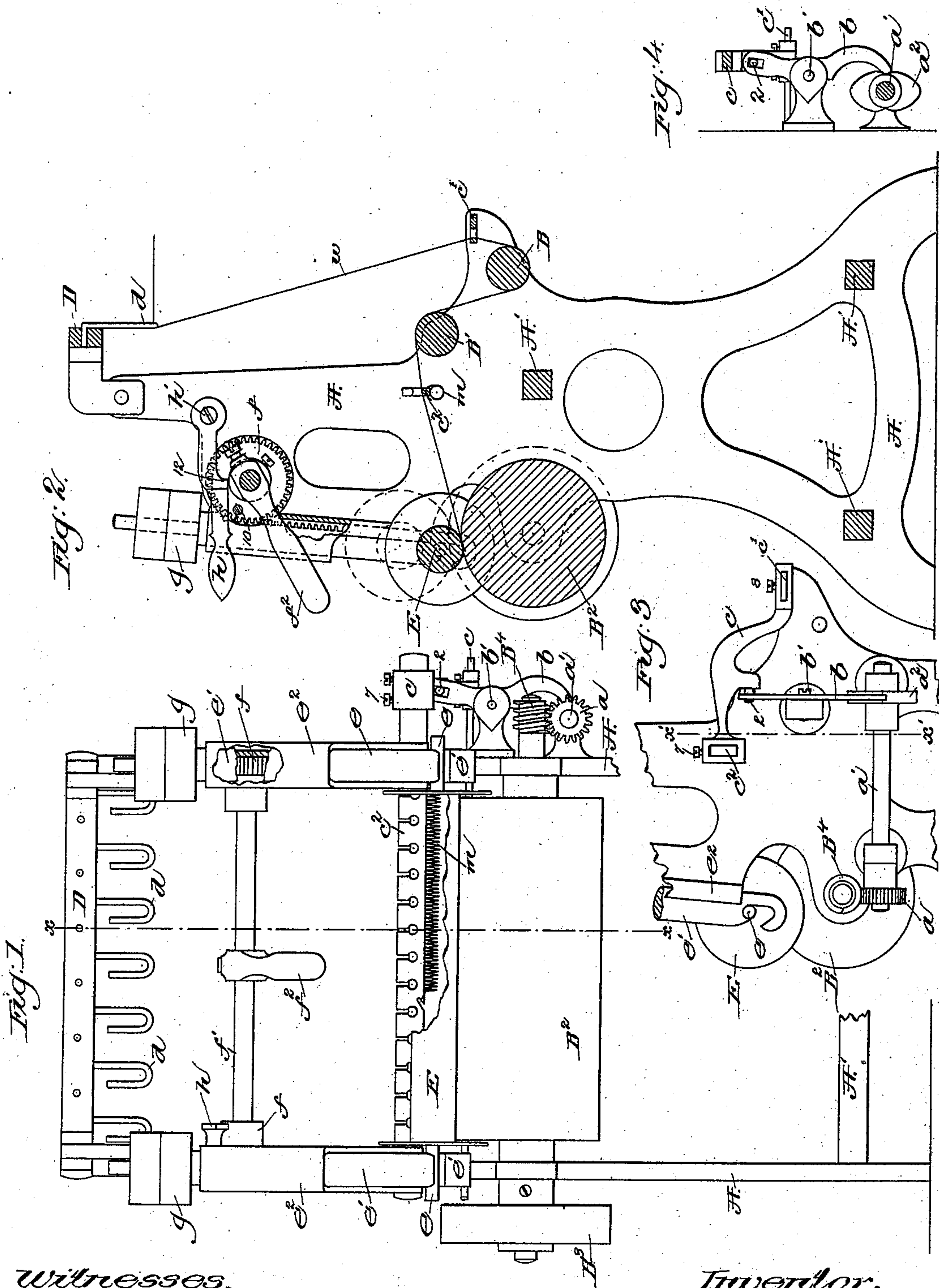


(No Model.)

J. M. STONE.  
SPOOLING MACHINE.

No. 376,834.

Patented Jan. 24, 1888.



Witnesses.  
Fred L. Emery.  
Howard F. Eaton.

Inventor.  
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# UNITED STATES PATENT OFFICE.

JOSEPH M. STONE, OF NORTH ANDOVER, MASSACHUSETTS, ASSIGNOR TO  
THE DAVIS & FURBER MACHINE COMPANY, OF SAME PLACE.

## SPOOLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 376,834, dated January 24, 1888.

Application filed January 3, 1887. Serial No. 223,193. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH M. STONE, of North Andover, county of Essex, and State of Massachusetts, have invented an Improvement in Spooling-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to provide a spooling-machine with readily-operated and improved means for raising both ends of the spool positively and uniformly from the drum when the spool has been filled with yarn and it is necessary to remove it from the machine or when it is desired to raise the spool at any stage in the operation of filling it. The spool-raising device acts also, as hereinafter shown, to weight the spool; and when more pressure than the weight of the device itself affords is needed to force the spool against the drum provision is made for increasing the pressure, as will be described. I have also provided the spooling-machine with mechanism for vibrating or reciprocating the guides commonly used in such machines.

Spooling-machines usually have two "guides," perforated with holes through which pass the yarns on their way to the spool, which is turned by the drum, the office of the guides being to lay the yarn on the spool in short sections or rings as the guides are vibrated from side to side, these guides being provided with as many holes as there are yarns to be put upon the spool.

Prior to my invention one of these guides has been vibrated—viz., the guide nearest the spool—the other guide remaining stationary; but this is objectionable, because the yarn coming from the stationary guide wears creases in the rolls, the effect of these creases being to injure the yarn and the rolls themselves. Also, I am aware that to overcome this difficulty of the creases both the back and front guides have been vibrated; but whenever this has been done, so far as I am aware, the mechanism for vibrating the guides has been so arranged that the guides have been moved simultaneously in opposite directions, which plan did indeed overcome the trouble of the creases on the rolls, but as the guides were moved in opposite directions the yarn was strained and in-

jured by being conducted alternately to the right and then to the left between the guides. In this my invention both guides are reciprocated simultaneously in the same direction, and the yarn is not strained and the rolls are not creased.

Figure 1, in front elevation, but partially broken out, shows a sufficient portion of a spooling-machine with my improvements added to enable them to be understood; Fig. 2, a vertical section of Fig. 1 in the line  $x$ ; Fig. 3, a detail of the right-hand end of Fig. 1, chiefly to show the devices moved by the shaft of the winding-drum; and Fig. 4, a sectional detail in the line  $x'$ , Fig. 3.

The side frames, A A, held together by suitable girts, A', have suitable bearings for the reception of the shafts or journals of the guide-rolls B B' and the winding drum or cylinder B<sup>2</sup>, all of usual construction, the shaft of the said drum or cylinder having a belt-pulley, B<sup>3</sup>, to receive a suitable belt by which to rotate it. The shaft of the drum B<sup>2</sup> has at one end a worm, B<sup>4</sup>, which engages a worm-gear,  $a$ , fast on a short horizontal shaft,  $a'$ , at the outside of the frame, the said shaft  $a'$  having attached to it, preferably, a double-throw cam,  $a^2$ , though one of single throw may be used, which acts upon the toe of a lever,  $b$ , pivoted at  $b'$ , the upper or opposite end of the said lever being slotted or forked to embrace a pin or stud, 2, of a bracket or arm,  $c$ , (see Fig. 3,) the opposite ends of which have boxes or hubs which receive in them the ends of two guide-bars,  $c'$   $c^2$ , they being secured in the said boxes by suitable set-screws, as 7 8.

The guide-bars are each provided with a series of holes for the passage through them of yarns  $w$  from suitable bobbins or from mule or other cops held in a creel-frame of usual construction, (not shown,) the said guide-bars being simultaneously reciprocated for a short distance in the same direction, thus obviating the cutting of the yarns into the rolls B B', the movement of both guides in the same rather than in opposite directions at the same time enabling the strain on the yarns to be reduced. The cross-beam D has a series of open eyes,  $d$ , which serve as guides for the yarn. The yarns  $w$  are wound upon a spool, E, of usual construction, which derives its



motion of rotation by contact of the yarn with the drum B<sup>2</sup>, on which the yarn on the spool rests.

The journals *e* of the spool E rest in open bearings at the ends of movable spool-lifters, herein shown as bars *e'*, which are adapted to slide in guides *e''*, attached to the frame-work, the said spool-lifters having rack-teeth attached to or forming a part of them, which are engaged by toothed plates *f*, which may be circular, thus constituting toothed wheels; or they might be toothed segments attached to a shaft, *f'*, having its bearings in the frame-work, the said shaft having attached to it a handle, *f''*, extended toward the end of the machine, where it may be readily taken hold of by the operator when it is desired to lift the spool E from contact with the drum B<sup>2</sup> to remove the spool from the drum or to mend a thread. Generally the weight of the spool-raising device is sufficient to press the spool against the winding-drum; but, if necessary, this pressure may be increased by adding weights, as hereinafter described.

The spool-lifters are acted upon by weights *g*, which press the spool toward or against the drum B<sup>2</sup>. The heavier the weights the closer the winding of the yarn on the spool, the spool-lifters rising in the guides as the diameter of the mass of yarn on the spool increases.

One of the toothed plates *f* is provided with a projection, (herein shown as a screw and marked 10,) which may be engaged by a locking device, *h*, made as a catch pivoted at *h'*, whenever the operator, through the handle *f''*, turns the shaft *f'* far enough to carry the said projection under the shoulder 12 of the locking device, the said locking device when it engages the said projection acting to hold the shaft and toothed wheels in such position as to keep the spool above the drum B<sup>2</sup>, so as to remain at rest even though the drum continues to rotate.

The lower end of the lever *b* is normally kept pressed against the cam, which actuates it by means of a spring, *m*, (see Fig. 1,) connected at one end to the guide-bar *c''* and at its other end to a hook on the frame-work.

I have herein shown the spool-lifters as toothed bars which are engaged by toothed wheels, these latter wheels and their connecting-shaft constituting lifting devices by which the spool-lifter and the spool therein may be readily lifted bodily from the drum; but prior to my invention I am not aware that a spooling-machine has been provided with means whereby the spool may be lifted at will from the drum by means connected with both ends of the spool or its journals, so I do not desire or intend to limit my invention to the exact form of spool-lifting mechanism herein shown, but may use any other well-known equivalent devices.

In my invention both ends of the spool or its

journals are pressed toward the drum, and by connecting the spool-lifters together, as shown, by the shaft *f'* it will be seen that both spool-lifters are made to slide in unison, thus pressing both ends of the spool upon the drum with equal force.

I am aware that spooling-machines have been made in which a single thread is wound upon each spool, the spools being held by sliding carriers, as in the United States Patent to Warburton, No. 197,912, dated December 4, 1877, and I do not claim such a machine, as in my machine the spool receives many threads, making what I term a "multiple-thread spooling-machine."

I claim—

1. In a multiple-thread spooling-machine, the winding-drum, and separate movable sliding spool-lifters *e'*, located at opposite sides of the machine, and guides therefor, combined with means to connect and actuate the said spool-lifters longitudinally and in unison, substantially as described.

2. In a multiple-thread spooling-machine, the winding-drum and separate movable sliding spool-lifters to support and lift the journals of the spool, combined with lifting mechanism including a shaft and gearing to cooperate with the spool-lifters, substantially as described, whereby the said spool-lifters may be moved to lift the spool from the drum, substantially as described.

3. In a multiple-thread spooling-machine, the winding-drum, the separate sliding spool-lifters at opposite sides of the machine, and means to connect and actuate them to insure their longitudinal movement in unison, combined with weights applied to the upper end of each of the sliding spool-lifters to force the spool against the drum, substantially as described.

4. The winding-drum, means to rotate it, and the separate toothed sliding lifter-bars to support the journals of the spool, combined with the rotating shaft *f'* and its toothed gears *f*, to engage with and move the said lifter-bars, the projection 10 upon the gear *f*, and the locking device *h*, to engage the said projection 10, to operate substantially as described.

5. The drum, means to rotate it, the worm, the guide-rolls B B', the shaft *a'*, having an attached worm-gear and cam, and the two guide-bars *c' c''*, combined with means, substantially as described, actuated by the said cam and connected to the said guide-bars to reciprocate them simultaneously in the same direction, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH M. STONE.

Witnesses:

JOSEPH H. STONE,  
EBEN A. BALDWIN.