

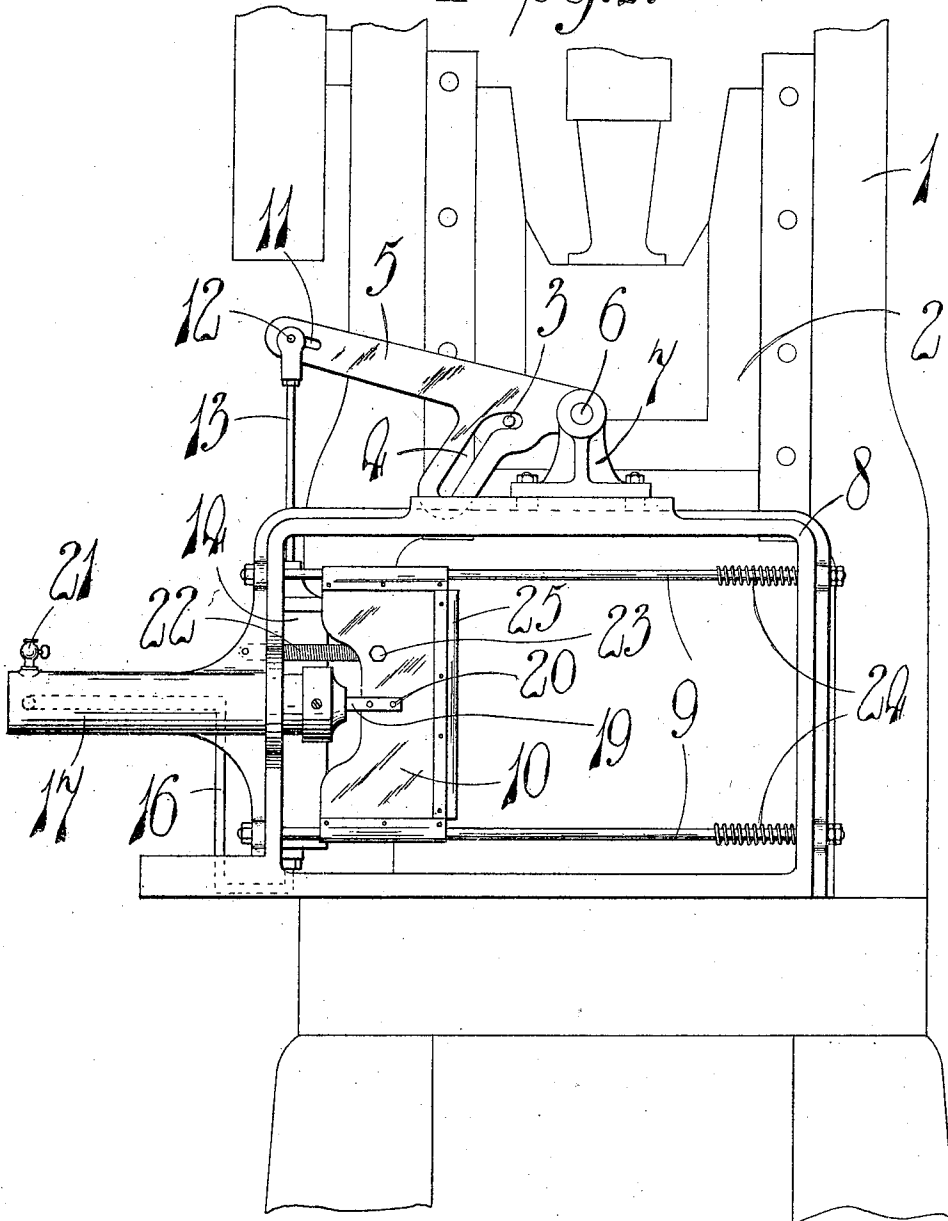
Dec. 26, 1922.

A. W. HORDERN.
PRESS GUARD.
FILED JUNE 5, 1922.

1,439,818.

4 SHEETS—SHEET 1.

Fig. 1.



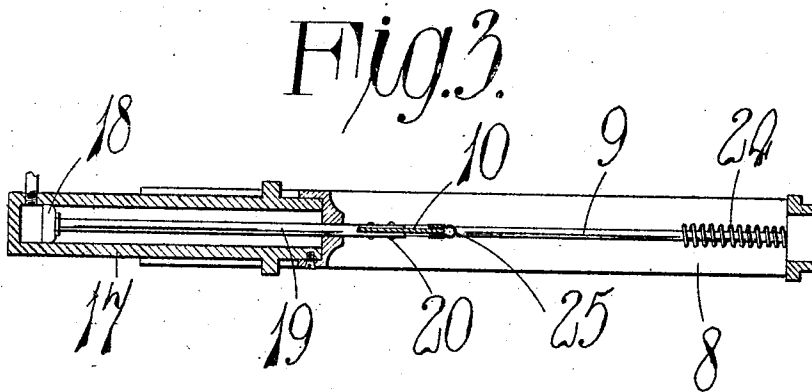
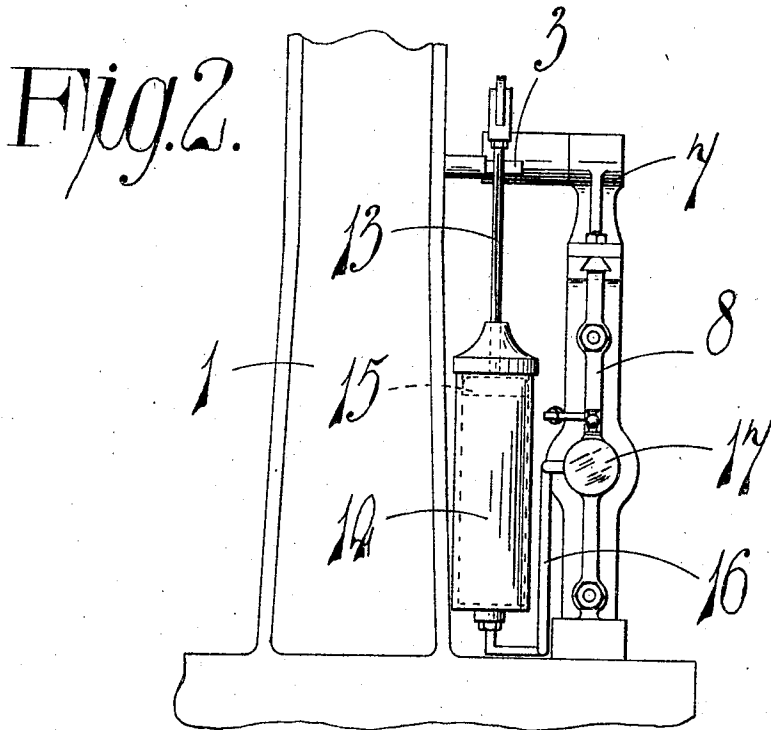
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4 SHEETS—SHEET 2.



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Alfred William Horden.
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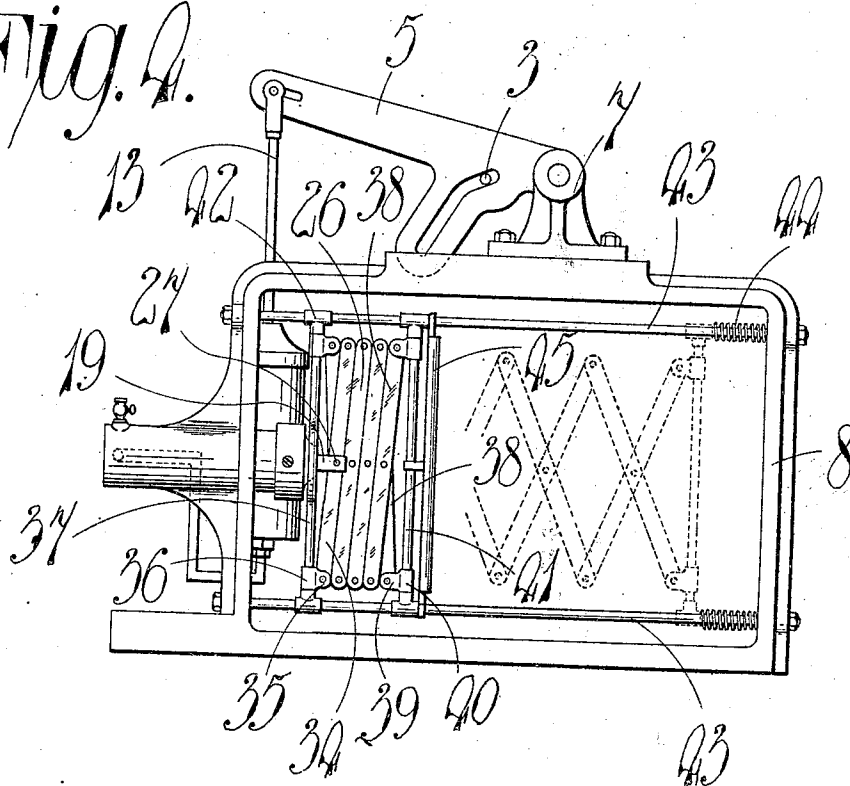
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4 SHEETS—SHEET 3.

Fig. 4.



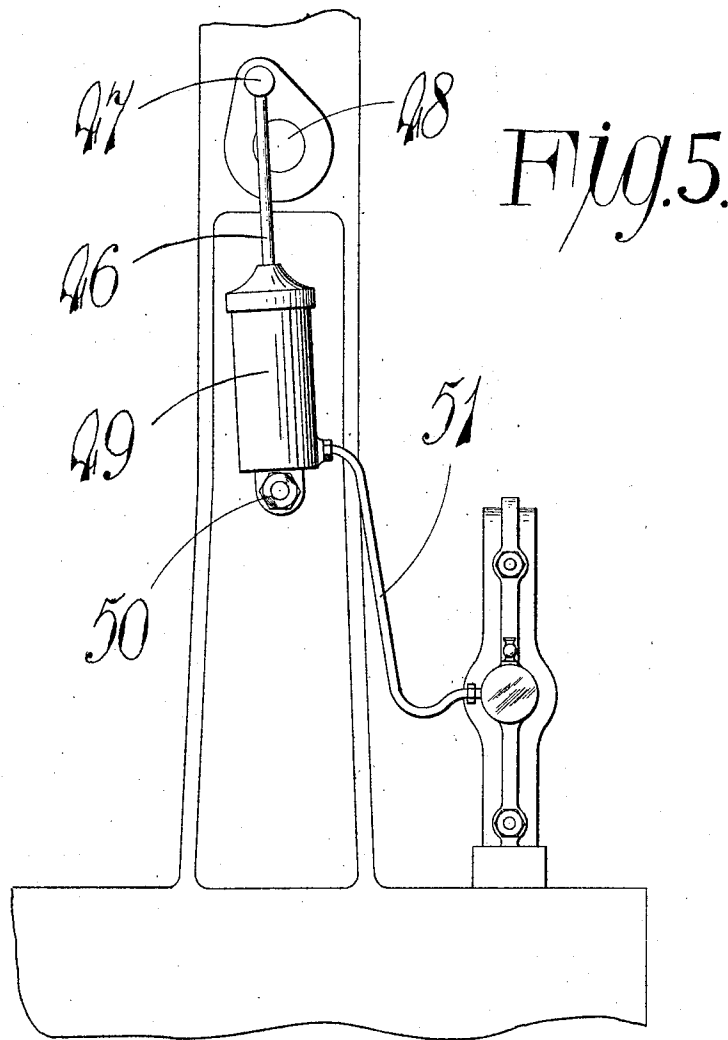
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

ALFRED WILLIAM HORDERN, OF BIRMINGHAM, ENGLAND.

PRESS GUARD.

Application filed June 5, 1922. Serial No. 566,158.

To all whom it may concern:

Be it known that I, ALFRED WILLIAM HORDERN, a subject of the King of Great Britain, residing at Vulcan Works, Vesey Street, Birmingham, in the county of Warwick, England, have invented certain new and useful Improvements in Press Guards; and I do hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to press guards and has for its primary object to provide improved actuating means for guards of presses, stamping hammers or other similar devices.

One of the objects of the present invention is to provide an actuating device so constructed that a standard design of actuating device can be applied without difficulty to various makes of presses.

Another object of the present invention is to provide a press guard and actuating mechanism wherein the greatest degree of safety is obtained by arranging that the guard moves into its operative position at the commencement of the downward movement of the ram and is positively held in its operative position until the ram has almost completed its upward movement.

A further object of the present invention is to provide a press guard which may be constructed as a self-contained unit for application to any press and which can be applied thereto with a minimum amount of addition to the press itself.

A further object of the present invention is to provide an improved form of press guard which will come into action more quickly than those at present generally in use.

Referring to the drawings:—

Figure 1 is a view in side elevation shewing one form of press guard and actuating mechanism constructed according to my invention.

Figure 2 is an end elevation thereof.

Figure 3 is a sectional plan shewing a portion of the device.

Figure 4 is a view in side elevation shewing another construction of press guard and actuating device in accordance with my invention.

Figure 5 shows an alternative method of moving the press guard from the press.

In the construction illustrated in Figures 1 to 3, the framework of the press is represented at 1 and the moving ram is shewn at 2. In this construction the press guard and its actuating mechanism is made as a single unit which can be applied to any press with a minimum of addition to the press. As will be seen from the drawings, the only fitting to be applied to the press in this case is an operating pin 3 which is secured to the ram. This pin 3 engages in a slot 4 formed in a lever 5 which is pivoted at 6 to a bracket 7 secured on a framework 8 which carries guides 9 upon which the press guard 10 slides.

The end of the lever 5 is provided with a slot 11 in which engages a pin 12 carried on the end of a piston rod 13.

This piston rod 13 operates in a fluid pressure cylinder 14, the rod 13 being connected to a piston 15. From the base of the cylinder 14 is a pipe connection 16 placing the cylinder 14 in communication with a second fluid pressure cylinder 17 which is arranged at right angles to the cylinder 14. Within the cylinder 17 is a piston 18 having a piston rod 19 which is connected at 20 to the press guard 10.

The rear end of the cylinder 17 is provided with a cock or tap 21 which can be opened to relieve the pressure therein when required.

The pipe connection 16 may if required be a flexible connection so that if the apparatus is to be applied to a machine wherein the distance between the ram in its upper position and the place where the guard must be fitted, is different from that in the press shewn in the drawings, the cylinder 17 and the guard 10 may be placed where they are required whilst the cylinder 14 and lever 5 may be mounted adjacent to the ram in its upper position.

It will be observed that the slot 4 is a curved slot. It is designed so that when the ram commences to descend the lever 5 is given an immediate movement which is sufficient to pump fluid from the cylinder 14 to the cylinder 17 and the fluid thus pumped operates the lever 18 so as to slide the press guard 10 along its guides 9. This movement is completed at the beginning of the downward movement of the ram, after which the pin 3 moves along the lower part of the slot 4 without causing any movement of the lever 5.

Upon the return movement of the ram no motion of the lever 5 takes place until

the ram has almost reached its upper position. The lever 5 is then operated so as to relieve the fluid pressure in the cylinder 17 when the press guard 10 is withdrawn by the tension spring 22 connected to the press guard at 23 and to the frame 8.

The guides 9 may be provided with coiled springs 24 which act as buffers for the press guard when it comes into operation whilst the leading edge of the press guard may be provided with a rubber or other buffer 25 to prevent the hand of the operator from being damaged if it should come into violent contact therewith.

In using fluid pressure or vacuum for conveying the motion from a lever such as 5 to the press guard 10 several advantages are obtained. For instance, if a flexible pipe connection is used between the cylinders 14 and 17 the relative positions of these cylinders may be varied to suit different sizes and makes of machines without rendering any modification in the design of the apparatus necessary. Further, the stroke or amount of movement of the press guard can be regulated as may be desired by providing a hole in the cylinder 17 which will form an exhaust port to be uncovered by the piston 18 when the required length of movement is obtained. Similarly by providing a hole in the cylinder 14, if required any part of the movement of the lever 5 may become lost motion, i. e. the lever 5 may move but the fluid under the piston 15 will escape through the hole if provided. After the hole has been passed by the piston 15 however, movement of the press guard will begin to take place.

In the construction shewn in Figure 4 the arrangement is similar to that described with reference to Figures 1, 2 and 3 except that in place of the press guard 10 I provide a press guard of lattice work or lazy tongs structure shewn at 26. In this case the piston rod 19 is connected at 27 to the end links 34 of the lattice work guard. These links 34 are pivotally connected to lugs 35 associated with bosses 36 which can slide on a transverse guide rod 37 connected to the frame.

At the other end of the lazy tongs guard the ends links 38 are pivoted to lugs 39 associated with sliding bosses 40 upon a transverse guide rod 41. The guide rod 41 at its extremities is connected to bosses 42 adapted to slide upon longitudinal guides 43 carried by the frame. Springs 44 may be provided acting between the ends of the bosses 42 and the end of the frame to serve as buffers.

The return movement of the guard 26 may either be obtained through the suction under the piston 15 when the lever 5 moves upwardly or a spring may be provided to assist in the return movement.

With this arrangement any movement given to the links 34 is magnified at the other end of the lazy tongs so that the leading edge of the guard will move much faster than the piston rod 19. The leading edge of the lazy tongs guard may be provided with a buffer 45 if required.

In the construction shewn in Figure 5 instead of driving the piston of the primary fluid pressure cylinder by means of a lever, the piston rod 46 is connected direct at 47 to a crank upon the driving shaft 48 of the press. When this construction is used it will be necessary for the primary fluid pressure 49 to be mounted for oscillation and it is accordingly pivoted at 50 to a fixture.

In the construction shewn in Figure 6 instead of employing a rigid pipe connection 16 between the primary fluid pressure and the fluid pressure cylinder associated with the guard a flexible pipe connection 51 is used so that the relative positions of the two fluid pressure cylinders can be arranged as may be most suitable for the machine to which the apparatus is applied.

In connection with Figure 6 it will be understood that the construction of the guard and the fluid pressure associated therewith may either be similar to that shewn in Figure 1 or that shewn in Figure 4.

What I claim then is:—

1. A guard for presses comprising a movable guard, an operating lever adapted to be moved by a projection on the ram of the press, a fluid pressure cylinder associated with said lever, a piston in said cylinder, a rod connecting said piston with said lever, a fluid pressure cylinder associated with said guard, a piston in said cylinder, a rod connecting said piston to said guard, and a pipe connection from one fluid pressure cylinder to the other, whereby motion of the operating lever is accompanied by motion of the guard.

2. A guard for presses comprising a guard mounted so that it can reciprocate, guides for said guard, a frame carrying said guides, an operating lever pivotally associated with said frame, and adapted to be moved by a projection on the ram of the press, a fluid pressure cylinder associated with said lever, a piston in said cylinder, a rod connecting said piston with said lever, a fluid pressure cylinder associated with said guard, a piston in said cylinder, a rod connecting said piston to said guard, and a pipe connection from one fluid pressure cylinder to the other, whereby motion of the operating lever is accompanied by motion of the guard.

3. A guard for presses comprising a movable guard, an operating lever having a two armed slot for engagement by a projection on the ram of the press, a fluid pressure cylinder associated with said lever, a piston

in said cylinder, a rod connecting said piston with said lever, a fluid pressure cylinder associated with said guard, a piston in said cylinder, a rod connecting said piston to said guard, and a pipe connection from one fluid pressure cylinder to the other, whereby motion of the operating lever is accompanied by motion of the guard.

4. A guard for presses comprising a movable guard, a fluid pressure cylinder, a piston in said cylinder, a rod connected to said piston and adapted to be connected to a moving part of the press, a fluid pressure cylinder associated with said guard, a piston in said cylinder, a rod connecting said piston to said guard, and a pipe connection from one fluid pressure cylinder to the other, whereby motion of the press is accompanied by motion of the guard.

5. A guard for presses comprising a guard mounted so that it can reciprocate, guides for said guard, a frame carrying said guides, a fluid pressure cylinder, a piston in said cylinder, a rod connected to said piston and adapted to be connected to a moving part of the press, a fluid pressure cylinder associated with said guard, a piston in said cylinder, a rod connecting said piston to said guard, and a pipe connection from one fluid pressure cylinder to the other, whereby motion of the press is accompanied by motion of the guard.

6. A guard for presses comprising a lazy tongs structure forming a reciprocating guard, guides for said guard, a frame carrying said guides, a fluid pressure cylinder, a piston in said cylinder, a rod connected to said piston and adapted to be connected to a moving part of the press, a fluid pressure cylinder associated with said guard, a piston in said cylinder, a rod connecting said piston to said guard, and a pipe connection from one fluid pressure cylinder to the other, whereby motion of the press is accompanied by motion of the guard.

7. A guard for presses comprising a lazy tongs structure forming a reciprocating guard, means for holding the rear end of said guard against longitudinal movement, guides for said guard, a frame carrying said guides, a fluid pressure cylinder, a piston in said cylinder, a rod connected to said piston and adapted to be connected to a moving part of the press, a fluid pressure cylinder associated with said guard, a piston in said cylinder, a rod connecting said piston to a point on the guard in advance of its rear end, and a pipe connection from one fluid pressure cylinder to the other, whereby motion of the press is accompanied by motion of the guard.

In witness whereof I affix my signature.

ALFRED WILLIAM HORDERN.