

Oct. 10, 1933.

E. DAVIS

1,929,484

CONTROL FOR POWER MECHANISM

Original Filed June 12, 1926 3 Sheets-Sheet 2

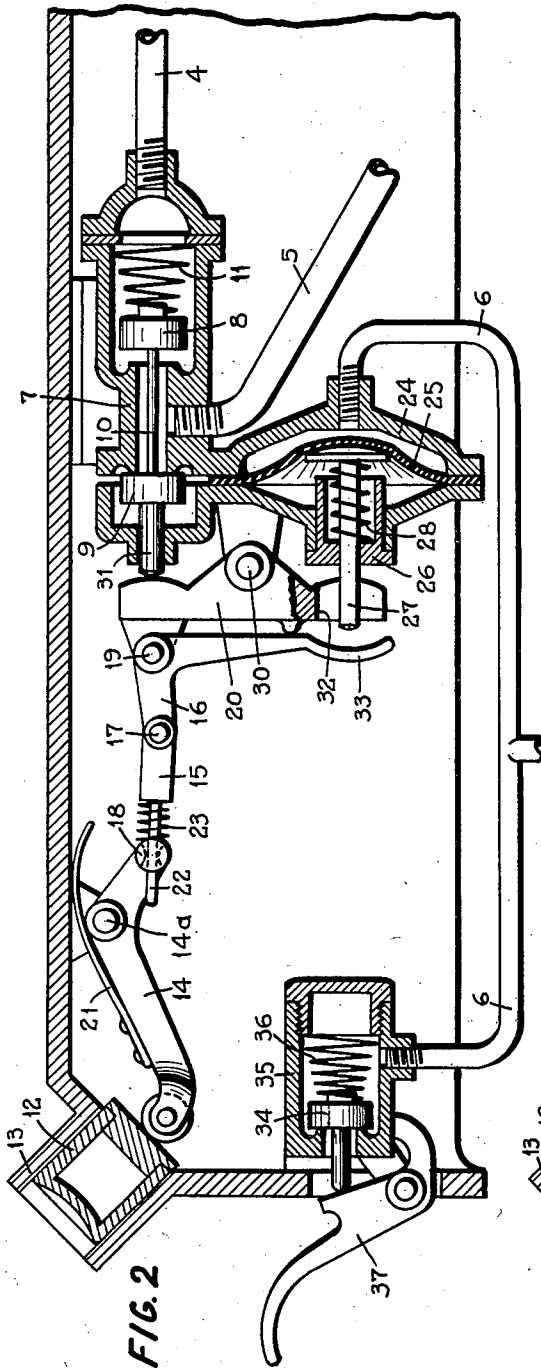


FIG. 2

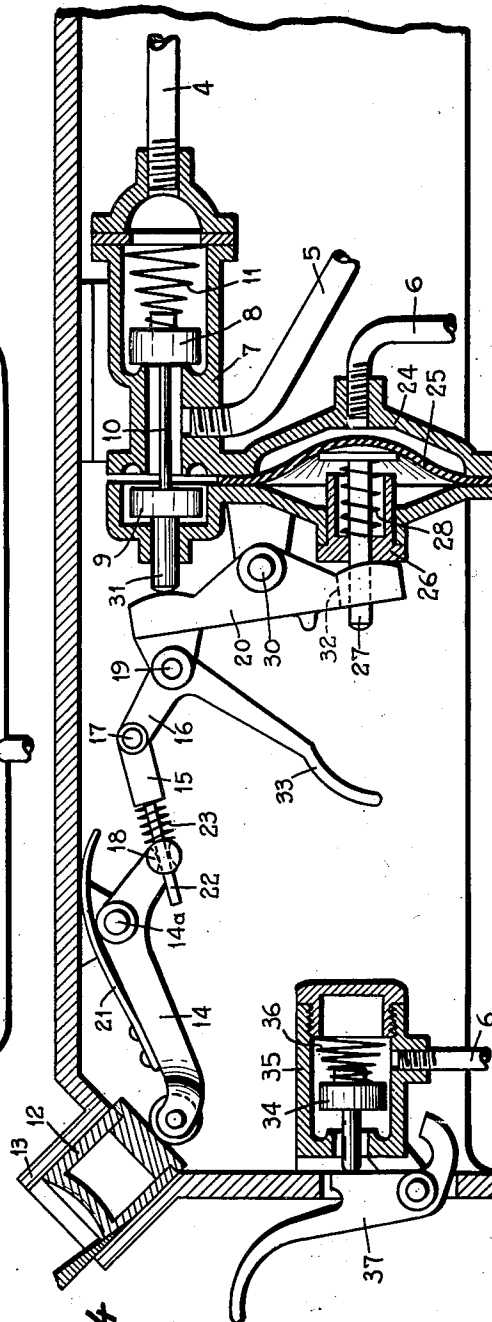


FIG. 4

INVENTOR
ERNEST DAVIS
BY
Bohleber & Ledbetter
ATTORNEYS

Oct. 10, 1933.

E. DAVIS

1,929,484

CONTROL FOR POWER MECHANISM

Original Filed June 12, 1926 3 Sheets-Sheet 3

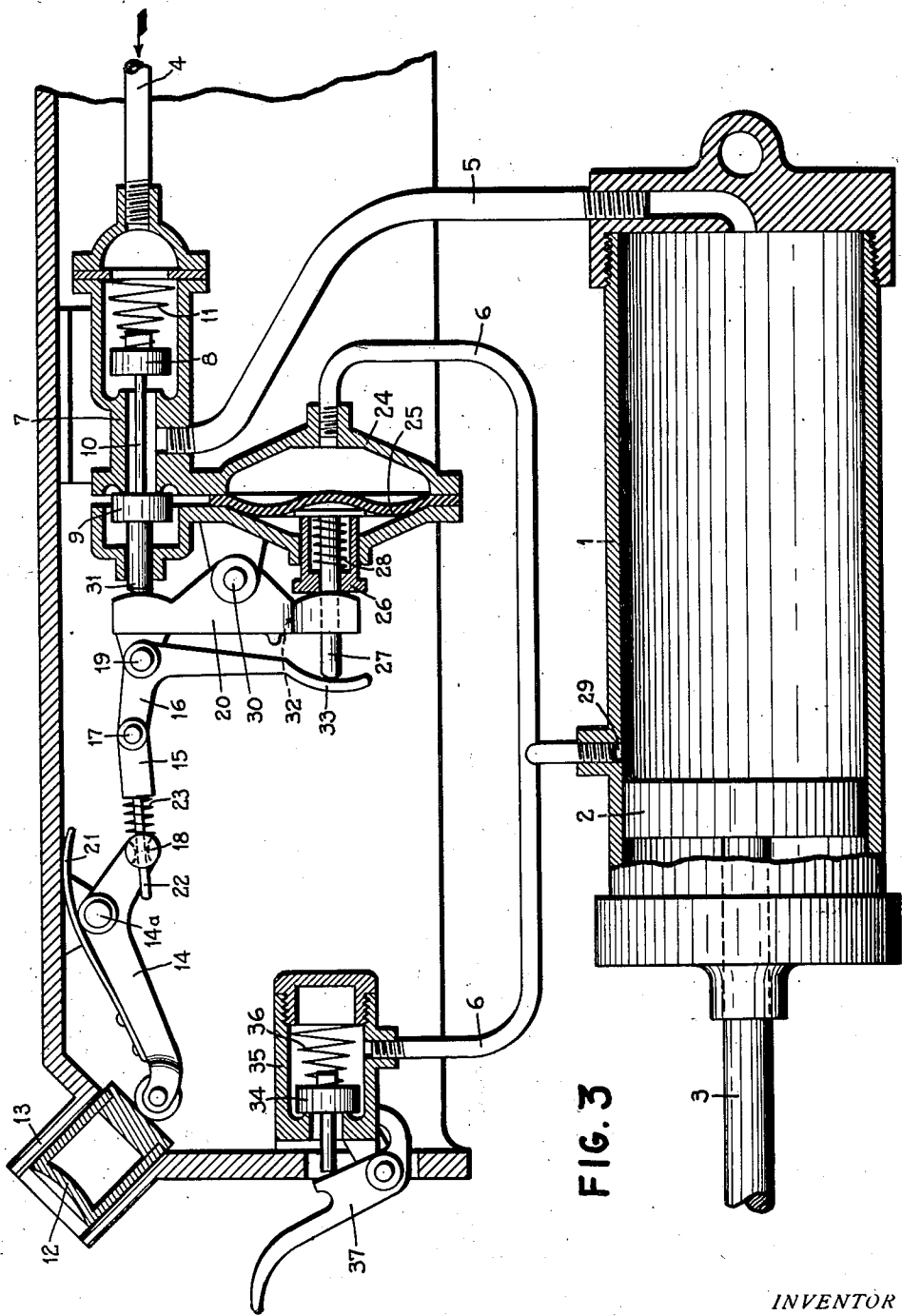


FIG. 3

INVENTOR
ERNEST DAVIS
BY *Bohleber & Ledbetter*
ATTORNEYS

UNITED STATES PATENT OFFICE

1,929,484

CONTROL FOR POWER MECHANISM

Ernest Davis, Syracuse, N. Y., assignor to The
Prosperity Company Inc., Syracuse, N. Y., a
corporation of New York

Application June 12, 1926, Serial No. 115,451
Renewed March 28, 1931

17 Claims. (Cl 121—38)

This invention relates to controlling mechanism for machines which are actuated by a fluid motor or by a reciprocating motor, or a motor actuated machine which is controlled by a manual, operable to start the machine going, and to automatically stop it, and also operable to prevent repeating of the operation except upon another manipulation of the handle or handles, that is, a control in which the handle can not be permanently set, or in which each operation of the machine requires that the operator manipulate the handle or other manual.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

This mechanism is particularly adapted to control the operation of pressing machines as garment and laundry pressing machines, particularly machines having a two hand control as it provides a means whereby the handle may be operated preliminary to each operation of the machine and can not be permanently tied down or held down so that the machine will repeat automatically or operate with one handle while the other handle is tied down.

This invention is designed for use with pressing machines of the two hand control type.

Figure 1 is a cross section through the control mechanism in open press or inoperative position and as applied to one handle or manual, the construction for the one handle shown being the same for two manuals or a two-hand control such as shown in my Patent 1,609,273 issued November 30, 1926 for Pneumatic control and safety device for pressing machines.

Figure 2 is a cross section through the control mechanism with the manual depressed and the parts in operated position.

Figure 3 shows the control mechanism in cross section with the piston of the motor in operated or closed press position and with the valve holding mechanism operated to hold the valves in operated position.

Figure 4 is a cross section through the control mechanism showing the manual tied in operated position and with the air exhausted from the diaphragm chamber, yet the valves return to inoperative position.

This control means is shown as applied to a fluid motor as a cylinder having a piston movable therein.

This mechanism comprises generally a fluid operated motor, a conduit system for conducting a motive fluid to and from said motor, valves in said system manually operable from their normal

position, means tending to automatically return them to a normal position, fluid operated means connected in said conduit system for holding the valves in their manually operated position, the manual means for operating the valves including a handle and connections between the handle and the valves, an interlock between such connections and the fluid operated means whereby the fluid operating means not only holds the valves in their operated position, but also, when the fluid operated means is released, operates said connections to permit the valves to return them to their normal position regardless of whether or not the handle is being held down by the operator.

As before stated, the motor comprises a cylinder and a piston movable in the cylinder, although any other form of motor or actuating means which stops after it is moved through part of its cycle of movement may be used.

1 designates the cylinder, and 2 the piston movable in the cylinder which piston has a rod 3 designed to be connected to the mechanism of a machine to be actuated.

The conduit system for conducting motive fluid to and from the cylinder comprises an intake pipe 4 for a motive fluid as air, a combined intake and exhaust pipe 5 leading to one end of the cylinder and pipe 6 to be presently described.

The system also includes a valve casing 7 connecting the pipes 4 and 5, and having intake and exhaust valves therein which are manually operable from their normal position, and fluid operated means for holding the valves in their manually operated position, such fluid operated means being connected to the pipe 6.

8 and 9 are respectively intake and exhaust valves within the valve casing 7, these valves being connected together by a stem 10 so that they act as a unit. The pipe 5 leads from the casing 7 at a point between the valves 8 and 9. The valves are normally arranged with the intake valve 8 closed or against its seat and exhaust valve 9 open or away from its seat and these valves are held in their normal position by a spring 11.

The means for manually operating the valves comprises a handle 12 and connections between the handle and said valves, these connections including a yielding part which permits the valves to be moved toward their normal position by the spring 11 when the automatic means tending to hold them in their operated position is released, and the operator holds down the handle 12.

The handle is here shown as a push button slidable in a suitable guideway 13. The con-

nections as here shown comprise a part as a lever 14 coacting directly with the handle 12, a pair of links 15 and 16 pivoted together at 17 at their adjacent ends and link 15 being connected at its other end 18 to the lever 14, and the other end of link 16 is pivoted at 19 to an interlocking member or lever 20 located between the fluid operated holding means and said connections or said valves. The lever 14 is shown as pivoted at 14a to the frame and as pressed against the push button 12 by a suitable spring 21.

The link 15 is provided with a rod 22 which slides diametrically through its pivotal connection 18 with the lever 14 and a spring 23 yieldingly resists such sliding or endwise movement of the link 15. The hole in the pivot 18 for the rod 22 is large enough to permit the rod to rock or fulcrum in said hole.

The fluid operated or movable means here shown, comprises a pressure chamber 24 and a diaphragm 25 in said chamber. A compound plunger is operated by said diaphragm. This plunger is here shown as an outer member 26 slidable in a suitable passage through the side of the diaphragm chamber, an inner member 27 slidable in the member 26 and extending beyond the end of the same, and a spring 28 interposed between said members and tending to cause them to act as a unit until the movement of one of them is limited. The outer member 26 of the compound plunger and the rocker arm 20 are holding devices which with the diaphragm 25 comprise locking or holding means for retaining the valves 8, 9 or control means in operated position. The inner member 27 with the diaphragm 25 comprise the means which is operable upon a predetermined movement of the motor and renders the normally operative connection between the handle 12 and the control means or valve stem 31 inoperative upon the existence of three conditions, namely, first, the motor means moving a predetermined distance to open the port 29 wherever it may be, secondly, upon the release of the holding means and, thirdly, upon the handle 12 being held depressed or in operated position.

The diaphragm chamber is connected in the conduit system and as here shown, it is connected by the pipe 6 to a port 29 in the cylinder arranged to be uncovered by the piston 2 when the piston is at or nearly at the limit of its power stroke. When the piston 2 does uncover the port 29, air passes into the diaphragm chamber and actuates the diaphragm to the opposite side of the chamber from that seen in the drawings, and in so doing, thrusts the compound plunger outwardly, the outer member 26 thereof thrusting against one arm of the lever 20, which lever is pivoted at 30 between its ends. The other arm of said lever coacts with a plunger 31 extending through a passage in the valve casing 7 and thrusting against the exhaust valve 9. The whole arrangement or holding means is such that the lever 20 when being acted upon by the diaphragm 25 holds the valves 8 and 9 in the position shown in the drawings to which they have been operated by the depression of the handle 12 or holds the press in closed position.

The member 27 of the plunger passes through a slot 32 in the lever 20 and engages an arm 33 of the link 16. That is, the link 16 is a bell crank, and the arm 33 thereof extends along the lever 20. The connections are normally in the position shown in Figure 1 and when the push button or handle 12 is depressed, the links 15 and 16 first move into the position shown in Figure 2 from

the position shown in Figure 1 and thus through the lever 20 and plunger 31 move the exhaust valve 9 to its closed position and the intake valve 8 to its open position. The motive fluid now passes from the pipe 4 to the cylinder 1, actuating the piston 2 until it uncovers the port 29 so that the air passes to the diaphragm chamber 24 and operates the diaphragm 25 and plunger member 26 which engages lever 20 to hold the valves 8 and 9 in their operated positions and thereby holds the press closed. After the movement of the lever 20 is limited by reason of the valve 9 engaging its seat, further movement of the diaphragm 25 moves the inner plunger section 27 relatively to the outer section 26 against the spring 28 so that the inner section 27 actuates the arm 33 into the position shown in Figure 3, and in so doing, moves the links 15, 16 into the position also shown in Figure 3. It will be observed, therefore, that the connection between the handle or button 12 and the control means or valve 7 is broken after the holding means is operated to hold the press in closed position.

When the pressure in the chamber 24 is released, the spring 11 acts to close the valve 8 and open the valve 9. This can be done regardless of whether or not the handle is being held down, owing to the fact that the link 15 and arm 16 are in their upper or dotted line position, that is, the pivot 17 connecting them is above the dead center line passing through the pivotal points 18 and 19. Thus, if the push button 12 is held depressed, when the release lever 37 is operated, parts 15 and 16 will move upwardly farther out of the dead center line as the valve 8 closes and the valve 9 opens. Hence, the press or other mechanism operated by the piston 3 will not automatically repeat its closing operation and can not be operated until the push button 12 is restored to its initial position.

This feature is of particular importance in machines having a two hand control with two manuals or push buttons 12, wherein the operator in order not to be hampered by the use of the two push buttons may lock down one of the push buttons by inserting a wedge between the push button and its casing 13 or stick it down with a wad of gum.

By my invention, the machine will not close if one of the push buttons is not initially locked in its depressed position. Although this device is applicable to single push button machines to prevent automatic repeated operation, it is particularly adapted for two hand control machines to prevent locking down of one of the manuals so as to operate the machine solely with the other hand leaving one hand of the operator free and in danger of being caught between the pressing elements.

The pressure is released from the chamber 24 by means of a normally closed exhaust valve 34 in a casing 35 which is connected in the pipe 6, this valve 34 being held against its seat by a spring 36 and operated against its spring by a handle lever 37 arranged near the handle 12.

Obviously, upon operating of the handle 37, air will exhaust from the chamber 24 permitting the diaphragm to collapse and the valve 8 to be closed by its spring 11. When the valve 8 closes the exhaust valve 9 opens to permit the air to exhaust from the cylinder 1. The piston 2 is returned to its starting position in the cylinder by counter-weights or springs associated with the pressing machine as is well known.

Obviously, if the operator removes his hand from the handle 12 before the piston uncovers the port 29, the exhaust 9 will open permitting air to exhaust from the cylinder. Thus, the operator must keep his hand on the handle until the motor has completed its power stroke or has gone through one-half its cycle of movement and when one-half of its cycle of movement is completed, the air can be exhausted from the cylinder regardless of whether or not the operator holds down the handle 12.

What I claim is:

1. A power mechanism comprising a fluid operated motor, a conduit system for conducting a motive fluid to and from the motor, a normally closed intake valve and a normally open exhaust valve in said conduit system, manually operable means for opening the intake valve and closing the exhaust valve including a handle and connections operated thereby, locking means including a member for holding the intake and exhaust valves in their manually operated position, means tending to return the valves to their normal position, means operating said connections out of their operated position independently of the handle when the handle is held in its operated position and the locking means is released, and means for releasing the locking means.
2. A power mechanism comprising a fluid operated motor, a conduit system for conducting a motive fluid to and from the motor, a normally closed intake valve and a normally open exhaust valve in said conduit system, manually operable means for opening the intake valve and closing the exhaust valve including a handle and connections operated thereby, locking means including a member for holding the intake and exhaust valves in their manually operated position, means tending to return the valves to their normal position, means operating said connections out of their operated positions independently of the handle when the handle is held in its operated position and the fluid operated means is released, means for releasing the locking means, said connections including a part arranged to be actuated by the locking means out of the position assumed by said parts when in their manually operated position whereby the valves are free to move to their normal position relatively to said parts when the lock releasing means is operated.
3. A power mechanism comprising a fluid operated motor, a conduit system for conducting a motive fluid to and from the motor, a normally closed intake valve and a normally open exhaust valve in said conduit system, manually operable means for opening the intake valve and closing the exhaust valve including a handle and connections operated thereby, locking means including a member operated thereby for holding the intake and exhaust valves in their manually operated positions, means tending to return the valves to their normal position, means operating said connections out of their operated positions independently of the handle when the handle is held in its operated position and the fluid operated means is released, means for releasing the locking means, said connections comprising a part coacting with the handle, a second part connected to the former part and movable relatively thereto out of its operated position and means operated by the locking means for moving said second part out of its operated position during the operation of the locking means.
4. A power mechanism comprising a fluid operated motor, a conduit system for conducting a motive fluid to and from the motor, a normally closed intake valve and a normally open exhaust valve in said conduit system, manually operable means for opening the intake valve and closing the exhaust valve including a handle and connections operated thereby, locking means including a member for holding the intake and exhaust valves in their manually operated position, means tending to return the valves to their normal position, means operating said connections out of their operated positions independently of the handle when the handle is held in its operated position and the fluid operated means is released, means for releasing the locking means, said connections including toggle links pivoted together at like ends and having their other ends pivotally connected to other parts of said connections, said links being operable by the handle into a straight line position when the valves are operated and one of the links having an arm arranged to be engaged by the locking means when operated to be moved thereby and shift said toggle links out of their dead center line.
5. A power mechanism comprising a fluid operated motor, a conduit system for conducting a motive fluid to and from the motor, a normally closed intake valve and a normally open exhaust valve in said conduit system, manually operable means for opening the intake valve and closing the exhaust valve including a handle and connections operated thereby, locking means including a member for holding the intake and exhaust valves in their manually operated position, means tending to return the valves to their normal position, means operating said connections out of their operated position independently of the handle when the handle is held in its operated position and the locking means is released, means for releasing the locking means, the valves having a stem associated therewith and the locking means also including an endwisely movable stem and said locking member comprising a lever pivoted between its ends and coacting at its opposite ends with said stems and the connections operated by the handle including a part carried by the lever to move therewith and relatively thereto.
6. A power mechanism comprising a fluid operated motor, a conduit system for conducting a motive fluid to and from the motor, a normally closed intake valve and a normally open exhaust valve in said conduit system, manually operable means for opening the intake valve and closing the exhaust valve including a handle and connections operated thereby, locking means including a member operated thereby for holding the intake and exhaust valves in their manually operated position, means tending to return the valves to their normal position, means operating said connections out of their operated position independently of the handle when the handle is held in its operated position and the locking means is released, means for releasing the locking means, the valves having a stem associated therewith and the locking means also including a stem and said locking member comprising a lever pivoted between its ends and coacting at its opposite ends with said stems, and said connections including a part carried by the lever to move therewith and relatively thereto and the

stem associated with the locking means being formed of two extensible sections, one coacting with the lever and the other with the part carried by the lever.

5 7. A power mechanism comprising a fluid operated motor, a conduit system for conducting a motive fluid to and from the motor, valves for controlling the flow of fluid through the system, locking means including a movable member for
10 holding the valves in their manually operated position, manual means for operating the valves including a handle and connections between the handle and said movable locking member whereby the movable member transmits the movement
15 of the handle to the valve through said member and breaks said connection when the locking means is operated so that the valves are free to return to their normal position independently of the handle when the locking means is released.
20

8. A power mechanism comprising a fluid operated motor, a conduit system for conducting motive fluid to and from the motor, valves for controlling the flow of fluid through said system,
25 locking means for holding the valves in their manually operated position, manual means for operating the valves including a handle and connections between the handle and said valves, the locking means comprising a movable member
30 forming a part of the connections between the handle and the valves and operating to break said connection when the locking means is operated and the valves free to return to their normal position independently of the handle
35 when the locking means is released, the locking means also comprising a compound plunger including inner and outer relatively movable telescoping members, a spring between said members and a lever carried by said movable locking
40 member and having an arm forming part of the connections between the handle and the valve, one of the telescoping members thrusting against the lever and the other against said member, means for actuating the telescoping members
45 and means for returning the valves and said connections to their normal positions.

9. A power mechanism including a fluid operated motor, a conduit system for conducting a motive fluid to and from the motor, valves for
50 controlling the flow of fluid to said system, a fluid operated means connected in said system for holding the valves in their manually operated position, manual means for operating the valves including a handle and connections between
55 the handle and said valves, means tending to return the valves to their normal position and interlocking mechanism between said connections and the fluid operating means whereby when the fluid operating means is released, the valves return to their normal positions independently of the handle, said interlocking mechanism including a lever and said connections including a lever coacting with the handle, toggle
60 links pivoted together and pivotally connected to the levers respectively, one link being movable endwise, a spring for resisting such endwise movement and the other link having an arm extending along the interlocking lever and said locking means including a compound plunger
65 consisting of telescoping members and a spring between said members, one member coacting with the interlocking lever and the other with said arm.

10. A power mechanism comprising a motor, a
75 member for controlling the operation of the mo-

tor, manually operable means for moving the controlling member from its normal to its operated position including a handle and connections operated by the handle, locking means for holding the controlling member in its operated
80 position including a member forming a part of said connection and means for actuating and for releasing the locking member, said connections also including a part carried by the locking member and movable therewith, means tending to
85 return the controlling member to its normal position when the locking means is released, the part carried by the locking member when operated serving to shift said connections to break the effective action thereof by the handle when
90 the handle is held in operated position.

11. In a machine having an opening and closing movement, actuating mechanism comprising a motor, a control member operable into position to connect the motor with its motive power, a
95 manual, motion transmitting connections between the manual and the control member to move it from its initial position, means tending to return the control member to its initial position, locking means operable automatically during each operation of the machine to lock the control member in its operated position, means operated by the locking means for effectively disconnecting the control member from the manual whereby the control member is free to
100 return to its starting position independently of the manual, and a second manual means for releasing the locking means.

12. In a machine having an opening and closing movement, actuating mechanism comprising
110 a motor, a control member operable into position to connect the motor with its motive power, a manual, motion transmitting connections between the manual and the control member, means tending to return the control member to its initial position, locking means operable during each operation of the machine to lock the control member in its operated position, a second manual means for releasing the locking means, and means operated by the locking means for shifting
115 the motion transmitting connections out of effective position whereby the control member is free to return to its initial position upon the operation of the second manual to release the locking means in the event the first manual is held
120 in its operated position.

13. A power mechanism comprising in combination motor means, control means normally in inoperative position and movable to control the operation of the motor means, means tending to
130 return the control means to its normal position, a handle, a connection normally operatively connecting the handle with the control means so that manual movement of the handle actuates the control means into operated position, holding
135 means retaining the control means in manually operated position, means to release the holding means, and means operable upon a predetermined movement of the motor means for rendering the connection between the handle and the control
140 means inoperative when the handle is in its operated position and upon release of the holding means, thereby requiring the resetting of the handle back to its normal position in order to again move the control means to its operated
145 position.

14. A power mechanism comprising in combination a fluid operated motor means, valve means connected to the motor means and normally in inoperative position, means tending to return
150

the valve means to its normal position, a handle, a connection normally operatively connecting the handle with the valve means and controlling the movement of the valve means to operated position upon manual movement of the handle, holding means retaining the valve means in manually operated position, means to release the holding means, and means operable upon a predetermined movement of the motor means for rendering the connection between the handle and the valve means inoperable with the handle in its operated position upon release of the holding means, thereby requiring the resetting of the handle back to its normal position in order to again move the valve means to its operated position.

15. A power mechanism comprising in combination a fluid operated motor, a conduit system for conducting a motive fluid to and from the motor, valve means in said conduit system and normally in inoperative position, means tending to return the valve means to its normal position, a handle, a connection normally operatively connecting the handle with the valve means and operable by the handle to move the valve means to operated position, movable means actuated upon a predetermined movement of the motor, holding devices actuated by the movable means for retaining the valve means in manually operated position, means to release the holding devices, and means actuated by the movable means for rendering the connection between the handle and the valve means inoperable with the handle in its operated position upon release of the holding means, thereby requiring the resetting of the handle back to its original position in order to again move the valve means to its operated position.

16. A power mechanism comprising in combination

motor means, control means normally in inoperative position and movable to control the operation of the motor means, means tending to return the control means to its normal position, a handle, a connection normally operatively connecting the handle with the control means so that manual movement of the handle actuates the control means into operated position, holding means retaining the press in operated position, means to release the holding means, and means operable to render the connection between the handle and the control means inoperable when the handle is in its operated position and after the operation of the holding means to hold the press closed, thereby requiring the resetting of the handle back to its normal position in order to again move the control means to its operated position.

17. A power mechanism comprising in combination motor means, control means normally in inoperative position and movable to control the operation of the motor means, means tending to return the control means to its normal position, a handle, a connection normally operatively connecting the handle with the control means so that manual movement of the handle actuates the control means into operated position, holding means retaining the control means in manually operated position, means to release the holding means, and means operable to render the connection between the handle and the control means inoperable when the handle is in its operated position and after the operation of the holding means to hold the control means in operated position, thereby requiring the resetting of the handle back to its normal position in order to again move the control means to its operated position.

ERNEST DAVIS.

115

120

125

130

135

140

145

150