March 21, 1950 P. J. MURCKO 2,501,347

DOUBLE SWEEP SAFETY GUARD FOR POWER PRESSES

Filed Jan. 23, 1947 2 Sheets-Sheet 1

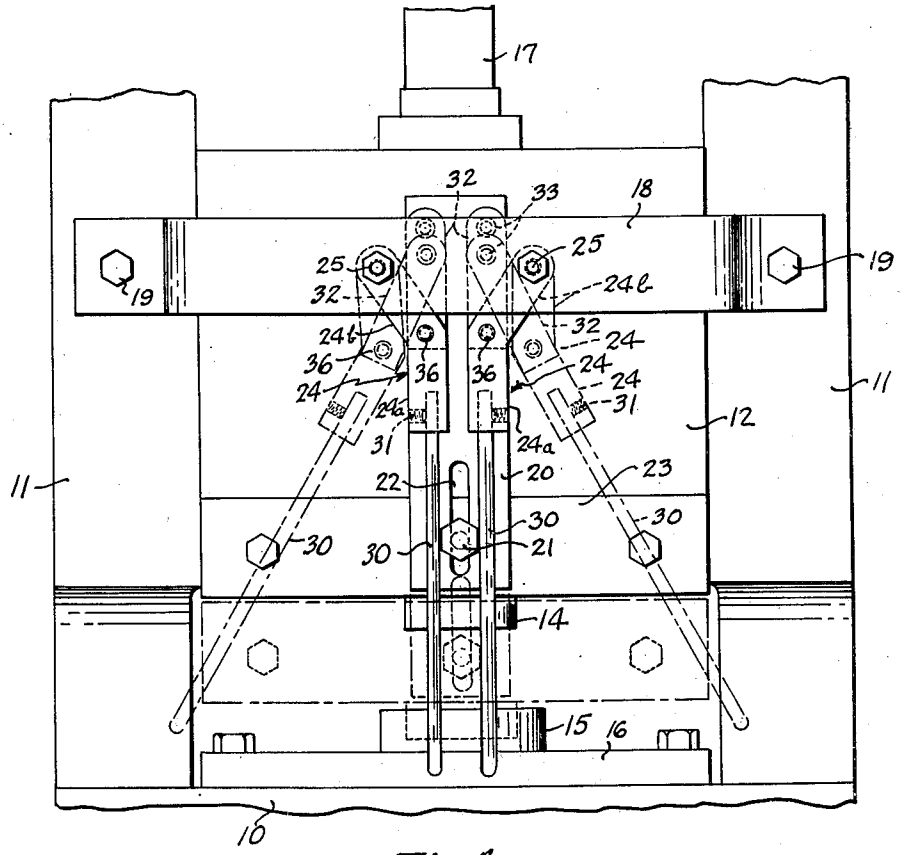


Fig. 1.

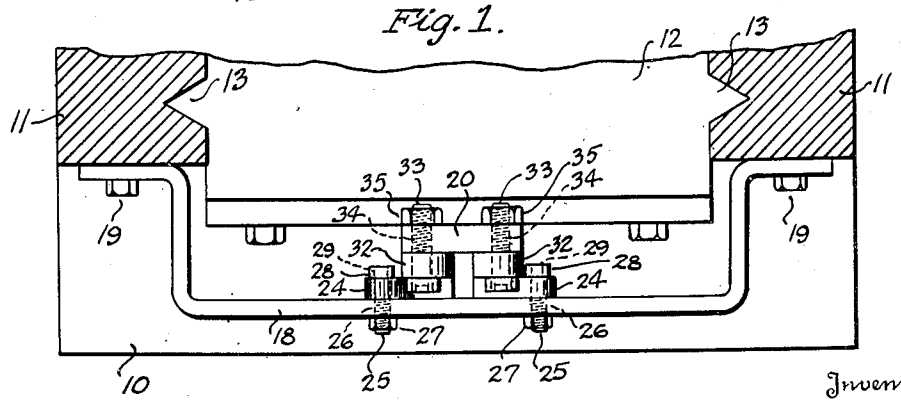


Fig. 2.

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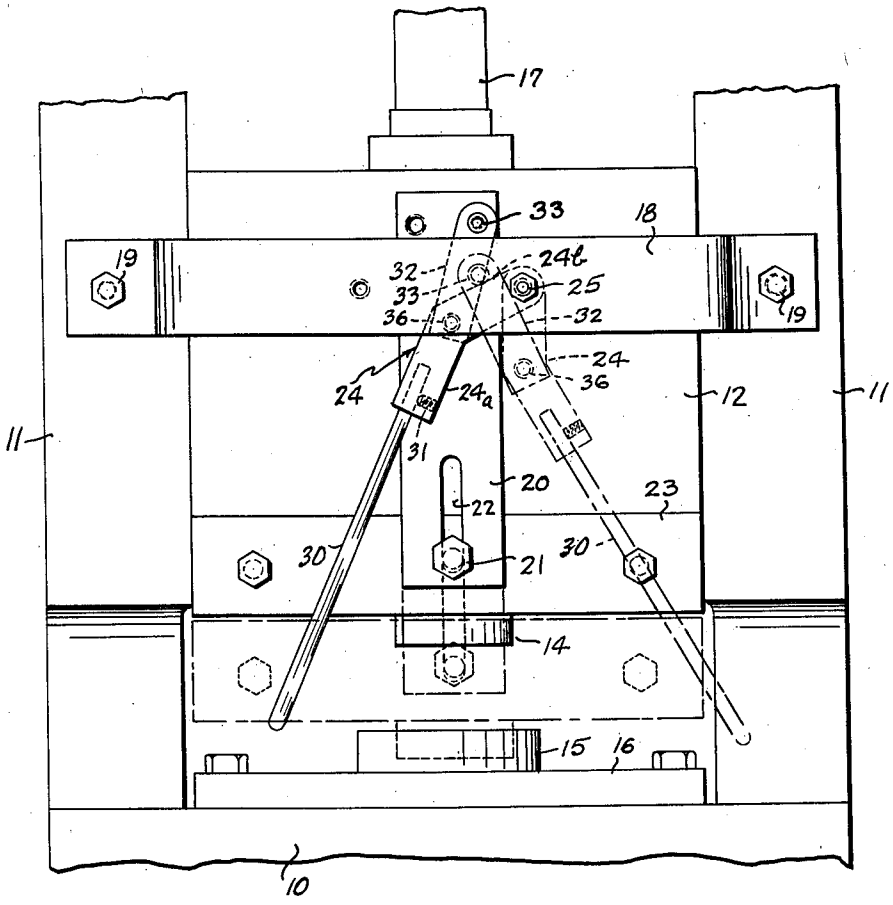


Fig. 3.

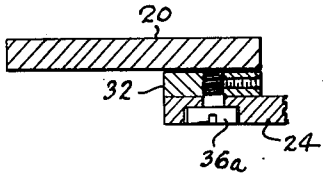


Fig. 4.

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Patented Mar. 21, 1950 2,501,347

UNITED STATES PATENT OFFICE

2,501,347

DOUBLE SWEEP SAFETY GUARD FOR POWER PRESSES

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Application January 23, 1947, Serial No. 723,754

3 Claims. (Cl. 74—615)

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This invention relates to a safety guard for presses, such, for example, as punch presses, forming presses, and the like, either of the foot press or power press type, and has for an object to provide an improved and simplified construction of the sweep type of safety guard which will be operated by movement of the press plunger or ram, to sweep across the front of the dies so that if the operator's hand happens to be too close to the dies it will be hit by the guard or pushed away before the dies come together and could cause injury.

Another object is to provide a device of this character which is so constructed and arranged that with the first movements of the plunger in a downward direction the guard has a wide sweep, and is thus given a quick action at the start of the stroke to insure that the hand of the operator is forced out of the way before the die on the plunger approaches the stationary die or the dies or plunger could cause injury.

Another object is to provide a construction which may be used either as a double sweep guard or a single sweep guard, depending on the space available and the type of action desired.

With the foregoing and other objects in view, I have devised the construction illustrated in the accompanying drawings forming a part of this specification. It is, however, to be understood the invention is not limited to the specific details of construction and arrangement shown, but may embody various changes and modifications within the scope of the invention.

In these drawings:

Fig. 1 is a front view of a portion of the press with my improved safety guard thereon and arranged as a double sweep guard;

Fig. 2 is a top plan view thereof, a portion of the plunger guide members of the press being shown in section;

Fig. 3 is a front view similar to Fig. 1, showing the device applied as a single sweep guard, and

Fig. 4 is a detail sectional view showing the connection between certain parts.

Referring first to Figs. 1 and 2, any suitable type of press is shown, comprising a base 10 and upright side or frame members 11, between which is mounted for vertical sliding movement the ram or plunger 12. In the illustration shown, this ram or plunger is guided in the side members 11 by any suitable guide means 13, and carries a punch or forming die 14 cooperating with a stationary die 15 on the bed 16 of the machine. These dies shown are merely to illustrate the device, and, of course, it may be used with any

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suitable type of dies. The ram or plunger 12 with the punch or die 14 is reciprocated up and down to and from the die 15 in the punching or forming operation by any suitable driving means, such as an eccentric or crank (not shown) through the bar 17. The operator may, for example, hold a strip of metal on the die 15 to be operated upon by punch or die 14, and if he has his hands too close to the die they may be injured, either by the dies or the lower end of the ram or plunger. To prevent this, I have devised the improved form of sweep guard shown.

The guard members are mounted on a substantially U-shaped strap or bar 18 secured at its opposite ends to the upright frame member 11 by any suitable means, such as the screws 19. Mounted on the ram or plunger 12 is a flat bar 20. This is secured in an upright position on the ram or plunger for vertical adjustment for a purpose presently to be described. Different ways of mounting may be used, but that shown comprises a screw 21 passing through an upright elongated slot 22 in the bar 20 and threaded into the lower member 23 of the ram or plunger 12. By this means, after the screw 21 is loosened, the bar 20 may be adjusted up and down on the ram or plunger to the desired position and then secured in this position by tightening the screw.

Pivotally mounted on the strap member 18 are two angularly shaped members or levers 24. These are pivotally suspended on the bar 18 by any suitable means such, for example, as the bolts or screws 25. These bolts or screws may be of any suitable type, but are preferably of the so-called "Allen" socket head screws, which are threaded into the bar 18 at 26 and secured by the lock nuts 27. At their inner ends they are provided with a socket head 28 which may be operated by any suitable type of socket wrench to fit the noncircular socket 29 of the head. These pivot screws 25 are mounted on the bar 18 on opposite sides of the bar 20 so that when the members or levers 24 are in their inner positions the lower portions 24a of these levers will be in a substantially vertical position, while the upper portions 24b will be inclined outwardly in opposite directions, as indicated in Fig. 1. Each member or lever 24 carries a guard rod 30 depending from it and secured to it by any suitable means. In the present construction the upper end of the rod is inserted in a socket in the lower end of the member 24 and secured therein by a set screw 31. These rods are of a length to ex-

tend down in front of the dies and to a point just above the base 10.

Pivoted to the upright bar 20 adjacent the upper end thereof is a pair of links 32. These links are each pivoted to the bar 20 at 33 by a screw similar to the screws 25, which may be the same type of screw, threaded into the bar 20 at 34 and secured by the lock nuts 35. At its lower end, each link 32 is pivotally connected to one of the members or levers 24 at 36 and when the guard rods 30 are in their inner or vertical position of Fig. 1 they are in substantial alignment with the links 32, and the pivotal support 25 for each of the levers 24 is located outside the vertical line through the pivots 33. Therefore, when the plunger or ram 12 moves downwardly and carries with it the bar 20, it will carry with it the pivots 33 and, therefore, the links 32. As the pivots 25 are located to one side (in this case outwardly of the vertical line through the pivots 33) this downward movement of the bar 20 and the links 32 will swing the members 24 outwardly about their pivots 25, as indicated by the broken lines Fig. 1, carrying with them the guard rods 30, and thus sweeping these two rods laterally outwardly across the front of the dies and the lower end of the ram or plunger, and should either of the operator's hands be dangerously close to the dies or plunger it will be hit by one of these rods and forced laterally out of the way before either the movable die or plunger are near enough to cause any injury. Because of this novel way of mounting the angular members or levers 24 in relation to the movable bar 20 and the links 32, a very rapid and relatively large movement is imparted to the guard rods 30 during the first downward movement of the plunger and the bar 20. In other words, this specific construction and arrangement gives a very quick action at the start of the downward movement of the plunger which is imparted to the guard rods, insuring that the operator's hand is hit and forced out of the way before there is any danger of injury, and still there is plenty of room for the rods to move during the rest of the movement of the plunger stroke. By means of the adjustable mounting for the bar 20, it will be understood it may be adjusted to any given position to properly locate the guard bars 30 and to give the required action, depending on the position of the ram or plunger 12 and the amount of movement of this plunger.

In some cases the press is so arranged that there may not be room for two sweeps or guard rods 30 or, due to the type of work being done, a single sweep may be preferred. This novel construction is adapted for use either as a double sweep guard or a single sweep guard. Fig. 3 illustrates its use as a single sweep guard. In this arrangement, one of the angle members or lever 24 is removed, in this case the left hand member, shown in Fig. 1, leaving only the right hand member, but as it is only a single sweep, the single guard bar 30 should sweep all the way across in front of the die instead of merely from the vertical central position to one side, as shown in Fig. 1. This is effected by means of adjustment of the bar 20. That is, after removal of the left hand member 24, the bar 20 is adjusted upwardly, after loosening the screw 21, as shown in Fig. 3. This movement through the link 32 will swing the angle member or lever 24 to the left to the full line inclined position of Fig. 3, placing the guard rod 30 carried by this member to an inclined position at the left of the dies, as

shown in full lines. The member 20 is clamped in this position, and then when the ram or plunger 12 descends it carries with it the link 32 and swings the lever 24 about the pivot 25 to the right or to the broken line position of Fig. 3, carrying with it the guard safety rod 30 and sweeping it clear across in front of the dies, so that should a hand of the operator be too near the dies, it will be hit and pushed out of the way. This full stroke and quick movement is possible because of the shape of the member 24 and the manner of mounting it on the supporting strap 18 with its pivot 25 laterally to one side of the vertical line through the pivotal connection 33 of the link to bar 20, and the relative position of the pivotal connection 36 of the lower end of the link to the member 24. In this particular case, as the pivotal connection 36 passes back of the strap 18, a screw with a counterbore head 36a is recessed into the lever member 24, but of course the same type of pivotal connection may be used if desired where the device is used as a double sweep.

It will be seen from the above that the device is a very simple one, involving a minimum number of parts, and that it is so mounted, constructed and arranged that it effectively sweeps entirely across in front of the die, and also because of this construction it has a very quick action during the first part of the stroke of the ram or plunger carrying the movable die, and, therefore, the operator's hand, should it be in a dangerous position is hit and forced to one side well before the plunger and die descend to a position where the hand would be injured. It will also be seen the device is readily adapted, depending on conditions and the operation desired, for use either as a double sweep or a single sweep guard.

Having thus set forth the nature of my invention, what I claim is:

1. A safety guard for presses and the like including a frame and a vertically reciprocating plunger, said guard comprising a bracket secured to a stationary part of the press, a bar, means mounting the bar on the plunger for vertical adjustment, a depending angularly shaped lever arm comprising an upright lower portion and an upper portion inclined laterally at an angle to the lower portion, pivot means connecting the upper end of the upper inclined portion of the lever arm to the bracket, a guard rod depending below the lower end of said arm in front of the plunger, and an upright link connection pivoted at its upper end to the bar and at its lower end to the lower portion of the arm below the pivotal connection of said arm to the bracket, said link in the upper position of the plunger being in substantial alignment with the lower portion of the arm so that the pivotal connection of the link to the bar is laterally to one side of the pivotal connection of the upper end of the arm to the bracket and downward movement of the plunger will act through the link to swing the arm about its pivot to swing the lower end of the rod laterally across the front of the plunger.

2. A safety guard for presses and the like including a frame and a vertically reciprocating plunger, said guard comprising a bracket secured to a stationary part of the press and located in front of the plunger, a depending angularly shaped lever comprising an upright lower portion and a laterally and upwardly inclined upper portion extending at an angle to the lower portion, pivot means connecting the upper end of said inclined upper portion of the lever to the bracket,

a guard rod depending from the lower end of the lever in front of the plunger, and an upright link pivoted at its upper end to the plunger and at its lower end to the lower part of the lever below the pivotal connection of said lever to the bracket, said link in the normal upper position of the plunger being in substantial alignment with the lower portion of the lever so that the pivotal connection of its upper end to the plunger is located laterally of the pivotal connection of the lever to the bracket and downward movement of the plunger will act through the link to swing the guard rod across in front of the plunger.

3. A safety guard for presses and the like including a frame and a vertically reciprocating plunger, said guard comprising a bracket secured to a stationary part of the machine and located in front of the plunger, a bar, means mounting the bar on the plunger for vertical adjustment, a pair of depending angularly shaped levers each comprising an upright lower portion and an upwardly and outwardly inclined upper portion, pivot means connecting the upper end of the inclined upper portion of each lever to the bracket so that their pivotal connections to the bracket are at laterally spaced points and located laterally from and on the opposite sides of the upright portions, a guard rod depending from the lower

end of each lever in front of the plunger, and an upright link for each lever each pivoted at its upper end to the bar and at its lower end to the lower portion of one of the levers below the pivotal connection of said lever to the bracket, said links in the normal upright position of the plunger being in substantial alignment with the lower portion of its respective lever so that its pivotal connection to the bar is inwardly of the pivotal connection of the lever to the bracket and downward movement of the plunger will act through the links to swing the guard rods across in front of the plunger.

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