

F. P. FELLOWS.
 AUTOMATIC SAFETY STOPPING DEVICE FOR MACHINES.
 APPLICATION FILED DEC. 6, 1915.

1,224,622.

Patented May 1, 1917.
 2 SHEETS—SHEET 1.

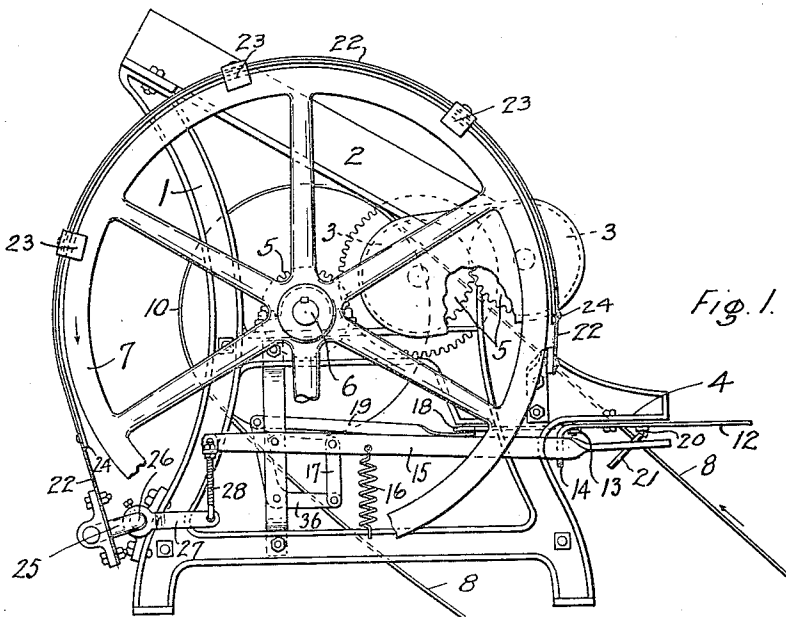


Fig. 1.

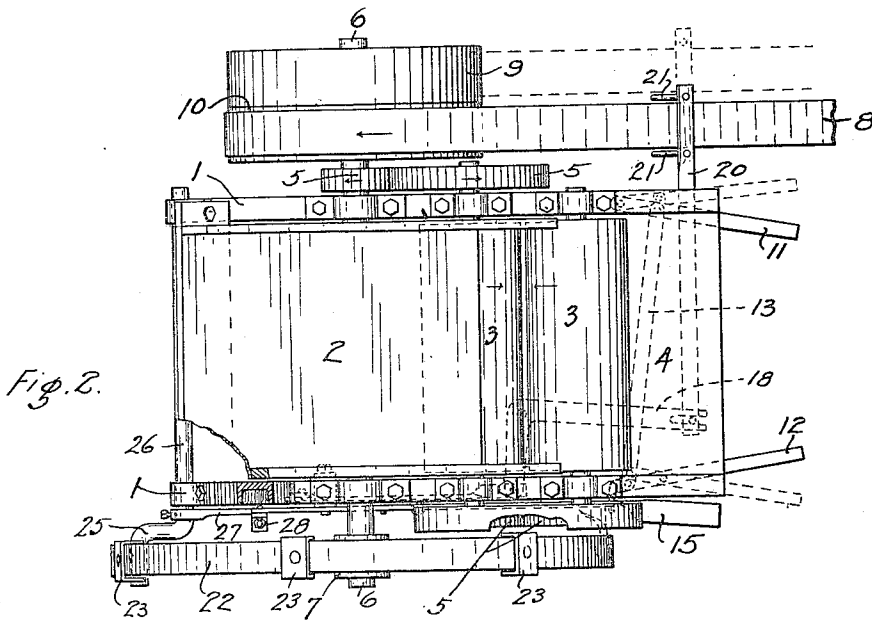


Fig. 2.

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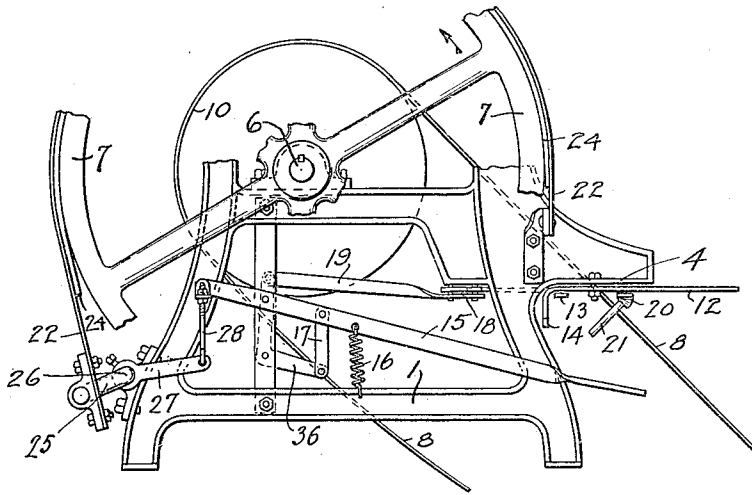


Fig. 3.

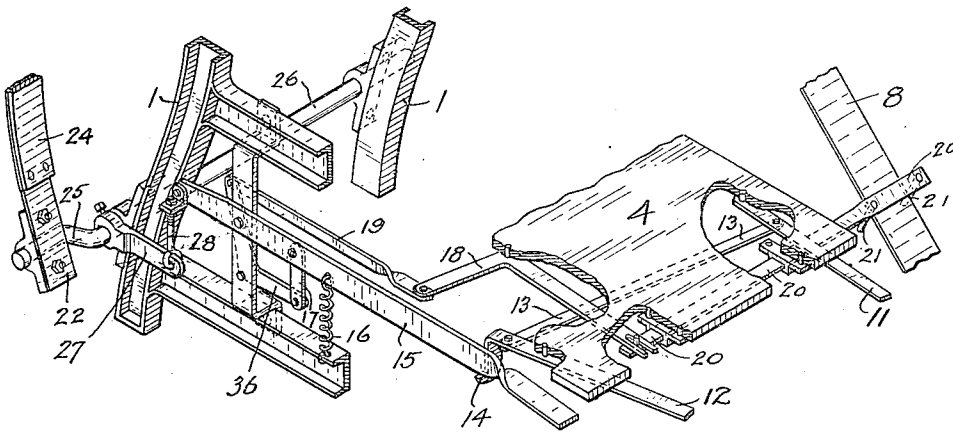


Fig. 4.

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UNITED STATES PATENT OFFICE.

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AUTOMATIC SAFETY STOPPING DEVICE FOR MACHINES.

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Specification of Letters Patent.

Patented May 1, 1917.

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To all whom it may concern:

Be it known that I, FRANK P. FELLOWS, a citizen of the United States, residing at Tacoma, in the county of Pierce, State of Washington, have invented certain new and useful Improvements in Automatic Safety Stopping Devices for Machines, of which the following is a specification.

This invention relates to devices for stopping machines on an emergency and is illustrated as applied especially to a dough-brake or kneading machine. The objects of the invention are to provide a device which will stop the machine to which it is applied substantially instantaneously in case of emergency, and to provide such means which can be applied without the use of the operator's hands. Other objects are to provide automatic means which is easily applied to old machines; which is adapted for use in a large class of machines, with slight changes; and which is inexpensive to make and to set up, sure in action, and requires practically no repairs.

I attain these and other objects by the devices, mechanisms, and arrangements illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a dough-brake equipped with my device; Fig. 2 is a plan thereof; Fig. 3 is a partial view, similar to Fig. 1, showing the mechanism released and acting to stop the machine; and Fig. 4 is a perspective view showing the stopping mechanism in inactive position and portions of the machine to which it is applied.

Similar numerals of reference refer to similar parts throughout the several views.

There is great danger in a dough-brake machine that the operator's hands will be caught between the rolls and, unless the machine can be immediately stopped, it is evident that he will suffer a serious if not a fatal accident. Both hands of the operator are engaged adjacent to and above the rolls and it is impractical for him, if one hand is thus caught, to reach out with the other hand to stop the machine and it is therefore necessary to provide an automatic means which will stop the machine at once when set in action by some other part of the operator's body. I have found that the legs,

near the knees, are best to use to start the automatic stopping device and I have therefore arranged my apparatus so that the operator stands between two levers, either one of which when displaced sidewise will release the stopping mechanism.

Referring to the drawings, it will be seen that the dough-brake consists of a pair of side frames 1 supporting an inclined trough 2 which leads to the brake rolls 3, near the front of the machine. A narrow table 4 is positioned below the rolls 3. The rolls 3 are driven in opposite direction by suitable gearing 5 from a main shaft 6, one end of which is provided with a large fly-wheel 7. The rolls 3 turn in such direction that their adjacent surfaces draw the material between them downward. The shaft 6 is driven by a belt 8 engaging either the loose pulley 9 or the pulley 10 which is fixed on the said shaft 6. All the above mechanism is without change from the usual dough-brake construction.

The stopping mechanism acts in two ways, namely by shifting the belt 8 from the pulley 10 to the loose pulley 9, and by applying a strong brake to the fly wheel to stop its rotation, but both parts are released and actuated by the same mechanism and substantially at the same time. Referring to Fig. 4, it will be seen that two releasing levers 11 and 12 are pivoted to the under side of the front table 4 and project therefrom in such position as to extend to each side of the operator's legs. These levers 11 and 12 are secured together by a rod 13 which is pivoted to the lever 11 between its pivot and its free end and to the lever 12 to the rear of the pivot so that if one lever 11 or 12 is pushed outward toward its side of the machine, the other lever also moves outward toward its side of the machine. These levers 11 and 12 move freely on their pivots so that it does not take an appreciable force to set the stopping mechanism in action. The lever 12 carries a latch lug 14 on its inner end, said lug being adapted to hold the stopping mechanism out of operative position when the free end of either lever is in its normal inward position, and to release said mechanism when the free end of either lever 11 or 12 is pushed outward even by a very small force.

A lever 15 is pivoted in suitable position to the side frame 1 of the machine and extends along said frame so that its free end rests on the latch lug 14, said lever 15 being adapted to move in a vertical plane. A strong spring 16 is secured to the frame and to the lever 15, between its pivot and its free end, said spring being adapted to actuate said free end of the lever 15 downward when the latch lug 14 is withdrawn from under it.

The belt shifting mechanism consists of a vertical bell-crank lever 36 pivoted to the frame 1, and connected to the lever 15 by a link 17; a horizontal bell-crank lever 18 pivoted to the machine under the table 4, and connected to the bell-crank lever 36 by a link 19; and a belt shifting bar 20 engaging the bell-crank lever 18 and slidably mounted under the table 4, and engaging the belt 8 by suitable pins 21 on each side thereof. The above mechanism is arranged so that when the lever 15 is raised and held by the lug 14, the rod 20 is drawn toward the machine and the belt 8 is in engagement with the pulley 10, and so that when said lever 15 is forced downward by the spring 16, the said rod 20 is pushed outward and the belt 8 is transferred to the loose pulley 9.

The brake-applying mechanism is also operated by the lever 15 and consists of a brake band 22 of fairly stiff metal, partially surrounding the fly-wheel 7 and held in place thereon by blocks 23 secured to the band 22 and engaging the sides of the fly-wheel. The brake band 22 is provided with a lining 24 of leather or other suitable material whereby it grips the surface of the fly-wheel 7 when it is drawn down into engagement therewith. One end of the metal strip 22 is secured to the side frame 1 of the machine and the other end is secured to a crank arm 25 of the horizontal rocker shaft 26 secured to the rear of the machine. The shaft 26 is provided with an operating lever 27 secured to it in suitable position, and said lever 27 is connected to the rear end of the lever 15, above described, by means of a link 28 whose length is adjustable as shown. This adjustment is such that the relative positions of said levers 15 and 27 may be adjusted whereby the braking action of the band on the fly-wheel is also adjusted. It is evident from the drawings that when the free end of the lever 15 is raised and held by the latch lug 14, that the crank arm 25 is raised and the brake band 22 is raised so that its friction surface 24 is removed from contact with the fly-wheel, but that as soon as the spring 16 draws the lever 15 downward, the crank arm 25 also moves downward and draws the brake band so that its friction surface 24 comes in close contact with the fly-wheel 7 and acts to stop its rotation practically at once.

It is evident that there are many changes in the form and arrangement of my invention which can be made when adapting it to other machines or to different arrangements of the driving belt or other driving mechanism, and I do not wish my invention to apply only to the form and arrangements herein illustrated and described but to all forms coming within its scope.

Having described my invention, what I claim is:

1. In an automatic stopping device for machines, the combination with a machine having a frame and a rotating flywheel; of a rocker shaft mounted on the machine and having a crank arm thereon; a brake band secured at one end to the frame of the machine and at the other end to the crank arm, and partially encircling said flywheel and adapted to apply an excessive retarding force thereto when in contact therewith; a lever connected to said rocker shaft and adapted to turn it; a latch engaging the lever to hold it from movement; a spring actuating said lever when it is released from said latch whereby the rocker shaft is turned and the brake band applied to said flywheel to stop its rotation; and a pivoted lever carrying said latch and positioned beside the operator's leg whereby, when said pivoted lever is displaced, said latch is removed and said brake band is applied to the flywheel.

2. In an automatic stopping device for machines, the combination with a machine having a frame and a rotating member mounted therein; of a spring-actuated brake mechanism adapted to engage said rotating member to stop it; a lever pivoted to the machine and having its free end projecting therefrom and positioned on one side of the operator's legs; a latch carried by the opposite end of said lever and engaging said spring-actuated brake mechanism to hold it from engaging said rotating member; a complementary lever pivoted to the machine and having its free end projecting therefrom and positioned on the other side of the operator's legs; and a connecting rod joining said complementary levers and secured to opposite sides of their pivots respectively, whereby if either of said levers is displaced said latch is removed and said brake mechanism is released to engage and stop the rotating member of the machine.

3. In an automatic stopping device for machines, the combination with a machine having a frame and a laterally released driving member; of a spring-actuated releasing mechanism adapted to laterally move said driving member to release it from driving connection with said machine; a lever pivoted to the machine and having its free end projecting therefrom and positioned on one side of the operator's legs; a latch car-

ried by the opposite end of said lever and engaging said spring-actuated releasing mechanism to hold it from laterally moving said driving member; a complementary lever pivoted to the machine and having its free end projecting therefrom and positioned on the other side of the operator's legs; and a connecting rod joining said complementary levers and secured to opposite sides of their pivots respectively, whereby if either of said levers is displaced said latch is removed and said releasing mechanism is freed to move said driving member out of driving connection with the machine. 10

FRANK P. FELLOWS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."