Sept. 5, 1939. C. S. MALOTT, JR 2,171,583

CONTROL FOR PRESSING MACHINES

Filed Sept. 18, 1937. 3 Sheets-Sheet 1

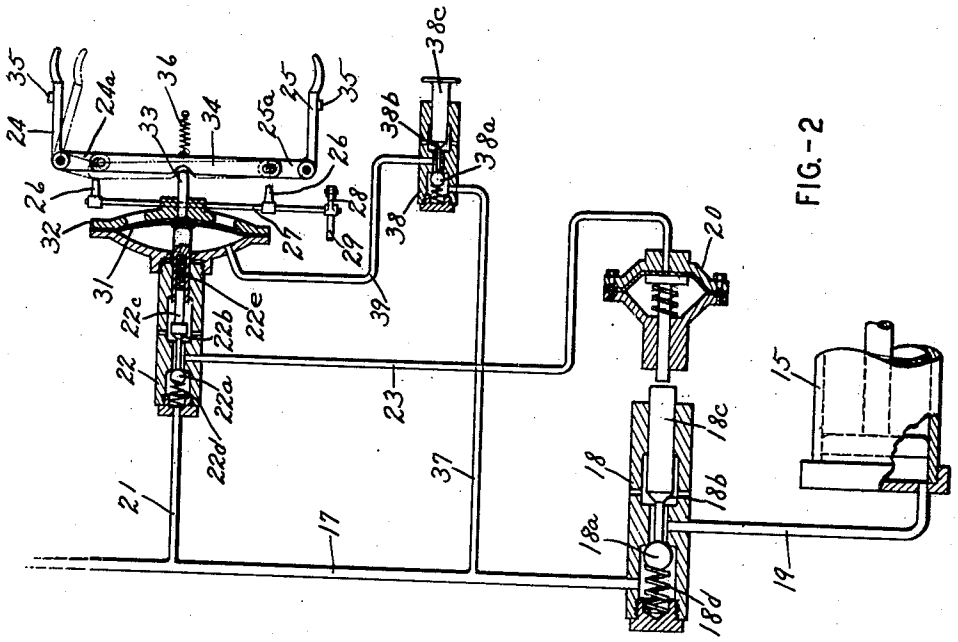


FIG.-2

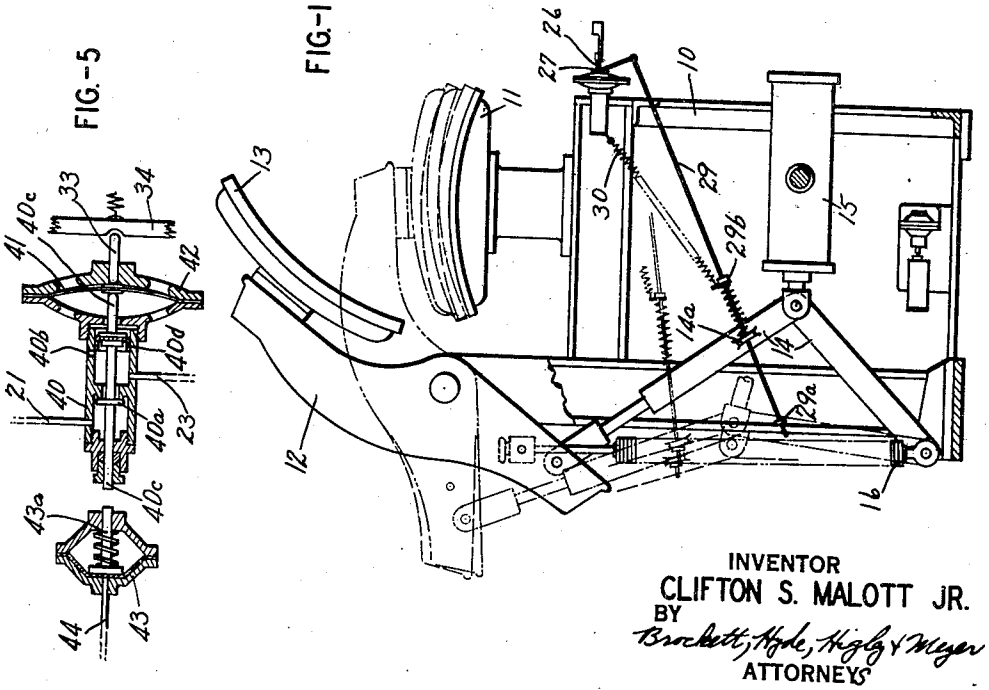


FIG.-1

FIG.-5

INVENTOR
CLIFTON S. MALOTT JR.
BY
Brockett, Hyde, Higby & Meyer
ATTORNEYS

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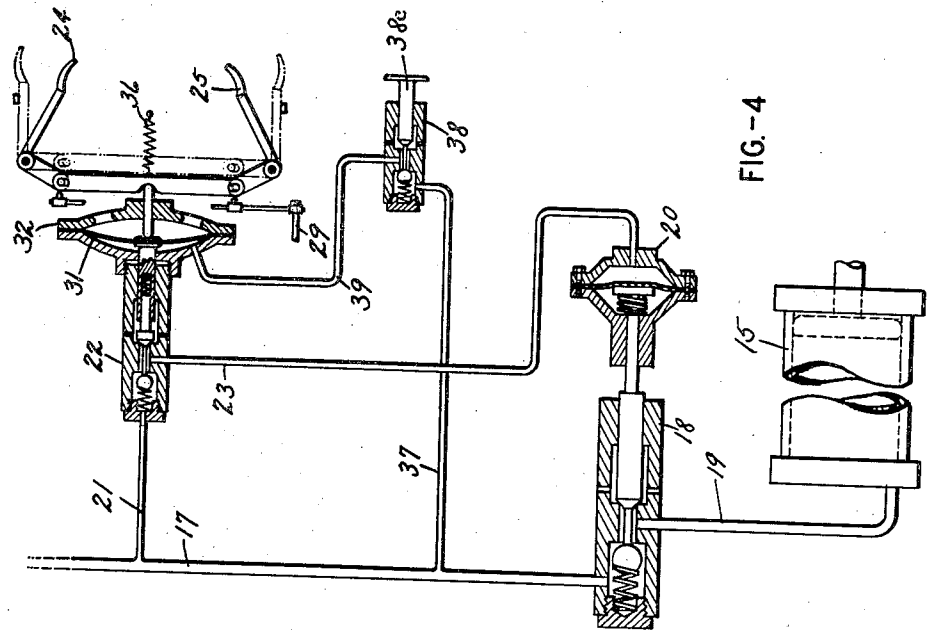


FIG.-4

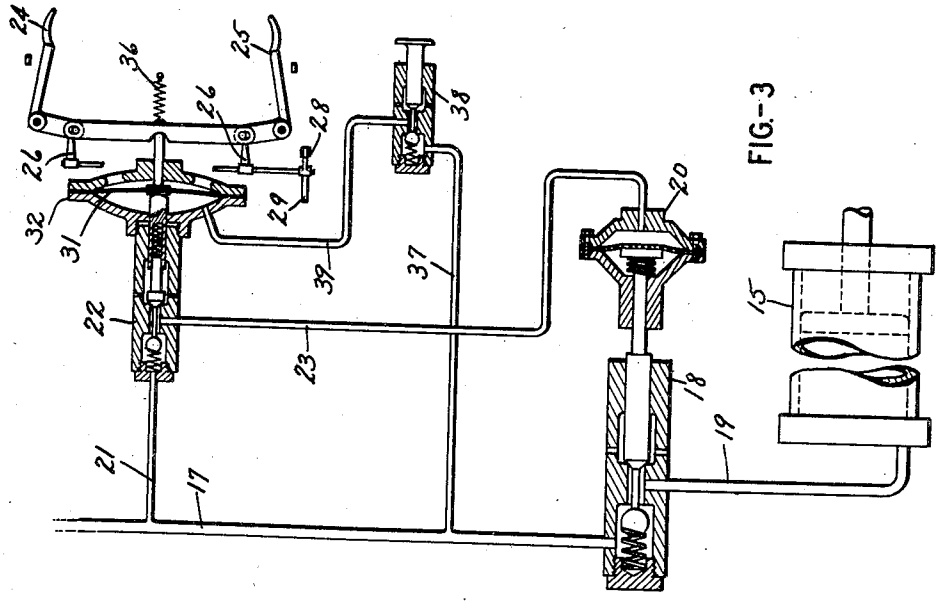


FIG.-3

INVENTOR
CLIFTON S. MALOTT JR.
BY
Brockett, Hyde, Higley & Meyer
ATTORNEYS

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CONTROL FOR PRESSING MACHINES

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FIG.-6

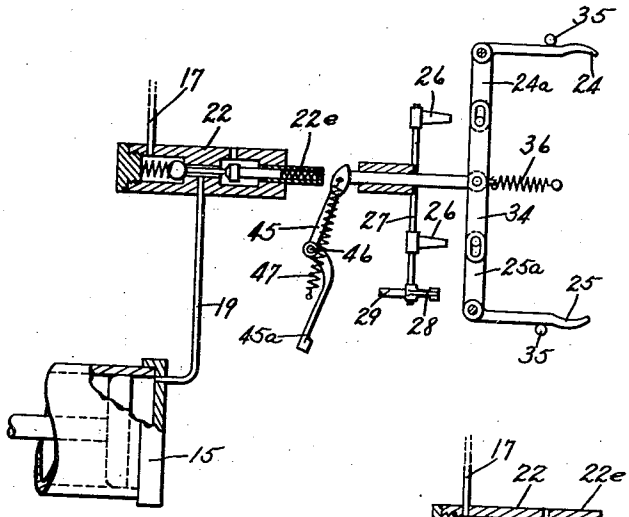
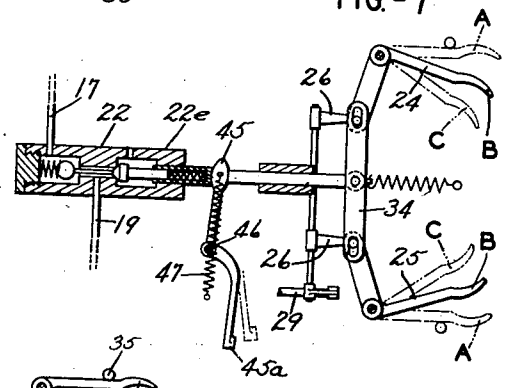


FIG.-7



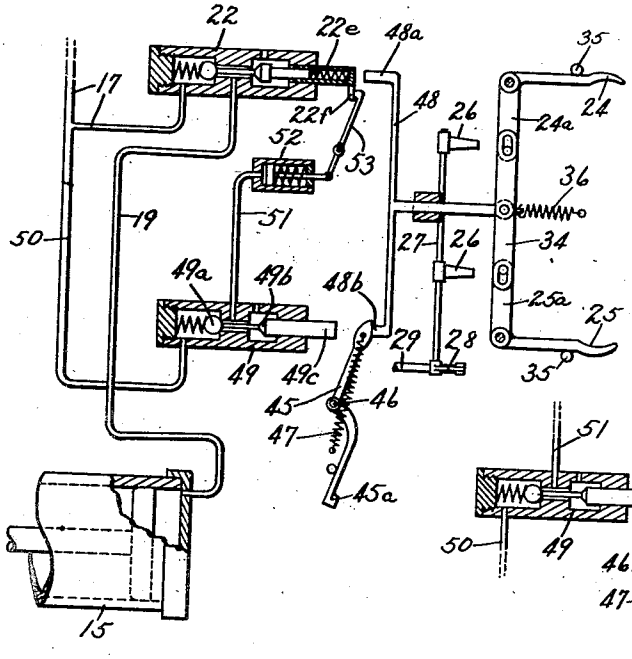
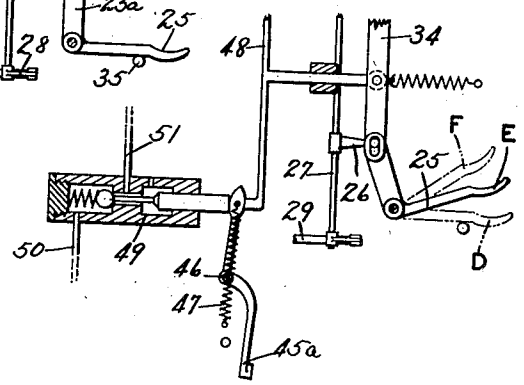


FIG.-8

FIG.-9



INVENTOR
CLIFTON S. MALOTT JR.
BY
Brockett, Hyde, Higley & Mayer
ATTORNEYS

Patented Sept. 5, 1939 2,171,583

UNITED STATES PATENT OFFICE

2,171,583

CONTROL FOR PRESSING MACHINES

Clifton S. Malott, Jr., Norwood, Ohio, assignor to The American Laundry Machinery Company, Norwood, Ohio, a corporation of Ohio

Application September 18, 1937, Serial No. 164,456

8 Claims. (Cl. 192—131)

This invention relates to improvements in control mechanism for pressing machines and more particularly for such machines used for laundry and garment work.

An object of the present invention is to provide in a power closed pressing machine spaced safety manuals for operating the power means, these manuals having a first stage of operation from unoperated to an intermediate position, and second stage operation from intermediate to full operated position, there being means governed by the relative position of the pressing members for controlling movement of the manual means through the second stage of operation, and control means for the power means so arranged with respect to the manuals as to require first stage movement thereof to place the control means in power supply position, and an over-center snap action device for holding the control means in power supply position, said device being arranged for movement over center by movement of the manuals through second stage operation.

My invention also includes novel arrangements for returning the control parts to unactuated position and also includes novel features in the arrangement of the parts as will more fully appear in the accompanying specification and drawings.

In the drawings, Fig. 1 is an end elevation of a pressing machine embodying my invention, showing the position of the parts with the press open in full lines, safe closed in dot-dash lines, and fully closed in dash lines; Fig. 2 is a diagrammatic view of the control mechanism for the press of Fig. 1, the position of the parts corresponding to the full line position of Fig. 1; Fig. 3 is a diagrammatic view of the control mechanism showing the position of the parts approximately corresponding to the dot-dash position of Fig. 1; Fig. 4 is a similar diagrammatic view of the control mechanism showing the positions corresponding to the dash position of Fig. 1; Fig. 5 shows a modification of a portion of the control mechanism of Figs. 1 to 4; Figs. 6 and 7 are diagrammatic views of a portion of the control mechanism showing a modified form; while Figs. 8 and 9 are diagrammatic views of portions of the control mechanism for a still further modification of the control mechanism.

I have illustrated my improved control mechanism as applied to a laundry press having a frame 10 supporting a pressing bed 11 and pivotally supporting a yoke. 12 which carries a pressing head 13 into and out of engagement with the pressing bed upon actuation of the toggle 14 by the fluid motor 15. A spring 16 urges the pressing head toward open position.

The power supply for motor 15 is by way of conduit 17, valve casing 18 and conduit 19. Casing 18 houses a normally closed inlet valve 18*a*, a normally open outlet valve 18*b*, both actuated by a common stem 18*c*. The valve parts may be held in normal position by a spring 18*d* although this spring may be omitted if the valve is so positioned that the parts automatically return to the position of Fig. 2 when the valve stem is released. While the valves in casing 18 might be directly operated by the control mechanism, I prefer to operate the same by the servo-motor 20, fluid supply for which is by way of conduit 21, valve casing 22 and conduit 23. The parts in casing 22 are similar to those in casing 18 and have been given similar suffixes. Here the valve stem has been provided with a yieldable end 22*e*.

Actuation of the valves in casing 22 is by means of a pair of manuals 24 and 25 pivotally mounted on the frame and so spaced apart as to require a hand of the operator on each of them for their coincidental operation. Movement of these manuals occurs in two stages, the first stage being from the unoperated position shown in full lines in Fig. 2 to an intermediate position shown in Fig. 3, and the second stage of operation corresponding to movement from the intermediate position of Fig. 3 to the full operated position of Fig. 4. Means is provided for limiting the movement of the manuals to first stage operation until the press is safely closed. In the present instance this means comprises stops 26 normally positioned to abut the arms 24*a* and 25*a* respectively of the manuals but removable when the press reaches safe closed position. The means for their removal here shown is provided by mounting the stops rigidly on a shaft 27 which is provided with an arm 28 pivotally connected to a rod 29 which passes through the slotted bracket 14*a* on the toggle 14. The rod carries collars 29*a* and 29*b* and is provided with a spring 30 which normally biases the stops to the position of Figs. 1 to 3.

Between the manuals and the control member 22 I provide an over-center snap action device having a central unstable position and a first stable position on the side toward the manuals and a second stable position on the side toward the control member. In Figs. 1 to 4 I have provided a snap action steel disk 31 firmly held in a housing 32 and so positioned that on one side the disk abuts the valve stem end 22*e* and on its opposite face engages the pin 33 which is in opera-

tive engagement with the central portion of a whiffletree or equalizer bar 34 whose opposite ends are pivotally connected to the manuals 24 and 25. It will be noted that the tendency of disk 31 to move toward the position of Fig. 2 will tend to hold the manuals in unoperated position against the abutments 35. However, this action may be supplemented by the spring 36 so that the manuals normally return to unoperated position.

The arrangement of the manuals is such with respect to the disk 31 that movement of one manual alone as indicated in dot-dash lines in Fig. 2, will not cause sufficient movement of disk 31 to actuate the valves in casing 22. However, upon coincidental actuation of both manuals through their first stage of operation to the limiting stops 26 as shown in Fig. 3, disk 31 is moved from its first stable position to a central unstable position short of the center. This movement is sufficient to actuate the valves in casing 22 as indicated in Fig. 3, but upon release of one or both manuals these valves will return to their normal power cut-off position. When the press is safely closed, however, and the stops 26 are removed as shown in Fig. 4, the manuals may be further operated to carry the disk 31 over center, whereupon by snap action it will move to its second stable position as shown in Fig. 4, where it is adapted to hold the valves in casing 22 in actuated position, whereupon the manuals may be released. The manuals in Fig. 4 are shown in full operated position although it will be understood that they need not be moved farther than sufficient to carry the disk 31 over center.

Suitable means is provided for returning the valves in casing 22 to their normal or power cut-off position. In Figs. 1 to 4 this means comprises making the housing 32 air-tight on the left side of the disk 31 and supplying air thereto through conduit 37, valve casing 38 and conduit 39. Casing 38 houses a normally closed inlet valve 38*a* and a normally open outlet valve 38*b* both operated by a release manual 38*c*.

In the modification of Fig. 5, a supply valve casing 40 performs a function similar to that described in connection with casing 22. Here the supply conduit is also marked 21 and the conduit leading to servo-motor 20 is marked 23. Casing 40 houses a normally closed inlet valve 40*a* and a normally open outlet valve 40*b* both operable by a common stem 40*c* which engages the over-center snap action device 41. It will be noted that the exhaust valve is provided with a flexible cup of leather or the like 40*d* so that at any time valve 40*a* is opened but not maintained in that position, flow of air through valve 40*a* against the cup 40*d* will return the valves to the position of Fig. 5 without the need of a spring.

The over-center snap action device of Fig. 5 as shown at 41 might be a disk similar to 31 but instead in this modification it may be a strip of spring steel or the like carried in a suitable bracket 42. The operation of this modification is exactly the same as that of Figs. 1 to 4 in that movement of both manuals through a first stage of operation will move the snap action member 41 short of center position and actuate the valves in casing 40 to supply power to motor 15. However, only upon removal of the stop means when the press is safely closed can the manuals be moved through their second stage of operation causing the member 41 to pass over center and snap into its second stable position to hold the valves in casing 40 operated. Here I have shown a different device for returning the valves in casing 40 to normal power cut-off position. This means comprises a servo-motor 43 having a fluid supply 44 and a push rod 43*a* adapted to engage the valve stem 40*c* which extends through the left end of casing 40 for this purpose. Supply to conduit 44 would be by means of a release manual 38*c* as previously described.

It is thought the operation of my control mechanism will be thoroughly understood but nevertheless will be here briefly reviewed. With the press in the full line position of Fig. 1, the operator arranges the work on bed 11 and moves both manuals through first stage of operation to the position of Fig. 3. This moves disk 31 short of center position but sufficiently to actuate the valves in casing 22 so as to supply fluid through conduits 21 and 23 to servo-motor 20. This makes a stroke to the left actuating the valves in casing 18 and supplying power to motor 15 through conduits 17 and 19. The manuals cannot be moved through their second stage of operation until the stop members 26 have been removed which occurs when the press is safely closed or approximately the dot-dash position of Fig. 1. Here the bracket 14*a* engages collar 29*a*, pulling on rod 29 and moving the stop members 26 to the position of Fig. 4, permitting further movement of the manuals. After the disk 31 is snapped over center it will hold the valves in casing 22 operated so as to retain the press closed under power. The manuals may then be released. To open the press, release manual 38*c* is momentarily operated moving disk 31 over center to the position of Fig. 2, whereupon the parts return to the position of Fig. 2 and the press opens.

In Figs. 6 and 7, I have shown a modified form of control mechanism wherein all of the parts not specially described are the same as those already mentioned. More specifically, the motor 15 is the press closing motor which in this instance is supplied directly through conduit 17, valve casing 22 and conduit 19 instead of through a pilot valve arrangement as previously described. In this modification the snap acting over-center device comprises a lever 45 pivotally mounted on the frame at 46 and having an actuating handle 45*a*. A spring 47 has one end fixed and the other attached to lever 45 so that upon oscillation of the lever the spring moves to opposite sides of pivot 46 so as to hold the lever in either of two positions.

In Fig. 6, the parts are in the position corresponding to the open press wherein the valves in casing 22 are in power cut off position. In the position of Fig. 7, when the operator has moved the manuals 24 and 25 from the unoperated position marked A to the full line intermediate position B, the whiffletree 34 has been advanced sufficiently to actuate the valves in casing 22 so as to supply fluid to motor 15 but not sufficiently to move spring 47 over center at 46. In this position of the parts if either manual is released the valves in casing 22 will return to fluid cut-off position and the lever 45 will return to the position of Fig. 6. The stops 26 prevent further movement of the manuals beyond the full line position of Fig. 7 until the pressing members reach safe closed position at which time a pull on rod 29 as previously described removes the stop members permitting further movement of the manuals to position C, Fig. 7. This movement is made possible by the yieldable valve stem end 22*e* and permits sufficient movement of lever 45 to carry spring 47 over the pivot 46 so that spring 47 will then

be available to hold the valves in casing **22** in operated position and the manuals may be released while the press remains closed with pressure fluid in motor **15**. To open the press, the operator moves the handle **45***a* to return the parts to the position of Fig. 6.

In the modification of Figs. 8 and 9, pressure fluid is supplied, as in the case of the modification of Figs. 6 and 7, through conduits 17 and 19 and the valves in casing **22** to the press operating motor **15**. Here the whiffletree **34** actuates a bar or yoke **48** having an arm **48***a* adapted to engage the valve stem **22***e* to move the valves in casing **22** to operated position when the manuals are moved to intermediate position. The yoke has another arm **48***b* which is adapted to engage the valve stem **49***c* to move the normally closed inlet valve **49***a* to open position while at the same time closing the normally open outlet valve **49***b* in casing **49**. This supplies pressure fluid through conduits **50** and **51** to servo-motor **52** which is adapted to act through lever **53** against abutment **22***f* on the valve stem **22***e* to hold the valves in casing **22** in operated position. In this modification a lever **45** analogous to that described in Figs. 6 and 7 is pivoted at **46** and provided with a spring **47** adapted to move either side of pivot **46** so as to hold the lever in each of two positions.

In the modification of Figs. 8 and 9, when the operator desires to close the press it is necessary to move manuals **24** and **25** from position D of Fig. 9 to the intermediate position E there shown, it being understood that both manuals must be moved to the intermediate position to cause the arm **48**a to move the valves in casing **22** to actuated position. Such movement, however, is insufficient to operate the valves in casing **49**. If either of the manuals is released at this time, the valves in casting **22** will return to the position of Fig. 8 and the press will open. Movement of the manuals beyond intermediate position is impossible until the press is safely closed because of the stops **26**. Here again when the press is safely closed a pull on rod **29** removes stops **26**, permitting further movement of manuals **24** and **25** to full operated position as indicated at F in Fig. 9. This is sufficient to cause arm **48***b* acting through lever **45** to move the valves in casing **49** to operated position, at the same time moving spring **47** over center beyond the pivot **46** so that spring **47** holds the valves in casing **49** in operated position, thus supplying fluid to servo-motor **52** which in turn holds the valves in casing **22** operated so that the press remains closed under power and the manuals may be released. To open the press the operator moves the handle **45***a* to return lever **45** to the position of Fig. 8, thus moving the valves in casing **49** to exhaust position, permitting the servo-motor **52** to release the valves in casing **22** so that they return to the position of Fig. 8.

What I claim is:

1. In a pressing machine, a pair of relatively movable coacting pressing members, power means for causing a pressing operation between said members, normally unactuated control means for causing actuation of said power means, manual means for operating said control means and comprising two manuals spaced to require a hand of the operator on each of them for coincidental actuation thereof, said control means and manual means being so constructed and arranged as to require coincidental operation of both manuals for effective actuation of said control means, said manual means having two stages of operation, a first stage adapted to actuate said control means whereby the pressing machine may be closed and a second stage after the press reaches safe closed position, means normally preventing effective second stage operation of said manual means, means responsive to movement of the machine to safe closed position for actuating said preventing means to permit second stage operation of said manual means, and a single over-center snap action device for holding said control means in actuated position, said device being so arranged with respect to said manual means as to require second stage operation of said manual means to move said device over center.

2. In a pressing machine, a pair of relatively movable coacting pressing members, power means for causing a pressing operation between said members, control means for said power means normally in power cut-off position, manual means for operating said control means and comprising two manuals spaced to require a hand of the operator on each of them for coincidental actuation thereof, said manual means having two stages of operation, a first stage from unoperated to intermediate position and a second stage from intermediate to full operated position, said control means being so arranged with respect to said manual means as to require first stage movement of said manual means to move said control means to power-supply position, means governed by the relative position of said pressing members for controlling movement of the manual means from intermediate to full operated position, and means including an over-center snap action device for holding said control means in power supply position, said device being arranged for movement over center by second stage operation of said manual means.

3. In a pressing machine, a pair of relatively movable coacting pressing members, power means for causing a pressing operation between said members, control means for said power means normally in power cut-off position, manual means for operating said control means comprising two manuals spaced to require a hand of the operator on each of them for coincidental actuation thereof, said manual means having two stages of operation, a first stage from unoperated to intermediate position and a second stage from intermediate to full operated position, an over-center snap action device between said control means and said manual means, said device having an unstable intermediate position and stable positions on each side thereof, said device in one of its stable positions having an operative connection with said manuals for holding them in unoperated position, said device in the other of its stable positions having an operative connection with said control means for holding the latter in actuated position, means governed by the relative position of said pressing members for controlling movement of the manual means from intermediate to full operated position, and said snap action device being arranged for movement short of center by first stage movement of said manual means.

4. In a pressing machine, a pair of relatively movable coacting pressing members, power means for causing a pressing operation between said members, governing means for said power means normally in power cut-off position, safety control means for said governing means comprising two

manuals spaced to require a hand of the operator on each of them for coincidental actuation thereof, said control means having two stages of operation, a first stage from unoperated to intermediate position and a second stage from intermediate to full operated position, an over-center snap action disk between said governing means and said control means, said disk having an unstable intermediate position and stable positions on each side thereof, said disk in one of its stable positions being effective upon said manuals for holding them in unoperated position, said disk in the other of its stable positions being effective upon said governing means for holding the latter in actuated position, means governed by the relative position of said pressing members for controlling movement of the manual means from intermediate to full operated position, and said snap action disk being arranged for movement short of its unstable intermediate position by first stage movement of said control means.

5. In a pressing machine, a pair of coacting relatively movable pressing members, power means for causing a pressing operation between said members, a governing member for said power means normally in power cut-off position, a pair of manuals spaced to require a hand of the operator on each of them for their coincidental operation, an over-center snap action disk having an unstable central position and stable positions on each side thereof, said disk being operatively connected with said manuals and with said governing member, the first of said stable positions corresponding to power cut-off position of said governing member, the second of said stable positions and said unstable position corresponding to power supply position of said governing member, said manuals having first and second stages of operation, stop means limiting said manuals to first stage operation, means for removing said stop means when said pressing members reach a safe-closed position, and the relation between said manuals and disk being such that coincidental actuation of both manuals through their first stage of operation moves said disk from its first stable position to unstable position short of center and actuation of said manuals through their second stage of operation moves said disk beyond center.

6. A pressing machine as in claim 5, including means for moving said disk from second stable position to first stable position whereby to return said governing member to power cut-off position.

7. In a pressing machine, a pair of relatively movable coacting pressing members, power means for causing a pressing operation between said members, governing means for said power means normally in power cut-off position, safety control means for operating said governing means comprising two manuals spaced to require a hand of the operator on each of them for coincidental actuation thereof, said control means having two stages of operation, a first stage from unoperated to intermediate position and a second stage from intermediate to full operated position, said governing means being so arranged with respect to said control means as to require first stage movement thereof to move said governing means to power-supply position, means governed by the relative position of said pressing members for controlling movement of the control means from intermediate to full operated position, an over-center snap action device for holding said governing means in actuated position, and said device being arranged for movement over center by second stage operation of said control means.

8. In a pressing machine, relatively movable pressing members, power operating means therefor, power supply governing means for said operating means having a normal tendency to move to "off" position, over-center snap action means associated with said governing means and adapted when advanced beyond center position to hold the same in "on" position, safety two hand control means associated with said snap action means and having two stage advance movement, a first stage to a position short of center position of the snap action means in which the governing means is in "on" position and a second stage which further advances the snap action means beyond center while holding said governing means in "on" position, said control means during retracting movement thereof being ineffective upon said snap action means, separate means for retracting the snap action means when it has been advanced beyond center, and means controlled by press operation for preventing advance motion of said snap action means beyond center until the press has been safely closed.

CLIFTON S. MALOTT, JR.