

March 22, 1932.

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1,850,404

SAFETY DEVICE FOR HAND FED POWER PRESSES OR LIKE MACHINES

Filed Jan. 12, 1931

2 Sheets-Sheet 1

FIG. 1.

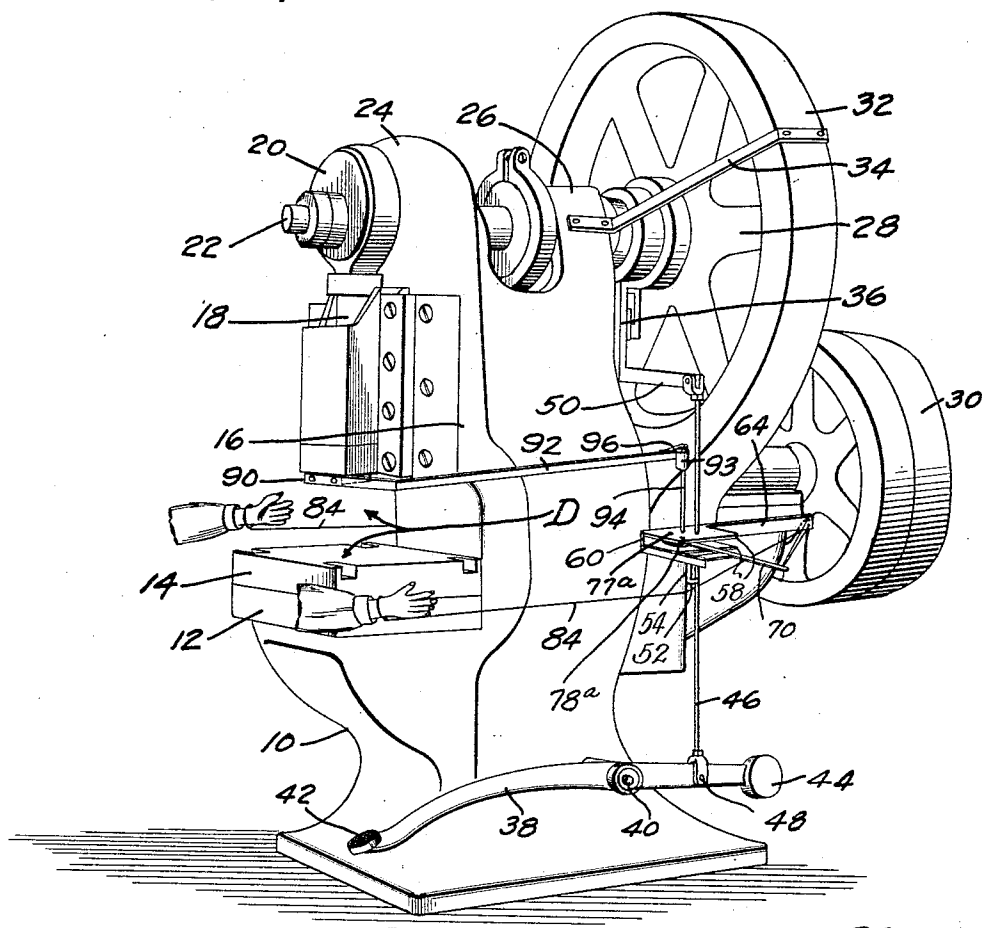


FIG. 2.

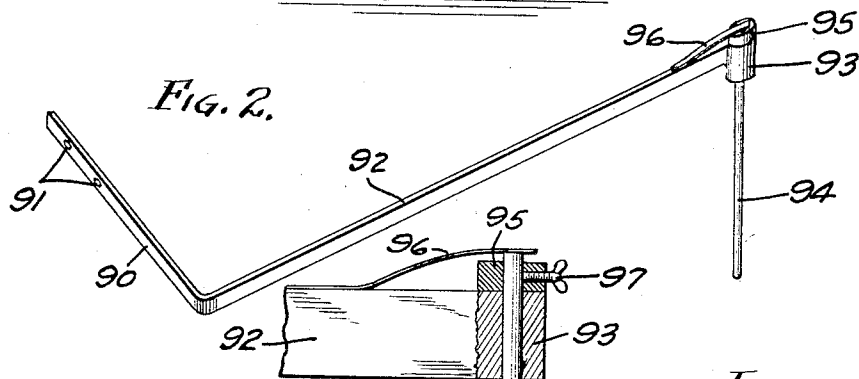


FIG. 2a.

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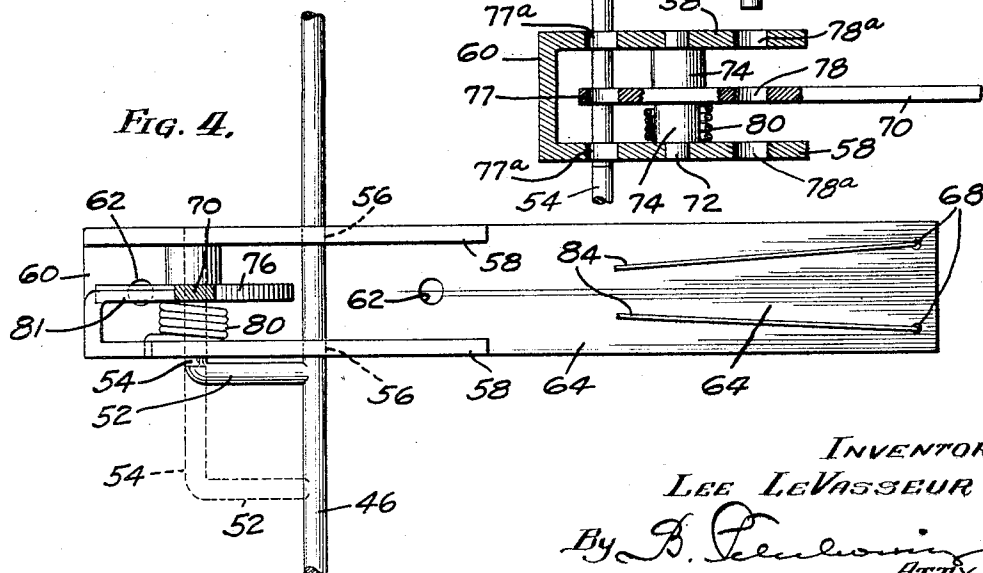
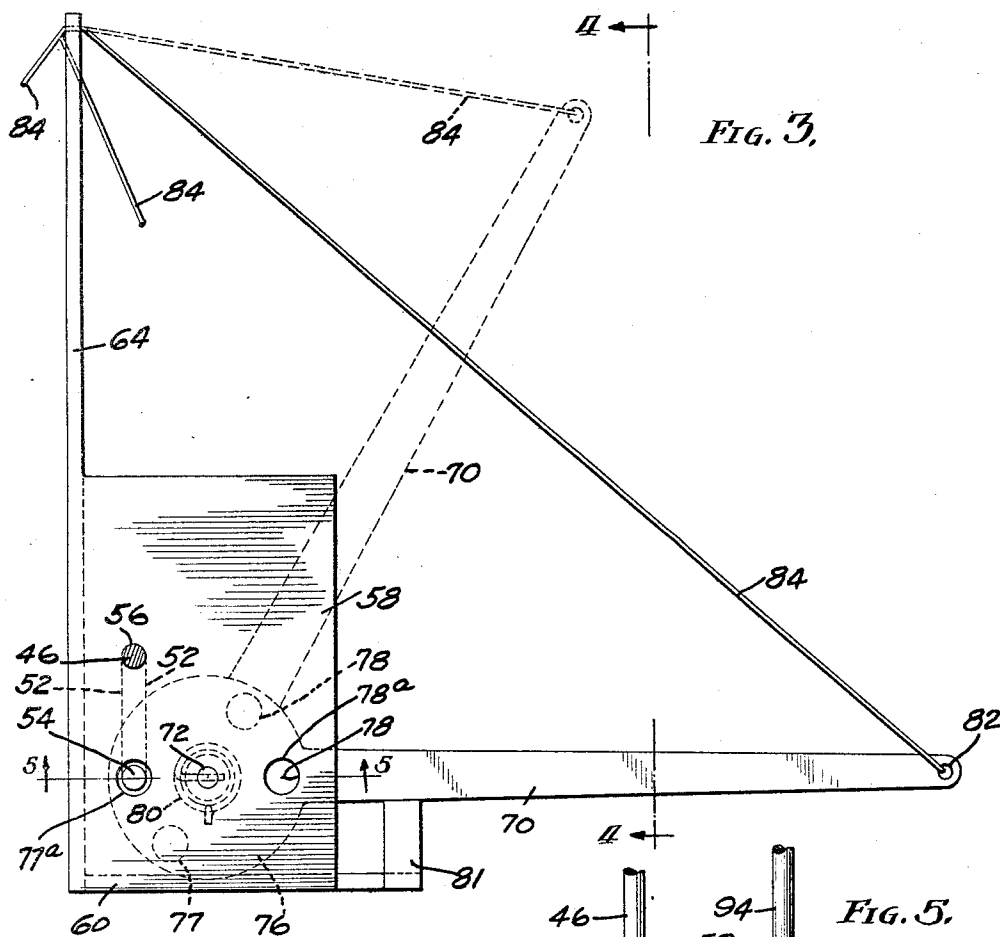
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SAFETY DEVICE FOR HAND FED POWER PRESSES OR LIKE MACHINES

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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SAFETY DEVICE FOR HAND FED POWER PRESSES OR LIKE MACHINES

Application filed January 12, 1931. Serial No. 508,084.

My invention relates to improvements in safety devices for hand fed power presses of any of the various types used for punching, stamping and forming operations and is particularly designed to prevent injuries to the hands of the operator whenever he may attempt to accidentally or unintentionally move them under the press hammer where they would otherwise be crushed or mutilated.

An object of my invention is to provide an improved device that is simple and reliable for the purpose specified, and which furthermore is particularly effective and efficient in that it involves a positive connection between the hands of the operator and the clutch which governs the moving part of the press whereby the clutch is disengaged, or, in a starting position, not connected with the moving part of the press, when the operator moves his hands under the press hammer.

A further object of my invention is to provide an improved device of this type associated with the clutch operating lever of a continuously driven power press, operable by the movement of the operator's hands into and out of the danger zone beneath the press hammer.

A further object of my invention is to provide an improved device attachable to the press hammer adopted to co-operate with the aforementioned means associated with the clutch whereby, after the hammer descends the operator's hands are held spaced away from the danger zone under the hammer.

Still another object is to so design and construct my improved safety appliance as to be applicable to machines of this type as known to the art and found on the market.

Other objects and advantages will be more apparent from the following description reference being had to the accompanying drawings in which;

Fig. 1 is a perspective view of a power operated punch press,

Fig. 2 is a perspective view of my improved attachment for the press hammer,

Fig. 2a is an enlarged fragmentary view partially in section of one end of said attachment,

Fig. 3 is an enlarged plan view of the attachment, secured to the frame and associated with the clutch operating lever, with a changed position shown in dotted lines.

Fig. 4 is a sectional view taken generally on the lines 4—4 of Fig. 3 looking in the direction of the arrows, and

Fig. 5 is a sectional view taken on the lines 5—5 of Fig. 3 looking in the direction of the arrows.

In the drawings I have shown a conventional type of power driven punch press comprising the base 10, having a table portion 12 upon which a stationary die holder 14 is positioned and an overhanging frame portion 16 within which a reciprocating hammer or die member 18 is mounted. The hammer 18 may be attached to an eccentric 20 which is secured to the drive shaft 22 mounted in suitable bearings 24 and 26 in the upper part of base 10. Shaft 22 extends to the rear of the punch press and carries a suitable driving gear 28 which is driven by a pinion (not shown) from a suitable motor or other source of continuous power.

A fly wheel 30 is mounted on the pinion shaft to provide centrifugal force to add to the steady driving of gear 28. Gear 28 is covered to prevent injury to an operator by a suitable guard 32 which encloses the teeth thereof and prevents normal access thereto. Guard 32 may be supported by suitable brackets 34 extending from the punch press base.

A clutch and throw out mechanism 36 is provided between drive gear 28 and shaft 22 and by a suitable arrangement is adapted to be controlled by an operator to start and stop the action of the hammer 18. For this purpose a lever 38 is pivotally mounted upon a suitable pivot pin 40 extending from the base 10. The lever 38 may have a treadle portion 42 at one end and a suitable weight 44 at its opposite end. A clutch operating lever 46 is pivotally secured to its opposite end to an operating arm 50 associated with the clutch throw out mechanism.

In the normal operation of the punch press downward pressure upon treadle 42 will move operating arm 50 to engage clutch

members between shaft 22 and drive gear 28 thus starting the operation of hammer 18. This will continue as long as treadle 42 is pressed downwardly and upon releasing of pressure upon treadle 42, through clutch operating lever 46, the clutch will be disengaged thus stopping the operation of the machine.

In applying my approved safety device to a machine of this type I provide the clutch operating lever 46 with a laterally disposed rod 52 which includes a vertical portion 54 arranged in spaced parallel relation with the lever 46 for a purpose to be more clearly described hereinafter. Clutch operating lever 46 extends through suitable openings 56 in upper and lower wall portions 58 of a bracket 60 fastened to the base 10 in the position shown in Fig. 1. Bracket 60 may be fastened by suitable bolts which extend through the opening 62 in back wall 64 of the bracket. Bracket 60 has a lateral arm 64 which extends parallel with the side of the punch press and has a pair of guide openings 68 at its outer end.

A movable arm 70 is pivotally mounted between upper and lower walls 58 of the bracket upon a suitable shaft 72. Suitable spacers 74 serve to position the arm medially between walls 58 in a horizontal plane. Arm 70 is provided with a circular disc portion 76 which contains a pair of concentrically disposed openings 77 and 78. These openings in a normal position coincide with similar openings 78a and 77a in upper wall 58 and similar opening 77a and 78a in lower wall 58. A torsion spring 80 is positioned around a spacer 74 having one end secured to lower wall 58 and its other end secured to shaft 72. This spring normally tends to hold arm 70 in the position shown in full lines in Fig. 3 against a suitable stop member 81 formed on the bracket 60. Arm 70 is provided at its outer end with an aperture 82 through which a suitable cord 84 is passed and anchored at said aperture by suitable means, one end of which cord extends through one of the openings 68 in the end of arm 64 and the other end of which extends through the other opening 68 in the end of arm 64. These cords 84 are arranged to extend to, and be securely fastened around the wrists of the right and left hands of the operator. The cord is adapted to be of a definite length so that when the hands are moved to the area D above the stationary die holder 14, arm 70 will be rotated toward arm 64. The relation of lever 46 to bracket 60 and associated parts will now be described. The vertical portion 54 of the rod 52 is adapted whenever the treadle 42 is pressed downwardly to extend upwardly through the openings 77a and 77 when an operator's hands are not in the danger zone D and, when arm 74 is not rotated this is possible. However, if arm 70

is rotated opening 77 will not be aligned with openings 77a and as a result part 54 will move upwardly against the under part of disk 76 and prevent further upward movements of clutch operating lever 46 and thereby prevent downward movement of hammer 18.

A further means for preventing injury to the hands of an operator comprises the provision of a member 90 attached to the lower portion of hammer 18 by bolts or other suitable fastening means passing through openings 91. Member 90 has an arm 92 extending to a point above bracket 60 where it has an enlarged bearing portion 93 in which a rod 94 is mounted. Rod 94 directly overlies openings 78 and 78a in brackets 60 and arm 70, respectively. Rod 94 has an adjusting means in the form of a collar 95 secured thereto by a suitable thumb screw 97 above bearing 93. A leaf spring 96 overlies the upper end of rod 94. The operation of this further safety means is as follows:

When the operator's hands are removed from the danger zone D and treadle 42 has been depressed and the clutch engaged hammer 18 will move downwardly carrying with it member 90 and rod 94. Rod 94 which directly overlies openings 78a and 78 will pass through these openings and effectively prevent rotation of arm 70 thus preventing the operator from moving his arms inwardly to the danger zone D. In this manner it can easily be seen that an effective means is provided for preventing injury to the hands of the operator after the punch press is in motion. With the previously described means it can readily be seen that any attempt to start the operation of the punch press while the operator's hands are in danger is effectively prevented.

While I have illustrated and described a specific embodiment of the invention I desire it to be understood that many modifications and changes may be made in the specific details thereof and I do not wish to be limited in any particular, rather what I desire to procure and protect by Letters Patent of the United States is:

What I claim as new is:

1. In a device of the character described for a power operated punch press provided with a foot pedal, a clutch and a connecting rod therebetween, a safety appliance comprising a bracket having openings through which said connecting rod passes, an offset vertical finger on said connecting rod, an arm pivotally mounted in said bracket having openings through which said finger passes in a normal operation and means associated with said arm and connected to an operator's hands for moving said openings when the operator's hands are below the punch hammer.

2. A safety device for a power operated

- press comprising in combination with a vertically movable element of the press, of a pivotally mounted horizontally movable arm having an opening therein, means for normally holding said arm in a predetermined position, means carried by said element for movement through said opening during the normal operation of the press, and means connecting said arm with the hands of the operator to change the position of said arm and render the press inoperative, when either hand of the operator is moved within the danger zone of the press.
3. A safety device of a power operated press comprising in combination with a vertically movable clutch control lever, of a pivotally mounted horizontally movable arm having an opening therein, yieldable means for normally holding said arm in a predetermined position, means carried by said lever and movable through said opening during the normal operation of the press, and means connecting said arm with the hands of the operator, whereby the position of the lever is changed to render the press inoperative, when either hand of the operator is moved within the danger zone of the press.
4. A safety device for a power operated press comprising in combination with a vertically movable element of the press, of a pivotally mounted horizontally movable arm having an opening therein, a rod carried by said element and including an offset portion arranged in spaced parallel relation thereto, yieldable means for holding said arm normally positioned with its opening located to receive said offset portion of the rod in the normal operation of the press, and means for shifting said arm to change the position of said opening and thereby render the press inoperative.
5. A safety device for a power operated press comprising in combination with a vertically movable element of the press, of a pivotally mounted horizontally movable arm having an opening therein, a rod carried by said element and including an offset portion arranged in spaced parallel relation thereto, means for holding said arm normally positioned with its opening located to receive said offset portion of the rod in the normal operation of the press, and means connecting said arm with the hands of the operator to shift said arm and thereby change the position of said opening to render the press inoperative, when either hand of the operator is moved within the danger zone of the press.
6. A safety device for a power operated press comprising in combination with a vertically movable element of the press, of a bracket secured to the press and including spaced superimposed walls having aligned openings, a horizontally movable arm pivoted between said walls and having an opening normally aligned with the openings of said walls, means carried by said element for movement through all of said openings during the normal operation of the press, and means for changing the position of said arm and its opening to render the press inoperative.
7. A safety device for a power operated press comprising in combination with a vertically movable element of the press, of a bracket secured to the press and including spaced superimposed walls having aligned openings, a horizontally movable arm pivoted between said walls and having an opening normally aligned with the openings of said walls, means carried by said element for movement through all of said openings during the normal operation of the press, and means connecting said arm with the hands of the operator to change the position of said arm and thereby render the press inoperative, when either hand of the operator is moved within the danger zone of the press.
- In testimony whereof I affix my signature.
LEE LE VASSEUR.