(No Model.)

D. T. WINTER.

STOP MOTION OR SAFETY BRAKE FOR MACHINERY.

No. 289,949. Patented Dec. 11, 1883.

Fig. 1.

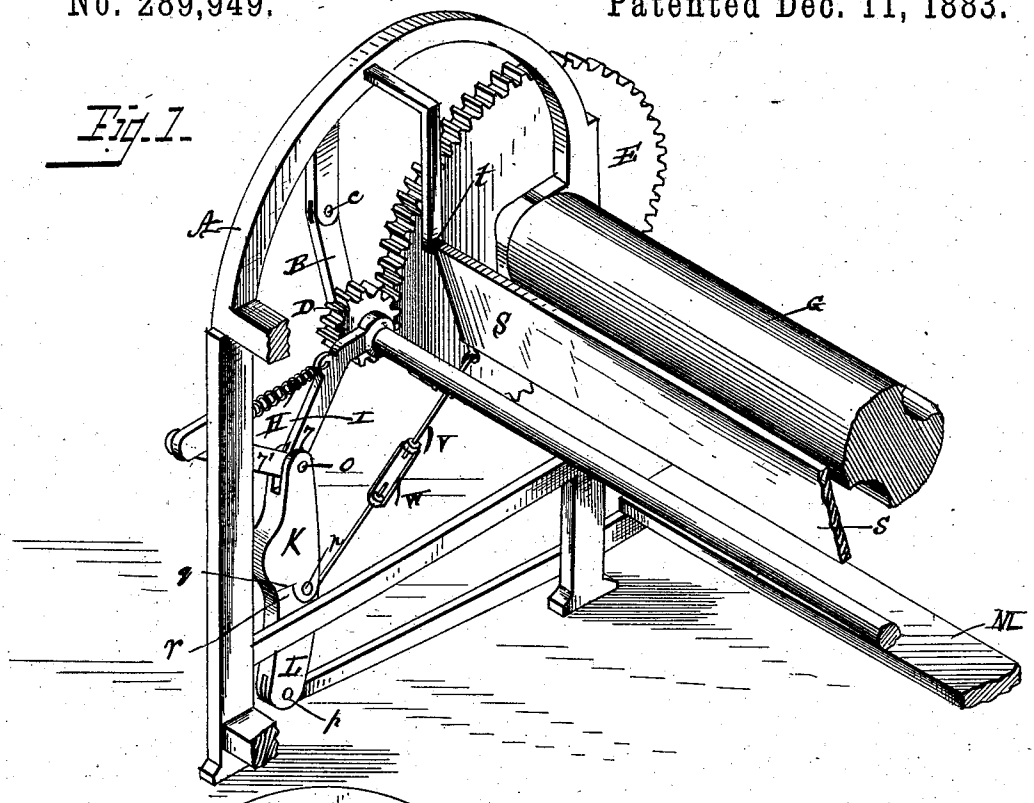


Fig. 2.

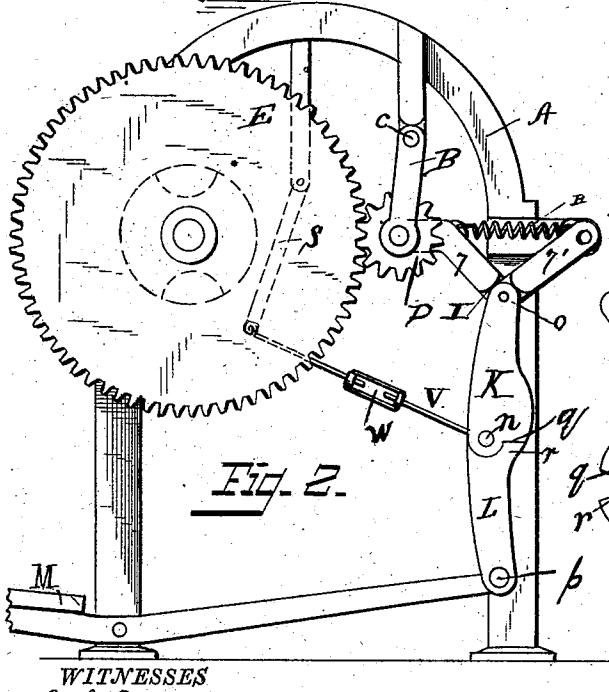
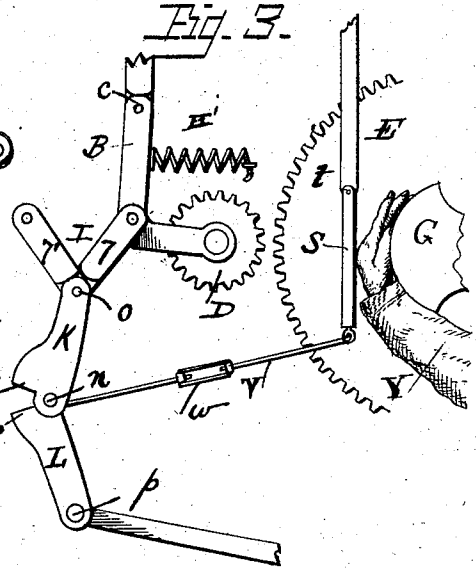


Fig. 3.



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STOP-MOTION OR SAFETY-BRAKE FOR MACHINERY.

SPECIFICATION forming part of Letters Patent No. 289,949, dated December 11, 1883.

Application filed September 4, 1883. (No model.)

To all whom it may concern:

Be it known that I, DAVID THOMAS WINTER, of Peabody, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Stop-Motions or Safety-Brakes for Machinery; and I do hereby declare that the following is a full, clear, and exact description of the invention, which 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 of reference marked thereon, which form a part of this specification.

My invention has for its object the immediate stoppage of machinery whenever, by accident or from any other cause, the operator's hand, arm, or any other object, would be likely to get between two or more adjacent moving or revolving parts of the mechanism; and it consists in a special mechanism hereinafter described.

I have shown my improvements as applied to a leather-splitting machine; but they may be used with other machines where instantaneous stoppage is desired to avoid injury to the person or injury to material, as in calenders used in cloth-manufactories, dye-houses, and bleacheries.

In the accompanying drawings, Figure 1 illustrates a perspective view of sufficient of a leather-splitting machine to show my improvements applied thereto. Fig. 2 is an end view of the same with the supports partly broken away, and showing the position the parts assume before the machine has been put out of gear; Fig. 3, a detail showing the position of parts when put out of gear, a pushing instead of a pulling spring being used.

A A represent the end frames or supports of the machine.

B is a swinging hinged bracket or bar, pivoted at *c*, and supporting near its lower end the gear D, which in its normal position engages with a larger gear, E. This gear is keyed or otherwise secured to the same shaft, F, as the cylinder or roller G.

H is a spring, tending to pull the gear D away from engagement with the gear E. The lower end of the bracket B is pivoted to one arm, 7, of a toggle, I, the other arm, 7′, of said toggle being pivoted upon the frame A.

K L is a hinged rod, connecting the toggle-joint of the toggle I with the treadle M. This connecting-rod is divided into two parts, K L, pivoted at *n*, forming a knee-joint, the pivot of which is a little inside of the line drawn from the two end pivots, *o* and *p*, when the rod is in its normal position. This hinged connecting-rod is also upon the outside of the joints made with two similar shoulders, *q* and *r*, which will strike against each other after the pivotal point *n* has passed a little to the inside of the line drawn from the points *o* and *p*. This construction will allow the joint to open only in one direction, outward, and the pivotal point *n* being inside the line drawn from the two points *o* and *p*, the entire connecting-rod in its normal position will be, to all intents and purposes, rigid; but when sufficient pressure is brought to bear upon the inside of the joint, so as to force it outside of the line drawn from the points *o* and *p*, the joint will open outward and the rod no longer acts as a single rigid rod. When the pressure is removed from the treadle, the spring H will bring the parts back to their normal positions.

S is an apron or hanging leaf, hinged or pivoted at *t* upon the frame A A a little back of the cylinder or roller G. This apron S extends the length of the machine and is parallel to the cylinder G′.

V is a small rod connecting the lower and free edge of the apron S with the knee-joint of the connecting-bar K. This rod V is preferably made in two parts, having screw-threads and a connecting and adjusting device, *w*, or turn-buckle.

When any pressure is brought to bear upon the lower part of the apron S, the knee-joint of the rod K L, by means of the connecting-rod V, will immediately open outward, the gear D will drop away by its own weight (the bar K L having ceased to support it) out of engagement with the gear E, and the cylinder G will cease to turn. A strong spring on the toggle or otherwise assists in the quick disengagement of these gears.

Y represents the operator's arm adjusting

the material, (see Fig. 3,) and serving to throw the gears out of engagement.

My invention is very important in connection with leather-splitting machines, for the operator, while working the machine, is often obliged to insert his hand and arm between the roller or cylinder and the leather around the same, so as to make the leather cling around the roller and to adjust it upon the roller. The operator's fingers are ordinarily very apt to be caught between the leather and the revolving roller, and his arm drawn around the latter and broken or torn out, as has often been the case; also, in case the leather begins to tear, the machine can be similarly instantly stopped and waste of material avoided.

The machine, by my attached stop-motion or safety-brake, is thrown out of gear in the same manner as if the operator had taken his foot off the treadle, but more promptly; but the operator is not likely to have the presence of mind to do this, for the tendency of the machine, when the arm is caught, is to draw the man down and make more pressure upon the treadle, instead of diminishing it.

Instead of depending on the weight only of gear D, a spring, as before named, can be used to press or pull this gear out the instant the hinge is sprung. I prefer to use a pulling-spring (see Figs. 1 and 2) directly on the upper ends of the toggle-arms 7 7′, so that when the hinge-rod is opened the gear D will leave the gear E instantly, being either pulled away or pressed away by the spring, as the case may be. A pushing-spring is shown at H′ in Fig. 3.

Each arm 7 7′ of the toggle I is provided with an ear or extension on its inner side, to which the coiled spring is fastened, and, as will be readily understood, this spring brings these arms nearer together when upward pressure at the joint is removed.

The apron or rod swings back and not downward, and merely breaks or opens the joint of the connecting-rod, and then the spring or the overbalance-weight of the treadle, or both conjoined, pull the gears apart.

It will be seen that the treadle must be overbalanced at its rear, so that when the operator's foot is removed or other pressure taken away from the forward end of this treadle, the rear end will descend and straighten the hinge-rod ready to work again as a rigid rod till again opened by side pressure.

I claim—

1. The knee-jointed vertical connecting-rod, constructed substantially as described, in combination with a toggle at one extremity of such rod, and with means for actuating the rod at its other extremity, the combination serving, when the knee-joint is opened, to stop any machinery operated by such rod.

2. The combination, with the knee-jointed connecting-rod K L, of the toggle 7 7′, the swinging bracket B, gear D, spring H, and the gear E, all substantially as shown and described.

3. The combination of the hinged apron S, rod V, jointed rod K L, and a toggle, the combination serving to disengage two gears, and thus effecting a stoppage of the machine, substantially as set forth.

4. The knee-jointed connecting-rod, constructed as described, and whereby it may act as a single rigid rod lengthwise, until pressure is brought against its joint crosswise and the joint opened.

5. The toggle-joint, substantially as described, each arm of which is provided with an extension or ear on its inside, to which is fastened a coiled spring serving to pull the toggles nearer together when upward pressure at the joint is removed

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