June 18, 1935. J. P. SINGISER 2,005,171

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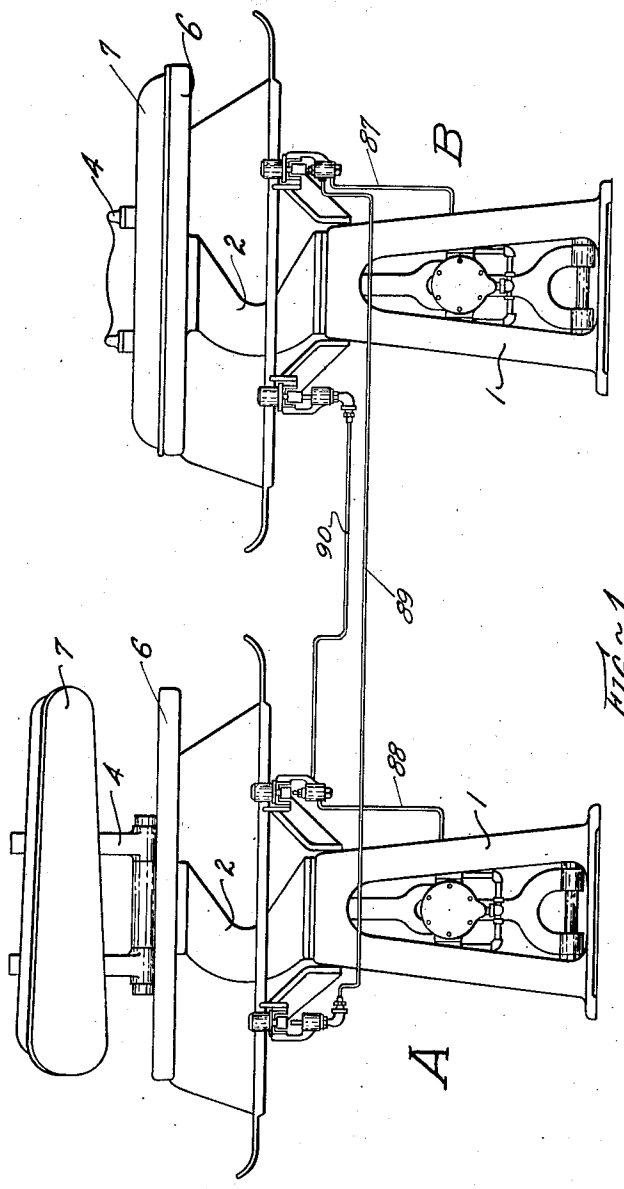

FIG. 1

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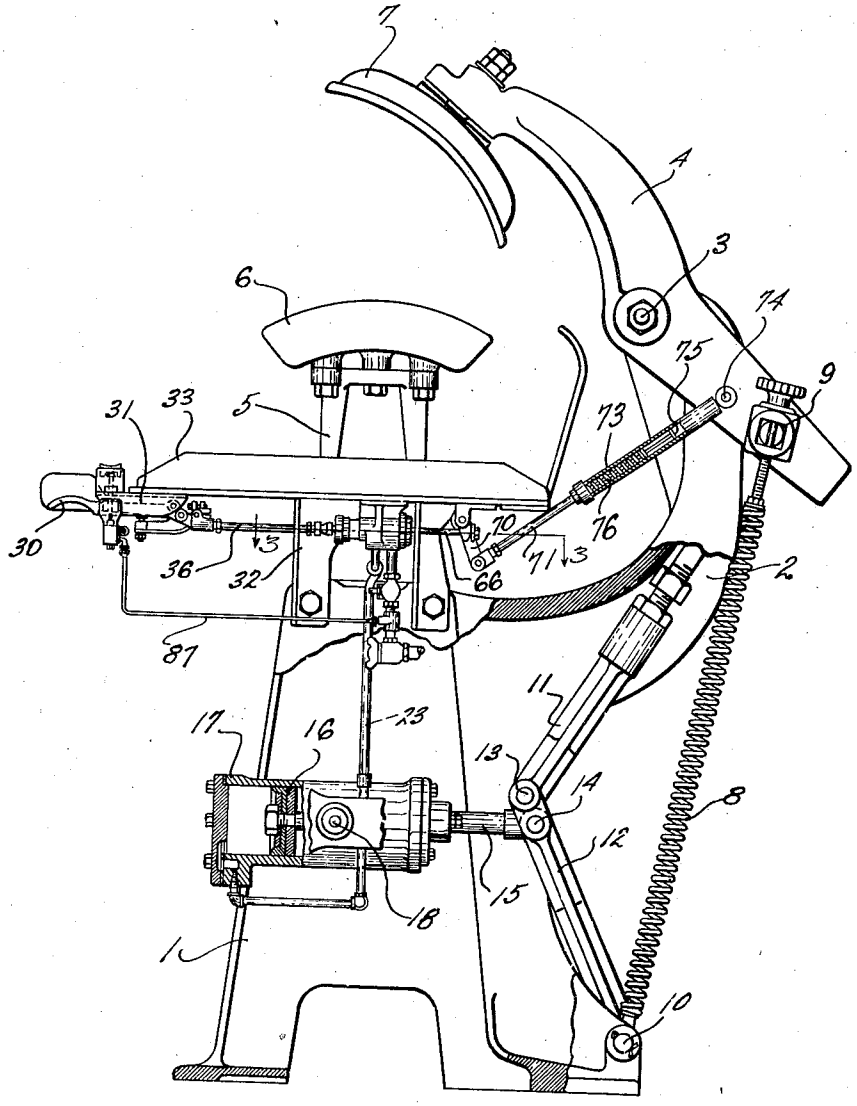

FIG. 2

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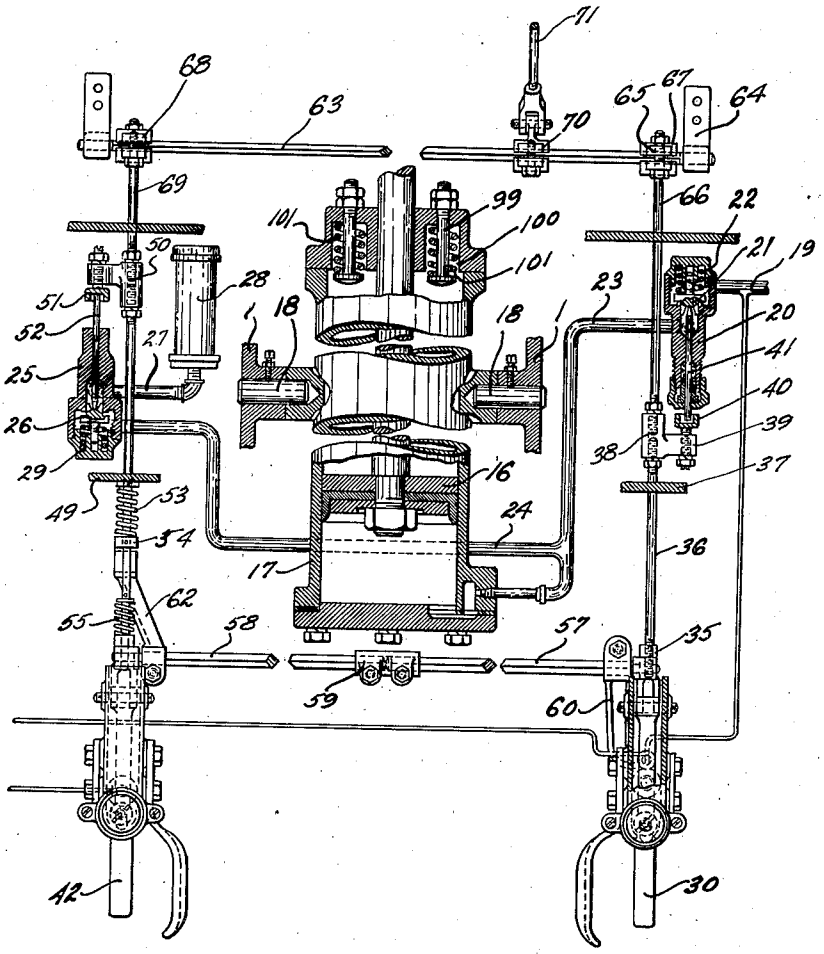

FIG. 3

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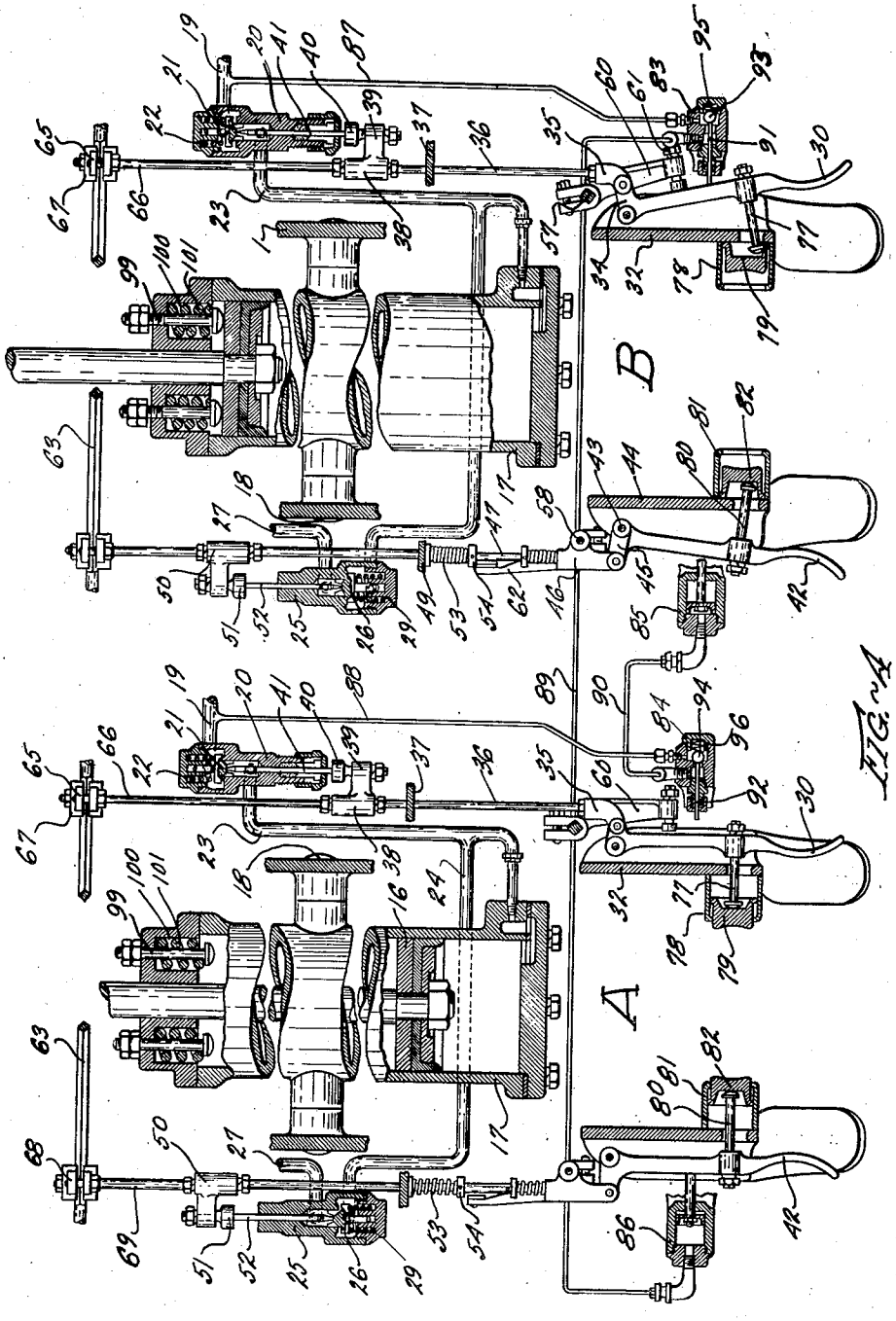

FIG. 4A

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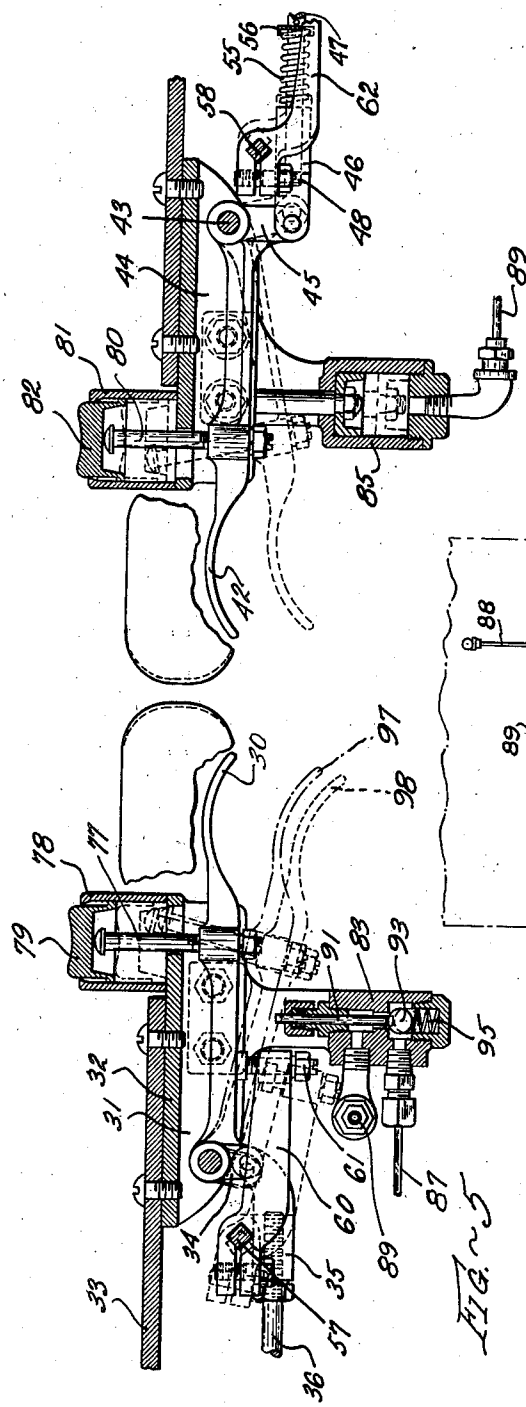

FIG. 5

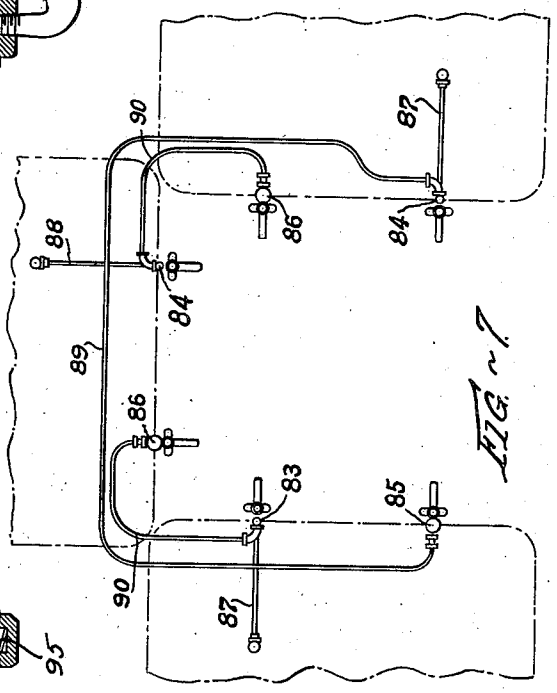

FIG. 7

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Patented June 18, 1935 2,005,171

UNITED STATES PATENT OFFICE

2,005,171

TANDEM POWER PRESS

John P. Singiser, Chicago, Ill., assignor to The American Laundry Machinery Company, Cincinnati, Ohio, a corporation of Ohio

Application August 13, 1930, Serial No. 474,890

6 Claims. (Cl. 121—38)

My invention relates to machines for pressing fabrics and pertains, particularly, to a control mechanism for operating a series of such machines that are operatively interconnected together either in a tandem or by group arrangement. Such machines embody pressing members adapted to be moved into or out of engagement with each other, and one or both of the pressing members may be movable, although it is customary to have the lowermost pressing member stationary and the uppermost pressing member movable into or out of engagement therewith.

The control of the machine is preferably of the two hand type and consists of push buttons and levers, or handles, the use of which has been more fully described in my prior Patent No. 1,851,990, granted April 5, 1932. In such construction either the push buttons or levers can be actuated to apply power actuating means for bringing the pressing members into engagement.

In accordance with my invention, the control arrangement for operating such machines in tandem or group embodies an auxiliary inlet valve located in close proximity to one of the operating levers or handles and an auxiliary cylinder and piston which is also located in close proximity to the other operating lever or handle of the machine. The depression of one of the control levers will open the auxiliary inlet valve and cause air to flow to the auxiliary cylinder that is adjacent one of the operating levers on another machine in the series to operate the auxiliary piston located in such cylinder. The actuation of this auxiliary piston releases the control valves to cause automatic opening of the latter machine. However, the auxiliary inlet valve and the auxiliary piston are not affected by movement of the push button controls, and, therefore, such controls are used when the machines are to be operated separately and independently.

One object of my invention is to provide a control mechanism for a series of machines operatively interconnected and disposed in tandem or group arrangement whereby the pressing members of one of the machines can be moved away from each other and the pressing members of another machine can be moved into engagement with each other simultaneously.

Another object of my invention is to provide control mechanism for a series of pressing machines operatively interconnected in a group or tandem arrangement whereby any one of the machines can be operated independently of the other.

Still another object of my invention is to provide a control mechanism of such nature that any one machine may be operated to cause separation of the pressing members that are in closed position immediately and independently of movement of the pressing members of other machines that are operatively interconnected therewith.

A further object of my invention is to provide a control mechanism of such nature that two or more machines operatively interconnected together can be manipulated simultaneously by a single operator.

Other objects of my invention will be seen in the following description and one embodiment thereof may be seen in the accompanying drawings wherein similar characters of reference designate corresponding parts, and wherein:

Fig. 1 is a view showing two pressing machines interconnected in accordance with the idea disclosed by my invention, one of said pressing machines having its pressing members in separated relation and the other machine having its pressing members in engagement with each other.

Fig. 2 is a side elevation of one of the pressing machines.

Fig. 3 is a sectional view taken in the plane of the line 3—3 of Fig. 2.

Fig. 4 is a sectional diagrammatic view showing the arrangement and construction of the control mechanism for two pressing machines that are operatively interconnected together.

Fig. 5 is a sectional view showing the operating mechanism for the auxiliary inlet valve.

Fig. 6 is a view similar to Fig. 5 but showing the operating mechanism for the auxiliary piston.

Fig. 7 is a diagrammatic view showing the arrangement of fluid connections for operating pressing machines when three machines are operatively interconnected together.

Referring to Fig. 1 of the drawings, I have shown two pressing machines A and B operatively interconnected together in accordance with my invention. These presses are identical in so far as mechanical construction is concerned and a description of one of the presses will suffice. As shown, the pressing members of the machine A are in separated relation while the pressing members of the machine B are in engagement with each other.

Referring to Fig. 2 of the drawings the type of press preferably employed consists of a frame

member 1 having an upwardly extending portion 2 which carries a pivot pin 3 for a head lever or pressure arm 4. A pedestal 5 on the frame 1 carries a lower pressing member 6 and the pressure arm or head lever 4 carries an upper pressing member 7. Springs 8 are connected at their upper ends by means of a swivel block arrangement 9 to one end of the pressure arm or head lever 4. The lower end of such springs are connected as at 10 to the machine frame. Such springs tend to move the pressure arm or head lever 4 in a clockwise direction thereby moving the pressing member 7 upwardly and away from the pressing member 6. The springs further tend to maintain the pressing members 6 and 7 in separated relation, the distance of separation being such as to permit convenient access to the lower pressing member 6 for the arrangement of the material to be pressed thereon.

Means for moving the upper pressing member 7 into engagement with the lower pressing member 6 consists of a fluid pressure operated mechanism adapted to move the head lever or pressure arm 4 through the medium of a toggle mechanism comprising an upper link member 11 having its one end pivotally connected to the pressure arm or head lever 4 and a lower member 12 having one end thereof pivotally mounted on the frame 1 as at 10, the free ends of the members 11 and 12 being pivotally connected together as at 13.

Connected by a pin 14 to the lower member 12 just below the connection 13 between the upper and lower members 11 and 12, is the rear end of a piston rod 15 that forms a part of a piston 16 adapted to reciprocate in a cylinder 17. As shown, the cylinder 17 is horizontally disposed and is mounted for oscillation on pins 18 having one of their ends supported in the frame 1. The purpose of connecting the piston rod 15 to the toggle 11, 12 just below the connection between the free ends of the links thereof is to permit an increased separation between the pressing members 6 and 7 by a shorter throw of the piston and piston rod.

Either steam or air may be used for moving the piston 16 in one direction in the cylinder 17 to effect closing movement of the pressing members 6 and 7. As shown in Figs. 3 and 4, the means for supplying such fluid to the cylinder 15 embodies a pipe 19 which may lead from a suitable source of supply (not shown) to the supply side of a casing 20 which contains a valve 21 controlling the flow of fluid through the casing and normally held against its seat to prevent such flow of fluid by a spring 22 bearing against the upper surface of the valve. A flexible tube or conduit 23 is connected at one end to the discharge side of the valve casing 20 and at its other end to the cylinder 17.

Movement of the pressing members 6 and 7 into engagement is caused by movement of the piston 16 in one direction. However, such pressing members are separated and the piston 16 moved in the opposing direction in the cylinder 17 by the springs 8 previously described. Therefore, to permit separation of the pressing members 6 and 7 it is necessary that means be provided for permitting the exhaust of the fluid pressure between the larger surface of the piston 16 and the corresponding surface of the cylinder 17. To accomplish this, a flexible conduit 24 leads from the flexible conduit 23 to one side of a casing 25 containing a valve 26 which normally prevents the escape of fluid to the atmosphere through the conduit 27 and the exhaust muffler 28, being normally held against its seat by a spring 29. Upon the movement of the valve 26 away from its seat against the pressure of the spring 29, the fluid pressure between the larger surface of the piston 16 and the corresponding surface of the cylinder 17 may escape through the conduit 24, casing 25, and exhaust conduit 27 to the atmosphere, whereby the piston 16 may be moved rearwardly by the springs 8. When the valve 26 is in open position, fluid pressure flowing through the conduit 23 will also escape to the atmosphere to such an extent as to not be effective to move the piston 16 within the cylinder.

In order to safeguard the operator of the press against having his hands caught between the pressing members when such pressing members move into engagement with each other, the control mechanism provided requires the use of both of the operator's hands to effect closing of the press. The use of one hand is needed for the operation of the valve 21 to permit flow of fluid to the cylinder 17 and use of the other hand is needed for the operation of the valve 26 to prevent escape of the fluid to the atmosphere. Such use of both hands is required until the pressing members 6 and 7 have been brought into substantial engagement with each other. A means for maintaining the valves 21 and 26 in their operative positions for a given length of time is provided so that the hands of the operator may be free immediately upon substantial engagement of the pressing members 6 and 7 while pressure continues to be exerted by one of such members on the other.

The operating means for the valve 21 embodies a hand lever 30 pivotally mounted in a bracket 31 carried by a bracket 32 that forms supporting means for one side of a work supporting table 33. This hand lever 30 is provided with a downwardly extending arm 34 connected to a clevis member 35 rigidly connected to the forward end of a rod 36. The rod 36 extends through a bracket 37 and the outer end of the rod 36 is connected to a bracket 38 carrying an arm 39 and a member 40, the member 40 engaging the extreme outer end of the valve stem 41 which has its inner end lying within the casing 20 for engagement with the valve 21.

With this construction, depression of the hand lever 30 will cause movment of the rod 36 longitudinally towards the casing 20 through the medium of the clevis arrangement 35 hereinbefore described which will result in movement of the valve stem 41 in the same direction and consequent movement of the valve 21 away from its seat against the pressure of the spring 22. The inlet valve 21 is thereby opened and fluid pressure for causing movement of the piston 16 in one direction and consequent movement of the pressing members 6 and 7 into engagement against the resistance of the springs 8 through the medium of the mechanism hereinbefore described is permitted to flow to the cylinder 17.

The operating means for the outlet or exhaust valve 26 is in two parts normally out of operative relation. One of these parts embodies a hand lever 42 pivoted upon the pin 43 mounted in a bracket 44, that forms a supporting means for the opposing side of the work supporting table 33 and is provided with a downwardly extending arm 45 connected to a clevis 46 which is, in turn, slidably connected with a rod 47. The other part of the operating means includes the rod 47 provided with a head 48. The rod 47 extends through a table bracket 49 and is secured at its

outer end to a bracket 50 carrying a member 51 adapted to engage the end of a valve stem 52 extending into the valve casing 25 and engaging the valve 26. When the two parts of the operating means are in operative relation as a result of the operation of mechanism hereinafter described, depression of the hand lever 42 effects rearward movement of the clevis 46, rod 47, and bracket 50 through engagement with the head 48 whereupon the member 51 will move away from the valve stem 52, the valve 26 being moved toward its seat by the spring 29 which will cut off fluid pressure flow from between the larger surface of the piston 16 and the corresponding surface of the cylinder 17 through the conduit 24, exhaust conduit 27, and the muffler 28 to the atmosphere and prevent the piston 16 from being moved forwardly in the cylinder 17 and the pressing members 6 and 7 from being separated by the action of the springs 8.

Referring to Fig. 3 of the drawings it will be seen that the inlet valve 21 normally remains closed by pressure of the spring 22 when the pressing members are in separated relation, but further means must be provided for overcoming the closing effect of the exhaust valve spring 29 in order to maintain the valve in open position when the pressing members are separated. Such means comprises a spring 53 surrounding the rod 47 of the outlet valve operating means and having its one end abutting the table bracket 49 and its opposing end abutting a collar 54 that is rigidly mounted on the rod 47. This spring is made considerably stronger than the exhaust valve spring 29. Therefore, the rod 47 of the exhaust valve operating means will be normally maintained in its rearwardmost position, with the result that the valve stem 52 is also maintained in its rearwardmost position and the valve 26 is held open by engagement of the stem with the valve.

In order to move the pressing members 6 and 7 into engagement, the operator must actuate the inlet valve operating means with one hand to open the inlet valve and exhaust valve operating means with the other to permit the exhaust valve to close. Such manual actuation of the valve operating means is necessary until the pressing members are moved into substantial engagement whereupon a maintaining means hereinafter described becomes effective to hold the inlet valve open and to permit the exhaust valve to remain closed for the pressing operation on the operating means being released.

As hereinbefore mentioned, the outlet valve operating means is in two parts normally out of operative relation and in such position that operation of one of the parts has no effect upon the other. For instance, the hand lever 42 may be depressed without causing movement of the outlet or exhaust valve actuating rod 47 because of the fact that the clevis 46 will merely slide upon the rod. A spring 55 is so arranged on the rod 47 that one of its ends abuts the forward end of the clevis 46 and its opposite end bears against a collar 56 disposed on the rod 47. This spring serves to return the hand lever 42 to its normal position.

The means for putting the two parts of the outlet valve operating means, namely, the hand lever and clevis arrangement and the rod 47, into operative relation, comprises two transversely extending rods 57 and 58 connected at their inner or adjacent ends by a coupling 59. The rod 57 is journalled in the clevis 35 of the inlet valve operating means and the rod 58 is journalled in the clevis 46 of the outlet valve operating means. A lever 60 is rigidly connected at one of its ends to the rod 57 and has an adjusting screw 61 on its opposing end and lying below the hand lever 30 of the inlet valve operating means in such position as to be moved downwardly by downward movement of the hand lever. In a like manner, the rod 58 carries an arm 62 having one end there- of lying immediately below the rod 47 slightly in advance of the collar 54 on such rod. It will be noted that the arm 62 extends in an opposite direction from the lever 60 and that the rods 57 and 58 are adapted to be rotated by the downward or upward movement of the lever 60.

With this construction, depression of the hand lever 30 of the inlet valve operating means will cause downward movement of the lever 60 and rotation of the rods 57 and 58 (see Figs. 3 and 5) to cause upward movement of the outer end of the arm 62 whereby such outer end will be moved into engagement with the rod 47 in advance of the collar 54 which is rigidly mounted on the rod as hereinbefore described. Thus, the two parts of the outlet valve operating mechanism will be moved into operative relation and depression of the hand lever 42 will cause longitudinal movement of the rod 47 and permit closing of the outlet or exhaust valve 26 by the action of the spring 29. However, if the inlet valve operating means is not actuated to elevate the one end of the rod 62, depression of the hand lever 42 will cause no movement of the rod 47.

By requiring the operation of the inlet valve operating means prior to the effective operation of the outlet valve operating means, the operator is compelled to use both hands to effect closing of the press. Such construction has a further advantage in that a leaky inlet valve will not permit closing of the press by the mere actuation of the outlet valve operating means.

The maintaining means for holding the inlet valve open and permitting the outlet or exhaust valve to remain closed a short time after the operator's hands have been removed from the inlet and exhaust valve operating handles 30 and 42 comprises a transversely extending rod 63 of non-circular form mounted in brackets 64 carried by the table supporting brackets. A lever 65 is rigidly secured on one end of the rod 63 and provided with a bifurcated portion in which a rod 66 is adapted to rest. Such rod has a collar 67 on one of its ends and the opposing end of the rod is rigidly secured in the bracket 38. A similar lever 68 is rigidly secured to the opposing end of the rod 63 and has a bifurcated portion in which one end of a rod 69 is adapted to rest, the opposing end of the rod being rigidly secured in the bracket 50. Such lever is, likewise, provided with a collar on one of its ends. The rod 63 is suitably supported in the table supporting brackets and a lever 70 is rigidly connected to the rod 63, such lever 70 having one of its ends connected to the lower end of a rod 71. As shown in Fig. 2, the free end of the rod 71 is adapted to slide within a sleeve 73 which has its upper end pivoted as at 74 on the head lever or pressure arm 4. Arranged in the sleeve 73 between a head 75 provided on the rod and the lower end of the sleeve is a coiled spring 76.

When the hand lever 30 is depressed to open the inlet valve 21 as hereinbefore described, the rod 66 is moved rearwardly. Also, depression of

the hand lever 30 serves to put the two parts of the outlet valve operating means in operative relation as hereinbefore described. Thus, depression of the hand lever 42 effects rearward movement of the rod 69 and permits closing of the outlet valve 26 whereby the pressing members 6 and 7 will be brought into operative relation. Since the sleeve 73 is pivotally connected to one end of the head lever or pressure arm 4 and such head lever or pressure arm moves in a counter-clockwise direction in the closing movement of the press, the sleeve will be elevated and the rod 71 moved upwardly by engagement of the spring 76 with the head 75 of the rod. Such upward movement of the rod 71 will rotate the rod 63 counter-clockwise thereby moving the bifurcated portion of the lever 65 into engagement with the head 67 on the rod 66 thereby maintaining such rod in its position as shifted by the handle 30. Referring to Fig. 3 of the drawings, it will be seen that rearward movement of the rod 66 will be effective to maintain the inlet valve 21 in open position.

The maintaining means are so arranged as to not be effective until the pressing members have been brought into engagement or substantially so. Therefore, should the operator hold the outlet valve closed but release the inlet valve before the pressing members come into engagement, the inlet valve will close under the action of the spring 22 and the press will not be closed. Further, if the inlet valve is open, but the operator releases the outlet or exhaust valve 26 before the maintaining means becomes effective to resist the spring 53 of the outlet valve operating means, the outlet valve will open and the press will not be closed, since the fluid for moving the piston 16 will escape through such outlet valve.

In addition to the hand levers 30 and 42, the inlet valve operating means and the outlet valve operating means are provided with push buttons by means of which the inlet and outlet valve operating means may be actuated by the press operator. The inlet valve and hand lever 30 has the lower end of a stem 77 adjustably mounted therein, the upper end of the stem lying within a sleeve 78 mounted on the top portion of the bracket 32. Slidably mounted in the upper end of the sleeve and operatively engaging the stem 77 is a push button 79. The hand lever 42 of the outlet valve operating means is provided with similar parts, namely, a stem 80, sleeve 81 and a push button 82. To operate the inlet valve operating means, either the hand lever 30 or the push button 79 may be depressed and, likewise, to operate the outlet valve operating means, the hand lever 42 or push button 82 may be depressed.

In Fig. 4 of the drawings, I have shown the mechanism provided for operating two pressing machines, A and B, when such machines are operatively connected in tandem arrangement. This mechanism consists of two auxiliary inlet valves 83 and 84 disposed adjacent the respective main inlet valve operating handles 30 and two auxiliary piston and cylinder constructions 85 and 86 disposed adjacent the respective outlet or exhaust main valve operating handles 42. As shown in this figure, the auxiliary inlet valves 83 and 84 are connected with the main supply conduits 19 by the conduits 87 and 88 respectively. Further, the auxiliary inlet valve 83 is connected with the auxiliary cylinder and piston construction 86 by a conduit 89 and the auxiliary inlet valve 84 is connected with the auxiliary cylinder and piston construction 85 by means of the conduit 90. The auxiliary inlet valves 83 and 84 consist respectively of valve stems 91 and 92, ball valves 93 and 94 and ball valve springs 95 and 96.

In the operation of this part of the apparatus, when the main inlet valve operating lever 30 of the press B is depressed to the position shown in Fig. 4, the valve stem 91 will be engaged and moved to push the ball valve 93 from its seat against the resistance of the spring 95. It is understood that depression of the hand lever 30 will open the main inlet valve 21 as hereinbefore described. Pushing of the ball valve 93 from its seat will permit fluid pressure from the main supply pipe 19 of the press B to flow through the conduit 87, auxiliary inlet valve 83, and the conduit 89 to the cylinder and piston construction 86 to move the cylinder inwardly and move the hand lever 42 of the press A to its release position by reason of contact between the piston rod and the hand lever. As will be understood, movement of the hand lever 42 to its normal position will permit fluid pressure between the larger surface of the piston 16 and the corresponding surface of the cylinder 17 to escape to the atmosphere whereby the pressing members 6 and 7 may be separated by action of the springs 8. Depression of the hand lever 42 of the press B, which is necessary in order that the outlet or exhaust valve be permitted to close so that the pressing members may be moved into contact with each other, moves the piston of the cylinder and piston construction 85 to the position shown in Fig. 4 by reason of contact between the operating lever 42 and the piston rod of such construction. The operating handle 30 of the press A is moved to normal position by action of the spring 22. Thus, the press B is closed while the press A is opened automatically and by the manual operation of the hand levers on but one press. In a reverse manner, depression of the hand lever 30 of the press A will push the valve 94 from its seat, simultaneously opening the main inlet valve 21 in that press and fluid pressure from the main supply pipe 19 will be permitted to flow through the conduit 88, auxiliary inlet valve 84 and conduit 90 to the cylinder and piston construction 85 whereby the piston will be moved to force the operating lever 42 to its normal position, which will enforce opening of the exhaust valve of the press B, escape of the fluid pressure from between the larger surface of the piston 16 and cooperating surface of the cylinder 17 of that press to the atmosphere and opening of the press by action of the springs 8. Likewise, depression of the hand lever 42 of the press A will move the piston of the cylinder and piston construction 86 to the opposing end of the cylinder of such construction, forcing the fluid pressure in such cylinder back into the line 87 and moving the piston to a position for operation in a subsequent cycle.

It will thus be seen that I have provided a means for simultaneously operating a plurality of presses connected in a tandem arrangement wherein it is necessary for the operator to actuate the hand levers of only one press. In Fig. 4, the piston 16 of the press B is shown in such position in the cylinder 17 as it will assume when the pressing members 6 and 7 of that press are in contact and the piston 16 of the press A is in the position in the cylinder 17 that it will assume when the pressing members 6 and 7 are separated as shown in Fig. 2. As hereinbefore stated, simultaneous closing one press and opening another is

effected by movement of the hand levers of one press only.

The push button controls 79 and 82 hereinbefore described are provided to permit the operation of any one of a series of operatively interconnected presses independently of any of the other presses. This is accomplished by reason of the fact that the inlet and exhaust valves of each press may be operated by the push button controls without moving the controls a sufficient distance to operate the auxiliary inlet valves, operated thereby when the main valves are fully operated, and thereby the auxiliary cylinder and piston constructions on the adjacent presses. In Fig. 5 of the drawings, the hand lever 30 of the inlet valve operating means is shown in three different positions. For example, it is shown in full line position in which the inlet valve of the press is closed, in dotted line position designated by the numeral 97 wherein the inlet valve will be opened but the ball valve of the auxiliary inlet valve will remain closed since the operating lever will not contact with the valve stem 91 when in this position, and in the dotted line position designated by the numeral 98 which position it assumes when depressed to its fullest extent, to open the auxiliary inlet valves as well as the main inlet valve.

In Fig. 6 of the drawings the operating lever 42 is shown in two positions, namely, the full line or normally inoperative position and the dotted line position assumed when depressed to its greatest extent. With the above construction, it will be seen that each press may be operated independently of the others by the employment of the push button controls without affecting the position of any of the other presses operatively interconnected therewith.

In Fig. 7 of the drawings, the inlet lines or conduits 87 and 88 for the auxiliary inlet valves 83 and 84 are shown diagrammatically as they would be arranged for three pressing machines operatively interconnected together so that operation of the controls of one pressing machine to bring about closure thereof would result in opening of a machine operatively interconnected therewith, there being one more auxiliary inlet 87, one more auxiliary inlet valve 84, and one more auxiliary cylinder and piston construction 86. With this arrangement, two of the machines would be in closed position while the third machine would be open. Then, closure of the third machine would cause opening of the first, closure of the first would cause opening of the second, and closure of the second would cause opening of the third press, the cycle following continuously in that manner.

To cushion the engagement of the two press members, a pair of bumpers are mounted in the rear end of the cylinder 17 for engagement by the piston 16. Each of these bumpers encloses a bolt 99 having its rear end adjustably mounted in an opening in the rear end wall of the cylinder, the rear end wall of the cylinder being provided with a cylindrical bore 100 in which the front end portion of the bolts lie surrounded by springs 101. One end of the springs engages the heads on the bolts 99 and the opposite end of the spring engages the rear end wall of the cylinder. With this construction, when the piston 16 is moved rearwardly the piston strikes against the heads of the bolts 99 and the springs 101 effectively prevent the piston from striking the rear end wall of the cylinder with any perceptible shock. Such bumpers have a further advantage in that they cause comparatively slow movement of the pressing members 6 and 7 into full engagement after the surface of the piston 16 strikes the heads of the bolts 101.

Referring to the drawings and the preceding description it will be seen that I have provided a control mechanism for a series of pressing machines operative or interconnected or disposed in tandem or group arrangement whereby the pressing members of one of the machines can be moved away from each other and the pressing members of another machine can be moved into engagement with each other simultaneously by the operation of the control levers of one machine only. I have also provided a control mechanism for a series of pressing machines operatively interconnected together whereby any one of the machines can be operated independently of the other and without effecting the relative position of the pressing members of the pressing machine interconnected therewith.

Various other advantageous features will be apparent from the preceding description.

What I claim is:

1. Apparatus of the character described, comprising two pressing machines connected in tandem, each of said machines including relatively movable pressing members, a power operator therefor, a releasing device for said power operator, and two-hand control means for the power operator including two manuals for actuation respectively by the two hands of the operator, the tandem connection between said machines including an operative connection from one of the manuals of one machine to the releasing device of the other, whereby joint actuation of both manuals of one machine produces operation of that machine and sole actuation of the said one manual of one machine actuates the releasing device of the other machine.

2. Apparatus of the character described, comprising two pressing machines connected in tandem, each of said machines including relatively movable pressing members, a power operator therefor, a releasing device for said power operator, and two-hand control means for the power operator including two manuals for actuation respectively by the two hands of the operator, one of the manuals of each machine being movable to a primary position for cooperation with its companion manual in single machine operation and to a secondary position for tandem control of the companion machine, the tandem connection between said machines including operating means for the releasing device of each machine extending to the other machine and having a part located in the path of movement of said one manual to its secondary position for operation thereby.

3. Apparatus of the character described, comprising two pressing machines connected in tandem, each of said machines including relatively movable pressing members, a power operator therefor, a releasing device for said power operator, and two-hand control means for the power operator including two manuals for actuation respectively by the two hands of the operator, one of the manuals of each machine being movable in one direction to a primary position for cooperation with its companion manual in single machine operation and in the same direction to a secondary position beyond the primary position for tandem control of the companion machine, the tandem connection between said machines including operating means for the releasing device of each machine extending to the

other machine and having a part located in the path of movement of said one manual to its secondary position for operation thereby.

4. Apparatus of the character described, comprising two pressing machines connected in tandem, each of said machines including relatively movable pressing members, a power operator therefor, releasing means for said power operator, two-hand control means for the power operator including two devices for actuation respectively by the two hands of the operator, one of the devices of each machine being movable to a primary position for cooperation with its companion device in single machine operation and to a secondary position for tandem control of the companion machine, and two manuals for actuating said one device of each machine, by one of which manuals it may be moved to said primary position and by the second of which it may be moved to said secondary position, the tandem connection between said machines including operating means for the releasing means of each machine extending to the other machine and having a part located in the path of movement of said one device to its secondary position for operation by its said second manual.

5. Apparatus of the character described, comprising two pressing machines connected in tandem, each of said machines including relatively movable pressing members, a power cylinder for effecting said movement, and means for controlling the flow of motive fluid to and from said cylinder including an inlet and exhaust valve and separate two-hand operating means therefor, the operating means for said exhaust valve comprising two parts normally out of operative relation, means controlled by operation of the inlet valve operating means for putting said parts into operative relation, the said operating means for the inlet valve of each machine including a member movable to a primary position for operating said inlet valve and for also putting said parts into operative relation and movable to a secondary position for tandem control of the companion machine, the tandem connection between said machines including operating means for the exhaust valve of each machine extending to the other machine and having a part located in the path of movement of said member when it is moved to its secondary position for operation thereby.

6. Apparatus of the character described, comprising two pressing machines connected in tandem, each of said machines including relatively movable pressing members, a fluid motor therefor, and two-hand control means for said motor including a normally closed inlet valve, a normally open outlet valve, and means for actuating said valves and including spaced manuals operable by the two hands of the operator, the tandem connection between said machines including an operative connection from the inlet valve actuating manual of one machine to the outlet valve actuating means of the other machine, whereby joint actuation of both manuals of one machine produces a closing operation of that machine and sole actuation of the inlet valve actuating manual of one machine actuates the outlet valve actuating means of the other machine.

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