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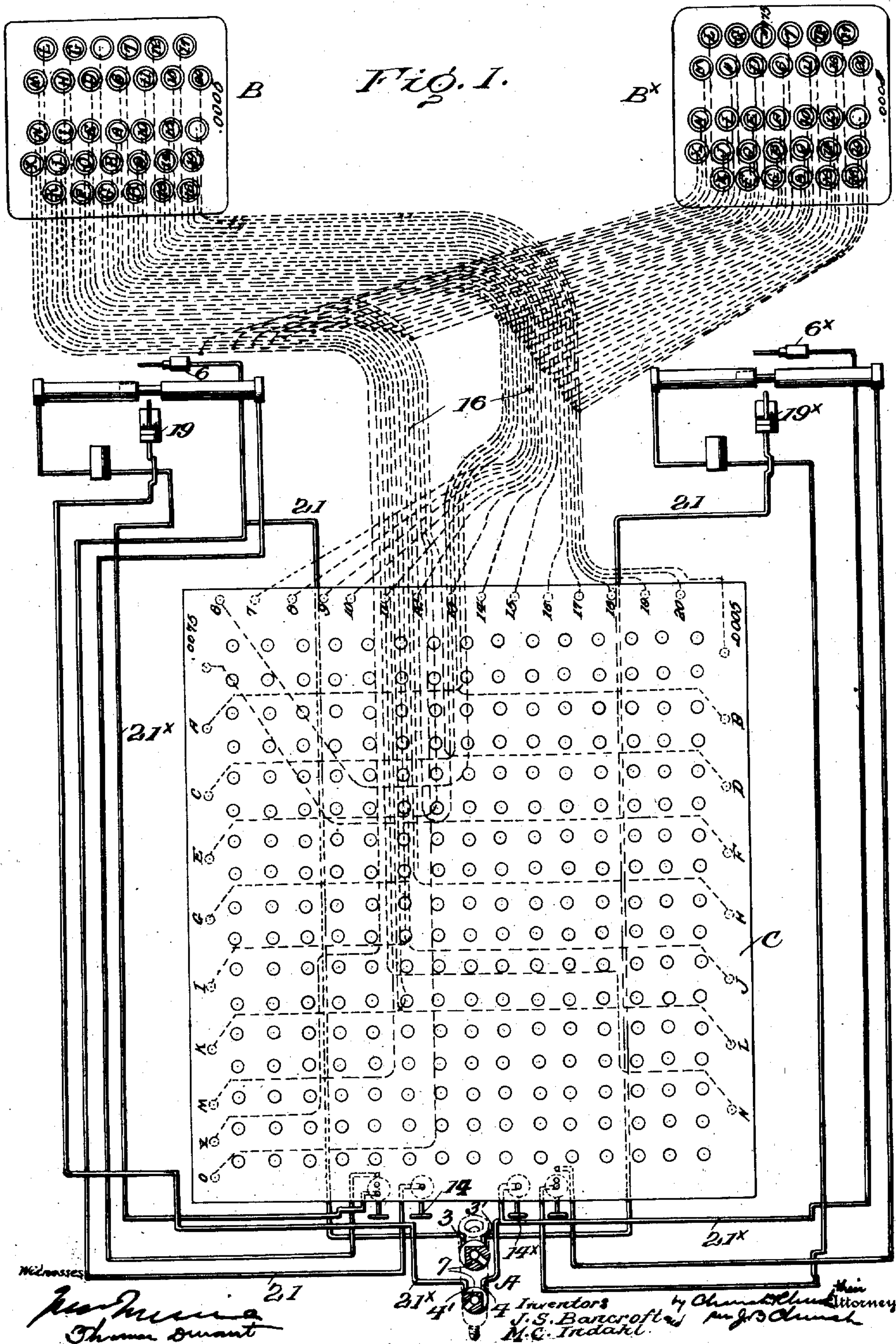
MULTIPLEX COMPOSING MACHINE.

APPLICATION FILED NOV. 15, 1910.

Patented Apr. 18, 1911.

989,557.

2 SHEETS—SHEET 1.



989,557.

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2 SHEETS—SHEET 2.

Fig. 3.

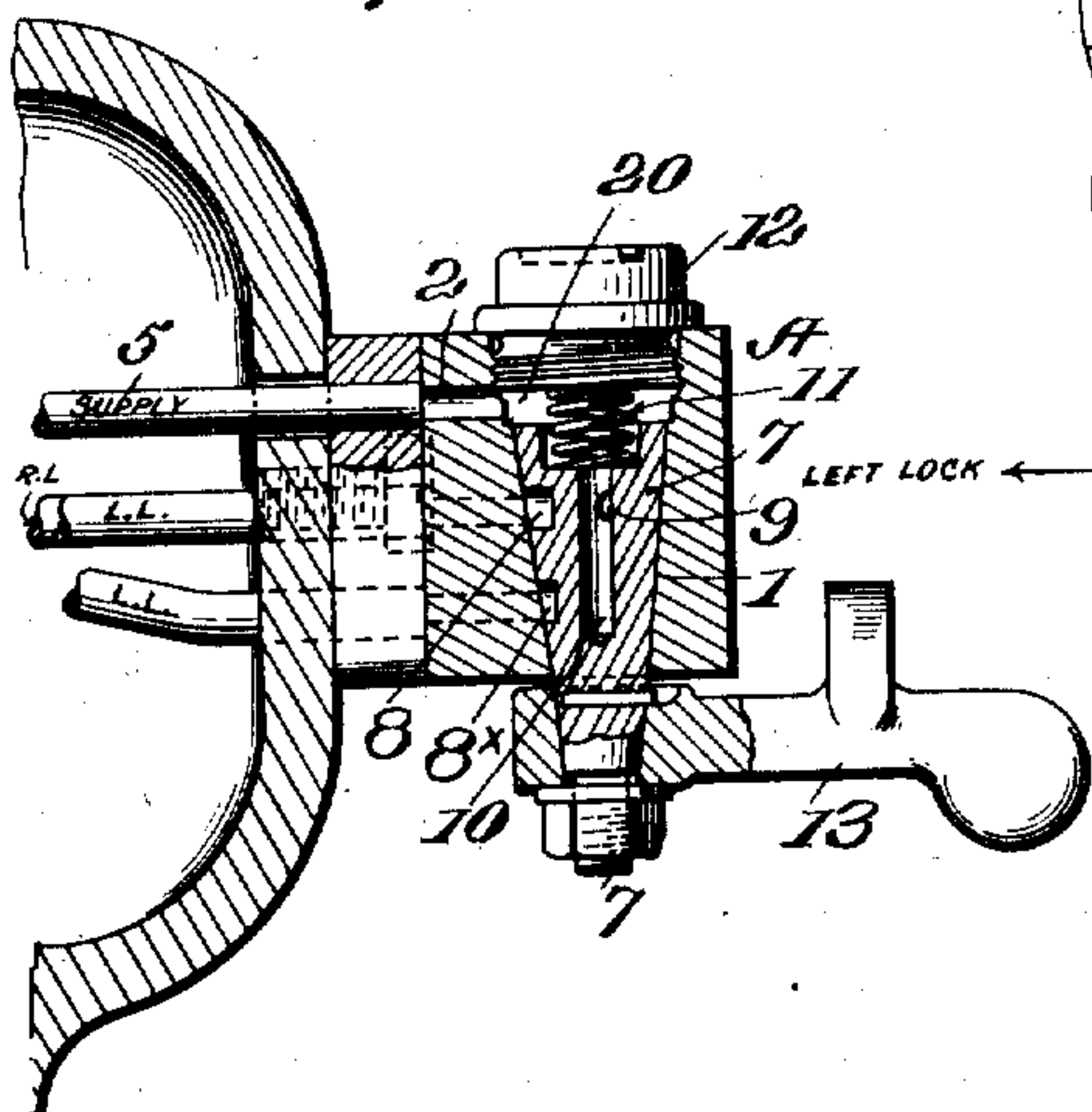


Fig. 2.

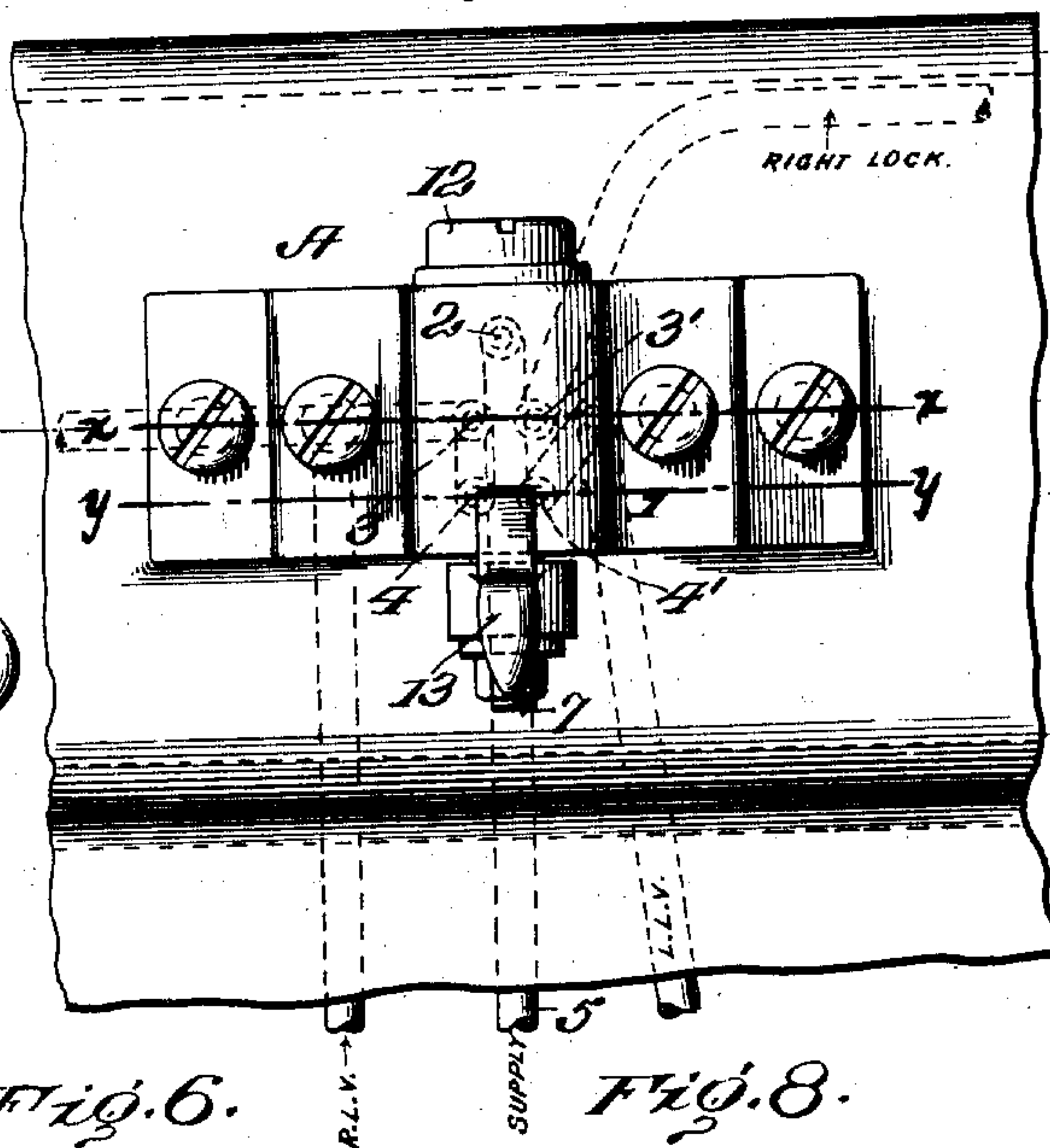


FIG. 4.

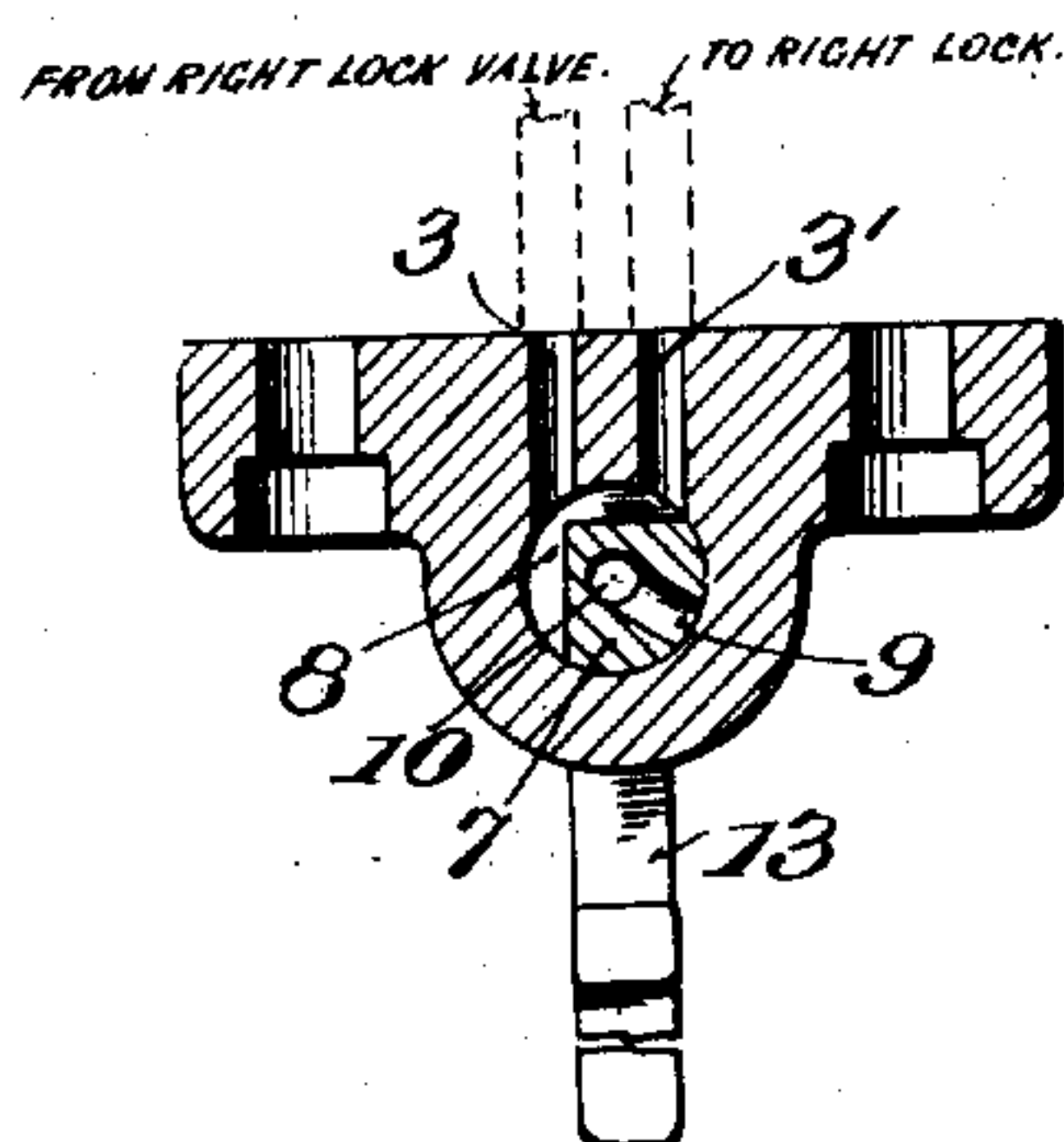


Fig. 5.

Fig. 6.

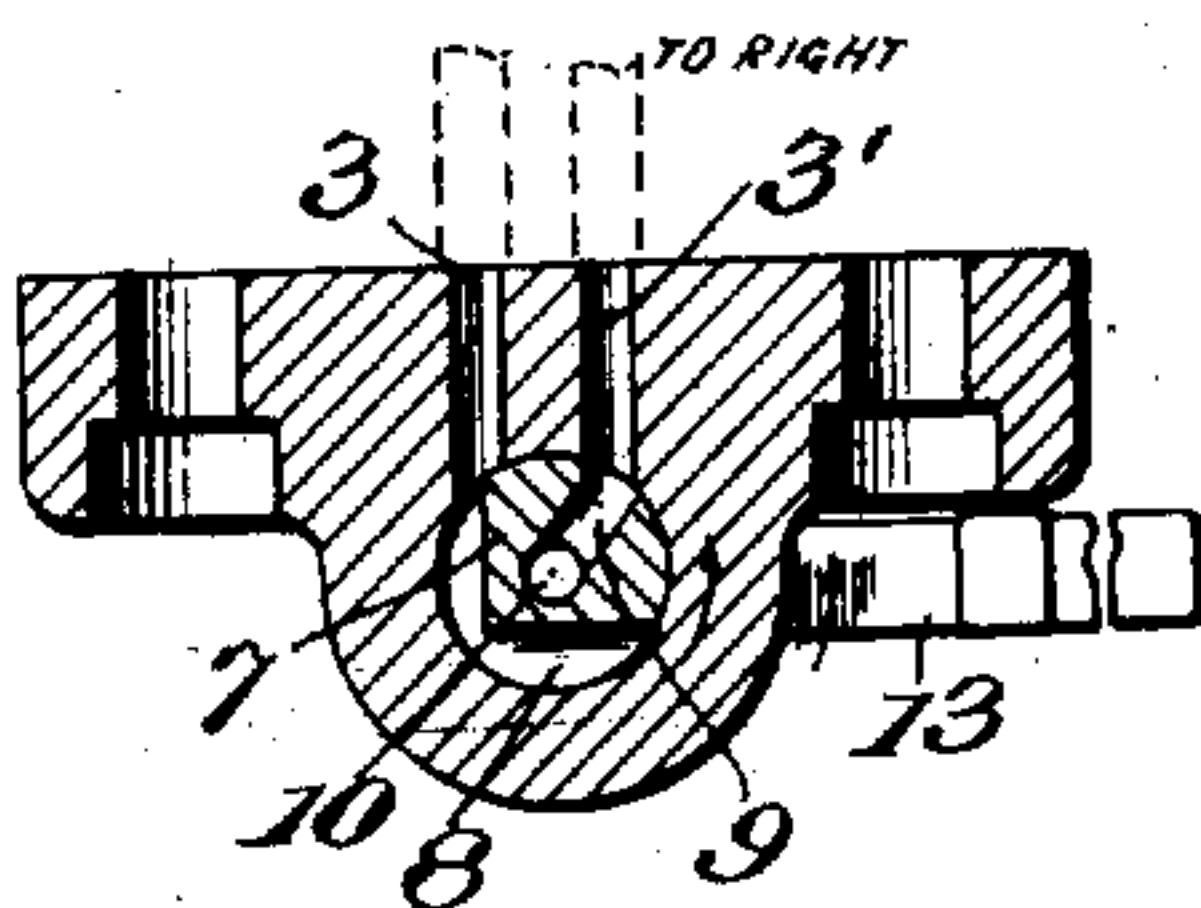


Fig. 7.

FIG. 8.

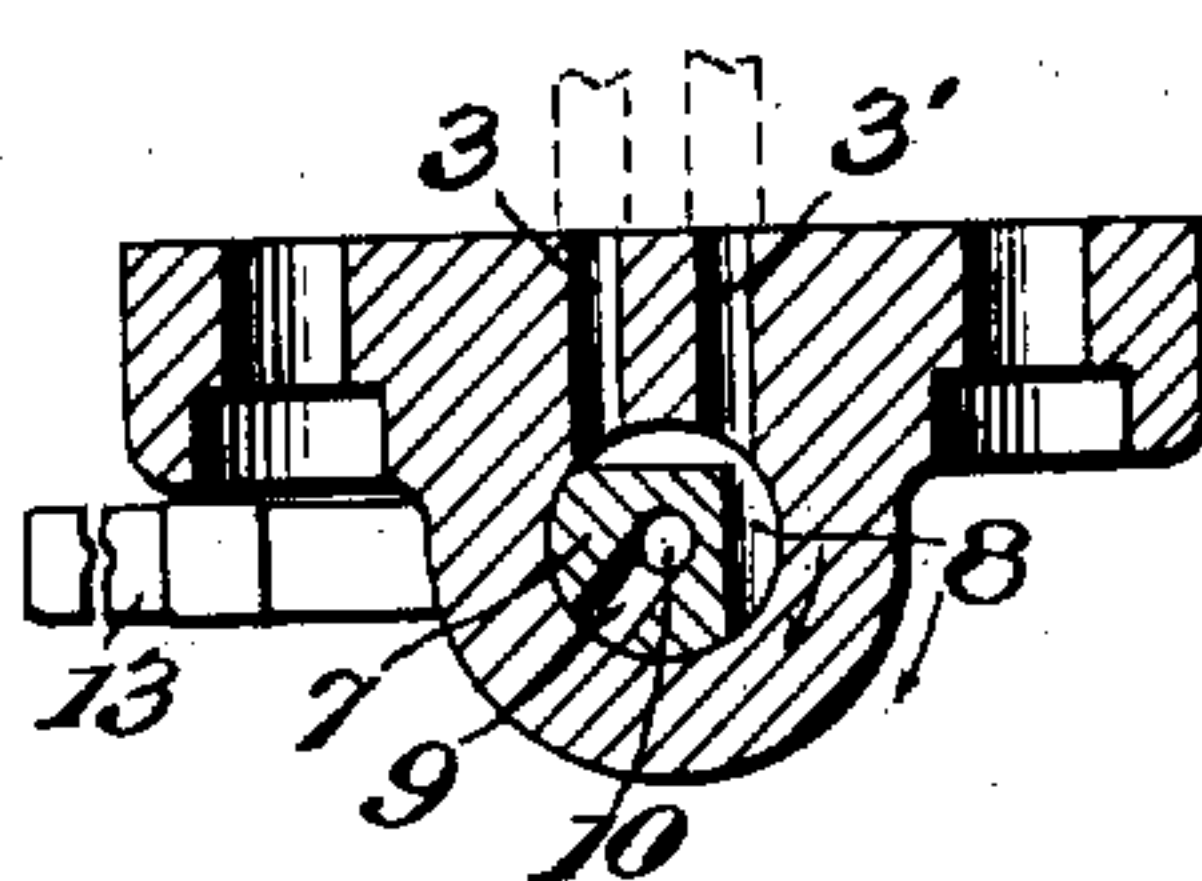
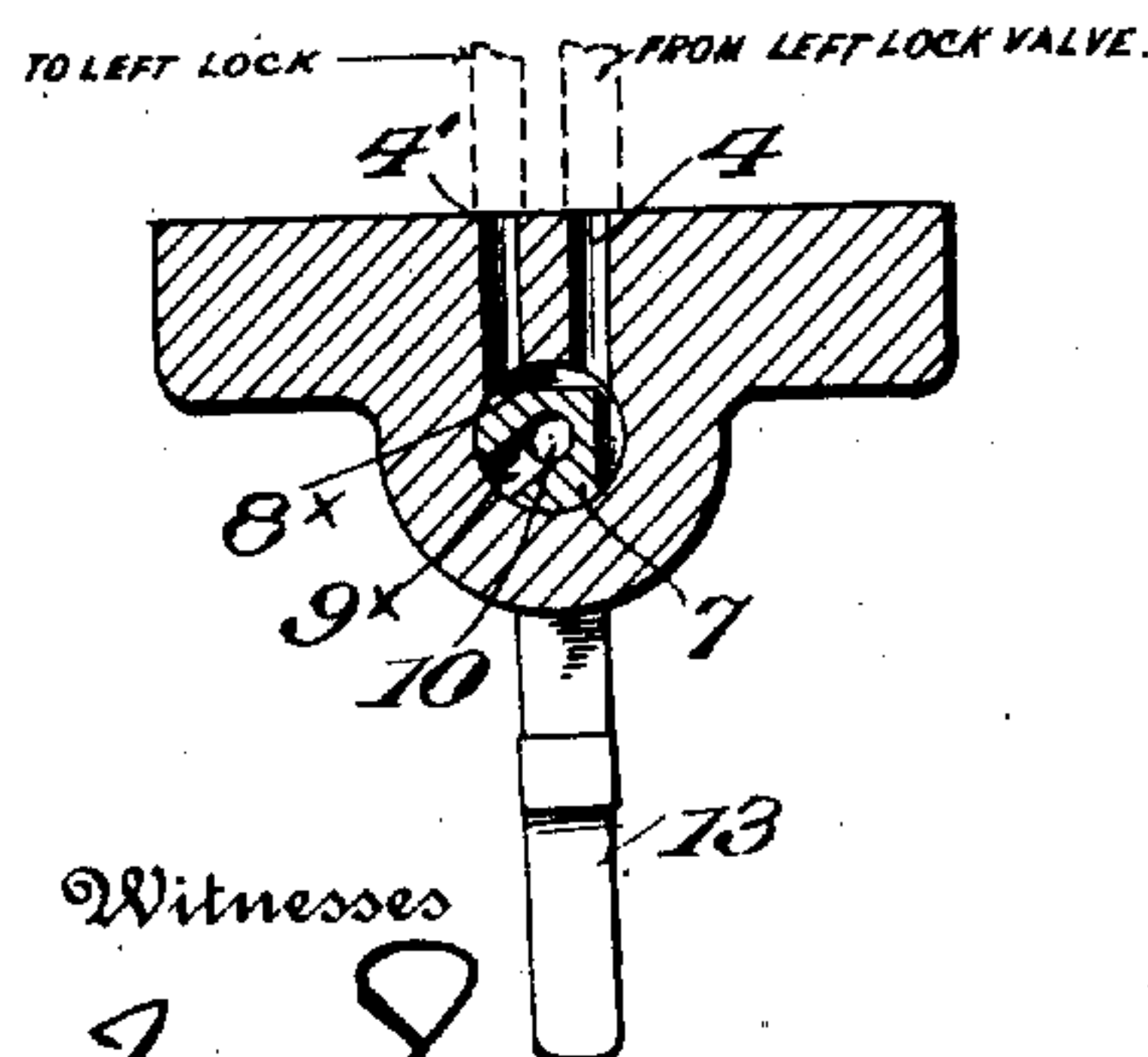
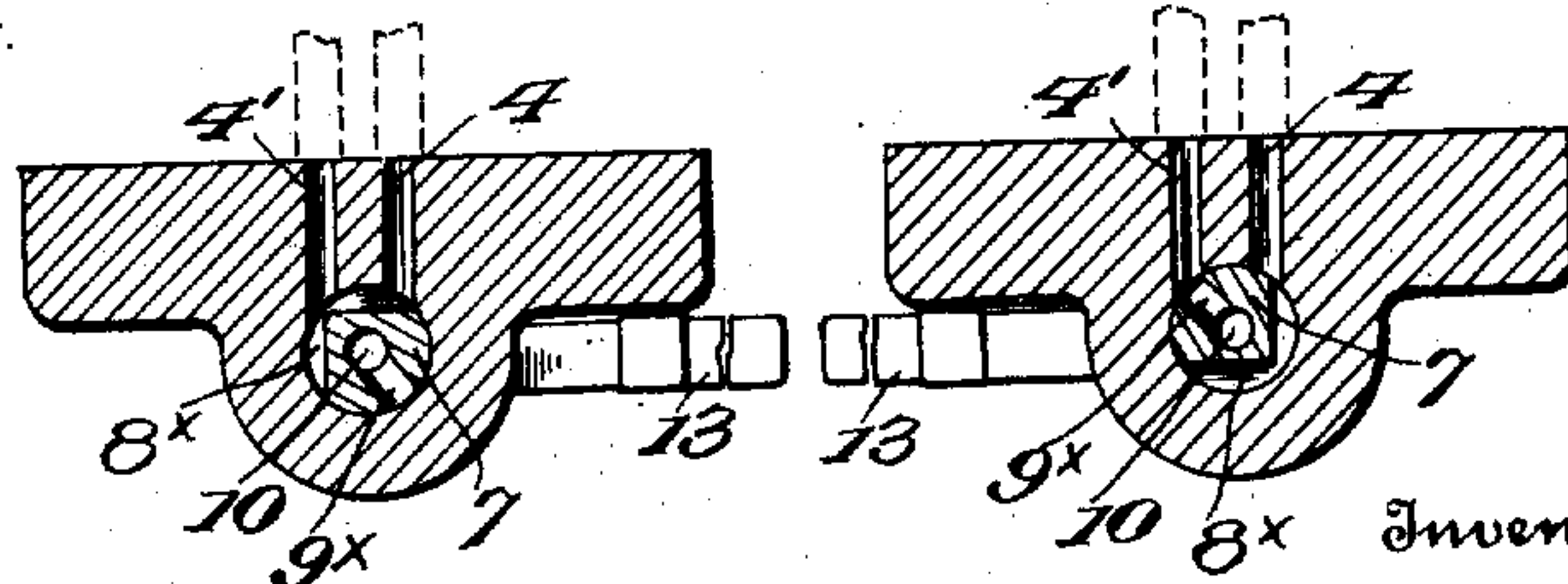


Fig. 9.



Witnesses

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UNITED STATES PATENT OFFICE.

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MULTIPLEX COMPOSING-MACHINE.

989,557.

Specification of Letters Patent.

Patented Apr. 18, 1911.

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To all whom it may concern:

Be it known that we, JOHN SELLERS BANCROFT and MAURITZ C. INDAHL, citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Multiplex Composing-Machines; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

This invention relates to multiplex composing machines for the production of the perforated record strips or controllers of automatic type casting and composing machines, and has for its principal object to provide means for coupling up the selecting mechanism with either or both composing units for simultaneous or dissimultaneous action.

The so-called multiplex composing machine as illustrated for example in Patent No. 925,073, dated June 15, 1909, is equipped with two complete composing units, a single selecting unit or keyboard, and means controlled from the selecting unit for temporarily suspending the action or responsiveness of either composing unit, to the end that certain operations, such as justification, etc., may be performed upon one composing unit to the exclusion of its companion unit. For this purpose each composing unit is provided with a separate lock-out responsive to a separate member or key of the selecting mechanism and operating upon the composing members or punches of its unit to render them non-responsive to the designating members or keys of the selecting mechanism, so that by operating the lock-out key pertaining to one composing unit, the selecting mechanism which normally actuates corresponding composing members or punches of both units is rendered operative upon only one of said units.

Although originally designed for composing the same matter in different measures or fonts, the multiplex composing machine has developed, in practice, capacities which render it valuable for other purposes. Thus, by setting or adjusting the two composing units for the same or different fonts, sets or measures, either can be controlled sepa-

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rately or simultaneously from the same selecting unit or keyboard, to produce multiple copies in the same or different sets or measures, or single copies in the set or measure to which either of the composing units is at the time adjusted; and it is to facilitate such extended use and at the same time preserve its initial capacity that the present improvement has been devised and applied, the same being shown as embodied in a valve structure which in one position preserves the multiplex functions; in a second position places the selecting unit in exclusive control of one composing unit; and in a third position places said selecting unit in exclusive control of the other composing unit. 60
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In the accompanying drawings illustrating a preferred form of embodiment Figure 1 is a diagrammatic plan view of a multiplex machine with the transposing member or valve applied thereto; Fig. 2 is a front elevation of the transposing valve; Fig. 3 is a vertical section through the valve; Fig. 4 is a transverse section on the line $x-x$ and, Fig. 5 is a similar section on the line $y-y$ when the valve is set for multiplex composition, Fig. 2. Figs. 6 and 7 are sectional views on lines $x-x$ and $y-y$ respectively with the valve in extreme right position. Figs. 8 and 9 are similar sections showing the valve in extreme left position. 75
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Corresponding letters and numerals designate like parts in the several figures.

For purposes of illustration the invention is shown applied to the machine of Patent No. 925,073, although equally applicable to other constructions, and, in practice, usually employed in connection with machines containing selecting and composing units patterned after those of Patent No. 944,405 of December 28, 1909. 90
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Referring particularly to Fig. 1, B, B^x represent the two composing units; C the selecting unit 19, 19^x the lock-outs for the respective composing units; 14, 14^x the lock-out valves; 21 21^x the conduits leading from the lock-out valves to their respective lock-outs and setting motors; 16 the conduits leading from the members or keys of the selecting units to corresponding performing members or cylinders of the two composing units; and 6, 6^x the setting motors for the justification indicating devices of the two 100
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units, the setting motor 6 pertaining to unit B being connected to conduit 21 controlled by valve 14 and the setting motor 6^x pertaining to unit B^x being connected to conduit 21^x controlled by valve 14^x.

Reference is had to Patent No. 925,073 for the details of construction and mode of operation. It will suffice for present purposes to observe that the selecting unit is provided with a series of keys 15 each controlling the inflow of air under pressure to one or more conduits 16, which latter are each connected through branches with corresponding performing members or pistons of the two composing units B B^x. Valve 14^x controls the admission of pressure to lock-out 19 of unit B and to the setting motor 6^x of unit B^x; while valve 14 in like manner controls lock-out 19^x of unit B^x and setting motor 6 of unit B.

When energized or brought into action by its controlling valve 14 or 14^x each lock-out operates to arrest or prevent effective action of the performing members of its composing unit, even when, through the action of a key of the selecting unit, pressure is admitted to one or more of its performing members, in which event composition will be performed at the composing unit whose lock-out is at the time deenergized or out of action.

During multiplex composition both valves 14, 14^x, remain closed and the keys of the selecting units simultaneously operate corresponding performing members of both composing units; when, however, a character is to be inserted at one composing unit to the exclusion of the other, or separate justification is required valve 14 or 14^x controlling the lockout of the excluded composing unit is displaced and so held while the key or keys of the selecting unit designating the exclusive matter is or are operated. This inherent capacity of the machine to produce either multiple or distinctive individual composition can be fully availed of only at the expense of speed and accuracy, owing to the discriminatory actions devolving upon the operator and tending to distract attention from copy and to multiply opportunity for error; and it is the purpose of the present invention to reduce these obstacles to the minimum, both in number and degree, by providing means whereby the transposition from multiple to either of two distinctive individual compositions, and vice versa, may be performed by the manipulation of a single member controlling the connections between the lock-outs and setting motors and their respective controlling valves, as will presently appear.

In the present instance, wherein the motive power for the lock-outs and setting motors is compressed air and the controlling means therefor valves governing the admis-

sion of the motor fluid, the transposing element takes the form of a valve mechanism A interposed in and controlling the lines of communication between valves 14 and 14^x and their respective lock-outs 19, 19^x and setting motors 6, 6^x (it being understood of course, that if other motive power, such, for example as electricity, is employed, the valve will be replaced by its recognized equivalent, to wit, a properly constructed switch.) The arrangement is such that when the valve or switching member is in one position the connections will be set for multiplex action; when set in another position separate action of the right composing unit will be indicated, and when set in the third position, separate action of the left composing unit will be indicated. The valve casing is provided with a cylindrical and, preferably, conical seat 1, containing five ports 2, 3, 3', 4 and 4'. Port 2 communicates through a conduit 5 with a constant air pressure supply chamber; of the two ports 3, 3', one is connected with valve 14 and setting motor 6, and the other to lock-out 19^x; and of the two ports 4, 4', one is connected to valve 14^x and setting motor 6^x and the other to lock-out 19.

Located within the valve casing is a cylindrical and, preferably, conical valve provided with two circumferential grooves or bridging passages 8, 8^x, each lying in the plane of one set of ports 3, 3', and 4, 4', respectively, and two supply ports or radial passages, 9, 9^x, the one in line with passage 8 and the other in line with passage 8^x. Both ports 9, 9^x, connect with a passage 10, the latter in open communication with port 2 through pressure chamber 20. Valve 7 is held to its seat by a spring 11 interposed between the end of the valve and a removable cap 12, and is provided at its lower end with a detachable handle and index 13.

The members of the valve mechanism are so constructed, arranged and proportioned that when handle 13 is turned to one of its indexed positions (preferably the central of three stations) communication will be established and maintained between ports 3, 3', through bridging passage 8 and between ports 4, 4', through bridging passage 8^x. In this position the conditions of the prior patented multiplex machine are preserved in their entirety, inasmuch as valve 14 is in direct and open communication with lock-out 19^x and setting motor 6 and valve 14^x with lock-out 19 and setting motor 6^x.

If handle 13 is turned to the right extreme position, Figs. 6 and 7, it will close the valve port 3, and establish communication between pressure chamber 20 and lockout port 3', at the same time retaining the valve and lockout ports 4, 4', in open communication. The effect will be to admit pressure to lock-out 19^x, thereby cutting out or preventing

the right hand composing unit B^x from responding to selecting unit C, at the same time maintaining open communication between ports 4, 4'. As a result of these changes in the connections composing unit B is placed under the direct and exclusive control of selecting unit C with its setting motor 6 in responsive relation to valve 14.

By turning handle 13 to the left or third indexed position, Figs. 8 and 9, the control is reversed, that is to say, port 4 is closed, port 4' connected with pressure chamber 20, and the passage between ports 3 and 3' opened, whereby the lock-out 19 is energized to arrest the action of composing unit B, and the setting motor 6^x of composing unit B^x is retained under the control of its valve 14^x so that composition can be performed upon the right hand unit B^x to the exclusion of unit B.

It will be noted that when valve 7 is set to admit pressure from chamber 20 to the lock-out of either composing unit, to render the other unit independently operative, communication is maintained between the lock-out of the operative composing unit and its controlling valve 14 or 14^x, thereby retaining said lockout in open communication with the exhaust of its valve 14 or 14^x. This is to prevent the trapping of air in the lock-out of the operative composing unit and the delays occasioned thereby, when a shift is made from one composing unit to the other, that is to say, when pressure is shifted from one lock out to the other.

Conveniently, the shifting valve mechanism is constructed in the form of a self-contained attachment, and is detachably secured to the front of the selecting unit frame in position to be readily accessible to the operator at the keyboard, and the only change or alteration necessary to apply the same to existing multiplex machines is the severing of the conduits leading to the lock-outs and the connection of the severed ends to the appropriate ports of the valve casing and the addition of a conduit connecting port 2 with the pressure chamber of the keyboard.

What we claim is:—

1. A multiplex composing machine provided with a plurality of composing units each including a lock-out and setting motor, and a selecting unit controlling the several composing units and provided with a plurality of lock-out valves, one for each composing unit and controlling the lock-out thereof together with the setting motor of the companion composing unit, and in combination therewith a valve mechanism controlling the lines of communication between the lock-outs, setting motors, control valves, and a pressure chamber, so that when the mechanism is in either of two positions of adjustment pressure will be admitted to the

lock-out of either composing unit and communication opened between the setting motor of the companion unit and one of the lock-out controlling valves, and when said mechanism is set in a third position pressure will be cut off from both lock-outs and communication opened between each lock-out valve and the lock-out of one and the setting motor of the other composing units.

2. In a multiple composing machine, provided with two composing units each equipped with a lock-out and a setting motor, a selecting unit common to the two composing units, and individual control members for the two setting motors, and in combination therewith, separate lines of communication between each of said control members and the lock-out of one and the setting motor of the other composing units including a three position switching mechanism or member controlling said lines of communication and operating to couple each individual control member with the lock-out of one and the setting motor of the other composing member, and for coupling the lock-out member of either composing unit with a constant source of pressure and the setting motor of the other unit with one of the individual control members.

3. In a multiple composing machine provided with two composing units each equipped with a lock-out and a setting motor, and a selecting unit common to the two composing units and provided with individual controlling valves for separate lines of communication between each of said valves and the lock-out of one and setting motor of the other composing unit, the combination with said controlling valves, lock-outs and setting motors, of a three-position valve mechanism controlling said individual lines of communication for selectively coupling each of the aforesaid controlling valves with the lock-out of one and the setting motor of the other composing unit for connecting the lock-out of the primary composing unit with a constant source of pressure and the setting motor of the secondary composing unit with one of the controlling valves, and connecting the lock-out of the secondary composing unit with a source of pressure and the setting motor of the primary composing unit with the other of said controlling valves.

4. In a multiple composing machine equipped with two composing units each provided with a lock-out and a setting motor, and a selecting unit common to said composing units and provided with individual control valves and separate lines of communication between each of the latter and the lock-out of one and the setting motor of the other, the combination with said valves, lock-outs, and setting motors, of a three-position valve controlling the afore-

said lines of communication the same including two sets of ports whereof one member of each set communicates with one of said control valves and the other with one of the lock-outs, and a valve member in cooperative relation with said ports and provided with a connecting passage and associated pressure supply passage for each set of valve and lock-out ports, said ports and passages being arranged and operating substantially as described and for the purpose set forth.

5. In a multiplex composing machine, provided with a selecting unit, and duplicate composing units, each equipped with a lock-out, a setting motor, and a control valve for the setting motor, and in combination therewith connections intermediate the control valve of each composing unit and the lock-out of the other composing unit, and a switching valve mechanism, the latter controlling the connections between the control valves and associated lock-outs, said switching valve including a casing provided with a valve seat containing two sets of ports whereof one member of each set is in open communication with a control valve and the other with the associated lock-out, a three positioned valve provided with two sets of ports or passages each set comprising a bridging member and a pressure supply member arranged in tandem in the direction of motion of the valve and cooperating with one of the aforesaid sets of ports in the casing, and means for shifting said valve in opposite directions from an intermediate position, the arrangement being such that when the valve is in the intermediate position each lock-out is in open communication with its control valve, and when said valve is moved to either extreme position pressure will be admitted to the corresponding lock-out and at the same time the connection with its controlling valve will be closed.

6. In a multiplex composing machine, such as described and in combination with the lock-outs and control valves pertaining to the two composing units, a shifting device or mechanism the same comprising a valve casing provided with two sets of ports whereof one member of each set is connected to the lock-out and the other to the

control valve of one composing unit and the other set connected in like manner to the lock-out and valve of the associated composing unit; a valve rotatably mounted in said casing and provided with two sets of ports or passages each set in the plane of one of the first mentioned sets of ports and one adapted to bridge the associated lock-out and valve ports and the other to admit pressure to the lock-out port, said pressure ports communicating with a passage in the valve and the latter opening into a pressure chamber in the casing.

7. A shift valve for multiplex composing machine such as described, the same including the following elements to wit; a chamfered casing provided with a conical valve seat containing two sets of ports; a conical valve provided with two sets of ports or passages each set in line with one set of ports in the casing, one member of each set of valve ports being adapted to bridge the corresponding casing ports and the other to register with one of said casing ports, and a passage opening through the head of the valve and communicating with the two non-bridging valve ports; a cap closing the end of the chamber in the valve casing; a spring interposed between said cap and the end of the valve, a supply passage communicating with the chamber at the end of the valve; and indexed actuating devices connected with the valve to position the latter.

8. In a multiplex composing machine equipped with two composing units each provided with lock-out and setting devices, a selecting unit common to the two composing units, and a plurality of lock-out and setting device control members, and in combination therewith, means for coupling individual control members with the lock-out devices of one and the setting devices of the associated composing unit, and for coupling one of said control members with the setting devices of one composing unit and actuating the lock-out devices of the associated composing unit.

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