May 7, 1940. B. J. VICTOR 2,199,766

SAFETY DEVICE FOR PRESSES

Filed Aug. 7, 1937 3 Sheets-Sheet 1

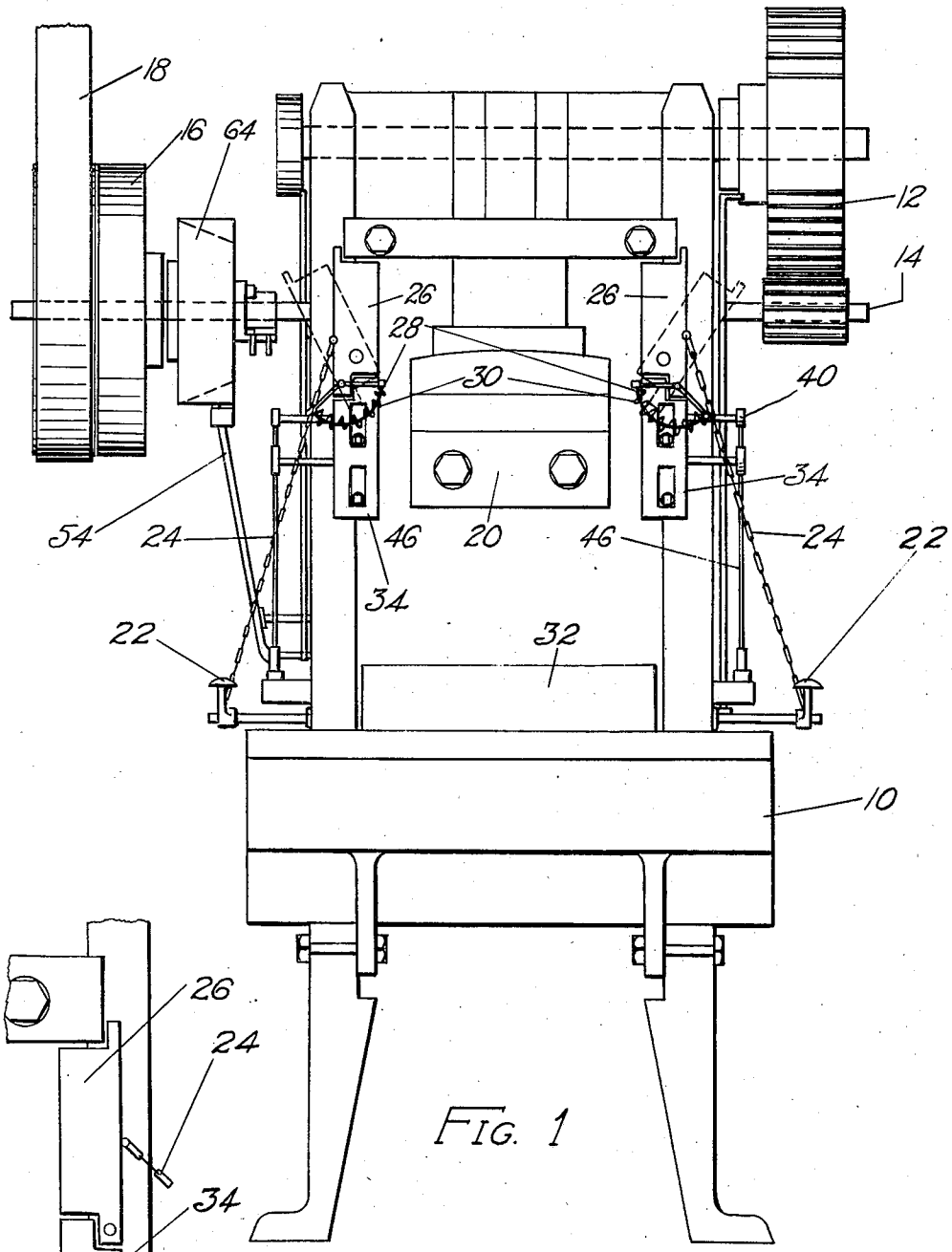


FIG. 1

FIG. 2

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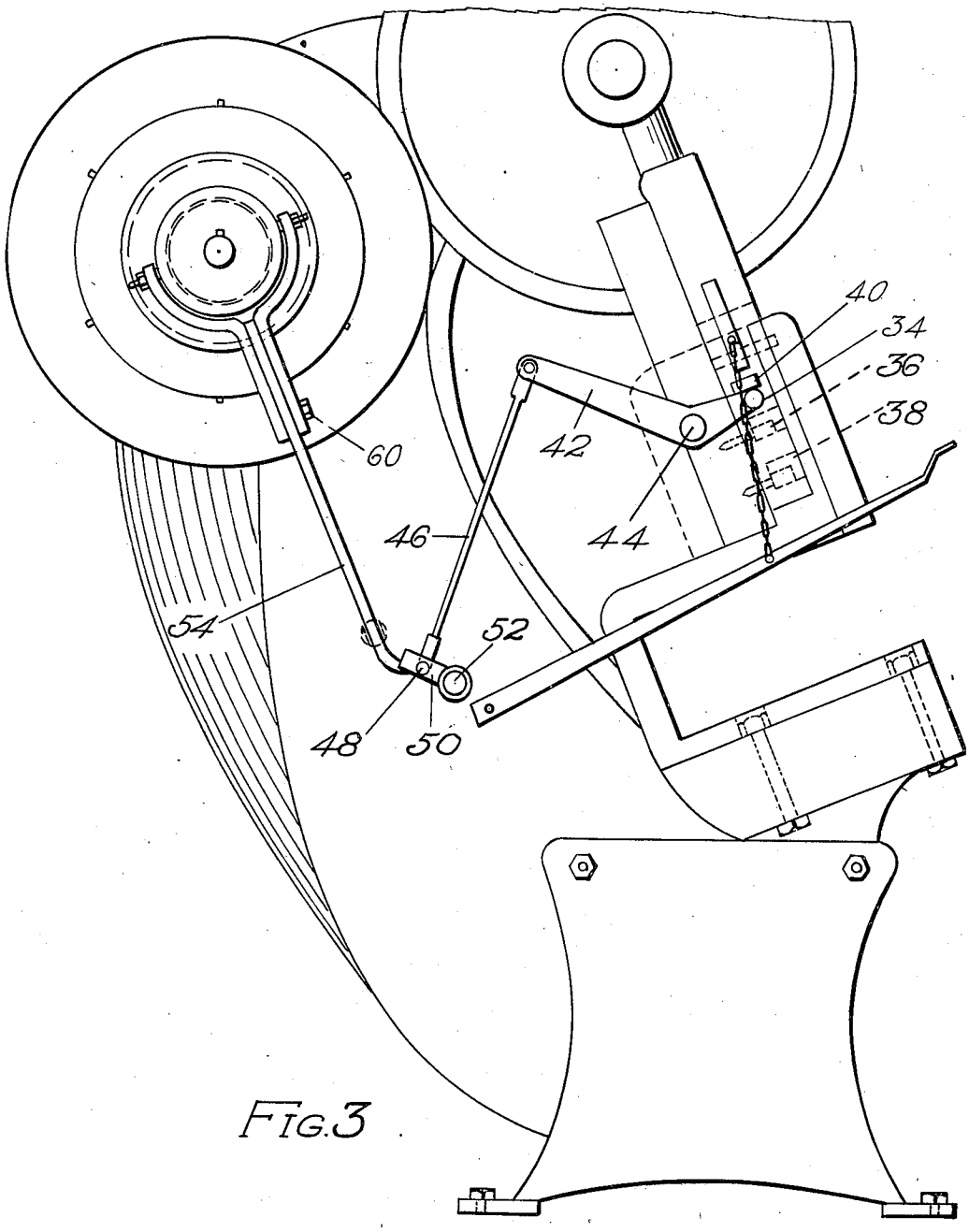


FIG. 3

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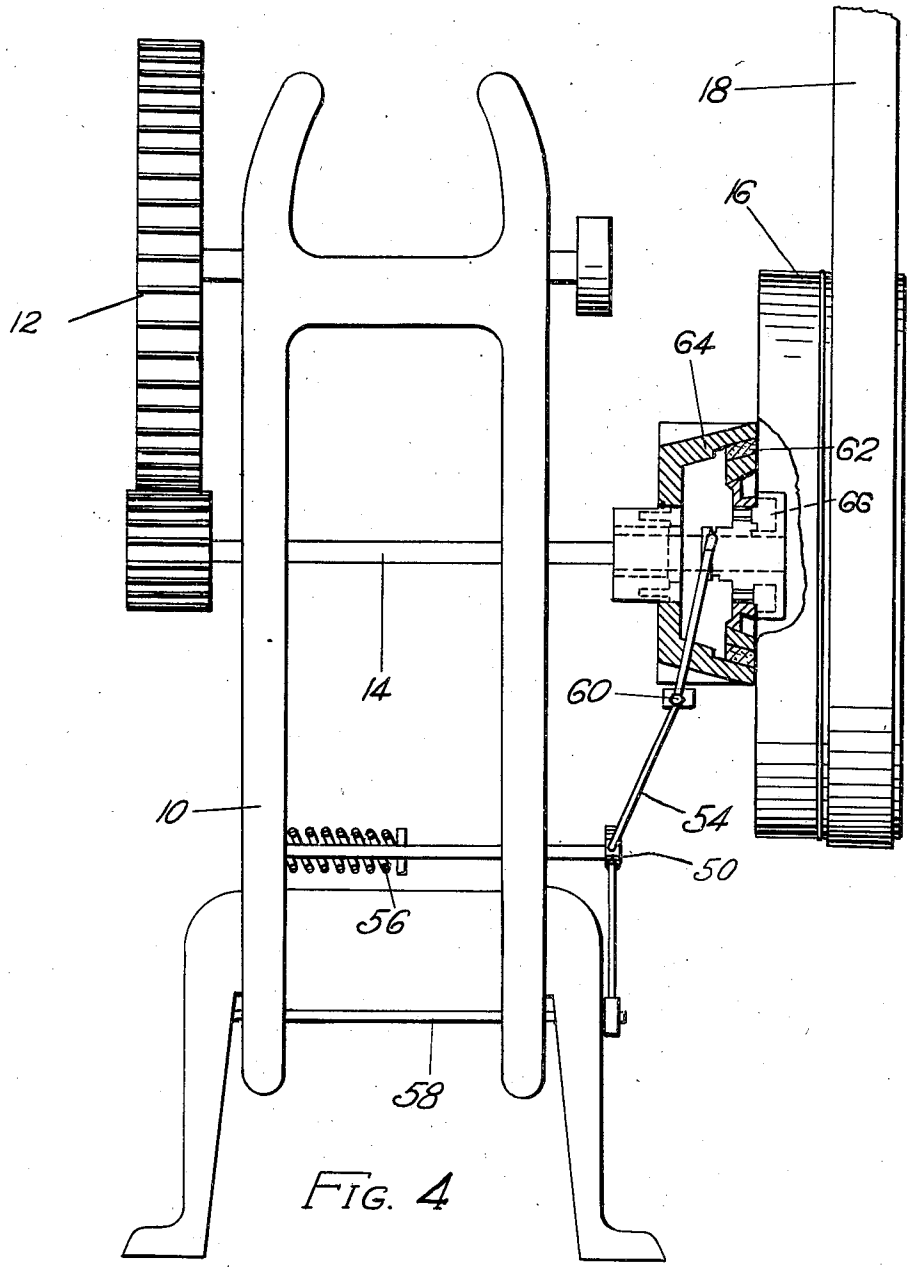


FIG. 4

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SAFETY DEVICE FOR PRESSES

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Application August 7, 1937, Serial No. 157,877

7 Claims. (Cl. 192—134)

This invention relates to an improved safety device, particularly for punch presses and the like, and has, for one of its principal objects, the provision of means whereby the punching or downward motion of the press will be immediately and positively stopped in the event of breakage of one of the parts, preventing undesirable movement resulting from inertia or momentum, which movement might possibly cause bad accidents.

The construction of the present device constitutes an improvement over the apparatus shown and described in my prior Patent No. 1,865,806, entitled "Safety attachment for punch presses," dated July 5, 1932.

A further object of the invention is to provide a simple yet efficient safeguard for the operators of punch presses of various types whereby the punching action will be instantly terminated in the event of accidental breakage of any part, particularly when the operator's hand or fingers would, in the normal course of operation, be in the proximity of the dies.

Other and further important objects of the invention will be apparent from the disclosures in the accompanying drawings and following specifications.

The invenion, in a preferred form, is shown in the drawings and hereinafter more fully described.

In the drawings:

Figure 1 is a front elevation of a punch press of the usual type, particularly that known as the back-geared press, and the figure includes a showing of portions of the safety device of this invention as applied to the press.

Figure 2 is a detail view of parts of the apparatus shown in Figure 1.

Figure 3 is a side elevation of a press, showing the safety device of this invention applied thereto.

Figure 4 is a rear view of the press, illustrating further portions of the safety apparatus.

As shown in the drawings:

The reference numeral 10 indicates generally the frame of a punch press of the gear type, having the usual driving gears 12 operated from a shaft 14 and driving pulleys 16 upon which a belt 18 is mounted.

The movable portion of the press is illustrated at 20, and one safety feature embodies a pair of depressible handles 22, one at each side of the device, each handle being connected by a chain or the like 24 to a hinged element 26, which elements are withdrawn into the position shown in dotted lines by a downward movement of the handles 22 whenever it is desired to operate the mechanism.

Curved rods 28 surrounded by coil springs 30 are fastened to the blocks 26 in such a manner that the blocks are normally propelled into the full-line position.

Obviously, if the blocks are in the position shown in full lines, the head 20 of the punch will not be allowed to descend into punching or working position against whatever material is on the bed 32 of the device.

In this event, downward movement of the head will also force the element 34 downwardly, as this will be impelled because the blocks 26 are in their full-line positions. This element 34 will be allowed to move downwardly until such time as the pins or bolts 36 in the slots 38 in the element 34 will contact the upper ends of the slots.

Before this happens, however, provision is made for an automatic stoppage of the machine by reason of a projection or lug 40 which is welded or otherwise fastened on the element 34 and which, in the downward movement of the element 34, will contact one end of a bell-crank lever 42 (Figure 3) which is pivoted at 44 on the machine and to the inner end of which is attached a link 46.

The lower end of the link is pivotally attached at 48 to a latch element 50 which is pivotally mounted at 52 on the machine, and this latch element normally retains the lower end of a brake release rod 54 in inoperative position.

A heavy coiled spring 56 (Figure 4) is mounted on a shaft 58 which runs transversely of the press and is normally held in compressed position by reason of the action of the latch 50.

However, when due to some accident, the latch 50 is tripped by reason of motion of the bell-crank lever 42, the spring 56 immediately comes into operation, pushing the brake rod 54 outwardly about its pivotal support 60, and this, in turn, operates to set the inner shoe 62 of a brake element against the corresponding outer cone 64. As will be evident from an inspection of Figure 4, the shoe 62 is mounted on the driving shaft 14 of the device, and as soon as this comes in contact with the inner face of the fixed brake cone element 64, the punch press action is immediately stopped, this stoppage being also due to the fact that clutch elements 66 are, at the same time, withdrawn from corresponding recesses in the driving pulley 16.

It will, therefore, be obvious that installation

of this safety device on any punch press will tend to eliminate casualties or other accidents inasmuch as no free motion of the punch elements is allowed at any time after a breakage or any other improper operation of a part.

I am aware that many changes may be made and numerous details of construction varied throughout a wide range without departing from the principles of this invention, and I, therefore, do not purpose limiting the patent granted hereon otherwise than as necessitated by the prior art.

I claim as my invention:

1. A safety device for presses, including clutch and brake elements on the driving shaft of the press, means for instantly releasing the clutch and setting the brake, said means including a spring-pressed rod extending transversely of the press, and latch means for normally retaining the rod in retracted position, together with a bell-crank lever mounted on the side of the press, a link connecting the bell-crank lever to the latch and means for automatically releasing the latch on accidental undesired operation of the press.

2. A safety device for presses, including clutch and brake elements on the driving shaft of the press, means for instantly releasing the clutch and setting the brake upon accidental undesired operation of any part of the press, said means including a spring-pressed rod, latch means for normally retaining the rod in retracted position, a bell-crank lever mounted on the side of the press, and a link connecting the bell-crank lever to the latch, and a projection on the movable portion of the press adapted to contact the end of the bell-crank lever upon undesirable downward movement.

3. A safety device for presses, including clutch and brake elements on the driving shaft of the press, means for instantly releasing the clutch and setting the brake upon accidental undesired operation of any part of the press, said means including a spring-pressed rod, latch means for normally retaining the rod in retracted position, a bell-crank lever mounted on the side of the press, a link connecting the bell-crank lever to the latch, a projection on the movable portion of the press adapted to contact the end of the bell-crank lever upon undesirable downward movement, and a pair of safety blocks normally positioned below the head of the press.

4. A safety device for presses, including clutch and brake elements on the driving shaft of the press, means for instantly releasing the clutch and setting the brake upon accidental undesired operation of any part of the press, said means including a spring-pressed rod, latch means for normally retaining the rod in retracted position, a bell-crank lever mounted on the side of the press, a link connecting the bell-crank lever to the latch, a projection on the movable portion of the press adapted to contact the end of the bell-crank lever upon undesirable downward movement, a pair of safety blocks normally positioned below the head of the press, and handles for temporarily removing the safety blocks from beneath the press head for normal operation thereof.

5. A safety device for presses, including clutch and brake elements on the driving shaft of the press, means for instantly releasing the clutch and setting the brake upon accidental undesired operation of any part of the press, said means including a spring-pressed rod, latch means for normally retaining the rod in retracted position, a bell-crank lever mounted on the side of the press, a link connecting the bell-crank lever to the latch, a projection on the movable portion of the press adapted to contact the end of the bell-crank lever upon undesirable downward movement, a pair of safety blocks normally positioned below the head of the press, handles for temporarily removing the safety blocks from beneath the press head for normal operation thereof, said handles being pivotally mounted, one on each side of the press and chain connections between the handles and said blocks.

6. A safety device for presses, including a clutch and brake elements on the driving shaft of the press, means for instantly releasing the clutch and setting the brake upon accidental undesired operation of any part of the press, said means including a spring-pressed rod, latch means for normally retaining the rod in retracted position, a bell-crank lever mounted on the side of the press, a link connecting the bell-crank lever to the latch, a projection on the movable portion of the press adapted to contact the end of the bell-crank lever upon undesirable downward movement, a pair of safety blocks normally positioned below the head of the press, handles for temporarily removing the safety blocks from beneath the press head for normal operation thereof, said handles being pivotally mounted, one on each side of the press, chain connections between the handles and said blocks, and pins projecting from the press head.

7. A safety device for presses, including a clutch and brake elements on the driving shaft of the press, means for instantly releasing the clutch and setting the brake upon accidental undesired operation of any part of the press, said means including a spring-pressed rod, latch means for normally retaining the rod in retracted position, a bell-crank lever mounted on the side of the press, a link connecting the bell-crank lever to the latch, a projection on the movable portion of the press adapted to contact the end of the bell-crank lever upon undesirable downward movement, a pair of safety blocks normally positioned below the head of the press, handles for temporarily removing the safety blocks from beneath the press head for normal operation thereof, said handles being pivotally mounted, one on each side of the press, chain connections between the handles and said blocks, and pins projecting from the press head, said pins mounted for longitudinal movement in slots in the press body.

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