

March 16, 1943.

W. F. GAYRING

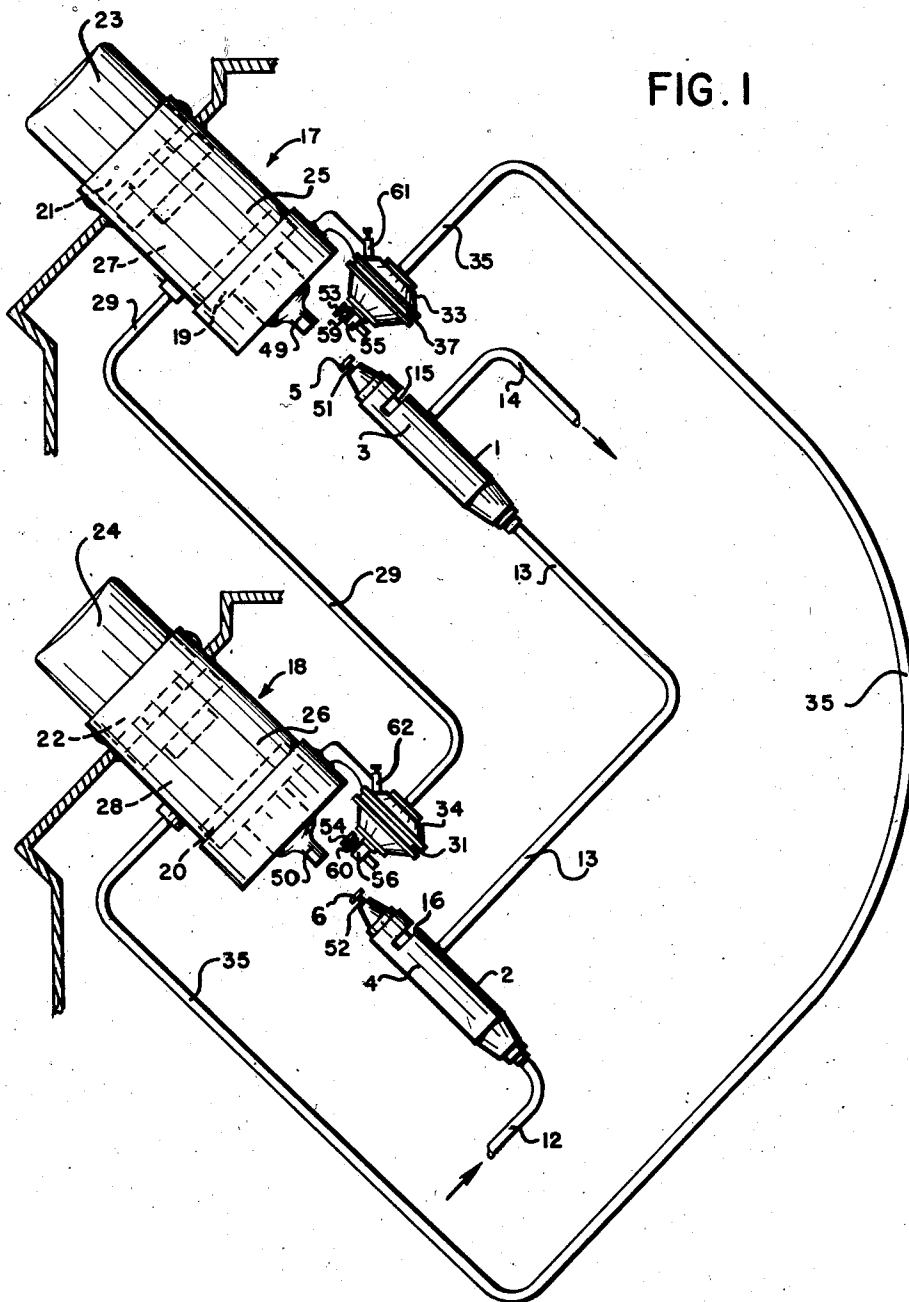
2,313,869

TWO HAND CONTROL

Filed July 26, 1941

3 Sheets-Sheet 1

FIG. 1



INVENTOR.
W.F. GAYRING
BY *Bodell and Thompson*
ATTORNEYS.

March 16, 1943.

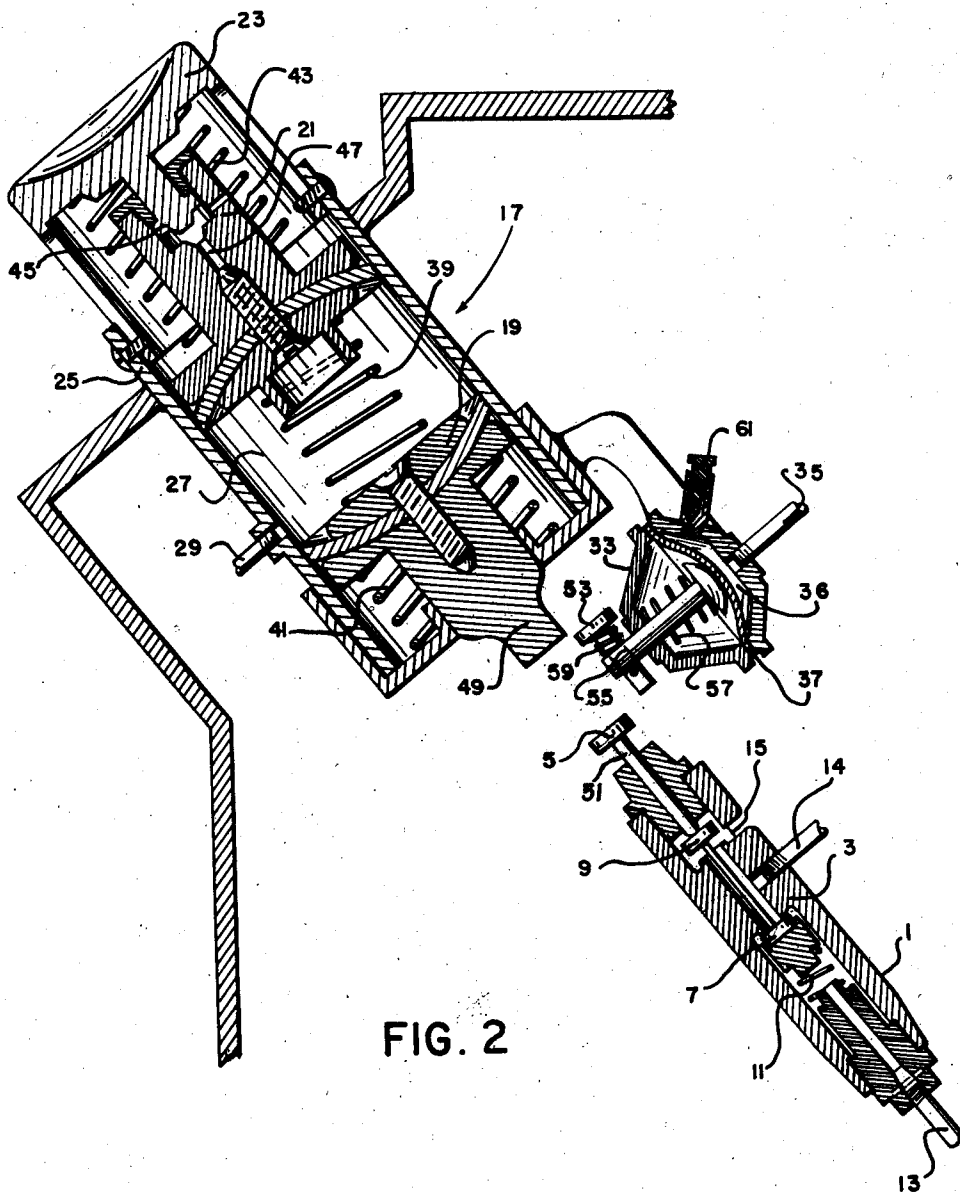
W. F. GAYRING

2,313,869

TWO HAND CONTROL

Filed July 26, 1941

3 Sheets-Sheet 2



INVENTOR.

W.F. GAYRING

BY *Bodell and Thompson*
ATTORNEYS.

March 16, 1943.

W. F. GAYRING

2,313,869

TWO HAND CONTROL

Filed July 26, 1941

3 Sheets-Sheet 3

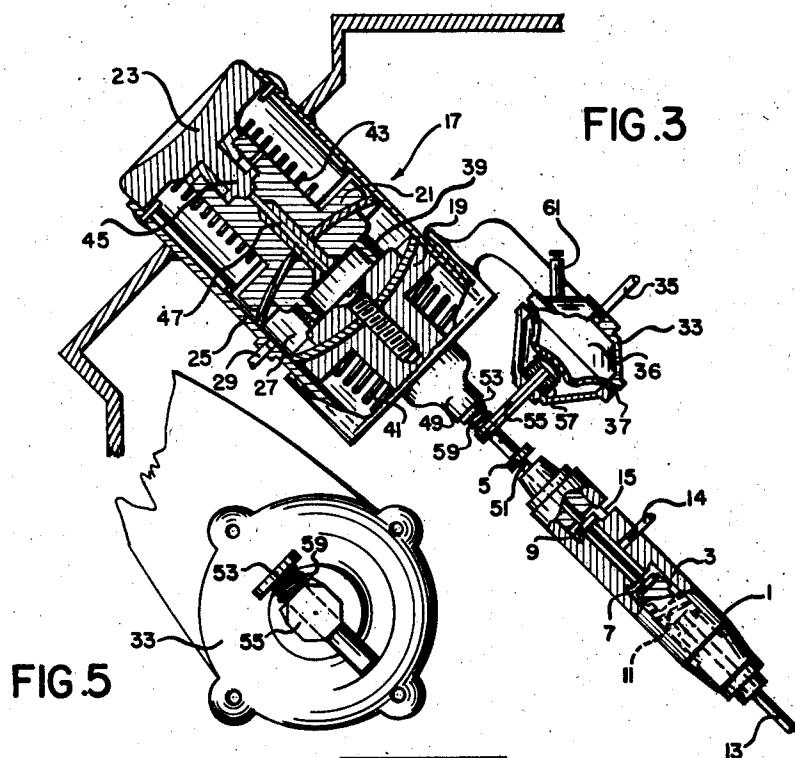
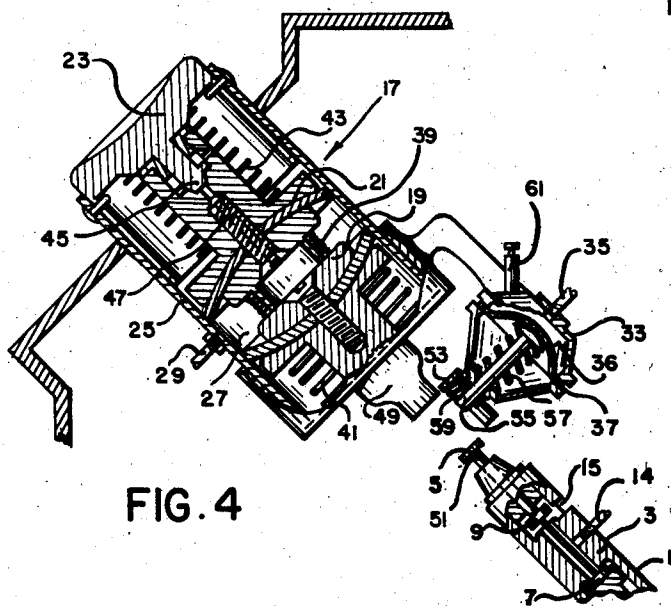


FIG. 5



INVENTOR.
W. F. GAYRING
BY *Bozell and Thompson*
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,313,869

TWO HAND CONTROL

Wallace F. Gayring, Minoa, N. Y., assignor to The Prosperity Company, Inc., Syracuse, N. Y., a corporation of New York

Application July 28, 1941, Serial No. 404,221

9 Claims. (Cl. 192—131)

This invention relates to two hand controls for controlling the operation of a machine, which has an operation dangerous to the operator, as power presses, punch presses, garment and laundry presses, and the like.

The invention has for its object a two hand control in which substantially simultaneous operation of both manuals is required and in which the operation of each manual operates means which controls the effective operation of the other manual, so that the operation of both manuals is required substantially simultaneously and the operation of each manual makes the other manual effective, or in other words, either manual can not be effectively operated unless the other manual is also operated simultaneously, and upon the operation of both manuals substantially simultaneously, each manual makes the other effective.

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

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is a diagrammatic view of this two hand control and the power members which the manuals operate.

Figure 2 is an enlarged sectional view through the manually operated mechanism and the power control member.

Figure 3 is a sectional view similar to Figure 1 on a reduced scale showing the effective operation of one manual when the other is simultaneously operated.

Figure 4 is a view similar to Figure 3 showing the ineffective operation of one manual when the other manual is not operated simultaneously.

Figure 5 is an elevation of one of the couplings and contiguous parts.

This two hand control comprises, in its general aspect, a pair of control elements for controlling the flow of power, these elements being here shown as valves for controlling the flow of air, each element including a self-returnable shiftable member, that is, in the illustrated embodiment, a spring-pressed valve member, both of which shiftable members must be operated substantially simultaneously to effect the flow of air through the power line, a pair of manuals including operating parts, and members operated thereby, and paired respectively with the shiftable members of the control elements or valves, and means operated by either operating part for

controlling the operation of the shiftable control member operated by the other operating part.

In the illustrated embodiment of the invention, this means consists of couplings between the members operated by the operating parts and the movable members of the control elements, the couplings being normally out of operative or coupling position and the coupling associated or paired with each control element and its manual being operated into effective or coupling position by the operation of the other manual.

1 and 2 designate, respectively, the control elements for controlling the flow of power to a motor or machine to which the two hand control is applied. The motor may be of any type and the control elements 1, 2 are here shown as valves for controlling the flow of pressure fluid, as compressed air, to a cylinder and piston motor not shown. Each control member comprises a valve casing 3 or 4, a movable member 5 or 6 therein having a normally closed intake valve head 7 and a normally open exhaust valve head 9. The valve member 5 or 6 is self-closing or held in its normal position in which the intake valve head 7 is closed by a suitable spring 11. The two valves or control members 1, 2 are connected in series in a power line. One of the valve casings, as 4, is connected to the main supply pipe 12. The valve casings are connected together by a pipe 13, and the valve casing, as 3, is connected by a pipe 14 to the pneumatic motor of the machine to which the two hand control is applied. When both movable members 5, 6 are operated to open the intake valve heads and close the exhaust valve heads, obviously the air will pass from the main pipe 12 to the valve casing 4, past the open intake valve head 8 through pipe 13 to valve casing 3, past the open intake valve head 7 thereof and through the pipe 14 to the pneumatic motor of the machine to which the two hand control is applied. When the valves are released, the springs 11 return them to their normal positions, so that the air can exhaust back from the pneumatic motor through the pipe 14, valve casing 3 and past the open intake valve head 9 through the exhaust outlet 15 to the outer air. The valve casing 4 has a similar exhaust outlet 16. When only one valve is operated, as will be hereinafter described, for instance, assume that the valve or control member 2 only is operated, then the air will pass from pipe 12 through the valve casing 4, pipe 13 where the air will be stopped, because the intake valve head 7 is closed. If the control member or valve 1 only is operated, the air from the main line 12 will not flow, because of the intake

valve head of valve 2 being closed, and hence both valves must be operated, in order to effect the flow of power.

The operating mechanism for the movable members or valves 5, 6, both of which must be operated simultaneously will now be described. 17 and 18 designate, generally, the manuals paired with the control members 1, 2. Each includes a movable member 19 or 20 paired with the shiftable element or valve 5 or 6, an operating part 21, 22 having a finger-piece 23 or 24, these parts and members 21, 19; 22, 20 being operable relatively to each other, and means operable by the relative movement of the operating part 21 or 22 relative to the movable member 19 or 20 for controlling the operation of the other valve member 5 or 6 controlled by the other operating part 21 or 22. In other words, the operation of the operating part 21 by its finger-piece 23 controls the operation of the valve member 6 by the other operating part 22, and likewise the operation of the operating part 22 controls the operation of the valve 5 by the operating part 21. The operating part 21 or 22 and the movable member 19 or 20 are shown as in the nature of pistons located in a cylinder 25 or 26 and spaced apart therein. The space 27 between the members 21 and 19 of the manual 17 is connected by a pipe 29 to means pressure operated, as a diaphragm chamber 34 having a diaphragm 31 therein, which operates a coupling member, to be presently described, and the space 28 between the operating part 22 and movable member 20 of the manual 18 is connected by a pipe 35 to a similar diaphragm chamber 36 having a diaphragm 37 coacting with a coupling member. The movement of the operating part 21 or 22 relative to the member 19 or 20 is against the action of a returning spring 39 interposed between them and the shifting movement of the movable member 19 or 20 is against the action of a returning spring 41, this spring being stronger than the spring 39. The finger-piece 23 or 24 is movable relatively to its corresponding operating part 21 or 22 against the action of a returning spring 43. The finger-piece 23 or 24 is provided with a normally open valve head 45 controlling an axial passage 47 through the member 21 or 22 to the space 27 or 28. This valve head 45 is normally held open by the spring 43. When the finger-piece 23 or 24 is operated or depressed, it closes the valve 45 so that the air in the space 27 or 28 is compressed. As soon as the operator releases the finger-pieces 23, 24, the valve 45 opens, permitting the air to escape from the space 27 or 28. The construction of these manuals 17, 18 per se forms no part of this invention.

The movable members 19 and 20 of the manuals 17, 18 have stems 49 and 50 alined with the movable valve members 5, 6 or with plungers 51, 52 slidable in the valve casings 3, 4 and thrusting against the exhaust valve heads 9, of the valve members 5, 6. The outer end of the plunger 51 or 52 or the movable member 5, 6 is spaced apart from the end of the stem 49 or 50.

53 and 54 designate the couplings, these being normally out of spaces between the stems 49, 50 and the members 5, 6, and in order to effect the operation of the valves 3, 4, must be shifted into such space. These coupling members are shown as heads carried by stems 55, 56 slidably mounted in the diaphragm chambers 36, 37 on the non-pressure sides thereof and thrusting against the diaphragms 33 or 34, they

being acted upon by returning springs as 57. The coupling heads 53, 54 are slidably mounted in the stems 55, 56 and the sliding movement is resisted by buffer springs 59, 60. Each of the diaphragm chambers 36, 37 is provided with a suitable bleeder or breather valve 61, 62.

In operation, upon the depression of both finger-pieces 23, 24, both valves 45, will be closed, and the operating members 21, 22 moved downwardly compressing the air in both spaces 27, 28, thus causing both the diaphragms 33, 34 to be actuated to move the couplings 53, 54 into the spaces between the stems 49 and 50 and plungers 51, 52. This movement compresses the springs 39, and continued movement causes the members 19, 20 to be depressed against the returning springs, and hence transmit motion to the valves 3, 4 to open them and permit the flow of power through the pipe 14 to the pneumatic motor or master valve to operate the machine to which this two hand control is applied. Upon the release of the finger-pieces, the air exhausts back from the diaphragm chambers, thus causing the couplings 53, 54 to be moved out of their operative position by the springs 57. If only one finger-piece is operated, as for instance the finger-piece 23, the stem 49 of the corresponding movable member will only idle in the space between the stem 49 and the corresponding plunger 51 of the control valve 3, and the control valve 3 will not be opened, but the coupling 54 of the other manual 18 operated by the finger-piece 24 will be shifted into operative position. However, as before explained, the operation of only one manual is of no avail, as only one control valve is opened. Upon the operation of the finger-piece 24 only, the stem 50 of the movable member 20 will merely idle in the space between it and the plunger 52 of the valve 4 from the coupling 53 of the other manual operated by the finger-piece 23 will be moved into coupling or operative position, but the subsequent operation of the finger-piece 23 will be of no avail, as the valve 3 will only be open while the valve 4 will still be closed. Hence, substantially the simultaneous operation of both finger-pieces 23, 24 is required. To avoid exact simultaneous operation and permit either manual to be operated a split second after the other, more or less lost motion may be provided between the stem 49 or 50 and the coupling 53 or 54 or between the coupling 53, 54 and the members 5, 6.

The two hand control here shown is particularly adapted for punch presses and the like of the type operated by a lever or pedal. For the general type of such punch press, see Patent No. 1,397,779, issued November 22, 1921. For the general construction of the manual shown herein, see Davis Patent No. 2,016,136, issued October 1, 1935.

What I claim is:

1. A two hand control including a pair of control elements for controlling the flow of power, each including a self-returnable shiftable member, both of which must be operated substantially simultaneously, a pair of manuals including operating parts and members operated respectively thereby and paired respectively with the shiftable members of the control elements, and means operated by either operating part for controlling the operation of the shiftable control member controlled by the other manually operated part.

2. A two hand control including a pair of control elements for controlling the flow of power, each including a self-returnable shiftable mem-

ber, both of which must be operated substantially simultaneously, a pair of manuals including operating parts and members operated respectively thereby and paired respectively with the shiftable members of the control elements, means operated by either operating part for controlling the operation of the shiftable control member controlled by the other manually operated part, said means including a coupling, one for each manually operated member shiftable into and out of a position between each manually operated member and the movable member of the companion power control element and normally out of coupling position, and means operated by the operation of each manually operated part for moving the coupling into operative position.

3. A two hand control including a pair of control elements for controlling the flow of power, each including a self-returnable shiftable member, both of which must be operated substantially simultaneously, a pair of manuals including operating parts and members operated respectively thereby and paired respectively with the shiftable members of the control elements, and means operated by either operating part for controlling the operation of the shiftable control member controlled by the other manually operated part, said means comprising a head for each manually operated member operated by the former parts and normally out of co-operative position relative thereto and movable into co-operative relation therewith by the operation of the other part.

4. A two hand control including a pair of elements for controlling the flow of power and connected in series in a power line, each including a shiftable member, both of which must be operated substantially simultaneously to effect the flow of power through the power line, a pair of manually operated parts operable to create air pressure, members operated by said parts respectively and paired respectively with the shiftable members of the control elements, and means operated by the air pressure created by one manually operated part for controlling the operation of the shiftable control member operated by the other manually operated part.

5. A two hand control including a pair of elements for controlling the flow of power and connected in series in a power line, each including a shiftable member, both of which must be operated substantially simultaneously to effect the flow of power through the power line, a pair of manually operated parts operable to create air pressure, members operated by said parts respectively and paired respectively with the shiftable members of the control elements, and means operated by the air pressure created by one manually operated part for controlling the operation of the shiftable control member operated by the other manually operated part, said means comprising heads for co-acting respectively with the manually operated part and normally out of position to co-act therewith, and each movable into co-action with its companion manually operated member upon the operation of the other manually operated member.

6. A two hand control including a pair of ele-

ments for controlling the flow of power and connected in series in a power line, each including a self-returnable shiftable member, both of which must be operated substantially simultaneously to effect the flow of power through the power line, a pair of self-returnable, manually operable parts, self-returnable members operated by said parts respectively and paired respectively with the shiftable members of the control elements, said parts being operable to create pressure between them and the members operated thereby, and means operated by the air pressure created by one part for controlling the operation of the shiftable control member operated by the other member, said means comprising a coupling movable into position between each member and its companion control member and normally out of such position and shiftable by the air pressure into such position.

7. A two hand control including a pair of elements for controlling the flow of power and connected in series in a power line, each including a self-returnable shiftable member, both of which must be operated substantially simultaneously to effect the flow of power through the power line, a pair of self-returnable, manually operable parts, self-returnable members operated by said parts respectively, and paired respectively with the shiftable members of the control elements, said parts being operable to create pressure between them and the members operated thereby, said parts having means operable to release the air pressure when the parts are released, and means operated by the air pressure created by one part for controlling the operation of the shiftable control member operated by the other manually operated member, said means comprising a coupling movable into position between each member and its companion control member and normally out of such position and shiftable by the air pressure into such position.

8. A two hand control including a pair of manuals, a pair of control members for a machine to which the two hand control is applied, operated by the manuals respectively, both of which control members must be operated to effect the operation of the machine, there being one control member for each manual, motion transmitting means between each manual and its companion control member, and means operated by the operation of either manual to control the effective operation of the other manual, whereby the operation of both manuals in unison is required to effect the operation of both control members.

9. A two hand control including a pair of manuals, a pair of control members for a machine to which the two hand control is applied, operated by the manuals respectively, both of which control members must be operated to effect the operation of the machine, there being one control member for each manual, motion transmitting means between each manual and its companion control member, each motion transmitting means including a coupling normally out of coupling position and shiftable into coupling position by the operation of the other manual.

WALLACE F. GAYRING.