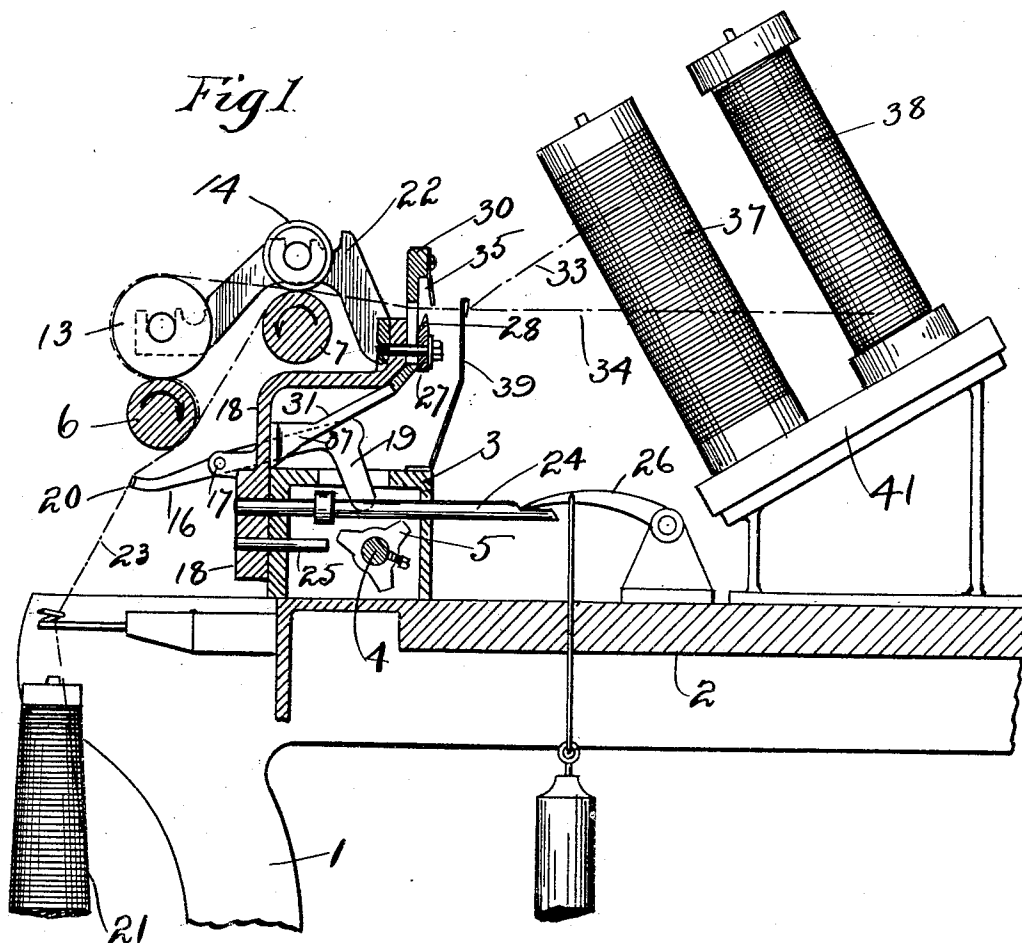
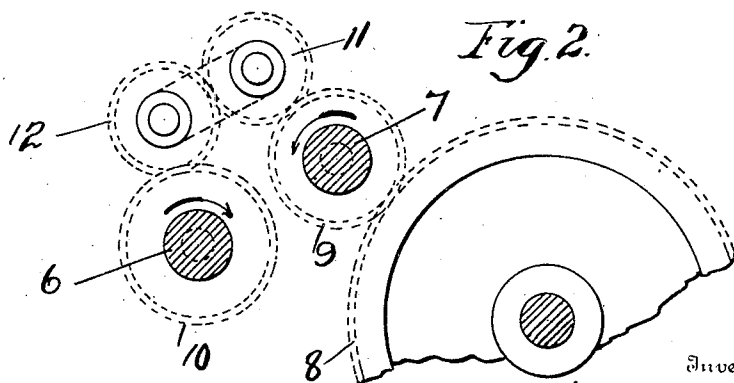


No. 784,922.

PATENTED MAR. 14, 1905.

H. & J. W. COLLINS.
TWISTING MACHINE:
APPLICATION FILED NOV. 7, 1904.

2 SHEETS—SHEET 1.



Witnesses

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Inventors

Henry Collins
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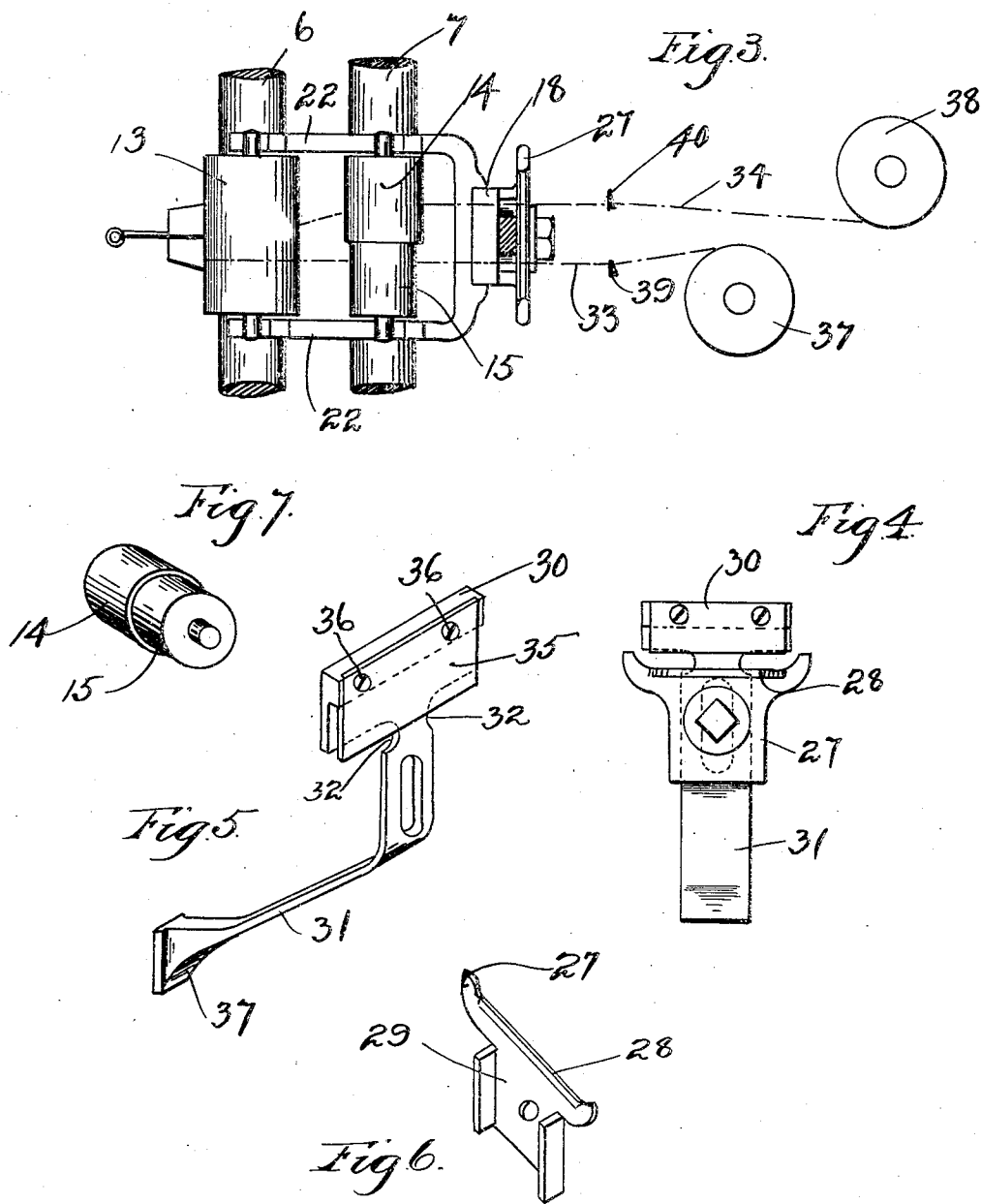
Howard E. Barlow
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UNITED STATES PATENT OFFICE.

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

TWISTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 784,922, dated March 14, 1905.

Application filed November 7, 1904. Serial No. 231,687.

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 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.

This invention relates to improvements in doubling and twisting machines, and has for its primary object to produce mechanism whereby threads of the same or different character may be fed at different relative speeds, to be subsequently twisted together into one. The result of this novel method of twisting produces a new and very desirable effect in the yarn. For example, in practice we run a cotton and a woolen yarn in different relative proportions to each other and spin them together. The woolen yarn is soft and resilient, and the cotton yarn is comparatively hard and non-elastic. By our particular arrangement of rolls and driving mechanism we feed the cotton yarn considerably faster than the woolen yarn, and when they are brought together and twisted the cotton thread is wound around the woolen thread, thereby taking up the extra length of the former. Said cotton thread being finer and harder embeds itself into the softer material. When a strain is applied to this twisted combination—cotton and woolen yarns—the cotton being less elastic than the wool would naturally break first if they were both of the same length; but as the cotton thread is longer than the wool being wound around the same in a helical form they are then both capable of elongation and each supports the other up to the breaking-point of both, thereby producing a very strong yarn of handsome appearance.

Another object of the invention is to provide a stop-motion that will operate to engage each of these threads separately.

The invention consists of other novel features and parts and combinations of the same,

as will be fully described hereinafter and then pointed out in the appended claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

In the drawings, Figure 1 represents a vertical section of a twister, taken between two spindles, showing a side view of the thread-detecting device and the arrangement of the double bank of feed-rolls. Fig. 2 represents the arrangement of the feed-rolls and the mechanism for driving the same. Fig. 3 is a plan view showing the arrangement of the spools, the rolls, and the manner in which the threads are led from the former to the latter. Fig. 4 is an end elevation of the double clamping device, showing the clamp-bar in its raised position. Fig. 5 is a perspective view of the double clamp-bar. Fig. 6 is a perspective view of the lower fixed jaw of the clamping device. Fig. 7 is a perspective view of the first top roll, showing a portion of it cut away to admit one of the threads to pass under it without nipping the same.

Referring to the drawings, at 1 is the end frame of the twisting-machine, and 2 its top board.

At 3 is a trough or box in which rotates the shaft 4, which shaft receives rotary motion from any suitable member or part of the machine and carries the spur or cam wheel 5.

At 6 and 7 are two long feed-rolls supported from the main frame in suitable bearings (not shown) and driven in the direction of the arrows at different relative speeds through the gears 8, 9, and 10 and intermediate change-gears 11 and 12. The roll 6 is the ordinary feed-roll commonly used in twist-ers; but the roll 7 is an extra roll used exclusively in our improved construction.

At 13 and 14 are the top rolls supported in the two-armed frame 22 from the sliding frame 18. Top roll 13 is made larger and heavier than roll 14, as the former is used in feeding the coarser yarn. The top roll 14, as shown in Figs. 3 and 7, is turned down at 15 at one end for about half its length, so as to

allow one of the threads to run between it and its driving-roll without being nipped.

At 16 is the stop-lever, pivoted at 17 on the sliding frame 18. One end 19 of the lever projects down into the trough 3 and is held out of the path of the rotating cam 5 by the thread 23, that engages its outer end 20 after said thread has left the rolls 6 and 7 on its way to the bobbin 21. The sliding frame 18 is fixed on the outer end of the sliding shaft 24, the pin 25 serving to assist in holding said frame in an upright position and still allow it the sliding motion. At 26 is a weighted arm that serves to retain the said shaft 24 in the desired position by friction.

At 27 is the lower fixed jaw of the clamping device. This jaw has a slightly-tapering clamping edge 28 and a hollow back at 29, through which the sliding clamp-jaw 30 works. The lower end 31 of this latter jaw extends downward and forward until it rests on the forward edge of the trough 3. Its lower edge is made tapering at 37, so it will fall and rise as the frame moves forward and back. The downwardly-extending portion of this sliding jaw is cut away at 32 32, just below the jaw, to allow the threads 33 and 34 to pass into their respective rolls on either side. At 35 is the removable plate that forms the back portion of this jaw and is held in position by the screws 36 36.

37 designates the spool of wool and 38 the spool of cotton, both of which are supported on the board 41 from the frame of the machine. The threads 33 and 34 from these spools lead through the eyes 39 and 40, respectively.

The operation of the device may be more fully described as follows: The woolen yarn is on one spool and the cotton on the other. They are each fed through their respective guide-eyes and on each side of the double clamping-bar, the cotton leading between the first two rolls 7 and 14, by which rolls it is fed forward and directly down over the stop-lever 16 to the twisting-point, while the woolen yarn 33 is fed beneath the cut-out portion of the top roll 14, over the upper side of the top roll 13, and down back of feed-roll 6 to join the cotton thread on its way over the stop-lever 16, where they are both twisted together and wound on the bobbin 21 below. The feed-roll 7, that carries this cotton yarn, runs considerably faster than the roll 6, that feeds the wool, the consequence being that when these two threads meet and are twisted the cotton thread is wound around the woolen thread, thereby taking up its extra length and on account of the tension on the same embeds itself into the softer material, giving a very handsome and novel effect to the finished yarn. The strength also is greatly increased by this process of laying the cotton around the wool, as by this construction the thread is capable of yielding to a certain degree, which would

be impossible if both of the threads were of the same length, thereby causing the cotton to support the wool up to the breaking-point of both. The cotton threads are sometimes drawn through a water-trough to lay the fiber closer together and produce a smoother finish to the yarn.

This device is not confined to the laying of cotton and woolen threads; but threads of any nature may be laid together in any proportion and twisted. Another feature of the device is the double clamping-bar that is arranged to clamp each of the two threads separately when a break occurs, thereby holding them positively and effectually preventing their being wound around the feed-rolls, which continue to run after the break occurs. The action of this stop-motion is as follows: The yarn or thread from the spools is passed over the said rolls in the manner above described and over the end of the lever 16, thus holding the latter in the position shown in Fig. 1. The yarn or thread then is conducted to the doubling or twisting machine, it being noticed that the downwardly-extended portion 19 of the lever is retained clear of the revolving cam 5. Should the yarn or thread from either or both of the spools break, it requiring both threads to control the lever 16, the latter is released and the end drops, thus causing the engagement of one of the wings or projecting members of the cam 5 with the downwardly-extended portion 19 of said lever, and as the cam continues to revolve it pushes forward said lever and the frame 18, to which it is attached, whereby the top rolls 13 and 14 are also carried forward clear of their respective driving-rolls 6 and 7, thereby relieving the rolls of their feeding action, and the running off of the yarn or thread ceases. At the same time as the frame 18 is carried forward a space is left between it and the edge of the trough against which the sliding clamp-bar rests, thereby allowing said clamp-bar to fall and bite and hold the two threads between it and its lower jaw 28, so that the tendency of the yarn or threads which lie on the revolving rolls to wind themselves around the same is effectually prevented, as feed of the yarn or thread to the rolls absolutely ceases when this jaw falls and bites them.

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

1. In a device of the character described, two feed-rolls, means for delivering two threads, means whereby said rolls will deliver said threads in different relative proportions to each other to be subsequently twisted together, and automatic clamping means for engaging each of the threads separately and independently to stop them both from feeding when one of said threads breaks.

2. In a twisting-machine, means for holding two or more spools of thread or yarn, two

sets of feed-rolls, means for driving said sets of rolls at different speeds, means including said rolls for feeding said threads one faster than the other to be subsequently twisted together and means whereby said threads will be automatically stopped from feeding when one of said threads breaks.

3. In a twisting-machine, means for holding two or more spools of thread or yarn, two sets of feed-rolls, means for driving said sets of rolls at different speeds, means including said rolls for feeding said threads one faster than the other to be subsequently twisted together and means including a clamp-bar whereby said threads will be automatically stopped from feeding when one of said threads breaks.

4. In a twisting-machine, means for holding two or more spools of thread or yarn, two sets of feed-rolls, means for driving said sets of rolls at different speeds, means whereby the threads are fed through said rolls separate and independent of each other, means including said rolls for feeding said threads one faster than the other to be subsequently twisted together and means for engaging each of the threads separately to automatically clamp and stop them both from feeding when one of said threads breaks.

5. In a twisting-machine, the combination of means for holding two or more spools of thread or yarn, two feed-rolls, a top roll for each feed-roll, means for driving said feed-rolls at different relative speeds to feed said threads one faster than the other to be subsequently twisted together, means for supporting the top rolls independent from the feed-rolls, means whereby said top rolls will be carried clear of the feed-rolls when a thread breaks and means for engaging each of the threads separately by a single sliding clamp-bar to stop them from feeding when a thread breaks.

6. In a twisting-machine, the combination of means for holding two or more spools of thread or yarn, two feed-rolls, a top roll for each feed-roll, means for driving said feed-rolls at different relative speeds to feed said threads one faster than the other to be subsequently twisted together, a sliding frame, means for supporting said top rolls from said frame, means whereby said top rolls will be carried forward clear of the feed-rolls when a thread breaks and means for engaging each of the threads to stop them from feeding when said frame is carried forward.

7. In a twisting-machine, the combination of means for holding two or more spools of thread or yarn, two feed-rolls, a top roll for each feed-roll, means for driving said feed-rolls at different relative speeds to feed said threads one

faster than the other to be subsequently twisted together, a longitudinally-sliding frame from which said top rolls are supported, means whereby said top rolls will be carried clear of the feed-rolls when a thread breaks and means for engaging each of the threads by a sliding clamp-bar to stop them from feeding when said frame is carried forward.

8. In a twisting-machine, the combination of means for holding a plurality of spools of thread or yarn, a plurality of feed-rolls, a top roll for each feed-roll, means for driving said feed-rolls at different relative speeds to feed said threads one faster than the other to be subsequently twisted together, a longitudinally-sliding frame from which said top rolls are supported independent from the feed-rolls, means whereby said top rolls will be carried forward clear of the said feed-rolls when a thread breaks, and clamping means for engaging each of the threads to stop them from feeding when a thread breaks.

9. In a twisting-machine the combination of means for holding two or more spools of thread or yarn, two feed-rolls, a top roll for each feed-roll, means for driving said feed-rolls at different relative speeds to feed said threads one faster than the other to be subsequently twisted together, means for supporting the top rolls independent from the feed-rolls, means whereby said top rolls will be carried clear of the feed-rolls when a thread breaks, and clamping means for engaging the threads to stop them from feeding when a thread breaks.

10. In a twisting-machine, the combination of means for holding two or more spools of thread or yarn, two feed-rolls, a top roll for each feed-roll, means for driving said feed-rolls at different relative speeds to feed said threads one faster than the other to be subsequently twisted together, a trough or box in which the cam rotates, a longitudinally-sliding frame from which said top rolls are supported, means for supporting said sliding frame from said trough or box, means whereby said top rolls will be carried forward clear of the feed-rolls when a thread breaks, a clamping-bar supported from said trough for engaging each of the threads separately, and means whereby said clamp-bar will fall and bite both of the threads when said frame is carried forward.

In testimony whereof we have hereunto set our hands this 4th day of November, A. D. 1904.

HENRY COLLINS.
JOSEPH W. COLLINS.

In presence of—

HOWARD E. BARLOW,
E. I. OGDEN.