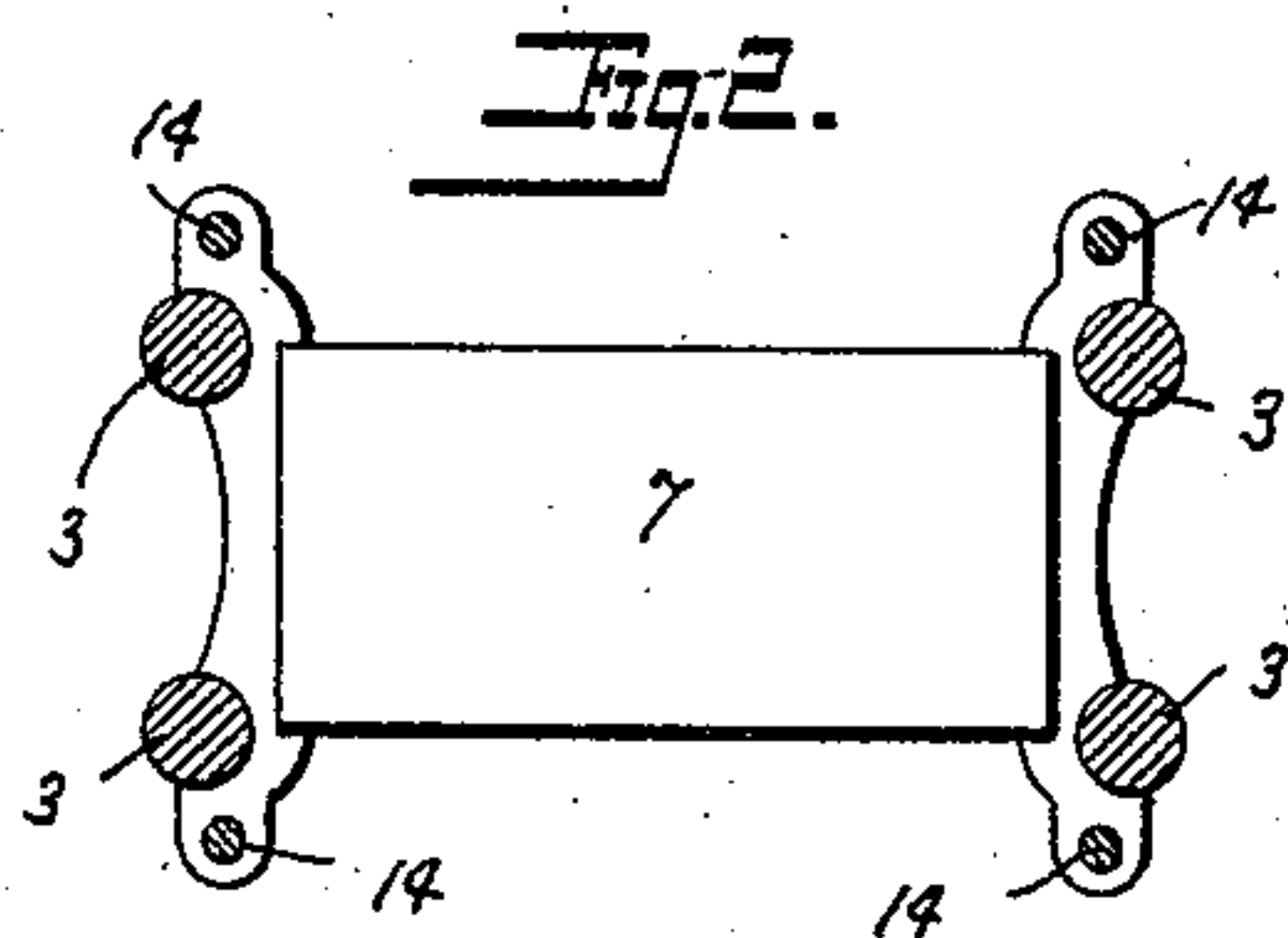
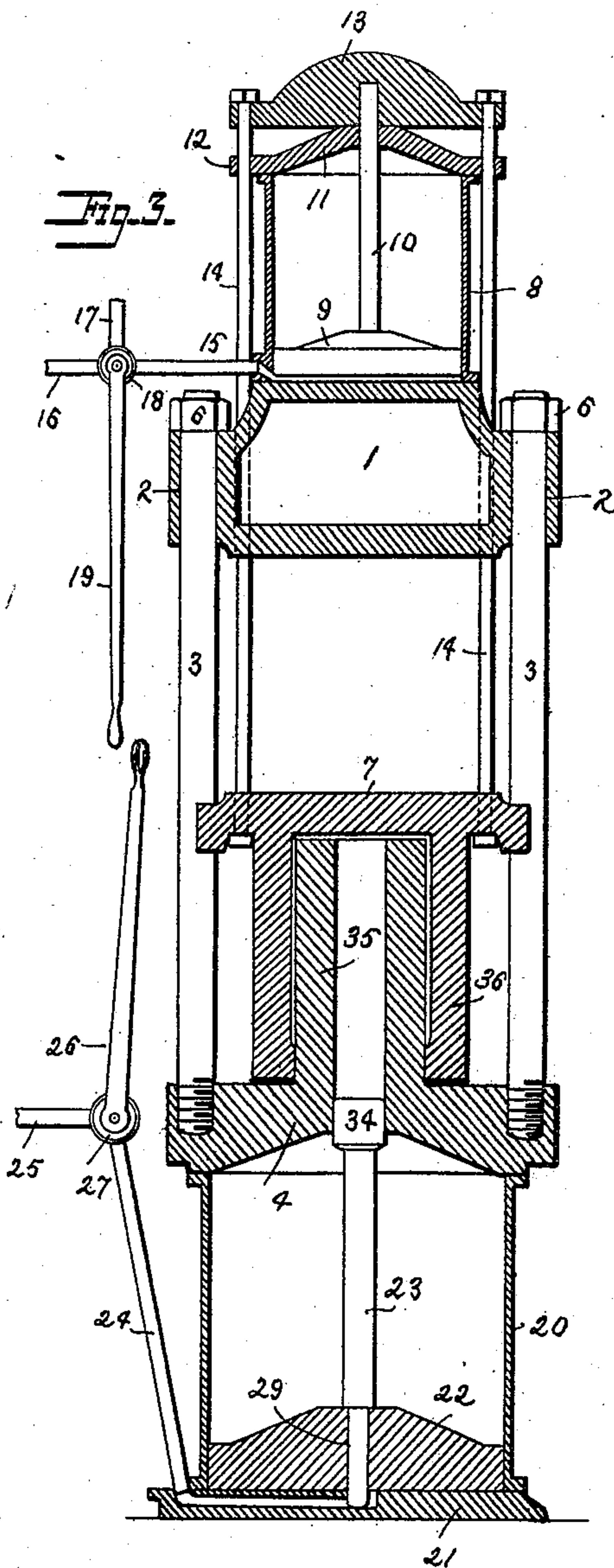
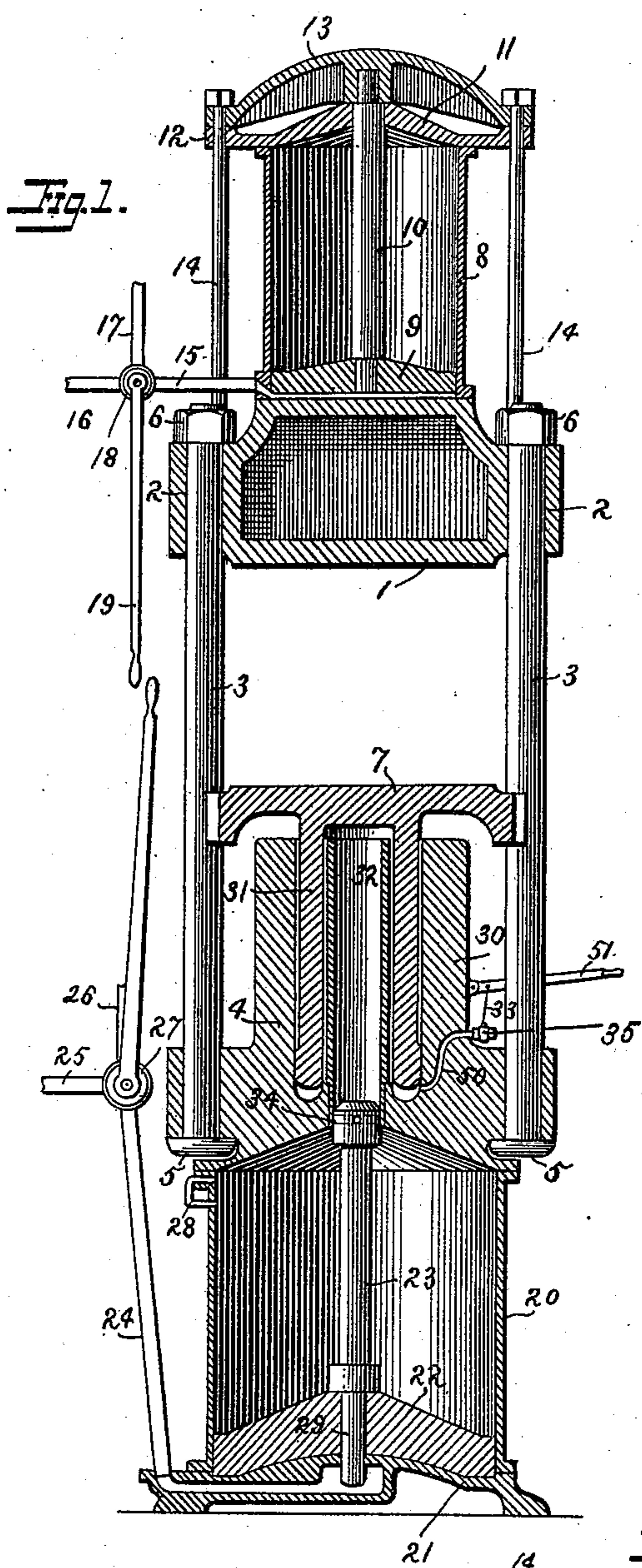


(No Model.)

S. J. WEBB.
HYDRAULIC PRESS.

No. 429,666.

Patented June 10, 1890.



Witnesses
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UNITED STATES PATENT OFFICE.

SAMUEL J. WEBB, OF MINDEN, LOUISIANA.

HYDRAULIC PRESS.

SPECIFICATION forming part of Letters Patent No. 429,666, dated June 10, 1890.

Application filed April 11, 1889. Serial No. 306,794. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL J. WEBB, a citizen of the United States, residing at Minden, in the parish of Webster and State of Louisiana, have invented certain new and useful Improvements in Hydraulic Presses, of which the following is a specification.

My invention relates to hydraulic presses, and more particularly to that class of hydraulic presses which is adapted to bale cotton, hay, and other material, although of course the principles of construction and arrangement of parts are such that it may be adapted and used for many and various purposes, especially where great strength and force are required; and the object of the invention is to improve the construction and operation of this class of presses, whereby a simple and compact arrangement of parts is attained that is capable of even and rapid operation under great strain or pressure and so proportioned and adjusted as not to be liable to get out of order.

To these ends my invention consists in a press constructed and arranged substantially as indicated hereinafter.

Referring to the accompanying drawings, Figure 1 is a sectional view of one form of press embodying my invention. Fig. 2 is a detail plan of the platen, and Fig. 3 is a sectional view showing a slightly different arrangement of parts embodying the same invention.

One of the first essentials in a press of this character is to provide a simple and yet exceedingly strong and compact frame-work which is capable of withstanding the enormous pressure to which the parts are subjected, and in order to attain this object the parts must be so proportioned and arranged that each will bear its proper amount of the strain. The greatest strain of course is between the bed and platen or platen-support of the press, and in order to accomplish the results desired I have embodied the press in the form substantially as illustrated in the accompanying drawings.

In the drawings, 1 represents the fixed or stationary portion of the bed of the press, which in this instance is shown hollow, and cast or otherwise formed in one piece and having openings 2 in its sides, through which

pass strong rods or bars 3, connecting the bed-plate 4 therewith. Various ways of connecting this fixed bed and bed-plate may be adopted, the principal object being that they shall be maintained in practically the same relations to each other under all conditions, as they together form the frame of the press. In Fig. 1 these rods 3 are shown as formed with heads 5 on their lower ends and as provided with a screw-thread at their upper ends, having nuts 6 fitted thereon, so that the relations of the bed and bed-plate may be accurately adjusted. In Fig. 3 the same result is accomplished by forming screw-threaded sockets in the bed-plate, into which the screw-threaded ends of the rods 3 fit, their other ends being provided with a head, as shown. When these parts are properly united, it will be seen that the relations of the bed and bed-plate can be maintained throughout all the operations of the press, and as these two parts and their connections are subjected to the greatest strain an important feature in the construction of the press is attained.

Mounted to move between the bed and bed-plate is the platen 7, which is guided by the rods 3 at each side, and the article or material to be pressed is of course placed between the movable platen 7 and the fixed bed 1. Mounted upon the upper portion of the bed 1 and in line therewith is a cylinder 8, having a piston 9 and piston-rod 10, and this cylinder may be covered with a head 11, serving as a guide for the piston-rod 10, and preferably provided with extensions 12, which serve as a guide for the lifting-rods, hereinafter described. Mounted upon the upper end of the piston-rod is a cross-head 13, which is connected by means of the lifting-rods 14 to the moving platen 7. The cylinder 8 is provided with a suitable inlet-pipe 15, connected to the feed-pipe 16 and an exhaust-pipe 17 by a three-way valve 18, having an operating-handle 19, by means of which the operating-fluid, preferably steam, may be admitted or discharged to and from the cylinder to move the piston and its connections.

Mounted below the bed-plate 4 is a cylinder 20, having a head 21, which is preferably extended to form a base-plate for the press to rest upon. This cylinder is provided with a

piston 22 and piston-rod 23, and a suitable pipe 24 is connected with the cylinder on one side and with the feed-pipe 25 and exhaust 26 on the other side through the medium of a three-way valve 27, whereby the motor-fluid, which is preferably steam, is admitted to and discharged from the said cylinder.

In order to prevent the shock or breakage of the parts in case of an accident, the cylinder may be provided with any suitable cushioning device to prevent the piston striking the head, and I have indicated one well-known form at 28, although other forms may be used. The end of the piston-rod 23 is shown extended through the piston at 29 and fitting into the steam-opening in the cylinder, so that as the piston approaches its lowermost position it will automatically cut off the exhaust-steam and form a cushion for itself in a manner well understood.

Formed on the bed-plate 4 is a hydraulic cylinder 30, into which fits an annular plunger 31, which forms part of or is secured to the moving platen 7, and is so adjusted as to slide freely but tightly in the cylinder 30; also, connected to the bed-plate is an inner annular cylinder 32. With the cylinder 30 communicates a supply-tube 50, provided with a check-valve 35, which may be opened by means of a lever 51, connected with the valve by a link 33. Between this annular cylinder and the plunger 31 there is a space sufficient to allow the free flow of the motor-fluid. Connected to the piston-rod 23 is the plunger 34, operating in the annular cylinder 32 of the hydraulic or other fluid press.

In Fig. 3 practically the same construction is shown in all respects, except in the specific arrangement of the hydraulic or other fluid press connected to the bed-plate. In this instance the bed-plate 4 is extended into a cylinder 35, and outside of this fits the cylinder 36, which is attached to or forms part of the platen 7. The function and mode of operation of the two forms of hydraulic presses shown are practically the same.

Such being the general construction, the operation will be readily understood, and is substantially as follows: The material to be pressed is placed upon the moving platen 7, and the valve 18 being opened, steam or other motor-fluid is admitted to the cylinder 8, which forces the piston 9 upward, which carries with it the cross-head 13, connected by the rods 14 to the moving platen. In this way the slack between the material to be pressed and the platen and bed is taken up and the first or initial pressure given to the material. As the platen 7 rises in this operation, water or other fluid flows into cylinder 30 to fill the space caused by the plunger 31 moving out of the cylinder 30. This operation being complete, steam or other fluid is admitted to the cylinder 20 and the piston 22 is forced upward. This is preferably made with a larger area than the cylinder 8, so that an increased amount of pressure from the same source of

power is produced on this piston. As the piston 22 rises, the plunger or piston head 34 passes upward through the annular cylinder 32. Check-valve 35 being closed, the fluid of course cannot pass out of cylinder 30, and the fluid is accordingly forced to pass from the annular cylinder 32 and to press the plunger 31 and move the platen 7 with greatly-increased pressure, and the final pressure upon the bale or other material is thus accomplished. It will be observed that in this way the original power or motor force is greatly increased to complete the final pressure, and the parts are so arranged that but a small amount of steam or other motor-fluid is necessary to take up the slack and produce the initial pressure, and the greater amount of steam in the larger cylinder is utilized and its power multiplied by means of the hydraulic press. As soon as the pressure has been completed the three-way valves and check-valve 35 are opened, so that the steam or other fluid is exhausted and the parts returned to their normal position.

By the arrangement shown in the drawings I produce a very compact press, capable also of exerting an enormous pressure, and it will be noticed that all the strain is practically in one right line, the pistons and cylinders being arranged one above the other.

While I have thus described the preferred embodiment of my invention, it is evident to those skilled in the art that it is not limited to the precise form and construction or arrangement of parts shown herein, as they may be varied.

I do not herein claim any features shown, described, and claimed in my application, Serial No. 299,691, filed February 15, 1889.

Having thus described my invention, what I claim is—

1. In a hydraulic press, the combination, with the fixed bed and movable platen, of a centrally-arranged hydraulic cylinder operating the platen, and two steam-cylinders, one arranged at each end of the press and adapted to act upon the platen, the three cylinders being arranged in a right line, substantially as described.

2. In a hydraulic press, the combination, with the bed and platen, of a steam-cylinder mounted upon the bed, another steam-cylinder mounted below the platen, and a hydraulic cylinder arranged above the lower steam-cylinder and between it and the platen, substantially as described.

3. The combination of the fixed bed and bed-plate rigidly connected thereto, a hydraulic cylinder formed in said bed-plate, a movable platen carrying a plunger operating in said cylinder, a steam-cylinder connected to the bed-plate, and a piston for said cylinder, the piston-rod of which supports the piston for the hydraulic cylinder, substantially as described.

4. The combination, with the fixed bed and bed-plate rigidly connected thereto, of a

steam-cylinder mounted upon the bed and connected to the moving platen, a hydraulic cylinder connected to the bed-plate, a plunger connected to the moving platen and operating in connection with said hydraulic cylinder, and a steam-cylinder connected to the bed-plate having a piston connected to operate the hydraulic press, substantially as described.

5 5. The combination, with the fixed bed and bed-plate connected thereto, the moving platen, a steam-cylinder mounted upon the bed-plate, a piston moving therein connected to the platen, a hydraulic cylinder mounted on the bed-plate, a plunger for said cylinder connected to the platen, another cylinder connected to the bed-plate having a piston operating the hydraulic press, and valves and connections connected to the steam-cylinder provided with levers or operating-handles, substantially as described.

10 6. The combination, with a fixed bed and bed-plate rigidly connected thereto, of a hydraulic cylinder formed in said bed-plate, a plunger connected to the movable platen and operating in said cylinder, a steam-cylinder fixed to the bed-plate and forming a base for supporting the press, a piston moving in said

cylinder, a piston-rod connected with the piston and carrying a piston operating in the hydraulic cylinder, substantially as described. 30

7. The combination, with the fixed bed and bed-plate rigidly secured thereto, of a moving platen, a cylinder mounted upon the fixed bed-plate and connected to the moving platen, a hydraulic cylinder formed in the bed-plate, and a plunger connected with the moving platen and operating in the hydraulic cylinder, substantially as described. 35

8. In a hydraulic press, the combination, with the fixed platen, a hydraulic cylinder rigidly secured thereto, an annular plunger moving in said cylinder and connected to the movable platen, an interior annular cylinder within the plunger and secured to the hydraulic cylinder, and a plunger adapted to said interior cylinder and entering from below the fixed platen, substantially as described. 40 45

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SAMUEL J. WEBB.

Witnesses:

WENTWORTH TERRY,
A. O. RULE.