No. 667,810. Patented Feb. 12, 1901.

J. E. TYNAN.

STOP MOTION FOR TWISTING MACHINES.

(Application filed Mar. 14, 1898.)

(No Model.)

Fig 1:

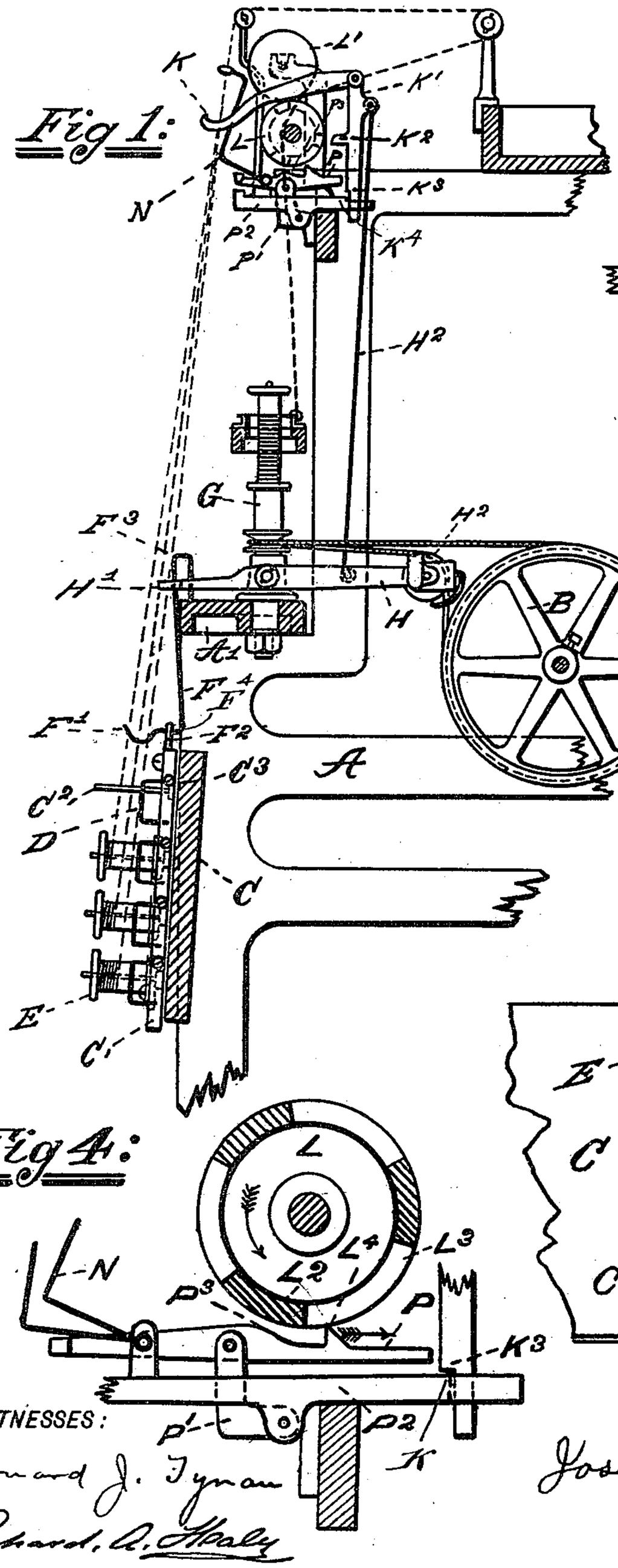

Fig 2:

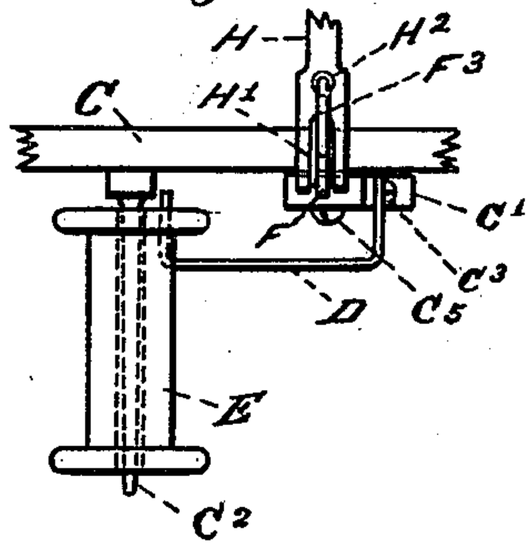

Fig 3:

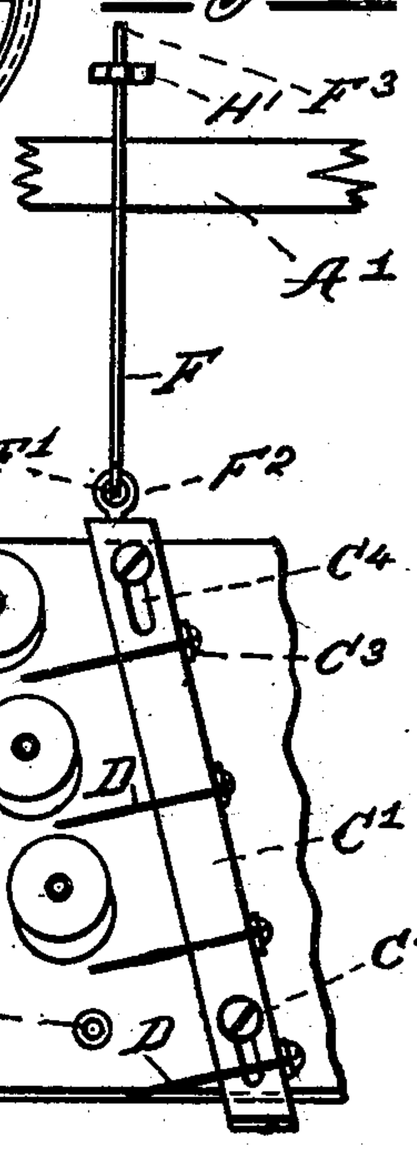

Fig 4:

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STOP-MOTION FOR TWISTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 667,810, dated February 12, 1901.

Application filed March 14, 1898. Serial No. 673,746. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH E. TYNAN, a citizen of the United States, residing at Paterson, in the county of Passaic and State of New Jersey, have invented a new and useful Improvement in Stop-Motions for Twisting-Machines, of which the following is a specification.

My invention relates to machines in which threads are doubled together, twisted, and laid upon a bobbin on a spindle by means of what is known as a "ring and traveler" or some similar device.

My improvement relates to the stop-motion employed to stop the revolution of a spindle on the breaking of a thread and to the application of a brake to stop the revolution of the bobbins from which the threads are drawn simultaneously with the stoppage of the spindle, together with a means of releasing the brake after it has done its work.

Figure 1 is a vertical cross-section of a doubling and spinning machine, showing the threads being drawn from bobbins placed upon a creel, said threads after passing over guides and a feed-roller being laid upon the bobbin on the spinning-spindle. This view also shows the method employed to drive the spinning-spindle. Fig. 2 is a plan view, in larger size, of one of the bobbins upon the creel with the brake mechanism used to stop the revolution of a bobbin on the breakage of a thread. Fig. 3 is a front elevation of the creel with the bobbins, the brake-bar, and the bobbin-brakes. Fig. 4 is a vertical cross-section of that part of the stop-motion that is directly acted upon by the breakage of a thread.

Throughout the drawings similar letters indicate similar parts.

In Fig. 1, A is the frame of the machine, and A′ is the spindle-rail on which the spinning-spindles are mounted.

B is a driving-pulley mounted upon a shaft to impart motion by means of a driving-band to the spindle G.

C is a creel-board.

C^2 represents the pins for the bobbins upon the creel-board.

D is the brake to be applied to the bobbins on the creel on the breakage of a thread, and E designates the bobbins mounted upon the creel.

F is a support connecting the bobbin-brake with the outer end H′ of a lever H, hinged on the bolster-case of the spindle.

K is a lever the pressing down of the outer end of which after a broken thread has been repaired will start the mechanism.

H^2 is a wire link supporting the lever H and hooked onto the latch K′, which is supported by having a shoulder K^3 resting on the ledge K^4, formed by the back end of the faller-stand P^2.

N represents fallers bearing against the threads, the falling of one of which on the breakage of a thread against the outer end of the rock-lever P will bear down the outer end of said lever and throw the claw upon its inner end into one of the mortises in the driving-roller L. This part of the mechanism is shown in detail in Fig. 4 and will be more fully explained hereinafter. The motion of the driving-roller L, engaged with the claw L^4, pushes the rock-lever P backward and forces it against the latch K′, swung to the inner end of the starting-lever K. The shoulder K^3 is pushed off the ledge K^4, on which it rests, and the latch K′ falls, pulling down the inner end of the lever K, raising the outer end of the lever K, and lifting the feed-roller L′ from contact with the driving-roller L. The falling of the latch K′ also allows the lever H to fall and the driving-band is loosened, so that it can no longer drive the spinning-spindle. At the same time the outer end of the lever H is raised, applying the brake D to the supply-bobbins and stopping the revolution of the same.

The application of a brake to supply bobbins to stop the revolution of the same on the breakage of a thread has been shown in a former patent granted to me—to wit, a patent dated January 18, 1887, numbered 356,216, and known as a "Machine for doubling and winding silk."

By adopting the band-slackening device for stopping spinning-spindles heretofore used on certain classes of twisting machinery and by placing the creel-board of the machine at the lower part of the frame instead of at the upper part, as is usual, I am enabled to adapt

the bobbin-brake to twisting-machines and to simultaneously stop the spinning-spindle and apply the brake to the supply-bobbins, as will be hereinafter explained.

The points which are new and which I now desire to secure are the mechanism for applying the bobbin-brake to twisting-machines, a novel means for releasing the bobbins from the brake when the parts have been stopped, and an improvement in the stop-motion device (shown in Fig. 4) that puts the bobbin-brake and band-slackening lever in operation.

I will now describe specifically the operation of the parts to which my present invention relates. The wires D, as shown in Figs. 2 and 3, are mounted upon a brake-bar C′, being secured thereto by screws, as at C^3. The brake-bar is secured to the creel-board by screws sliding in slots, as at C^4 and C^5. F^2 is an eye or hook secured to the upper end of the brake-bar. F is a support connecting the brake-bar with the outer end of the lever H. F^4 is the part of the support F which directly supports the brake-bar by being passed through the eye F^2. This part F^4 has at its end a hook F′, the use of which will be hereinafter explained. F^3 is a hook upon the upper end of the support F. The lever H has at its outer end a fork H′, which encompasses the outer side of the hook F^3. The inner end of this hook passes through a hole back of this fork, as shown at H^4 in Fig. 2, and rests upon the spindle-rail. When a thread has broken and the inner end of the lever H has fallen, the outer end of the lever H, having the fork H′, is raised. This raises the support F, whereby the brake-bar, sliding upon the screws at C^4 and C^5, is pulled upward, and the wire brakes D are pressed against the bobbins E, stopping the revolution of the same and preventing them from the momentum they have attained in revolving from continuing to revolve and throw off slack thread. It is at this point that the hook F′ becomes of use. When the stop-motion has operated and the brake has been applied, the operator pushes the support F, bending it slightly against the edge of the frame A′ until the brake-bar hangs in the hook F′. The result of this is that the brake-bar is allowed to fall, the wires D are removed from contact with the bobbins E, and said bobbins are free to be revolved in drawing the thread from them to repair the broken threads. The object of the hook F^3 being extended above the fork H′ is to allow the outer end of the lever H when an end is broken to be raised a considerable distance before it comes in contact with the top of the hook F^3 to raise and operate the bobbin-brake. By this means I delay the application of the brake and leave the supply-bobbins free to be revolved until the feed-roller has ceased to draw the threads from them.

While I use the spindle-rail as a fulcrum against which to bend the support F in throwing the brake out of operation when the bobbins have ceased to revolve, any other fulcrum secured to the frame would do as well. The method of engaging the support F with the outer end of the lever H is likewise subject to variation. It is obvious also that the hook F′ and part F^4 could be upon the brake-bar and the eye or hook F^2 upon the support F without changing the operation of the device. I prefer it, however, as shown. When the broken threads have been repaired and the outer end of the starting-lever K is pressed down by the operator, the inner end of the lever K is raised, the shoulder K^3 upon the latch K′ springs upon its supporting-ledge, the lever H is raised, the driving-band is tightened, and the spinning-spindle begins to revolve. This part of the mechanism is fully explained in my patent for silk-throwing machines hereinbefore referred to. When the machine is thus started up, the outer end of the lever H is lowered and the brake-bar C′ falls to the position shown in Fig. 3, its weight resting upon the screws C^5. When the brake-bar has fallen, the support F, which has been bent slightly by the operator, as hereinbefore explained, springs back into a straight position, and the hook F′ being loose in the eye F^2 the part F^4 of the support F is sprung into the eye F^2. The parts have then assumed their normal running position. The support F, with the part F^4 and the hook F′, operated as I have described, forms an efficient method of removing the brake from the bobbins after their rotation has been stopped to allow them to be revolved to draw off thread for "piecing-up" purposes.

In Fig. 4 I show another improvement in the stop-motion mechanism, relating to that part of the same that is directly affected by the breaking of a thread. L is the revolving roller upon which the feed-roller rests. It is shown in section, with mortises for engaging the claw upon the rock-lever. P^2 is the faller-stand, and P′ is a swing-yoke mounted therein. P is the rock-lever, and L^4 is the claw on the rock-lever. N represents the fallers that bear against the thread. When a thread breaks, one of the fallers N falls upon the arm at the outer end of the rock-lever P and tips the lever, so that the claw L^4 enters one of the mortises L^3 in the driving-roller and becomes impinged against the edge of the mortise. The drawings show the claw about to enter into one of these mortises. When the claw has become engaged with the roller, the movement of the roller forces the rock-lever backward, the swing-yoke moving on its pivot to allow of the travel of the rock-lever, and the rear end of the rock-lever pushes the shoulder K^3 off from its supporting-ledge and allows the mechanism to operate. This part of the mechanism is set forth fully in the patent granted to me for machines for throwing silk, hereinbefore referred to.

The improvement which I now desire to se-

cure consists of the swell P^3, the operation and advantages of which I will now describe. When the claw L^4 enters the mortise L^3 in the driving-roller L on the breakage of a thread and becomes impinged against the edge of a mortise and carried backward, it becomes necessary to release the claw from the roller before the roller has carried it beyond a certain point; otherwise the claw will lock in the roller. In the former patent referred to, in which this stop-motion is shown, I employ for this purpose the same flange K^2 upon the latch K', as is shown in Fig. 1 of the drawings accompanying this application. When the latch K' falls, the flange K^2 falls upon the inner end of the rock-lever P, and so pulls the claw L^4 from its position in the roller. I have found, however, that a great exactness of adjustment is required to remove the claw from the roller in this way. I still retain the flange K^2 to fall upon the rear end of the rock-lever after the claw has left the mortise in the roller and hold the lever down, so that its claw cannot again come in contact with the mortises in the driving-roller; but for the purpose of forcing the tooth from the roller I employ the swell P^3. When the claw is engaged in the driving-roller and the rock-lever and the swing-yoke P' are carried backward, the swell P^3 is pressed against the outer surface of the driving-roller at a part where there is no mortise. As the driving-roller forces the parts backward the swing-yoke in swinging rises, while the part of the surface of the driving-roller against which the swell P^3 rests finds a lower position. The result is that the swell P^3 is carried downward, carrying the claw L^4 with it, and by the time the rear end of the rock-lever has forced the shoulder K^3 of the latch from its supporting-ledge the claw L^4 has been forced out of contact with the driving-roller. By this means I do away with great exactness in construction and make the machine more safe and certain in its operation. When the claw has been forced from the driving-roller, the weight of the swing-yoke P' draws the rock-lever back to its original position.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A creel-board with pins for the bobbins mounted thereon, a brake-bar, with brakes mounted thereon, a support for the brake-bar, the horizontal portion F^4 of said support, the hook or depressed portion F' forming an extension thereof, the eye F^2 on the brake-bar, adapted to engage the horizontal and depressed portions of the support, a stop-motion mechanism, a spinning-spindle, a driving-band, and a pulley for the band, in combination with a band-slackening lever, controlled by the stop-motion mechanism, and having an outer end, adapted to operate the brake-bar when the band is slackened, substantially as and for the purpose described.

2. A creel-board provided with bobbin-supports, a brake-bar having brakes for the bobbins, an eye F^2 on the brake-bar, a support for the brake-bar having a horizontal portion, F^4, and a hook F', adapted to engage the eye on the brake-bar, in combination with means for raising the support, and thereby the brake-bar, upon the breakage of a thread, substantially as and for the purpose described.

3. A creel-board provided with bobbin-supports, a brake-bar having brakes for the bobbins, an eye F^2 on the brake-bar, a support for the brake-bar having a horizontal portion F^4 and a hook F' adapted to engage the eye on the brake-bar, and a fulcrum, A', in combination with means for raising the support and thereby the brake-bar upon the breakage of a thread, substantially as and for the purpose described.

4. The combination, with the driving-roller L, and means for revolving the same, of the feed-roller L', the faller-stand, the fallers mounted thereon, the swing-yoke P', the rock-lever P pivoted thereto, against which the fallers act, said lever having the claw L^4 and the swell P^3, the lever K, the latch K'; pivoted to the lever K and having a shoulder K^3, the ledge K^4, a spindle, driving means therefor, and connections between the latch and driving means to stop the spindle, substantially as set forth.

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