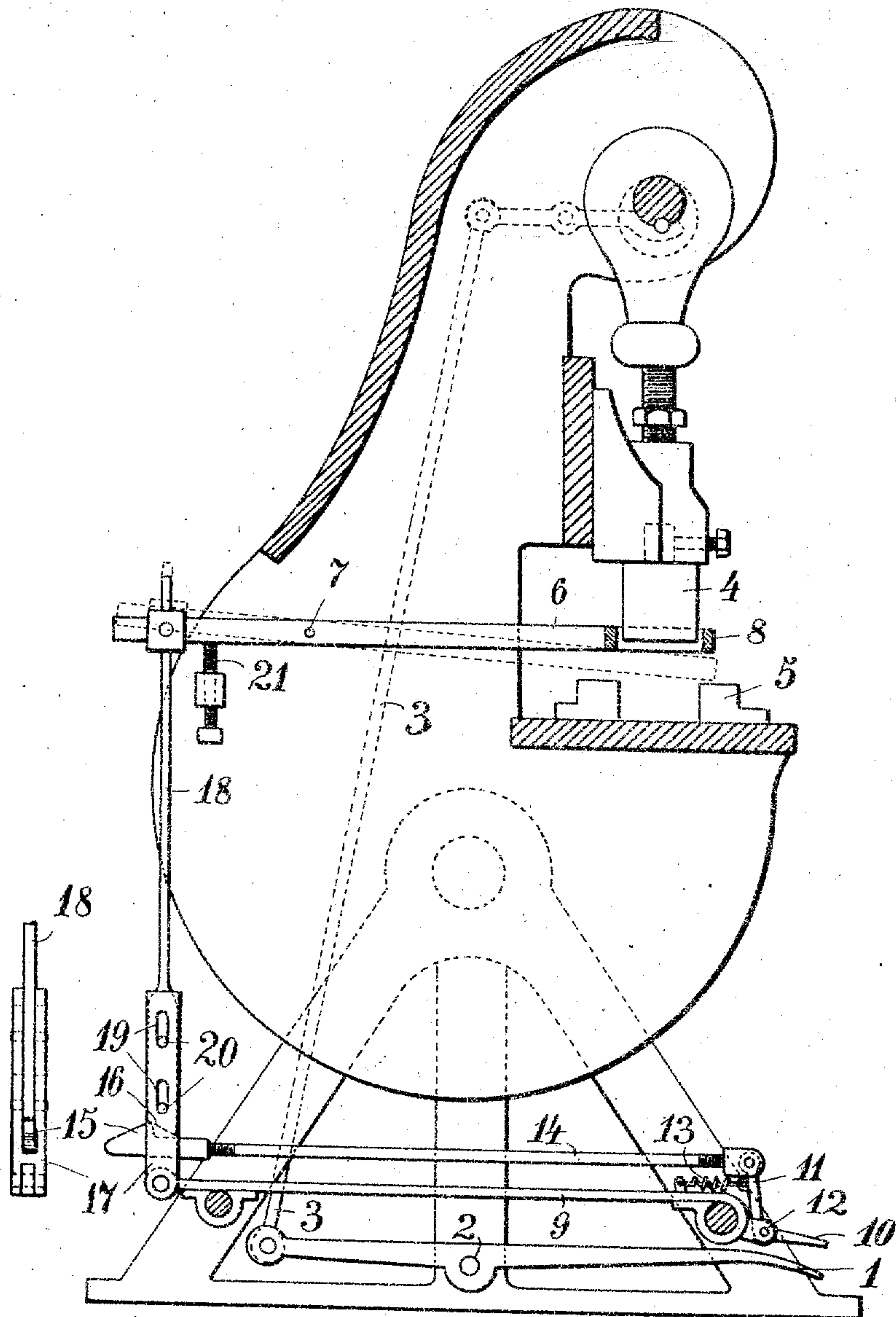


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 PROTECTING MECHANISM FOR PRESSING, PUNCHING, AND CUTTING MACHINES, &c.  
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# UNITED STATES PATENT OFFICE.

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PROTECTING MECHANISM FOR PRESSING, PUNCHING, AND CUTTING MACHINES, &c.

969,961.

Specification of Letters Patent.

Patented Sept. 13, 1910.

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*To all whom it may concern:*

Be it known that I, GUSTAV KRAMER, a subject of the King of Norway, residing at Sandviken, near Christiania, Norway, have invented certain new and useful Improvements in Protecting Mechanisms for Pressing, Punching, Cutting Machines, or the Like; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

The present invention has for its object to provide a safety device in which the protecting member which may be of any suitable construction is actuated by a lever combined with the starting mechanism in such a manner that the starting mechanism is not actuated before said lever has been caused to move a certain distance.

The apparatus forming the subject matter of the present invention is broadly characterized by the fact that the protecting device acts as a kind of "forerunner" of the operating member by moving in the same direction as the latter in such a manner that for instance it may clamp the hand or fingers of the workman or any foreign body inadvertently placed between the operating parts and cause said protecting device to be stopped in its motion which will moreover prevent the actuation of the mechanism of the machine or tool. Owing to this mode of operation of the protecting member the same may have a very simple form and small size and it should as much as possible inclose the operating member so that wherever the workman might hold his fingers within the reach of the operating parts it will prevent the protecting member from moving into its final position; further it should be sufficiently rigid so as not to bend under the pressure to which it is subjected by the pressure on the starting apparatus. The arrangement is so made that the "forerunner" moves in the same direction as the operating part.

In the annexed drawing the device is shown as applied to a punching machine to be started by treading on a foot-board but it will be understood that it may also be

used in machines which are started by hand or otherwise while it may easily be applied to new as well as to old machines of any construction.

The releasing mechanism for the operating member comprises a lever 1 fulcrumed on the machine frame at 2 and connected by means of a rod 3 with the starting members. The operating member here shown consists of a reciprocable punch 4 coöperating with a matrix, as 5. The protecting member consists of an oscillating arm 6 pivoted at 7, and has preferably formed on its front end a ring 8 which surrounds the punch 4. The mechanism for operating the protecting member comprises a bell-crank lever 10, 11, pivotally mounted in a bracket 12 formed on a bar 9 mounted on the machine frame above the lever 1. The arm 10 of the bell-crank lever lies over the front end of the lever 1 and protects the latter from engagement by the foot of the operator. Said arm 10 is held normally elevated above the lever 1 by means of a spring 13 which is connected to the rod 9 and to the arm 11, and the latter is pivotally connected to one end of an actuating member or rod 14, the free end of the latter being provided with a cam-shaped head 15. This head rests in a guide-block 17 fixed on the rear end of rod 9 and supports the lower beveled end 16 of a rod 18, the upper end of which is adjustably and pivotally connected to the rear end of the arm 6. The lower end of the rod 18 is guided in the block 17 by means of pins 19 on said end projecting into slots 20 in the head 17. A regulating screw, as 21, is provided, by means of which the position of the arm 6 may be adjusted vertically.

The mode of operation of the apparatus will be clearly understood from the above description. If the person operating steps on the arm 10 of the bell crank-lever the rod 14 will be pulled forward and by the action of the head 15 on the inclined end surface of the rod 18 the latter will be raised so that the arm 6 will be rocked on its pivot its ring shaped fore-end moving downward. If during this movement the latter meets with some obstruction such as a person's hand the arm 10 will not reach the lever 1 and thus the starting device will not be actuated. If no obstruction is met with the



arm 10 will press on the lever 1 thereby causing the machine to perform its work.

The protecting device may be so formed as to also strike off or remove during the return movement of the punch the material if any adhering to the same. To enable the apparatus to operate in the said manner it must be so adjusted that the lower edge of the protecting member occupies a lower position than the lower edge of the punch. For this purpose the adjustment is effected in the construction illustrated in the drawing by the screw 21 which will then during the operation of the machine afford the necessary resistance for the removal of the material.

According to my improved kind of machine a more or less perfect annular shape may be given to the "forerunner" and it may also be made higher so as to better cover the space of operation. Generally a form like the one illustrated will afford sufficient protection. While fully protecting the workman it does not in any way impede the work; if for instance a greater number of articles are to be punched out of a sheet-iron plate without stopping the machine the feeding of the sheet iron between each stroke of the punch may be effected without being impeded by the protecting member which in this case only rests on the sheet-iron.

#### Claims:

1. The combination with a reciprocable operating member, of an oscillatory protecting member, mechanism for operating the protecting member, and mechanism operated by said operating mechanism to release the operating member.

2. The combination with a reciprocable operating member, of an oscillatory protecting member surrounding the latter, mechanism for operating the protecting member, and mechanism operated by said operating mechanism to release the operating member.

3. The combination with a reciprocable operating member, of a pivoted protecting member, a pivoted lever connected with the operating member, a pivoted arm mounted

above said lever and movable into engagement therewith, and means to operatively connect the arm with the protecting member.

4. The combination with a reciprocable punching member, of a pivoted arm having its free end near said member, a foot lever for releasing the punching member, a bell-crank lever movable into engagement with the foot lever, a rod connected to the bell-crank lever, and a slide operable by the rod and connected to the pivoted arm.

5. The combination with a reciprocable operating member, of releasing mechanism therefor embodying a foot lever, a pivoted protecting member for the operating member, a slide adjustably connected with the protecting member, a bell-crank lever movable into engagement with the foot-lever, and a rod connected to the bell-crank lever adapted to actuate the slide.

6. The combination with a reciprocable punching or pressing member, of a releasing mechanism therefor embodying a foot lever, an oscillatory protecting member for the pressing member, a guide-block, a slide therein adjustably connected with the protecting member, a bell-crank lever movable into engagement with the foot lever, and a rod pivotally connected with the bell-crank lever and having an inclined head supporting the slide.

7. In a machine for pressing, punching cutting or the like the combination with pressing, punching or cutting members of a protecting member, a foot actuated lever for starting the machine, a foot actuated bell crank lever mounted above the starting lever and being connected with a rod acting on another rod connected with the above named protecting member.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

GUSTAV KRAMER.

Witnesses:

MARTIN ECKHOFF,  
OTTO J. GILLANS.