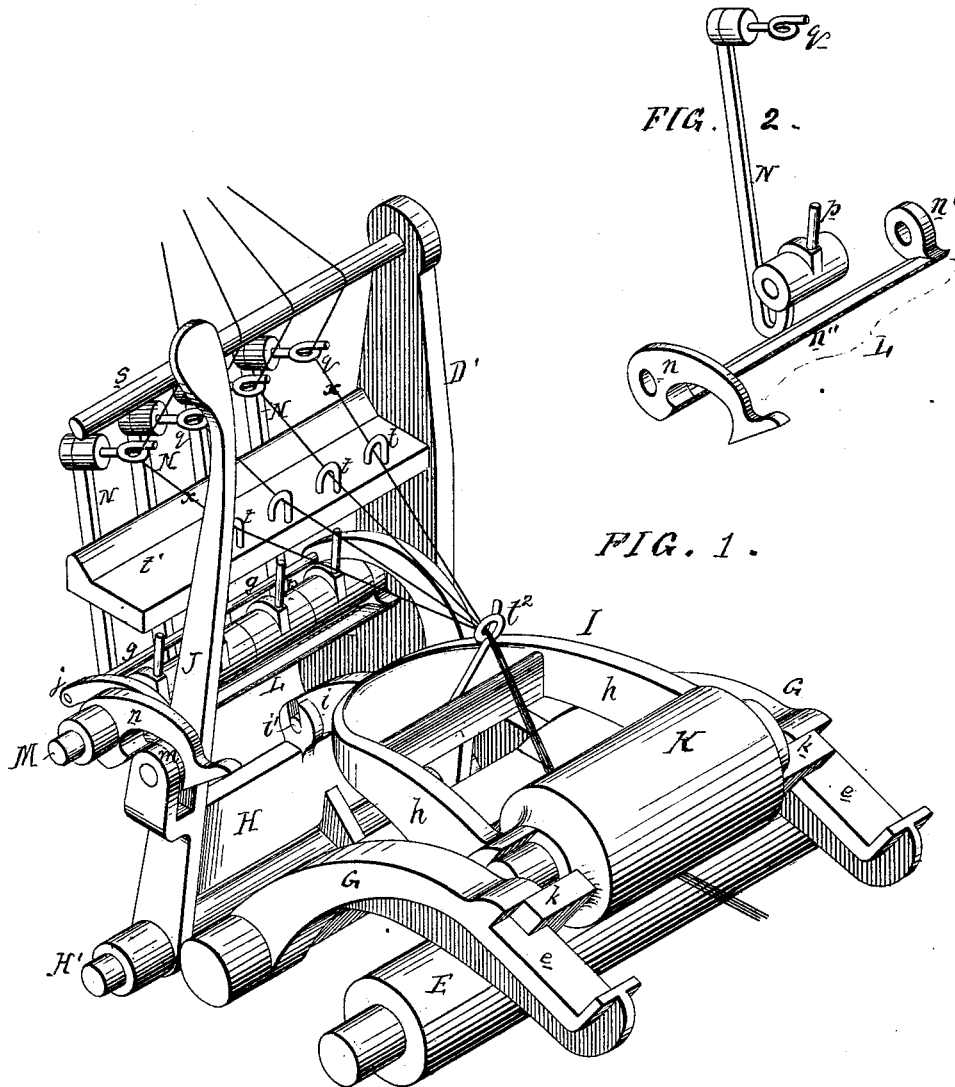


J. H. KNOWLES.
 Stop-Motion for Twisting and Spinning Frames.
 No. 218,279. Patented Aug. 5, 1879.



WITNESSES

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IMPROVEMENT IN STOP-MOTIONS FOR TWISTING AND SPINNING FRAMES.

Specification forming part of Letters Patent No. **218,279**, dated August 5, 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 Twisting and Spinning Machines, of which the following is a specification.

My invention relates to improvements in stop-motions for that class of twisting and spinning machines in which more than two threads are twisted, and wound around the bobbin or cop-tube of each spindle; and my invention consists of the combination of a sliding carriage for supporting the upper roller, a rocking frame hinged to the carriage, a catch or other device for retaining and releasing the said rocking frame and carriage, and a system of loosely-pivoted and weighted arms, each guiding one of the threads, all substantially as described hereinafter, so that when any one or more of the threads break the weighted arm or arms will fall, and through the medium of the said catch or other device will release the rocking frame and permit the carriage to slide forward and downward so far that the upper roller will be moved away from the lower roller.

My invention further consists of certain mechanism, described hereinafter, for automatically restoring the weighted thread-guiding arms to an elevated position immediately after performing their duty of releasing the carriage.

In the accompanying drawings, Figure 1, Sheet 1, is a perspective view of my improved stop-motion for twisting and spinning machines; Fig. 2, a detached portion of Fig. 1; Figs. 3, 4, and 5, Sheet 2, views illustrating the operating parts of the device in different positions; and Fig. 6, a sectional plan on the line 1 2, Fig. 3.

In Fig. 3, A represents a horizontal bar (commonly called the "angle-girth") which extends from end to end of the machine, is secured to the usual frames B, and forms, with the latter, a part of the fixed frame-work of the machine.

The usual eye-bars *a*, having eyes *a'*, for guiding the threads and spindle-rails *b*, (the upper one only of which is shown in the drawings,) are secured to the frame-work. All these parts are common to other twisting-machines, and will therefore require no further description.

It has not been deemed necessary to illustrate in the drawings the device for guiding the twisted thread to the bobbin or cop-tube, as this may consist of the well-known ring and traveler rail, or of the equally well-known systems of fliers or caps.

Stands D are secured at the usual intervals to the rail A, and in these stands are the bearings for the shaft, of which each lower roller, E, forms a part, the said shaft being driven in the manner common to machines of this class.

Two frames, D', are secured to or form a part of each stand D, and between these frames D' are arranged the devices which constitute the main elements of my invention.

To the stands D or to the frames D' are secured two fixed arms, G G, Fig. 1, having downwardly-inclined bearings *e* for projections *k* on a carriage, I, which consists mainly of two arms, *h h*, slotted for the reception of the journals of the upper roller, K, and a third arm, *i*, which is so pivoted at *i'* to a rocking frame, H, that it can be readily detached therefrom, this rocking frame being secured to a shaft, H', which has its bearings in the opposite frames, D' D'.

An arm, J, forms part of the rocking frame, or is secured thereto, or to the shaft H', and this arm carries an anti-friction roller, *m*, over which a latch-lever, *n*, is arranged to fit, as best observed in Fig. 1.

The latch-lever forms part of a swinging frame, L, (best observed in the detached perspective view, Fig. 2,) the frame consisting of the said latch-lever, a ring, *n'*, and a bar, *n''*, which connects the lever and ring together, the whole being hung loosely to a shaft, M, which passes through and is secured to the two frames D' D'.

The rocking frame H has also two rearwardly-projecting arms, *j j*, which are connected together by a rod, *g*.

To the shaft M are also loosely hinged as many arms N as there are threads to be twisted together—four, in the present instance—and each arm is weighted at the top, where there is a guiding-eye, *q*, for the thread, and is curved below, so as to form a shoulder, *y*, which, under the circumstances explained hereinafter, comes in contact with the bar *n''* of the swinging frame L. On the hub of each

weighted arm N is a projection, *p*, the object of which will be rendered apparent hereinafter.

Each of the four threads *x* passes over a rod, *s*, which connects the upper ends of the two frames D' D' together; thence through an eye, *q*, in one of the weighted arms N; thence through an eye, *t*, on the cross-bar *t'* of the frame; thence through an eye, *t''*, on the carriage I or the frames D', and thence between the rollers K and E and through the eye *a'* to the bobbin or cop on the spindle.

As long as all the threads remain unbroken the several parts will be in the position shown in Fig. 3, with the threads pressed against the bottom roller by the top roller, which, when in this position, is not supported vertically by the carriage I; but if one of the threads is broken—say, the thread *x* in Figs. 4 and 5—the arm N, which has hitherto been retained in the position shown in the said figure by the tension of the thread, will fall to the position shown in Fig. 4, in doing which the bent portion or shoulder *y* of the arm will strike the bar *n''* of the swinging frame L, of which the latch-lever *n* forms a part, and this frame will be turned to such an extent on the shaft M that the said latch-lever will be raised from the anti-friction roller on the arm J of the rocking-frame, as shown in Fig. 4.

When this arm J has been entirely released from the latch-lever the carriage I will slide down the inclined bearings *e e* of the arms G G, and the upper roller, K, will be moved away from the lower roller, as shown in Fig. 5, so that the two rollers can have no further control of the threads.

The arm N, in falling, is arrested by its projection *p* coming in contact with the rod *g*, which, as before remarked, connects the two arms *j j* of the rocking frame together; hence when the latch-lever releases the rocking frame the movement of the latter to the position Fig. 5 will cause the movement of the arms N to the position shown in that figure, where they rest against the cross-bar *t'*.

After the broken thread has been properly pieced the attendant pushes back the arm J and restores the several parts to the position shown in Fig. 3.

It will be seen that if any one or more of the threads should be broken the result will be the same—that is, the downward sliding of the carriage and the movement of the upper roller away from the lower roller.

The device for effecting the automatic restoration of a weighted arm, N, to an elevated position immediately after it has released the swinging frame and carriage is an important feature of my invention, for it relieves the

attendant from the duty of manipulating the arms after they have fallen.

A shaft, W, having bearings in the frames D' D', extends from end to end of the machine, and has arms Y, carrying a wire, *w*, by which, on the shaft being so turned that its arm occupies the position shown by dotted lines in Fig. 3, all the weighted arms N throughout the machine will be retained in an elevated position. This device, however, is only brought into play when the machine is stopped.

An arm, *v*, on the rocking frame is connected by a cord or wire, *v'*, to the long weighted arm of a bell-crank lever, T, the short arm of which is connected to the guided brake-plate T', which projects between the flanges of a pulley, *t''*, on the spindle *d*.

When, owing to breaking of a thread or threads, the rocking frame is released and moves forward, the weighted arm of the bell-crank lever, previously supported by the wire *v*, will fall, and the concave edge of the brake will be brought into contact with the periphery of the pulley, thereby stopping the spindle simultaneously, or nearly so, with the breaking of a thread.

The brake will be withdrawn from the pulley when the rocking frame is pushed back to the position Fig. 3.

If it is not desired to twist as many threads as there are weighted arms N, those arms which are not in use may be allowed to remain in the position shown in Fig. 5, where they will not interfere with the working of other portions of the device.

I claim as my invention—

1. The combination, in a twisting or spinning machine, of the carriage I, adapted to inclined guides or ways, and carrying the upper roller, K, with a rocking frame, H, connected to the said carriage, the swinging frame L, and its latch-lever *n*, constructed for the retention and releasing of the rocking frame, and a series of loosely-pivoted and weighted thread-guiding arms, N, constructed for operating on the said swinging frame, all substantially as set forth.

2. The combination of the rocking frame H and the rod *g*, secured to the said frame, with the weighted arms N, provided with the projection *p* on each arm, substantially as specified.

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

J. HENRY KNOWLES.

Witnesses:

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HENRY HOWSON, Jr.