

Jan. 2, 1923.

1,441,112

I. PATRICK ET AL.
CLUTCH OPERATING MECHANISM.
FILED JUNE 14, 1921.

2 SHEETS-SHEET 2

Fig. 2.

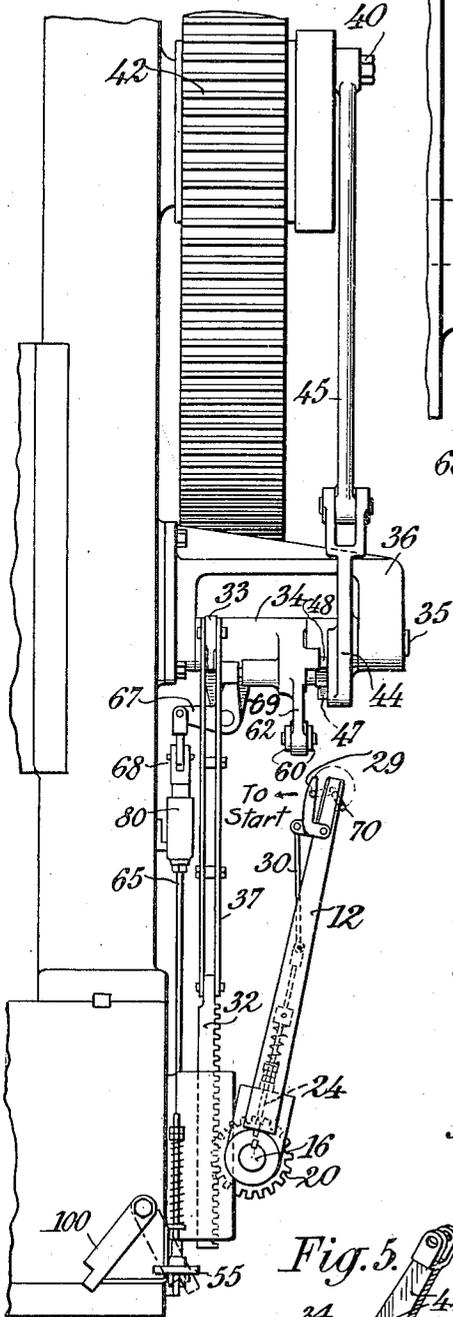


Fig. 3.

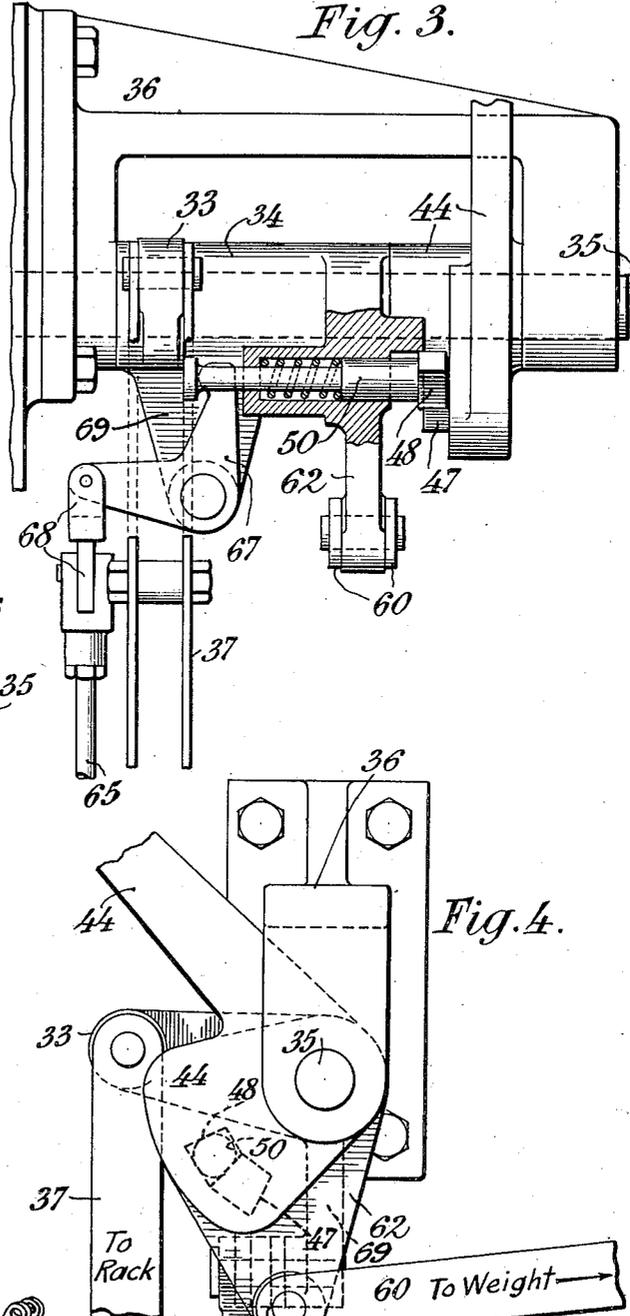


Fig. 4.

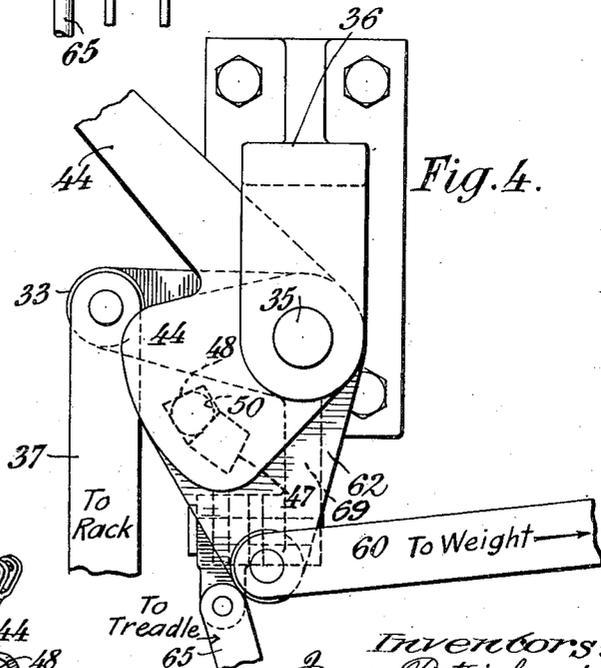
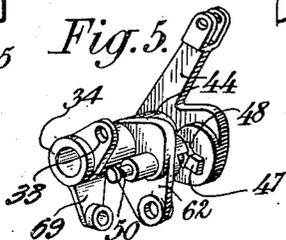


Fig. 5.



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2 SHEETS-SHEET 1

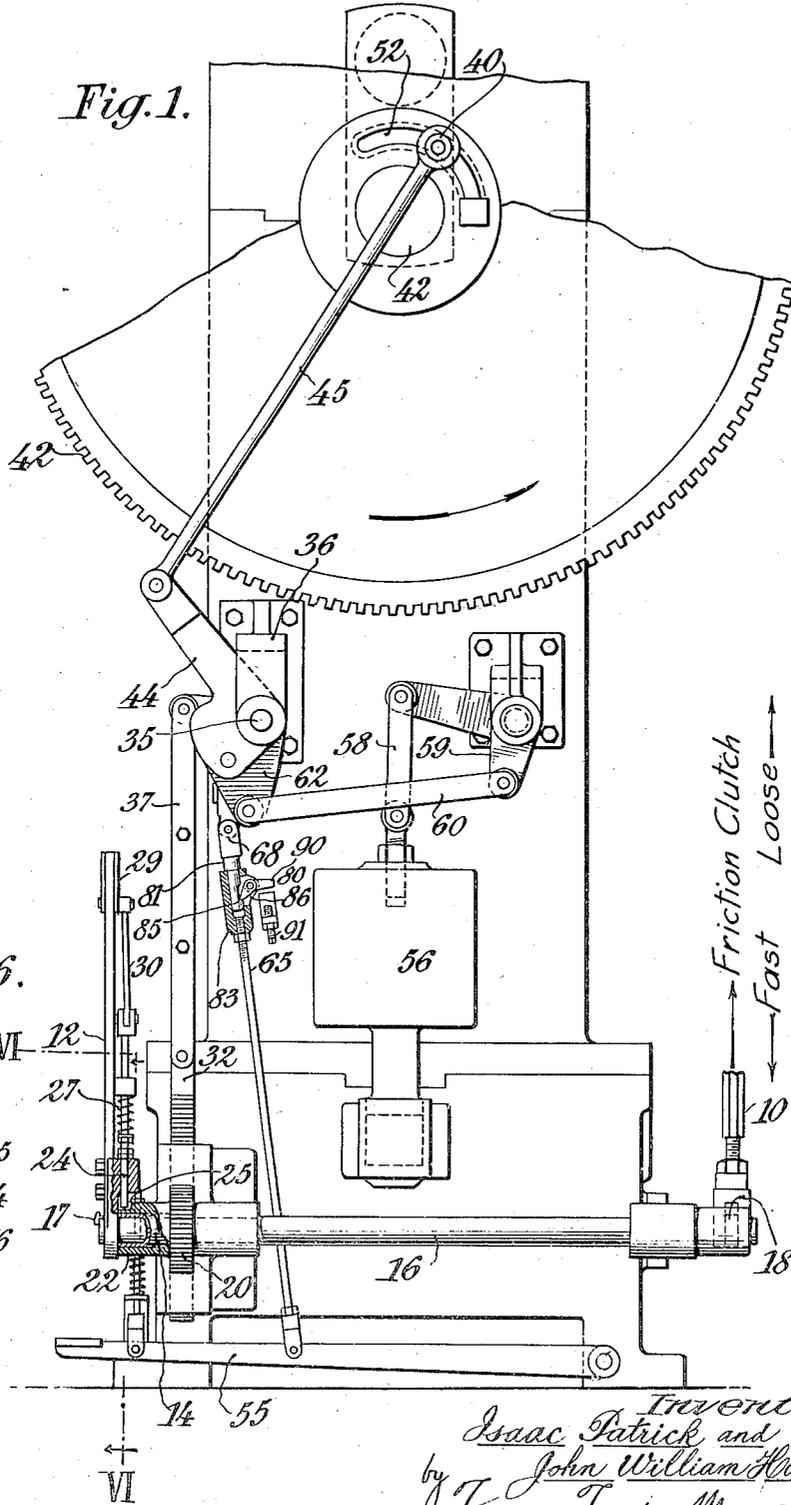
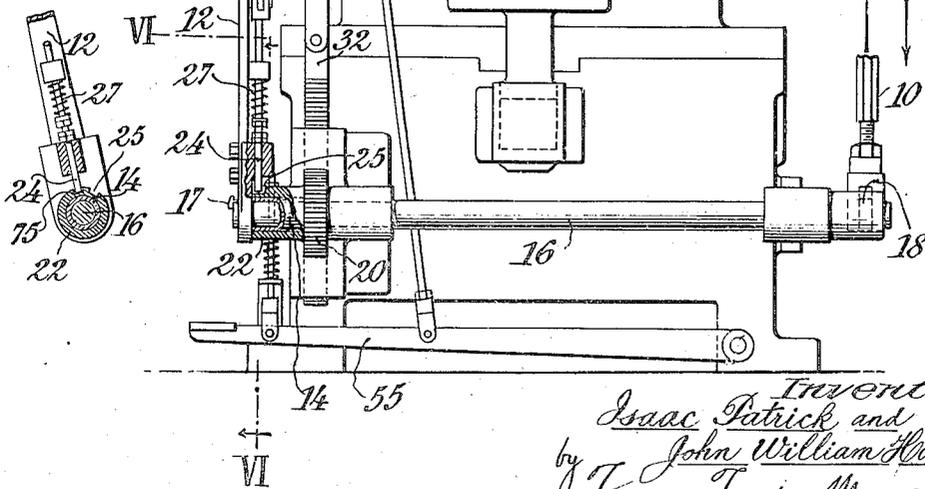


Fig. 6.



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UNITED STATES PATENT OFFICE.

ISAAC PATRICK, OF JAMAICA, AND JOHN W. HOLSTEAD, OF BROOKLYN, NEW YORK,
ASSIGNORS TO E. W. BLISS COMPANY, OF BROOKLYN, NEW YORK.

CLUTCH-OPERATING MECHANISM.

Application filed June 14, 1921. Serial No. 477,594.

To all whom it may concern:

Be it known that we, ISAAC PATRICK and JOHN WILLIAM HOLSTEAD, both subjects of the King of Great Britain, the former residing in Jamaica, county of Queens, and State of New York, and the latter in Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Clutch-Operating Mechanism, of which the following is a specification.

This invention relates to clutch operating mechanism for presses, especially large presses, and aims to provide improvements therein.

The invention provides a mechanism which admits of automatic stopping of the press following each operation, or of continuous running, and also admits of hand starting as well as foot starting. It also admits of hand-stopping at any part of the operation of the press.

The invention further provides a mechanism capable of being put into a condition wherein accidental pressure upon the hand or foot operating levers will not start the press.

The invention further provides a construction wherein a second or repeated operation of the press may be avoided when it is intended to operate the press for a single operation, and the operating lever is held too long.

The invention, hence, provides a device well adapted for use in setting dies, as well as for use, under varying conditions, in the normal operation of the press.

The invention, further, provides a novel combination of parts for effecting the foregoing purposes, and which, furthermore, operates in a reliable manner.

An embodiment of the invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a side view of so much of a press as is necessary, showing the invention applied thereto.

Figure 2 is a view of the parts shown in Fig. 1, viewed from the front of the press.

Figs. 3 and 4 are enlarged detail views, in front and side elevation, of certain parts of the mechanism.

Fig. 5 is a detail perspective view of the parts 34 and 44, designed to more clearly show the relation of these parts.

Fig. 6 is a sectional view, on the line VI—VI, Fig. 1.

Referring to said drawings, numeral 10 designates a rod connected to a clutch, and usually a friction clutch, (not shown) and 12 designates a hand lever for operating said clutch rod 10. The hand lever 12 is conveniently fast on a sleeve 14 keyed to a rock shaft 16, as indicated at 17, and the clutch rod 10 is conveniently attached to an arm 18 on said rock shaft 16. Consequently, the clutch may be moved to a fast or loose position by a simple movement of said hand-lever 12.

Means are provided whereby the clutch-rod 10 may be automatically operated, to stop the press after each operation. This means conveniently comprises a hub 22 loose on the sleeve 14 on the shaft 16, having a pinion 20 thereon, and adapted to be made fast or loose on said rock shaft 16, by means of a bolt 24 on said hand-lever 12, and a notch 25 in said hub 22. The bolt 24 is normally pressed toward the notch 25, by means of a spring 27, and may be retracted from said notch by means of a lever 29 (and a connecting rod 30) conveniently so located as to be grasped by the hand when operating the lever 12.

Meshing with the pinion 20 is a rack 32, connected to an arm 33 on a rock-sleeve 34, (journaled on a pin 35 in a bracket 36) through a rod or strap 37.

The rock sleeve 34 is turned, so as to move the rack 32 to rotate the pinion 20 (and when the bolt 24 is engaged in the notch 25 in the pinion hub 22) the rock shaft 16, to operate the clutch rod 10, by means of a crank-pin 40 or the like, on the main crank shaft driving gear 42, (or other similarly timed part) through a rock arm 44, connecting rod 45, and interengaging shoulders or abutments 47, 48, on the rock arm 44 and rock sleeve 34. The rock-arm 44 is conveniently journaled on the same pin 35 as the rock-sleeve 34, and the abutment 48 on said sleeve 34 is conveniently in the form of a spring-pressed bolt 50. Consequently, when the parts are in the position shown in Fig. 1 (corresponding to the top position of the upstroke of the punch) the pin 40 will have turned the interengaged sleeve 34 and rock-arm 44 to lift the rack 32, rotate the pinion 20, and thereby have rocked the shaft 16 and arm 18 thereon to move the

clutch rod 10 to throw off the clutch, and the working parts of the press will thereby have been stopped.

The crank-pin 40 is preferably fastened in a slot 52, which admits of the action of the clutch being adjustably timed in relation to any determined position of the punch driving means (main crank-shaft).

Starting of the press may be effected in two ways:

First. With the parts already described, this may be done by a simple movement of the hand lever 12 in the proper direction (direction of the arrow, Fig. 2 in the construction illustrated), the hand lever being disconnected from the pinion hub 22, by pressing the lever 29 to withdraw the bolt 24 from the notch 25. The hand-lever 12, being fast to the rock-shaft 16, turns the latter to move the clutch rod 10 in the proper direction to fasten the clutch parts, and thereby start the press.

Secondly. The press may be started, by the operation of a foot-lever 55 and associated parts. These parts conveniently comprise a weight 56, connected, through suitable levers and links 58, 59, 60, to an arm 62 on the rock-sleeve 34, and a rod 65, connected to the foot lever 55 and to a bell crank-lever 67 on an arm 69 on bracket 34, which bell crank-lever 67 is adapted to engage the spring-pressed bolt 50, heretofore described. The joint between the rod 65 and bell crank-lever 67 is a universal one, as indicated at 68, Fig. 3, which admits of rocking movement of the sleeve 34, and also turning of the bell-crank 67. Consequently, when pressure is exerted on the foot lever 55, the bolt 50 is shifted in a direction to disengage the shoulders 47, 48, which allows the weight 56 to turn the sleeve 34, and thereby press down the rack 32, thereby rotating the pinion 20 and shaft 16 (locked thereto through the bolt 24 and notch 25 in the pinion hub 22), whereby a pull is exerted on the clutch rod in the proper direction to make fast the clutch. The heads of the abutments or shoulders 47, 48, are preferably made broad enough not to catch behind one another in the position of the arm 62, corresponding to the lowest position of the weight, so that, when the sleeve 44 is rocked downward by the movement of the crank pin 40, contemporary with the operation of the press, the shoulder 47 may slide on the shoulder 48 until the spring pressed bolt 50 may again press the shoulder 48 into engagement with the shoulder 47, whereby, upon the movement of the crank pin 40 to its position corresponding to the top-stroke of the punch (position Fig. 1) the sleeve 34 will be rocked, thereby pulling up on the rack 32, and rotating the shaft 16 to actuate the clutch rod 10 to loosen the clutch and stop the press, as heretofore described.

In order to prevent the press from repeating, due to the operator failing to remove his foot from the foot-lever 55, a suitable make-and-break-joint 80 is provided between the bolt 50 and the foot-lever, and this joint is conveniently in the form of a telescoping stud 81 and sleeve 83 between the end of the rod 65 and the universal connection 68. The stud 81 is conveniently formed with a notch or shoulder 85 and the sleeve 83 with a latch 86 adapted to engage the shoulder 85 to normally maintain the connection between the stud 81 and sleeve 83, and the latch 86 is conveniently weighted as by a tail 90 for pressing said latch into engagement with said shoulder 85. Means are provided for disengaging the latch 86 and shoulder 85 following the withdrawal of the bolt 50 from engagement with the shoulder 47, and these means are conveniently the tail 90 on the latch 86, and a stop or abutment 91 on the frame of the press, and in the line of movement of the tail 90 when the sleeve 83 and associated parts are moved by the rod 65.

Therefore, when the operator depresses the lever 55, after the bolt 50 (with the abutment 48 thereon) is withdrawn from engagement with the abutment 47 (allowing the rock-sleeve 34 to turn under the action of the weight 56 and press the rack 32 downward to turn the pinion 20, and through it, the shaft 16, to operate the clutch to operate the press) the tail 90 strikes the abutment 91 moving the latch 86 out of engagement with the shoulder 85 thereby disconnecting the parts 81, 83 of the joint 80, so that the bolt 50 may spring into engagement with the abutment 47 (following the movement of the rock arm 44 by the rod 45 connected to the pin 40 on the gear wheel 42) and the rock-sleeve 34 be lifted when the press operation is completed, and thereby stop the press by the movement of the rock-shaft 16 through the rack 32 and pinion 20 connection. Consequently, continued pressure on the lever 55 due to the operator not removing his foot will have no effect on the operation of the rock arm 44 to operate through the bolt 50 and rock sleeve 34 and associated parts to stop the press after one operation.

To run the press continuously, it is simply necessary to lock the lever 29 in position to hold the bolt 24 out of the notch 25, and this may be effected by a loop 70 (Fig. 2) on the hand lever 12. When this loop 70 is thrown to the position shown in dotted lines (Fig. 2), the bolt 24 will be held out of the notch 25, and consequently the pinion 20 and hub 22 may turn idly on the shaft 16, so that, when the rack is moved, either by the crank-pin 40, or weight 56, no effect will be produced on the rock-shaft, and, consequently, none on the clutch controlled by

the clutch rod 10. The press may, however, be stopped at any time, by an appropriate movement of the hand lever 12.

To enable the weight 56 to remain idle during the time the parts are arranged for continuous running, means such as a treadle lock 100, may be provided. By partially depressing the foot lever 55 and holding it by the lock 100, the bolt 50 will be held retracted, so that the abutment 47 on the rock arm 44 moves idly by the abutment 48 on said bolt 50 and no movement of the rock sleeve 34 (connected to the weight) is produced. The foot lever 55 in this position is not depressed to the extent that the stop 91 acts to disengage the parts 81, 83 of the joint 80 on rod 65.

To lock the mechanism, so that the accidental movement of the clutch operating lever 12 or foot lever 55 will not start the press (a condition of great utility and safety in setting dies) it is simply necessary to release the weight 56, (as by withdrawing the bolt 50 by pressure on the foot lever 55) and at the same time draw the bolt 24 (on the hand lever 12) out of the notch 25 in the pinion hub 22, and hold or throw the lever 12 to position to loosen the clutch (position shown in Fig. 2). The weight 56 and associated parts now being in their lowest position, any later movement of the foot lever 55 will produce no movement of the shaft 16 and clutch rod 10 to start the press, and movement of the hand lever 12 in the direction to start the press (direction of arrow Fig. 2) is prevented by dropping the bolt 24 in a notch 75 in the hub 22. With the bolt 24 in the notch 75, no movement of the hand lever 12 may be effected, inasmuch as an attempt to move the hand lever 12 in the direction to start the press, will merely jam the pinion 20 and rack 32, these parts being at the limit of their movement, as heretofore explained.

The operation of the device has been quite fully explained in the foregoing description.

In brief, hand starting and stopping may be effected at any time (or position of the press), by movement in one direction or the other of the hand lever 12.

Automatic stopping of the press, following the completion of each stroke of the press, (or at any other part of the press cycle) may be effected by the crank pin 40 acting through rod 45, which pulls up on the lever 44 and this latter, acting through abutments 47, 48, pulls up on the rock sleeve 34, and thereby pulls up on the rack 32 to turn the pinion 20 (fast to the rock shaft 16) through the bolt 24 on the lever 12, engaging the notch 25 in the pinion hub 22) to rock the shaft 16 to push on the clutch rod 10 to loosen the clutch.

Stopping of the press by hand in case of emergency, may be effected by disconnecting

bolt 24 from hub 22 by means of lever 29 and throwing hand lever 12 to the right in Fig. 2 without disengaging the parts 47—48 of the automatic attachment and when starting up by hand again the automatic mechanism will function as though the cycle had not been interrupted.

Starting may be effected by pressure of the foot lever 55 (leaving both hands free for feeding the press), such operation acting to draw the bolt 50 to release the rock-sleeve 34, pressed on by the weight 56, which pressure turns the rock-sleeve 34, causing it to press on the rack 32 to rotate the pinion 20 to rock the shaft 16, and thereby pull on the clutch rod 10 to fasten the clutch.

If the operator neglects to remove his foot from the lever 55, the press is prevented from repeating or making a second operation by reason of the parts of the joint 80 being disconnected, thereby rendering the bolt 50 independent, for the time being, of the lever 55, as heretofore more fully explained.

Continuous running of the press may be effected by locking the bolt 24 on the lever 12 out of position to engage in the notch 25, as by means of the loop 70 (Fig. 2), whereupon the pinion 20 may turn idly on the rock shaft 16 under the influence of the rack 32, weight 56, crank pin 40 and connecting parts.

To stop the press automatically, when running continuously, it is simply necessary to throw the loop 70 off of the lever 29, whereupon the bolt 24 will engage the notch 25 in the hub 22, and thereby connect the rock shaft 16 with the rack 32 and pinion 20, so that on the upstroke of the press, the rock arm 44, rock sleeve 34, bolt 50 and rod 37 will turn the shaft 16 in a direction to throw out the clutch and stop the press.

Locking of the mechanism, to nullify accidental movement of the foot lever 55, or hand lever 12, may be effected by releasing the weight 56 (as by withdrawing the bolt 50), while the bolt 24, on the hand lever 12, held out of engagement with the notch 25 in the pinion hub 22 (so that the weight and associated parts operate without affecting the rock-shaft 16 and clutch rod 10), and thereupon dropping the bolt 24 in a locking notch 75 in the pinion hub 22.

The invention may receive other embodiments than that herein specifically illustrated and described.

What is claimed is:

1. Clutch operating mechanism for presses, comprising a clutch rod, a rock-shaft for operating said clutch-rod, manual means for operating said rock-shaft, automatic means for operating said rock-shaft, and means under the control of the operator for holding or releasing said automatic means, and an interlocking fast and loose connec-

tion between said manual operating means and said automatic operating means.

2. Clutch operating mechanism for presses, comprising a clutch rod, a rock-shaft for operating said clutch rod, manual means for operating said rock-shaft, automatic means for operating said rock-shaft, means worked in timed relation to the working parts of the press for actuating said automatic operating mechanism to turn said shaft in a direction opposite to the direction in which it is turned by said automatic means, and means under the control of the operator for holding or releasing said automatic means, and an interlocking connection between said manual operating means and said automatic operating means, whereby said manual means may operate the rock-shaft independently of the operation of the automatic operating means.

3. Clutch operating mechanism for presses, comprising a clutch rod, a rock shaft for operating said clutch-rod, manual means for operating said rock-shaft, automatic means for operating said rock-shaft, and means under the control of the operator for holding or releasing said automatic means, interlocking fast and loose connection between said manual operating means and said automatic operating means, and means for holding said interlocking connection between said manual operating means and said automatic operating means permanently out of engagement, whereby said clutch rod may maintain a determined position, as a position for continuous running of a press, for an indefinite time.

4. Clutch operating mechanism for presses, comprising a clutch rod, a rock-shaft for operating said clutch rod, manual means for operating said rock-shaft, automatic means for operating said rock-shaft, means worked

in timed relation to the working parts of the press for actuating said automatic operating mechanism to turn said shaft in a direction opposite to the direction in which it is turned by said automatic means, and means under the control of the operator for holding or releasing said automatic means, and an interlocking connection between said manual operating means and said automatic operating means, whereby said manual means may operate the rock-shaft independently of the operation of the automatic operating means, and means for holding said interlocking connection between said manual operating means and said automatic operating means permanently out of engagement, whereby said clutch rod may maintain a determined position, as a position for continuous running of a press, for an indefinite time.

5. Clutch operating mechanism for presses or the like, comprising a clutch rod, means under the control of manual means for automatically moving the clutch rod to position to start the press, means under the control of a moving part of the press to move the clutch rod to a position to automatically stop the press, and means for disconnecting the clutch rod from the action of either of said means, whereby the clutch rod may be placed in a position for continuous running of the press, and a lever permanently connected to said clutch rod, whereby said clutch rod is always under the control of said lever.

In witness whereof, we have hereunto signed our names.

ISAAC PATRICK,
JOHN W. HOLSTEAD.

Witnesses:

M. D. TRUESDALE,
A. W. KOENTIG.