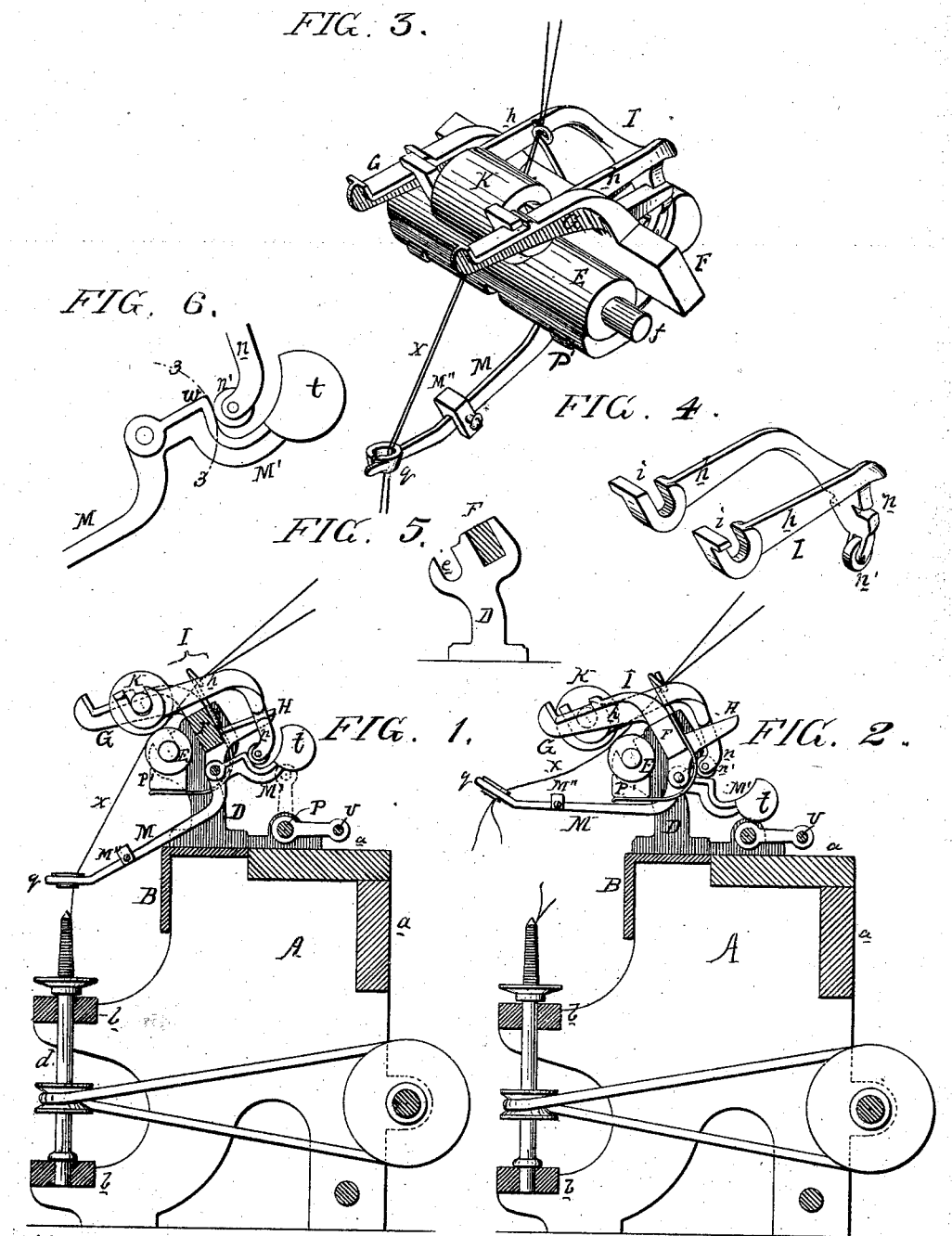


J. H. KNOWLES.  
 Stop-Motion for Doubling and Twisting Machines.  
 No. 216,867.      Patented June 24, 1879.



WITNESSES

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# UNITED STATES PATENT OFFICE.

J. HENRY KNOWLES, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN STOP-MOTIONS FOR DOUBLING AND TWISTING MACHINES.

Specification forming part of Letters Patent No. **216,867**, dated June 24, 1879; application filed January 28, 1879.

*To all whom it may concern:*

Be it known that I, J. HENRY KNOWLES, of Philadelphia, Pennsylvania, have invented a new and useful Improvement in Stop-Motions for Doubling and Twisting Machines, of which the following is a specification.

My invention relates to improvements in that class of stop-motions for doubling and twisting machines in which the upper roller is released and permitted to slide away from the lower roller when a thread or threads break; and my improvements consist in the combination of a carriage adapted to fixed inclined guides and carrying an upper roller with a pivoted lever, one arm of which serves as a thread-guide, the other arm preponderating and being constructed for the retention and releasing of the carriage under the circumstances explained hereinafter.

In the accompanying drawings, Figures 1 and 2 are vertical sections of sufficient of a doubling and twisting machine to illustrate my invention, the two views showing the operating parts in different positions; Fig. 3, a perspective view of the stop-motion; Fig. 4, a detached portion of Fig. 3; Fig. 5, a side view of one of the roller-stands, and Fig. 6 an enlarged view of part of Fig. 1.

The main frame-work of the machine consists of standards A, one of which is shown in Figs. 1 and 2, a horizontal rail, B, commonly termed the "angle-girth," which is secured to the standards, boards *a a*, also secured to the standards, and rails *b b*, in which are the bearings for the spindles *d*, all of which parts are common to ordinary doubling and twisting machines, and therefore will not require further explanation.

It has not been deemed necessary to show the device for directing the doubled and twisted threads to the bobbins or cop on the spindle, as this may consist either of the usual ring and traveler frame of the common cop-frame or of the ordinary fliers.

To the rail B of the frame-work are secured, at suitable intervals, the roller-stands D, in which are bearings *e* for the journals *f* of the shaft, of which the lower roller, E, forms a part, and to these stands is fitted and secured a bar, F, having forwardly and downwardly project-

ing arms G G over the roller E and rear projections, H H.

It may be remarked here that it is not necessary in all cases to adhere to the ordinary stands D, which have been selected in the present instance with a view of showing how my device can be applied to machines now in use without removing said stands.

I is a carriage, consisting of two inclined arms, *h h*, having bearings *i* for the journals *m* of the upper roller, K, and a third arm, *n*, which is preferably furnished at its lower end with the anti-friction roller *n'*. The front end of this carriage is guided by the two inclined arms G G in a manner too clearly shown in the drawings to need description, and the rear arm, *n*, is guided by the two projections H H, which are adapted to slots in the said arm, and which are attached to or form part of the bar F.

To lugs on the under side of this bar is pivoted a lever, the long arm, M, of which has at its outer end an eye, *q*, for guiding the doubled threads X, the short arm, M', carrying a weight, *t*, which tends to maintain the lever in the position shown in Fig. 2. The tension of the thread X between the rollers and the eye *q*, however, is such as to maintain the lever in the position Fig. 1. It is only when threads are broken, or one thread is broken, that the preponderance of the short arm of the lever will induce the latter to assume the position shown in Fig. 2.

The long arm, M, of the lever is furnished with a weight, M'', by the adjustment of which the proper preponderance of the short arm of the lever may be attained.

On the short arm of the lever is formed a shoulder, *w*, for the anti-friction roller *n'* on the arm *n* of the carriage to bear against, this shoulder (best observed in the enlarged view, Fig. 6) being made in the arc 3 of a circle of which the axis of the lever's pivot is the center, so that there may be no further obstruction to the free movement of the lever than the very slight additional friction caused by the pressure of the carriage against the shoulder *w*.

When the machine is in operation, and as long as the threads remain unbroken, the op-

erating parts of the device will be in the position shown in Fig. 1, the long arm of the lever being depressed by the tension on the threads, and bearing against the fixed rail B of the frame or other suitable stop, the carriage H being retained at the limit of its rearward movement by the shoulder *w* of the lever, and the threads being pressed against the lower roller by the weight of the upper roller, which, when in this position, is not supported vertically by the carriage.

Should the doubled threads break between the rollers and the bobbin, the lever, being free from the control of the said threads, will, owing to the preponderance of the arm M', assume the position shown in Fig. 2, and the carriage, being freed from the control of the shoulder *w* of the lever, will at once slide forward and downward in the direction determined by the inclined guiding-arms G G and guiding-projections H H, so that when the carriage has been arrested by suitable stops on the said guiding-arms the upper roller, carried by the sliding frame, will be in the position Fig. 2, and the threads will be free from the control of the rollers. After the threads have been properly pieced the several parts may be restored to the position shown in Fig. 1 by simply depressing the long arm, M, of the lever.

The results described above will take place should one of the threads above the roller break, for the remaining unbroken thread, after passing between the rollers, will not be strong enough to resist the tension to which it must be subjected, and will consequently be broken.

It will be understood that, while there must be one carriage, one upper roller, and one lever for each spindle of the machine, several rollers, E, constitute parts of a shaft, several of these shafts being coupled together, so as to be driven simultaneously through the medium of gearing usually employed in doubling-machines.

A shaft, P, adapted to suitable bearings on

the frame-work of the machine, extends throughout the entire length of the same, and this shaft has arms carrying a rod, *v*, which, on turning the shaft in the direction of the arrow Fig. 1, can be brought directly beneath the short arms, M', of all the levers, and will serve to retain the same in the position Fig. 7. This device, however, is only used when the machine is stopped.

P' is a wiper, pressed constantly against the under side of the roller E by means of suitable springs, and serving to prevent the winding of broken threads round the roller E.

I am aware that in doubling-machines mechanism has been used by the aid of which upper rollers have been released, and have been permitted to move away from the lower rollers on the breakage of the threads. This, therefore, I do not claim, broadly; but

I claim as my invention—

1. The combination, in a doubling or twisting machine, of a carriage, I, adapted to fixed inclined guides, and carrying the upper roller, K, with a pivoted lever, one arm, M, of which serves to guide the threads; the other and preponderating arm being constructed for the retention and releasing of the carriage, all substantially as set forth.

2. The combination of the lever M M', provided with a shoulder, *w*, made in the arc of a circle of which the axis of the lever's pivot is the center, with the carriage I, having the arm *n*, provided with the anti-friction-roller *n'*, all substantially as set forth.

3. The combination of the carriage I, the bar F, provided with the arms G G, and lever M M' with the ordinary stands D, substantially as described.

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

J. HENRY KNOWLES.

Witnesses:

WILLIAM J. COOPER,  
HENRY HOWSON, Jr.