March 19, 1929. H. F. VICKERS 1,706,088

PRESS

Filed Feb. 9, 1927

Fig. 1.

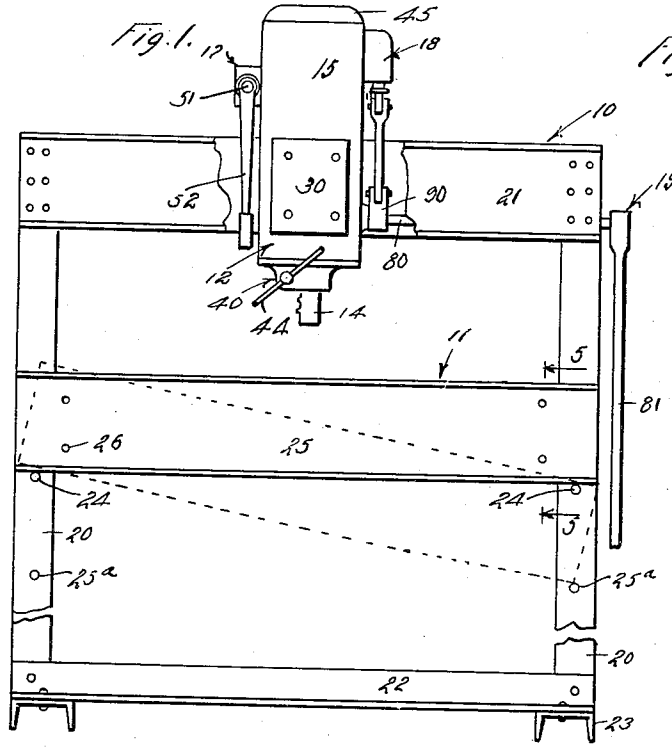


Fig. 2.

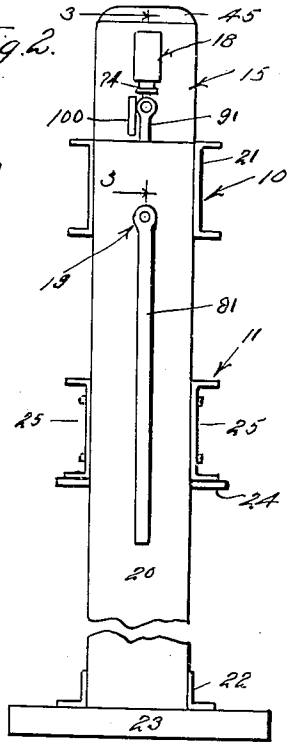


Fig. 3.

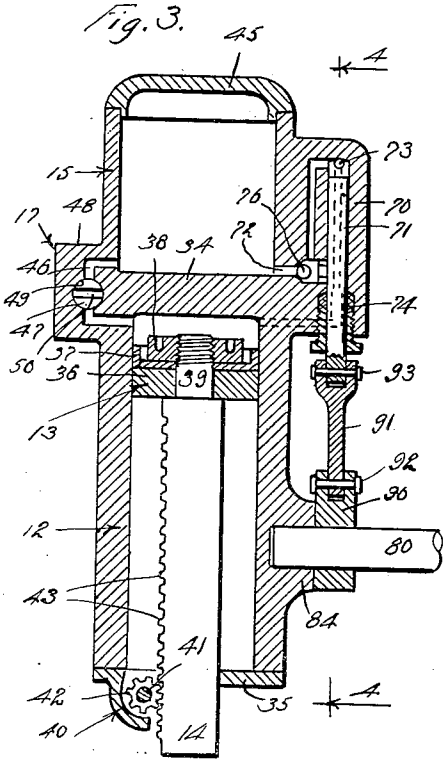


Fig. 4.

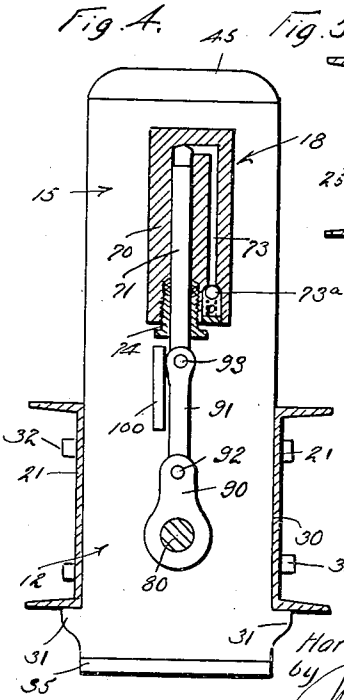
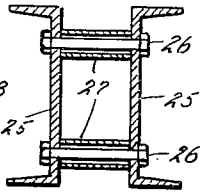


Fig. 5.



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UNITED STATES PATENT OFFICE.

HARRY F. VICKERS, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO VICKERS MANUFACTURING COMPANY, OF LOS ANGELES, CALIFORNIA, A CORPORATION OF CALIFORNIA.

PRESS.

Application filed February 9, 1927. Serial No. 167,061.

This invention has to do with a press, and has particular reference to a hydraulic press.

An object of my present invention is to provide a simple, practical and effective hydraulic press, suitable for use in garages, machine shops and other like places.

It is another object of this invention to provide a hydraulic press which can be easily and conveniently adjusted to accommodate work of various sizes.

A further object of my present invention is to provide a simple, effective and inexpensive form and arrangement of parts for a hydraulic press.

The various objects and features of my present invention will be best and more fully understood from the following detailed description of a typical form of the invention throughout which description reference is had to the accompanying drawings, in which:

Fig. 1 is a front elevation of the press with certain parts broken away;

Fig. 2 is a side elevation of the press;

Fig. 3 is an enlarged detailed sectional view taken substantially as indicated by line 3—3 on Fig. 2;

Fig. 4 is a sectional view taken as indicated by line 4—4 on Fig. 3; and

Fig. 5 is a sectional view taken as indicated by line 5—5 on Fig. 1.

The press provided by my present invention includes, generally, a frame 10, a work carrier 11, supported by the frame, a cylinder 12 mounted on the frame, a piston 13 operable in the cylinder, a push rod or stem 14 attached to the piston, a fluid reservoir 15, a valve controlled connection 17 between the reservoir and cylinder, pump means 18 for receiving fluid from the reservoir and pumping it into the cylinder, operating means 19 for the pump, and means 40 for manually operating the push rod 14.

The frame 10 may be constructed in various manners to suit various operating conditions, it being preferred to form it generally of two vertical ends 20 and head or top beams 21, which extend between the upper ends of the ends 20. The ends 20 of the frame may be formed of channel irons of suitable size, and, in practice, it is desirable to connect the lower parts of the ends by suitable brace beams 22. Further, seat or base parts 23 may be provided at the lower ends of the ends 20 to form effective supports for the apparatus. The top beams 21 are preferably attached or secured to the front and rear sides of the ends 20 so that they are spaced apart to receive the cylinder 12, as will be hereinafter described. In practice, the beams 21 may be formed of channel irons secured to the ends 20 so that they face outwardly, as clearly shown in Fig. 2 of the drawings.

The work carrier 11 is adapted to be supported in various positions between the ends 20. In the preferred construction, the work carrier includes two beams 25 arranged at the front and rear sides of the ends 20 to be supported on pins 24 arranged through openings 25^a provided in the flanges of the end beams 20. The beams 25 are connected together adjacent their ends by means of bolts 26 and are spaced apart to properly fit the ends 20 by means of spacing sleeves 27 carried on the bolts 26, as clearly shown in Fig. 5 of the drawings. In accordance with my invention, I provide several sets of openings 25^a in the flanges of the ends 20, and I space one of the bolts 26 at each end of the carrier 11 inward from the ends of the beams 25 so that the carrier can be tilted to position, such as is indicated in dotted lines in Fig. 2, in moving it from one position to another on the ends 20. To vary or change the position of the work carrier, the pins 24 are arranged in different sets or holes 25^a, it being preferred in practice to adjust one end of the carrier at a time, as indicated by dotted lines in Fig. 1, as such operation can be easily performed by one man without danger of losing control of the carrier and without undue effort.

The cylinder 12 is mounted in an upright or vertical position between the top beams 21 of the frame. The cylinder casting may be provided at opposite sides with flat faces 30 to engage the beams 21, and, in accordance with my invention, I provide lugs or projection 31 on the sides of the cylinder to engage under the beams 21 in the manner shown in Fig. 4 of the drawings. The cylinder may be secured in position between the beams 21 by means of cap screws 32 arranged through the beams 21 and into suitable tapped holes provided in the faces 31. The cylinder is closed at its upper end by an integral head 34 and at its lower end by a removable head 35.

The piston 13 is slidably mounted in the cylinder and includes a body 36, a packing member 37 and a retaining nut 38, which

holds the packing member in position with reference to the body. The parts of the piston are assembled on a screw threaded stud or projection 39, provided on the end of the push rod 14. The packing member 37 may be a cup leather or other suitable packing means arranged to effectively prevent leakage of pressure or fluid downwardly past the piston. The push rod 14 extends downwardly from the piston and projects through a suitable opening provided in the head 35 at the lower end of the cylinder.

The means 40, provided for manually operating the push rod 14, may include a shaft 41 carried by the head 35 at the lower end of the cylinder, a pinion 42 on the shaft to mesh with teeth 43 formed on one side of the push rod, and an operating handle 44, provided on the shaft 41 at the exterior of the head. The teeth 43, provided on the push rod, form a rack with which the pinion 42 meshes so that rotation of the pinion through operation of the handle 44 causes vertical movement of the push rod.

In accordance with the arrangement provided by my invention, the fluid reservoir 15 is formed above or at the top of the cylinder 12. In the preferred construction, the side wall of the reservoir is integral with the cylinder 12 and continues or projects upwardly from the cylinder so that the top head 34 of the cylinder forms a bottom for the reservoir. In practice, I provide a suitable cover or closure 45 for the top of the reservoir.

The connection 17 between the reservoir and the upper end of the cylinder preferably includes a port 46 and a valve 47 for controlling flow of fluid through the port. A suitable enlargement of projection 48 is provided on one side of the structure formed by the cylinder and reservoir at the point of connection between the cylinder and reservoir. The port 46 extends through the projection 48 and has one end in communication with the lower part of the reservoir and the other end in communication with the upper end of the cylinder. The valve 47 is rotatably carried in an opening 49 formed transversely through the projection 48 to intersect the port 46. The valve has an opening 50 through it, adapted to be moved into and out of register with the port to open and close the connection between the reservoir and cylinder. When the opening 50 in the valve is out of register with the port 46, as shown in Fig. 3, the connection between the reservoir and cylinder is closed. The valve has a stem 51 extending from the projection 48 and, in practice, the stem is provided with an operating handle 52.

The pump means 18, provided for pumping fluid from the reservoir into the upper end of the cylinder 12, may include a cylinder 70 formed or provided on one side of the unit formed by the cylinder 12 and reservoir 15, a plunger 71 operable in the cylinder 70, a valve controlled port 72 connecting the reservoir with the upper end of the cylinder 70, and a valve controlled port 73, connecting the upper end of the cylinder 12 with the upper end of the cylinder 70. The cylinder 70 is preferably formed or cast integral with the reservoir 15 and cylinder 12 and is formed so that its axis is parallel with that of the cylinder 12. The plunger 71 freely fits the cylinder 70 and projects from the lower end of the cylinder through a suitable packing gland 74. The port 72 connects the lower end of the reservoir 15 with the upper end of the cylinder 70 and has a check valve 76 in it to admit fluid from the reservoir to the cylinder. The port 73 connects the upper end of the cylinder 70 with the upper end of the cylinder 12, and has a check valve 73^a in it to admit fluid from the cylinder 70 to the cylinder 12. The plunger is adapted to be reciprocated in the cylinder so that fluid is drawn into the cylinder 70 past valve 76 and is then forced out of the cylinder 70 past the valve 73^a and into the cylinder 12. It will be noted from inspection of the drawings, that the ports 72 and 73 are formed in or through the casting or body of the parts above described, making it unnnecessary to provide special pipes or fittings to make these connections.

The operating means 19, provided for actuating the pump, preferably includes an operating shaft 80 carried by the frame 10, an operating lever 81 on the shaft, and a connection between the shaft and the plunger whereby rotation or operation of the shaft causes reciprocation of the plunger. The shaft 80, in accordance with my preferred arrangement, is located between the top beams 21 of the frame and has one end carried in a bearing 84 formed on the side of the cylinder 12 and has its other end projecting through one of the end beams 20. The operating lever 81 is fixed on the outer or projecting end of the shaft 80, in the manner clearly shown in Fig. 1 of the drawings. The operating connection between the shaft 80 and plunger 71 preferably includes a crank arm 90 fixed on the shaft 80, and a connecting rod 91 connecting the crank arm and plunger. In the arrangement shown in the drawing, a pin 92 pivotally connects one end of the connecting rod with the crank arm 90, while a pin 93 connects the other end of the connecting rod with the lower end of the plunger 71. A guide 100 is preferably provided on the side of the cylinder to guide the projecting end of the plunger 71. With this arrangement, the plunger is operated by rotation of the shaft 80, caused by swinging or operating the operating lever 81. This particular arrangement is very effective as the operating lever 81 has a great mechanical advantage over the plunger 71, particu-

larly as the plunger reaches the end of its stroke, at which time the plunger connecting rod and crank arm approach the alignment position which they assume when the plunger is completely operated. If the plunger 71 is operated through a short stroke with the parts approaching the aligned position, the fluid will be pumped into the cylinder 12 at a very high pressure.

A very noteworthy feature of my invention is the unitary construction formed by the cylinder 12, reservoir 15, valve controlled connection 17 between the reservoir 15, and the pump 18. The main portion of these parts being in the form of a single casting, the device is made very simple and compact. Further, this particular arrangement and formation of parts makes the device very simple and inexpensive to manufacture and assemble, and makes it simple and dependable in operation.

Having described only a typical preferred form of my invention, I do not wish to limit myself to the specific details set forth, but wish to reserve to myself any changes or variations that may appear to those skilled in the art or fall within the scope of the following claim.

Having described my invention, I claim:

A press, including a frame having ends and a top extending between the ends, and a unitary structure carried by the top including a cylinder, a piston in the cylinder, a push rod connected with the piston and projecting downwardly from the cylinder, means for manually operating the piston, including a pinion meshing with teeth on the rod and a handle for operating the pinion, a fluid reservoir formed integral with the cylinder above the cylinder, a valve controlled fluid connection between the reservoir and cylinder, and a pump for pumping fluid from the reservoir into the cylinder including a pump cylinder, formed integral with said cylinder, a plunger extending into the pump cylinder, a valve controlled connection for admitting fluid from the reservoir into the head end of the pump cylinder, and a valve controlled connection for conducting fluid from said end of the pump cylinder to the upper end of the first mentioned cylinder.

In witness that I claim the foregoing I have hereunto subscribed my name this 7th day of December, 1926.

HARRY F. VICKERS.