J. SCHADE, Jr.

SAFETY DEVICE.

APPLICATION FILED MAR. 27, 1914.

1,103,437.

Patented July 14, 1914.

2 SHEETS—SHEET 1.

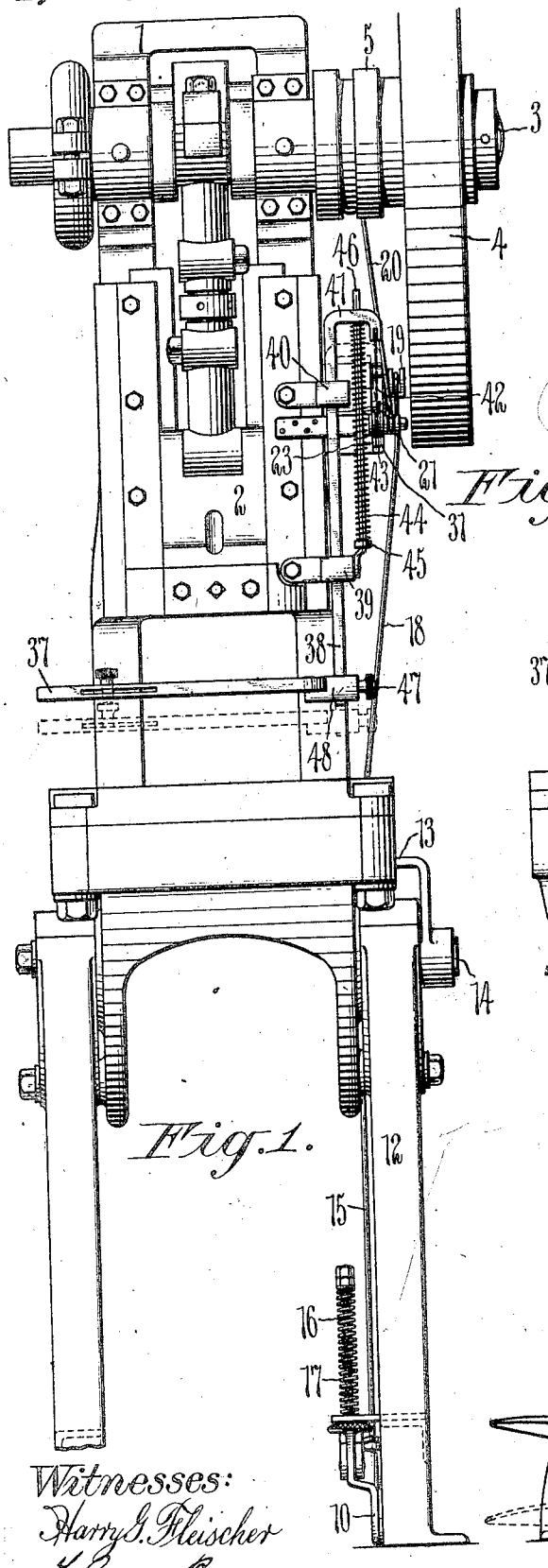


Fig. 1.

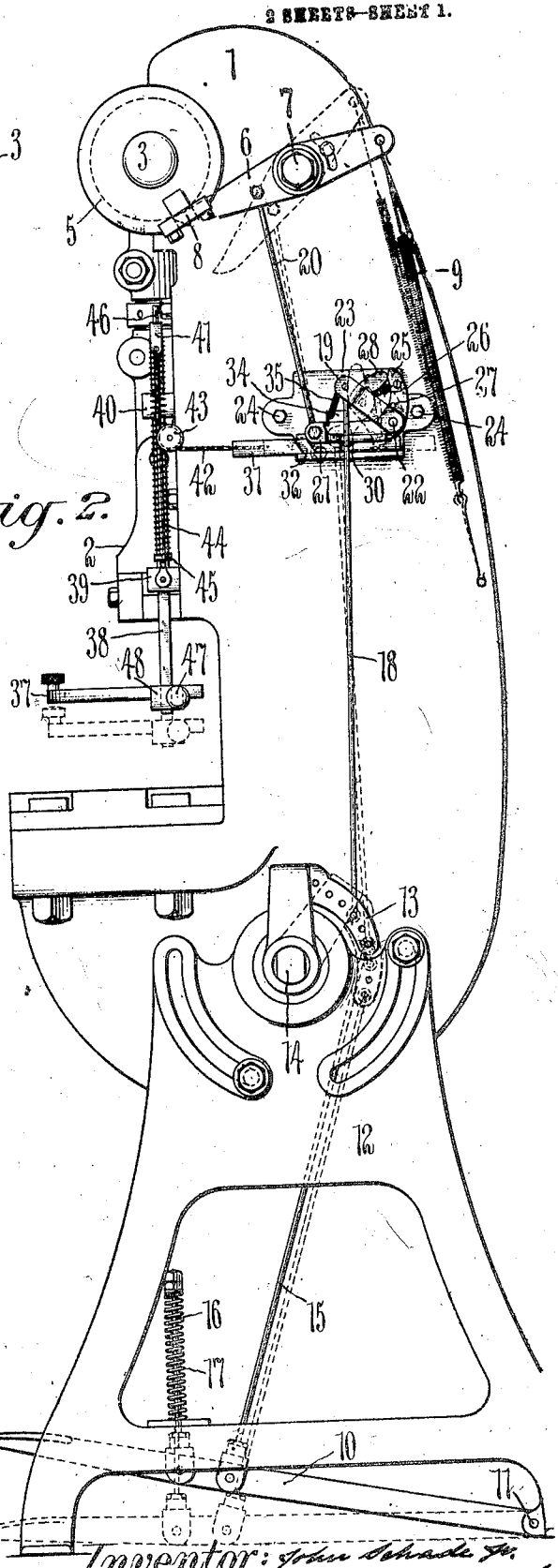


Fig. 2.

Witnesses:
Harry G. Fleischer
F. George Barry.

Inventor: John Schade Jr.
by attorneys Brownell & Reid

J. SCHADE, JR.

SAFETY DEVICE.

APPLICATION FILED MAR. 27, 1914.

1,103,437.

Patented July 14, 1914.

2 SHEETS—SHEET 2.

Fig. 3.

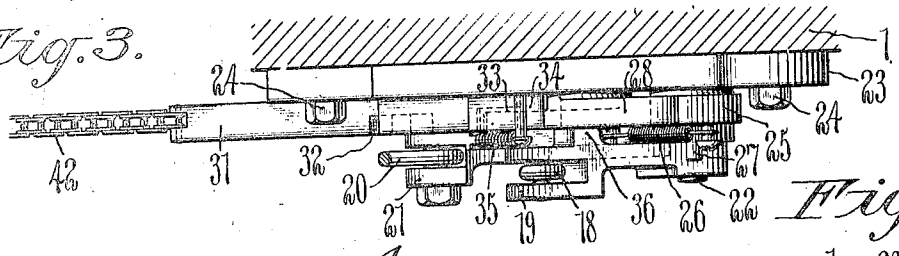


Fig. 6.

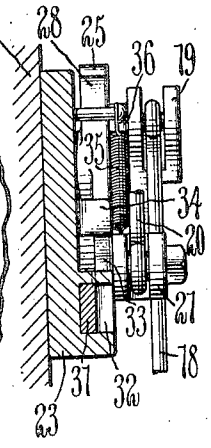


Fig. 4.

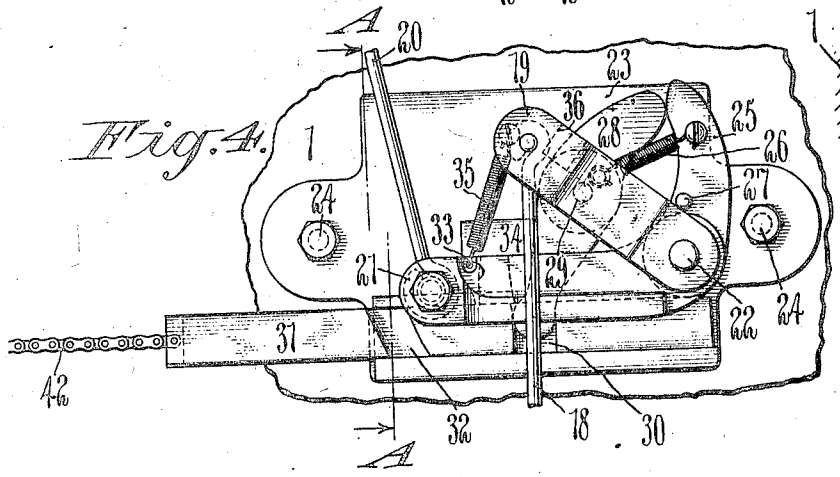


Fig. 5.

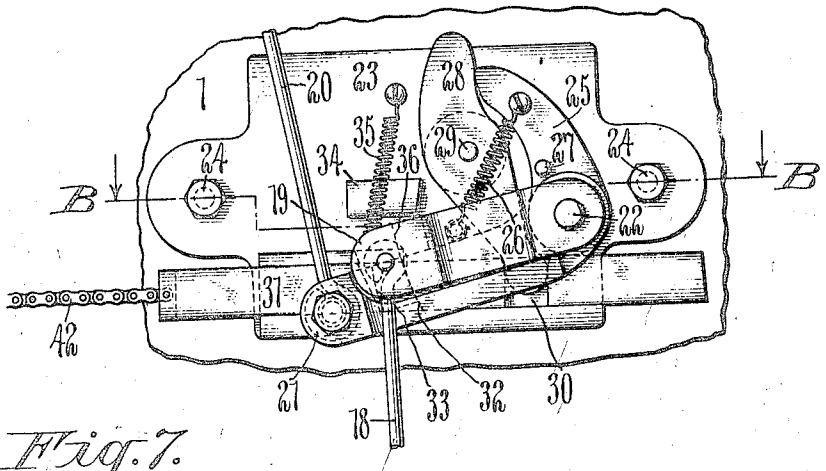
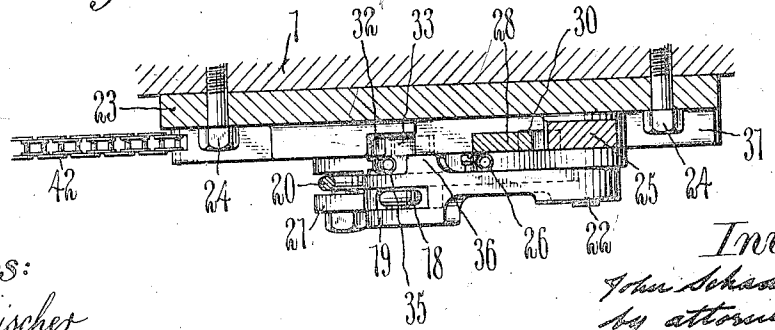


Fig. 7.



Witnesses:
Harry J. Fleischer
F. George Barry.

Inventor:
John Schade Jr.
by attorneys
Brownell and Brownell

UNITED STATES PATENT OFFICE.

JOHN SCHADE, JR., OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO ALFRED C. WESSMANN, OF NEW YORK, N. Y.

SAFETY DEVICE.

1,103,437. Specification of Letters Patent. Patented July 14, 1914.

Application filed March 27, 1914. Serial No. 827,640.

To all whom it may concern:

Be it known that I, JOHN SCHADE, JR., a citizen of the United States, and resident of the borough of Brooklyn, in the city and State of New York, have invented a new and useful Improvement in Safety Devices, of which the following is a specification.

The object of my invention is to provide a safety device for reciprocating machines, such as power presses for punching, shearing, forming, forging, etc., which will automatically control the movement of the reciprocating member, should the operator's hand be in any position within the operating field of the press, where it might be injured by the movement of the said member.

A further object is to provide a device that is economical and inexpensive in the manufacture, and one that can be readily applied to the machines now in common use, without reconstructing any of the parts thereon.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 represents a front elevation of a power press with my safety device applied thereto, Fig. 2 represents a side elevation of the same, the drive wheel being removed to show the parts more clearly, Fig. 3 represents a detail plan view of a part of my device on an enlarged scale, Fig. 4 represents a front elevation of the same showing the parts in the position which they will assume when the reciprocating member is at rest, Fig. 5 represents a view of the same showing the parts in the position which they assume when the reciprocating member is at work, Fig. 6 represents a vertical section taken in the plane of the line A—A of Fig. 4, looking in the direction of the arrows, and Fig. 7 represents a horizontal section taken in the plane of the line B—B of Fig. 5, looking in the direction of the arrows.

The power press which I have illustrated in Figs. 1 and 2 is one that is in common use and serves no purpose other than to show one form of machine to which my safety device may be applied.

This power press consists of a frame denoted by 1, a reciprocating member 2 fitted to slide therein, a drive shaft 3 mounted in the frame above the member 2, a drive wheel 4 loose on said shaft and a clutch 5 mounted on said shaft and having a clutch releasing lever 6 for locking the shaft to the drive wheel.

The clutch releasing lever 6 is pivoted to the frame at 7, and is actuated to hold the clutch slide 8 normally out of engagement with the drive wheel by means of a spring 9. The clutch releasing lever 6 is indirectly operated from a treadle 10, fulcrumed at 11 to the side frame 12, which treadle is connected to a rocking crescent 13 mounted on a stud 14 in the frame 12, by means of a rod 15.

The treadle 10 is held at the limit of its upward movement by a rod 16 connected thereto and coacting with a spring 17 mounted on the frame 12.

A rod 18 extends upwardly and connects the rocking crescent 13 with the treadle actuated lever 19 of a safety device which will be hereinafter explained. A rod 20 connects a lever 21 of the safety device to the clutch releasing lever 6. The safety device is interposed between and connected to the operating treadle and clutch releasing lever and is constructed as follows: The lever 19 to which the rod 18 is connected, is mounted on a stud 22 fixed to the base plate 23, which is secured by bolts 24 to the frame 1. A rocking toe 25 is also loosely mounted on the stud 22 and is yieldingly connected to the lever 19 by a spring 26. A stop 27 is located on the rocking toe 25 to be engaged by the lever 19 for lifting the toe to its normal position.

A two armed slide bar lever 28, mounted on a stud 29, fixed to the base plate, has its upper arm arranged to be engaged by the rocking toe 25, and its opposite arm adapted to engage a slot 30 in a horizontal bar 31, which is mounted to slide in the base plate. This slide bar 31 is further provided with a slot 32 which is adapted to receive a lug 33 fast on the locking lever 21, which is also pivoted on the stud 22, and connected to the clutch releasing lever 6 through the rod 20. This locking lever 21 is held in its normal position against a stop 34 fast on the base plate, by a spring 35.

The locking lever 21 is moved to its locking position by the engagement of the lug 36 fast on the treadle actuated lever 19, which forces the lug 33 into the slot 32 of the slide bar 31, as shown in Figs. 5 and 7.

A reciprocating guard 37 surrounds the front of the reciprocating member at the point

of its contact with the work, and is adjustably secured to the lower end of a bar 38, which is mounted to slide vertically in bearings 39, 40, fixed to the frame 1. The upper end of the said bar is turned laterally, as shown at 41, for the purpose of attaching one end of a flexible connection 42, in the present instance a chain, which passes around an idler pulley 43, the other end of which chain is connected to the slide bar 31.

The bar 38 is held at the limit of its upward movement by means of a spring 44 interposed between the laterally turned portion 41 of the bar 38 and a collar 45 fast on a rod 46, one end of which is secured to the bearing 39, and the other end passing through the portion 41.

The guard 37 may be adjusted on the bar 38 and locked thereto by means of the thumb screw 47 and clamp 48.

In operation: As the operator presses the treadle 10 down, it will carry with it the rod 15, the rocking crescent 13, the rod 18 and the treadle actuated lever 19. The lever 19 being connected to the rocking toe 25 by the spring 26 will cause the toe 25 to rock and force the two armed slide bar lever 28 forward, which, in turn, rocks on its pivot 29 and slides the slide bar 31 rearwardly, which will, through its flexible connection, pull the bar 38 and the guard 37 downwardly so as to surround the operating field of the press. The complete downward movement of the lever 19 will pull the toe 25 so that the lever 28 will push the slide bar 31 rearwardly until the slot 32 will be in register with the lug 33 on the locking lever 21 whence the lever 19, with its lug 36, will force the lever 21 and lug 33 down to the limit of its movement, as shown in Figs. 5 and 7, in which position the clutch releasing lever 6 will be removed from the clutch by the rod 20, thereby allowing the clutch slide 8 to engage the drive wheel, which will rotate the shaft and force the reciprocating member to its work, in the usual manner. Should there be any obstruction beneath the guard 37, such as the operator's hand, the guard will be held against completing its downward movement which will prevent the slide bar 31 from moving rearwardly its full stroke, so that the slot 32 will not register with the lug 33 on the lever 21 and the lever 19 will continue in its downward movement until its lug 36 strikes the lever 21, which, with its lug 33 resting on top of the slide bar 31, will hold the lever 19 until the obstacle is removed or until the pressure is removed from the treadle. It will be seen that if the slide bar cannot travel rearwardly its full stroke, the lever 28 and toe 25 will hold the same position, while the lever 19 still travels downwardly to the limit of its movement, thereby putting the spring 26 to its tension. The tension of this spring 26 is all that the operator will feel if caught under the guard 37. It is necessary that the guard must travel down to within a distance of the work where it is impossible to get the operator's hand or finger beneath the reciprocating member, before the clutch releasing lever 6 is withdrawn.

While I have shown a reciprocating guard 37 in the form of a bar, it will be understood that any form of shield might be fixed thereto, according to the protection desired to cover the operating field of the press.

It is evident that slight changes might be resorted to in the form, construction and arrangement of the several parts without departing from the spirit and scope of my invention; hence I do not wish to limit myself strictly to the structure herein set forth, but

What I claim is:

1. The combination with the clutch of a power press and an operating treadle therefor, and a clutch releasing lever, of a reciprocating guard adapted to be moved by the treadle into position to protect the operating field of the press, and means interposed between said treadle and lever, comprising a slide bar flexibly connected to said guard, a lever engaging said bar, a rocking toe engaging said lever, a treadle actuated lever having a yielding connection with said toe, a locking lever connected to said releasing lever coacting with the treadle actuated lever, whereby the complete downward movement of the guard will permit the treadle to actuate the clutch.

2. The combination with the clutch of a power press and an operating treadle therefor, and a clutch releasing lever, of a reciprocating guard adapted to be moved by the treadle into position to protect the operating field of the press, and means interposed between said treadle and lever, comprising a slide bar having a recess therein and flexibly connected to said guard, a lever engaging said bar, a rocking toe engaging said lever, a treadle actuated lever having a yielding connection with said toe, a locking lever provided with a lug arranged to enter said recess in the slide bar for locking the same, said locking lever being connected to said releasing lever and coacting with the treadle actuated lever, whereby the complete downward movement of the guard will permit the treadle to actuate the clutch.

3. The combination with the clutch of a power press, and an operating treadle therefor, and a clutch releasing lever, of a vertically reciprocating bar mounted on the press, a guard adjustably secured thereto, and means interposed between the treadle and lever under the control of the treadle for moving the reciprocating bar with its guard into position to protect the operating field of the press, said means comprising a slide bar having a recess therein and flexibly con-

nected to said reciprocating bar, a lever engaging said slide bar, a rocking toe engaging said lever, a treadle actuated lever having a yielding connection with said toe, a locking lever provided with a lug arranged to enter said recess in the slide bar for locking the same, said locking lever being connected to said releasing lever and coacting with the treadle actuated lever, whereby the complete downward movement of the guard and bar will permit the treadle to actuate the clutch.

4. The combination with the clutch of a power press, and an operating treadle therefor, and a clutch releasing lever, of a vertically reciprocating bar mounted on the press, a guard adjustably secured thereto, and means interposed between the treadle and lever under the control of the treadle for moving the reciprocating bar with its guard into position to protect the operating field of the press, said means comprising a slide bar having a recess therein and flexibly connected to said reciprocating bar, a lever engaging said slide bar, a spring for returning the guard, reciprocating bar, the slide bar and the lever to their normal positions, a rocking toe engaging said lever, a treadle actuated lever having a yielding connection with said toe, a locking lever provided with a lug arranged to enter said recess in the slide bar for locking the same, said locking lever being connected to said releasing lever, and coacting with the treadle actuated lever, whereby the complete downward movement of the guard and bar will permit the treadle to actuate the clutch.

5. The combination with the clutch of a power press, and an operating treadle therefor, and a clutch releasing lever, of a vertically reciprocating bar mounted on the press, a guard adjustably secured thereto, and means interposed between the treadle and lever under the control of the treadle for moving the reciprocating bar with its guard into position to protect the operating field of the press, said means comprising a slide bar having a recess therein and flexibly connected to said reciprocating bar, a lever engaging said slide bar, a spring for returning the guard, reciprocating bar, the slide bar and the lever to their normal positions, a rocking toe engaging said lever, a treadle actuated lever having a yielding connection with said toe, a locking lever provided with a lug arranged to enter said recess in the slide bar for locking the same, a stop for limiting the upward movement of the locking lever, a spring for drawing said lever to said stop, said locking lever being connected to said releasing lever, and coacting with the treadle actuated lever, whereby the complete downward movement of the guard and bar will permit the treadle to actuate the clutch.

6. The combination with the clutch of a power press, and an operating treadle therefor, and a clutch releasing lever, of a vertically reciprocating bar mounted on the press, a guard adjustably secured thereto, and means interposed between the treadle and lever under the control of the treadle for moving the reciprocating bar with its guard into position to protect the operating field of the press, said means comprising a slide bar having a recess therein and flexibly connected to said reciprocating bar, a lever engaging said slide bar, a spring for returning the guard, reciprocating bar, the slide bar and the lever to their normal positions, a rocking toe engaging said lever, a treadle actuated lever having a yielding connection with said toe, a locking lever provided with a lug arranged to enter said recess in the slide bar for locking the same, a stop for limiting the upward movement of the locking lever, a spring for drawing said lever to said stop, said locking lever being connected to said releasing lever, said treadle actuated lever being provided with a lug for engaging said locking lever to move it into locking engagement with the slide bar, whereby the complete downward movement of the gaurd and bar will permit the treadle to actuate the clutch.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this sixteenth day of March 1914.

JOHN SCHADE, JR.

Witnesses:

F. GEORGE BARRY,

C. S. SUNDGREN.