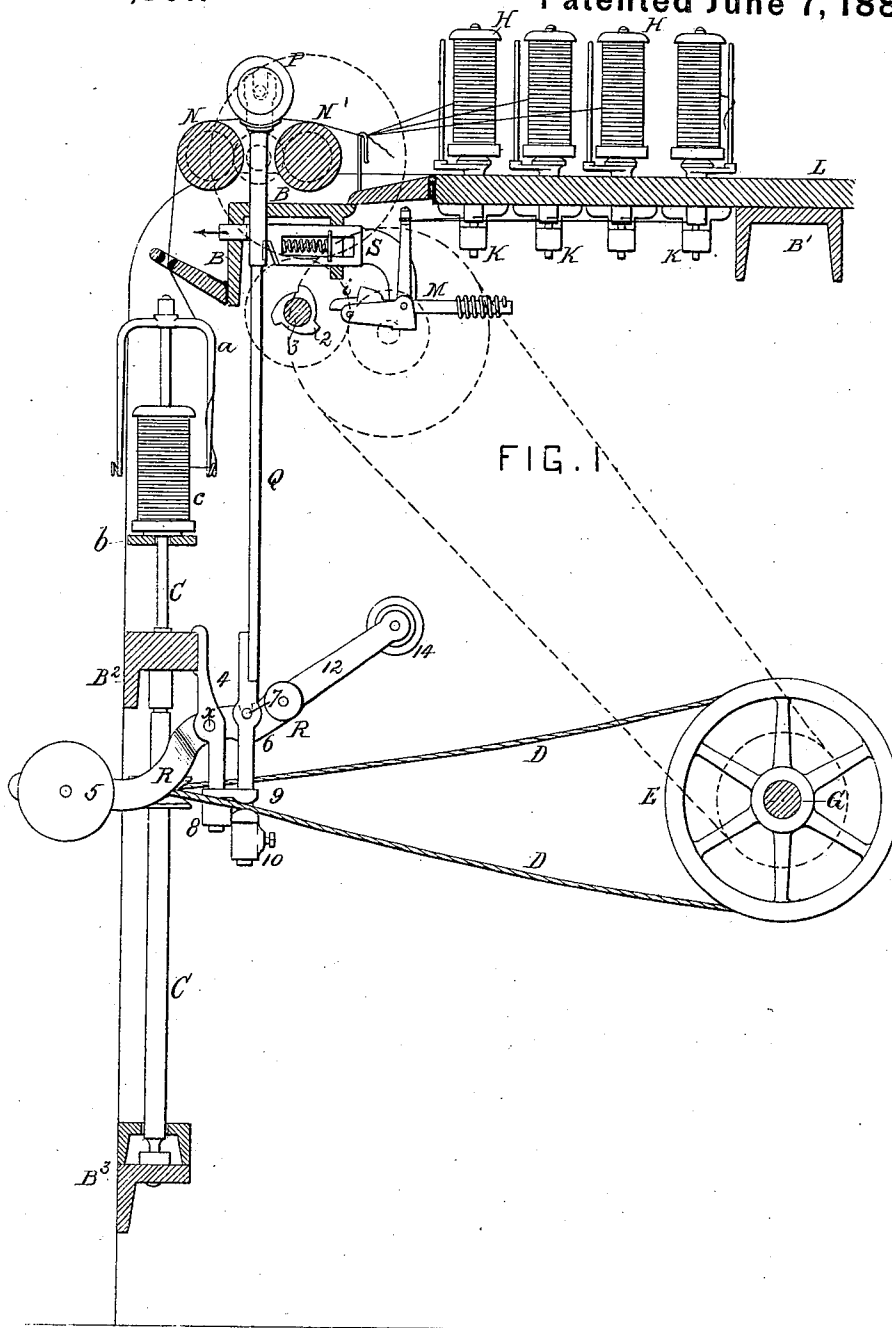


(No Model.)

3 Sheets—Sheet 1.

J. BOYD.
Stop Motion Mechanism for Twisting Machines, &c.
No. 242,591.

Patented June 7, 1881.



Witnesses:

James F. Tobin.
Harry Smith

Inventor

John Boyd
by his Attorney
Houson and Son

(No Model.)

3 Sheets—Sheet 2.

J. BOYD.

Stop Motion Mechanism for Twisting Machines, &c.
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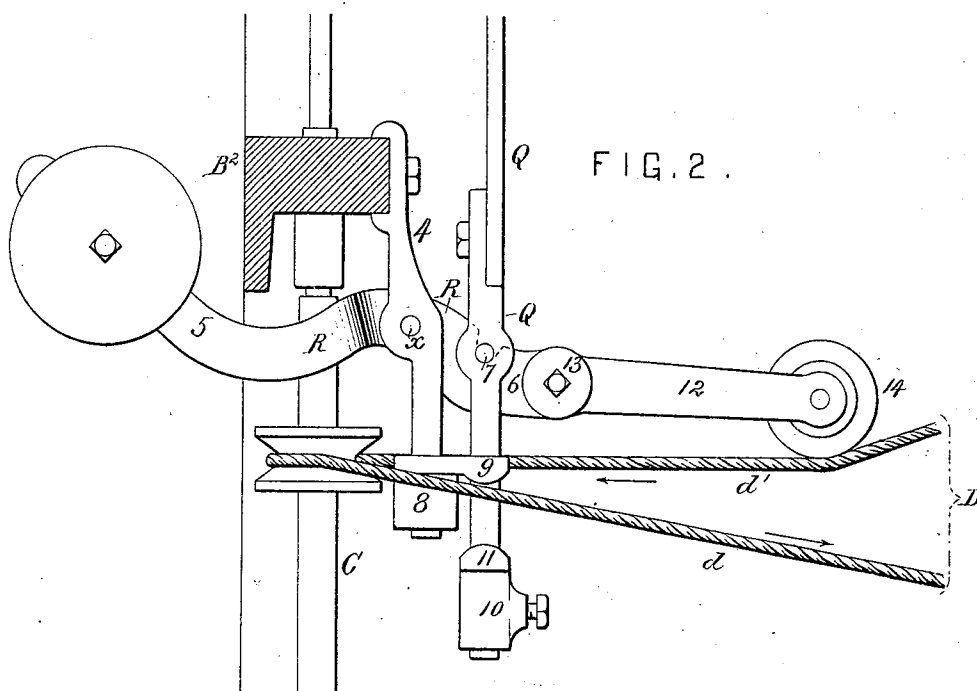
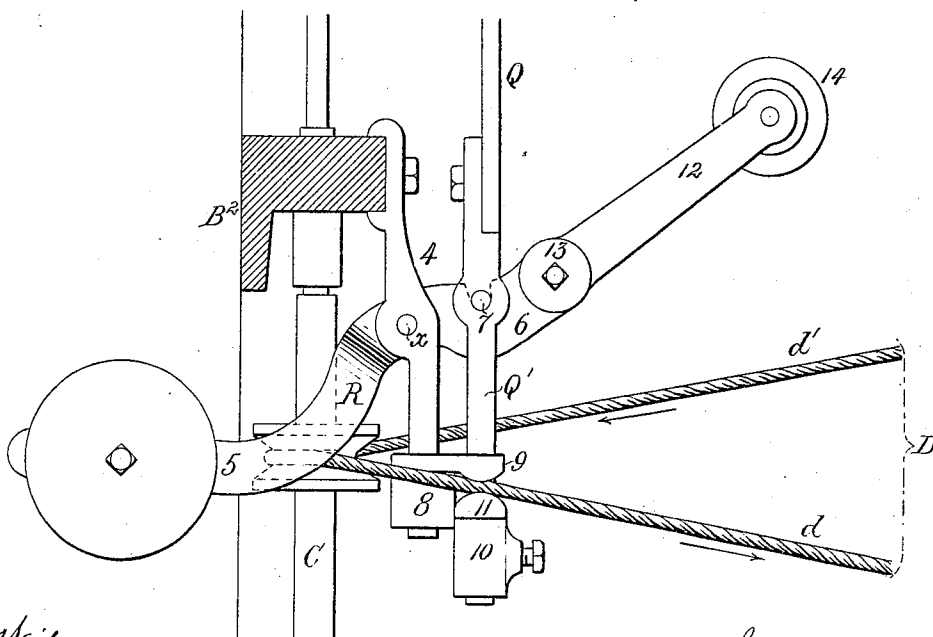


FIG. 3.



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Inventor:

John Boyd
by his Attorneys,
Houston and Jones

(No Model.)

3 Sheets—Sheet 3.

J. BOYD.

Stop Motion Mechanism for Twisting Machines, &c.
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FIG. 4.

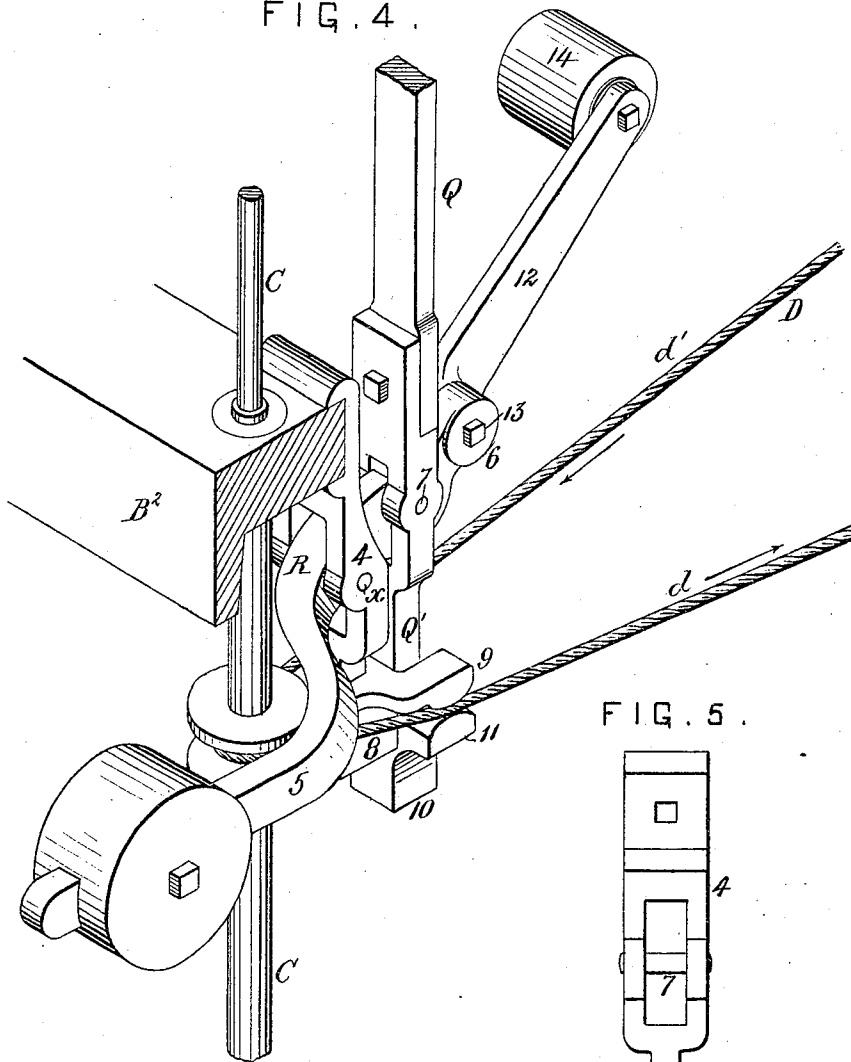
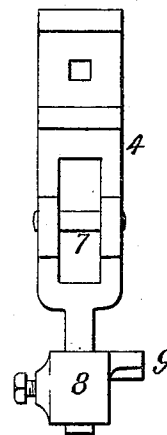


FIG. 5.



Witnesses:

James F. Tobin.
Harry Smith.

Inventor:

Inventor:
John Boyd
by his attorneys
Howson and Son

UNITED STATES PATENT OFFICE.

JOHN BOYD, OF GLASGOW, SCOTLAND.

STOP-MOTION MECHANISM FOR TWISTING-MACHINES, &c.

SPECIFICATION forming part of Letters Patent No. 242,591, dated June 7, 1881.

Application filed November 30, 1880. (No model.)

To all whom it may concern:

Be it known that I, JOHN BOYD, a subject of the Queen of Great Britain and Ireland, residing in Glasgow, Scotland, have invented certain Improvements in Stop-Motion Mechanism for Twisting, Winding, and Similar Machines, of which the following is a specification.

My invention relates to stop-motions for twisting and winding machines and other machines of analogous character in which it is desirable to arrest the winding or twisting and winding operation when a thread breaks or fails; and my invention consists, mainly, of a device, fully described hereinafter, for gripping the spindle-driving band or cord, and thereby stopping the spindle, the device acting in conjunction with any stop-motion mechanism, the operations of which are due to the breaking or failure of a thread.

My invention further consists of a device, described hereinafter, for permitting the spindle-driving cord or band to become loose on the breakage or failure of a thread.

Other features of my invention will be too fully explained hereinafter to need preliminary explanation.

In the accompanying drawings, Figure 1, Sheet 1, is a vertical section of sufficient of a winding and twisting machine to illustrate the application thereto of my device for stopping a spindle when a thread breaks; Figs. 2 and 3, Sheet 2, enlarged views, showing the stopping device in different positions; Fig. 4, Sheet 3, a perspective view of the stopping mechanism; Fig. 5, a view of a bracket detached.

The machine has the usual end frames, connected together by rails B, B', B², and B³, C being one of the spindles, provided with the usual flier, and b the lifting-rail. The spindle is driven from a drum or pulley, E, on the main shaft G by a cord, D, passing round a grooved pulley on the said spindle.

In describing my device for arresting the movement of this spindle, it will be necessary, in the first instance, to refer to the fact that when a thread breaks a rod, Q, is released and raised by a weighted lever, R. The mechanism for releasing this rod and arresting the feeding of the several threads when one or more of them is broken, although shown in Fig. 1, forms no part of my present invention, but is the sub-

ject of a separate application for a patent filed by me November 30, 1880, serial No. 21,367. I will, however, refer to it hereinafter in brief terms.

To the spindle-rail B² is secured a bracket, 4, through a slot in which passes a lever, R, the latter being pivoted to the said bracket at x. The arm 5 of this lever is bent to clear the spindle and rail, as shown in Figs. 2, 3, and 4, and is so weighted that it will raise the rod Q when the latter is released. The arm 6 of the lever passes through a slot in a plate, Q', secured to the lower end of the rod Q, Fig. 4, the said arm bearing against the under side of a pin, 7, which passes through the plate, and which is adapted to a notch in the said arm.

To the arm 6 is secured an extension, 12, by means of a set-screw, 13, so that it may be adjusted to different positions and secured after adjustment, and this extension carries a roller or pulley, 14, for the purpose explained hereinafter.

On the lower portion of the bracket 4 is a vertically-adjustable block, 8, a projection, 9, on which forms an upper jaw; and on the lower portion of the plate Q' is a vertically-adjustable block, 10, a projection, 11, on which forms another jaw immediately below the jaw 9.

As long as the spindle is being driven through the medium of the cord or band D the several parts will be in the positions shown in Fig. 2, the portion d of the cord traversing between the two jaws, but as near as possible to the fixed jaw 9 without being in absolute contact therewith, and the pulley 14, carried by the extension 12 of the lever R, bearing upon the portion d' of the driving-cord and maintaining the latter in such a tight condition that it will properly perform its duty of driving the spindle. When a thread breaks, however, the rod Q will be released and will be raised by the weighted arm 5 of the lever R, and the jaw 11 at the lower end of the said rod will force the portion d of the cord against the upper jaw 9; at the same time the portion d' of the cord will be relieved from the tightening influence of the roller 14, and will become loose simultaneously with the gripping of the other parts of the cord by and between the jaws, and the result of this must be the stopping of the spindle, the cord acting as a brake on the pulley; but on de-

pressing the rod Q the several parts will be restored to their former positions, Fig. 2, and the cord will resume its driving action.

It will be seen that the gripping action of the jaws on the cord is directly due to the upward movement of the rod Q, but it is indirectly due to the breaking of a thread. There are many stop-motion devices or parts of such devices which might be combined with the cord-arresting jaws; but I prefer that for which I have made the separate application for a patent, above referred to, and which I will now briefly describe, reference being had to Fig. 1, Sheet 1.

There are, in the present instance, four threads to be twisted and wound, and these threads are derived from as many bobbins, H. Each bobbin rests on a carrier, and both are supported by a fixed spindle secured to a bracket, K, on the under side of a board, L, secured to the rail B' of the frame. The carrier of each bobbin is connected by a cord to one arm of a trigger, M, as many of these triggers as there are bobbins being pivoted on the spring-bolt S, which is arranged to slide in the rail B, a spring connected with the bolt tending to force the same in the direction of the arrow, Fig. 1. The four threads from the bobbins pass over the feed-rollers N N', which are driven in the usual manner, and beneath the feed-roller P to the flier, by which the threads are twisted and wound round the bobbin C. The roller P, when elevated, is carried solely by the rod Q, and when the latter is released the said roller P is supported solely by the rollers N N'. The rod Q is retained in a depressed position by the spring-bolt, which carries the pivoted triggers, and the rod remains in this position as long as all the carriers are held by their threads in a forward position, each thread by its tension through the medium of its carrier maintaining the arm i of its trigger clear of the cam-like projections 2 on the shaft 3, which is driven continuously from the driving-shaft G of the machine. But the moment a thread breaks or fails its influence over its bobbin and carrier ceases, and the preponderance of the arm i of the trigger causes it to fall, so that it is acted on by one of the projections on the shaft 3. The spring-bolts will then be retracted, the rod Q released and raised by the weighted arm 5 of the lever R, causing all the parts to assume the positions shown in Fig. 1. All the threads are thus retained between the elevated roller P and a plate at the top of the rod, and at the same time the driving-cord is gripped between the

jaws 9 and 11 in the manner described above. After the thread has been pieced, the rod is depressed, the bobbin from which the thread is derived turned until the tension on the thread is resumed, when the trigger will be moved beyond the influence of the projections on the shaft 3, and at the same time the driving-cord will be released and will resume its driving duties.

I may remark in conclusion that as regards the cord-arresting device I have found that better results are attained by gripping the cord as it leaves the pulley of the spindle—that is, the portion d of the cord, Fig. 4—than by gripping the other portion as it approaches the pulley.

I claim as my invention—

1. The combination, in a twisting and winding or analogous machine, of a stop-motion trigger, means for causing the threads to control said trigger, and jaws adapted to the spindle-driving cord with mechanism, substantially as described, for causing the said jaws to gripe the cord in obedience to the action of said trigger, substantially as set forth.

2. The combination of a stop-motion trigger of a twisting and winding or analogous machine and jaws adapted to the driving-cord with a device for tightening and loosening the said cord and mechanism, substantially as described, for operating the said device and for actuating the jaws in obedience to the action of the trigger.

3. The combination of a stop-motion trigger of a twisting and winding or analogous machine, the spindle-driving cord D, and fixed jaw 9 with the rod Q, having a jaw, 11, devices for imparting an upward tendency to said rod, and with mechanism, substantially as described, for retaining and releasing the said rod in obedience to the action of the trigger.

4. The combination of the frame-work, the block 8, carrying the jaw 9, and made adjustable on said frame-work, with the rod Q, carrying the jaw 11, adjustable on the rod, all substantially as set forth.

5. The combination, with the driving-cord, of the lever R, having a weighted arm, 5, and an arm carrying a roller, 14, with the rod Q, controlled by the lever and carrying the jaw 11, all substantially as described.

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

Witnesses:

JOHN BOYD.

JAMES F. TOBIN,
HARRY SMITH.