

Sept. 3, 1935.

C. M. GOFF ET AL

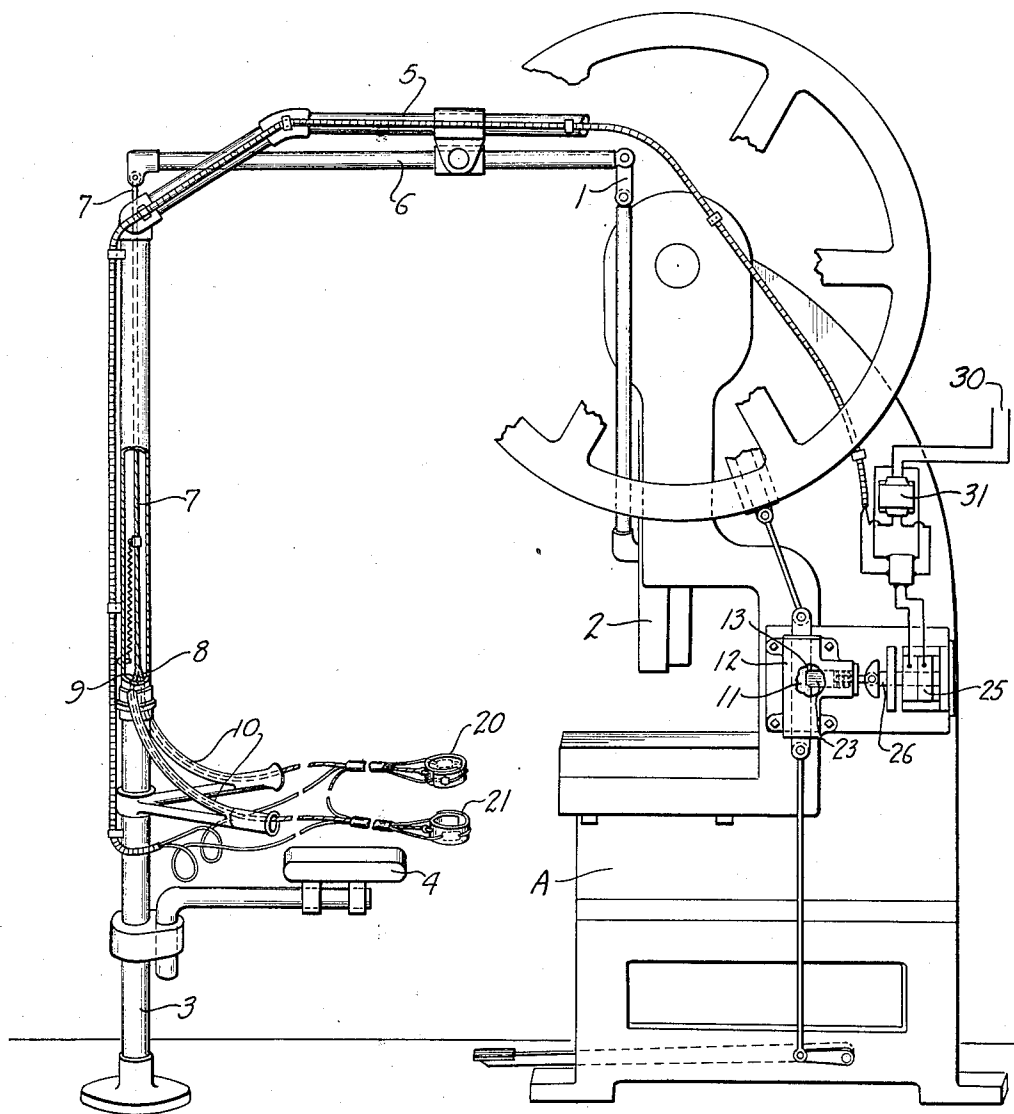
2,013,441

SAFETY DEVICE FOR POWER PRESSES

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2 Sheets-Sheet 1

FIG. 1.



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FIG. 2.

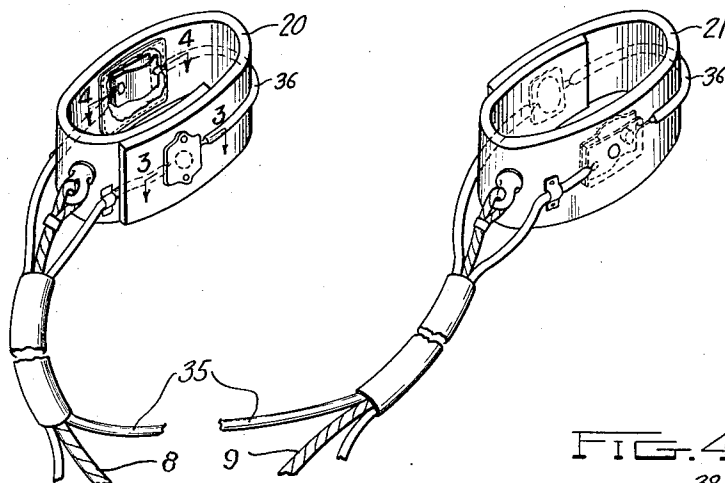


FIG. 3.

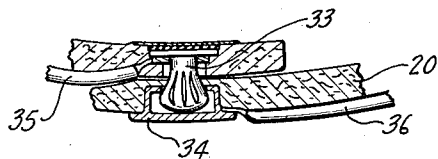


FIG. 4.

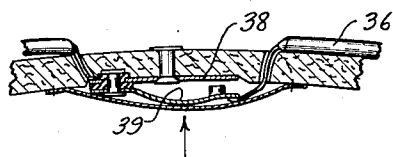
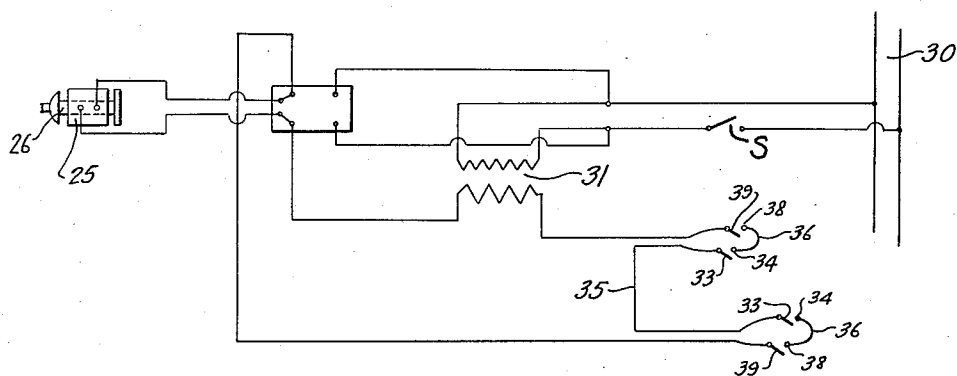


FIG. 5.



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SAFETY DEVICE FOR POWER PRESSES

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8 Claims. (Cl. 192—131)

This invention relates to a safety device for presses, and is more particularly directed to an electrically operated attachment for devices which are already known.

5 In the patent to Possons, 1,417,346, of May 23, 1922, is shown a safety device comprising a pair of cuff members to be worn by the operator, and a connection between the cuff members and the slide of the press so that the operator's hands are forcibly withdrawn from engagement with the press at the proper time. This device, and the great majority of similar expedients now on the market, possess the inherent disadvantage that the press can be run by the operator without utilizing the protective mechanism. Thus, the factor of safety depends entirely upon the will of the operator in deciding whether or not he will make use of the device provided for his safety.

20 The present invention has for its primary object the provision of a safety device for a press which must be worn by the operator so long as he is running the press.

Another object of the invention is the provision of electrically operated means to prevent the operator from running a power press without utilizing the device provided for his protection.

Other objects and advantages of the invention will become apparent as the description proceeds, reference being had to the accompanying drawings which disclose a preferred embodiment of the invention and in which—

Figure 1 is a partially diagrammatic perspective view, with parts broken away, of the device as installed on a press; Fig. 2 is a detail view, with a part broken away, of the cuff members; Figs. 3 and 4 are fragmentary sectional views on lines 3—3 and 4—4, respectively, of Fig. 2; and Fig. 5 is a wiring diagram.

40 Referring to the drawings, and particularly to Fig. 1, the present invention is disclosed in connection with a safety device of the type shown in the patent to Possons, 1,417,346. According to that invention, a link 1 is connected to a reciprocating part of a power press A, such as a slide 2. A hollow standard 3 is disposed in front of the press and has a seat 4 carried in a bracket intermediate its ends. In order to brace the standard 3, the upper member 5 extends laterally to join a part of the press frame in a connection which is not here shown.

A rocker-arm 6 is pivoted intermediate the ends of the lateral member 5, and is operatively connected at one end to the link 1 and at its other end to a cable member 7 which extends

down inside the hollow upright part of the frame 3 to a point above and behind the operator's seat 4. At this point the cable 7 is branched into two parts 8 and 9, each of which trains through a respective guide tube 10 to the right and left of the operator's seat. At their outer ends, the cable parts 8 and 9 are attached to cuffs 20 and 21 adapted to be worn about the wrists of the operator. It will thus be seen that so long as the operator wears the cuffs 20 and 21 his hands will be pulled away from the press as the slide 2 descends and, through the link 1 and rocker-arm 6, takes up on the cable to which the cuffs are attached. It will be further seen that the operator can allow the cuffs to hang unused and the press can still be operated.

In order to prevent operation without using the safety device, the present invention provides electrical means to lock the press against operation and to prevent actuation of the press operating trip. In the present instance, the trip mechanism includes a slide bar 11, mounted in a guide 12 attached to the side of the press frame, so that any movement of the trip mechanism imparts longitudinal movement to such bar. A spring pressed bolt 23 is reciprocally mounted in the guide 12 at a side of the slide bar 11 and normally engages a notch or shouldered portion 13 in the bar to lock it against movement. A solenoid 25 is adapted to withdraw the bolt 23 by acting on an armature 26 connected to the bolt. It will thus be seen that only so long as the solenoid is energized can the press be started, and if for any reason the solenoid circuit is not closed, operation of the press is impossible.

The solenoid circuit derives its power from any suitable line 30 through a transformer 31. Interposed in series in the circuit are a plurality of switches which are carried by the cuffs worn by the operator and which will presently be described. If any one of the switches is open, no power passes to the solenoid and the press cannot be operated.

Referring now to Figs. 2, 3, and 4, the cuff members 20 and 21 are similar, so that only one will be described. The cuff preferably comprises a body of flexible material which will conform in shape to the wrist of the operator. A separable fastener is provided to fix the overlapping ends in place about the wrist and includes, in the present instance, a male member 33 and a female member 34. Each of the two members making up the fastener serve also as switch means and are electrically connected in the solenoid circuit by wires 35 and 36, respectively.

At the opposite side of the cuff from the fastener is another circuit closing device which, in the form shown, comprises a metallic plate 38 carried by the cuff, and a spring contact arm 39 insulated by a part 40 from the plate 38 at its fulcrum point. A suitable flexible covering 41 overlies the contact arm so that the latter does not directly engage the wrist of the operator. The metallic plate is connected in the circuit by a wire 42 and the contact arm 39 is connected to and end of the wire 36 which runs to the separable fastener. It will thus be seen that the two switches 20 formed in each cuff are in series.

In order to require the operator to wear both cuffs to make the safety device effective, the wire 35 is connected by a loop to both switches formed by the fastening members. As will be seen from the wiring diagram in Fig. 5, all of the switches on the two cuffs are thus placed in series.

In operation, the operator closes a snap switch S, and places the cuffs about his wrists and engages the separable fastener parts 33 and 34. The pressure of his wrists on the spring contact arms 39 moves these members against the plates 33 so that the solenoid circuit is entirely closed and the dog 23 is withdrawn from engagement with the keeper 24. The press can now be actuated by the treadle in the usual way, and the hand withdrawing safety device will operate to remove the operator's hands from the path of the slide.

It will be appreciated that if for any reason a single switch remains open the press cannot function.

Obviously, numerous changes may be made in the form and disposition of the several switch parts, and it should be expressly understood that the disclosures above-described are simply for purposes of illustrating one embodiment of the invention.

What we claim is:

1. A safety device for power presses including means to lock the press against operation, a pair of cuff members adapted to be retained about the wrists of the operator by separable fasteners, and electrical means to release said locking means, said electrical means being energized only when the fasteners of both cuffs are engaged.

2. A safety device for power presses including means to lock the press against operation, a pair of cuff members adapted to be retained about the wrists of the operator by separable fasteners, a switch carried by each cuff member, and electrical means to release said locking means, said electrical means being energized only upon a closing of both said switches.

3. A safety device for power presses including means to lock the press against operation, a pair of cuff members adapted to be retained about the wrists of the operator by separable fasteners, a switch carried by each cuff member and adapted to be closed by pressure of the operator's wrist when the cuff is worn, and electrical means to release said locking means, said electrical means being energized only upon a closing of both said switches.

4. A safety device for power presses including means to lock the press against operation, a pair of cuff members adapted to be retained about the

wrists of the operator, metallic separable fasteners for said cuffs, a switch carried by each cuff member and adapted to be closed by pressure of the operator's wrist, electrical means to release said locking means, and electrical connection between said switch and said separable fastener on each cuff in circuit with said electrical means, whereby said electrical means is energized only when said separable fasteners and said switches are closed.

5. A safety device for power presses including a cuff to be worn by a hand of the operator, means attaching said cuff to a movable part of the press, whereby the attached hand is positively moved to a place of safety during a predetermined portion of a cycle of operations of the press, a trip mechanism for the press, means normally locking said trip mechanism against movement, and electrical means operable, when energized, to effect a release of said locking means, said electrical means including a switch associated with said cuff and closed by an attaching of the cuff to the operator.

6. A safety device for power presses including a cuff to be worn by a hand of the operator, means attaching said cuff to a movable part of the press, whereby the attached hand is positively moved to a place of safety during a predetermined portion of a cycle of operations of the press, a trip mechanism for the press, means normally locking said trip mechanism against movement, and electrical means operable, when energized, to effect a release of said locking means, said electrical means including a plurality of electrical switches in series, which are closed by an attaching of the cuff to the operator's arm.

7. A safety device for power presses including a pair of cuffs to be worn on the wrists of the operator, means attaching said cuffs to a movable part of the press, whereby the attached hands are positively moved to a place of safety during a predetermined portion of a cycle of operations of the press, a trip mechanism for the press, means normally locking said trip mechanism against movement, and electrical means operable, when energized, to effect a release of said locking means, said electrical means including a plurality of switches in series at least one of which is attached to each of said cuffs and closed by an attaching of the respective cuff to the operator.

8. In combination, in a power press, means for attaching to the operator and automatically operable by an operation of the press to impart predetermined safety movements to the operator, a manually operable trip mechanism for the press, means normally locking said mechanism against tripping, and electrical means operable, when energized, to actuate said locking means to release said mechanism, said electrical means having a plurality of switches in series associated with said first means and necessary for all to be manually operated to close the energizing circuit of said electrical means, one at least of said switches being carried by said attaching means and closed by an attaching of such means to the operator.

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