April 2, 1940. A. H. ADAMS 2,196,165

PRESS OPERATING MECHANISM

Filed Aug. 26, 1936 7 Sheets-Sheet 1

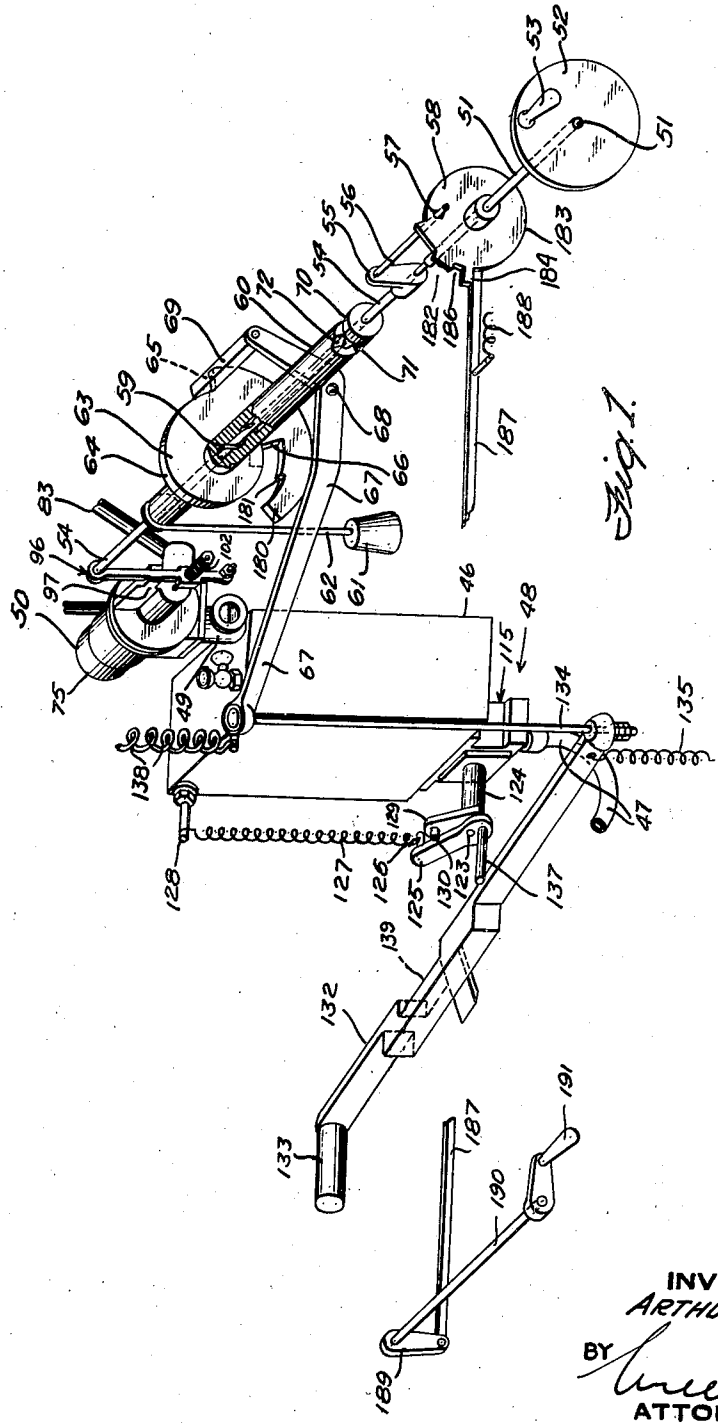

Fig. 1.

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PRESS OPERATING MECHANISM

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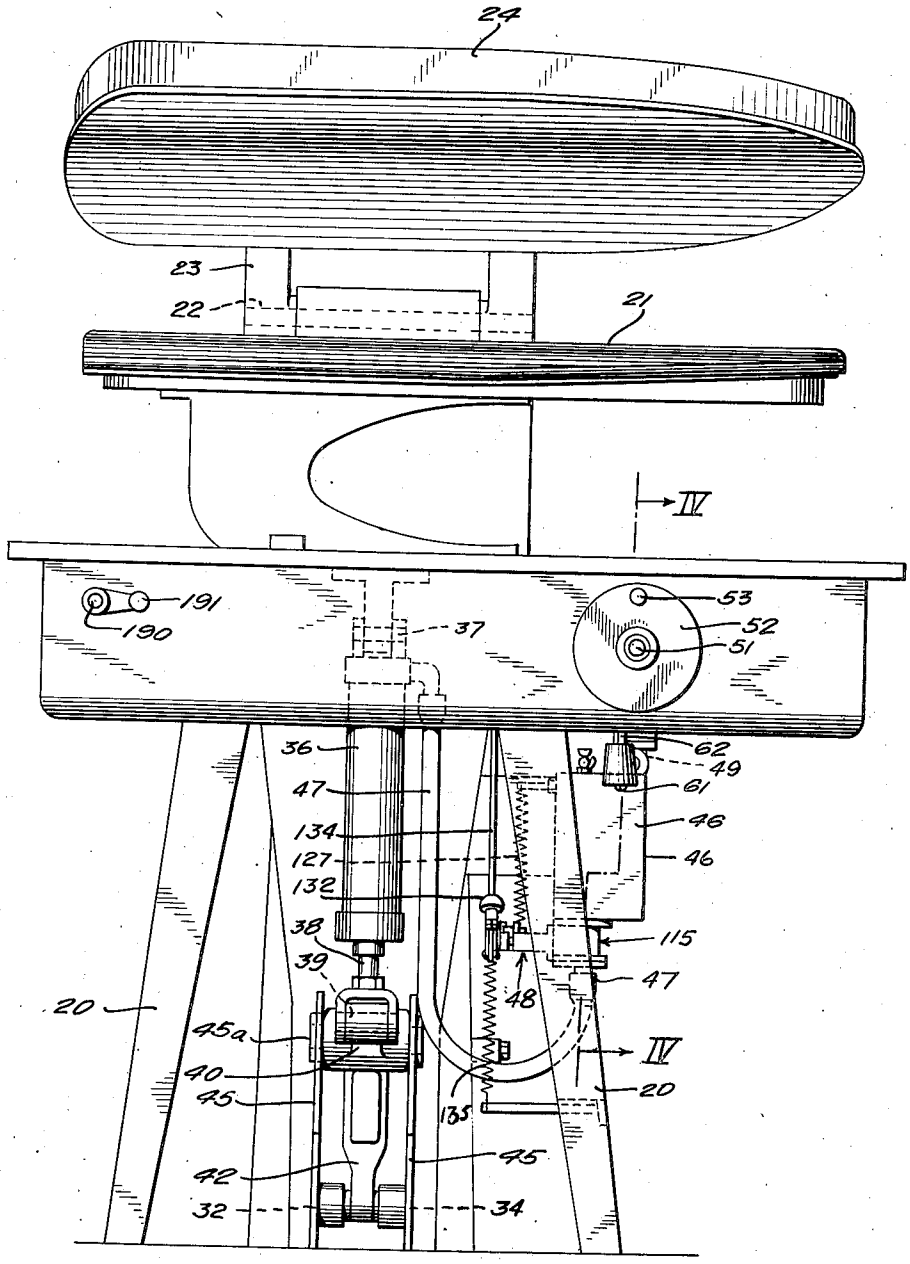
Fig. 2.



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PRESS OPERATING MECHANISM

Filed Aug. 26, 1936 7 Sheets-Sheet 3

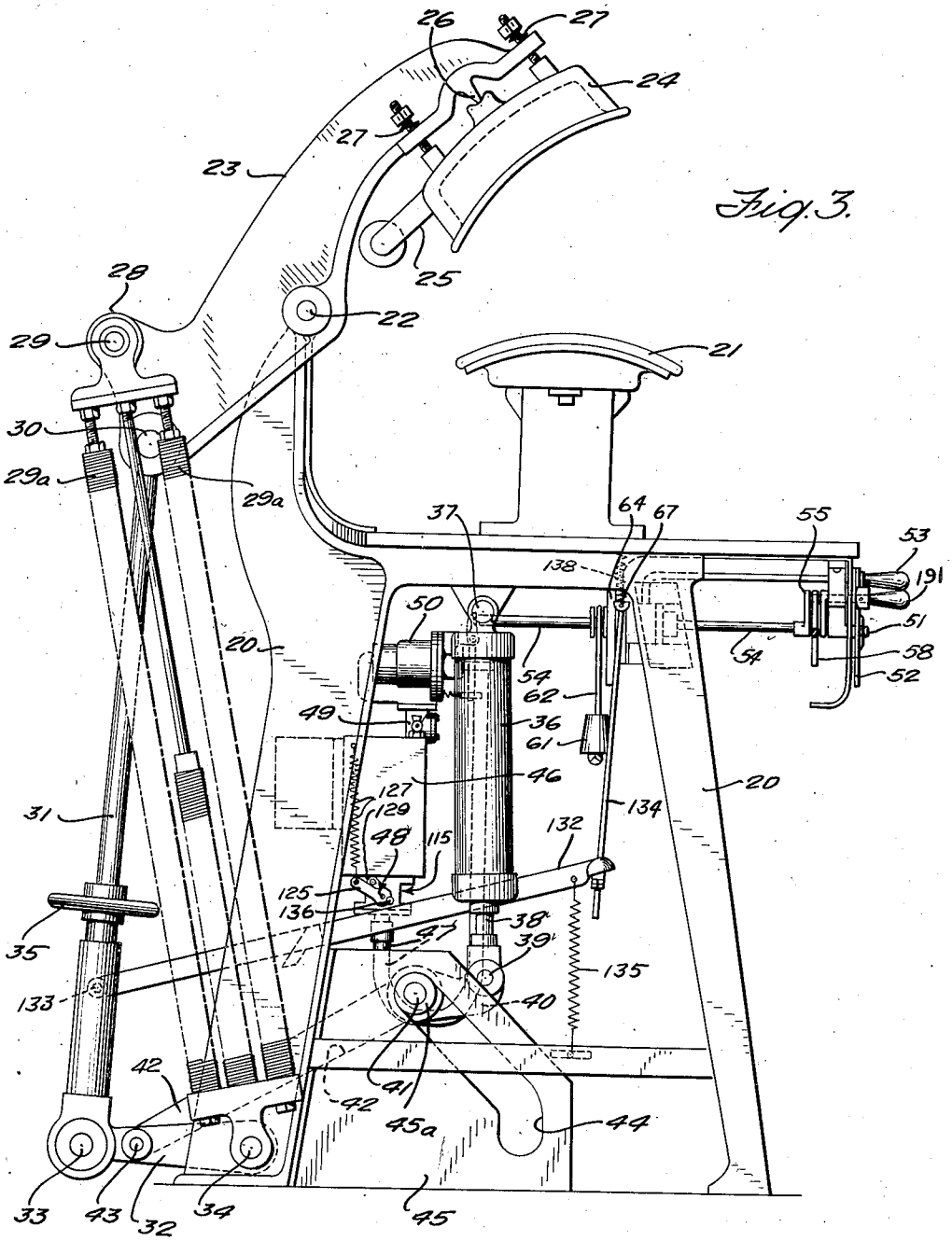

Fig. 3.

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PRESS OPERATING MECHANISM

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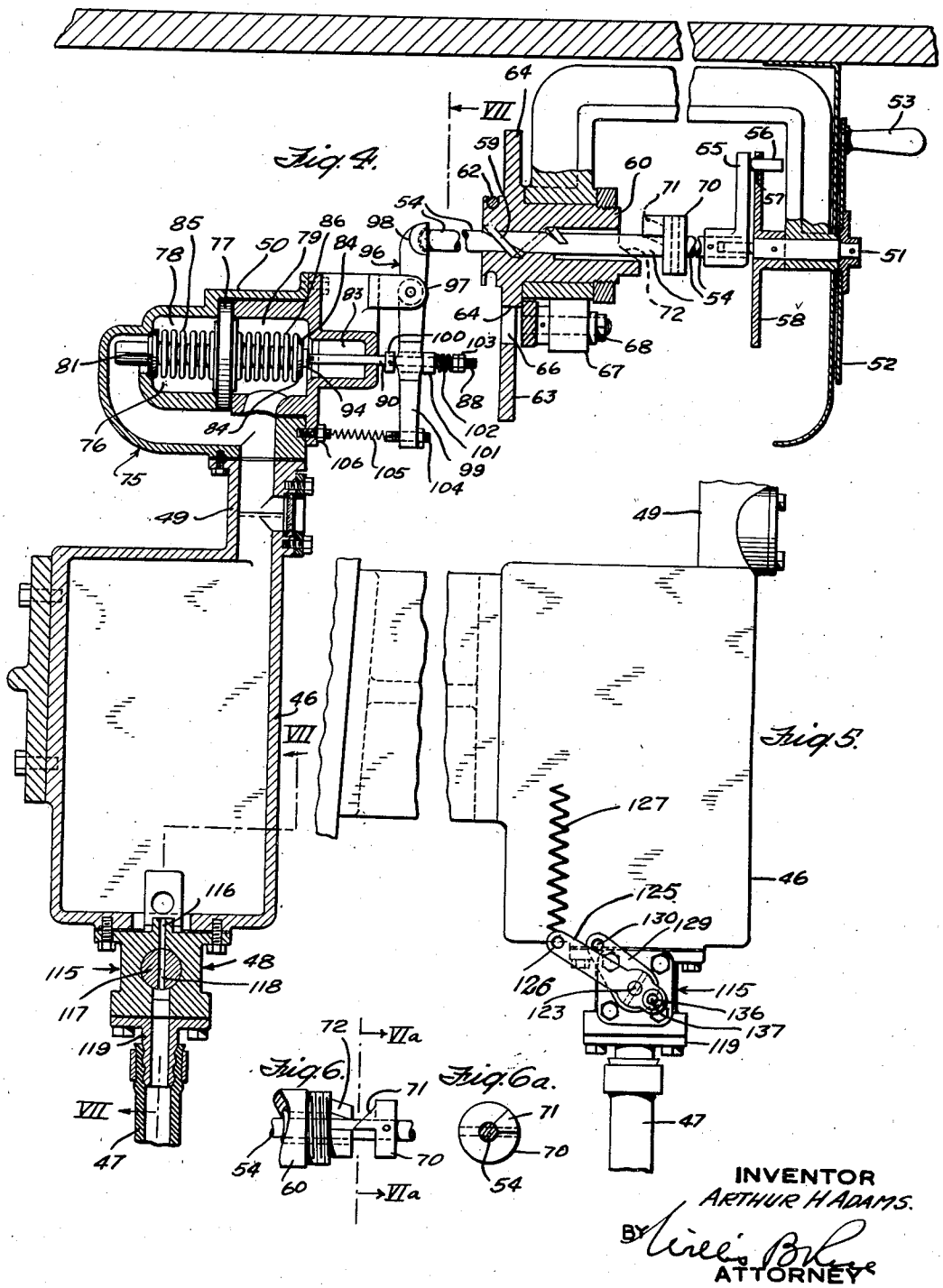

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PRESS OPERATING MECHANISM

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Fig. 7.

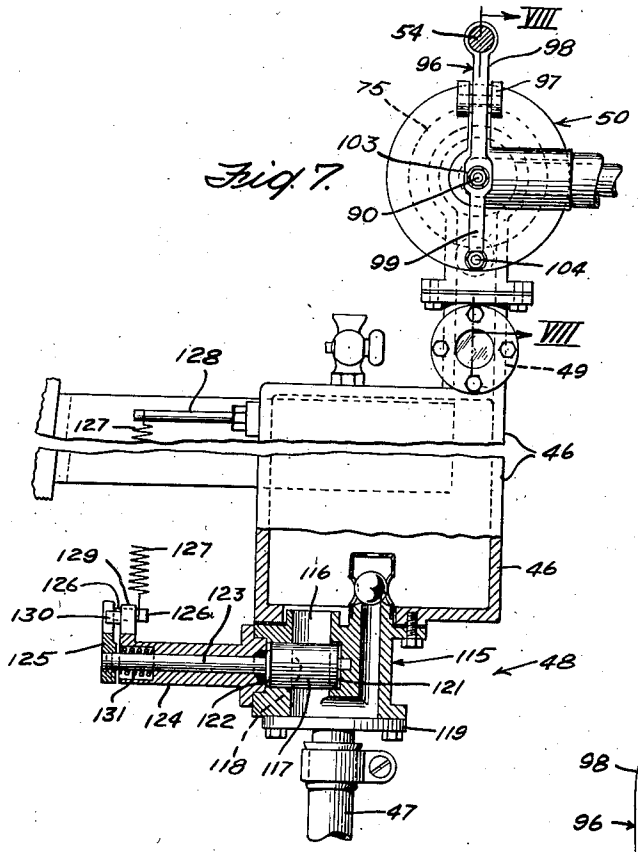
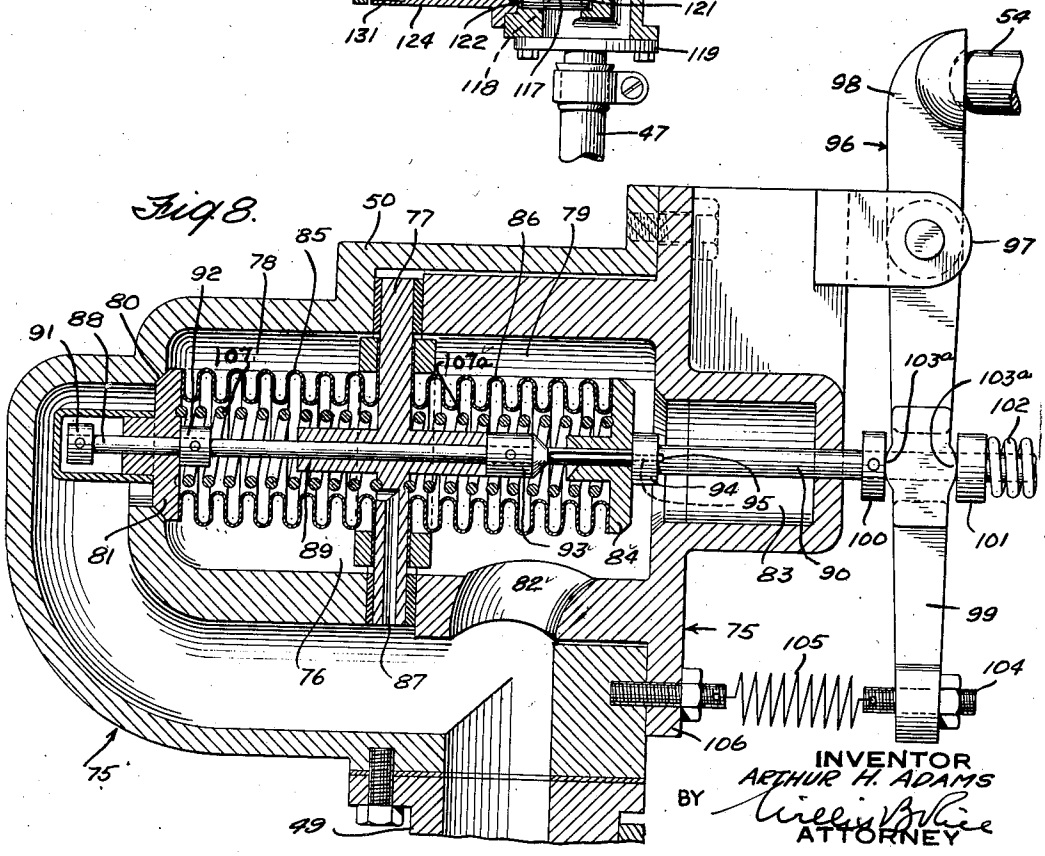


Fig. 8.



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PRESS OPERATING MECHANISM

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Fig. 9.

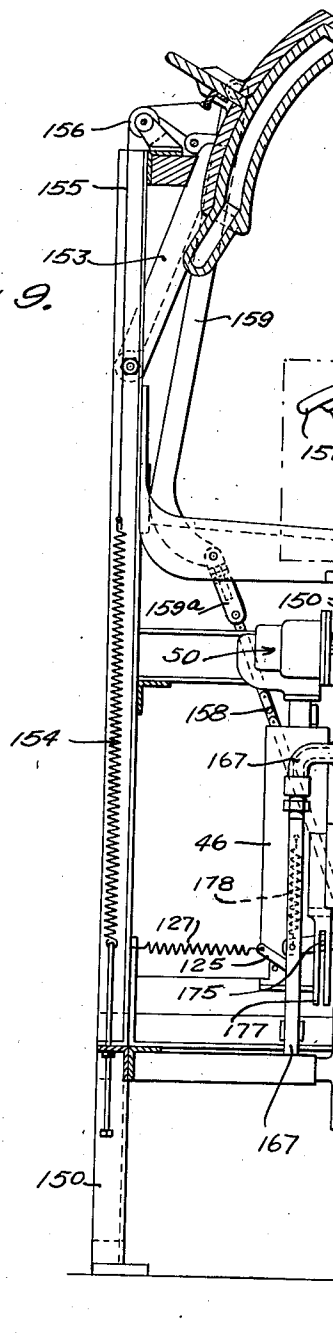
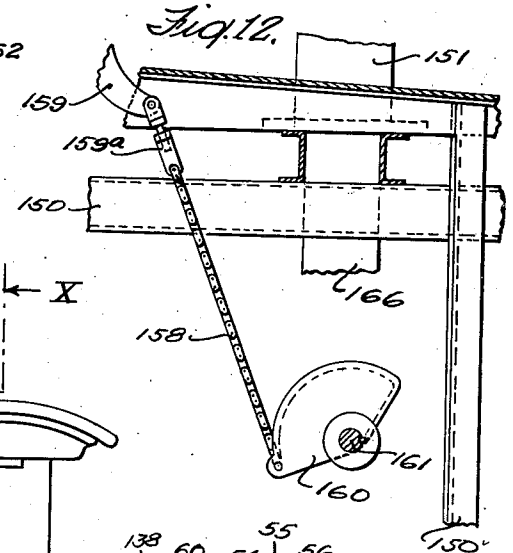
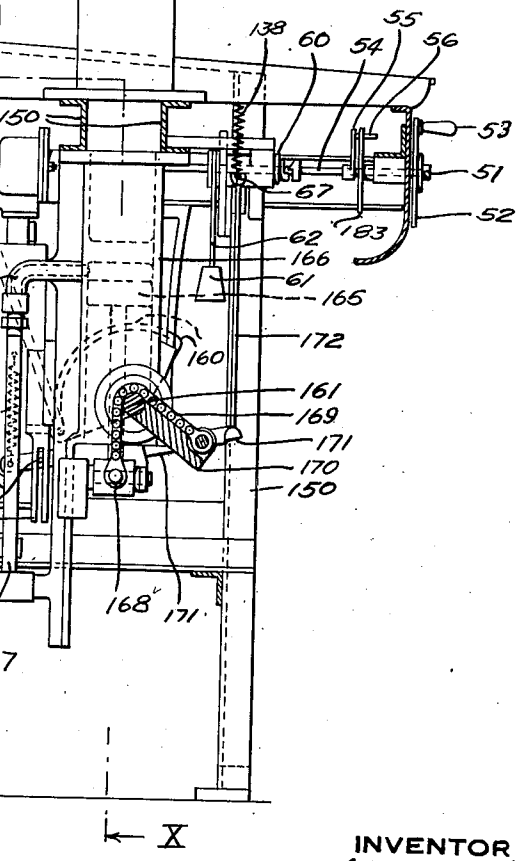


Fig. 12.





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PRESS OPERATING MECHANISM

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Fig. 10.

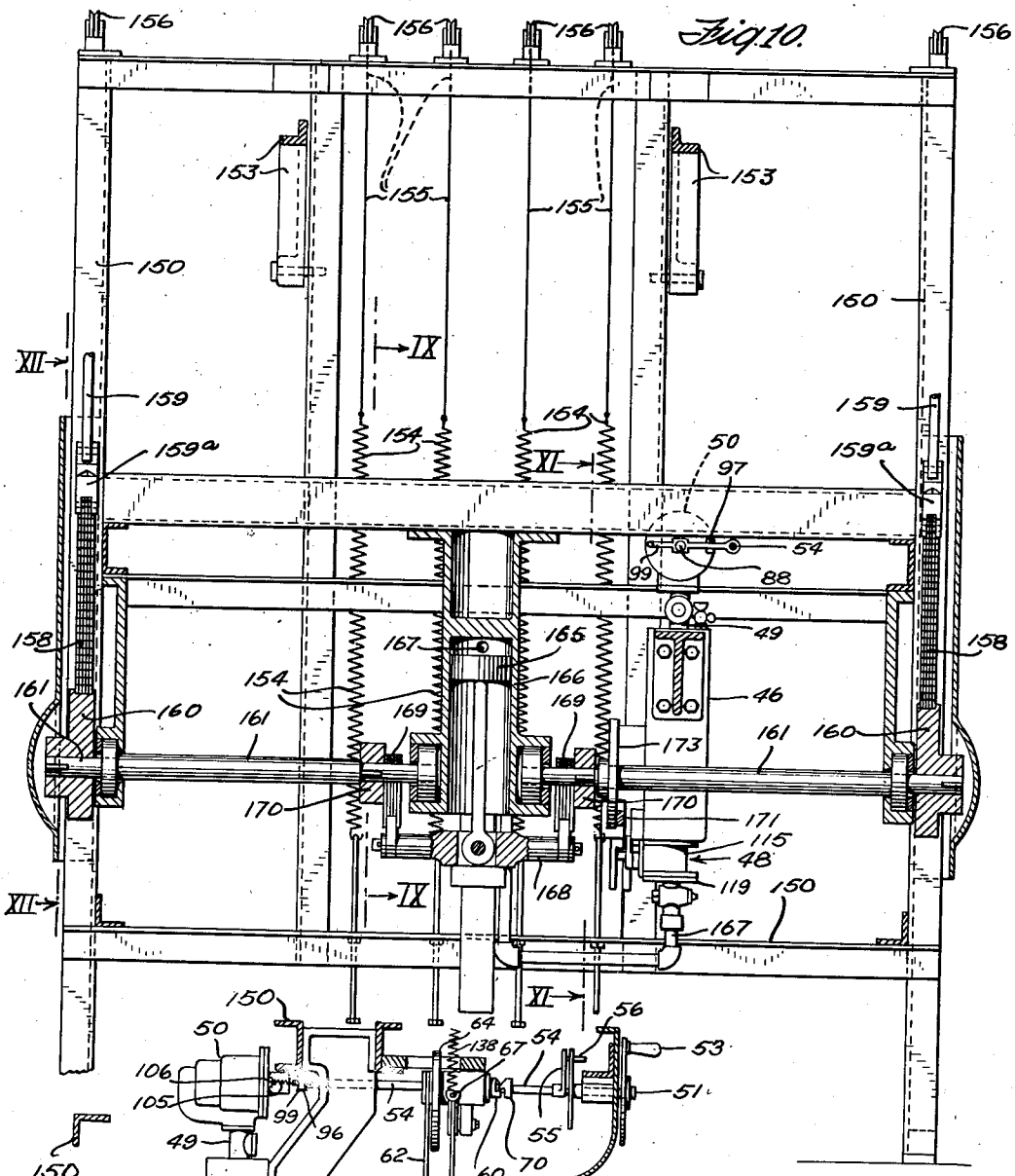
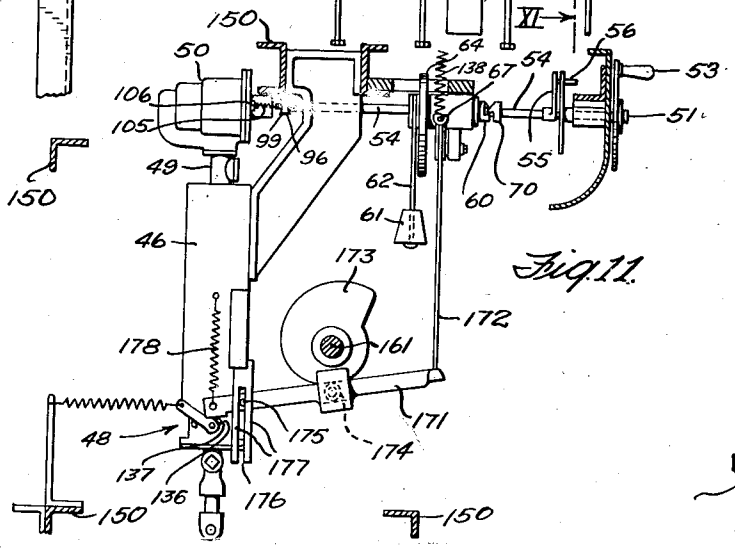


Fig. 11.



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Patented Apr. 2, 1940 2,196,165

UNITED STATES PATENT OFFICE

2,196,165

PRESS OPERATING MECHANISM

Arthur H. Adams, New York, N. Y., assignor to American Machine and Metals, Inc., New York, N. Y., a corporation of Delaware

Application August 26, 1936, Serial No. 98,081

21 Claims. (Cl. 38—40)

This invention relates to a mechanism for the control of reciprocating machinery particularly represented in laundry presses and since the device is specially adapted for laundry presses, it is herewith illustrated in that application.

It is an object of the invention to provide a mechanism for the control of such a press or the like which will permit the press head to be manipulated accurately in accordance with the manipulation of a control lever so that the position of the press may be determined at all times and its rate of movement may be determined by the movement of the control lever.

It is a further object to provide a press which will be dead beat in response to its operating mechanism, that is, which may be accurately and quickly brought to a given position without overrunning that position. Thus it may be brought to closed position or to a position near to a closed position with considerable force without danger of slamming.

It is a further object to provide a press which may be closed slowly, if desired, and which nevertheless may exert the full pressure when closed.

It is a further object to provide a press in which a reversal of the control handle during the process of closing, as for example if it be discovered that a hand or something else is in the way of the press, the head will instantly respond to the reversal of the control mechanism without slamming against the buck.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the features of construction, combination of elements, and arrangements of parts, which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description, taken in connection with the accompanying drawings, in which:

Figure 1 is a diagrammatic view of the valve mechanism of this invention.

Figure 2 is a front elevation of a toggle press embodying the invention.

Figure 3 is a side elevation of the same.

Figure 4 is a section on the line IV—IV of Figure 2 on an enlarged scale.

Figure 5 is a detail elevational view showing the valve control levers.

Figure 6 is a detail section of the control for the spiral nut.

Figure 6a is a transverse section on the line VIa—VIa of Figure 6.

Figure 7 is an enlarged section on the line VII—VII of Figure 4.

Figure 8 is a section on the line VIII—VIII of Figure 7 showing the valve control means.

Figure 9 is a section on the line IX—IX of Figure 10, showing the invention as applied to a chain type of press.

Figure 10 is a section on the line X—X of Figure 9, parts being omitted for clarity.

Figure 11 is a section on the line XI—XI of Figure 10.

Figure 12 is a section on the line XII—XII of Figure 10.

In the embodiment of the invention shown in Figures 2 to 8 inclusive, the numeral 20 designates a frame carrying a buck 21 and having pivoted thereto at 22 a lever 23, carrying a head 24 in position to cooperate with the buck 21. It will be understood that the head will have suitable means for heating it, as for example a steam line 25 and that it will be provided with equalizing means, such for example as the pivot-pressure point 26 and equalizing springs 27.

The lever 23 has a rearwardly extending arm 28 pivoted at 29 to counterbalancing springs 29a and at 30 to a lever operating mechanism for closing the press, comprising a pair of toggle links 31 and 32 pivoted to each other at 33, the link 31 being connected to the pivot 30 and the link 32 to a pivot 34 on the main frame. The link 31 may be made adjustable in length as shown at 35.

A cylinder 36 is pivoted to the frame 20 at 37 and carries a piston and piston rod 38 which is pivoted at 39 to an arm 40 of a lever pivoted on a sliding pivot 41 and having its rear arm 42 pivoted to the link 32 at 43. The position of the sliding pivot 41 is determined by slots 44 in plates 45 carried by the main frame 20, the pivot 41 having rollers 45a moving in the said slots whereby, as pressure is applied to the cylinder, the toggle is moved to close the press.

A press in accordance with this invention is preferably operated by a dead beat operating mechanism, as for example by liquid pressure rather than by air. Air pressure has a resiliency which is undesired in this mechanism since it is inconsistent with the accurate co-ordination of the movement of the head with the movement of the control mechanism.

It will be understood that within certain aspects of this invention liquid from any source having sufficient pressure may be used, being ex-

hausted after use in any convenient way. For the sake of economy, however, I prefer to supply the liquid from a source to which it can be returned for re-use. There is accordingly provided upon the frame a liquid chamber 46 adapted to contain oil or other incompressible fluid, and connecting with the interior of the cylinder 36 through a pipe 47 under the control of valve 48.

The liquid within the chamber 46 is kept under air pressure through a pipe 49 under control of a valve 50. This valve is so arranged as to admit air to the chamber 46 in one position of the valve, to build up sufficient fluid pressure to operate the press, and in another position of the valve to permit the escape of a sufficient amount of air to lower the fluid pressure to the point where the press may be opened by the counterbalancing springs 29*a*, the oil flowing back again into the fluid chamber 46.

The control mechanism is designed to control the air pressure within the fluid chamber and to control the operation of the valve 48 in such a way that the pressing head will assume a position corresponding exactly to the position of the control lever. This mechanism is functionally most clearly shown in Figure 1. The physical position of the parts upon the machine is shown in the other views.

There is mounted upon the frame 20, a shaft 51 carrying a disc 52 with a handle 53, which serves as the control lever to move the press and at the same time to indicate by its position at all times the exact position of the pressing head 24. This shaft 51 is co-axial with a shaft 54 and is connected to drive the latter through the medium of a crank arm 55 carrying a pin 56 slidable in an opening 57 in a plate 58 fixed upon the shaft 51. By this construction, the shaft 54 will rotate with the shaft 51, but the former is free to move along its axis relative to the shaft 51.

The shaft 54 carries a screw 59 with a very steep pitch adapted to co-operate with a nut 60, freely rotatable upon the shaft 54. This nut is urged in a counterclockwise direction by a weight 61 upon a cord 62, thereby to move the shaft 54 toward the shaft 51. The nut 60 carries a cam plate 63 having a spiral cam surface 64 terminating at one end in a shoulder or stop 65 and at the other in a shoulder 66. A lever 67 pivoted to the main frame at 68 carries a pin 69 (see Figure 1) adapted to follow the cam surface 64 as fast as the actual movement of the press permits so that the limiting position of the lever 67 is positively determined by the position of the cam 64.

A collar 70 is provided upon the shaft 54 and this collar and the nut 60 are provided with co-operating surfaces 71 and 72 arranged to engage each other as the shaft 54 is rotated. These surfaces, however, are so spaced that a predetermined movement of the shaft occurs before these surfaces engage sufficient to operate the air valve 50 as will be described.

With the foregoing construction it will be clear that during the first part of the movement of the handle 53, the shaft 54 will be rotated and moved endwise, but the nut 60 will not be rotated. This initial endwise movement of the shaft 54 is arranged to operate the air valve 50.

The valve 50 comprises generally a casing 75 communicating with the interior of the chamber 46 through the pipe 49 and housing within it an inner chamber 76 divided by a partition 77 into two compartments 78 and 79. The compartment 78 is directly connected to the source of air pressure so that it is at all times filled with air under pressure. This compartment communicates with the interior of the casing 75 through a port 80 controlled by a poppet valve 81. The chamber 79 communicates with the interior of the casing 75 through an opening 82 and with the atmosphere or air at a lower pressure through an exhaust port 83 controlled by a poppet valve 84.

A bellows 85 within compartment 78 is connected at one end to the poppet valve 81 and at the other to the partition 77 and a second bellows 86 lies within the chamber 79 being connected at one end to the partition 77, and at the other to the poppet valve 84. A channel 87 affords communication between the interior of the bellows 85 and the interior of the casing 75.

The valves 81 and 84 are slidably mounted upon a rod 88, carried in a housing 89 upon the partition 77 and extending outwardly of the casing 75 as shown at 90. This rod 88 has a pair of collars 91 and 92 fixed upon it in position to operate the valve 81 but to afford a certain lost motion of the rod before the valve is operated. A similar pair of collars 93 and 94 are fixed upon the rod 88 in position to operate the valve 84 but the rod 88 at the point where the valve 84 slides upon it between the collars 93 and 94 is provided with a groove 95 affording a passageway between the interior of the bellows 86 and the exhaust port 83. This groove 95 is arranged to be closed by the collar 93 when the collar is moved to its extreme position to the right.

The rod 88 as it passes through the bearing in the partition 77 may be made slightly smaller than its bearing, sufficient to provide air leakage around the rod from the interior of one of the bellows to the other.

A lever 96 is pivoted on the casing 75 at 97 and has one arm 98 in position to be engaged by the shaft 54 and it has another arm 99 articulated to the extension 90 of rod 88 through the medium of a fixed collar 100 and a sliding collar 101 held by a spring 102 and lock nuts 103, the parts 100 and 101 preferably engaging the opposite sides of a ball portion 103*a* on the lever 96 to permit oscillation of the lever without interfering with the articulation.

At the extreme end of the arm 99 there is a stud 104 connected by a spring 105 with the housing at 106. This spring being of such tension that it can move the rod 88 and the valves mounted upon that rod to the left as shown in the figure, to close the intake valve and open the exhaust valve, as will be described, but the spring 105 is of such strength that when the handle 53 is rotated, the nut 60 being held against rotation by the weight 61, the shaft 54 will be moved along its axis to permit valve 81 to open and valve 84 to be closed, but when the handle 53 and shaft 54 are returned to normal, the spring 105 will operate the valve rod 88 to operate the valves in the reverse direction.

A spring 107 within the bellows 85 tends to hold the intake valve 81 closed, and a spring 107*a* within the bellows 86 tends to hold the exhaust valve 84 closed.

With the foregoing construction, with the valve in the position shown in the figure, the intake valve 81 being closed, it will be clear that full pressure will be inside the chamber 78, but the interior of the bellows 85 and 86, and the compartment 79, and the casing 75 will be substantially under atmospheric pressure because they are in communication with each other and with the exhaust port 83. Under these circumstances,

therefore, the pressure upon the oil within the oil reservoir 46 will be atmospheric.

As soon, however, as the shaft 54 is moved to the left, it will move the rod 88 to the right. The first effect of this is to permit the valve 84 to be closed by its spring 107a as soon as the collar 94 has been retracted by the rod 88. Just at the time when the exhaust valve closes, the collar 91 starts to move the intake valve 81, allowing air to pass from the compartment 78 into the interior of the casing 75, the bellows 85 and the compartment 79. This equalizes the pressure upon the interior and the exterior of the bellows 85, so that the air pressure no longer has any effect upon the movement of the valve 81 and the operating mechanism need contend only with the pressure of the spring 107. At about this time the collar 93 acting as a valve, closes the groove 95, thus sealing bellows 86 and permitting pressure to build up in its interior by the slow leakage around the rod 88. The effect of this building up of pressure within the bellows 86 is to cause the pressure in the bellows to assist in holding the valve 84 against its seat.

In this position, therefore, the exhaust valve is held closed by the combined effect of the spring 107a and of the air pressure within the bellows while the intake valve is held open against the resistance only of the spring 107.

As soon as the rod 54 is moved so that the lever 96 can be brought back to its left hand position by the spring 105, the first effect is to permit the intake valve 81 to be closed and to open the passageway comprising the groove 95. This releases the air pressure within the bellows 86, thereby greatly lessening the resistance of the valve 84 to opening. As the rod 88 moves further to the left, the intake valve is held open by the collar 94.

As will be seen from the foregoing, when the intake valve 81 is open, the pressures inside and outside of the bellows 85 are high, but when the intake valve is closed the pressure is high outside the intake bellows and it is atmospheric in the interior.

When the exhaust valve 84 is open, the bellows 86 has atmospheric pressure both inside and out so that it is balanced for closing. In spite of the leakage of air around the piston, no pressure is built up because the air is immediately exhausted through the groove 95. As soon as the exhaust valve closes, however, pressure is placed in the compartment 79 at once and at the same time the nut 93 also closes the groove 95, pressure is built up inside the exhaust bellows 86 to assist in holding the valve in place.

When the exhaust valve starts to open the rod 88 moves, opening the groove 95 and relieving the air pressure within the interior of the bellows 86 before the valve 84 leaves its seat so that the exhaust valve, although it has been held closed by the full pressure of the air, can be opened, resisted only by the pressure of the spring 107a.

The purpose of the valve 50 is to control the pressure upon the fluid within the fluid chamber 46 so that the fluid pressure will be sufficient to operate the press when required and will be relieved sufficiently to permit the press to return to normal when desired. The actual control of the movement of the press is by means of the valve 48 which operates to admit fluid from the chamber 46 to the main cylinder of the press and to shut it off at a pre-determinable time to determine the operation and fix the position of the press.

The valve 48 as illustrated comprises a block 115 having a port 116 and a cylinder 117 mounted for rotation in a recess in said block (see Figures 4 and 7) having a port 118 adapted to be brought into and out of registry with the port 116 in the block 115. A suitable fitting 119 is attached to the block 115 to carry the conduit 57 communicating with the upper end of the cylinder 36. A groove 121 affords communication between the inner end of the cylinder 117 and its bearing so that the pressure of the oil may be used to urge the cylinder 117 outwardly against a packing member 122 so that the pressure of the fluid is used to maintain a tight joint between the cylinder and the packing member to prevent leakage through the bearings.

The position of the cylinder 117 is controlled by a rod 123 journaled in a bearing 124 attached to the block 115 and it carries at its outer end a crank 125 having a pin 126 which is connected to a spring 127 anchored to the main housing 46 at 128, the bias of the spring being such as normally to hold the valve in its closed position at all times and an arm 129 integral with bearing 124 carries a pin 130 to serve as a stop to limit the movement of the arm 125 in response to the spring. A suitable spring 131 may be housed within a recess in the end of the member 124 to keep the end of the cylinder 117 against the packing member 122.

The valve 48 is controlled by a lever 132, pivoted at one end at 133 to link 31 of the toggle and at the other end connected to the lever 67 by a rod 134.

A spring 135 urges the lever 132 downwardly and a roller may if desired be provided upon a pin 137 carried by the crank arm 125 in position to be engaged by the lever 132 in its upward travel. A second spring 138 is arranged to urge the lever 67 upwardly and it is made strong enough to lift lever 132 against the action of spring 135 and hold lever 132 against roller 136. This spring 138, however, is not strong enough to overcome the tension of spring 127 of valve 48 and thus the valve is adapted to be closed only when arm 69 is held by cam 64 to support one end of lever 132 and when pin 133 at the other end is moved upwardly by the action of the press.

The mechanism may be designed to leave full pressure on the press in the closed position. This may be accomplished by so designing the cam 64 that when it is in the full press closed position, the rod 134 will not be raised sufficiently to cause the complete closing of the press completely to shut off the oil.

This result, however, may also be achieved, if desired, by providing upon the lever 132 a notch 139 in which the roller 136 may move in the full press closed position again to allow the valve slightly to open, for it will be understood that in the particular type press here chosen for illustration, the rod 132 moves longitudinally as well as vertically during the closing movement.

In order to prevent the press from being slammed closed too rapidly, there is provided upon the cam 64 projecting stops 180 and 181, these stops being spaced from the surface of the cam 64 slightly more than the thickness of the pin 69 so that if the handle 53 be rotated so fast that the actual operation of the press cannot pull up the pin 133 to keep the pin 69 in contact with the surface of the cam 64, the pin 69 will encounter the stop 180 or the stop 181 and resist further movement of the handle 53 until the press has caught up. It being understood that

during this time the pin 69 is being held out from the cam by the force of the spring 138. As soon, however, as the press has caught up with the movement and drawn the pin 69 inwardly toward the cam surface 64 it passes off of the inner edge of the stops 180 or 181 and permits further rotation of the handle 53.

Operators on presses, particularly in laundries, have frequently desired to start the movement of the head while still arranging the garment upon the buck, but this has proved dangerous with the mechanisms heretofore available, because of the likelihood of getting the left hand caught under the head, because with such mechanisms once the press has started to close, no accurate control of its further movement was possible. With the mechanism herein provided such dangers are eliminated because the press cannot be slammed closed and the closing movement is at all times within control of the operator through control of the handle 53.

There is provided, however, mechanism to prevent the closing of the press beyond the point where danger to the hands might occur without the employment of both hands upon the closing mechanism. To this end the circumference of the plate 58 is made generally circumferential as shown at 183, but at one point is provided with a stop 184 and beyond the stop 184 is a recess 186. A rod 187 is slidingly mounted upon the main frame to engage the surface of the plate 58 in position to bear against the circumferential portion 183 during the initial major portion of the closing movement, but to engage the stop 184 while the press is still far enough open to prevent damage to the hands and the recess 186 is arranged in position to hold the press in its completely closed position.

The rod 187 is urged into contact with the plate 58 by a spring 188 and is withdrawn from contact by an arm 189 on a shaft 190 controlled by a crank 191.

With the foregoing construction it will be clear that as the handle 53 is rotated, the first portion of its movement will create an end thrust on the shaft 54 to open the air valve to start the movement of the press, the liquid valve being at this time already opened.

The beginning of the movement of the press, however, will at once raise the lever 132, close the liquid valve and stop further movement. If, however, the handle 53 is turned or has been turned on further than its initial amount so as to rotate the cam 64 to a new position, the rod 134 will be lower, thus requiring a further closing of the press before the oil pressure is cut off. Thus, the position of the press is completely determined by the handle 53. Before, however, the press can be closed far enough to do any damage to the left hand, the crank 191 must be operated to withdraw rod 187 from contact with the plate 58 and then in order to lock the press in the closed position, the crank 191 must be released to permit the rod 187 to enter the recess 186. Thus the mechanism requires the use of both hands before the press may be closed and neither hand may be released from the mechanism at any critical time without opening the press, and crank 191 cannot be fastened in any position to permit operation of the press by the right hand only, since if locked in the one position it will prevent closing the press, and if locked in the reverse position, it will mean that the press cannot be held closed at any time.

In the form of the invention disclosed in Figures 9, 10, 11 and 12, the press comprises a frame 150 on which is supported a buck 151, a head 152 supported from the frame 153 by a pair of links 153, one at each end of the head, counterbalance springs 154 are connected by means of a cable 155 operated over a pulley 156 and connected to the head 152 to help counter-balance the weight of the head, and these springs may be sufficient, if desired, to raise the head against the force of gravity when the closing means is released.

The press is operated through the medium of links 159 connected to chains 158, the length of the chains being adjustable through the medium of screw connectors 159a. The chains 158 are connected to and adapted to be wound upon cam shaped drums 160 fixed on separate shafts 161 (as shown in Figure 10), journaled in the frame work cylinder 166 of the machine, the cams 160 being so designed that as the shafts 161 rotate, the cams will be turned to wind the chains up to lower the head 152, but the cam at one point 162 is of markedly smaller diameter so as to increase the leverage between the rotation of the shaft and the depression of the head, and thus increase the pressure of the head against the buck when they are in engagement. A piston 165 moving in a cylinder 166 is operated by fluid pressure admitted through a conduit 167. This piston 165 is connected to a cross head 168 mounted for vertical movement upon the frame and connected at each end to chains 169, the other end of which is connected to a cam arm 170 upon the shaft 161. The cam arm is, for the major part of its periphery of small diameter so that as the chain is moved by the cross head 168, the shafts 161 are rotated rapidly to move the head 152 of the press into contact with the buck, but at that time the diameter of the cam arm 170 changes to give increased leverage to the chain in its effect upon the shaft 161 and it will be observed that the increased leverage between the chain 169 and the cam arm 170 occurs at the same time as the increased leverage between the chain 158 and the cam 160, thus producing by the combined effect a very great increase in the pressure between the head and the buck.

The control mechanism may be applied to this press with substantially the same mechanism as that previously described, thus there may be provided a handle 53 operating the valve control shaft 54 through the medium of the nut 60 and the associated parts, and this shaft 54 will also control the fluid pressure within the chamber 46 through the valve 50. The valve 48 may control the admission of the incompressible fluid to the operating cylinder 166, all of this mechanism being the same as that previously described.

In this embodiment of the invention, however, instead of the lever 132 operated from the toggle of the press, there may be provided a lever 171 connected at one end to the rearwardly extending arm of the lever 167 by a rod 172 and pivotally engaging the surface of a cam 173 fixed on the shaft 161. Preferably, there is provided upon the lever 171 a roller 174 which rides upon the surface of the cam 173.

The position of the lever 171 is determined by a pin 175 on the lever which moves in slots 176 in arms 177. A spring 178 supports the free end of the lever 171 and holds the roller 174 in engagement with the cam surface. The free end of the lever 171 is arranged to engage the roller 137 on the pin 132 to operate the valve 48 in the manner previously described.

In this embodiment, as in the previous em-

bodiment, the position of the cam 64 determines the position of the pivoted end of the lever 171 or 132 and hence determines the amount of movement of the press which will occur before the valve 48 closes. Since, moreover, the press is operated by an incompressible fluid, which is dead beat in its effect, it will be seen that the movement of the press stops as soon as the valve 48 is closed, and thus there is determined a position of the pressing head which corresponds to each position of the operating handle 53.

The operation of this embodiment is precisely the same as the operation previously described, it being understood, of course, that the control of the lever 171 by means of the cam 173 corresponds in all respects to the control of the lever 132 by the link 31 and if desired, the cam 173 may be arranged to permit the fluid valve again to be opened when the full closed position of the press is attained, or as previously suggested, the cams may be relatively so cut that the valve is never completely closed at the time that the closed position of the press is attained.

It will be readily understood that the above servo mechanism may be applied to any form of press closing device by controlling the action of the liquid valve jointly by the servo mechanism and by the operation of the press so that the servo mechanism itself determines the point in the operation at which the press will cut off its own power.

With any of the mechanism heretofore described, it will be clear that the press is at all times completely under control of the operator and will move only as far as the operator herself indicates. Moreover, it is impossible for the operator to move the press in such a manner as to slam shut on her hand, although at the same time, if desired, she may, within the limits of absolute safety, re-arrange the garment upon the buck during the closing movement, while still insuring that her hand will not be caught.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A press operating mechanism comprising a liquid motor for closing a press, a liquid supply, a liquid valve for shutting off the liquid supply from said motor to stop the press, means operable by the movement of the press for closing the liquid valve after a predetermined closing movement of the press, means for determining the amount of said predetermined movement and common means for setting said determining means and for imposing pressure on said liquid.

2. A press operating mechanism comprising a liquid motor for closing a press, a liquid supply, a liquid valve for shutting off the liquid supply from said motor to stop the press, means operable by the movement of the press for closing the liquid valve after a predetermined closing movement of the press, means for determining the amount, an air pressure line and common means for adjusting said predetermined movement and for connecting said air pressure line to said liquid supply.

3. A laundry press having a liquid motor connected to close the same, a liquid chamber and valve connecting said liquid chamber to said motor, a rotary cam, a member controlled by said cam and by the movement of the press for closing the valve including a follower cooperating with the cam surface, a hand controlled shaft in limited screw engagement with said cam, whereby an initial movement of said shaft will move said shaft endwise within said cam and a further movement will rotate said cam, a mechanism including a valve for imposing pressure upon the liquid within said chamber, said valve being connected to said shaft to be operated by said endwise movement and means to prevent rotation of said cam during the relative screw movement between the shaft and cam.

4. A press operating mechanism comprising a piston and cylinder adapted to be connected to operate a press, means for admitting a liquid to such cylinder under pressure, a valve for controlling the admission of said liquid, means including a movable handle for controlling said valve, said piston and cylinder being connected to close the press, means operated by the movement of the press for closing the valve and hand control means to correspond to the position of the handle for varying the position in the movement of the press at which said valve is closed.

5. A press operating mechanism comprising in combination, a piston and cylinder connected to move the press elements relative to each other, a reservoir of liquid connected to said cylinder under control of a liquid valve, an air valve for admitting air pressure to said fluid chamber and for relieving the same, valve operating mechanism actuated by the movement of the press element for closing said fluid valve, a conditioning device for determining the point in the movement of the press at which said fluid valve is closed and a hand operated mechanism for varying the position of said conditioning device and simultaneously controlling said air valve.

6. A press operating mechanism including mechanism for relatively moving the elements of the press including a stopping device controlled by the movement of the press to stop the movement at a predetermined point, a cam for determining the point at which said operating mechanism functions to stop the movement of the press, and a handle for varying the position of said cam and for simultaneously starting the actuation of said moving mechanism.

7. A press operating mechanism comprising in combination a piston and cylinder for relatively moving the press elements, a liquid chamber communicating with said cylinder and having a liquid control valve, means operated by the position of the press for shutting off said valve, means for imposing pressure upon the liquid within said liquid chamber, a cam for varying the position in which said liquid valve is closed by the movement of the press and means for varying the position of said cam and for simultaneously operating said pressure imposing mechanism to impart pressure to the liquid in said liquid chamber.

8. Means for operating a press including a cylinder and piston, means to connect said cylinder and piston to the press elements to actuate the press, a source of liquid, means for admitting liquid to said cylinder and a valve for controlling the flow of said liquid to the cylinder, a lever movable about a variable pivot and connected to a movable portion of the press and to said liquid valve whereby, with any stationary position of said pivot, the closing of the press will

close the valve, and hand control means for varying the position of said pivot to vary the position of the point in the operation of the press when said valve will automatically close, whereby the degree of closing of the press is determined by the position of said pivot.

9. Means for operating a press including a cylinder and piston, means to connect said cylinder and piston to the press elements to actuate the press, a liquid chamber, means for admitting liquid to said cylinder and a valve for controlling the flow of said liquid to the cylinder, a lever movable about a variable pivot and connected to a movable portion of the press and to said liquid valve whereby, with any stationary position of said pivot, the closing of the press will close the valve, and hand control means for varying the position of said pivot to vary the position of the press when said valve is automatically closed, whereby the degree of closing is determined by the position of said pivot, means for varying the pressure of the liquid within the chamber and common means for operating said air pressure varying means and said pivot varying means.

10. Means for operating a press including a cylinder and piston, means to connect said cylinder and piston to the press elements to actuate the press, a liquid chamber, means for admitting liquid to said cylinder and a valve for controlling the flow of said liquid to the cylinder, a lever movable about a variable pivot and connected to one of the press elements and to said liquid valve whereby, with any stationary position of said pivot, the operation of the press elements will close the press, and hand control means for varying the position of said pivot to vary the position of the press when said valve is automatically closed, whereby the degree of closing is determined by the position of said pivot, a source of air supply, an air valve for connecting said liquid chamber in the alternative with said source of air supply and exhaust, means operated by the mechanism for varying the position of said pivot for operating said air valve.

11. Means for operating a press including a cylinder and piston, means for connecting said cylinder and piston to actuate the press, a source of liquid connected to said cylinder and a valve for controlling the flow of liquid to said cylinder, a lever connected to said valve and to one of the press elements and having a floating pivot, hand control for adjusting the position of said moving pivot whereby the point in the operation of said press element at which the valve will be closed by said press element is varied in accordance with the position of said pivot.

12. A claim in accordance with the preceding claim, in which the fluid pressure is obtained from a chamber and an air supply and a valve for controlling the admission of air to said chamber to impose pressure on the liquid therein, and there being common means for adjusting the pivot adjusting means to vary the position of closing the liquid valve and for operating the air valve.

13. Means for operating a press including a cylinder and piston, means to connect the cylinder and piston to actuate the press, a liquid chamber connected to said cylinder, a valve for controlling the flow of liquid from said chamber to said cylinder, a source of air supply, a valve for controlling the flow of air from said air supply to said liquid chamber, a mechanical element responsive to the position of the press elements for closing said liquid valve, means for controlling the responsiveness of said valve to said element including a cam and hand control means for varying the position of said cam and a cam follower engaging said element, and means controlled by the movement of said cam follower to control said air valve to shut off air from said chamber.

14. Means for operating a press including a cylinder and piston, means to connect the cylinder and piston to actuate the press, a liquid chamber connected to said cylinder, a liquid valve for controlling the flow of liquid from said chamber to said cylinder, a source of air supply, a valve for controlling the flow of air from said air supply to said liquid chamber, a mechanical element responsive to the position of the press elements for closing said liquid valve, means for controlling the responsiveness of said valve to said element including a nut, a circular cam carried by said nut, a threaded shaft working in said nut, means to limit the turning of said shaft relative to said nut, means operated by relative movement between said nut and said shaft to control said air valve and means operated by said cam for limiting the movement of said mechanical element, to vary the closing position of said liquid valve.

15. A press operating mechanism comprising in combination mechanism for actuating the press elements, means controlled by the movement of the press for stopping said mechanism, means for controlling the responsiveness of said stopping means to the press movement, including a cam and cam follower and manual means for controlling the relative position of said cam and cam follower and means actuated by said cam follower for varying the position of stopping of said stopping means.

16. A press operating mechanism comprising a piston and cylinder connected to actuate the press to closed position, a supply of liquid under pressure for relatively moving said cylinder and piston including a valve for controlling the liquid and a mechanism operated by the press for closing said valve at any point between the full open position and the full closed position of the press, said valve closing mechanism including manual means to select such point and said valve closing mechanism being constructed and arranged to open said valve when the full press closing movement has been made.

17. A press operating device comprising motive fluid actuated means for moving the press to closed position, means to control the supply of motive fluid to said press moving means, means responsive to the position of the press for restraining said motive fluid controlling means, hand actuated means causing the operation of the press and mechanism responsive to said press responsive means for blocking the movement of said hand actuated mechanism when the latter is moved faster than the press can move.

18. A press operating device comprising in combination a liquid press motor means including a liquid chamber and a liquid valve for admitting operating liquid to said motor, means including an air supply and an air valve for admitting air under pressure to said liquid chamber, means operated by the movement of the press to close said liquid valve at any predetermined point in the closing movement of the press, means for setting said predetermined point including a lost motion mechanism connecting said setting means and said air valve, whereby the operation of said last mentioned means will

first operate the air valve and then set said setting means.

19. A press operating device comprising in combination, a liquid press motor means including a liquid chamber and a liquid valve for admitting operating liquid to said motor, means including an air supply and an air valve for admitting fluid under pressure to said liquid chamber, means operated by the movement of the press to close said liquid valve at any predetermined point in the closing movement of the press, means for setting said predetermined point and a hand device connected to said setting device and to said air valve so constructed and arranged that upon movement of said hand device to close the press it will first open said air valve before setting said setting means.

20. A press operating mechanism comprising in combination a piston and cylinder connected at one end to the press to close the same, a valve for admitting liquid under pressure to said piston and cylinder, a lever for closing said valve connected at one end to said press having a floating pivot at the other end connected to a cam follower, a hand controlled cam for limiting the position of said floating pivot, means associated with said cam for stopping the movement thereof when the cam is moved faster to closed position than the press can follow.

21. A press operating mechanism comprising a fluid controlled piston and cylinder connected to operate the press, a valve for admitting fluid under pressure to said cylinder to move the press, a lever connected to said valve and to a movable portion of said press and having a floating pivot, a control handle, a shaft having a sliding driving connection with said control handle, a longitudinally fixed nut having a screw connection with said shaft and carrying a cam, said shaft being adapted to rotate within said nut for a predetermined length and thereafter to rotate said nut, an air valve adapted to impart pressure to the fluid control by the longitudinal movement of said shaft in said nut, a cam follower cooperating with said cam and connected to said floating pivot, said cam being so shaped as to move said floating pivot progressively in a direction to open said fluid valve as said handle is turned, whereby the initial operation of the handle moves the said shaft longitudinally in said nut to open the valve and thereafter rotates said cam progressively to alter the position of said floating pivot and thereby progressively to change the point in the closing of the press at which the press cuts off the liquid valve.

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