March 28, 1950 J. H. BENDER 2,502,072

HYDRAULIC PRESS ATTACHMENT AND FRAME

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Fig. 1.

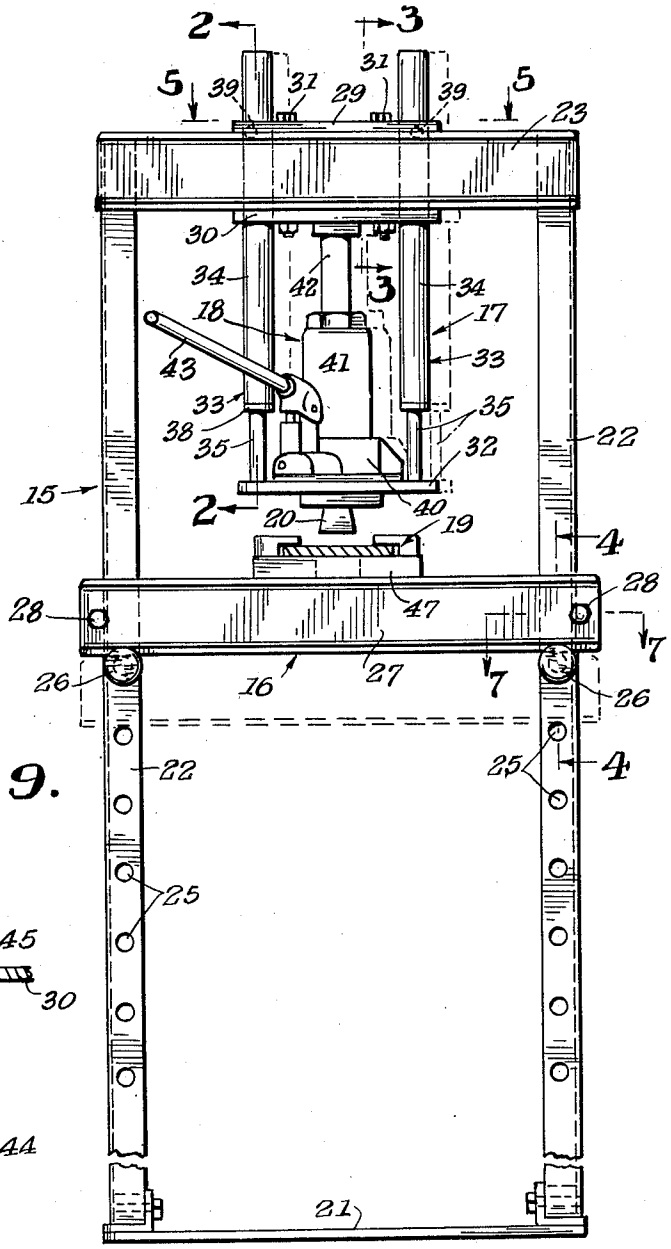
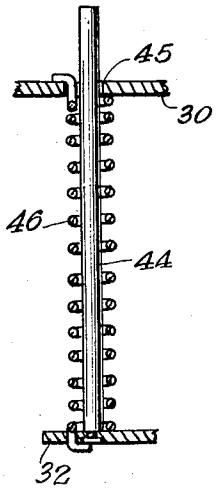


Fig. 9.



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Fig. 2.

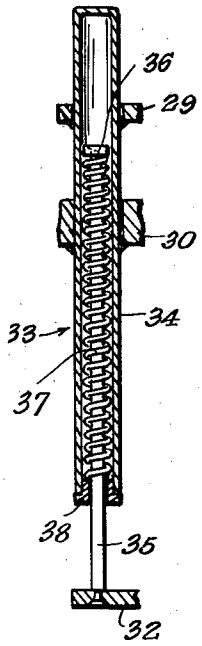


Fig. 3.

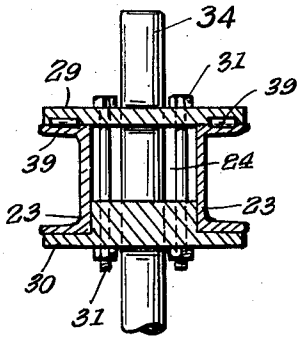


Fig. 4.

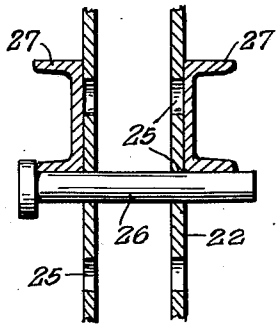


Fig. 5.

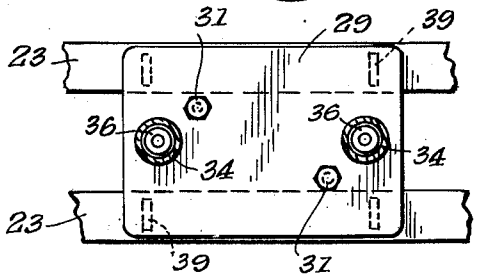


Fig. 6.

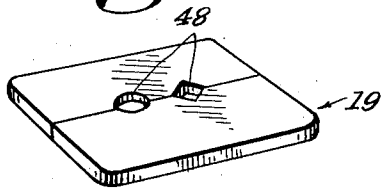
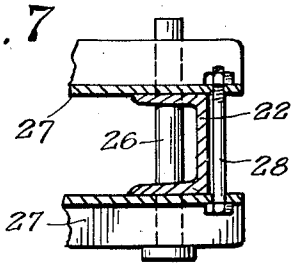


Fig. 7



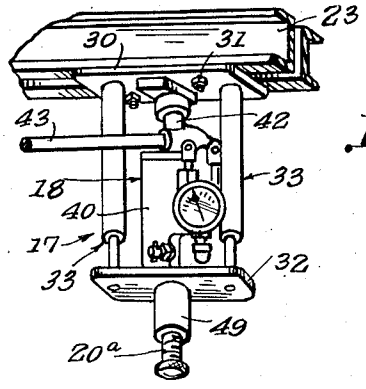


Fig. 8.

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UNITED STATES PATENT OFFICE

2,502,072

HYDRAULIC PRESS ATTACHMENT AND FRAME

John H. Bender, Maywood, Calif.

Application November 6, 1946, Serial No. 708,177

2 Claims. (Cl. 164—95)

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This invention relates to a hydraulic press and has for its primary object to provide a press frame embodying novel means for supporting a conventional hydraulic jack in said frame whereby press power is applied between fixed and adjustable portions of the frame.

Another object of the invention is to provide novel means for mounting a hydraulic jack in a press frame and to provide for lateral shifting of the jack and its mounting means so that the press is adapted to perform more than one press operation between fixed and adjustable portions of the frame.

Another object of the invention is to provide novel support means for a hydraulic jack in a press frame, which means includes springs for returning the jack after performing a press operation, the fluid in the jack providing a dash pot for the action of said springs.

A further object of the invention is to provide a novel combination of a press frame having an adjustable die bed, a jack supporting cradle carried by the frame for relative lateral adjustment with respect to the die bed and embodying return spring means, and a conventional hydraulic jack supported in the cradle for moving a punch or the like toward and from the die bed, the jack being operative to tension the mentioned springs in one direction of operation and the jack fluid serving to dampen the return force of the tensioned spring means when moving in the other direction.

My invention also has for its objects to provide such means that are positive in operation, convenient in use, easily installed in a working position and easily disconnected therefrom, economical of manufacture, relatively simple, and of general superiority and serviceability.

The invention also comprises novel details of construction and novel combinations and arrangements of parts, which will more fully appear in the course of the following description. However, the drawings merely show and the following description merely describes one embodiment of the present invention, which is given by way of illustration or example only.

In the drawings, like reference characters designate similar parts in the several views.

Fig. 1 is a partly broken front elevational view of a hydraulic press embodying the present invention.

Figs. 2, 3 and 4 are enlarged vertical sectional views as taken on the respective lines 2—2, 3—3 and 4—4 of Fig. 1.

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Fig. 5 is an enlarged plan sectional view as taken on the line 5—5 of Fig. 1.

Fig. 6 is a perspective view of an anvil or die used in the invention.

Fig. 7 is a cross-sectional view as taken on the line 7—7 of Fig. 1.

Fig. 8 is a fragmentary perspective view of a modified form of jack application.

Fig. 9 is a view similar to Fig. 2, showing a modification.

The press which is illustrated comprises, generally, a stand or frame 15, a die bed 16 adjustably mounted on the frame, a cradle 17 mounted on the frame for relative lateral adjustment, a conventional hydraulic jack 18 carried by the cradle 17, and an anvil or die 19 mounted on the bed 16 for association with a tool 20 carried by the cradle 17 and moved by the jack 18.

The frame 15, as shown, comprises a base 21 which supports a pair of spaced vertical structural members such as the channels 22, and a pair of channels 23 connecting the top ends of the channels 22 and secured as by welding one on either side of said channels 22 to provide a longitudinal space 24. In this manner a rectangular press frame is provided in which the channels 23 comprise a fixed press platen and serve to mount the cradle 17 and jack 18.

A lower intermediate portion of each channel 22, through both flanges thereof, is provided with a series of spaced holes 25 for a cross pin 26 which serves as a rest or support for the bed. Adjustment of the bed relative to the platen of the frame is readily effected by placing the pins 26 in horizontally aligned selected holes 25 and resting the bed on said pins.

The bed 16 comprises a pair of channels 27 connected at each end by a bolt or the like 28 to be unitary. These channels extend horizontally on either side of the vertical channels 22 and said bolts 28 extend across the backs of said vertical channels to confine the latter and prevent them from bowing outwardly under such forces tending to cause said bowing.

The cradle 17 comprises a plate 29 on the upper side of the platen 23, a plate 30 on the other side thereof, a pair of bolts 31 connecting said plates to form a slide block movable laterally along the platen, a jack mounting plate 32, and a pair of columns 33 extending through the plates 29 and 30 and mounting the plate 32 horizontally between the platen 23 and the bed 16. Each column 33 comprises a cylinder 34 fixedly connected to the plates 29 and 30, a stem 35 extending into the cylinder connected at one end to the

plate 32 and having an abutment head 36 at the other end, and a compression spring 37 about the stem in the cylinder and between said head 36 and an abutment shoulder 38 on the end of the cylinder. The columns are vertically disposed and in this manner the plate 32 is resiliently suspended on springs 37 from the cradle block formed by plates 29 and 30.

As pointed out, the cradle 17 is laterally adjustably movable along the platen 23. To facilitate said movement bearing rollers 39 in suitable race grooves formed in both the bottom of the plate 29 and the top flanges of the platen 23 are provided. By loosening the bolts 31, the cradle 17 can be moved to an adjusted position in the frame 15 and when said bolts are tightened, the cradle will be fixed in operative position, as can be well understood.

The hydraulic jack 18 is a conventional commercial item and is placed with its base 40 on the plate 32, with its cylinder 41 extending toward the platen, and with its ram 42 bearing against the bottom face of the plate 30. Typically, the jack is provided with an operating handle 43. It will be evident that in this application of the jack, the ram 42 is stationary at all times in the operation of the jack and that the jack body, which comprises the base 40 and cylinder 41, is movable relatively thereto together with the plate 32.

When the jack is operated to move the plate 32 toward the die 19 on the bed 16, the springs 37 are compressed. When the plate is to be returned to elevated position, the fluid in the jack is released or by-passed in the conventional manner to permit the tensioned springs to elevate said plate as slowly resisted by the dash pot action of the by-passing fluid. A rapid and shock inducing return is thereby obviated.

As shown in Fig. 9, the columns 33 may be replaced by rods 44 which are fixed to plate 32 and extend through clearance holes 45 in plate 30. In this application, a coiled tension spring 46 about each rod 44 and having its ends anchored to said plates, is tensioned by movement of plate 32 downward and acts to elevate said plate upon release of the fluid in jack 18.

The die 19 may be mounted on a bolster 47 either placed on or secured to the bed 16. As contemplated, the die may have a plurality of cavities 48 for reception of complementary punches 20 replaceably carried by the plate 32. By inserting the proper punch 20 and shifting the cradle 17 to align said punch and its complementary cavity 48, a press operation can be facilely performed by actuation of the jack handle 43.

The machine above described may be used as an arbor press which frequently requires considerable power. Either the jack shown in Fig. 1 or the more powerful one shown in Fig. 8, may be used for arbor pressing or other operations. Instead of the punch 20 an adjustable bolt or the like 20*a* may be mounted in a threaded sleeve 49 depending from plate 32. By engaging the head of said bolt with the end of an arbor or like member, the press may be operated to press said arbor into place.

While I have illustrated and described what I now regard as the preferred embodiment of my invention, the construction is, of course, subject to modifications without departing from the spirit and scope of my invention. I, therefore, do not wish to restrict myself to the particular form of construction illustrated and described, but desire to avail myself of all modifications that may fall within the scope of the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a press, a fixed platen composed of spaced transverse members, a pair of plates engaged across the top and bottom of the platen members, bolt means for drawing said plates into firm contact with the platen members and for loosening them for adjustable movement along the platen members, extensible members extending downward from the upper of said pair of plates and carrying a punch-supporting plate between their lower ends, a jack on the latter plate and engaged with the lower of said pair of plates for depressing the punch-supporting plate and extending the extensible members, and spring means associated with the extensible members for tensioning the same and for contracting them after extension of the jack upon release of the jack pressure.

2. A press comprising spaced vertical channel members having transverse aligned holes through the flanges thereof; a platen comprising front and rear transverse channel members welded one on each side of the vertical members at the top thereof, there being a space between the transverse members; a frame arranged in said space for adjustment relative to the vertical members, said frame comprising a plate spanning said space above the transverse members, bearing rollers mounting said plate on the tops of said latter members, a second plate spanning said space below and engaged with the bottoms of the transverse members and having a thickened portion extending into the space to locate said second plate relative to the front and back of the press, and a plurality of bolts for connecting said plates and extending through the mentioned space, said bolts, when tightened, drawing the plates toward each other to lock against the transverse members, and, when loosened, the rolling engagement between the upper plate and the transverse members affords adjustable movement of the frame along the latter members; a jack beneath and operatively engaged with the lower plate of the frame; a cradle supporting said jack and comprising a jack-mounting plate, a pair of cylinders extending through and fixed to the frame on each side of the jack, said cylinders having open bottom ends, a stem extending from said jack-mounting plate into each cylinder, a head on the end of each stem, a shoulder on the open end of each cylinder, and a compression spring around each stem between said head and shoulder to urge the jack-supporting plate and the jack in a direction toward the platen and the frame thereon; a cross-pin in one of each of an aligned pair of the mentioned holes in the vertical members; a die bed supported on said pins; and a die having one part carried by the jack-supporting plate and the other adjustably carried by the die bed.

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