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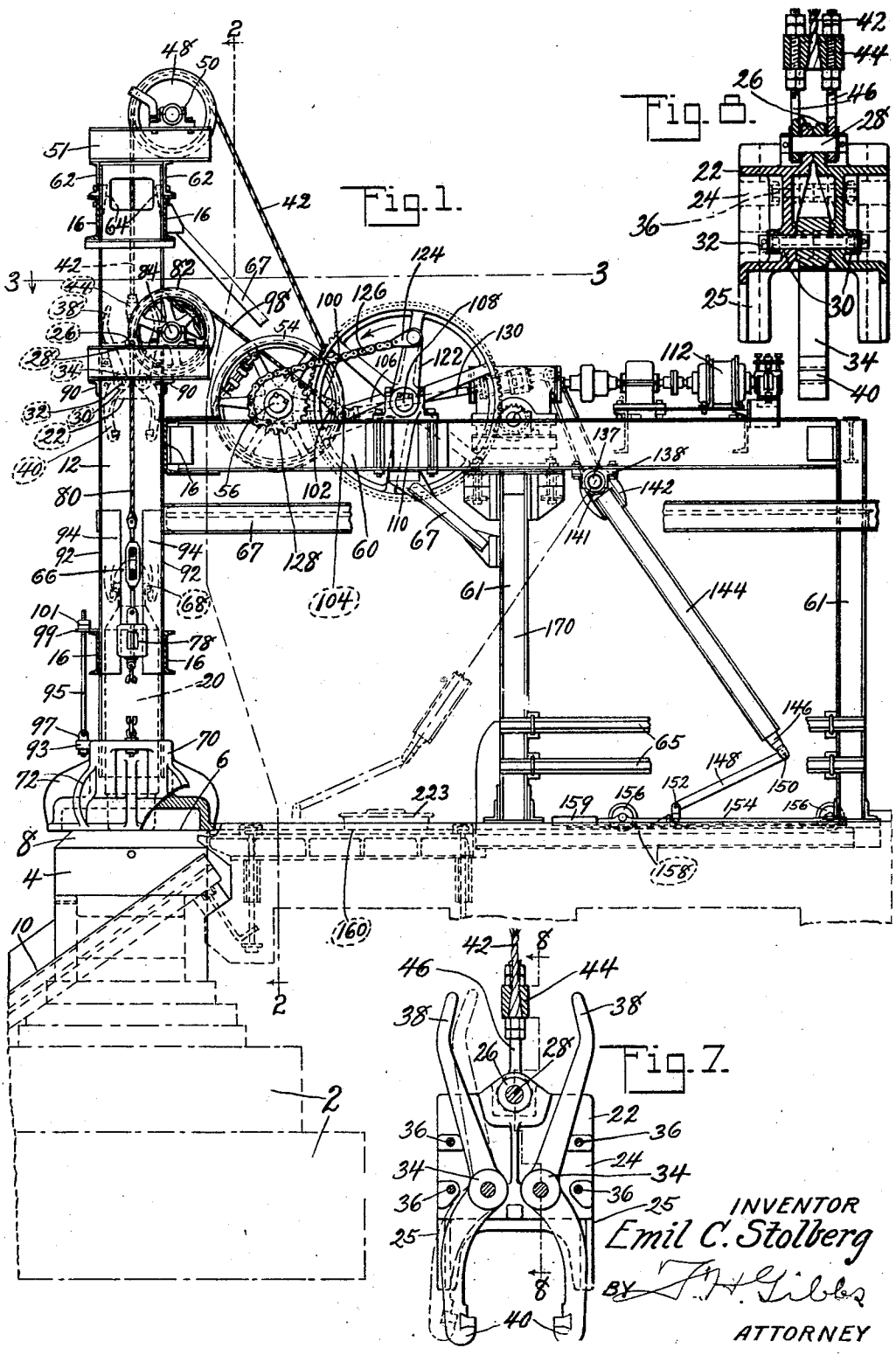
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WHEEL BREAKING MACHINE

Filed Feb. 14, 1929

3 Sheets-Sheet 1



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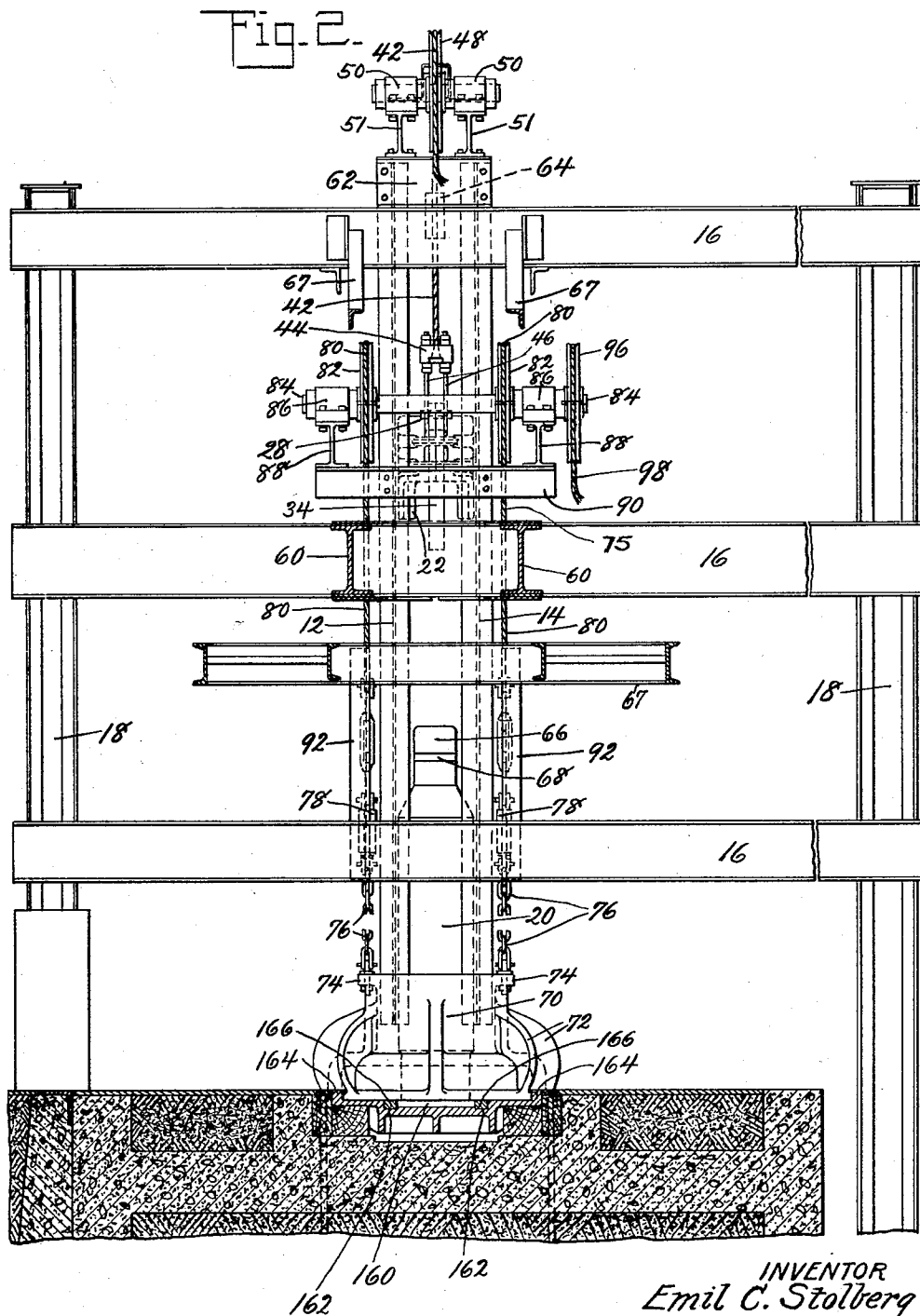
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WHEEL BREAKING MACHINE

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3 Sheets-Sheet 2



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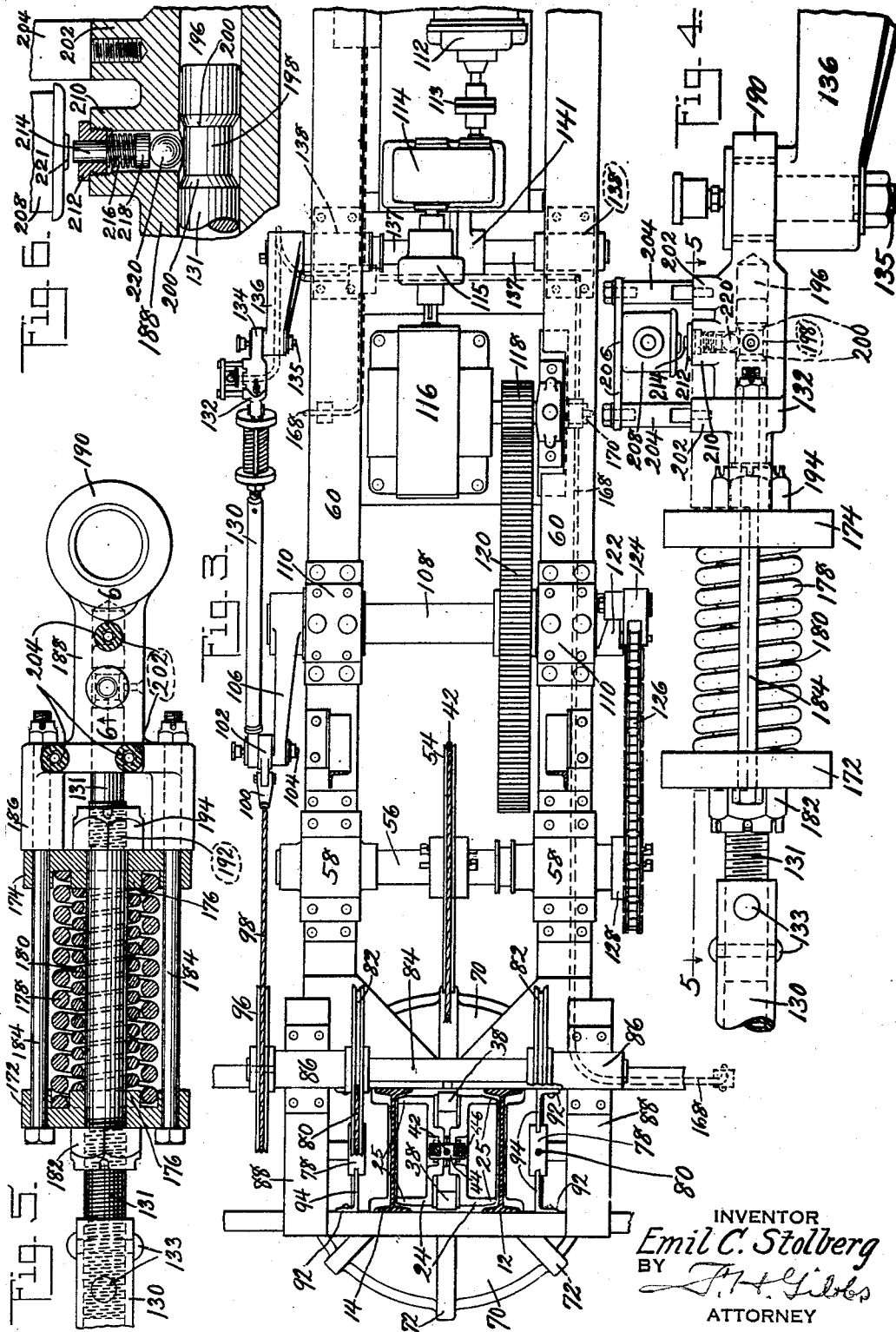
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WHEEL BREAKING MACHINE

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3 Sheets-Sheet 3



# UNITED STATES PATENT OFFICE

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## WHEEL-BREAKING MACHINE

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This invention relates to wheel breaking machines, and has for one object the provision of a machine of the character described in which the action proceeds automatically after a wheel is placed upon a platform adjacent the anvil of the machine.

Another object of the invention is the provision of a wheel breaking machine which is continuously operated and in which the various operations follow in predetermined sequence at predetermined intervals.

A further object of the invention is the provision of a wheel breaking machine in which the various operations follow in predetermined sequence at predetermined intervals and which machine is provided with an automatically operating safety device.

A still further object of the invention is the provision of a wheel breaking machine in which, should an emergency arise, the electric circuit which controls the operating mechanism for the machine will be broken automatically and the machine thus stopped.

Other objects and advantages of this invention will be apparent from the following description taken in conjunction with the accompanying drawings in which:

Figure 1 is a side elevation of the machine of the present invention, certain parts being shown in section and others being shown broken away;

Fig. 2 is a sectional view on the line 2—2, Fig. 1;

Fig. 3 is a partial top plan view of the device, the view being taken on the line 3—3, Fig. 1, certain parts being broken away;

Fig. 4 is an enlarged detail view of the safety mechanism associated with the device;

Fig. 5 is a sectional view on the line 5—5, Fig. 4;

Fig. 6 is a sectional view on the line 6—6, Fig. 5; and

Figs. 7 and 8 are detail views of the tong housing and tongs with a part of the elevating means therefor, Fig. 7 being a vertical section taken where the two halves, which constitute the housing, join, and Fig. 8 a vertical section taken on the line 8—8 of Fig. 7.

Referring now more in detail to the device

as shown in the drawings, the invention includes a base 2 of concrete, or other suitable material, upon which an anvil 4 is supported, the latter being of any preferred construction and having a top face 6 and a beveled upper edge 8. Secured to the base 2 adjacent the anvil is a chute 10 for receiving fragments of a broken wheel from the anvil and for discharging said fragments into a suitable pit, not shown.

At opposite sides of the anvil are placed uprights 12 and 14 which, in the instance shown, are supported by cross-pieces 16; the ends of which are secured to upright columns 18, as clearly shown in Fig. 2; the cross-pieces being bolted, riveted or otherwise secured to the uprights 12 and 14, whereby said uprights are maintained in a rigid manner in their predetermined spaced relation. The uprights 12 and 14 are preferably of such form as to provide guideways for a hammer 20 and a tong housing 22, and, in the present instance, are I-beams, as shown in Fig. 3. The tong housing 22 is formed of oppositely disposed members 24, which may be castings, arranged back to back, and having flanges 25 extending between the cords of the uprights 12 and 14 to be guided thereby (see Fig. 3). The members 24 are provided with apertured lugs 26 through which a lifting pin 28 extends (see Figs. 1, 2, 7 and 8) and, further, are provided with apertured lugs 30 which receive pins 32 for pivotally mounting the tongs 34; the latter including the elongated handles 38 and grab ends 40. The members 24 are connected together in assembled relation to form the housing, by bolts 36.

The tong housing, and hence the tongs, is raised by means of a cable 42 connected to a socket 44 secured to the tong housing by rods 46, the lower ends of which are connected to the lifting pin 28, as shown clearly in Figs. 7 and 8. While the arrangement shown and just described provides a satisfactory connection of the cable 42 with the tong housing, it is to be understood that this disclosure is merely illustrative, as, obviously, the cable 42 may be connected to the tong housing in any preferred or desired manner within the spirit and scope of the present invention.

The cable 42 extends upwardly, and is arranged over a sheave 48 mounted in bearings 50 supported by I-beams 51 secured to oppositely arranged channels 62 extending between and connected to uprights 12 and 14, and said cable 42 extends over and is connected to a sheave 54 mounted on an axle 56, which latter is supported in bearings 58 on a frame comprising spaced horizontal I-beams 60 and the vertical columns 61; the forward ends of the beams 60 being secured to one of the cross-pieces 16, as shown in Figs. 1 and 2. The frame further comprises guard-rails 65 and bracing members 67 to provide a rugged structure.

Secured to the inner channels 62 are trip-blocks 64 which are adapted to be engaged by the handles 38 of the tongs whereby to spread the grab ends 40 of the tongs as hereinafter to be described.

The hammer 20 may assume any desired form, but, in the instance shown, includes a head 66 provided with a horizontal rib 68 on each side thereof to furnish a means by which the grab ends 40 of the tongs may engage the hammer to elevate the latter.

Normally arranged immediately over the anvil and in a position to surround a wheel to be broken, is a cage 70 provided with reinforcing ribs 72 and with lugs 74, to which latter are secured the lower ends of lifting elements indicated generally at 75. These lifting elements are preferably flexible and, in the instance shown, include cables 80 and chains 76; counterweights 78 being provided at the lower ends of the cables 80 to which the upper ends of the chains 76 are secured. The upper ends of the lifting elements 75, more particularly the upper ends of the cables 80, are connected to sheaves 82 mounted outside of the uprights 12 and 14 respectively, on a shaft 84, supported in bearings 86, carried by brackets 88, mounted on and secured to supporting bars 90 arranged across the uprights 12 and 14, as clearly shown in Fig. 2. Adjacent the lower ends of the uprights 12 and 14 are opposed angles 92, the inwardly extending legs 94 thereof serving as guides for the counterweights 78, the latter being provided with slots on their side edges to receive the legs 94 of said angles, as clearly shown in Fig. 3.

In the operation of the device, as will be hereinafter pointed out, the cage is elevated and lowered to its normal position prior to the completion of the elevation of the hammer 20, and it is necessary that the cage remain in normal position surrounding the wheel to be broken until after the hammer has dropped on to the wheel, and, to effect this, the lifting elements are so arranged that a slight slack is provided therein, more particularly at the lower ends thereof. The lower ends of the lifting elements 75 might, of course, be cables, similar to the cables 80,

or the lower ends of said lifting elements may assume various forms, but, to provide a simple arrangement, the lower ends of the lifting elements have been indicated as chains.

Referring now to Fig. 1, it can be seen that one portion of the cage 70 normally seats or rests on the anvil when it is in its lowered position, while another portion is not directly supported, due to the beveled edge 8, and, to insure the proper positioning of the cage, the latter is provided with an apertured lug 93, to which the lower end of a supporting rod 95 is secured as by a clevis 97, the rod extending through an eye 99 secured to a cross-piece 16. The upper end of the rod 95 is threaded to receive adjusting nuts 101, whereby the cage may be properly adjusted to prevent any binding thereof with the uprights 12 and 14.

The shaft 84, hereinbefore mentioned, carries a sheave 96, at one end to which one end of a cable 98 is secured. The other end of the cable is connected to a socket 100 pivotally secured to a link 102 journaled on a pin 104, which latter is connected to a crank arm 106 secured to and rotatable with a shaft 108 mounted in bearings 110 on the frame members 60.

The frame formed of the members 60 supports the operating or actuating devices for the machine, and the same include a motor 112 connected by a coupling 113 to a reduction gearing 114, which latter drives a second reduction gearing 116 through the medium of a suitable connector 115. In the present instance, the connector 115 has been shown as a clutch element, but it is obvious that the reduction gearings 114 and 116 may be connected by means of any suitable coupling. In some cases, it may be advisable to use a manually operated clutch, and for this reason, the connector 115 has been shown as a clutch. The second reduction gearing 116 drives a pinion 118 which is in mesh with a large gear 120 mounted on the shaft 108 heretofore mentioned. The shaft 108 carries the crank 106 at one end thereof, and its other end is provided with a crank 122 having a link 124 carried thereby, to which one end of a sprocket chain 126 is connected. The opposite end of the sprocket chain 126 is arranged over and secured to a gear 128 mounted on the end of the shaft 56 heretofore mentioned. The pin 104 carried by the crank 106 has pivotally connected thereto one end of actuating rod 130, the other end of which is connected to a safety mechanism indicated generally in Fig. 3, at 132, and which is pivotally connected at 134 to a pin 135 carried by a crank 136 secured to one end of a shaft 137 arranged in bearings 138 attached to the frame members 60. Secured to the shaft 137, intermediate the bearings 138, is a hub 141 (see Fig. 1) having a bifurcated portion 142 into which one end of a pusher lever 144 is se-

cured. The lever 144 may be of any preferred form, and carries a bracket 146 at its lower end to which a link 148 is pivotally connected, as at 150; the opposite end of the link being pivotally secured at 152 to a pusher carriage 154 mounted on rollers 156 which travel on rails 158. The carriage 154 is of suitable form and at its forward end is provided with a pusher 159.

As will be pointed out, the carriage 154 reciprocates toward and from the anvil, and is movable forwardly to and over a wheel slide 160, the pusher 159 being adapted to force a wheel, which has been placed on the slide 160, on to the anvil 4.

The wheel slide is shown in section in Fig. 2, and may comprise a casting having a longitudinal depressed area 162, the depressed area being provided with longitudinal wear-strips 166 serving as rails over which the rollers 156 travel during the movement of the carriage 154, and flanged sides 164, the casting or wheel slide extending to the anvil, as clearly shown in Fig. 1.

The wheel breaker of the present invention is actuated by an electric motor 112, and electric wiring is indicated at 168, but, inasmuch as the particular electric circuits form no parts of the present invention, they are not described in detail. Suffice to say, that a main starting switch 170 is provided for normally starting and stopping the motor, and, further, the safety mechanism 132 is included for the purpose of breaking the circuit and stopping the machine in an emergency. In addition, it will be noted that during operation of the machine of the present invention, there is a normally closed electric circuit which is automatically broken by the safety mechanism, hereinafter described, by the continued operation of the machine upon the stopping of the pusher lever occasioned by its encountering an abnormal resistance; all as more clearly pointed out hereafter.

The safety mechanism is clearly indicated in Figs. 4, 5 and 6, wherein it can be seen that the extension rod 131, which, in practice, is pinned, as at 133, to the rod 130, extends through spaced spring seats or followers 172 and 174, respectively, said followers being provided with bosses 176, between which followers springs 178 and 180 are concentrically arranged. As clearly shown in Fig. 5, the springs 178 and 180 are of different tension, spring 178 being seated in the recess defined by the bosses, 176, while the bosses themselves serve as seating means for the concentric spring 180 arranged around the rod 131. The threaded end of rod 131 is provided with a nut 182, or other suitable backing means, for the plate 172, and the plates 172 and 174 are connected by tie-bolts 184 extending through said plates and through the ends 186 of a bifurcated connector 188, the outer end

of which later is ring shaped, as at 190, to engage the pin 135.

Intermediate the ends of the rod 131 a threaded portion 192 is provided to which a nut 194 is secured for an obvious purpose. The connector 188 is provided with a longitudinal recess 196 which receives the free end of the rod 131, as clearly shown in Fig. 6. Also, as shown in this Fig. 6, the rod 131 adjacent its free end is provided with an annular recess 198, the walls of which are beveled as shown at 200. The connector 188 is provided with tapped lugs 202 to which vertical posts 204 are secured. In the instance shown in the drawings, particularly Fig. 5, three posts 204 are shown, although obviously this is merely by way of example, and said posts support a plate 206 from which a switch box 208 depends. The connector 188 is also provided with an apertured lug 210, the end of which is normally closed by a plug 212 having a central aperture therethrough in which a plunger 214 is mounted; the plunger being normally urged in a downward direction by a spring 216 and having a head 218 seating on the ball 220. As clearly shown in Fig. 6, the spring 216 retains the plunger in spaced relation to the push button 221 of the switch box 208, and also serves to retain the ball 220 in contact with the rod 131. During normal operation of the device, the ball is received or seated in the recess 198 of the rod 131. The switch box 208 is of such form that, upon actuation of the plunger 214, the driving circuit for the machine of the present invention will be broken and the machine therefore stopped automatically. Plunger 214, it will be apparent, is actuated by movement of the rod 131 relative to the connector 188, whereby the ball 220 is forced up either of the bevels 200 on to the periphery of the rod 131.

In operation, assume the parts to be arranged in the position shown in full lines in Fig. 1. A car wheel to be broken is indicated at 223, the same being placed on the wheel slide 160, as shown in dotted lines in Fig. 1. The machine is now ready to operate to break a wheel. The main starting switch 170 is then actuated. The switch 170 may be an ordinary push button switch or any preferred type of switch. Closing the circuit by the switch 170 will start the motor 112 which will drive the reduction gearings 114 and 116, and hence the pinion 118, which latter will rotate the large gear 120 in a counter clockwise direction. Rotation of the gear 120, it is apparent, will rotate the shaft 108 and actuate the cranks 106 and 122. Rotation of the crank 106 will pull the cable 98 to turn the shaft 84, which latter will turn the sheaves 82 and elevate the cage 70 to clear the anvil 4. While this action is taking place, it will be apparent that the crank 122 will be rotated counter clockwise, this

5 permitting the tong housing 22 to descend by gravity, due to the weight of said housing, and, while so doing, of course, the sheave 54 will be rotated, turning the shaft 56 and the gear 128. Because of the weight of the housing 22, the cable 42 will be prevented from jumping off of sheaves 48 and 54. When the housing 22 reaches substantially its lowest position, the tongs will engage the weight and, at this time, the crank 122 will have completed approximately one-half of one revolution, or will have traveled about 180°. Preferably the cable 42 is of such length as to permit slight slack therein when the housing has reached its lowermost position to provide for variations in the positions of the hammer 20 in use. For example, if the hammer is resting upon a fragment of a broken wheel, it will be arranged slightly higher than if it were resting directly on the anvil and the cable 42 is long enough to permit the tongs to grab the hammer at its lowest possible position. Continued rotation of the gear 120, and hence crank 122, will reverse the direction of rotation of the gear 128, which will obviously rotate the sheave 54 similarly and elevate the tong housing and the tongs will elevate the hammer 20. The machine at this time, it can be seen, has the cage elevated, or, to be more exact, the cage and hammer 20 are being simultaneously elevated, whereby to clear the anvil, and, during this movement, the crank 106 is actuating the crank 136, through the medium of the rod 130, forcing the crank 136 rearwardly to turn shaft 137, and therefore move lever 144 and the pusher forwardly to the extreme forward position and push the wheel on the wheel slide 160 on to the anvil 4. Continued rotation of the gear 120 causes the crank 106 to complete its rotation, withdrawing the pusher 159 to its normal position. The cage, it is apparent, will descend by gravity. It can be seen that the counterweights 78 will continue to descend after the cage is seated; that is, when the cage is in normal position the distance which the counterweights descend being commensurate with the length of cable 80. The lifting elements are of such length as to permit a slight slack therein when the cage is in normal position, and the counterweights provide a means for retaining the cables 80, and hence the cable 98, taut. This provides a variable slack in the cage lifting elements 75, particularly in the chains 76, to effect a dwell in the operation of the cage. By this is meant that the cage is permitted to remain in normal position around a wheel to be broken a predetermined time, sufficient to allow the hammer to operate before the initiation of the next successive lift or elevation of the cage. While the counterweights 78 are descending, the handles 138 of the tongs engage the trip-blocks 64 to release the tongs from their en-

gagement with the hammer and permit the hammer to fall on to the wheel to break the same, the wheel fragments being prevented from scattering by the cage.

From the above description, it is believed apparent that the operation of the machine will be fully understood by those skilled in the art.

It is possible, of course, that an emergency may arise, such for example, as a wheel becoming jammed or wedged on the slide, or the pusher might be jammed. In this event, breaking of certain parts of the device may occur. For example, if the pusher carriage jams, the joint at the hub 141 may give way. To avoid such an occurrence, the safety mechanism has been supplied. Let us assume that the carriage 154 is jammed. Rearward movement of the lever rod 130 is therefore against an element which is tending to remain stationary. If the jam is sufficient, it is apparent that the rod 131 will move in the recess 196, whereupon the ball 220 will be urged upwardly to actuate the plunger 214 which, in turn, will act on the button 221 to break the circuit for the machine and thus stop the latter from further operation until the jam has been relieved.

The drawings disclose one embodiment of the invention, but it is to be understood that these drawings are for illustrative purposes only and that various changes in the form and proportions of the device may be made within the scope of the appended claims without departing from the spirit of the invention.

What is claimed is:

1. In a wheel breaking machine, an anvil to hold a wheel to be broken, a cage normally arranged adjacent the anvil to surround the wheel to be broken, a hammer, a pusher for forcing the wheel to be broken onto the anvil, means for elevating the hammer and cage, means for reciprocating the pusher, and actuating means common to the elevating and reciprocating means for operating said elevating and reciprocating means in predetermined sequence.

2. In a wheel breaking machine, an anvil to hold a wheel to be broken, a cage normally surrounding the wheel, a hammer, means for elevating the cage, tongs for lifting the hammer, a pusher adapted to force a wheel to be broken on to the anvil, and common mechanism for simultaneously actuating the cage, tongs and pusher in predetermined sequence.

3. In a wheel breaking machine, an anvil, upright guideways adjacent the anvil, a hammer in said guideways, a cage around said guideways and normally arranged immediately above the anvil, tongs guided by the guideways for elevating the hammer, a cable to which the tongs are secured, a cable for elevating the cage, sheaves to which the cables are secured, a pusher for forcing a wheel to

be broken onto the anvil, a lever for actuating said pusher, and means for operating said sheave and pusher lever simultaneously in predetermined sequence whereby the pusher forces a wheel onto the anvil after the cage is elevated and whereby the hammer is released from the tongs after the cage reaches its normal position.

4. In a wheel breaking machine, an anvil, a cage normally adjacent the anvil, a hammer, means for lifting the hammer, a pusher for forcing a wheel onto the anvil, a pusher lever, means for elevating the cage, means for operating the lifting means, elevating means and pusher simultaneously in predetermined sequence, and automatic means for stopping the operating means upon failure of the pusher means.

5. In a wheel breaking machine, an anvil, guideways arranged adjacent the anvil, a hammer slidable in the guideways, means for lifting the hammer, a cage normally adjacent the anvil, cables for lifting the cage, sheaves to which the cables are connected, an actuating sheave for operating the cable sheaves, a sheave to which the hammer lifting means is secured, a pusher, a lever for reciprocating the pusher, and driving mechanism for reciprocating said pusher and the sheaves simultaneously in predetermined sequence.

6. In a wheel breaking machine, an anvil, a hammer, a cage, a pusher, lifting means for the hammer and cage, drive means for simultaneously actuating the hammer, cage and pusher in predetermined sequence, and automatically operating means for stopping the drive means upon failure of the pusher.

7. In a wheel breaking machine, an anvil, a hammer adapted to cooperate with said anvil, vertical guideways for the hammer, a housing movable in the guideways, tongs carried by the housing, a cage normally just adjacent the anvil and arranged around the guideways, a horizontal frame extending from the guideways, a driving mechanism mounted on the frame, cables for lifting the tong housing and cage, sheaves actuated by the driving mechanism for lifting the tong housing and cage, and a pusher actuated by said driving mechanism simultaneously with the elevation of the tong housing and cage.

8. In a wheel breaking machine, an anvil, a hammer, a cage normally just adjacent the anvil, a pusher for forcing a wheel onto the anvil, cables connected to the hammer and cage, sheaves to which the cables are connected, a main driving element, cranks rotated by said driving element for actuating the said sheaves to simultaneously lift the hammer and cage, and a lever connected to the pusher and to one of said cranks to reciprocate said pusher, the forward movement thereof occurring while the cage is in elevated position.

9. In a wheel breaking machine, an anvil,

upright elements adjacent the anvil, a hammer between said uprights, a tong housing guided in said uprights, tongs pivoted in said housing, a sheave at the upper ends of said uprights, a cable connected to the tong housing and arranged over the sheave, a cage normally arranged immediately over the anvil, spaced sheaves supported by the uprights, cables secured to said sheaves and cage for lifting the latter, said cage being adapted to descend by gravity, counterweights for maintaining the cables taut, a main driving element, and means driven by said main driving element for simultaneously lifting the cage and hammer, said means being adapted to lift the cage its full distance prior to the completion of elevation of the hammer and permitting the cage to be lowered to normal position prior to the completion of elevation of the hammer.

10. In a wheel breaking machine, an anvil to hold a wheel to be broken, a cage normally surrounding the wheel, a hammer, a pusher, means for lifting the cage, and means connected to the pusher and cage elevating means for forcing the pusher forwardly upon lifting of the cage and for withdrawing the pusher prior to lowering of the cage.

11. In a wheel breaking machine, an anvil to hold a wheel, a cage normally surrounding the wheel and adapted to lower to normal position by gravity, a pusher, means for lifting the cage, driving means for actuating the cage lifting means, and a lever operatively connected to the said driving means for forcing the pusher forwardly simultaneously with the lifting of the cage and for withdrawing it prior to the normal positioning of the cage.

12. In a wheel breaking machine, an anvil to hold a wheel, a cage normally surrounding the wheel and movable upwardly therefrom and adapted to be lowered by gravity, means for lifting the cage, a driving element for actuating the cage lifting means, a lever connected to the pusher and to the driving means for forcing the pusher forwardly simultaneously with the lifting of the cage, and automatic means operable upon failure of the pusher for stopping the driving means.

13. In a wheel breaking machine, an anvil, a wheel slide adjacent thereto, uprights adjacent the anvil, a hammer guided thereby, tongs guided in said uprights and adapted to lower by gravity to grip the hammer, a cage normally arranged immediately over the anvil and adapted to drop to normal position by gravity, means for lifting the tongs to elevate the hammer, means independent of the tong lifting means for elevating the cage a lesser distance than the hammer, a main driving element, means operated by the driving element for actuating the hammer and cage lifting means, and a pusher connected for operation to the actuating means for the cage lifting means.

14. In a wheel breaking machine, an anvil, a hammer, a cage normally arranged immediately over the anvil, driving mechanism, means driven by said driving mechanism for elevating the hammer, means secured to the cage for lifting the latter by the driving mechanism simultaneously with the elevation of the hammer, said lifting means being of such length as to permit a slack therein, whereby the elevation of the cage is initiated after the hammer is dropped.

15. In a wheel breaking machine, an anvil, a hammer, a cage normally arranged immediately over the anvil, driving mechanism, means driven by said driving mechanism for elevating the hammer, means secured to the cage for lifting the latter by the driving mechanism simultaneously with the elevation of the hammer, said lifting means being of such length as to permit a slack therein, whereby the elevation of the cage is initiated after the hammer is dropped, and counterweights for maintaining said cables taut.

16. In a wheel breaking machine, an anvil, a cage normally adjacent the anvil, a hammer, means for lifting the hammer, means for lifting the cage, mechanism for simultaneously actuating the cage lifting means and hammer lifting means, a pusher for forcing a wheel to be broken on to the anvil, and a lever connected to the pusher and to the aforesaid mechanism and actuated by the latter for operating the pusher.

17. An apparatus for breaking car wheels comprising an anvil, a cage normally arranged adjacent the anvil, a pusher, common mechanism for actuating the pusher and cage in predetermined sequence to force a wheel to be broken on to the anvil, a hammer for breaking the wheel, and a reciprocating device automatically engaging the hammer upon starting an upward stroke of its reciprocation and automatically releasing said hammer at the limit of its upward stroke.

18. An apparatus for breaking car wheels comprising an anvil, a cage normally arranged adjacent the anvil, a pusher, common mechanism for actuating the pusher and cage in predetermined sequence to force a wheel to be broken on to the anvil, a hammer for breaking the wheel, a lifting device for said hammer, said lifting device having jaws engaging the hammer to lift the same, and means whereby said jaws are released at the limit of their upward movement.

19. An apparatus for breaking car wheels comprising an anvil, a cage normally arranged adjacent the anvil, a pusher, common mechanism for actuating the pusher and cage in predetermined sequence to force a wheel to be broken on to the anvil, a hammer for breaking the wheel, a lifting device for said hammer, said lifting device having jaws engaging the hammer to lift the same, and means ar-

ranged inside the path of movement of said jaws for disengaging the latter from the hammer at the limit of the upward movement of said jaws.

20. In a wheel breaking machine, an anvil, a cage, a hammer, a pusher for forcing a wheel onto the anvil, a pusher lever, power driven means for actuating the cage, hammer and pusher lever, and automatic means for shutting off the power to said power driven means when said pusher encounters an abnormal resistance to its normal movement.

21. In a wheel breaking machine, a pusher for forcing a wheel into position to be broken, a lever for actuating said pusher, power driven means for actuating the lever, and automatically actuated means for cutting off the power to said driven means when the pusher encounters an abnormal resistance to its normal movement.

22. The combination with a wheel breaking machine comprising an anvil, a hammer, a cage, and mechanism for actuating said hammer and cage, of a pusher connected to said mechanism, a normally closed electric circuit for controlling the operation of said actuating mechanism, and a circuit breaker for breaking the electric circuit when the pusher encounters an abnormal resistance to its normal movement.

23. The combination with an electrically operated wheel breaking machine, of a pusher lever for forcing a wheel into position to be broken, a normally closed electric circuit for operating the machine, and a control for the circuit actuated upon the stopping of the pusher lever occasioned by its encountering an abnormal resistance.

24. The combination with an electrically operated wheel breaking machine, of a pusher lever for forcing a wheel into position to be broken, a normally closed electric circuit for operating the machine, and a control for the circuit actuated by the continued operation of the machine upon the stopping of the pusher lever occasioned by its encountering an abnormal resistance.

In witness whereof I have hereunto set my hand.

EMIL C. STOLBERG.