July 30, 1929. H. H. McDERMOTT 1,722,638

OPERATIVE MECHANISM FOR STEAM PRESSES

Original Filed Dec. 26, 1924 3 Sheets-Sheet 1

Fig. 1.

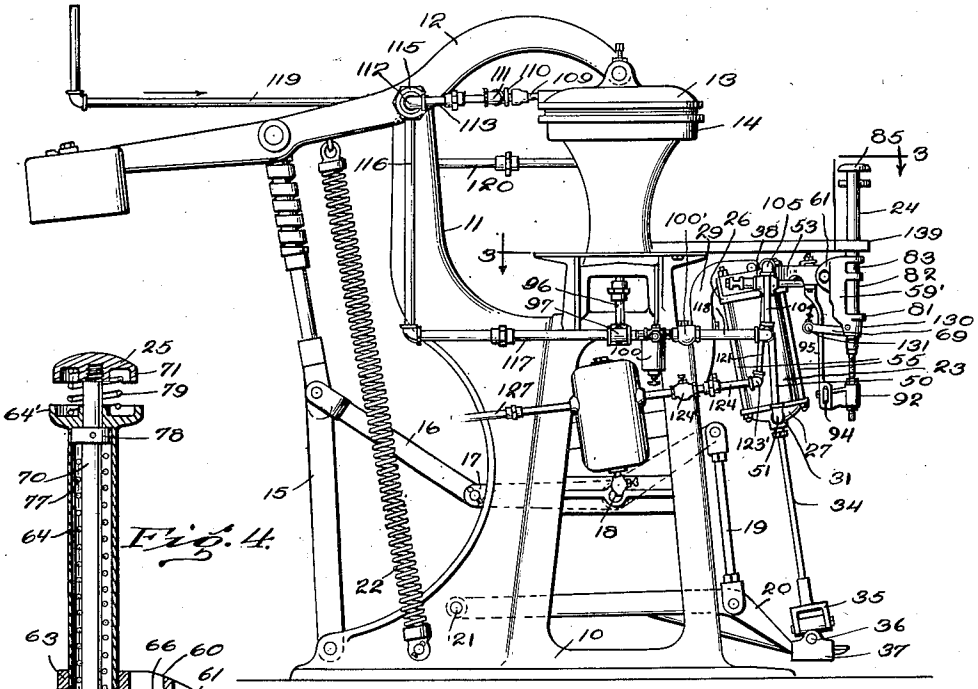


Fig. 4.

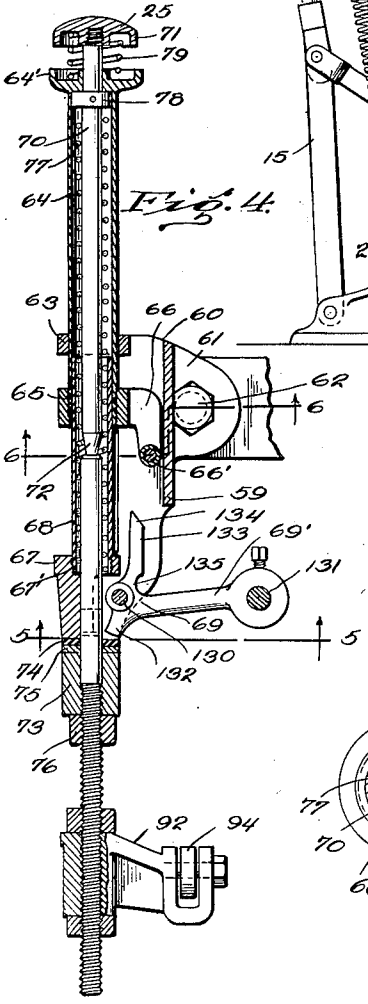


Fig. 5.

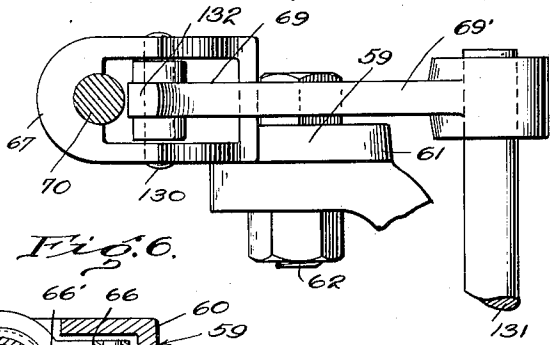
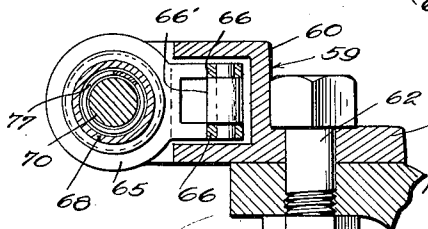


Fig. 6.



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Fig. 2.

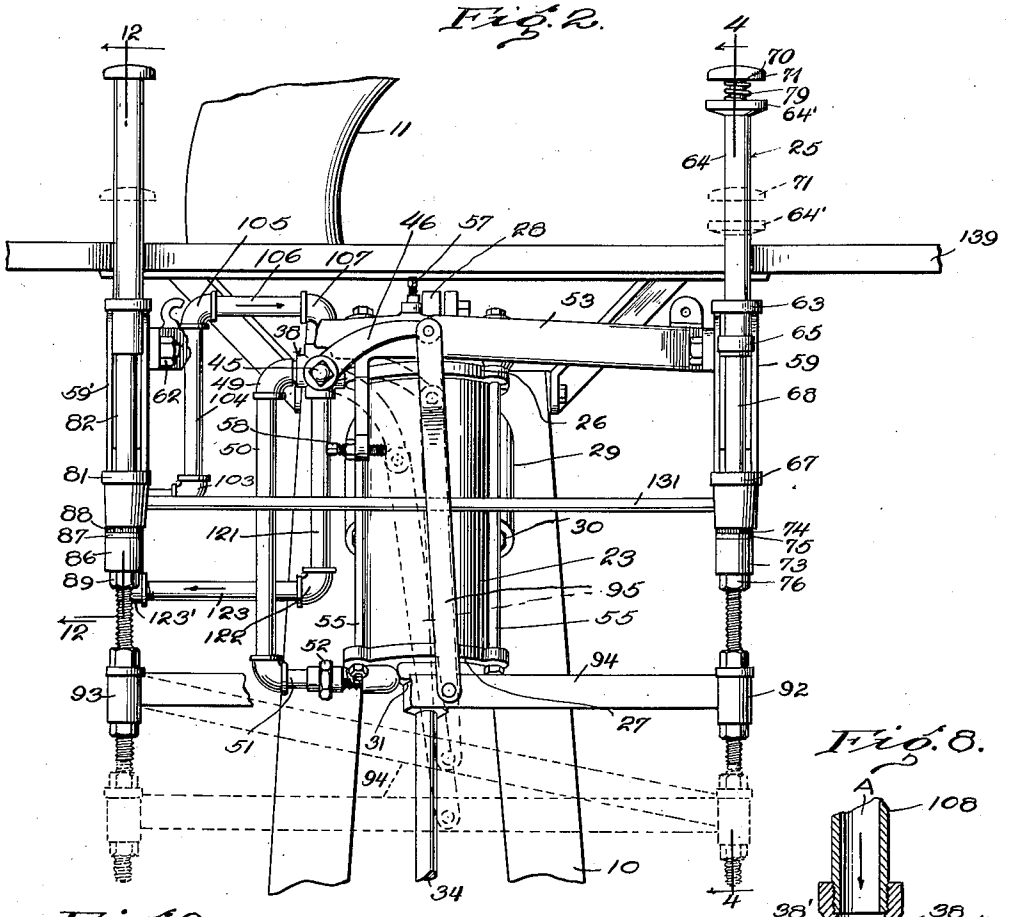


Fig. 8.

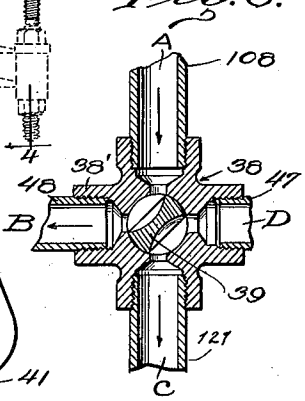


Fig. 9.

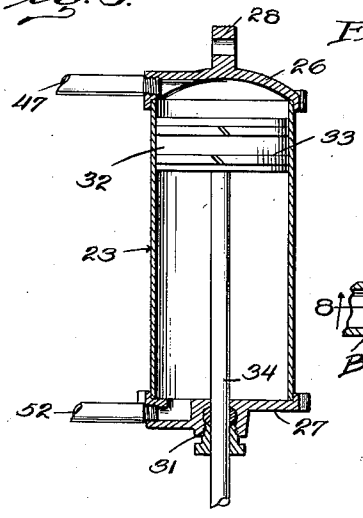
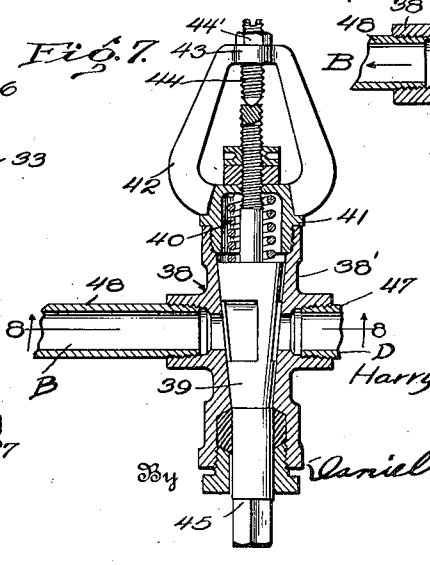


Fig. 7.



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OPERATIVE MECHANISM FOR STEAM PRESSES

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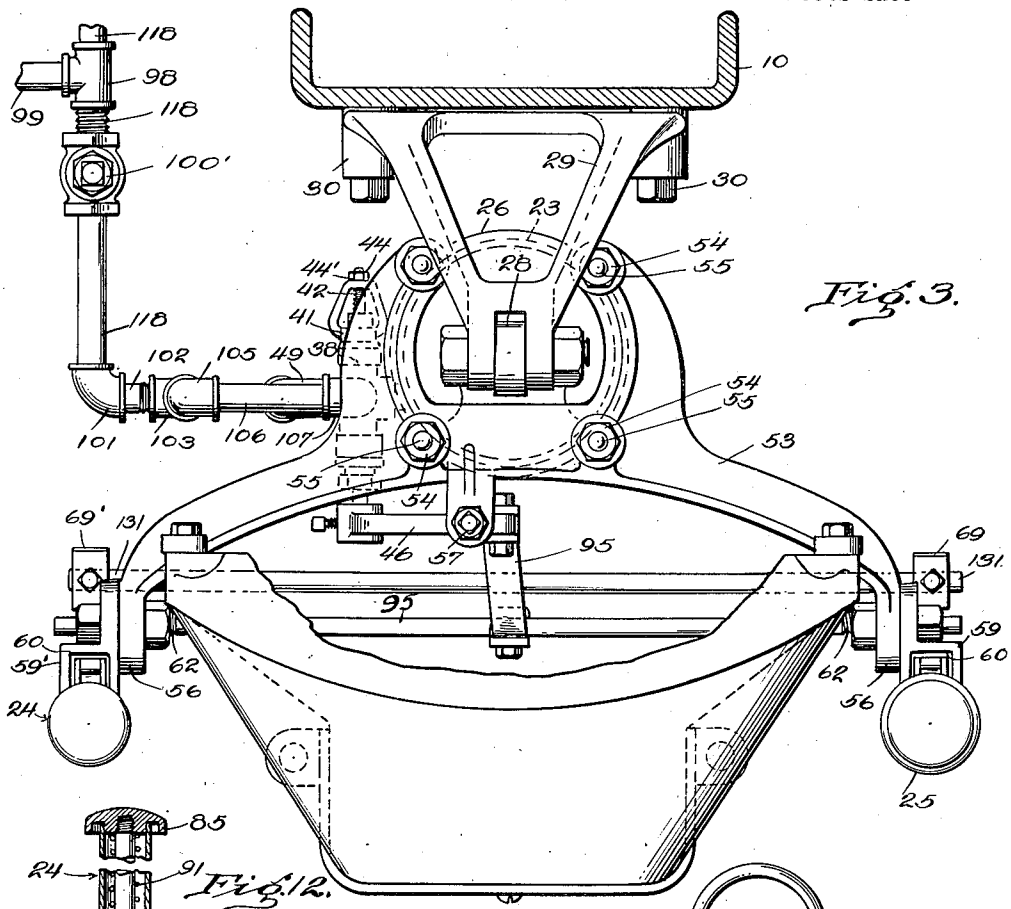


Fig. 3.

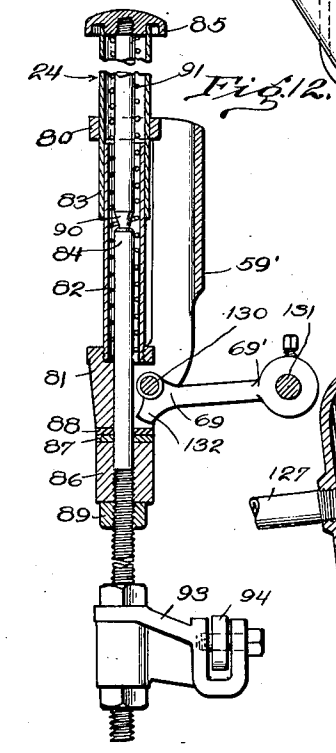


Fig. 12.

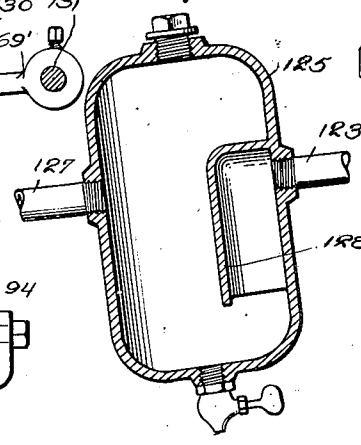


Fig. 10.

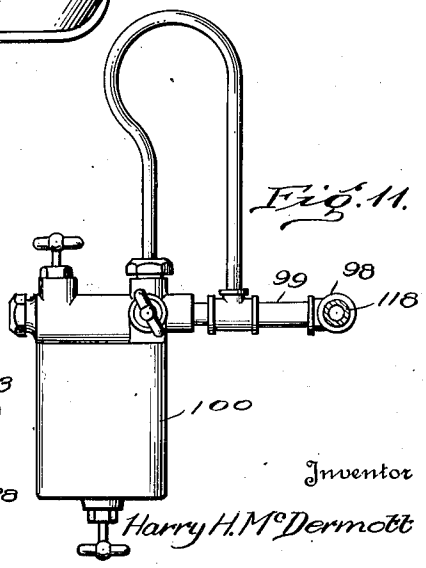


Fig. 11.

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Patented July 30, 1929. 1,722,638

UNITED STATES PATENT OFFICE.

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OPERATIVE MECHANISM FOR STEAM PRESSES.

Original application filed December 26, 1924, Serial No. 758,121. Divided and this application filed April 28, 1926. Serial No. 105,223.

The present invention relates generally to pressing machines such as are used by dyeing and cleaning establishments by tailors and pressers, and by laundries for pressing garments, fabrics, etc.

One of the objects of the invention is to provide a pressing machine in which the pressing or ironing pressure on the textile or garment is secured by power actuated means, whereby the effort required to operate the machine is reduced to a minimum and whereby a much higher pressure can be applied to the work than is possible to obtain through levers operated by foot or hand power. This greater pressure gives a better finish to the work and produces a more lasting press.

Another object attained through the use of the above power actuating means is a greater rapidity of operation of the machine.

Another object of the invention is to utilize the exhaust steam from the heating chambers of the presser head and buck for the power operation of the machine.

Another object attained by my invention is the automatic regulation of the volume of heat supplied to the presser head and buck in accordance with the rapidity of operation of the machine.

Another object attained is the frequent withdrawal of condensation from the heating chambers of the presser head and buck to the end of obtaining a more efficient heating of the presser head and buck.

Another object of the invention is to provide power operating means which can be built directly into the pressing machine in its original construction, or which can be embodied in an attachment adapted for ready application to foot-operated pressing machines.

In the drawings illustrating a preferred embodiment of the invention:

Fig. 1 is a side elevation showing my invention embodied in the usual type of pressing machine comprising a presser head and buck.

Fig. 2 shows a fragmental front elevation on an enlarged scale taken so that the controller mechanism and operating cylinder are clearly shown.

Fig. 3 is a fragmental plan view taken on lines 3—3 of Fig. 1 shown at a larger scale.

Fig. 4 is an enlarged vertical sectional view taken through one of the telescoping controllers.

Fig. 5 is a partial sectional view taken on line 5—5 of Fig. 4 showing the trip latch arrangement.

Fig. 6 is a partial sectional view taken on line 6—6 of Fig. 4 showing the clamp carrying the knock out roller and a portion of the yoke bracket.

Fig. 7 is a vertical section taken through a four way valve.

Fig. 8 is a cross section taken on line 8—8 of Fig 7, showing the ports.

Fig. 9 is a vertical section through an operating cylinder and its heads.

Fig. 10 is a cross sectional view taken through the oil separator employed in the exhaust line from the operating cylinder.

Fig. 11 is a side elevation of a lubricating device shown connected to a port of the inlet steam line leading to the operating cylinder.

Fig. 12 is a view similar to Fig. 4 of the other telescoping controller.

The press which may be considered as representative of conventional press construction, comprises a frame 10 having an upper standard or arm 11 extending upwardly from the rear of the frame for pivotally supporting the presser head lever 12. Pivotally mounted on the front end of this lever is the presser head 13 which is adapted to be brought down upon the lower pressing buck 14 supported on the frame 10. The garment or fabric to be pressed is, of course, inserted between the presser head and the buck. Both the presser head and buck are adapted to be heated by steam which is conducted through well-know heating chambers in both, supplied with steam through pipes 119, 120. The lever 12 carries a rear counterweight to balance the weight of the presser head.

A toggle lever consisting of a pair of toggle links 15 is pivotally secured to the balanced lever 12 at one end and to the frame 10 at the other end. The knuckle or pivot of said toggle has connection through a link 16 with one end of a lever 17, which is fulcrumed at 18 to a cross brace of the frame for up and down rocking motion. A connecting rod 19 at the other end of lever 17 connects it pivotally with a treadle lever 20 which is pivotally secured to the frame as at

21. To this treadle lever the device of the present invention is operatively connected. By virtue of its ability to make operative connection to this treadle lever the present mechanism has ready applicability as an attachment to old machines. Moreover it also permits operation by foot power.

In steam heated pressing bucks a source of steam under moderate pressure is always available and one of the features of the invention is the provision of means for utilizing this steam for operating the upper presser head. Another feature is the arrangement whereby the exhaust steam discharged from the heating chambers of the presser head and buck is used in this power operation.

This power actuation is performed by a cylinder 23 which is supported directly under the front table of the machine and which has operative connection with the treadle 20, as I shall presently describe.

The feature of control of pressing machines generally and its particular application to a pressing machine as herein characterized forms no part of the present invention, and is the subject of Patent No. 1,587,078, dated June 1, 1926, of which the present application is a division. These control features will be described in the following, however, in sufficient detail for a complete understanding of the invention.

Two controllers 24 and 25 are provided to control inlet of steam to the ends of the cylinder 23, these controllers being so related that both must be forced down simultaneously or steam will not be admitted to the cylinder 23 to bring the head and buck together. This compels the use of both hands on the controllers and consequently there is no possibility of having one hand caught between the presser head and buck. Accidents caused through the carelessness of the operator in getting his or her hands injured between the head and the buck are thus positively avoided.

The cylinder 23 illustrated in Fig 9 is of the conventional type, closed at the top and bottom by cylinder head 26 and 27 respectively, each having internally threaded ports. The upper head is provided with a lug 28 having a transverse bore therein to receive a pivot bolt for securing it pivotally on a bracket 29 secured to the frame 10 by means of bolts 30 (Fig. 3). The lower cylinder head is provided with packing and a stuffing box 31 to prevent escape of steam from the cylinder which has a reciprocating piston 32 mounted therein. Piston rings 33 are provided in said piston and a piston rod 34 secured thereto extends downwardly and has a yoke 35 secured to its end. A connecting joint 36 is pivotally mounted on said yoke, and has pivotal connection with a clamp 37 fixedly secured to the treadle lever 20, thus forming a universal joint to connect the press operatively with the cylinder.

In Fig. 7 is shown a longitudinal section of a four way valve 38 in which a housing 38′ is provided with four tapped openings or ports A, B, C and D, best indicated in Fig. 8. A tapered valve stem 39 having cut away portions for placing these openings A, B, C and D, in communication with each other, is rotatably fitted within said housing and held yieldingly in place by a compression spring 40 surrounding a portion of the stem of reduced diameter and held in place by a threaded cap 41 engaging the internal threads of the housing 38′.

Integral with said cap is a yoke 42 having a tapped opening 43 at its upper end through which a headless set screw 44, having a lock nut 44′ extends for engaging the top of the reduced portion of the valve stem 39, to provide for its adjustment. The other end 45 of said valve stem is of polygonal cross section to receive a valve lever 46, shown in Fig. 2.

The port A of the valve housing has connection with the source of steam supply, which, as I shall hereinafter trace, is from the heating chambers of the presser head 13 and the buck 14 (thereby utilizing the waste steam from these chambers). The port B connects to the bottom of the operating cylinder 23 for forcing the piston upwardly in opening the press and the port D connects to the top of the operating cylinder for forcing the piston downwardly in closing the press. The port C connects to exhaust. In connecting the port D to the top of the cylinder 23, a nipple 47 shown in Figs. 3, 8 and 9 leads directly from the opening D into the upper cylinder head 26. In connecting the port B to the bottom of the cylinder a conduit 48 leads from the port and connects through an elbow 49 with a pipe 50 (Fig. 2). This pipe in turn connects through an elbow 51 and detachable union connection 52 with the inlet port opening into the bottom of the cylinder through the lower cylinder head 27.

A yoke bracket 53 illustrated in Fig. 3 has openings 54 that register with openings in lugs on the cylinder heads 26 and 27. Bolts 55 extend through both cylinder heads and through the yoke bracket 53 and are provided with nuts at both ends which hold the cylinder heads in place on the cylinder and the cylinder 23 firmly secured to said yoke bracket 53. This bracket terminates in ears 56 having horizontal bores therein to carry brackets 59, 59′ which in turn support the two depressible controllers 24 and 25. A table or apron 139 is supported below the buck 14 for supporting the garments or fabrics, and these two controllers are supported at the front edge of this table.

The brackets 59 illustrated in Figs. 3, 4 and 6 each comprise a channel shaped casting 60 having an apertured wing 61 extending laterally from one side thereof to be connected to the ears 56 by means of a bolt 62. At the top of each bracket 59, 59′ a guide boss 63 slidably receives a tube 64 having a circular handle 64′ formed at its upper end. The other end of this tube 64 is threaded and has secured to this threaded portion a clamp 65 formed with a downwardly extending arm 66 having a transverse horizontal bore in its bifurcated lower end which carries a knock-out roller 66′. A lower boss 67 on the bracket casting 59 has a tapped counter bore 67′ into which threads the lower end of a second or inner tube 68, which has a snug sliding fit in the outer tube 64.

It will be observed from Figs. 4 and 12 that the back walls of the channel portions of the brackets 59, 59′ are cut away at their lower ends to receive trip latch levers 69. As shown in Fig. 5 these trip latch levers are pivoted on pivot pins 130 which have their ends mounted in the side walls of the brackets 59. The rearwardly projecting ends 69′ of the two latch levers have bosses in which are secured, as by set screws, the ends of a horizontal rod or shaft 131. This shaft rises and falls with the up and down swinging movement of the latch levers, but compels the two latch levers to move together. Under the weight of this shaft the lower latching noses 132 of the two levers normally swing in and bear against vertical latch rods which I shall presently describe. The latch lever for the right hand control 25 has an upward extension 133 having a cam surface 134 on its upper end and a notched-out recess 135 at its lower end.

Associated with this right hand control 25 is a latching or releasing rod 70 which extends through bores of reduced diameter in the head 64′ of the tube 64 and in the boss 67 of the bracket 59. The upper end of this rod carries the operating knob or handle 71. At a predetermined point in the length of the rod 70 is formed an annular groove or notch 72 having a substantially square lower shoulder for engagement by the nose 130 of the latch lever, as I shall presently describe. The lower end of said rod is threaded for a relatively long distance and carries a buffer 73 adapted to strike the bottom of the boss 67 to limit the upward movement of the rod. A fiber washer 74 and a felt washer 75 are interposed between said buffer and boss 67, to reduce the shock and make the device quiet in operation. A lock nut 76 holds the buffer 73 in the desired adjusted position.

A long compression spring 77 surrounds the releasing rod 70 and is confined between a collar 78 secured thereto and the boss 67, this spring normally serving to hold the annular groove 72 out of engagement with the trip latch 69 and the telescoping elements in distended position relative to each other. Another compression spring 79 of greater compression strength is interposed between the handle 71 and the head of tube 64.

The left hand telescoping controller 24 shown in Fig. 12 is mounted in a channel bracket 59′ identical with channel bracket 59 except the wing 61 extends from the opposite side of the channel portion for mounting the bracket on the other side of the machine.

Extending upwardly from a tapped counter bore in lower boss 81 of the bracket 59′ is a guiding tube 82, similar to the tube 68, provided to slidingly guide the outer tube 83 which reciprocates in a bore in upper boss 80. A rod 84, similar to latch rod 70, extends from a handle 85, secured to this outer tube, down through a bore of reduced diameter in the lower boss 81 and supports a buffer 86 in the same manner as the other control element 25, having a shock absorbing felt washer 87 and a fiber washer 88 interposed between said buffer and lower boss. A lock nut 89 holds the buffer in adjusted position in the same manner as in its companion controller. An annular notch 90 is provided in the rod 84 in a manner similar to and in substantially the same horizontal plane as in its companion rod. A spring 91 surrounds rod 84 and is interposed between the handle 85 of the outer tube and the lower boss 81 to normally hold the outer tube and the rod in extended position.

Supported on the lower threaded ends of the two rods 70 are adjustable clevises or brackets 92 and 93, these being held between lock nuts for adjustment. Extending across the front of the machine and pivotally supported in these members is a cross-bar or lever 94 which functions analogously to a whippletree. Pivotally connected to the center of this cross lever is a link 95 which makes pivotal connection at its upper end to the valve operating lever 46 (Fig. 2). With both controls 24 and 25 in their normal upper positions this cross lever will assume the full line position of Fig. 2 for one position of the four way valve. This position of the valve lever is predetermined by the adjustable stop screw 57. For a completely down position of both controls the cross lever 94 will assume approximately the dotted line position of Fig. 2 for another position of the four way valve. The downward movement of the valve lever 46 may also be limited by the stop screw 58. In lieu of the stop screws 57 and 58 I may employ gag pots or spring cushioning devices. The different positions of the four way valve and their relation to the operation of the machine will be described at greater length

after describing the steam connections more in detail.

As previously stated, the source of steam supply for the operating cylinder 23 is from the heating chambers of the upper presser head 13 and the stationary buck 14. Accordingly, the exhaust steam lines leading from these two heating chambers pass to the main steam inlet port A of the four way valve, from which valve the application of steam on the upper and lower sides of the piston is controlled. I shall first describe the exhaust line connection from the buck 14 to the inlet port A of the four way valve. The exhaust steam leaving the buck passes downwardly through a pipe line 96 (Fig. 1) connecting with a horizontal line 118 by means of a T 97 interposed therein. This horizontal line 118 is a manifold or common supply line into which both the presser head and the buck exhaust. Interposed in this manifold line 118 is a T 98 which may have connection through pipe 99 with a lubricator 100 of any desired type, such a lubricator being illustrated in Fig. 11. A plug cock 100′ may also be interposed in the manifold line 118 to regulate the amount of steam allowed to pass through the line to the four way valve. An elbow 101 on the end of the manifold line 118 connects with one end of a nipple 102, having an upwardly directed elbow 103 at its other end. A short length of pipe 104 (Fig. 1) projects vertically therefrom and makes connection with an inwardly directed elbow 105 (Fig. 3) from which a short pipe 106 extends horizontally and makes connection with a downwardly facing elbow 107. Leading from this latter elbow is a short pipe 108 (Fig. 8) which connects with the top or inlet port A of the four way valve 38.

Referring now to the connections by which the exhaust steam coming from the presser head 13 is conducted to the manifold line 118, it will be observed from Fig. 1 that an outlet pipe 109 leading from the heating chamber of the presser head connects with a laterally turned elbow 110. This elbow is in turn connected to a rearwardly directed elbow 111 which is connected with another inwardly directed elbow 112 by means of nipples 113 and a connecting union. Connecting with the inner end of elbow 112 is any suitable type of swivel joint 115 which is aligned with the pivotal axis of the presser head lever 12 to accommodate the pivotal movement of the presser head. A pipe 116 extends downwardly from said swing joint and has a forwardly directed elbow connecting through pipe 117, which in turn connects to the T 97 communicating with manifold line 118. Thus the exhaust steam from the heating chambers of both the presser head and the buck is conducted to the port A of the four way valve 38.

From the exhaust port C or bottom end of the four way valve a pipe 121 extends downwardly (Figs. 2 and 8) to which an outwardly directed elbow 122 is secured. Leading from this elbow is a pipe 123 connecting through a rearwardly directed elbow 123′ (Fig. 1) with a pipe 124 containing a check valve 124′. A continuation of the pipe 123 connects the check valve with an oil separator 125, and another line 127, leads from said oil separator into the atmosphere or where ever it is desired to direct this exhaust steam for other uses.

Fig. 10 illustrates this construction of oil separator 125. The steam entering from pipe 123 is deflected downwardly by the baffle 128 of channel section, where it expands into the relatively large volume of the separator chamber. Here the oil particles are precipitated, after which the exhaust steam is conducted away through the outlet pipe 127.

To bring the head 13 down into engagement with the buck 14 steam must be admitted to the top of the piston 32 through port D leading from the four way valve 38. To accomplish this the operator presses down simultaneously on both telescoping controllers 24 and 25, thus moving both ends of the cross bar or whippletree 94 downwardly until it assumes the horizontal position shown in the dotted lines in Fig. 2. This operates through the link 95 to move the rotary element of the four way valve through its required movement to admit steam to the top of the cylinder. As the telescoping controllers are forced down the outer tubes 64 and 83 telescope over the guides 68 and 82 and the knock out roller 66′ on clamp 65 engages the upwardly projecting cam end 134 on the trip member 69 causing its nose 132 to move outwardly until the roller reaches the cut back portion 135. The latch then drops under the action of gravity bringing the nose 132 into engagement with the annular notch 72 in rod 70. Since both trip levers 69 are joined by the connecting bar 131 this results in the opposite controller 24 being also latched in down position.

If either of the telescoping controllers are pushed down separately, as for example the controller 25, the cross bar 94 takes the angular position shown in the intermediate dotted line position in Fig. 2 bringing the valve into neutral position thus preventing the piston from moving and consequently the head from operating. In this position the trip levers will not catch nor lock the head down for the reason that they are so connected as to act only in unison; therefore, it will be necessary for the operator to use both hands simultaneously to bring the head down, and to bring the annular grooves in rods 70 and 84 in horizontal

alignment in order to permit the noses of the trip latches to engage therewith. This also prevents one of the controllers being pushed down part way and then released.

In this bottom horizontal position of the cross bar 94 the port D is open and admits steam to the top of the piston, from the heating chambers in the presser head and buck, and simultaneously therewith places the port B in communication with the exhaust port C so that the steam remaining in the lower end of the cylinder can be exhausted.

To raise the head from the buck 14, the right hand control 25 is grasped and the two knobs or handles 64′ and 71 are squeezed together. The handle 71 and its rod 70 being down to substantially the bottom of its stroke, this squeezing raises the bottom handle 64′ and through it the sleeve 64 and knock out roller 66′. The upward movement of the knock out roller raises it out of the notched out portion 135 and cams the upper end 133 of the trip latch lever forwardly to release the nose 132 from the notch 72. This movement also occurs at the latch lever for the outer controller through the rod 131, and consequently both controllers are simultaneously released. The resulting upward movement of the cross bar 94 under the action of the springs 77 and 91 returns the four way valve to its former position again and connects the port B to the presser head and buck for admitting steam to the bottom of the cylinder and connects the upper end of the cylinder to exhaust. The resulting upward movement of the piston raises the presser head to its elevated position. The machine is then in its original starting position. The springs 22 tend to hold the head in this elevated position.

It will be noted that the power actuating means for the presser head utilizes the exhaust steam from the heating chests of the presser head and buck and in this sense is of economical operation as it utilizes heat units which would otherwise be lost. It will also be noted that the rapidity of operation of the presser head automatically governs the rate of steam circulation through the heating chests of the machine i. e. as the presser head is operated more rapidly a greater amount of heat must be supplied to the head and to the buck to compensate for the greater volume of heat absorbed by the increased number of garments pressed and this is automatically taken care of by the increased rate of steam flow through the heating chests to the operating cylinder. The periodic withdrawal of steam from these heating chests to the operating cylinder tends to remove the chilled steam from the chests and minimize condensation therein.

I do not intend to be limited to the particular details herein shown and described, as it will be obvious that the foregoing is merely an exemplary embodiment of the invention.

I claim:

In a press having a heated head and a heated buck, a press foot lever for actuating said head, a cylinder having a reciprocating piston connected to said press foot lever, and means for alternately admitting steam to the opposite ends of said cylinder from a pipe line leading from said buck and head for operating the press and cylinder, and oil separating means on said pipe line.

In testimony whereof I affix my signature at 10 South La Salle Street, Chicago, Illinois.

HARRY H. McDERMOTT.