

APPLICATION FILED MAY 13, 1911.

2 SHEETS—SHEET 1.



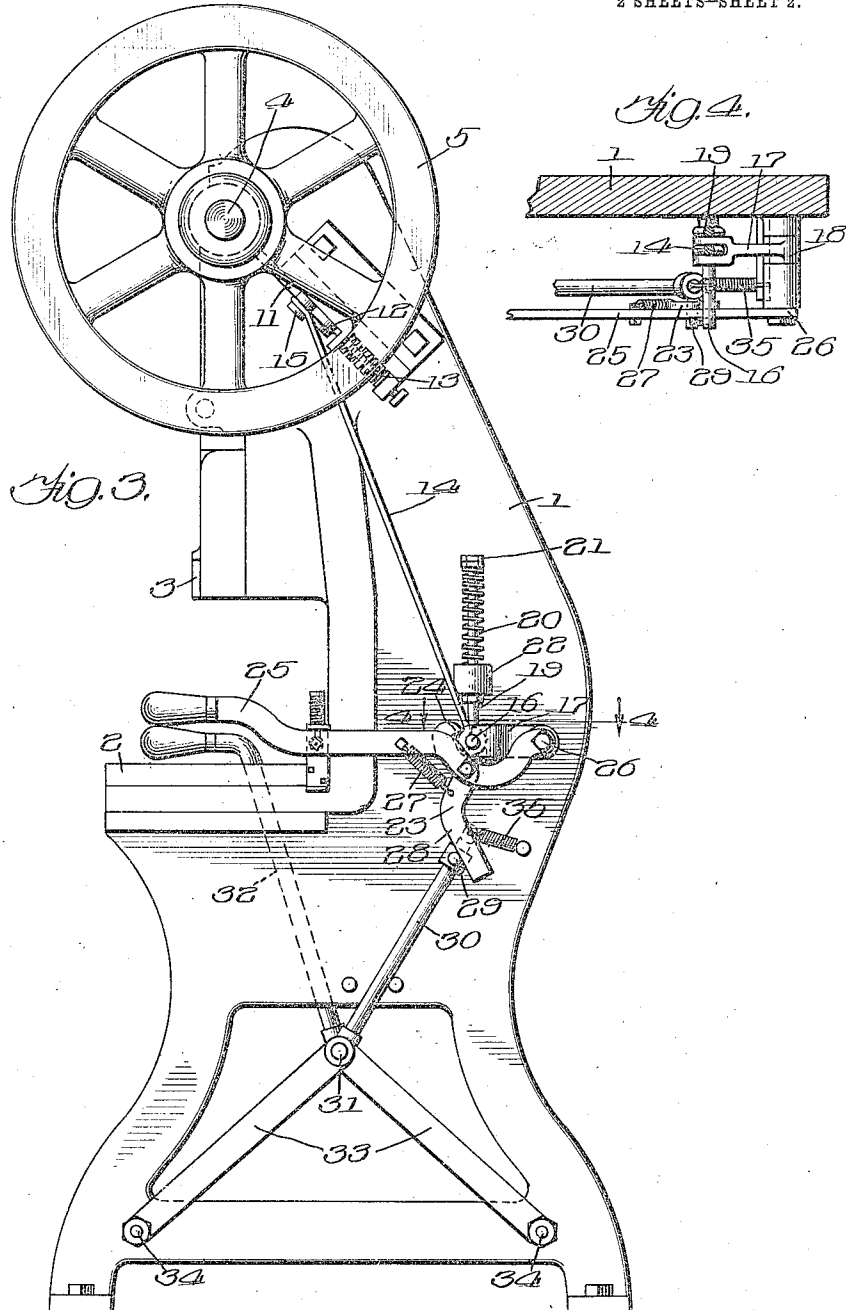
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SAFETY MANIPULATING DEVICE.
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1,046,378.

Patented Dec. 3, 1912.
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UNITED STATES PATENT OFFICE.

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SAFETY MANIPULATING DEVICE.

1,046,378.

Specification of Letters Patent.

Patented Dec. 3, 1912.

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To all whom it may concern:

Be it known that I, WILLIAM COTTRELL, 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, 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 whereby machinery may be set in motion, or otherwise manipulated, with safety to the operator.

In the use of machinery—punch presses, for example—it has been found in the past that accidents would frequently occur owing to the operator failing to remove his hand or hands from beneath the punch before the descent of the latter; and various safety devices have been proposed for preventing accidents of this character. For instance, in punch presses, it has been proposed to provide a releasable latch, which coöperates with a hand lever for starting the punch press and prevents the hand lever from being operated until the latch has been released, the construction being such that the other hand of the operator must be employed in order to release the latch. Both hands of the operator being thus employed, it is impossible for either of them to be in a dangerous position when the punch descends.

It is the principal object of my invention to produce a safety manipulating device for machinery which will be still safer than those heretofore proposed; and it is a further object to improve upon safety manipulating devices, by rendering them simpler and more certain in their operation.

An embodiment of my invention, as applied to a punch press, is shown by way of example, in the accompanying drawing, and described in the following specification. I wish it to be understood, however, that the embodiment shown and described,

is only one of many forms which my invention may take, and that changes may be made in the embodiment shown, within the scope of my invention as defined in the appended claims.

In the drawings: Figure 1 is a front elevation of a die press having one embodiment of my invention attached thereto for starting the press; Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1; Fig. 3 is a side elevation of the die press illustrated in Fig. 1; and Fig. 4 is a sectional view taken on the line 4—4 of Fig. 3.

Referring now to the structure shown in the drawings, the machine 1 illustrated therein is a stamping press of the kind which is adapted to run "open," if desired, after having once been tripped. This press has the usual frame-work carrying the table 2, over which operates the usual punch carrying member 3, this member being reciprocated by an eccentric or crank on the driving shaft 4 of the press. The shaft 4 is driven from a pulley wheel 5 which is loosely mounted on the shaft and adapted to run free thereon except during the intervals when it is connected to the shaft by the clutching mechanism. The clutching mechanism for connecting the pulley to the shaft may be of any construction at present used in presses of this character, and in the present instance consists of a rotatable key 6 (Fig. 2) mounted in a suitable slot in the shaft 4 and adapted when rotated to engage in slots or openings 7 formed in the hub of the pulley 5. The key is given a half revolution by a coiled spring 8 abutting at one end against a stop 9 carried on a collar on the shaft and at the other end against the lower end of an arm 10 integrally formed with the key. When the pulley is running free the arm 10 is held against movement under the influence of the spring 8 by a tripping stop 11 pivoted at 12 to the frame of the machine and held in the path of the arm 10 by a coiled spring 13. This tripping stop is moved out of the path of the arm 10 to permit the same to trip the clutch, by

the movement of a rod 14 connected to the stop at 15. The mechanism thus far described is the ordinary form of tripping mechanism at present used on various types of die presses.

Heretofore the rod 14 has usually been operated by means of a foot lever mounted on the machine, the result being that frequently the operator depresses the lever by his foot during the time that he is inserting or removing the material to be operated on in the press. Frequently his hands or fingers are not removed from the path of the descending punch quickly enough and the punch catches them, either mutilating or cutting the fingers off. In order to prevent such accidents, I provide a safety device for manipulating the tripping mechanism which is so constructed that both hands of the operator must be used, thereby keeping them out of the path of the punch when it is moving. The rod 14 is connected at its lower end with a catch pin 16 mounted on a lever 17 pivoted at 18 to the side frame. This pin 16 is held in its normal or raised position by a rod 19 passing through a coiled spring 20 and having on its end a stop or collar 21 bearing on the upper end of the spring, the lower end of the spring being adapted to bear on a lug or abutment 22 extending from the side frame of the machine. For pulling the catch 16 downwardly and thereby moving with it the rod 14 I provide a trigger 23 having a shoulder 24 adapted to engage over the finger 16. This trigger is pivoted to an operating lever 25, which, in turn, is pivotally mounted at 26 on the side frame of the press and is provided with a handle to be pressed by the operator. The trigger is pulled into position to engage the catch 16 by a coiled spring 27, one end of which is attached to the lever 25 and the other end of which is attached to the trigger. The lower end of the trigger 23 is extended to form a cam surface 28 which bears upon a stop or cam member 29 extending from the arm 30.

The arm 30 is mounted upon a transversely extending rod or shaft 31 which extends through the lower portion of the frame of the machine and has on its opposite end an operating lever 32 provided with a handle. It will be noted that this lever 32 is on the side of the machine opposite the lever 25 and is so positioned that both levers cannot be operated by the same hand of the operator. Suitable supports are provided for the shaft 31 in the form of braces 33 attached to the cross bracing rods 34 of the machine. The cam or stop member 29 is held in normal position or in position to be engaged by the cam surface 28 by a coiled spring 35, one end of which is attached to the end of the arm 30 and the other end of

which is attached to the side frame of the machine.

Due to the fact that the stop or cam member 29 is in the path of the cam surface 28 of the trigger, if the lever 25 is depressed to trip the press the cam surface 28 will ride on the stop or cam member 29 and throw the shoulder 24 out of engaging position for the catch 16, so that the operation of the tripping mechanism must be as follows: The lever 32 is first depressed. This rotates the shaft 31 and, moving the arm 30 laterally, throws the stop 29 out of the path of the cam surface 28. The spring 27 will then tend to hold the trigger 23 in a position to engage the catch 16, and when the lever 25 is depressed the shoulder 24 will engage over the catch 16, depressing the catch and thus throwing the tripping stop 11 out of the path of the arm 10, so that the press will be tripped and caused to operate. The shoulder 24 is so inclined that it will readily slip off the catch 16 and when the catch reaches the lowermost limit of its movement the stopping of the movement of this catch will cause the trigger 23 to disengage the finger, thereby permitting it to fly back so that the stop 11 will be in the path of the arm 10 to disengage the pulley from the shaft when one revolution of the shaft is made. In order that the downward movement of the lever 25 will not tend to throw the arm 24 when this lever alone is moved, the coiled spring 35 is in practice made stronger than the spring 27. Attention is called to the fact that the levers 25 and 32 are disposed on opposite sides of the machine and are therefore so positioned that they cannot be moved by the same hand of the operator.

One of the important features of my invention is that the actuating member for the clutch trip—in the structure herein described, the lever 25—normally may be freely moved without affecting the clutch trip. It is only when an operative connection has been established between the actuating member and the clutch trip, that movement of such actuating member operates the clutch trip. The effect of this is that, should the means for establishing such connection become damaged, the press could not be worked until the damage was repaired. This is a considerable advantage over older forms of safety manipulating devices, such, for instance, as those in which a latch is placed in the path of the operating lever, which latch must be removed with one hand before the lever can be operated with the other hand. In these older forms of safety manipulating devices, if the latch—sometimes merely a light magnet armature—should become broken or out of position, the press could still be operated, with rather

more ease than before, the safety device being, however, out of commission. In such circumstances, an operator who preferred the easier operation to his own safety, might
 5 continue to operate the machine without the safety device. My invention renders this impossible, making necessary, as it does, the repair of any damage which may have occurred to the safety device, before the machine can be operated again.

Another important feature of my invention consists in the fact that the clutch trip cannot be held in its tripping position with one hand, after having once been moved into
 15 such tripping position by the use of both hands. In safety manipulating devices, as heretofore proposed, in which the latch was moved out of the path of the clutch trip actuating member, it was possible for the
 20 operator to release said latch with, say, his left hand, operate the clutch trip actuating member with his right hand, and then continue feeding the material to the machine while holding the clutch trip actuating
 25 member down with the right hand. In other words, two hands were necessary to start the machine, but one hand was only necessary in order to hold the clutch in operative position; and a careless operator
 30 might, therefore, endanger his safety, by feeding the material to the continuously running machine with his left hand, while holding the clutch in operative position with his right hand. My invention renders
 35 this manner of operating the machine impossible; since, if the lever 32 is released, the spring 35 will pull the abutment 29 against the latch 23, thus releasing the connection between the hand lever 25 and the
 40 trip mechanism and causing the clutch to be thrown out.

Besides the advantages noted above, the safety manipulating device described has the further advantage that it may be connected with any machine without modifying
 45 or changing the same to any material extent.

While I have shown and described one embodiment of my invention, I wish it understood that the invention may be embodied in various other constructions, and that changes may be made in the particular construction shown, without exceeding the scope of the invention, what I claim being:

1. A safety manipulating device for machinery comprising a movable part, adapted, when moved, to perform the desired operation with respect to the machinery, a movable member adapted to actuate said movable part when operatively connected therewith, but normally disconnected therefrom
 55 and movable independently thereof, and a hand-operated device for establishing an operative connection between said actuating member and said movable part to enable

said member to actuate said movable part, 65 a portion of said device being placed apart from said actuating member, for the purposes set forth.

2. A safety manipulating device for machinery comprising a movable part, adapted, 70 when moved, to perform the desired operation with respect to the machinery, a movable member adapted to actuate said movable part when operatively connected therewith, but normally disconnected therefrom 75 and movable independently thereof, a hand-operated device for establishing an operative connection between said actuating member and said movable part, to enable said member to actuate said movable part, said 80 device being placed apart from said actuating member, and means for effecting the disconnection of said actuating member from said movable part, as soon as said device is released, for the purposes set forth. 85

3. A safety manipulating device for machinery comprising a movable part, adapted, when moved, to perform the desired operation with respect to the machinery, a rockable lever, a latch cooperating with said 90 rockable lever and adapted to connect operatively said lever with said movable part, said latch being normally out of connecting position, and a hand-operated device adapted, when operated, to cause said latch to 95 connect said lever with said movable part, a portion of said device being placed apart from said lever, for the purposes set forth.

4. A safety manipulating device for machinery comprising a movable part, adapted, 100 when moved, to perform the desired operation with respect to the machinery, a rockable lever, a latch cooperating with said rockable lever and adapted to connect operatively said lever with said movable part, 105 and a hand-operated device for normally preventing said latch from making operative connection between said lever and said movable part, but adapted, when operated to permit said latch to make such operative 110 connection, a portion of said device being placed apart from said lever, for the purposes set forth.

5. A safety manipulating device for machinery comprising a movable part, adapted, 115 when moved, to perform the desired operation with respect to the machinery, a rockable lever, a latch cooperating with said rockable lever and adapted to connect operatively said lever with said movable 120 part, a hand-operated device for normally preventing said latch from making operative connection between said lever and said movable part, but adapted, when operated, to permit said latch to make such operative 125 connection, a portion of said device being placed apart from said lever, and means causing said latch to release said lever from

said movable part upon said device being released, 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 rockable lever for actuating said movable part, a latch pivoted upon said lever and adapted to connect operatively said lever with said movable part, means tending to throw said latch into connecting position, and a hand-operated device for normally holding said latch out of connecting position, but adapted, when operated, to permit said latch to move into connecting position, said device having a portion placed apart from said lever, for the purposes set forth.

7. A safety manipulating device for machinery comprising a movable part, adapted, when moved, to perform the desired operation with respect to the machinery, a rockable lever for actuating said movable part, a latch pivoted upon said lever and adapted to connect operatively said lever with said movable part, means tending to throw said latch into connecting position, a hand-operated device for normally holding said latch out of connecting position, but adapted, when operated, to permit said latch to move into connecting position, said device having a portion placed apart from said lever, and means for restoring said device, when released, to its position in which it holds said latch out of connecting position, for the purposes set forth.

8. The combination with a tripping mechanism for intermittently operated machinery, of an operating member normally disconnected from said tripping mechanism but adapted to actuate said tripping mechanism when operatively connected therewith, normally inoperative means for operatively connecting said member with said mechanism, a second member coöperating with said connecting means adapted, when operated, to render said connecting means operative, said members being placed apart, for the purposes set forth.

9. The combination with a tripping mechanism for intermittently operated machinery, of a trigger normally disconnected from said tripping mechanism but adapted to actuate the same when operatively connected therewith, a member for operating said trigger, to cause said tripping mechanism to be actuated when said trigger is operatively connected therewith, and a second member, connected with said trigger, and adapted, when operated, to cause said trigger to make operative connection with said tripping mechanism, said members being placed apart, for the purposes set forth.

10. The combination with a tripping mechanism for intermittently operated machinery,

of an actuating member, a trigger carried by said actuating member and movable into and out of operative relation with said tripping mechanism, a stop adapted to be engaged by said trigger and to maintain said trigger out of operative relation with said tripping mechanism so as to permit said actuating member to be moved without affecting said tripping mechanism, and a second member, connected with said stop, and adapted, when operated, to move said stop out of operative relation with said trigger so as to permit said trigger to make operative connection with said tripping mechanism, said members being placed apart, for the purposes set forth.

11. The combination with a tripping mechanism for intermittently operated machinery, of a depressible lever, a trigger carried by said lever and movable into and out of operative relation with said tripping mechanism, means for normally holding said trigger out of operative relation with said tripping mechanism, and a second depressible lever for operating said means to permit said trigger to move into operative relation with said tripping mechanism, whereby movement of said first-named lever will result in the actuating of said tripping mechanism, said levers being placed apart, for the purposes set forth.

12. The combination with a tripping mechanism for intermittently operated machinery, a catch connected therewith, a trigger for engaging said catch, a lever on which said trigger is pivotally mounted, a cam surface on said trigger, a cam member engaging said surface and adapted to move said trigger out of engaging position when said lever is depressed, a second lever connected with said cam member, for moving said cam member out of engagement with said cam surface, to permit said trigger to engage said catch when the first lever is depressed, said levers being placed apart, for the purposes set forth.

13. A safety manipulating device for machinery comprising a movable part, adapted, when moved, to perform the desired operation with respect to the machinery, a pair of members placed apart and adapted to be operated by the attendant, said members being normally separately movable without affecting said movable part, and means controlled by one of said members for compelling movement of said movable part when the other member is operated.

14. A safety device for tripping the clutch mechanism of punch presses, comprising a movable part, adapted, when moved, to trip the clutch of the press, a pair of hand levers placed one on each side of the press, said levers being normally separately movable without affecting said movable part, and

means controlled by one of said hand levers for compelling movement of said movable part when the other hand lever is operated.

15 A safety tripping mechanism 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 for actuating said movable part, said hand lever being normally movable independently of said movable part, and a second hand lever located at the opposite side of the press for establishing an operative

connection between said first-named hand lever and said movable part, to enable said first-named hand lever to actuate said movable part, for the purposes set forth. 15

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

WILLIAM COTTRELL.

Witnesses:

P. D. PHILLIPS,

E. O. DETTRICK.