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SAFETY DEVICE FOR POWER PUNCH PRESSES.

APPLICATION FILED FEB. 28, 1916.

**1,215,972.** Patented Feb. 13, 1917.

Fig. 2.

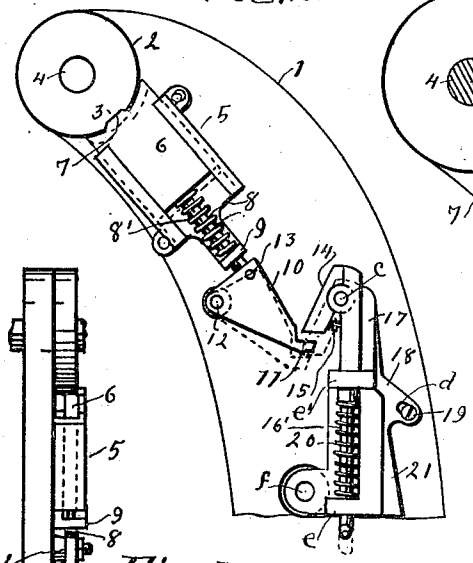
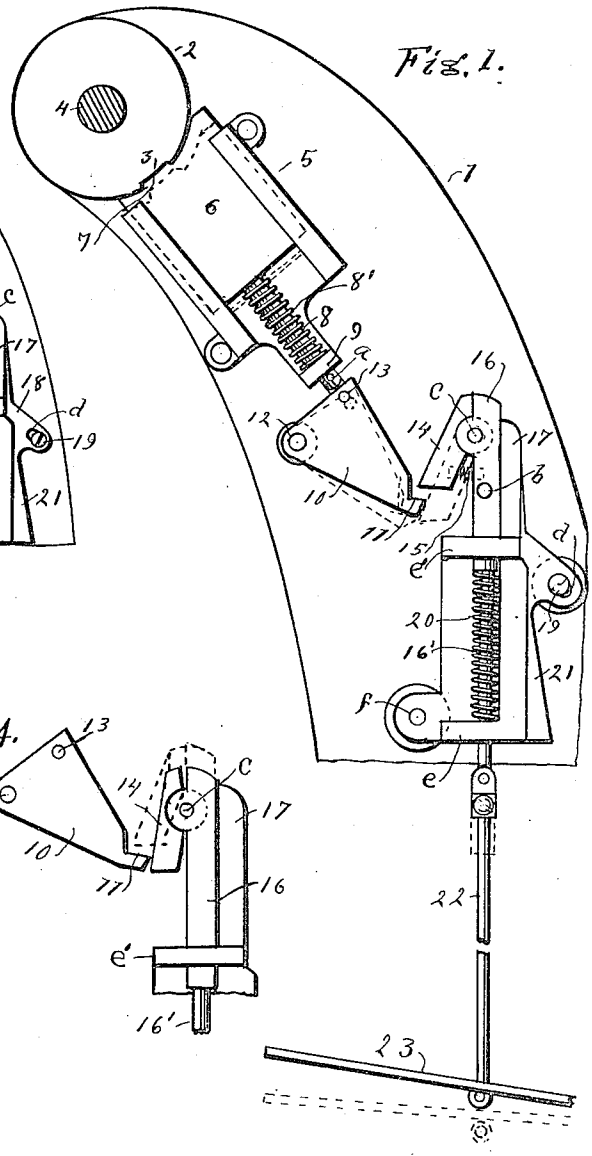


Fig. 1.



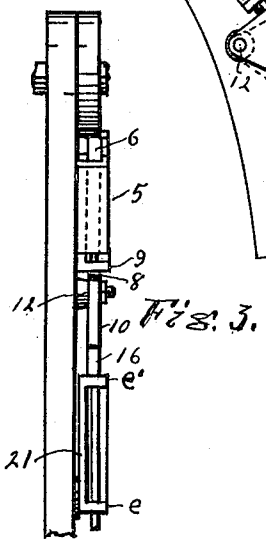
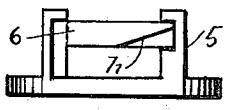


Fig. 3.

Fig. 4.



Fig. 5.



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# UNITED STATES PATENT OFFICE.

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## SAFETY DEVICE FOR POWER PUNCH-PRESSES.

1,215,972. Specification of Letters Patent. Patented Feb. 13, 1917.

Application filed February 28, 1916. Serial No. 81,043.

*To all whom it may concern:*

Be it known that we, MATTHYS NUBERG and JOHN VAN DEN BOOGAARD, citizens of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Safety Devices for Power Punch-Presses, of which the following is a specification.

Our invention relates to improvements in safety devices for punch presses, and its objects are: first, to provide a means whereby the same movement of the pedal. that releases the crank shaft and allows the punch head to descend, will cause the crank shaft to be locked firmly in place at the completion of a single revolution of the shaft, and, second, to provide a means whereby the "trip" may be made to so hold the locking device as to allow of continuous revolution of the crank shaft.

We attain these objects by the mechanism illustrated in the accompanying drawing, in which Figure 1 is a side elevation of the upper end of the press frame with our device in position thereon, showing the trip in position to slide off from the end of the actuating lever and allow the locking slide to lock the crank shaft in place at each complete revolution of said shaft; Fig. 2 is a like view on a smaller scale, showing the trip in position to hold the locking slide out of contact with the lock wheel on the crank shaft so the crank shaft will be made to revolve continuously when the pedal is pressed, and held downward; Fig. 3 is an edge elevation of the same with the main trip spring removed; Fig. 4 is a side elevation of the trip and the actuating lever showing the trip in the position it must assume when being raised from position below, to position above the end of the actuating lever; Fig. 5 is an end view of the locking slide and its carriage.

Similar reference characters indicate similar parts throughout the several views.

As our invention relates entirely to the construction and application of the locking slide and its several connections, we have shown but one form of locking wheel, deeming this sufficient as it fully illustrates the operation of our invention, whether used upon a peripheral, or upon a side surface locking wheel.

In Figs. 1 and 2, 1 represents the upper end of the side of the upper portion of a punch press; 2 represents the locking wheel, or clutch wheel, an essential part of all forms of punch presses, in one form or another. In this instance we have shown this wheel having the clutch, or locking element in the periphery, as at 3, and 4 represents the end of the crank shaft. Our invention consists of a carriage 5, which is securely attached to the side 1 of the press frame and arranged for the free longitudinal movement of the locking slide 6, which, in this instance, is represented as having a projecting locking lug 7 that is fitted to properly engage the depression 3 in the locking wheel 2 to lock this wheel so it could not be made to revolve until the lug 7 is withdrawn therefrom. The carriage 5 is provided with a standard 9 some distance back from the carriage proper, and the slide 6 has an arm 8 extending backward therefrom and passing through an opening through said standard, as indicated in Figs. 1 and 2, and this arm has a helical spring 8′ thereon between the standard 9 and the back end of the slide 6 designed to hold the slide forcibly against the surface of the locking wheel 2, as indicated in Figs. 1 and 2.

We provide for drawing the slide 6 backward from contact with the locking wheel 2 by means of a lever 10, which we pivotally connect with the side 1 of the press, as indicated at 12, and then we pivotally connect the end of the arm 8 with this lever, as at 13, so that any downward movement of the free end of this lever, indicated by its dotted lines in Figs. 1 and 2, will draw the slide 6 backward accordingly, as represented by dotted lines in said figures, and leave the locking wheel 2 free to revolve with the shaft 4. The lever 10 is provided with a backwardly extending bearing 11, the use of which will be hereinafter explained.

To actuate the lever 10 we provide a trip 14 which is pivotally connected with the slide 16, as at *c*, and is held in normal position by means of any available form of spring, as indicated at 15, so that when the slide 16 is drawn downward by means of the pedal 23, and the connecting rod 22, the lower end of the trip 14 will engage the projecting end 11 of the lever 10 and will draw this end of said lever downward sufficiently to free the clutch and allow the locking wheel 2 to revolve, when the end of the lever will slide from under the trip 14, and the slide 6 will be forced back into engagement

with the locking wheel 2 and stop the revolving of said wheel at the end of the first revolution, thus rendering it impossible for the crank shaft 4 to make more than one revolution with each depression of the pedal 23.

The slide 6 is thrown and held in normal position against the periphery of the wheel 2 by means of any available form of spring, as indicated at 8, so that there can be no possible question about properly and safely locking the wheel 2 the instant the lever is released, as hereinbefore explained. *a* represents a pin or stop designed to bear against the bearing 9 to avert the danger of the slide pressing too heavily against the periphery of the wheel 2 or the stem 8′ of said slide from being forced out of its bearing 9 under any conditions.

The slide bearing 21 is pivotally connected with the side 1 of the press, as at *f*, and at 19 it is slidingly connected with the press by means of the bolt or screw 19 passing through the slot *d*, so the upper end of the frame 21 may be thrown over to the right, as in Fig. 1, or to the left, as in Fig. 2, and there secured with the screw or bolt 19. This frame has bearings *e* and *e′* connected therewith and so arranged that the square portion of the slide 16 will slide freely through the bearing *e′*, and the round portion, 16′ will slide freely through the bearing *e* for the free longitudinal movement of this slide which is forced upward into normal position by the spring 20. In Fig. 4 we have shown the trip 14 in the position it must assume when being forced upward into normal position to pass the end of the lever 10.

In Fig. 1 we have shown the frame 21 in position, with the metal at the upper end of the slot *d* resting against the screw or bolt 19 and the lower end of the trip 14 in position to slip by the end of the lever 10 when the pedal 23 is drawn downward to actuate the lever 10, but when it is desired to so set the trip 14 that the shaft 4 will continue to revolve as long as the pedal is held downward, we loosen the bolt 19 and throw the upper end of the frame 21 to the left until the end of the trip covers the entire length of the end 11 of the lever 10, as indicated in Fig. 2, and secure the frame in this position by screwing the bolt 19 firmly in place, in which position the trip cannot be drawn off of its bearing on the end 11 of the lever 10, and the shaft 4 is free to revolve continuously until the pedal 23 is released and returned to normal position.

In Fig. 5, *h* indicates an incline on the back surface of the slide 6 placed there for the purpose of demonstrating that the slide may be arranged to operate various forms of trip mechanism in punch presses.

*b*, in Fig. 1, represents a pin in the trip slide, that is designed to engage the bar *e′* and prevent the slide from being drawn downward beyond the desired position for properly actuating the lever 10.

It is evident that mechanical means, other than those herein shown and described, may be successfully utilized to bring about the results herein aimed at, hence we do not desire to restrict ourselves absolutely to this exact construction, but desire to reserve the right to vary the same as conditions may require or convenience may suggest.

What we claim as new, and desire to secure by Letter Patent of the United States, is:—

1. In combination with the crank shaft and locking wheel of a punch press, a slide secured to the side of the press frame in position to be made to engage the locking wheel, a spring arranged to force the slide firmly against the locking wheel, a lever pivotally connected with the press frame at one point and with the locking slide at another point, a vertically movable trip connected with the frame in position to be made to engage the free end of the lever to draw the locking slide from contact with the locking wheel and to release the lever and allow the slide to return to the wheel, at each downward movement of the trip, means for drawing said trip downward, and means for forcing said trip upward into normal position.

2. In combination with the frame, the crank shaft and the locking wheel of a punch press, a carriageway mounted on the side of the frame, a slide mounted in said carriageway in position to be moved longitudinally to secure and release the locking wheel, means for forcing the slide to hold the locking wheel firmly in place, a lever pivotally secured to the frame at one point, and pivotally connected with the slide at another point, a trip frame movably mounted on the side of the frame, a longitudinally movable trip slide mounted on the trip frame, a trip pivotally mounted near the upper end of said trip slide in position to engage the end of the lever when moving downward to a given point and then to disengage from the lever allowing the lever to return to normal position, means for drawing the trip slide and trip downward to actuate, and then to release the lever, and means for forcing the trip slide and trip upward past the end of the lever into position to again engage and actuate the lever upon a repeated downward movement of the slide and trip.

3. In combination with the frame, the crank shaft and the locking wheel of a punch press, a longitudinally movable locking slide connected with the side of the frame, means for forcing this slide into position to engage and secure the locking

wheel, a lever pivotally connected with the frame and with the slide, a trip slide frame pivotally connected with the press frame at one end to render the other end laterally movable, means for securing the adjustable end firmly in desired position, a longitudinally movable trip slide mounted on the trip frame, a trip pivotally connected with said slide in position to engage and actuate the lever on its downward movement and to slide past the end of the lever on its upward movement, means for forcing and holding the trip slide upward, and means for drawing said lever downward.

Signed at Grand Rapids, Michigan, February 22, 1916.

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**Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."**