

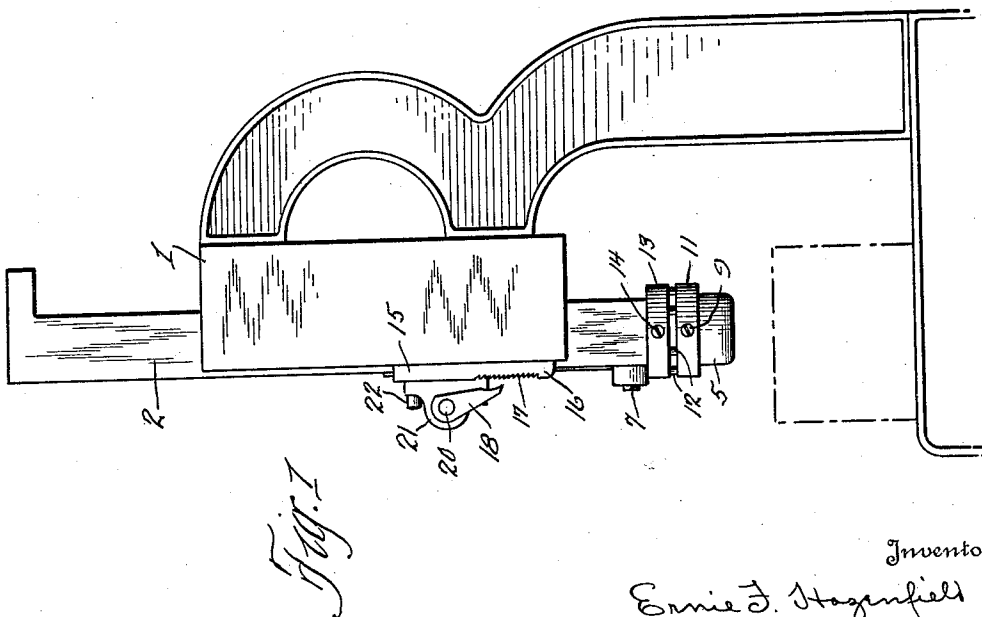
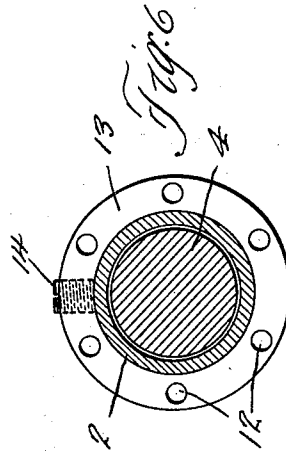
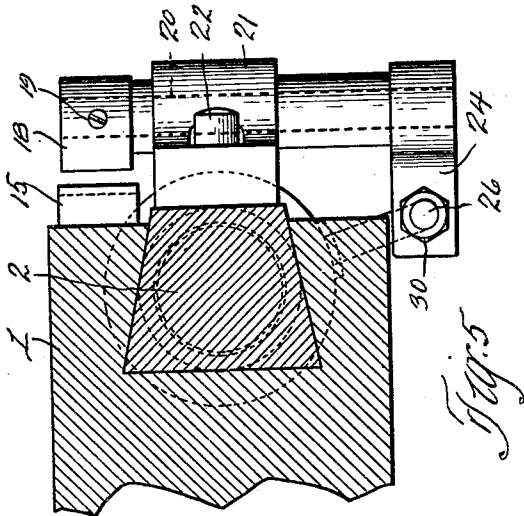
Aug. 2, 1932.

E. F. HAZENFIELD
SAFETY DEVICE FOR PRESSES

1,869,895

Filed Aug. 2, 1930

2 Sheets-Sheet 1



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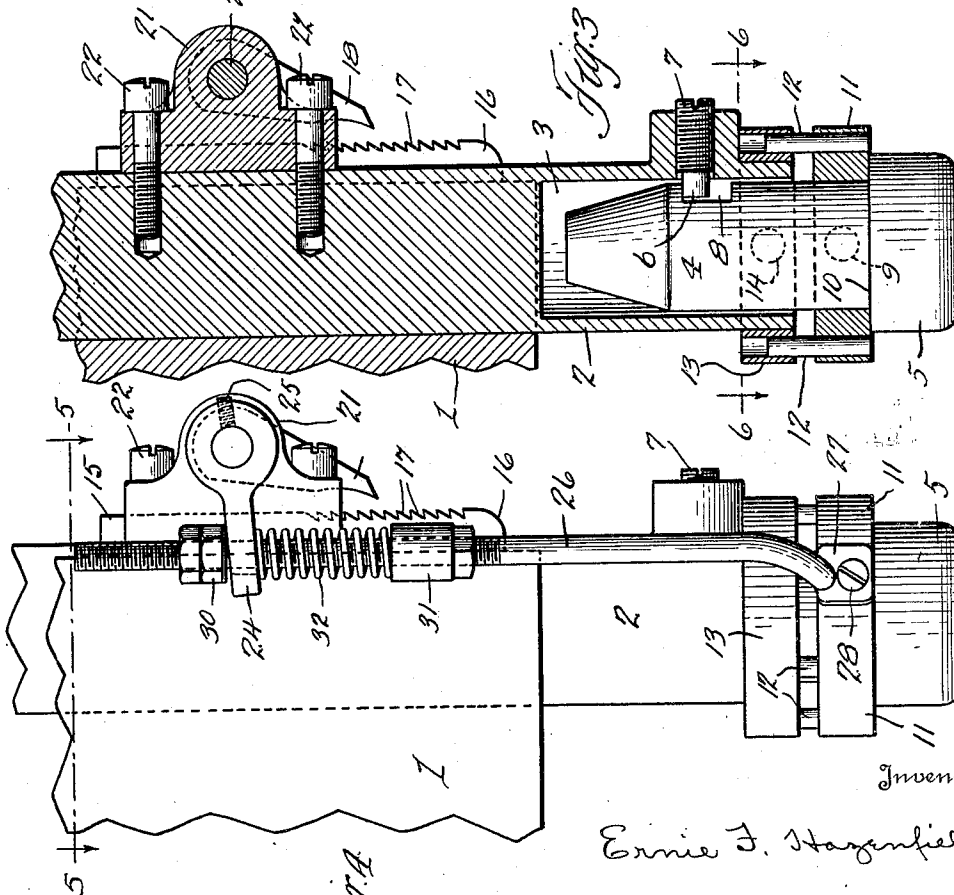
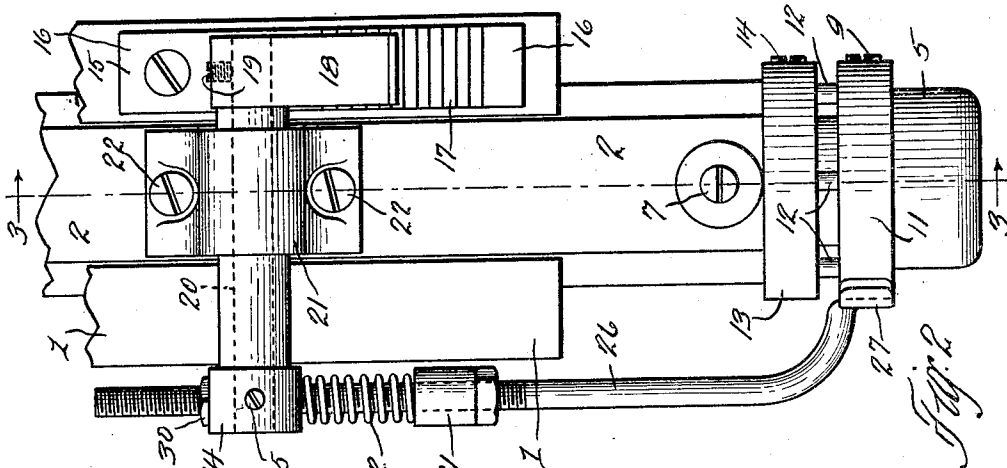
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UNITED STATES PATENT OFFICE

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SAFETY DEVICE FOR PRESSES

Application filed August 2, 1930. Serial No. 472,599.

This invention relates to safety device for presses, and its primary purpose is to simplify, cheapen and generally improve the kind of safety device disclosed in United States Letters Patent No. 1,606,222, issued November 9, 1926.

In principle, the present invention is the same as that of the aforesaid patent, but in the earlier invention it was necessary to materially modify or change the press parts in order to adapt them to the installation of the safety device, whereas it is an object of the present invention to provide a construction which is applicable to a press without any appreciable change or modification in the standard parts of the press, and in which all parts of the device are in plain view and readily accessible, which greatly facilitates the application of the invention to presses and makes easier any adjustments that are required in its mechanism.

The advantages of the present invention will appear as I proceed to describe the same with reference to the accompanying drawings wherein Fig. 1 represents a side elevation of a press equipped with my improved safety device; Fig. 2 is a front elevation of the portion of the press to which the device is applied; Fig. 3 is a section on the line 3—3 of Fig. 2, with the press head or punch in elevation; Fig. 4 is a left hand elevation of the parts shown in Fig. 2; Fig. 5 is a section on the line 5—5 of Fig. 4; and Fig. 6 is a section on the line 6—6 of Fig. 3.

The purpose of the device, as in the case of its predecessor, is to prevent injury to the fingers of the operator should he get them beneath the press head or punch when the latter is descending. Without the safety device, his fingers would be crushed. With the device, the downward movement of the plunger of the press is arrested before the head or punch has descended far enough to mash the fingers. The device is actuated to stop the plunger by a slight relative movement between the head or punch and the plunger incident to the latter's coming in contact with an obstruction, such as the operator's fingers, as will appear from the following description.

The press comprises, generally, a guiding standard 1 within which a plunger 2 is reciprocated by suitable mechanism (not shown). Fitting loosely within a socket 3 in the lower end of the plunger 2 is the shank 4 of a press head or punch 5, and the head or punch is prevented from dropping out of the socket 3 by a stop 6 that is formed by the inner end of a set screw 7, which end occupies a notch 8 in the shank 4. Secured, as by a set screw 9, to the shank 4 immediately above a shoulder 10 that is formed by the enlarged lower end of the head or punch 5 is a collar 11 from which a plurality of guiding pins 12 rise, six of such pins being shown in the present embodiment. These pins have a driving fit within bores in the collar 11 and a sliding fit in bores in a collar 13 that is secured, as by a set screw 14, to the lower end of the plunger 2. Contact of the collar 11 with the lower end of the plunger and the adjacent face of the collar 13 arrests upward movement of the head or punch with respect to the plunger, and the former is prevented from turning with respect to the latter by the guiding pins 12.

Secured, as by screws, one of which is shown at 15 in Fig. 2, to one side of the front of the guiding standard 1, is a rack 16, the toothed portion 17 of which is in the nature of a ratchet. Arranged for cooperation under certain conditions, with the teeth of the rack is a pawl 18 that is fastened, as by a set screw 19, to one end of a shaft 20 that is journaled in a bearing 21 secured, as by screws 22, to the front of the plunger 2. A trip arm 24 is shown as fastened by a set screw 25 to the end of the shaft 20 remote from the pawl 18, and extending loosely through a hole in said arm is the threaded upper end of a rod 26 whose lower end is formed to provide a base flange 27 that is secured by a screw 28 to the previously mentioned collar 11 that is carried by and is movable with the head or punch 5. Upper and lower abutments 30 and 31, respectively, are carried by the rod 26 above and below the arm 24, the former being provided by a pair of cooperating lock nuts that are threaded on the rod, and the latter by a sleeve that is supported by a nut that is

screwed onto the rod. Thus the abutments may be adjusted vertically on the rod to alter the position of the arm 24 and consequently the relation of the pawl 18 to the rack 16. A
 5 coil spring 32 is carried by the rod 26 and is interposed between the abutment 31 and the underside of the rocker arm 24.

In the normal operation of the press, the nose of the pawl 18 descends below the lower
 10 end of the rack 16 before the head or punch 5 engages the work. Consequently upon such engagement the descent of the head or punch 5 is momentarily arrested but the plunger continues to move downwardly and upon the
 15 engagement of its lower end and the adjacent face of the collar 13 with the collar 11 carries the punch or head downwardly with it to perform the function of the press in the usual way. However, should an obstruction, such
 20 as the fingers of the operator, be inadvertently left between the head or punch 5 and the work when the press is operated, such obstruction will prematurely stop the descent of the head or punch and then the slight continued downward movement of the plunger
 25 will cause the inner end of the tripper arm 24 to be swung upwardly by reason of the stopping of the push rod 26 and cause the shaft 20 to be rocked and the pawl 18 to be thrown
 30 into engagement with the rack 16, whereupon the downward movement of the plunger will be immediately arrested and prevent injury to the operator's fingers.

Having thus described my invention, what
 35 I claim is:

1. In combination with a guiding standard and a plunger movably supported thereby, a head carried by the plunger and having a limited amount of movement with respect
 40 thereto, means capable of arresting downward movement of the plunger, and operative connections between said means and the head arranged exteriorly of the head and plunger for rendering said means effective to stop the
 45 plunger upon premature stopping of the head.

2. In combination with a guiding standard and a plunger movably supported thereby, a head carried by the plunger and having a
 50 limited amount of movement with respect thereto, a rack arranged upon the standard, a pawl carried by the plunger for cooperation with the rack but normally moving past the same, a trip arm having operative connection
 55 with the pawl, and a push rod connected to the head and extending alongside the plunger for cooperation with the trip arm to move the same and engage the pawl with the rack upon premature stopping of the head.

3. In combination with a guiding standard and a plunger movably supported thereby, a head carried by the plunger and having a limited amount of movement with respect
 60 thereto, a rack arranged on the face of the standard, a shaft rotatably supported by the

plunger, a pawl on the shaft for cooperation with the rack but normally moving past the same, a trip arm also mounted on the shaft, and operative connections between the head and said arm arranged exteriorly of the head
 70 and plunger for tripping the arm thereby to swing the pawl into engagement with the rack upon premature stopping of the head.

4. In combination with a guiding standard and a plunger movably supported thereby, a head carried by the plunger and having a limited amount of movement with respect
 75 thereto, a rack arranged on the face of the standard, a bearing carried by the front of the plunger, a shaft journaled in said bearing, a pawl on one end of the shaft for cooperation with the rack but normally moving past the
 80 same, a trip arm secured to the other end of the shaft, and a push rod connected to the head and extending alongside the plunger for cooperation with the trip arm to move the same and engage the pawl with the rack upon
 85 premature stopping of the head.

5. In combination with a guiding standard and a plunger movably supported thereby, a head carried by the plunger and having a limited amount of movement with respect
 90 thereto, a rack on the standard, a shaft rotatably supported by the plunger, a pawl carried by the plunger for cooperation with the rack but normally moving past the same, a trip arm operatively connected to the pawl and having an opening adjacent its free end, a push rod connected with the head and extended through the opening in the trip arm,
 95 and an abutment on the rod for transmitting the movement of the rod to said trip arm so that the trip arm will be actuated and the pawl engaged with the rack upon premature
 100 stopping of the head.

6. In combination with a guiding standard and a plunger movably supported thereby, a head carried by the plunger and having a limited amount of movement with respect
 105 thereto, a rack on the standard, a pawl carried by the plunger for cooperation with the rack, a trip arm operatively connected to the pawl and having an opening adjacent its free end, a push rod connected with the head and extended through the opening in the trip
 110 arm, an abutment on the rod between the head and arm, and a spring interposed between said abutment and the adjacent side of the arm.

7. In combination with a guiding standard and a plunger movably supported thereby, a head carried by the plunger and having a limited amount of movement with respect
 115 thereto, a rack on the standard, a shaft rotatably supported by the plunger, a pawl fixed to one end of the shaft for cooperation with the rack, a trip arm fixed to the opposite end of the shaft and having an opening adjacent its free end, a push rod connected with the head and extended through the opening in
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the trip arm, abutments carried by and adjustable along the rod on opposite sides of the trip arm, and a spring interposed between one of the abutments and the adjacent side of the arm.

5 In testimony whereof, I hereunto affix my signature.

ERNIE F. HAZENFIELD.

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