

July 12, 1949.

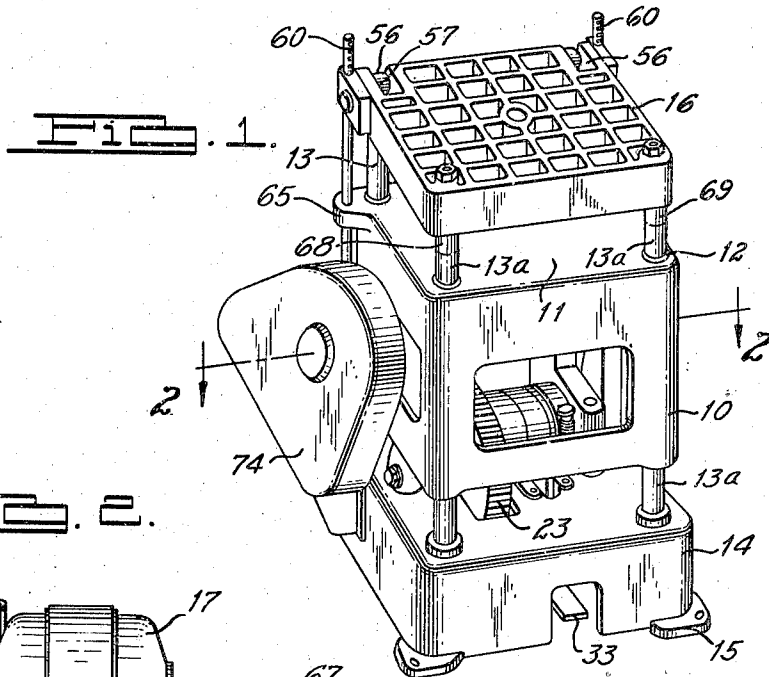
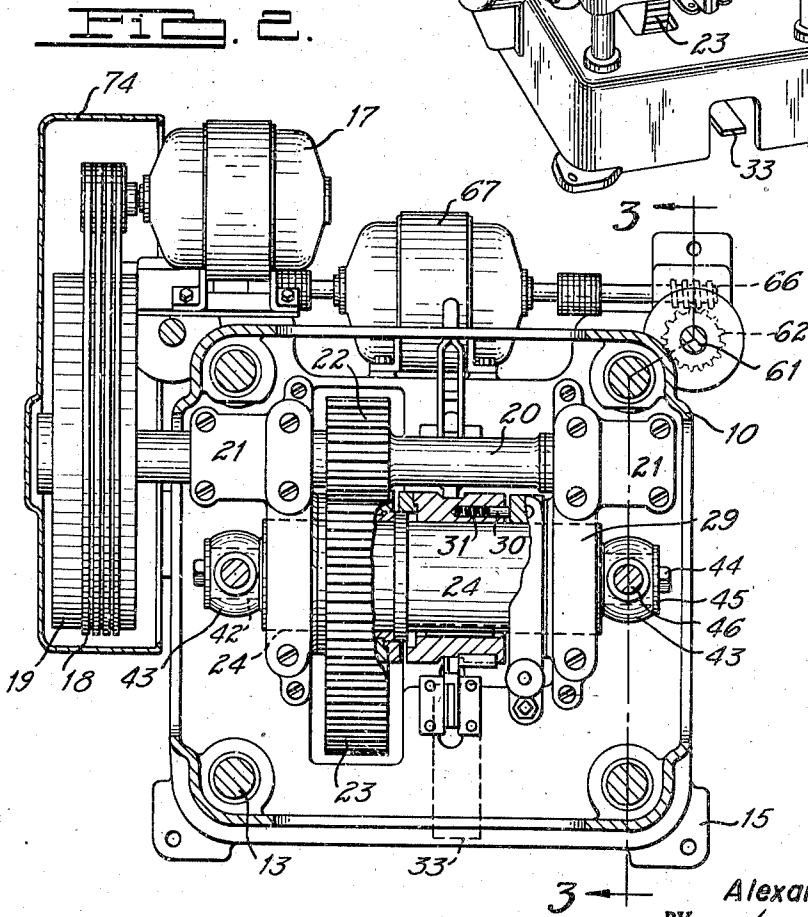
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2,475,692

POWER PRESS

Filed Sept. 20, 1946

4 Sheets-Sheet 1



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4 Sheets-Sheet 2

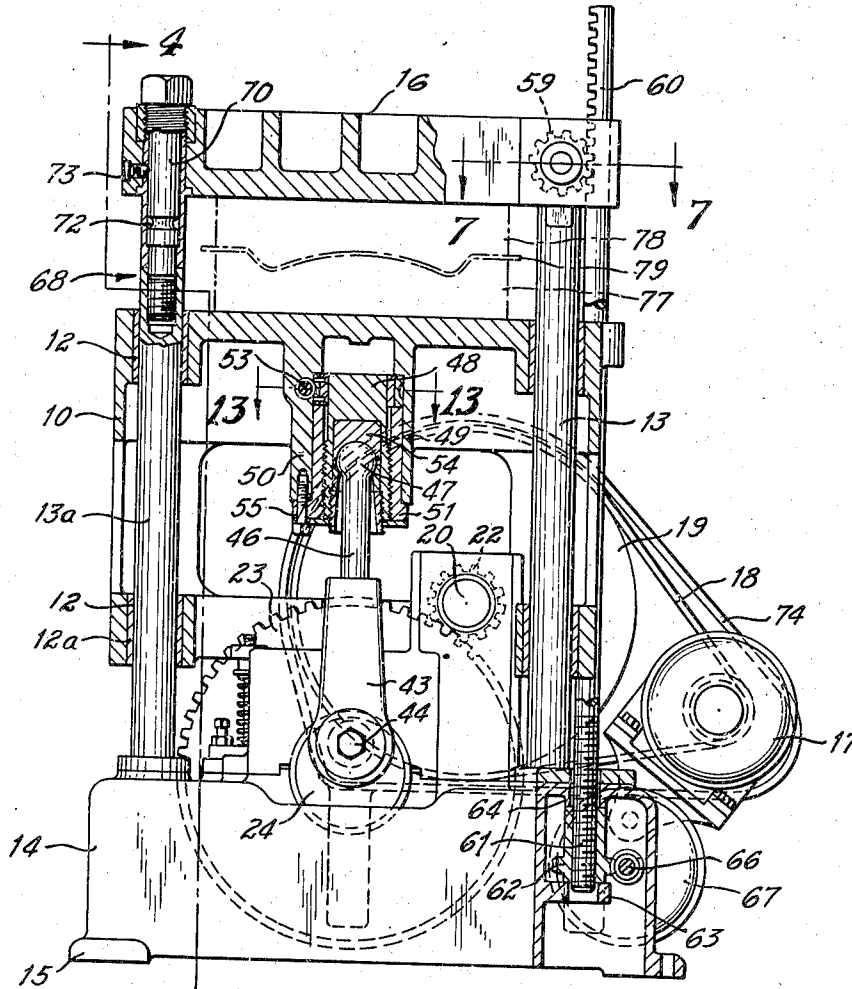


FIG. 3.

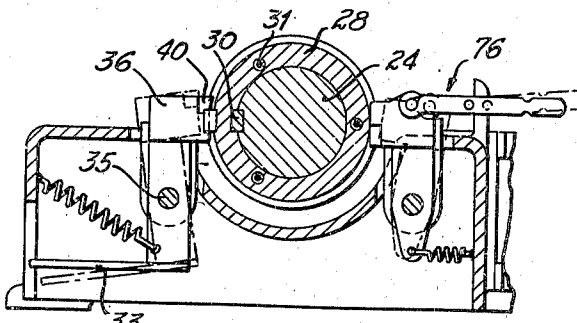


FIG. 5.

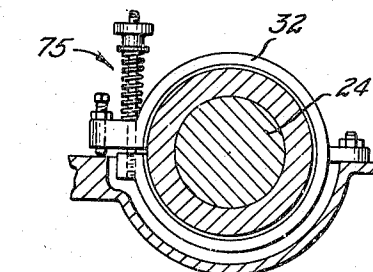


FIG. 6.
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4 Sheets-Sheet 3

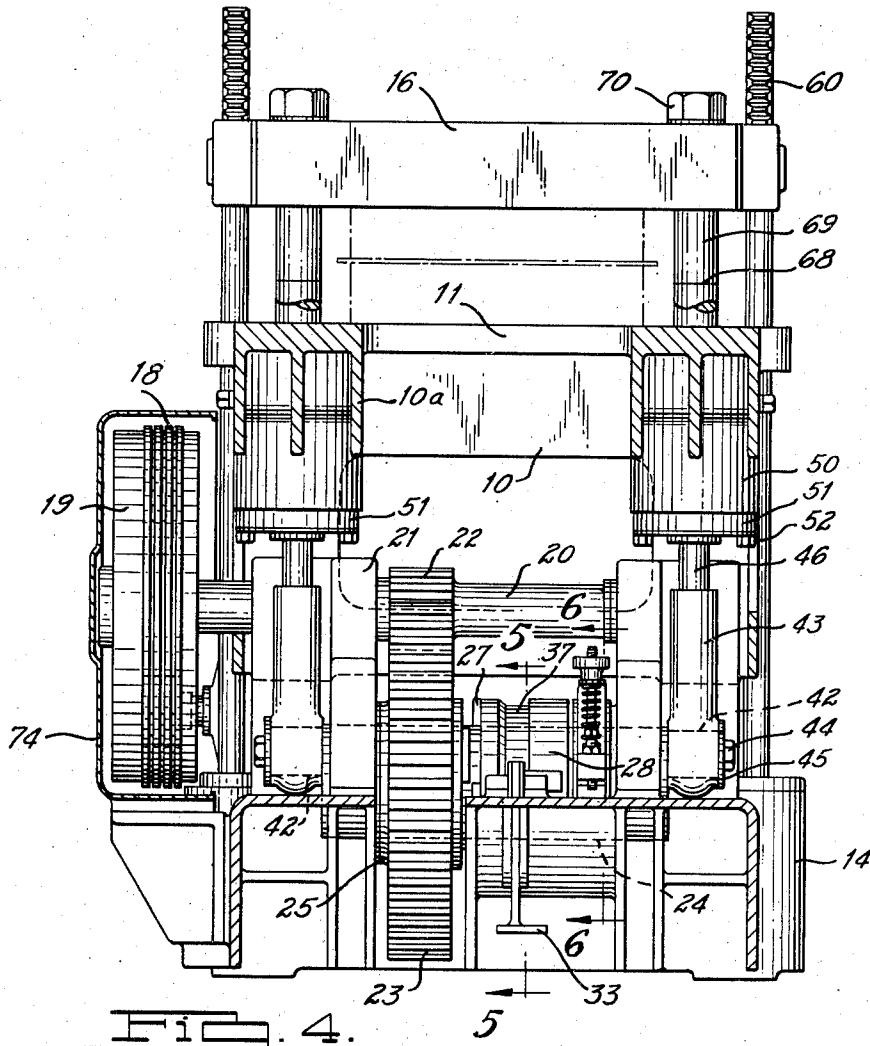


FIG. 4.

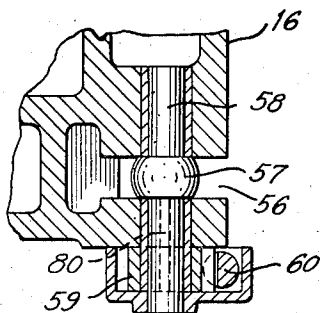


FIG. 7.

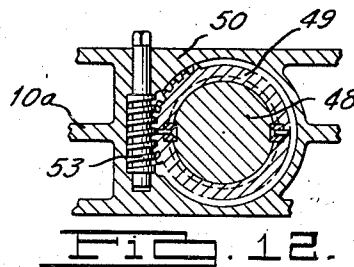


FIG. 12.

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4 Sheets-Sheet 4

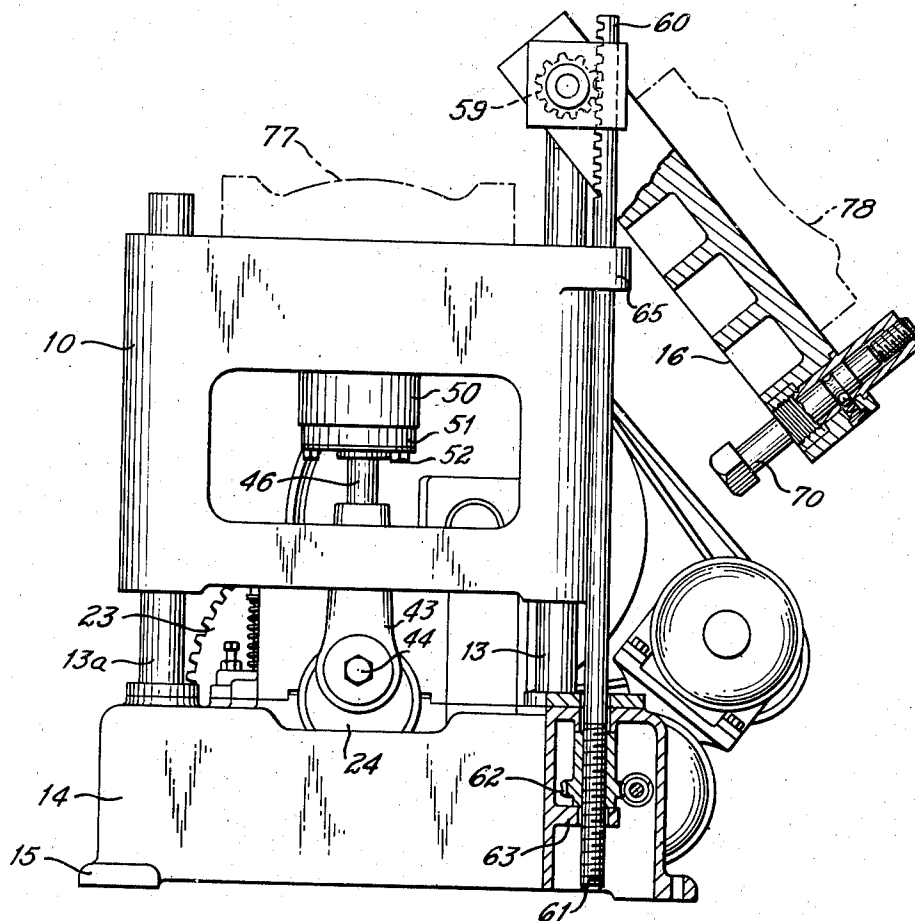


FIG. 8.

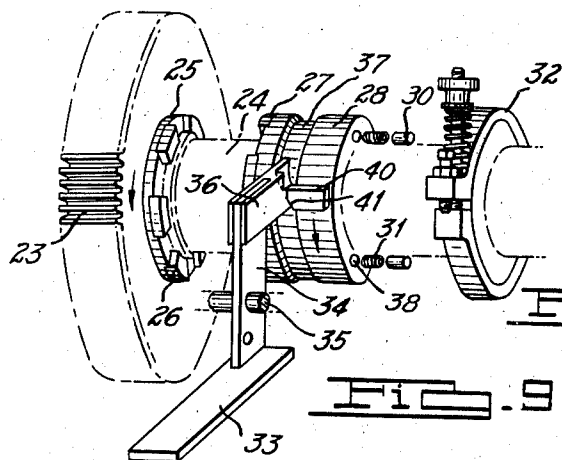


FIG. 9.

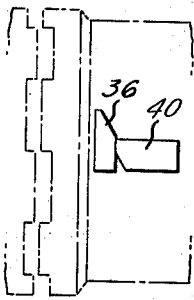


FIG. 10.

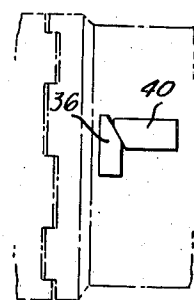


FIG. 11.

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2,475,692

POWER PRESS

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Application September 20, 1946, Serial No. 698,174

2 Claims. (Cl. 76-4)

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My invention pertains to a single action, crank type, press, employing one vertically movable ram. The press includes certain new features facilitating placement and adjustment of dies, which features will be described in the course of specifications of the press, reference being had to accompanying drawings in which:

Figure 1 is a perspective view of the press;

Figure 2 is a sectional view of the press, on line 2-2 of Figure 1;

Figure 3 is a vertical sectional view of the press on line 3-3 of Figure 2;

Figure 4 is a vertical sectional view on line 4-4 of Figure 3;

Figure 5 is a sectional view of a mechanism in the press on line 5-5 of Figure 4;

Figure 6 is a sectional view of a detail of construction on line 6-6 of Figure 4;

Figure 7 is a sectional view of a detail of construction on line 7-7 of Figure 3;

Figure 8 is a side elevation partly in section of my improved press with a head member in an outwardly swung position;

Figure 9 is an exploded view of the clutch mechanism employed in the press;

Figure 10 is a diagrammatic presentation of a clutch and member actuating the same, the clutch being shown in its disengaged position;

Figure 11 is a diagrammatic presentation of the clutch and a member actuating the same, the clutch being shown in its engaged position;

Figure 12 is a sectional view on line 13-13 of Figure 3.

Similar numerals refer to similar parts throughout the several views.

Departing from the conventional structural design in which the ram of the press is driven downwardly towards a stationary plate supporting a die, the ram in my press travels upwardly towards a normally stationary head having a die mounted thereon on the lower surface thereof.

The ram generally indicated by numeral 10, is made in the form of a substantially rectangular cage, its upper plate 11 being suitable for support of a die or dies. At each corner the ram is provided with two apertures 12, one at top and one at bottom, each having a liner 12a permitting the mounting of ram on two pairs of guide columns 13 and 13a which rise vertically from a base 14. The latter is equipped with foot plates 15 for application of bolts in order that the press might be affixed to its foundation. The head of the press, indicated by numeral 16, is mounted on said guide columns 13 and 13a in a manner which will be described hereinbelow.

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The press as shown by me is operated by means of an electric motor 17, a belt 18 being used to drive a fly wheel 19. Shaft 20 of the wheel, rotating in journal boxes 21, carries a pinion 22 which is in mesh with a gear wheel 23 freely rotating on axle 24. The axle is held in bearings 29. The hub 25 of the gear wheel, on the side remote from the fly wheel 19, is slotted radially to form intervening blocks 26. These, as best shown in Figure 9, are to interlock with correspondingly located blocks 27 on a sleeve 28 seated on said axle 24, and which is adapted to move slidably towards hub portion 25 into an interlocking engagement of said blocks 26 and 27. It will be understood that the sleeve rotates with axle 24 and is kept in said rotatable relation by means of a key 30 as shown in Figure 5.

A plurality of coiled springs 31, disposed within sockets 38 in sleeve 28, and kept therein by means of pins 30 abutting against the flat, radially extending webbing of collar 32, bear against the end of sleeve 28 urging it in the direction of wheel 23 for engagement of blocks 27 with blocks 26 thereon. Thus the sleeve, including its blocks, forms a clutch designed to bring about the rotation of axle 24 when it is so desired. The operative action of the clutch is controlled by means of a pedal 33 which actuates a lever 34 fulcrumed on a pin 35 and terminating with a cross bar 36, fitting into an annular groove 37 in sleeve 28. The end of cross bar 36 fitting into said annular groove 37 has a side face cut on a slant of approximately 45 degrees. The sleeve 28 carries on its surface two lugs 40, disposed parallel to axle 24, but diametrically opposed to each other. Each lug has a diagonally formed contact face 41 corresponding to the angle of slant on the crossbar and extending into the path of the said face on crossbar 36.

The purpose of the pedal control is to disengage the clutch 28 from the driving wheel 23. This occurs when lug 40 is brought in the course of the rotation of the clutch 28 against the projecting end of crossbar 36. By reason of the diagonal contact face 41 coming to encounter the slanting face of the crossbar, the clutch is shifted away from the slotted hub 25 of wheel 23.

The engagement of lug 40 with the crossbar 36, and the relative position of the clutch with respect to the driving wheel 23, is shown diagrammatically in Figures 10 and 11. The first named of said figures shows the clutch in its disengaged position; Figure 11 shows the clutch in its engaged position with said wheel 23.

Located at each end of axle 24, is an off-center

crank pin 42 fitting into a bearing in the lower end of a crank 43 which is held in place on said pin 42 by means of a retaining screw 44 passing through a washer 45. The upper portion 46 of the crank, being of reduced diameter, terminates in a ball shaped member 47, fitting into a socket within a thimble 48. The latter is axially held within cylinder 49, which in turn is disposed in a chamber 50. The chamber is integrally connected to, and extends downwardly from the lower surface of the top plate 11 of ram 10. At its lower end the cylinder 49 is provided with an outwardly turned flange 51, through which bolts 52 pass to secure the cylinder to the rim portion on the open end of chamber 50. A worm gear drive, located at the upper end of cylinder 49, and generally indicated by numeral 53, serves to rotate said cylinder. The drive which is shown in detail in Figure 13, permits withdrawal of the thimble 48 from said cylinder into which it is threaded. This, obviously, can be accomplished by rotating the cylinder 49 while thimble 48 is held stationary against rotation. A bearing 54 within the thimble is in contact with the upper hemisphere of the ball member 47, hereinafter referred to as a ball, while a complementary bearing 55, hollowed axially for passage of crank 46, is disposed on the lower side of said ball.

The mechanism described above, including the drive wheel 23 the crank pins 42, and the crank rods 43 extending into chambers within the movable rams, discloses elements needed to cause reciprocal vertical movements of the ram, and in general, omitting novel details of construction, pertains to means already known in art. I shall now describe inventive features of my concept pertaining to the movable head 16 of my press.

As already indicated, the head rests normally on two pairs of guide columns 13 and 13a, and is pivotally mounted as best shown in Figure 1. For this purpose the head contains two spaced recesses 56 for admission of the upper ends 57 of one pair of adjoining columns 13. Said ends are flattened on opposite sides and perforated for reception of pintles 58, extending into adjoining portions of head 16 as shown in Figure 7.

Mounted on each pintle outwardly of the recess 56 is a pinion 59 in mesh with rack 60. The lower end 61 of the rack is circular in cross section and is axially threaded into pinion 62 which is held against axial movement between a supporting bracket 63 and a bearing 64 within the upper plate of base 14 as shown in Figure 3. Another sliding bearing for the rack rod is provided in a projection 65, jutting out of the upper part of ram 10. Pinion 62 is driven by a worm 66 actuated by motor 67.

Columns 13a, are cut laterally at 68. In each case the part 69, extending upwardly from the cut and passing through head 16 as shown in Figure 3, is hollowed axially and contains a bolt 70. The bolt, as will be noted, is adapted to be threaded into a socket 71 within said column 13a, below the cut 68. An annular groove and ball arrangement, marked 72 and 73 respectively, forms a conventional device to prevent the bolt from being entirely withdrawn from head 16.

To conclude my description I wish to refer to the following details of construction:

Numeral 74 indicates a guard in form of an inclosure for the fly wheel 19. Numeral 75 indicates an adjusting device for collar 32, mentioned in the course of the specification, and numeral 76 indicates, in general, a mechanism

serving to disconnect the clutch 28 from the drive wheel 23 upon completion of a one-half of full rotation of the clutch in its engaged position. As the mechanism is not inventive and is only incidental to the structural design of my press, more specific details are omitted. Finally, numerals 77 and 78 indicate dies affixed to the ram and to head 16 respectively, while numeral 79 shows a metal sheet disposed between the dies for operation thereon.

The operation of the press in view of the preceding description is quite obvious. The ram 10, which supports a die 77, may be moved vertically upon guide columns 13 and 13a, first to be thrust against the die on the lower side of head 16, and then to be brought away from it. This is accomplished by means of the crank rods 46 driven by shaft 24 and disposed at their upper ends within respective chambers 50, which are slung from the under surface of top plate 11 of the ram 10. There are, as the drawings disclose, two such crank rods 46, and two chambers 50.

The operation of the ram is controlled by the clutch already described, each upward movement of the ram being controlled by a foot pedal 33 acting indirectly upon the clutch. These details are of a standard variety. The operation of the head including its novel features is as follows:

When, in order to adjust the dies, or to replace them, it is desirable to have the head swung outwardly to the position shown in Figure 8, the press is brought to a stop, bolts 70 unscrewed to disconnect the lower sections of columns 13a from their top portions 69, whereupon by means of a switch which is not shown, motor 67 is set running. The worm drive 66 causes the rotation of pinion 62 which brings about the downward vertical movement of rack 60. The rack engaged to pinion 59, causes the head to be swung on its pivots upwardly from column 13a in an arc of 180 degrees or more for easy inspection, replacement or adjustment of the die mounted thereon.

I wish to point out that the press is especially designed for and adapted as a try-out press, particularly useful in the process of finishing dies. By reason of my structure it is possible to adjust the dies, to file off respective parts thereof, or to otherwise improve them, without the necessity of removing them from the supporting plate.

I wish also to state that the location of the head in its outswung position also makes it possible to adjust or replace the die located on top of the ram.

To bring the head back to its normal position as shown in Figure 1, the worm gear 66 is made to run in the opposite direction, this causing the rack 60 to swing the head 16 back from its position as shown in Figure 8 to that shown in Figure 3.

It will be seen that some changes may be made in the structure of my press without deviating from the inventive principles disclosed herein. What I, therefore, wish to claim is as follows:

1. In a power press of the kind described, a base, four vertical columns mounted thereon and arranged in a quadrangle, two adjoining columns out of said four having each at its top an axially threaded aperture, a horizontally disposed pintle journaled in the top portion of each of the opposite two columns, a normally horizontally disposed head of the press, said head being keyed at one side to said pintles and having at the opposite side two bolts vertically disposed therein and projecting downwardly from said head and being

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adapted to be screwed into the axial apertures in the respective columns.

2. In a power press of the kind described, a base, four vertical columns mounted thereon and arranged in a quadrangle, two adjoining columns out of said four having each at its top an axially threaded aperture, a horizontally disposed pintle journaled in the top portion of each of the opposite two columns, a normally horizontally disposed head of the press, said head being keyed at one side to said pintles and having at the opposite side two bolts vertically disposed therein and projecting downwardly from said head and being adapted to be screwed into the axial apertures in the respective columns, rack and pinion means to cause the pintles to turn around their

respective axes and to impart an upright swing to the head when the bolts are unscrewed from said axially threaded apertures.

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6

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The following references are of record in the file of this patent:

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