June 10, 1958 R. E. WISSMAN 2,837,992

INCLINING ATTACHMENT FOR PRESS

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FIG. 1

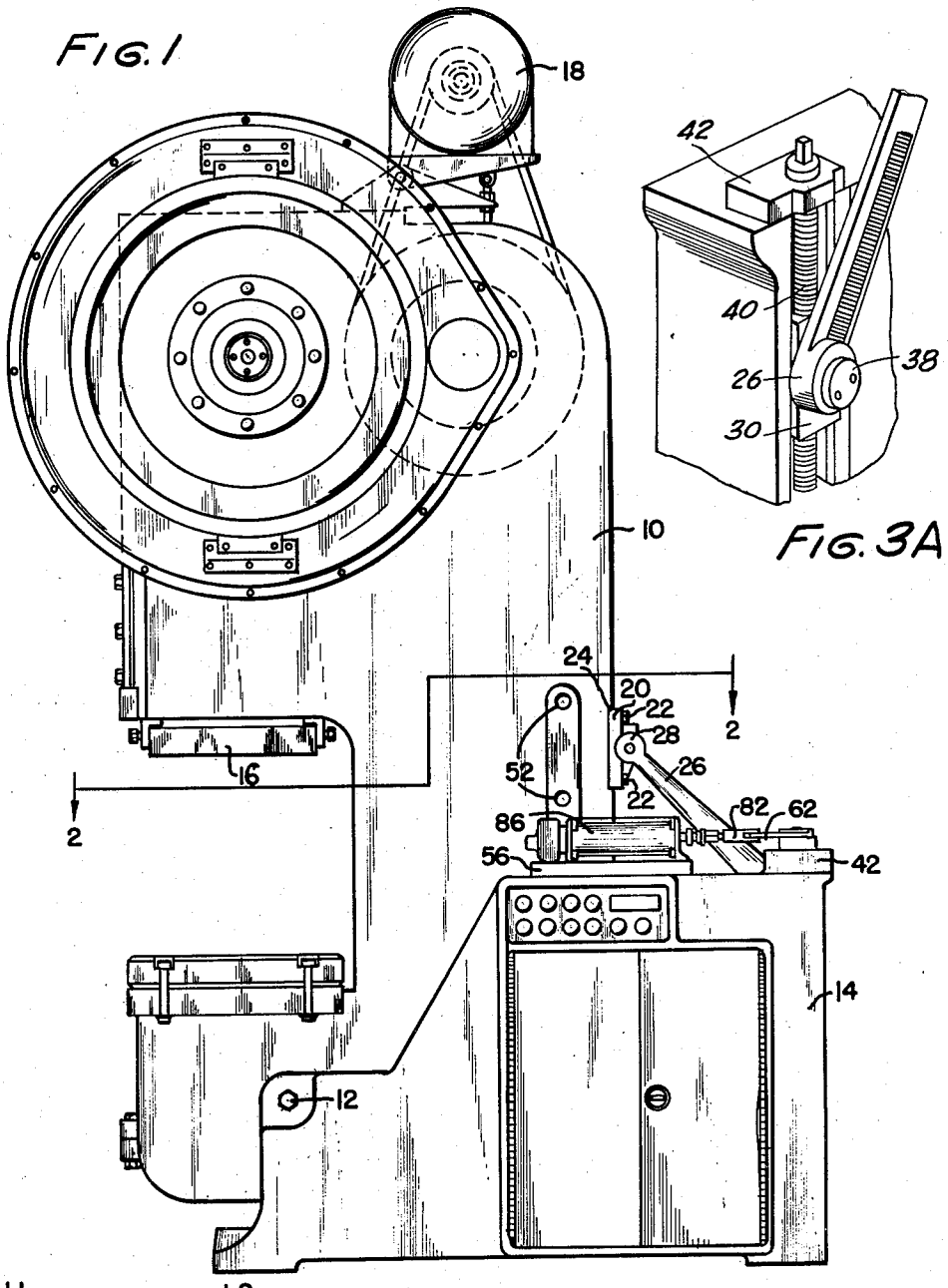


FIG. 3A

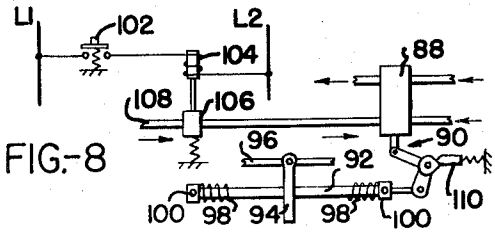


FIG.-8

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FIG.-2

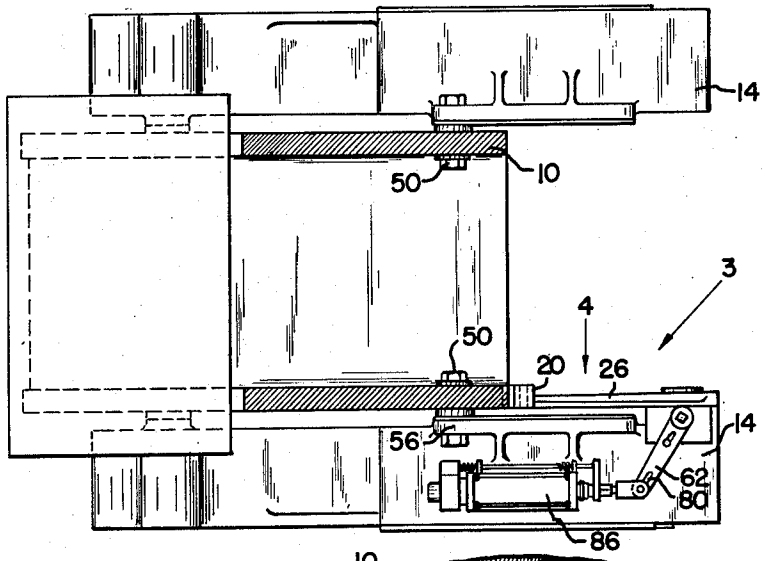
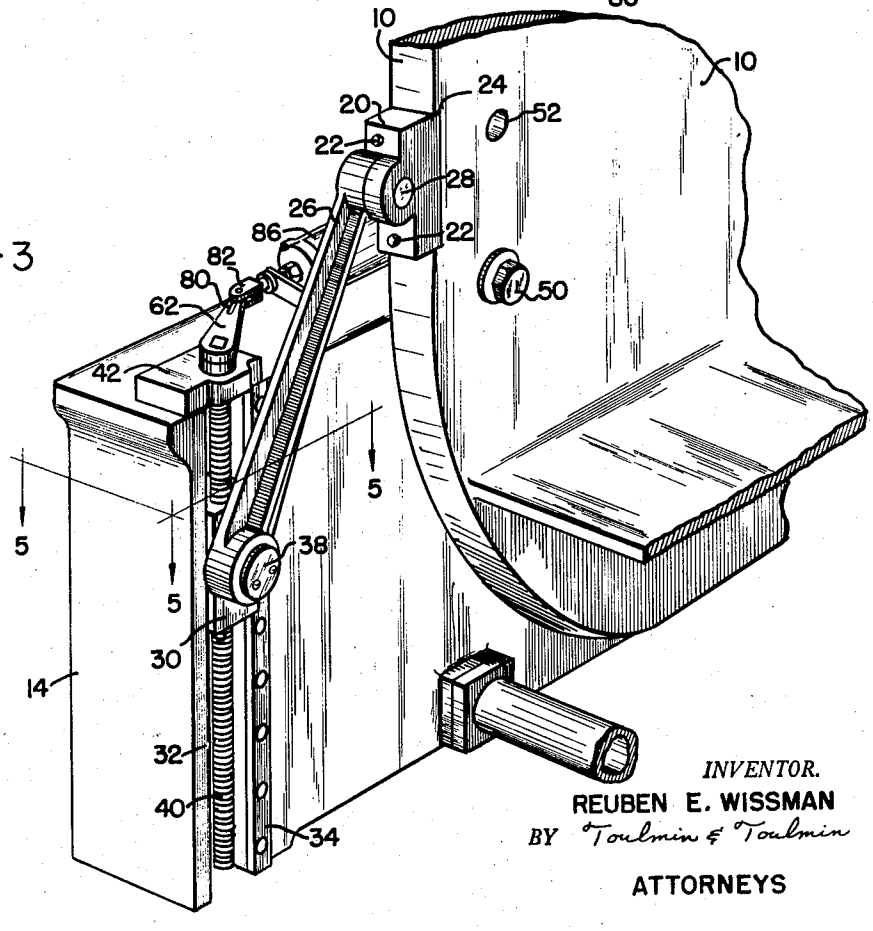


FIG.-3



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FIG-4

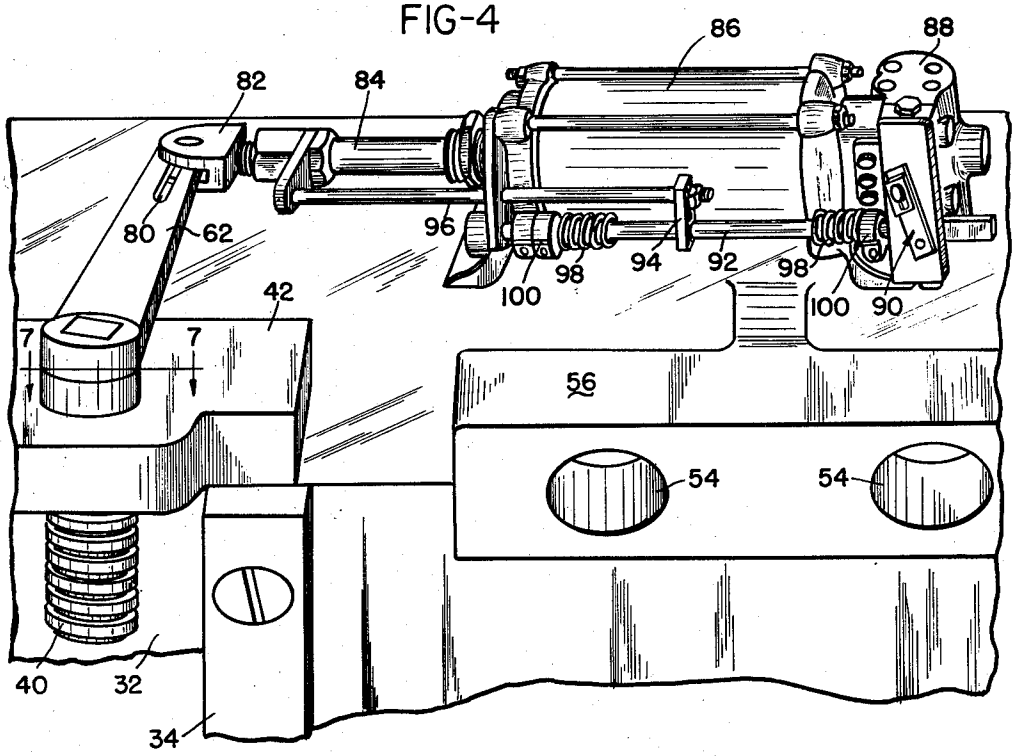


FIG-5

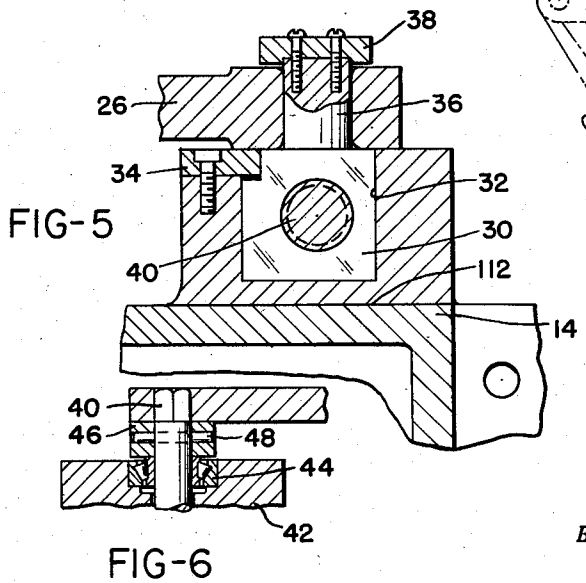
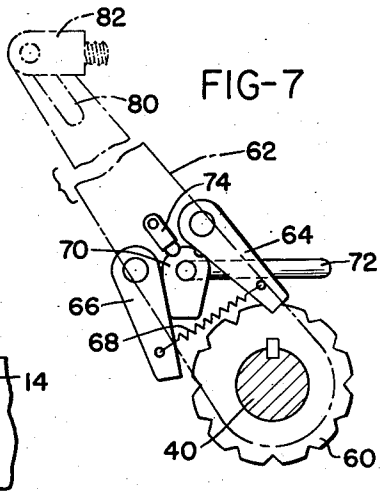


FIG-6

FIG-7



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United States Patent Office 2,837,992 Patented June 10, 1958

2,837,992

INCLINING ATTACHMENT FOR PRESS

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Application January 6, 1954, Serial No. 402,547

4 Claims. (Cl. 100—231)

This invention relates to presses, and particularly to an inclining attachment for a press.

A great many metal working presses, particularly mechanical presses, are arranged so that they can be tilted for the purpose of facilitating operating work therein. Heretofore, this has generally been accomplished by means of a vertical screw connected between the press frame and the leg structure of the press in about the center thereof and manually operated for tilting the press frame on the leg structure. A device of this nature is satisfactory for the purpose of tilting the press frame, but has certain other disadvantages, namely, that it obstructs the back of the press, making it difficult to place tote boxes and the like behind the press for receiving operated workpieces, and also requires considerable effort to adjust the press frame.

Having the foregoing in mind, it is a primary object of the present invention to provide an inclining attachment for tilting a press frame on the supporting leg structure therefor which will avoid the drawbacks referred to above.

A particular object of this invention is the provision of an inclining attachment for tilting the press frame on the leg structure which will leave the back of the press unobstructed.

Another particular object is the provision of an inclining attachment for a press which is power operated, thereby relieving the operator of the work of manually operating the inclining attachment.

A still further object is the provision of an inclining attachment for tilting a press frame on its supporting leg structure which is extremely strong but which does not tend to bind or become difficult to operate in any position of adjustment of the press frame.

These and other objects and advantages will become more apparent upon reference to the following description taken in connection with the accompanying drawings, in which:

Figure 1 is a side elevational view of a press having an inclining attachment according to the present invention;

Figure 2 is a plan section through the press frame, indicated by line 2—2 on Figure 1;

Figure 3 is a perspective view looking in the direction of the arrow 3 in Figure 2, showing the inclining attachment for the press according to this invention;

Figure 4 is another perspective view looking in the direction of the arrow 4 in Figure 2;

Figure 5 is a plan section, indicated by line 5—5 on Figure 3, showing the slidable nut in the press leg forming a part of the inclining attachment;

Figure 6 is a vertical section at the upper end of the inclining screw showing the manner in which it is supported in the leg of the press;

Figure 7 is a plan section, indicated by line 7—7 on Figure 4, showing more or less diagrammatically a ratchet mechanism forming a part of the drive to the screw of the inclining attachment; and

Figure 8 is a diagrammatic representation of the control circuit for controlling the operation of the drive motor for the inclining attachment.

Referring to the drawings more in detail, the press illustrated in Figure 1 comprises a press frame 10 pivotally connected by pivot pins or bolts 12 with a base structure that comprises the spaced legs 14. Located within the press frame is a press slide 16 adapted for being driven through a suitable gear train by a drive motor 18.

The press frame 10 is tiltable about the pivot pins 12 by a mechanism connected between one of the legs 14 and the back edge of one of the side members of the press frame. The inclining attachment is best illustrated in Figure 3, wherein is will be seen that there is a bearing block 20 fastened to the back edge of one side part of frame 10, as by the cap screws 22. Preferably, the back edge of frame 10 is notched, as at 24, to receive block 20 to provide for good support of the block on the press frame at all times.

The block 20 is pivotally connected with the upper end of a link 26 by pivot pin 28, while the lower end of link 26 is connected with a block 30 located in leg 14.

The arrangement of block 30 in leg 14 and its connection with link 26 will be seen in Figure 5, wherein it will be noted that leg 14 is formed with a slot 32 on its inner side in which block 30 is fitted, with a flat gib 34 being provided that will retain block 30 in place.

Figure 5 will also show that block 30 comprises a trunnion portion 36 extending through link 26 and with a plate 38 being secured to the trunnion portion to retain the link in assembled relation therewith.

Block 30 has a threaded bore therein through which extends screw 40 that runs vertically within slot 32, and which has its upper end supportingly journaled in a support block 42, as will be seen in Figure 6. Block 42 has therein an anti-friction bearing 44, the outer race of which is supported by block 42, and the inner race of which closely surrounds the upper end of screw 40 and supports the said screw by means of collar 46 abutting the inner race of the bearing and pinned to screw 40 by pin 48.

At this point, it will be apparent that rotation of screw 40 will cause movement of block 30 vertically along slot 32, and this will bring about tilting of press frame 10 relative to the supporting legs thereof because of its connection with nut 30 by link 26. It will also be apparent that, as the press frame tilts backwardly from its Figure 1 position, the link 26 will move toward a vertical position, thus tending to reduce the possibility of the inclining attachment binding at any time.

Normally, the press frame will be moved to certain predetermined tilted positions, and in which positions it is adapted for being retained by the bolts 50 adapted for being received in the apertures 52 in the sides of the press frame and the apertures 54 in an upstanding rib 56 on the legs of the press. It will be understood, however, that the press frame could be tilted to positions

intermediate the said predetermined positions if so desired.

It will also be noted that the inclining attachment according to the present invention leaves the back of the press open, as will best be seen in Figure 2, so that tote boxes or lift trucks can readily be run into the space between the legs at the back of the press, thus greatly facilitating the handling of workpieces from the press that have been dropped through the back after the workpieces have been operated upon by the press.

According to the present invention it is contemplated to power operate screw **40**, and with this in mind I provide on the upper end of screw **40**, as will be seen in Figure 7, a ratchet drive disk **60** adapted for being drivingly connected with drive arm **62** by means of one or the other of the directional pawls **64**, **66**, which are spring urged by spring **68** toward the periphery of disk **60**, and which can be made selectively effective by cam **70** adapted for being turned between its two operative positions by finger lever **72**. Detent mechanism **74** retains cam **70** in its adjusted positions.

Drive arm **62** has its outer end slotted at **80** and connected by clevis **82** with the end of a ram **84** that extends into cylinder **86** of an air motor. The air motor is of a type which will continuously reciprocate when energized by a supply of compressed air thereto. This is accomplished by providing the air motor with a reversing valve **88** adapted for being shifted between its two operative positions by a mechanism, generally indicated at **90**, and which mechanism is controlled by a reciprocable rod **92** adapted for actuation by a member **94** carried on rod **96** that is connected with ram **84**. Springs **98** and the collars **100** on rod **92** provide the means whereby reciprocation of rod **96** and member **94** will bring about axial movement of rod **92** and therefore shifting of valve **88**.

The control circuit is diagrammatically represented in Figure 8, wherein it will be seen that connected between power lines L1 and L2 and in series with normally open push button **102** is a solenoid **104** for opening a normally closed shut-off valve **106** located in compressed air conduit **108** leading to the inlet of reversing valve **88** for the air motor. Figure 8 also indicates a detent mechanism at **110** for the shifting mechanism **90** for the reversing valve which will insure that the reversing valve always shifts completely to one of its operative positions when the mechanism **90** is actuated.

It will be evident that the screw could be manually operated if desired, and that the advantage would still obtain that the back of the press was left open, while at the same time the actuation of the inclining screw would be relatively easy and would not tend to bind in any position of the press frame. However, it is preferred that the screw be provided with the ratchet drive and motor operator as disclosed for the purpose of making the adjustment of the press frame as easy as possible while speeding up this operation. While the air motor illustrated and described is to be preferred for reasons of economy and the like, it will be evident that other motor means could also be utilized, such as an electric motor, and the same advantages of rapid power operation of the inclining screw would be had.

While the inclining attachment has been illustrated as being an integral part of the press structure, it will also be evident that the inclining attachment could be manufactured and sold as a separate article of commerce. This could be accomplished by constructing that portion of the leg of the press containing the slot **32** as a separate member and securing it to the inside of the press leg by bolts. The outline at **112** in Figure 5 illustrates how the slide for the block **30** could be bolted to the press leg. In this case, the block at the upper end of screw **40** would preferably be mounted on the upper end of the slide member so that the entire portion of the inclining attachment associated with the leg could be supplied as a single unit and secured to the press leg as a single integral unit.

It will be understood that this invention is susceptible to modification in order to adapt it to different usages and conditions, and, accordingly, it is desired to comprehend such modifications within this invention as may fall within the scope of the appended claims.

I claim:

1. In an inclinable press, a press frame having side plates and being pivotally mounted between a pair of spaced upright stationary supporting legs, there being a vertical guide groove in the inner face adjacent the rear edge of one of said supporting legs, a movable block having a threaded bore therethrough within said groove and restrained against lateral movement by the walls of said groove, a gib along one edge of said vertical groove to retain said block within said groove, there being a recess in the rear edge of the side plate adjacent said one leg, a second block fixed within said recess, a link pivotally connecting said blocks, a screw within said guide groove and passing through said threaded bore of said movable block, means rotatably supporting the upper end of said screw, a reversible ratchet drive on the upper end of said screw and having a drive arm extending therefrom, a reciprocating motor connected to said drive arm, means for reversing the direction of travel of said motor to result in continuous reciprocation thereof when said motor is energized, and means for controlling the energization of said motor.

2. In an inclinable press, a press frame having side plates and being pivotally mounted between a pair of spaced upright stationary supporting legs, there being a vertical guide groove in the inner face adjacent the rear edge of one of said legs, a movable block having a threaded bore therethrough within said groove and restrained against lateral movement by the walls of said groove, a screw within said groove passing through said threaded bore, means rotatably supporting the upper end of said screw, a link pivotally connecting said movable block with the rear edge of the side plate adjacent said grooved leg, a reversible ratchet drive on the upper end of said screw and having a drive arm extending therefrom, a reciprocating motor connected to said drive arm, means for reversing the direction of travel of said motor to result in continuous reciprocation thereof when said motor is energized, and means for controlling the energization of said motor.

3. In an inclinable press, a press frame having side plates and being pivotally mounted between a pair of spaced upright stationary supporting legs, there being a vertical guide groove in the inner face adjacent the rear edge of one of said legs, a movable block having a threaded bore therethrough within said guide groove and restrained against lateral movement by the walls of said groove, a gib along one edge of said vertical groove to retain said block within said groove, there being a recess in the rear edge of the press frame side plate adjacent said grooved leg, a second block fixed within said recess, a link pivotally connecting said blocks, a screw within said guide groove and passing through the threaded bore of said movable block, means rotatably supporting the upper end of said screw, and means on said grooved supporting leg and connected to said screw to selectively rotate said screw in either direction.

4. In an inclinable press, a press frame having side plates and being pivotally mounted between a pair of spaced upright stationary supporting legs, there being a vertical guide groove in the inner face adjacent the rear edge of one of said legs, a movable block having a threaded bore therethrough within said guide groove and restrained against lateral movement by the walls of said groove, there being a recess in the rear edge of the press frame side plate adjacent said grooved leg, a second block fixed within said recess, a link pivotally connecting said movable and fixed blocks, a screw within said guide

groove and passing through said threaded bore of said movable block, means rotatably supporting the upper end of said screw, a reversible ratchet drive on the upper end of said screw and having a drive arm extending therefrom, a reciprocating motor connected to said drive arm, means for reversing the direction of travel of said motor to result in continuous reciprocation thereof when said motor is energized, and means for controlling the energization of said motor.

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