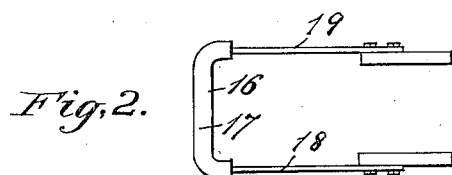
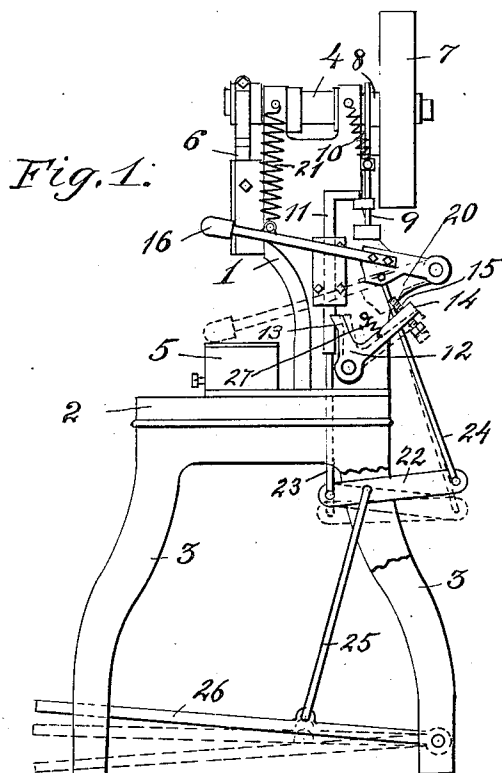


1,060,608.

Patented May 6, 1913.



WITNESSES:

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GEORGE P. KNAPP, OF BRIDGEPORT, CONNECTICUT.

SAFETY DEVICE.

1,060,608.

Specification of Letters Patent.

Patented May 6, 1913.

Application filed July 25, 1912. Serial No. 711,580.

To all whom it may concern:

Be it known that I, GEORGE P. KNAPP, citizen of the United States, and resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Safety Devices, of which the following is a specification.

My invention relates to an improved safety device to be used in connection with power presses and is for the purpose of preventing the operators of such machines from personal injury while performing their work.

It consists in a movable guard pivoted to the frame of the press and so actuated by the treadle that before the working head of the press can be connected with, and operated by, the driving power the guard will be moved into its protecting position surrounding the work field, the connecting mechanism between the tripping treadle of the machine and the several operative parts being such as to preclude the possibility of the press being tripped before the hands of the operator are entirely removed from the working field of the machine and the guard in its protecting position.

It further consists in the particular mechanism whereby the treadle of the machine is connected to the several parts so that as soon as the working head is operably connected with the power driven pulley and begins its movement, the guard is released from its protecting position and is moved out of the work field to leave the press clear for the introduction of work for the next operation, thereby saving much valuable time and increasing the output of the machine.

In the accompanying drawings:—Figure 1, is a side elevation of a power press provided with my improved safety device, and, Fig. 2, is a plan view of the swinging guard detached from the machine.

This invention is illustrated in connection with a "bench power press" in which 1 is an upright frame mounted on a base or table 2, supported on legs 3 and having bearings formed in its upper part for a horizontal shaft 4 to the forward end of which is connected a vertically sliding tool carrying head 6 adapted to cause the operating tool to act on work held in a die block mounted on the table 2. On the rear end of the shaft 4 is mounted a loose driving pulley 7 arranged to derive motion and power through a belt

(not shown) and on the shaft 4, between the drive pulley 7 and the frame 1 of the machine, is mounted a trip clutch 8 which may be of any one of the many forms commonly used in similar places, having a sliding pull bar 9 a downward movement of which will throw the clutch into operation and cause the drive pulley to be actively connected with the shaft 4 for one revolution. A return spring 10 attached at one end to the frame 1 and at the other end to the bar 9, and properly tensioned, will tend to retain the bar 9 in its raised position or will return it to such position after it has been pulled down to operate the clutch. These several parts being well known to users of power presses, a more detailed description is omitted.

Upon the side of the frame 1 in guideways attached to or integral with said frame is mounted a vertically sliding bar 11 preferably formed of a straight vertical part to pass freely through the guide way with an offset portion at its upper end to connect with the sliding clutch bar 9 as shown so that when the bar 11 is pulled down the clutch will be operated to connect the drive pulley and the shaft of the press. Also upon the side of the press frame 1 and slightly to the rear of the sliding bar 11 is pivoted a latch 12 preferably made as shown with an upward and forward projecting arm 13 made to terminate in a pointed latch-tooth to engage a notch in the rear side of the sliding bar 11, the notch so located that when engaged by the latch the bar will be locked in its uppermost position, and prevented from operating the clutch until released. An upward and backward projecting arm 14 on the latch is provided with an adjustable contact screw 15 the purpose of which will be presently described. A guard 16 preferably made as shown in Fig. 2, with a cross arm 17 and two parallel arms 18—19, is pivoted to a bracket 20 made integral with or attached to the frame 1 of the machine in such manner that the forward cross arm may be moved up and down in front of the working field of the press as illustrated in dotted lines in the drawings. This guard 16 is padded at its forward end and adapted so to inclose the work field of the press when in its lower position as to prevent the introduction of the hands of the operator or other obstruction, and when in its raised position, to leave the work field clear, and a spring 21

is provided, attached at one end to the frame 1 and at the other end to the guard, and is so tensioned as to tend to maintain the guard in its raised position.

5 The arm 18 of the guard is so formed at its rear end that it will overlie the latch arm 14 and its set screw 15 so that a downward movement of the guard will cause the latch 12 to be operated to free the slide bar 11 and permit it to operate the clutch bar 9, and the set screw 15 will permit of such an adjustment that this unlocking of the clutch operating parts will not take place until the guard has reached a position in its downward movement to preclude the introduction of the hands of the operator into the working field of the press or if the hands are in the working field the guard will be prevented from moving down far enough to effect the unlocking of the clutch trip.

10 For the positive and timely actuation of the several parts described there is provided a floating lever 22 attached at one end by means of a draw rod 23 with the slide bar 11 and by means of a similar draw rod 24 with the guard 16 at a point forward of its pivotal connection with the frame of the machine, and a draw rod 25 is connected at one end to the floating lever 22 and at its other end with an operating lever 26 preferably in the form of a treadle pivoted at the rear end to the supporting legs of the press and extending to the front of the press in easy reach of the operator's foot.

15 The operation of my device will be readily understood to be as follows:—The material to be operated on is introduced by hand into the holder or fixture in the die block 5 and the hands of the operator withdrawn from the working field of the press and the operating lever 26 pressed down. The floating lever 22 is drawn down and, by reason of the sliding bar 11 being locked in its upward position by the latch 12, the lever draws down the guard against the action of its spring till it entirely incloses the work field of the machine at which time the latch arm 14 is depressed and the latch 13 withdrawn from the notch in the sliding clutch bar 9 and the latter is then free and is drawn down to trip the clutch and permit the drive-pulley 7 to act on the press head 6 and cause it to perform its work on the piece in the die block 5 and while this is being done the return spring 21 will lift the guard 16 away from the work field. A release of the treadle from pressure will permit the return of the trip parts to their normal position. A spring 27 attached at one end to the frame 1 and at the other end to the arm 14 of the latch tends to throw the latch 12 into the notch in the sliding bar 11 when the parts are returned to their normal position as described above. Should the hands of the operator or any obstruction be left in the work-

ing field when the treadle lever 26 is depressed it will interfere with the downward movement of the guard 16 and the latch 12 will not be withdrawn from the notch in the trip bar 11 and the press cannot be operated until the obstruction is removed. Particular attention is called to the operation of the floating lever 22 whereby the guard is permitted to rise and clear the work field as soon as the press has been tripped, whereas, until the guard has been lowered sufficiently to insure a clear field the press cannot be tripped.

What I claim as my invention is:—

1. The combination with the driving clutch of a power press and operated by a treadle in common therewith, and a guard pivoted to swing into position to protect the operating field of the press, of a floating lever interposed between the actuating treadle and the operated parts substantially as shown.

2. The combination with a power press having a constantly moving drive pulley and a tripping clutch between said pulley and the working head of the press, of a swinging guard adapted to be moved to surround the work field of the machine, and tripping mechanism embodying a floating lever substantially as shown and connected to first positively move the guard into protecting position and then trip the clutch, all substantially as shown.

3. In a power press the combination with a latched clutch tripping rod, of a floating lever connected at one end with the clutch trip and at the other end with the swinging guard and actuated through a third and intermediate connection with an operating lever, all substantially as shown and described.

4. The combination with a latched tripping rod of a power press of a swinging guard adapted to move into and out of the working field of the press and actuated by a treadle in common with the press tripping rod, the guard adapted to release the latch of the tripping rod when the guard in its movement has reached a position to protect the working field of the press, all substantially as shown.

5. In a power press and in combination, a power driven, reciprocating, tool-carrying head provided with a tripping clutch between the power supply and the head and a latched actuating rod therefor, a swinging guard arranged to move into and out of the working field of the press, a floating lever connected at one end to the latched actuating rod of the clutch and at the other end to the swinging guard and at its central part with an operating lever, means to trip the latch on the clutch actuating rod when the guard is brought into position to guard the working field of the machine, a spring to

normally hold the power clutch open and a spring to normally hold the guard in a position to permit free access to the working field of the press, all substantially as, and for the purpose, set forth.

6. In a power press a latched connecting rod for actuating the power clutch connected to one end of a floating lever, a pivoted guard frame adapted to swing into position to guard the working field of the press against the action of a spring and connected to the other end of the floating lever, an operating lever connected to the central part of the floating lever, the several parts and points of connection so arranged that the first movement of the operating lever will cause the guard to be moved into position to guard the working field of the press and free the power clutch whereupon the latter will be operated and the guard will be allowed to return to its normal position by

reason of its spring, all substantially as shown.

7. In a power press a sliding head and a driven pulley having an intervening clutch operated by a sliding connection normally locked in open position, a swinging guard normally held withdrawn from the work field of the press and adapted, when moved into position to guard the work field of the press, to unlatch the sliding connection of the clutch, and a floating lever connected to act on both the swinging guard and the power controlling clutch, all substantially shown and described.

Signed at Bridgeport, in the county of Fairfield and State of Connecticut this day of July 12 A. D. 1912.

GEORGE P. KNAPP.

Witnesses:

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J. E. McCrady.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."