

F. S. ALIANO.
SAFETY APPLIANCE FOR HAND FED POWER PRESSES.
APPLICATION FILED JUNE 28, 1911.

1,014,359.

Patented Jan. 9, 1912.

Fig. 1.

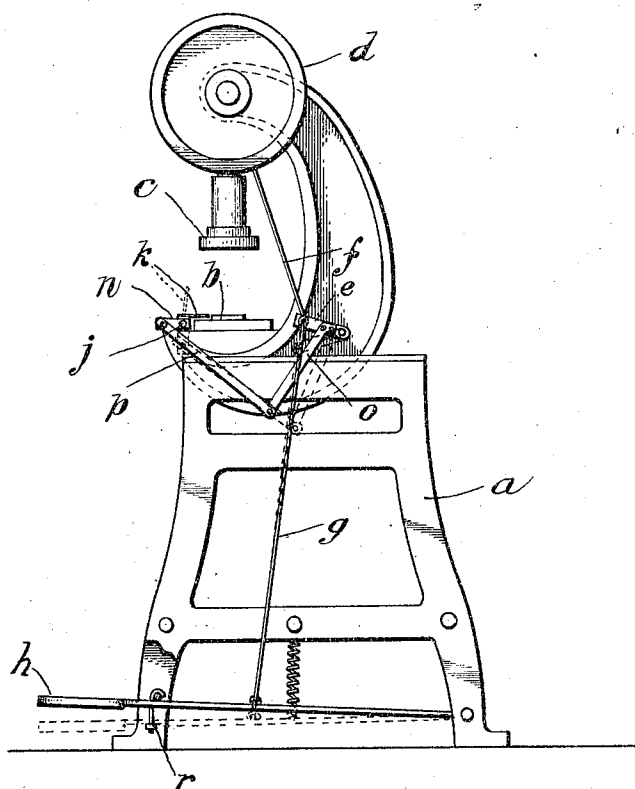


Fig. 2.

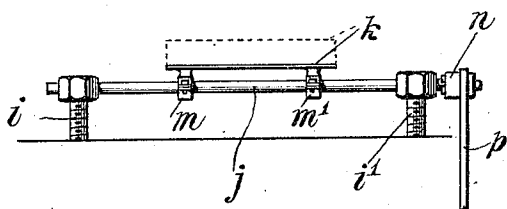


Fig. 3.

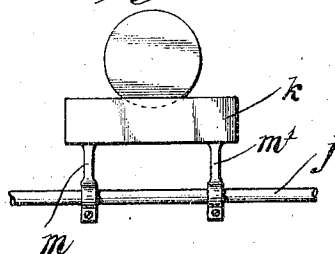
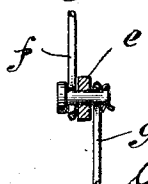


Fig. 4.



Attest:
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UNITED STATES PATENT OFFICE.

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SAFETY APPLIANCE FOR HAND-FED POWER-PRESSES.

1,014,359.

Specification of Letters Patent.

Patented Jan. 9, 1912.

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To all whom it may concern:

Be it known that I, FRANK S. ALIANO, a citizen of the United States, residing in the borough of Brooklyn, in the city of New York, county of Kings, and State of New York, have invented certain new and useful Improvements in Safety Appliances for Hand-Fed Power-Presses, of which the following is a specification, reference being had therein to the accompanying drawings, which form a part thereof.

My invention relates to safety appliances for hand fed power presses and more particularly to an appliance to prevent injury to the hand of the operator.

The main object of the invention is to provide an appliance of this character which will be so disposed as not to obstruct the space between the punch or ram and the operator, while at the same time being so actuated before the two parts of the die are brought together as to not only apprise the operator of the fact that the press has been tripped, but to actually remove his hand from beneath the punch so as to preclude any possibility of loss of, or injury to, the fingers.

A further object is to provide an appliance of this character which will not reduce the capacity of the press and will not under any circumstances be capable of engaging and holding the hand of the operator with any portion thereof projecting beneath the punch.

A still further object is to provide a guard of this character which will serve more or less as a guide over which the work must be fed to the press and which furthermore may be used by the operator to lock the treadle, the mere act of feeding placing the press under the control of the hands of the operator.

A still further object is to provide a guard of this character which will be actuated through the tripping mechanism for the press, and wherein the parts may be so set as to actuate the guard prior to the setting of the press clutch so as to apprise the operator of the fact that the press has been tripped before the eccentric shaft has been coupled to the fly-wheel.

A still further object is to provide a guard of this character which may be adjusted as to height to accommodate it to use with different dies used upon a press. And a still further object is to provide an appliance of

this kind which may be applied to the ordinary power press without the necessity for reorganizing any of the operative parts of the press.

My invention consists primarily in a safety appliance for hand fed power presses, embodying therein a guard member located between the punch and the operator; and means actuated substantially simultaneously with the tripping of the press whereby said member is raised and moved away from the die; and in such other novel features of construction and combination of parts as are hereinafter set forth and described, and more particularly pointed out in the claims hereto appended.

Referring to the drawings:—Figure 1 is a side elevation of a press embodying my invention; Fig. 2 is a front elevation of my attachment showing parts of the press about same; Fig. 3 is a plan view of the attachment shown in relation to the lower die; Fig. 4 is a detail view of a portion of the actuating mechanism.

Like letters refer to like parts throughout all of the several views.

In the embodiment of my invention shown in the accompanying drawings, *a* indicates the frame of the press which frame carries the bed for the die indicated at *b*, the punch or ram indicated at *c*, the fly-wheel *d*, the eccentric shaft, not shown, and the clutch mechanism adapted to connect said eccentric shaft with said fly-wheel, also not shown. This mechanism is old and well known in this art and a detailed showing thereof in the drawings and a detailed description thereof in the specification is, therefore, not given.

Mounted upon the side frame of the machine, is a crank *e*, extending from which are a rod *f* by means of which the clutch between the eccentric shaft and the fly-wheel is actuated, and a second rod *g* connecting said crank with the controlling treadle *h*. This arrangement is also old and well known in this art and is described merely because in the preferred form of the invention said crank is utilized for actuating the safety guard so as to cause said guard to be under the control of the trip mechanism and at the same time permit said trip mechanism to be placed under the control of the guard if the operator so desires.

Mounted upon opposite sides of the bed *b* are vertically adjustable bearings *i i'* in

which is rotatably mounted the shaft *j* upon a plane which coincides with that of the face of the die member carried on said bed. The rod *j* has mounted thereon the guard plate *k* the means of attachment being such as to permit said plate to be adjusted laterally, or to be set at any desired angle to facilitate the feeding operation, which, in all operations excepting blanking, must be done over the top surface of said plate. The plate *k* is attached to the rod *j* by means of arms *m* and *m'* having split ends adapted to straddle the said shaft or rod and be clamped thereon by means of set screws. Any other desired adjustable means of attachment between the plate and the shaft may be used, however, this means of attachment being a mere expedient within the skill of the ordinary mechanic.

Carried by the shaft *j* is a crank arm *n*. Mounted upon and movable with the crank arm *e* is a downwardly projected arm *o* and pivotally connected with the lower end of this arm and with the crank arm *n* is a link *p* by means of which motion of the crank arm *e* is transmitted to the crank arm *n* so as to cause the oscillation of the shaft *j* simultaneously with the initial movement of the crank arm *e* to set the clutch mechanism. To cause movement of the guard plate *k* prior to the initial movement of the clutch mechanism, I provide lost motion between the crank arm *e* and the rod *f*, the amount of this lost motion being sufficient to partially raise the plate *k* prior to any movement of the rod *f* in setting the clutch.

The arrangement of levers described is such that the guard plate may become locked in the raised position and at the same time hold the clutch in the set position. To obviate this difficulty, however, I provide a stop *r* acting upon the treadle which limits the amount of depression of the treadle and the amount of oscillatory movement of the shaft *j* to a point where the spring acting upon the treadle will instantly restore the guard plate *k* and the clutch mechanism to the normal, inoperative position.

The operation of the herein described apparatus is substantially as follows:—When feeding the press, the operator passes one or both hands containing the part to be operated upon above and close to the plate *k* positioning the part properly upon the die. The operator then depresses the treadle *h* setting the clutch mechanism through the rods *f* and *g* and the intermediate oscillatory crank arm *e*. This operation couples the eccentric shaft to the fly wheel *d* causing the rapid reciprocation of the punch. The rapidity of operation of the press results in frequent and serious injuries to the hands of the operator due in part to lack of celerity in removing the hands from

under the rapidly descending punch, in part to carelessness or a lack of attention to the work, and frequently to the accidental tripping of the clutch mechanism through the treadle. In a machine equipped with the appliance above described, however, the operator while his hand is still upon the metal part may depress the treadle with impunity as one of two results will follow, the instant the treadle is depressed. Either the guard plate *k* will be raised upwardly and toward the operator with sufficient force to actually move the hands from under the punch; or else sufficient power may be applied upon said plate *k* through the hands to block and prevent the depression of the treadle to an extent to set the clutch. It will thus be observed that while the clutch mechanism is operated by the foot of the operator, this mechanism is under the control of the hands of the operator so that if the operator should observe that the part is misplaced in the die he may arrest the operation of the clutch setting mechanism by means of the hands for the purpose of re-adjusting the part in the die. If, however, the operator fails to so check the clutch setting mechanism, his hands will nevertheless be moved from beneath the punch so that no accident can result from this attempt to correct the misplacing of a part. As the treadle is depressed, the crank arm *e* is oscillated through the rod *g*, the arm *o* at the same time being oscillated and transmitting the oscillatory movement to the shaft *j* through the link *p*. The lost motion between the rod *f* and the crank arm *e* will permit a sufficient movement of the arm *e*, prior to any movement of the rod *f* and the clutch mechanism carried thereby, to initiate the oscillatory movement of the shaft *j* and raise the guard plate *k* for a sufficient distance to touch the hand of the operator and apprise him of the fact that the clutch mechanism is about to become operative. This will give the operator ample time to remove his hands, but if he fail to do so, the further oscillation of the plate *k* will forcibly displace his hands sufficiently to prevent any part thereof from projecting under the die. The plate *k* in its oscillation rises above the die carried by the bed of the machine and at the same time moves toward the operator, thus serving to lift the hands out of their position relative to the die and at the same time take them without the range of the punch. If the operator hold the treadle depressed, the plate *k* will be held elevated, and thus form a barrier which will prevent the hands from being brought beneath the punch, thus enforcing careful and proper operation of the press.

If it be desired to raise or lower the guard plate *k* to adapt it to dies of different thicknesses, this adjustment may be accomplished

by means of the vertically adjustable bearings *i i'*. The plate *k* should be of a width to protect any size of die which may be used in a press, and preferably is of a width to prevent any attempt to place the hand thereunder. If it be desired to adjust the guard without adjusting the bearings, the manner of mounting said guard upon the shaft *j* as shown and described will permit the plate to be either raised or lowered as desired, so that the work may be slid over the surface of the plate upon the die.

While I have described the device as being especially adapted for use in connection with power presses, I do not intend to limit its application to such. More accidents occur, however, upon such presses than upon foot presses and the field of greatest utility of the device will be in connection with power presses.

It is not my intention to limit the invention in its broader aspects to the precise details of construction shown in the accompanying drawings, it being apparent that such may be modified without departing from the spirit or scope of the invention.

Having described my invention, what I claim as new and desire to have protected by Letters Patent, is:—

1. A safety appliance for hand fed power presses, embodying therein a guard normally extending across and below the feeding space between the punch and the operator, and means for simultaneously raising said guard and moving it toward the operator.

2. A safety appliance for hand fed power presses, embodying therein means adjacent the punch, a punch tripping mechanism, and connections between said means and the tripping mechanism whereby the tripping mechanism may be blocked by the hand of the operator to prevent the operation of the press.

3. A safety appliance for hand fed power presses, embodying therein an oscillatory guard normally extending across and below the feeding space and mounted between the punch and the operator, and means oscillating said guard for simultaneously raising same and moving it toward the operator.

4. A safety appliance for hand fed power presses, embodying therein a guard normally extending across and below the feeding space between the punch and the operator, means for simultaneously raising said guard and moving it toward the operator, a punch tripping mechanism, and connections between said means and the tripping mechanism whereby said guard will be actuated through said tripping mechanism.

5. A safety appliance for hand fed power presses, embodying therein an oscillatory guard normally extending across and below the feeding space and mounted between the

punch and the operator, means oscillating said guard for simultaneously raising same and moving it toward the operator, a punch tripping mechanism, and connections between said means and the punch tripping mechanism whereby said guard will be oscillated through said tripping mechanism.

6. A safety appliance for hand fed power presses, embodying therein a guard normally extending across and below the feeding space between the punch and the operator, means for simultaneously raising said guard and moving it toward the operator, a punch tripping mechanism and connections between said means and the tripping mechanism whereby said guard will be actuated through said tripping mechanism, said connections being so set relative to said punch tripping mechanism as to cause the actuation of the guard prior to the actuation of the clutch.

7. A safety appliance for hand fed power presses, embodying therein an oscillatory guard mounted between the punch and the operator, means oscillating said guard for simultaneously raising same and moving it toward the operator, a punch tripping mechanism and connections between said means and the punch tripping mechanism whereby said guard will be oscillated through said tripping mechanism, said connections being so set relative to said punch tripping mechanism as to cause the actuation of the guard prior to the actuation of the clutch.

8. A safety appliance for hand fed power presses, embodying therein a guard normally between the punch and the operator, means whereby the height of said guard may be adjusted, and means for simultaneously raising said guard and moving it toward the operator.

9. A safety appliance for hand fed power presses, embodying therein an oscillatory shaft mounted between the punch and the operator, a guard normally extending across and below the feeding space carried by said shaft and normally extending across and below the feeding space and between the punch and the operator, a crank upon said shaft, a crank carried by the frame of the machine, connecting means between said last named crank and the treadle, and between said crank and the controlling clutch, and connections between said cranks, whereby said shaft will be oscillated for simultaneously raising said guard and moving it toward the operator with the tripping of the clutch.

10. A safety appliance for hand fed power presses, embodying therein an oscillatory shaft mounted between the punch and the operator, a guard extending across and below the feeding space carried by said shaft, a crank upon said shaft, a crank carried by the frame of the machine, an arm project-

ing downwardly and forwardly from said last named crank and movable therewith, and a link pivotally connected with said first named crank and said arm whereby
5 said shaft will be oscillated for simultaneously raising said guard and moving it toward the operator with the tripping of the clutch.

11. A safety appliance for hand fed power
10 presses, embodying therein an oscillatory shaft mounted between the punch and the operator, a guard carried by said shaft, a crank upon said shaft, a crank carried by the frame of the machine, an arm projecting
15 downwardly and forwardly from said last named crank and movable therewith, and a link pivotally connected with said first named crank and said arm whereby said shaft will be oscillated for simultaneously
20 raising said guard and moving it toward the operator with the tripping of the clutch,

said rod connecting the crank with the clutch mechanism affording lost motion between it and the crank whereby said shaft will be oscillated prior to the action of the clutch. 25

12. A safety appliance for hand fed power presses, embodying therein an oscillatory shaft mounted between the punch and the operator, a guard plate mounted upon said shaft and projecting toward the punch, said
30 plate normally extending across and below the feeding space, and means oscillating said shaft for simultaneously raising said plate and moving it toward the operator prior to the closing of the die. 35

In witness whereof, I have hereunto affixed my signature in the presence of two witnesses, this 26th day of June.

FRANK S. ALIANO.

Witnesses:

F. T. WENTWORTH,
EUGENE WENING.

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