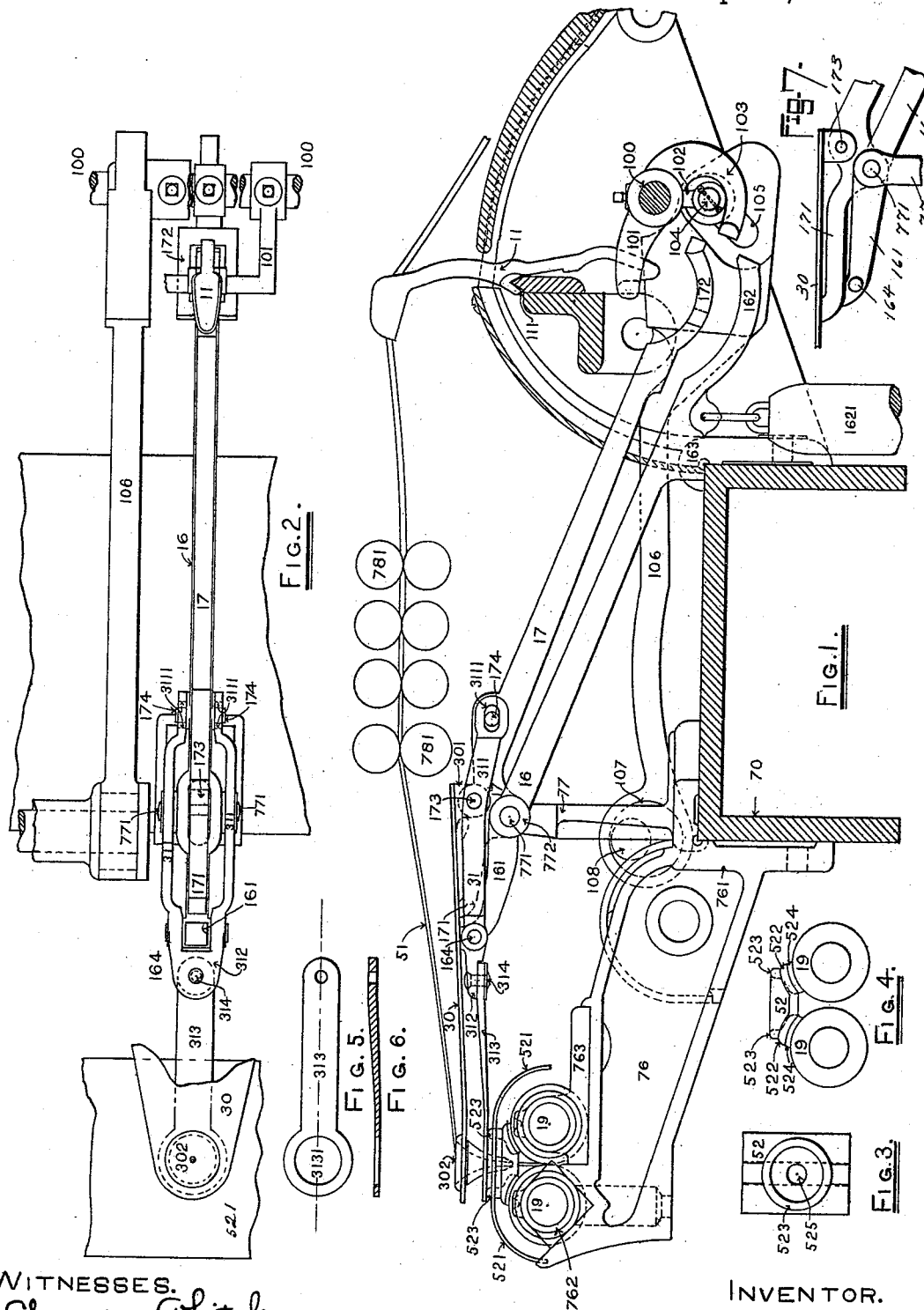


(No Model.)

A. FALLS.  
STOP MOTION DEVICE FOR DRAWING FRAMES.  
No. 494,558. Patented Apr. 4, 1893.



WITNESSES.  
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# UNITED STATES PATENT OFFICE.

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## STOP-MOTION DEVICE FOR DRAWING-FRAMES.

SPECIFICATION forming part of Letters Patent No. 494,558, dated April 4, 1893.

Application filed November 29, 1892. Serial No. 453,497. (No model.)

*To all whom it may concern:*

Be it known that I, ALONZO FALLS, a citizen of the United States, residing at Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Stop-Motion Devices for Drawing-Frames, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to stop-motions for drawing-frames. Stop-motion devices have been employed in such machines for various purposes and of various forms. Some forms thereof have been combined with the rollers of the drawing-frame and arranged to operate to stop the operation of the said frame in case of the lapping or accumulating of fibrous material around the said rollers, while other forms have been combined with a movable trumpet and arranged to operate to arrest the motion of the machine whenever the sliver passing from the delivering pair of drawing-rollers through such trumpet to the calender-rolls becomes too thin, breaks, or runs out, and whenever thick places appear therein.

My invention has for one of its objects to provide improved devices for causing a drawing-frame to be stopped whenever the sliver laps or winds about either of the calendar-rolls.

It has for another of its objects to combine such devices in a drawing-frame with devices, including a trumpet, operating to effect the stopping of the machine whenever an ordinary breakage of the sliver occurs, or the sliver runs out or becomes either too thick or thin.

The invention consists in certain features of improved, simple and durable construction and arrangement, and in certain novel and useful combinations of parts, and first will be described herein with reference to the accompanying drawings, and then will be particularly pointed out and clearly defined in the claims at the close of this specification.

In the drawings, Figure 1 is a view in side elevation, with certain parts in transverse section, of part of a drawing-frame with my invention applied thereto. Fig. 2 is a view in plan of certain parts hereinafter to be described. Fig. 3 is a view in plan of the clearer which is applied to the calender-rolls. Fig.

4 is a view showing the said clearer in end elevation and representing the calender-rolls in outline. Figs. 5 and 6, represent the spring plate 313 in detail. Fig. 7 is a detail view showing a slight modification.

At 70 is shown the table by which the various parts hereinafter to be described are supported, at 781 are shown the drawing-rollers, and at 51 is shown the fibrous material issuing from between the delivering pair of drawing-rollers and passing in the form of a sliver through the trumpet 302, which is located in front of the drawing rollers and guides the sliver into the bite of the calender-rolls 19, 19, which last are mounted in boxes 762 and 763 on the stand 76 secured to the front side of the table 70.

At 521 is the cover-plate for the calender-rolls.

At 11 is shown one of the detector-spoons at the receiving side of the drawing-rollers. At 111 is shown the rail or bar on the angular upper edge of which the detector-spoons are pivoted.

At 100 is shown the striker-shaft carrying the striker 101 which engages with the lower ends of the detector-spoons when the slivers passing over the upper ends of the said detector-spoons break or run out and permit the spoons to swing into a vertical position.

At 102 is shown an arm on the striker-shaft 100, the said arm being provided with a pin or projection 104 which enters an inclined slot 105 in the free end of an arm 106 that is formed at its other end to fit around an eccentric 107 on a rotating shaft 108. The weight of the free end of the arm 106 causes it to descend until the upper end of the slot 105 rests upon the pin 104, where it remains, normally, while the action of the eccentric transmits rocking movement to the striker-shaft 100. When, however, the rocking of the striker-shaft is stopped, as, for instance, by the striker 101 engaging in its downward sweep with one of the detector-spoons, the arm 106, as it is pressed toward the right in Fig. 1 by the action of the eccentric, slides upward over the pin or projection 104, which then is held fixed or stationary in consequence of the engagement of the striker with the detector-spoon, and acts as a cam. The rising movement of the arm is utilized in known

manner, and through the co-operation of known devices, to stop the machine.

All of the foregoing parts are or may be of known construction and may be actuated in any suitable known manner.

At 77 is a stand secured on the upper side of the table 70, which stand I utilize as a pivotal support for the trumpet-lever 17 and the stop-lever 16. By preference, the two levers just mentioned are pivoted by a single pin 771 to the upper end of the stand 77, the trumpet-lever being formed with an off-setting lug on its under side, as shown in Fig. 1, through which pin 771 passes. The trumpet-lever has pivoted thereto the sliver-plate 30 which latter has formed therein near its forward end a hole in which the trumpet 302 is placed, and at its rear end has a lug 301 through a hole in which is passed the pin 173 by which the sliver-plate is pivoted to the trumpet-lever. The sliver-plate constitutes a supporting arm for the trumpet. Normally, the said sliver-plate rests on the upper side of the forward extension or arm 171 of the trumpet-lever, and the said plate and lever ordinarily move as one around the pivot of the trumpet-lever. The trumpet and the sliver-plate may be swung backward out of close proximity to the calender-rolls when it is desired to expose or uncover the said rolls, as is occasionally necessary when the attendant cleanses the machine or removes waste. The sliver-plate is pivoted at such distance from the bite of the calender-rolls as to enable the said rolls to be completely uncovered and the trumpet to be removed entirely out of the way by simply throwing back the plate and trumpet. The rear arm of the stop-lever normally rests against the upper side of the table 70, as represented, and the said lever has a forwardly-projecting contact-arm 161 which extends beneath the sliver-plate into position to be struck thereby, at a point in advance of the pivotal points of the trumpet-lever and stop-lever, when the trumpet and the sliver-plate are depressed. The rear arms of the trumpet-lever and stop-lever are prolonged so that their free ends are located closely adjacent to the striker-shaft 100, on which latter is mounted a second striker 103 which plays in proximity to the said ends. By preference, the rearwardly-extending arms of the levers, which are made heavy enough to overbalance the forwardly-extending arms thereof, and the parts which are sustained by the latter, are formed parallel, or substantially so, and the free ends of the said rearwardly-extending arms are adjacent to each other. It is not absolutely essential that the said rear arms of the levers should be parallel with each other throughout their whole length, the requisite being that their free ends shall terminate near to each other and to the path of the striker 103. During the proper working of a drawing-frame having applied thereto the stop-motion devices operating in connection with the

trumpet, which have just been described, the trumpet is dragged down by the frictional resistance to the slipping of the fibrous material through the stricture thereof, and thereby the trumpet-lever is turned on its pivot so as to raise its rear end above the path of the striker 103, and the said end will not act to stop the movement of the said striker and the striker-shaft 100. When the trumpet is not dragged down, owing to the breakage or absence of the sliver, or to the same becoming too thin, the rear arm of the trumpet lever is permitted to descend so that its free end arrives in the path of movement of the striker 103, whereupon it arrests the next forward movement of the latter and the striker-shaft, and occasions the stoppage of the machine, as will be understood. So long as the fibrous material continues properly to pass through the trumpet, the trumpet is dragged down by the frictional resistance aforesaid until the sliver-plate bears upon the contact-arm 161 of the stop-lever, the point of contact being in advance of the points at which the trumpet-lever and stop-lever are pivoted, the stop-lever constituting a counterweighted stop against which the sliver-plate or arm is held down while the frictional resistance continues, it operating to arrest the movement of the trumpet-lever so long as the frictional resistance does not rise above a pre-determined limit. When the trumpet is so forcibly dragged down by the frictional resistance as to cause the stop-lever to be turned on its pivot, as will occur when an unusual bulk of fibrous material reaches the trumpet, the free end of the rear arm of the stop-lever is carried into the path of movement of the striker 103, with the result that the latter is arrested in its movement and the machine is stopped. The striker 103 instead of being arranged on an oscillating shaft may be mounted and actuated in any other known or suitable manner. In some cases I may provide for causing the forwardly extending arm of the trumpet-lever, instead of the sliver-plate, to bear against the contact-arm when the trumpet is dragged down as herein described, as is shown in Fig. 7.

For the purpose of causing the machine to be stopped in case of the lapping or accumulating of fibrous material around the calender-rolls, I provide as follows. The calender-roll clearer 52 has shoes 522, 522, lined with clearer cloth 524, 524, which rest upon the calender-rolls, an orifice 525 for the passage of the sliver and the lower portion of the trumpet there-through, and a circular flange 523 which projects upward through a circular hole in the cover-plate 521. Above the said circular flange 523 is located the forward end of a plate 313, the rear end of the said plate being connected by a bolt or rivet 314 with the forward end of a stirrup 31 which is pivoted at 164 to the arm 161 of the stop-lever 16, the rear ends of the two arms of the said stirrup being formed with longitudinally-extending slots

3111, 3111, for the reception of the ends of the ends of the pin 174 carried by the rear arm 172 of the trumpet-lever 17. The bolt or pin 314 passes vertically through the forward end 5 312 of the stirrup 31 and the rear end of the plate 313, and the said plate is free to rotate horizontally, as may be desired or necessary, about the said bolt or pin as a pivot. The plate 313 is made, preferably, of spring steel, 10 and in its forward end is made a circular hole 3131 through which the lower portion of the trumpet 302 passes, this hole being made slightly larger than the hole made in the sliver-plate 30 for the reception of the trumpet. The operation of these devices is as follows. 15 When the sliver laps or winds about either or both of the calender-rolls, 19, 19, the fibrous accumulation first enlarges the diameter of one or both of the said rolls, and then 20 raises the clearer 52. This raises the plate 313 and turns the stirrup 31 on pin 164 as on a pivot, depressing the slotted rear ends of the arms of the stirrup and depressing also the rear end 172 of the trumpet-lever 17 into 25 the path of the striker 103, thereby causing the forward movement of the said striker to be arrested and the machine to be stopped. When a bunch or knot in the sliver sticks in the trumpet and the trumpet and sliver-plate 30 are pulled down thereby, causing the contact-arm of the stop-lever to be borne upon so as to effect the turning of the said lever and raise its rear arm 162 into position to stop the forward movement of the striker 103, the 35 spring plate 313 bends so as to permit the turning of the trumpet-lever and stop-lever.

The combination of the spring-plate 313, and stirrup 31, with the trumpet-lever, stop-lever, calender-roll clearer, &c., enables me to 40 provide simply and without undue complication or multiplicity of parts, for stopping the drawing-frame whenever the sliver laps or accumulates upon the calender-rolls, in addition to stopping the frame whenever ordinary 45 breakage of the sliver occurs, or the latter runs out, or a thin or thick place presents itself therein.

I do not claim broadly herein the combination of parts comprising the trumpet, the 50 sliver-plate, the trumpet-lever, the stop-lever, the striker, and the striker-shaft, inasmuch as I have laid claim thereto in my application for patent filed December 2, 1892, Serial No. 453,868. Herein I seek to cover such devices 55 only when combined with the additional features of this case, and as hereinafter recited.

I claim as my invention—

1. The combination with the calender-rolls,

the clearer, and the striker, of a plate supported in position to be borne against by the 60 clearer when moved by an accumulation of fibrous material upon the rolls, a pivoted support for the said plate, and a lever connected with the said pivoted support and movable thereby into the range of the striker, substan- 65 tially as described.

2. The combination with the calender-rolls, the clearer, the trumpet, the trumpet-lever supporting the trumpet, and the striker, of a plate supported in position to be borne against 70 by the clearer when moved by an accumulation of fibrous material upon the rolls, and a pivoted support for the said plate engaging with the trumpet-lever and operating to move the said lever into the range of the striker 75 when the clearer and plate are raised, substantially as described.

3. The combination with the calender-rolls, the clearer, the trumpet, the trumpet-lever supporting the trumpet, the stop-lever, and 80 the striker moving in proximity to the ends of the said levers, of a plate supported in position to be borne against by the clearer when moved by an accumulation of fibrous material upon the rolls, and a support for the said 85 plate pivoted upon the stop lever and engaging with the trumpet lever, substantially as described.

4. The combination with the calender-rolls, the clearer, the trumpet, the trumpet-lever 90 supporting the trumpet, and the striker, of a spring plate supported in position to be borne against by the clearer when moved by an accumulation of fibrous material upon the rolls, and a pivoted support for the said plate engaging 95 with the trumpet-lever and operating to move the said lever into the range of the striker when the clearer and plate are raised, substantially as described.

5. The combination with the calender-rolls, 100 the clearer, the trumpet, the trumpet-lever supporting the trumpet, the stop-lever, and the striker moving in proximity to the ends of the said levers, of a spring plate supported in position to be borne against by the clearer 105 when moved by an accumulation of fibrous material upon the rolls, and a support for the said spring plate pivoted upon the stop-lever and engaging with the trumpet-lever, substantially as described. 110

In testimony whereof I affix my signature in presence of two witnesses.

ALONZO FALLS.

Witnesses:

CHANNING WHITAKER,  
SAML. G. STEPHENS.