

(No Model.)

2 Sheets—Sheet 1.

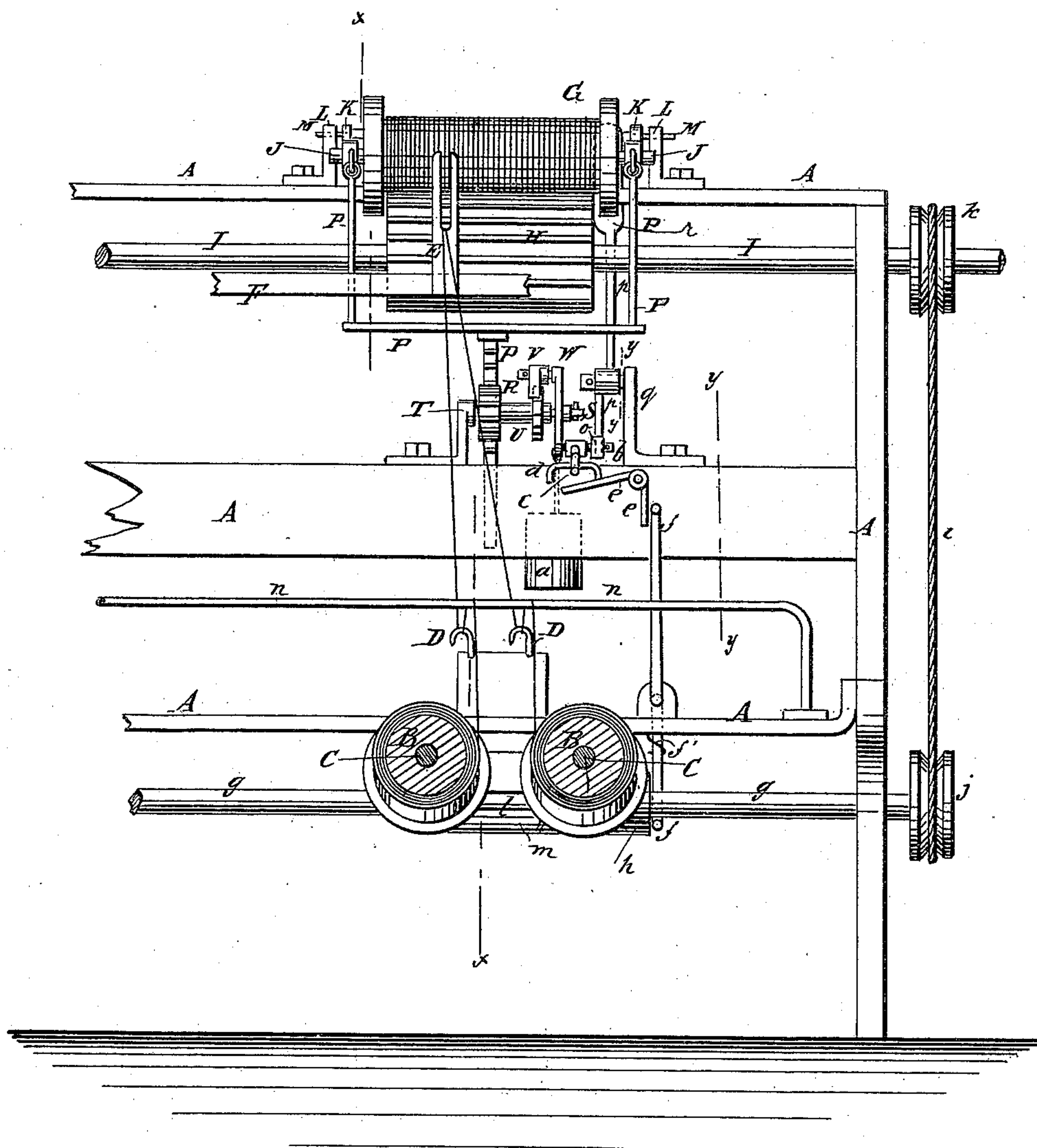
L. V. RICHMOND.

DOUBLING SPOOLER.

No. 310,722.

Patented Jan. 13, 1885.

Fig: 1.



WITNESSES:

Chas. Nida
G. Sudgwick

INVENTOR:

L. V. Richmond
BY *munro*
ATTORNEYS.

(No Model.)

2 Sheets—Sheet 2.

L. V. RICHMOND.

DOUBLING SPOOLER.

No. 310,722.

Patented Jan. 13, 1885.

Fig: 2.

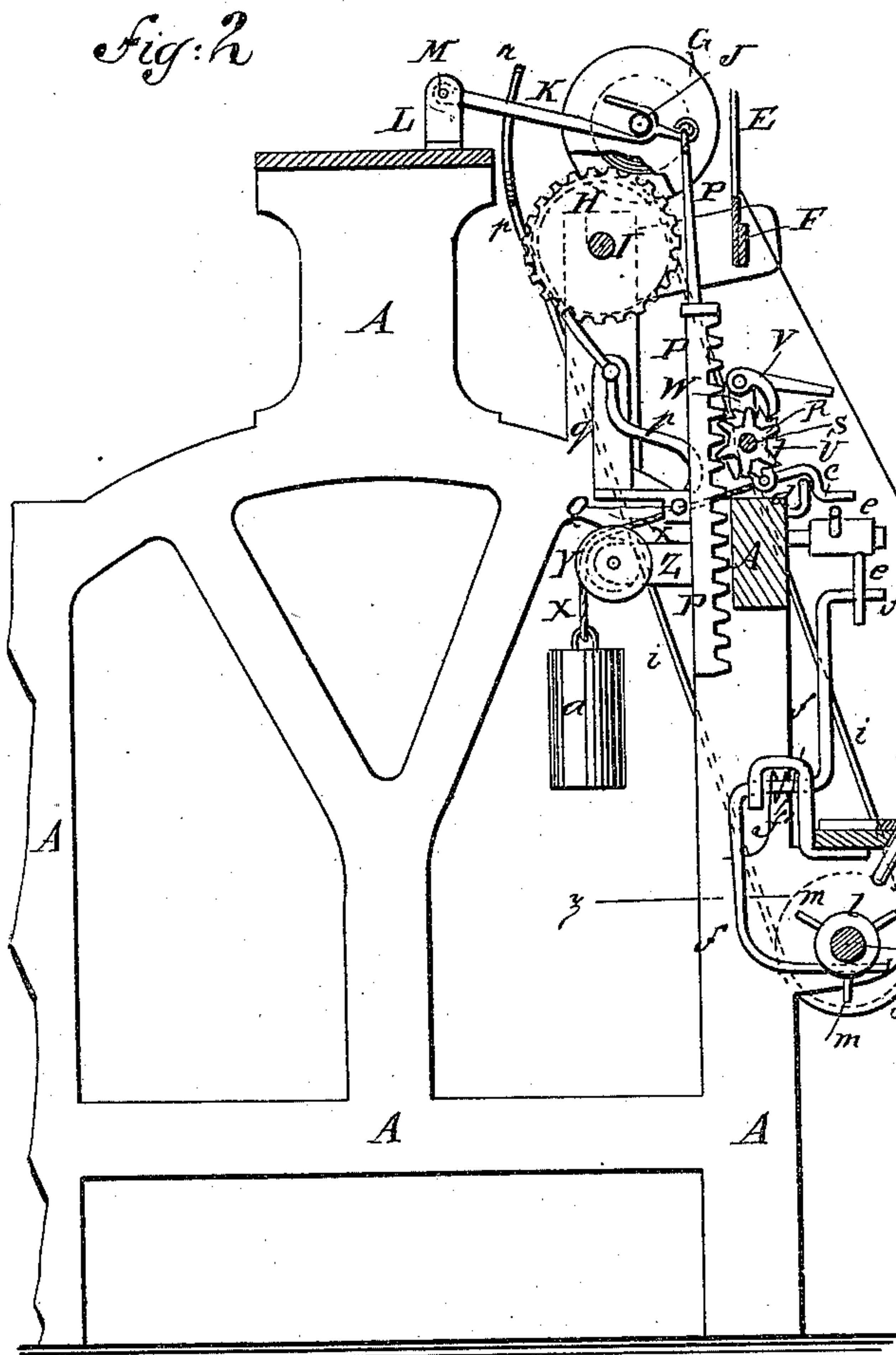


Fig: 3.

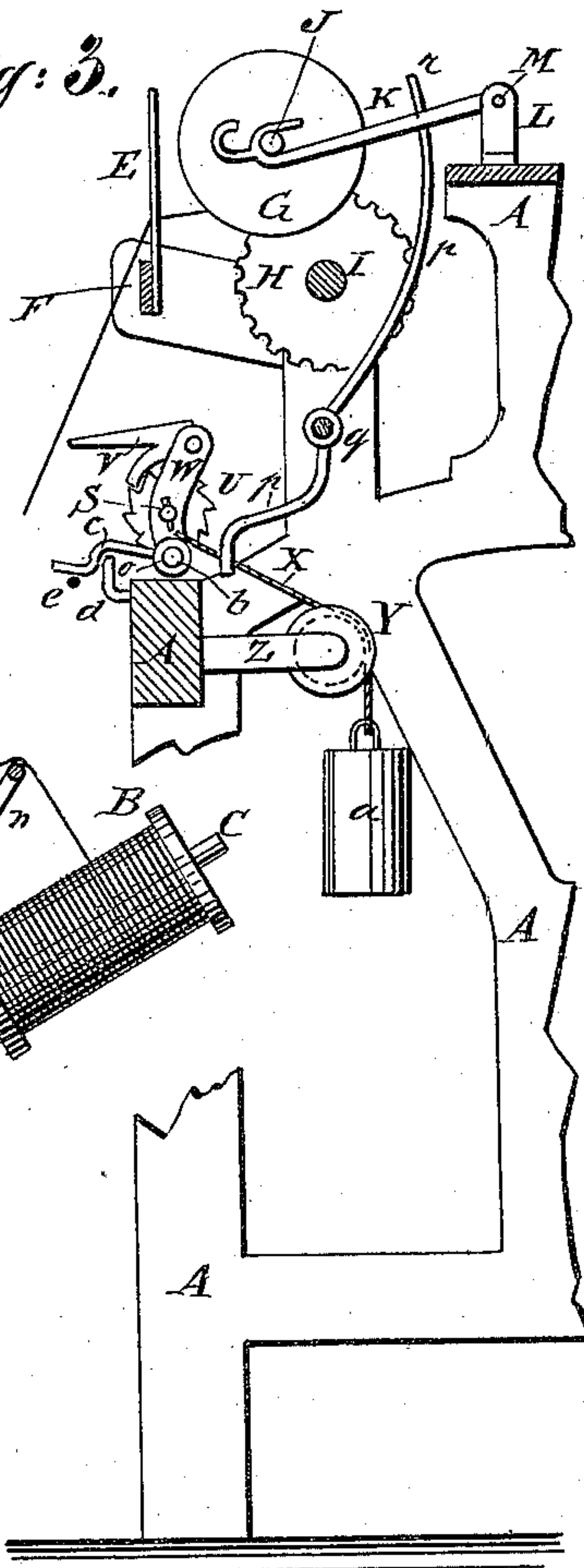
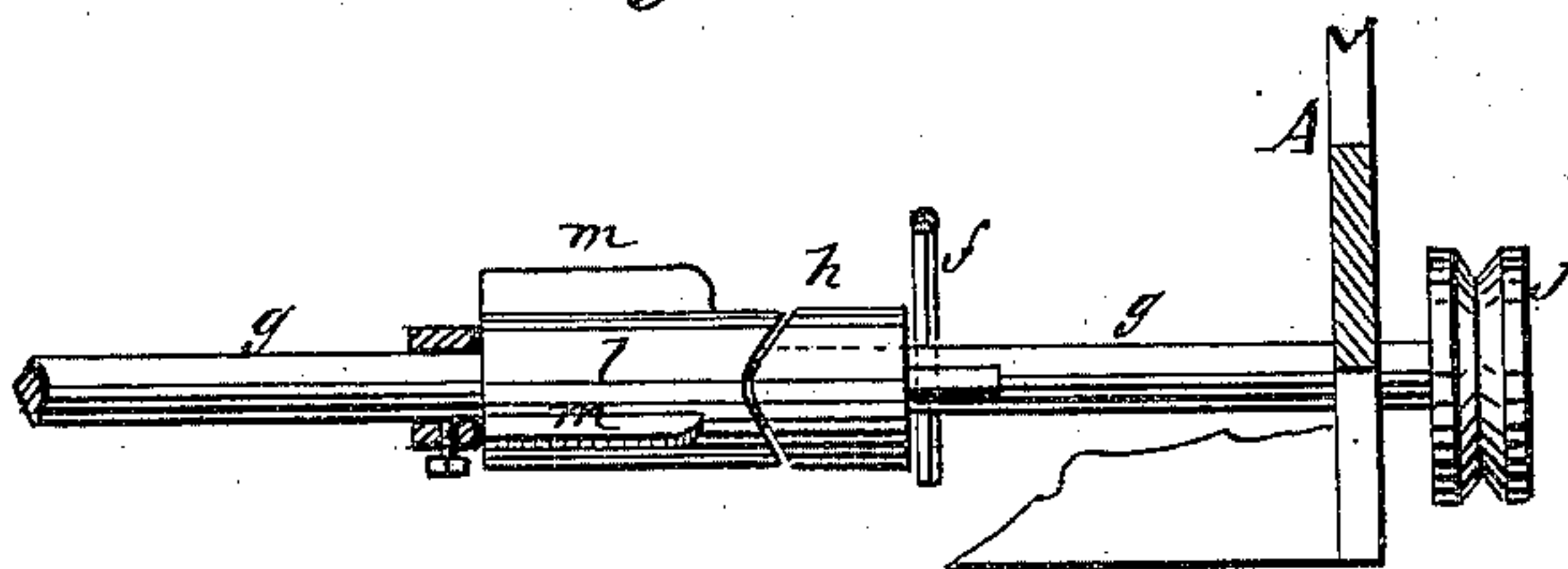


Fig: 4.



WITNESSES:

Anas. Nida
C. Sedgwick

INVENTOR:

L. V. Richmond
BY *Munniff*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

LEONARD V. RICHMOND, OF SAND LAKE, NEW YORK.

DOUBLING-SPOOLER.

SPECIFICATION forming part of Letters Patent No. 310,722, dated January 13, 1885.

Application filed October 23, 1883. (No model.)

To all whom it may concern:

Be it known that I, LEONARD V. RICHMOND, of Sand Lake, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Doubling-Spoolers, of which the following is a full, clear, and exact description.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1, Sheet 1, is a front elevation of a portion of a machine embodying my improvement, the spools being shown in section. Fig. 2, Sheet 2, is a sectional side elevation of the same, taken through the broken line *x x*, Fig. 1. Fig. 3, Sheet 2, is a sectional side elevation of the same, taken through the line *y y y y*, Fig. 1. Fig. 4, Sheet 2, is a sectional plan view of a part of the same, taken through the line *z z*, Fig. 2.

The object of this invention is to facilitate the doubling of yarn upon upright and drum spoolers from cops, spools, and bobbins by providing a mechanism that will stop the receiving-spool automatically should one of the threads break or one of the spools become empty, and thus prevent a single thread from being wound upon the said receiving-spool, thereby economizing time and preventing waste of material.

The form of spooler known as a "drum-spooler" is that shown in the present application, where the receiving-spool is rotated by the drum. The upright spooler is one where the receiving-spool is mounted upon an upright revolving shaft and is revolved thereby.

The invention consists in the combination, with the spool-carrying arms of a doubling-spooler, of a forked rack-bar, a connected gear-wheel and ratchet-wheel, a pawl and its carrying-lever, and a suspended weight for raising the receiving-spool out of gear, a latch and catch for locking the pawl-carrying lever against the gravity of the weight, connecting-levers, a sliding sleeve having scalloped rear end, a loose sleeve having scalloped forward end and radial flanges and sliding hook-pins, and a brake-lever, whereby the dropping of a hook-pin will throw the receiving-spool out of gear and stop the motion of said spool, as will be hereinafter fully described.

A represents the frame of the machine. B are the spools from which the single threads are unwound, and which revolve upon stationary spindles C, attached to a bar of the frame A. From the spools B the threads pass singly through hooks formed upon the upper ends of the pins D, and are brought together and pass through the slotted guide-arm E, attached to the traverse-bar F, which is operated in the ordinary manner. These pins D are mounted loosely in bearings in the frame A in rear of the spools B.

The mechanism for operating the traverse-bar F is not shown in the drawings, as there is nothing new in its construction. From the guide-arm E the doubled thread passes to and is wound upon the receiving-spool G, which rests upon and is revolved by the corrugated cylinder H, attached to the shaft I. The shaft I revolves in bearings attached to the frame A, and receives motion by a belt and pulleys from any convenient motor.

The receiving-spool G is placed upon a spindle, J, the ends of which rest in slotted bearings in the outer parts of the arms K. The inner ends of the arms K are pivoted to supports L, attached to the frame A by a rod, M, or other equivalent means.

To the outer ends of the arms K are pivoted the upper ends of the prongs of the forked upper end of the rack-bar P, which passes down through a keeper, Q, attached to a bar of the frame A. The teeth of the rack-bar P mesh into the teeth of a small gear-wheel, R, which revolves upon a spindle, S, secured at one end to a support, T, attached to a bar of the frame A.

With the gear-wheel R, by means of a sleeve, is rigidly connected a ratchet-wheel, U, with the teeth of which engages the pawl V, pivoted to the upper end of a short lever, W, the latter being pivoted to the free end of the spindle S, where it is kept in place by a pin, collar, or other equivalent means.

To the lower end of the lever W is attached the upper end of a cord, X, which passes over a pulley, Y, pivoted to a support, Z, attached to a bar of the frame A.

To the lower end of the cord X is attached a weight, *a*, of a sufficient gravity to draw the lower end of the lever W inward, and cause the pawl V to turn the ratchet-wheel U and

gear-wheel R, which raises the rack-bar P and the arms K, raising the spool G out of contact with the corrugated cylinder H.

To the outer side of the lower end of the lever W is attached a spindle, *b*, to which is pivoted a latch, *c*. The latch *c* is made with a shoulder to engage with a catch, *d*, attached to a bar of the frame A, to which bar is pivoted the angle of an elbow-lever, *e*, in such a position that the upper arm of the said lever will rest beneath the latch *c*, so as when the said lever is operated to raise the latch *c* from the catch *d* and allow the weight *a* to raise the spool G out of contact with the corrugated cylinder H.

Against the lower arm of the elbow-lever *e* rests the upper arm of the lever *f*, which is pivoted to a bar of the frame A in such a position that its lower arm will rest against or close to the side of the shaft *g* and close to the end of a sleeve, *h*, placed upon the shaft *g*, and connected with the said shaft by a tongue and groove or other suitable means, so that the said sleeve will be carried around by and with the shaft *g*, and can have a longitudinal movement upon the said shaft. The lower end of the lever *f* is held against the end of the sleeve *h* by a spring, *f'*, connected with the lower arm of the said lever. The shaft *g* revolves in bearings attached to the frame A, and is driven by a belt, *i*, and pulleys *j k* from the shaft I.

The rear end of the sleeve *h* is scalloped, to correspond with the correspondingly scalloped forward end of the sleeve *l*, placed loosely upon the shaft *g*, and held from sliding rearwardly upon the said shaft by a collar secured to the shaft or by a stop attached to a bar of the frame A, or by other equivalent means. The stop referred to as the equivalent of the collar may be a pin secured to the bar of the frame A above or near the shaft *g*, and projecting across the rear end of the sleeve, to prevent the sleeve from backward movement. Upon the sleeve *l* are formed three or more longitudinal radial flanges, *m*, as shown in Figs. 2 and 4. The flanged sleeve *l m* is placed directly below the hook-pins D, as shown in Figs. 1 and 2. The threads, in passing from the spools B to the hook-pins D, pass over a guide-rod, *n*, attached to the frame A, and placed at a higher level than the hooks of the said pins D, so that the said threads, when the machine is in operation, will exert a strain to hold the said hook-pins raised, as shown in Figs. 1 and 2. With this construction, when one of the threads breaks the hook-pin D supported by the said thread drops, so that its lower end will be struck by a flange, *m*, of the sleeve *l*, and the said sleeve will be stopped and held from revolving, and the scallops upon its forward end will push the sleeve *h* forward, operating the levers *f e*, and disengaging the latch *c* from the catch *d*, when the gravity of the weight *a* will move the lever W, and cause the pawl V to operate the ratchet-wheel U and gear-wheel R, raising the rack-

bar P, and raising the spool G out of contact with the corrugated cylinder H. As the lower end of the lever W is drawn back by the gravity of the weight *a*, the spindle *b* or a small roller, *o*, placed upon the said spindle, will be drawn against the lower end of the lever *p*, pivoted to a support, *q*, attached to the frame A, and will force the brake-shoe *r*, formed upon or attached to the upper end of the said lever *p*, against the flange of the receiving-spool G, to stop the said spool and prevent a single thread from being wound upon the said spool.

It will be observed that as the spool G fills it rises, raising the rack-bar P, and turning the gear-wheel R and ratchet-wheel U, without affecting the position of any other part of the machine. The main shaft I continues to revolve after the receiving-spool has been disengaged therefrom.

In order to reset the parts to cause the corrugated drum to rotate the receiving-spool, the latch *c* is pulled forward and pressed down to engage the stop *d*, or the upper part of lever W may be pushed backward. This will allow the rack and receiving-spool to lower by gravity, and will cause the brake to swing away from the flange on said receiving-spool G, when the drum H, which revolves continually with the shaft I, will rotate said spool G and cause the winding to begin again.

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

1. The combination, with the arms adapted to carry the receiving-spool, of the forked rack P, spindle S, the gear-wheel R, the ratchet-wheel and pawl U V, the pawl-carrying lever W, cord X, pulley Y, and the weight *a*, substantially as herein shown and described, whereby the said spool can be raised by the gravity of the said weight, as set forth.

2. The combination, with the arms adapted to carry the receiving-spool and the rack connected to said arms, of the spindle S, gear-wheel R, and ratchet U, connected together and loosely mounted on said spindle, lever W, pivoted on spindle S, pawl V, pivoted to the upper end of said lever and engaging the ratchet-wheel, latch *c* at the lower end of said lever, catch *d*, and mechanism connected with the lower end of said lever, opposite the said latch, for drawing the lower end inward, substantially as set forth, whereby when the latch is released and the lower end of the lever moved inward the upper end of the lever and its pawl will be forced outward to turn the ratchet-wheel and raise the rack and the receiving-spool connected thereto, as described.

3. The combination, with the lever-locking latch *c*, of the levers *e f*, the shaft *g*, the sliding sleeve *h*, having scalloped rear end, the loose sleeve *l*, having scalloped forward end and radial flanges *m*, means for preventing the sleeve *l* from longitudinal movement, and the hook-pins D, substantially as herein shown

and described, whereby the said latch will be disengaged automatically by the dropping of a hook-pin, as set forth.

4. The combination, with the weight *a*, cord
5 X, pulley Y, shaft S, pawl-carrying lever W,
and spindle *b*, of the brake-lever *p*, hav-
ing a brake, substantially as herein shown
and described, whereby the movement of the
said pawl-carrying lever to raise the receiv-
10 ing-spool will apply the brake to the said spool,
as set forth.

5. The combination, with the spool-carry-
ing arms K, of the forked rack-bar P, the gear-
wheel R, the ratchet-wheel and pawl U V, the
15 pawl-carrying lever W, and the cord X, pul-
ley Y, spindle S, and weight *a* for raising the

receiving-spool, the latch and catch *c d* for
locking the lever W against the gravity of the
weight *a*, the levers *e f*, shaft *g*, the sliding
sleeve *h*, having scalloped rear end, the loose 20
sleeve *l*, provided with means for preventing its
longitudinal movement, and having scalloped
forward end and radial flanges *m*, the hook-
pins D, the lever *p*, and brake *r*, substantially
as herein shown and described, whereby the 25
dropping of a hook-pin will throw the receiv-
ing-spool out of gear and stop the motion of
the said spool, as set forth.

LEONARD V. RICHMOND.

Witnesses:

WILLARD GRIGGS,
GEORGE GETTLE.