July 8, 1952 I. PATRICK 2,602,508

PRESS INCLINING DEVICE

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Fig. 1.

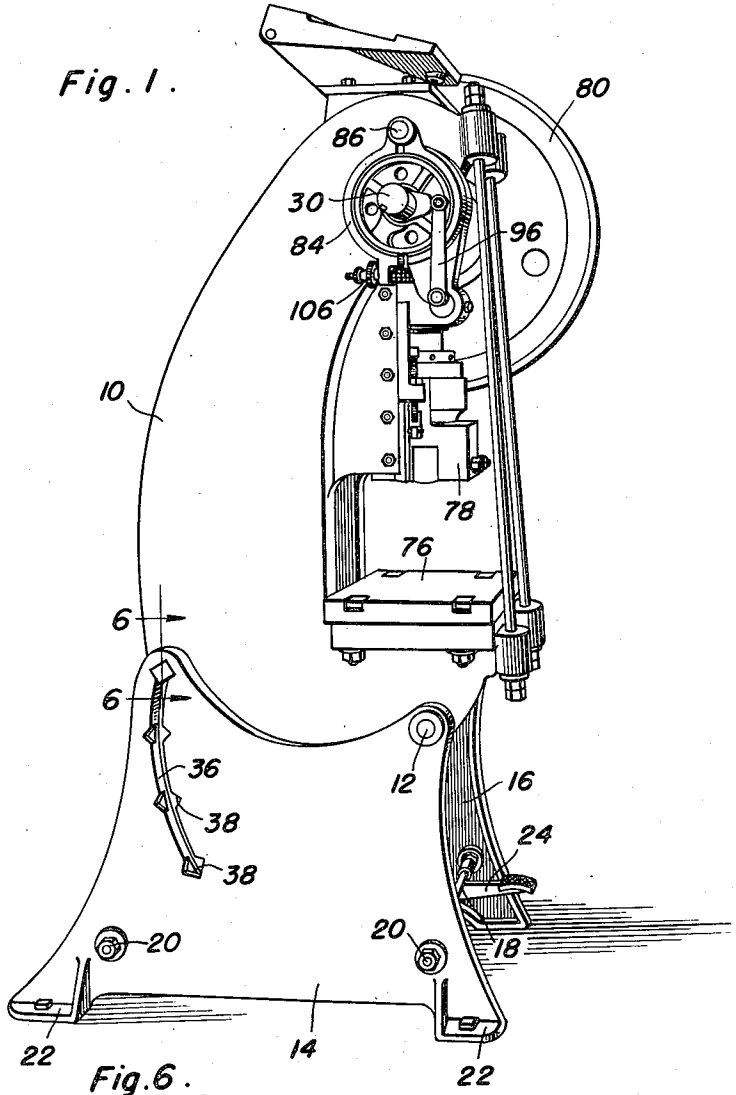
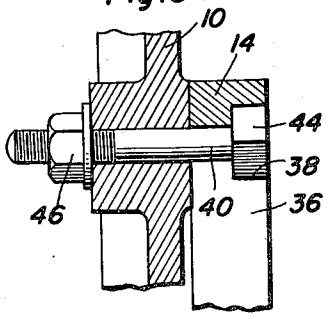


Fig. 6.



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Fig. 2.

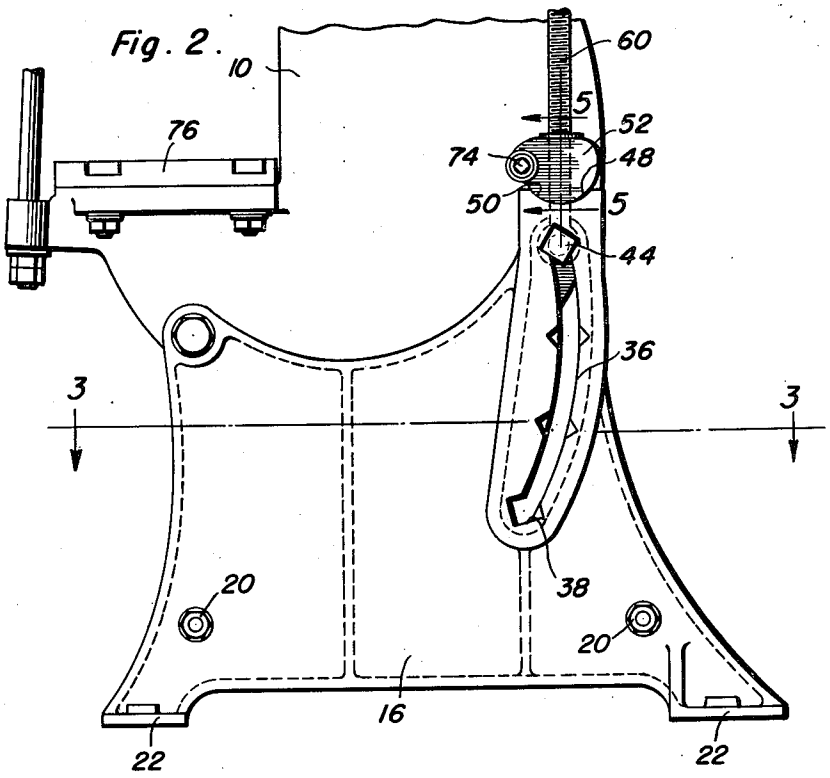
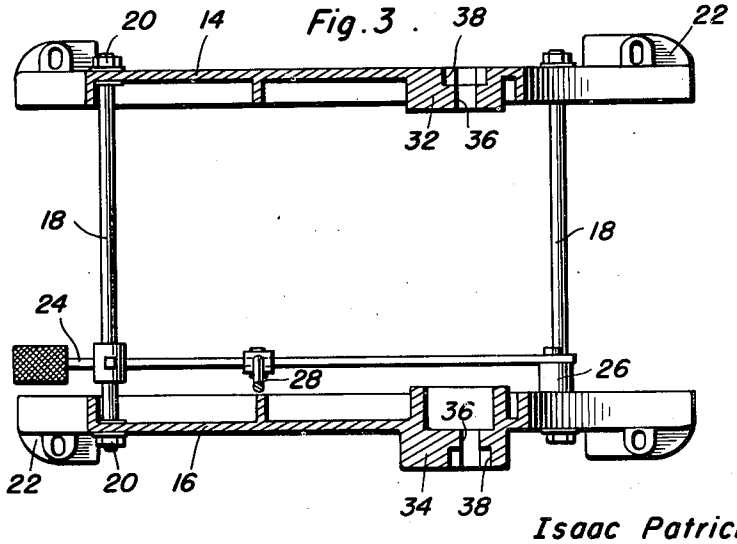


Fig. 3.



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Fig. 4.

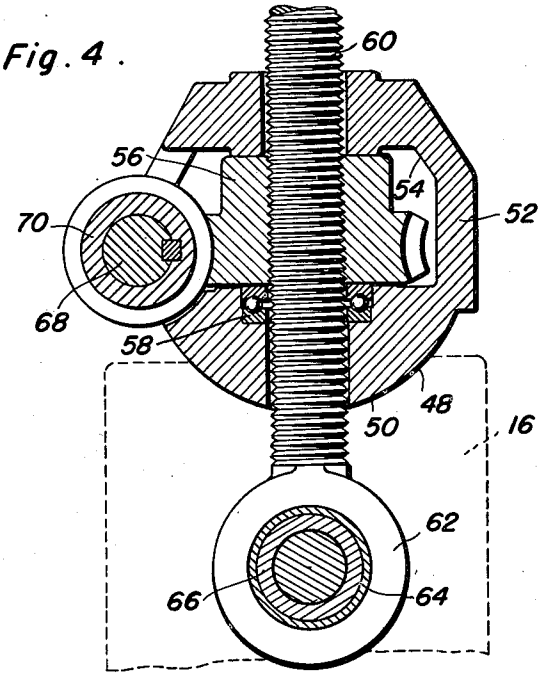
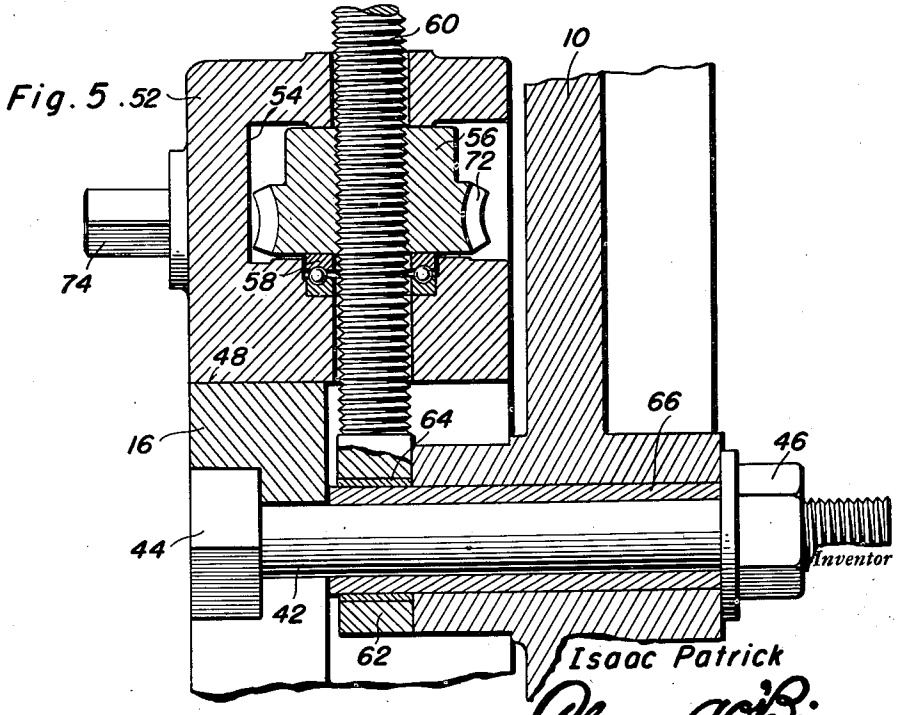


Fig. 5.



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UNITED STATES PATENT OFFICE

2,602,508

PRESS INCLINING DEVICE

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Application May 3, 1948, Serial No. 24,737

4 Claims. (Cl. 164—103)

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This invention comprises novel and useful improvements in a press inclining device and more specifically pertains to an improved frame construction of an inclining press together with an advantageous mechanism for adjustably inclining the press body upon its support and for maintaining the body in predetermined inclined position thereon.

The primary object of this invention is to provide an inclinable press having improved means for attaining any desired inclination of the press body, together with a simplified and dependable mechanism for locking the press body in various inclined positions.

An important feature of the invention resides in the provision of an inclined press having a support and a press body pivotally connected to the support at one end of the body, and having inclination varying and inclination fastening means at the other end of the press body engageable with the support.

A further feature of the invention resides in the provision of a press inclining means as set forth in the preceding paragraph, wherein an inclining screw is connected to the support and the press body for causing pivotal movement of the body upon the support to attain a predetermined inclination; and wherein locking means are provided for securing the press body in various predetermined positions of inclination and for relieving the inclining screw of all load when the body is in said predetermined positions of inclination.

A further feature of the invention includes the provision of an inclining nut which is mounted rotatably in a housing, for engagement with a screw-threaded inclining screw, said housing having a bearing surface which is oscillatably engaged upon a bearing recess of the support, whereby the inclining screw and inclining nut may possess the necessary slight angular swivelling motion to accommodate themselves to their connection with the support and press body during varying degrees of inclination of these two elements.

A still further important feature of the invention includes the provision of an inclination adjusting means in accordance with the preceding features wherein a bushing is provided in the press body for journaling the inclining screw and a locking pin for maintaining the press in various selected positions of inclination.

And a final important feature and object of the invention, is to provide an inclinable press which shall be of compact but durable construction, shall be easily adjusted throughout its range of inclination, shall reduce to a minimum the wear upon the inclination adjusting and inclination locking parts of the mechanism, and which shall be of relatively simple construction, but strong and dependable in its operation.

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These, together with various ancillary features and objects of the invention which will later become apparent as the following description proceeds, are attained by this device, a preferred embodiment of which has been illustrated by way of example only, in the accompanying drawings, wherein:

Figure 1 is a side elevational view showing in perspective a preferred embodiment of an inclinable press embodying the features of this invention;

Figure 2 is a fragmentary side elevational view of one side of the press, illustrating in particular the support, the lower portion of the press body, the pivotal connection of the body on the support, the press inclining means and the inclination locking means of the device;

Figure 3 is a horizontal sectional detail view taken substantially upon the plane of the section line 3—3 of Figure 2, and illustrating the construction of various features of the support members of the press;

Figure 4 is a fragmentary vertical central sectional view taken substantially at right angles through the center of Figure 5;

Figure 5 is a vertical transverse sectional detail view taken substantially upon the plane of the section line 5—5 of Figure 2, and being taken substantially at right angles to Figure 4; and,

Figure 6 is a fragmentary detail view taken upon an enlarged scale substantially upon the plane of the vertical sectional line 6—6 of Figure 1.

Referring now more specifically to the accompanying drawings, wherein like numerals designate similar parts throughout the various views, attention is directed to the press inclining frame and mechanism illustrated in Figures 1–6 of the attached drawings.

In the embodiment of press chosen for the purposes of illustrating the principles of this invention, the numeral 10 designates generally the press body which may be of any suitable construction, whether fabricated from various members or of one piece construction as preferred, this press body at one end being pivotally connected as by pins 12 to the upper end portions of parallel plates 14 and 16 which constitute standards between which the press body

is mounted for adjustment through various inclinations as set forth hereinafter.

As will be best seen by reference to Figures 1 and 3, the plates 14 and 16 forming the standards of the support are of substantially identical construction, being provided with transversely extending reinforcing rods 18 having fastening nuts 20 thereon for adding rigidity to the frame-work of the support. Suitable lugs 22 are provided to constitute brackets or supporting lugs by means of which the standards of the support may be anchored to any suitable foundation as desired.

A suitable foot operated control pedal 24 is terminally pivoted to a fulcrum lug 26 formed upon the standard 16, which lever is connected with a control shaft 28 by means of which the operation of the crankshaft of the press, this crankshaft being indicated at 30, is controlled.

The operation and construction of the control mechanism for the crankshaft of the press in itself forms no part of the subject matter of this invention, being set forth and claimed in my co-pending application Serial No. 32,177, filed June 10, 1948, for Clutch and Latch Operated Clutches and Control, patented October 9, 1951, Patent No. 2,570,849.

The standards 14 and 16 are provided with laterally extending bosses 32 and 34, respectively, which bosses are provided with arcuate slots 36, each of these slots being formed with the center of the pivot pins 12 as a center. Vertically spaced at suitable intervals along the length of the slots 36, are a plurality of laterally enlarged recesses 38 which are preferably non-circular in character. Any suitable number of these recesses may be provided, four having been illustrated in the drawings for depicting the principles of the invention. These recesses constitute seats for receiving locking or supporting pins carried by the press body 10, for supporting the body in various predetermined inclined positions of adjustment as set forth hereinafter.

As will be apparent from the detailed views of Figures 5 and 6, these adjusting pins consist of externally screw-threaded shank portions 40 and 42 carried by and extending through suitable bores in the body member 10 and being slidably received in the slots 36 of the standards 14 and 16, respectively. These pins are provided with shouldered or headed portions 44 which are selectively engageable in the recesses 38, and the shanks are externally threaded and provided with adjusting nuts 46 for fastening the pins in seated positions in the recesses 38. It will thus be apparent that the headed portions 44 may be selectively placed in any of the recesses 38, to thereby position the body member 10 in various angularly inclined position of adjustment, and that the positions so attained may be maintained by tightening the nut 46, to thereby retain the headed portion in its seat 38. In order to effect an adjustment of the press, it is merely necessary to release the nuts 46, whereupon the shanks 40 may be moved laterally until the headed portions 44 are withdrawn from their recesses 38, whereupon the shank 40 may be moved throughout the slot 36 into any desired position of adjustment, and the press again locked in selected position.

Although the arcuate slot arrangement above described is deemed to be the simplest and most effective method of attaining the desired adjustable inclination of the press body, it will be readily understood that the slot 36 could be formed as a straight or linear slot, and that the necessary lateral movement of the bolt relative thereto during the arcuate movement of the press body about the pivots 12 could be obtained by mounting the bolt in a slot in the body 10 which is inclined slightly to the slot 36, to thereby permit the necessary lateral relative movement of the bolt shank 40.

Moreover, it is to be understood that other fastening or locking means than the simple construction of nuts 46 illustrated could be employed in order to provide an easily applied and released locking means for retaining the shoulders 44 in the recesses 38.

By means of the aforementioned construction it is evident that the press body may be readily inclined and secured in various positions of inclination. However, in order to raise and lower the body, the following mechanism is provided for conveniently handling the great weight of the press. As shown in Figures 2, 4 and 5, the standard 16, above the upper termination of the slot 36 therein, is provided with an arcuate, substantially spherical depression, recess or surface 48, which constitutes a bearing for receiving the complementary, arcuate or spherically convexed surface 50 formed on the lower part of the housing or casing member 52 whereby the latter is oscillatably or swivelly mounted upon and supported by the standard 16. The casing 52 is provided with a hollow chamber 54 within which is positioned an elevating nut 56 which rests upon a suitable anti-friction bearing 58 suitably mounted in the chamber 54, and which constitutes a thrust bearing for the inclining nut 56.

Extending through aligned vertical bores in the upper and lower walls of the casing 52, and screw-threadingly engaging an internal bore of the inclining nut 56, is an inclining screw 60, whose lower extremity is provided with a bearing member 62 having a bearing recess lined with a bronze or other suitable bearing material 64 and which embraces and is journaled upon the protruding end of a steel bushing or sleeve 66 which is press-fitted or otherwise secured in the press body 10, and which sleeve slidably receives the above mentioned shank 42 of the adjusting pin extending into the standard 16. It will thus be seen that the steel liner or sleeve 66 serves the joint functions of providing a journal for the end of the elevating screw 60, and also serves to retain and slidably position the adjusting pin 42.

As will be more readily apparent from Figures 2 and 4, an operating shaft 68 is suitably journaled and extends through the walls of the casing 52, and is provided with a worm gear 70 which extends into the chamber 54 of the casing and is constantly in mesh with a gear 72 rigidly carried by and forming a part of the circumference of the inclining nut 56. The extending portion of the shaft 68 may be provided with a squared section 74 for receiving a handle or any other suitable means for rotating the shaft, not shown, whereby upon rotation of the shaft, the nut 56 will be rotated, and since the latter is retained in the casing 52 against vertical movement, rotation of this nut will cause relative movement of the inclining screw 60 with respect to the housing 52. Since the lower end of the inclining screw is fulcrumed upon the liner or bushing 66, and therefore is anchored and cannot move, the housing 52 being journaled upon the bearing surface 48, the press body 10 is raised and lowered by means of the pivotal engagement of the same with the bearing portion 62 of the screw.

It will therefore be evident that in order to

raise the rear of the press, that is, to incline the press forwardly about its pivot pins 12, the nut 56 is rotated in such a direction as to cause the inclining screw 60 to be drawn upwardly through the nut 56 and casing 52, thereby raising the rear end of the press body 10, until the proper position has been attained, and the adjusting pins 40 and 42 have been positioned in and locked in their seating recesses 38. When the adjusting pins have been positioned and secured, the elevating screw 60 is lowered sufficiently to directly apply the weight of the press to the adjusting pins and relieve the elevating screw and its associated mechanism from any of the strain of supporting the press in its adjusted position.

It will thus be readily seen that the press may be easily raised or lowered, and when the desired position has been attained, the elevating mechanism is relieved from the strain of maintaining the press in adjusted position.

The relative swivelling surfaces at 48 and 50 are provided to permit the necessary slight angular inclination of the elevating screw, and its associated inclining nut and housing, which occurs by reason of the arcuate movement of the sleeve 66 which constitutes the fulcrum pin of the inclining screw. This arcuate movement or oscillation of the housing 52 in its bearing seat 48 is relatively slight, being of the order of about 7½ degrees from the perpendicular or vertical plane passing through the center of the fulcrum sleeve or bushing 66.

Attention is next directed more specifically to Figure 1 wherein it will be seen that the press body 10 includes an adjustable and replaceable press bed or anvil 76, a ram 78 which is suitably mounted upon the press body 10 for guided vertical movement thereon towards and from the press bed 76, together with the above mentioned crankshaft 30, and a mechanism connecting the ram 78 with the crankshaft for reciprocation thereby. The crankshaft is provided with a pulley 80 or any other suitable means for applying power to the crankshaft for rotating the same and thus actuating and reciprocating the ram 78.

Since numerous modifications will readily occur to those skilled in the art after a consideration of the foregoing specification and accompanying drawings, it is not desired to limit the invention to the exact constructions shown and described, but all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. In an inclinable press, a support, a body pivoted at one end to said support, inclination adjusting means connecting the other end of said body and said support, said adjusting means comprising an arcuate slot and an adjusting pin on said body and slidable in said slot, said pin having an enlarged portion, a plurality of vertically spaced lateral locking recesses extending from said slot for selectively receiving the enlarged portion of said pin in adjusted positions in said slot and securing said press body in selected positions of inclinations on said support, means connected to said support and said other end of said body for pivoting said body about its pivoted connection to said support, said inclining means comprising an inclining nut, means mounting said nut on said support for swivelling movement, an inclining screw threaded on said nut, means for rotating said nut to cause said screw to incline said body, an eye on said screw, said eye surrounding said pin and being journaled on said body.

2. The combination of claim 1, wherein said mounting means includes a housing for said nut, a gear on said nut, operating means extending into said housing and engaging said gear for rotating said nut.

3. The combination of claim 2, wherein said mounting means further includes a bearing recess therein, said housing having a bearing surface swiveled in said recess.

4. In an inclinable press, a support, a press body pivoted at one end to said support, a housing secured to said support and operatively connected to said press body having an arcuate bearing surface, an open bearing recess in said support for journaling said bearing surface, a nut in said housing and an inclining screw threaded therein, a bushing carried by said press body, said screw having a bearing journaled on said bushing, a slot in said support, a pin slidable through said bushing and extending through and movable longitudinally of said slot, means for rotating said nut to vary the inclination of said press body and means to lock said pin in selected portions of said slot for locking said body in inclined position, said locking means including vertically spaced lateral enlargements of said slot, said pin having an enlarged portion receivable in said lateral enlargements.

ISAAC PATRICK.

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