



ELECTRICAL
SURGICAL
APPARATUS

BOSTON
PHILADELPHIA

Victor goods can be de

CABLE A1 ELECTRIC

CATALOGUE No. 32

OF

VICTOR ELECTRO-SURGICAL APPARATUS

HIGH FREQUENCY APPARATUS,	X RAY COILS,
GALVANIC AND FARADIC OUTFITS,	FINSSEN RAY OUTFITS,
CAUTERY TRANSFORMERS,	ELECTRODES,
EAR AND EYE MASSEUR PUMPS,	WALL PLATES AND CABINETS,
SHUNT CURRENT CONTROLLERS,	SURGICAL DRILLING ENGINES,
AIR COMPRESSORS,	MOTOR-GENERATORS,
SINUSOIDAL MACHINES,	HEAD LAMPS,
AIR HEATERS,	EYE MAGNETS,
VIBRATORY MASSAGE APPARATUS,	
MOTORS, RHEOSTATS, PORTABLE	
BATTERIES, ETC., ETC.	

MANUFACTURED BY

VICTOR ELECTRIC COMPANY

Main Office and Factory: 55-57-59 and 61 Market Street

CHICAGO, ILL.

New York Branch House: 110 East 23rd Street

WE HAVE DIRECT REPRESENTATIVES AND AGENCIES IN

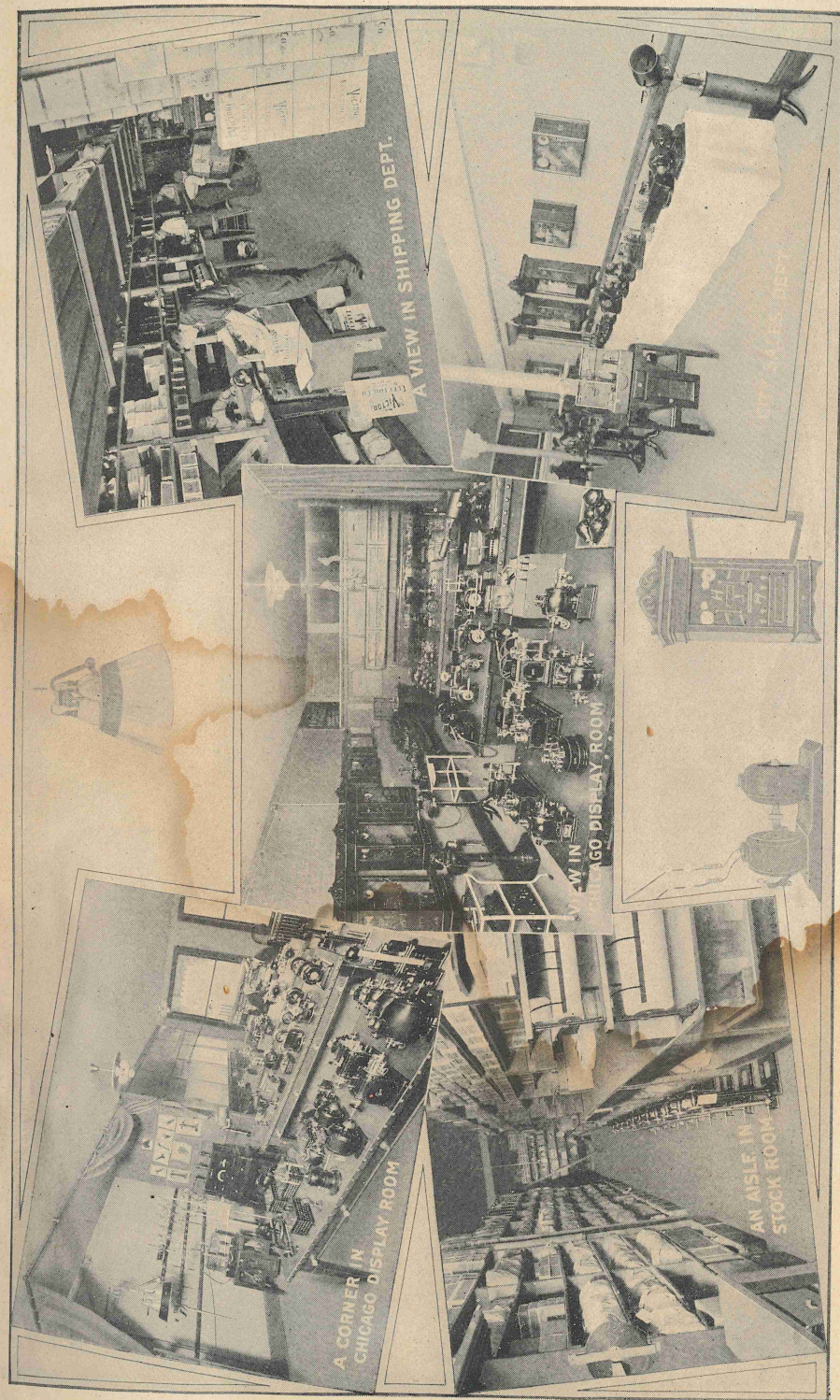
NEW YORK
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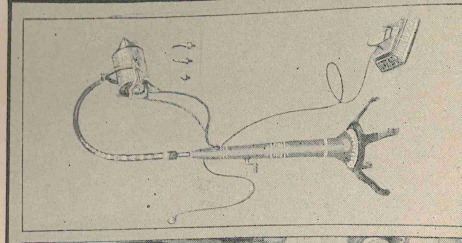
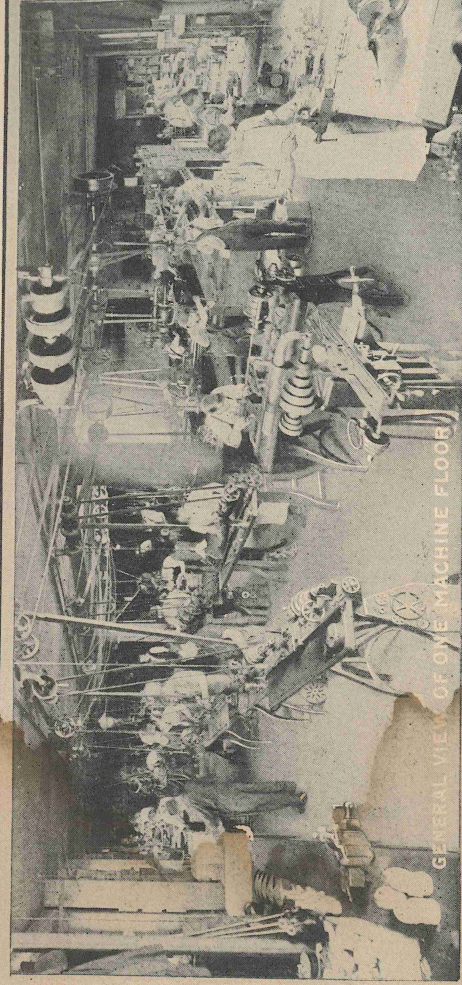
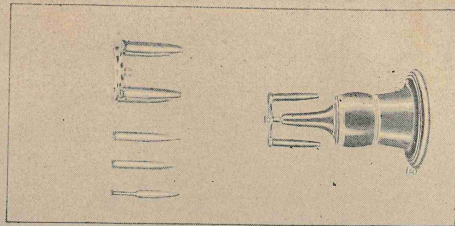
BALTIMORE
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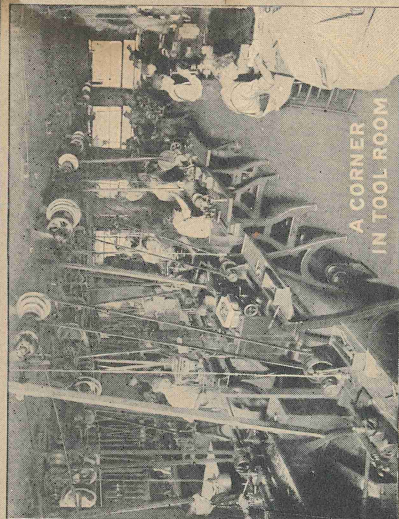
Victor goods can be bought of any reputable dealer in Surgical Instruments
and Physicians' Supplies.

CABLE ADDRESS: VICELECTRIC

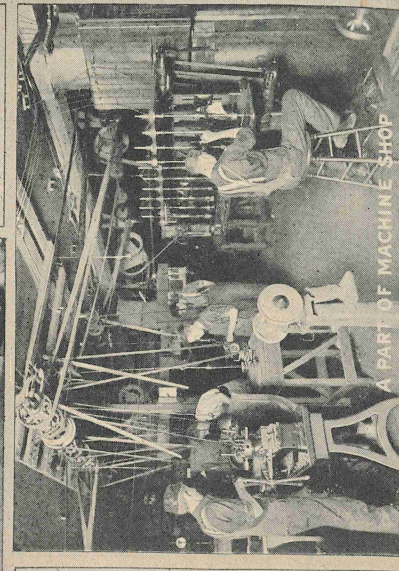
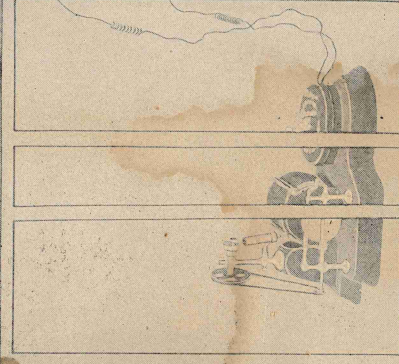




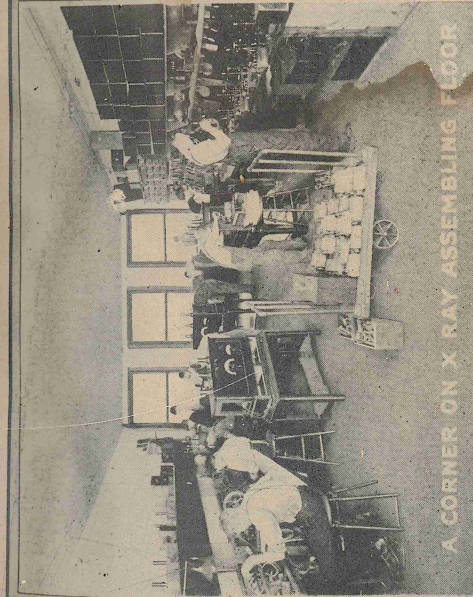
GENERAL VIEW OF ONE MACHINE FLOOR



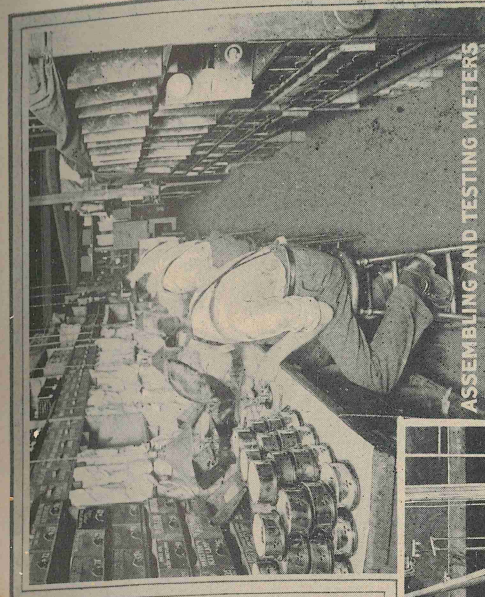
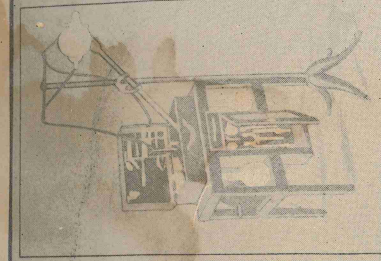
A CORNER
IN TOOL ROOM



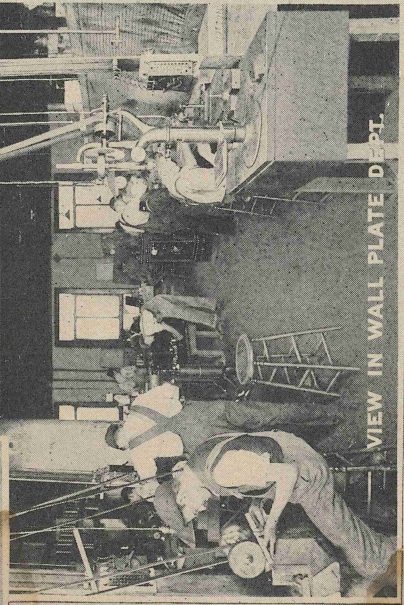
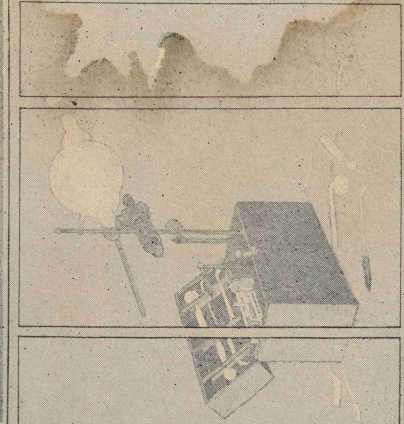
A PART OF MACHINE SHOP



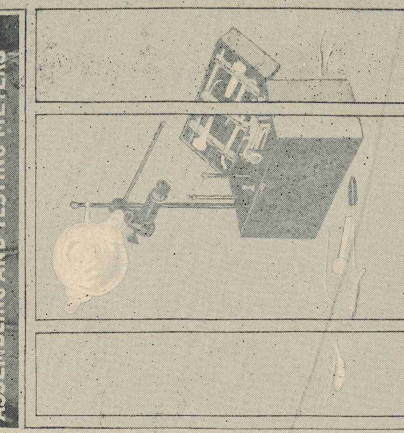
A CORNER ON X RAY ASSEMBLING FLOOR

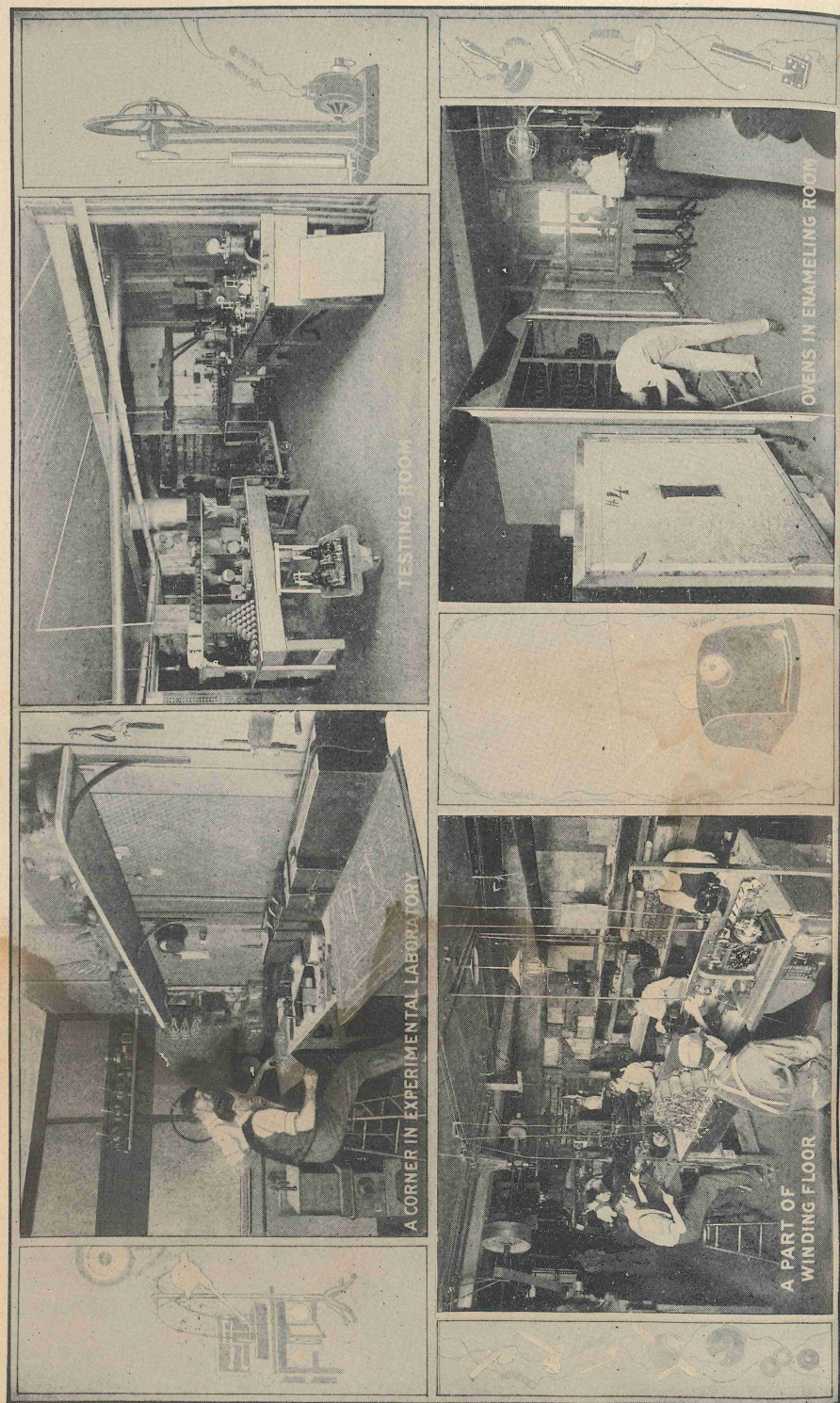


ASSEMBLING AND TESTING METERS



VIEW IN WALL PLATE DEPT.





INTRODUCTORY.

THE PHYSICIAN is never so completely at the mercy of the manufacturer or dealer as when he is purchasing electrical appliances; experience may have taught him how to intelligently choose almost all other instruments needed in his work, but nothing short of a thorough technical electrical education would enable him to determine as to whether an electrical apparatus would **properly** perform its functions.

Thus the manufacturer catering to the electrical needs of the Medical Profession has resting upon him a responsibility greater than in some cases he seems to realize.

We have a full comprehension of our responsibility and our patrons may be assured that the designers of Victor apparatus have a thorough knowledge of the electrical, mechanical and medical problems involved.

We have endeavored to build our business on a foundation of truth and fair dealing; the essence of our business policy is contained in the following statements of the things we **do not do** and the things we **do**.

Following are a few of the things we **do not do**:

We do not make any misrepresentations in our advertising matter.

We do not claim to give two, three, or more dollars' worth of value for one dollar.

We do not want your money if we can't give you what you want or need.

We will not sell an instrument unless its use has been indicated and endorsed by competent medical authority.

We do not charge you one price and your neighbor another.

Here are a few things we **do**:

We guarantee all our goods for two years from date of purchase. We **keep** our guarantee.

Our aim is to give the **BEST** for the **LEAST** money. In many cases our **per cent** of profit is less than others make on cheap goods sold at cheap prices. It is well to remember that the cheapest goods must yield a profit, and that on the other hand no manufacturer or merchant can long exist in a competitive field if his prices are unfair or exorbitant. On many items our prices will be found as low or lower than are being asked for goods of inferior quality—in these cases through our superior manufacturing facilities we have been able to lower the cost without affecting the quality.

We will answer as fully as possible every question asked relative to our goods and their uses.

If we have not what you want we will tell you so at once and, if possible, advise you where to get it.

Our goods are in the hands of every reputable dealer in the United States and they all know us; ask your dealer and he will undoubtedly back our guarantee with his own.

If you order from your dealer, your order will receive the same attention as though you ordered direct from the factory. If you order direct from us please describe your current. If it is direct we must know the voltage; if alternating we must know both the voltage and alternations.

We have correspondents who are at your service.

NOTE.

Our success and the excellent reputation of Victor goods has brought forth the usual crop of imitators and we suggest that our patrons, when in any doubt as to the genuineness of an instrument offered as a Victor, look for our trade mark  which appears on every article of our manufacture.

Illustrations frequently appear in the Journals and in the circulars of other manufacturers, that are identical with our cuts, we wish to state positively that in **EVERY** instance of this kind our competitor has paid tribute to the Victor reputation by copying our cuts, hoping thereby to make it appear that his product is up to the Victor standard.

TERMS AND INSTRUCTIONS FOR ORDERING.

All prices are for delivery F. O. B. Chicago.

Freight charges from Chicago are added on deliveries made from Pacific Coast stock, this charge averages 5 per cent on catalog list.

We allow a discount of 5 per cent from catalog prices for cash with order or C. O. D. Customers not known to us and desiring goods shipped C. O. D. must accompany order with sufficient cash to cover transportation charges. When so requested we will ship goods by express C. O. D. with privilege of examination.

We extend credit to reliable physicians who do not find it convenient to pay spot cash, but applications for credit must be accompanied by reference, as to reliability, to another manufacturer, a dealer, or a local banker.

Where goods are sold on time prices are subject to no discount and 6 per cent interest is charged on deferred payments.

All goods are guaranteed to be exactly as represented or money refunded, there are no strings attached to this guarantee. Those unacquainted with us are referred to the R. G. Dunn & Co. or Bradstreet's Mercantile Agency as to our responsibility, and if requested, we will gladly send you a list of our customers in your vicinity.

All goods cataloged are regularly carried in stock and we can usually ship on same day order is received.

Where no shipping instructions are given, orders calling for heavy goods will be sent by freight, but where express charges are only slightly in excess of freight, goods will be expressed: very light articles such as electrodes, etc., are usually sent by mail. In ordering it is best to give catalog page as well as name of article, and if the apparatus ordered is for use on an electric lighting circuit always state whether the lighting current is direct or alternating, if direct state the voltage, if alternating state voltage and number of alternations, if in doubt ask the Lighting Co.

When goods are returned to us either for repairs or credit, transportation charges should be prepaid, and a tag bearing the customer's name and address should be attached to the article.

All correspondence should be addressed to the Victor Electric Co. and not to individuals, to insure its being given immediate attention.

OUR GUARANTEE.

We guarantee all motors, instruments and apparatus manufactured by us, to be in first class working order and free from defects when they leave our factory, and with the exceptions noted below, we will make **Free of Charge** any and all repairs that may be necessitated because of defective material or workmanship for a term of two years from date of purchase.

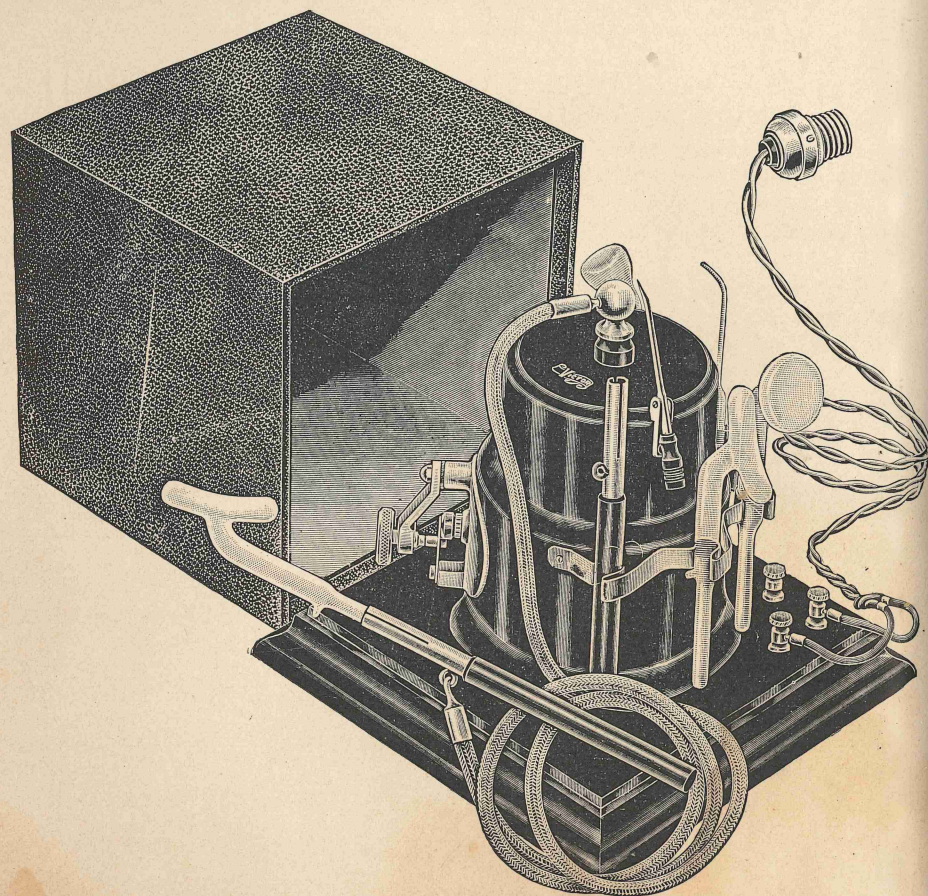
Massage cables and sheaths are guaranteed for one year; lamps and heating tubes and units are not guaranteed.

X-Ray tubes, vacuum electrodes and all articles of glass are carefully packed and if broken in transit the transportation company can usually be held responsible. In such cases the local agent of the transportation company should be at once notified, meanwhile the packing box and material must be left as nearly as possible just as received.

We do not pay repair bills incurred without consulting us; if goods are defective notify us at once.

VICTOR GEM HIGH FREQUENCY TREATMENT COIL.

WILL OPERATE ON EITHER DIRECT OR ALTERNATING CURRENT. FOR VACUUM ELECTRODE TREATMENTS ONLY.



Price complete, with all accessories as shown, - - \$25.00

It is hardly conceivable that any practicing physician could be found who is not, at least to some extent, interested in the therapeutic application of high frequency currents, but, quite naturally, many of them hesitate to invest the rather large sum heretofore required in order to obtain any reliable apparatus for the generation of these currents.

In designing the Gem outfit, it has been our idea to place at the disposal of the physician desiring to test for himself, some of the claims made for this modality, a comparatively low-priced apparatus, yet, having sufficient capacity to deliver high frequency currents in large enough volume to do really effective work in vacuum electrode treatments.

This little high frequency oscillator will also be found very useful as an adjunct to heavier and more elaborate X-ray and high frequency equipments. In all ordinary vacuum electrode work, it will be found just as effective as any of the larger outfits, and for this class of work it will be found much more convenient and far more economical in operation. Furthermore its portability makes it invaluable to the general practitioner, as it can easily be carried to the patient's bedside, thus greatly extending its field of usefulness.

RANGE OF THE GEM OUTFIT.

This coil is capable of breaking down an air gap of one inch, this being the extreme distance across the adjustable gap at the main terminals. The volume of energy transformed is sufficient to excite all vacuum electrodes ordinarily met with, regardless of shape or size. This, we believe, cannot be truthfully said of any similar apparatus heretofore offered at anything like this figure.

We do not claim that the Gem outfit can be used for X-ray work of any kind, neither will it deliver high frequency currents in sufficient volume for general D'Arsonvalization as in Auto Condensation, Auto Conduction, etc. If these heavier currents are desired, we recommend the larger type of Victor high frequency apparatus, upon which we will gladly send literature on application.

MANIPULATION.

The connections and regulation of the current are so simple as to hardly require explanation. On the right hand side of the coil will be found three ordinary binding posts marked "110," "0" and "104" respectively. If the 110 volt direct current is available, connect the attachment cords to "110" and "0". If the alternating current is to be used, connect the attachment cords to "104" and "0".

The current is regulated solely by a knurled thumb screw shown on the left hand side of the coil. Turning this to the right, increases the intensity of the current and turning it to the left, vice versa.

ACCESSORIES.

With these outfits are furnished one pair of attachment cords for connection to any electric light socket, one extra heavy high frequency electrode cord, one electrode handle and four vacuum electrodes, viz., external throat, surface (for general application), urethral and eye.

WEIGHT AND DIMENSIONS.

The Gem Coil, including all electrodes, handle, attachment cords and protecting case, weighs only five pounds.

The base is ten inches square over all and the machine with the cover in place is ten inches high.

CONSTRUCTION.

The same material and construction are used in the Gem outfit as will be found in the larger sizes of Victor high frequency apparatus. The transformer is insulated with the regular high potential insulation and in addition is encased in an airtight compartment and filled with a waxlike compound, the air being extracted from this compound by a special process, giving as perfect an insulation as possible.

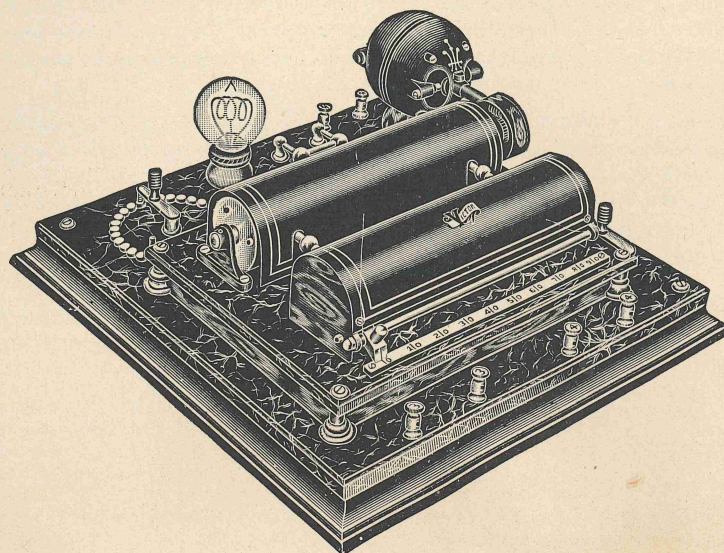
The condenser is made of lead foil and the highest grade of India Mica.

The contact points on the spark gap regulator are made up of the best alloy of non-fusible metals that is obtainable. These points should last, at the least possible calculation, from eighteen months to two years and they can be renewed for a few cents and put on the machine in less than a minute's time.

FINISH.

The Gem outfit is attractive in design, the transformer, condenser, etc., being enclosed in a hard rubber hood or bonnet and heavy brass spring clips surrounding the coil for holding the handle, electrodes, etc.

The protecting case is substantially made of wood and covered with a high grade of black leatherette.

VICTOR MULTIPLEX SINUSOIDAL OUTFIT

Price including pair of electrode cords and spongio piline electrodes.....\$85.00
 Additional for milliampere meter if desired..... 12.00

So many forms of apparatus for the production of so-called Sinusoidal Current have been offered to the profession, and electro-theraputists who have written about this modality have usually been so vague in the characterization of the particular form of sine wave indicated in certain conditions that the average physician has a rather vague impression as to just what the true Sinusoidal Current is.

Briefly stated, a sine wave or sinusoidal current is a current which rises from zero to a certain maximum, then, without breaking, drops or recedes to zero, and without pausing, rises to the same maximum in the opposite direction, again receding, without breaking, to zero, and continuing thus to rise and fall without intermission or break, first flowing in one direction, then the other.

Very few of the sinusoidal machines heretofore available for the use of the electro-therapist have been so designed as to give him adequate control of the length of the sine wave and the voltage as well. In fact, the majority of machines have simply delivered a sine current of a fixed periodicity. These machines have done very well as far as they have gone, but their usefulness has been restricted to the few indications calling for the particular length of sine which they are capable of delivering.

In the multiplex outfit, we have succeeded in giving the physician full and independent control of the length of the sine wave, and of its voltage, the range being sufficient to cover every possible indication.

In the treatment of intestinal and other involuntary muscles, a very slow sine is indicated. The Multiplex can be adjusted to give as low as 10 cycles per minute. This means that the muscle can be stimulated to contraction and as gradually relaxed ten times per minute. From this point, the rapidity or length of the sine can be gradually increased and maintained at any point desired, up to 100 per minute. This range covers practically every indication for the slow sine wave.

A fact worthy of mention is that nervous patients will tolerate a higher voltage and a greater quantity of current delivered through the medium of the slow sine wave than in any other form, with the possible exception of extremely high frequency currents.

The rapid sinusoidal is indicated in cell and nerve stimulation, in cases where rapid muscular contractions are desired, etc. The Multiplex will deliver the rapid sine over a wide range as to wave length and voltage. The maximum rapidity is approximately 7,200 per minute, maximum voltage 70.

A third form of sinusoidal current can be obtained from the Multiplex which never before, to our knowledge, has been made available; this we have termed Multiplex, or surging sinusoidal. It is a long sine wave upon which is imposed a short or rapid sine wave. It will at once occur to the experienced electro-therapeutist that this will be of great value where it is desired to obtain slow muscular contractions and at the same time to give cell stimulation. This modality is enthusiastically spoken of by all operators who have had an opportunity to test its efficacy, and the prediction is made that it will prove as useful, and perhaps may be of greater service than any of the older forms of electro-therapeutic currents.

In addition to the various forms of sinusoidal currents above outlined, provision is made on the Multiplex for obtaining a perfectly regulated galvanic current, and a regulated surging galvanic current, this latter differs from the sinusoidal in that there is no change of polarity, the current is made to gradually rise and fall or intensify and diminish while flowing constantly in one direction. Thus the polar effects will continue to be manifest, though the current possesses in every other respect all the characteristics of the sinusoidal. Particular attention is directed to the fact that all the currents delivered from this apparatus are under perfect and independent control as to voltage. To illustrate, it is possible to obtain a sine wave of say 15 per minute at a voltage of 5, then, without altering or in any way disturbing the sine of the current, the voltage may be increased to a maximum of 70, the voltage control being of such a character that the graduations are in a very small fraction of a volt, the same voltage control being obtainable regardless of the length of the sine.

The Multiplex is entirely self contained, and is ready to be attached to any electric light socket. It is calculated for the direct current, or for use in connection with a small generating set such as the one illustrated in our catalogue, if no direct current is available.

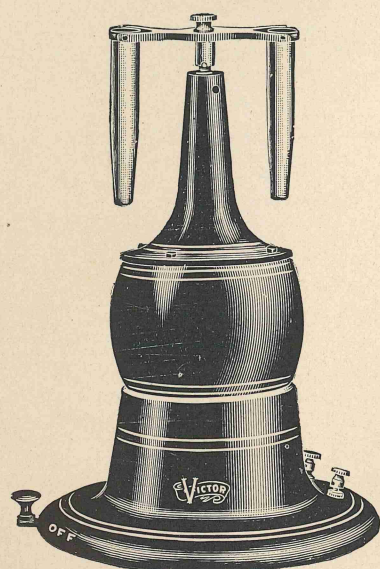
It can be supplied for connection direct to an alternating current, but when used in this way, all of the currents delivered at the patient's binding posts partake of the character of the alternating supply current, thus greatly restricting its range of usefulness.

One method that may be employed where alternating current only is available, is to install a group of 40 or more battery cells, either wet or dry, the Multiplex can then be so wired and arranged that the alternating lighting current is used to run the motor which operates the switching mechanism, while through an independent circuit the battery cells supply the current which is passed through the resistance drums to the patient.

There is no extra charge for arranging the outfit in this way aside from the cost of the battery cells.

Milliampere Meter.—A meter may be employed if desired with the Multiplex. We will supply one with the outfit for \$12.00 additional, or any detached meter can be used by cutting it in series with the patient. This is accomplished by attaching one of the treatment electrodes to one side of the meter and connecting the other side of meter to the patient's binding post on the Multiplex to which this electrode would otherwise have been attached.

THE VICTOR ELECTRIC CENTRIFUGE



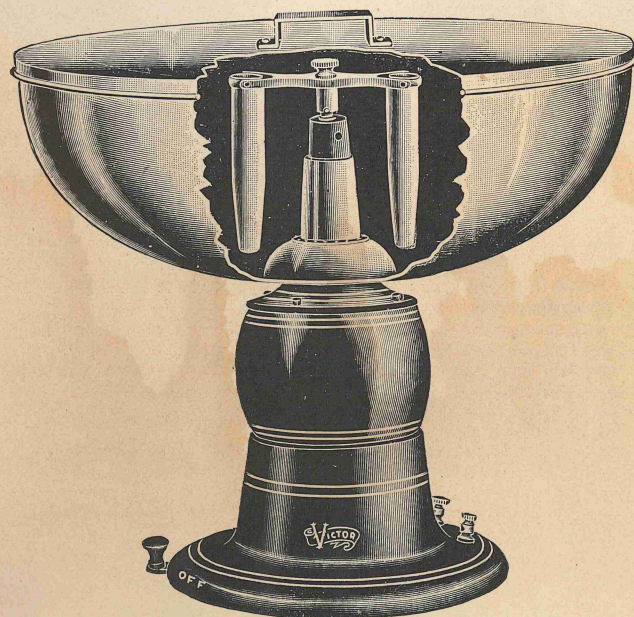
Price of Victor No. 1 Centrifuge with speed controlling rheostat and two sedimentation tubes (one graduated) with protectors.

For Direct Current 110 to 220 volts \$30.00

For 60 Cycle Alternating Current \$30.00

If 4-arm attachment is wanted in place of 2-arm, add \$3.00.

Prices for Currents of other Cycles and Voltages given on request.



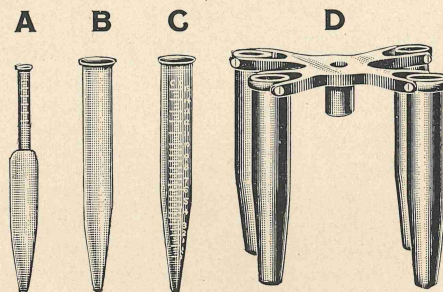
DOMES PROTECTOR FOR VICTOR CENTRIFUGE

The Dome Protector is designed to protect the operator and others from flying particles or liquids and to avoid the possibility of any person or object coming in contact with the rapidly moving arms. By lessening the air resistance it increases the speed of the Centrifuge under the same load conditions, thus adding to its capacity.

Made of heavy spun copper.

No trouble to put it in place.

Price.....\$7.50



A—Special tube for milk analysis accurate within one-fifth of one per cent of fat.....50c.

B—Plain ungraduated tube.....15c.

C—Graduated urine tube.....55c.

D—Four tube attachments complete, can be used when desired on Victor Centrifuge in place of regulator, two tube single arm. Useful in laboratories. Dome protectors should always be used with attachment **D**, without glassware\$5.00

HEMATOCRIT.



Price of Hematocrit (as shown) with two graduated blood tubes and two plain Sputum tubes.....\$5.00

Speed indicators or gauges (not shown) from.....\$1.00 to \$2.50

THE VICTOR ELECTRIC CENTRIFUGE

No one now questions the value of the Centrifuge for the analysis of blood, urine, milk, water, etc. The advantages of electrically operated Centrifuges over those operated by hand or water power are so obvious as hardly to require mention, briefly stated, the electric Centrifuge—Is far more accurate because of the ability to obtain and maintain any speed desired—does away with the severe and taxing manual labor of hand operation,—saves time, is quiet in operation and in every way more convenient.

After reading the following description of the Victor we believe you will agree, that it would hardly be possible to construct an apparatus better suited to the exacting requirements of this method of analysis.

POWER. The motor has ample power to insure steadiness and uniformity of speed under varying load conditions.

SPEED. The maximum speed of the Direct Current Outfit is 2200 R. P. M. Alternating Current Outfit 1600 R. P. M., at these speeds the machine will carry arms and tubes of sufficient length to develop ample centrifugal force for blood precipitation, sputum examination, etc.

SPEED REGULATION. It is of prime importance that the speed of the centrifuge be under good control, there are sure to be occasional variations of current and other factors that would prevent the maintaining of a uniform speed under all conditions, unless some speed regulator were provided, then extremely fragile sediment must be handled with medium speed, while very light sediments require the highest speed to produce sedimentation.

All Victor Centrifuges, whether for direct or alternating current, are provided with speed regulator having a number of steps.

Provision is made so that the speed may be determined by means of any ordinary speed gauge.

RIGIDITY. It is essential that the utmost steadiness be maintained in operation, furthermore, it is necessary, after precipitation has taken place, and the tubes come to rest that they do so gradually, and when they finally come to a perpendicular position that they meet with no obstruction, for should they be subjected to even a slight jar it would frequently result in the recombining of the fluids in the tube and of course the result of the test would be nil. In the Victor Centrifuge the necessary rigidity and steadiness is obtained, first, by the use of a broad, heavy base, second, an unusually heavy armature is used, this being carefully and accurately balanced. Other means are also provided to prevent the striking of the tubes when the machine is stopped.

IRON CLAD. A glance at the illustration will show that the machine is completely encased in an iron outer jacket. This thoroughly protects all of the working parts from accidental injury and from the spilling of fluids, etc. It also makes it possible to thoroughly cleanse the entire exterior.

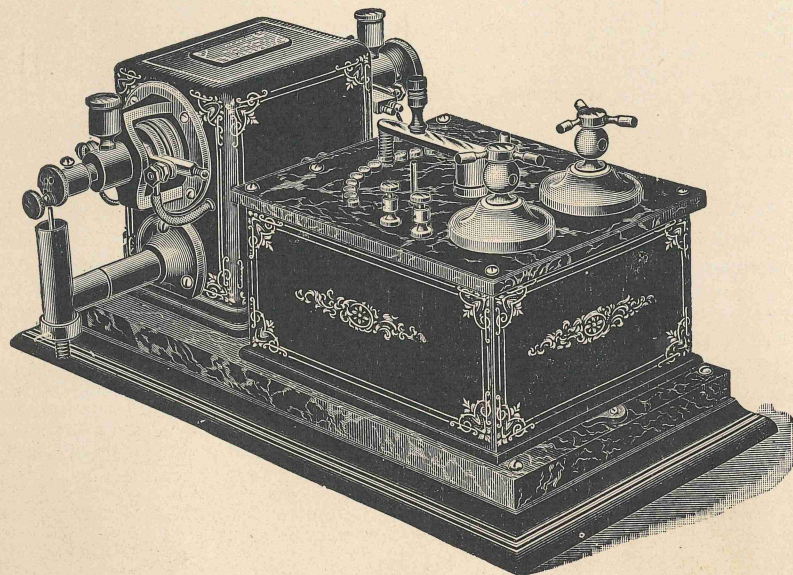
BRUSHES. The brushes which transmit the current to the rotating commutator and thence to the armature are the only parts that require occasional renewal. These brushes are easily accessible through the broad opening at the bottom of the outfit.

DURABILITY. The bearings and the commutator are the only parts on an electric centrifuge that are subjected to frictional wear. In the Victor Outfit the bearings and commutator are at least twice as large as the ones ordinarily used in machines of this size so that the machine being iron clad and having wearing parts double the size actually required, is practically indestructible, and the cost of maintenance is so small as to be negligible.

FINISH. The iron exterior of the outfit is first ground and polished, then treated with four baked coats of black japan, resulting in a highly polished black surface, impervious to acids and alkalis.

No. 2 TRANSFORMER WITH EAR PUMP ATTACHED. FOR AURAL, EYE, AND FACIAL MASSAGE.

Patented May 19, 1903.



Price (without attachments) for 110 or 220 volt direct current.....	\$60 00
Price with ear pump.....	75 00
Price additional wound for 500 volt direct current.....	25 00

This apparatus is designed to entirely replace the storage battery for cautery work where the direct current is available.

The outfit consists of a rotary transformer which converts the 110 or 220 volt direct current, to an alternating current, and a separate induction transformer which reduces the voltage and increases the quantity to a point suitable for cautery work. Binding posts are provided for attaching examination lamps.

There is no metallic connection between the cautery knife and the street current; the secondary winding from which the cautery current is obtained is entirely insulated from the primary or operating current, thereby rendering its use absolutely safe; the current flow is under perfect control.

The motor transformer has sufficient power to operate nasal drills and trephines and is arranged so that a cable, sheath and hand-piece can be directly attached if desired; the speed of the motor is under perfect control.

A small, specially constructed air pump is detachably connected to one end of the motor; this pump we believe meets the requirements for aural and eye massage better than any similar apparatus heretofore offered to the profession; the arrangement of valves is such that either compression alone, exhaust alone, suction with release, or vibration can be obtained at the will of the operator.

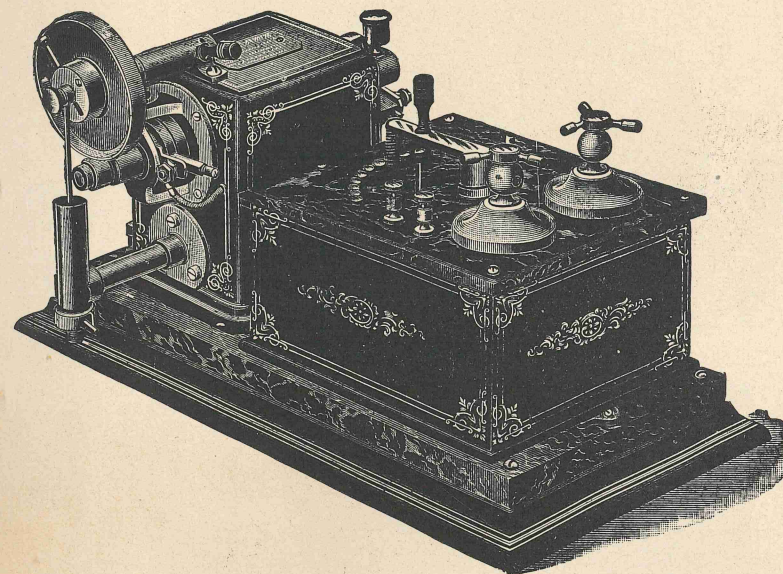
The length of stroke is adjustable, and the range of speed is from less than 100 to 2,000 strokes per minute.

See illustrations and description elsewhere (in this catalogue) of attachments for pneuma massage of the eye and ear.

Sinusoidal current may also be drawn from this instrument. This current is highly endorsed by some specialists for the treatment of atrophy of the optic nerve.

No. 2 TRANSFORMER WITH PYNCHON EAR PUMP. FOR AURAL AND EYE MASSAGE.

Patented May 19, 1903.



Price with pump attached, as shown, for 110 or 220 volt direct current.....	\$85 00
Price as shown in illustration, wound and fitted for No. 1 massage handle, but not including No. 1 handle.....	90 00
Price of shunt rheostat for connecting above outfit to 500 volt current.....	25 00

This apparatus, with the exception of the ear pump, is in every respect the same as the one shown elsewhere in this catalogue.

The changes in the ear pump were made at the suggestion of Dr. Edwin Pynchon, of Chicago.

Instead of being connected directly to the motor shaft, a reducing gear is used so that the pump can be run at a very low speed while the motor is allowed to run at a much higher speed. The points gained by this are absolute steadiness, and the ease with which the pump is thrown in and out of service, which is accomplished by a single movement of the lever shown on top of the motor.

The total length of stroke obtainable is $1\frac{1}{4}$ inches. Any length within this limit can be used as desired. The operator is aided in the adjustment by a graduated scale which is attached to the sliding block.

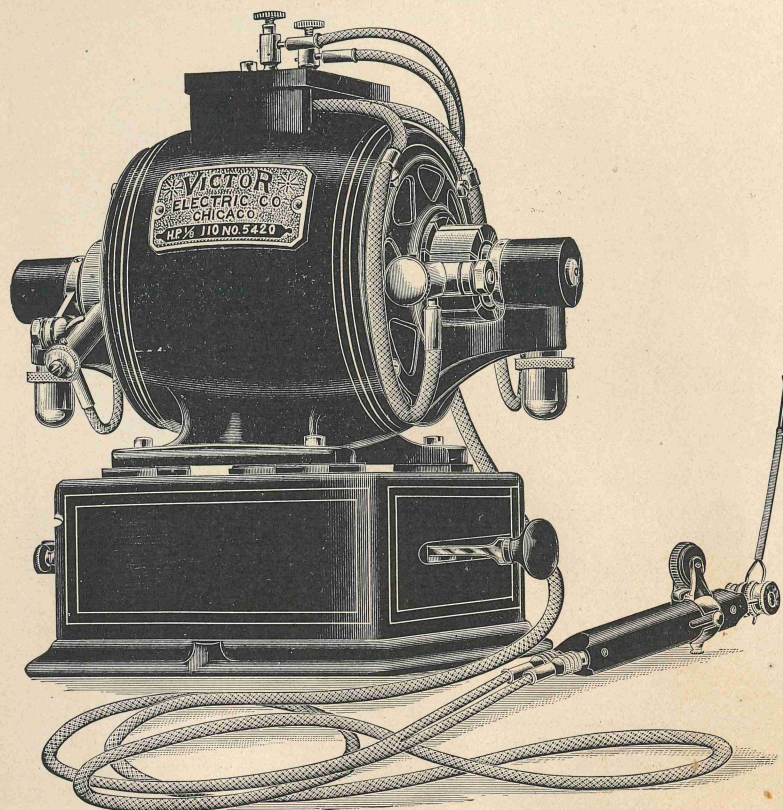
With this pump either suction alone, suction with release, compression alone, or vibration, which is alternate suction and compression, can be obtained.

On one end of the motor shaft a fitting is provided to which a cable sheath and hand piece for nasal drill or saw can be attached, or our No. 2 small massage handle.

If it is desired to use the No. 1 handle an extra charge is made and nasal drill can not be attached without a special fitting.

A very interesting paper on Pneumatic Massage in Aural Practice was read by Dr. Edwin Pynchon at the seventh annual meeting of the Western Ophthalmologic and Otolaryngologic Association, held in Chicago, April 10th to 12th, 1902. We have a limited number of reprints of this paper, which we shall be pleased to send to those who are interested in this subject.

VICTOR NO. 8 CAUTERY TRANSFORMER. FOR DIRECT CURRENT.



Price for 110 volt direct current\$35 00
Price for 220 volt direct current 38 00

Cautery handle and cords are not furnished with this instrument.
(Not furnished for 500 volt current.)

The apparatus here illustrated is designed for the use of eye, ear, nose and throat specialists, who require cautery current but do not care for the ear pump and nasal drilling attachments as furnished with our No. 2 Transformer.

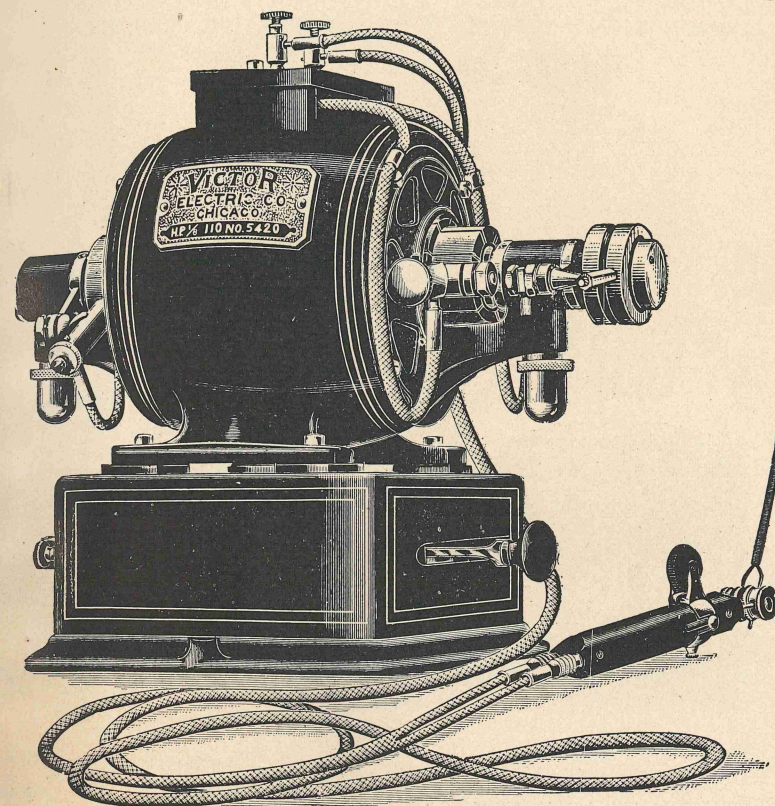
This instrument does not deliver as large a volume of current as our No. 2 outfit, nevertheless it will heat any of the cautery electrodes illustrated in our catalogue.

By the use of this outfit the storage battery may be entirely dispensed with; where the direct current is available all that is necessary is to attach it to any electric light socket.

The current flow is perfectly controlled by means of the lever projecting from the base. Current suitable for operating diagnostic lamps is obtainable and under perfect control.

Quiet in operation, artistic in design, finely finished, and so substantially constructed, that with ordinary care it is good for years of service with practically no deterioration.

VICTOR NO. 9 TRANSFORMER. DELIVERS CAUTERY AND SINUSOIDAL CURRENTS.



Price for 110 volt, direct current\$47 00
Price for 220 volt, direct current 50 00

Cautery handle and cords are not furnished with this instrument.

The above apparatus is very similar to our No. 8 Transformer, but is so constructed that a sinusoidal current is generated without in any way conflicting or interfering with the delivery of the cautery current.

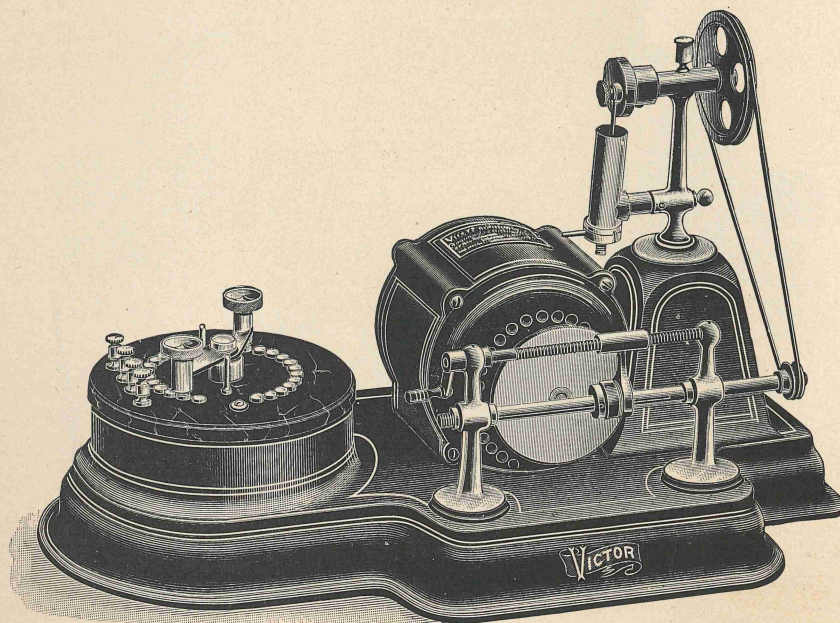
When attached to a 110 or 220 volt direct current this machine will deliver cautery current of sufficient strength to heat any of the cautery electrodes illustrated in our catalogue, current suitable for illuminating diagnostic lamps and instruments, and a sinusoidal current of a maximum voltage of 75.

The cautery and diagnostic lamp currents can be perfectly controlled by means of the lever projecting from the base. The sinusoidal current can be controlled in a measure, but we advise that it be carried through a wall plate or some suitable form of shunt rheostat so that a perfect and independent control of voltage can be obtained.

In convenience, utility, durability, design and finish this apparatus is fully up to our usual standard.

No. 6 TRANSFORMER.**COMBINATION INSTRUMENT FOR ALTERNATING CURRENT.**

Patented May 19 and June 30, 1903.



Price of outfit as shown with ear pump for 104 to 115 volts, 60 cycle alternating current..... \$100 00
 Additional for 125 to 133 cycle current..... 10 00

The No. 6 transformer is designed to give precisely the same service when supplied with an alternating current as is obtained from the No. 2 transformer on the direct current.

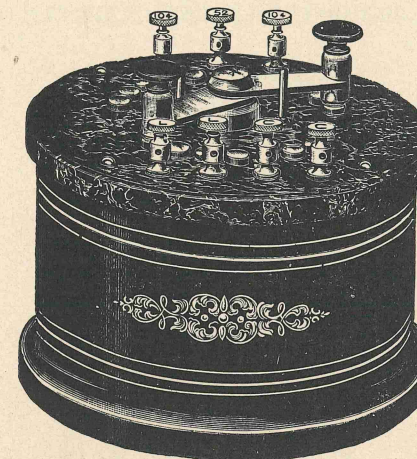
The ear pump shown is the Pynchon pump with the difference that its speed in this case is controlled entirely by mechanical means instead of only partially so as is the case in the direct current outfit. Its speed is under such perfect control that any number of strokes can be obtained from 60 to 4,000 per minute and the action is steady and uniform throughout this range.

In addition to operating the pump provision is made for attaching cable, sheath and hand piece for nasal drills, saws, trephines, etc., and for attaching the Victor Vibratory Massage Handle, the same speed controller being used as is used for the ear pump.

The transformer for cautery and diagnostic lamps is the same as shown separately elsewhere in this catalogue.

The outfit is mounted on a suitably designed and finished base.

The entire instrument is finished in jet black, nickel and oxidized copper, and no pains has been spared to bring it up to the usual "Victor" standard of excellence as to utility, durability and beauty.

ALTERNATING CAUTERY TRANSFORMER.

Price for either 52 or 104 volt current.....\$25 00

Above cut illustrates our cautery transformer for the 52 or 104 volt alternating current.

It is so arranged that the cautery knife can be heated and the diagnostic lamp lighted at the same time and each controlled independently; this controlling is done by means of switch levers so constructed that perfect and permanent contact is insured.

We wish to call attention to the high efficiency of this transformer. It consumes only a trifle more power than is being delivered at the secondary end; the majority of the transformers sold to the surgical trade are of the ordinary open coil type and waste from two to three times the power actually required for the work performed.

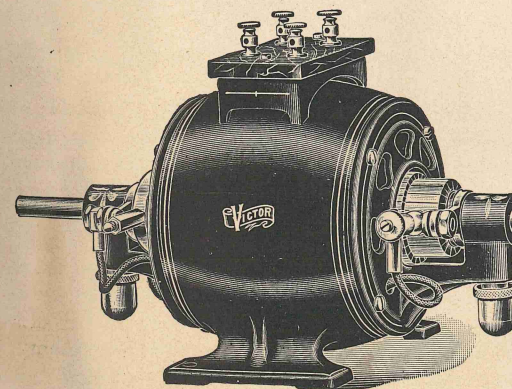
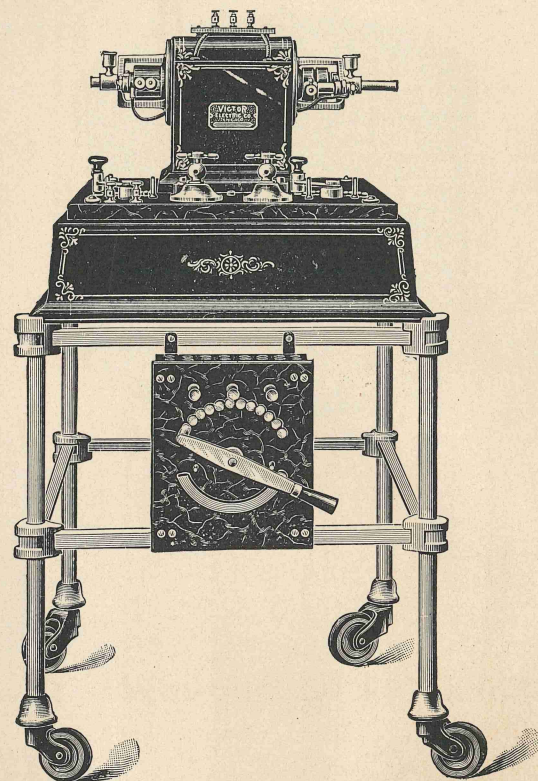
MOTOR GENERATOR OR SINUSOIDAL CONVERTER.

Illustration shows a motor generator which converts the direct to an alternating or sinusoidal current. By attaching an induction or alternating transformer to the secondary side, cautery current is obtained; a sinusoidal wave current is also produced which can be passed through and controlled by any of the Victor wall plates.

The motor is $\frac{1}{8}$ H. P. and can be used for operating nasal drills or for furnishing power for any purpose not requiring more than $\frac{1}{8}$ H. P.

If it is desired to operate a static machine, the $\frac{1}{4}$ H. P. machine will be required, and should be used in connection with our 11 point speed controller.

Price of $\frac{1}{8}$ H. P. for 110 and 220 volt current.....\$30 00
 Price of $\frac{1}{4}$ H. P. for 110 volt current..... 45 50
 Price of $\frac{1}{4}$ H. P. for 220 volt current..... 47 00
 Price of $\frac{1}{2}$ H. P. for 110 volt current..... 66 00
 Price of $\frac{1}{2}$ H. P. for 220 volt current..... 69 00
 Price of $\frac{3}{4}$ H. P. for 110 volt current..... 71 00
 Price of $\frac{3}{4}$ H. P. for 220 volt current..... 74 00

No. 3 VICTOR CAUTERY TRANSFORMER.**FOR USE ON DIRECT CURRENT 110 OR 220 VOLTS.**

Price of outfit complete with speed controlling rheostat, but without table.....\$150 00
 Price of table..... 15 00

This Transformer was originally designed for Andrew J. Downes, A. M., M. D., of Philadelphia, Pa., for the purpose of heating his electro-thermo hemostatic forceps (see The Journal of the American Medical Association, August 17, 1901, in which appears an article on Electro-thermic Hemostasis in abdominal and pelvic surgery, by Dr. A. J. Downes).

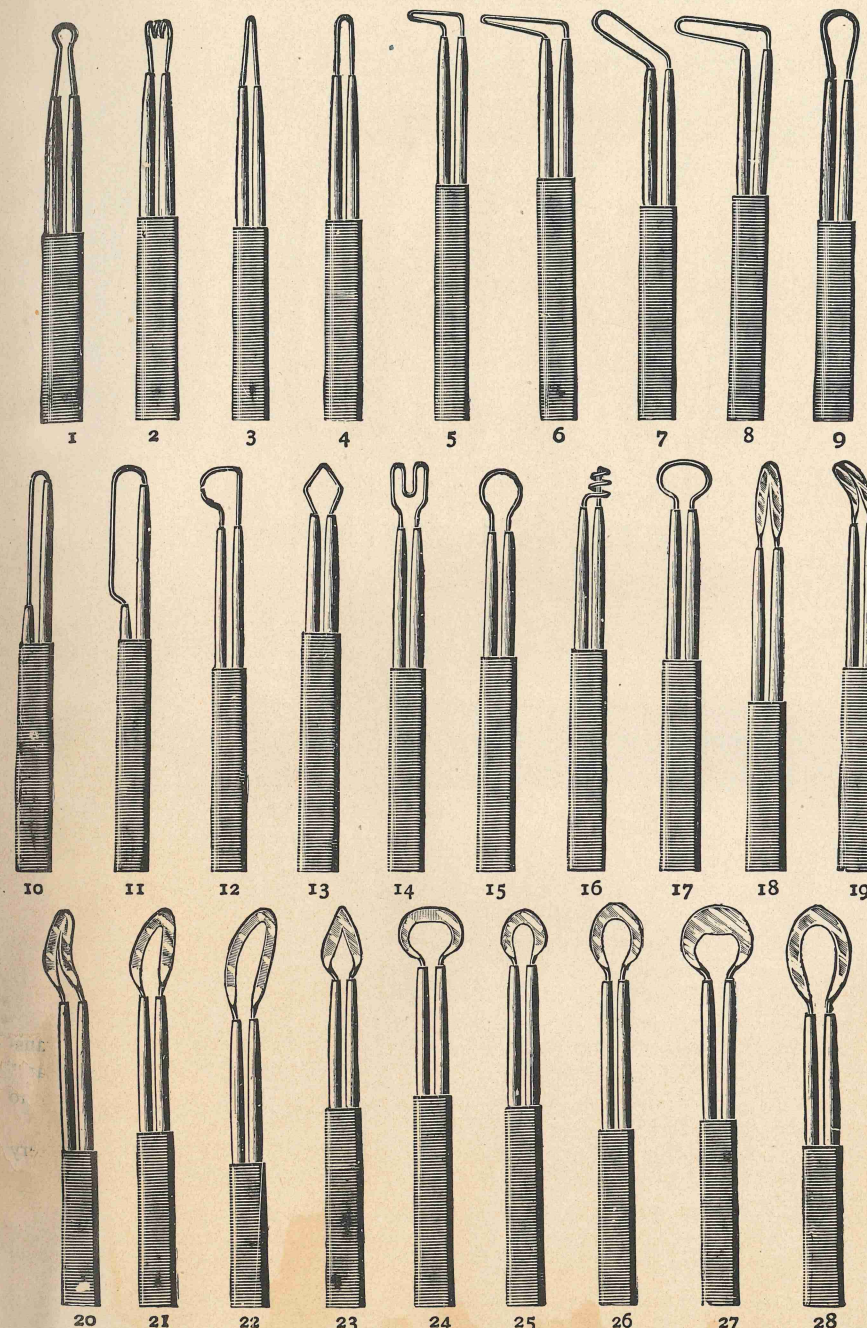
The apparatus consists of a $\frac{1}{2}$ H. P. motor transformer, suitable induction transformer and a speed controlling rheostat; it has a greater capacity than any other transformer on the market, and is the only one that will furnish more than enough current + satisfactorily operate the Botini Incisor.

Separate binding posts are provided for attaching a diagnostic lamp, and the cautery current and lamp can be independently controlled by means of separate switches.

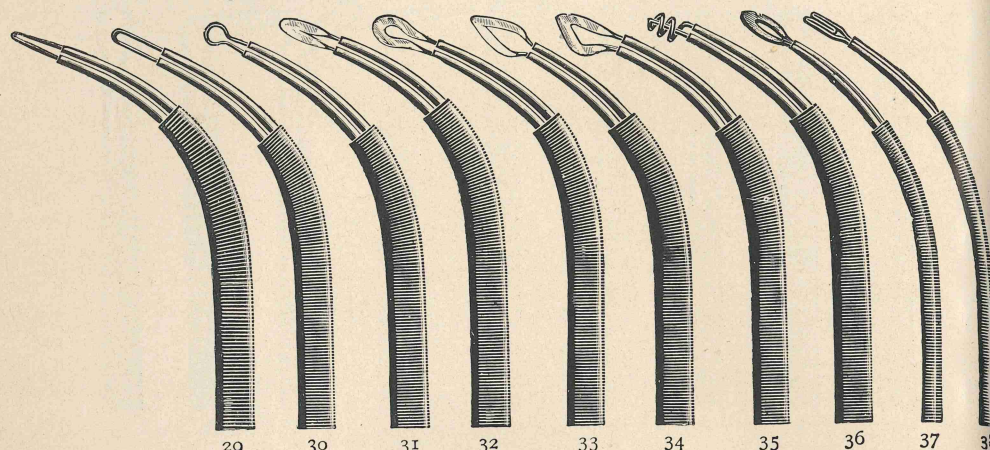
The motor can be used for operating a static machine, or for other power purposes within its capacity.

It is very quiet in operation, and the finish and workmanship are up to our usual standard.

We will furnish the outfit with or without the table; it can be placed on any table or pedestal of suitable strength.

CAUTERY ELECTRODES.

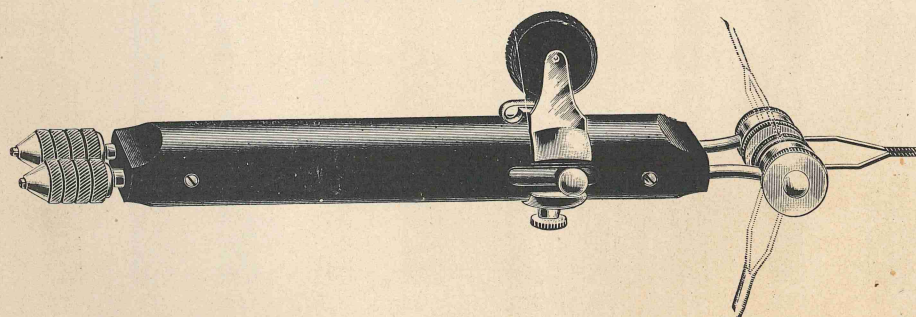
Price of electrodes, Nos. 1 to 19 inclusive and No. 25.....\$0 75
 Price of electrodes, Nos. 20, 21, 22, 23, 24 and 26..... 90
 Price of electrodes, Nos. 27 and 28..... 1 10

CAUTERY ELECTRODES—Continued.

Price of electrodes Nos. 29 to 38 inclusive \$1 00

VICTOR No. 1 CAUTERY HANDLE.

(Patent applied for.)



Price as shown with snare wheel.....\$4 75
 Price of handle without snare wheel..... 4 00
 Price of canulas 1 00
 Price of cautery cords, complete with tips, per pair..... 1 75

In the cautery handle here illustrated the chucks which hold the cautery electrodes are swiveled in such a manner that the knife or electrode after being inserted in the chucks can be moved to any angle desired, the convenience of this arrangement will be apparent at once.

The switch makes contact by sliding a plunger into a spring chuck or socket thus insuring perfect contact and great durability.

Chucks are used for holding the cord tips instead of the set screws ordinarily employed, thus there are no projecting thumb screws to give annoyance while handle is being manipulated.

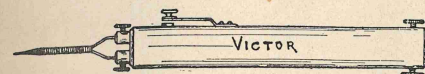
The snare wheel is placed in position by sliding over the handle, and it can be set at any point desired, with the wheel at any desired angle. A spring prevents the wheel from backing up. An ideal instrument for cautery work, finished attractively in hard rubber and nickel.

Our cautery electrodes are so constructed that it is impossible for the tips to become loosened, and a perfect, permanent contact is maintained between the copper holders and the platinum tips; they are insulated with closely wound silk.

VICTOR CAUTERY HANDLE NO. 2.

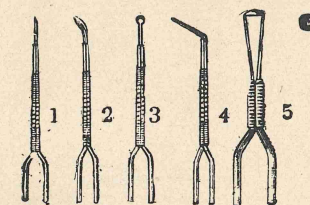
Price\$2 25

The No. 2 is a very serviceable handle made of hard rubber with nickel plated substantial set screw terminals. Has no snare attachment.

SPECIAL SMALL CAUTERY HANDLES FOR EYE WORK.

Price\$2 50

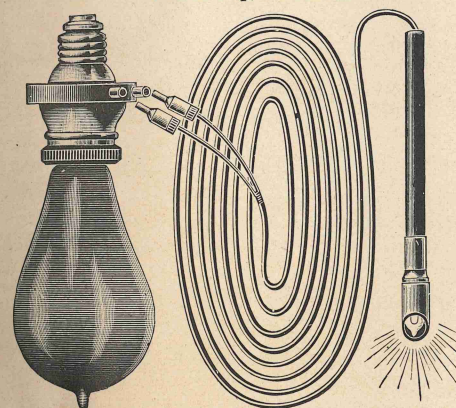
Price of cautery cords complete with tips for above handle 1 25

SPECIAL SMALL CAUTERY ELECTRODES FOR EYE WORK.

Price, 1, 2, 3, 4.....\$1 00
 Price, No. 5 1 25

DIAGNOSTIC LAMP AND RHEOSTAT.

Vetter Tap, Patented.



Accompanying cut illustrates a diagnostic lamp and rheostat for operating it on the electric light current.

This rheostat can be attached to any ordinary lamp socket; the diagnostic lamp can be attached and detached at will, there are no switch levers or contacts to give trouble.

The large lamp that is used for resistance is enameled black and emits no light whatever.

The small lamp is the same as those used in connection with batteries, being mounted to fit into a small socket and when burned out or damaged, is easily replaced in the same manner as the ordinary incandescent lamps.

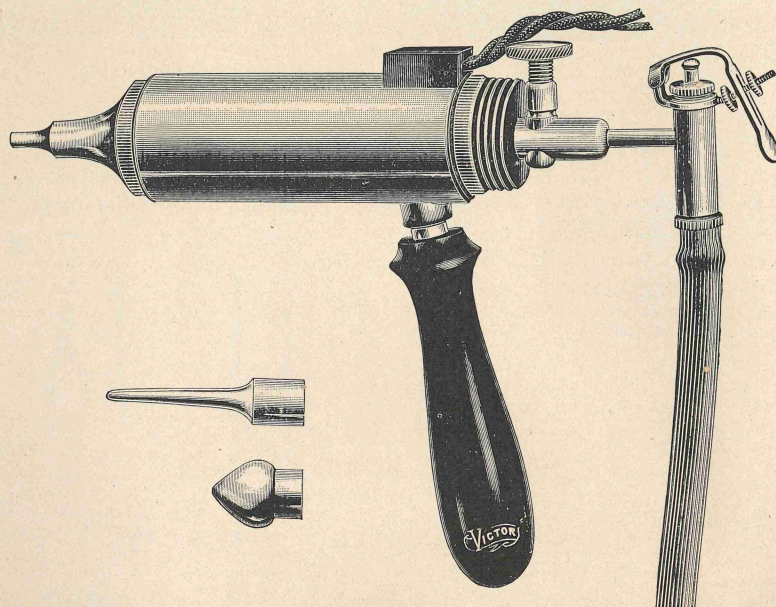
The light is intensely brilliant. Reflector is removable.

We can furnish the rheostat for the 110 volt direct or alternating currents.

The miniature lamp requires $3\frac{1}{2}$ volts and $\frac{1}{2}$ ampere and can be used in connection with any office battery or transformer; it can be used in connection with any of our Wall Plates or Transformers.

Price complete with rheostat as shown.....\$5 00
 Price of Diagnostic Lamp without rheostat..... 3 00

THE VICTOR ELECTRIC AIR HEATER.



Price complete, as shown, with two tips, without cut-off, for either direct or alternating current, 110 volts.....\$12 00
 Price of special rheostat for regulating heat..... 6 00
 Additional for 220 volt current..... 2 00

It is now generally acknowledged that superheating the medicated air used in the treatment of certain diseases of the ear and nose greatly enhances its value as a curative agent.

After a thorough investigation of the subject in the course of which we consulted a number of specialists (a few of whom were already employing some form of air heater) we have devised an instrument which we believe will completely fulfil all requirements.

The heating tube which is enclosed in the outer casing is so constructed that the air passes not only *through* it but *around* it, thus giving it twice the capacity of any other heater now on the market. The heating tube can be quickly and easily removed and replaced by a new one at an expense of seventy-five cents; with ordinary use a tube will last for two years or more.

A medicator or receptacle for medicated felt or cotton is embodied in the heater, so placed that the air is passed through it on its way to the heating tube. Access to the medicator is had by unscrewing the back cap or cover.

A heat radiating device is interposed between the back of the heater and the valves to prevent the metal parts that come in contact with the operator's hand from heating to an uncomfortable degree.

A valve is provided by means of which the flow of air can be regulated. This valve is inserted in the air inlet stem. The inlet stem is of suitable size and shape so that an ordinary air hose can be slipped over it, but the usual method of attaching it to the compressed air tank is by inserting the nozzle of an ordinary cut-off which will fit neatly into the opening in the inlet stem.

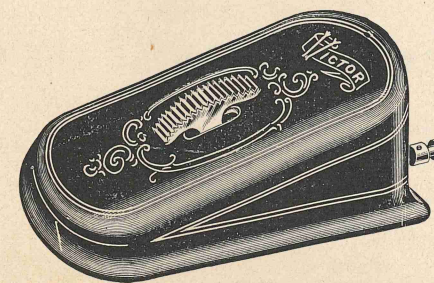
HEAT REGULATION. The method commonly employed to regulate the temperature of the air is to alternately allow the current to flow through the heater a short time, then cut it off. This necessarily keeps the operator's attention directed more or less to the manipulation of the switch, not to mention the rapid destruction of the switch contacts due to almost constant arcing at the break.

We strongly recommend the use of a regulating rheostat for the purpose of temperature control, and we have devised one specially for this purpose. When this rheostat is used the operator is enabled, by manipulating the rheostat lever and the air valve, to obtain any flow of air desired maintained at any desired temperature.

An ear, nasal and throat tip is furnished with each instrument; an insulated Eustachian Catherer will be furnished for \$1.25 extra.

NOTE—We have a very interesting reprint on the use of heated air in Aural practice. If interested write for it.

ON AND OFF FOOT SWITCH.

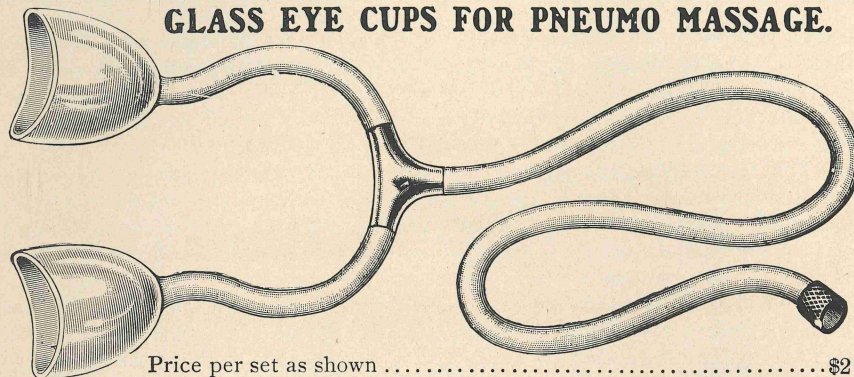


Price.....\$5 00

The Foot Switch here shown was designed to meet the demand for a thoroughly reliable and durable floor switch to be used in connection with instruments which, while being used, require the undivided attention of the operator and keep both his hands engaged, thus rendering the use of a hand switch very inconvenient.

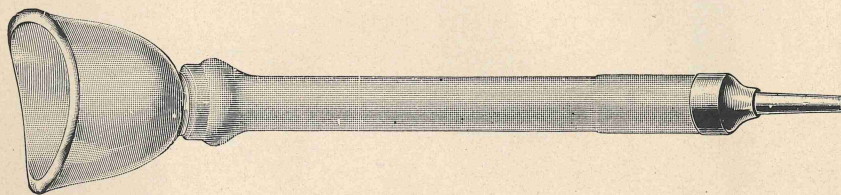
This switch is operated by the ball of the foot, the heel remaining on the floor; the switch is normally closed, a slight pressure of the foot opens the circuit, upon the removal of the foot the circuit is automatically closed. Those who have used ordinary push buttons for this purpose and been subjected to almost daily annoyance therefrom will appreciate this device.

We recommend the use of this switch in connection with our No. 2 Transformer when used for nasal drilling, and with our Bone Surgery Engine.

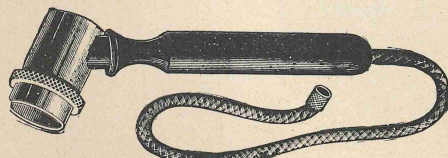
GLASS EYE CUPS FOR PNEUMO MASSAGE.

Price per set as shown\$2 00

These cups are made of clear crystal glass, through which the operator can clearly perceive the action that is taking place during treatment. They are moulded to follow the conformation of the eye-ball as closely as possible. They can be used in connection with any of our ear pumps or with any apparatus capable of compression, suction and vibration of the air.

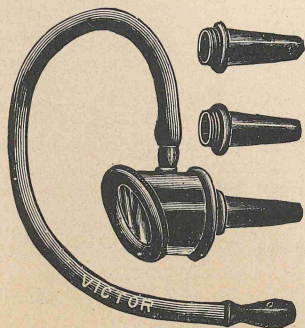


Single Glass Eye Cup.....\$1 25

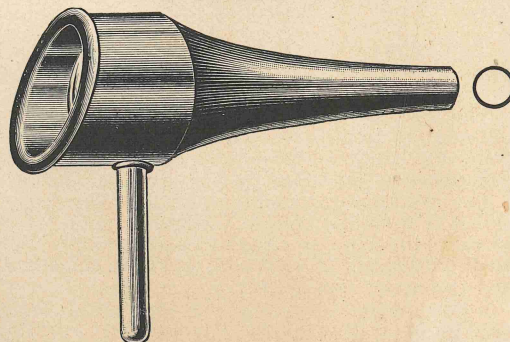
INSTRUMENT FOR MASSAGING THE CORNEA.

Price with four feet of hose.....\$3 75

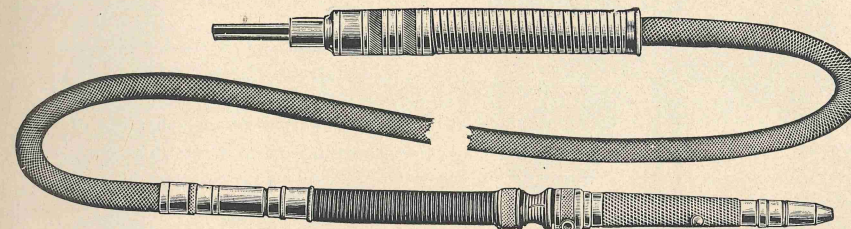
The knurled collar is removable and is used to hold some suitable elastic material, such as rubber dam stretched tensely across the opening. The instrument is attached to the ear pump, which pneumatically vibrates the rubber diaphragm.

VICTOR OTOSCOPE.

Price of otoscope with four feet rubber tubing for attachment to ear pump.....\$2 25

PLAIN OTOSCOPE.

Price with four feet rubber tubing for attachment to ear pump.....\$1 25

UNIVERSAL HANDPIECE.**FOR HOLDING ALL NASAL DRILLS AND TREPHINES.**

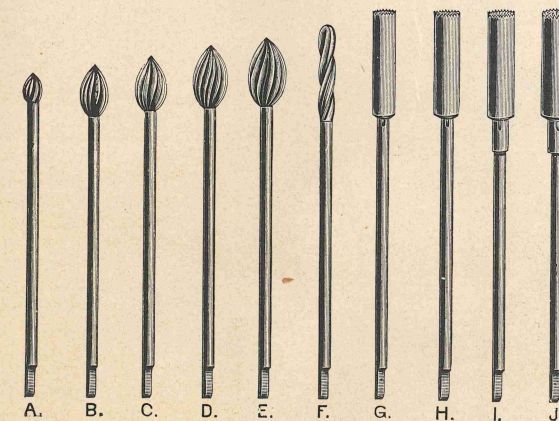
Price of extra long surgical cable, sheath, wrist joint, arm support and handpiece complete.....\$15 00

Price of handpiece only..... 9 00

PYNCHON NASAL TREPHINE.**WITH GUARD.**

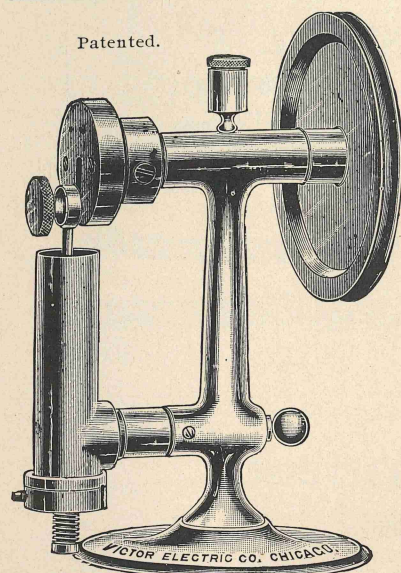
Price of Pynchon nasal trephine with guard.....\$5 00

The advantages of the Pynchon trephine and guard are quite apparent; it only cuts at the point desired, it can be inserted and withdrawn while revolving, without danger, and it does not become easily clogged.

ORDINARY SURGICAL DRILLS, BURS AND TREPHINES.

Price of A.....\$0 75
 Price of B, C, D, G, H..... 1 50
 Price of E, I, J..... 1 75

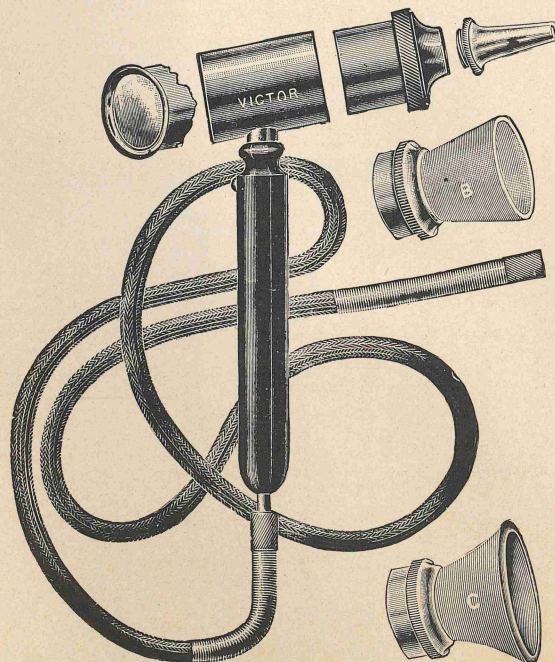
Patented.

**VICTOR EAR PUMP.**

Accompanying cut shows the Victor ear pump mounted on a base, and provided with a grooved pulley so that it can be operated by any motor, electric or otherwise. The valve arrangement, adjustment of stroke, etc., is precisely the same as with the Pynchon pump, that is, exhaust alone, exhaust with release, vibration, and compression alone can be obtained, and the length of stroke perfectly adjusted. Speed control being a very essential feature, it would be necessary to have a speed controller in connection with whatever motor was used.

The pump is mechanically perfect and finely finished.

Ear pump, price.....\$20 00

ATTACHMENT FOR PNEUMO EYE, EAR, FACIAL AND SKIN MASSAGE.

This instrument can be attached to any of the ear pumps, and has a wide range of usefulness; a soft rubber terminal is provided suitable for pneumo massage of the eye, as well as for general application; a smaller metal terminal is furnished, this as well as the instrument without either of the terminals can be used for vacuum cupping or facial massage. An otoscope terminal is provided for ear treatment.

A magnifying lens is set in the back of the instrument through which effects can be observed. A hole is provided at the back of the handle at a convenient point to be covered by the operator's thumb; so long as this opening is left uncovered the instrument is entirely inoperative, thus it will be seen that the apparatus is at all times under the instant and absolute control of the operator.

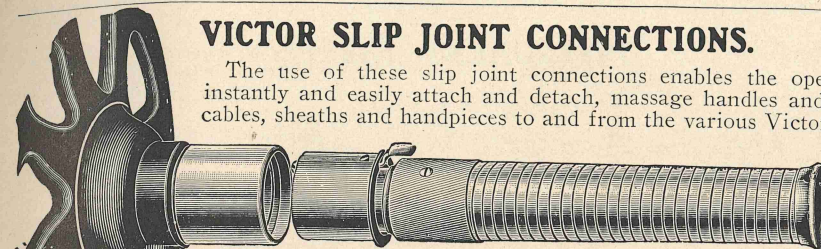
When used in connection with a Victor ear pump, either suction alone, suction with re-

lease, vibration, or compression alone can be obtained.

Price, as shown, without attachment C.....\$7 00

Attachment C is soft rubber, extra large, useful in scalp and body cupping.

Price 1 50

**VICTOR SLIP JOINT CONNECTIONS.**

The use of these slip joint connections enables the operator to instantly and easily attach and detach, massage handles and drilling cables, sheaths and handpieces to and from the various Victor motors

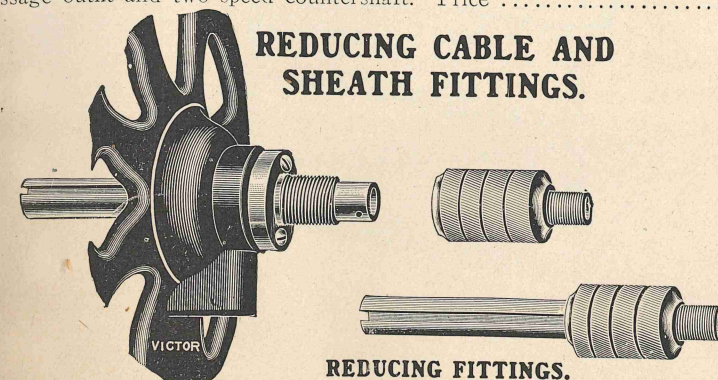
and controllers.

No. 1. Is for use on all Victor direct current motors used in connection with Victor Nos. 1, 3 and 5 handles and bone surgery handpiece. Price\$1 50

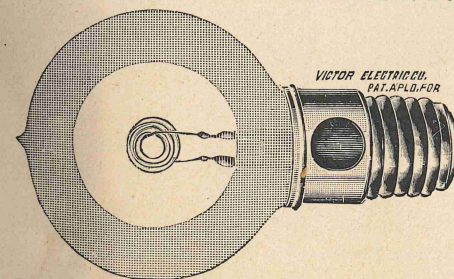
No. 2. Same as No. 1, only for use on No. 6 transformer, No. 7 massage outfit, alternating massage motor, alternating bone surgery engine and two speed countershaft. Price.....\$1 50

No. 3. For use on all Victor direct current apparatus used in connection with No. 2 massage handles and cable sheath and handpiece for nasal drilling. Price.....\$1 50

No. 4. Same as above for use on alternating motors, No. 6 transformers, No. 7 massage outfit and two speed countershaft. Price\$1 50

**REDUCING CABLE AND SHEATH FITTINGS.****REDUCING FITTINGS.**

If it is desired to use either a Victor No. 2 massage handle or small nasal drilling cable sheath and handpiece in connection with any motor or apparatus which has been fitted to take either the Nos. 1, 12 or 5 massage handles or the bone surgery handpiece, it will be necessary to purchase a reducing fitting for this purpose; in ordering, describe the motor or apparatus for which fitting is intended. Price.....\$1 00

OCULIST'S LAMP AND SWIVEL SOCKET ATTACHMENT.

Price, Oculist's Lamp (110 Volts)....\$1 00

Price for voltages other than 110 on application.

Swivel Socket Attachment..... 50

to be revolved in either direction and still make perfect contact. This also allows the operator to change the position of the lamp at will so that either clear or frosted surface may be used as desired.

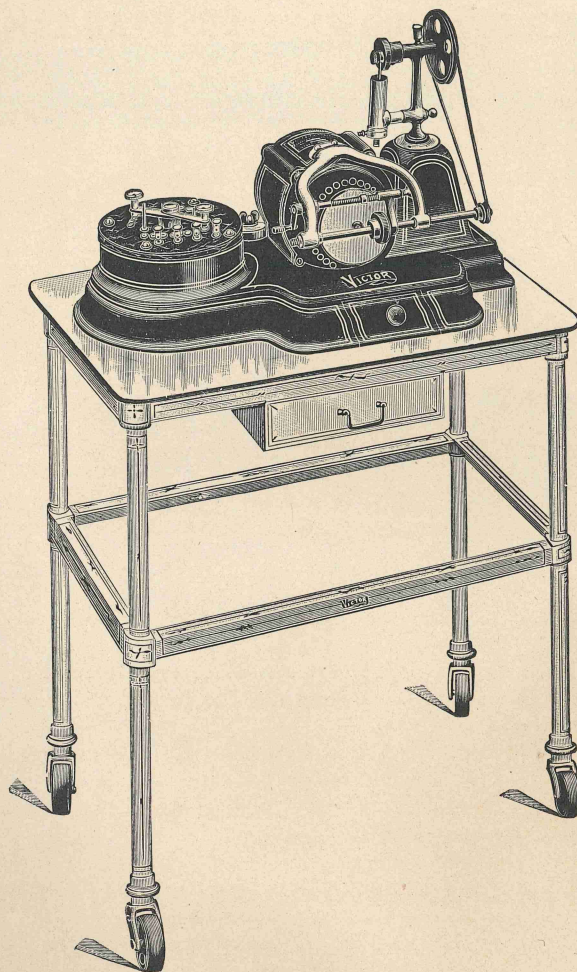
The Oculist's lamp here shown is 24 C. P.—has spiral filament, the bulb is frosted with exception of circular clear space as illustrated.

The best lamp for retinoscopy, ophthalmoscopy, or any use where strong centralized illumination is desired.

Owing to the spiral form of the filament, the projection of the bright filament forms—so objectionable in the ordinary style of lamp—is reduced to a minimum.

The Swivel attachment illustrated is screwed onto the base of the lamp, and the whole then screwed into the regular socket. This attachment allows the lamp

INSTRUMENT TABLE.



Price of table only \$25 00
 Price of slightly smaller table without drawer, but with three glass shelves..... 12 00

Dimensions: 25½ inches long, 16½ inches wide, 30 inches high. Drawer 10 inches square.

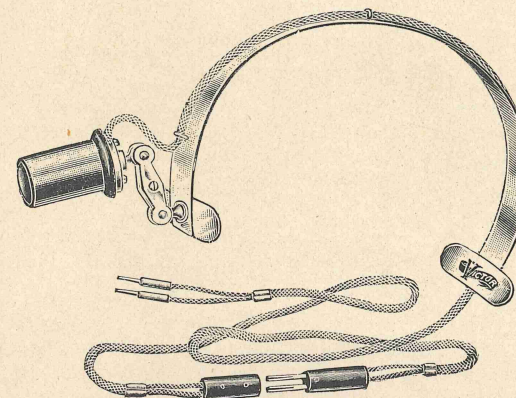
The table here illustrated is of convenient height and size for our No. 2 Transformer, No. 4 Massage Outfit, No. 6 or No. 7 Combination Outfit.

It is substantially made of steel tubing, steel frame and fittings, the top is heavy French plate glass with rounded corners and polished edge.

The table is provided with an iron drawer and large patent swivel castors.

The finish is far superior to that ordinarily found in furniture of this character.

VICTOR NO. 1 ELECTRIC HEAD LAMP.



Price \$10 00
 Price, with current tap and black lamp rheostat for the 110 volt current.... 12 00

The Victor No. 1 head lamp is designed to give the maximum of illumination with the minimum of weight and it can be worn without the least discomfort for any length of time. A double universal joint is provided by means of which the lamp can be brought down and its rays made to coincide with the line of vision of either or both eyes, this joint also enables the operator to temporarily place the lamp out of his way without removing it from the head; in fact the lamp can be placed in any position and the rays directed at the will of the operator.

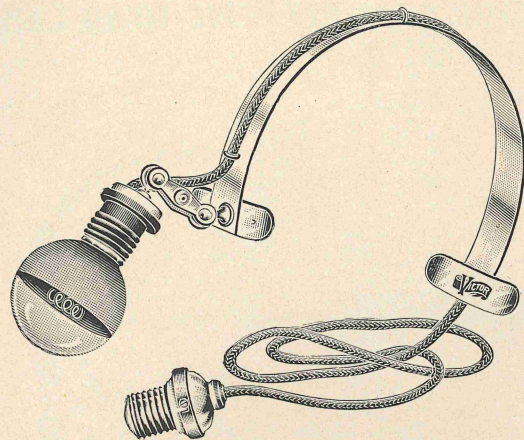
A first class lens is used and set in a telescoping receptacle so that the rays can be focused at any distance. It gives a clear white light almost entirely free from shadows.

Owing to the comparatively small size of the lamp, and the method of attachment to the head band no heat whatever is felt by the wearer.

In almost every other head lamp, yet devised, where a satisfactory volume of light is developed, the weight is so great as to be very objectionable and the heat communicated to the forehead of the wearer practically prohibits their use, excepting for short intervals.

In the Victor head lamp the wearer is absolutely insulated from the supply current, hence it can safely be used on either direct or alternating street circuits. It can also be operated from battery cells. When connected to a lighting circuit some form of rheostat is necessary. If desired we will furnish a series lamp rheostat for this purpose for two dollars.

VICTOR NO. 2 HEAD LAMP



Price complete as shown, ready for attachment to either direct or alternating current, 100 to 115 volts.....\$6.50

The lamp here shown is designed more especially as an aid to the surgeon at the operating table. The lamp bulb itself is about the size and weight of an ordinary 16 candle power lamp. Instead of being pear shaped it is spherical, the back hemisphere being silvered, thus affording the best possible reflecting surface, and having the advantage that the reflector cannot become dimmed.

The filament is almost entirely surrounded by the mirror backed reflector, so that there are but few divergent rays.

A double universal joint attachment enables the operator to direct the rays toward any desired point. If desired, they may be directed straight downward.

The field of illumination is sufficiently broad for all purposes, and at the same time enough concentration is obtained to insure satisfactory illumination over the field covered.

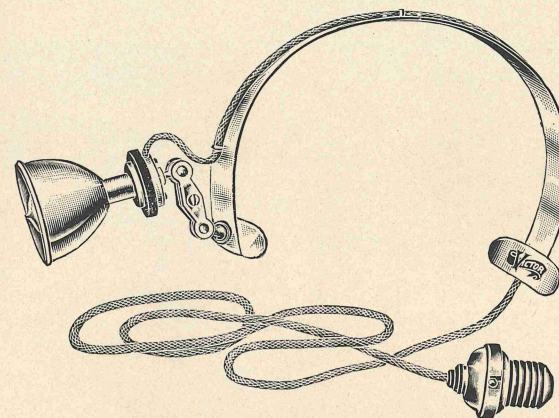
As the lamp must necessarily be worn for some little time, the construction is made as light as possible. Therefore, the weight will not prove burdensome.

The method of attaching the lamp to the head-band insures that practically no heat is transmitted to the band, thence to the forehead of the operator.

It can be attached to any convenient electric light socket without interposing resistance of any kind, as the lamp is calculated to stand the 110-volt current.

Metal parts are nickel plated, and the conducting cord is extra heavy, this precluding any possibility of short circuit.

VICTOR No. 3 HEAD LAMP



Price complete as shown, ready for attachment to either direct or alternating current, 100 to 115 volts, - - - \$7.50

The No. 3 head lamp like the No. 2 pattern is intended to illuminate a fairly broad field and fully meets the requirements of the surgeon.

The lamp bulb is about one-third the size and weight of an ordinary 16 C. P. incandescent lamp and is mounted in a highly polished aluminum parabolic reflector.

Although quite small the lamp bulb is calculated to be connected directly to the commercial lighting circuits without interposing auxilliary resistance of any kind; the volume of light developed is much greater than from an ordinary miniature lamp and with the aid of the reflector a very satisfactory illumination over the field covered is obtained.

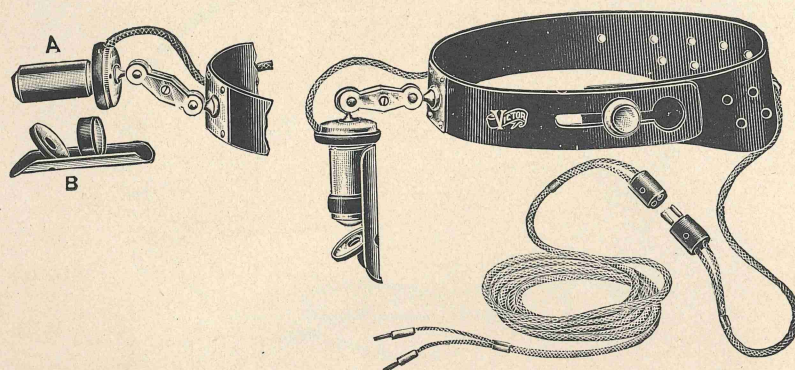
The No. 3 lamp has the double universal joint attachment enabling the operator to direct the light in any direction desired, including the directly downward adjustment.

Extra precautions are taken to so thoroughly insulate the "live" parts of the lamp and connections as to make it practically impossible for a short circuit to occur or for the wearer to come into contact with the circuit.

The chief advantages of the No. 3 lamp over those of the No. 2 type are less weight, and no annoyance from the scaling off of the mercury backing used on the mirror backed lamp bulbs.

The fact that this is an American made lamp and easily procurable in the home market, will appeal to those who have at times been forced to wait several weeks for lamp bulbs of this kind to be imported from abroad.

Victor "Kirstein" No. 4 Head Lamp



Price of head lamp complete as shown..... \$18.00
 Price of current tap and black lamp rheostat for 110 volt current 2.00

This head lamp is calculated to answer practically every purpose for which head lamps are required.

The part "B" is detachable and when removed the operator has a lamp similar to the Victor No. 1 head lamp, for general purposes; has telescoping receptacle giving adjustable focus, powerful condensing lens and lamp of approximately 6 C. P. The double universal joint makes it possible to instantly obtain any position or angle desired.

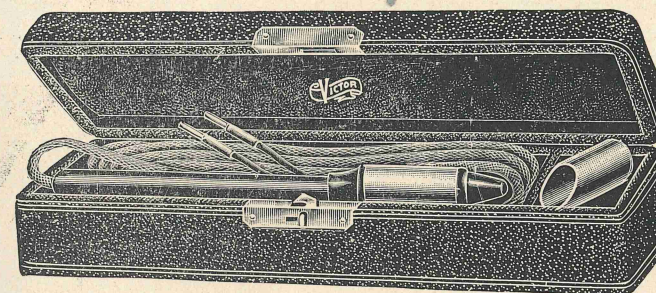
When part "B" is in place the light is projected on a plane mirror adjusted at a convenient angle to reflect the rays along the line of vision. The mirror is perforated at its center to give the eye an unobstructed view of the surface under observation.

The head-band is made of material that is practically indestructable, can be quickly adjusted to any size head, and when once so adjusted can be put on and taken off as easily and conveniently as a hat, and owing to its width and shape is worn with as much comfort as a correctly fitting hat.

It will be noted that the connecting cord is made in two pieces, each piece terminating in a slip switch connection, this switch makes a perfect connection, but a sharp pull separates the two halves; this will often save the operator from an annoying experience, when he steps beyond the range of the cord.

This lamp can be used in connection with any Victor Transformer, lamp regulator or wall plate (except the No. 1), with our series current tap and black resistance lamp. If no electric light circuit is available a group of battery cells of three or more may be employed.

Victor "Perfection" Transilluminating Set



Price complete as shown in leather covered plush lined case..... \$10.00
 Price of Transilluminating condensing lens complete ready to attach to Victor diagnostic lamp..... 6.00

The above set consists of the Victor diagnostic lamp with ordinary detachable reflector, and a special condensing lens mounted in a suitable holder, arranged to be slipped over the lamp bulb in place of the ordinary lamp reflector, with which it is interchangeable, all contained in a neat, substantial leather covered, plush lined case.

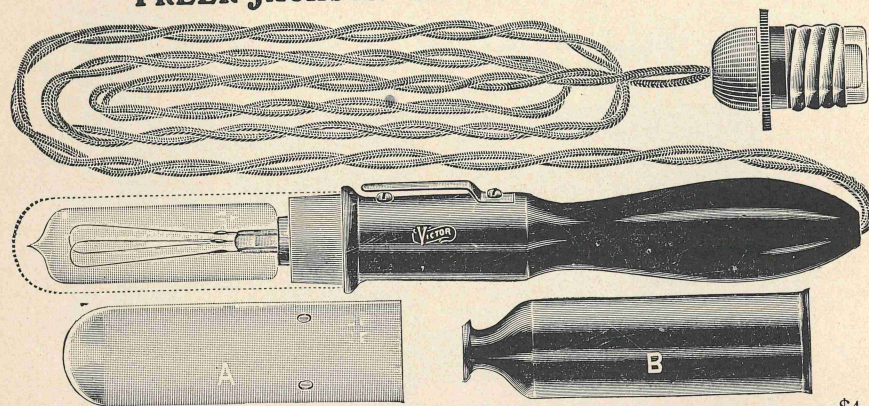
Any physician possessing a Victor diagnostic lamp need only purchase the condensing lens attachment, this attachment being adapted to fit the Victor lamps.

This instrument is an ideal transocular illuminator because of the conical shape of the lens holder, the brilliant light developed, and the absence of heat.

In making differential diagnosis between detachment of the retina and intraocular tumor, the apex of the instrument is placed to one side of the globe on the upper or lower lid or against the conjunctival sclera, in the latter case the eye being cocaineized. If an opaque foreign body, such as a tumor, be within the globe a shadow will be formed and the tumor itself illuminated so that it may be readily seen through the coats of the eye. Where no obstruction to the light exists, the whole globe will be brilliantly lighted and the pupil will show a red reflex.

For examination of the frontal sinus, place the apex under the eyebrow, for the mastoid, under the tip of the process. If empyema of the maxillary sinus be suspected, remove the end of the instrument, wrap a piece of gauze around the handle and place the end with the exposed lamp attached in the mouth. If no disease be present, the whole face and pupils will be illuminated; if obstruction exists in the antrum that side of the face above the cheek and the pupil remain dark. The methods are to be carried out in a dark room.

This instrument can be used in connection with any of the Victor transformers, Victor wall plates (except No. 1), lamp regulators, or a small group of battery cells will answer equally well.

FREER-JACKSON TRANSILLUMINATOR.

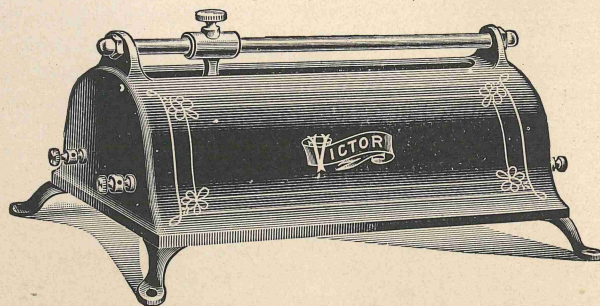
Price ready to attach to any electric lamp socket.....\$4 50

This transilluminator owes its popularity chiefly to the following points:
The source of light is a long, high candle power lamp, calculated to deliver a much greater volume of light than is possible with any of the small transilluminators provided with miniature lamps. The great volume of light available is especially valuable in examinations of the antrum and frontal sinus.

In order to insulate to a great extent the heat developed by the lamp bulb, a clear glass shield is provided, which permits of the transilluminator being placed for a few moments in direct contact with the mucous surface, without danger of burning.

In order to adapt it for trans-ocular illumination, an opaque glass shield is provided, having a suitable opening and terminal at its outer end. At the base of the lamp, a rubber collar or gasket is provided, over which the glass shields fit; this collar serves two purposes—it holds the shield firmly in position, and is a perfect fit, preventing the escape of light when the opaque shield is being used.

Transilluminators of this type are offered that are provided with rubber shields instead of glass. The weakness of this method is that the rubber becomes unbearably hot very quickly, and frequently, owing to the heat, the rubber shields adhere to the lamp bulb to such an extent as to make it impossible to detach them without breaking the lamp. Furthermore, the glass shields can be cleansed and sterilized much more thoroughly and conveniently than the rubber.

DIAGNOSTIC LAMP REGULATOR.

Price for either alternating or direct current.....\$12 00

The accompanying illustration shows a practical, reliable and durable instrument for controlling the street current for lighting diagnostic lamps. It has sufficient voltage range and a capacity of one and a quarter amperes, so that any lamp from the cysto-scope to the largest examination lamp may be used. The regulation is obtained by moving the slide shown on top of the instrument.

THE VICTOR SOCKET LAMP RESISTANCE CURRENT CONTROLLER FOR MINIATURE LAMPS

Made according to suggestions by Dr. Otto Freer, Chicago

Dr. Freer has shown in his writings that many of the best types of electric head lamps possessing qualities which no other means of illumination can supply for the purposes of laryngology, rhinology and otology, are nearly all provided with heavy filament miniature lamps in order that they may glow with proper brilliancy. We have produced as an indispensable aid in the operation of these lamps a perfect current controller, whose wide range of adjustment adapts it to all grades of miniature lights from the minute rice grain type requiring a minimum of current to those possessing so heavy a carbon that they require an ampere or more to bring them to a white glow.

Controllers embodying the main principles of ours have been in use for some years, but have been so imperfectly and unsubstantially constructed that unexpected interruptions of the current passing through them have been frequent, so that it was not safe to undertake an operation with their aid without having one or two reserve controllers at hand. Nevertheless, these lamp resistance rheostats have proven so practical, because of their adaptability to miniature lamps of greatly varying voltage and amperage, that, in spite of their frailty and need of frequent repairs, they have proven increasingly popular, especially for the heavy filament one ampere lamps used in the Kirstein and other head lamps.

Dr. Freer, has had an experience extending over five years in the use of the old style instrument, and having become thus well acquainted with its faults he has advised us how to overcome them in the manufacture of the Victor Socket Lamp Resistance Controller.

The defects of construction found in the old style controller resulted in excessive heating of the instrument when miniature lamps with filaments of sufficient thickness to yield a brilliant white light, without danger of burning out, were employed. Such lamps require an ampere of current and a 50 candle power incandescent lamp in series in the controller, so that great heat results when this heavy current is carried through the very fine wire employed in the make-up of these older appliances.

One effect of this undue heating is to cause the fiber used in constructing the framework of the instrument to crack, so that it speedily disintegrates. A second result of the overheating is warping of the coils of wire that compose the resistance of the controller. This warping causing a number of the strands to adhere so that they form a short circuit which leads to an unexpected blazing out and destruction of the carbon filament of the miniature lamp when the current is gradually increased with the regulating handle. This burning out of the lamps proves not only expensive, but arrests the course of an operation until an extra lamp can be obtained.

A third effect of the overheating is occasional melting of the solder which holds the body of the controller to its plug so that the whole instrument has been known to drop detached to the floor, when thus melted off.

A fourth bad result from the heating is refusal to move the brass contact of the controller designed to travel up and down the wire coil and regulate the amount of the current and intensity of the light.

The Victor Socket Controller avoids the faults detailed in the following manner:

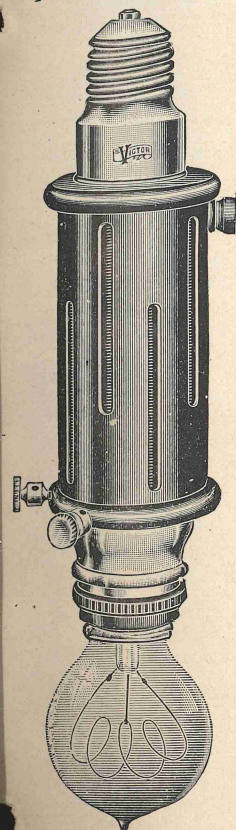
To avoid overheating, the instrument is wound with coarser wire than the old style one. The required resistance being obtained from extra length of the wire.

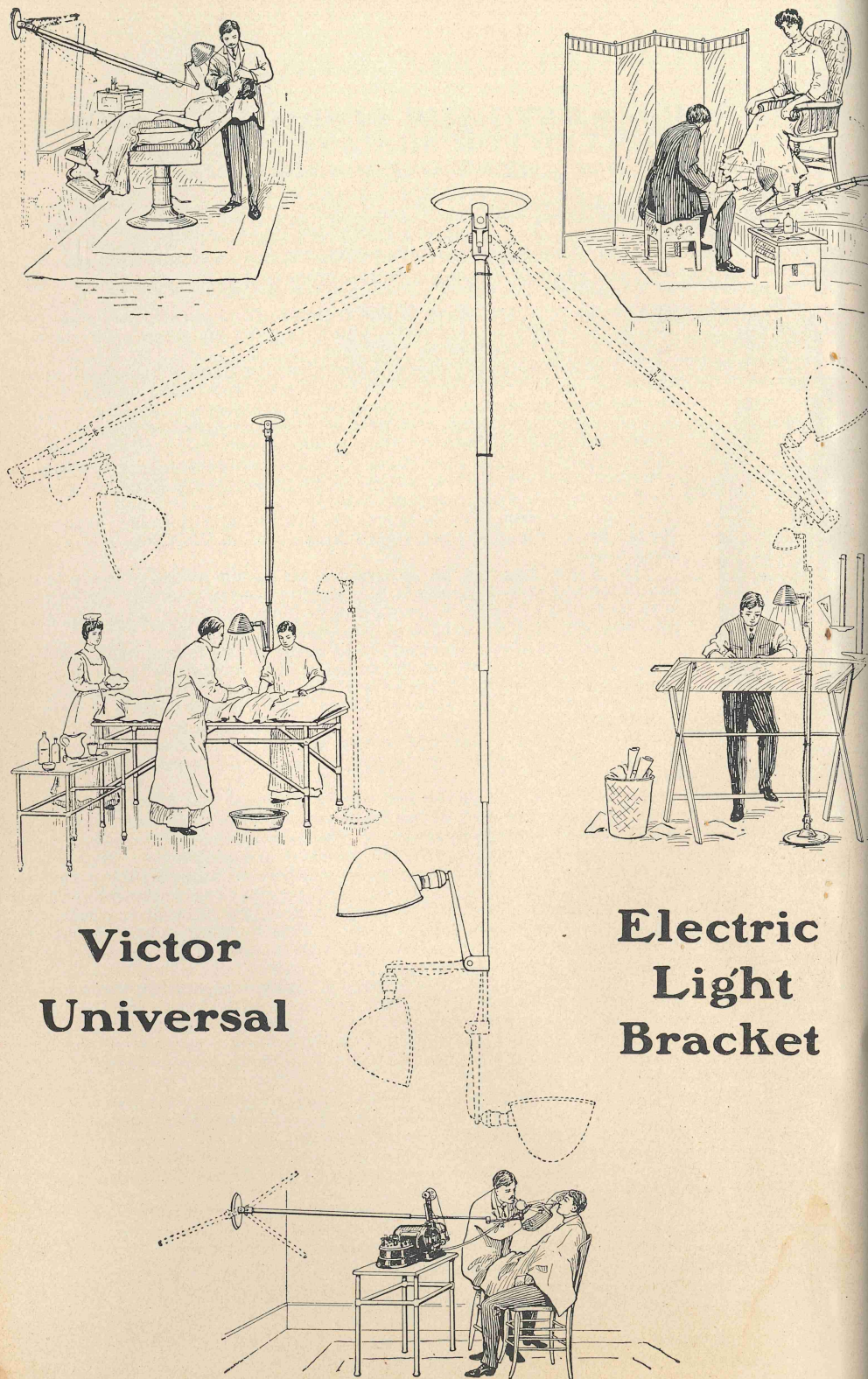
The absence of excessive heat keeps the wire coils from becoming displaced or warped, hence short circuits and burning out of the little lamps cannot occur, while the current can be increased with absolute evenness.

The Victor Controller unlike the frail older ones referred to, is made in a most substantial manner so that it will stand the stress of use. Its appearance is neat in finish and design.

The resistance lamps are enameled black. The deep color of the lamp prevents it from dazzling the observer when the miniature lamp is used. The lamps are 8, 16 and 32 candle power, to adjust them to miniature lamps of varying amperage and voltage. The controller is wound for the 110-volt current. Instruments adjusted to the 220-volt current can be had upon order.

Price including one 32 C. P. Resistance Lamp - - - \$9.50
Price each for additional Resistance Lamps, 8, 16 or 32 C. P. .60





**Victor
Universal**

**Electric
Light
Bracket**

This bracket is so designed that it may be fastened to either wall or ceiling at any convenient point desired, and being provided with a universal joint near its base, it can be swung or moved to any angle desired. The construction of the joint is such that a perfect spiral may be described with the end of the bracket, starting with a circle not more than two inches in diameter and, when the bracket is fully extended, ending with a circle twelve feet in diameter. There is sufficient friction in this joint so that the bracket will remain in any position in which it is placed.

TELESCOPING FEATURE

The bracket may be telescoped until it extends outward not more than three feet, or may be extended to a distance of almost nine feet. In addition to this the terminal arm which holds the lamp proper is hinged and swiveled so that it is independently adjustable to any desired position. By means of special device the bracket is made to retain its rigidity even when extended to its greatest length, and although the sections telescope smoothly one within the other, provision is made so that all lost motion is automatically taken up. The universal friction joint is so constructed that, when necessary, the wear can be taken up simply by tightening two small bolts. When desired we can furnish the bracket with a weighted base so that it can be placed upon the floor in the operating room, or other place, where it is desirable to have a moveable light with no fixed point of attachment. When the bracket is so mounted it loses none of its mobility, retaining the features of adjustment to any angle, extensibility and reflector adjustment.

APPLICATIONS

A few of the many applications of this bracket are indicated in the illustration. Perhaps its greatest field of usefulness is in the operating room and at the operating chair. The dentist will find it an ideal diagnostic and working lamp from the fact that it can be attached to the wall, above and entirely out of the way of all other wall attachments and yet owing to its adjustability, can be almost instantly brought to the point desired and the light concentrated on the mouth of the patient. When through, a single movement of the arm suffices to temporarily get it out of the way, and when through for the day it is telescoped and thrown around toward the wall, thus not extending out into the room at all. In construction the bracket is sufficiently heavy to sustain any kind of reflector and any size of lamp desired up to one hundred candle power. In a few instances brackets of this type have been installed in hospitals in all of the private rooms used for patients and is by far the best medium yet devised for carrying and sustaining a lamp for examinations, removing and replacing dressings, and is especially desirable as a reading lamp, it being possible for the patient to adjust the lamp to his various changes of position, a thing that cannot be so well accomplished with a bracket of any other design.

The eye, ear, nose and throat specialist will find this bracket a great convenience where his operating corner is so crowded with other apparatus as to make it extremely difficult to accommodate some of the other forms of working and diagnostic lamps at the present time on the market. This bracket can be attached to the wall above everything else and almost instantly brought into the exact position desired when needed. The bracket is so durably constructed that it is practically good for a lifetime. It is finished in oxidized copper, the finish that has proven the most satisfactory, owing to its durability for fixtures of this character. At the price quoted, and unless otherwise specified, a special lamp of approximately 32 candle power will be furnished with the bracket, and a conical reflector, having a bright inner surface with the outside finished in green enamel, will be furnished. The bracket is all complete and ready for immediate attachment either to some convenient electric light socket or to the electric light wiring.

Price Complete as shown for attachment to wall or ceiling \$15.00
with weighted base on application

ABOUT VICTOR WALL CABINETS AND PLATES AND OTHERS.

The primary function of the wall plate or cabinet is to control the current. If it fails in this, it is worse than useless for it wastes the time of both the physician and the patient. There is in the entire electro-therapeutic line, perhaps, no instrument or apparatus which is offered to the profession in such variety both as to design and price as the wall plate.

It has never been our policy to condemn indiscriminately the product of other manufacturers. We do, however, most heartily condemn those who, under the pretense of saving the physician money, in reality are serving their own pockets by supplying at a low figure apparatus that is but a pretense, lacking many, if not all of the qualities that are absolutely necessary for the obtaining of the best results.

There are a number of others who are manufacturing and supplying good wall plates, but we have yet to find one really good wall plate being offered to the profession which does not sell for at least as high a price as the VICTOR.

It is frequently the case that when a busy physician, who has not seriously investigated the electrical branch of therapeutics, decides upon the purchase of a wall plate, he only investigates far enough to find whether the plate he purchases will deliver the galvanic and faradic modalities in some form. No more serious mistake can be made: as well might he administer drugs without regard to dosage and quality.

No therapeutic agent has ever been employed that demands of a physician closer attention to diagnosis, dosage and quality.

Electricity in its different forms, has in many instances diametrically opposite physiological effects.

The different polar effects are too well known to require mention.

Electricity at an extremely high voltage and high frequency, may be administered with perfect safety and is beneficial in many indications; employing the same quantity and the same voltage at a somewhat lower frequency; it would inevitably prove fatal. This latter is only one striking illustration of the fact that the manufacturer who designs apparatus for the therapeutic use of electricity and the physician employing it for this purpose should have a thorough knowledge of the laws governing this remarkable modality. Furthermore, it will be apparent that the less the physician knows of the subject, the more dependent he is upon the manufacturer, and the more essential it is that he should purchase apparatus of proven quality.

Our wall plates, as well as other of our apparatus, are used and endorsed by those advanced workers in this field who have long since passed the point where it would be possible to impose upon them, either by asking an exorbitant price for a good article (competition is just as keen on the high grade plane as upon the lower levels), or to induce them to purchase at any price an outfit that would not properly perform its functions. It is not our policy to publish testimonial letters, but we feel safe in referring any prospective purchaser to any one or more of the physicians of recognized authority in this line.

METALLIC WIRE RHEOSTAT. Experience has shown that graphite, though a cheap and convenient form of resistance, is utterly unreliable and under certain circumstances dangerous. We are prepared to prove this statement conclusively and to

the satisfaction of any physician who will take time to investigate. *We do not use graphite.* The material used for resistance in the Victor plates is metallic wire of sufficient size to insure durability and freedom from heat.

In this connection we desire to call attention to the fact that we have consistently condemned graphite as a resistance medium from the day we made our initial bow as purveyors to the electrical needs of the medical profession. Those who are at all familiar with the subject, will recall that ten years ago, we were practically the only manufacturers who took this stand; today, it is hard to find one reputable manufacturer in this line who has not either abandoned the graphite rheostat entirely, or at least who has not publicly acknowledged its short-comings. Unfortunately, however, many of the wire rheostats that have been substituted for graphite, in the make-up of other wall plates, are in reality little, if any, improvement over the graphite, their designers, lacking our experience, have failed to take into account many points in design and construction that are absolutely essential in a good wire rheostat for therapeutic uses. For instance, the alloy—of which the wire is composed—must be of the proper quality; the wire must be of sufficient size so that its temperature is not effected by the passage of the current through it; it must be properly protected against the oxidizing influence of the atmosphere; the wire must be wound in some form so that it is not exposed to any mechanical strain. If a travelling contact is made to pass directly across the surface of the wire composing the rheostat, the exposed surface of the wire must present an absolutely uniform and even path for the passage of the contact; the contact itself must be correctly designed and particular attention paid to the amount of tension or pressure with which it is forced against the exposed wire. Then a great deal depends upon the mechanism to enable the operator to move the travelling contact with perfect ease and uniformity.

In fact, the designing and mechanical difficulties involved in the making of a good wire rheostat for therapeutic purposes was partly responsible for the failure of other manufacturers to adopt it until practically forced to do so, and they are now attempting, in many cases, to make a wire rheostat at the same manufacturing cost as was formerly involved in making the graphite. Our experience has demonstrated this to be impossible.

PERFECT REGULATION. Any voltage desired from zero to a maximum of 75 or more can be obtained in any desired dosage and we guarantee a perfectly smooth regulation of absolute and unchanging uniformity. We wish to state that our regulating rheostats are not to be confounded with the old type button form where there is a decided jump from one step to another. In our rheostats the construction is of such a nature that there is no jump, the increase being just as smooth, even, and gradual as is possible with any rheostat no matter of what material or construction.

VOLTAGE INDICATOR. Advanced electro-therapeutists have come to realize that it is just as necessary that the voltage or pressure of the current be known as its quantity or milliamperage. All of our plates are provided with a volt scale which indicates at all times accurately the voltage of the current being delivered.

MILLIAMPERE METER. The important point about a milliamper meter is not as to whether the scale is pen marked; in other words, hand calibrated, or whether it has a printed scale, but the thing of paramount importance is as to whether the meter tells the truth when it is new and after it has been in use for a year or more. It is a safe statement to make that at least fifty per cent of the cheaper milliamper meters will be out of calibration from fifteen to forty per cent before they are two years old. We will guarantee that our meters will vary less than ten per cent in four years.

The fact that there is no method of determining the voltage in any of the cheaper plates used and that the milliamperere meter is of questionable veracity should be sufficient ground to cause a thinking physician to decide against them.

AUTOMATIC INTERRUPTER. An interrupter of improved type is used by means of which the galvanic or faradic current can be interrupted at any desired rate. Other manufacturers have in some instances attempted to copy this interrupter, but so far have signally failed to produce its equal.

FARADIC COIL. There is some difference in opinion as to the most useful or desirable length of secondary winding to be used in faradic coils. We have, therefore, in the construction of our coils in which extremely long secondaries are used, arranged so that twenty-one different variations in the length of the secondary can be obtained by means of a very simple switching device.

We exercise great care in the construction of our faradic coils and in the design and construction of the vibrators, the latter being of quite as much importance to the proper operation of the coil as any other part of it.

DIAGNOSTIC LAMP REGULATOR. Another feature not ordinarily found on wall plates and never on the cheaper variety is a diagnostic lamp regulator so arranged that a lamp of any size may be used. This regulator, although incorporated in our plates, is independent of the galvanic and faradic regulation, hence the lamps can be used during treatments.

GENERAL CONSTRUCTION. We could cover several pages in describing minutely the detail of construction used in these plates, showing the great care and attention given to the minutest details. Not having the space, however, we will simply call attention to the difference in the construction of the switches as used on the Victor plates and those employed by the majority of other manufacturers. Since we adopted the switch construction we are now using and which we have been using for some eight years, we have yet to hear of a single instance of a switch's failing to make contact, whereas with other plates and other types of switches this is a very common source of trouble. In short, no expense is spared in the manufacture of Victor plates to insure that they will unfailingly respond when called upon for service, even after years of constant use.

INDEPENDENT CONTROL OF VOLTAGE AND MILLIAMPERAGE. Some manufacturers claim for their plates a separate control of voltage and milliamperage regardless of the resistance of the patient. If these claims were literally true Ohm's law would have been set at defiance. As a matter of fact the current strength or rate of flow (milliamperage) depends upon two factors each of equal importance, viz. the voltage or pressure and the Ohmic resistance of the conductor through which the current is being forced. In therapeutic applications the patient forms a part of the conductor and manifestly the patient's ohmic resistance must be taken into account.

To illustrate: the voltage available from any wall plate is limited to the voltage of the current from which it draws its supply ordinarily, this cannot exceed 110, now, we will assume that it is desired to pass 40 milliamperes through the patient. Assuming that the maximum voltage available is 110 by applying Ohm's law

$$\left(C = \frac{E \text{ or } V}{R}\right) 40 \text{ milliamperes} = \frac{4}{100} \text{ ampere} \frac{110V}{.04C} = 2750R.$$

So it becomes plainly evident that the patient's resistance must not exceed 2,750 ohms. And if the patient's resistance exceeds this amount no rheostat or current controller can avail to force the desired 40 milliamperes through. This result can only be obtained by increasing the size of the electrodes that are in contact with the patient or by placing the electrodes nearer together, thus in fact reducing the resistance of the patient.

ELECTROLYSIS.

BY C. S. NEISWANGER, M. D.

If the physician who would use electricity as an adjunct in his practice would study well the laws of electrolysis he would have little trouble in mastering the whole subject.

Electrolysis more properly covers the whole field of what we call galvanism, or direct currents, and, in order to get a proper understanding of it, we must commence at the rudiments so as to avoid confusion.

If the physician will become thoroughly conversant with the three fundamental principles of electrical energy, *voltage*, *amperage* and *resistance*, he will never regret the time spent.

Voltage is not electricity, but only one of the component parts of electrical energy, and although itself perfectly harmless, it becomes a dangerous factor under certain conditions. Voltage then is the pressure at which electricity is used and can be likened to the pressure in a steam boiler. We would not call the pressure in a boiler steam, and it would be evidently as improper to call voltage electricity. It is pressure. We then have:

$$\text{Voltage} = \text{pressure} = E. M. F. = E.$$

E. M. F. stands for "electro motive force" and is the best and at the same time the technical name for voltage, because it tells just what it is—the force that moves electricity. Wherever we see the letter "E" in electrical formula, it always means voltage.

In most of the text books for physicians *amperage* is defined as *current* or *quantity*. This is obviously wrong, because we must not look upon electricity as a thing or entity, but a condition. Amperage, then, is only the *rate at which electricity flows* and that rate is governed entirely by the pressure or voltage. If I say I am giving my patient fifty milliamperes of current, I mean that a rate of flow of fifty milliamperes is maintained throughout the entire circuit, and consequently just that much is passing through the patient.

Resistance is anything that opposes the passage of electricity. Every force has its resistance. If that were not the case we would be able to get something out of nothing, and thus violate the law of conservation of energy. If it were not for resistance we could easily produce perpetual motion.

It must now be understood that there is a definite relationship existing between these three factors, voltage, amperage and resistance, and that we cannot destroy this relationship. If two electrodes from an acting galvanic battery be placed upon the body and a certain amount of *pressure* (voltage) be turned into the circuit, a definite rate of current flow (amperage) will be established. If now we move the electrodes to another part of the body where the *resistance is greater*, the same amount of voltage will not maintain the same current flow, but in order to obtain the original amperage we must either increase the *pressure* or decrease the *resistance*. So if we gain in one of these factors it must be at the expense of one of the others.

It is easy to change force or energy from one form to another and this interchange of energy is the physical life of the world. The chemical energy within the cell begets

electrical energy and with this electrical energy we can, in turn, break up chemical compounds. This is electrolysis—the breaking up of substances into their elements by electricity.

In studying this subject the main fact to be kept in sight is that where substances are broken up into their elements by electricity we have left certain products of decomposition which Faraday named "ions." These ions take a definite direction toward one or the other poles of the battery, some having a strong affinity for the positive pole, others for the negative. Following the universal law that "likes repel and unlikes attract," these ions appearing at the positive must have been repelled by the negative and are therefore *like* the negative and we call them *electro negative* substances. Likewise those appearing at the negative side we call *electro positive*.

The body fluids are largely composed of water, and therefore contain oxygen and hydrogen. In the process of electrolysis the former is *electro negative* and collects around the *positive* pole, the latter goes toward the *negative*, and it is this affinity that gives the two poles an exactly opposite therapeutic effect. If the application of one pole is indicated for a certain condition, the other will aggravate it, so it becomes necessary to become thoroughly conversant with this part of the subject.

Oxygen is an *acid maker*, consequently the tissues adjacent to the *positive* pole are rendered *acid*. An acid condition is *against pain* because it means the beginning of the death of tissue, consequently we call the positive pole *sedative*.

Hydrogen is an *alkali maker*, therefore hydrogen collecting around the negative pole—the tissues in the immediate vicinity of this pole are rendered alkaline. An alkaline condition means a condition of over-stimulation or *irritation*. All inflammations are due to an excessive *alkalinity* of the part. It is evident, then, that while the positive pole will alleviate an inflammatory condition, a negative application will produce a state simulating inflammation.

The positive pole, by its acidity, coagulates the albuminoids of the blood and therefore *hardens* or shrinks tissue.

The negative pole acts much like caustic soda or potassium, softening, disintegrating or liquifying tissue; so it becomes apparent that whenever we desire to produce decomposition of tissue, such as warts, moles, or in fact, any benign growth, it is necessary to use the negative pole.

The positive pole, by its sedative action on the vasomotor nerves, lessens the lumen of the blood vessels, thereby decreasing the blood supply to the part.

The negative pole, by stimulating the vasomotor nerves, dilates the blood vessels.

CATAPHORESIS.

BY C. S. NEISWANGER, M. D.

Cataphoresis is the process of introducing medicament into the tissues and circulation by means of the *direct* current.

Many misleading statements have appeared in literature regarding this process, the principal one being that because the movement of a direct current is *from* the positive to the negative, all medicines must be placed upon the *positive* electrode so as to be forced or pushed along in the *direction* of the current.

Cataphoresis, however, is an electrolytic process, following closely the law of electrolysis, and whenever suitable medicine is placed upon *either* pole of a galvanic battery, that medicine is decomposed or broken up into its elements or ions. These ions, then, having an affinity for one or the other pole of the battery, the selection of the *active* pole would depend upon which *part* of the medicament we wish to use. Suppose, for instance, we have a solution of lithium citrate on one of the poles of an acting galvanic battery, the current in passing through the solution *breaks it up* into lithium and citric acid. The lithium or base has a strong affinity for and moves *toward* the negative pole, while the citric acid has just as strong an affinity for the positive. It becomes evident at once to the most casual observer, that if it is desired to utilize the lithium as the medicament it must be placed upon the positive pole because it is *repelled* by that pole, and, in seeking its affinity, the negative—which is on some other part of the body—it is carried deeply into the tissues, the depth depending upon the amperage employed and the length of time it is allowed to flow. If, however, the solution be placed on the positive electrode for the purpose of utilizing the lithium or base, as described above, the citric acid, having no affinity for the negative, will remain at or upon the positive electrode and not penetrate the tissues.

It is not hard to formulate a rule to govern us as to these cataphoric applications, because the substances used for this purpose are what we might call binary compounds, or those composed of a base and an acid. If it were kept in mind that all *bases*, whether metallic or alkaloidal, have an affinity for the *negative* and are repelled by the positive, and that the *acid*, or that which takes its place, has just as strong affinity for the *positive* and is repelled by the negative, then the rule would be stated as follows: If we wish to utilize the base, the medicament should be placed on the *positive* pole, but if it is the acid that is desired we must use it from the *negative* pole.

A few practical applications will serve to illustrate the rule. Suppose we are treating a case of indolent goitre and wish to utilize the resolvent properties of iodine. We will use a solution of Potass. Iod.—any strength—in which the potassium is the base and the iodine takes the place of the acid. It is evident that the solution must be used upon the *negative* pole because the iodine is *repelled* by that pole and taken, in a minutely subdivided and nascent state, into the enlarged gland.

In treating this class of cases, especially where the enlarged gland is hard, and it is desirable to gain time, the writer often uses, hypodermically, dilute Lugol's solution, which is diffused by leaving the hypodermic needle in place and using it as the negative electrode. For this purpose it is only necessary to take an all metal hypodermic syringe and solder on it a receptacle for the cord tip. Such an electrode is also valuable for the painless removal of growths, by first injecting into them a drop or so of solution of cocaine, and, without removing the needle, which is attached to the negative pole, turn on sufficient current to decompose the growth without causing the patient any appreciable pain.

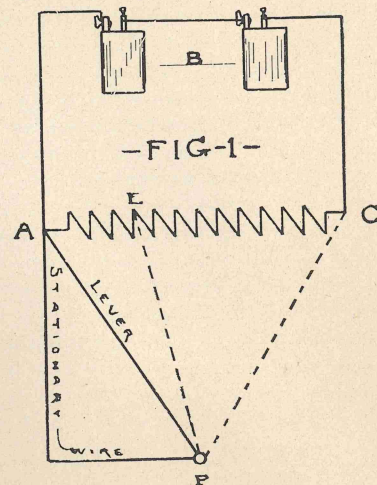
We can produce the most profound local anesthesia, through the skin, by using a solution of cocaine cataphorically and do minor surgical work, such as the removal of small growths, or the incision of an abscess, without pain to the patient.

RHEOSTATS.

BY C. S. NEISWANGER, M. D.

Resistance fills two important offices in the use of electricity for any purpose. First, it reduces the ampereage or rate of flow of current. Second, it produces heat. From the first fact then, we must conclude that while resistance placed in a circuit reduces the ampereage it does not correspondingly effect the voltage or pressure upon the line. From the second fact we conclude that anything that offers resistance to the flow of a current of electricity produces heat and the most heat is developed at the point of the greatest resistance. The latter fact is only due to an interchange of energy. In this instance part of the electrical energy is dissipated into heat energy.

A rheostat is an instrument for the purpose of furnishing a variable resistance. In other words, it is an instrument by which the resistance in a circuit may be increased or decreased at the will of the operator. These instruments are usually of two varieties: the series and shunt. Until very recently the former variety was the one in general use but is now almost obsolete because it simply reduced the flow of current without materially effecting the voltage on the line. The shunt variety, the one being



in common use upon all modern batteries today, is really not a current selector in the true sense of the word, but more of a volt selector. In other words, there is only one way we know of for reducing the voltage or pressure in a circuit and that is by shunt.

A shunt is simply a loop off the main circuit. The term is not, strictly speaking, an electrical word. Shunt rheostats are of two varieties as in use at the present time for therapeutical purposes; the graphite and those composed of other resistance metals. As there is considerable difference in the working of these two varieties, it is deemed advisable to give a description of both.

Suppose the operator takes in each hand a conducting wire and places them in contact with a bare wire overhead carrying a current of electricity. As long as the two

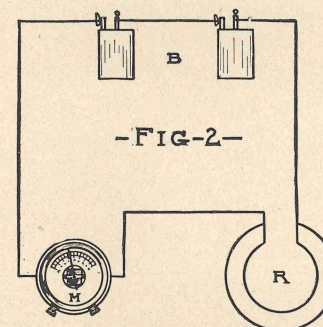
wires in the hands of the operator touch each other upon the main wire the person receives no electricity because there is no circuit, but if the wire in the left hand is held stationary and the one in the right hand moved over the surface of the wire from left to right, then the person forms a loop and is a shunt off the main circuit and the farther these two wires are separated, or in other words, the greater the distance between the two points of contact on the wire, the more current will flow through the person.

In the diagram shown herewith B is the battery and the wave line A C represents the graphite surface of a rheostat, which, for purposes of illustration, has been straightened out in place of being circular; P is the patient and the line A P the movable lever.

As long as the lever A P remains at the starting point there is no shunt, consequently the patient P receives none of the current flowing through the graphite, but should the lever be moved toward the right to the point E on the graphite surface, then the patient P receives current from the main circuit in proportion as the resistance from A to E varies as the resistance of the loop A P E.

If now the lever be moved still farther to the right until it reaches the point C, then the current the patient receives will be in direct proportion as the resistance of the graphite A C varies as the resistance of the loop A P C.

It will become apparent that if the resistance from A to C is much greater than the loop A P C, then most of the current will pass through this loop in which the patient is placed. If, however, the resistance in the graphite from A to C varies as it does in



most graphite rheostats, and if so much graphite has been spread upon the surface of the slate that the resistance from A to C is less than the resistance of the loop A P C, then the latter circuit will receive very little current. The writer's attention was forcibly called to this fact lately by the receipt of a number of letters from parties throughout the country who had purchased batteries, making statements something like the following: "I have fifty cells attached to my wall plate and I am treating the patient for some pelvic trouble, having a large electrode upon the abdomen and a small one upon a mucous surface in the vagina. Now, I have my rheostat turned round as far as it will go and all my meter registers is six or seven milliamperes. What is the matter with my battery? I have written to the manufacturers, who tell me that I have not enough battery power, so I have added more cells but only increased my ampereage in the above mentioned operation by three or four."

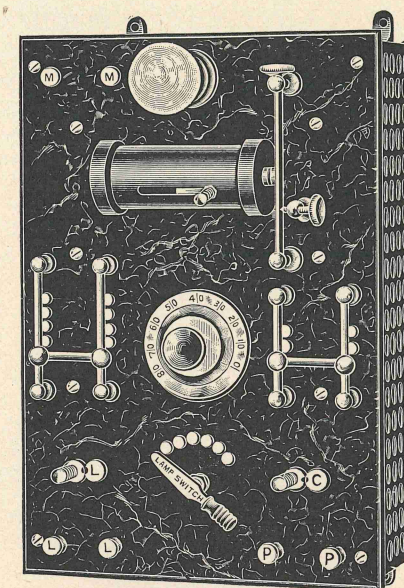
These complaints have gotten to be so frequent that the writer concluded to make an investigation and was surprised to find that many manufacturers who were making a shunt rheostat did not know the principles upon which it was constructed. At one

of the factories visited the proprietor was asked if we could see the person making the rheostats. This request was readily granted and we saw a workman spreading graphite upon a slate surface with a brush, which, being allowed to dry, was afterwards polished much the same as we would do to a stove. When we asked the question whether the workman paid any attention to the amount of graphite placed upon the slate, we were told that he did not, because it made no difference. Then we asked the workman to connect up a rheostat and milliamperemeter in series with the 110 volt as follows (see diagram, Fig. 2), in which B is the battery, R is the rheostat, and M the meter. It will be readily understood that the meter M must measure the amount of current flowing through the circuit and the voltage in this circuit being known, we may then easily calculate the resistance on the graphite rheostat R. In the instance in question, the meter when placed in circuit as herein described, registered 100 milliamperes. If we take Ohms Law $C = \frac{E}{R}$, we then have from our experiment, as shown in the diagram, where the meter registers 100 milliamperes, or 1-10 of an ampere, the following: $\frac{1}{10} = \frac{110}{R}$; $R = 1100$, from which we ascertain that the resistance of the graphite rheostat from the A to C, (see Fig. 1), is 1,100 Ohms. Now the resistance of the patient's body varies from 5,000 to 10,000 Ohms, so that in this instance we would have all or nearly all the current flowing over the lesser resistance from A to C rather than through the loop A P C, consequently the patient would receive little or no current and we must conclude there is too much graphite spread upon the slate. If now, we take a fine piece of emery or sand paper and gently rub off some of the graphite surface on the rheostat R, the resistance in the circuit will be correspondingly increased and the meter will go down. Suppose we rub the graphite off from the rheostat R, until the meter M registers ten milliamperes or 1-100 of an ampere, then we have the formula from Ohms Law $\frac{1}{100} = \frac{110}{R}$; $R = 11,000$, from which we deduce that the resistance of the rheostat R has been altered from 1,100 Ohms to 11,000 Ohms and consequently the resistance from A to C (Fig. 1) being 11,000, and the resistance off the loop A P C being very much less, more current will pass through the loop than over the main circuit.

The main fault then in the graphite shunt rheostat comes from not being able to standardize the resistance. In other words, the resistance of the graphite rheostat is seldom alike in two instances. The operator must be constantly taking off or putting on graphite in order to overcome these difficulties. Another very important objection in the graphite surface has been referred to in the former part of this article when it was stated that whenever a current of electricity passes through any resistance, heat is evolved. Now the current in passing over the graphite, necessarily heats it and graphite and carbon having the peculiar property of having their resistance decreased by heat, the meter will keep going up for some time after the rheostat has ceased to be turned on.

If now the resistance material A C were changed from graphite to some high resistance wire in coil, we could establish a *known* resistance in the main circuit at all times, as for instance when the contact was at E (Fig. 1) we would have established in the patient's circuit A P E, a definite and known amount of voltage, just as such voltage would be definite if the lever were placed anywhere along the resistance surface A C.

THE VICTOR "OXFORD" WALL PLATE.



Price, complete, including electrode cords, universal handles and pair of small Spongipilene electrodes, for 110 volt direct current.....\$35 00
 Additional for 220 volt direct current (including special shunt reducer)..... 15 00
 Price, complete as above, arranged for battery cells..... 35 00

In the Oxford Plate we offer the profession a thoroughly reliable instrument for the control and measurement of the galvanic and faradic modalities. It is designed chiefly for those who from lack of space cannot make room for a larger and more elaborate outfit, and for operators who only occasionally find use for the galvanic and faradic modalities and who do not care to invest in a more expensive apparatus for the production of these currents.

GALVANIC CURRENT. The electro-therapist or experience knows that it is useless to expect to obtain results from the galvanic current unless he has it under such perfect control that he is enabled to give it in any desired dosage, therefore in the design of the Oxford Plate we have sacrificed none of the essential points, in-so-far as the controller is concerned, that have deservedly popularized the Victor wall plates, the resistance medium is metallic wire of sufficient size to safely carry the current, this wire is wound upon a large cylindrical drum, a heavy plunger contact is made to travel transversely across this drum, picking up one convolution of wire after another so that the voltage may be raised so gradually that there is no shock perceptible to the patient; the regulator is operated by means of gear mechanism simply by the turning of a large circular knob or handle which will be noted in the illustration near the center of the instrument; as this regulator is revolved the

figures on the outer stationary dial ring accurately indicate the voltage being delivered to the patient. This regulator in appearance and method of manipulation is very similar to an ordinary safe combination handle and dial, with which everyone is quite familiar.

FARADIC CURRENTS. A thoroughly first-class faradic coil is mounted on this plate, provided with a good ribbon vibrator, the tension of the vibrator being adjustable, makes it possible to vary the frequency over a wide range. The strength of the faradic currents is regulated by an independent controller, the handle of which will be noted projecting from the coil in the illustration.

COMBINATION CURRENT. The combined galvanic and faradic current can be obtained from the Oxford Plate, and we wish to direct particular attention to the fact that it is the secondary faradic and not the primary which is combined with the galvanic current. Because of the fact that the faradic coil possesses an independent regulator it is possible to regulate the galvanic and the faradic currents, when used in combination, independently, thus the galvanic current can be run up to its greatest strength if desired, whilst the faradic current can be made barely perceptible, or vice versa.

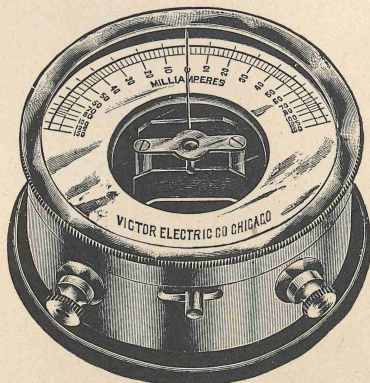
DIAGNOSTIC LAMP CURRENT. An entirely independent circuit having its own regulator is provided for lighting diagnostic lamps. The diagnostic lamps are connected to a separate pair of binding posts. It will thus be seen a diagnostic lamp may be used at the same time a treatment is being given.

This plate can be used to regulate the sinusoidal modality; see description and application of No. 3 switch.

Although no milliamperemeter is mounted on the Oxford Plate, one of these meters can be easily connected and used in conjunction with it if desired.

This plate is designed for use either as a table or wall instrument. As will be noted, it is not contained in a cabinet; its dimensions are 16 inches long, 11 inches wide and 8½ inches high or deep.

PORTABLE MILLIAMPEREMETER.



Diameter 4 inches. Scale 0 to 150.

Similar in style and construction to our larger meters, having the adjustable dial, and is quite as accurate and reliable.

The range is from 0 to 150, each subdivision having a value of two milliamperes.

Where a portable instrument is desired this little Victor will be found to fulfill every requirement.

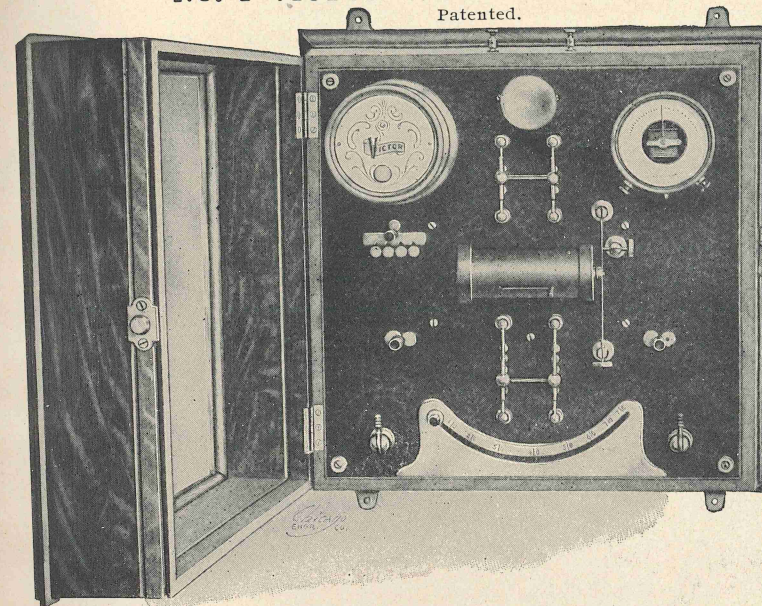
This instrument is also recommended, where it is desired to use a meter in conjunction with the "Oxford" plate.

Price\$10 00

Same style, 5¼ inches in diameter..... 10 00

NO. 1 VICTOR WALL PLATE.

Patented.



Price, complete as shown, for 110 volt direct current\$50 00
Price, complete as shown, for battery cells 50 00

Although this plate is lower in price than any complete plate we have heretofore placed on the market we do not wish it understood that it is in any sense a cheap apparatus. It is a thoroughly first class, reliable, scientific, and accurate instrument, the difference in price between it and the higher priced plates being accounted for by the fact that it has a more limited field of usefulness than some of the others. There is no diagnostic lamp circuit and it lacks some of the combinations of currents to be obtained with the other plates, but it is capable of delivering all of the currents that can be obtained from any of the ordinary wall plates sold by other manufacturers as their best product.

From this plate can be obtained, the straight galvanic current of any voltage desired from zero to seventy-five; a combined galvanic and faradic; primary faradic; secondary faradic; interrupted galvanic or interrupted faradic current. A thoroughly first class milliamperemeter is provided for measuring the quantity of current delivered, and a volt scale indicates at all times the voltage of the current being delivered. No graphite whatever is used in the construction of this instrument, the resistance medium being metallic wire the same as in the higher priced plates.

The regulation is practically perfect. A separate regulator is provided for the high frequency, secondary faradic. The switches are of an original design, easily operated and of such construction that absolutely perfect and permanent contact is assured.

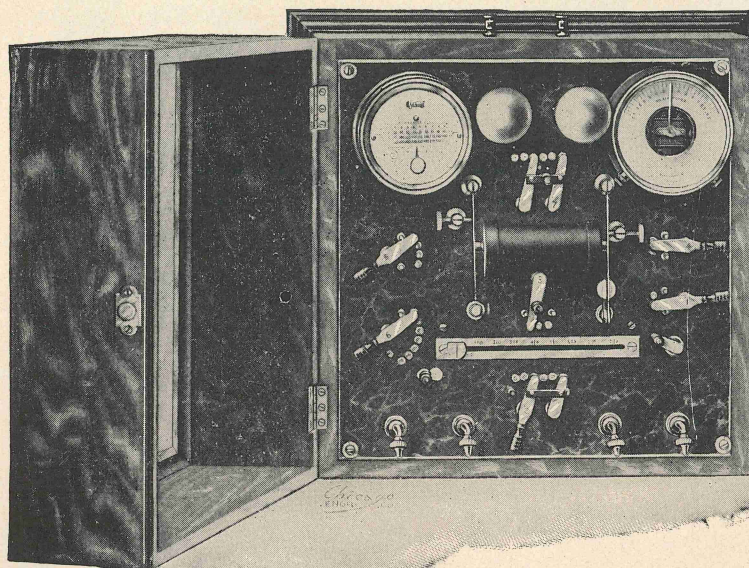
The plate is contained in a quarter-sawed oak case, provided with a plate-glass front. The entire outfit is well finished and will prove an ornament to the best appointed office.

We do not wish to have it understood that we are claiming that for fifty dollars (the price of this plate) we are furnishing a plate worth seventy-five or a hundred dollars, but we do claim, and it is a fact, that this outfit is the best value for the money of any similar outfit heretofore placed on the market.

This plate can be used to regulate the sinusoidal modality, see description and application of No. 3 switch.

NO. 2 VICTOR WALL OR TABLE PLATE.

Patented.



Price complete for 110 volt direct current or for battery cells	\$75 00
Price complete for 220 volt current	90 00
Price complete for 500 volt current	100 00

The above apparatus is similar in all respects to the No. 3 \$90 wall cabinet with the exception that a smaller cabinet is furnished; this case, however, is nicely finished in oak, and is provided with a plate glass hinged door.

500 VOLT CURRENT.

Where the 500 volt current only is available the best plan is to install our \$30 generator, which can be operated by a $\frac{1}{4}$ H. P. 500 volt motor. The same motor may also be used to operate a static machine or air compressor.

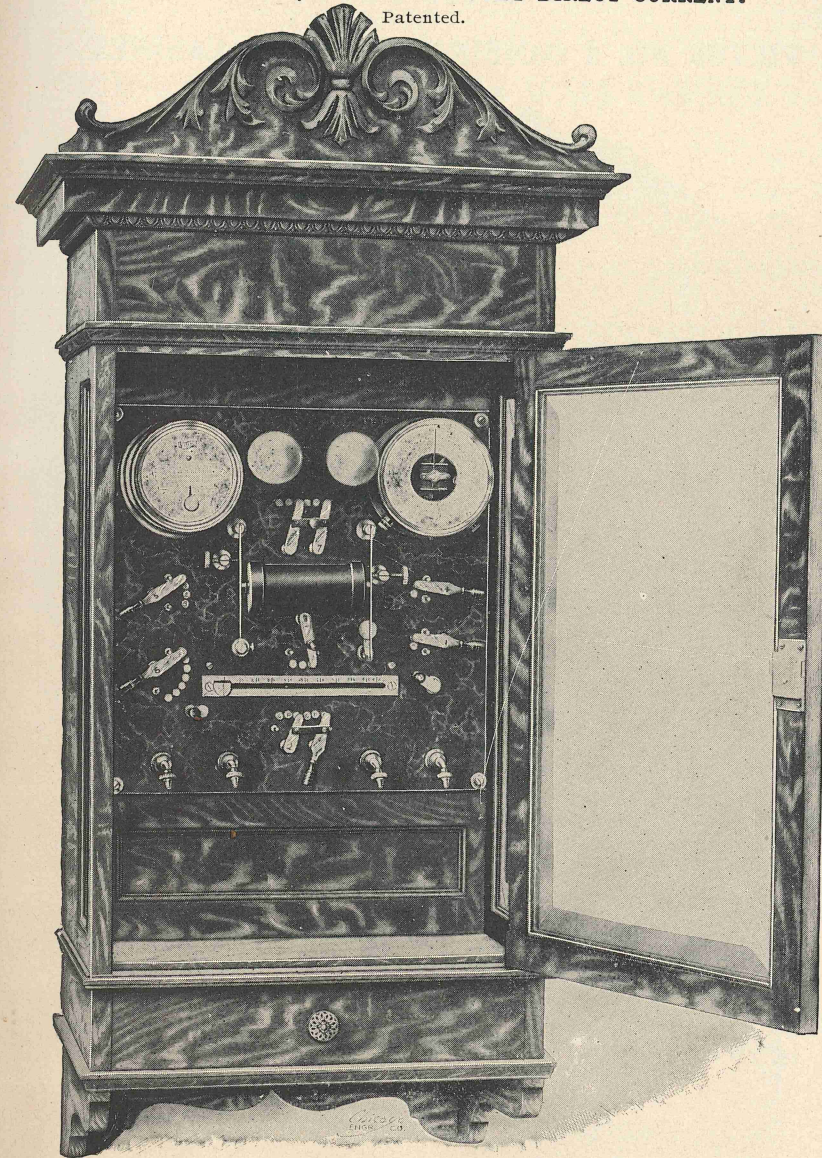
This method insures absolute immunity from danger of shocks from the 500 volt current, there being no metallic connection between the wall plate and the street current.

We have, however, devised a special rheostat which actually reduces the 500 volt to a 110 volt current. The use of this rheostat insures the same service precisely as would be obtained from the 110 volt current, and the danger from accidental shock is reduced to a minimum.

The No. 2 plate can be used to regulate the sinusoidal modality, see description and application of No. 3 switch.

VICTOR ELECTRO-THERAPEUTIC WALL CABINET NO. 3.
FOR USE ON 110, 220 AND 500 VOLT DIRECT CURRENT.

Patented.



Price complete as shown in cut for 110 volt current or for battery cells.....	\$90 00
Price complete as shown in cut for 220 volt current.....	105 00
Price complete as shown in cut for 500 volt current.....	115 00

The woodwork in above cabinet is finished in polished golden oak, the switchboard is a dark Georgia marble, and the combination makes a handsome and durable finish.

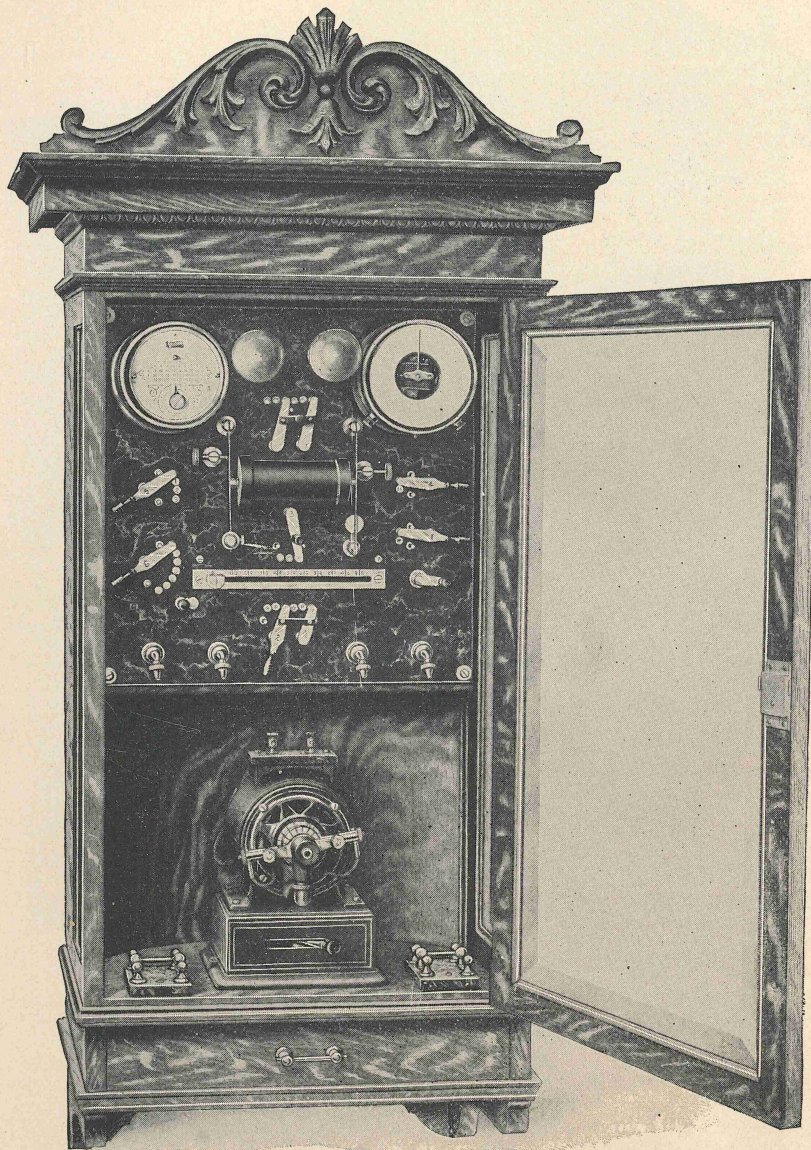
The apparatus when supplied with current from a 110, 220 or 500 volt direct current, or from battery cells will deliver the following currents:

A perfectly regulated galvanic current; a current suitable for electrolysis; a current for lighting diagnostic lamps, a primary faradic; a secondary faradic; an interrupted galvanic; a combined galvanic and faradic, and faradic current of any desired frequency.

This plate can be used to regulate the sinusoidal modality, see description and application of No. 3 switch.

VICTOR NO. 4 COMBINATION WALL CABINET.

Patented.



Price complete for 110 volt direct current\$165 00
 Price complete for 220 volt direct current 182 00

VICTOR NO. 4 COMBINATION WALL CABINET.

The outfit here shown is intended for operation on the continuous, or direct, street current of either 110 or 220 volts. From it can be obtained almost every known form and variation of galvanic and faradic currents, including the straight galvanic, interrupted galvanic, combined galvanic and faradic, primary faradic, secondary faradic, sinusoidal, cautery, and diagnostic lamp currents.

The method of regulation is such that absolute uniformity and accuracy is insured. This applies equally to the regulation of all the various currents above enumerated. A first class milliamperemeter is furnished for measuring the quantity and a volt scale indicates at all times the voltage of the current being used. This latter is a feature of far more importance than the inexperienced electro-therapist usually attributes to it. It is a fact recognized by all of the advanced workers in this field that voltage or pressure is fully as important as the quantity in galvanic treatments; more especially in electrolysis and cataphoresis. As proof of this, we would cite the well known fact that a current of from two to three amperes may be passed through the human body with comparative safety if a low voltage is employed; whilst this same quantity of current would inevitably prove fatal if the voltage were raised to a dangerous point.

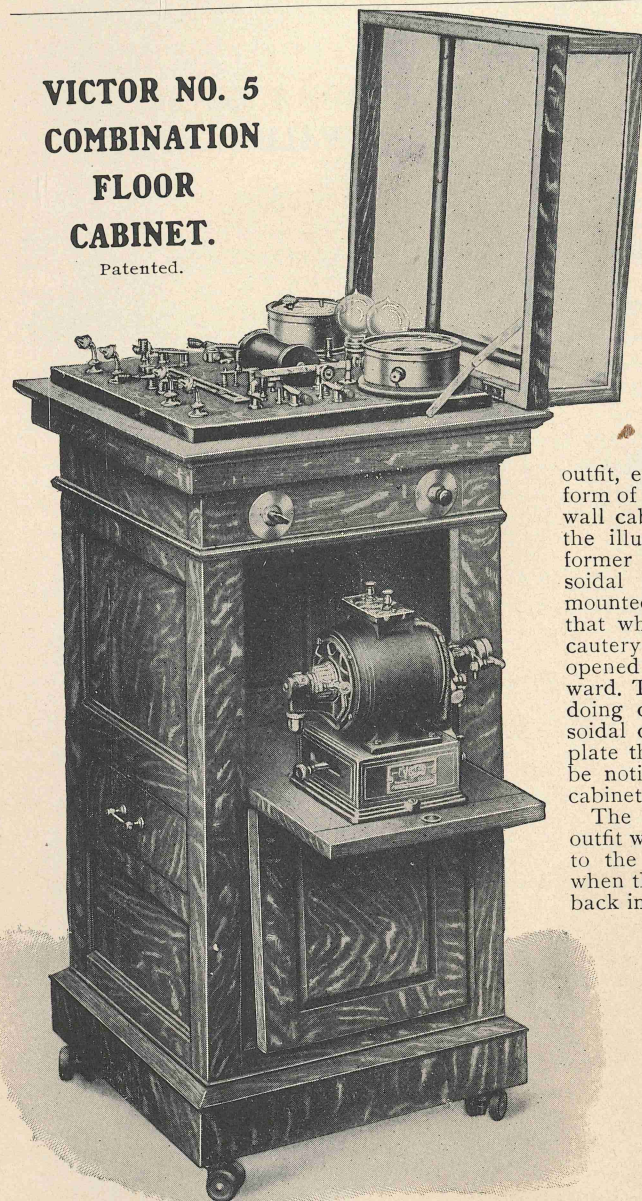
The faradic coil furnished with the No. 4 outfit has a secondary winding of medium length; the coil being provided with a ribbon vibrator as well as what is ordinarily known as a coarse vibrator. The ribbon vibrator is employed to produce sedative effects by increasing the frequency or interruptions of the current. This type of faradic coil is endorsed by Prof. Chas. S. Neiswanger. We are prepared, however, if desired, to furnish with this outfit, at a small additional cost, a faradic coil having a secondary eight thousand feet in length, so pointed off and subdivided that twenty-one different lengths of wire may be employed at will.

The sinusoidal current is generated by the motor transformer shown in the lower portion of the cabinet. This is a true sinusoidal current with means provided for varying the length of the sine as well as perfectly controlling the voltage. This same motor transformer also provides the cautery current. This current is of sufficient volume to satisfactorily heat all ordinary cautery electrodes such as are illustrated in our catalogue. The No. 4 outfit is designed to occupy wall space only and for that reason will appeal to those who have limited floor space in their operating rooms. In appearance, this outfit is all that could be desired. The cabinet itself, unless otherwise ordered, is furnished in highly polished golden oak and every part of the apparatus is well finished. It is artistic in design and will prove an ornament as well as a convenience in the best appointed office.

It is hardly necessary to state that no graphite is used in the construction of this apparatus, the resistance material being entirely of metallic wire, thus insuring that there will be absolutely no change in the regulation even after years of service.

VICTOR NO. 5 COMBINATION FLOOR CABINET.

Patented.



Price complete, as shown, for 110 volt direct current.....\$180 00
Price complete, as shown, for 220 volt direct current..... 197 00

The Victor No. 5 Floor Cabinet is for use on the direct, or continuous, street current of 110 or 220 volts. This outfit delivers precisely the same currents and is in every respect a duplicate of the No. 4 combination outfit, excepting that it is in the form of a floor cabinet instead of a wall cabinet. As will be seen in the illustration, the motor transformer which generates the sinusoidal and cautery currents is mounted upon a sliding shelf so that when it is desired to obtain cautery current, a drop door is opened and this shelf pulled forward. This is only necessary when doing cautery work as the sinusoidal current is delivered to the plate through a switch which will be noticed on the outside of the cabinet.

The illustration of our No. 6 outfit will give a very good idea as to the appearance of the No. 5 when the motor transformer is slid back in place and the door closed. A large, roomy drawer is provided for holding electrodes. The handle of this drawer will be noticed projecting from the front of this cabinet a little below the center.

We wish to call attention in this place to the fact that in this apparatus, as in all of our instruments, where cabinet work is necessary, we employ the very best cabinet work. It

may not, perhaps, be generally known that there is a wide difference in the quality and price of cabinets which might appear at first sight to be very similar. We wish to state as a fact that we could manufacture an exact duplicate of this cabinet in external appearance for less than one-half the cost that we actually put into it, but at the end of one or two years, the difference between the two cabinets would become very apparent. In fact, no better cabinet can be constructed than the one we furnish with this outfit. We have endeavored to produce an ideal electro-therapeutic apparatus in a floor cabinet form and we believe that for convenience, durability, scientific accuracy, compactness, and beauty of design and finish, the equal of this equipment cannot be found.

VICTOR NO. 6 BATTERY CABINET OUTFIT.

Patented.

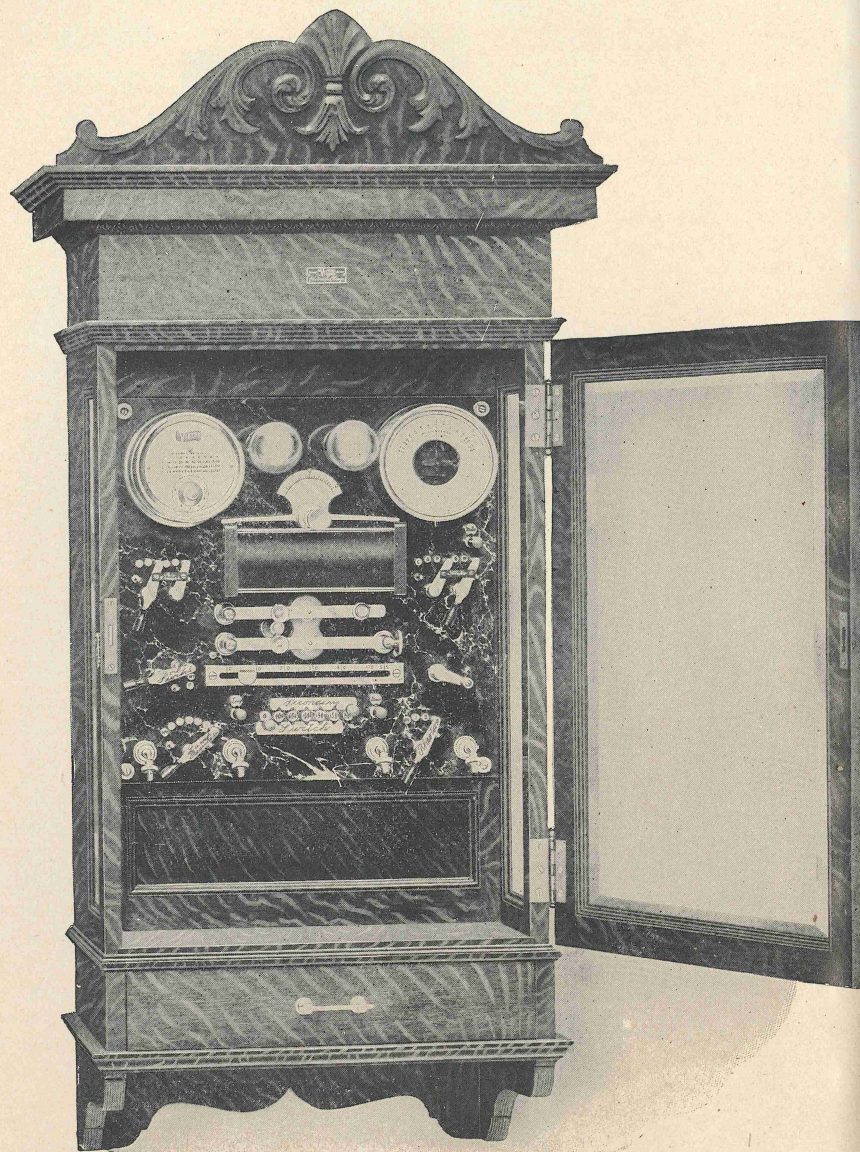


Price complete, with 43 battery cells,\$135 00

The plate used in the No. 6 outfit is identical with the one furnished with the No. 4 and No. 5 combination outfits, excepting that in the No. 6 outfit the plate is arranged to be operated from battery cells. The battery cells are of the dry type and are placed in suitable shelves provided for them in the cabinet. The cabinet is supplied with an electrode drawer and the entire back panel is removable, although when this panel is in place it is so nicely fitted that the appearance of the cabinet is in no way marred. The cabinet as a whole, is in every way equal to the No. 5. There is, of course, no sinusoidal or cautery attachments to this outfit. If, however, the alternating current is available, we are prepared to furnish the outfit with a cautery or sinusoidal attachment, drawing the necessary supply current from the alternating lighting circuit.

VICTOR HIGH TENSION PLATE.

Patented.



Price complete as shown in cut for 110 volt current	\$120 00
Price complete as shown in cut for 220 volt current	135 00
Price complete as shown in cut for 500 volt current	145 00

VICTOR HIGH TENSION PLATE.

The illustration shows the plate in the same housing as our No. 3 plate. However, we can furnish the high tension plate enclosed in any of our cabinets (excepting the No. 1 cabinet, which is too small). We can also furnish it in any of the combination outfits, the price in each instance will be thirty (\$30) dollars higher than the list price of the combination in question with the ordinary plate.

The Victor high tension plate differs from our other plates in the following particulars:

The faradic coil has a secondary winding eight thousand feet in length. This winding is so pointed off and controlled by switches that the full eight thousand feet may be made available or any one of twenty-one different lengths ranging from a minimum of five hundred feet to the eight-thousand maximum.

The plate is provided with a coarse vibrator and with a fine ribbon vibrator. These are not attached directly to the coil, but are separately mounted on the plate and are actuated by independent magnets.

Provision is made to interrupt each and all of the currents delivered by the plate by an automatic rheotome, giving twenty-seven different rates of interruptions.

The milliamperemeter is provided with a double scale; one scale reading from zero to twenty and the other from zero to four hundred.

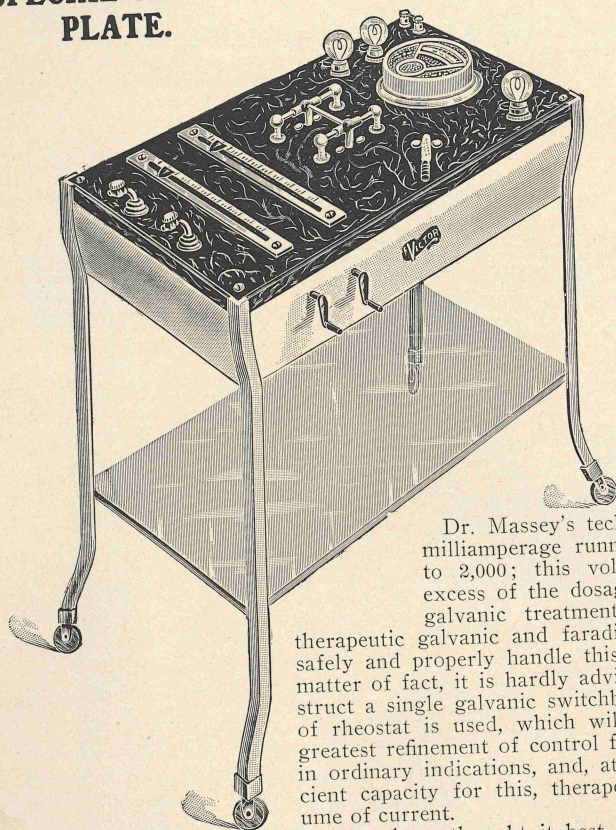
The faradic coil is provided with a separate and independent regulator, thus when the combined galvanic and faradic currents are used, these currents may be independently regulated. The switches are plainly marked with the proper designation of the function of each, this in place of the figure marking used on the other plates.

Aside from the above points, the construction of our plate is similar to that of our ordinary plates. The galvanic regulator is provided with an accurate volt scale, a separate circuit being provided for the lighting of diagnostic lamps, etc.

In the design of this, our most complete and elaborate therapeutic plate, we have not followed the suggestion of any one electrotherapist, but it represents a consensus of the opinions of a large number of workers in this field as to the best combinations of currents and the best methods of control. When you add to this the best efforts of our mechanical and electrical designers, we believe that few will dispute the statement that the possessor of one of these plates will have at his command the best apparatus of this character to be had anywhere in the world at any price.

The high tension plate can be used to regulate the sinusoidal modality, see description and application of the No. 3 switch.

SPECIAL MASSEY GALVANIC TABLE PLATE.



Price as shown for
110-volt direct
current\$80 00

Dr. G. Betton Massey, of Philadelphia, has kindly permitted the use of his name in connection with the apparatus here illustrated.

Every electro-therapist, and every physician who has made any attempt to keep abreast of the times, must be more or less familiar with the reports of the remarkable results obtained by Dr. Massey with his mercury-zinc electrolysis method in the treatment of cancer, as well as in other conditions requiring the use of unusually heavy currents.

Dr. Massey's technique, calls for the use of milliamperage running up, in some instances, to 2,000; this volume of current is far in excess of the dosage required for all ordinary galvanic treatments, consequently, very few therapeutic galvanic and faradic cabinets are arranged to safely and properly handle this amount of current. As a matter of fact, it is hardly advisable or practicable to construct a single galvanic switchboard, no matter what form of rheostat is used, which will be calculated to give the greatest refinement of control for the light dosage required in ordinary indications, and, at the same time, have sufficient capacity for this, therapeutically, extraordinary volume of current.

After consulting Dr. Massey, we have thought it best to devise an outfit specially calculated for this purpose; by this we do not mean that the Massey outfit cannot be used at all where a small dosage is required, as it is possible to obtain a dosage as low as one milliamper, but the range of control is such that a very slight movement of the rheostat controlling mechanism would be sufficient to permit the passage of this small quantity.

In this apparatus, no graphite whatever is used, the resistance material being metallic wire made of special alloy; the principle of construction is the same as in the Victor wall plates, excepting that, essentially, the resistance drums are larger, and there is a greater length of larger resistance wire. In order to attain the desired result, it is necessary to make use of two large resistance drums, each with its own independent controlling mechanism. The milliamper meter is almost three times as large as those used on the ordinary wall plates; the meter is of the "dead-beat" variety and is guaranteed to be absolutely accurate, the movement being the same type as used in the most accurate laboratory instruments.

The flow of current is controlled by means of the two small cranks, which are seen projecting from one side of the instrument; these cranks operate threaded rods, which engage the traveling contacts that pass over the resistance wire. These contacts take up one convolution of wire after another, and as there are several hundred turns or convolutions of wire on the two drums, it will be seen that in spite of the capacity of the rheostat, there is a considerable refinement of control.

As will be seen from the illustration, the switchboard is mounted on a suitable iron table, provided with smooth, easy rolling castors; the construction and finish of the table is of the very best. A glass shelf is provided, which will be found a great convenience. The switchboard is finished in imitation of dark Georgia maple and the table in white enamel.

PRICE LIST OF VICTOR WALL PLATES, CABINETS AND COMBINATIONS.

In the following price list the plates and the cabinets in which they are housed, are separately designated by number and the combination of each plate, when in a certain cabinet or housing, is given a number for convenience in ordering.

There are three styles of plates, Nos. 1, 2 and 3. No. 1 is the \$50.00 plate and is not interchangeable. No. 2 plate is the medium-priced plate shown in the catalogue on page 54. No. 3 is the high tension plate shown in page 60. No. 1 cabinet is the one housing the No. 1 plate shown on page 53. No. 2 cabinet is the one housing a No. 2 plate on page 54. No. 3 cabinet is the one shown on page 55, housing a No. 2 plate. No. 4 cabinet is the one shown on page 56. No. 5 cabinet is the one shown on page 58. No. 6 cabinet is shown on page 59.

Prices for 220 volt current are omitted.

No. 1, fifty (\$50.00) dollar plate.....	\$50 00
No. 2, No. 2 plate in No. 2 case.....	75 00
No. 3, No. 2 plate in No. 3 case.....	90 00
No. 4, No. 2 plate in No. 4 case with No. 9 transformer, for cautery and sinusoidal.....	165 00
No. 5, No. 2 plate in No. 5 cabinet with No. 9 transformer for cautery and sinusoidal.....	180 00
No. 6 is No. 2 plate in No. 6 cabinet, complete with batteries; plate to be used for batteries.....	135 00
No. 7, No. 3 high tension plate in No. 2 case.....	105 00
No. 8, No. 3 plate in No. 3 case.....	120 00
No. 9, No. 3 plate in No. 4 case.....	195 00
No. 10, No. 3 plate in No. 5 case.....	210 00
No. 11, No. 3 plate in No. 6 case.....	165 00
No. 12, No. 2 or No. 3 plate as designated, mounted in No. 5 case with alternating cautery transformer in place of the No. 9 transformer.	
This combination would be used where alternating current was available, the alternating current being used for cautery and sinusoidal and the plate operated by a generating set or other source of direct current.	
Price with No. 2 plate.....	\$163 00
Price with No. 3 plate.....	193 00
Oxford plate (no cabinet).....	35 00

GALVANIC CONTROLLER.

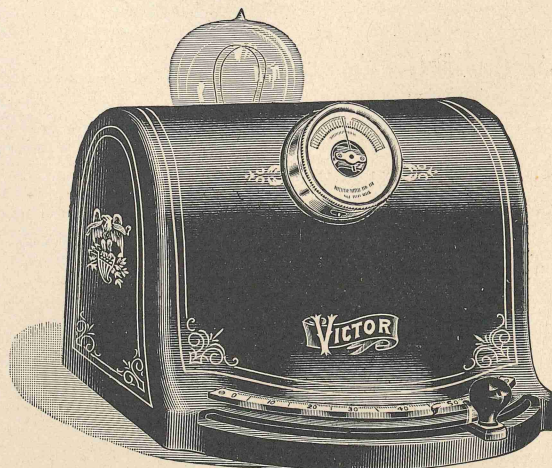
Price for 110 volt direct current.....\$15 00
 Price for 220 volt direct current..... 18 00

The above instrument is a thoroughly reliable controller where galvanic current only is desired; a metallic wire rheostat is used, insuring permanently uniform regulation. The regulation is obtained by simply moving the lever projecting from the base, the voltage being delivered to the patient is automatically indicated on the scale shown on front of instrument.

The range of the controller is from zero to 60 volts.

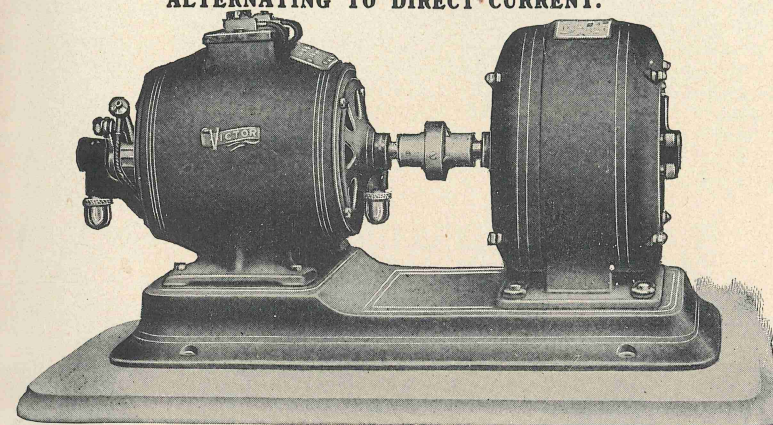
An ideal instrument for electrolysis.

Where alternating current only is available this controller can be attached, the resulting current in this case will be sinusoidal with voltage control.

GALVANIC CONTROLLER WITH MILLIAMPERE-METER.

Price for 110 volt direct current.....\$30 00
 Price for 220 volt direct current..... 31 00

This instrument is in every respect the same as the galvanic controller, excepting that a first-class milliammeter is furnished for measuring the quantity of current being administered.

DIRECT CONNECTED GENERATING SET FOR TRANSFORMING ALTERNATING TO DIRECT CURRENT.

Price for 60 cycle alternating current..... \$90 00
 Price for 125 and 133 cycle alternating current..... 105 00
 Price for 25 to 40 cycle alternating current..... 120 00

As will be apparent at a glance, this outfit consists of an alternating current motor attached by means of a coupling to a direct current generator, the alternating current operating the motor which in turn drives the generator which develops a direct current suitable for operating therapeutic cabinets, shunt controllers, wall cabinets, eye magnets, etc. This generating set has a capacity of one ampere at 110 volts, thus supplying a sufficient volume of current so that practically the same results are obtained in the use of any of our therapeutic cabinets or plates when connected to it as though the 110 volt direct lighting circuit were available.

We wish to call special attention to the coupling used between the motor and the generator. This coupling is so constructed that there is absolutely no metallic connection between the motor and the generator, thus obviating all danger from accidental crossing of outside wires.

The current generated is even and smooth, closely resembling that which is obtained from battery cells. We would recommend the use of this outfit in preference to the belted type for the reason that there is no difficulty or annoyance from belt slippage, breakage, etc. To add to the usefulness of this outfit we now extend the shaft at one end and supply a grooved pulley so that the motor can be used for light power purposes, such as operating a No. 2 air compressor, two speed countershaft to which a No. 1 vibrator handle can be attached, etc., etc.

We might mention in this connection that all of our therapeutic plates, cabinets, etc., as well as our eye magnets are furnished for operation from this generating set at the same price as given in the price list for each instrument for the 110 volt direct current. This direct connected outfit is arranged for slow speed. This, plus correctness in construction, insures quietness in operation.

Where the alternating current only is available we would recommend this outfit as being far more satisfactory than the use of battery cells although the initial cost is somewhat higher. When it is considered that battery cells are a constant source of expense and this outfit will run for years with no expense for repairs aside from a few cents for brush renewals, it is a safe statement to make that in the end the motor generator will prove the cheapest as well as the most satisfactory. Where the motor is used there will be no diminishing of current either in voltage or quantity, even after years of use, whilst in the case of battery cells, deterioration starts at once and causes constant diminishing of the output.

In design and finish this apparatus is fully up to our usual standard and will therefore not prove disappointing.

ELECTROLYTIC RECTIFIERS.

Since the publication of the article entitled "The Truth About the Electrolytic Rectifier," written for us by Wm. O. Eddy, B. S. (reprints of which we shall be pleased to furnish on application). Many improvements have been made in the design and construction of the rectifiers of this type being offered to the medical profession,

but even the best of them fail to perfectly rectify the alternating current, and the majority of them deliver a pulsating semi-direct current, which may have some therapeutic value, but which bears little resemblance to true galvanism.

Unquestionably the direct current dynamo or generator and battery cells remain as the only resources of the physician who wishes to obtain from his wall plate an absolutely even uniform flow of galvanic current.

Victor wall plates will operate in connection with fluid rectifiers, but necessarily the currents delivered to the patient must partake of the characteristics of the current delivered by the rectifier. The same is, of course, true regardless of the make or type of wall plate employed.

VICTOR HOME FARADIC BATTERY No. 1.



Price, including electrodes as shown in cut..... \$8.50
The battery here shown was designed to meet the demand for a serviceable outfit for home use in the many cases where the physician prescribes frequent faradic applications.

The coil has a secondary winding of medium length, is well made, mounted on marbleized slate, and is provided with a reliable vibrator.

Current is supplied from a single dry cell of standard make.

Case is well made and covered with imitation leather, which, however, cannot be told from genuine, and is quite durable.

This battery is not intended as a substitute for the physicians' No. 1 outfit, but it is far superior to the small cheap outfits so extensively advertised to the laity, and that are nothing more or less than "shocking" machines.

PHYSICIANS' No. 2 PORTABLE FARADIC BATTERY.



Price, including cords and spongio electrodes..... \$13.50

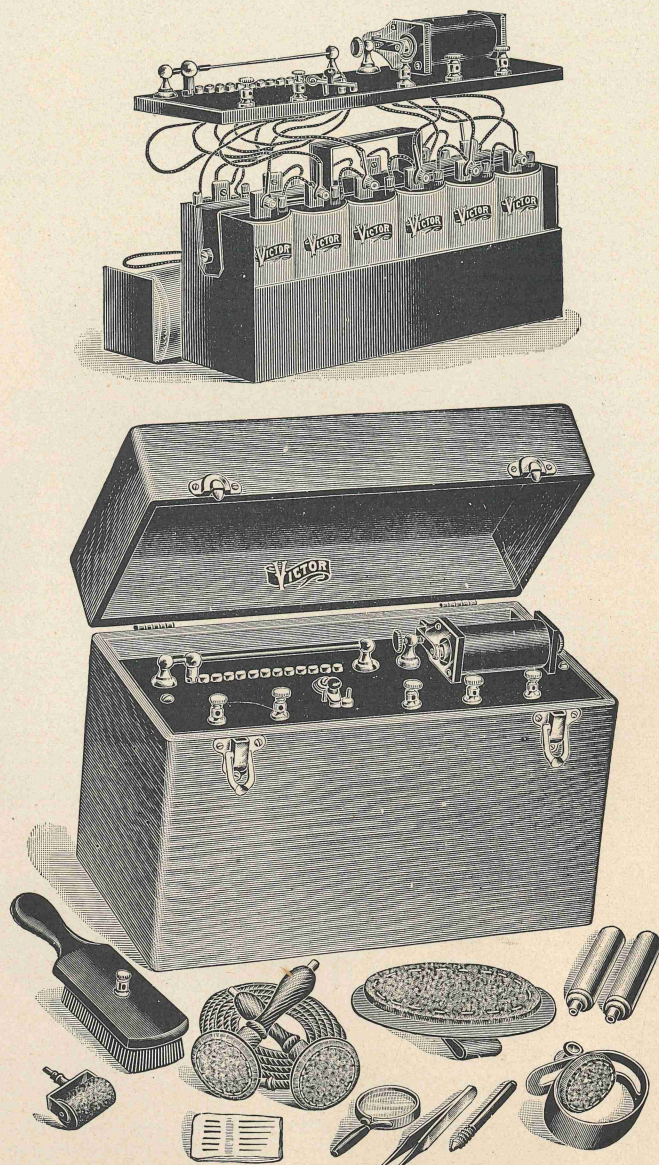
This battery is mounted in a handsome case, covered with genuine seal grain leather and provided with leather handle for carrying.

Special attention is called to the faradic coil which is provided with extra long secondary winding, is very carefully and substantially constructed, has polished hard rubber heads and covering, altogether a far better coil than ordinarily found in batteries of this type. Current is supplied by dry cells that are easy of access, being easily renewed when necessary; first-class dry cells have been found more satisfactory and less annoying for this class of work than those of the acid type formerly used. These cells can be purchased from any dealer and can be replaced by the physician himself.

An adjustable ribbon vibrator enables the operator to obtain much higher frequency than is ordinarily available from batteries of this class.

The currents available are primary faradic, secondary faradic and a combination of these two. An outfit from which the physician may confidently expect results.

Victor No. 3 Fourteen Cell Combined Galvanic and Faradic Outfit



Price including all electrodes shown in illustration.....\$30.00
 Price with pair of electrode cords, one small sponge and
 one metal handle electrode 25.00

The electrodes furnished with the No. 3 outfit when ordered complete are as follows: One pair of electrode cords, one pair of universal handles, one pair

of hand spongiopile electrodes, one large spongiopile electrode, one wrist spongiopile electrode, one pair of metal handles, one hard rubber needle holder, one pair depilatory forceps, one hand magnifying glass, three steel broaches for epilation, three Hayes' bulbous pointed needles, one hair brush electrode, one wheel or roller electrode.

The foregoing is recommended as covering the widest range of usefulness in the field of work in which this type of battery is ordinarily employed.

The currents available from this battery are 18 volts Galvanic Primary Faradic, Secondary Faradic and Combined Primary and Secondary Faradic. This battery is mounted in a handsome Golden Oak case, with heavy, durable nickel plated trimmings. The coil, switches, etc., are mounted upon marble, thus avoiding the inevitable oxidizing and warping that results from the use of rubber for this purpose.

The faradic coil is provided with long secondary winding, has polished hard rubber covering, is carefully constructed and is guaranteed by us to be a first class physician's coil.

The current for the galvanic circuit is supplied from 12 first class dry cells of standard size. Special attention is called to the design of the switch by means of which these cells are cut into the circuit one at a time if it is desired to increase the voltage. The contacts of this switch are arranged in a line immediately below a metal rail supported at each of its ends by substantial posts. In place of the usual thin strip of metal made to do duty as a switch in ordinary batteries of this kind, a traveling plunger switch is mounted on the rail above the contact points. This plunger is forced directly down on to the contact points by means of a spiral spring, insuring absolutely perfect and uniform contact at all times, regardless of the position of the switches or of the length of time the battery has been in use.

The upper surface of each contact point is slightly hollowed out or dished, the lower end of the plunger switch being curved to fit these indentations. The effect is to cause the plunger point to automatically find the exact center of the contact and some little pressure is required to move it to the center of the next contact; it is almost impossible for the plunger to bridge across two contacts and remain in that position. Thus all the troubles incident to the use of the old type lever switch are obviated.

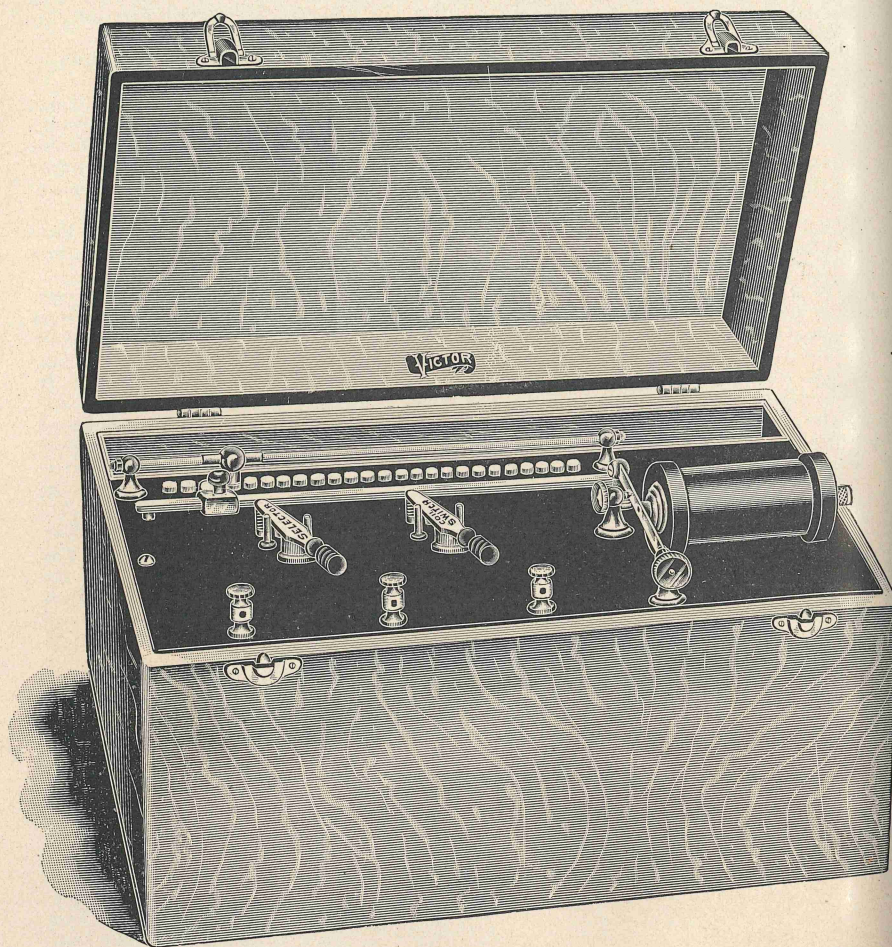
In the upper half of the illustration is shown the method of mounting the batteries in the case. As will be seen, the battery cells are mounted in a removable tray. When it is desired to renew the battery cells, the switch top is quickly removed by unscrewing the two screws which hold it in place. When this switch plate is lifted up a handle is exposed which extends upward from the tray and the entire set of batteries can be lifted out of the case. The batteries are so placed in the tray that all connections and binding posts are quite accessible. The ends of all connecting wires are provided with flat metal terminals made to fit the binding posts.

This construction makes it entirely unnecessary to send the battery to an electrician when it is desired to renew the cells. The physician may simply purchase the cells, remove the tray, disconnect and replace one cell at a time and can thus renew his batteries in whole or in part with perfect ease without the least chance of making a wrong connection.

As much attention is paid to the detail of construction in these batteries as is done in the case of the largest and most expensive Victor Combination Cabinets, and it is owing to this care in the design and construction of the individual parts that Victor apparatus can be invariably depended upon to give uniformly good service.

Note—Diagnostic lamps can be operated from this battery.

Victor No. 4 Twenty-Seven Cell Combined Galvanic and Faradic Portable Battery



Price, including cords, universal handles and spongio discs\$38.00

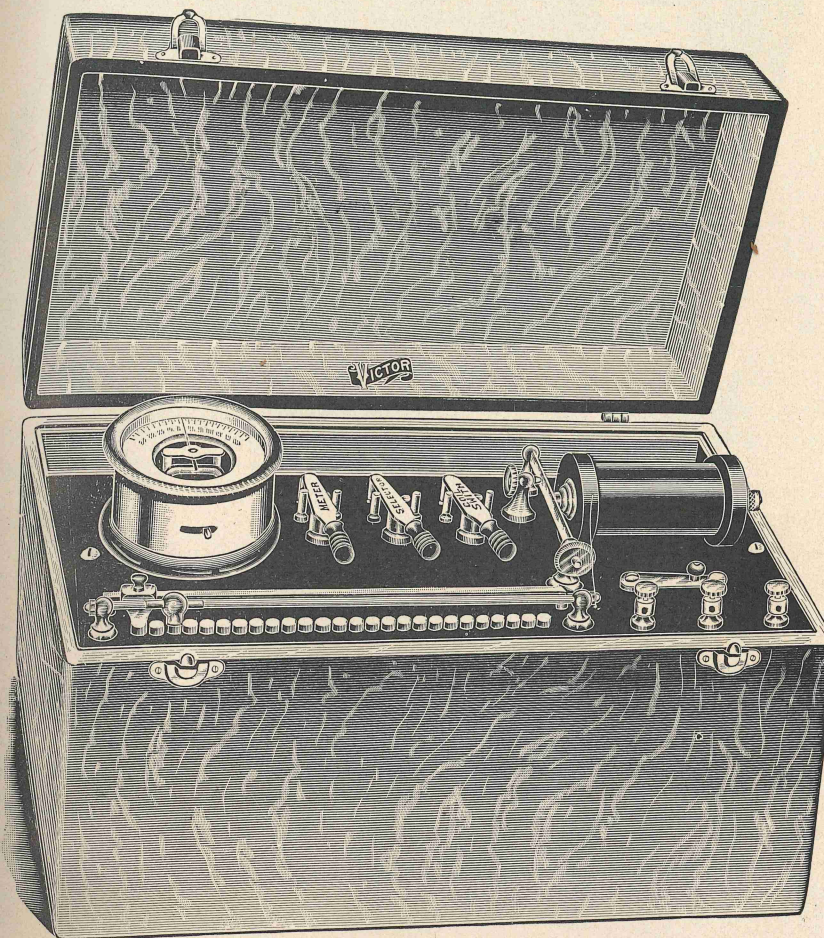
Embodied in this outfit are many entirely new and original features. One of them to which we desire to direct special attention, being the combination of galvanic and secondary faradic current which are each under independent control. This is a combination found in no other portable battery.

The galvanic current is regulated, *i. e.*, the voltage is increased or decreased by increasing or decreasing the number of cells in the circuit. This is accomplished by means of a double cell selector switch, enabling the operator to add single cells to the circuit or to select any cell or group of cells desired. The cell selector switching mechanism is shown in the illustration and consists of a row of contact points arranged beneath the two horizontal rails, each of these rails carrying a traveling switch.

These traveling switches are provided on their under sides with plunger contacts. These plunger contacts are forced directly down on the contact points by means of a spiral spring, insuring absolutely perfect and uniform contact at all times, regardless of the position of the switches or the length of time the battery has been in use.

The upper surface of each contact point is slightly hollowed out or dished,

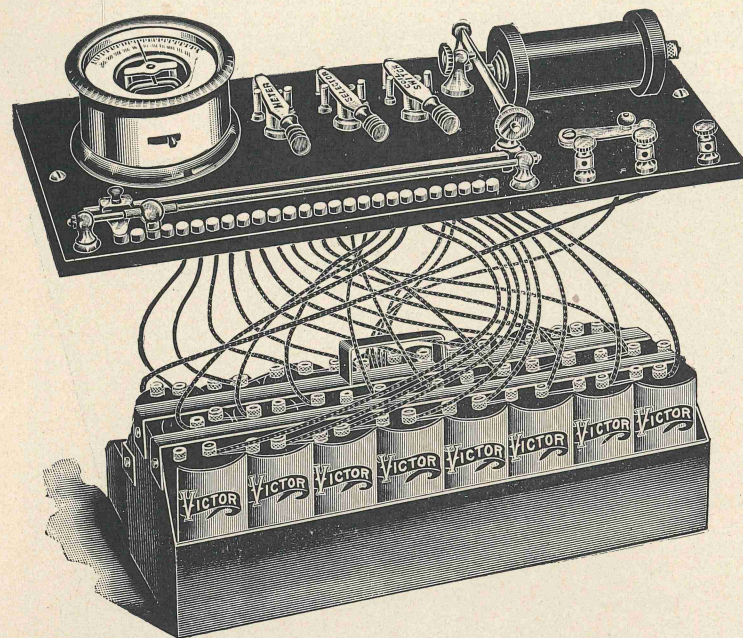
Victor No. 5 Twenty-seven Cell Combined Galvanic and Faradic Portable Battery



Price, including conducting cords, universal handles and spongio discs,
\$50.00

the lower end of the plunger switch being curved to fit these indentations. The effect is to cause the plunger point to automatically find the exact center of the contact and some little pressure is required to move it to the center of the next contact; it is almost impossible for the plunger to bridge across two contacts and remain in that position. Thus all the troubles incident to the use of the old type lever switch are obviated.

In a separate illustration is shown the method of mounting the batteries in the case. As will be seen, the battery cells are mounted in a removable tray. When it is desired to renew the battery cells, the switch top is quickly removed by unscrewing the two screws which hold it in place. When this switch plate is lifted up a handle is exposed which extends upward from the tray and the entire set of batteries can be lifted out of the case. The batteries are so placed in the tray that all connections and binding posts are quite accessible. The ends of all connecting wires are provided with flat metal term-



Illustrating interior of No. 4 and 5 outfits showing how cells are arranged in removable tray

inals made to fit the binding posts.

This construction makes it entirely unnecessary to send the battery to an electrician when it is desired to renew the cells. The physician may simply purchase the cells, remove the tray, disconnect and replace one cell at a time and can thus renew his batteries in whole or in part with perfect ease without the least chance of making a wrong connection.

An interrupter key permits of an interruption of the galvanic current, and, in fact of all currents delivered by the battery, when desired.

The faradic coil is provided with long secondary winding, has a ribbon vibrator of best construction, enabling the operator to obtain a much higher and more even rate of vibration than with the vibrators ordinarily supplied with portable batteries.

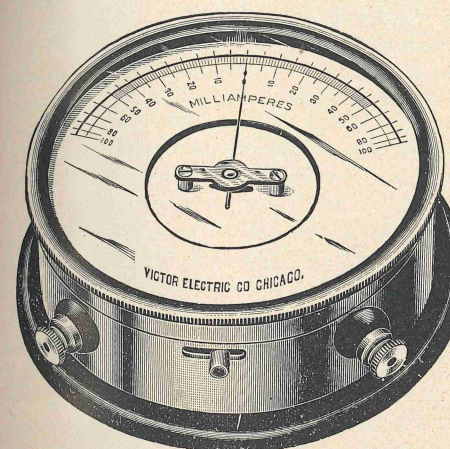
The combined galvanic and secondary faradic currents with independent control that can be obtained from this outfit will be found very useful; more especially where the galvanic current is being used for its polar effects as in electrolysis. In these cases, the secondary faradic current can be combined with the galvanic and used as a sedative thus avoiding a great deal of the pain incident to the electro-chemic action taking place at one of the poles.

As is usual in Victor apparatus, a great deal of attention is paid to the detail of construction in these batteries. The containing case is of highly finished golden oak, the cabinet work of which is beyond criticism, the switches, etc., are mounted upon marble or marbleized slate, materials which are far more durable and of finer appearance than hard rubber, the material often employed for this purpose.

NOTE—Diagnostic lamps can be operated from this battery.

The Victor No. 5 portable battery is in every particular identical with the No. 4, excepting that a first-class milliamperemeter for measuring the quantity of current being delivered is incorporated in the outfit. Any further description of the No. 5 would, therefore, be superfluous.

MILLIAMPEREMETERS.



Diameter $5\frac{1}{4}$ inches. Scale 0 to 100 milliamperes.

Price.....\$10 00

and where the physician requires neither an extremely high nor a very low reading it will fulfil satisfactorily every requirement.

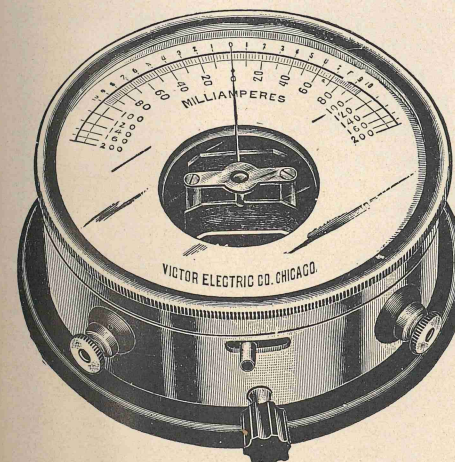
This meter will be found very accurate and reliable under all conditions, being practically unaffected by outside magnetic influences.

Will work equally well in either a horizontal or vertical position.

A special feature of this meter is the adjustable dial; the dial can be shifted in either direction by means of a little handle which will be noted projecting from the lower part of the case, thus should the needle be accidentally thrown out of adjustment the trouble is easily and quickly remedied.

The range of reading is from 0 to 100, each subdivision representing one milliamperere.

The range of this instrument is sufficient for all ordinary therapeutic work



Diameter $5\frac{1}{4}$ inches. Scale in black 0 to 400.

Scale in red 0 to 20.
Price.....\$12 00

tioners, particularly those devoted to the more delicate operations of the eye and the brain, where currents of a fraction of a milliamperere may be required, and it is desired to have subdivisions of the scale so divided as to make the reading of fractions of a milliamperere easily legible.

Combining as it does two instruments in one, there is probably no instrument on the market offering the wide range of reading and accuracy of measurements at so low a price.

This meter is very similar in principle and construction to the one above described.

This meter does not vary in its construction from the regular form described above, except in the introduction of a shunt to permit of the use of a scale, reading 0 to 20 milliamperes, each small subdivision being $\frac{1}{2}$ milliamperere. This shunt is controlled by a plug in the front of the case of the meter.

WHEN THE PLUG IS IN the reading is from the lower scale, figures in black, each scale subdivision being 4 milliamperes.

WHEN THE PLUG IS OUT the reading is from the upper scale, figures in red, each scale subdivision being $\frac{1}{2}$ milliamperere.

The range of reading up the lower scale is from 0 to 400 milliamperes.

We recommend this shunt combination meter as very satisfactorily supplying the need experienced by some practi-

VICTOR ASEPTIC ELECTRODES.

Doubtless every electro-therapeutist has frequently regretted the necessity of using electrodes that by reason of their construction could not be thoroughly sterilized. This is more specially true of urethral, vaginal and rectal electrodes having long stems insulated with hard rubber tubing. It is impossible to fit a hard rubber sleeve over a metal stem so perfectly that there is not a small space left between the stem and the insulator, and in this space the germs and dirt are bound to collect. To disinfect it, the whole electrode is sterilized in some chemical solution which enters this space and forms verdigris from the action on the copper stem, and, no matter how carefully the outside may be wiped, electrodes that appear perfectly clean on the outside frequently are in a filthy condition inside the insulating sleeve.

Another serious objection to the old method is that the hard rubber sleeve is brittle and easily cracked, chipped or broken. The hard rubber is also rigid and unyielding, making it impossible for the physician to alter the curve of his electrode in the slightest degree.

Commercial hard rubber is full of small metallic impurities which seriously impairs its insulating qualities. It is also full of small "pin holes" and is non-homogeneous.

We have met and fully overcome all of these defects by an entirely original insulating process. By this process the parts of the electrodes requiring to be insulated are completely coated with pure rubber gum in the liquid state. They are then baked to the necessary degree of hardness and polished until they are absolutely smooth and bright.

The results are, first, the entire elimination of space between the electrode and the insulating material, so that after being sterilized the electrode is invariably perfectly aseptic; pure rubber gum being used, it is impossible that there should be any metallic or other foreign matter in the insulating material; the insulation is sufficiently flexible so that electrode stems can be easily bent to take any new angle desired (this latter is a specially desirable feature, as the electrode can be made to conform to slight structural variations in each individual case).

By this process it is possible to make the electrode stems considerably smaller than by the old method, and as the physician will instantly recognize, there are many cases in which this is of the utmost importance.

Summing up, the advantages of the new process over the old are added aseptic qualities, more perfect insulation, greater utility, less painful in application, higher polish and greater durability.

The new process has been followed wherever feasible in the manufacture of the electrodes illustrated in the following pages, and as will be noted, the prices are in many instances no higher than is being charged for the old style by other manufacturers.

It is now almost three years since we adopted the improved method of insulation, and many thousands of electrodes so treated are now in service. Very few complaints of defective insulation have been received, in fact, not more than one-fourth the trouble that would have developed with an equal number constructed according to the old method.

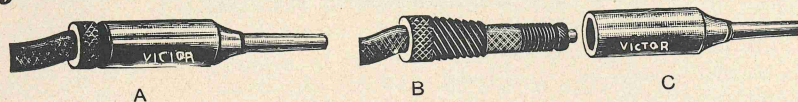
STERILIZING METHOD.

Electrodes insulated with rubber should not be boiled. After thoroughly cleansing them with brush and soap, place them in a tall jar or bottle—for instance, a Mason fruit jar—filled with an antiseptic solution such as formalin, zymocide or boric acid and leave them there until wanted for use. In the case of copper electrodes, in addition to the soap and brush the copper should be rubbed with sapolio to remove the oxidization. If the electrode is to be amalgamated with the acid nitrate of mercury that will be all sufficient to sterilize it completely.

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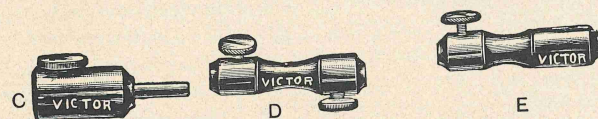
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ADJUSTABLE CORD TIPS AND UNIVERSAL CONNECTORS.

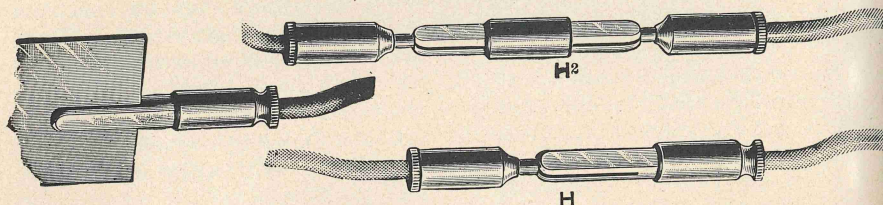


Victor Adjustable Cord Tips. Price, per pair..... \$0 12

SOME VERY USEFUL CONNECTORS.

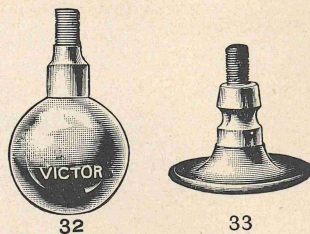


- C. Universal Cord Tip Connector, to connect cord tips of any battery with Victor Battery, each \$0 10
 E. Universal Electrode Connector, to connect cord tips of any battery with the Victor Electrodes, each 10
 D. Double Connector. for wires and cords, each..... 10



DR. W. J. HERDMAN'S CONVENIENT CONNECTORS.

Price, Double Connector H² each..... \$0 10
 Price, Single Connector H, each..... 10

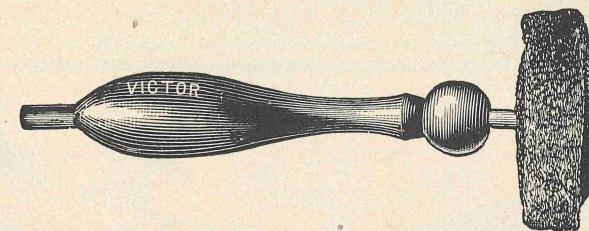


- 32 Ball Electrode \$0 30
 33 Disc Electrode 20



- 14 Tongue Plate, insulated \$0 60

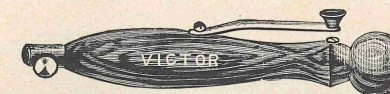
ELECTRODES.



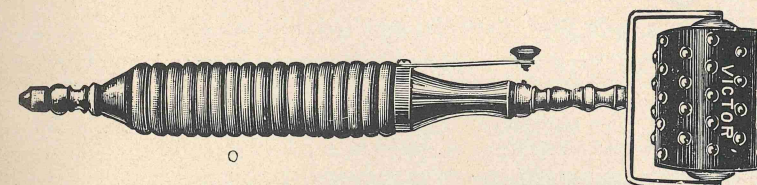
- No. 1. Universal handles, with sponge covered discs, per pair..... \$0 55
 Sponge discs, per pair..... 25
 Universal handles with set screw, per pair..... 35



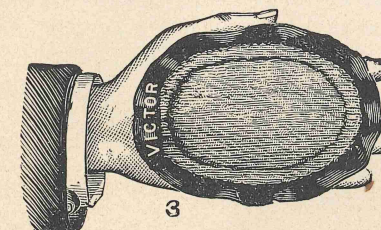
- No. 40. Nickel-plated metal handles, per pair..... \$0 30



- No. 87. Universal handle, with interrupter, each..... \$0 50

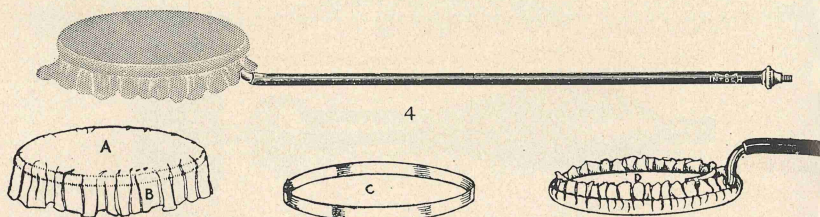


- No. 0. Wheel electrode, of hard rubber, set with metallic points, for muscular faradization, universal hard rubber handle, with current interrupter.... \$2 00
 Handle only..... 1 00



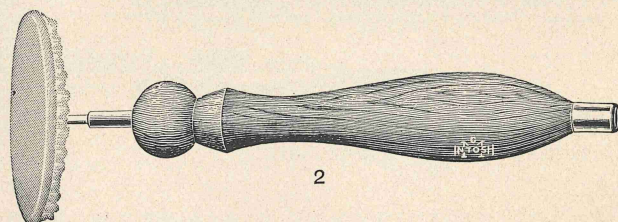
- No. 3. Sponge covered electrode, insulated with soft rubber for general application with the hand..... \$0 60

PAD ELECTRODES



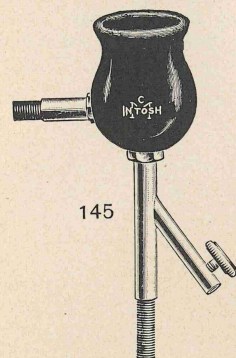
4. Dr. Hubbell's Aseptic Pad Electrode, with long handle..... \$1 50

This very practical form of electrode offers the important advantage of greater asepsis than any other form of pad electrode. It is far more cleanly and sanitary than the ordinary sponge electrode as it can be instantly fitted with a new covering of gauze or other material for each individual case. The disc A is first covered with a layer of gauze B, after which it is shaped and smoothed out by passing it through the ring C, when the handle is next clamped into position on the back of the pad as in D. The disc is four inches in diameter and is attached to a long handle insulated with hard rubber, making a most suitable appliance for spinal application.

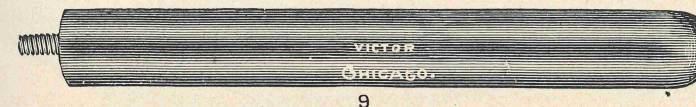


2. Dr. Hubbell's Aseptic Disc Electrode, with universal handle..... \$0 50
Price, per pair..... 1 00

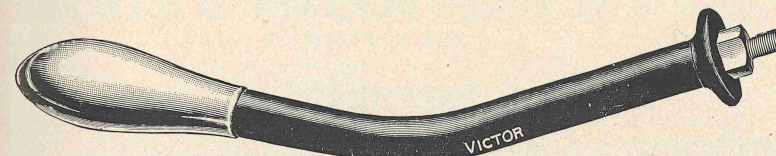
This electrode is constructed on the same plan as the instrument above described, but as the disc is much smaller no ring is necessary to shape the pad, as this can be done by the hand. This instrument will be welcomed by physicians who appreciate the importance of perfect cleanliness in electrical application.



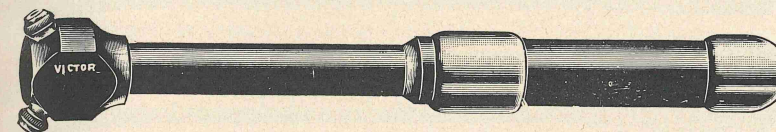
145. Electrolytic Water Massage Cup..... \$3 50



9. Vaginal Electrode, nickel-plated \$0 50



68. Curved Vaginal Electrode, insulated \$1 25



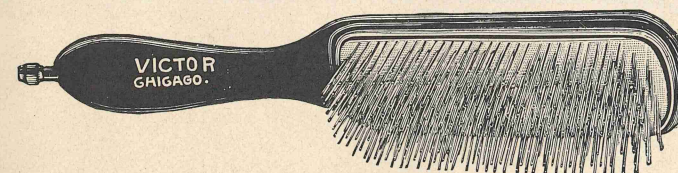
86. Dr. A. H. Goelet's Bipolar Vaginal Electrode \$2 25



116. Goldspohn's Vaginal Electrode, copper Ball on Insulated Stem \$1 00
We can furnish, at same price, ball of iron if preferred.



91. Fitz Hugh's Electrode for treating erosions of the external os by metallic electrolysis \$1 25

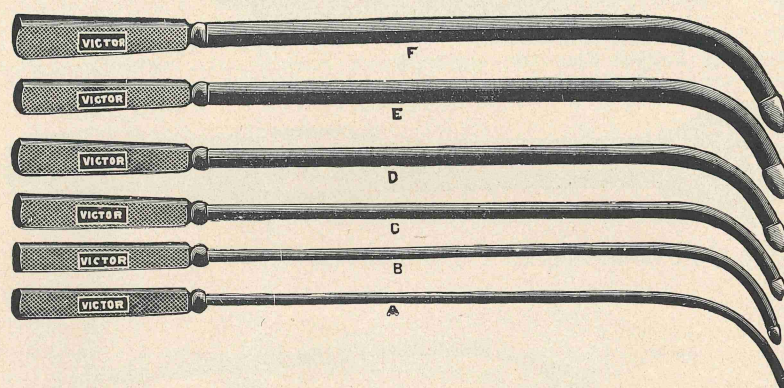


35. Hair Brush Electrode \$0 75



126. C. W. BOWEN PROSTATIC ELECTRODE.
PRICE, \$3.00.

URETHRAL.

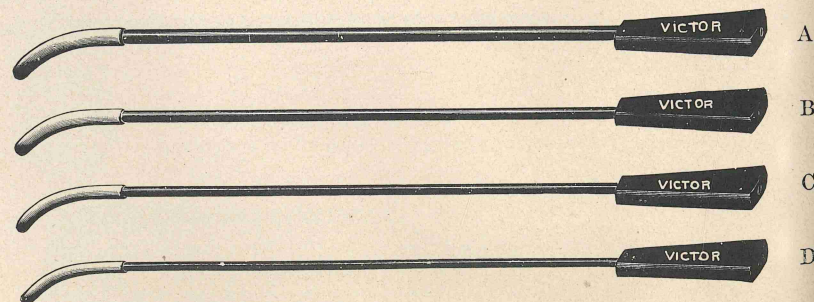


132. NEWMAN'S ELECTRODES

FOR THE TREATMENT OF URETHRAL STRICTURE BY ELECTROLYSIS.

These electrodes are made with the hard rubber insulation vulcanized onto the metal stem, thus guarding against all danger from septic poisoning.

Newman's Electrodes, curved sizes 12 to 28, French..... \$1 00
Set of 6 in velvet lined morocco case..... 7 50



119. Dr. A. Goldspohn's Intra-uterine Electrode, contact of copper one and one-half inches long.

Price, per set of four, sizes 12 to 20, French..... \$4 00
Price one only 1 00

No. 95. NEISWANGER'S VAGINAL CATAPHORIC ELECTRODE.



Price.....\$2 50

This new and original instrument was designed by Dr. C. S. Neiswanger, the well-known electro-therapist. It consists of a ball of pure copper, pierced by numerous holes, and fitted to a small brass tube, which is insulated by a coating of hard rubber. The insulated tube is surmounted by a nozzle for attachment with a syringe, as well as a connection for the conducting cord. The instrument affords a means of applying the oxy-chloride of copper, together with a cataphoric dosage of a desirable medicament.

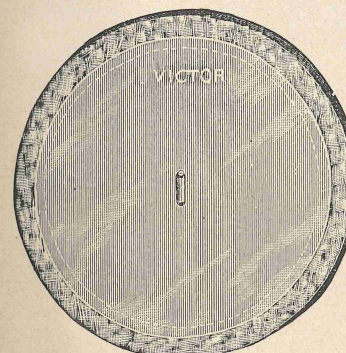
Dr. Neiswanger uses it with marked success in cases of fibroid tumors, employing in connection a solution of suprarenal, adrenalin or thuja. He has also utilized it in cases of inflamed ovaries and tubes, omitting the drug application.

No. 143. COPPER FISTULA ELECTRODE.

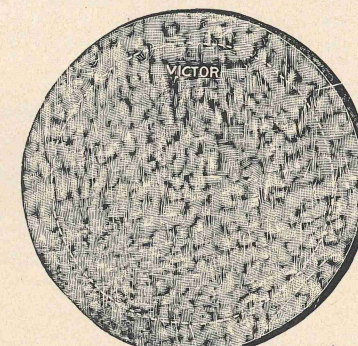


Price.....\$0 50

This electrode has been found useful in treating fistulæ, by applying the oxy-chloride of copper in connection with the positive pole of the galvanic current. The tip of the electrode is of a bulbous shape, which permits of an easy introduction to the affected tract.



BACK.



FACE.

No. 66. DR. P. S. HAYES' SPONGIO PILINE-ABDOMINAL ELECTRODE.

Block tin, price\$1 50

NOTE.—This electrode should be thoroughly saturated with water and placed over the abdomen upon a piece of chamois skin which has been soaked in warm water.

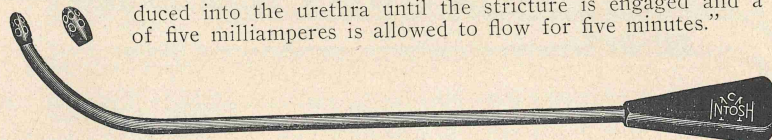
IN REGARD TO THE TECHNIQUE FOR TREATMENT OF HYPERTROPHY OF THE PROSTATE STRUCTURE, ETC., DR. NEISWANGER SAYS:

"In treating prostatic enlargements by the former process of using iodine on the negative pole of the current, many difficulties were to be overcome and such care exercised in the technique that it was almost impossible for the physician not an expert electro-therapist to use it successfully.

"The same electrode is employed that was introduced by me several years since—viz., No. 100. The applicator for this class of work was formerly made of copper, but, for the newer method, galvanized iron wire is best suited. Absorbent cotton is loosely wound around the applicator for about three inches, and after being saturated with the solution of thiosinamin it is replaced in the hard rubber receptacle and introduced into the prostatic urethra. It is then attached to the positive pole of a constant current battery and a current strength of ten milliamperes is allowed to flow for ten minutes. The negative is the usual abdominal pad.

"Treatment is given every fourth day.

"My electrodes for the treatment of urethral stricture by the same method are made in two sizes—No. 18 F. and No. 24 F. In these electrodes to the usual insulated stem is attached a hollow hard-rubber olive with perforations. After loosely winding cotton around the platinum point it is saturated with the thiosinamin solution and the olive screwed on. The electrode after being attached to the positive pole is introduced into the urethra until the stricture is engaged and a current of five milliamperes is allowed to flow for five minutes."



No. 75. Neiswanger's Urethral Cataphoric Electrode, including two olives Nos. 18 and 24 French \$3 00

Has been successfully employed by Dr. Neiswanger for the cataphoric application of thiosinamin in urethral stricture. The hard rubber olive has a hollow chamber to contain moistened cotton, making contact with a platinum terminal.



No. 94. Neiswanger's Cataphoric Cervix Electrode \$3 00

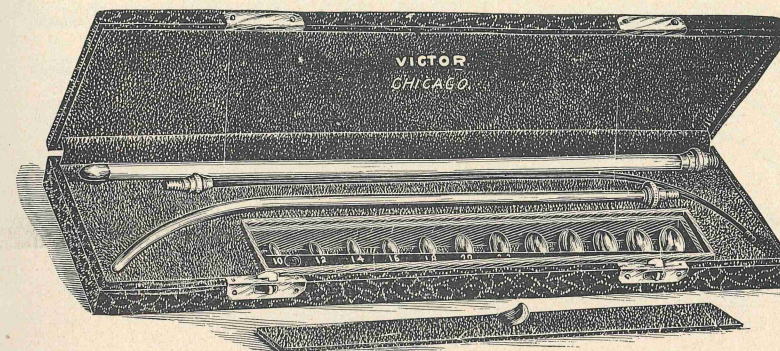
This electrode is constructed on the same general plan as the instrument described above, having a hollow ball and platinum terminal. Has been used in treating lacerations of the cervix with thiosinamin with gratifying results.



No. 100. Neiswanger's Cataphoric Electrode, for making applications to the prostatic urethra \$1 50

100-A. Neiswanger's Cathaphoric Electrode, with perforations covering full length of stem 1 75

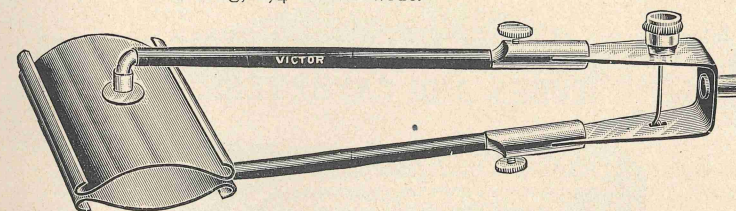
The staff is composed of hard rubber throughout, hollowed to receive the applicator. For 1½ inches and commencing ½ inch from the distal end, are bored a number of small holes through which electrical connection is made or medicament applied to the prostatic urethra.



GENITO-URINARY ELECTRODE CASE.

Price \$6 00

This case contains metallic sound, flexible and inflexible urethral electrodes, and two dozen olives, numbered from 10 to 32, French scale, all contained in a velvet lined Morocco case, 12 inches long, 3¼ inches wide.



109. Neiswanger's Electrode for the treatment of varicocele \$1 00

This is a uni-polar divided current electrode designed to be used on the positive pole, consequently the terminals are of pure block tin which will stand the corrosive action of that pole. The terminals should be covered with wet cotton and placed one on either side of the enlarged mass of blood vessels.



98. Dr. F. H. Martin's Block Tin Intra-Uterine Electrodes.

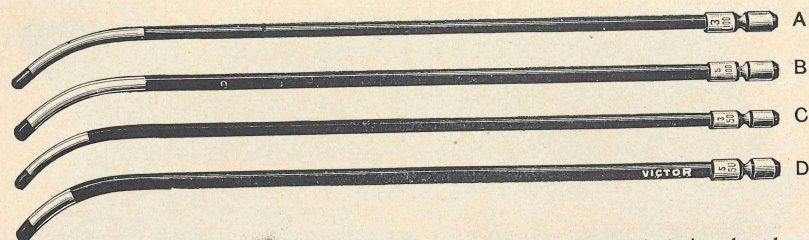
These electrodes are becoming more and more popular as a cheap and very satisfactory substitute for the more desirable though likewise more costly platinum electrodes.

Dr. Martin's Block Tin Intra-Uterine Electrodes, price, including Rubber Muff, each \$1 00



DR. MARTIN'S DOUBLE COPPER INTRA-UTERINE ELECTRODE.

In sets of two. Size of stem as follows: Small, 3 and 5 mm.; large, 7 and 10 mm.
Price, per set of two, including two muffs \$2 00
Price, either one only, including one muff 1 00

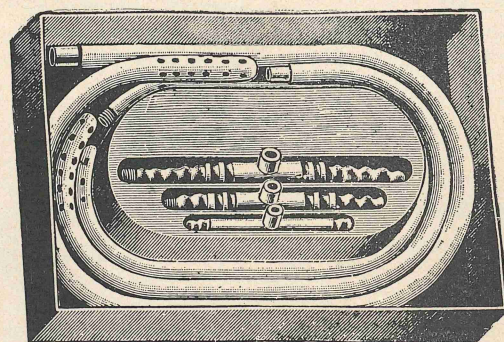


99. Neiswanger's Block Tin Intrauterine Concentration Electrodes, insulated tip and stem. Price, set of four..... \$5 00
 Price, one only 1 25
 These electrodes can be furnished in copper if desired. Price same as for the block tin.



16. Cup-shaped Electrode for uterus, insulated, complete, consisting of staff and cup \$1 50

131. THE JOHNSON HYDRO-ELECTRIC RECTAL TUBES AND CATHETERS.



- Price, as shown in cut, set of 3 \$5 00
 Price, one only, large size, complete 2 00
 Price, one only, medium size, complete 1 75
 Price, one only, small size, complete 1 50
 Price, one only, rubber catheter only..... 1 25

A GOOD LUBRICANT FOR ELECTRODES.

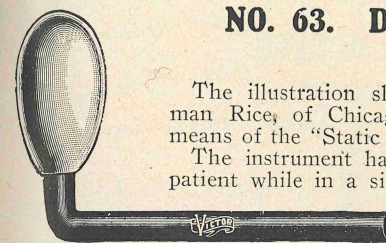
Dr. C. S. Neiswanger of Chicago, the eminent electro-therapeutist, recommends the following as a most satisfactory lubricant and one that does not interfere with the action of the current:

Take 1 oz. of the best white gum tragacanth, put into a quart Mason jar and add 1 pint of water and 1 pint of glyco-thymoline, or any other antiseptic solution; let stand until tragacanth is dissolved.

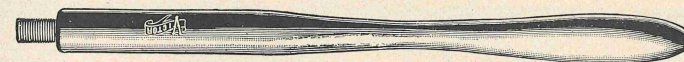
NO. 63. DR. RICE'S IMPROVED RECTAL ELECTRODE.

The illustration shows the electrode designed by Dr. May Cushman Rice, of Chicago, as used in the treatment of constipation by means of the "Static Surging Current."

The instrument has been constructed so as to be applicable to the patient while in a sitting posture. The bulb is made of pure copper, and is affixed to an insulated stem.



Price \$1 00



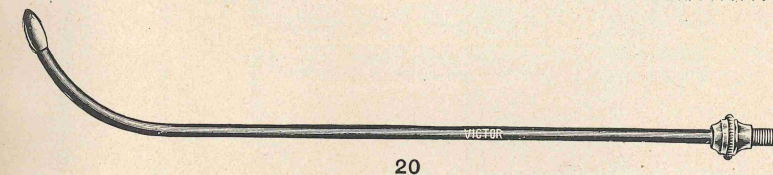
6. Rectal Electrode, nickel plated \$0 50



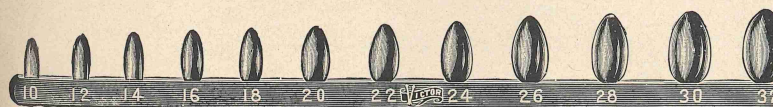
7. Rectal Electrode, insulated with polished hard rubber, N. P. \$0 75



67. Dr. Patterson's Electrode for cataphoric treatment of the rectum and prostate; perforated chamber at end, communicating through hollow stem with inlet nipple through which fluid can be passed during treatment; chamber is accessible by unscrewing perforated end. Price..... \$1 75

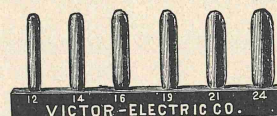


20. Spiral Flexible Uterine or Urethral Electrode, insulated..... \$0 60
 21. Uterine or Urethral Electrode, insulated with hard rubber..... 60



70. Assorted Olives for Nos. 20 and 21 Electrodes..... \$1 50

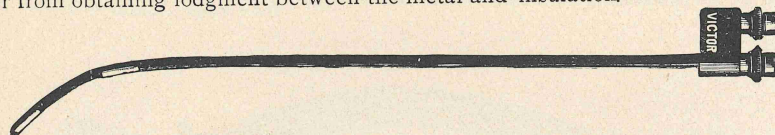
No. 104 STAFF AND OLIVES FOR METALLIC ELECTROLYSIS.



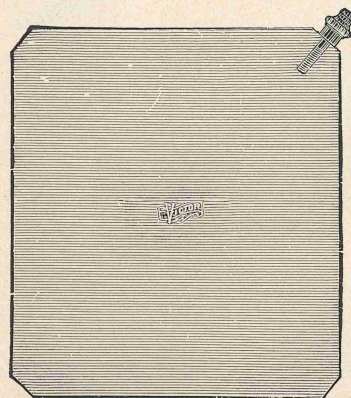
Price, two stems and set of six olives, zinc or copper.....\$2 50

This electrode is designed to be used for metallic electrolysis. The olive points are either copper or zinc and range in size from No. 12 to No. 24 French scale.

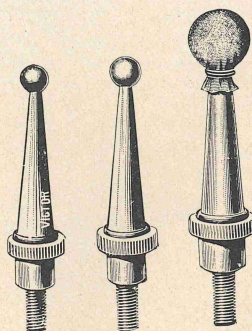
The hard rubber insulation is vulcanized on the metal stem, thus preventing septic matter from obtaining lodgment between the metal and insulation.



93. Apostoli Bipolar Intrauterine Electrode. Price\$2 00

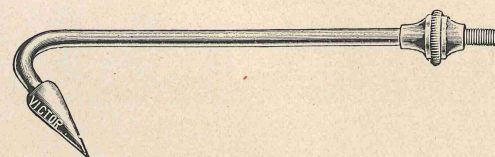


52



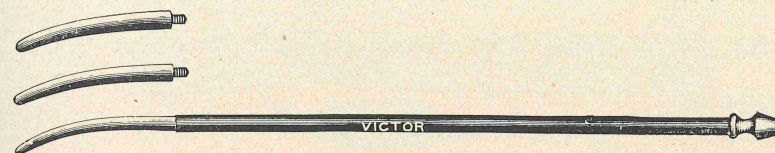
102

52. Metal Foot Plate..... 25
102. Erbs' Electrodes, each 20



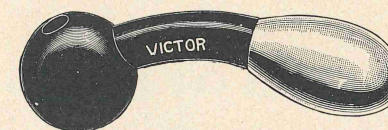
26

26. Duchenne's Metallic Points, for muscular Faradization, per pair, gold-plated..\$1 00



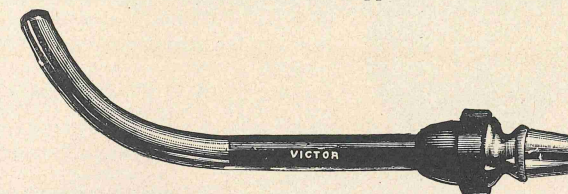
115

115. Goelet's Intra-Uterine Negative Dilating Electrode. Set of 3 with one stem \$1 50
115A. Same as above with copper tips..... 1 75



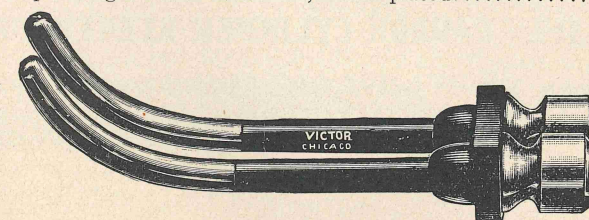
53

53. New Style Rectal Electrode, insulated..... \$1 25
53A. Special for Hemorrhoids, made of pure copper..... 1 50



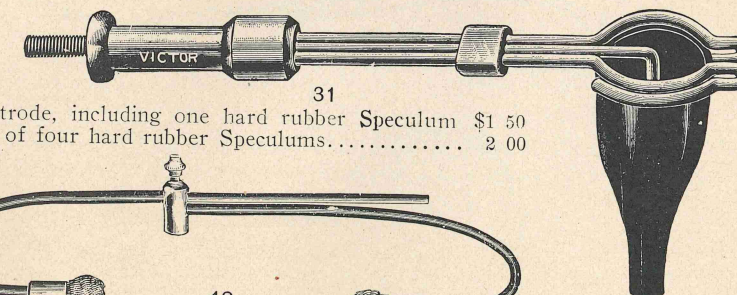
64

64. Dr. Sharp's Single Nasal Electrode, nickel plated..... \$0 75



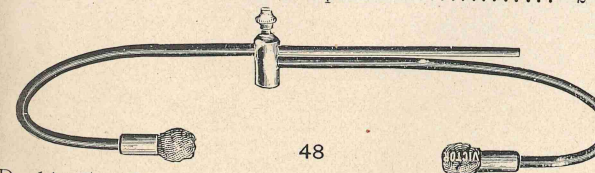
65

65. Dr. Sharp's Double Nasal Electrode, nickel plated \$1 50
These can be supplied at same price in copper, if desired.



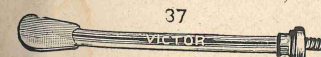
31

31. Ear Electrode, including one hard rubber Speculum \$1 50
With set of four hard rubber Speculums..... 2 00



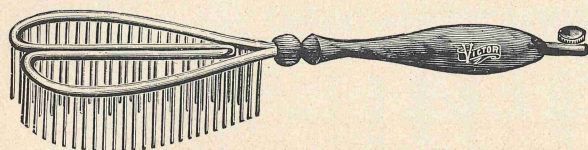
48

48. Double Ear Electrode, insulated \$1 25



37

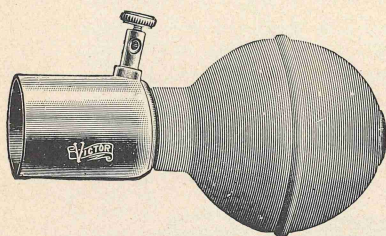
37. Small Eye Electrode 0 60

No. 141. SANITARY HAIR BRUSH ELECTRODE.

A new and unique instrument for Electrical Scalp Treatment; it offers a number of advantages over the ordinary hair brush electrode, chief of which are the durability of the appli-

ance and the ease with which it can be rendered thoroughly aseptic.

Price \$2 00

No. 139. NEW VACUUM CUP MASSAGE ELECTRODE.

This is one of the most up-to-date massage instruments on the market today. As its name indicates it combines the use of electricity with vacuum massage. It affords one of the most pleasant methods of applying electricity to the face, as the instrument makes especially good contact, owing to the vacuum pressure, thus doing away with the unpleasant stinging sensation which prevails with instruments making poor contact. It brings the glow of health back to faded cheeks. It may be used with

any faradic battery.

Price \$1 25

No. 142. CARBON CYLINDER ELECTRODE.

A very convenient Carbon Electrode, especially suited to applications with the positive pole; size five

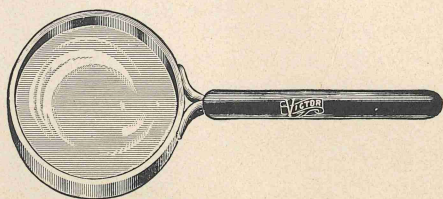


inches in length by three quarters of an inch in diameter. It was designed by a dermatologist for bleaching the face, but it is useful in any treatment where a non-corrosive electrode of this shape is suitable.

Price \$0 75

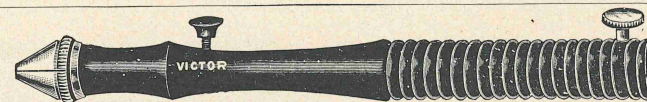


12. Comedone Extractor \$1 00



114

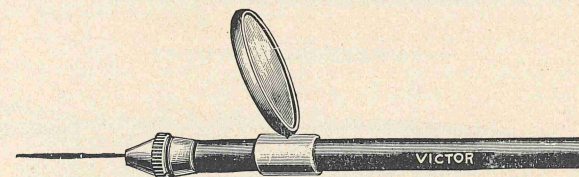
114. Magnifying Glass Price, \$0 50



61. Hard Rubber Needle Holder, with interrupter. Price \$1 00

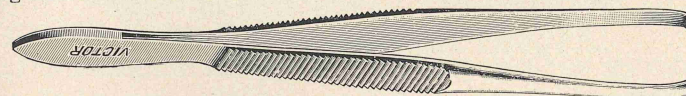


107. Hard Rubber Needle Holder, round. Price \$0 75



107A. Needle Holder, with magnifying glass. Price \$1 50
Postage, 10c.

A new and convenient device for use in epilation. The needle holder will receive any size of needle, while the lense may be adjusted to the proper focus by means of the sliding sleeve on which it is mounted.



72A. Depilatory Forceps, best grade imported \$0 75

NEEDLES FOR EPILATION.

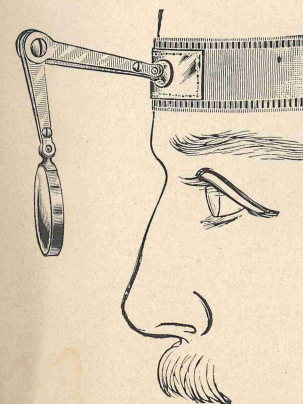
Steel Needles (Broaches) for removing hair. Price each \$0 05

Steel Needles (Broaches) for removing hair. Price per dozen 50

Hayes' Bulbous Pointed Needles. Price each 10

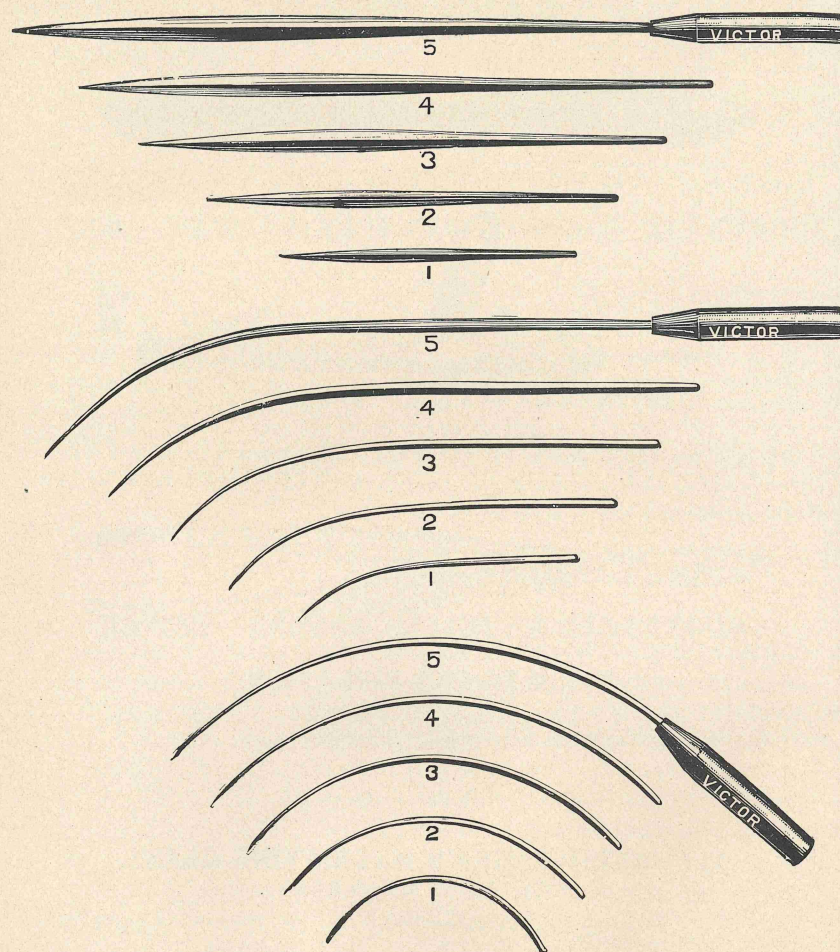
Hayes' Bulbous Pointed Needles. Price per dozen 1 00

Iridio Platinum Needles, sharp point. Price each 40

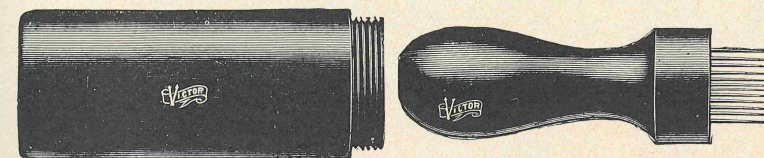
**133. NEISWANGER'S MAGNIFYING GLASS.
MOUNTED ON HEAD BAND.**

In the operation for the removal of superfluous hair by electrolysis, a good magnifying glass is an essential requisite, and as it is a matter of great inconvenience to use the ordinary glass (both hands being already employed with needle and forceps) the above has been devised. It is light and convenient, and can be used on the head of the operator or patient. Being provided with two "ball and socket" joints it is easily and quickly adjusted and the focal distance being five inches allows of ample working room between the glass and seat of operation.

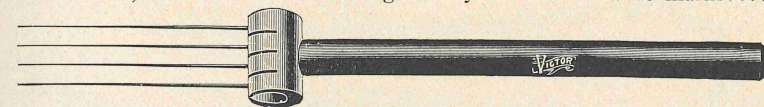
Price \$1 50



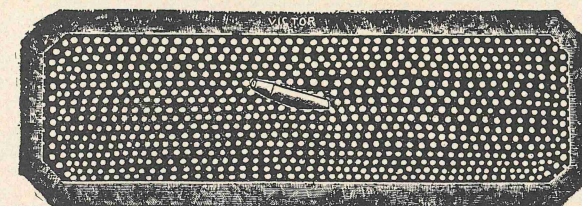
- No. 47. Gold plated needles for electrolysis. Straight, half curved, full curved, flattened needles (shown in cut full size). Extra heavy triple gold plated. Price of Nos. 1, 2, 3, 4 and 5, each.....\$0 40
We furnish needle tip holder with each No. 47 needle without extra charge. Price of needle tip holder only..... 10



108. Needle Disc, for the removal of "Pigmentary Nævus" or wine marks.....\$2 00



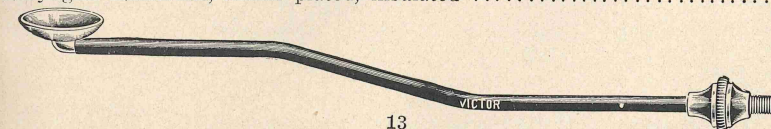
92. Hemorrhoidal Needle Holder. Price\$1 00
The No. 5 Cambric Needle is the most satisfactory to use with this holder. Select carefully with reference to straightness.



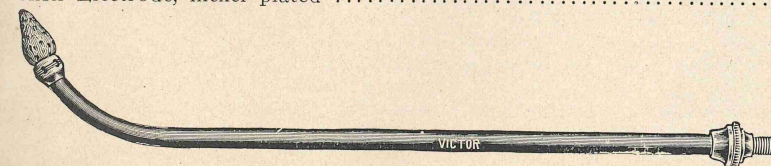
- 96. DISPERSIVE ELECTRODES.**
OF FLEXIBLE PERFORATED METAL, WITH COVERING OF SPONGIO-PILINE.
- | | |
|--------------------|-------------|
| Size, 4x6 inches |\$0 75 |
| Size, 5x7 inches | 1 00 |
| Size, 6x8 inches | 1 25 |
| Size, 7x9 inches | 1 50 |
| Size, 8x12 inches | 2 00 |
| Size, 10x12 inches | 2 00 |
| Size, 6x18 inches | 2 00 |



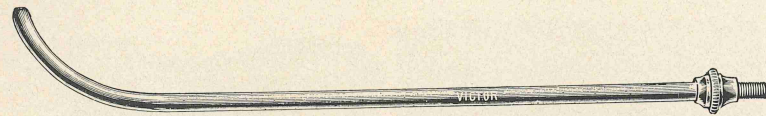
25. Laryngeal Electrode, nickel plated, insulated\$0 40



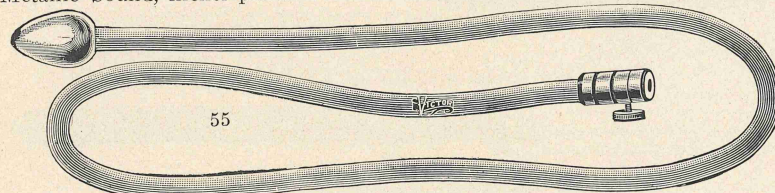
13. Tonsil Electrode, nickel plated\$0 75



28. Laryngeal Electrode, with sponge tip\$0 50

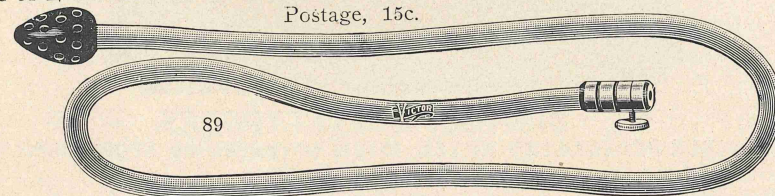


50. Metallic Sound, nickel plated \$0 50



55. ESOPHAGEAL ELECTRODE.
FOR THE TREATMENT OF STRICTURE OF THE ESOPHAGUS AND
ESOPHAGOPLEGIA.

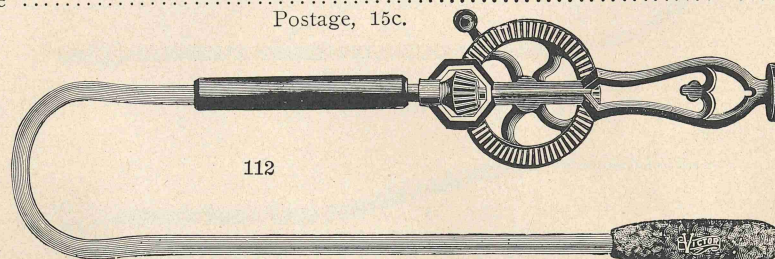
These Electrodes have a spiral inside, are very flexible and insulated with rubber; they are 24 inches in length, and are furnished with four metal olives which screw firmly on the distal end. These olives are $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$ and $\frac{3}{4}$ inch in diameter. Price of Electrode with set of Olives..... \$2 50



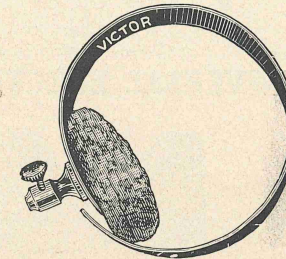
89. STOMACH ELECTRODE.
FOR THE APPLICATION OF GALVANISM OR FARADISM WITHIN THE STOMACH
OR RECTUM.

This is a very flexible Electrode insulated with very smooth colon tube, the olive point being of hard rubber with perforations, so that the current only comes in contact with the mucous surface through an aqueous medium previously injected. Price \$2 00

Postage, 15c.



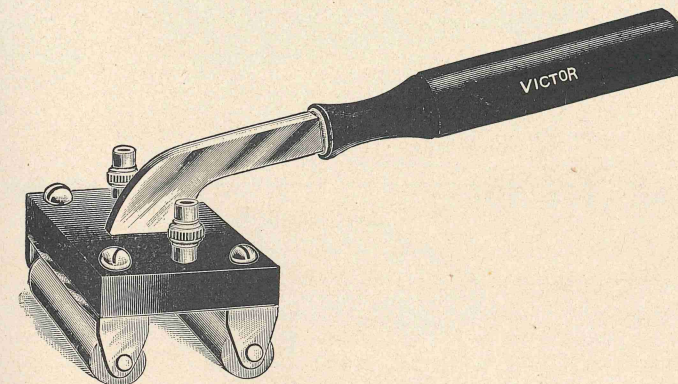
112. Dr. F. B. Turck's Gyromele (revolving sound)..... \$3 00
 "The various cultures are secured from the mucous membrane by using a revolving sponge introduced into the empty stomach. This instrument is named the Gyromele (revolving sound), which for bacteriologic purposes is inclosed in a sheath, until it reaches the stomach, to prevent contamination from the mouth and esophagus. Revolutions are produced by an apparatus not unlike a surgical drill, which revolves the sponge in the stomach and removes the adherent material from the mucous membrane for bacteriologic investigation."—Dr. Fenton B. Turck on the Early Diagnosis of Carcinoma of the Stomach, etc.



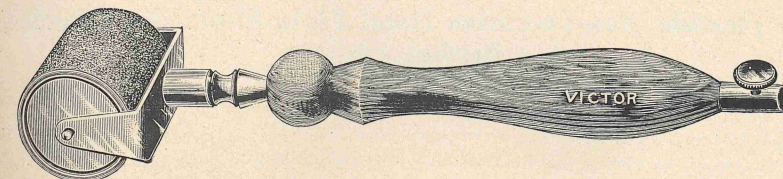
30. Arm or Wrist Electrode, each..... \$0 75



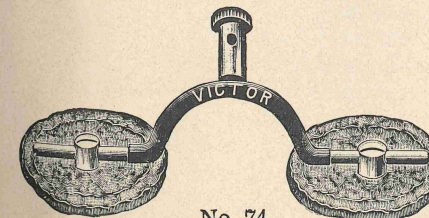
106. Dr. W. E. Casselberry's Bipolar Needle Holder..... \$1 25



- 128 Small Bipolar Roller Massage Electrode. Price..... \$2 50



11. Massage Roller, chamois covered roller for facial massage. Price..... \$1 00

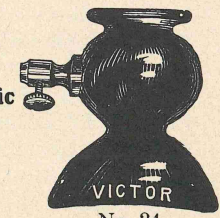


No. 74

74. Double Eye Sponge Electrode, adjustable..... \$1 25
 34. Eye Cup Electrode..... 1 00

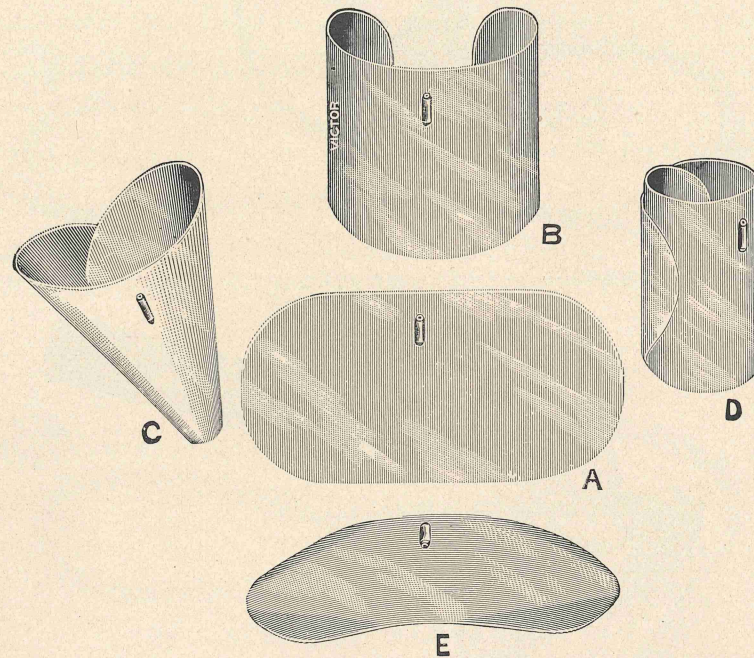
ELECTRODES

For Applying Galvanic
and Faradic Cur-
rents to the
Eyes.



No. 34

59. UNIVERSAL ELECTRODE.



Price..... \$1 00

A Flexible, Non-Corrosive Metal Plate Electrode, Insuring Perfect Asepsis.

The instrument is of an oval shape, measuring 5 by 10 inches. When in use it is intended to be covered with a layer of moist absorbent cotton, or other pad material.

The illustrations give some idea of many diverse forms into which this electrode can be readily molded by the hand; and many others will suggest themselves to the mind of the operator.

Figure A shows a flat formation for surface application.

Figure B illustrates a semi-cylindrical shape suitable for neck, arm or leg.

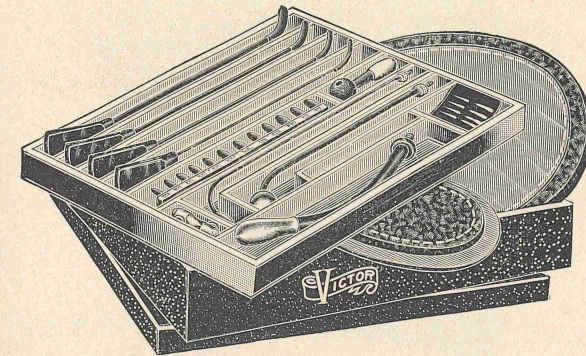
Figure C sets forth a cornucopia shape useful in scrotal or breast treatment.

Figure D is a tubular or cylindrical formation adaptable in a variety of uses.

Figure E shows the electrode molded to conform to the curves of the abdomen.

With galvanic, faradic and sinusoidal currents it makes a convenient abdominal pad and is equally useful for a multitude of general applications and special purposes.

With static currents it possesses a similarly wide range of adaptability and is peculiarly suitable in conjunction with the Morton wave or static surging current.



THE PRACTITIONER'S ELECTRODE SET, No. 3.

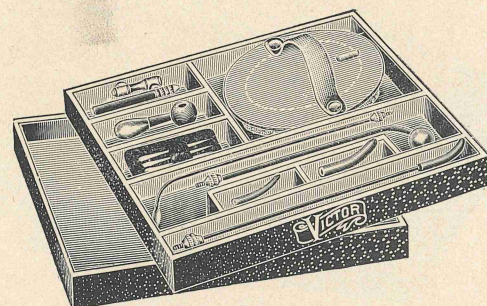
Price \$10 75

A selection of our most popular and useful electrodes, embracing those best suited to the requirements of general practice. To further emphasize the adaptability of this set we might add that it has been endorsed by Dr. C. S. Neiswanger of Chicago, the well-known electro-therapist.

Every article in this set is a "live one;" contains:

1 No. 116 Goldspohn's Copper Ball Vaginal Electrode.....	\$1 00
1 No. 21 Hard Rubber Insulated Urethral Electrode.....	60
1 No. 70 Set (12) Assorted Olives for above.....	1 50
1 No. 53A Copper Rectal Electrode.....	1 50
1 Set (4) No. 119 Goldspohn's Copper Intra-Uterine Electrodes.....	4 00
1 No. 68 Insulated Curved Vaginal Electrode.....	1 25
1 No. 66 Hayes Spongio Pile Abdominal Electrode.....	1 50
1 No. 3 Hand Spongio Electrode.....	60
1 No. 107 Hard Rubber Needle Holder.....	75
6 Hayes Bulbous Pointed Steel Needles.....	60
1 Universal Electrode Connector.....	10

Instead of the flimsy pasteboard box ordinarily used for this purpose, this set is put up in a substantial case made with wood frame, wood partitions and covered with leatherette



IDEAL ELECTRODE SET, No. 4.

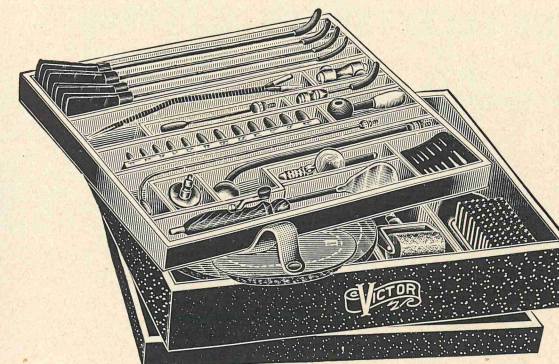
Price.....\$5 50

This assortment embraces a comprehensive list of electrodes including those most frequently required by the general practitioner, comprising those offering especially good value; these instruments are particularly suitable for applying the galvanic, faradic and sinusoidal currents and may be used with any of our wall-plates or portable batteries.

EMBRACING

1 Set No. 115 (3) Goelet's Dilating Electrodes, copper, with stem	\$1 50
1 No. 116 Goldspohn's Copper Ball Vaginal Electrode	1 00
1 No. 53A Copper Rectal Electrode	1 50
1 No. 21 Hard Rubber Insulated Urethral Electrode	60
1 No. 107 Hard Rubber Needle Holder.....	75
3 Hayes' Bulbous Pointed Steel Needles.....	30
1 No. 3 Spongio Pad Electrode.....	60
1 "E" Universal Electrode Connector.....	10

Put up in substantial wooden frame box covered with leatherette, neat in appearance and intended to last.



THERAPEUTIST'S ASSORTMENT, No. 5.

Price \$16 00

This assortment of electrodes has been made up especially for the physician who contemplates making quite a specialty of Electro-Therapeutical practice, as it embraces a very complete set of instruments, covering almost every variety of application. The physician purchasing a Wall Cabinet cannot very well afford to be without a complete set of instruments such as this which really opens up the full capabilities of the apparatus itself.

COMPRISES

1 No. 14 Insulated Tongue Plate, copper.....	\$0 60
1 No. 37 Small Spatula-shaped Eye Electrode, copper.....	60
1 No. 64 Nasal Electrode, copper.....	75
1 No. 106 Casselberry's Bipolar Needle Electrode.....	1 00
1 No. 87 Interrupting Handle.....	50
1 No. 33 Disc, medium.....	20
1 No. 116 Goldspohn's Copper Ball Vaginal Electrode.....	1 00
1 No. 53A Copper Rectal Electrode.....	1 50
1 Set (4) No. 119 Goldspohn's Copper Intra-uterine Electrode.....	4 00
1 No. 21 Hard Rubber Insulated Urethral Electrode.....	60
1 Set No. 70 (12) Assorted Olives for above.....	1 50
1 No. 66 Hayes' Abdominal Electrode	1 50
1 No. 107A Needle Holder with magnifying glass.....	1 50
6 Hayes' Bulbous Pointed Steel Needles.....	60
1 No. 35 Hair Brush Electrode.....	75
1 No. 11 Massage Roller.....	1 00
1 No. 3 Hand Spongio Electrode.....	60
1 "E" Universal Electrode Connector.....	10

Contained in conveniently arranged, substantial wood frame case, covered with leatherette, neat in appearance and made to stand service.

THE SELECTION OF ELECTRODES.

The physician entering the field of electro-therapeutics finds the selection of suitable electrodes a rather perplexing problem, especially as some writers recommend the use of some favorite metal in almost every conceivable application. Neiswanger is partial to copper, Massey holds fast to zinc, and Martin is a strong advocate of platinum. The matter really resolves itself to the question, "Shall the particular electrode be soluble or insoluble;" in other words, shall it be immune or subject to the electrolytic decomposition which takes place at the positive pole.

THE POSITIVE POLE of the galvanic current liberates and attracts the atoms of oxygen and chlorine found in the fluids of the body which attack the metal composing the electrode; and if it be one of the baser metals, such as copper, zinc, or iron, a salt is readily formed; this constituting the oxychloride of the respective metal.

THE NEGATIVE POLE gives rise to no such decomposition as takes place at the positive and therefore the metal used is not an important factor; although nickel-plated instruments are usually utilized for special applications with this pole, because they do not tarnish or rust.

THE FARADIC CURRENT has no chemical properties and the metal utilized is not an essential item, although nickel-plating is preferred.

THE SINUSOIDAL CURRENT lays no claim to any special polar effects and accommodates itself to the form of electrode most readily available.

COPPER, ZINC AND IRON are used largely for their antiseptic and astringent properties and the former is in popular favor at the present day. A copper electrode is valuable for metallic electrolysis at the positive pole and is useful on the negative pole or with the faradic current.

NICKEL-PLATED ELECTRODES are designed especially for use with the faradic current or the negative pole in galvanism, and should on no account be employed on the positive pole, as the plating would be stripped; this also applies to gold-plated needles, for, it will be recollected, gold is subject to the influence of chlorine.

BLOCK-TIN, PLATINUM AND CARBON are capable of withstanding the action of the positive pole, being unaffected by either chlorine or oxygen; and therefore may be utilized where the effects of this pole are desired in cases where the application of metallic salts is not indicated. Platinum is very costly and carbon is brittle and hard to work, but block-tin is more practical, as the cost is not prohibitive and it is easy of adaptation.

VAGINAL AND INTRA-UTERINE ELECTRODES are always best of copper, except for faradization or dilating, when nickel-plating is preferable.

RECTAL ELECTRODES are usually more desirable in copper, as the treatment of hemorrhoids demands this particular metallic salt.

ABDOMINAL ELECTRODES are preferably composed of a block-tin plate with a suitable covering.

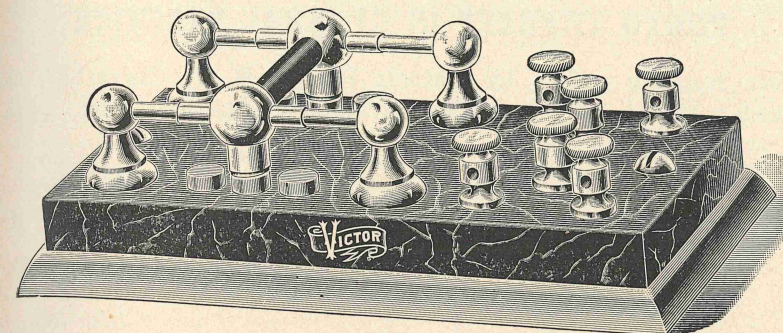
URETHRAL ELECTRODES, if required solely for the treatment of stricture, should be nickel-plated, but for the treatment of gleet and kindred ailments copper is indicated.

EYE, EAR, NOSE AND THROAT ELECTRODES are largely called for in copper, but in cases where the faradic or sinusoidal currents are to be employed, nickel-plating is more desirable.

EPILATING ELECTRODES OR NEEDLES are usually of steel, as the negative pole is most commonly employed for this purpose.

AS A SUMMARY it might be said that copper is a very serviceable, all-round metal, and can occasionally be replaced by zinc or iron; but nickel-plated instruments are in a class of their own, and are unexcelled for certain special applications.

VICTOR No. 3 THROW-OVER SWITCH.



Price\$4 50

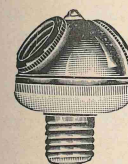
The use of this switch enables the operator to entirely disconnect his wall plate, or other current controller from the source of current supply used for galvanism and faradism, and to connect it instead to some generator of sinusoidal current, for instance, to either our No. 2 or No. 9 Transformer or any of our motors equipped with sinusoidal commutator.

In the absence of any of these the alternating commercial lighting current may be used for sinusoidal effects.

Any of the Victor wall plates when properly connected through one of these switches to any of the above mentioned sources, from which the sinusoidal modality can be derived, will control the voltage and current flow perfectly.

The No. 3 switch can also be used as a pole changer if desired.

WIRELESS RECEPTACLE PLUG.



Fits any Edison base socket, receives any combination of lamps and attachment plugs.

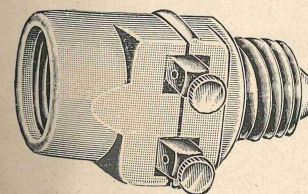
By its use a one light pendant or bracket is converted into a cluster.

A great convenience for charging storage batteries, connecting fan motors, or for attaching two or more motors or instruments to a single socket.

PRICE LIST

No. 92.	2 light multiple.....	\$1 00
No. 92½.	2 light series.....	1 10
No. 93.	3 light multiple.....	1 30
No. 93B.	2 light special, with binding posts, for charging storage battery.....	1 50
No. 94.	4 light multiple.....	1 60

VICTOR CURRENT TAP.



Price as shown.....\$1 00

Fits any Edison base socket, very useful where it is desired to connect small diagnostic lamps or other electrical devices, requiring but a small quantity of current, to the 110 volt electric light circuit. The Tap is attached to a convenient fixture—an ordinary incandescent lamp is then screwed into it; a pair of binding posts will be noted in the illustration to which connection can be readily made.

Any instrument attached to these binding posts will be in series with the lamp that is screwed into the tap.

The entire exterior of this Current Tap with the exception of the binding posts is white glazed porcelain, the construction is substantial and it is almost unbreakable.

PHOTO THERAPY IN GENERAL PRACTICE

Extracts from an article by Herbert Pitcher, M. D., Haverhill, Mass., which appeared in the *Journal of Advanced Therapeutics*, Sept., 1906.

When Dr. Oliver Wendell Holmes made the classical remark, "If all the drugs were cast into the sea, it would be well for man and bad for the fishes," he little realized that his fling at drugs would become a fact and that a large portion of his professional brethren would become drug nihilists.

I believe "Osler's Practice of Medicine" is considered by good judges of medical lore to be the best work on that subject in the English language. His definition of disease, pathology, etiology, histology, diagnosis, prognosis are all quite voluminous, but when he comes to treatment it is dismissed in a dozen lines or so. What does this indicate? Are the best teachers losing confidence in drugs?

Drug medication in itself has always been more or less uncertain. An old practitioner once said, "There are only two drugs of which I am sure, one is opium and the other castor oil."

We pride ourselves upon the position the family physician occupies in the world, but it is humiliating after we have burned the midnight oil as students, toiled night and day as practitioners, run at the beck and call of the rich and poor, the good and bad, laid awake nights worrying over the ills of our patients, to perhaps be greeted some morning with the salutation, "We have concluded to try Christian Science."

I know people are prone to run after "false gods," but it seems to me they continue to run, and like sheep jumping over the wall, they have many followers.

We pooh at Christian Science, osteopathy and other cults, but when quite a large per cent of our patients take up with that kind of foolishness we begin to wonder why.

Evidently they are beginning to think, and many of them are tired and sick of being drugged, and they are calling for more rational treatment. Undoubtedly, drugs will always be used in acute diseases, but in so called chronic diseases, I think other and better remedies can be used. Some great man has said, "To electrical forces and animal serums and extracts must we look in the future in all probability for the remedies to combat many diseases now called incurable." Looking back ten years we can note many new and wonderful discoveries. Some of them have overturned law which seemed as fixed as the hills. Could we but look into the future a few years, our eyes would no doubt be dazzled by the brilliant achievements to come.

The inhibitory power of sunlight upon the growth of tubercle bacilli was established some years ago and is too well known to admit of discussion. Its action upon tuberculosis of the lungs, joints, bones and glands, as well as upon bronchitis, asthma and many other diseases is recognized and utilized.

In the crowded cities where the greatest need exists for radiant energy is just the place we cannot obtain it. Here we find a good substitute in the electric light.

The utility of light and heat as a therapeutic agent is now so generally recognized by the medical profession all over the world that the better equipped hospitals and infirmaries are provided with apparatus for administering this treatment.

Crothers, of Hartford, has made many practical experiments with the radiant light bath in many conditions dependent upon toxemias. His conclusions are that "It penetrates to the deeper tissues of the body and is turned into heat and so transformed into nerve energy more positively than administrations of dry hot air.

"The clinical effects of the radiant light bath prove its power as an eliminating agent, and as a corrector of neurotic, nutrient and capillary disturbances. Its physiological action depends upon the heat and chemical rays, coming in contact with the substances that are resistant to their passage and thus transforming them into heat and light energy.

"The skin is a poor conductor of heat, but readily transmits light and radiant energy. Thus, in the deeper tissues, it becomes changed into heat.

"Radiant energy has two marked actions on the skin and tissues—one of stimulation and the other sedation.

"The stimulating action falls first on the sensory, then on the vasomotor and heat centers, and lastly, on the secreting centers. The vasomotor centers, controlling the constriction and dilation of the walls of the arteries, respond very quickly to surface charges.

"Light has a special action on the vasodilators of the arteries, stimulating increased activity and permitting the blood to flow more rapidly to the surface. This takes off the burden of the heart's action and relieves the constrictions to the arterial circulation and to the capillaries. Oxidation is increased with an increase of elimination. There is a fall in arterial tension and a uniformity in the action of the heart and respiration."

The effects of this method of treatment on arterio sclerosis are rational and beneficial. In albuminuria, Dr. Lebon has had many cases which were improved. Good results follow this treatment in rheumatoid arthritis, also in gout rheumatism, asthma and neuralgic conditions.

Electric lamps that possess the actinic or chemical rays and the heat rays, radiant heat—which are powerfully stimulating and penetrating, produce dilation of superficial blood vessels, relieving congestion of internal organs, affording an analgesic action which is most gratifying.

How well every mother recognizes the benefit following the application of a mustard paste to the stomach when the children have a pain therein, or a hot flaxseed meal poultice, or other hot fomentation to the chest when they have bronchitis. They know it relieves and does good by bringing the blood to the surface.

How much more beneficial must be a method of treatment whereby the vessels are more fully dilated than is possible by any other method except that of radiant heat which penetrates beyond the surface. It is not the heat alone which is so beneficial, it is the light rays as well which penetrate the tissues and stimulate the vasodilator nerves and relieve congested internal organs.

THE VICTOR "SUN" THERAPEUTIC ARC LAMP.

The physician contemplating the purchase of some form of therapeutic light apparatus must inevitably become confused by the mass of conflicting statements which he will find not only in the extravagantly written advertising literature, extolling the merits of the different apparatus offered for his consideration, but also in the writings of the earlier investigators in this comparatively new field.

Although Prof. Finsen did not entirely disregard the therapeutic virtues of the lower light frequencies, his investigations were chiefly confined to the chemical energies of the ultra violet and actinic end of the spectrum, and there can be but little doubt that the germicidal power of light lies chiefly in the ultra violet radiations and in the region lying beyond the upper end of the visible spectrum. It was found that the most effective and efficient generator of ultra violet radiations or light extremely rich in these vibrations was the electric arc. Furthermore, as glass was

found to be opaque, or nearly so, to the actinic vibrations, incandescent electric bulbs, whether large or small either as a unit or arranged in multiples, are of little service where the bacteriacidal and chemical energy of the extreme upper spectrum alone is wanted. It has, however, been conclusively demonstrated that concentrated light from incandescent lamps possesses the power to effect decided physiological changes.

These effects have by some authorities been attributed solely to the action of convective heat. Closer analysis, however, makes it appear that not only do some of the ultra violet radiations pass through the glass, but that every portion of the visible spectrum entirely independent of the heat vibrations is distinctly useful therapeutically. For instance, we quote the following from Dr. Cleaves: "The complex of chemically active light energy produces the best results. Under the use of the concentrated chemical frequencies of the electric arc it is clearly pointed out that the penetrant blue, indigo and violet frequencies are factors of great importance where deep seated processes are to be acted upon, that their presence is more necessary than the ultra violet, but that, after all, it is the complex of chemically active light energy which is capable of producing the best results."

It will at once become apparent that this view of the situation infinitely broadens the therapeutic field of usefulness for concentrated light.

It is not possible in this place to go at any length into the physics, physiological actions and therapeutic indications of this very complex therapeutic agent. Briefly stated, the ideal therapeutic light outfit should possess the following features,—the light should be generated by a powerful electric arc, the electrodes should be chemically prepared so as to produce an arc as rich as possible in the ultra violet and other rays of the upper spectrum, must possess some means for collecting and concentrating as many as possible of the generated rays without loss from absorption, should possess suitable means for adjusting the focal distance, should be capable of separating the light from the heat vibrations when necessary or desired, should be portable and capable of quick and easy adjustment so that the rays could be made effective at any point desired without moving the patient.

An apparatus possessing all of these features to the point of theoretical perfection has not as yet been produced, in fact, if it were possible to construct such an outfit its price would practically prohibit its use excepting in a few large sanitariums and hospitals. We claim, however, in the new Victor "Sun" Therapeutic Light outfit to have placed at the command of every physician having at his disposal any ordinary electric light service, a thoroughly practical equipment with which he can obtain, if used understandingly, nearly every result to be expected of the most expensive and complicated Therapeutic light apparatus.

POWER OF ARC. A rheostat of approved construction permits the passing of from ten to fourteen amperes across the arc. A more powerful arc might for some few indications be desirable, but would necessitate special wiring from the electric light service and furthermore the consumption of current would be so great as to make its operation and maintenance quite expensive. The size and power of the arc is only one factor effecting the actual amount of light energy available for treatment work. The composition of the electrodes or contacts, and the design of the concentrating reflector or lens being of equal importance.

COMPOSITION OF ELECTRODES. The electrodes used in the "Sun" lamp are composed of the purest carbon obtainable, having cores made up of magnesium, potassium and iron. These elements giving off light vibrations very rich in ultra violet, violet and blue radiations.

CONCENTRATING REFLECTOR AND LENS. A concave-convex mirror reflector is used. This is made of a specially tempered glass flux so transparent to all of the rays as to prevent little loss by absorption. The metal reflectors almost universally used in apparatus of this character are open to the very serious objection that the reflecting surface is sure to become impaired after only a few days of use and it is practically impossible for the physician to keep this type of reflector in proper condition. Nothing short of frequent expert attention will accomplish it. It is quite probable that a large majority of light outfits provided with metal reflectors that have been in use for three months or more have lost from fifty to eighty per cent of their concentrating power owing to the tarnishing and surface deterioration of the metal reflectors. On the contrary mirror backed glass reflectors suffer practically no deterioration.

ADJUSTMENT OF FOCUS. Convenient means are provided for varying the distance between the arc and the reflector. This may be done while the lamp is in operation and makes it possible to focus the rays anywhere desired from a point immediately in front of the lamp hood to as great a distance from the arc as desired. Thus when intense convective heat is wanted the focus is adjusted to a point a short distance away from the hood, where the heat manifested is sufficient to cause the instant combustion of any inflammable material held in the focal area. For ordinary light treatments the focal area should be some three feet from the arc. At this point the light rays are very powerful and if desired can be almost entirely freed from heat rays, as by a suitable adjustment of the arc the heat rays are focused at either side of a central area where a deep blue and violet field, practically free from heat is available. The heat rays may be entirely intercepted by interposing a screen of suitable material such as asbestos paper, having an aperture to permit of the passage of the light rays.

ADJUSTABILITY. Not only is the focal point adjustable but suitable means are provided to raise and lower the lamp to any desired height and also to adjust the hood to any desired angle.

PORTABILITY. The entire lamp outfit is self contained and comparatively light. It is mounted on easily rolling ball bearing castors and even while in operation can be moved about at the will of the operator, the only limitation being the length of the flexible conducting cable used to convey current to the lamp.

RANGE. The new Victor Sun Therapeutic lamp can be used for practically every therapeutic indication for light and radiant heat. The bactericidal action of light is now a well known and established fact. Its efficacy in the treatment of lupus has been well established by Finsen and many others. Besides lupus and the various dermal tuberculoses, in which it is destined to be the treatment par excellence it has been used in lupus erythematosus, psoriasis, epithelioma, acne vulgaris, rosacea, alopecia areata, eczema, ringworm, contagious impetigo, and various ulcerations with success.

In the foregoing conditions the chemical or actinic rays of the more refrangible end of the spectrum are mainly depended upon for results.

Obviously if beneficial physiological effects in the deep seated tissues and internal organs are to be credited to light radiations it must be proven that the light rays are capable of deep penetration. We cannot do better in this place than to quote from an article by Wm. S. Gottheil, M. D. and Milton W. Franklin, M. D. published in Medical Record, April 19th, 1902. "In the present state of our knowledge concerning light, the following assertions may be made—That the tissues of the human body, like all other substances are penetrable to varying degrees by the wave vibrations of light;

and that these vibrations form an essential part of the stimuli that determine the life activity of the cells, with effects that may be beneficial or injurious.

The ordinary phenomena of trans illumination show the perviousness of thin layers, as in the ear or cheek, to the visual rays.

That actinic absorption occurs in the tissues is evident from the fact that the body is opaque both optically and chemically to light under ordinary circumstances. In estimating the value of any special source of light for the purpose of influencing the deeper tissues of the body, it is necessary to prove the efficient penetration only of the actinic or chemical rays; for the portion reflected from the surface is small, and all the rest, save that which passes through the tissues is absorbed and effective. The question is an important one, for on its answer depends the entire applicability of the method for treating effections of the internal organs."

The authors then proceed to describe a series of experiments in which the generator or source of light was a powerful arc lamp of the "Actinolite" type. Ordinary photographic plates were used as sensitometers. The subject of the experiments was a mechanic, aged 23 years with good firm tissues.

Developed negatives of average density were selected, and to the face of each the film side of a sensitive plate was applied. The edges of the plates were bound with black lantern slide strips, and the back of each set covered with thick opaque paper. By this means the plates were so protected that light could reach them only through the negative.

The prepared sets of plates were applied, with the negative next to the skin of the body of the subject in the dark room, and the whole covered with adhesive strips and black cloth so thoroughly that no light could possibly affect the plate without first passing through the body. When all was ready the subject was seated in front of the arc and the light passed through various portions of his body on to the sensitive plates.

PLATE ONE. Light on the anterior surface of the fore arm, plate on the back. Thickness of transilluminated tissues, eight cm. Time of exposure ten minutes. The plate shows the image of the negative together with the shadows of the radius and ulna.

PLATE TWO. Taken through the shoulder, light upon the anterior upper portion of the thorax, plate upon the scapula, thickness of the tissue about 16 cm. Time of exposure, twenty minutes. This plate showed a fairly even deposit, save where the great differences of density of the various parts of the scapula affect the result.

PLATE THREE. Taken through the left abdominal region, light upon the left umbilical region, plate, on the left lumbar. Depth of tissue, about 19 cm. Time, thirty minutes. This plate showed a very even and perfect exposure save where the disc of light, not quite accurately directed, failed to cover the entire plate.

CONCLUSION. Light in proper concentration from a source of sufficient actinic power, can be made to penetrate the entire thickness of the human body including both surfaces of the skin; hence all the internal organs are accessible to its influence.

The following is quoted from the excellent work on Light Energy by Margaret A. Cleaves, M. D.:

"Chemical action is not confined to frequencies of short wave length, any more than thermal action is confined to the frequencies of the red region. Under proper conditions the green, red and infra-red frequencies will all produce photographic action. A proof of the chemical action of the red frequencies can be had in the ability to photograph through the human body. At least the inference seems fair, for it is the red frequencies which pass through. The hand photographed by Gebhart had a photographic plate placed in the hollow of the palm. It was then imbedded in plaster

of Paris save for the dorsal surface. After twenty minutes' exposure to the light of an electric arc, the plate was subsequently removed to the dark room and developed. It was found to be darkened and the contours of the hand and fingers were distinctly seen, showing that the light had penetrated. Similar experiments have been made by Freund, Strebel, Kime, Gottheil and others. The only physical distinction to be made between light rays, heat rays, and actinic rays is that of wave lengths, and by reason of the different wave lengths a difference of physical action upon the living organism takes place; it is with the different component parts of the structure as it is elsewhere in the physical world, the effects are those of heat, light or chemical action according to the state or conditions of matter upon which the energy from the sun or an artificial source is radiated."

The rays from an electric arc are a combination of heat, light and chemical rays. As was shown in the description of the "Sun" Therapeutic arc lamp it is possible to obtain a fairly complete division of the light and heat rays, simply by the manipulation of the carbons and of the reflector. The rays may be still further divided and selected by the use of colored glass screens. Two of these screens, blue and ruby respectively are furnished with the outfit and adapted to be attached temporarily to the front of the hood. In one place Cleaves states that "Photo biology has established, for example, a bactericidal action for the middle third of the ultra violet region, the ability to excite tissue reaction also to the ultra violet, but the exact locality not determined; a quieting action upon the nervous system to the blue frequencies and apparently an increase of muscular power under their influence. There is also apparently an exciting or stimulating action upon the nervous system from the frequencies of the red region."

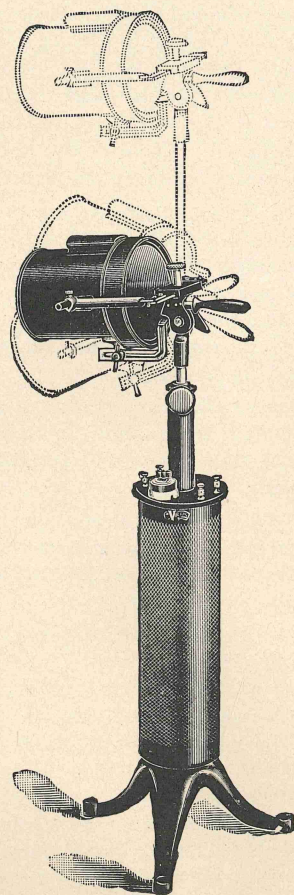
Again the same author states, "To eliminate the long and low frequency rays, a screen of blue glass can be placed between the patient and the light. In this way the thermal effect is minimized to such an extent that a prolonged application can be borne for any period of time desired. The use of the screen, however, cuts off the ultra violet frequencies, thereby diminishing the intensity of the chemical action. Still, therapeutic results seem to warrant the conclusion that the diminution is not sufficient to interfere with results in general conditions.

"The writer prefers the entire radiant energy of the arc, and never interposes the screen save where there is undue sensitiveness to the sensation of heat. Even in very nervous patients the action as a rule of an expenditure of this radiant energy is extremely quieting and beneficial."

NOTE—Before attaching a colored glass screen the operator is particularly cautioned to see that the focal point is thrown well beyond the point where the light passes through the screen, otherwise the glass is sure to be almost instantly broken by the intense convective heat.

It is a mistake to suppose that it is necessary or even desirable to entirely eliminate radiant heat when giving light treatment. As a matter of fact the presence of a certain amount of radiant heat aids and accentuates the physiological action of light vibrations. It is of course desirable in the majority of light treatments not to subject the patient to an unpleasant amount of heat. The design and construction of the Victor Sun Arc lamp is such that without moving either the lamp or the patient, the operator may at will regulate the intensity of the radiant heat from the point where solar erythema will be produced in a few minutes to a point where only a very moderate amount of warmth is perceptible. This without varying the wave length of the light vibrations. It is also possible to obtain a convective heat so fiercely intense as to produce caustic or cautery effects almost instantly.

Water Cooled Iron Electrodes. The method of substituting all metal electrodes in place of the carbons, constructing the electrodes so that they could be kept entirely cool by passing a continuous stream of water through them was employed by us several years ago in the Victor Finsen Arc Lamp. These electrodes could also be used in connection with the Sun Therapeutic arc lamp, but we do not advise it. It is true the radiations given off when all metal electrodes are used are much richer in the ultra violet and actinic energies, but it is not practicable to pass more than three or four amperes across such an arc, otherwise it becomes impossible even by water circulating the electrodes to keep them sufficiently cool so that the points do not fuse too rapidly; even with this apparently small arc globules of molten metal are constantly becoming detached from the contact points and results either in short circuiting the arc or otherwise causing trouble. Furthermore it is questionable whether or not any actual gain is made, the diminishing of the arc practically balancing the gain made by increasing the percentage of ultra violet and chemical radiations.



VICTOR "SUN" THERAPEUTIC ARC LAMP.

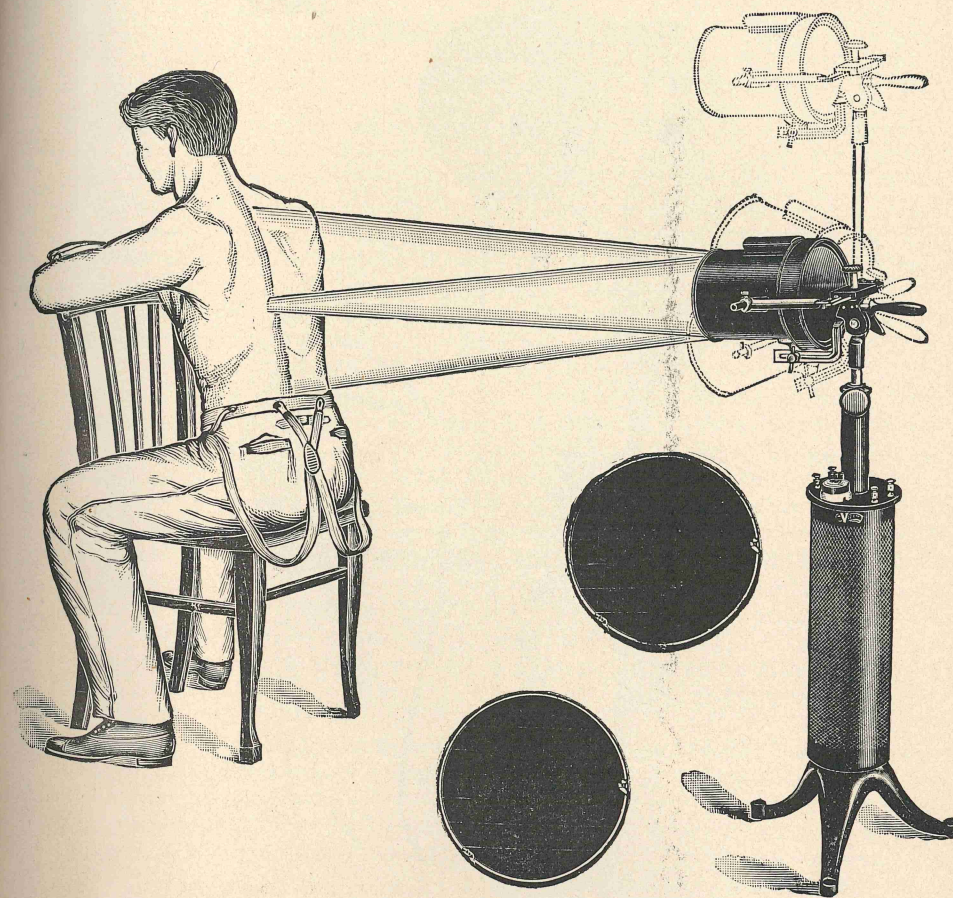
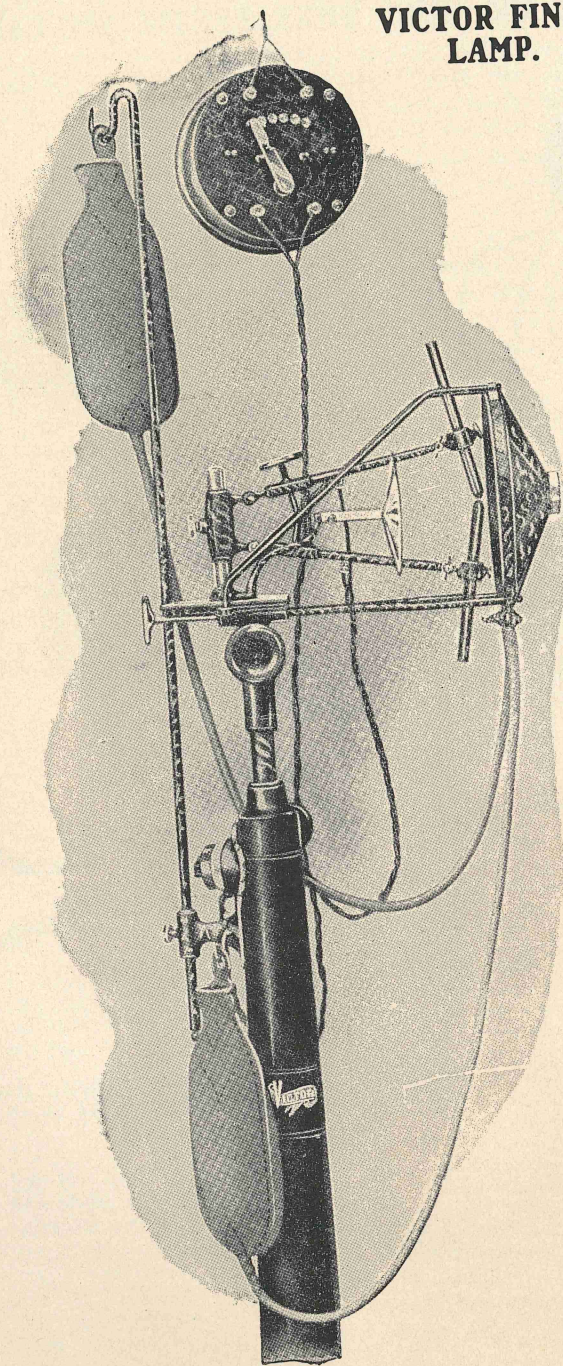


Illustration shows range or focal adjustment possible to obtain without moving either lamp or patient.—The converging lines show the full energy of the arc concentrated over an area about two inches in diameter.—The diverging lines indicate the extent of the field possible to treat when the convergent rays are not desired. The dotted lines show range of height and angle adjustment.

The color screens shown in illustration can be almost instantly attached to or removed from the front of the hood, suitable spring clips being provided for this purpose.

Price of Sun Arc outfit complete as shown, including one blue and one ruby glass color screen, twelve special cored carbons—switch, fuse block and connecting cable—for either direct or alternating current lighting circuits.....	\$60 00
Special cored carbons, 8 inches long, per dozen.....	2 00
Price of extra color screens, each.....	2 50

NOTE—Ordinary electric light carbons may be used in this lamp, but we strongly recommend the use of the special cored variety. (See descriptive matter elsewhere in this catalog.)

**VICTOR FINSEN
LAMP.****VICTOR FINSEN LIGHT.**

Unlike the Victor "Sun" arc lamp, which is designed as an all around therapeutic lamp. The Victor Finsen light is designed strictly in accordance with Prof. Finsen's ideas (or as nearly so as is possible in a comparatively small outfit) and its field of usefulness is confined almost entirely to the treatment of skin diseases.

Many operators prefer to use lamps of this type in cases of lupus, etc., owing to the fact that the arc can be brought into close proximity to the affected area, thus reducing to a minimum the loss of the actinic energy by atmospheric absorption.

We assume that every physician is more or less familiar with the researches and discoveries of Prof. Finsen. Later investigators have verified Finsen's conclusion that the germicidal power of light lies in the ultra violet rays almost entirely.

To be effective an apparatus for the production of the ultra-violet rays for therapeutic use should as nearly as possible exclude all other rays and concentrate the germicidal ones. It is therefore a mistake to make use of an apparatus that produces pure white light for treating malignant skin diseases, such as Lupus, etc. It is a well known law of physics that glass acts as almost a complete barrier to the passage of ultra violet rays, therefore incandescent bulbs are entirely unsuitable for the production of this modality, although where a unity of light is desired this objection to incandescent bulbs is not so pronounced. The electric arc is the best means for producing the so called Finsen rays, and of all the base metals the combustion of iron in the electric arc produces these rays in the greatest volume.

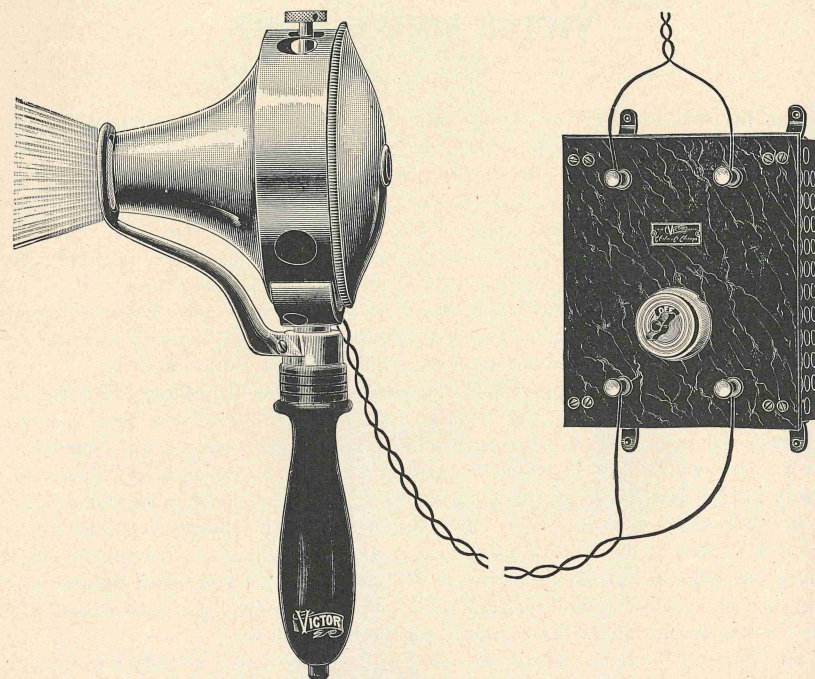
In the Victor Finsen the arc is of sufficient size to produce an effective volume of light, and is so designed that the part under treatment can be brought within a few inches of the arc.

How often is the physician seriously handicapped in the use of physical apparatus, because of the failure of the designer to intelligently provide means of adjustment to facilitate the application under varying conditions. The Victor Finsen is provided with practical and convenient means for instant adjustment of focus and position. Two sets of water circulated lenses are furnished. In constructing this apparatus, we have endeavored to place in the hands of the general practitioner an outfit which would enable him to obtain results fully equal to those which follow treatments by this method in the few large institutes especially equipped for the purpose, at the same time giving him an outfit easily manipulated and cheaply maintained. A rheostat is furnished by means of which the arc can be made to consume any quantity up to sixteen amperes, according to the volume of light desired.

The design and finish are all that could be desired. The outfit is complete and self-contained and when shipped is ready for connection to any electric light circuit. A set of directions accompanies each outfit, enabling any physician to become proficient in its use in less than one hour.

Price for use on 110 volt, direct, or 104 volt to 120 volt alternating, as shown in the cut, complete	\$100 00
Price for use on 220 volt direct current	115 00
Price for use on 500 volt direct current	125 00

VICTOR HAND FINSEN LAMP FOR DIRECT CURRENT.



Price, complete, ready for connection to 110 or 220 volt direct current\$30 00

The lamp here illustrated is designed (when in use) to be held in the hand, the compression lens being held against the part under treatment.

The arc in this lamp consumes a much smaller amount of current than is required for our large Finsen outfit with a subsequent loss in penetrating power, but by the use of iron electrodes an arc very rich in ultra-violet rays is secured.

The amount of heat developed is not nearly so great as is the case with the large lamp, nevertheless, it is sufficient to render its use very uncomfortable to the patient were no provision made to prevent the compression lens from heating. As will be seen in the illustration, we obviate this difficulty by having the lens supported by a separate arm which is independently attached to the lamp handle. This prevents the heat from being transmitted by radiation to the lens through the body of the lamp.

This feature, together with the lightness, simplicity of construction and convenience of this instrument constitute its chief points of excellence.

While this lamp is not as efficacious as the larger one, it will accomplish the same results with somewhat longer exposures, and we can fully recommend it to physicians who feel that the nature of their practice would not justify their investing in the larger outfit.

This lamp cannot be used on alternating current.

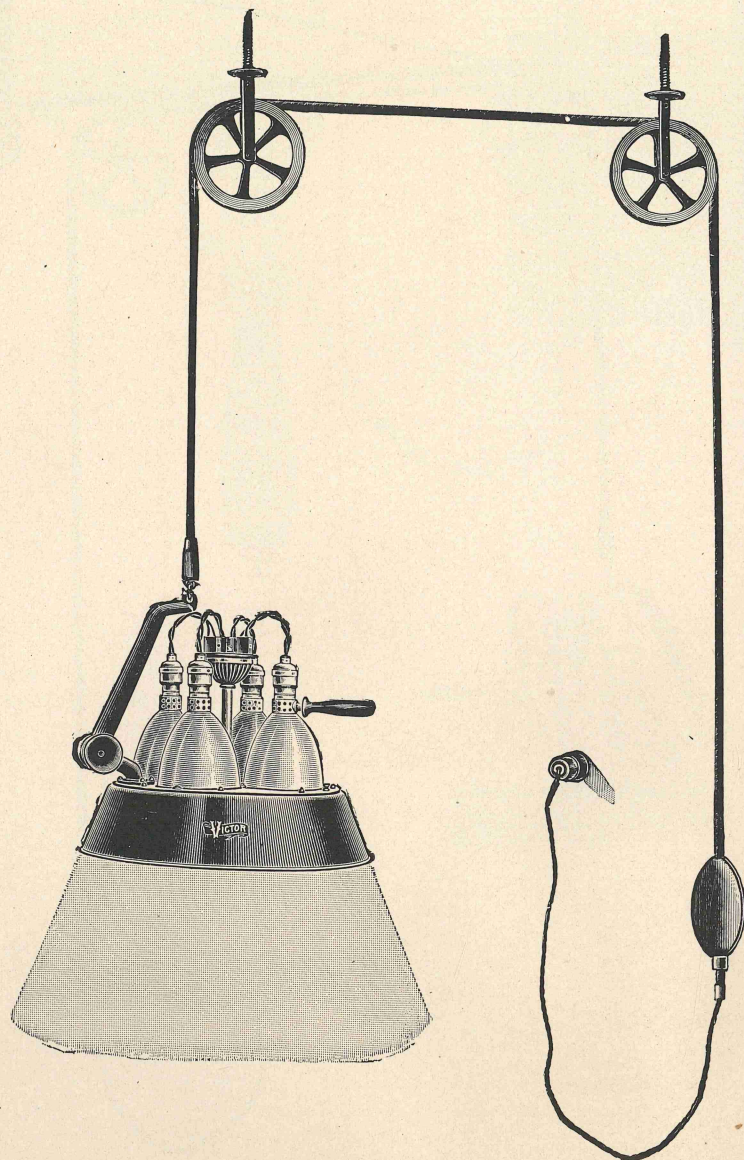
VICTOR SOLAR INCANDESCENT THERAPEUTIC LAMP OUTFIT.

STYLE A.
Patented.

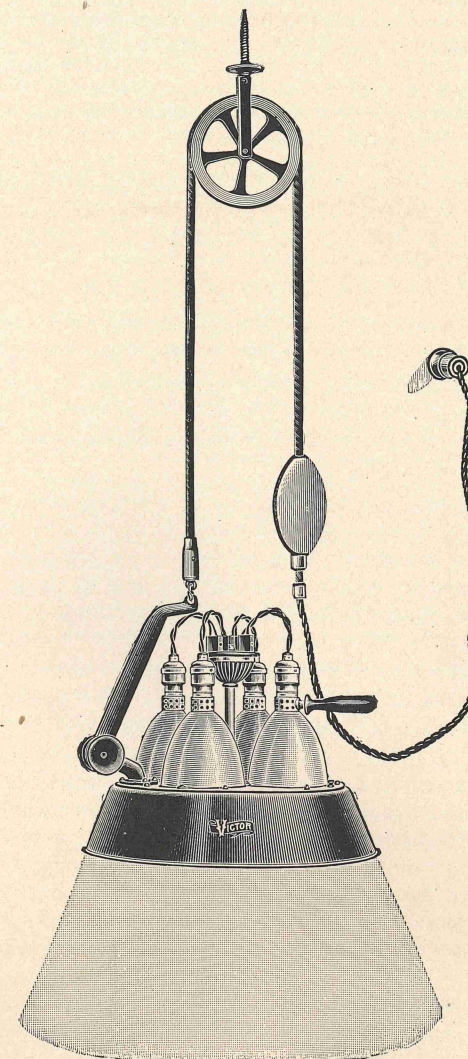


SOLAR THERAPEUTIC INCANDESCENT LAMP OUTFIT.**STYLE B.**

Patented.

**SOLAR THERAPEUTIC INCANDESCENT LAMP OUTFIT.****STYLE C.**

Patented.

**PRICE LIST.**

Price of Victor Solar Outfit, Style A, complete, including two sets of lamps for 110 volts, direct or alternating current.....	\$86 00
Price of Victor Solar Outfit, Style B, complete as above.....	73 50
Price of Victor Solar Outfit, Style C, complete as above.....	70 50
For 220 volt current add \$5.00 to above prices.	
Ray screens, for small detachable lamp, either blue, orange or violet, each....	1 50
Ray screen holder, for large solar lamp, with set of 3 Ray screens.....	12 00

VICTOR SOLAR THERAPEUTIC INCANDESCENT LAMP OUTFIT.

The source of the light in the Victor solar outfit is four special large lamps which, when in position in the solar outfit, give an aggregate of 500 candle power. These lamps are so placed that the filaments occupy practically the same plane and these filaments each being of considerable length are coiled so that practically the entire filament of each lamp occupies a common plane. It will thus be seen that the light all emanates from the same plane, thus making it possible by a proper system of condensers and reflectors to direct the rays with the least possible loss to the desired point. Each individual lamp is mounted in its own parabolic reflector.

The individual reflectors all open into a single large reflector which is designed to collect and redirect all of the divergent rays, the whole system of reflectors being calculated to collect and direct both the heat and light rays so that at a point immediately below the opening of the large reflector, which is eighteen inches in diameter, there is an even distribution of all the available light and heat rays.

When all the lamps are burning to their full candle power an intensely brilliant light is manifest at this point as well as heat in sufficient quantity for cauterization.

When the four lamps are burning at their maximum power a current of almost ten amperes is passing through the filaments and the average distance of the filaments from the point where the rays are to be used or made available is less than would be possible if a single lamp were used.

This result could not be obtained by the use of a large group of ordinary lamps, as in that case the average distance of the filaments from the point where the rays were to be used would be much greater than in the case of the large single lamp and it would be impossible to secure an effective volume of light and heat at the point desired, neither is it possible to secure the desired result by mounting four or five large lamps in a single reflector nor by using lamps not having filaments of proper composition; these are facts which we have determined by actual experiment.

The inner surfaces of all the reflectors are silver plated and hand burnished, thus the highest possible polish and reflecting power is secured.

Each of the four lamps is provided with a short length of wire terminating in a small hard rubber terminal and arranged so that each one can be independently connected or disconnected at will, thus any one, or a selection of any two or three lamps of the group may be burned alone if desired. In many cases two lamps will be found sufficient, in some cases one is all that is necessary and as will be apparent, a material saving in operating expenses is effected. Perhaps the chief advantage, however, of this arrangement is that treatments may be begun with a single lamp and as the patient becomes more tolerant the remaining lamps can be added one at a time.

To add to the convenience and usefulness of this outfit we have arranged so that one of the individual reflectors with its lamp can be quickly and completely detached from the large outfit. We also provide a separate attachment plug and cord to which this individual lamp can be quickly attached and connected with any convenient lamp socket. The detachable reflector is the one which, as will be noted in the illustration, is provided with a handle. This will be found a great convenience as in many instances the area to be treated is small and perhaps located where it would be difficult or inconvenient to use the large outfit, and over a limited area the individual lamp is just as effective as the large outfit, and it costs but one-fourth as much to operate.

To still further decrease the operating expense, which in an outfit of this kind is a considerable item, we supply with each equipment, four extra lamps which in the aggregate only consume about one-third the quantity of current required by the group of large lamps. These lamps, which are also of special design, are to be used in treatments where diffused light is indicated. Where large lamps are used the only method of obtaining diffused light and heat is by increasing the distance from the patient. This, of course, answers the purpose but it is a useless waste of power.

For the benefit of those who desire to test some of the claims made for colored light in therapeutic work we have devised color screens which are adapted to be instantly attached to the rim of the individual detachable reflector, these ray screens can, of course, be furnished in any color; however, the colors which seem to be in the greatest demand are blue, violet, red and orange, and it is these colors that we carry in stock. No ray screens are furnished with the outfit unless so ordered.

It will be seen from the illustration that the No. 1 lamp is suspended from a substantial though light bracket, this bracket to be attached to the wall, and is swiveled in its support so that it can be swung laterally. The bracket is extensible, its shortest length being 2 feet 11 inches, its greatest length 4 feet 2 inches. On the under side of the bracket are two pulleys over which passes a substantial, flexible, braided cable, having the double function of supporting the light and carrying the conducting wires. As will be noted a counter weight is fastened to the reverse end of this cable, its weight being calculated to exactly balance the weight of the lamp, with the result that the lamp can be raised and lowered through quite a wide range with but slight exertion and will remain in any position where placed.

Owing to the fact that it is suspended from a flexible cable and that the bracket moves laterally in either direction the lamp can be readily swung or moved in practically a horizontal plane. This is also true of the B and C styles, but to a limited degree.

The elimination of the suspending bracket is the sole difference between styles A and styles B and C. The style B outfit is provided with two pulleys arranged so that they can be screwed into the ceiling or an overhead beam. The style C outfit has a single supporting pulley. In all other respects the B and C outfits are identical with style A.

As it is often desirable to direct the rays at an angle, provision is made so that the lamp can be quickly and conveniently set or tilted and automatically held at any angle from a vertical to a right angle.

In the construction of the Victor therapeutic lamp, we have had in mind that durability is a very essential feature in an apparatus that is likely to become a permanent fixture in the office or hospital equipment. The materials used in the construction of this apparatus have been carefully selected, where any choice was possible, with a view of their strength and durability and it is almost superfluous to say that the workmanship is of the highest grade. We believe it is a safe statement to make that the factory cost of the Victor outfit is higher and its intrinsic value greater than is the case with any other outfit for a similar purpose at the present time on the market.

Aside from occasional lamp renewals there will be no expense for repairs or maintenance. It will be apparent that lamp renewals will not be as serious an item of expense as is the case where a single large lamp is used. It will only be necessary to keep on hand one extra lamp in case one of the lamps should burn out during a treatment. We shall supply lamps for renewals at \$1.50 each and they will be carried in stock at all times for immediate delivery.

LEWIS INSTITUTE

CHICAGO

SCIENCE, LITERATURE, TECHNOLOGY

FRED A. ROGERS, B. S. (E. E.)

Department of Physics
and Electrical Engineering

January 4, 1907.

THE VICTOR ELECTRIC COMPANY,
55-61 MARKET STREET, CITY.

Gentlemen:

In compliance with your request, I have tested in the laboratories of Lewis Institute the candle-power of the incandescent lamps submitted by you, and have also compared the spectra of these lamps with that of sunlight.

The candle-power was determined by comparison with a standard 16-candle-power of the incandescent lamp by means of a Flicker photometer, and the spectra was compared by means of a Geneva Society spectrometer.

The results of the candle power tests of the groups of lamps are tabulated below:

Group No. 1	110 volts	392 candle-power
Group No. 1	115 volts	530 candle-power
Group No. 2	110 volts	378 candle-power
Group No. 3	105 volts	312 candle-power
Group No. 3	115 volts	500 candle-power

The result of the candle-power tests of the single lamps are given in the following table:

Lamp	No.	Reflector	Voltage	Candle-power
100 C. P.	4	Deep	110	36.7
100 C. P. Special	5	Shallow	110	260.0
50 C. P. Special	6	Shallow	115	76.0

I submit herewith sketches showing position and distribution of the various colors in the spectra of the different lamps together with a sketch of the sunlight spectra for comparison.

Trusting that this will be satisfactory to you, I remain,

Yours truly,

(Signed) FRED. A. ROGERS.

LEWIS INSTITUTE

CHICAGO

SCIENCE LITERATURE TECHNOLOGY

FRED A. ROGERS B.S. (E.E.)
DEPARTMENT OF PHYSICS
AND ELECTRICAL ENGINEERING

SPECTRUM OF SUNLIGHT					ULTRA-VIOLET
INFRA-RED	RED	Y.W.	GREEN	BLUE	VIOLET
SPECTRUM OF LAMP No. 1 (115-VOLTS) VICTOR					
	RED	Y.W.	GREEN	BLUE	VIOLET
SPECTRUM OF LAMP No. 3 (115 VOLTS) VICTOR					
	RED	Y.W.	GREEN	BLUE	VIOLET
SPECTRUM OF LAMP - No. 4 (110-VOLTS) VICTOR					
	RED	Y.W.	GREEN	BLUE	VIOLET
SPECTRUM OF LAMP No. 5 (110 VOLTS) VICTOR					
	RED	Y.W.	GREEN	BLUE	VIOLET
LIMIT OF VISIBLE SUNLIGHT SPECTRUM					

EXPLANATION

In testing the nominal candle power of incandescent lamps no reflector is used, thus the light emanating from the filament surface actually exposed to the photometer is all that is registered.

In all the tests here recorded (save one) our special reflectors were used by means of which practically all of the rays are collected and redirected through the reflector opening.

Where the report mentions the groups of lamps, they refer to our regular Solar outfit with four lamps in position. Group No. 1 consisted of four of the special 50 candle power lamps. This is the same lamp we ordinarily supply with our M. I. P. lamp.

As you will note, in the candle power tests, this group, when attached to the 110 volts, current shows 392 candle power, and when the voltage was raised to 115, the candle power was 530. These lamps were designed and intended for the 115 volt current, so that the normal candle power of the Solar outfit, when equipped with these four lamps, is 530 candle power. Our object in having the tests made on the lower voltage was simply to see what the drop in candle power would be with only 5% drop in the voltage.

Group No. 2 consisted of four standard 110 Volt Carbon filament 50 candle power lamps. As you will see, they developed 398 candle power when burned at their normal voltage, or at 110.

Group No. 3 consisted of four of the 32 candle power special lamps which we supply with the Solar outfit for ordinary treatments. These lamps were designed and intended for 105 volt current. When burned at 105 volts, they developed 312 candle power, and, as you will note, when burned at 115 volts, or 10% high, they developed a candle power of 500, the ratio of rise in candle power being much greater than the rise in voltage.

This is the extra group of lamps supplied with our Solar outfit.

The candle power tests made with the single lamps require the following explanation:

In tests Nos. 4 and 5, the same identical lamp was used, but with a different reflector. In test No. 4, an ordinary deep cone reflector was used. In test No. 5 our regular reflector such as we supply with therapeutic lamps was used. They have designated this as the shallow reflector. Please note the immense difference between the candle power developed with the ordinary reflector and that which is developed by the use of the special reflector with the same lamp.

Test No. 6 shows the actual candle power of our regular M. I. P. lamp with which we furnish the 50 candle power special lamp.

In the diagram of spectrums, the first diagram is the sunlight spectrum.

The second diagram is the spectrum of our special 50 candle power lamp, the same as furnished with the M. I. P. lamp outfit.

The third diagram is the spectrum of a very large bulb, heavy filament, incandescent lamp.

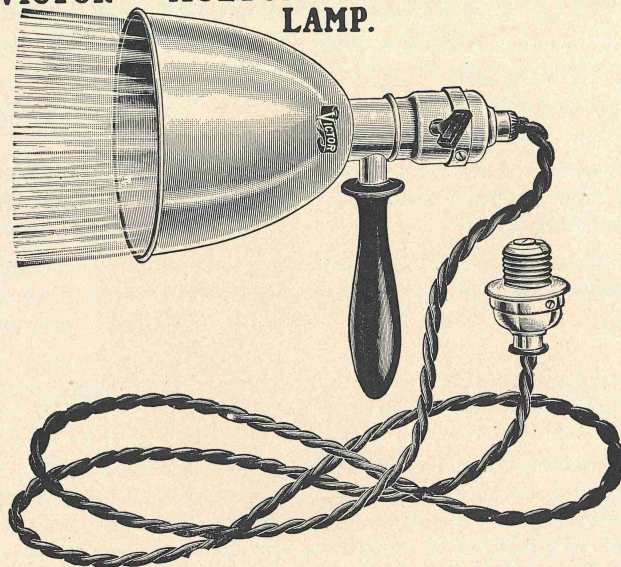
Diagrams 4 and 5 show the spectrum of the special 32 candle power lamp, No. 4 being the spectrum when the lamp was burned at normal voltage, No. 5 when burned 10% high.

Please note the extremely close resemblance to the Solar or sunlight spectrum of all of our lamps, also that there is no appreciable difference between the spectrum of our therapeutic lamps and that of the very large lamp with heavy filament.

The reports here presented are authoritative and convincingly prove that the quality of the light is practically the same as Solar light, and the quantity all that we claim.

In view of certain statements emanating from a competitor, a concern that seems to be wasting much energy in an effort to crush competition that might more profitably be employed in promoting its sales along legitimate lines, we have secured the consent of a number of physicians who are using our therapeutic lamps to refer to them in cases where prospective customers were in doubt, as to the efficacy of the Solar and M. I. P. lamps. These physicians are for the most part widely known and recognized as conservative and conscientious, we are not permitted to use their names in an advertising way, but they have kindly consented to briefly state the results of their experience direct upon request.

THE VICTOR "MULTUM IN PARVO" THERAPEUTIC LAMP.



Price Complete as shown, with High C. P. Lamp and 2 Ray Screens, \$10.00

"	"	"	"	"	"	"	"	"	"	without "	"	7.50
"	"	"	"	"	"	"	"	"	"	"	"	6.50

Price of Colored Ray Screens, Red, Yellow, Blue, Violet, each, 1.50

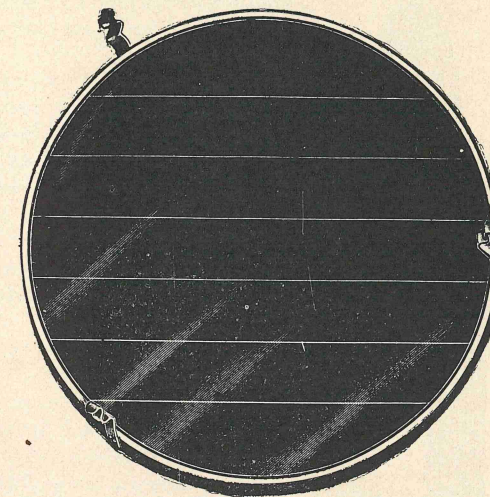
This little Victor outfit has been designed more especially for the benefit of those who desire to test the value of concentrated light and radiant heat as a therapeutic agent without investing in one of the large and more expensive lamps being at the present time offered to the profession. There seems to be no doubt but that light in this form is distinctly beneficial in many conditions and it has been recorded as a specific treatment by some authorities in some few conditions.

Necessarily the essential features of an outfit of this kind must be the source of light and the means for concentrating it at the point desired. In the case of the Multum-in-parvo, the light is supplied by an incandescent light of special construction designed to give the greatest possible volume of light from a filament occupying comparatively small space. More than 50 candle power is developed and the light occupies a space not greater than ordinarily required for a standard 32 candle power lamp. The shape of the filament is such that the greater portion of the light emanates from the same plane. The reflector or hood is conical in shape, heavily silver-plated, burnished on the inner surface, and acts as a condenser and concentrator, making available practically the entire output of light and heat. The concentration is so perfect that any combustible material such as paper held at the focal point is scorched in a few moments. Of all the various forms of lamps designed to utilize the therapeutic power of light, those of the type of the Multum-in-parvo when properly designed and constructed seem to more nearly approach the solar rays, and, according to Finsen, the nearer we simulate sunlight the nearer we approach the ideal.

The rays given off by this little lamp have the same germicidal power as those given off by the largest lamp that could be made, but of course the area which can be covered at one time is more limited, and all other known effects of concentrated light may be looked for with certainty. Practically the only difference between this light and a larger one of the same type is the difference in area that can be covered at one treatment. While not recommending this lamp as a substitute for the larger therapeutic lamps, there are numerous conditions, perhaps one-half the cases, in which this form of treatment is indicated, a small lamp will be equally efficacious, much more convenient and much less expensive to operate, requiring approximately about one-tenth the power consumed by the larger outfits. The Multum-in-parvo is not to be confused with the ordinary incandescent lamp encased in a cheap reflector frequently offered at a low figure but dear at any price. The usual Victor standard of correctness in design and construction has been maintained in the Multum-in-parvo.

RAY SCREENS.

FOR TREATMENT WITH COLORED LIGHT.



Price, each \$1 50
Price for set of 3 large screens with holder for Solar Lamp..... 12 00

Owing to the fact that good results have been reported from the use of colored light we have devised a means of quickly and conveniently attaching ray screens to the therapeutic lamps. This plan has many advantages over the method of using colored lamps; the colored lamps burn out, thus entailing a considerable expense for maintenance; the ray screens will last indefinitely unless broken accidentally. The annoyance of having to change lamps is also eliminated. The screens attach to the bottom of the reflector by means of spring clips and can be attached and detached almost instantly.

PORTABLE CARRYING CASE.

FOR M.I.P LAMP AND SCREENS.

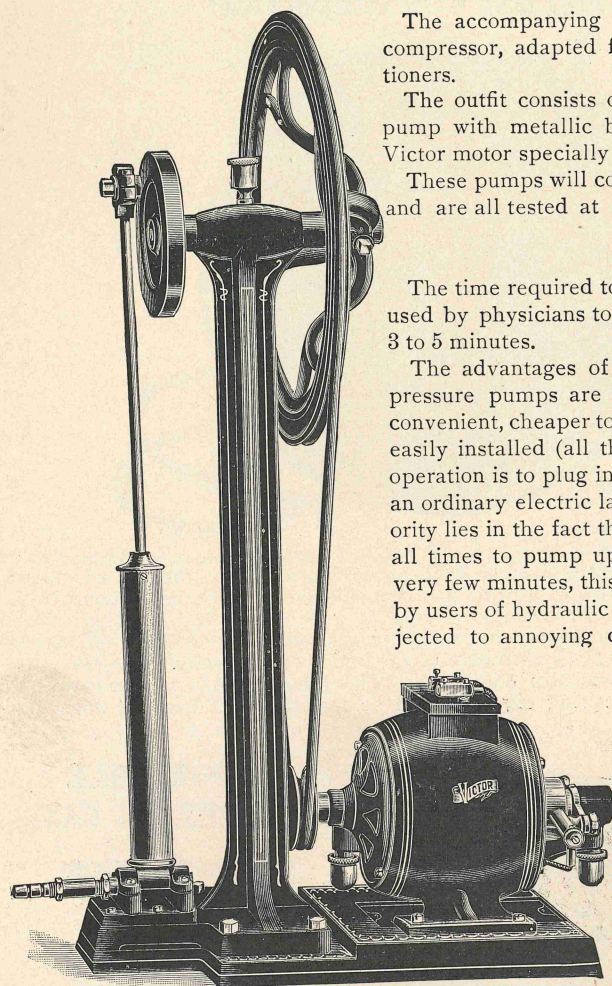


Accompanying cut illustrates a substantially made, leather covered, plush lined case suitably arranged to contain the Multum In Parvo lamp complete, one extra bulb and three colored ray screens.

Is provided with heavy, nickel plated corner pieces, catches and handle.

Price of complete outfit, as shown, including Multum In Parvo lamp with high candle power bulb, three ray screens, red, blue, violet, and carrying case \$16 25

Price of case only..... 6 00

No. 2 VICTOR AIR COMPRESSOR.

The accompanying cut shows an electric air compressor, adapted for the use of busy practitioners.

The outfit consists of a single action piston air pump with metallic ball valves, operated by a Victor motor specially designed for the purpose.

These pumps will compress air up to 80 pounds and are all tested at that pressure.

The time required to fill the receiver ordinarily used by physicians to a working pressure is from 3 to 5 minutes.

The advantages of this outfit over the water pressure pumps are obvious. It is much more convenient, cheaper to operate and maintain, more easily installed (all that is necessary to start it in operation is to plug in a lamp socket the same as an ordinary electric lamp), but its greatest superiority lies in the fact that it can be relied upon at all times to pump up any desired pressure in a very few minutes, this feature will be appreciated by users of hydraulic pumps who have been subjected to annoying delays caused by low water pressure and the inability of the pump to keep up the supply of air. The Victor pump is very quiet in operation and is ordinarily placed directly in the operating room.

It costs no more to run than an ordinary fan motor.

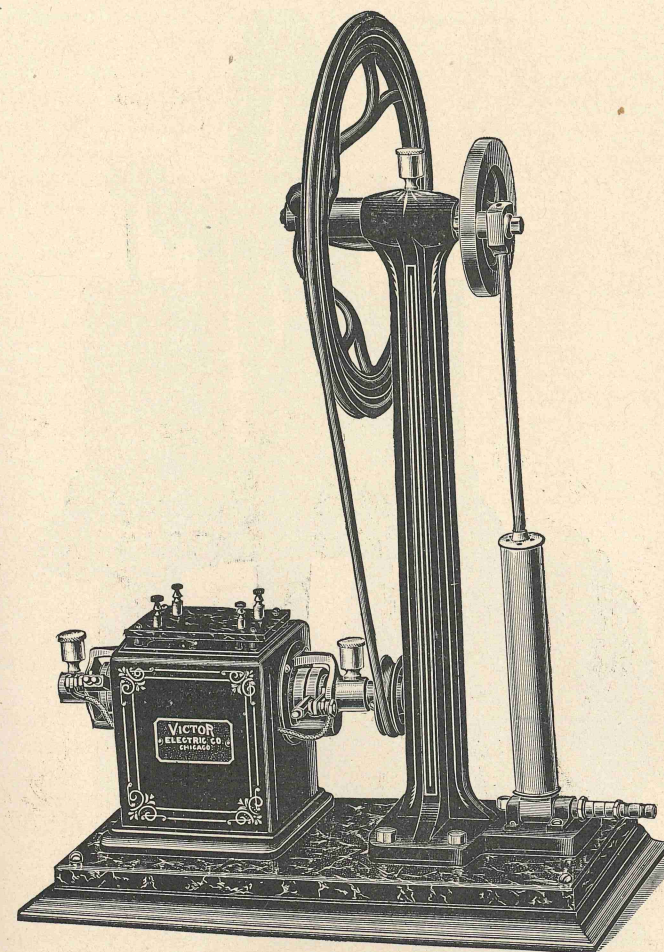
All wearing parts are extremely simple and durable. The only part

that requires occasional renewal is the leather packing of the piston, this can be replaced by anyone in a few minutes and costs but a few cents.

Price, as shown in cut wound for 110 or 220 volt current.....	\$55 00
Price, wound for 500 volt current, consisting of pump as shown and $\frac{1}{4}$ H. P. motor and rheostat.....	88 00
Price of complete pump without motor.....	28 00
Price of complete pump for alternating current of 7,200 alternations.....	55 00
Price of complete pump for alternating current of 16,000 alternations.....	60 00

In ordering describe current.

NOTE—Compressors equipped with alternating current motors are not guaranteed to compress higher than 45 pounds.

No. 2 AIR COMPRESSOR WITH TRANSFORMER MOTOR.

Price, wound for 110 or 220 volt current	\$60 00
Price, wound for 500 volt current	90 00

500 volt outfit consists of air compressor operated by $\frac{1}{4}$ H.P. motor and separate speed controlling rheostat.

Accompanying illustration shows the No. 2 air compressor, operated by a transformer motor.

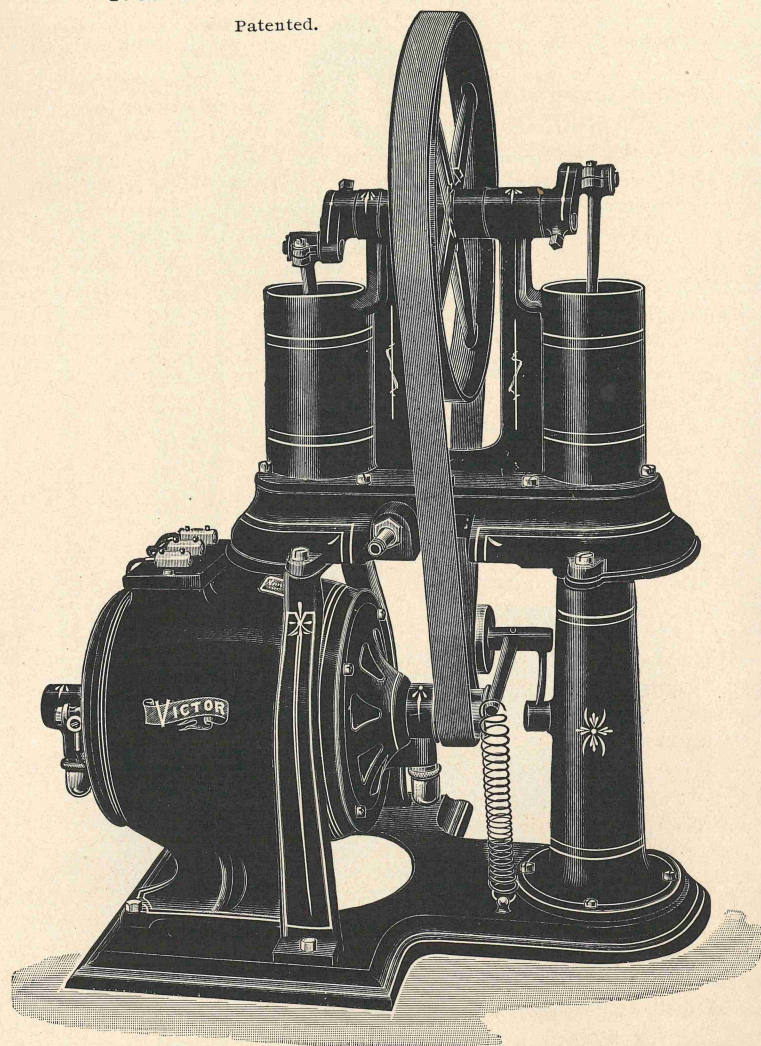
In this case the motor serves a double purpose—besides operating the compressor it supplies an alternating current which, when connected to an alternating current cautery transformer, supplies cautery and diagnostic lamp currents.

By purchasing the Victor Alternating Current Cautery Transformer, price \$25.00, and the outfit as above, a net saving of \$30.00 is effected.

It is not practical, however, to use either the nasal drill or ear pump in connection with the motor transformer when mounted in this way.

NO. 4 VICTOR AIR COMPRESSOR.

Patented.



Price complete, as shown, with motor for 110 volt direct current.....	\$100 00
Price complete, with motor for 220 volt direct current	105 00
Price complete, with motor for 500 volt direct current (motor $\frac{3}{4}$ H. P.).....	125 00
Price complete, with motor for 104 to 110 volt 60 cycle alternating current, and guaranteed to compress up to 60 lbs. pressure.....	145 00
Price complete, with motor for 104 to 110 volt 125 to 133 cycle alternating current, and guaranteed to compress up to 60 lbs. pressure.....	145 00
Price of compressor, without motor but with sub-base and belt tightener.....	56 00
Price of compressor, without motor or sub-base.....	45 00

NO. 4 AIR COMPRESSOR.

This compressor was designed to meet the demand from hospitals, sanitariums, etc., and for a compressor of greater capacity than the No. 2. It is not to be understood that this air compressor is capable of compressing up to a higher pressure than No. 2, but it will handle a volume of air four times greater than the smaller one.

Some idea of the capacity of the No. 4 compressor, as well as that of the No. 2, will be obtained from the following data of tests made with both compressors.

In each instance the motors were operated by 110 volt direct current and the capacity of the tank used was ten gallons.

WITH THE NO. 4 COMPRESSOR.

15 pounds pressure was obtained in 23 seconds.

30 pounds pressure was obtained in 1 minute and 5 seconds.

45 pounds pressure was obtained in 1 minute and 50 seconds.

60 pounds pressure was obtained in 3 minutes and 4 seconds.

WITH THE NO. 2 COMPRESSOR.

15 pounds pressure was obtained in 1 minutes and 34 seconds.

30 pounds pressure was obtained in 3 minutes and 50 seconds.

45 pounds pressure was obtained in 6 minutes and 47 seconds.

60 pounds pressure was obtained in 10 minutes and 40 seconds.

The capacity of the No. 4 Compressor under actual working conditions at different pressures is further indicated by the following data: Average results obtained from tests made with No. 4 Compressor equipped with $\frac{1}{2}$ H. P. 110 V Victor motor, pumping into a 15-gallon tank.

Speed of Compressor.	290 R. P. M.	260 R. P. M.	250 R. P. M.	225 R. P. M.	210 R. P. M.	200 R. P. M.	185 R. P. M.	180 R. P. M.
Pressure ...	10 lbs.	20 lbs.	30 lbs.	40 lbs.	50 lbs.	60 lbs.	70 lbs.	80 lbs.
Total Time...	25 sec.	50 sec.	1 m. 25 sec.	2 m. 5 sec.	2 m. 40 sec.	3 m. 40 sec.	4 m. 36 sec.	5 m. 50 sec.
Time req. for each 10 lb. increase ..		28 sec.	32 sec.	37 sec.	43 sec.	50 sec.	58 sec.	1 m. 10 sec.

Many attempts have been made by other manufacturers to place on the market a compressor having the capacity of this new type Victor, but, through faults in design and construction, they have all failed to come up to expectations. Our long experience in the manufacture of the smaller apparatus stood us in good stead in the design of the larger one.

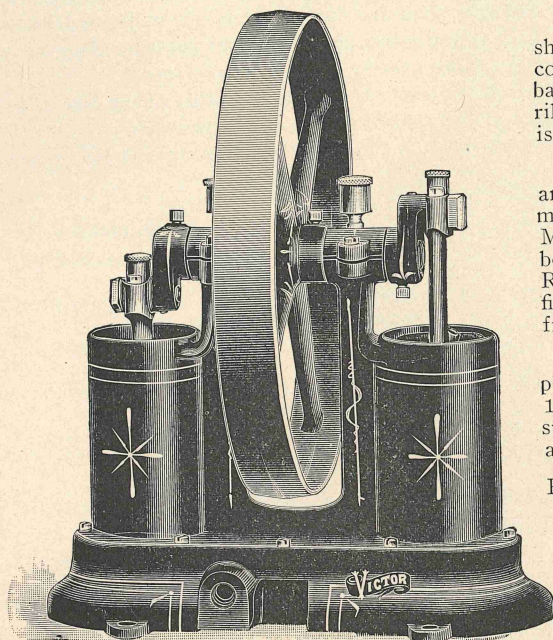
The fit between the pistons and the cylinders is perfect; means have been provided for keeping pistons lubricated; the valves are of special construction, calculated to stand the great strain to which they will unquestionably be subjected. Each outfit made for the direct current is tested up to eighty pounds pressure. We would suggest, however, that in actual service, they be allowed to operate at as low a pressure as possible, the reason for this will be readily understood when we state that the strain on the wearing parts is almost four times greater at a pressure of eighty pounds than at a pressure of forty pounds.

The motor furnished for the direct current outfit is capable of developing one-half horsepower, and the winding is calculated especially for this work. We mention this for the reason that, although any first-class motor can be used to operate the compressor, it is hardly likely that so good results will be obtained with the use of a motor of another make.

We have endeavored to make this outfit operate with the least possible noise, and if it is used for intermittent service only, it may be placed in the clinic room. There is a certain amount of noise that is unavoidable, but it is not great enough to be objectionable unless the outfit is to be operated continuously, in which case, we would recommend its being placed at some point where the noise would make no difference.

It will be necessary occasionally to replace worn out packings. These packings are quite inexpensive and the directions which accompany the outfit give full instructions on this point.

VICTOR NO. 4 AIR COMPRESSOR. WITHOUT MOTOR OR SUBBASE.



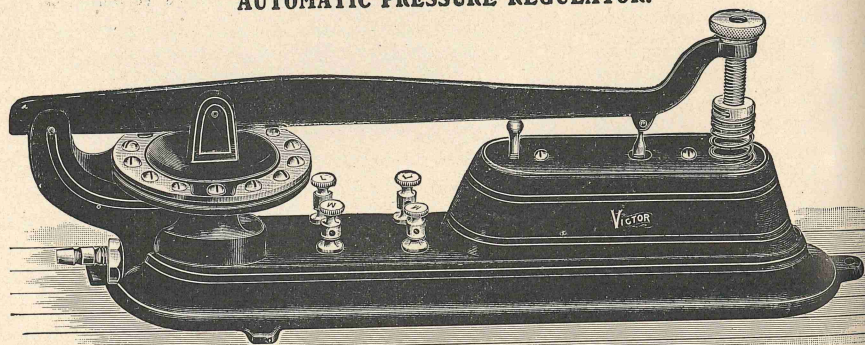
The accompanying illustration shows the No. 4 double cylinder compressor without motor or subbase; the compressor is ordinarily supplied in this way when it is desired to belt it to a line shaft.

At low and medium pressures and for intermittent service the maximum safe speed is 360 R. P. M. The cylinders are $2\frac{1}{2}$ inch bore, stroke 2 inches; hence at 360 R. P. M. the capacity of the outfit is 4 cubic feet or 30 gallons of free air per minute.

The No. 4 may safely be employed to obtain pressures up to 125 lbs., but for the higher pressures the speed should be materially reduced.

Price of Compressor, alone
as shown\$45 00

AUTOMATIC PRESSURE REGULATOR.

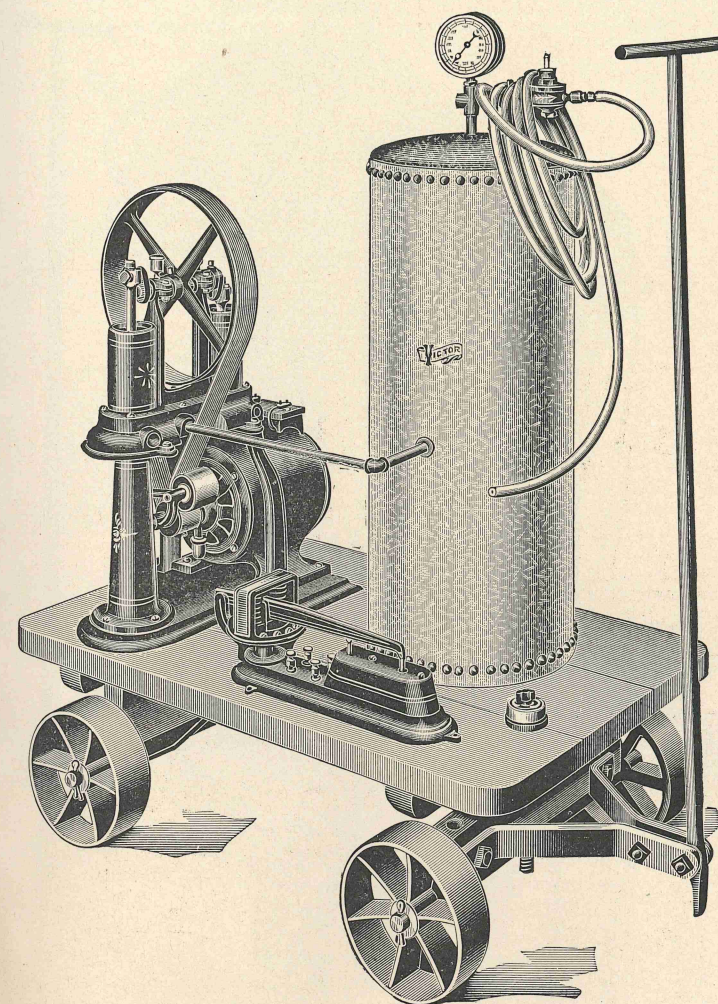


Price when purchased alone.....\$20 00
Price when purchased with our pump..... 15 00

This apparatus controls the pressure within a range of 14 pounds, by automatically throwing a switch and starting the motor when pressure is too low, and stopping the motor when pressure is up to the desired point. It can be set to start at any pressure from 10 to 25 pounds, and to cut off at a point 14 pounds higher.

This device simply saves the operator the trouble of throwing a hand switch. The troubles to which controllers of this kind are usually subject are waste or loss of air and a burning away of switch contact points, due to the arcing of the current. The construction of the Victor Pressure Regulator is such that there is absolutely no leakage and practically no arcing at the switch contacts, thus making it by far the most durable regulator on the market.

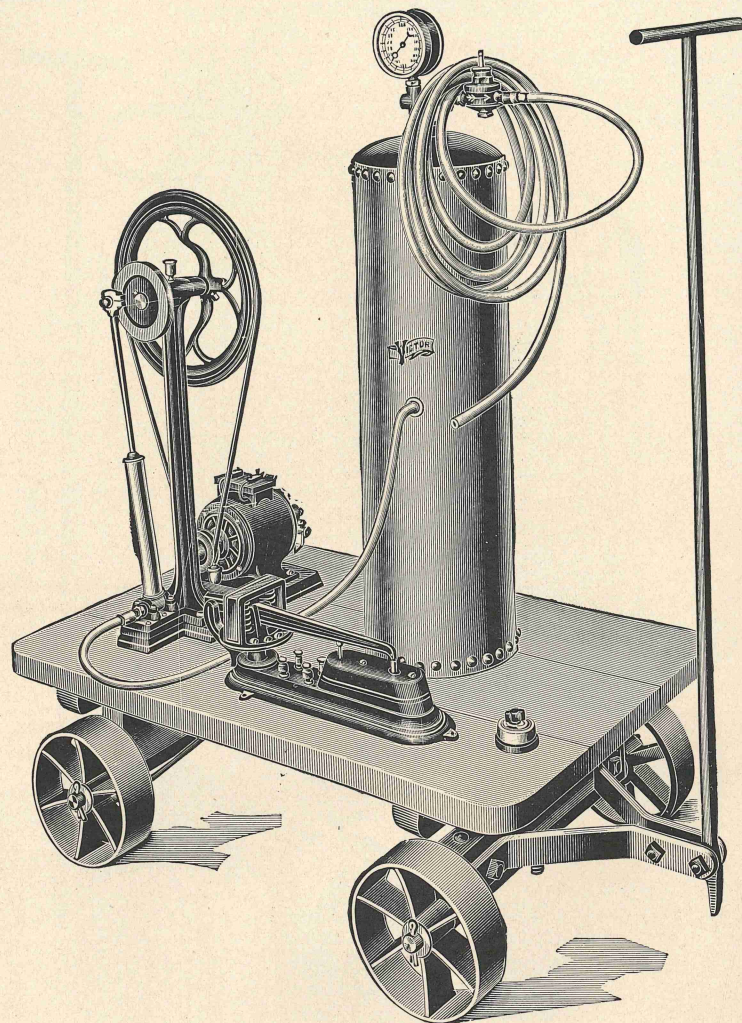
VICTOR NO. 4 COMPRESSOR MOUNTED ON TRUCK.



We are frequently requested to quote upon the No. 4 Compressor with complete portable equipment; for the benefit of those who wish to procure complete outfits of this character we here illustrate the No. 4 with all essential accessories mounted upon a substantial truck, and connected ready for operation.

No. 4 Compressor with motor for 110 volt direct current.....	\$100 00
Automatic Pressure Regulator (to regulate tank pressure).....	15 00
Air Regulator (governs pressure and flow of air through outlet hose independent of tank pressure)	4 50
Air Hose (10 feet best 3 ply cloth insertion rubber hose)	1 80
Pressure Gauge (scale registers 0 to 100 lbs.).....	5 50
Tank (15 gallons capacity) riveted galvanized steel	12 00
Truck, 2x3 feet	14 00

On and off switch, pipe fittings, etc., furnished gratis when complete outfit is ordered.

VICTOR NO. 2 COMPRESSOR MOUNTED ON TRUCK.

For many classes of work in which compressed air is employed it is essential, or desirable, that the complete compressor equipment be portable. We here show the No. 2 outfit complete with parts and accessories as enumerated below mounted on substantial truck and all ready for operation.

No. 2 Compressor with motor for 110 or 220 volt direct current.....	\$55 00
Automatic Pressure Regulator (to regulate tank pressure).....	15 00
Air Regulator (governs pressure and flow of air through outlet hose), independent of tank pressure	4 50
Air Hose, 10 feet best cloth insertion, 3 ply rubber air hose.....	1 80
Pressure Gauge (registers 0 to 100 lbs.)	5 50
Tank (capacity, 8 gallons) riveted galvanized steel	9 00
Truck, 2x3 feet	14 00
On and off switch, pipe fittings, etc., furnished gratis when complete outfit is ordered.	

VICTOR ENGINE FOR BONE SURGERY.

Patent applied for.

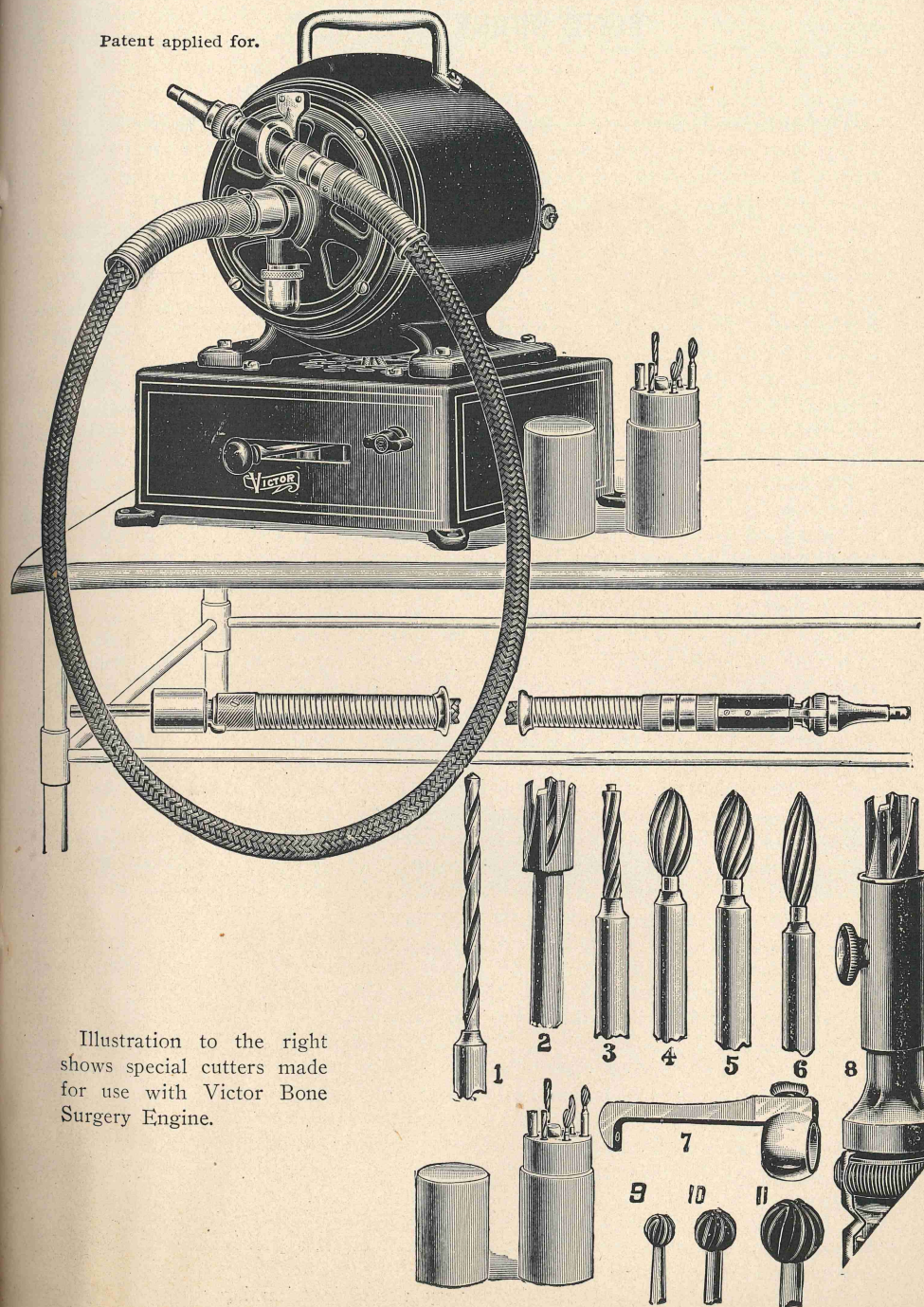


Illustration to the right shows special cutters made for use with Victor Bone Surgery Engine.

BONE SURGERY ENGINE.

We feel it hardly necessary to dilate on the advantages of using an engine for work of this character over the old chisel and mallet plan, as they are so obvious that it would seem to be superfluous to call attention to them, so we shall simply pass to the description of our outfit and its various parts.

Knowing that lack of power had been a great draw-back in some of the engines previously devised for work in bone surgery, we decided to use for the purpose a motor having not only all power required, but a considerable surplus besides. The motor is capable of developing one-fifth h. p. and will stand a considerable over-load, if necessary. It is specially constructed for this purpose, being wound for proper speed, quiet in operation and in every way well adapted to the work.

Speed control being also quite essential, we provide a suitable rheostat, which is mounted in the base upon which the motor rests, thus the entire outfit is compact and self-contained and can be quite easily shifted about—a suitable handle being provided by means of which it can be lifted and carried.

The hand piece, or tool holder, is of very simple construction, strong and durable and can easily be sterilized, this latter feature being a very important one. The power is transmitted from the motor to the hand piece by means of a strong, yet very flexible, cable contained in a neatly braided sheath covering. A slip-joint connection is made between the cable and sheath and the motor so that it can be attached and detached almost instantly and without difficulty.

In the cutting instruments, themselves, we have followed, in the main, designs that have been gradually worked out in actual service and have been found the most practical. No. 1 is a twist drill, designed for drilling holes in bones and is used principally when it is desired to wire the ends of a broken bone together. No. 2 is a trephine, a very useful instrument, the chief function of which is making the initial opening for an operation on the skull. No. 3 is a spiral osteotome, designed to cut on the sides only. This is used in connection with the guard No. 7. No. 3 is placed in the hand piece the same as an ordinary drill and the guard is fitted over it. The small stud extending from the end of No. 3 fits in a small hole provided in the inner surface of the upper end of No. 7, and the guard is clamped by means of a set-screw firmly to the end of the tool-holder. This instrument is intended to be used after the initial opening has been made, to elongate the opening; in fact, it operates in practically the same manner as a saw, excepting that it is a perfectly safe instrument to use, there being no danger of injury to the soft tissues underlying the brain case, and, at the same time, it can be easily guided in the desired direction. It cuts rapidly and freely and the deep spirals between the cutting edges cause it to clear itself as it cuts.

Nos. 4 and 5 are elongated burs. They will penetrate bone very readily, and their principal use is for cutting laterally and to cut away as much of the bone as may be desired. They are not to be used, however, for drilling through the skull, as, owing to their shape, they would be likely to cause injury to underlying tissue.

No. 6 is a spiral osteotome with a drill-point. It will cut either on the end or sides. The other uses for these cutters will readily suggest themselves to the experienced surgeon.

No. 8 shows a guard in position when No. 2 trephine is being used; this guard can be set so that the trephine will cut to any desired depth, a positive stop then preventing its cutting any deeper.

Nos. 9-10 and 11 are spherical burs, very useful in trimming, beveling, cleaning cavities, etc.

The engine, as a whole, will be found well adapted to almost all operations upon the bony structures. It is at all times under perfect control, and, in the hands of an experienced surgeon, it will be found to greatly shorten the time of, and to simplify such operations as resection, or the removal of necrotic portions of bones, etc. It is also invaluable in cases where it is necessary to open the brain case and make fenestræ of any shape or size as in operations on the mastoid, on the temporal bone, making new sutures on the braincase, and for removing necrosis of the maxillary bones, etc.

WHERE THE ELECTRICAL CURRENT IS NOT AVAILABLE.

Where it is not possible to use the electric motor to furnish power we have devised a foot-power engine, intended, of course, to be operated by an assistant. In the foot-power engine the same cable, sheath, tool-holder, and cutting implements are used, but the cable and sheath is attached to a pulley-head carried on the top of a standard of adjustable height. The power is transmitted from a large fly-wheel near the base of the engine to the pulley-head by means of belting. In operating the engine, the foot of the assistant is placed in a stirrup set close to the floor and attached to the fly-wheel. It is possible to maintain a sufficiently high speed for rapid work without excessive fatigue.

The price of the foot-power outfit, complete, is given in the price list printed in this catalogue.

It is hardly necessary to state that in the construction of this engine great care has been given to every detail, and we are in a position to guarantee a minimum amount of trouble in its operation, and it is our belief that we have produced the best and most practical outfit for this work that has ever before been offered to the profession.

A complete set of directions accompany each outfit—these directions minutely describing the method of operation and the care of every portion of the engine.

BONE SURGERY HANDPIECE.

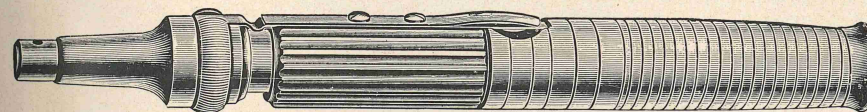


Illustration shows the all metal detachable handpiece supplied with the Victor Bone Surgery Engine. The handpiece is attached and detached in a moment by a simple manipulation of the spring which will be noted at upper edge of illustration.

Being entirely of metal the handpiece is in no way damaged by the sterilizing necessary each time it is used—all parts accessible, can be entirely taken apart and reassembled by any one in a few moments.

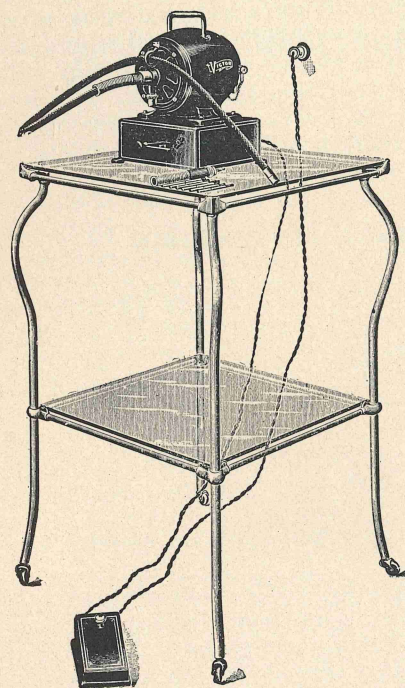
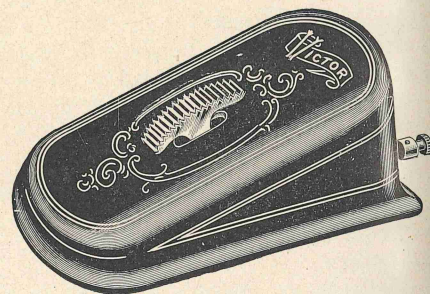


Illustration to the left shows Bone Surgery Engine ready for use, except that handpiece is detached; the foot switch shown in this illustration is considered indispensable by some operators, as it gives the surgeon direct control of the engine, yet leaving both hands free.

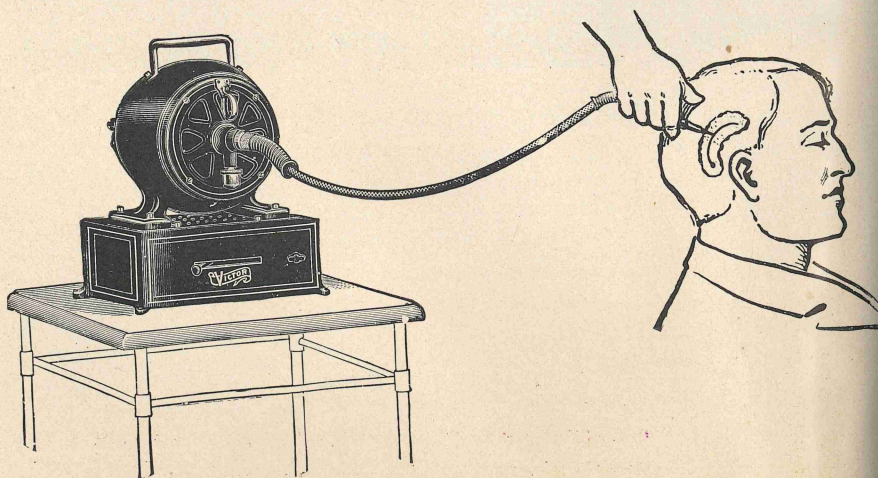
This is on "On" and "Off" switch and has nothing to do with the speed control; it is so constructed that the current can be cut off either by pressure, or by removing the foot, as the operator may prefer.



Price of "On" and "Off" foot switch\$5 00
 Price of table with 3 glass shelves12 00

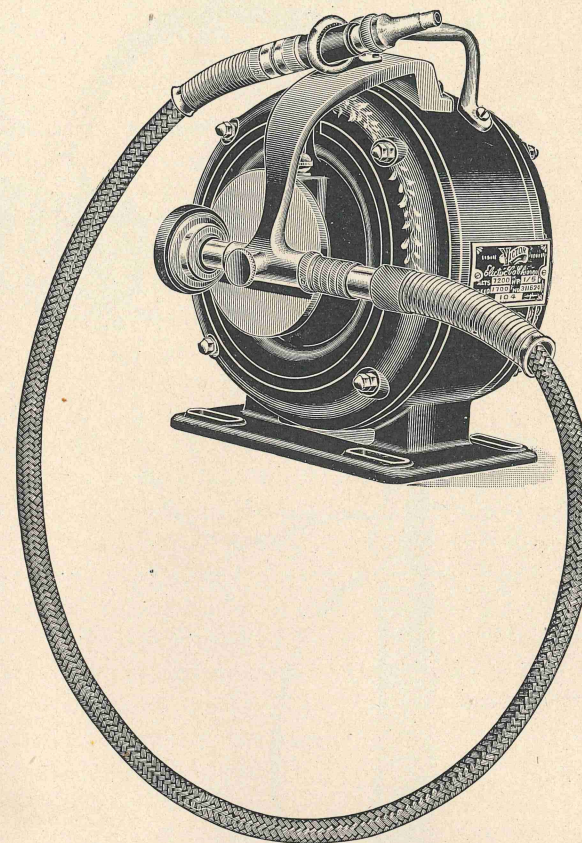
The foot switch not being an absolutely essential part of the engine is not included with it unless specified in the order.

Illustration below suggests a good method of holding the handpiece, the thumb being used as a brace to steady the hand.



BONE SURGERY FOR ALTERNATING CURRENT.

Patented.



Price of engine complete as shown for 110 volt direct current with all cutters...\$115 00
 Price of engine complete for 220 volt direct current 120 00
 Price of cable, sheath and hand piece without drills or cutters 30 00
 Price of No. 1 drill for drilling holes in bones, when wiring the ends of a broken bone together 1 00
 Price of No. 2 trephine for making the initial opening in skull operations..... 2 50
 Price of No. 3 spiral osteotome (which is used in connection with the guard No. 7) for making fenestræ in the brain case 3 00
 Price of No. 7 guard, used in connection with No. 3 2 00
 Price of No. 4 elongated bur for excavating, etc. 3 00
 Price of No. 5 elongated bur 3 00
 Price of No. 6 spiral osteotome with drill point; will cut freely in all directions. 3 00

Price of No. 8 guard, used in connection with No. 2 trephine ... 1 50

Price of No. 9 bur..... 2 50

Price of No. 10 and 11, each..... 3 00

Price of foot-power engine complete with all cutters 77 00

Price for alternating current complete including all cutters 125 00

VICTOR GIANT MAGNET ON CRANE.

Patented.

**GIANT EYE MAGNET.**

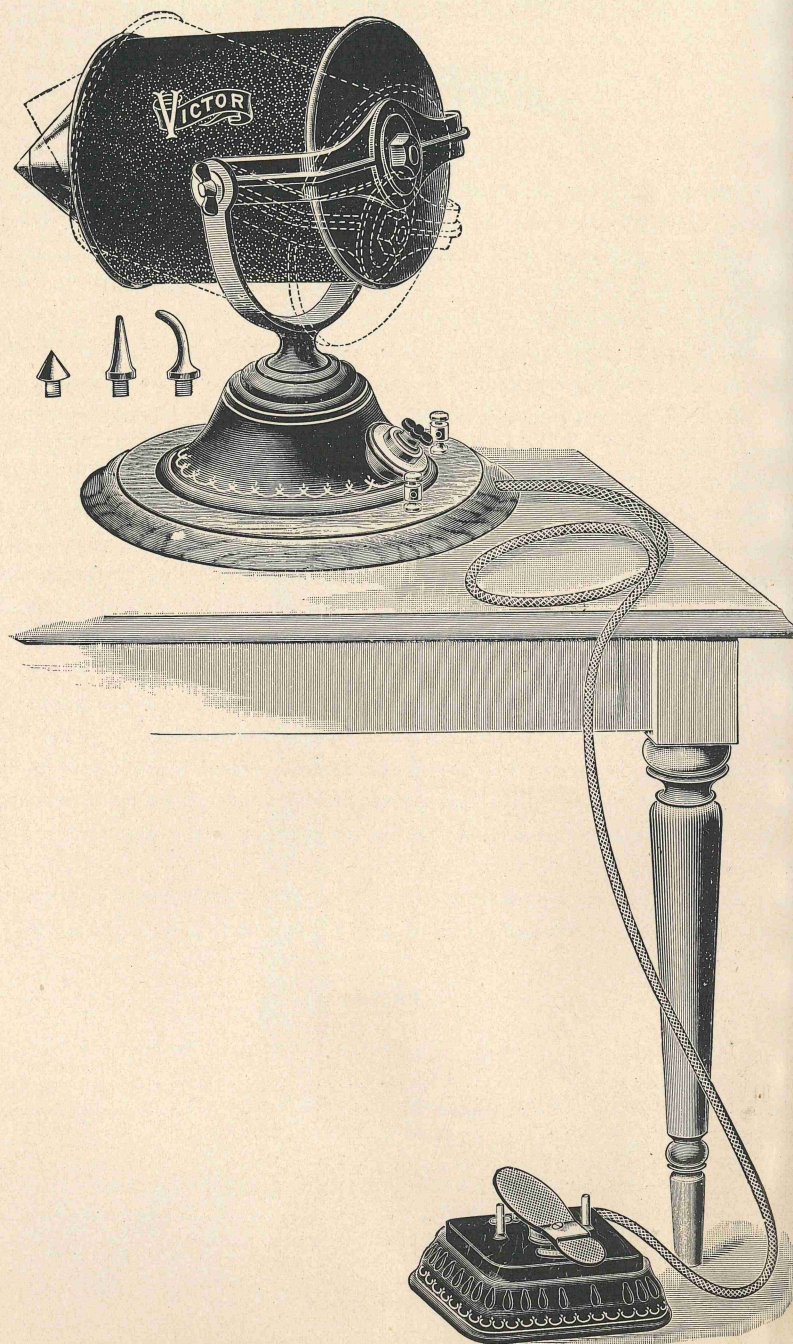
In the design and construction of this magnet we have combined great strength, perfect poise, ease of manipulation and absolute control of the magnetic field. The magnet alone weighs about sixty pounds and has a lifting power of approximately four hundred pounds to the square inch. It measures ten inches in length from the tip to the rear end and is five and one-half inches in diameter. The crane, although weighing with the magnet considerably more than one hundred pounds, is mounted upon swivelled, light running castors and the entire instrument can be moved without any great effort. The magnet can be raised and lowered easily, quickly and safely by means of crank and gear arrangement as shown in the illustration. The magnet is swivelled so that it can be rotated in a complete circle and can be tilted to any angle desired. It is so poised that but little effort is required in adjusting it to the desired position and it can be immovably locked in any position. The chief advantage of this construction is that the patient may be laid on a couch or operating table and the crane moved into such a position that the magnet is suspended directly over him, then by means of the raising and lowering mechanism the magnet may be lowered to the exact position desired; the accidental lowering of the magnet is impossible.

It is best to use a rheostat in connection with the magnet so that its immense pulling power can be kept under perfect control. This is accomplished with the rheostats listed. We strongly advise the use of the foot-controller in preference to the one operated by hand, for the reason that the use of the former allows the operator perfect freedom in the use of both his hands, as well as enabling him to concentrate his attention upon the work in hand.

By the use of the very best material obtainable and by the exercise of proper care in construction, we have produced a magnet which is second to none in the world.

PRICES.

Price without rheostat, but otherwise as shown in the cut, for 110 volt, direct current or for batteries.....	\$85 00
Price additional wound for 220 volt, direct current.....	3 00
Price additional wound for 500 volt, direct current.....	5 00
Price of foot-rheostat for any circuit	25 00
Price of graduated wall-rheostat for 110 or 220 volt and battery circuits.....	9 00
Price of graduated wall-rheostat for 500 volt circuit.....	12 00
Price of crane only when not sold with the Victor giant magnet.....	40 00

GIANT EYE MAGNET.

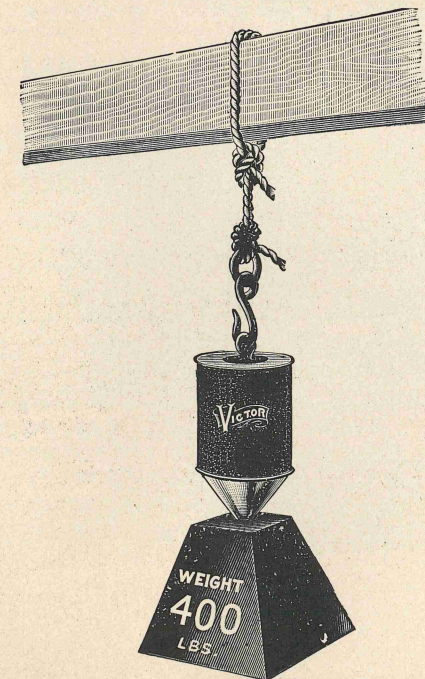
The giant magnet illustrated upon the opposite page has the same power and is, in fact, precisely the same so far as the magnet is concerned as the one shown in connection with the crane. The difference lies simply in its mounting. It is swivelled so that it can be rotated in a complete circle and can be tilted to any angle desired. It is so poised that but little exertion is required in adjusting it to the desired position and it can be immovably locked in any position. It cannot be raised or lowered, neither can it be moved about so freely as the one mounted on the crane, but it does very well for office use.

Price, wound for 110 volt direct current or for batteries.....	\$60 00
Price, wound for 220 volt direct current.....	63 00
Price, wound for 500 volt direct current.....	65 00
Price of graduated rheostat for 110-220 volt and battery circuits.....	9 00
Price of graduated rheostat for 500 volt circuit.....	12 00
Price of graduated foot-controller for any circuit.....	25 00

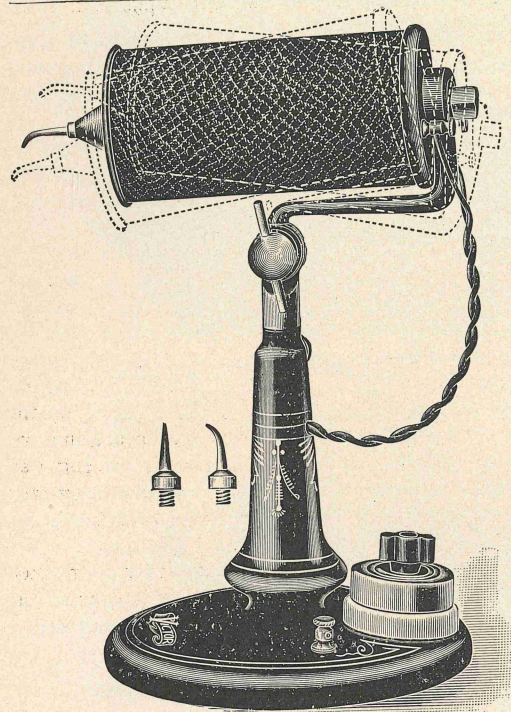
NOTE—As these magnets cannot be used on alternating current we have frequent requests to supply them wound for use in connection with our Generating set, this we do without extra charge, but do not guarantee that the magnet will have full strength as it is somewhat beyond the capacity of our generating set to fully energize it, however we have a number of them in operation in this way that are giving good results.

Fluid Rectifiers may be employed to transform the Alternating current for the operation of these magnets; the chief objection to the use of the fluid rectifiers in connection with wall plates, viz.: The pulsatory character of the rectified current, does not apply to any great extent to Magnet operation.

If a rectifier is used be sure it has a capacity of five amperes.



SHOWING METHOD OF TESTING VICTOR GIANT MAGNET.



VICTOR No. 2 LITTLE GIANT EYE MAGNET.

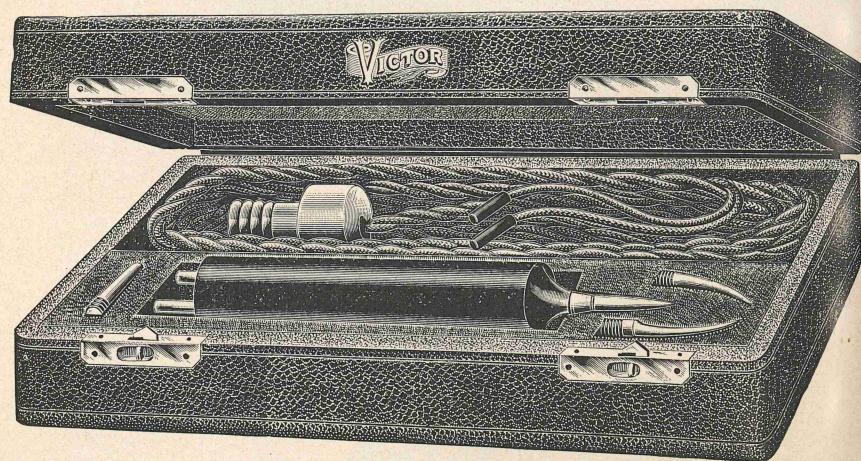
The No. 2, Little Giant Eye Magnet has a little over one-fourth the strength of the large Victor Giant Magnet. It can be raised and lowered, swivelled and tilted. It is provided with two interchangeable gold-plated tips and is equal in appearance and workmanship to the larger magnet.

Every Physician should have one of these instruments for emergency cases, even though he does not feel warranted in installing one of the larger outfits. The field strength for a distance of one inch from the point is quite effective, and, although it is not to be compared with the larger magnet, it is an instrument made for use and is in no sense a toy.

Price for 110 or 220 Volt current or for batteries... \$25 00

Price of Hand Controller Rheostat..... 5 00

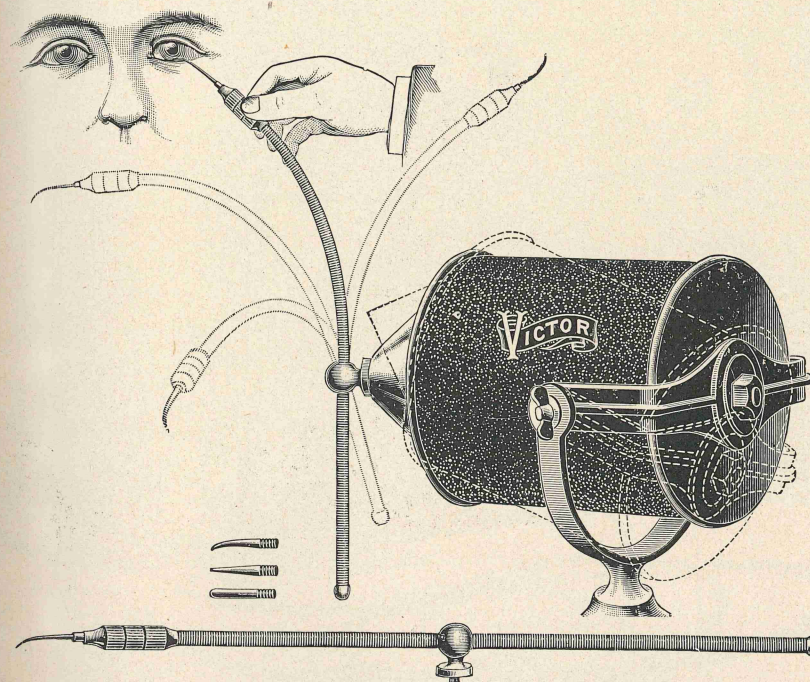
VICTOR No. 3 EYE MAGNET IN CASE.



Price for 110 volt direct current or for batteries complete as shown in case..... \$12 00

This magnet is 5¾ in. long without tip, and 1¼ in. in diameter; we supply with it 4 gold-plated tips and an attachment plug and cord. The Victor No. 3 is by far the strongest hand or portable magnet on the market; it is completely covered with polished hard rubber, the case is leather covered and plush lined.

FLEXIBLE TIP FOR GIANT MAGNET.



Price of flexible tip attachment with four gold plated points, without case..... \$7 50

Price of neat substantial leather case, as shown..... 75

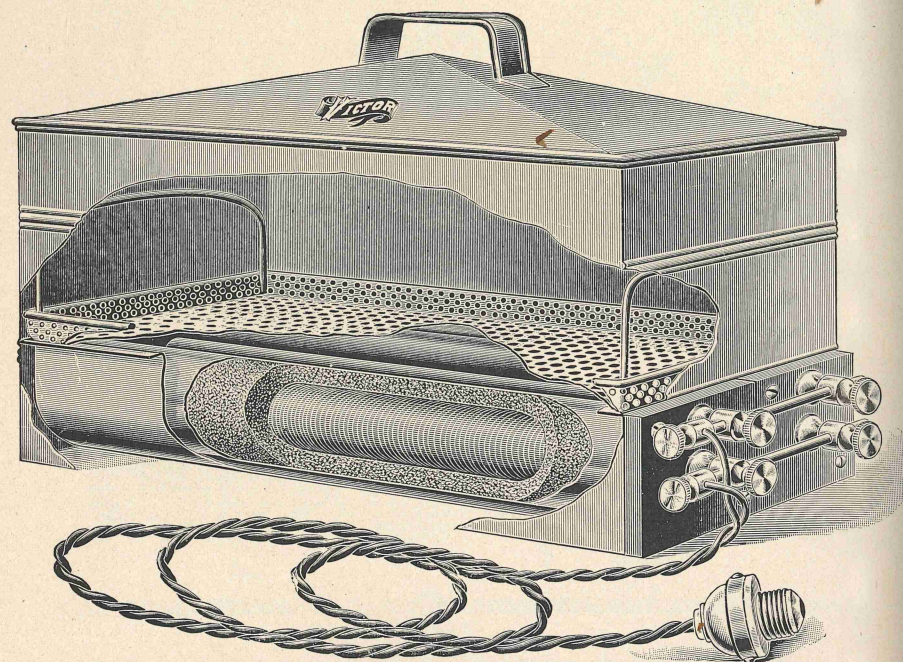
The convenience and usefulness of this device will be apparent at a glance. As shown in the illustration, it is intended to be attached to the Giant Magnet by placing the holder on the point of the magnet, the same as an ordinary tip, then the flexible tip (composed of tightly woven steel wires) can be moved freely through its holder until the operator can handle the small chuck with perfect freedom.

Some of the strength of the Giant Magnet is of course sacrificed, but even with the flexible tip extended to its farthest point the strength is far greater than would be the case with a small hand magnet.

In extracting magnetic bodies that have actually penetrated the vitreous body the full strength of the Giant Magnet is required to attract and draw the magnetic particle forward, then the flexible tip may be brought into play for the manipulation usually necessary before the particle can be withdrawn. For all minor operations the extensible tip will be found far more convenient and efficient than the small hand magnet usually employed.

VICTOR STERILIZER.

Patented.

**MADE IN TWO SIZES.**

Price of No. 1 size, 10 in. long, 4½ in. wide, 4½ in. deep\$20 00

Price of No. 2 size, 18½ in. long, 6 in. wide, 4½ in. deep 35 00

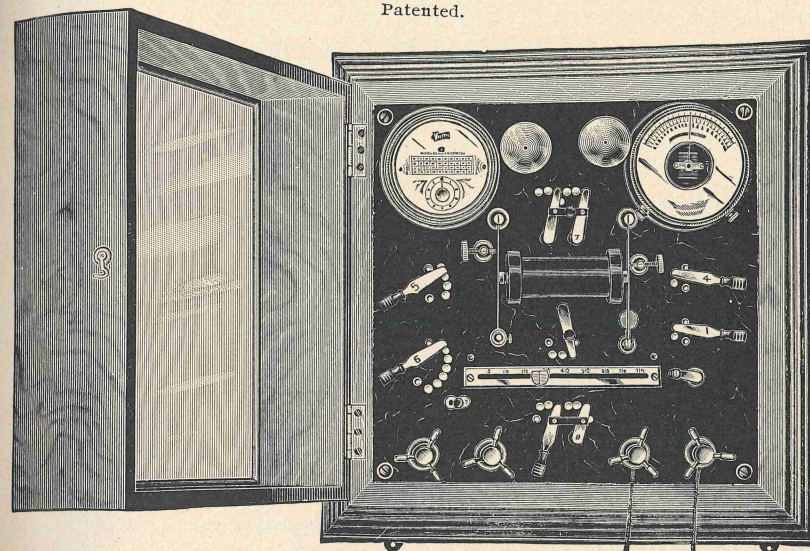
The Victor Sterilizer is entirely original in design, differing from others at present on the market in that the heating coils can be regulated, and in being provided with removable heating coils.

As shown by the illustration the heat is electrically generated in two heating tubes, extending the full length of the Sterilizer. Either one or both of these tubes can be put into service. The resistance wire is wound around porcelain tubes, then covered with porcelain and baked, this construction insuring the greatest possible durability, and in ordinary service these heating tubes should last not less than two years. In case either of the tubes burn out, the physician himself can easily replace the burned-out tube with a new one, the cost of the new tubes being \$1.40 each; thus at a very moderate cost for maintenance the Sterilizer is good for a lifetime of service.

Owing to the construction and method of installing these heating tubes the water is brought to the boiling point much more quickly and with a smaller consumption of current than has been possible with any sterilizers heretofore designed. The containing vessel is of heavy copper, tinned on the inner surfaces, the exterior being left in polished copper. The usual removable tray is provided. The outfit is supplied with attachment plug and cord, and when received by the customer is all ready to be attached to either direct or alternating current.

**VICTOR EAR PHONE MASSAGE INSTRUMENTS
FOR ATTACHMENT TO WALL PLATE.**

Patented.



Price, single instrument.... \$6 50

Price, per pair..... 12 00

That phone, or sound, massage is very beneficial in some forms of deafness is a well recognized fact. In the instruments here shown, when attached to any of our wall plates, the following results can be obtained:

In the first place, they are so constructed as to be quite adaptable; they can be made to press closely against the ear in every case; the wide curved springs, by means of which they are held in place, can be fitted without difficulty to women's heads, no matter how the hair is dressed; the tone can be raised and lowered and any number of distinct sounds produced per second desired.

They are provided with independent sound regulators so that when both ears are treated simultaneously, sounds may be made very loud and sharp in one and very low and soft in the other.

This is of importance where the conditions differ in the ears. When connected to any of our wall plates, they will respond to the interrupted galvanic and to the faradic currents, both high and low frequency, the regulating being accomplished the same as though an electrical treatment were being given.

They can also be attached and used in connection with our No. 2 transformer outfits or in connection with any faradic coil, if the wall plate is not available. However, the range of control is not so great when used in this way.

We have received some very favorable and even enthusiastic reports from some of the specialists now making use of these instruments.

The instruments, although usually sold in pairs, are independent and can be used singly if desired.



VIBRATORY MASSAGE AND VICTOR VIBRATORS.

This form of treatment now numbers among its advocates some of the highest and best medical authorities, and there is no longer the least doubt that the benefits to be derived from it are manifold.

Mechano-therapeutics have been undeservedly neglected in the past, although for time out of mind massage administered by medical gymnasts has been prescribed by physicians for certain ailments. It is only recently that apparatus has been devised which has made it possible for the physician to perform this work himself, without sacrifice of either time or dignity.

In the Victor vibrator the power is supplied by an extremely high speed electric motor which operates suitable mechanism for converting this power into vibratory waves of such power that, when applied at a point in the upper chest region, they will penetrate and permeate the entire trunk; or if the operator so wills, they may be made so gentle as to barely ripple the tissue in the immediate neighborhood of the point of application, both their frequency and vigor being under perfect control.

Attachments are furnished for localizing the treatment when necessary.

Lubrication is an important factor in keeping high speed mechanism of this nature in smooth working order, a point that has been well looked after in the "Victor"; and what is perhaps of fully as much importance, we have effectually confined the lubricating oil to the places requiring it, and it is impossible for any of it to escape while the vibrator is in action, thus insuring perfect cleanliness both to operator and patient.

We are frequently asked by correspondents to name the particular diseases in which vibratory massage is considered especially efficacious. This question is in part answered in the brief series of articles on vibratory massage by specialists in this line, which we will furnish free upon request. We wish to say in this connection that we esteem it a favor to have our patrons report results, whether favorable or not, obtained by the use of our instruments. All such letters are carefully tabulated and filed, and are frequently of great benefit and assistance to others who are exploring the same field.

The improved Victor No. 1 massage handle undoubtedly has the widest application of any massage implement on the market, and fully meets every requirement. We make a modification of this handle much smaller than the regular one; the smaller one is intended for the use of the eye, ear, nose and throat specialists, and can be attached to any of our instruments that are arranged for attaching cable and sheath for drilling and trephining.

The popularity of the Victor No. 1 Vibrator and its almost universal adoption by the medical profession, seems to have moved competing manufacturers to concentrate the fire of their criticism on the Victor; in the absence of any real defect, they have in their extremity attempted to point out a fault where none exists. The prospective purchaser of a vibrator is frequently told that the "Victor" vibrates the hands, as a matter of fact there is not a vibrator made but that imparts some vibration to the operator if it is designed to be held in the physician's hand when in use, the Victor No. 1 imparts a little more than some others, but not enough to cause the least discomfort, and certainly not sufficient to in any way affect the operator's arm. For the benefit of those who might hesitate to use the No. 1 vibrator because of misleading statements made by competitors with reference to this point we have compiled a list of the names of several hundred physicians who are using this outfit to any of whom we can refer—and in addition we have over a hundred letters from physicians who have used this vibrator for more than two years, these letters are replies to requests for a statement as to whether even the slightest effect had been produced because of this slight vibration of the hand, in every case the replies are an emphatic negative.

In this connection we would direct attention to the fact that we ourselves manufacture vibrators of every variety and can furnish an outfit, if preferred by our customer, designed to give as little vibration to the operator as is the case with any vibrator made and our profit on the other models is just as great as on the No. 1. We advocate the latter simply because we are firmly convinced we are best serving our patrons' interests, our judgment being based entirely upon the statements of physicians of wide experience in this field.

In selecting an outfit the physician should convince himself that the apparatus possesses all of the following features:

The motor, whether direct or alternating, should be capable of producing from five to six thousand vibrations per minute, with some form of speed controller by means of which this number can be reduced to from one to two thousand, as a minimum with a gradual increase from that to the maximum.

In addition to the speed, or number of vibrations, their vigor, or strength, must be controlled.

Must possess sufficient mobility to enable the operator to move the applicator and not the patient during treatment.

Must be so constructed that no lubricating oil can escape to soil the clothing of the patient or the operator.

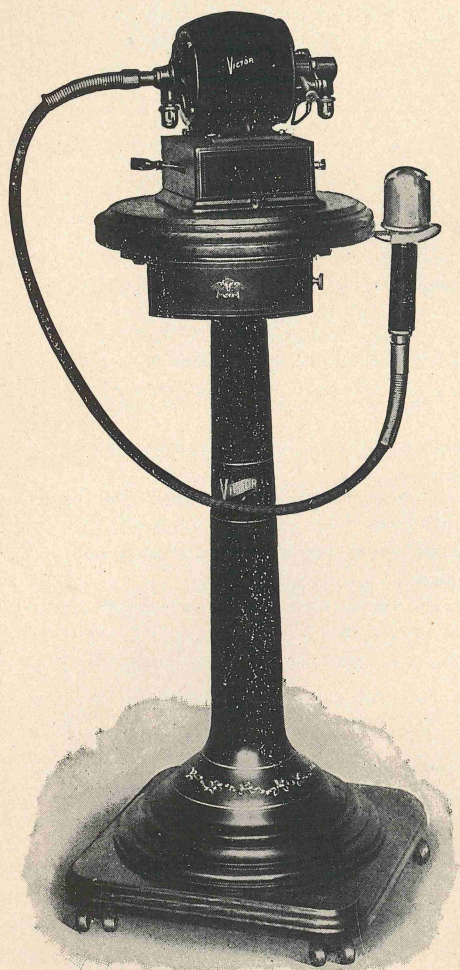
Vibratodes, or applicators, must be properly designed and constructed.

Victor vibrators possess all of these points of excellence and many more. You cannot make a mistake in ordering one of our equipments. We will allow you to examine and test your apparatus before accepting it.

NOTE.—In addition to a number of original articles, and reprints relative to this method of treatment, we have on file a large number of clinical reports sent us by physicians who have successfully used our vibrator. We are, therefore, prepared to intelligently reply to inquiries as to the best method of treatment to be used in specific cases.

No. 1 VICTOR MASSAGE OUTFIT.**FOR 110 OR 220 VOLT DIRECT CURRENT.**

Patented Oct. 27, 1903.

The above model is sold to Physicians *only*.

This outfit consists of our regular massage motor specially wound to give proper speed for this work, with speed controller in base. (It is absolutely essential to have the right kind of motor and controller if good results are to be obtained.) To the motor is attached our No. 1 physician's handle, separately illustrated and described elsewhere in this bulletin, and this handle is unquestionably the *best on the market* for physicians, owing to the fact that the *strength* as well as the number of vibrations is under *perfect* control, and because of the synchronous wave character of the vibration.

The pedestal can be adjusted to any height desired; the top rotates, thus allowing the motor to adjust itself automatically as the operator moves the massage handle.

The top and base are finished in golden oak; the column is iron finely finished, and patent swivel, leather faced castors are provided.

Price of outfit without pedestal, for 110 volt current \$70 00

Price of outfit without pedestal, for 220 volt current 73 00

We furnish \$5.00 worth of applicators free with this outfit, which purchaser may select if he chooses, or we will send a selection of six.

Price of pedestal.....\$20 00

No. 1 VICTOR MASSAGE OUTFIT.**FOR ALTERNATING CURRENT.**

Patented June 30, 1903, and Oct. 27, 1903.



This outfit consists of the No. 1 handle attached to an alternating current motor so constructed that the speed is regulated perfectly by mechanical means, thus obviating the constant destructive sparking that is *inevitable* when commutators are used on alternating current motors.

This motor is guaranteed against burning out, and it is a fact that it will last four times as long as the commutator motors ordinarily sold for this purpose.

The pedestal is described elsewhere in this catalogue

Price of outfit (with \$5.00 worth of applicators) for 60 cycle current.....\$75 00

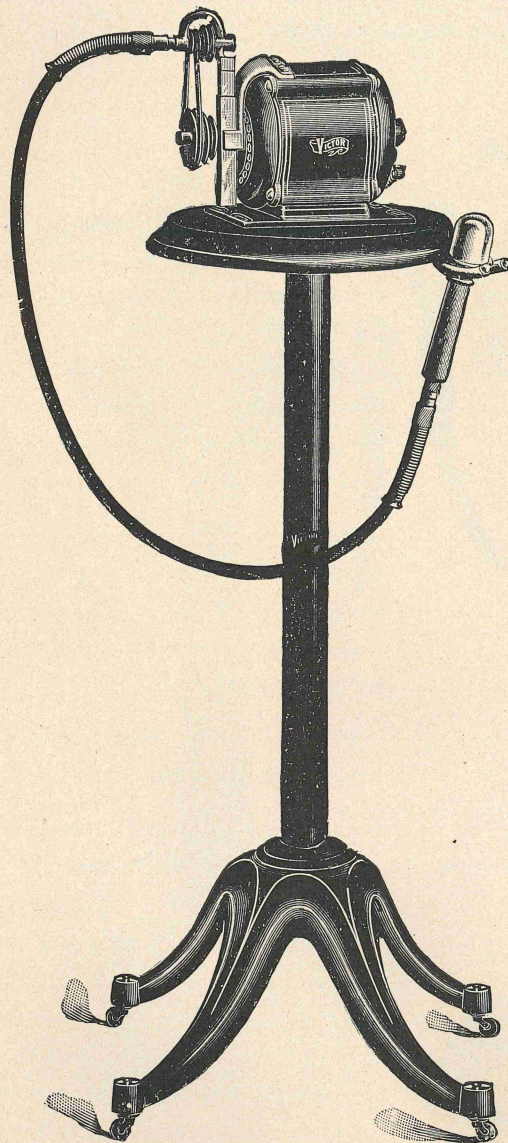
Additional for 125 or 133 cycle current..... 5 00

Price of pedestal..... 20 00

Where vibration is indicated the Victor No. 1 *always* gets results. Remember that in more than half the conditions calling for this modality, small hand vibrators are too weak and are entirely inadequate.

VICTOR NO. 14 VIBRATOR.**FOR ALTERNATING CURRENT.**

Patented.



The No. 14 outfit here illustrated differs from the No. 1 Victor Vibrator only in the method of speed control, and in the pedestal.

Speed control is here obtained by means of inverted cone pulleys, the upper cone being mounted on a vertically sliding arm, this arm being forced upward by a suitable spring so as to maintain proper tension on the belt. When it is desired to change speed this sliding arm is readily forced down to sufficiently slacken the belt so that it can be easily shifted from one cone to another.

A fast, medium and slow speed is provided for.

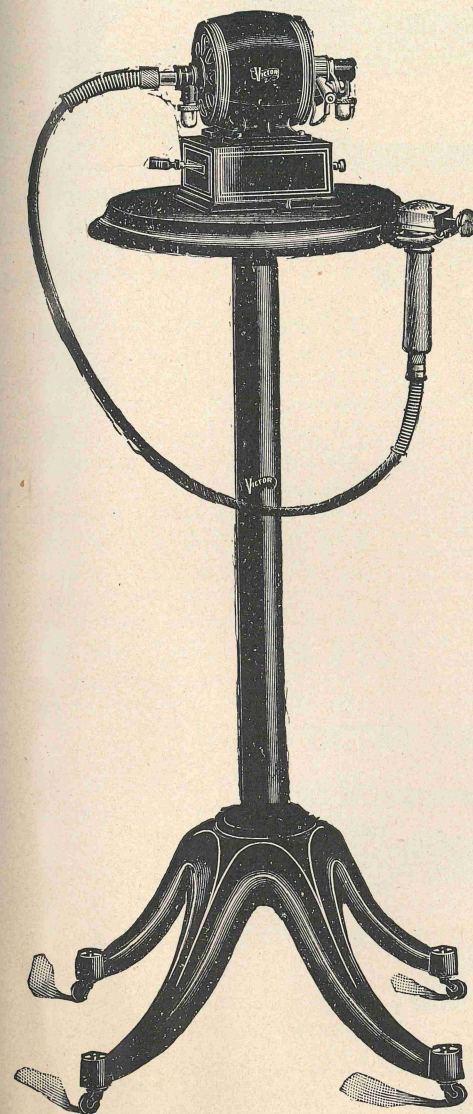
The Pedestal is entirely of iron, finely finished in jet black enamel suitably ornamented. It is provided with swivel top allowing the vibrator to rotate easily in either direction.

The Handle, the medium through which the vibration is imparted is the well known No. 1 model which has won the endorsement of a great majority of the Medical Profession.

Price complete, including a selection of applicators to the value of \$5.00, without pedestal\$65 00
 Price complete as above, with pedestal 75 00

VICTOR No. 15 VIBRATOR.**FOR DIRECT CURRENT.**

Patented.



The No. 15 Vibrator imparts a lateral stroke only, a movement that is very useful in skin and scalp treatments; it is capable of imparting vibrations of as deep penetration as any massage machine on the market and, although it is not to be compared with the Victor No. 1 Vibrator, excellent results can be obtained by its use. Outfits delivering this same kind of movement have been and are being sold for as high as \$200.00.

The construction of the handle is extremely simple insuring great durability.

Any of our applicators can be attached to the No. 12 handle.

The motors used with these outfits are considerably smaller than are used with the No. 1 equipments, the handles not requiring as much power to operate as is the case with the No. 1.

The speed control of the direct current motors is identical with the No. 1 outfits. The motor is often not sufficiently considered when a vibrator is being selected, yet it is of at least as much importance as the vibrator handle, for unless the power and speed is right the best handle will be useless.

Price for 110 volt direct current with pedestal, (\$3.00 add. for 220 volts)\$60 00

Price of handle including \$5.00 worth of applicators without motor 25 00

Price of 110 volt D. C. motor without handle, (\$3.00 add. for 220 volts) 25 00

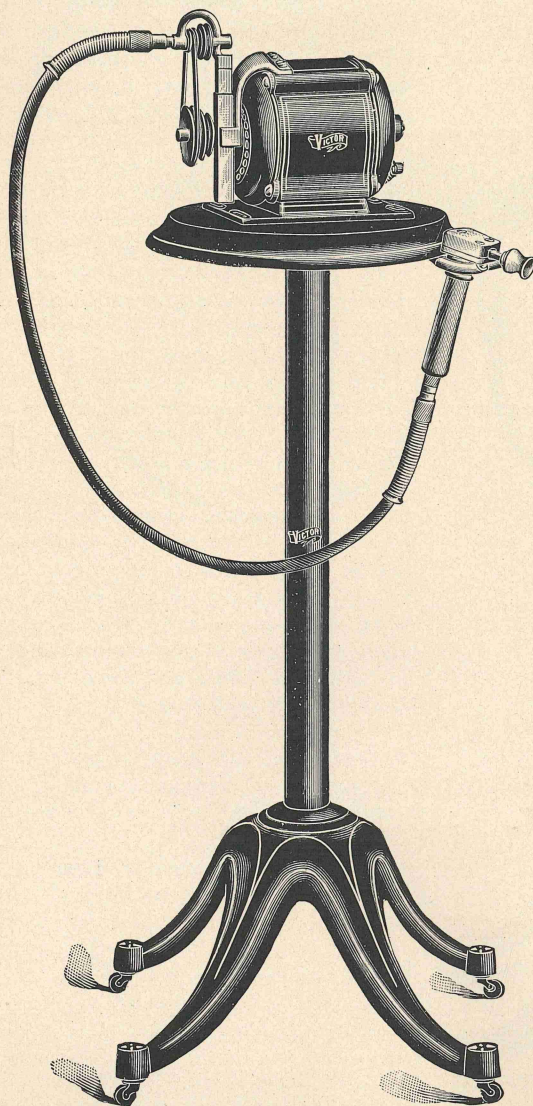
Price of pedestal when sold with our outfit 10 00

The above outfit is for direct current either 110 or 220 volts. For alternating current outfit see following page.

Applicators to the value of \$5.00 are included with complete outfit.

VICTOR NO. 15 VIBRATOR FOR ALTERNATING CURRENT.

Patented.



The above outfit is for A. C. current only.

This outfit is identical with the No. 15, arranged for the direct current, except that a different motor is used, and another method of speed control is employed.

For the alternating current we furnish a motor of the induction type, having no brushes or commutator, these latter always proving a constant source of trouble and expense when used on alternating current motors.

With our outfit on the A. C. current speed control is obtained by means of two inverted cones admitting of a slow, medium and fast speed.

The vibrator gives a lateral rubbing stroke, just the movement most desirable for facial and scalp massage. In the construction of the vibrator handle only two moving parts are used, these being made of hardened steel and calculated to last for years of hard service.

Price of outfit complete with pedestal for 60 cycle, 104 to 220 volt current.....\$65 00

For A. C. current other than above add \$5.00.

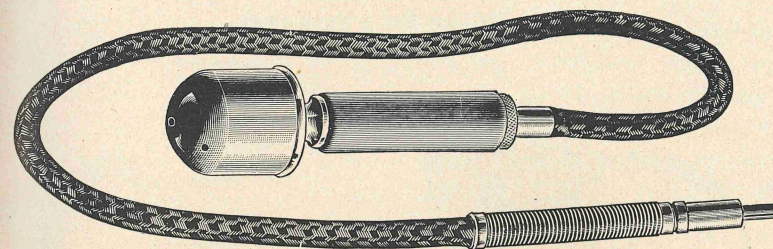
Price of handle and applicators 25 00

Price of motor, when purchased alone 35 00

Price of pedestal, when sold with the outfit..... 10 00

NO. 1 VICTOR MESSAGE HANDLE.

Patented Oct. 27, 1903.



Price with cable sheath and six attachments \$35 00

As the result of several years' experience in the manufacture of vibratory massage apparatus (during which time we have made a number of handles of different types) we are convinced that the Victor No. 1 is by far the best for use in the physician's office.

From it can be obtained the percussion or hammer blow, the frictional or rubbing movement, and the genuine vibratory wave, this latter being of far more importance than any other movement in massage treatment.

A means of adjustment is provided enabling the physician to obtain *absolutely any degree of strength or vigor of vibration desired.*

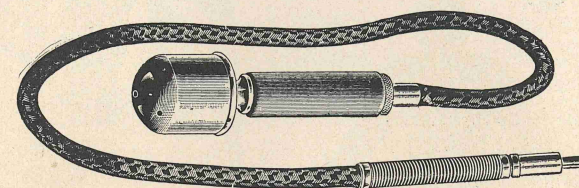
The applicators for localizing treatment can be attached to the handle so that they project either in a straight line with the handle or at right angles to it.

In abdominal and general massage the handle may be used as shown in cut without any attachments.

In some massage handles almost as much vibration is communicated to the operator's hand as to the patient. The construction of the No. 1 handle is such that hardly 5 per cent of the vibration is felt by the operator, and the handle may be used for almost any length of time without discomfort to the physician.

There is no frictional wear in this handle except in the bearings through which the cable passes, this makes it by far the most durable handle on the market, and this point deserves very serious consideration. The extraordinary rapidity of movement required in vibratory treatments, if best results are to be obtained, means rapid wear at all bearing points.

NO. 2 VICTOR MESSAGE HANDLE.



Price with four applicators \$25 00

We here illustrate a massage handle which is practically a miniature of our No. 1, being about one-half the size of the No. 1. It is designed more especially for the use of eye, ear, nose and throat specialists for use about the head and face and has ample penetration for this class of work. It is not recommended, however, and is not suitable for general massage treatments, not being capable of producing vibration of deep penetration.

We furnish with this handle four applicators especially adapted to head and facial work. However, any of the applicators illustrated may be attached to this handle if desired. The cable and sheath fitting is the same as the one used with the nasal drilling hand piece, hence the No. 2 may be attached to our No. 2 transformer or, in fact, any of our combination outfits with which a nasal drilling attachment can be used.

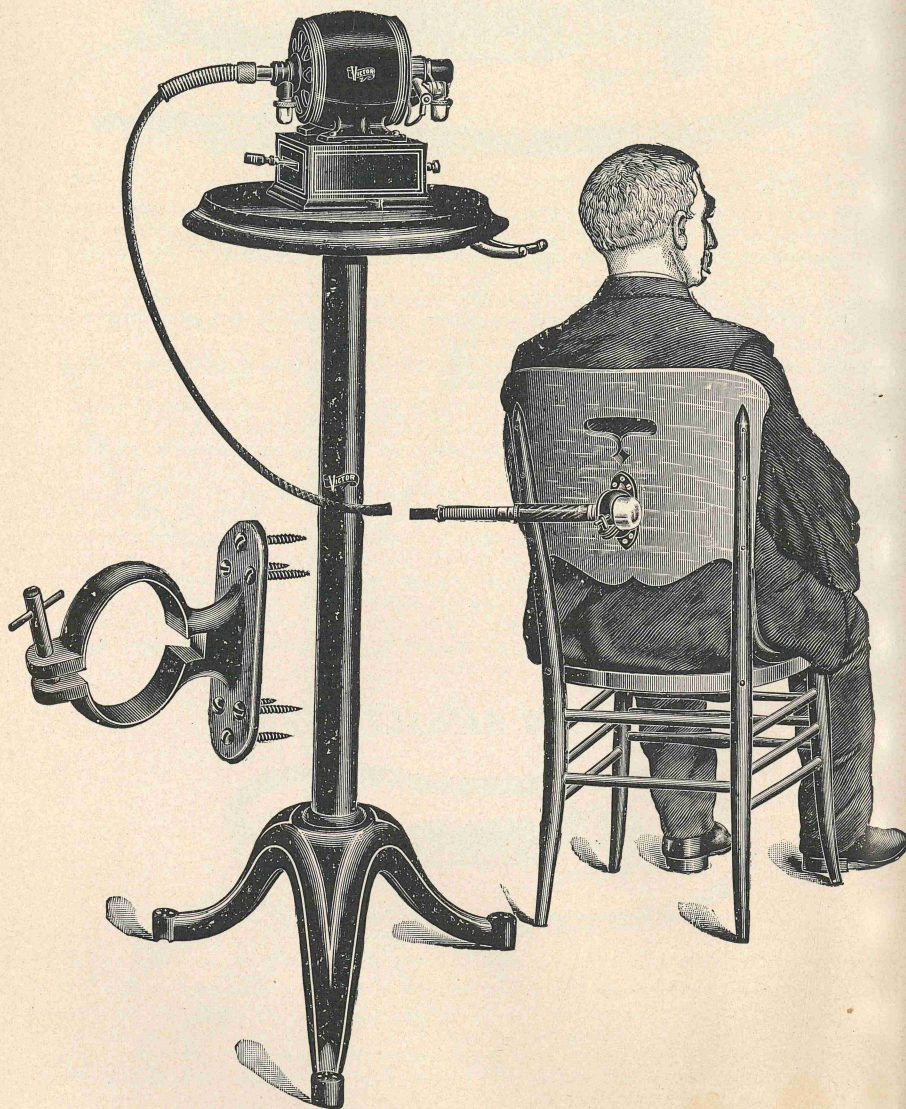
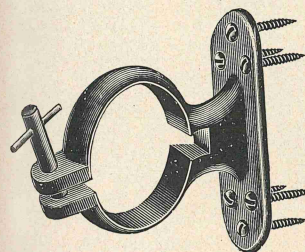
CHAIR CLAMP.**FOR VICTOR NO. 1 VIBRATOR.**

Illustration shows method of attaching Victor No. 1 Handle to chair by means of adjustable clamp.

NEW APPLICATION FOR VICTOR NO. 1 VIBRATOR.

**Chair Clamp
for Victor No. 1 Vibrator**



PRICE \$2.75

Any physician now possessing a VICTOR No. 1 vibrator and a substantial chair, can by the purchase of one of the clamps shown herewith, have available a form of vibration which has been highly recommended by some authorities.

The clamp is of substantial construction, made of bronze. The opening allows the cap or head of the handle to be passed through until the shoulder seats firmly against the ring or hoop of the clamp. By means of the adjusting screw, the clamp is tightened firmly around the handle, and all is in readiness for the treatment. The clamp, of course, having first been fastened by means of the screws to a point near the center of the back of the chair.

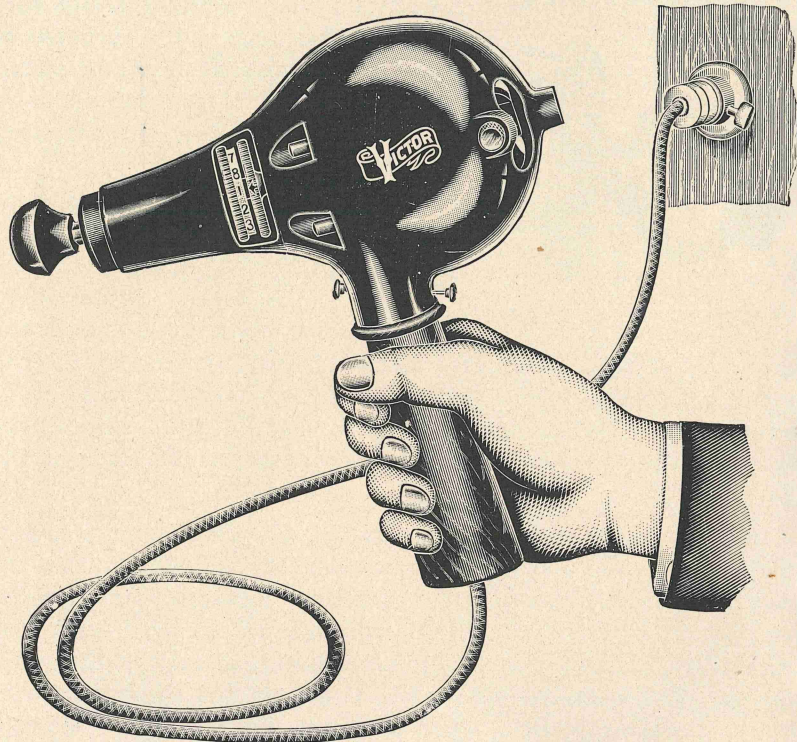
In this application, the nature of the vibration is not changed, still being of the same synchronous circular wave character. Its peculiarity lies in the fact that if the patient is seated firmly in the chair, that is, if the back is held well against the chair-back, the vibration will be distributed with great evenness throughout the entire anatomy. The vibrations will be felt at almost the same degree of strength throughout the trunk and the limbs, it is also quite noticeable in the head.

The effect is to increase circulation without danger of congestion; it is to a certain degree sedative, one writer claims it to be almost a specific treatment in insomnia. The nervous patient is soothed, and relieved, the anaemic patient is invigorated. When greatly fatigued or exhausted, a few minutes in the chair is extremely restful and refreshing. It is the least irritating and pleasantest form of general application in vibratory massage. We recommend it to all of our patrons already possessing a No. 1 vibrator as well as to those contemplating the purchase of one, as being well worth the price of the clamp, and the little trouble incident to making the attachment.

This simple attachment gives to the possessor of a No. 1 Vibrator a modality superior to the so called "vibrating chair" for which as high as \$150.00 has been asked.

VICTOR PORTABLE VIBRATOR.

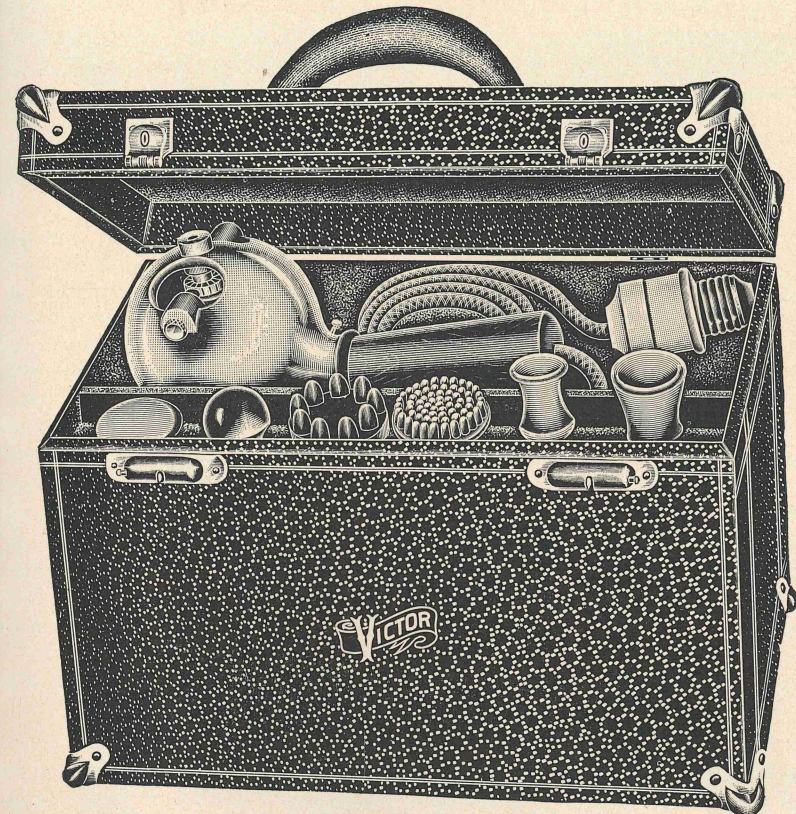
Patented.

**VICTOR PORTABLE VIBRATOR.**

This portable outfit was not designed as a substitute for, or to in any way replace the No. 1 vibrator, but rather to fill a well recognized demand for a comparatively light and portable outfit, more particularly for use at the patient's bedside.

In its design, we have endeavored to preserve, as far as possible, the good features of our No. 1 outfit, but it is obviously impossible to construct an outfit in so small a compass as this and at the same time make it as effective as the larger one in every particular, its field of usefulness being much more restricted.

CHARACTER OF VIBRATION. The character, or nature of the stroke delivered by the vibrator is really the all important point. It is a mistake to suppose that good results can be obtained from any outfit which will simply shake the tissue. The VICTOR Portable Outfit delivers a synchronous oscillatory stroke or movement and the waves are deeply penetrative, each succeeding wave aiding the effectiveness of its predecessor. An excellent test to determine the character of the stroke delivered by any small outfit is to attach a hard rubber applicator, start the vibrator and press the applicator firmly against the palm of the hand or directly to the surface of the skin at any point. If, after the applicator is so held for a few seconds, a burning sensation is felt, then the stroke is not correct, for a great deal of the power is being wasted on surface friction which, in a vibrator of correct design, would be available for the penetrating waves that must be relied upon to produce the desired effects.

VICTOR PORTABLE VIBRATOR.

Price, complete, as shown in plush lined case with six applicators for either direct or alternating current.....\$45 00
Arranged to operate on both direct and alternating current, additional..... 5 00

Using the same applicator, make an application in the chest region, and at the same time utter vocal sounds, and note the effect upon the lung tissue and vocal cords. The vibrator which produces the most noticeable effect, is the one possessing the best motion.

PERCUSSION STROKE. The percussion blow or stroke is not a desirable one in the majority of conditions, but has its advantages in certain indications. With the VICTOR Portable Outfit, it is possible to change the stroke so as to obtain a direct percussion blow for cases where it is needed, and the VICTOR outfit is the only one which delivers both the oscillatory and the percussion stroke.

REGULATION. Next in importance to the character of the vibration is the regulation of the length or strength of the wave. It is possible with the VICTOR to obtain regulation over a very wide range, starting with an almost imperceptible stroke up to one of a greater strength than it would seem possible to obtain from so small an outfit. This is accomplished by the manipulation of the knurled regulating thumb wheel which will be noted in the illustration projecting slightly from the side of the vibrator.

The point to which we wish to direct particular attention in this connection is that the strength of vibration being used is always indicated upon a **VISIBLE SCALE**. This is a feature not found in any other vibrator and its importance should at once be apparent to any physician who has made use of this modality.

VICTOR PORTABLE VIBRATOR.

STRENGTH OF MOTOR. The depth or extent of penetration or strength of vibration must depend upon the power of the motor which is driving or operating the vibrator, as well as upon the character of the vibratory motion. So far as our tests have shown, motors ordinarily employed for this purpose are entirely too weak, forcing the physician, if he desires to obtain a very rapid rate of vibration, to use an extremely small stroke, thus nullifying to a great extent the effectiveness of the treatment. Recognizing this to be the case, we designed a motor especially for this purpose, aiming to produce a maximum of power in a motor occupying the minimum of space. The complete outfit weighs but three pounds, and the allowable space has been so well economized that this little motor gives a greater output in power in proportion to its size and weight than any other motor we have tested.

COMMUTATOR. In small motors of this class, the commutator is the part exposed to the greatest wear. We would ask the prospective purchaser to compare the commutator used on the VICTOR Portable Vibrator with that of any other one made. Examination will disclose the fact that the VICTOR commutator is larger, has more sections, better insulation between sections, and that it is far more substantial. Hand vibrators are no more durable than their weakest part, therefore in making comparisons, the wearing parts should receive the investigator's closest attention.

SWITCH. Two small studs with button terminals will be noted in the illustration projecting from the vibrator just above the handle within easy reach of the operator's thumb and finger. Pressing one of these buttons with the thumb starts the motor, pulling backward with the index finger on the other button stops it.

This is a quick spring break snap switch, positive in its action and is practically indestructible.

Great care has been exercised in the design and construction of this outfit to make all parts exposed to wear as durable as possible; provision is made so that wearing surfaces can be effectively lubricated, and the escape of surplus oil has been guarded against. This vibrator is almost entirely inclosed, presenting a smooth exterior surface.

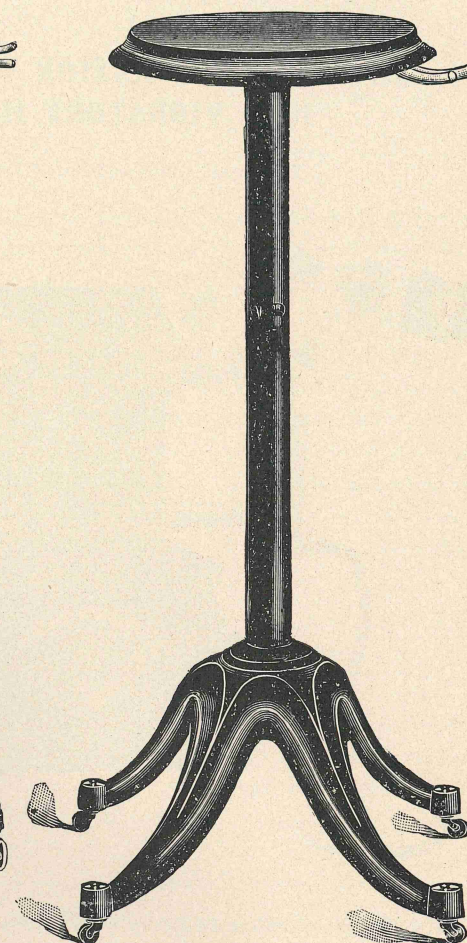
This portable vibrator is made to operate on either direct or alternating currents, and, as indicated in the illustration, the vibrator is contained in a leather covered, plush lined case of very substantial construction. With it, we supply six applicators and a suitable plug and cord for attaching to any electric lamp socket. The covering of the case is genuine seal-grained leather, and the vibrator is finished in japan and nickel.

No. 1 PEDESTAL.



Price..... \$20 00

No. 2 PEDESTAL.



Price, when sold with a Victor outfit \$10 00

Price, when sold separately..... 12 00

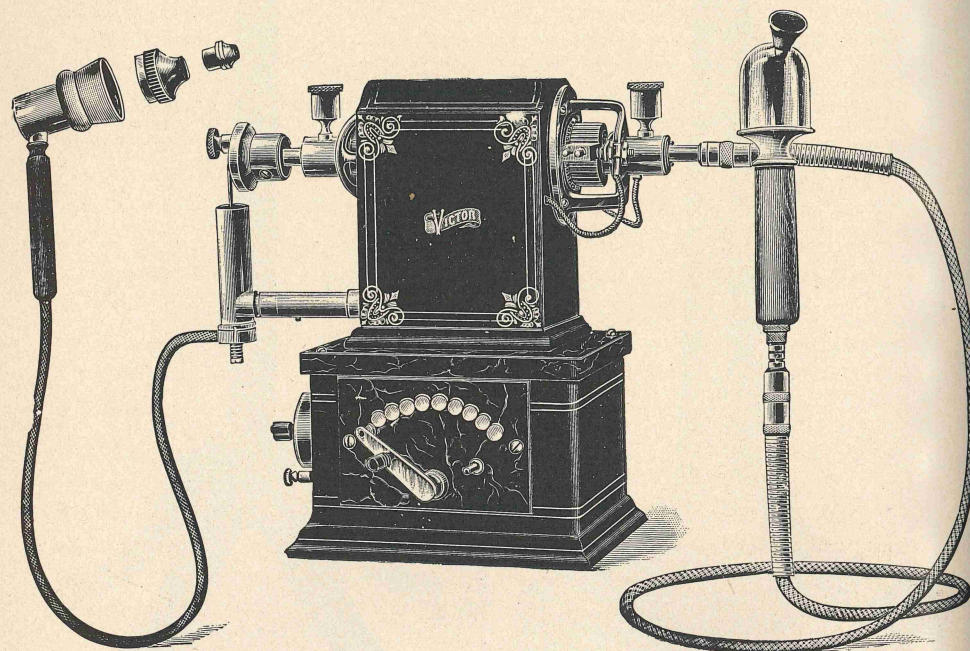
The No. 1 Pedestal can be adjusted to any height desired and firmly locked in position; the top is swiveled to allow of free rotation. The top and bottom are of quartered golden oak finely finished; has central tapering supporting column of iron, finely finished.

Patent swivel double roller castors are used, facilitating the easy movement of the outfit without danger of marring the floor. The top of the No. 1 is 12 inches in diameter and it is an ideal support for any instrument or apparatus in the use of which height, adjustment and accessibility from all points are essential.

The No. 2 Pedestal is entirely of iron, finished in black enamel and suitably ornamented. Has swivel top but no height adjustment, has rubber covered fork to hold massage handle. Has four supporting legs making it practically impossible to accidentally upset it, has easy rolling swivel castors. Top is 12 inches in diameter same as the No. 1.

No. 4 VICTOR COMBINATION PNEUMATIC AND MECHANICAL VIBRATORY MASSAGE OUTFIT.

Protected by Letters Patent 728526 and other patents pending.



Price of outfit complete as shown with all attachments, 110 volts direct current..	\$107 00
Price of same for 220 volt direct current.....	110 00
Price of motor and regulator without attachments, 110 volts.....	50 00
Price of motor and regulator without attachments, 220 volts.....	53 00
Price of No. 1 massage handle with 6 applicators.....	35 00
Price of small pneuma massage pump.....	15 00
Price of pneuma facial and skin massage attachment.....	7 00

This outfit consists of a special motor, with double speed controller, a pneumatic pump, with special attachments, and the No. 1 massage handle.

The motor can be operated at any speed from 200 R. P. M. to 6,000 R. P. M.; two speed controllers are provided, one for the pump (which for some work must be operated quite slowly), and one for the vibrator handle; but one of these controllers is shown in the illustration, the other one being on the opposite side of the machine.

The pump is so constructed that any length of stroke from nothing to $1\frac{1}{4}$ inches can be obtained as desired, and either of four air movements obtained, viz.: Straight exhaust or suction for developing and building up tissue; suction with release, a very useful movement in ear massage, as well as a very pleasing skin treatment—the effect is a slight lifting and dropping of the membrane or skin; alternate suction and compression for vibratory massage of the ear drum, eye or skin; and last a succession of forward impulses or compressions, for forcing the ear drum inward, and also for driving the blood away from the part under treatment.

For ear massage an otoscope is required, and glass cups are best adapted to eye treatment; neither of these attachments are shown with the outfit, as none but eye and ear specialists would require them.

The attachment shown in the illustration in connection with the pump is so arranged that end pieces of different shape and size (one of them rubber) can be used, an air port hole is provided in the handle which comes just under the operator's thumb, thus giving him perfect control of the air without regard to the motor; a silk covered hose leads to the pump.

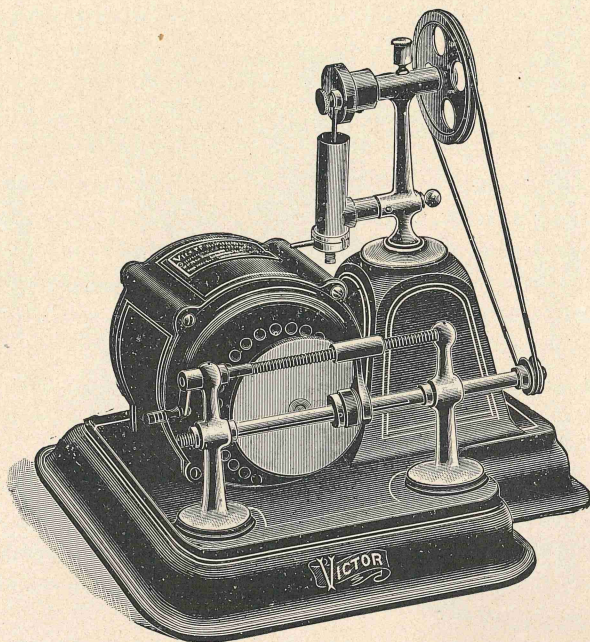
The vibratory massage handle is the No. 1 physicians handle described elsewhere.

Where the massage work is to be confined to the face and head our No. 2 handle will answer all purposes, it is the same as the No. 1 except that it is much smaller being about one-half size, it possesses all the adjustment features of the No. 1, but does not deliver vibrations of sufficient vigor for general work. It is \$10.00 lower in price than the No. 1.

No. 7 COMBINATION PNEUMATIC AND MECHANICAL VIBRATORY MASSAGE OUTFIT.

FOR ALTERNATING CURRENT.

Patented May 19, 1903, and Oct. 27, 1903



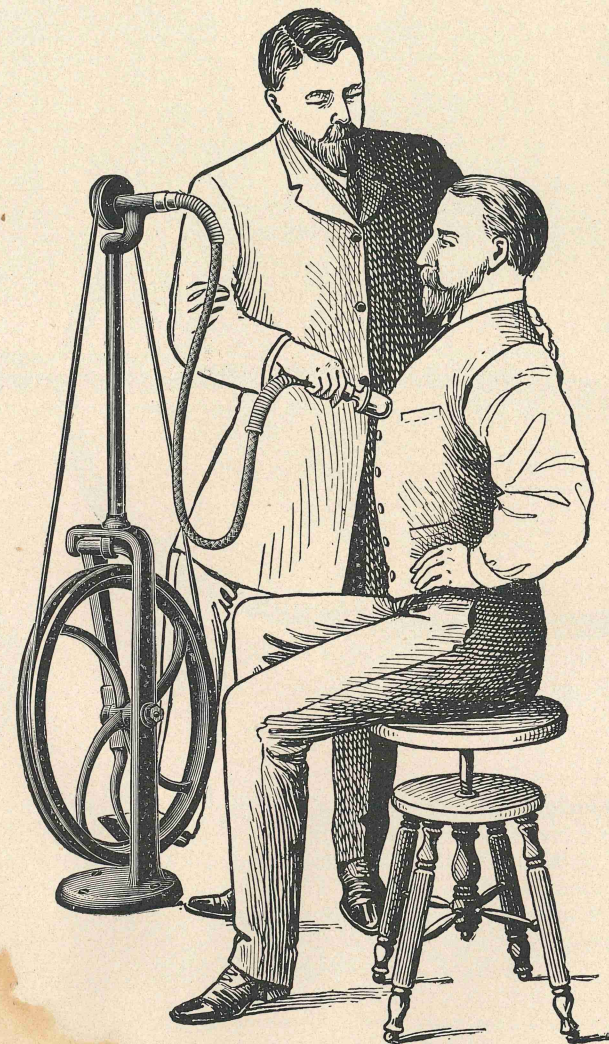
Price of outfit without attachments, as shown in cut, for 104 to 115 volts, 60 cycle, alternating current.....	\$75 00
Additional for 125 or 133 cycle current.....	5 00
Price of either No. 1 or No. 5 massage handle.....	35 00
Price of pneuma facial and skin massage attachment.....	7 00

The outfit here illustrated is designed to give the same results identically, where alternating current only is available, as are obtained with the No. 4 outfit on the direct current.

The pneuma massage attachment as shown in connection with the No. 4 outfit is to be attached to the masseur pump shown in cut, and any of the Victor vibrator handles can be used.

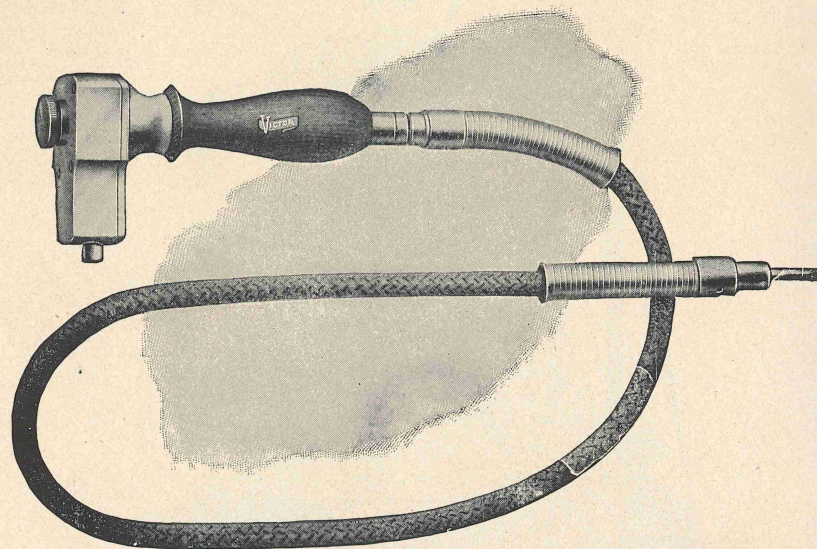
The speed control is perfect, covering a range of from 60 to 6,000 per minute. Quiet in operation, artistic in design, finely finished and perfect in every detail.

FOOT POWER VIBRATORY MASSAGE OUTFIT.



Price complete as illustrated with either No. 1 or No. 5 vibrator handle and 6 applicators.....\$65 00

Where no electric power is available the Victor foot power vibrator will be found almost as effective as the electric vibrator. By putting forth a moderate effort as high as 4,000 vibrations per minute can be obtained with this outfit.

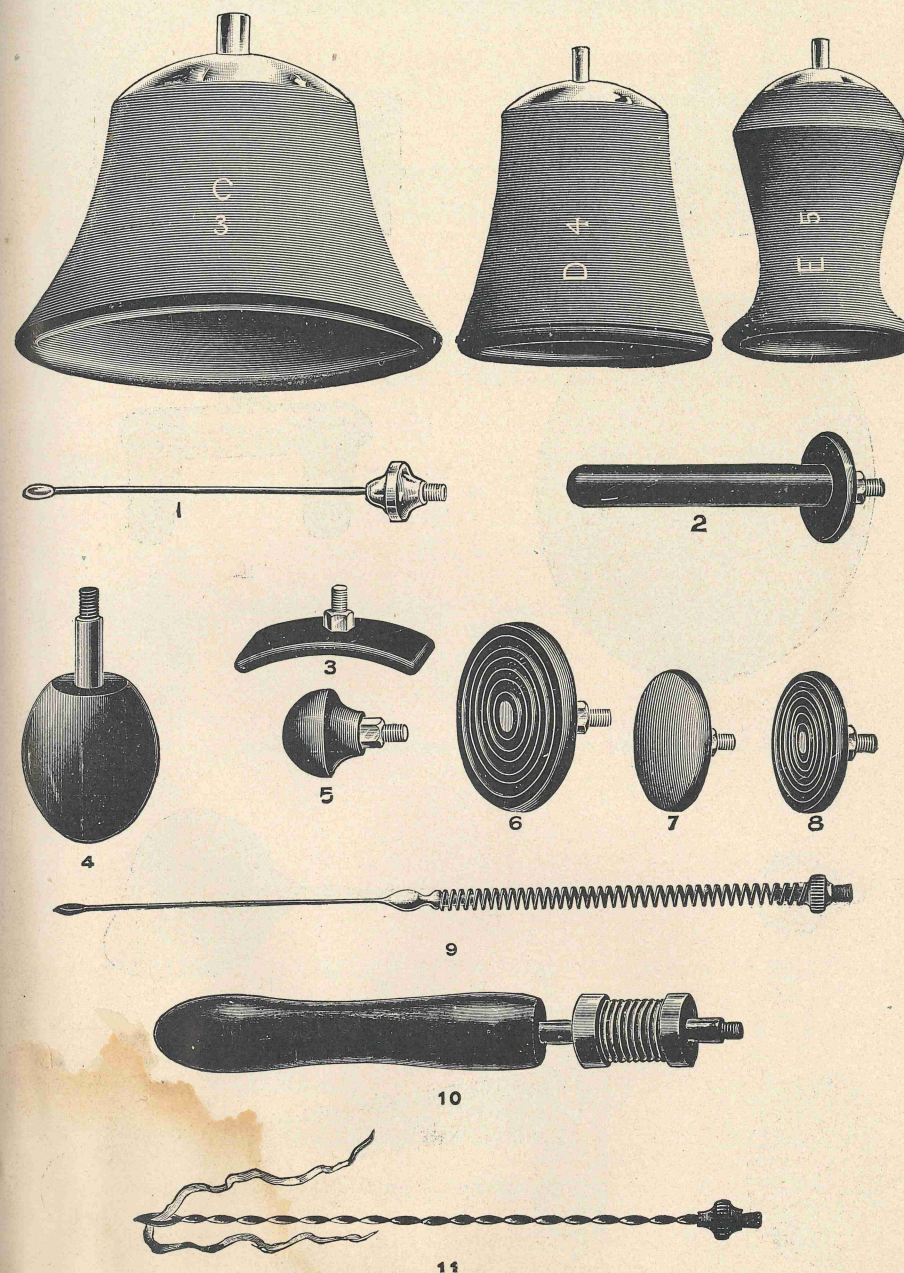
VICTOR NO. 5 MESSAGE HANDLE.

Price with cable and sheath and six applicators \$35 00

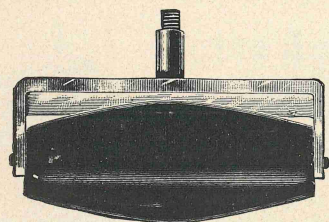
The No. 5 handle differs from the No. 1 in that the movement imparted to the applicator is of a reciprocating nature adjustable to seven different lengths of stroke. The adjusting of the stroke is accomplished by means of a knurled adjusting screw projecting from the cap of the vibrator. This vibrator is of the type that imports the least possible vibration to the operator's hand, a point that is made much of by some manufacturers, but which in reality is of minor importance. We believe it to be the best handle of this particular type on the market.

The range of usefulness is not so wide as that of the No. 1 handle, although, owing to the construction, its cost is the same. In its design and construction we have paid special attention to the parts subjected to the greatest frictional wear and we believe we are justified in making the statement that this handle will outwear any vibrator of similar type at the present time on the market. This is a very important point for there is perhaps no instrument used by the physician which is so liable to break down, owing to the severe conditions under which it is used as the vibrator.

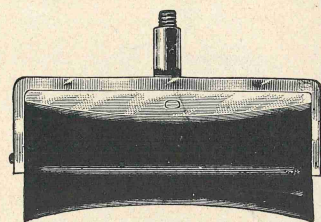
The No. 5 handle can be attached to the same fittings as the No. 1 and requires about the same amount of power. All of the applicators shown in our catalogue are made to fit this handle as well as the No. 1.

MASSAGE APPLICATORS.

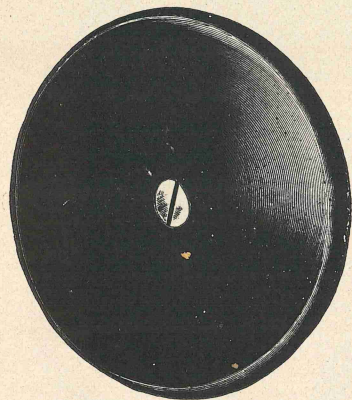
MASSAGE APPLICATORS.



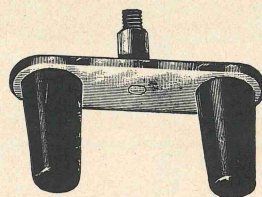
12



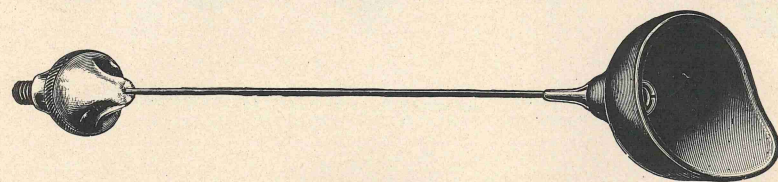
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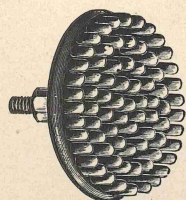
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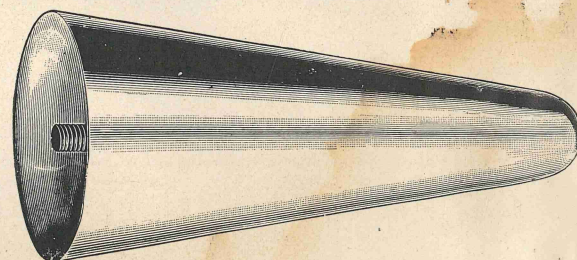
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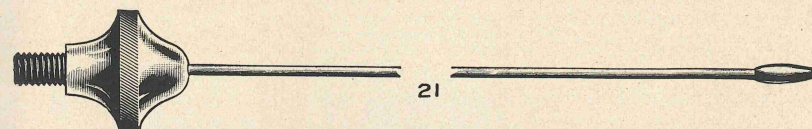
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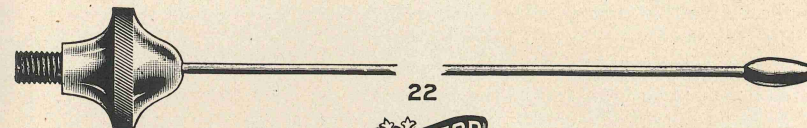
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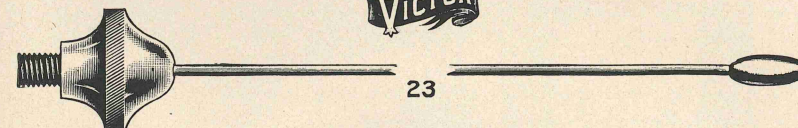
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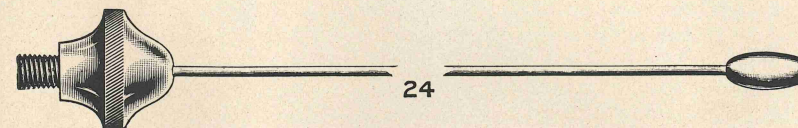
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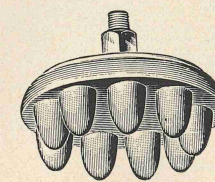
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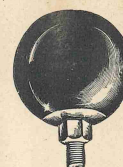
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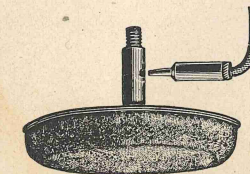
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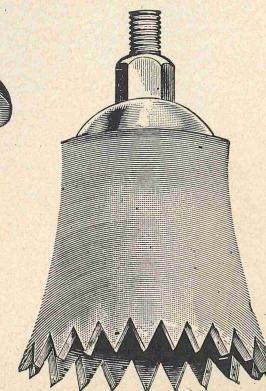
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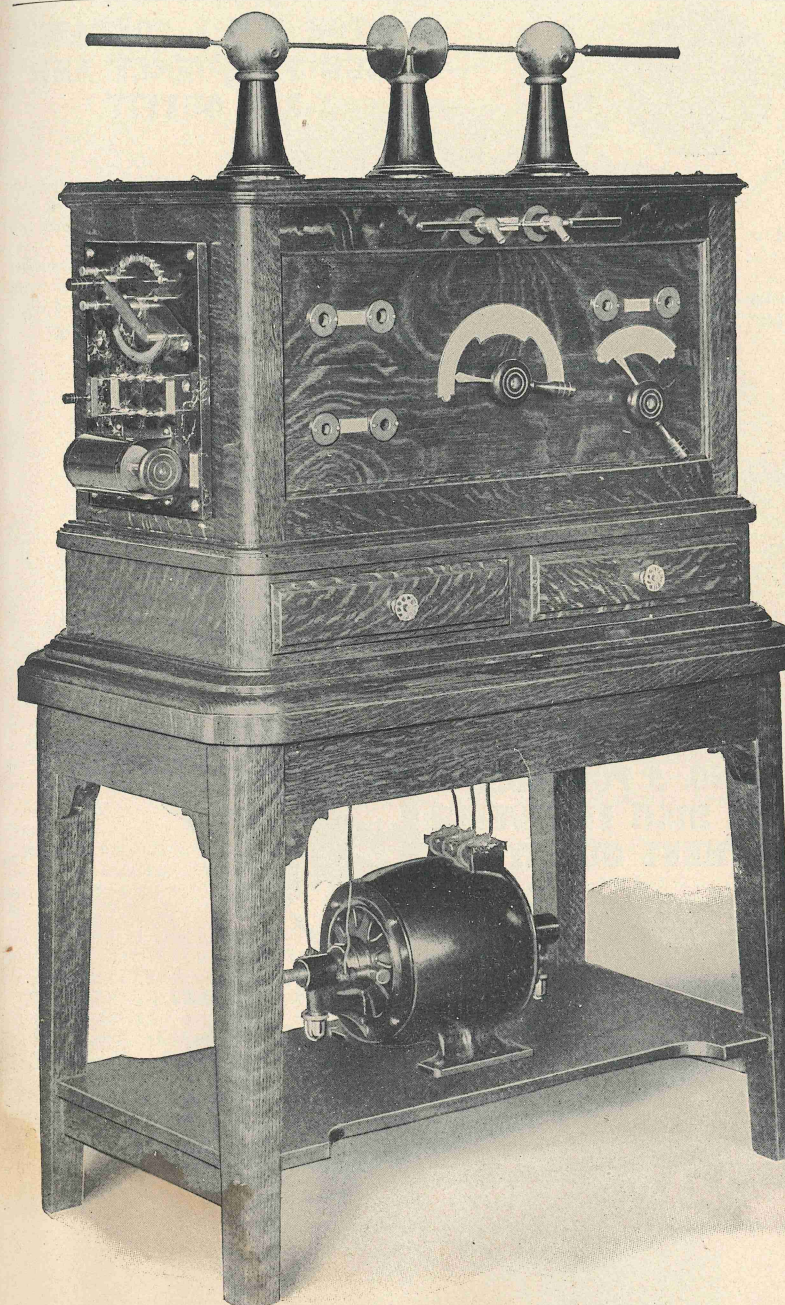
D Rubber Cone with
serrated edge.

RUBBER CONES.**DESCRIPTION AND PRICE LIST.**

C. Soft rubber cone, extra large for abdominal and general application.....	\$1 25
D. Soft rubber cone, adapted to mastoid and head.....	60
D. Soft rubber cone, with serrated or corrugated edge.....	60
E. Soft rubber cone, facial application, especially around nose and eyes.....	60

APPLICATORS.

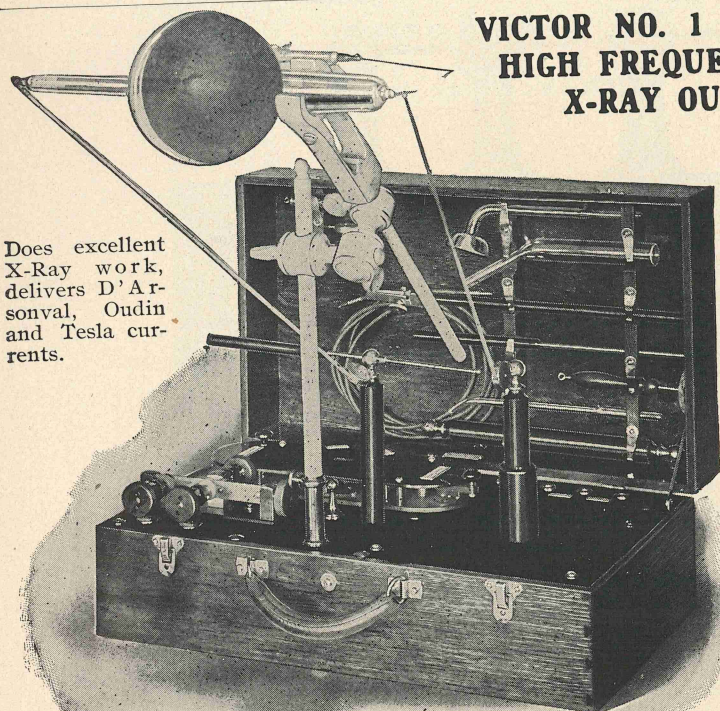
No. 1. Straight probe for mucous membrane	\$0 50
No. 2. Straight rectal application (internal)	75
No. 3. Curved applicator for throat and curved surfaces	75
No. 4. Rectal for external use	75
No. 5. Hard rubber medium size, for muscular vibration	75
No. 6. Large corrugated rubber disc, for abdominal massage	75
No. 7. Cushioned applicator, general work	90
No. 8. Small corrugated hard rubber disc	60
No. 9. Probe for mucous membranes with spring to lessen severity of vibrations	90
No. 10. Spring to lessen severity of vibrations (cut shows application).....	50
No. 11. Probe made of twisted silver wire with eyelet to carry medicated ribbon	75
No. 12. Large convex hard rubber muscle roller	1 25
No. 13. Large concave hard rubber muscle roller	1 25
No. 14. Large concave hard rubber heart applicator	1 25
No. 15. Spinal applicator (fingers separated sufficiently to span the spine)	1 25
No. 16. Uterine applicator, cotton to be placed in the hard rubber cup each time before using	1 40
No. 17. Soft rubber brush	75
No. 18. Expanding rectal applicator, 4½ inches long, 2 inches at base, devised Dr. J. Rawson Pennington of Chicago	1 50
No. 19. Soft rubber rectal applicator, 5 inches long	1 50
No. 20. Soft rubber rectal applicator, 13 inches long, with hole through center and water inlet and outlet for flushing colon	2 50
No. 20. Without flushing attachment	2 00
No. 21. For massaging prostatic region through the urethra, they are	} each..... 75
No. 22. softened for some distance from the outer end so that they	
No. 23. can be made to take any curve desired, cuts are ⅔ actual	
No. 24. size, length 6 inches	
No. 25. Combination prostatic applicator and electrode, diameter ½ inch, length 4½ inches	2 00
No. 26. Soft rubbers	90
No. 27. Solid soft rubber ball 1⅞ inch in diameter.....	75
No. 28. Combination applicator and electrode.....	60

**VICTOR HIGH FREQUENCY, AND X-RAY CABINET, TYPE A.**

For complete description and prices of this and many other models see our special X-Ray catalog.

VICTOR NO. 1 PORTABLE HIGH FREQUENCY AND X-RAY OUTFIT.

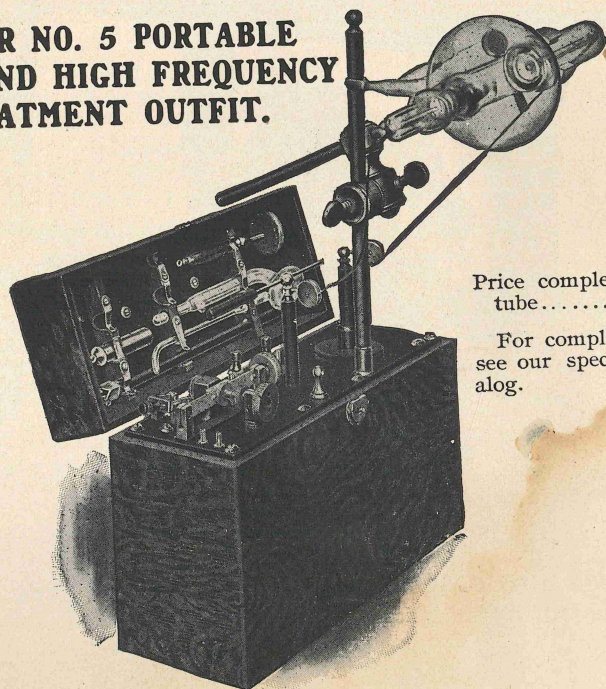
Does excellent
X-Ray work,
delivers D'Ar-
sonval, Oudin
and Tesla cur-
rents.



Price complete
less X-Ray
tube, \$160 00

For complete
description see
our special X-
Ray catalog.

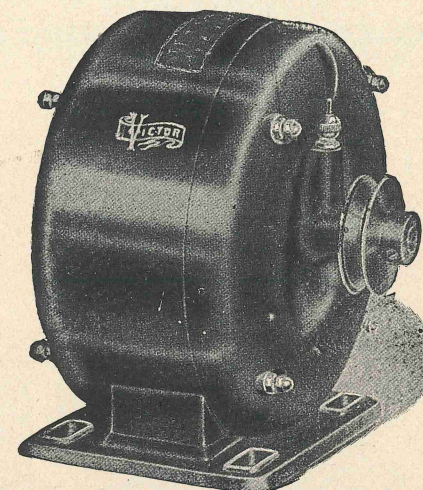
VICTOR NO. 5 PORTABLE X-RAY AND HIGH FREQUENCY TREATMENT OUTFIT.



Price complete less X-Ray
tube.....\$75 00

For complete description
see our special X-Ray cat-
alog.

ALTERNATING CURRENT POWER MOTORS.



AUTOMATIC START INDUCTION MOTORS FOR SINGLE PHASE CURRENT.

These motors are extremely compact, giving the maximum of power in the minimum of space, the construction is very simple and durable.

They start automatically when current is turned on, being provided with a starting device for this purpose.

No commutator, brushes nor insulated armature windings are employed, and the line wires may be connected direct to the binding posts without starting box or any special wiring or appliances.

Large numbers of these machines have been placed in service during the last few years and are giving the highest degree of satisfaction.

HORSEPOWER AND SPEEDS. These condensed types are made in three frames. The two smaller frames (types 24 D A) develop respectively 1/40 and 1/20 horsepower on a 60 cycle current, at speeds of from 1650 to 1700 r. p. m. Motors in the largest frame (type 32 D A) develop 1/10 to 1/6 horsepower at approximately 1700 r. p. m. and 1/8 horsepower at 1150 r. p. m. on 60 cycles. Both types in the 24 D A frame are of the same diameter but of different thickness. All dimensions of the type 32 D A motor are greater than those of the 24 D A frame.

AUTOMATIC START, EFFICIENCY. All of these motors have 1/2 inch tool steel shafts accurately ground to size, and self-lubricating bronze bearings. As they operate on the simple induction principle without brushes or commutator to require adjustment, cleaning or renewal, they are thoroughly durable and need no attention beyond ordinary oiling. The automatic starting device with which they are equipped secures a prompt, definite start the instant the current is turned on and gives the motor a heavy starting torque. This device in combination with the form of field winding followed, is responsible for the high efficiency of these motors. This automatic device has been proved entirely satisfactory by the operation of thousands of motors so equipped.

Like other induction motors of this class, **these types operate at a constant speed**, which cannot be regulated or changed.

When speed control is essential, it can be obtained by the use of our mechanical speed regulator as illustrated elsewhere in this catalogue.

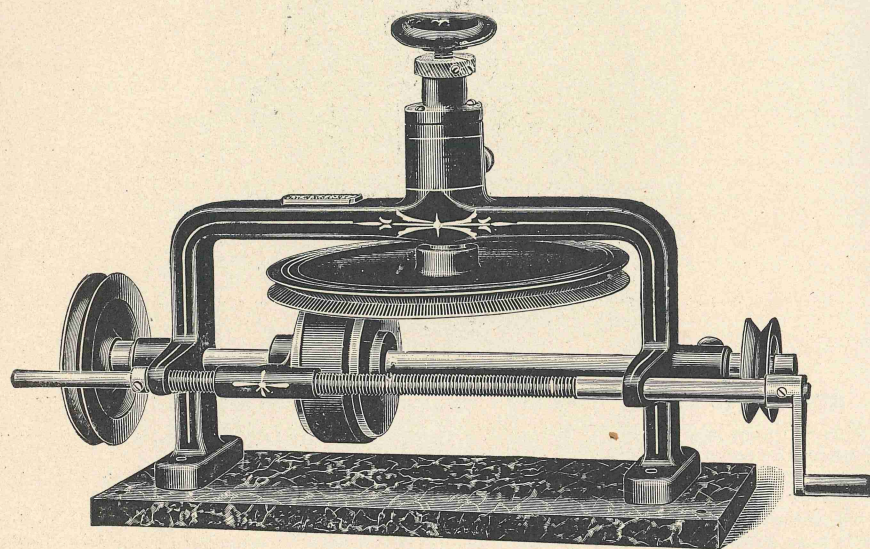
PRICES.

1/4 H. P. 104 to 115 volts 60 cycle.....	\$33 00	125 to 133 cycle.....	\$33 00
1/2 H. P. 104 to 115 volts 60 cycle.....	37 00	125 to 133 cycle.....	40 00
3/4 H. P. 104 to 115 volts 60 cycle.....	65 00	125 to 133 cycle.....	65 00
1 H. P. 104 to 115 volts 60 cycle.....	90 00	125 to 133 cycle.....	90 00

FRICITION SPEED CONTROLLERS.

FOR USE IN CONNECTION WITH ALTERNATING CURRENT MOTORS OF 1-4 H.P.
OR LESS.

Patent applied for.



Price.....\$25 00

The fact that the speed of alternating current motors of the induction type cannot be controlled, makes it necessary to interpose some mechanical device between the motor and the machine operated where speed control is desired, as with static machines, etc.

In the Victor controller the motor is belted to the large friction disc, which has a grooved edge to take a round belt; this large disc transmits the power to a smaller leather-faced friction wheel, set at a right angle to the larger one.

This smaller wheel is keyed to a shaft in such a way as to admit of its being moved laterally along the shaft, at the same time causing the shaft to revolve.

The pulley to which the machine to be operated is belted, is attached to the end of this shaft.

The small friction wheel is moved laterally across the face of the large one by means of a threaded rod, carrying a fork which engages the small wheel; this rod is provided with a crank for operating it.

An adjustment is provided to regulate the pressure of the large disc against the operating wheel.

The nature of the work performed by this apparatus requires that it should be perfect in mechanical construction if efficiency, durability and quietness in operation are to be obtained; we guarantee that it possesses all of these qualities.

The report printed below relates to the "Victor" Friction Speed Controller and was received from the Superintendent of the Emerson Electric Manufacturing Co. of St. Louis, Mo., after making a thorough test.

REPORT ON VICTOR 1-4 H. P. SPEED REGULATOR.

This speed regulator was tested with a 1-3 H. P., P. I. 6-48 motor on 104 volts, 7200 alternations and with the disc properly adjusted appears to give the following results:

Motor running free - - 90 watts
With belt to large disc - 100 "
With friction gear running - 170 "

This was operating the regulator with a belt from the 3" pulley on the motor to about 8½" on the regulator, thus driving the disc about 400 R. P. M. At this speed of the disc it was possible to get any speed in either direction from approximately 100 R. P. M. to 700 R. P. M., and when running at the higher speeds the gear would transmit the full power of the motor running the load up to 550 to 600 watts, at which time the motor should be delivering about 4 H. P.

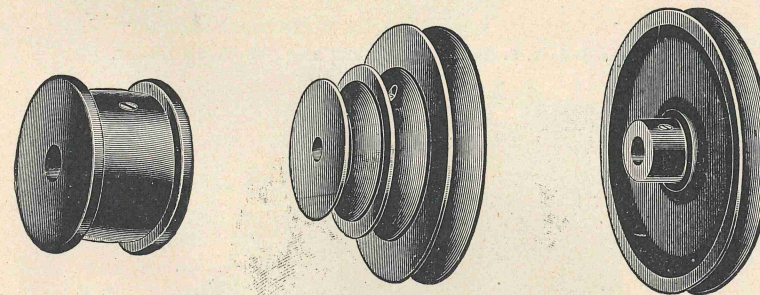
From this test it would appear that this speed regulator is a very satisfactory piece of apparatus and transmits the power quite economically, in fact, much more so than we expected. It is possible, however, to put sufficient tension on the disc so that a very large part of the power would be lost, as in fact enough friction can be added in this manner to stop the motor, but this appears to be entirely unnecessary, and if properly adjusted, the transmitter will apparently work with very little loss of power, and we should be safe in advocating its use in connection with our motors up to and including 1-3 H. P., at least for intermittent work such as static machines or work of this character.

(Signed)

C. R. MESTON,

Superintendent Emerson Electric Manufacturing Co.

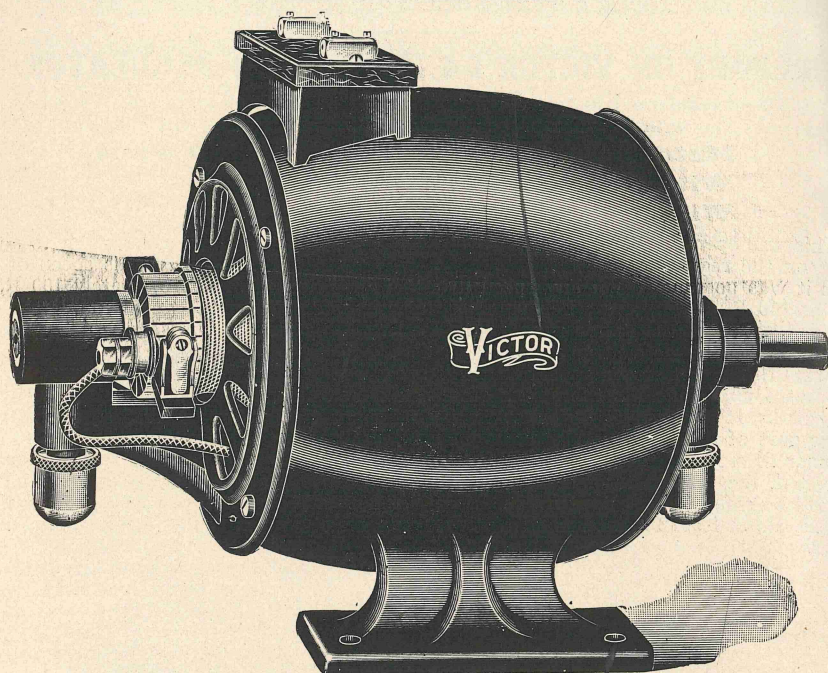
PULLEYS.



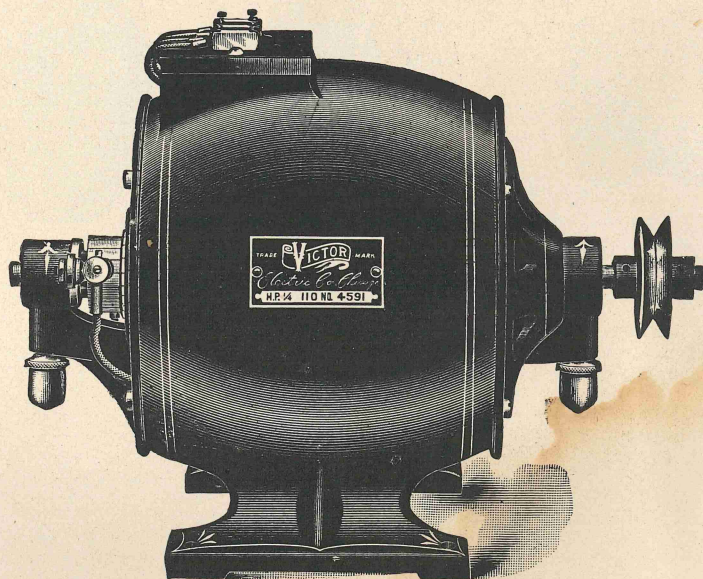
	Diameter.	Width.	Price.
Pulleys for flat belt.....	3 in.	1½ in.	\$1 75
Pulleys for flat belt.....	2¼ in.	1¼ in.	1 25
Pulleys for flat belt.....	2 in.	1¼ in.	1 10
Pulleys for flat belt.....	1½ in.	1¼ in.	1 00

	No. of steps or cones.	Diameter of largest cone.	Diameter of smallest cone.	Price.
Grooved pulleys for round belt.....	Single	4 in.	.....	\$1 00
Grooved pulleys for round belt.....	Single	3 in.	.....	90
Grooved pulleys for round belt.....	Single	2½ in.	.....	80
Grooved pulleys for round belt.....	Single	2 in.	.....	75
Grooved pulleys for round belt.....	2	4½ in.	2½ in.	2 00
Grooved pulleys for round belt.....	2	3½ in.	2½ in.	1 75
Grooved pulleys for round belt.....	2	2½ in.	2 in.	1 25
Grooved pulleys for round belt.....	3	4 in.	2½ in.	2 25
Grooved pulleys for round belt.....	3	3½ in.	2½ in.	2 25
Grooved pulleys for round belt.....	3	2¾ in.	1¾ in.	2 00

VICTOR DIRECT CURRENT POWER MOTORS. SEMI-ENCLOSED TYPE.



1-2 and 3-4-H. P. Made for 110, 220 and 500-Volt Current.

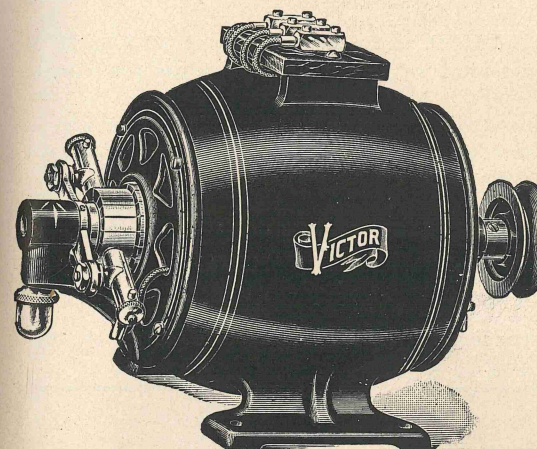


1-5 to 1-3-H. P. Made for 110, 220 and 500 Volt Current

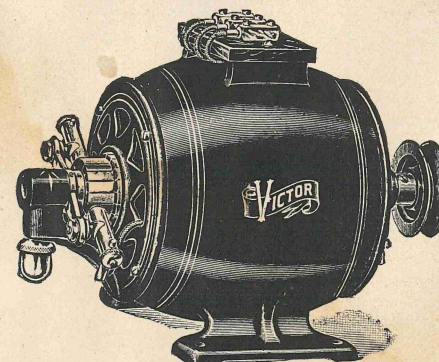
The motors here illustrated and described are thoroughly high class in every respect. They are not to be compared with the cheap motors ordinarily furnished for commercial work, designed and constructed as they are especially for the use of the physicians, dentists and others requiring quiet running, well finished, practical, and durable machines. No motors could be so well adapted to the work of operating static machines. For this purpose, they are used in connection with our speed controlling rheostats, these latter being also particularly well adapted for static machine work. The motors are iron clad, durable, quiet in operation, and finely finished in black japan and nickel. They are all guaranteed for two years and with proper care, there is no reason why they should not last almost a life-time.

Realizing that in many instances small motors get into the hands of persons having little or no knowledge of machinery, we have endeavored as far as possible to so construct this line of small motors that they will operate with the least possible attention.

The bearings are self-oiling; the commutators are of special composition, calculated to wear better and more evenly than copper. Adjustable rocker-arms are used to carry brush-holders so designed as to insure ample carrying capacity as well as convenience in removing and renewing brushes.



1-6 - H. P. Made for 110 and 220-Volt Current.

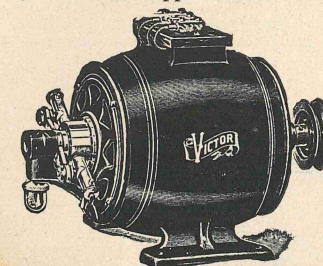


1-8 - H. P. Made for 110 and 220-Volt Current.

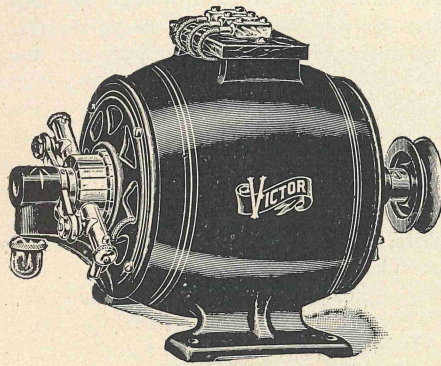
Although all parts are enclosed and protected from accidental injury with the exception of the commutator and brushes, the end castings are provided with open spaces to insure good ventilation and all of these machines will stand a considerable over-load without excessive sparking or heating. All parts are interchangeable and are carried constantly in stock and will be found in every instance to fit perfectly in their places.

All machines are given an insulation test on a voltage three times that for which they are wound. The dimension diagram and data shown give all of the important dimensions.

We carry in stock almost all of these machines wound as dynamos and are prepared to supply any of them as dynamos for any voltage from 6 to 220. Prices on special dynamos on application.



1-12 - H. P. Made for 110 and 220-Volt Current.

1-6 H. P. DYNAMO.

Price of dynamo wound to develop 110 volts and $\frac{3}{4}$ ampere.....\$30 00
 Price of smaller dynamo, same type, wound to develop 110 volts and $\frac{1}{2}$ ampere 22 50

This machine, when operated at a speed of 2000 R. P. M., will deliver a continuous or direct current of 110 volts and about one ampere. The current has the same physical properties as the ordinary continuous electric light current; hence it is well adapted to furnish current for therapeutic plates and cabinets that are designed for operation on electric light circuits; but it must be borne in mind that its capacity is limited to one ampere, sufficient for all

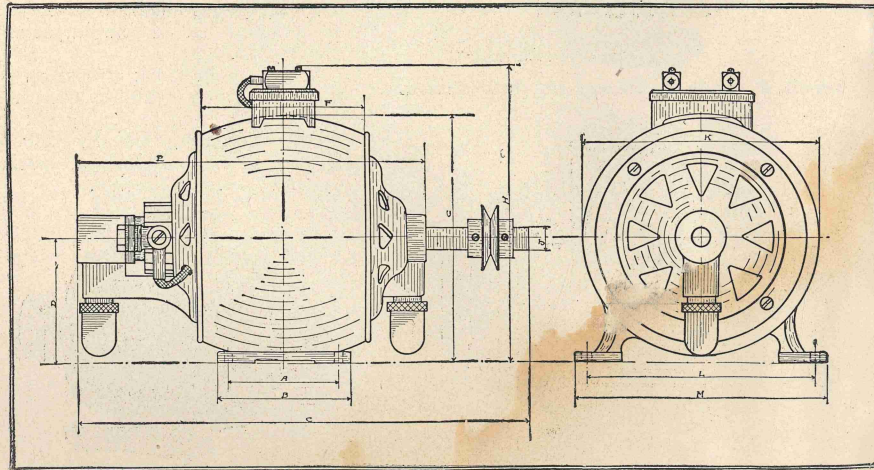
galvanism and faradism, but not for cautery or for operating motors or lights, excepting the small diagnostic lamps.

The dynamo can be operated by a 1-6 H. P. alternating current motor; a $\frac{1}{4}$ H. P., however, is recommended, or if the pressure is over 35 lbs. a 6-inch water power motor will be found effective.

It will be apparent that there is no metallic connection between this dynamo and the motor which drives it; hence we frequently furnish it where only a 500 volt direct current is available. The dynamo being driven by a 500 volt motor, this method insures absolute immunity from accidental shocks.

The smaller dynamo mentioned in price list will furnish sufficient current for the galvanic and faradic currents when connected to our wall plates, but not sufficient for the diagnostic lamps.

Letters in diagram refer to corresponding letters which will be found at the heads of dimension columns on following page.



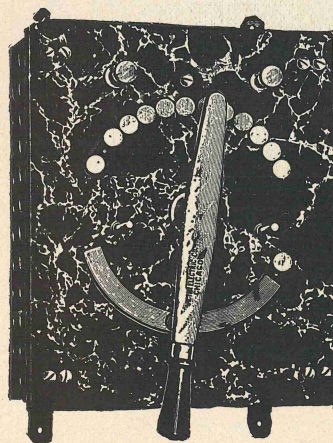
Dimension Diagram.

DIMENSIONS, WEIGHT AND PRICES OF VICTOR DIRECT CURRENT MOTORS.

H. P.	VOLTS.	Wght. in Lbs	A	B	C	D	E	F	G	H	J	K	L	M	Speed when shunt wound.	Price when shunt wound.	Price series wound.	Speed of speed con-troller.
$\frac{1}{8}$	110	12½	2¼"	27½"	9 3/16"	25½"	7¼"	33/8"	5¼"	6¼"	1 1/16"	5"	45/8"	5¼"	2900	\$18 00	\$18 00	\$5 50
$\frac{1}{8}$	220	12½	2¼"	27½"	9 3/16"	25½"	7¼"	33/8"	5¼"	6¼"	1 1/16"	5"	45/8"	5¼"	2900	20 50	20 50	5 50
$\frac{1}{8}$	110	18	27/8"	313/8"	10¼"	215/8"	8¼"	4¼"	55/8"	65/8"	1 1/16"	5½"	47½"	5¾"	2200	22 50	22 50	5 50
$\frac{1}{8}$	220	18	27/8"	313/8"	10¼"	215/8"	8¼"	4¼"	55/8"	65/8"	1 1/16"	5½"	47½"	5¾"	2200	25 00	25 00	5 50
$\frac{1}{8}$	110	30	3½"	43/8"	133/8"	3¾"	9¾"	513/8"	7"	8"	1 1/16"	6¾"	6"	7"	1600	27 00	27 00	8 00
$\frac{1}{8}$	220	30	3½"	43/8"	133/8"	3¾"	9¾"	513/8"	7"	8"	1 1/16"	6¾"	6"	7"	1600	29 00	29 00	8 00
$\frac{1}{8}$	110	30	3½"	43/8"	133/8"	3¾"	9¾"	513/8"	7"	8"	1 1/16"	6¾"	6"	7"	2500	30 00	.....	8 00
$\frac{1}{8}$	220	30	3½"	43/8"	133/8"	3¾"	9¾"	513/8"	7"	8"	1 1/16"	6¾"	6"	7"	2500	32 00	.....	8 00
$\frac{1}{4}$	110	57	5¼"	6"	14"	5¼"	11¾"	71/8"	9 3/8"	10½"	1 1/16"	8¾"	77/8"	8¾"	1650	41 00	.....	9 00
$\frac{1}{4}$	220	57	5¼"	6"	14"	5¼"	11¾"	71/8"	9 3/8"	10½"	1 1/16"	8¾"	77/8"	8¾"	1650	42 50	.....	9 00
$\frac{1}{4}$	110	57	5¼"	6"	14"	5¼"	11¾"	71/8"	9 3/8"	10½"	1 1/16"	8¾"	77/8"	8¾"	2200	44 00	44 00	9 00
$\frac{1}{4}$	220	57	5¼"	6"	14"	5¼"	11¾"	71/8"	9 3/8"	10½"	1 1/16"	8¾"	77/8"	8¾"	2200	45 50	45 50	9 00
$\frac{1}{2}$	500	57	5¼"	6"	14"	5¼"	11¾"	71/8"	9 3/8"	10½"	1 1/16"	8¾"	77/8"	8¾"	.....	.....	51 00	9 00
$\frac{1}{2}$	110	57	5¼"	6"	14"	5¼"	11¾"	71/8"	9 3/8"	10½"	1 1/16"	8¾"	77/8"	8¾"	2700	.....	45 00	9 00
$\frac{1}{2}$	220	57	5¼"	6"	14"	5¼"	11¾"	71/8"	9 3/8"	10½"	1 1/16"	8¾"	77/8"	8¾"	2700	.....	46 50	9 00
$\frac{1}{2}$	110	95	53/8"	6½"	173/8"	5½"	15¼"	7¾"	10¼"	12"	¾"	95/8"	8¾"	10"	1800	.....	60 00	9 00
$\frac{1}{2}$	220	95	53/8"	6½"	173/8"	5½"	15¼"	7¾"	10¼"	12"	¾"	95/8"	8¾"	10"	1800	.....	63 00	9 00
$\frac{1}{2}$	500	95	53/8"	6½"	173/8"	5½"	15¼"	7¾"	10¼"	12"	¾"	95/8"	8¾"	10"	1800	.....	70 00	12 00
$\frac{3}{4}$	110	95	53/8"	6½"	173/8"	5½"	15¼"	7¾"	10¼"	12"	¾"	95/8"	8¾"	10"	2500	.....	65 00	9 00
$\frac{3}{4}$	220	95	53/8"	6½"	173/8"	5½"	15¼"	7¾"	10¼"	12"	¾"	95/8"	8¾"	10"	2500	.....	68 00	9 00
$\frac{3}{4}$	500	95	53/8"	6½"	173/8"	5½"	15¼"	7¾"	10¼"	12"	¾"	95/8"	8¾"	10"	2500	.....	75 00	12 00

With the $\frac{1}{8}$ and $\frac{1}{4}$ Horse Power Motors, we furnish a Grooved Pulley for round belt; with the Larger Machines we furnish either a Grooved or a Flat Pulley, as desired.
 We will equip any of our Direct Current Motors with Sinusoidal Commutator if desired. The charge will be \$4.50 extra for $\frac{1}{8}$ to $\frac{1}{4}$ H. P. Motors and \$6.00 for $\frac{1}{4}$ to $\frac{3}{4}$ H. P. Motors.

12 POINT SPEED CONTROLLER.



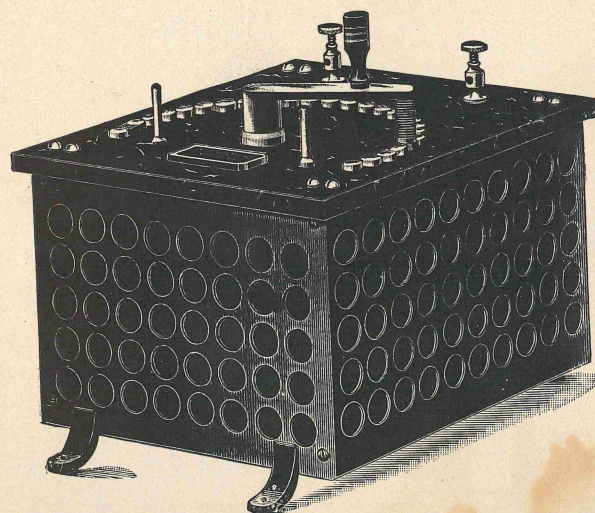
Accompanying cut shows the style rheostat used for controlling the speed of the $\frac{1}{4}$ and $\frac{1}{2}$ H. P. motors. The resistance wire in these controllers is wound upon asbestos covered metal cores and mounted so as to secure the greatest radiation. The containing box is of perforated metal; the top is marbleized slate, thus no combustible material enters into its construction.

The traveling contacts are self-aligning and so constructed that perfect contact is assured, each one being forced down upon the permanent contacts by spiral springs.

All parts are nicely finished in marble, japan and nickel.

Price \$9 00

25 POINT RHEOSTAT.



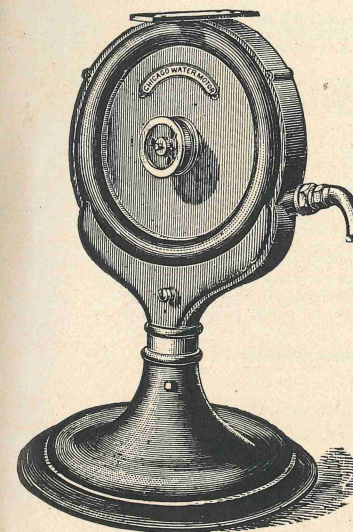
This rheostat when used in connection with our motors for static work insures *absolutely perfect* speed regulation.

A different resistance is required for static machines of different sizes and makes, and when ordering, a description of the static machine that is to be operated should be sent us.

Price for Series
Wound Motors.....\$15 00

Price for Shunt
Wound Motors..... 16 50

WATER MOTORS.



Where no electric power is available we recommend these water motors for operating static machines, dynamos, vibrators, etc. At 20 lbs. pressure the motor will deliver $\frac{1}{4}$ H. P., and as pressure increases the power developed is greater until at 75 lbs. pressure $\frac{1}{2}$ H. P. is available.

At any pressure above 30 lbs. one of these motors will satisfactorily operate our \$30.00 Dynamo for connection to wall plates.

At any pressure above 20 lbs. motor will furnish ample power to operate our No. 1 Vibrator when attached to our Two Speed Countershaft.

Price complete with jet, nozzle and pulley.....\$35 00

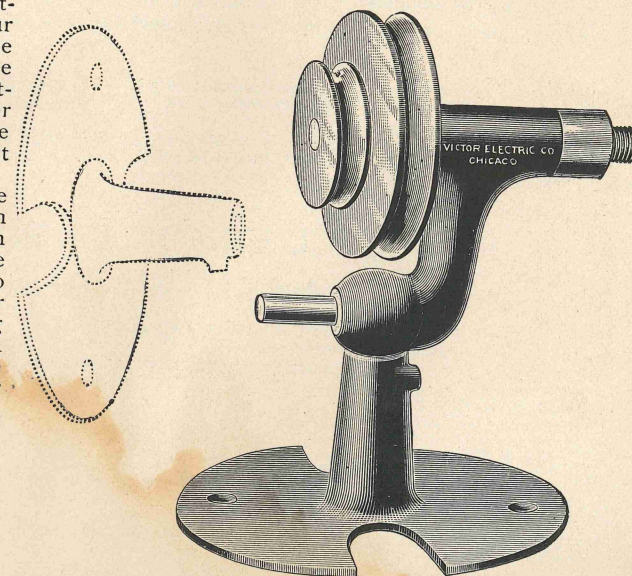
TWO SPEED COUNTER SHAFT.

This countershaft is fitted so that any of our massage handles can be attached to it; the countershaft can be belted to any motor either water or electric; the motor must be at least $\frac{1}{4}$ H. P.

As will be seen, the power can be belted from above, below or from either side, and the base can be attached either to the wall or to a shelf or table, two studs being provided, either of which can be used, one for the wall position and one for the table.

Where a large motor is being used for operating a static machine, the same motor can in this way be utilized for operating a massage handle in a fairly satisfactory manner.

Price.....\$5 00



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Chapter 1.—Consideration of the Relative Frequency.	Chapter 9.—General Principles Governing the Therapeutic Application of High-Potential Currents.
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Chapter 4.—Disruptive Discharges, Sparks.	Chapter 12.—Nervous Diseases.
Chapter 5.—The Convective Discharges or Effluve.	Chapter 13.—Diseases of the Rectum, Sigmoid, and Genito-Urinary Apparatus.
Chapter 6.—High-Potential Currents with Vacuum Tubes.	Chapter 14.—Application of High-Potential Currents to Gynecology.
Chapter 7.—High-Frequency Currents by Auto-Conduction and Auto-Condensation Methods.	Chapter 15.—Diseases of the Ear, Nose, Throat, and Eyes.
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Arm supports for dental outfits, for surgical cables and sheaths and for No. 2 massage outfits. Each	1 00	Hose clamps. (A convenient clamp for attaching air hose to outlet of Victor air compressors.) Each.	15
Attachment plug and 8 ft. cord....	75	Hubbel plugs	30
Belts, No. 2 pump	50	Iron frames under motor connecting blocks	40
Belts, No. 4 pump.....	1 75	Lamp cord, per foot (approved No. 18 duplex).....	03
Belts, No. 6 transformer and No. 7 massage outfits.....	15	Lamps, 50 candle power	1 50
Bone surgery engine, flexible cables	3 50	Lamps, 32 candle power, resistance	75
Bone surgery engine, sheaths.....	2 50	Lamps, 20 candle power, resistance	50
Brushes, carbon, $\frac{3}{16}$, $\frac{5}{16}$, $\frac{1}{4}$, $\frac{3}{8}$. Per pair	15	Magnet tips, large. Each.....	50
Brushes, gauze, $\frac{3}{8}$ inch round. Per pair	25	Magnet tips, No. 2. Each.....	40
Brushes $\frac{3}{16}$ for low voltage. Per pair	1 25	Magnet tips, No. 3. Each.....	25
Cable ends for massage handles ...	15	Massage cables No. 1 handle....	3 50
Cables for surgical handpiece	2 50	Massage cables No. 2 handle.....	2 50
Caps for No. 1 massage handle....	1 00	Massage sheaths	2 50
Connecting cord for headlamps, 7 ft. length (without switch or attachment plug).....	1 00	Milliampere meter plugs. Each..	50
Connecting rod for No. 4 compressor	1 90	Miniature lamps for No. 1 head lamp.....	75
Cup grease. Per box.....	25	Miniature lamps for No. 3 head lamp.....	75
Dry batteries, No. 4.....	25	Miniature lamps for No. 4 head lamp.....	1 50
Dry batteries, No. 5.....	30	Mirror back lamps for No. 2 head lamp	1 25
Dry batteries, No. 6.....	30	Motor connecting blocks, slate top, binding posts and lugs.....	1 00
Ear pump piston, only.....	1 25	Packing for No. 2 compressors....	10
Ear pump piston rod, only.....	25	Packing for No. 4 compressors ...	20
Electrode cords for batteries and wall plates, 6 ft. Per pair.....	75	Packing for ear pump. Each.....	10
Electrode cords for batteries and wall plates, 8 ft. Per pair	85	Pedestal castors, set of four.....	75
Electrode cord tips. Per pair.....	12	Pedestal forks.....	75
Fork support for vibrator handle..	75	Relief valve for No. 2 compressor.	35
Friction wheels, leather covered, for No. 1 A. C. massage motor ..	1 00	Resistance units for air heater	75
Friction wheels, leather covered, for mechanical speed controller..	75	Resistance units for sterilizer	1 40
Friction wheel for No. 2 transformer Pyncheon pump	75	Ribbons for vibrators for No. 1 and No. 2 wall plates.....	75
Friction wheels, leather covered, for No. 6 transformer and No. 7 massage outfits.....	2 25	Ribbons for vibrators for high speed plate.....	1 25
		Switch break plug used with headlamps	1 25

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