No. 676,056. Patented June 11, 1901.

J. E. TYNAN.

STOP MOTION FOR BELT DRIVEN TWISTING MACHINES.

(Application filed Oct. 24, 1900.)

(No Model.)

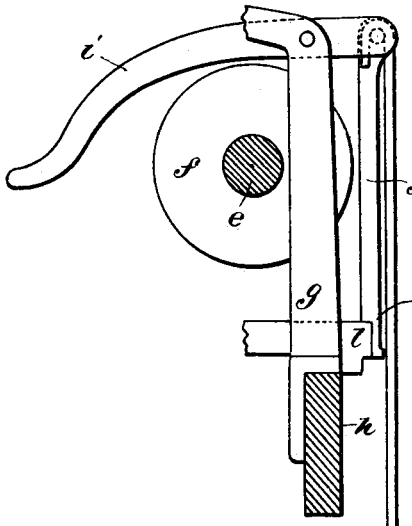


Fig. 1.

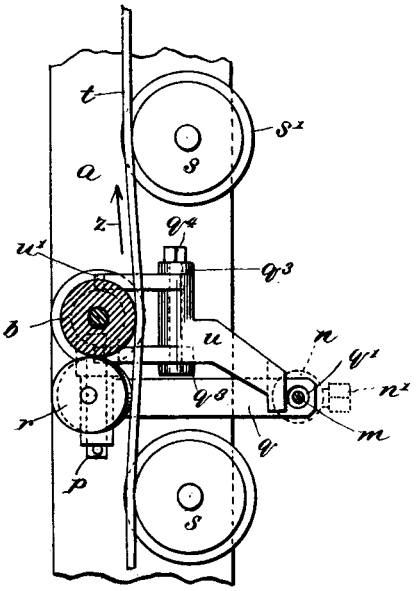
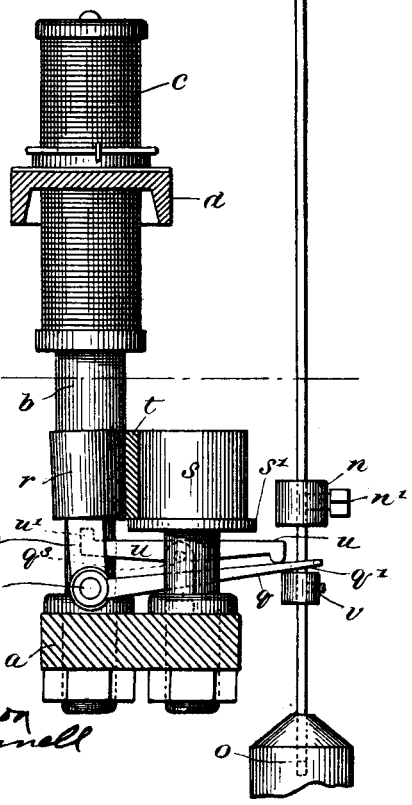


Fig. 2.



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STOP-MOTION FOR BELT-DRIVEN TWISTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 676,056, dated June 11, 1901.

Application filed October 24, 1900. Serial No. 34,230. (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 Stop-Motion for Belt-Driven Twisting-Machines, of which the following is a specification.

My invention relates to that class of twisting-machines in which the pressure of a moving belt, which passes by and presses against each twisting-spindle on the spindle-rail, causes all of such spindles to revolve.

The object of my invention is to provide means for removing such driving power from an individual spindle when it is desired to stop such spindle without interfering with the imparting of motion by the driving-belt to the other spindles upon the same spindle-rail.

In the drawings, Figure 1 is an end elevation of my device, and Fig. 2 is a plan view of the same.

Throughout the drawings similar letters indicate similar parts.

The spindle-rail of the machine is shown at *a*. Upon this rail is mounted the spindle *b*, carrying the bobbin *c*, on which thread is laid by means of a ring and traveler mounted upon the ring-rail *d*. The whirl or pulley of the spindle *b* is shown at *b'*. A driving-shaft to operate the feeding and stop-motion devices is shown at *e*, and on this driving-shaft is mounted the driving-roller *f*. The stand *g* is secured to the rail *h* and has pivoted at its upper end the lever *i*, upon the rear end of which lever is pivoted the latch *j*, having the part *k* to rest upon the rear end *l* of another bracket secured to the rail *h*. There is also hung upon the rear or inner end of the lever *i* the rod *m*, which extends downward to connect the stop-motion of the feeding mechanism with the stop-motion of the spindle and enable the former stop-motion to put the latter in operation.

There is nothing in any of the parts above referred to to which my present invention directly relates. Said parts have all been shown in former patents granted to me, and particularly in my application for patent, Serial No. 673,746, allowed August 18, 1900, on stop-motions for twisting-machines and not yet issued. I have not thought it necessary, therefore, to show all such parts in full, but have merely shown enough to indicate the relation of such parts to the devices included in my present invention, and which I will now proceed to describe.

A driving-belt *t* runs the entire length of the spindle-rail, traveling in the direction of the arrow Z, and drives the spindle *b*, together with other spindles upon the same spindle-rail, through contact with the whirls *b'* of the spindles. As the whirl *b'* of each spindle is for all practical purposes a part of the spindle to which it belongs, I will throughout this specification speak of the spindle *b* as an entirety, inclusive of the whirl *b'*.

At *s* are shown fixed guard-pulleys, each having the flange *s'* to act as a support for the driving-belt *t*. There is one of such guard-pulleys *s* for each spindle *b*, each spindle being placed between two of such guard-pulleys in such a position that the outer side of the belt *t* will drive the spindle, while the inner side of the belt is supported by the guard-pulleys. At the base of the spindle *b* is secured the stud *p*, upon which swings the lever *q*, having the hole *q'* at its inner end and the stem q^2 at its outer end. In this stem q^2 is mounted an idler-pulley *r*, which idler-pulley is out of contact with the driving-belt when the spindle is being revolved. The rod *m* passes through the hole *q'* and has a weight *o* at its lower end. Secured to the rod by means of the set-screw *n'* is the block *n*. A forked bracket q^3 is secured to the spindle-rail of the machine, and hinged between the forks of this bracket by means of the stud q^4 is the lever *u*, the rear end of which lever rests upon the lever *q*. This lever *u* has two fingers *u'* at its inner end, one of said fingers being on one side and one on the other side of the bolster-case of the spindle *b*, and the tops of said fingers being at a point slightly beneath the whirl *b'* of the spindle.

When the rod *m* falls through the breakage of a thread or through the actuation of the stop-motion of the feeding mechanism from any cause, as is fully described in my former application above referred to, the weight *o* pulls the rod down with considerable force, and the block *n* forces the inner end of the lever *u* downward. The lever *u* in its turn

forces the inner end of the lever q downward. This movement of the lever q causes the stem q^2 and its idler-pulley r to move in the direction of the belt t and to press the belt t out of contact with the spindle b, thus allowing the spindle to stop. At the same time, in order to accelerate the stoppage of the spindle and to prevent it from revolving through its momentum after the driving power has been removed from it, the fingers u' through the depression of the inner end of the lever u are raised, come into contact with the under side of the whirl b' of the spindle, one on each side of the same, and slightly raise said spindle in its bolster-case, thus acting as a brake and bringing said spindle to a sudden stop. If the lever u were dispensed with, the block n on the rod m would strike directly on the lever q and perform the same function in causing the idler-pulley r to press the driving-belt t away from the spindle b. In this form the apparatus can be used without a brake, the spindle being allowed to run until its momentum has been overcome. I think it better, however, to use the brake and prefer it in the form shown, although various forms of brake can be made to perform the same purpose. When the broken threads have been repaired and it is desired to start the parts, the lever i is pressed downward by the operator, as described in my former patent above referred to, the part k of the latch j becomes locked on the bracket l, the rod m, block n, and weight o are raised, the lever q is raised by the block v, which travels upward with the rod m, and the idler-pulley r is thrown away from the driving-line of the belt t, allowing the belt to come in contact with and drive the spindle b. The rising of the lever q causes the inner end of the lever u to rise, and in this way the brake-fingers u' are drawn from contact with the under side of the whirl b'.

In the use of a ring-and-traveler device for laying thread upon a bobbin it is essential that the spindle which is twisting and taking up the thread should be a fixture on the spindle-rail. This fact makes it impracticable to get an operative device for removing the pressure of the driving-belt from this class of spindles by moving the spindle out of contact with the driving-belt, as the sides of the ring on the ring-rail would injure the thread on the bobbin by rubbing against it. In my invention when I desire to stop the spindle I remove the driving-belt out of contact with the spindle, so that the spindle at all times maintains its fixed position upon the spindle-rail.

I am aware that on machines of this general class attempts have been made to apply a stop-motion to the twisting-spindles by having a pulley or pulleys to press the driving-belt against each twisting-spindle and providing means to remove the pressure of such pulley or pulleys from such driving-belt when it was desired to stop the spindle; but it must be kept in mind that there is a straight row of spindles to be driven by the same belt along the entire side of a machine, so that when the pressure pulley or pulleys are removed from pressing against the driving-belt such driving-belt is nevertheless kept in its original line and in contact with the twisting-spindle by virtue of the pressure of the pressure-pulleys operating on the spindles to the right and left of the spindle it is desired to stop. Consequently with such a method a spindle can only be stopped by the application of a brake to the spindle strong enough to cause it to cease to revolve in spite of the fact that the driving-belt is still rubbing against it. If the spindle is stopped in this way, it will soon grow hot from the rubbing of the belt and will also destroy the belt.

In my invention I remove the driving-belt from contact with the spindle, so that the spindle will cease to revolve or will be stopped promptly by the brake, and the guard-pulleys s, so placed that each twisting-spindle is between two of them, cause the stopping and running of each spindle to be entirely independent of and to exert no influence upon the stopping or running of adjoining spindles.

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

1. A spindle-rail, a twisting-spindle thereon having its base secured thereto, a driving-belt to drive said spindle, and means for driving said belt, in combination with an idler-pulley adjacent to said driving-belt, a bearing for said idler-pulley, and means, brought into operation when the parts are to be stopped, to press the idler-pulley against the driving-belt, to remove the driving-belt from contact with the twisting-spindle, substantially as and for the purpose described.

2. A spindle-rail, a twisting-spindle thereon having its base secured thereto, a driving-belt and means for driving the same, in combination with guard-pulleys for the belt on the side of the driving-belt opposite the twisting-spindle, an idler-pulley on the same side of the driving-belt as the twisting-spindle, and means, brought into operation when the parts are to be stopped, to press the idler-pulley against the driving-belt, to remove the driving-belt from contact with the twisting-spindle, substantially as and for the purpose described.

3. In a twisting-machine, a spindle-rail, a row of twisting-spindles secured thereto, a driving-belt to drive all of said spindles in common, and means for driving said belt, in combination with a series of idler-pulleys, one of which idler-pulleys is mounted adjacent to each of said twisting-spindles, bearings for said idler-pulleys, means, brought into operation when an individual twisting-spindle is to be stopped, to press the idler-pulley relating to such twisting-spindle against the driving-belt, to remove the driving-belt from contact with such twisting-spindle, and guard-pulleys, so mounted as to prevent the stop-

page of an individual twisting-spindle from disturbing the contact of the driving-belt with the other twisting-spindles upon the same spindle-rail, substantially as and for the purpose described.

4. A spindle-rail, a twisting-spindle thereon having its base secured thereto, a driving-belt and means for driving the same, in combination with guard-pulleys for the belt on the side of the driving-belt opposite the twisting-spindle, an idler-pulley on the same side of the driving-belt as the twisting-spindle, a brake for the twisting-spindle, and means, brought into operation when the parts are to be stopped, to press the idler-pulley against the driving-belt, and to bring the brake into contact with the twisting-spindle, substantially as and for the purpose described.

5. The spindle-rail a, the spindle b, having its base secured to said spindle-rail, the guard-pulleys s, the driving-belt t, and means for driving said belt, in combination with the rod m, capable of descending when the parts are to be stopped, the lever q having the stem q^2, the idler-pulley r, mounted in the stem q^2, and the block n, secured to the rod m, substantially as and for the purpose described.

6. The spindle-rail a, the spindle b, having its base secured to said spindle-rail, the guard-pulleys s, the driving-belt t, and means for driving said belt, in combination with the rod m, capable of descending when the parts are to be stopped, the brake-lever u, having a finger u', a support for said brake-lever, the lever q, having the stem q^2, the idler-pulley r, mounted in the stem q^2, and the block n, secured to the rod m, substantially as and for the purpose described.

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