I. W. Clark.

Stop Motion for Spooling Mach.

No. 89,854. Patented May 11, 1869.

Fig: 2.

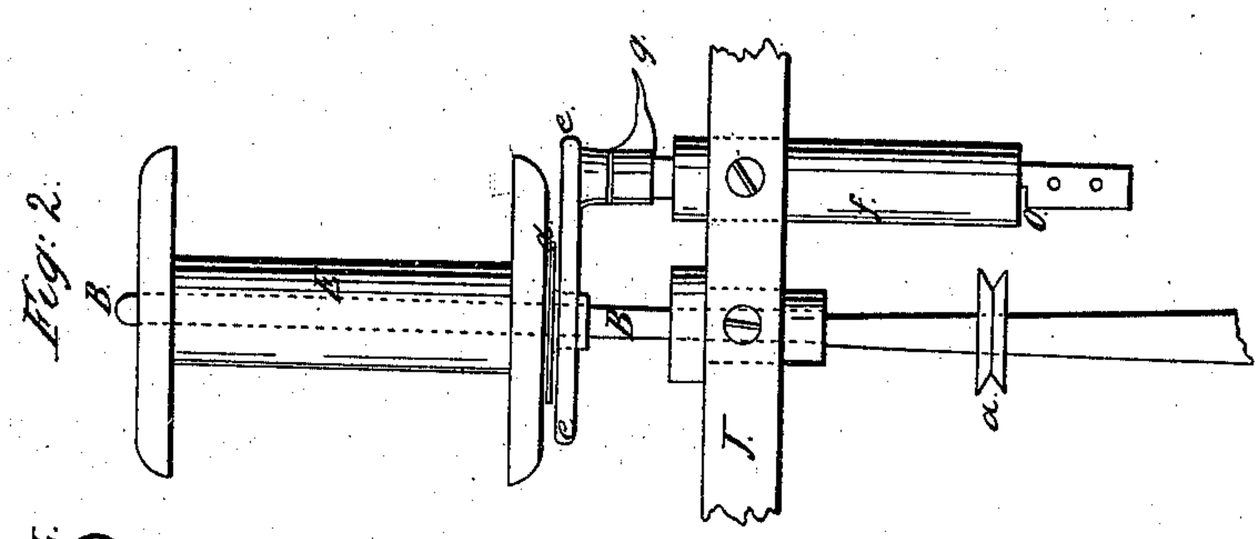

Fig: 3.

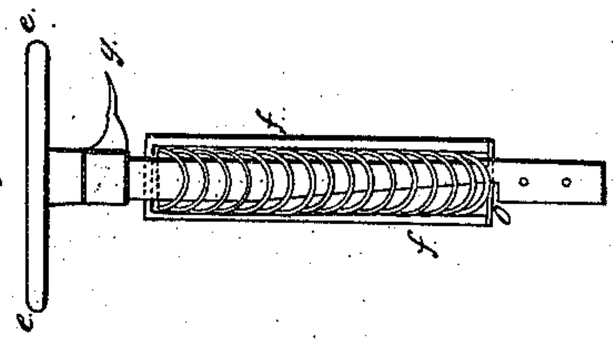

Fig: 1

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Letters Patent No. 89,854, *dated May* 11, 1869.

IMPROVEMENT IN STOPPING-MECHANISM FOR MACHINE FOR DOUBLING YARN.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, ISAAC W. CLARKE, of the city and county of Providence, in the State of Rhode Island, have invented a new and useful Improvement in Stop-Motion for Machine for Doubling Yarn; and I do hereby declare that the following specification, taken in connection with the drawings making a part of the same, is a full, clear, and exact description thereof.

Figure 1 is partially an end view and partially a transverse and vertical section.

Figure 2 is a front view of one of the spools, a portion of the spindle-rail, and the plate for unseating the spool.

Figure 3 is a view of the means for latching down the plate for unseating the spool.

A "doubler" is a well-known machine in use among manufacturers of fibrous material. The office which it performs is that of laying together in one thread two or more strands of fine yarns, which have severally previously been spun and wound upon cops or bobbins. The several strands to compose the thread may, as in the thread-manufacture, be of the same material, or, as in the cassimere-manufacture, they may be of different materials, as silk and worsted. The colors, too, are often different, as found in silk, poplin, and other manufactures.

Inasmuch as it is important that the thread should be of uniform size, by containing throughout its entire length the same number of strands, and as each strand, from its extreme fineness, possesses a small amount of strength and is readily broken, it is obvious that some means for arresting the doubling-process, upon the instant that a break in a single strand occurs, is greatly to be desired.

Devices for this purpose have heretofore been applied to machines of this class, but no one of them, with which I am acquainted, possesses the sensitiveness, or the principle of operation which characterize the improvement herein described.

In the drawing—

A represents one end of the usual rectangular framework of a machine of this kind.

B are the spindles, (of which there is the usual number,) suitably stepped and bolstered. Bands passing around the drum C, and winding about the pulleys *a* upon the spindles, give motion to the latter, while thread-guides *b*, projecting from a traverse-rail, which is suitably guided by rods D, are made to traverse the spools E, by means of the lever F, and heart-cam motion G, all operating in the way well understood among builders of this class of machinery.

The several cops filled with yarn H, are supposed to be arranged with their axes at right angles with the line of draught, as shown, and the yarn is led from them through guiding-eyes *c*, and over a felt-covered beam, I, the friction of the latter furnishing the requisite degree of tension.

Before describing the further progress of the yarn, it will be necessary to point out the apparatus by which, in case any strand chances to break, the spool upon which such strand, with its fellows, composing the thread, is to be wound, shall cease to revolve.

Each spool E fits loosely upon its spindle B, and is revolved with the spindle entirely by the friction of its lower head against the surface of a flange, or disk-plate, *d*, attached to the spindle B, and which flange forms a support for the spool.

In practice, this friction will be found quite sufficient, but a pin projecting from such flange, and entering a recess in the lower head of the spool, may be added to insure that result if preferred.

Underneath the lower head of each spool, is an annular plate, *e*, for which any equivalent device may be used, the office of which is, by the means hereinafter described, to fly upward upon the breaking of a strand of yarn, and its central opening being greater in diameter than the flange *d*, lifts the spool E clear of such flange, from which, as before said, the spool derives motion.

Appropriate to each spool, and conveniently located in reference thereto, as, for instance, by being placed upright in a longitudinal rail, J, running the length of the machine, (see figs. 2 and 3,) is a barrel, or tube, *f*, which contains a rod, around which is coiled a spring, so arranged within the barrel, that when such rod is pushed downward, the coils of the spring will be compressed.

The upper end of this rod is connected with the annular plate *e*, before mentioned.

A finger-piece, *g*, for operating such rod, projects from the same, near the neck by which the rod joins the annular plate.

The rod referred to, at a point near the bottom of the tube *f*, is formed into a latch, *o*, and at the back side of the latch is a spring, constantly under pressure against the inner surface of the tube, and so arranged, that, upon the rod being pushed down far enough to allow it, such latch will catch hold of the bottom edge of the tube, and retain the rod in that position against the upward pressure of the coiled spring which surrounds the rod before mentioned.

The particular way of enabling the rod to latch itself in a certain position, is not material. Other arrangements will readily suggest themselves, as, for instance, the lower extremity of the rod itself may be made into a spring with a catch upon its end.

Referring now to the yarn, the course of which has not been traced beyond the felt-tension beam I, it is to be understood that each strand is to be conducted over a pulley, K, or equivalent smooth surface, and from thence over the supporting beam L, when the desired number of strands is led together through the traversing guide-eye *b*, forming a thread to be wound upon the spool.

Let it be supposed now that each thread is to be composed of three strands of yarn; then should there

be three pulleys K, or equivalent eyes, each one bearing against its proper strand of yarn, as in the one instance shown in the drawing.

A description of the office which any one of these pulleys K, and the apparatus of which it is a part, performs in the combination in the hereinbefore-described mechanism for disconnecting the spool from its source of motion, will be the same for all.

The pulley K, or its equivalent smooth surface, over which the thread is to pass, forms the end of a short lever, M, whose fulcrum is at *h*.

This lever has a short arm, *i*, slightly bent or curved inward. When the machine is working properly, the arm should stand nearly at the perpendicular, but its centre of gravity is nevertheless, by reason of the weighted arm N, out of the perpendicular, and causes a slight tension to be brought upon the yarn, and without the support of the yarn, the lever would fall to the side upon which the weight N is placed.

Each of these weighted tension-levers is mounted upon a bar, O, running lengthwise of the machine, and they are arranged in sets of three, or any other number appropriate to each spool.

Underneath the longitudinal bar O, and for each spool, is a thin plate, *k*, fitted to slide for a short distance.

It has three slots cut in it, corresponding with the number of short arms *i*.

These arms occupy three slots, but do not fill them from front to rear, there being left a clear space of one-sixteenth of an inch, more or less, between the back edge of the arm *i* and the end of the slot.

This clear space is graduated by the distance which the weighted arm N will pass through in falling, it being designed that just before the end of such arm brings up upon the face of the bar O, the back edge of the arm *i* shall strike, by the impetus which it has acquired, a smart blow upon the end of the slot in the plate *k*, and consequently slide the latter with a sudden jerk.

The plate *k*, so capable of being operated by any one of its set of weighted tension-levers, is connected with its proper latch, hereinbefore described as attached to the end of the spring-rod within the tube *f*, by means of a wire link, P, so that the fall of a weighted tension-lever, in consequence of the breaking of its supporting-yarn, will, of necessity, trip the latch which holds down such rod, and allow the coiled spring within the tube *f* to throw up the annular plate *e*, and disconnect the spool E, upon which such strand of yarn, if it had not broken, would have been, with its fellows, wound from the flange *d* upon the spindle from which such spool derives its motion.

It will be observed that the characteristic feature which distinguishes my apparatus for this purpose, is that although when the machine is in operation, a very inconsiderable strain is brought upon the yarn by the weighted tension-levers M, yet upon the breaking of the yarn, the principle of accelerated force acquired by a falling body in free space, may be made available to increase the power which the short arm *i* of the lever is required to exert to effect a trip; and furthermore, it will be noticed that the spool being so disconnected from its source of motion, is instantly brought to a state of rest, the unbroken yarns acting as drag-weights for this purpose.

After the broken end is mended, all that is required to put the spool which has been stopped again into motion, is to depress the finger-piece *g*.

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

The combination of the weighted tension-lever M, the link-connection *k* P, and the spool-unseating spring-plate *e*, or the equivalents thereof, substantially as described, the apparatus operating, upon the fall of such lever M, to disconnect the spool E from its source of motion, as herein set forth.

Also, the combination, with a spool, E, seated upon a flange, *d*, upon the spindle of a spring-plate, *e*, or equivalent device for unseating the spool, substantially as described.

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Witnesses:

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