

No. 784,923.

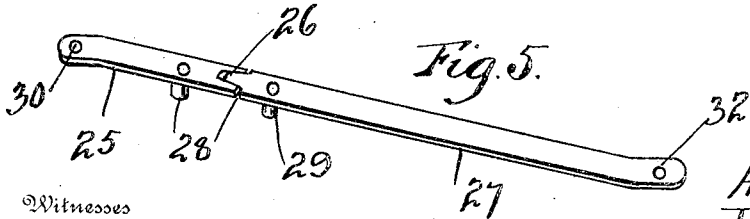
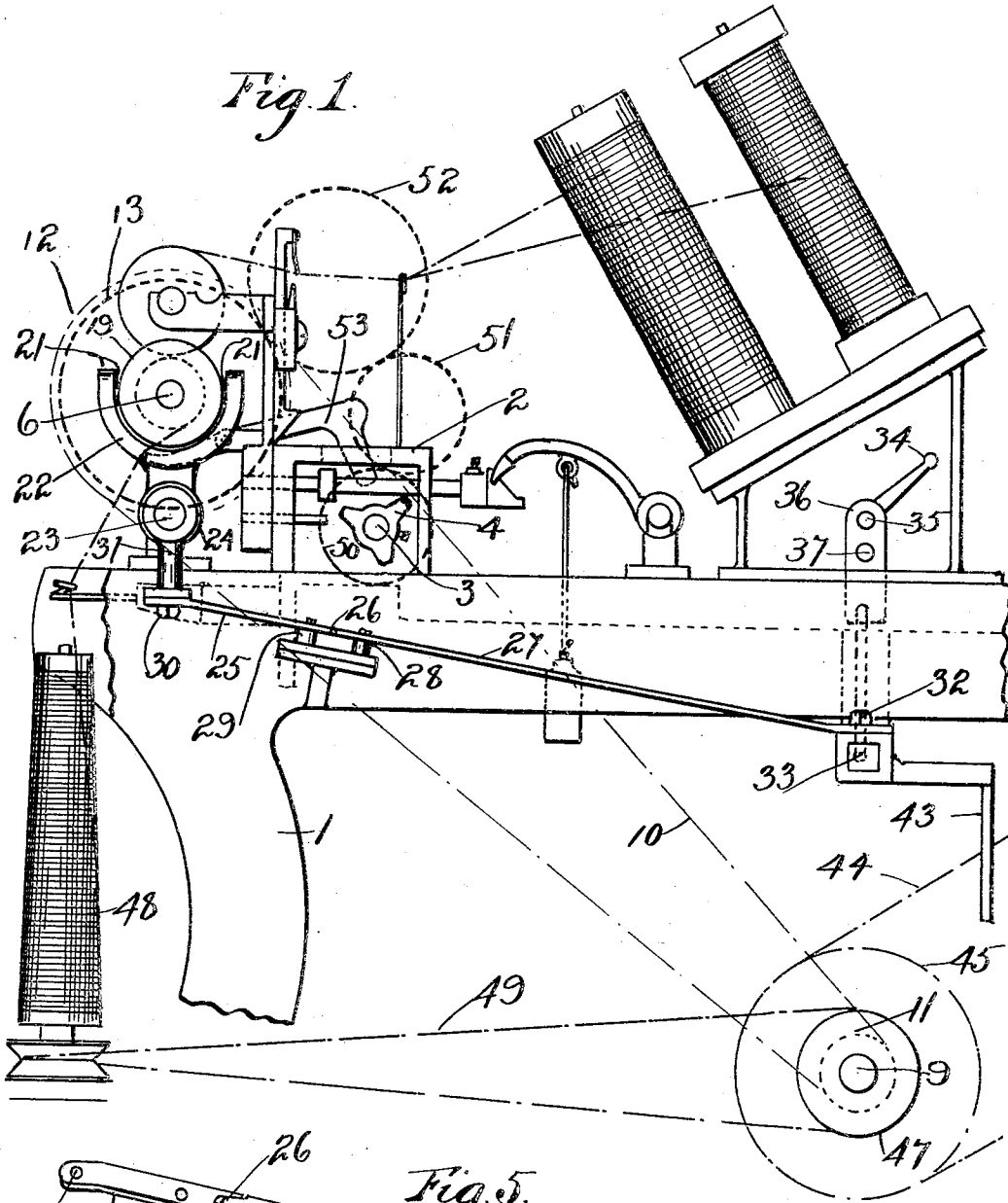
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H. & J. W. COLLINS.

STARTING OR STOPPING DEVICE FOR TWISTING MACHINES.

APPLICATION FILED DEC. 19, 1904.

2 SHEETS—SHEET 1.



Witnesses  
Frank A. Foster  
E. S. Ogden

Inventors,  
Henry Collins.  
Joseph W. Collins.  
Howard E. Barlow.  
Attorney

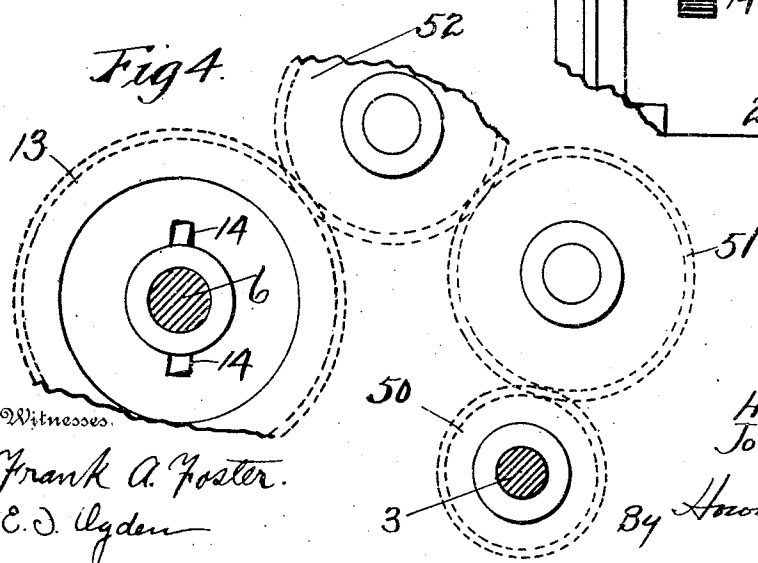
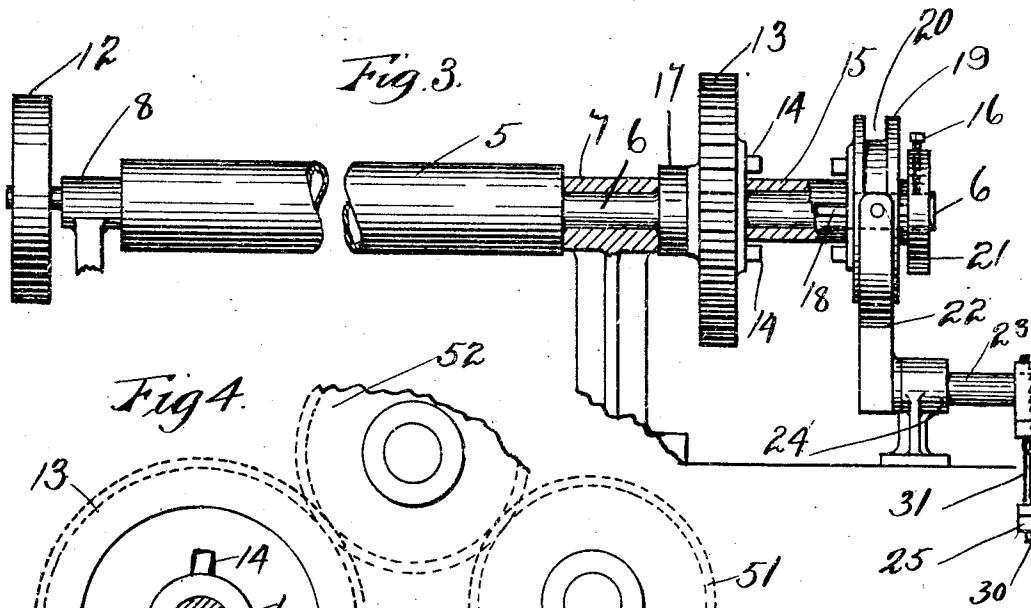
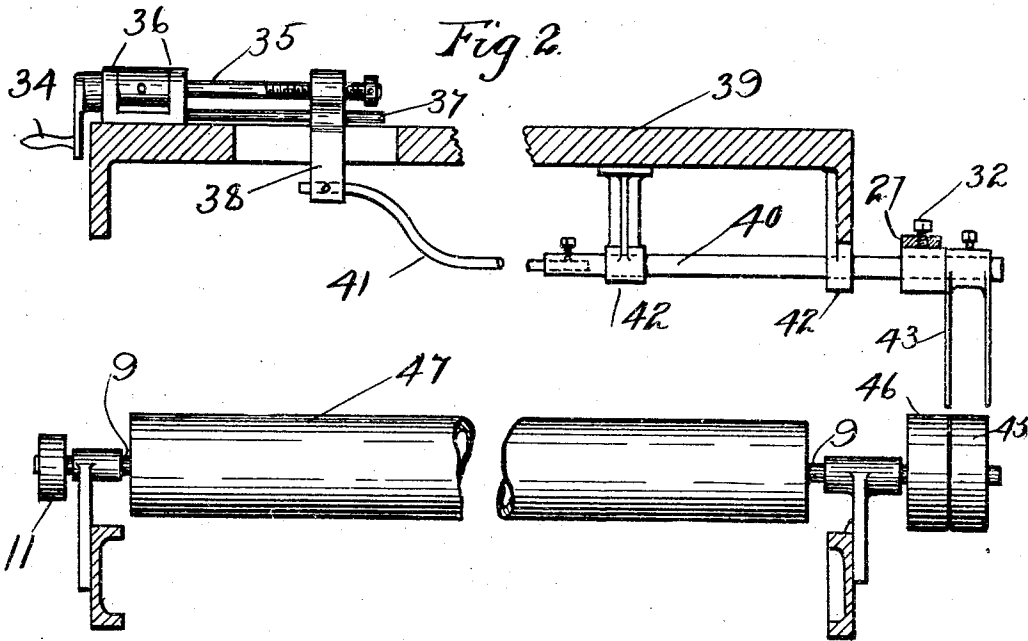
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2 SHEETS—SHEET 2.



Witnesses.  
 Frank A. Foster.  
 E. J. Upton

Inventors  
 Henry Collins  
 Joseph W. Collins.  
 By Howard E. Barlow  
 Attorney

# UNITED STATES PATENT OFFICE.

HENRY COLLINS AND JOSEPH W. COLLINS, OF PAWTUCKET, RHODE ISLAND.

## STARTING OR STOPPING DEVICE FOR TWISTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 784,923, dated March 14, 1905.

Application filed December 19, 1904. Serial No. 237,571.

*To all whom it may concern:*

Be it known that we, HENRY COLLINS and JOSEPH W. COLLINS, residents of the city of Pawtucket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Starting or Stopping Devices for Twisting-Machines; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form a part of this specification.

Our invention relates to starting and stopping motion for doubling and twisting machines, and has for its object to provide means whereby the stop-levers may be lifted out of engagement with the lever-actuating cam before said cam is set in motion. In doubling and twisting machines of this character the yarn slackens up as soon as the machine stops, thereby allowing the stop-levers to fall into engagement with the lever-actuating cam, and should the said cam not have been previously stopped or should it start to rotate before said levers had been lifted out of engagement therewith said levers would be thrown forward and all of the threads broken. To obviate this, we have arranged that the twisting mechanism may be started first to produce a tension on the threads and raise the said stop-levers out of engagement with the cam before said cam is allowed to start, said mechanism being also arranged to stop the rotation of said cam before the stopping of the rolls and spindles or before said levers are allowed to fall.

The invention is fully set forth in this specification and more particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 illustrates an end elevation of the doubling and twisting mechanism, showing a portion of the starting and stopping mechanism for operating the lever-actuating cam. Fig. 2 represents a portion of the frame of the machine in section, showing the screw-actuating device for throwing the belt-shifter to start and stop the machine. Fig. 3 is a side eleva-

tion, partly in section, showing a portion of the lower roll with the driving-gear and sliding clutch and a portion of its actuating mechanism. Fig. 4 shows the clutch-gear on the lower roll, the gear on the cam-shaft, and the two intermediate gears by which said cam-gear is driven from the said clutch-gear. Fig. 5 is a perspective view representing the double-acting connecting-rod that operates the clutch mechanism from the belt-shifting rod.

Referring to the drawings, at 1 is the end frame of the twisting-machine.

At 2 is an inverted trough or box in which rotates the cam-shaft 3. On this shaft is fixed the spur or cam wheel 4.

At 5 is the lower feed-roll, mounted on the shaft 6 to turn in the bearings 7 and 8. (See Fig. 3.) This roll may be driven by gears or in any other suitable way; but for convenience it is illustrated as being driven from the drum-shaft 9, through the belt 10, over the pulleys 11 and 12. On one end of this roll-shaft 6 is loosely mounted the gear 13, which gear has the clutch-lugs 14 14 projecting from one of its faces. At 15 is a sleeve fixed to said shaft by the set-screw 16, which sleeve extends in from the end of the shaft to the face of the said gear, serving to hold it back against the collar 17 and prevent an endwise movement of the same. Mounted on this sleeve 15 to slide endwise in the keyway 18 is the clutch-collar 19, which has a circular groove at 20 to receive the yoke-pins 21 21. The yoke 22, in the upper ends of which these pins 21 are located, is mounted on the shaft 23 to slide endwise in the bearing 24 and carry with it said clutch-collar 19. Connected to the outer end of this shaft 23 is the shifting lever 25. This shifting lever, as best illustrated in Figs. 1 and 5, has a double action produced by the joint 26, that divides it into two parts 25 and 27, which parts are independently pivoted at 28 and 29, respectively, the outer end of 25 being pivotally connected at 30, through the bracket 31, to the shaft 23, the opposite end of this double-acting shifting lever being pivotally connected at 32 to the belt-shift bar 40.

It is found desirable in this machine, in order to avoid the starting and stopping of the

same inadvertently to control the starting and stopping mechanism by the action of a hand-operated screw, as best illustrated in Fig. 2, in which 34 is the handle, and 35 the threaded screw held to turn in the bearings 36. Extending outward from the lower portion of this bearing-frame is the bearing-pin 37. The nut 38 is threaded onto the screw 35 and also has a bearing on the pin 37 to prevent the same from turning, but allowing a longitudinal motion. This nut extends down through the top board 39 of the machine and is connected to the sliding bar 40 by the rod 41. This sliding bar 40 is preferably made square and is arranged to move longitudinally in the bearings 42 42. To this bar at 32 is connected the end 27 of the above-mentioned shifting lever, and on the outer end of this bar is mounted the fork 43, which engages the driving-belt 44 to throw the same from the loose pulley 45 to the tight pulley 46, these two pulleys being mounted on the drum-shaft 9, and through which pulleys the drum 47 is rotated. One of the bobbins is shown at 48, which is rotated in the usual way from this drum 47 through the belt 49. The cam-shaft 3 is driven by the gear 50 from the clutch-gear 13 on the lower-roll shaft 6, through the intermediate gears 51 and 52.

30 The operation of the device may be further described as follows: In machines of this character it is found advisable on account of the high speed of some of the running parts, as well as for other reasons, to start the same up slowly. This is accomplished in the present instance by the use of the hand-operated screw mechanism, which throws the driving-belt gradually from the tight to the loose pulley, and vice versa. One end of the double-acting shifting lever is connected at 32 to the belt-shifting bar 40 and its opposite end is connected to the clutch-actuating mechanism. (Illustrated in Fig. 3.) The said clutch is thereby caused to be operated in time with the rest of the mechanism to start and stop the cam-shaft through the train of gears. (Illustrated in Fig. 4.) As the main driving-belt is slowly moved from the loose to the tight pulley the mechanism is gradually started up. At the same time the double-action shifting lever moves the clutch-collar 19 gradually toward the face of the clutch-gear; but it is not until the machine is fully started and the slack of the threads taken up by the twisting-spindle to raise the stop-levers 52 out of engagement with the cam 4 that the clutch-lugs 14 14 in the collar engage those in the face of the gear to start the cam to revolve. In stopping the machine the reverse action takes place. As soon as the screw-actuated belt-shifting bar commences to move in the opposite direction to throw the belt from the tight to the loose pulley the clutch on the collar is withdrawn from the clutch-gear at the beginning of the stroke and the rotation of said cam

ceases, while the action of the rest of the machinery continues until the driving-belt has been completely withdrawn from the tight pulley.

This machine is very practical in its construction and effective in operation.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a device for stopping and starting twisting-machines, stop-levers, a stop-lever-actuating cam and means whereby said levers will be automatically raised out of engagement with said cam before said cam is started to rotate.

2. In a device for stopping and starting twisting-machines, stop-levers, a stop-lever-actuating cam, means whereby said levers will be automatically raised out of engagement with said cam before said cam is started to rotate, and means whereby the cam is caused to cease rotating before said levers are allowed to fall into engagement with the same when it is desired to stop the machine.

3. In a device for stopping and starting twisting-machines, stop-levers, a stop-lever-actuating cam and means whereby said cam is started automatically to rotate after said levers have been raised out of engagement therewith.

4. In a device for stopping and starting twisting-machines, stop-levers, a stop-lever-actuating cam, and means including a clutch and clutch-actuating mechanism whereby said cam is started automatically to rotate after said levers have been raised out of engagement therewith.

5. In a device for stopping and starting twisting-machines, stop-levers, a stop-lever-actuating cam, a lower roll and lower-roll shaft, means mounted on said roll-shaft and detachable therefrom, said means being connected to transmit a rotary motion to said cam, and means for connecting said rotary transmitting means to said roll-shaft after said roll-shaft has been started.

6. In a device for stopping and starting twisting-machines, stop-levers, a stop-lever-actuating cam, a lower roll and lower-roll shaft, means mounted on said roll-shaft and detachable therefrom, said means being connected to transmit a rotary motion to said cam, and means including a clutch for connecting said rotary transmitting means to said roll-shaft after said roll-shaft has been started.

7. In a device for stopping and starting twisting-machines, stop-levers, a stop-lever-actuating cam, a lower roll and lower-roll shaft, a clutch-gear mounted on said roll-shaft through which gear a rotary motion is transmitted to said cam, a clutch-collar also mounted on said shaft and means operated by the movement of the belt-shipper to throw said clutch-collar into engagement with said clutch-gear causing the same to rotate the said cam

after the spindles have been started to tighten the threads and raise said stop-levers from said cam.

5 8. In a device for stopping and starting twisting-machines, stop-levers, a stop-lever-actuating cam, a lower roll and lower-roll shaft, a clutch-gear mounted on said roll-shaft through which gear a rotary motion is transmitted to said cam, a clutch-collar also mounted on said shaft, and means including a double acting shifting lever operated by the movement of the belt-shipper to throw said clutch-collar into engagement with said clutch-gear

causing the same to rotate the said cam after the spindles have been started to tighten the threads and raise said stop-levers from said cam. 15

In testimony whereof we have hereunto set our hands this 17th day of December, A. D. 1904.

HENRY COLLINS.  
JOSEPH W. COLLINS.

In presence of—

HOWARD E. BARLOW,  
ESTHER I. OGDEN.