

T. A. MATHEWSON.  
Spooling-Machine.

No. 169,058.

Patented Feb. 23, 1875.

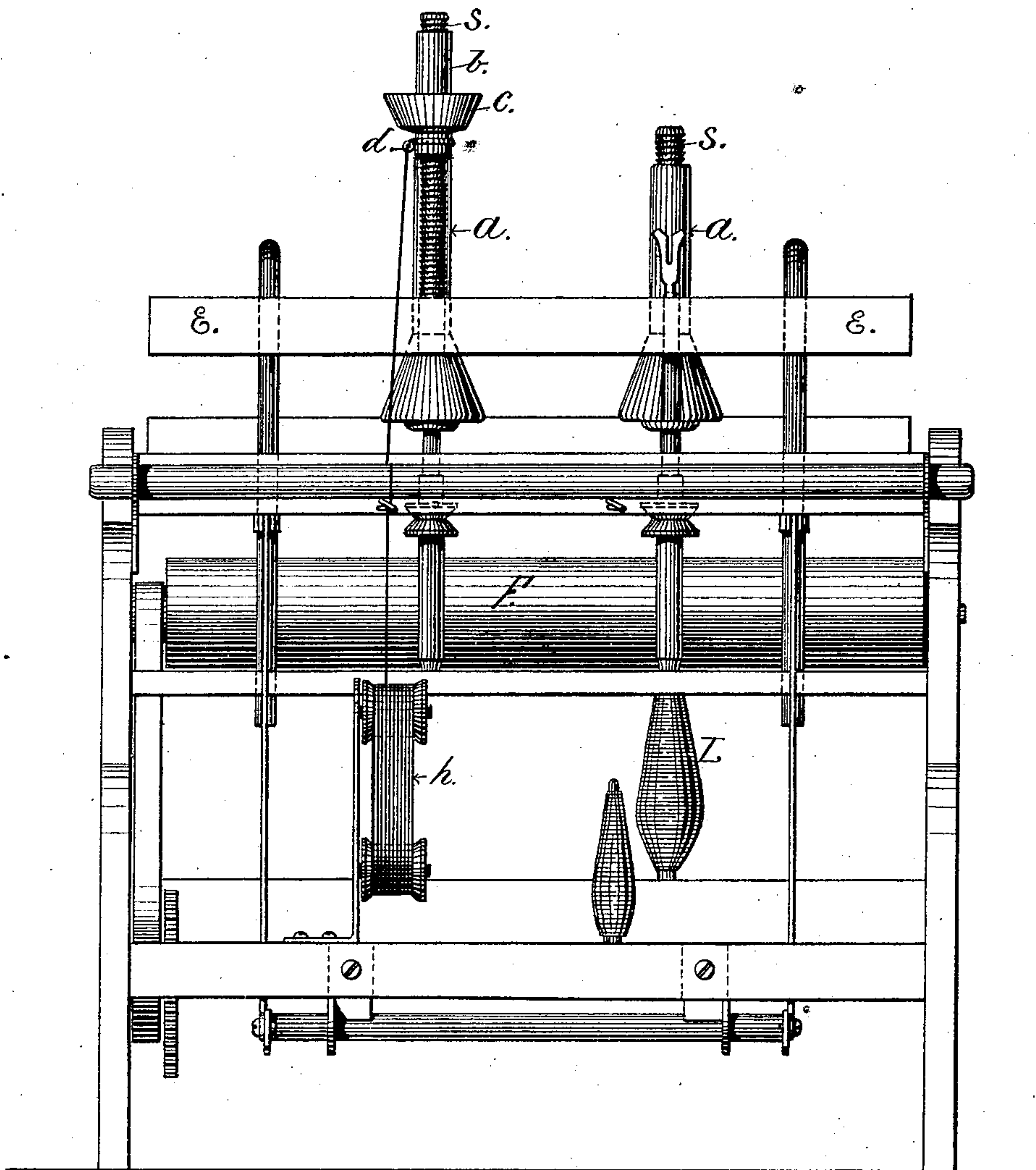


FIG. 1.

WITNESSES.

*L. P. Langworthy.*  
*E. W. Eaton.*

INVENTOR.

*Thomas A. Mathewson*  
*by Joseph A. Miller*  
*his Attorney*

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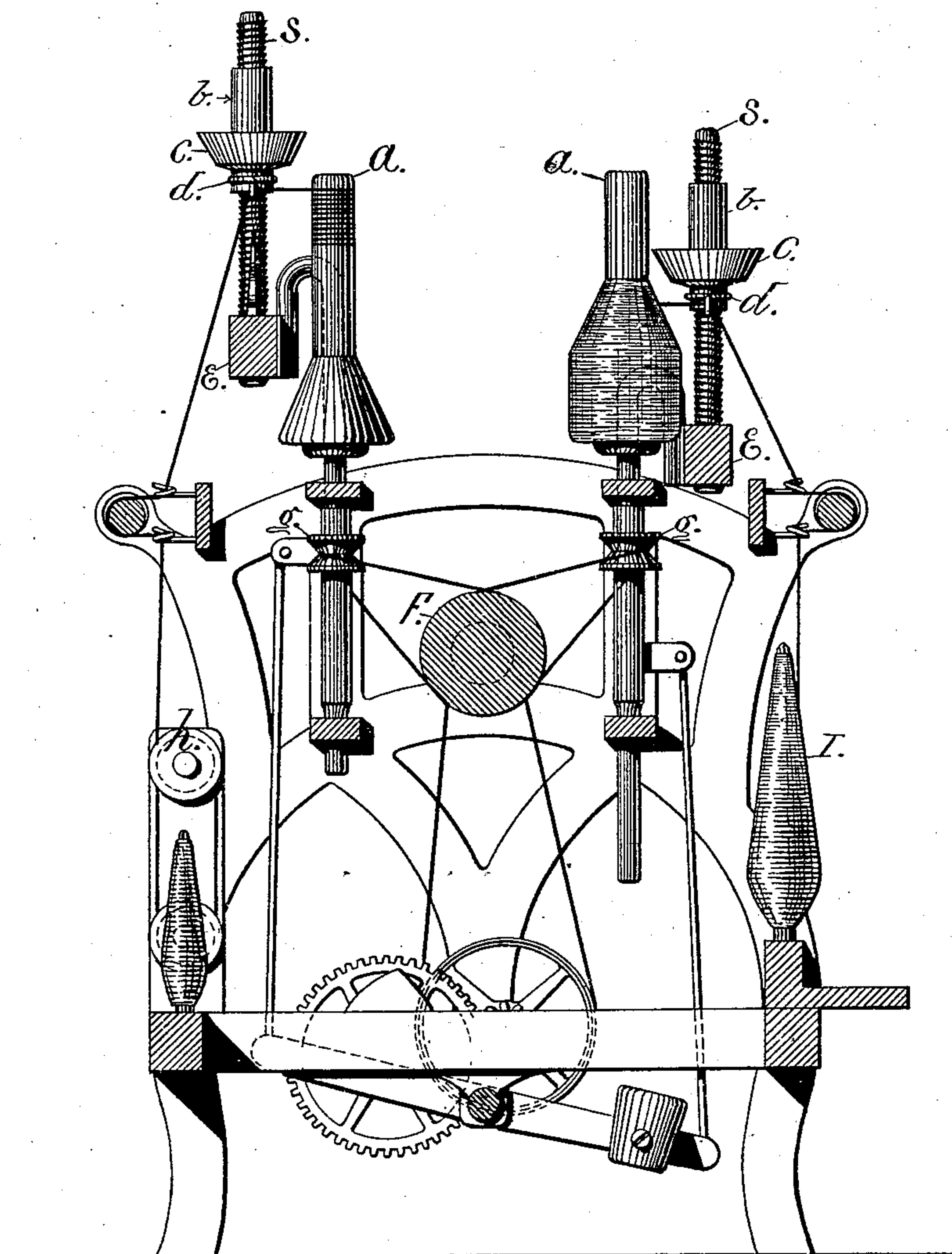


FIG. 2.

WITNESSES.

*L. P. Langworthy*  
*R. W. Eaton*

INVENTOR.

*Thomas A. Mathewson*  
*by Joseph A. Miller*  
*his Attorney*

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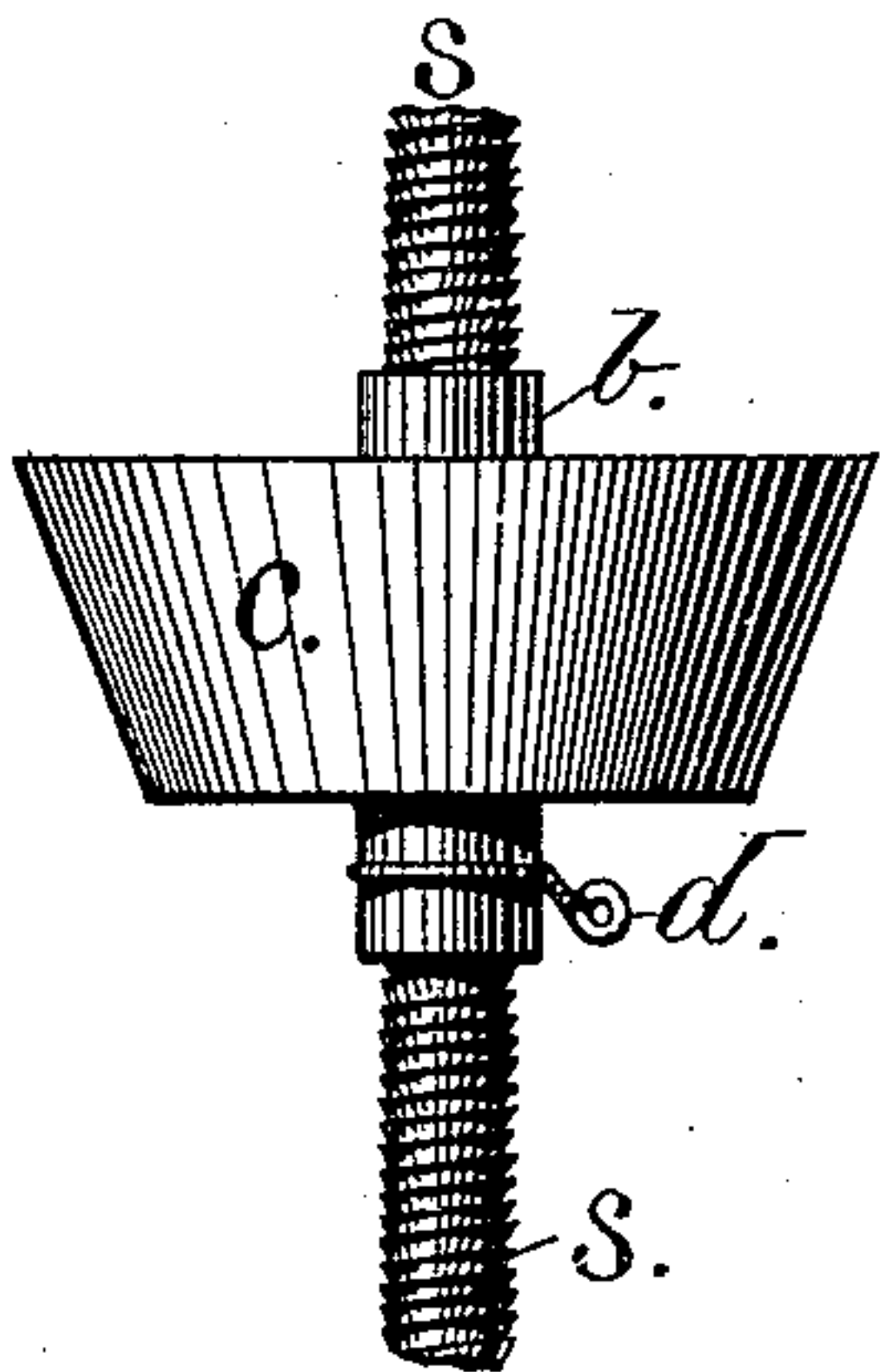


FIG. 3.

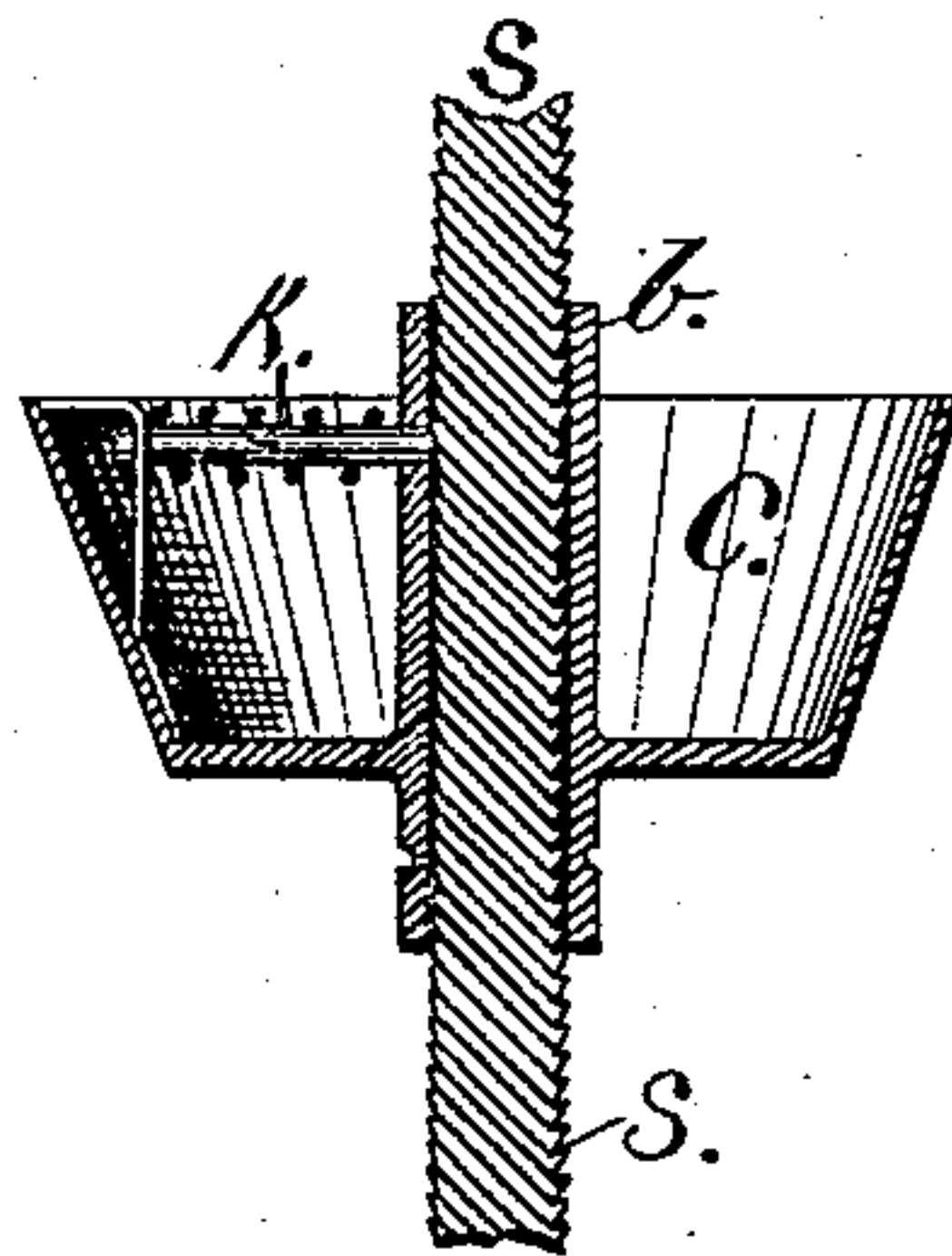


FIG. 4.

WITNESSES.

L. P. Langworthy.  
R. W. Eaton.

INVENTOR.

Thomas A. Mathewson  
by Joseph A. Miller  
his Attorney



# UNITED STATES PATENT OFFICE.

THOMAS A. MATHEWSON, OF PAWTUCKET, RHODE ISLAND.

## IMPROVEMENT IN SPOOLING-MACHINES.

Specification forming part of Letters Patent No. 160,058, dated February 23, 1875; application filed November 11, 1874.

*To all whom it may concern:*

Be it known that I, THOMAS A. MATHEWSON, of the town of Pawtucket, county of Providence, State of Rhode Island, have invented a new and useful Improvement in Spooling-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, which, with the accompanying drawings forming part of this specification, will enable others skilled in the art to make and use the same.

Figure I shows my improved spooling-frame in view. Fig. II is a transverse section of the same, showing one spool or bobbin partly filled, with the automatic guide-cone and adjustable carrier in its proper position, while the other spool, being empty and newly placed on the spindle, the automatic guide-cone is shown at the upper end of the screw, and about to be placed in its position. Fig. III is a view of the automatic guide-cone and the adjustable carrier. Fig. IV is a vertical section of the automatic cone, the screw, and the peculiar form of the screw-thread, having a saw-tooth or ratched section, as also the pawl and the spring, which holds the same against the screw.

Similar letters of reference indicate corresponding parts.

The object of this invention is to produce a machine for winding, automatically, thread on spools, such as are shown in the drawings, in which A is the spool or bobbin, with a cone-shaped base, and a central extension of uniform diameter above the cone. The thread must be so wound on these spools as to preserve the shape of the cone, it being wound first up and then down the cone, so that when unwinding, each thread will lift freely from the cone without entangling, such spools being largely used for knitting-machines.

The nature of my invention consists in the arrangement for guiding the thread, as hereinafter more fully described.

In my improved spooling-frame, the spools are generally of considerable diameter and height. They are, therefore, placed upon spindles, resting in a step, and rotated around their vertical axis, rotation being imparted by bands passing around the driving-cylinder F, and the whirl *g* secured to the spindle. By

this arrangement all the spools are in sight of the operative. The frame also occupies less room than when such spools project laterally, while the power required to drive a frame, in which the spindles carrying the large and heavy spools rest on a step, is much less than where such spindles are supported horizontally in long bearings. The spooling-frame being especially designed for winding cone-spools or bobbins, the reciprocating motion imparted to the rails E E is of such length and relative speed as will maintain the original shape of the cone at the base of the spool.

Fig. II shows a spool on the right side of the frame, marked A. This spool is shown about half filled with thread. The automatic guide-cone C and the adjustable carrier *d* are shown in their proper position on the screw S. As the spool is revolving with the spindle and the rail E carrying the screw S, the cone C and carrier *d* reciprocates vertically, the thread is wound on the bobbin or spool A downward, until the cone C comes in contact with the revolving spool, at the moment when the downward motion of the rail E changes to the upward motion; and by this momentary contact the cone C is made to revolve on the screw S sufficient to raise the cone and thread carrier as much as the two thicknesses of thread wound on the spool by the upward and downward motion require.

On the left-hand side of the same Fig. II an empty spool, A, is shown, and the automatic cone C and adjustable carrier *d* are shown opposite the top of the empty bobbin. It would now be difficult for the operative to place the cone C and carrier *d* in the proper position, so that when the downward motion of the rail E, carrying the screw S, cone C, and thread-carrier *d*, ceases, and the upward motion commences, the thread would be wound exactly at the lowest point of the cone on the spool, and with an ordinary screw great skill and experience would be required.

In my improved arrangement this is a simple operation. The thread being started, as shown, on the empty spool *d*, the operative places one finger into the cone C on the trigger or loop attached to the pawl K, shown in Fig. IV, and detaches the same from the screw S. The cone C and carrier *d* are now free to



slide down to the bottom of the screw and rest on the rail E. As soon as the cone C comes in contact with the conical part of the spool, the automatic cone C and carrier *d* will be raised, and slide upward on the screw S, owing to the peculiar shape of the thread on the screw, until the lowest point of descent is reached, at which point the thread-carrier will be on a line with the lowest edge of the cone on the spool, and as soon as the ascending motion commences the cone C and carrier *d* will be relieved from the spool and guide the thread upward over the cone of the spool, and on the return motion downward on the same. If no thread had been wound on the spool during this reciprocation of the rail E, and by it of the cone C and carrier *d*, the cone C would not touch the cone of the spool, and would continue to reciprocate, maintaining the same position on the screw S. If, however, thread is wound on the spool, the surface of the cone on the spool is raised, and at the lowest point of the downward motion of the cone C the same comes in contact with the spool, and the rotation of the latter turns the cone C sufficiently on the screw S to raise the same, and with the carrier *d*. An additional layer after layer is thus regularly and automatically laid on the spool.

The operation of this machine is continuous, for as soon as one spool is completed another empty spool takes its place on the spindle. The automatic cone and carrier are placed on the bottom of the screw S, and left to adjust themselves. Very little skill is required, and the spools produced are absolutely perfect, each thread being laid with the greatest precision. The machine is never stopped, and continues to perform its work automatically as long as the different parts are in proper order.

In Figs. III and IV enlarged views and sections of the screw S, cone C, carrier *d*, and pawl K are shown, from which it will be seen that the thread of the screw is like the teeth of a saw or a ratchet in section, while the pawl corresponds with this section, and is held, by a light spring, against the screw, and so supports the cone and carrier at any required position. By this peculiar form of the screw the cone C easily slides upward on the screw, but resists all downward motion when the pawl K is in place. The cone is therefore easily raised when coming in contact with the spool, on starting a new spool, to the proper position for winding the thread on the bottom of the cone on the spool, and all subsequent adjustment is automatically produced by the rotation of the cone C on the screw S by the momentary contact of the cone at the lowest point of the reciprocating motion with the spool.

In place of the screw a simple ratchet may be used, so that the carrier will be lifted, when the same comes in contact with the spool, to the proper height, and continue to lift the same at each reciprocating motion. Such an arrangement, although practical, I do not consider as good as the arrangement shown and described.

The carrier *d*, swinging loosely within the groove on the sleeve *b*, and forming an eye for carrying the thread and guiding the laying of the same onto the spool, adjusts itself to the different positions required. At the upper end of the reciprocating movement the projecting eye extends from the sleeve toward the spool, and in this position offers less resistance, friction, or drag to the thread. The spool is therefore wound more loosely in the center, while at the lowest point of the reciprocation the eye of the carrier is parallel with the machine, the thread is wound faster, and the friction on the carrier is greater; consequently the bobbin or spool is wound harder on the outside, making a better spool, which will stand more handling and unwind more perfectly, while the same-sized spool will contain more thread. The carrier, being loose on the sleeve, also allows the cone C to turn freely when in momentary contact with the spool without changing the position of the carrier, except raising the same.

When winding from cops or bobbins onto the spool at the end of a bobbin, or when the yarn breaks by accident, it becomes difficult with the square-threaded screw to so adjust the carrier that the winding shall be continued at the same part of the bobbin, and the carrier must therefore be adjusted so as to be in exactly the proper position to form a regular spool. By placing the cone at the bottom of my saw-toothed section-screw the cone and carrier will be lifted by the spool exactly into the proper position without exerting too much pressure on the yarn on the spool.

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

1. In combination with the cone C and sleeve *b*, the thread-carrier *d*, supported loosely upon the sleeve *b*, for guiding the thread onto the vertical spool, substantially as and for the purpose herein described.

2. The screw S, having the threads on the same formed of a saw-tooth section, in combination with the cone C and carrier *d*, in a spooling-machine, substantially as and for the purpose described.

THOMAS A. MATHEWSON.

Witnesses:

WM. C. CHASE,

JOSEPH A. MILLER.