Aug. 20, 1929. H. E. MILLINGAR ET AL 1,725,469

AUTOMATIC STOP

Filed March 1, 1926 2 Sheets-Sheet 1

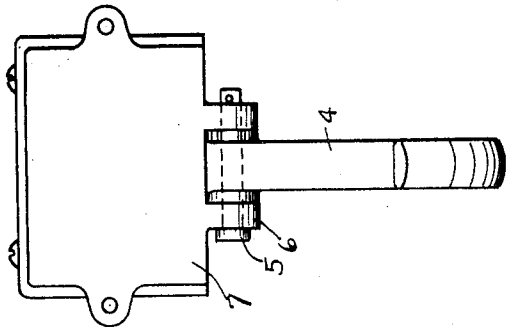


Fig. 2.

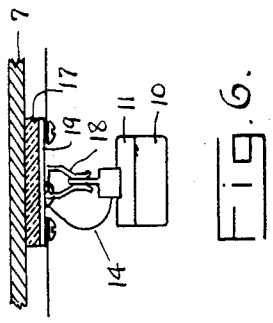


Fig. 6.

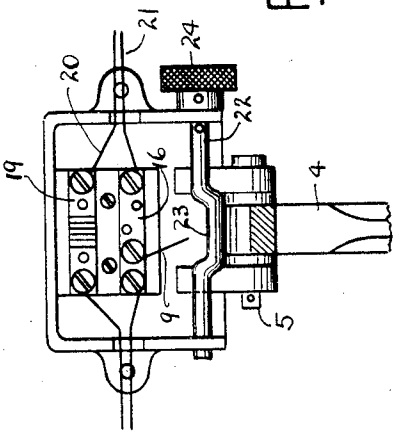


Fig. 3.

Fig. 1.

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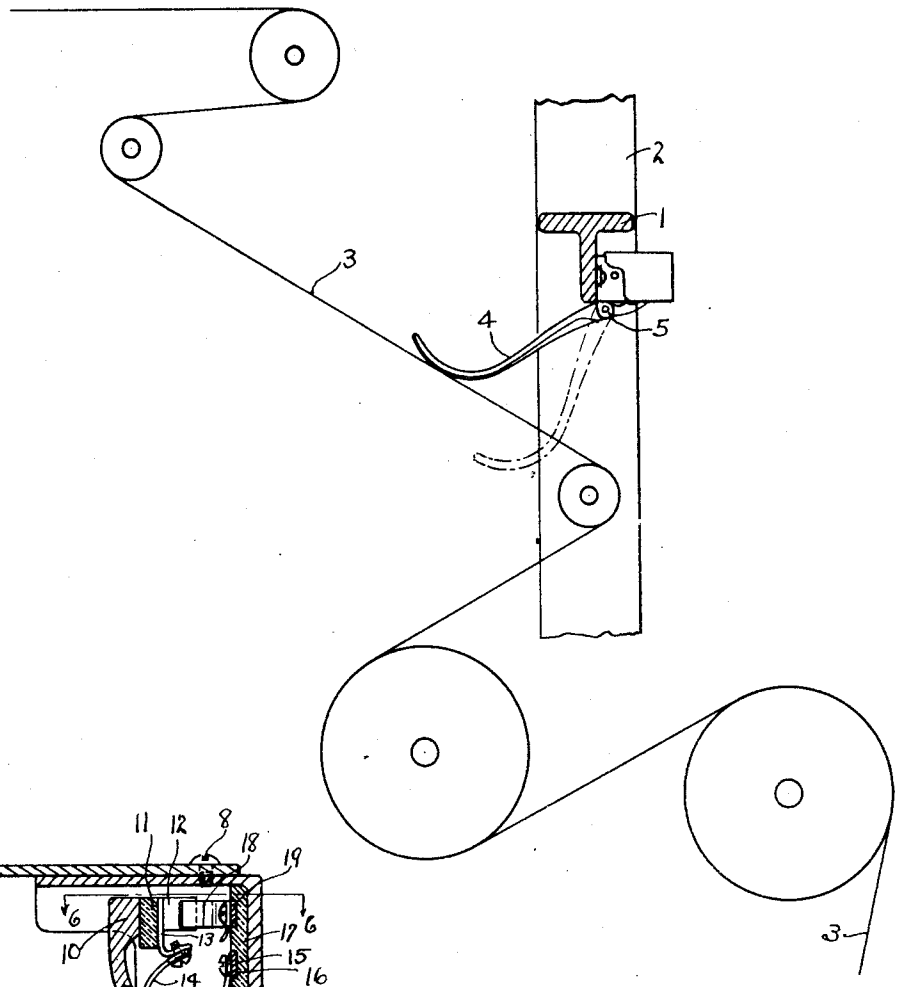


Fig. 5.

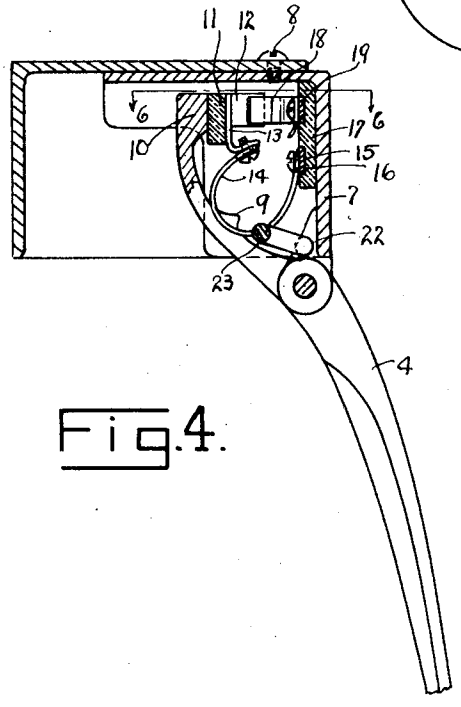


Fig. 4.

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Patented Aug. 20, 1929. 1,725,469

UNITED STATES PATENT OFFICE.

HARRY E. MILLINGAR AND TURNER T. POPE, OF HOUSTON, TEXAS.

AUTOMATIC STOP.

Application filed March 1, 1926. Serial No. 91,381.

Our invention relates to an automatic stop to be employed in stopping the motor and applying the brake on machinery, such as printing presses. It is adapted, as will be obvious, for use on other types of machinery of somewhat similar construction, but is shown and illustrated herewith as being employed upon a printing press.

It is an object of the invention to provide a gravity-controlled lever which will fall and automatically close an electric circuit to shut off the current and stop the press when the web of paper which is passing through the press becomes broken. It is desired that the switch operated by the lever be connected in a normally open circuit, the object of the lever being to close the said circuit and act to control the circuit in which the electric motor is connected. It is also desired to provide means to hold the lever arm in inoperative position when desired.

Referring to the drawing herewith wherein a preferred embodiment of the invention is disclosed, Fig. 1 is a side elevation of the controlling lever arm and its mounting. Fig. 2 is front view thereof. Fig. 3 is a rear view with the housing removed to show the wiring connections. Fig. 4 is a longitudinal section through the housing of the switch box showing the switch in closed position. Fig. 5 is a side elevation, the support for the switch box being in section and illustrating the position of the device when in use. Fig. 6 is a horizontal section taken on the line 6—6 of Fig. 4. Like numerals of reference are employed to designate like parts in all the views.

Our invention is shown as being connected upon a cross beam 1 of a supporting frame 2 of a printing press, and it is understood that the device may be positioned preferably at a point about centrally of the web of paper 3 which is passing through the press. It will be understood that as the paper is thus passing through the press in the printing of the paper, the breaking of the web of paper is a serious matter and if the press is allowed to continue to operate with the broken web of paper the paper will become entangled and it will entail some difficulty and labor to again start the web running through the press in the proper manner. Our device is adapted to be operated when the web 3 of paper becomes slack or broken, due to some disarrangement or tearing of the paper.

The device consists, therefore, of a lever 4 which has its forward end curved upwardly to provide a smooth lower face to rest upon the paper, as shown particularly in Fig. 5. The lever is pivoted at its inner end at 5 to a pair of lugs 6 secured to a bracket 7. The end of the lever and the end lugs are provided with openings to receive the pin 5 by means of which the lever arm is pivoted in position.

The bracket 7 forms part of a housing which, as seen in Fig. 4, is made up of two angular plates or boxes which interfit and enclose the upper end and the sides of the housing. The two plates are secured together by screws 8 so that they may be taken apart when desired. The lever is pivoted at a point immediately below the main body of the housing and has an upper end extending beyond the pivotal point into the housing. This arm is curved and has a central lug or point 9 thereon and an end head 10, the said head adapted to contact when the lever is in its lowered position, with an insulating plate 11, to which is secured the knife portion 12 with an ordinary construction of electric switch. This knife portion is supported upon the plate 11 and has a lower curved end 13 to which is secured a curved resilient wire 14 acting as a conductor in the electric circuit. The opposite end of the wire 14 is connected at 15 to a strip of conducting material 16 secured upon the inner face of a plate 17 of insulating material. The switch member 12 is adapted to fit between the two arms of the switch member 18 which is secured upon a strip of conducting material on the insulating plate 17. The manner in which these strips 16 and 19 are mounted upon the plate 17 is best shown in Fig. 3, and it will be noted that the upper strip 19 is connected at its ends to a wire 20 forming part of an electric circuit. The lower strip 16 is connected to another wire of the circuit, indicated at 21. It will be observed that when the upper head 10 of the lever 4 is operated to throw the switch into closed position, as shown in Fig. 4, the two strips of conducting material 16 and 19 will be connected, thus closing the circuit between the wires 20 and 21.

It is contemplated that this switch will be connected in an auxiliary circuit having therein a relay, or similar circuit breaking device, which when actuated by the closing

of the circuit will withdraw the switch upon the main circuit in which the motors operating the press are connected. Thus when the switch is closed by means of the lever 4, the result will be the switch in the main circuit will be opened by means of relay or solenoid or other similar device so that the press will be immediately stopped. It will be noted that the arm 4 will have to drop an appreciable amount to close the circuit within the contact box and when the paper becomes slack enough to allow the arm 4 to drop into what is approximately the dotted line position, shown in Fig. 5, the paper running through the press will be either broken or caught in some way so that it will necessitate the stopping of the machinery.

It is contemplated that there may be several of these stop arms on a large press and each of these devices will be connected within the same circuit. When one of the arms is dropped to close the circuit, it will, of course, stop the press in the manner described. When for some reason in the larger compound presses, it is not necessary to use all of the automatic switches thus provided, any one of them may be thrown out of operative position and held from falling to close the circuit by means of a cam formed in the lower portion of the housing. This cam comprises a shaft 22 mounted in the sides of the box and directly above the pivotal point of the lever 4. This shaft has an offset portion 23 between its ends which acts as a crank arm.

The shaft 22 upon which this arm is formed may be rotated through a thumb nut 24 at the side of the housing. The cam portion 23 of the shaft is directly in the path of the upper end of the lever 4 and when the shaft 22 is rotated to bring the arm 23 against the lever, it will depress the upper portion and raise the lower arm into the position shown in Fig. 1, and in this position the cam 23 will contact with the lug 9 upon the lever and hold it in elevated position out of contact with the upper end and prevent the closing of the switch.

This device is adapted to work in an entirely automatic manner and will positively act to control the motive power of the press as soon as trouble occurs. Being placed in an open circuit, it is not affected by vibration or slight slackening in the paper, as would be the case if the device was in a normally closed circuit. It operates only when the paper on the press is slackened to an appreciable amount so as to cause difficulty in the operation of the press.

It is believed that the advantages of this construction will be obvious to those skilled in the art. What we claim as new and desire to protect by Letters Patent is:

1. In a device of the character described, a housing, an electric switch in said housing, a lever pivoted to said housing and comprising two portions, one of said portions being of greater weight than the other of said portions, the portion of lesser weight being disposed within said housing, a cam adjacent said pivot, and within said housing and means on said lever adapted to engage with said cam to retain the larger lever in a predetermined elevated position.

2. A paper break detector mechanism comprising a housing, an electric switch in said housing and a two part lever pivoted to said housing, one of said parts disposed within said housing and adapted to contact with said switch, the second said part disposed outside of said housing and adapted to contact with the paper and a rotatable independently operated cam for retaining said parts out of contact with the switch and with the paper.

In testimony whereof, we hereunto affix our signatures this 25th day of February, A. D. 1926.

HARRY E. MILLINGAR.
TURNER T. POPE.