(No Model.) 3 Sheets—Sheet 1.

S. ETCHELLS.

DOUBLING AND TWISTING MACHINE.

No. 342,505. Patented May 25, 1886.

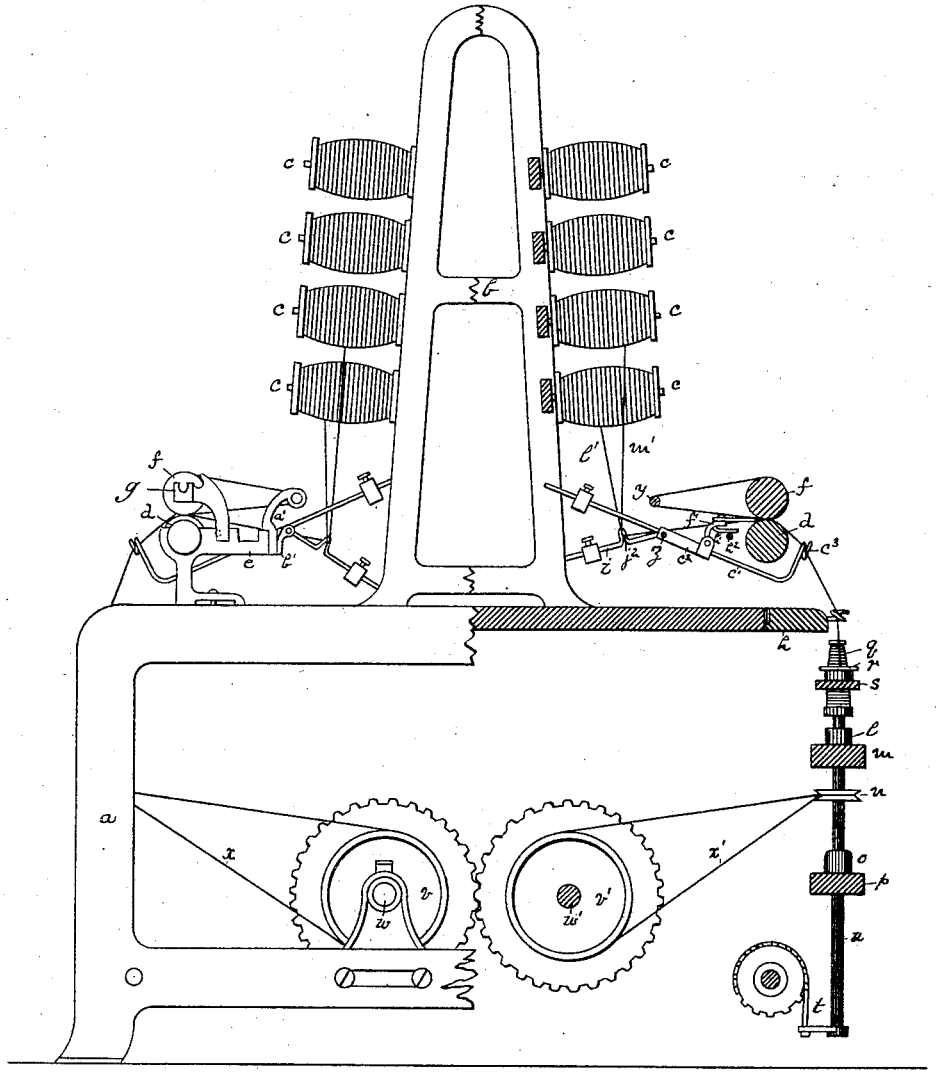

Fig. 1.

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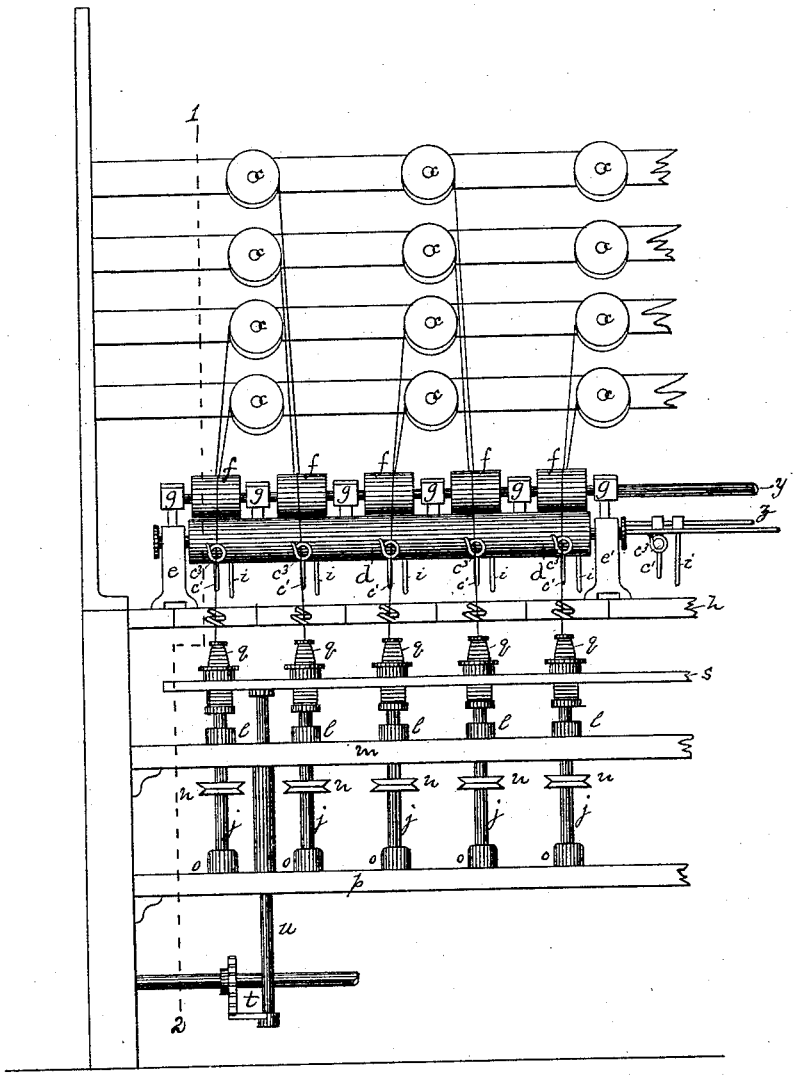

Fig. 2.

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(No Model.) 3 Sheets—Sheet 3.

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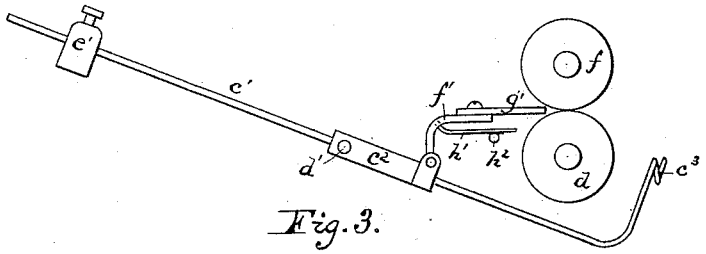

Fig. 3.

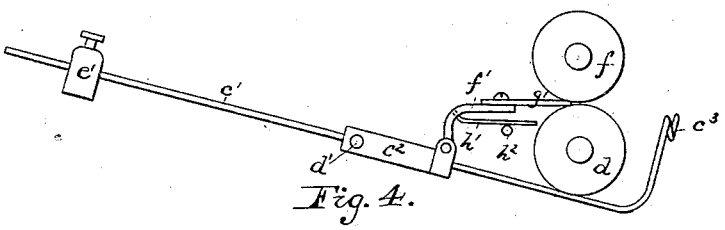

Fig. 4.

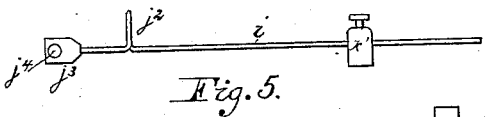

Fig. 5.

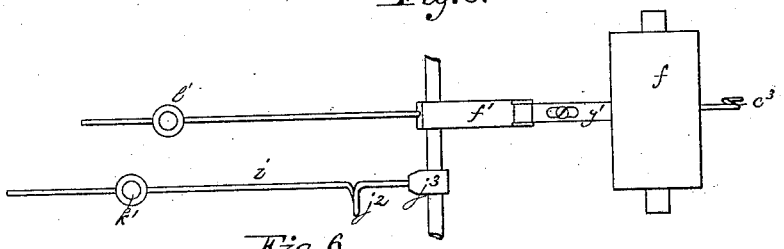

Fig. 6.

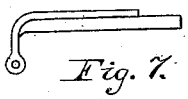

Fig. 7.

Fig. 8.

WITNESSES:

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UNITED STATES PATENT OFFICE.

SAMUEL ETCHELLS, OF NEW CASTLE, DELAWARE.

DOUBLING AND TWISTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 342,505, dated May 25, 1886

Application filed October 15, 1885. Serial No. 179,975. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL ETCHELLS, a citizen of the United States, residing at New Castle, in New Castle county, Delaware, have invented a new and useful Improvement in Doubling and Twisting Machines, of which invention the following is a specification.

My invention relates to machines for doubling and twisting yarns of cotton or other fibrous materials.

It consists of a self-acting device for taking up the slack yarn, and thereby preventing the kinking which occurs at the starting of the machine, and also for stopping the motion of the upper roller when the yarn breaks; and it further consists of a combination, with said stop-motion, of a device for requiring the individual yarns to be drawn evenly between the rollers preparatory to receiving the twist which incorporates them into a single yarn.

In the annexed drawings, Figure 1 is in part an elevation of one end, and in part a section on the line 1 2 in Fig. 2, of an ordinary twisting machine embodying my invention, a portion of the end face-plate of the machine being broken away. Fig. 2 is a front elevation of one division of the machine. Figs. 3 and 4 are respectively side elevations of the rollers and of the pivoted levers and lever-rest constituting my device for taking up the slack yarn and stopping the motion of the upper roller, the former view showing the relative positions of the levers and rollers when the doubling and twisting operation is proceeding normally, and the latter view showing the relative positions of the same parts when the yarn has been broken and the upper roller raised. Fig. 5 is a side elevation of the evener. Fig. 6 is a plan of the stopping device, evener, and upper roller. Fig. 7 is a side, and Fig. 8 a front, elevation of a casting which is the equivalent of the pivoted wire lever f'.

a represents the face-plate of one end of a doubling and twisting machine; b, the spool-stand; c, the spools containing yarns to be doubled and twisted; d, the lower or driving roller extending the length of one division of the machine. The journals of the roller d have bearings in the pillow-blocks e and e'.

f are the upper rollers, the journals of which turn in open bearings, as at g.

h is the hinged wire-board.

j are spindles; l, bolsters.

m is the bolster-rail.

n are spindle-whirls; o, steps; p, the step-rail.

q are bobbins; r, rings.

s is the ring-rail; t, the lifter; u, the connecting-bar between the ring-rail s and the lifter t.

v and v' are pulleys on the shafts w and w'.

x and x' are belts for driving the spindles j on the two opposite sides of the machine. A driving-pulley (not shown) is placed at the other extremity of shaft w, and this pulley is connected by a belt with line-shafting to obtain power for running the machine.

y and z are rods, which extend in the rear of the rollers for the length of a division of the machine, these rods being conveniently supported by brackets a' and b', (see Fig. 1,) attached to the pillow-blocks e and e'. The rod z is the shaft of the several stop-levers, which I will now proceed to describe.

c' is a wire lever of the form clearly shown in Figs. 3 and 4. It may consist of a single piece of wire with the enlargement or casting c^2 formed around it; or it may consist of two separate pieces of wire screwed or otherwise secured to an enlargement or a casting, c^2.

d' is the shaft-hole through which the rod z passes.

e' is an adjustable weight. The lever c' vibrates freely on the rod or shaft z.

f' is a short lever pivoted on the lever c'. It is made with an upward bend, as shown.

g' is a non-metallic strip adjustably attached to the lever f'. It is preferably made of vulcanized paper, and may consist of pasteboard or other like stiff material, but should not be metallic, because a metal strip is found to unduly wear the rollers when in contact with them.

h' is a wire rigidly attached to the lever f'. It rests on the rod h^2, and supports the strip g' in such position that the forward end of the strip is caused to come near to, but is kept from touching, the rollers (see Fig. 3) when the machine is working regularly. This condition is essential to the successful operation of the stop-levers, as I have found from practice that if the end of the strip g' rests in constant contact with the rollers when they are running it catches lint and dirt from the rollers, to the serious detriment of the operation. The rod h^2 extends the length of a division

(corresponding with the length of the lower or driving-roller) of the machine, and is supported by posts—one at each end—rising from the frame of the machine.

i is the evener, which preferably consists of a wire bent to form the loop j^2, and attached to the casting or enlargement j^3, which is provided with the shaft-hole j^4 for the rod or shaft *z*.

k' is an adjustable weight.

The evener *i* vibrates freely on the rod or shaft *z*, and is not restrained in the extent of its movement. The yarns *l'* and *m'* intended to be doubled and twisted are passed through the loop j^2 of the evener, thence between the rollers *d* and *f*, over the upper roller, *f*, around the rod *y*, thence between the rollers *d* and *f*, and through the hook c^3 at the fore end of the lever *c;* thence through an eye in the wire-board *h*, and through the traveler-ring to the bobbin, receiving the requisite twisting between the rollers *d f* and the bobbin, upon which the twisted strand is wound. The weight *k'* is adjusted on the evener *j'* to suit the strength of the yarn to be twisted, and whenever from any cause the individual yarns are delivered unevenly by the spools the weight *k'* depresses the evener and draws the yarn having the greatest tension until it is delivered evenly with the other yarn or yarns. This action takes place automatically whenever the individual yarns are delivered unevenly by the different spools. When the yarn breaks in front of the rollers, the fore arm of the pivoted lever *c'* instantly swings up to the driving-roller *d*, causing the front end of the strip *g'* to press under the upper roller, *f*, raising it, as shown in Fig. 4, and at once stopping its motion; and whenever the yarn breaks in the rear of the rollers a similar action takes place as soon as the end of the yarn has passed between the rollers. It will be seen that the fore arm of the pivoted lever *c'* has considerable free upward motion before it is stopped by coming in contact with the driving-roller. It will also be seen that lever *c'* exerts a constant upward pressure on the yarn sufficient to keep that part of it between the rollers and bobbin taut under the varying conditions of change in the diameter of the bobbin. It thus effects a great saving in yarn and operatives' time by taking up the slack and preventing the kinking of the yarn.

It is preferred to use the evener in conjunction with the stop-levers, as described; but it can be advantageously used without the stop-levers.

Instead of providing the lever *f'* with the wire *h'*, the lever and wire may consist of a casting formed in one piece with a rib, h^2, as represented in Fig. 7; and instead of employing the rod h^2 to support this lever, the lever may in some frames be supported by or from the cap-bar or other part of the frame independent of the lever *c'*.

I claim—

1. The following devices for preventing the kinking of the yarn, and when the yarn breaks stopping the motion of the upper roller, viz: first, the lever *c';* second, its supporting-shaft *z;* third, the upwardly-bent lever *f'*, pivoted on said lever *c'*, said lever *f'* being provided with the strip *g'*, and with the supporting wire or rib *h';* fourth, a rest, h^2, independent of said levers, in combination with devices for guiding and twisting the yarn in a doubling and twisting machine, substantially as set forth.

2. In combination, viz: first, the pivoted lever *c'*, provided with a strip, *g'*, and with a supporting wire or rib, *h'*; second, the lever *f'*, pivoted on said lever *c';* third, a rest, h^2, independent of said levers; fourth, the pivoted lever *i*, the shaft *z*, the levers *c'* and *i* being respectively supported by said shaft; fifth, the rollers and devices for guiding the yarns from the spools to the twisting mechanism; sixth, the twisting mechanism, and, seventh, the supports for the spools containing the yarns to be twisted, substantially as set forth.

SAMUEL ETCHELLS.

Witnesses:
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JOHN A. MCCANN.