

Nov. 27, 1945.

F. J. RODE ET AL

2,389,818

PRESS

Filed July 17, 1943

3 Sheets-Sheet 1

Fig. 1

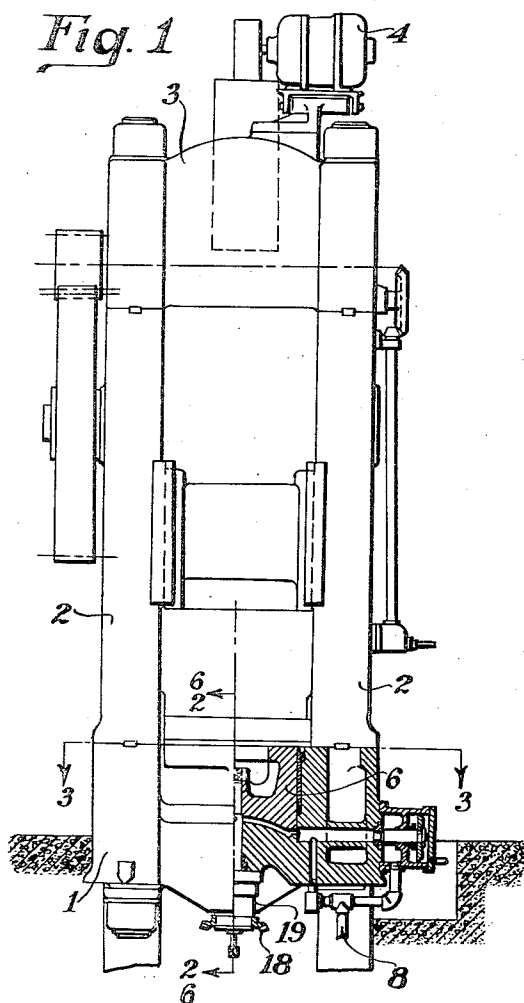


Fig. 2

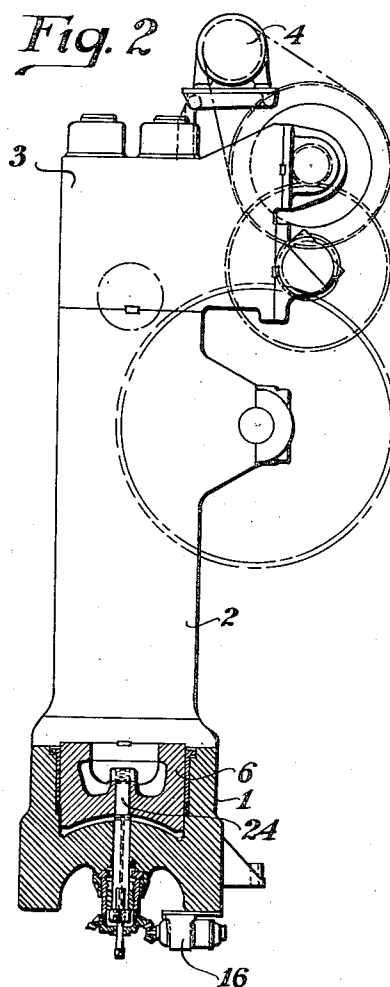
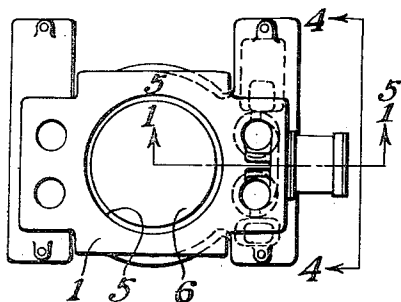


Fig. 3

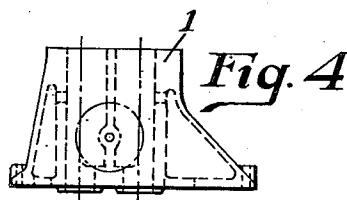


Fig. 4

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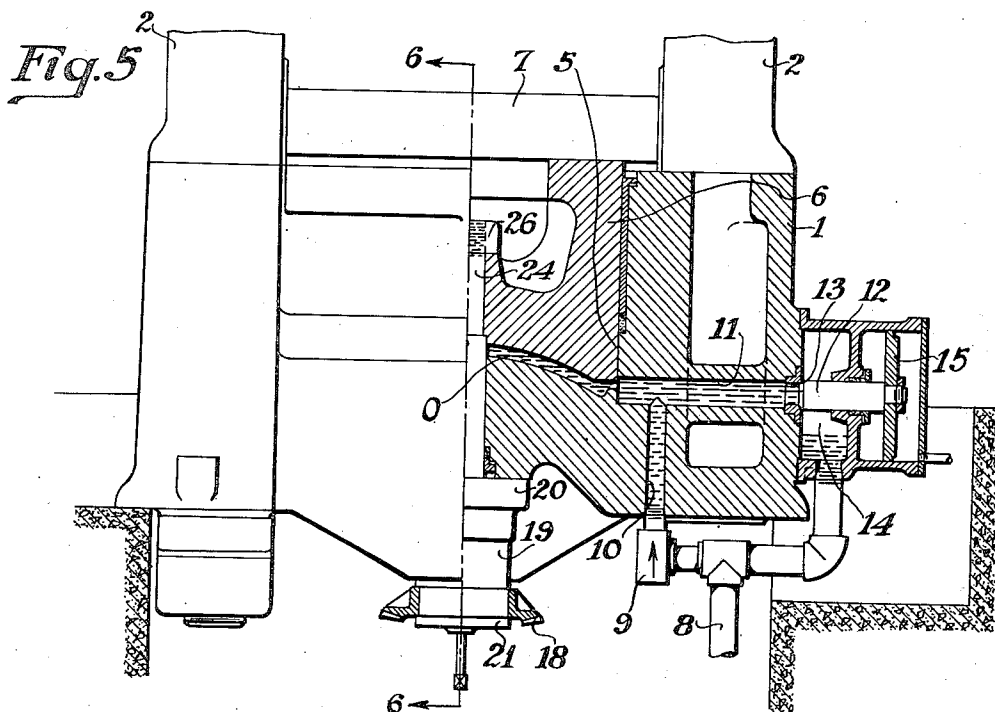
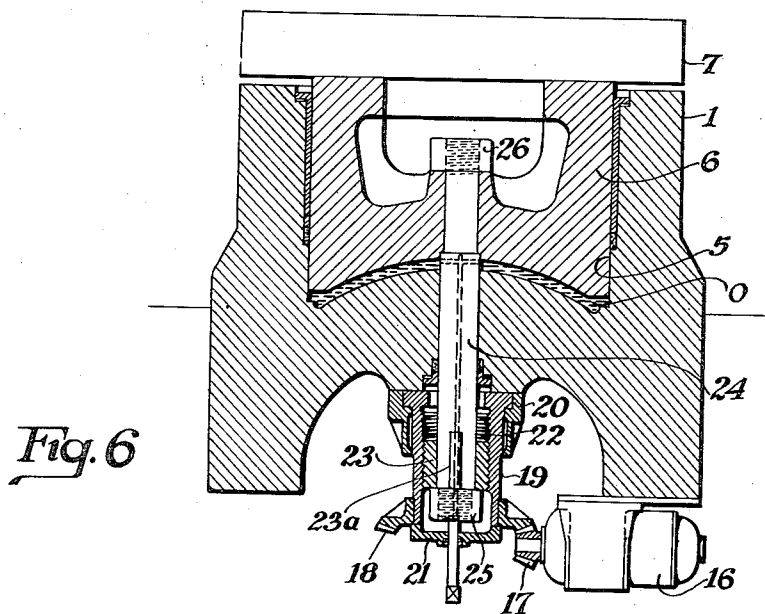
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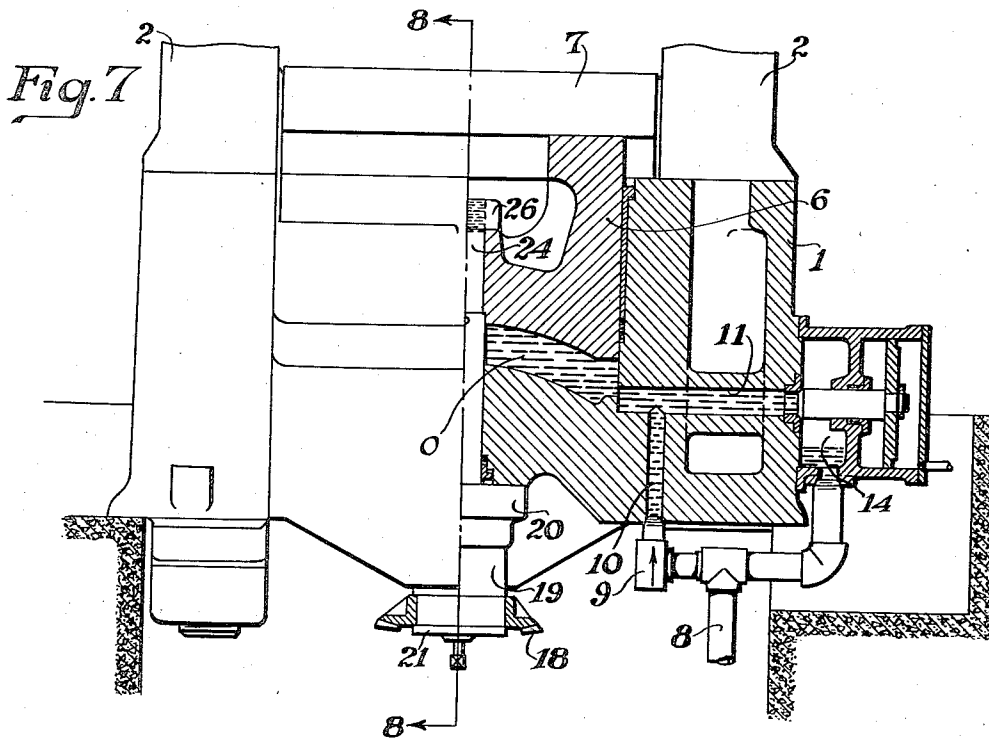
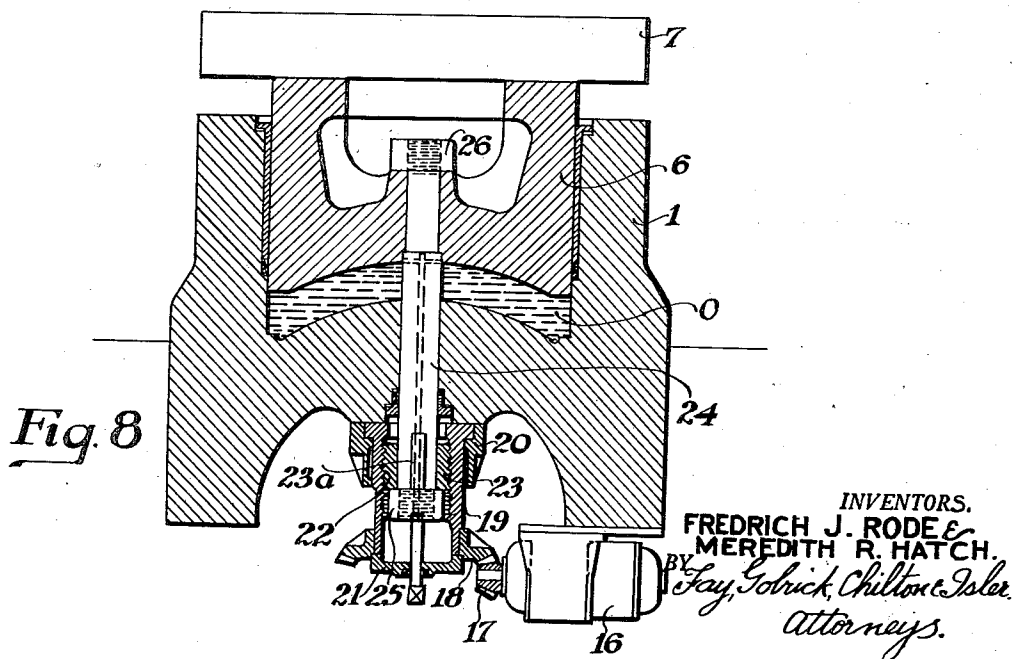
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,389,818

PRESS

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Application July 17, 1943, Serial No. 495,110

7 Claims. (Cl. 100—70)

This invention relates, as indicated, to presses, but has reference more particularly to means for adjusting the working space in presses of the knuckle joint type, which are equipped with so-called safety beds, that is a bed having means incorporated therein for affording relief in case of overload.

It has heretofore been proposed to adjust the working space in presses of the aforesaid type, by providing a wedge associated with the crown of the press, whereby manipulation of the wedge raised or lowered the crown to a slight extent. The extent of this adjustment is usually limited to about half an inch, and adjustments beyond this were accomplished by shimming up the dies with plates.

Another expedient for this purpose, which has been proposed is that described in U. S. Patent No. 1,866,595, in which a rather complicated toothed arrangement is provided for effecting adjustment of the bed elevation relative to the stationary base of the press.

The present invention has as its primary object the elimination of shims in obtaining adjustment of the working space in presses of the aforesaid type, and the provision of means whereby a desired degree of adjustment may be obtained irrespective of whether or not means are provided for adjusting the crown of the press.

Another object of the invention is to provide for adjustment of the working space in presses of the aforesaid type by adjusting the position of the bolster of the press by means which are extremely simple in construction, and relatively easy to operate.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims; the annexed drawings and the following description setting forth in detail certain structure embodying the invention, such disclosed structure constituting, however, but one of various forms in which the principle of the invention may be used.

In said annexed drawings:

Fig. 1 is a view, partly in front elevation, and partly in section, of a press embodying the novel features of the invention;

Fig. 2 is a view, partly in elevation, and partly in section along the line 2—2 of Fig. 1;

Fig. 3 is a cross-sectional view, taken on the line 3—3 of Fig. 1;

Fig. 4 is a side elevation of the base of the press, as viewed in the direction indicated by the arrows 4—4 of Fig. 3;

Fig. 5 is a view, on an enlarged scale, of the lower portion of Fig. 1, showing the bed of the press in its lowermost position;

Fig. 6 is a cross-sectional view, taken along the line 6—6 of Fig. 5;

Fig. 7 is a view similar to Fig. 5, but showing the bed in its uppermost position, and

Fig. 8 is a cross-sectional view, taken along the line 8—8 of Fig. 7.

Referring more particularly to the drawings, the press will be seen to comprise a base 1 having uprights 2 mounted thereon, which support a crown 3. The press, in this instance, is driven by a motor 4 through suitable mechanism which is diagrammatically indicated, but which need not be described in detail, since it forms no part of the present invention.

Mounted within an opening or recess 5 in the bed portion of the base 1 of the press is an adjustable bed 6, upon which is mounted the bolster plate 7.

The adjustable bed 6 is of the safety type, being hydraulically supported by a layer of oil O, which is supplied at a predetermined pressure to the underside of the bed, as by means of a conduit 8, the oil passing through a check valve 9, and intersecting passageways 10 and 11 in the base 1 of the press.

The oil pressure is sufficient to maintain the bed 6 of the press in a predetermined position under all normal working conditions, but in the event of an overload, the pressure on the bed will be relieved by movement of a relief valve 12 to the right, as viewed in Fig. 5, which opens the port 13, permitting oil to leak into a relief chamber 14 attached to the side of the base of the press. Such oil finds its back back into conduit 8. The relief valve 12 is normally maintained in a closed position by air pressure which is maintained against a piston 15 secured to one end of the valve 12.

Mechanism is also provided for permitting adjustment of the bed 6 when desired. Such mechanism includes a motor 16 which is supported by the base 1 and has mounted on the shaft thereof a pinion 17. The pinion 17 is in mesh with a bevel gear 18, which, in turn, is keyed to a cylinder 19. The cylinder 19 is rotatably supported as by a bearing 20 on the base 1 of the press, and is closed at the bottom as by means of an end plate 21.

The cylinder 19 is internally threaded as at 22, and has disposed therein a sleeve or nut 23 which is in threaded engagement with the cylinder. The nut 23 is keyed, as by a key 23a,

to the lower end of a piston 24, so as to prevent rotation of the nut relatively to the piston and is supported on the piston by means of a nut 25 secured to the lower threaded end of the piston. The upper end of the piston 24 is secured to the bed 6 of the press as by means of a nut 26, which is secured to the upper threaded end of the piston.

It will be seen from the foregoing construction that when it is desired to elevate the bolster 7 of the press, as for example, from the position shown in Figs. 5 and 6 to the position shown in Figs. 7 and 8, it is necessary only to cause the motor 16 to rotate the cylinder 19 in the desired direction. This causes the nut 23 to be elevated, permitting the oil pressure beneath the adjustable bed 6 to elevate the bed until the nut 25 comes into contact with the nut 23.

When it is desired to lower the bolster, the motor 16 is caused to rotate in the opposite direction, lowering the nut 23, which, since it bears against the nut 25, pulls the piston 24, and consequently the bed 6, downwardly. In order to accomplish this, the pressure of the oil O must be relieved, and in order to do this, the air pressure on the valve 12 is relieved, permitting the oil under the bed 6 to return to a sump or tank which is usually provided for this purpose.

It is thus seen that we have provided a simple, efficient adjustment in the beds of presses of the type described. In actual practice, an adjustment of as much as eight or more inches can be provided in this manner.

Other modes of applying the principle of our invention may be employed instead of the one explained, change being made as regards the structure herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

We therefore particularly point out and distinctly claim as our invention:

1. In a press of the character described, a base, a bed movable vertically with respect to said base, said bed being movable in response to a fluid, a motor, and a screw-actuated stop driven by said motor for limiting the extent of movement of said bed.

2. In a press of the character described, a base, a bed movable relatively to said base, a piston

secured to said bed and having a nut secured to the lower end thereof, an internally-threaded sleeve journaled for rotation about the axis of said piston, and a stop element movable in response to rotation of said sleeve and adapted for engagement with said nut to limit the extent of movement of said bed.

3. In a press of the character described, a base, a bed movable relatively to said base, a piston secured to said bed, an internally-threaded sleeve secured to said base, said sleeve being revoluble about its axis, a stop element threadedly secured to said sleeve and surrounding the lower end of said piston, and a nut secured to said piston and engageable by said stop element.

4. In a press of the character described, a base, a bed movable relatively to said base, a piston secured to said bed and extending through said base, an internally threaded cylinder secured to said base, a stop element within said cylinder and in threaded engagement therewith, said stop element surrounding the lower end of said piston, a nut secured to said piston and engageable by said stop element, and a motor for rotating said cylinder to raise or lower said stop element.

5. In a press of the character described, a bed, a fluid for elevating said bed, an adjustable element for limiting the extent of elevation of said bed by said fluid, and power-driven means for adjusting the position of said element.

6. In a press of the character described, a base, a bed movable relatively to said base, an element carried by said base, a member rotatable about said element, and a stop element movable in response to rotation of said member and adapted for engagement with said first-named element to limit the extent of movement of said bed.

7. In a press of the character described, a base, a bed movable relatively to said base, a piston secured to said bed, an internally-threaded sleeve, said sleeve being rotatable about its axis, a stop element threadedly secured to said sleeve and surrounding the lower end of said piston, said element being keyed to but movable longitudinally along said piston, and a nut secured to said piston and engageable by said stop element.

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