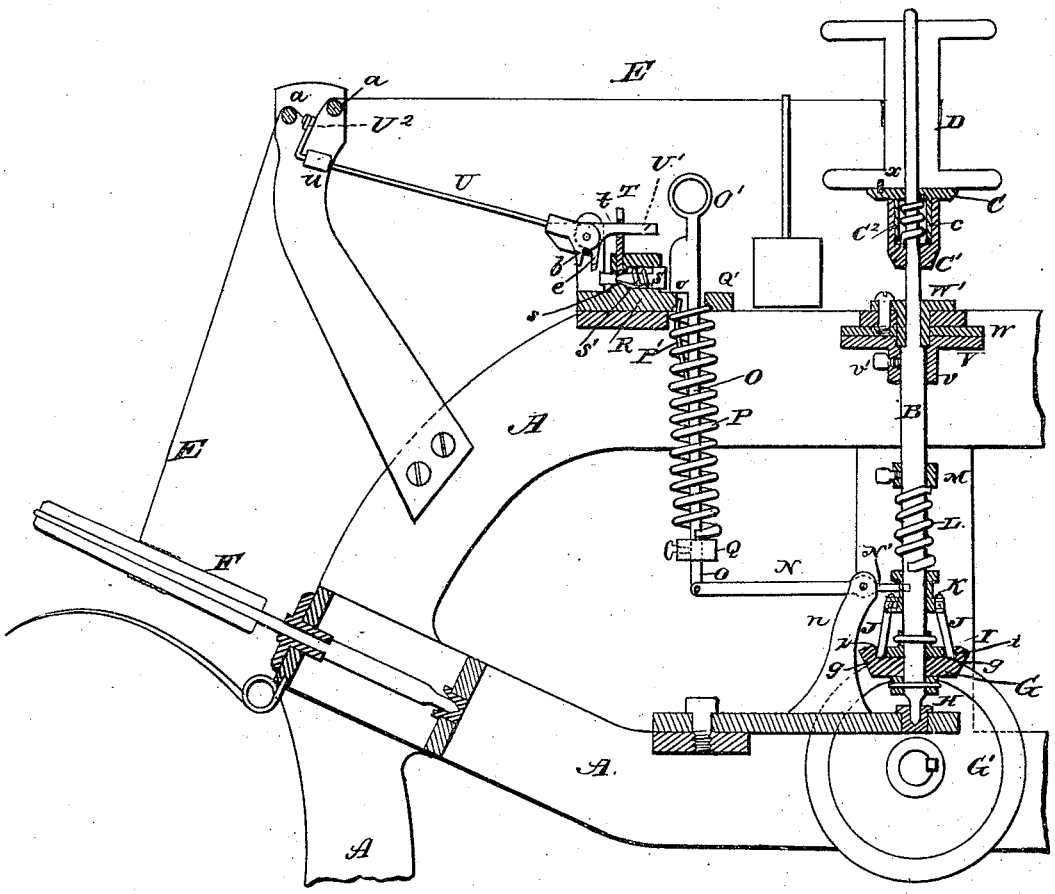
(No Model.)

L. C. BILLINGS.

MACHINE FOR SPOOLING YARN.

No. 266,419. Patented Oct. 24, 1882.



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MACHINE FOR SPOOLING YARN.

SPECIFICATION forming part of Letters Patent No. 266,419, dated October 24, 1882.

Application filed April 27, 1882. (No model.)

To all whom it may concern:

Be it known that I, LOUIS C. BILLINGS, of Milford, in the county of Hillsborough and State of New Hampshire, have invented certain new and useful Improvements in Machines for Spooling Yarn; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, which forms a part of this specification.

My invention has relation to machines for spooling yarn, (more especially knitting-yarn,) thread, or silk; and it consists, first, in the construction and combination of parts of an automatically-operating stop motion or mechanism for stopping the machine if the yarn or thread should break; and, secondly, in an improved construction of the spool-driver, so as to "ease" both starting and stopping of the spool, and thus prevent any undue jar, which, both in starting and stopping the machine, is apt to break the yarn or thread. Co-operating with these devices, I use a brake mechanism, all of which will be hereinafter more fully described.

In the accompanying drawing I have shown a side view of so much of a spooling-machine as is necessary to illustrate my invention, some of the parts being shown in section for the better illustration of the operative parts of the devices thus shown.

A represents the frame of the machine. B is the vertical spindle which rotates the spool-driver, (shown at C and C′,) and D is the spool upon which the yarn or thread E is to be wound from a cop or reel. (Shown at F.) At the lower end of spindle B is a miter wheel or pinion, G, which is driven by a gear-wheel, G′, and runs loosely between two disks, H and I, that are fastened to and revolve with the spindle. The upper disk, I, rests within a circular recess in the top of pinion G, and has radial slots to permit of the insertion of fingers J J, which are pivoted at their upper ends in a collar, K, that slides upon the spindle. The lower free ends of the fingers J project through the radial slots *i* in disk I down into notches *g* in the recessed face of pinion G; and it follows that when the pinion rotates and the fingers J are in the described position, as shown in the drawing, said fingers engage with both disk I and pinion G, which are thus interlocked and revolve together, and with them the spindle B. Downward pressure upon the sliding collar K is caused by a spring, L, the tension or force of which may be regulated by means of an adjustable collar, M, against which its upper end abuts. The sliding collar K has a circumferential groove, into which projects the bifurcated inner end, N′, of an arm or lever, N, which has its fulcrum in the standard *n*. At the outer end of lever N is pivoted a rod, O, the upper end of which has a shoulder or offset, *o*, and a handle or pull-ring, O′, for "setting" it, as hereinafter described.

P is a spiral spring, which encircles rod O between an adjustable collar, Q, at its lower end, and a retaining-block, Q′, secured upon the frame of the machine. By adjusting collar Q up or down on rod O the tension of spring P may be regulated in like manner as the spring L upon spindle B. When rod O is in its set position, as shown in the drawing, its offset or shoulder, *o*, overlaps and bears against the plate or casting R, in which works a bolt, S, the reduced end of which is encircled by a spring, S′. At the rear end of the bolt is an annular notch or groove, *s*, adapted to receive the lower end of the trigger T, which slides in a vertical slot in the upper part of plate R and has a slot or opening, *t*, for the insertion of the short lever U′, which is fulcrumed upon the same axis as lever U, which has a small weight, *u*, and is bent to form an eye, U^2, at its outer end, through which the yarn or thread is inserted. Thus, by the yarn passing over the guide-wires *a a*, it will be seen that lever U is held in an elevated position; but if the yarn should break on its passage from the cop or reel F to the spool D lever U will be released and its weighted long arm drop down, which causes a lip, *b*, upon its inner end to strike a corresponding lip, *e*, upon the inner end of the short lever U′, thus throwing the outer end of the latter upward and raising the trigger T, which releases the spring-bolt S. This, impelled by its spring, flies forward, and, striking the shoulder *o*, releases rod O, and this again, actuated by its encircling spring P, tilts or depresses the long arm of lever N N′, the short arm of which will raise the sliding collar K, (spring P being more powerful than spring L,) and

thus disengage or uncouple the clutch-fingers J J from disk I and pinion G. This disconnects or uncouples disk I and pinion G, and causes the latter to run loose on the spindle until, by setting rod O in the manner described, the coupling is again effected.

To stop the rotation of the spindle by its inherent velocity after uncoupling it from the driving-gear, I employ a brake mechanism, which consists of a disk, V, which is fastened by its collar *v* and a set-screw, *v'*, upon spindle B, below another disk, W, which is fastened in any suitable manner in the frame of the machine. This last-named disk, W, is stationary, and has a central collar or bushing, W', through which spindle B is free to slide up or down. When the yarn breaks, and collar K is slid up upon the spindle to disengage its clutch-fingers from disk I and pinion G, the contraction of spring L will throw the spindle in an upward direction, so as to bring its disk V into frictional contact with the stationary disk W, which will stop the rotation of the spindle and make it come to a perfect standstill.

The rod O has a spring, P', affixed on one side, the free end of which, when the rod is "set," bears against plate R, and assists spring-bolt S in throwing shoulder *o* off of plate R when the trigger is sprung, so as to insure certain and rapid working of the spring-rod.

The spool-driver consists of two parts—viz., a circular plate or disk, C, which has a downward-projecting cylindrical sleeve, *c*, which fits into a cylindrical shell, C', through which the spindle is inserted centrally, and to which it is securely fastened, so that the spindle B and shell C' will rotate together. C^2 is a coiled spring, one end of which is fastened in the lower part of shell C', and its upper end in disk C inside of its sleeve *c*, the spindle B passing centrally through the spring. The spool D rests upon disk C, a pin or stud, *x*, connecting them so that they will revolve together. From the foregoing it will be seen that the connecting medium between the shell C' and disk C is formed by the coiled spring C^2. In other words, the parts C, *c*, and C' are not connected rigidly, but have a flexible or yielding coupling or connection formed by the spring C^2. Hence in starting the rotation of the spindle B this spring will receive the first shock or jar, and will thus ease the starting of disk C and the spool. In like manner, when the machine is suddenly stopped, spring C^2 will relax and permit disk C some play independent of shell C' and the spindle, so that the yarn will have time to slacken by degrees instead of breaking, as it would do if the spool were brought to a sudden stoppage from its high velocity.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a machine for spooling yarn, thread, or silk, the stop motion or mechanism consisting of the levers U' and U, the latter having the eye U^2 for the yarn to pass through on its passage from the cop or reel F to the spool D, trigger T, spring-bolt S, rod O, having the offset or shoulder *o*, and provided with the springs P and P' and adjustable collar Q, lever N N', sliding collar K, having pivoted clutch-fingers J J, loose pinion G, having notches *g*, and spindle B, having the fixed disks H and I, spring L, and adjustable collar M, all constructed and combined substantially as and for the purpose herein shown and set forth.

2. In a machine for spooling yarn, thread, or silk, the combination of the spindle B, provided with suitable mechanism for rotating it, brake-disk V, fixed adjustably upon the spindle, brake-disk W, fixed in the frame of the machine, and having a central bushing, W', for the insertion of the spindle, adjustable collar M, spring L, collar K, and mechanism for sliding the same upon the spindle, and thereby disengaging or uncoupling it (the spindle) from its rotating mechanism, substantially as and for the purpose herein shown and set forth.

3. In a machine for spooling yarn, thread, or silk, the combination of spindle B, having the shell C' fixed thereon, disk C, having the pin or stud *x* and cylindrical sleeve *c*, fitting into shell C', and coiled spring C^2, encircling the spindle within sleeve *c*, and having its upper end fixed in disk C and its lower end fixed in the bottom of shell C', substantially as and for the purpose herein shown and described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

LOUIS C. BILLINGS.

Witnesses:
F. E. KALEY,
FRANCIS M. COLE.