Oct. 31, 1950 A. BORZYM 2,527,698

POWER PRESS

Original Filed Jan. 16, 1947 2 Sheets-Sheet 1

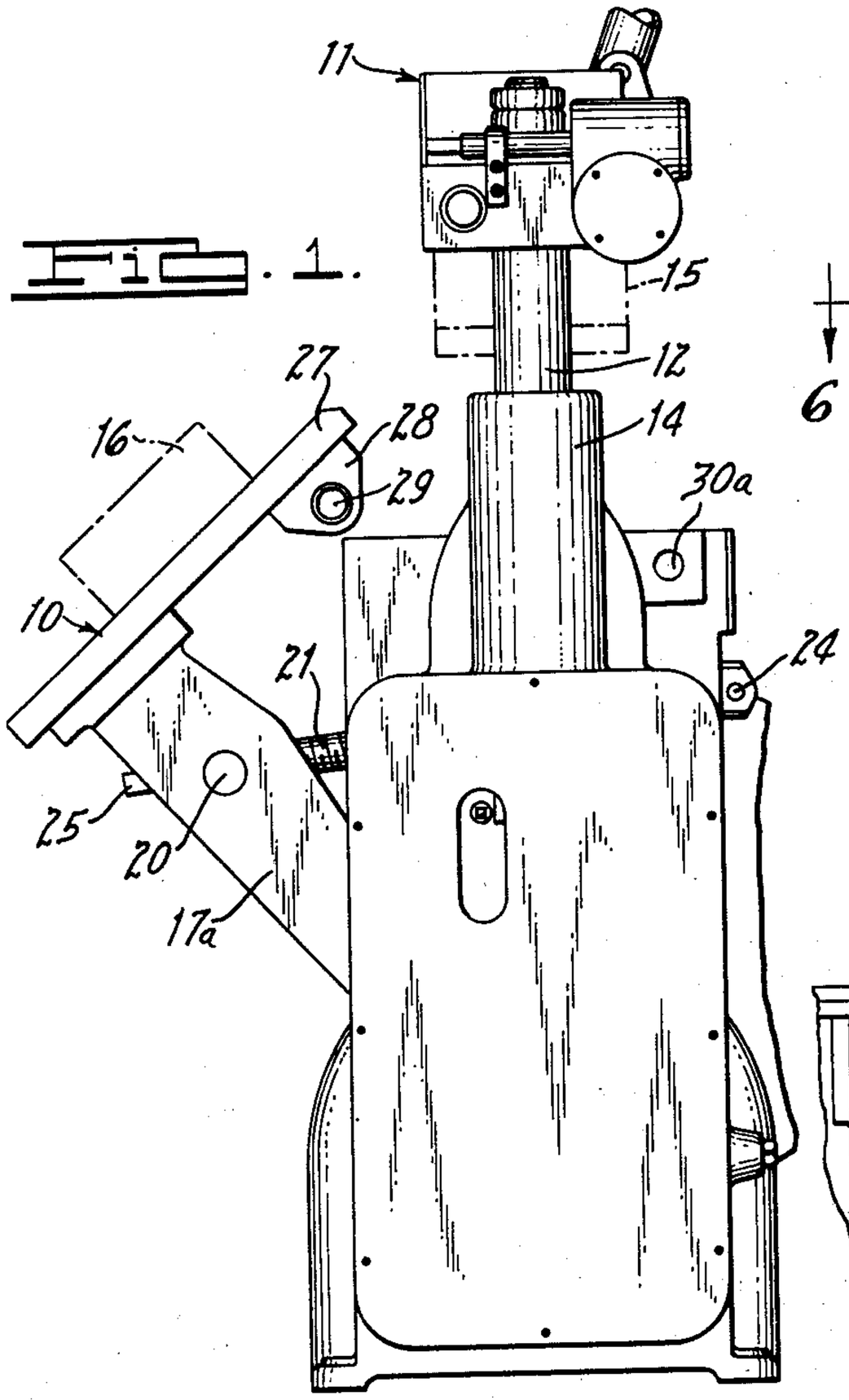

Fig. 1.

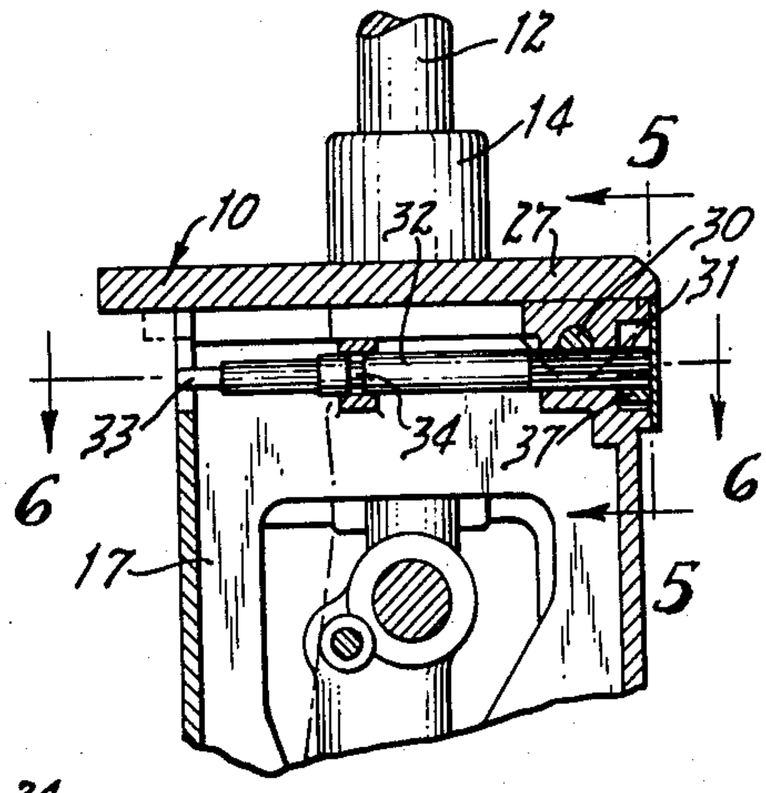

Fig. 4.

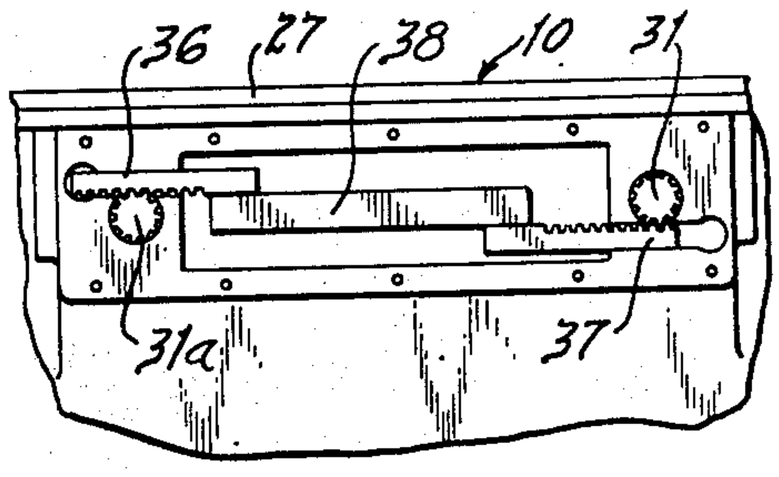

Fig. 5.

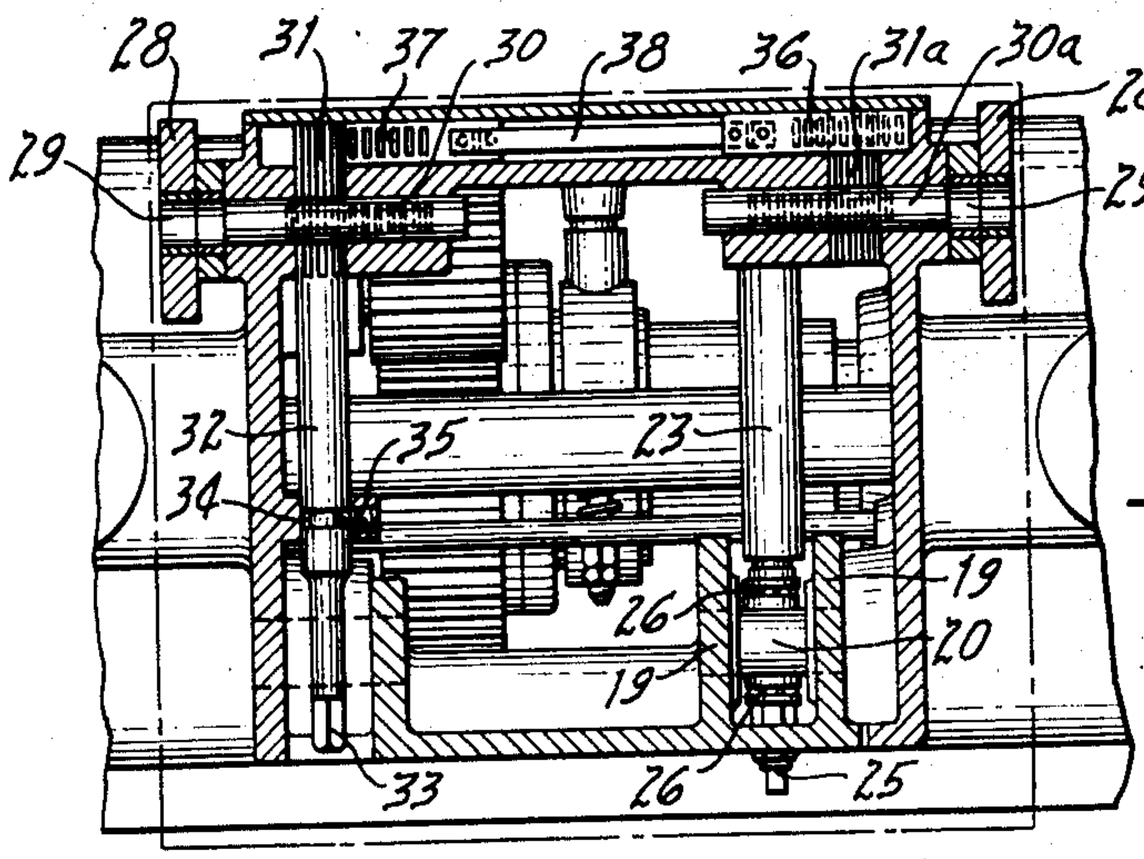

Fig. 6.

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Oct. 31, 1950 A. BORZYM 2,527,698

POWER PRESS

Original Filed Jan. 16, 1947 2 Sheets-Sheet 2

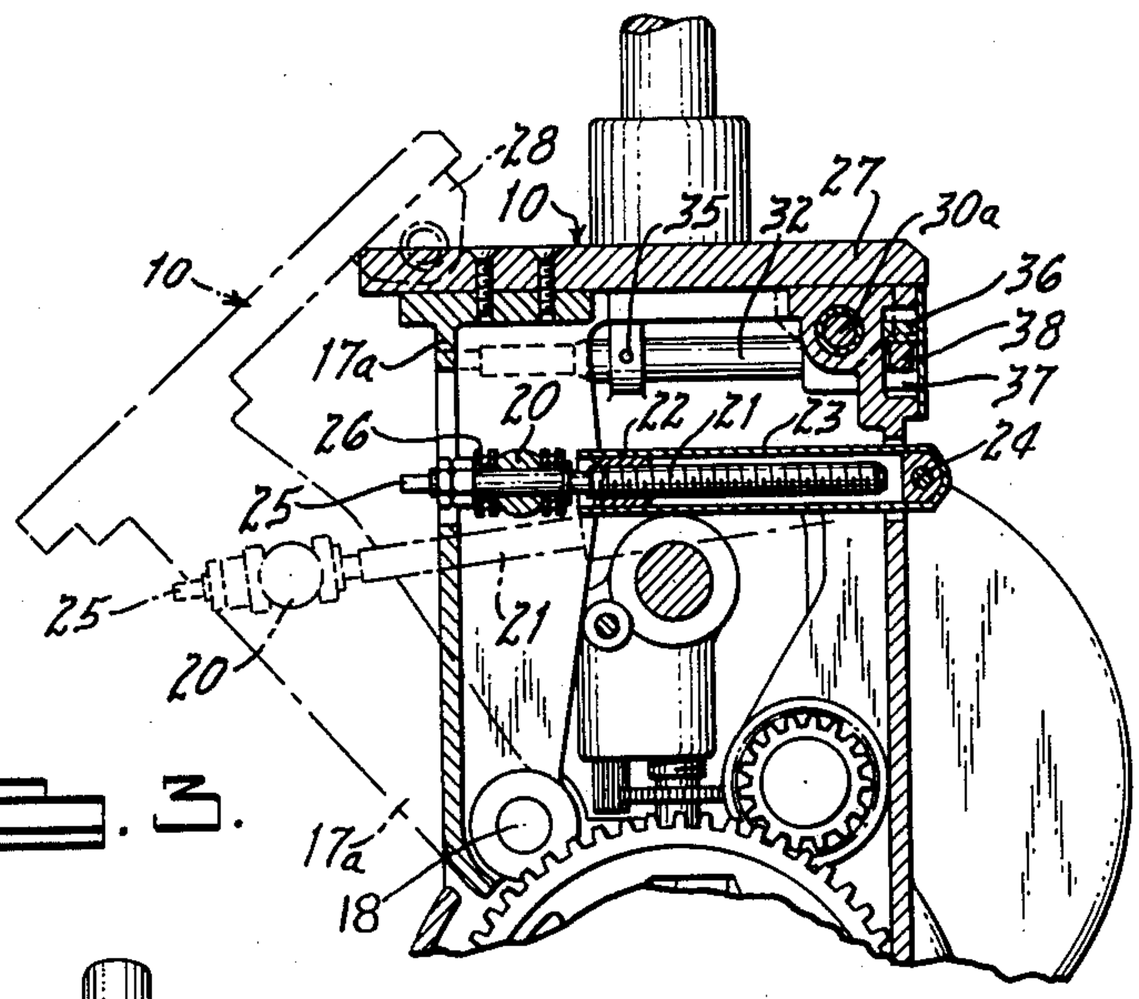

Fig. 3.

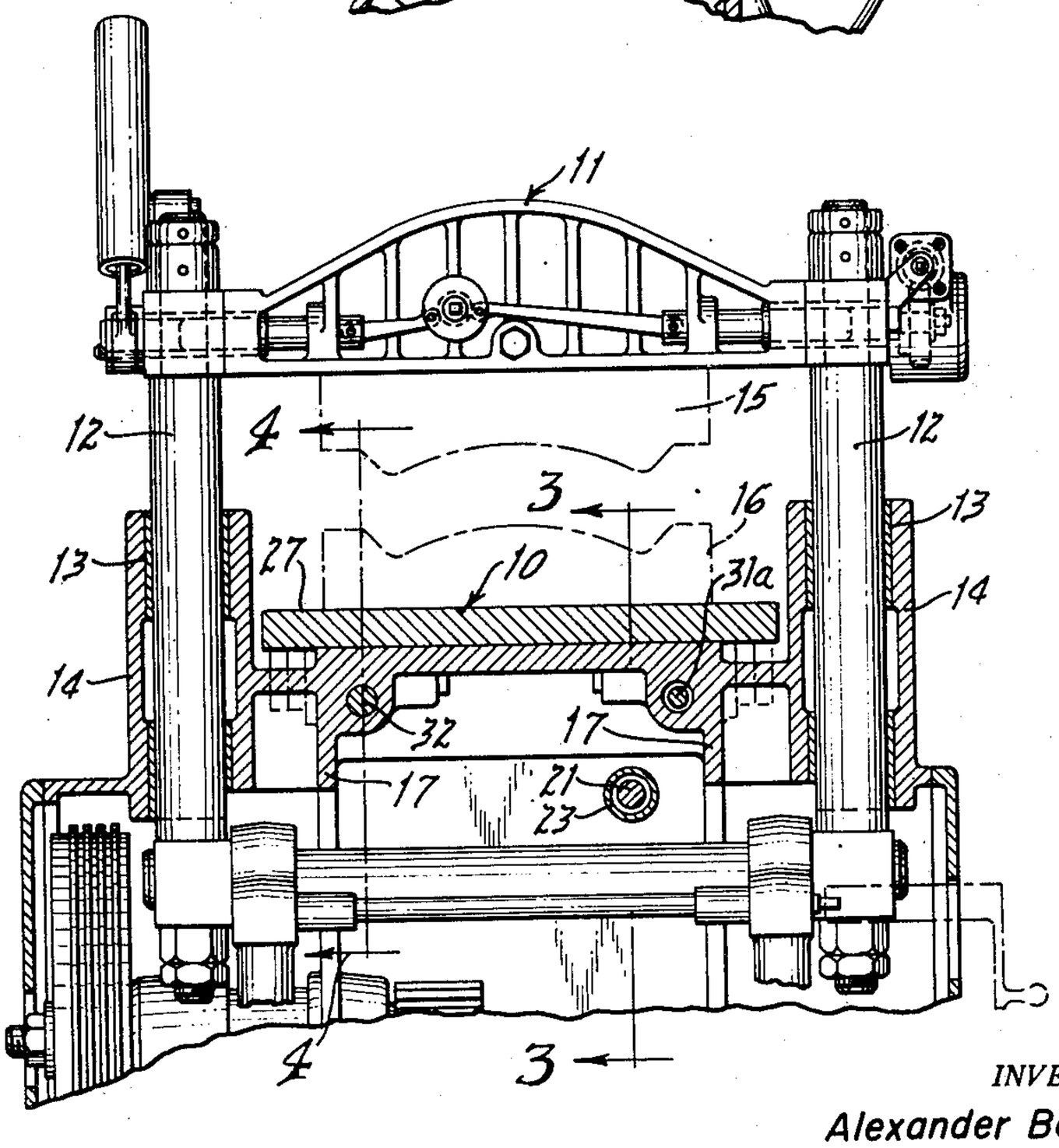

Fig. 2.

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Patented Oct. 31, 1950 2,527,698

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POWER PRESS

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Original application January 16, 1947, Serial No. 722,427. Divided and this application August 13, 1949, Serial No. 110,120

5 Claims. (Cl. 113—38)

1

The improvement for which a patent is prayed pertains to means for tilting a bolster plate that is a die-holding member of the press in order that the die may be mounted on said plate and inspected or adjusted, as the case may be, has been divided from parent application, Serial Number 722,427, filed on January 16, 1947.

The applicant will now describe the improvement with reference to the accompanying drawings, which include illustrations identical with those shown in the parent application, Serial Number 722,427, excepting that the number of figures shown herein has been reduced and reference numbers have been changed, and excepting for the fact that some of the figures shown fully in the aforesaid application are shown in fragment in the present application. Referring to the drawings of the present application:

Fig. 1 is a side elevational view of a power press with a die supporting bolster plate swung out from its normal operative position;

Fig. 2 is a front elevational view of said press, partly in section, and confined to the upper part of the press;

Fig. 3 is a sectional view on line 3—3 of Fig. 2;

Fig. 4 is a sectional view on line 4—4 of Fig. 2;

Fig. 5 is a partial elevational view on line 5—5 of Fig. 4;

Fig. 6 is a sectional view on line 6—6 of Fig. 4.

Similar numerals refer to similar parts throughout the several views.

The power press described herein is of a type which includes a bolster plate 10, normally disposed in a horizontal plane, and a ram 11 mounted on vertical columns 12. The columns are slidingly disposed within bearings 13 enclosed within cylindrical guides 14 which form a part of the framework of the press. The ram is designed to be moved vertically on said columns in a reciprocal up and down movement with respect to the bolster plate in order that a die 15, mounted on the underside of the ram, may be brought into operative engagement with a die 16 mounted on the bolster plate 10.

The reciprocal vertical movement of the ram is effected by means of a crank shaft driven by power means in an arrangement which is well known in the art and which needs no explanation. An inventive improvement in the mounting of the columns for response to the action of the crank shaft has been fully described by the applicant in his above-named parent application.

The novel features of the present application pertain to the mounting and to the operation of the bolster plate. The plate 10 is supported by an

2

upright prop or standard, generally indicated by numeral 17, and including what may be considered two legs 17*a* pivotally mounted within the lower part of the framework of the press at 18. Pivotally supported at its outer ends within two parallel webs 19 forming one of said legs 17*a* within said standard is a horizontal shaft 20 capable of being turned about its axis within bearings provided by said webs, as best shown in Fig. 6. The shaft has a diametrical aperture for reception of a bolt 21, which, by reason of its being mounted in said pivoted shaft, will be referred to as a swivel bolt. The bolt has a threaded portion for engagement with a nut 22 held in place within a tubular sleeve 23, which, at one end, is pivotally connected, by means of a pin 24, to the frame of the press, as shown in Figs. 1 and 3. The bolt, at its end remote from said pin 24, is provided with an angular stud 25. A set of ball bearings 26, straddling shaft 20, facilitates rotation of said bolt 21.

What may be considered the front part of the bolster plate 10 is provided, on its underside, with two ears 28, these being in a spaced relation to each other and each being provided with an eye 29. The ears serve as means whereby plate 10 may be locked in a horizontal position. This is carried out by means of locking pins 30 and 30*a*, respectively. The pins are contained within the framework of the press, and are alined with said eyes 29. The body portion of each pin forms a toothed rack. One of the racks is actuated by means of a pinion 31, the shaft of which terminates, at one end, with a stud 33. An annular groove 34 within the shaft of the pinion and a radially interposed screw 35 projecting into the groove prevent longitudinal displacement of said pinion. Pinion 31, as will be readily understood, is employed to propel locking pin 30 into the adjoining eye 29 of ear 28. As the other pin 30*a* is to move simultaneously in the opposite direction for a similar engagement with the other ear 28, a pair of racks has been devised for that purpose. The racks 36 and 37 are joined by means of an intermediate bar 38. Pinion 31 engages rack 37 from above, while another pinion 31*a*, designed to propel locking pin 30, is in engagement with rack 36 from below. This is best shown in Fig. 5. It will be understood that said racks and pinions are supported within the framework of the press below the level of plate 10.

I shall now describe the manner of operation of said bolster plate. Normally the plate is in a horizontal position, as shown in solid lines in Fig. 3. For the purpose of the present descrip-

tion, it will be assumed that the plate is out of its normal position, specifically, that the plate has been swung out on its prop **17** to a position shown in Fig. 1, when die **16** may be properly set in place or inspected, as the case may be. Now, in order to bring the plate back to its normal position, a crank is applied to the end of stud **25** in order that the bolt **21** may be rotated. As the bolt is threaded, and as the threaded portion of the bolt is in engagement with a stationary nut within the sleeve, the rotation of the bolt in a clockwise direction will cause the bolt to move axially into the said sleeve, causing prop **17** to swing on its pivoted supports from a position shown in Fig. 1 to a position shown in solid lines in Fig. 3. When the swing has been completed, eyes **29** and ears **28** will be in alinement with locking pins **30** and **30***a*. At this stage a crank is applied to stud **33** at the end of shaft **32** of pinion **31**. As the shaft is rotated in a counter-clockwise direction, it will engage the locking bolt **30** and propel it into the adjoining eye **29**. Simultaneously, said pinion **31**, being in engagement with rack **37**, will cause rack **36** to rotate pinion **31***a* in a clockwise direction. The pinion, meshed with the locking pin **30***a*, will drive it into adjoining eye **29** in member **28**. As a result of the entry of the locking pins into the respective eyes **29**, the bolster plate will be held firmly in place during the operation of the press.

To cause disengagement of the locking pins from said eyes **29**, stud **33** would have to be rotated in the opposite direction from that first-described, and to cause the bolster plate to move outwardly from its normal position, as shown in Fig. 3, stud **25** would have to be rotated in a counter-clockwise direction to cause the threaded bolt **21** to move outwardly of sleeve **23**.

It will be understood that some changes may be made in the structure of the press without departing from the inventive principle disclosed herein.

What the applicant, therefore, wishes to claim is as follows:

1. In a power press of the kind described, and including a framework, a horizontally disposed bolster plate, and a ram movable reciprocally into operative engagement therewith, an upright supporting prop for the bolster plate, said prop being mounted pivotally at its lower end within the framework, a sleeve pivotally held within the framework, a horizontally disposed swivel bolt pivotally affixed at one end to the prop member and axially threaded into said sleeve, means at the end of the swivel bolt to rotate it axially to cause its withdrawal from the sleeve to swing the bolster plate on its prop outwardly from its horizontal position within the framework.

2. In a press of the kind described, including a framework, a die-supporting ram at the top, and means to impart to the ram a vertical reciprocal movement, a bolster plate beneath the ram, an upright prop pivoted at its lower end and supporting the plate, said plate having, at one end, a pair of ears spaced from each other, each ear having an eye therein, a tubular sleeve pivoted at one end within the framework, a horizontally disposed swivel bolt connected to the prop and threaded into said tubular sleeve, means at the outer end of the swivel bolt for axial rotation thereof for its withdrawal from the sleeve to swing the bolster plate outwardly from under the ram, and laterally movable bolts within the frame, the bolts being adapted to be moved into the respective eyes to lock said plate in place.

3. In a press of the kind described, including a framework, a die-supporting ram, and power means to move the ram in a reciprocal vertical movement, a bolster plate assembly comprising a bolster plate normally disposed horizontally directly beneath the ram, supporting means extending from one end of the bolster plate downwardly for a pivotal connection within said framework, downwardly extending ears at the opposite end of the plate provided with eyes therein, an inwardly threaded sleeve pivotally affixed at one end within the framework beneath said bolster plate, a swivel bolt substantially horizontally disposed under said bolster plate, one end of which is affixed pivotally to said plate-supporting means while the other end is axially disposed within the threaded sleeve, horizontally movable bolts within the framework below the bolster plate normally disposed within the eyes in said ears, rack and pinion means to withdraw the bolts from said eyes, and separate means to axially turn the swivel bolt to cause its axial withdrawal from the sleeve to swing the bolster plate on said supporting means from under the ram of the press.

4. In a press of the kind described, including a framework, die-supporting ram, and power means to move the ram vertically, bolster plate assembly including a horizontally disposed bolster plate having, at its front, downwardly projecting ears for a locking engagement with the framework, a leg support at the rear end of the plate extending downwardly and pivotally connected at its lower end to said framework, means to swing the plate on its leg support from under the ram of the press, said means including a tubular member affixed at one end to the framework of the press and having a threaded nut in a stationary position in said tubular member, a bolt horizontally disposed under the bolster plate, said bolt being pivotally connected to the leg and threaded into said nut, means to rotate the bolt about its axis to cause its withdrawal from the stationary nut for the purpose of swinging the bolster plate on its support outwardly from under the ram.

5. In a press of the kind described, including a framework, die-supporting ram, and power means to move the ram vertically, bolster plate assembly including a horizontally disposed bolster plate having, at its front, downwardly projecting ears for a locking engagement with the framework, manually operable rack and pinion means to move the locking bolts for engagement with the ears, a leg support at the rear end of the plate extending downwardly and pivotally connected to said framework, means to swing the plate on its leg support from under the ram of the press, said means including a tubular sleeve at one end pivotally affixed to the framework and having a stationary threaded member therein, a threaded swivel bolt horizontally disposed under the bolster plate, said bolt being pivotally connected to the leg and adapted to be threaded into said threaded member within the sleeve, and means to rotate the bolt axially to cause its withdrawal from the sleeve.

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