(No Model.) 3 Sheets—Sheet 1.

F. FEARON.

STOP MOTION MECHANISM FOR DOUBLING MACHINES.

No. 349,487. Patented Sept. 21, 1886.

FIG. 1.

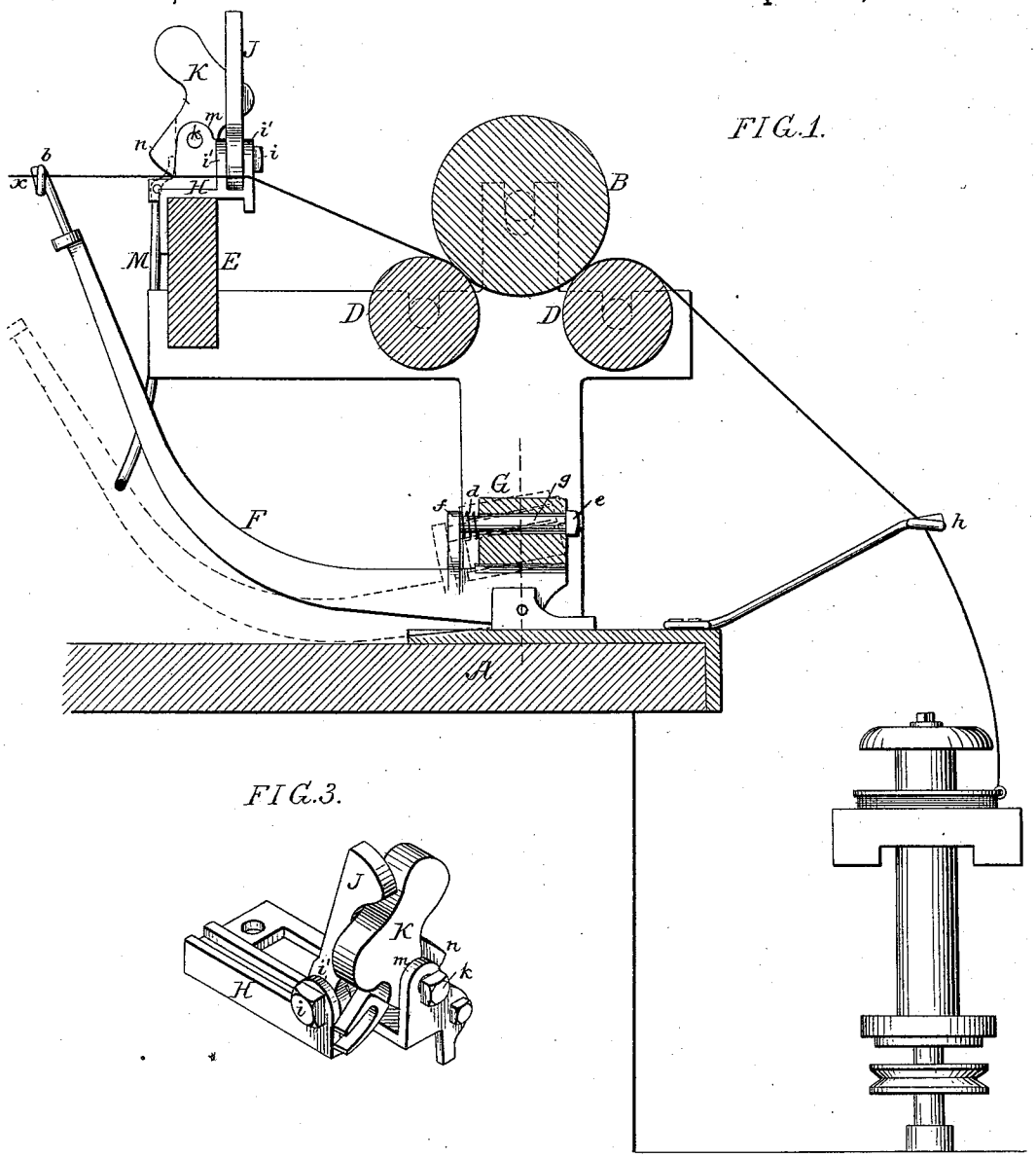
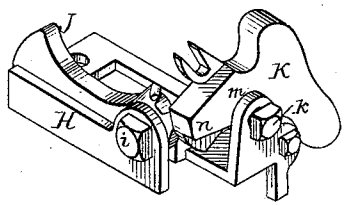


FIG. 3.

FIG. 4.



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F. FEARON.

STOP MOTION MECHANISM FOR DOUBLING MACHINES.

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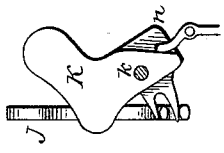


FIG. 7.

FIG. 2.

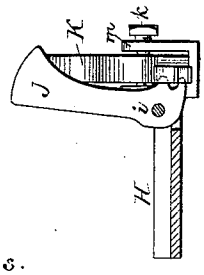


FIG. 5.

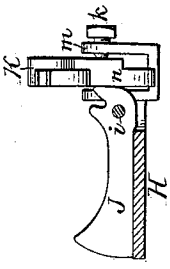


FIG. 6.

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(No Model.) 3 Sheets—Sheet 3.

F. FEARON.

STOP MOTION MECHANISM FOR DOUBLING MACHINES.

No. 349,487. Patented Sept. 21, 1886.

FIG. 9.

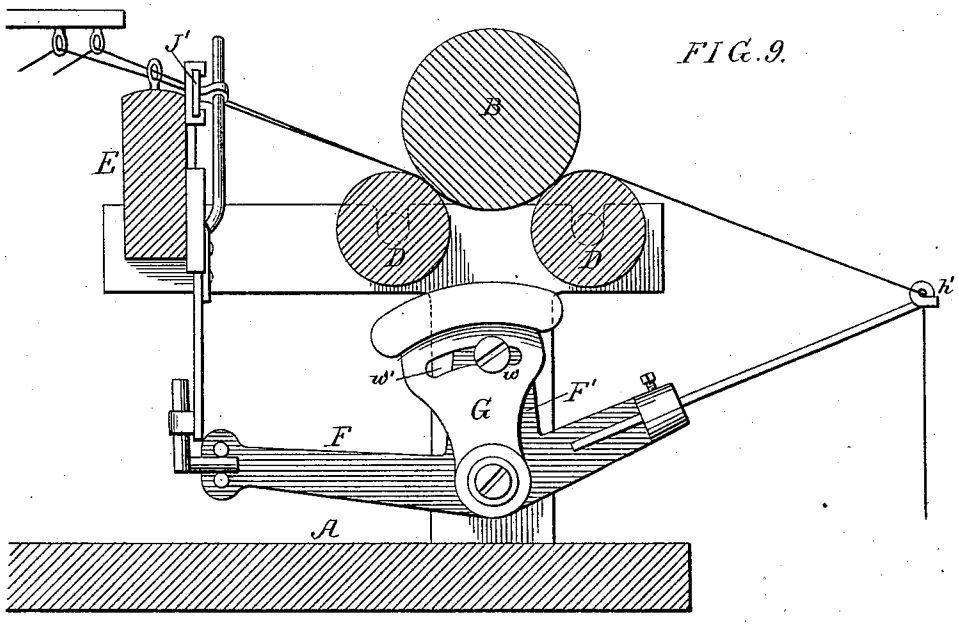


FIG. 10.

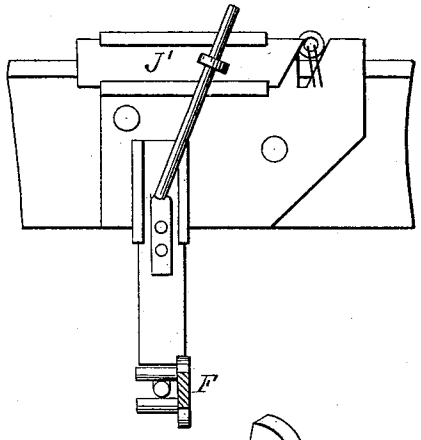
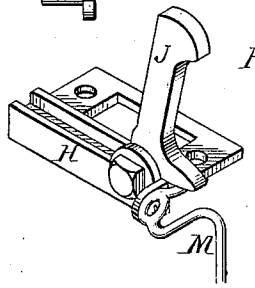


FIG. 8.



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UNITED STATES PATENT OFFICE.

FRANCIS FEARON, OF PHILADELPHIA, PENNSYLVANIA.

STOP-MOTION MECHANISM FOR DOUBLING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 349,487, dated September 21, 1886.

Application filed September 14, 1885. Serial No. 176,994. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS FEARON, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Stop-Motion Mechanism for Doubling-Machines, of which the following is a specification.

The object of my invention is to construct sensitive and positive thread-stop mechanism for doubling-frames; and this object I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawings, in which—

Figure 1 is a transverse section, partly in elevation, of sufficient of a doubling-frame to illustrate my invention; Fig. 2, a perspective view, partly in section, of parts shown in Fig. 1; Figs. 3 and 4, perspective views of the thread-retaining mechanism in different positions; Figs. 5 and 6, front views of the same, partly in section; Fig. 7, an end view of the thread-retainer, looking in the direction of the arrow, Fig. 2; and Figs. 8, 9, and 10 views showing modifications of some features of the invention.

In Figs. 1 and 2, A represents part of the longitudinal rail of a doubling-frame, to bearings in brackets on which are adapted the spindles of the drawing-rolls B D D, as usual, said brackets also carrying the longitudinal rail E, on which is the thread-stop mechanism described hereinafter.

In the drawings I have shown one end only of each of the rails A and E and of the rolls B D D, and but one of the brackets and one set of detectors and stop mechanism, but it should be understood that in the working machine the rails and feed-rolls extend the full length of the machine, and the detector-levers and stop mechanism are repeated at suitable intervals, there being one set of these devices for each of the doubled yarns to be produced, showing the stop-motion devices for one set of threads.

As shown in Fig. 2, each doubled yarn is to be composed of three strands, and there are three detector-levers, F—one for each strand—the long arm of each lever carrying at the end an eye, *b*, and the short arm of the lever being provided with an adjustable weight, G, which is guided on the lever and is under the influence of a spring, *d*, and nut *e*, the spring being interposed between one end of the weight and a stud, *f*, on the lever, and the nut *e* bearing upon the opposite end of the weight, and being adapted to the threaded outer end of a rod, *g*, carried by the stud *f*, and passing through an opening in the weight. By this means the weight can be so adjusted in respect to a vertical line drawn through the axis of the lever that the preponderance of weight on the long arm of the lever is but slight, so that a very fine strand is sufficient to keep the lever in the elevated position, but when on the breaking of a strand the lever falls, as shown by dotted lines in Fig. 1, the center of gravity of the weight changes and its influence is exerted more effectively upon the long arm of the lever, so as to increase the force of descent of the latter. The strands *x*, which are to form the doubled yarn, pass from the eyes *b* of the levers F over a grooved plate, H, on the bar E, thence between the rollers B D D, thence through an eye, *h*, projecting from the bar A, and finally to the twisting and winding device.

To a pin, *i*, carried by brackets *i'* at one end of the plate H is hung a lever, J, having a forked short arm, and to pins *k*, carried by brackets *m* on the plate H, is hung a lever, K, the short arm of which is also forked, said lever K being at right angles to the lever J, so that the forked arms of the two levers are adapted for engagement with each other. To bearings on the plate H is hung a lever, M, the long arm of which is bent so as to project into the path of the detector-levers F, the short arm of this lever acting upon an arm, *n*, of the lever K.

When the device is in operation, the parts are in the position shown in Figs. 1 and 2, both levers J and K being elevated, and their forked short arms in engagement with each other, and the detector-levers being held in the elevated position shown by the strands *x* passing through the eyes *b*. Should one of the strands break, the lever F controlled thereby will fall, the long arm of the lever striking upon the long arm of the trip-lever M, the short arm of which will thereby be brought

into contact with the arm *n* of the lever K, so as to trip said lever sufficiently to shift its center of gravity to the rear of the axis and cause the lever to fall backward, the short arm of the lever, by engagement with the short arm of the lever J, tripping the latter and causing it to fall into the groove of the plate H, so as to firmly confine the strands *x* therein. (See Figs. 4 and 6.) It will be observed that the detector-levers are held up by the threads so as to be clear of the bent arm of the trip-lever M, whereby when a thread breaks its detector-lever will acquire momentum before striking the trip-lever, certainty in the operation of the latter being thus insured. When the lever J is down, it is firmly locked in position by the engagement of its short arm with the arm *n* of the lever K, so that no strain upon the strands *x* will suffice to lift the lever J from the groove and permit the passage of the strands beneath the same. The strands being thus held are broken by the draft of the machine, so that the formation of yarn of less than the proper number of strands is prevented.

In the modified form of the device shown in Figs. 9 and 10, a single detector-lever F is used instead of a series of said levers, one arm of this lever controlling a grip-plate, J′, and the other arm having an eye, *h*′, for the passage of the doubled yarn. The thread-clamping devices shown in these figures form no especial part of my present invention, that portion of the device shown which constitutes part of my invention being the counterbalance-weight G, which is hung to the pivoted lever, but is adjustable in respect to a vertical line drawn through the axis of the lever, being secured in position after adjustment by a set-screw, *w*, adapted to a slot, *w*′, in the weight, and to a threaded opening in a third arm, F′, of the lever. In this case the lever is held in position when the yarn which is being produced has the proper number of strands; but should less than the proper number be delivered the strain upon the lever is reduced to such an extent that the weight will trip the same and operate the locking device so as to retain the strands and cause the breaking of the same, in the manner above set forth.

Various other modifications of my invention will suggest themselves to those skilled in the art to which the same appertains. For instance, the lever J may be operated upon directly by the lever M, if desired, as shown in Fig. 8; but the use of the supplementary lever K is preferred, as it provides for a more definite operation of said lever J and for the locking of the same when down.

I claim as my invention—

1. The combination of the pivoted detector-lever F, having a thread-guide, with the weight G, located above the pivotal axis of the lever and occupying the relation described in respect to a vertical line drawn through said pivotal axis, whereby the weight serves to balance the lever when the latter is held up by the thread, but causes a constantly-increasing preponderance of weight on the falling arm of the lever when the thread breaks, all substantially as specified.

2. The combination of the pivoted detector-lever F, having a thread-guide, with the weight G, located above the pivotal axis of the lever and adjustable longitudinally in respect to a vertical line drawn through said pivotal axis, all substantially as specified.

3. The combination of the draft-rolls, a thread-supporting plate, a pivoted retaining-lever, a tripping device therefor, and a series of detector-levers, each having a thread-guiding eye and each constructed as described, whereby when supported by the thread it is held away from an arm of the tripping device, and on the breaking of the thread acquires momentum before striking said arm, all substantially as specified.

4. The combination of the draft-rolls, the thread-supporting plate, the detector-levers, the trip-lever acted upon by said detector-levers, a thread-retaining lever, J, and an actuating-lever, K, therefor, said lever K being acted upon by the trip-lever, and the short arms of the levers J and K being constructed for engagement with each other when said levers are elevated, all substantially as specified.

5. The combination of the draft-rolls, the thread-supporting plate, the detector-levers, the trip-lever, the thread-retaining lever J, and the lever K, acted upon by the trip-lever, the short arms of said levers J and K having bearing-faces which, when the levers are down, are in contact with each other, whereby the lever J is locked in position by the lever K, all substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANCIS FEARON.

Witnesses:
JOHN E. PARKER,
HARRY SMITH.