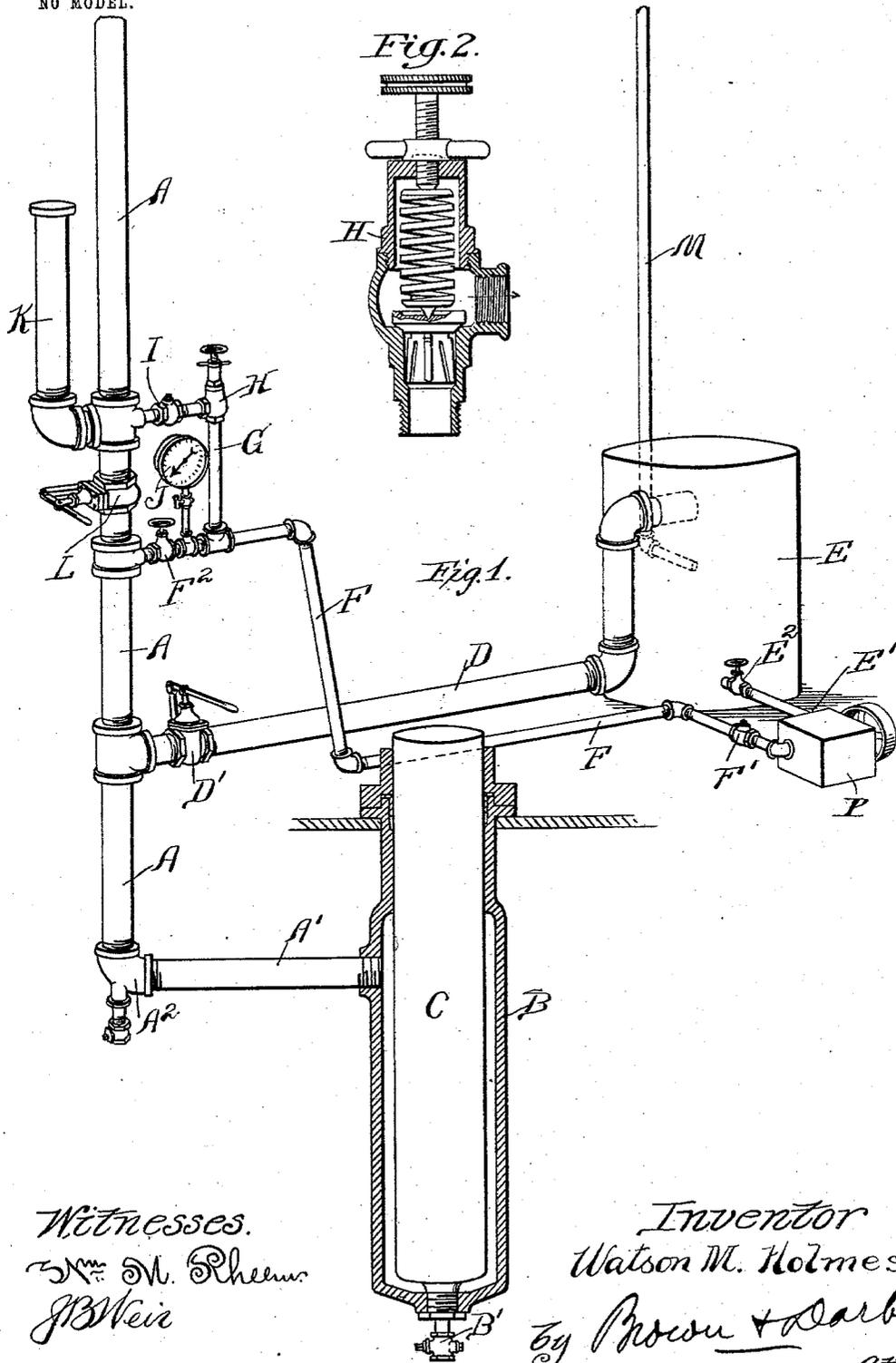


W. M. HOLMES.
FLUID SYSTEM FOR PRESSES OR THE LIKE.
APPLICATION FILED SEPT. 4, 1900.

NO MODEL.



Witnesses.
Wm. M. Pheasant
J. B. Weir

Inventor
Watson M. Holmes
by Brown & Darby
attys.

UNITED STATES PATENT OFFICE.

WATSON M. HOLMES, OF HOOSICK FALLS, NEW YORK, ASSIGNOR, BY
MESNE ASSIGNMENTS, TO PLANTERS COMPRESS COMPANY, A COR-
PORATION OF MAINE.

FLUID SYSTEM FOR PRESSES OR THE LIKE.

SPECIFICATION forming part of Letters Patent No. 753,261, dated March 1, 1904.

Application filed September 4, 1900. Serial No. 23,376. (No model.)

To all whom it may concern:

Be it known that I, WATSON M. HOLMES, a citizen of the United States, residing at Hoosick Falls, in the county of Rensselaer and State of New York, have invented a new and useful Improvement in Fluid Systems for Presses or the Like, of which the following is a specification.

This invention relates to fluid systems for presses and the like.

The object of the invention is to provide a fluid system for presses and the like which is simple and efficient wherein the jack may be quickly raised or lowered or may be made to recede under a constant and predetermined uniform pressure, which may be readily and easily regulated at the will of the operator.

In the operation of a press, and particularly a press of the type set forth in Patent No. 630,369, granted August 8, 1899, to George A. Lowry, wherein a resistance-abutment is provided for the forming bale, it is desirable to provide a resistance-abutment wherein the receding movement may be made gradual and against a constant uniform predetermined pressure during the formation of the compressed column in order that uniform density throughout the length of the column may be secured. It is also desirable that this pressure may be readily and easily regulated at the will of the operator in order that change of pressure may be effected according to the condition and characteristic of the material being compressed. It is also important to provide means whereby when a sufficient length of column to form a finished bale has been produced the resistance abutment or jack may be quickly moved away from the end of the column in order to permit the bale to be detached and removed, and it is equally desirable that the resistance-abutment be quickly moved again into engagement with the end of the column when the bale has been detached and removed.

It is the special purpose of the present invention to provide a fluid system wherein these desirable ends are secured in a most simple and efficient manner.

Referring to the drawings, Figure 1 illustrates a construction and arrangement of such a system as applied to a jack and embodying the principles of my invention, that portion of the movable member of the jack which engages with the compressed column being broken off and the cylinder of the jack shown in longitudinal section. Fig. 2 is an enlarged view in section of a relief-valve that may be used.

In the drawings, A designates a stand-pipe designed to communicate at one end with a suitable tank (not shown) or other suitable source of fluid-pressure and at the other end through pipe A' with the cylinder B, which forms one member of a fluid-operated jack, the other member being a plunger C, arranged within the cylinder in the ordinary manner, so that the introduction of fluid into the cylinder tends to expand the jack by expelling the plunger from the cylinder.

The drawings show the construction which is most usual in connection with presses of the type above referred to—to wit, a jack in which the plunger is the moving member and the cylinder the stationary member, in which case the plunger supports or constitutes the resistance-abutment of the press. It will, however, be obvious from the description hereinafter contained that the scope of my invention does not depend upon the particular type of jack employed, provided the same be operated by fluid-pressure, nor upon the arrangement of the jack with respect to the resistance-abutment, provided that the introduction of fluid into the cylinder tends to expand the jack and move one of its members in the direction in which it is desired to exert pressure.

The pipe D, equipped with a suitable control-valve D', leads from the pipe A to a tank E, which I will hereinafter designate the "spill-tank." A pump P is arranged to draw its supply from the spill-tank through the pipe E', in which is located a control-valve E'', and to discharge through the pipe F, which enters the stand-pipe on the cylinder side of a control-valve L, located in said stand-pipe.

The pipe F contains a check-valve F', the entrance to a pipe G, which delivers into the stand-pipe on the other side of control-valve L, a pressure-gage J, and a control-valve F².
 5 The pipe G contains a relief-valve H, which may be of any suitable construction—as, for example, that shown in Fig. 2 and fully described in the United States Patent granted to me, numbered 645,722—and also contains a
 10 check-valve I. An overflow-pipe M leads from the pressure-tank of the stand-pipe and delivers into the spill-tank E. An air-chamber K communicates with the stand-pipe above the valve L, and drain-cocks B' and A² may
 15 be provided for the stand-pipe and jack-cylinder.

The operation of my fluid-pressure system is as follows: When it is desired to fill the upper or pressure tank, the operating fluid is
 20 first placed in the auxiliary or spill tank E, the valves F² and L are closed, and the relief-valve so regulated that the fluid may pass therethrough under very little pressure, and the valve E² of the pump supply-pipe E' is
 25 opened. The pump is then started, and through it the operating medium is drawn from spill-tank E through pipe E' by the pump and is forced or delivered from the pump through
 30 pipe F, branch G, relief-valve H, check-valve I, and stand-pipe A into the upper or pressure tank until the desired amount is delivered into said tank. Any overflow from said tank
 35 returns to the spill-tank E through pipe M. The check-valve F' prevents backflow to the pump, and the check-valve I serves to prevent the escape of the fluid from the pressure-tank when it may become necessary to remove the
 40 relief-valve in order to make necessary repairs. When it is desired to raise or expand the jack quickly—as, for instance, when it is desired to replace the resistance-abutment
 45 against the end of the compressed column after a bale has been detached therefrom and removed—the valve D' is closed and the valve L is opened. The operating fluid thereupon
 50 passes freely from the pressure-tank through the pipes A and A' into the jack-cylinder, and hence effects a quick movement of the jack. In order to lower the resistance-abutment
 55 quickly—as, for instance, when a bale has been formed and is ready to be detached and removed—the valve L being closed, the valve D' is opened. This leaves the fluid contained in the jack free to flow through the pipes A', A,
 60 and D into the spill-tank E, thus permitting the portion of the jack carrying the resistance-abutment to fall away from the compressed column as rapidly as the fluid can flow out. When it is desired to allow the member carrying
 65 the resistance-abutment to recede gradually under a constant and uniform predetermined pressure—as, for instance, during the operation of the press while the compressed column is being formed—the valves D' and L are closed
 and valve F² is opened. The entire system is

now filled with the operating fluid; but the pressure-tank and the upper part of the stand-pipe A is cut off from the lower part of the system and can be reached by fluid from the lower part of the system only through the by-
 70 pass G. The advance of the forming column of compressed material causes a recession of the resistance-abutment and that portion of the jack on which it is mounted, and this receding movement of the jack causes a displacement
 75 of fluid in the jack-cylinder through the pipes A', lower part of A F G, into the upper part of stand-pipe A, and thence into the upper or pressure tank. Incidentally it must pass through the relief-valve H, which may
 80 be suitably adjusted, so that a certain degree of pressure will be required for the fluid to open the valve and escape. By this means the pressure in the jack and lower part of the piping system may be maintained uniform and
 85 constant at a predetermined point even while the jack is receding. The pressure-gage in communication with this portion of the system indicates the degree of pressure in the fluid medium, and consequently the pressure
 90 opposing the receding movement of the jack, and the amount of that pressure may be regulated at will by adjusting the relief-valve.

It will be observed that the discharge from the pump into the upper or storage tank also
 95 takes place through the relief-valve H, and the pressure of such discharge, together with the pressure created by the receding of the jack, will be indicated by the pressure-gage J.
 100 The drain-cocks A² and B' enable the system to be drained when desired.

From the foregoing description, taken in connection with the accompanying drawings, it will be readily seen and understood that I
 105 provide an exceedingly simple and efficient hydraulic system for accomplishing the objects and securing the results had in view, and while I have described the application of my system for use in connection with a baling-press of a particular type it is to be understood that my invention is not to be limited or
 110 restricted in the use thereof to such application or to such type of press.

I claim—

1. In an apparatus of the class described, a
 115 jack comprising a cylinder and a plunger operating therein, a source of fluid-pressure communicating with the cylinder, means to close communication between said source of pressure and the cylinder, and a relief-valve from
 120 the cylinder to said source of pressure.

2. In an apparatus of the class described, a
 125 jack comprising a cylinder and a plunger operating therein, a source of fluid-pressure communicating with the cylinder, means to close communication between said source of pressure and the cylinder, a relief-valve from the cylinder to said source of pressure, and a discharge-pipe and valve therefor communicating
 130 with the cylinder.

3. In an apparatus of the class described, a jack comprising a cylinder and a plunger operating therein, a source of fluid-pressure communicating with the cylinder, a controlling-valve between said source of pressure and the cylinder, a relief-valve from the cylinder to said source of pressure, and a pressure-pump arranged to deliver fluid into the system on the cylinder side of the relief-valve.

4. In an apparatus of the class described, a jack comprising a cylinder and a plunger operating therein, a source of fluid-pressure communicating with the cylinder, a valve between said source of pressure and the cylinder, a relief-valve communicating with the cylinder, and a pressure-pump arranged to deliver into the system on the cylinder side of the first-mentioned valve.

5. In a fluid system for presses, a jack comprising a cylinder and a plunger operating therein, a stand-pipe delivering into said cylinder, a control-valve arranged in said stand-pipe, a branch pipe communicating with said stand-pipe on opposite sides of said control-valve, and a relief-valve arranged in said branch pipe, whereby a uniform and constant pressure may oppose the receding movement of said jack, as and for the purpose set forth.

6. In a fluid system for presses, a jack comprising a cylinder and a plunger operating therein, a stand-pipe delivering into said cylinder, a control-valve arranged in said stand-pipe, a by-pass around said control-valve, a pressure-gage and a relief-valve arranged in said by-pass, as and for the purpose set forth.

7. In a fluid system for presses, a jack comprising a cylinder and a plunger operating therein, a stand-pipe delivering into said cylinder, a control-valve arranged in said stand-pipe, a by-pass around said valve, a pressure-relief valve arranged in said by-pass, and a

pump discharge-pipe communicating with said by-pass, as and for the purpose set forth.

8. In a fluid system for presses, a jack comprising a cylinder and a plunger operating therein, a stand-pipe delivering into said cylinder, a control-valve arranged therein, a by-pass around said control-valve, a relief-valve arranged in said by-pass, a spill-tank, a discharge-pipe communicating with said cylinder and delivering into said tank, a pump discharge-pipe adapted to receive its supply from said spill-tank, and communicating with said by-pass, a control-valve arranged in said discharge-pipe, and check-valves arranged in said by-pass and in said pump discharge-pipe, as and for the purpose set forth.

9. In an apparatus of the class described, a jack comprising a cylinder and a plunger operating therein, a source of fluid-pressure communicating with the cylinder, and valve mechanism arranged to afford a free passage for fluid from the source of supply and an automatically-restricted passage in the reverse direction.

10. In an apparatus of the class described, a jack comprising a cylinder and a plunger operating therein; a source of fluid-pressure communicating with the cylinder; a valve arranged to afford a free passage for fluid from said source to the cylinder, a valve arranged to afford a restricted passage from the cylinder to said source; and a pressure-supply pump delivering into the system on the cylinder side of the valve mechanism.

In witness whereof I have hereunto set my hand, this 29th day of August, 1900, in the presence of the subscribing witnesses.

WATSON M. HOLMES.

Witnesses:

GUY CUNNINGHAM,
W. M. RHEEM.