May 8, 1928. 1,668,545

L. BORAKS

SAFETY GUARD FOR PUNCH PRESSES

Filed Jan. 13, 1927 2 Sheets-Sheet 1

Fig. 1.

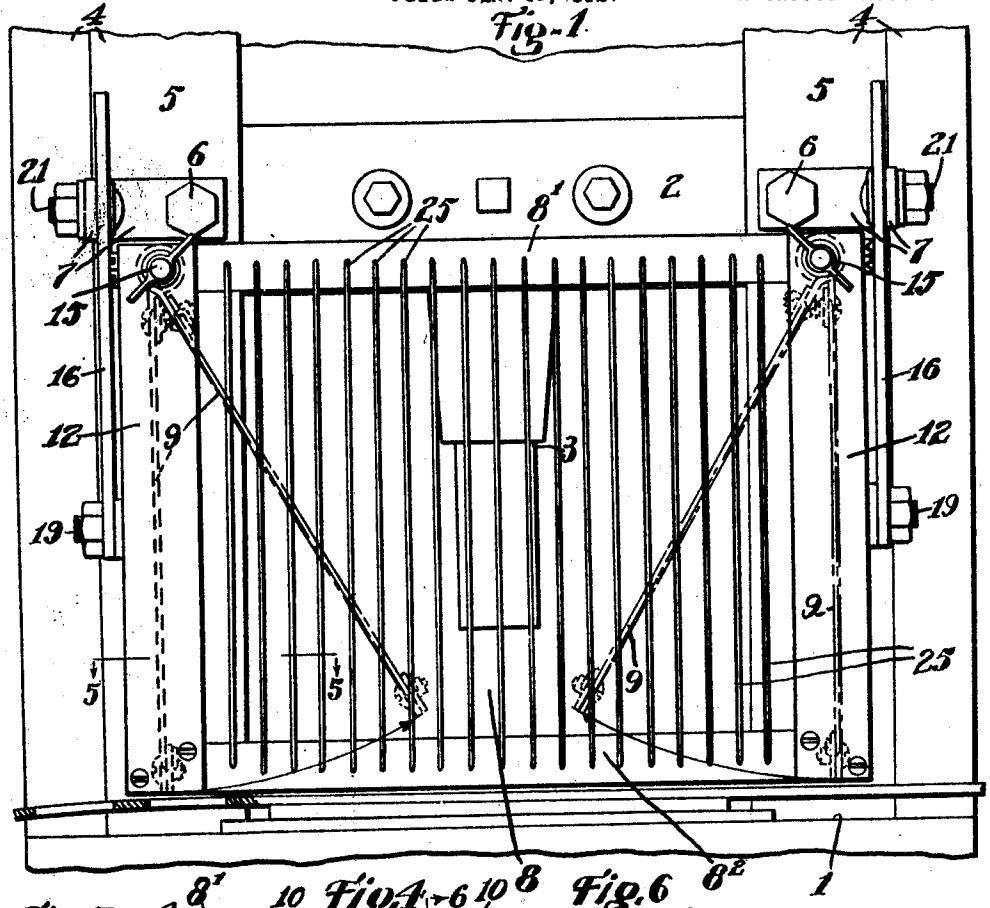


Fig. 5

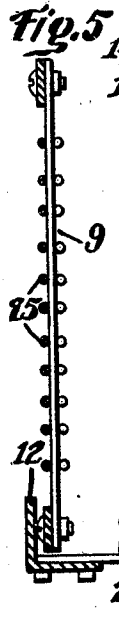


Fig. 4

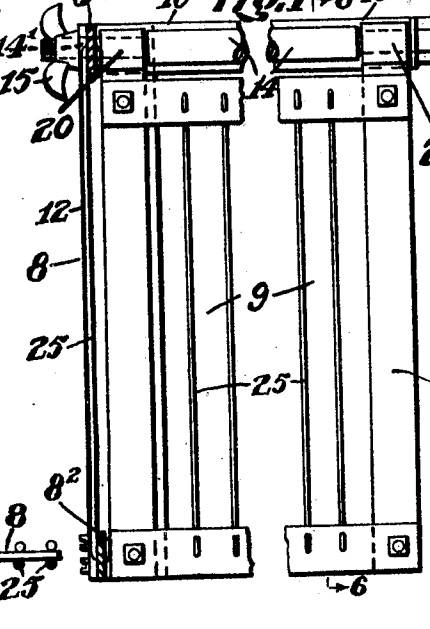
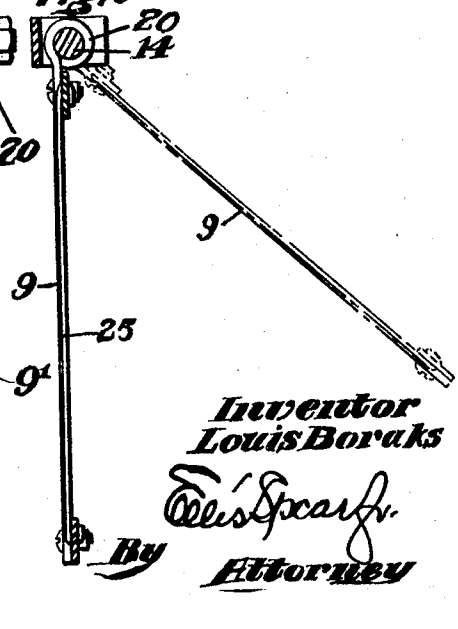


Fig. 6



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Fig. 2

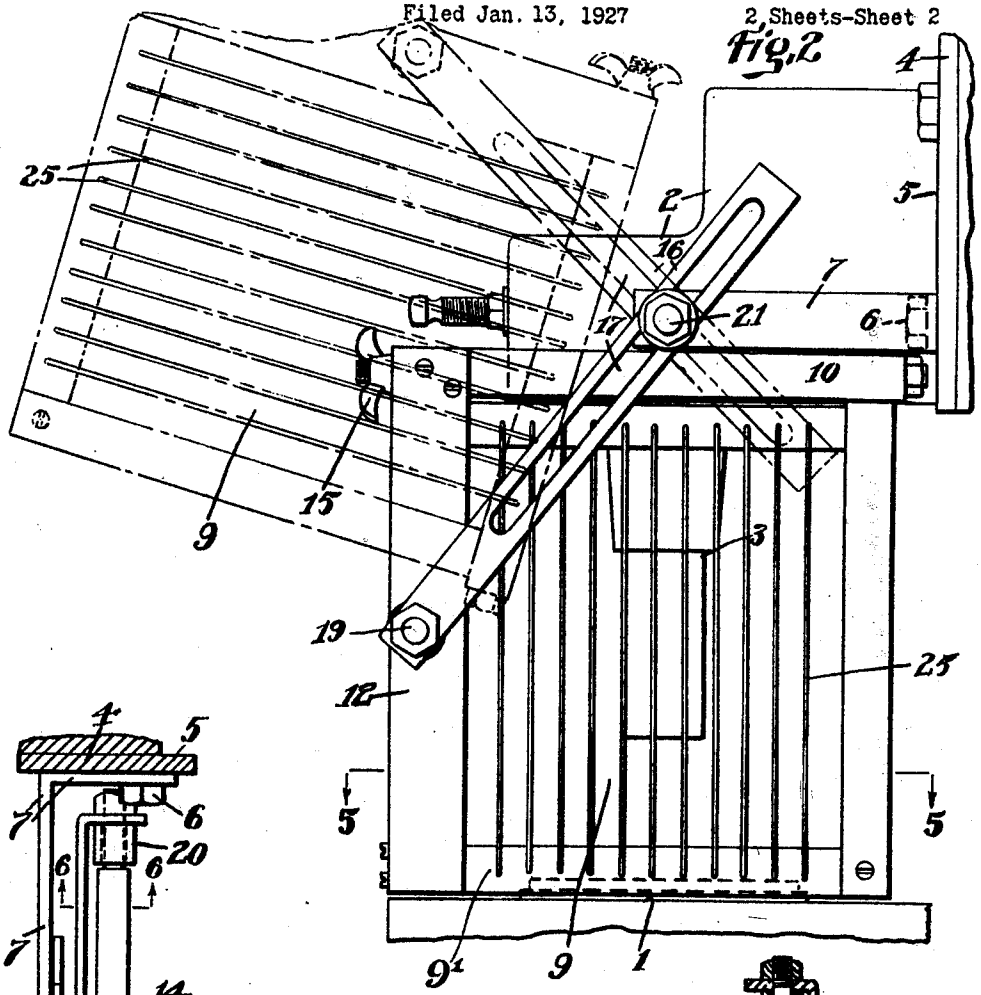
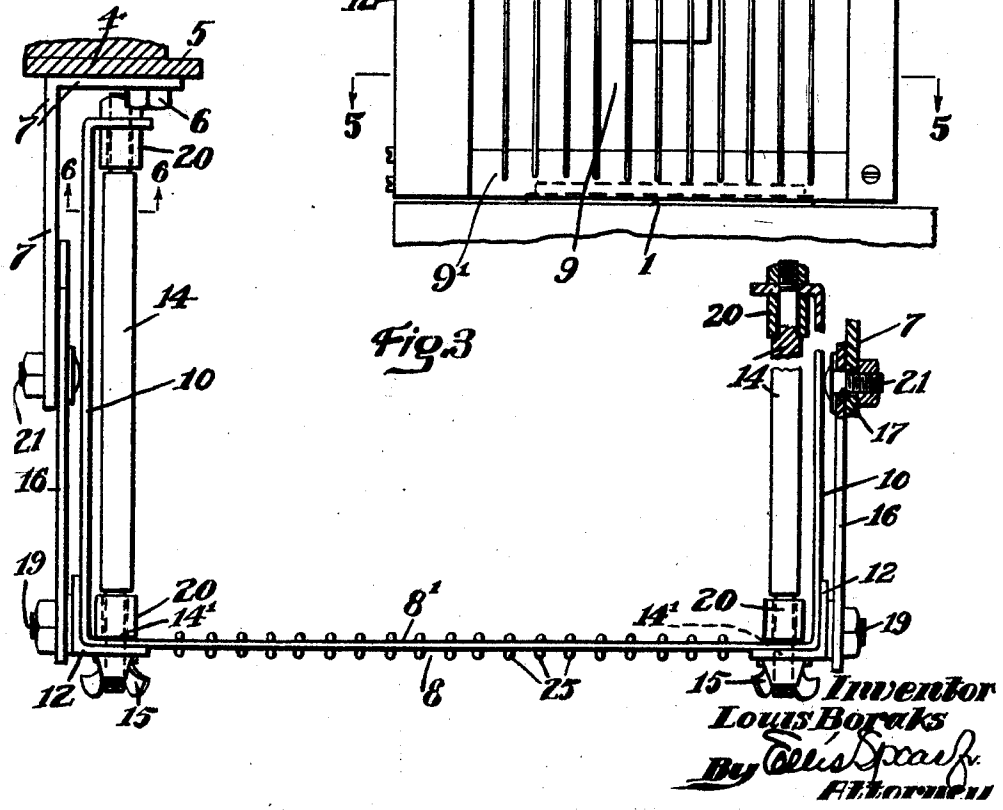


Fig. 3



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UNITED STATES PATENT OFFICE.

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SAFETY GUARD FOR PUNCH PRESSES.

Application filed January 13, 1927. Serial No. 160,930.

The safeguarding of certain machines such as the punch press has been provided for by many devices and of these a variety are in use.

The problem has two phases of difficulty, one the actual efficiency of the guard and the other the inertia of the operative or owner who are frequently reluctant to use the guard or derelict in maintenance thereof.

The dangers involved in the use of such machines are so well recognized that in September, 1926, the United States Department of Labor issued a code entitled "Bulletin of the United States Bureau of Labor Statistics, No. 430—Safety Code for Power Presses and Foot and Hand Presses". As set forth therein, the use of power presses and foot and hand presses for stamping and forming pieces of metal and other material has grown so rapidly, and the loss of hands or fingers on these presses as commonly operated is so frequent, that this hazard has become one of the most serious mechanical problems in accident prevention. To overcome these dangers a wide variety of guards and feeding methods has been devised.

Special regulation is made in the code for the safeguarding of press hazards at point of operation and specific requirement for suitable means is incorporated.

There are three methods of feeding the press, an automatic feed, a semi-automatic feed and a manual feed. It is required that in the case of the automatic and semi-automatic feeds the ram be either enclosed, the ram stroke limited, or a gate guard provided. In the case of the manual feed in addition to the above there is an alternative of using a sweep guard or special hand tools.

My invention deals with the safeguarding of the press by the provision of an enclosure of the ram.

The safety code makes specific requirements as to the details of safeguarding and to these details and the accompanying illustrations, reference is made as a disclosure of the prior art. My invention is intended to comply with all requirements of the code as well as furnish a more economical and satisfactory guard than has heretofore been known.

The problem involved is so old and accidents of this nature so common that the risk is not only specifically insurable but the safety devices classified and rated for insurance credit.

The present invention approached from the viewpoint of insurance contemplates a guard of the highest rating and one offering the least use resistance, to the common end of preventing the maiming of the operative and making possible the most efficient insurance for unavoidable injury.

The guard of the present invention is of the barrier type which while accepted as the most efficient and reliable type is but infrequently used and then usually on automatic or special tool presses where frequent access to the ram and dies is unnecessary. As the matter of accessibility of the press and adjustability of the guard for the various heights and sizes of dies and tools used are conditions precedent for the survival of the guard in use, my invention provides for both, while maintaining a cost price consistent with insurance rates. My guard is distinguished from others now in use in that it is a fixture attached directly to the frame work of the press, which because of its great variety of adjustments need not be removed from the press in setting up new tools, and may be adjusted to all sizes of tools used in a common punch press. My guard may be adjusted vertically, horizontally and angularly, and it may be raised entirely above the setting up point without being removed from the press. Furthermore the guard itself may be fixed in any position and the two side barriers yet be laterally adjustable.

While my invention is capable of rather wide variation in details of structure I have illustrated in the accompanying drawings a form sufficiently representative to enable any shop head to make an efficient and satisfactory guard for any standard type of press.

In these drawings:

Fig. 1 is a front elevation of such guard applied to a press indicated in outline.

Fig. 2 is a similarly treated side view.

Fig. 3 is a plan view of the guard.

Fig. 4 is an end view looking from the inside of the guard.

Fig. 5 is a section on the lines 5—5 of Figs. 1 and 2, and

Fig. 6 is a section on the lines 6—6 of Figs. 3 and 4.

In the drawings I have shown at 1 the usual floor foundation or other support upon which the punch press is securely fastened or anchored in place and indicates the usual condition of standing room at the press. A

press ram 2 which carries desired die members or tools 3 is shown mounted in the slide 4 to which it is gibbed as at 5. These parts are uniform equipment for any punch press. Attached to the framework 4 by the bolts 6 holding the gibs 5 are a pair of brackets 7 to which my barrier guard is adapted to be attached as will be hereinafter described, and upon which it may be swung vertically, horizontally and angularly to permit access to the ram or to define or limit the work area.

My guard comprises a front barrier 8 and side barriers 9. The front barrier consists of a top cross bar 8′ and a bottom cross bar 8^2 joined by suitably spaced vertical connecting wires 25. The side barriers have a complete frame work 9′, the top and bottom being joined by the spaced vertical connecting wires 25.

The top cross bar 8′ of the front barrier is bent at right angles to either end to provide side arms 10. These arms 10 are again turned at right angles at their extreme rear ends and bored to receive one end of a rod 14 on which is hung, by means of hinges 20, the side barrier 9.

At its forward end the rod 14 passes through a hole in the frame work 8′ of the front barrier 8 and the top of the angle iron 12 as shown at 14′ where it is held by a wing nut 15. The side barrier 9 may be rotated by its hinges 20 on the rod 14 so that it may be moved inwardly or outwardly as desired to enclose a smaller or larger working area than provided when the barrier hangs vertically.

About midway of the corner angle iron 12 I have pivoted by means of a bolt 19 a lever 16 slotted at 17. The slot 17 permits the arm to slide or swing on a pivotal stud 21 in the end of the bracket 7 which is attached to the uprights 3 of the punch press by bolts 6 as above described.

The slot 17 in the lever 16 permits the front barrier 8 to be adjusted vertically or angularly on the pivotal stud 21. The bolt in this stud may be loosened and as desired the front clearance of the barrier from the ram be adjusted. Regardless of the height or distance of the barrier from the work area it may be raised or swung on the pivotal stud 21 from its normal position outside of the dies or other tools to a position where it overlies the working area, permitting access thereto when it is desired to change the dies or repair the same. It will be obvious that any partial elevation or tilting or angular adjustment is also permitted by reason of the free pivotal mounting 21.

Because of the fact that the arm 16 is connected at its forward end to the angle iron 12, which connects the front barrier 8 and the side arms 10 which carry the side barriers 9 both front and side barriers may be adjusted or swung upwardly or in or outwardly as one unit. The peculiar sliding and pivoting nature of the slotted arm 17 and pivots 19 and 21 not only allows the guard to be swung above the operating area but permits the barrier to be adjusted to conform to the height and longitudinal dimension of the operating area. The possibilities of adjustment by means of the slot 17 and pivots 19 and 21 therefore are two-fold, first with reference to the height of the work, second with reference to the forward extension of the barrier from the ram.

As stated, the side barriers 9 may be swung laterally on the metal rods 14. By this means an adjustment and variation transversely of the die operating area is permitted. This permits the side guards to be brought close to the lower die members to give complete convenience for feeding the stock or other attendant operation. In operation my barrier is first attached to the bracket 7 by the pivotal stud 21 through the slot 17 of the lever 16. The pivotal studs 19 and 21 may be suitably adjusted so that the front barrier 8 and the side barrier 9 may be properly positioned about the ram with reference to the operating zone. When a satisfactory adjustment has been secured the bolts may be tightened. The barrier guard maintains this selected relative spaced relation to the operating zone until a further arrangement is effected by means of the slot 17 and studs 19 and 21.

My guard is a practical and efficient solution of the need for protection from the dangers outlined in the official safety code for such presses. It has proven satisfactory in operation and is so easy of adjustment that the temptation on the part of the operative to dispense with the guard is avoided. The device is capable of cheap production, is quickly installed and has the added advantage of remaining attached to the press during periods of idleness or when the press is stopped for change of tools or repair. As a final part of the press, it is always available and as the time required to adjust it is so short the constant use of the device is practically assured.

Any modification in the construction of the barrier members and the arrangement or attachment of the same with relation to the supports or to each other or any variation in the arrangement of pivoting may be resorted to without departing from the spirit of my invention if within the limits of the appended claims.

What I therefore claim and desire to secure by Letters Patent is:

1. A barrier guard for a punch press or the like comprising a top frame, lateral barrier walls hinged thereto, means for adjustably supporting said guard with reference to the operating zone of said press com-

prising a slotted lever arm pivoted to said press whereby vertical and clearance adjustment of said guard with relation to said work area is effected.

2. A barrier guard for a punch press or the like comprising a front barrier and side barriers, said front barrier having a projecting arm, a support for said side barriers comprising a rod carried by said projecting arm, said side barriers being hinged to said rod and rotatable thereon to permit lateral adjustment of said side barrier with relation to the operating zone.

3. A barrier guard for a punch press or the like comprising a front barrier and side barriers each consisting of top and bottom frame members connected by suitable spaced vertical wires, said top frame of said front barrier being extended and bent at right angles to provide supports for said side barriers, and means for fastening said side barrier to said support.

4. A barrier guard for a punch press or the like comprising a front barrier and side barriers each consisting of top and bottom frame members, said top frame of said front barrier being extended and bent at right angles to provide supports for said side barriers, and means for fastening said side barrier to said support.

5. A barrier guard for a punch press or the like comprising a front barrier and side barriers each consisting of top and bottom frame members, said top frame of said front barrier being extended and bent at right angles to provide supports for said side barriers, and means for connecting said side barriers to said support comprising a rod secured to said support, said side barriers being hinged to said rod and adapted to rotate thereon to permit a lateral adjustment of said side barriers.

6. A barrier guard for a punch press or the like comprising a front barrier and side barriers each consisting of a top frame and bottom frame, said top frame of said front barrier being extended and bent at right angles to provide supports for said side barriers, an angleiron fastened to said front barrier and said support for said side barrier, a slotted arm pivotally connected at one end to said angleiron and at the other end to the frame work of the press permitting vertical and clearance adjustment of said guard with reference to the work area.

7. A barrier guard for a punch press or the like comprising a front barrier and side barriers each consisting of a top frame and bottom frame, said top frame of said front barrier being extended and bent at right angles to provide supports for said side barriers, means fastening said side barriers to said support, an angleiron fastened to said front barrier and said support for said side barriers, a slotted arm pivotally connected at one end to said angleirons and at the other end to the frame work of the press, permitting adjustment of said guard with reference to the work area.

8. A barrier guard for a punch press or the like comprising a front barrier and side barriers each consisting of a top frame and bottom frame, said top frame of said front barrier being extended and bent at right angles to provide supports for said side barriers, means fastening said side barriers to said support comprising a rod secured to said support, said side barriers being hinged to said rod and adapted to rotate thereon to permit a lateral adjustment of said side barriers.

9. A barrier guard for a punch press or the like comprising a front barrier, and a side barrier mounted for angular adjustment laterally of said front barrier, and a sliding support pivoted at one end to said guard and at the other to the framework of the press and permitting adjustment of said guard with relation to the operating zone of said press.

10. In combination with a machine having a reciprocating ram, a barrier guard constituting a rigid three sided barrier and comprising front and side barrier members in continuous enclosing relation and of a height greater than the ram stroke, means for relatively adjusting the barrier members to vary the enclosed area adjacent the work, and means for displaceably supporting the guard for access to the tool.

11. A barrier guard for a punch press or the like, constituting a rigid three sided barrier and comprising front and side barrier members in continuous enclosing relation, means for relatively adjusting the barrier members to vary the enclosed area, and means for displaceably supporting the guard relative to the work.

12. A barrier guard for a punch press or the like comprising a rigid framework and front and side barrier members carried thereby in continuous enclosing relation, said side members being adjustable transversely relative of the front member to vary the enclosed area adjacent the work, a frame bracket for the press and a swinging and sliding connection between said frame and said bracket.

In testimony whereof I affix my signature.

LOUIS BORAKS.