

W. H. GRANSDEN.

COTTON PRESS.

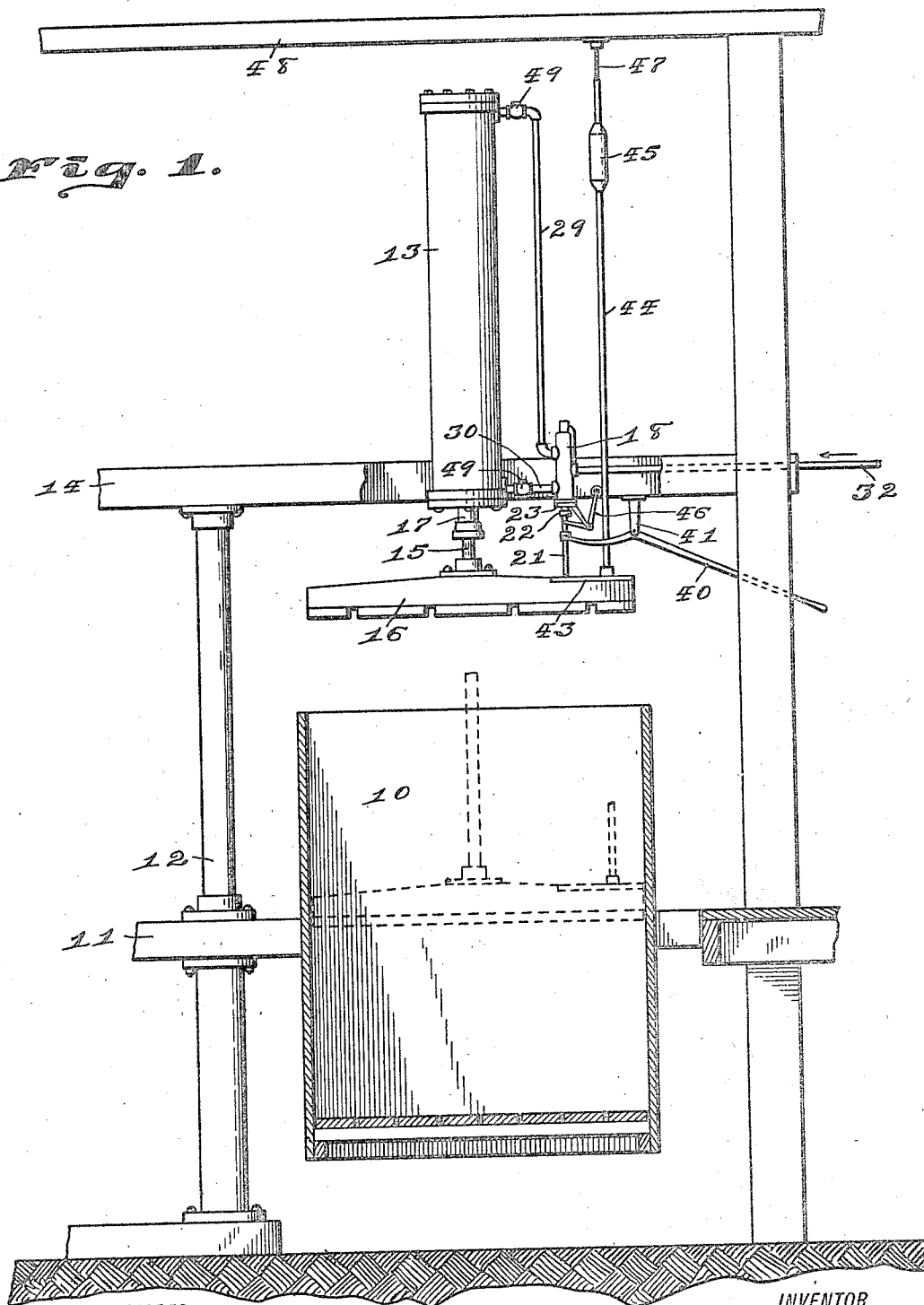
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3 SHEETS—SHEET 1.

1,179,822.

Fig. 1.



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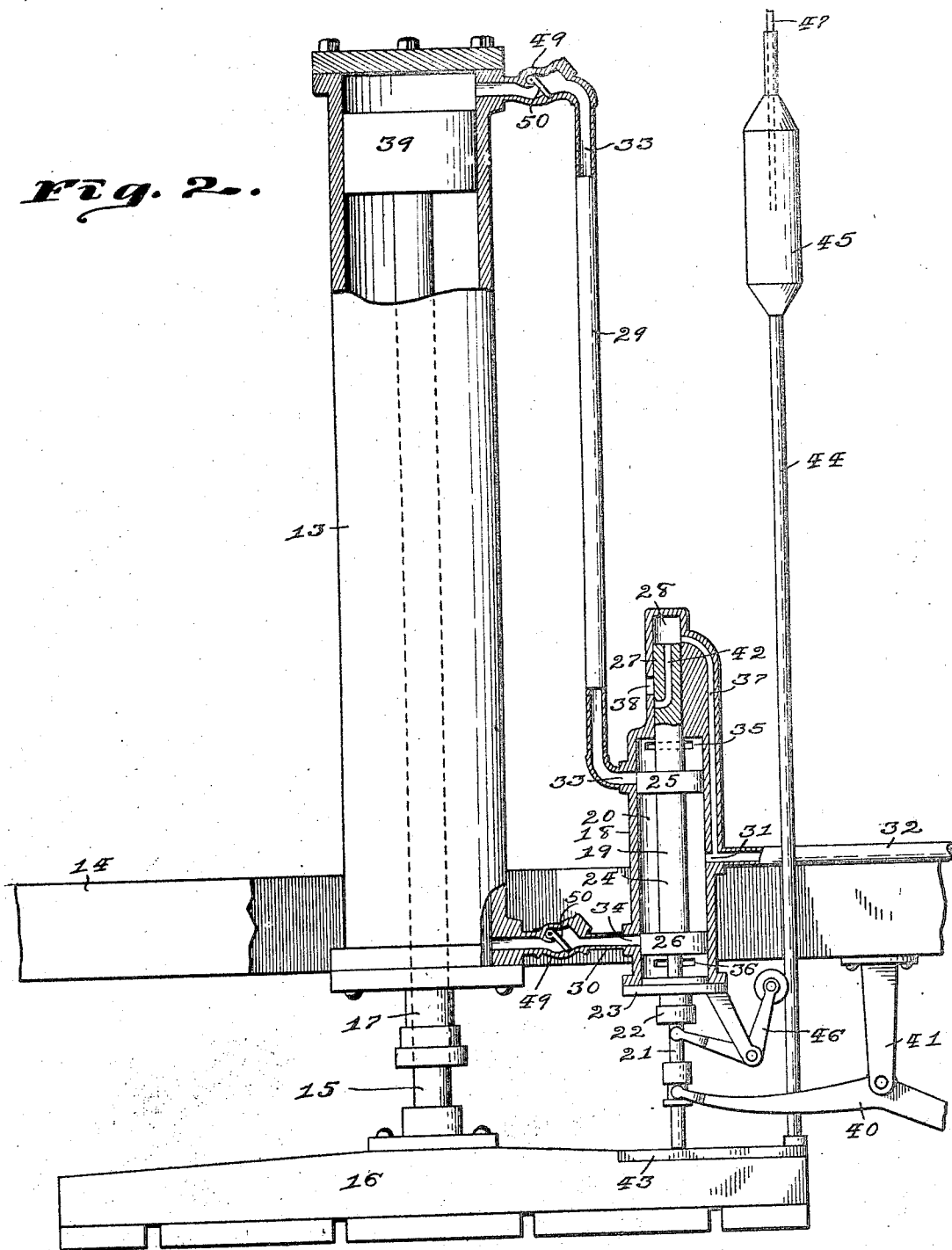
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Fig. 2.



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Fig. 3.

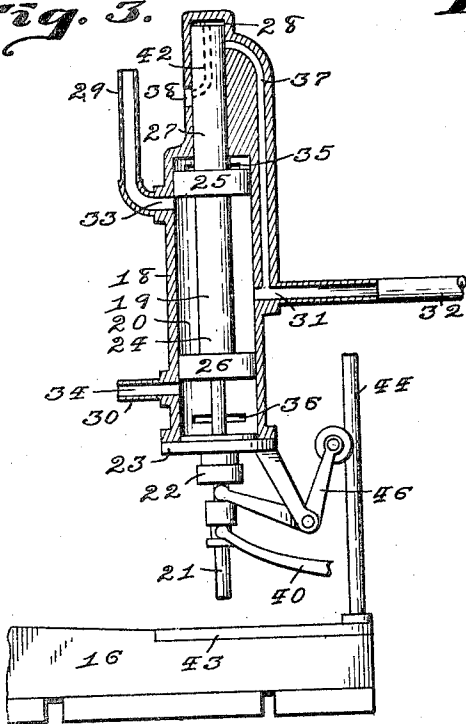


Fig. 4.

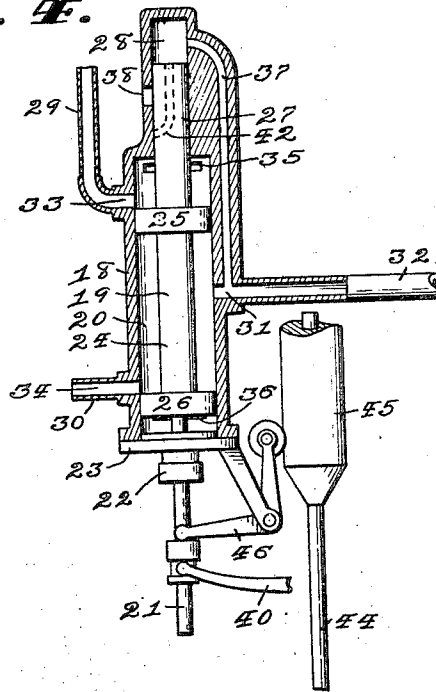


Fig. 5.

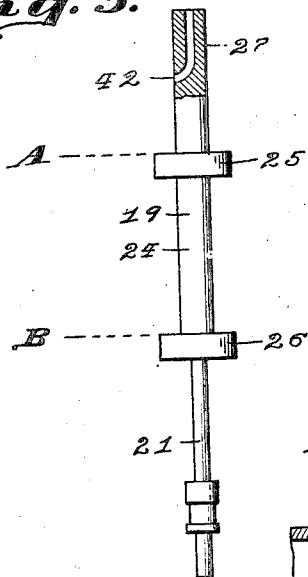


Fig. 6.

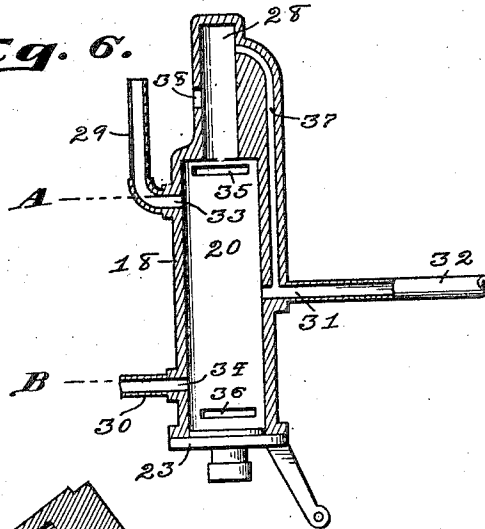
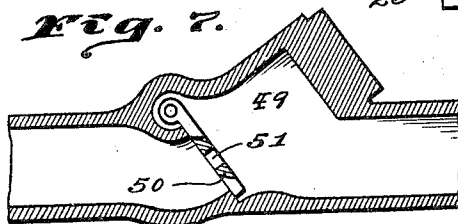


Fig. 7.



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COTTON-PRESS.

1,179,822.

Specification of Letters Patent.

Patented Apr. 18, 1916.

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To all whom it may concern:

Be it known that I, WILLIAM H. GRANSDEN, a citizen of the United States, residing at Granite, in the county of Greer and State of Oklahoma, have invented certain new and useful Improvements in Cotton-Presses, of which the following is a specification, reference being had to the accompanying drawings.

10 The invention pertains to cotton presses, and more especially to the apparatus which tramps the cotton in the press-box. In apparatus of this kind heretofore used, the tramper-foot of the press is carried by the
15 lower end of the piston-rod of a steam cylinder which is mounted in vertical position over the press-box. The supply of steam to the cylinder for actuating the tramper-foot is controlled by a manually operated valve, steam being first admitted above the piston
20 to drive the tramper-foot downward, and then below the piston to raise the tramper-foot to initial position. With the apparatus arranged in this way, the operator often
25 carelessly waits or hesitates at the completion of the down stroke of the tramper-foot and allows excessive pressure to set up above the piston. Again, in returning the tramper-foot to the upper or initial end of
30 its throw and supporting it until the next down stroke, the pressure below the piston soon rises to that of the boiler. With the apparatus arranged and handled in this way, steam is wasted at both ends of the
35 stroke, and at the lower end of the cylinder water from condensation is forced past the stuffing-box of the piston-rod by excessive steam pressure and is sprayed into the cotton.

An object, therefore, of the present invention is to overcome the objections named.

Other objects and advantages of the invention will be set forth in the ensuing description.

The accompanying drawings show one embodiment of the invention in practical form.

45 Figure 1 is an elevation view, partly in section, showing a press-box and a steam actuated tramper-foot with the invention in use in connection therewith. Fig. 2 is an enlarged reproduction, partly in section, of a portion of Fig. 1, the proportion of the parts being slightly changed. Fig. 3 is a reproduction of a portion of Fig. 2, with parts shifted to different positions. Fig. 4
50 is a reproduction of a portion of Fig. 2, with the parts shifted to still another position.

Fig. 5 is an elevation view of a valve. Fig. 6 is a sectional view of a valve casing. Fig. 7 is a still larger sectional view of a check-valve.

All the views are taken in the same direction.

Referring to the several figures, in all of which like characters of reference designate like parts, 10 designates a press-box which is supported by the usual revolving platform 11 and vertical spindle 12; 13 a steam cylinder which is bolted to a supporting chord 14 over the press-box; 15 the piston-rod of said cylinder; 16 the tramper-foot
65 carried by the lower end of said piston-rod; and 17 the stuffing-box for said piston-rod.

In carrying out the objects stated, a valve-casing 18, shown separately in Fig. 6, is mounted in vertical position at the side of the cylinder 13 and supported by the chord 14. A valve 19 of the piston type, shown separately in Fig. 5, fits in the chamber 20 of the valve-casing 18, with its stem 21 passing down through a stuffing-box 22 in the lower head 23 of said valve-casing parallel with the piston-rod 15. The body 24 of this valve 19 has two lips 25 and 26 which have a steam-tight fit in the chamber 20 as pistons for the purpose of sliding into closed position over certain ports, and the upper end of the body 24 is formed into a piston 27 having a steam-tight fit in an upper chamber 28 which is a small upward continuation of the chamber 20.

To simplify the drawings and this description, the cylinder 13 and the valve-casing 18, together with the pipes 29 and 30 which connect them, are shown as cast integral.

95 The valve-casing 18 is provided with the following ports: an inlet port 31 between the lips 25 and 26 of the valve 19, into which live steam is taken through a pipe 32 from a suitable source; a port 33 which leads from near the upper end of the chamber 20 through the pipe 29 into the upper end of the cylinder 13; a port 34 which leads from near the lower end of said chamber through the pipe 30 into the lower end of said cylinder; an exhaust port 35 which opens from the upper end of the chamber 20 to the atmosphere; a similar port 36 which opens from the lower end of said chamber to the atmosphere; a small port 37 which leads from the inlet port 31 upward into the small chamber 28; and an exhaust

port 38 which opens from said chamber 28 to the atmosphere.

With the parts in the initial position shown in Figs. 1 and 2, the valve 19 has been shifted a portion of its upward stroke by the lifting action of the tramper-foot 16 on the lower end of its stem 21, and its lower lip 26 has just completely closed the lower port 34 against live steam from between said lip and the upper lip 25; said tramper-foot being supported only by steam expansion below the piston 39. When condensation of the steam allows the tramper-foot 16 to begin to settle down, the valve 19 also drops slightly from lack of support by the tramper-foot and under pressure of live steam in the upper chamber 28, thereby opening the port 34 and admitting the small amount of live steam required under the piston 39 to restore the tramper-foot and said valve to initial position. With the parts arranged and operating in this way, only the small amount of live steam required to supply low-pressure condensation is needed to support the tramper-foot 16.

To give the full down stroke of the tramper-foot 16, the valve 19 is manually shifted to full throw upward into the position shown in Fig. 3 by the use of a lever 40 fulcrumed in a bracket 41 on a supporting portion 14 of the supporting frame work; this movement of the valve being against live steam in the upper chamber 28 until the small port 37 is closed by the upper or piston portion 27 of said valve, but unresisted after the closing of said port and the simultaneous release of trapped steam by registration of a small relief port 42 of said piston portion with the exhaust port 38. With the valve 19 in this uppermost position, its lips 25 and 26 are at full throw above their respective ports 33 and 34, thus admitting live steam through the port 33 to drive the piston downward, and simultaneously allowing the steam below said piston to exhaust through the ports 34 and 36 to the atmosphere. On account of the absence of pressure above the valve 19 at its full upward throw, the friction of its stuffing-box 22 and the weight of its actuating lever 40 will hold it in said position until moved by other parts.

In this instance, the tramper-foot 16 is provided with a wearing plate 43, adapted to have repeated lifting contact with the stem 21 of the valve 19 without undue wear, and this plate supports a vertical rod 44 upon the upper end of which a tripping cam 45 is fixed. Near the completion of the down stroke of the tramper-foot 16, and while its speed is greatly reduced by resistance of packed cotton, the cam 45 trips a bell-lever 46 which is fulcrumed in an arm on the lower head 23 of the valve-

casing 18, and this bell-lever, acting on the stem 21, shifts the valve 19 slowly downward until closing of the relief port 42 in the upper piston portion 27 of said valve and the simultaneous opening of the port 37 allows live steam in the upper chamber 28 to shift said valve to full down stroke with a quick movement. A rod 47 depending from a supporting portion 48 of the frame work telescopes down into the rod 44 and guides its upper end against undue lateral movement.

With the valve 19 shifted to its lowermost position, its lips 25 and 26 are at full throw below their respective ports 33 and 34, thus admitting live steam through the port 34 to drive the piston 39 and tramper-foot 16 upward and simultaneously allow the steam above said piston to exhaust through the ports 33 and 35. Near the completion of the full upward stroke of the tramper-foot 16, it meets the stem 21 of the valve 19, lifting said valve to the initial position shown in Figs. 1 and 2 and closing the ports 33 and 34.

In order to reduce the movements of the tramper-foot 16 to safe speed and avoid a fanning or suction effect on the cotton, and at the same time allow free exhaust of steam from the cylinder 13, each of the ports 33 and 34 to the cylinder is provided with a check-valve 49 which opens from said cylinder and may be of the swing-gate type shown in Fig. 7. The gates proper of these check-valves 49, while allowing free exhaust, are seated by admission of steam toward the cylinder 13, and each is provided with a small orifice 51, shown only in Fig. 7, through which the limited amount of steam required to move the tramper-foot 16 may pass. With the piston 39 and tramper-foot 16 thus limited in speed, their momentum will not cause them to slam or to overrun their normal throw.

For perfect operation, it is possibly preferable that the distance between the upper faces of the lips 25 and 26 of the valve 19, as indicated by the lines A and B in Fig. 5, be slightly less than the distance between the upper edges of the two ports 33 and 34 of the valve-casing 18, as indicated by the lines A and B in Fig. 6, so that with the lower port 34 just completely closed by said valve in the initial position shown in Fig. 2 the port 33 will stand slightly open. This will release any pressure that might otherwise be set up above the piston 39 from leakage and thereby avoid short downward thrusts of said piston while being held in initial position for the next full down stroke.

Having thus described the invention, I claim:—

1. A tramper-foot adapted to be moved to and from its work by fluid pressure, a valve

for controlling the fluid pressure, and means whereby return of said tramper-foot to initial position after a working throw closes said valve.

2. A fluid pressure cylinder having a piston and adapted to move a tramper-foot, a reciprocal valve mechanism so arranged that when shifted to one end of its throw fluid is admitted to one end of the cylinder and when shifted to the opposite end of said throw fluid is admitted to the opposite end of said cylinder, said valve mechanism also being so arranged that when in neutral or intermediate position no fluid is admitted to the cylinder, and means whereby return of said piston to initial position after a working stroke shifts said valve mechanism to neutral position.

3. A fluid pressure cylinder having a piston and adapted to move a tramper-foot, a reciprocal valve mechanism adapted to control the admission and exhaust of fluid to the cylinder to produce reciprocating movement of said piston, said valve mechanism being so arranged that when shifted to a position intermediate its full throw no fluid is admitted to the cylinder, means whereby return of the piston to initial position after a working stroke shifts said valve mechanism to intermediate position, and yieldable means acting to hold the valve mechanism away from intermediate position in opposition to the shifting action of the piston thereon.

4. A fluid pressure cylinder having a piston and adapted to move a tramper-foot, a reciprocal valve mechanism adapted to control the admission and exhaust of fluid to the cylinder to produce reciprocating movement of said piston, said valve mechanism being so arranged that when shifted to intermediate position no fluid is admitted to the cylinder, yieldable means resisting movement of the valve mechanism toward the position which produces the working stroke of the piston, manually operable means for overpowering the yieldable means and shifting the valve mechanism to position to produce the working stroke of the piston, means whereby completion of the working stroke of the piston shifts the valve mechanism to position to produce the return stroke of the piston, and means whereby completion of the return stroke of the piston shifts the valve mechanism to intermediate position.

5. A valve mechanism adapted to be shifted to direct a supply of fluid pressure, yieldable means resisting shifting movement of the valve mechanism in one direction, manually operable means for overpowering the yieldable means and shifting said valve mechanism, and means whereby shifting movement of the valve mechanism for a portion of its throw in opposition to the yieldable means renders said yieldable means inactive.

6. A valve mechanism adapted to be shifted to direct a supply of fluid pressure, yieldable means resisting shifting movement of the valve mechanism in one direction, means for overpowering the yieldable means and shifting the valve mechanism, means whereby shifting movement of the valve mechanism for a portion of its throw in opposition to the yieldable means renders said yieldable means inactive, and the remainder of the throw unresisted, and means whereby a return portion of the throw of the valve mechanism renders the yieldable means active.

7. A fluid pressure cylinder having a piston and piston-rod, a reciprocal valve mechanism adapted to control the admission and exhaust of fluid to the cylinder to produce reciprocating movement of the piston, said valve mechanism being so arranged that when shifted to a position intermediate the ends of its full throw no fluid is admitted to the cylinder, means whereby return of the piston to initial position after a working stroke shifts said valve mechanism to intermediate position, yieldable means acting to resist movement of the valve mechanism to intermediate position by the piston, means whereby shifting movement of the valve mechanism for a portion of its throw toward or past intermediate position in opposition to the yieldable means renders said yieldable means inactive, and the remainder of the throw unresisted, and means whereby a return portion of the throw of the valve mechanism renders the yieldable means active.

Witness my hand this 23 day of April, 1915.

WILLIAM H. GRANSDEN.

Witnesses:

C. A. HOOTON,
O. K. CORKEN.