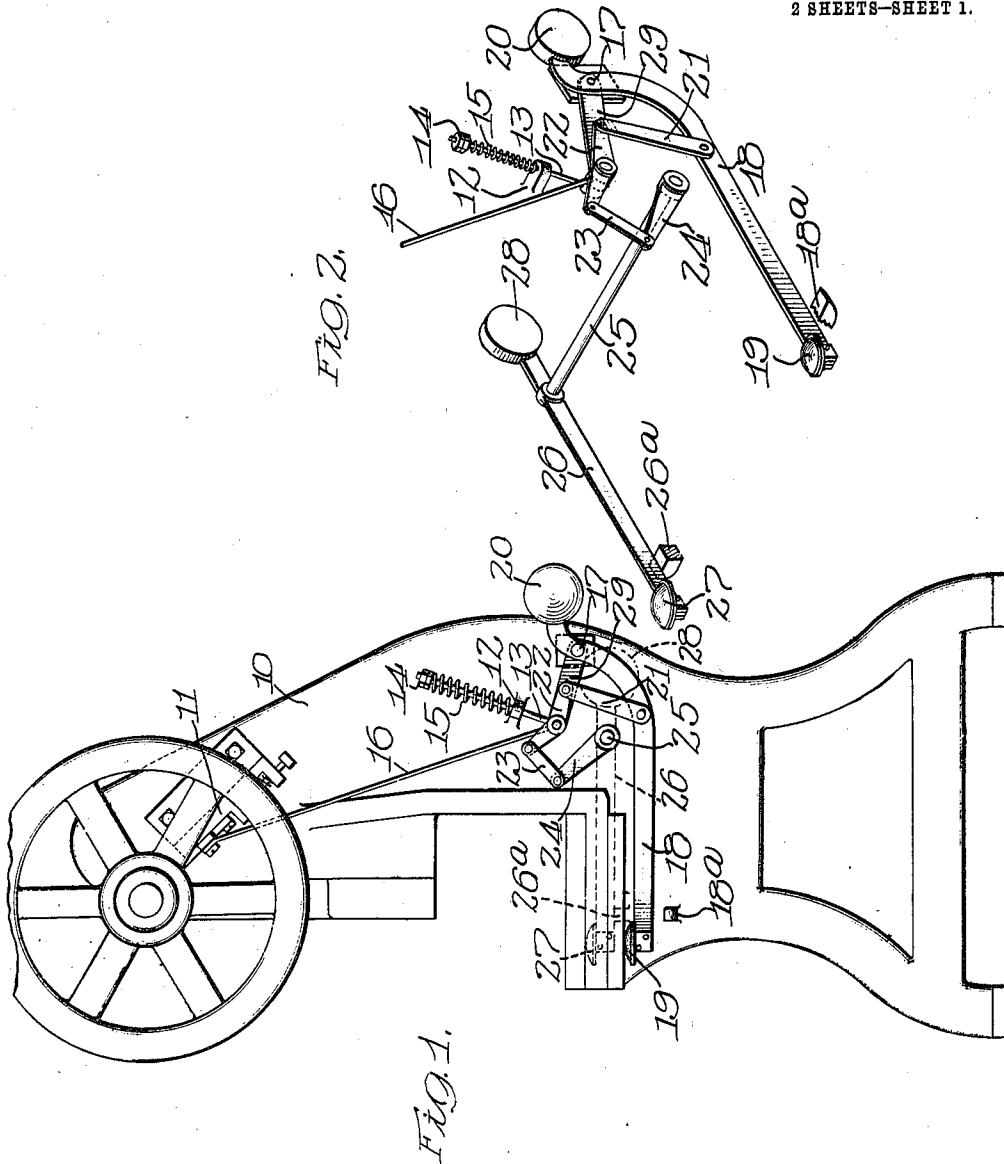


R. B. BENJAMIN.
SAFETY MANIPULATING DEVICE FOR MACHINERY.
APPLICATION FILED MAR. 1, 1912.

1,046,374.

Patented Dec. 3, 1912.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 3.

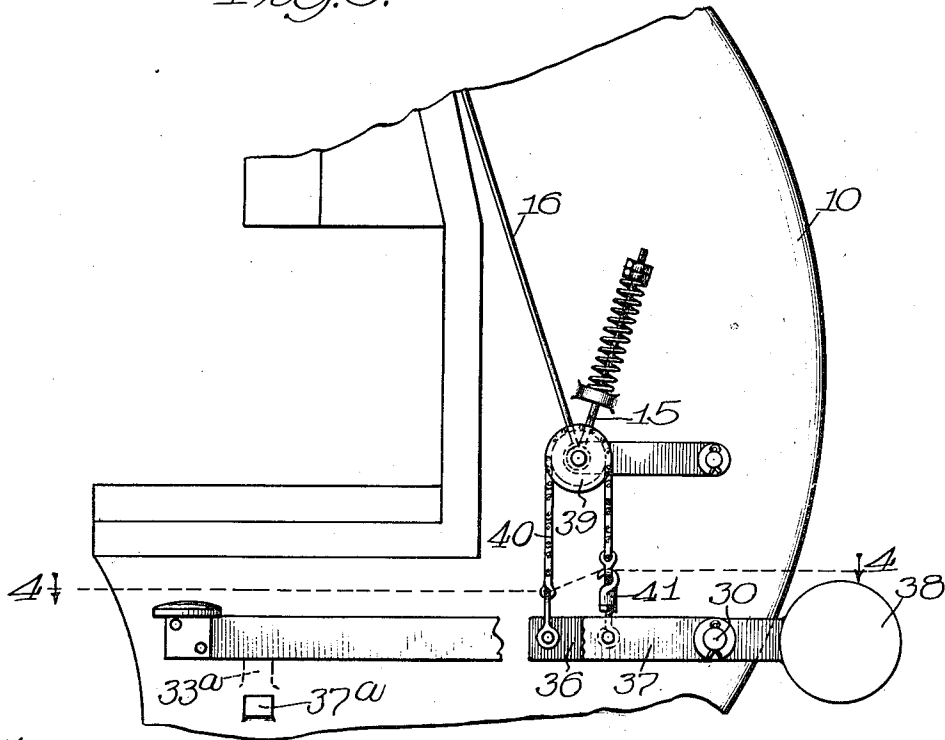
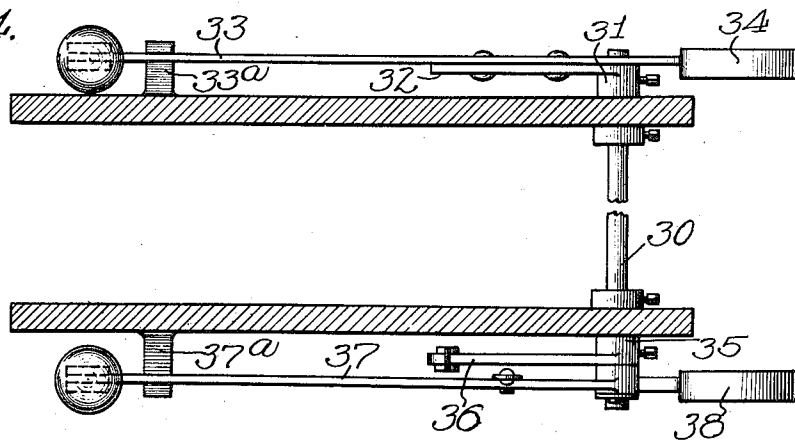


Fig. 4.



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UNITED STATES PATENT OFFICE.

REUBEN B. BENJAMIN, OF CHICAGO, ILLINOIS.

SAFETY MANIPULATING DEVICE FOR MACHINERY.

1,046,374.

Specification of Letters Patent.

Patented Dec. 3, 1912.

Application filed March 1, 1912. Serial No. 681,004.

To all whom it may concern:

Be it known that I, REUBEN B. BENJAMIN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Safety Manipulating Devices for Machinery, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention pertains to safety manipulating devices for machinery; that is to devices for insuring safety of the operator in running machines which have to be intermittently operated, as, for instance, in the case of punch presses. Various mechanisms have been from time to time devised with this end in view; for instance, in the case of punch presses, it has been proposed to provide a mechanically or magnetically-released latch which normally prevents movement of a lever for operating the machine, such latch being disposed so as to require the use of the other hand of the operator to effect its release; and, in my co-pending application Serial No. 657,330, filed October 28th, 1911, I have described an electromagnetic mechanism, in which the operating lever may normally be moved without affecting the machine, but may be made operative by means of an electromagnetic device which requires the use of the other hand of the operator before it can be energized. Devices of this general character enhance the safety of the operator, for the reason that they require the use of both his hands, and thus tend to prevent accidents, such, for instance, as have frequently occurred in the use of punch presses by reason of the operator failing to remove his hands from beneath the punch before the latter has descended.

It is the principal object of the present invention to produce a safety manipulating device of the general character denoted above, which may be used with ease and comfort, and which will be of a simple, efficient and durable construction.

Two constructions of safety manipulating device made in accordance with my invention are shown in the accompanying drawings, in which:

Figure 1 is a side view of a punch press provided with a safety manipulating device

constructed in accordance with my invention; Fig. 2 is a perspective view of the manipulating device separated from the remainder of the device; Fig. 3 is a side view of a punch press provided with another form of safety manipulating device constructed in accordance with my invention; and Fig. 4 is a section on the line 4-4 of Fig. 3 looking in the direction of the arrows.

Referring now to Figs. 1 and 2 of the drawings, 10 indicates the frame of a punch press, 11 indicating the trip mechanism by means of which the clutch between the punch and the source of power is thrown into driving connection. The trip mechanism may be of any of the well known constructions, and description of it is not, therefore, required here.

Slidably mounted in a lug 12 formed upon the press frame 10, is a stem 13, bearing, at its upper end, nuts or the like 14, between which, and the lug 12, is interposed a compression spring 15. A rod 16 is connected between the lower end of the stem 13 and the clutch trip mechanism 11; so that when the stem 13 is moved downward, the trip is released and the driving clutch connection thereby made. When the stem 13 is released, after being depressed, the spring 15 returns to its original position.

The mechanism above described is similar to well known mechanisms employed for the same purpose, and does not, in itself, form any part of my invention. The embodiment of my invention herein set forth, consisting of a safety device for manipulating the clutch trip, coöperates with the stem 13 and rod 16. This device will now be described.

Extending laterally from one side of the press frame 10, is a pin 17, upon which is rockably mounted an actuating lever 18, having at its front end a handle 19, and at its rear end a counterweight 20. An equalizing member is connected to the actuating lever 18 by means of a link 21. The equalizing member consists, in the present modification, of a beam 22, which is rockably secured intermediate its ends to the lower end of the stem 13. To the opposite end of the beam 22 is connected, by means of a link 23, a crank arm 24, carried by a shaft 25, which passes laterally through the press frame 10. To the opposite end of the shaft 25—i. e., to the end on the side of the press

remote from the actuating lever 18—is secured a second actuating lever 26 having, at its front end, a handle 27, and, at its rear end, a counterweight 28. A spacing member 29 is connected between the part of the stem 13 upon which the beam 22 is mounted, and the pin 17.

The operation of the device is as follows: When it is desired to operate the clutch trip, both of the hand levers are depressed, the result being that a downward pressure is exerted upon each end of the beam 22. The effect of this downward pressure is to pull the stem 13 downward against the action of the spring 15, the stem 13 carrying with it the rod 16, and the clutch trip being thereby operated. It will be seen that, in order that this operation may be effected, it is necessary that one hand of the operator be on each of the actuating levers 18 and 26. The operator's hands are, therefore, necessarily out of danger when the punch descends. The operation of either of the actuating levers alone will not have the effect of actuating the clutch trip. For instance, if the actuating lever 18 be depressed alone, the downward pressure thereby imparted to the right hand end of the beam 22 will merely result in the beam rocking about its pivot, the right hand end descending and the left hand end rising and causing the lifting of the hand lever 26. Precisely the opposite result occurs when the actuating lever 26 is operated alone, the actuating lever 18 rising, and the clutch trip remaining unaffected. The effect of operating either of the hand levers alone is only, therefore, that the other hand lever rises, the clutch trip remaining unactuated. If, however, one of the actuating levers is operated, thereby causing the rising of the other actuating member, and is then held down while the other actuating lever is depressed, the clutch trip will be operated, the beam 22 being, under such circumstances, unable to rock about its pivot.

In the construction shown, I have provided stops 18^a and 26^a, which limit the downward movement of the levers 18 and 26, respectively. The balance weights 20 and 28 may be such that the levers 18 and 26 will lie at equal distances above their stops, or, as shown in the drawing, the arrangement may be such that the lever 26 normally rests upon its stop 26^a, while the lever 18 is disposed considerably above its stop 18^a. It will be seen that the arrangement of the stops shown in the drawing makes no difference in the operation of the mechanism; since, before the clutch trip could be actuated it would be necessary to hold the lever 26 down upon its stop 26^a with one hand while depressing the lever 18 upon its stop 18^a with the other hand.

Safety manipulating devices constructed

in accordance with the present invention, have the advantage that they may be used with ease and comfort. It is necessary, of course, that both the lever 26 and the lever 18 be depressed before the clutch trip will be actuated; but it is immaterial whether one or the other of the levers 26 and 18 are depressed first, or whether both are depressed together. In all circumstances, the levers will work easily and smoothly; and there is no chance of either of them descending with an objectionable suddenness as would be the case with a mechanism in which a stop might be withdrawn. The principle employed is such that the device may be of a very simple and strong construction; and there is little or no chance of the device becoming out of order in the course of use.

In the modification of my invention shown in Figs. 3 and 4, I provide a horizontal shaft 30 rockably mounted in the press frame 10. Secured to one end of the shaft 30, is a collar 31, formed with an outwardly extending arm 32 to which is secured, as by rivets or the like, an actuating lever 33, having a counterweight 34. To the other end of the shaft 30 is secured a collar 35 having an arm 36 similar to the arm 32 of the collar 31. Rockably mounted on the shaft 30, adjacent to the collar 35, is an actuating lever 37 provided with a counterweight 38. It will be seen from the above that movement imparted to the actuating lever 33 will result in a rocking of the shaft 30, while the actuating lever 37 may be moved independently of the shaft 30. The equalizing member, in this modification, consists of a pulley and chain. A small pulley wheel 39 is mounted upon the end of a member 15, which is similar to the member 15 described in the modification referred to above. Over this pulley wheel, passes a chain or other flexible member 40, one end of which is secured to the arm 36, and the other end of which is secured to the actuating lever 37. A tension-adjusting device 41 is provided, for adjusting the length of the chain as may be desired. Stops 33^a and 37^a are provided, similar to the stops 18^a and 26^a which are provided in the modification referred to above.

It will be seen that the modification last referred to has a similar effect to that of the modification shown in Figs. 1 and 2. Supposing that the actuating lever 37 be depressed, without the other hand being first employed to hold the actuating lever 33 down, the result would merely be that the force exerted upon the actuating lever 37, would be transmitted, by the chain 40, to the arm 36. The result of depressing the actuating lever 37 would therefore be that the actuating lever 33 would rise, just as was the case with the levers 18 and 26 in the modi-

fication shown in Figs. 1 and 2. In this construction, also, therefore, one hand must be used to hold down the actuating lever 33, and the other hand used to depress the actuating lever 37, before the clutch can be tripped.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A safety manipulating device for machinery comprising a movable part, adapted, when moved, to perform the desired operation with respect to the machinery, an actuating member for said movable part, a movable member adapted to be manually held against movement, said movable member having a portion thereof positioned apart from said actuating member, and means for connecting said actuating member with said movable member through the intermediary of said movable part, whereby when said actuating member is moved without said movable member being held against movement, a movement of said movable member will be effected without said movable part being affected, but when said actuating member is moved while said movable member is held against movement, said movable part will be moved; for the purposes set forth.
2. A safety manipulating device for machinery comprising a movable part, adapted, when moved, to perform the desired operation with respect to the machinery, an equalizing member cooperating with said movable part, an actuating member for said movable part, said actuating member being connected with said equalizing member, a movable member connected with said equalizing member, said movable member being adapted to be manually held against movement and having a portion thereof positioned apart from said actuating member, whereby when said actuating member is moved without said movable member being held against movement, a movement of said movable member will be effected without said movable part being affected, but when said actuating member is moved while said movable member is held against movement, said movable part will be moved, for the purposes set forth.
3. A safety manipulating device for machinery comprising a movable part, adapted, when moved, to perform the desired operation with respect to the machinery, an equalizing member cooperating with said movable part and pivotally mounted with respect thereto, a movable member cooperating with said equalizing member, a second movable member cooperating with said equalizing member, whereby force applied to either of said movable members alone merely effects a movement of the other member without affecting said movable part, and whereby force applied to both of said

movable members effects a movement of said movable part, portions of said movable members being positioned apart from each other, for the purposes set forth.

4. A safety manipulating device for machinery comprising a movable part, adapted, when moved, to perform the desired operation with respect to the machinery, a beam cooperating with said movable part and pivotally mounted with respect thereto, a movable actuating member cooperating with said beam so as to rock said beam in one direction when said actuating member is operated, a second actuating member cooperating with said beam so as to rock the same in the opposite direction when said second named actuating member is operated, whereby said movable part is moved when both of said actuating members are operated, but not when either of said actuating members is operated alone, portions of said actuating members being positioned apart from each other, for the purposes set forth.

5. A safety manipulating device for punch presses or the like, comprising a movable part, adapted, when moved, to effect an operation of the press, a beam cooperating with said movable part and pivotally mounted with respect thereto, a movable actuating lever rockably mounted at one side of the press, and cooperating with said beam so as to rock the latter in one direction when the lever is rocked, a movable actuating lever upon the opposite side of the machine to said first named actuating lever, a movable member cooperating with said beam, so as to rock the latter in the opposite direction when said movable member is moved, and means for connecting said movable member with said second named actuating lever, whereby said movable part is moved when both of said actuating levers are operated, but not when either of said actuating members is operated alone, for the purposes set forth.

6. A safety manipulating device for machinery comprising a movable part, adapted, when moved, to perform the desired operation with respect to the machinery, a beam pivotally connected with said movable part, a movable actuating member cooperating with said beam so as to depress one end thereof when said actuating member is operated, a shaft, a crank carried by said shaft and arranged to cooperate with said beam so as to depress the opposite end thereof when said shaft is rocked, and means for rocking said shaft, whereby said movable member is moved when said actuating member is operated and said shaft is rocked, but not when said actuating member is operated without said shaft being rocked, or vice versa, for the purposes set forth.

7. The combination with a machine, of a safety manipulating device therefor, com-

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prising a movable part, adapted, when moved, to perform the desired operation with respect to the machine, a beam pivotally connected with said movable part, a lever rockably mounted upon said machine, a link for connecting said lever with one end of said beam, a shaft rockably mounted upon said machine, a crank arm secured to said shaft, a link for connecting said crank arm with the other end of said beam, and a lever connected with said shaft, for the purposes set forth.

8. A safety clutch tripping device for punch presses comprising a movable part, adapted, when moved, to trip the clutch of the press, a hand lever located at one side of the press, a movable member adapted to be manually held against movement, said movable member being disposed at the other side of the press, and means for connecting said hand lever with said movable member through the intermediary of said movable part, whereby when said hand lever is moved without said movable member being held against movement, a movement of said movable member will be effected without said movable part being affected, but when said hand lever is moved while said movable member is held against movement, said mov-

able part will be moved, for the purposes set forth.

9. A safety clutch tripping device for punch presses comprising a movable part, adapted, when moved, to trip the clutch of the press, an equalizing member cooperating with said movable part, a hand lever located at one side of the press, for actuating said movable part, said hand lever being connected with said equalizing member, a movable member, located at the other side of the press, connected with said equalizing member, said movable member being adapted to be manually held against movement, whereby when said hand lever is moved without said movable member being held against movement, a movement of said movable member will be effected without said movable part being affected, but when said hand lever is moved while said movable member is held against movement, said movable part will be moved, for the purposes set forth.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

REUBEN B. BENJAMIN.

Witnesses:

MABEL REYNOLDS,

C. E. KANE.