RL. 897-1951

LEFT—Inventor George Kelk, left and Boyd Ferris of the Patents Section look over the specifications of one of Kelk's inventions at Avro Canada.

INVENTIONS ARE BIG BUSINESS AT AVRO CANADA

By H. C. LUTTMAN
Patents Officer
Special to Canadian Aviation

AT AVRO Canada it is appreciated that the vitality of the aircraft industry must depend upon the initiative and ingenuity of everybody engaged in it, and that every employee is in some position to contribute, each in his own way, to the more efficient production of better airplanes and better engines. A procedure for handling inventions has therefore been established and a scheme of awards has been drawn up to encourage employees to submit their ideas for consideration. During the last three years this plan has resulted in the submission of more than 200 inventions, most of which have been of sufficient merit to warrant the filing of patent applications.

In November, 1947, the company set up a patents department to study the proposals put forward by employees, to investigate their novelty and patentability, and to collaborate with the company's patent attorneys in the preparation and prosecution of patent applications. Every employee has direct access to the patents department. Some inventors object to revealing their ideas to their supervisors and dislike having to submit them "through the proper channels," so that channels have been made as short as possible.

The company's over-all patent policy is based upon recommendations of an inventions committee, composed of the managers of various divisions, under the chairmanship of the director of manufacturing. This committee meets from time to time to consider problems outside the discretion of the patents department.

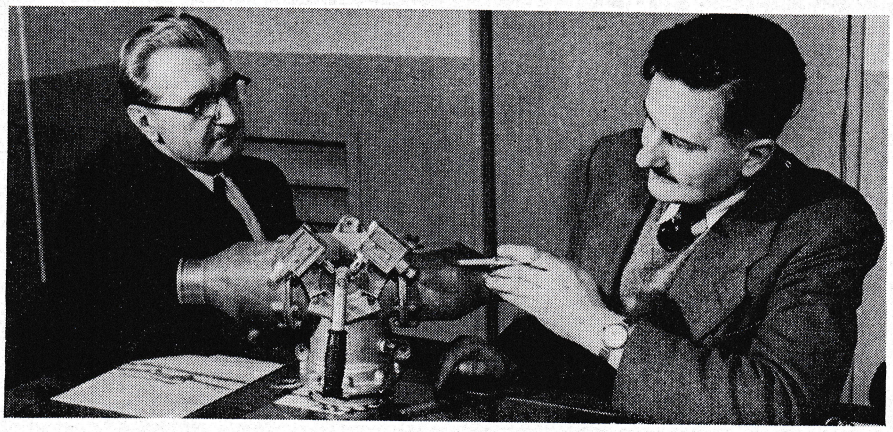
The patents department at Avro has worked out a simple procedure for the submission of initial disclosures. The inventor must write a brief description of his proposal, sign it in the presence of two witnesses, then hand it over to the patents department for registration. Thereafter the patents officer or a member of his staff discusses the case with the inventor and with specialist engineers who can pass some judgment on its merits. The commercial potentialities and patentability of the invention are considered.

The range of invention encountered is extremely wide because almost every form of engineering seems to find its way into an airplane in one way or another. The patents department at Avro Canada has had to tackle aerodynamic features of compressor design, structural characteristics of turbine blades, electronic devices for test purposes, machine tools associated with blade manufacture, various proposals for anti-icing of gas turbine intake components, small but vital details of combustion equipment, temperature regulation of pressurized compartments, and power-booster systems for flying controls, to mention but a few.

Certainly there is never a dull moment. A patents engineer in the aircraft business must possess a fair degree of technical flexibility. An ability to split hairs is an asset too.

If, after initial investigation by the patents department, an idea seems to have some promise it is referred to the patent attorneys for a novelty search, which is usually carried out in the U. S. Patent Office. The extent of the search may vary according to circumstances but normally it is confined to the patents which have been issued on the same subject as the invention in question.

It is surprising how often an exist-



RIGHT — Inventor K. Ksieski looks on as Charles Luttman, Avro Patents Officer, examines his underwing refueling valve.

ing patent or an obvious (and therefore unpatentable) combination of existing patents reveals a complete anticipation of an idea which the present "inventor" and all his specialist colleagues quite sincerely believe to be new.

In due course the patent attorneys report on the search and, if the report is favorable, the patents department goes ahead with the preparation of a draft patent specification and the associated claims.

After clearance for security by the RCAF, the draft is passed to the patent attorneys to be used as a basis for the preparation of the formal application. Finally, the inventor is asked to sign the appropriate documents and the case is filed.

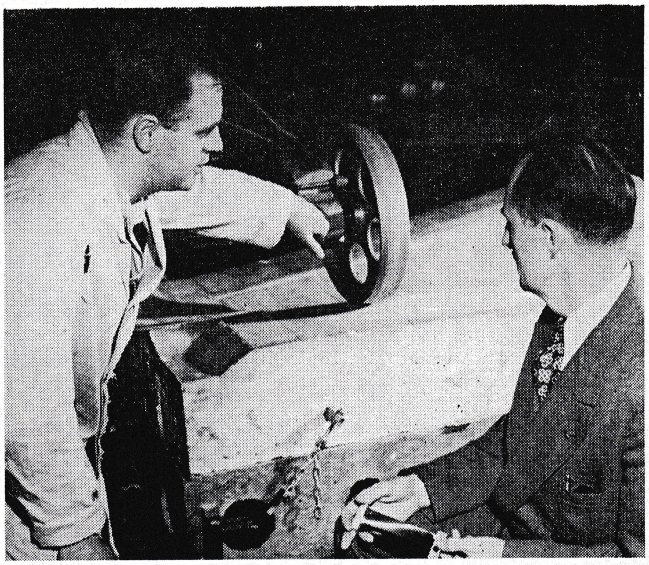
On the filing of the application, the inventor is given a cash award and if, after a long time and a great deal of hard work by the patent attorney and the patents department, the Patent Office grants a patent, the inventor receives a further sum. This arrangement was worked out by the inventions committee after thorough study of the problem.

This then is the invention procedure now in operation at Avro Canada; it is perhaps of some interest to consider what is behind it all.

Background—In the early days of the aircraft industries in Great Britain and the U. S., many companies went to considerable lengths to build up their patent holdings, and in some cases this policy proved to be very profitable. Of course one or two basic patents were at first something of an impediment to the natural growth of aviation and, in the interest of national defense, means had to be devised to make these patents generally available. A solution was found and the holders of the patents benefited accordingly.

Although important patents in the airframe field are now few, and progress is being made by "a lot of little things" rather than by basic discoveries the gas turbine engine art is in very much the same condition as was airframe development at the end of the 1914-18 war. Consequently the scramble for patents has started again, this time on gas turbine engines and methods of manufacturing them. This time the Canadian industry is making a bid for a place in the sun.

Why Get Patents?—The development of inventions and the obtaining and exploiting of patents is an expensive business and, though there are notable exceptions, the private inventor nowadays is in no position to compete with the big industrial research organizations.



J. O. Creek, right, inventor of the Avro Canada copying machine, sees it in action with operator Raymond Hepburn demonstrating.

The chief advantage enjoyed by the private inventor lies in the fact that he is not interested in production. He does not have to use his patents to bargain for use of other patents, as does the manufacturer. No one can embarrass him by claiming that he is infringing a patent, thus he is free to sell or license any patents he may hold, and once his initial expenses have been covered the remaining proceeds are pure profit.

On the other hand a production organization, such as Avro Canada, must inevitably use inventions which have been patented by other companies and it must develop an armory of patents of its own with which it can bargain with other patent holders on an exchange basis.

This bargaining is not necessarily done in terms of individual patents but companies may deal in "packages" of patents covering certain specific fields. For example one company may have a package of patents on combustion on which it has been conducting a development program, and another a similar package on compressor design. On a very rough estimate of the values of the packages, these companies may agree to allow one another to use their patented developments without payment of royalties, though neither may actually need all the patents in the packages. Neither company may recover the costs of its developing program or of obtaining its patents, but each company will benefit from the other's work and will reap rewards from two development programs for the cost of one.

On work for national defense the Government usually indemnifies a contractor against infringement claims, particularly in the aircraft business where performance cannot be compromised by second-rate design or tortuous atempts to circumvent a patent. Even so it is the duty of the contractor to protect his government so far as he is able, and this is of some importance where foreign patentees are concerned.

If, for example, a Canadian company wishes to use an Avro Canada patent in a government contract, the government can to some extent dictate what reward, if any, shall be paid to Avro, but if Avro Canada wishes to use a patent belonging to a foreign firm the position is a little more delicate; the situation is a good deal easier if the foreign firm is interested in using a patent or a group of patents which Avro Canada controls.

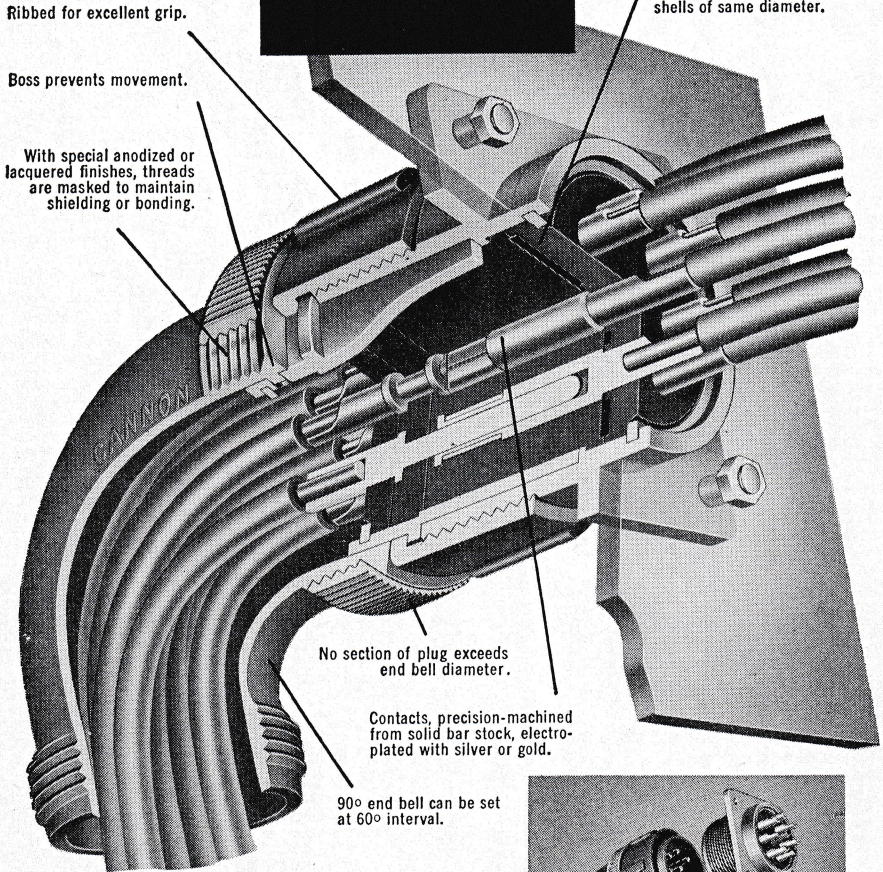
In the non-government market, a contractor must be prepared to fight his own battles and if we in Canada ever hope to sell an airplane south of the border we must be armed to defend ourselves "patentwise" against the inevitable pressure from the United States industry; otherwise our prices will be so inflated by the royalties which we shall have to pay, that they will be no longer competitive. Once again we must build up an armory of patents, to be used primarily for the defense of our industry.

In addition to the fields of invention bearing directly upon airframes and engines and their many services, the problems of manufacture and production are of major importance, and many patents dealing with machine tools and manufacturing processes have originated in the aircraft industry.

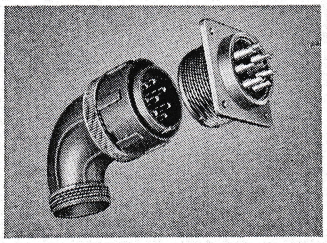
(Continued on page 38)

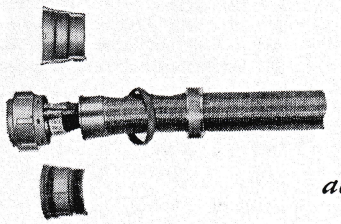
Here's why those in the know

—demand **CANNON PLUGS**



Type AN Connectors are made in 6 styles; straight and 90° cord plugs; box, wall, and extension cord receptacles; and special quick disconnect plugs. Fifteen diameters for inserts with contact arrangements from single to 100 contacts. Contact capacities from 5 to 200 amps. Peak voltages from 70 to 9,000 volts.





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Manpower—Three years ago, service and civilian defense personnel totaled 54,000. Today the figure is almost 90,000. During the next three years, service personnel will increase to 115,000, plus 33,000 civilians, a 65% increase over present strength.

"Because of the large requirements of the RCAF, not only in building up to its total of 40 regular and auxiliary squadrons, but also in the training services, the RCAF will . . . have more men than the Army has today and will be spending nearly as much as the other two services put together."

Avro Inventions Big Business

(Continued from page 19)

At present, a tremendous amount of work is being done on the ways and means of manufacturing blades for gas turbine engines and many patents are likely to come out of it. Consequently every development and production organization is protecting its rights to every invention it makes along this difficult and costly path.

Eventually one or two "answers" will materialize; the patents on these answers will be extremely valuable, for the competition, both commercial and international, is so intense that no one can afford to adopt second-rate or incomplete solutions to the problem.

From the foregoing it will be clear that patents exert a powerful but often-overlooked influence throughout the aircraft business and any company which ignores them altogether is asking for trouble. It is true that the extent to which various companies become involved varies considerably, but since the war there has been some renewed interest, especially in the relatively new arts such as helicopters and gas turbine engines which came into prominence during the war years.

The Patent Offices issue weekly publications giving details of the patents granted and hardly a week goes by without its share of helicopter and gas turbine patents, thrown in among the strange assortment of calculating machines, riding-boot driers, electrical appliances, brassieres, plastics, poultry pluckers and the rest.

Ownership of Patents—It is well-settled in common law that an employee must assign to his employer the rights to any invention which is made within the scope of his employment, and this is often confirmed by some form of Employee's Inventions Agreement which attempts to define this employer-employee relationship,

so that both parties will know where they stand. Accordingly when an employee dreams up an improvement which he believes to be new, he hands it over to his employer who then goes through the formalities of obtaining a patent.

In Canada the applicant for the patent may be the actual inventor or inventors, or anyone properly entitled to the invention. The employer usually arranges for the application to be prepared in the inventor's name, together with a form of assignment which will accompany the application to the patent office. By this means the patent, if and when granted, will be issued to the employer, the inventor being named in the patent documents as the "assignor."

Unfortunately the protection afforded by a patent is limited to the country in which it is granted and, if protection is wanted elsewhere, other applications must be filed. If they are filed within a year of the first filing, they can claim the priority date of the first. So the inventor and his employer have to sign their names a good many times before adequate protection in the major manufacturing countries is assured.

The relationship between employee and employer is reflected, at least in Canada, in the relationship between the employer and the government. Any patents procured by a company working on a government development contract are generally assigned to the Crown, on the theory that the Crown is the company's employer and pays for the development work from which the patents arose.

A Crown company, known as Canadian Patents and Development Limited, has been established to hold and exploit patents derived from such sources as the National Research Council and companies working on government development contracts. However patents assigned to the Crown are not altogether lost to the originating companies, since there are agreements between the companies and Canadian Patents and Development Limited whereby they can use the patents should the need arise.

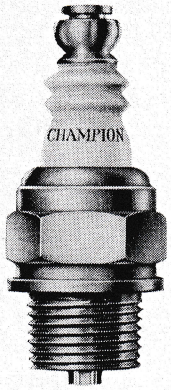
Awards to Inventors—The life of a patent varies in different countries; in Canada it is 17 years. When it has expired it cannot be renewed, the theory being that the government grants an inventor a protected monopoly of his invention for a specific number of years, in exchange for his disclosure of his invention so that the public can benefit from it; if he has not profited from this monopoly in 17 years and it is therefore virtually impossible to evaluate a patent at its inception. For this reason, in addition to the fact that many patents are not of much value on their own but have some value in helping to swell a "package," it is very difficult to establish a satisfactory scheme of awards in any industrial organization.

Every inventor is bound to receive some inspiration from his surroundings; he can consult specialists on the finer points of his invention; and he can often use the company's facilities for its test and development. It is therefore no easy matter to determine exactly how valuable a contribution has in fact been made by the employee recognized in law as the actual inventor. It is so complex a problem that every scheme of awards must inevitably be riddled with injustices and inequalities, not only between the inventors themselves but between the inventors and those employees whose non-inventive work may be of even greater value to the company's progress.

However most companies recognize that some incentive to invention is desirable, over and above the dim glory of immortality in Patent Office publications and there are all sorts of plans in operation. Some firms try to

AIRCRAFT ENGINES
AND ACCESSORIES

CANADA'S FAVORITE
CHAMPION
SPARK PLUGS



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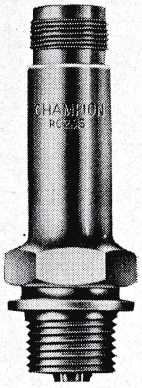

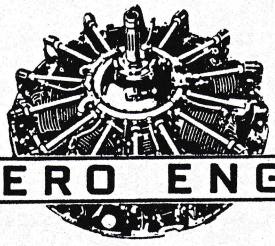

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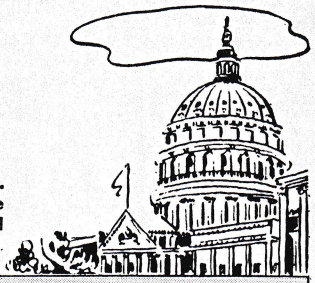

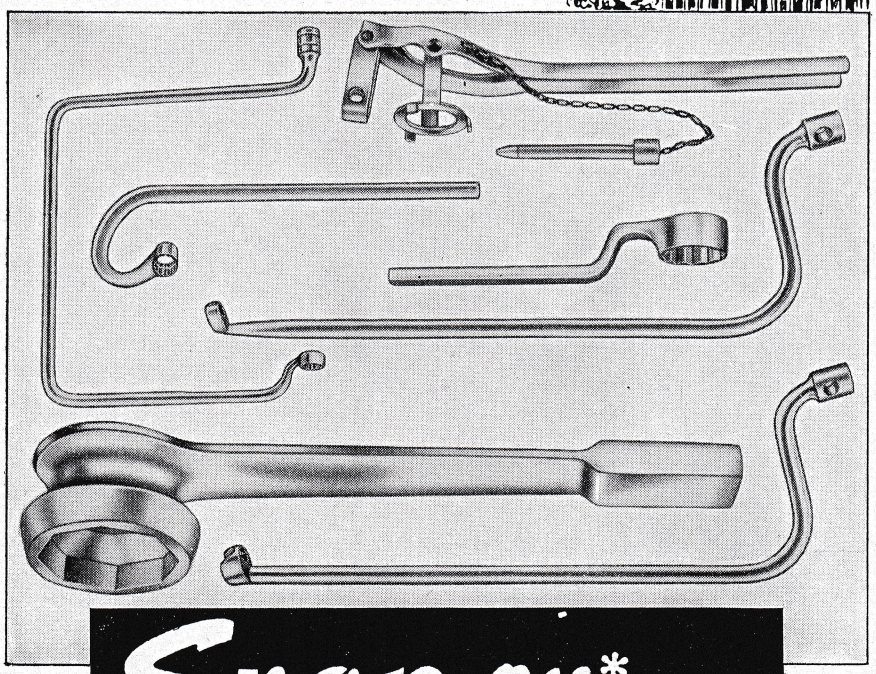

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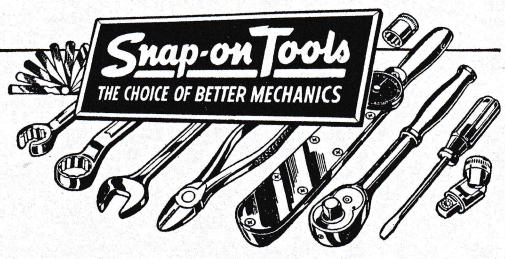

give their inventors a percentage of the royalties accruing from their patents, with or without a lump sum cash award: some have no scheme of awards at all. For their part, Canadian Patents and Development Limited work on the share-of-the-proceeds plan, which is a satisfactory arrangement between the Crown and government contractors but is not so well suited to the individual companies' dealings with individual inventor-employees.

The management of patents is a big subject and one on which we have very little experience in the aircraft industry in Canada. We have not been at it long enough to form any definite conclusions and we are shaping our course on the practices of others, through conditions so changeable that even the most experienced can give little advice. From the date of application it may be several years before a patent is granted and then there are 17 years or so in which to use the control which the patent gives.

In a couple of decades we will have learned some lessons and recognized some of our mistakes, but wars and government indemnities and the probable development of all sorts of complicated cross-licensing agreements with the growth of the industry, all these and many other factors combine to obscure the way ahead. In the meantime, however, we do all we can to stimulate and to apply the creative power of invention.

Defense Is Theme Of Flying Clubs

(Continued from page 24)

our hangar doors will rust in the closed position."

3. **Executive Interest and Action**—Gordon Ducklow — The flying club needs sound direction. As goes the board of directors, so goes the club. Board members should know flying as well as business administration.

Duties of the Board—a. Regular meetings hold the interest of the board; b. The board is responsible for setting club policy which is then passed on to management. The board should not interfere with management; c. Offer encouragement and incentive to the manager; d. The board should lead, not drive.

4. **Flying Club Publicity** — Ronald A. Keith—In the broadest sense, public relations is a four-pronged instrument. In involves: 1. Direct selling; 2. Promotion; 3. Customer service; 4. Publicity. Promotion and customer