

(No Model.)

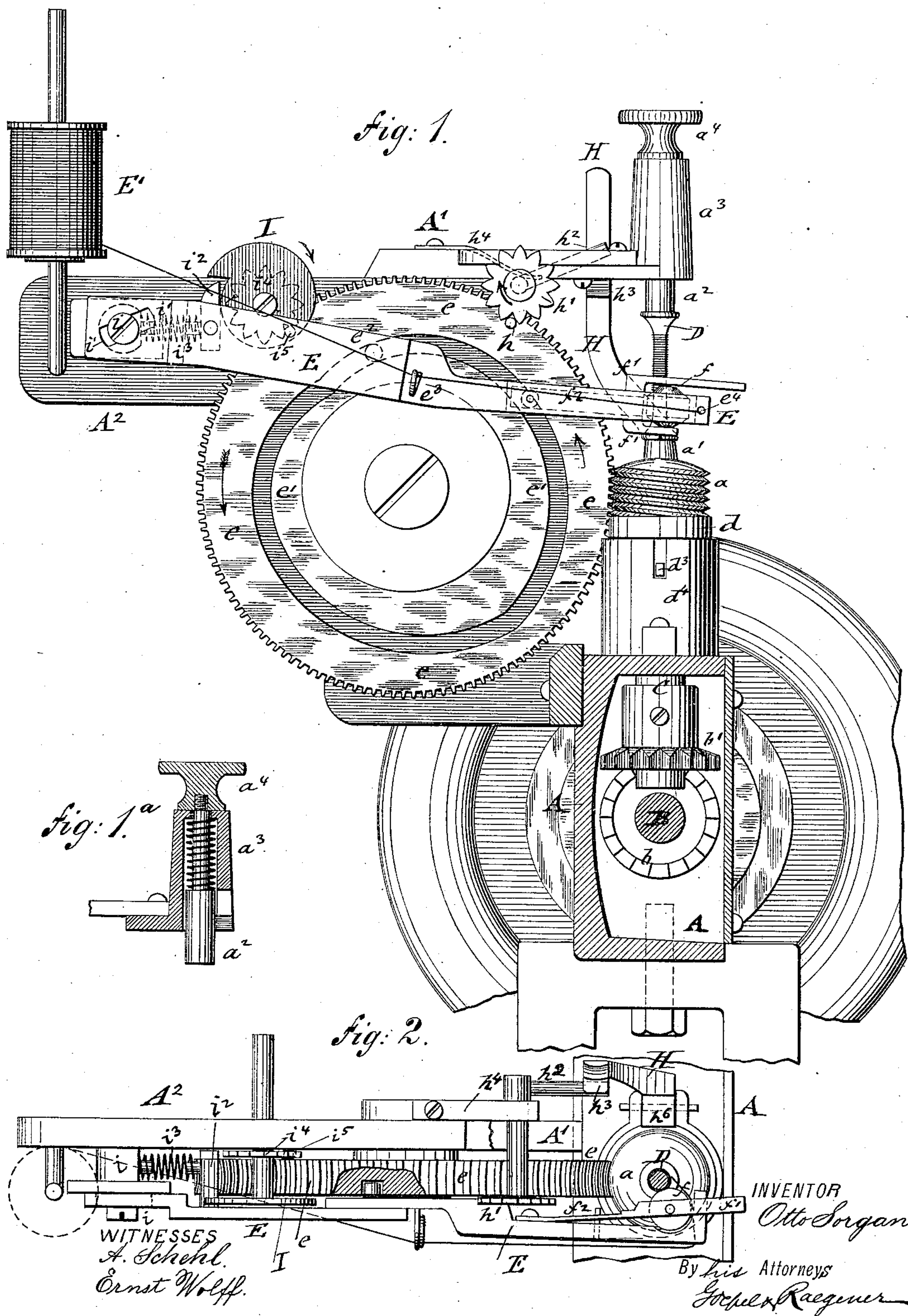
2 Sheets—Sheet 1.

O. SORGAN.

MACHINE FOR WINDING BOBBINS FOR SEWING MACHINES, &c.

No. 336,168.

Patented Feb. 16, 1886.



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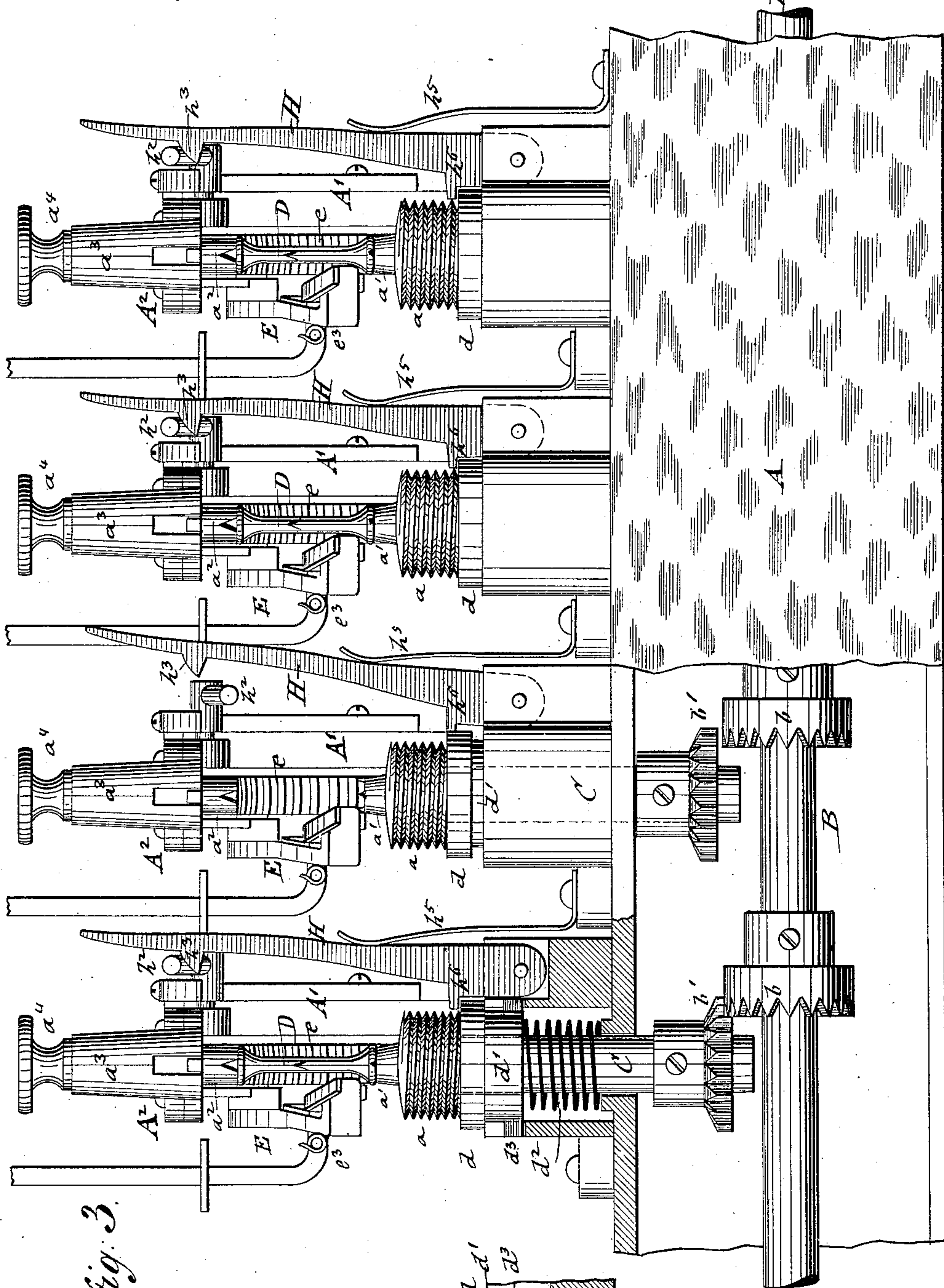


Fig. 3.

WITNESSES  
A. Schehl.  
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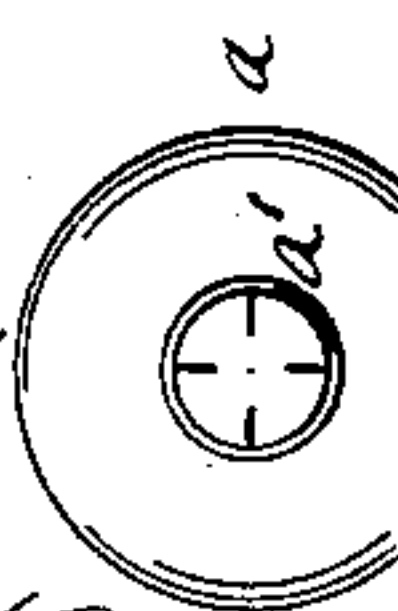
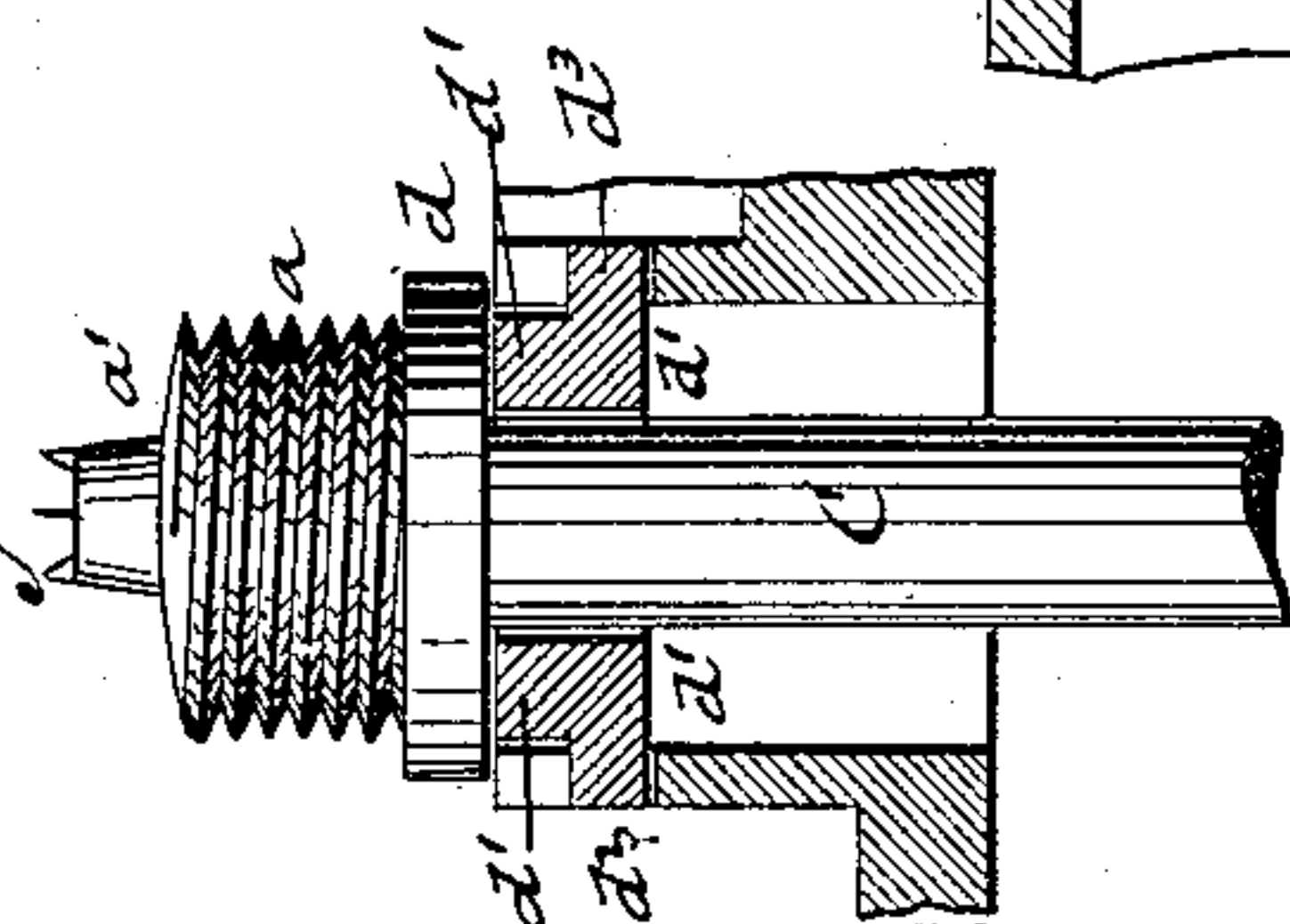


Fig. 3.



INVENTOR

Otto Sorgan  
By his Attorneys  
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# UNITED STATES PATENT OFFICE.

OTTO SORGAN, OF NEW YORK, N. Y.

## MACHINE FOR WINDING BOBBINS FOR SEWING-MACHINES, &c.

SPECIFICATION forming part of Letters Patent No. 336,163, dated February 16, 1886.

Application filed April 25, 1885. Serial No. 163,393. (No model.)

*To all whom it may concern:*

Be it known that I, OTTO SORGAN, of the city, county, and State of New York, have invented certain new and useful Improvements in Machines for Winding Bobbins for Sewing-Machines, &c., of which the following is a specification.

In quilting and other sewing machines large quantities of bobbins are used, which require considerable time for winding.

The object of this invention is to furnish an improved machine for winding the bobbins for quilting or other sewing machines in such a manner that each bobbin is supplied with a certain length of thread, the winding operation being interrupted when the required length is wound thereon and the thread distributed evenly over the spool and the ends of the same.

In the accompanying drawings, Figure 1 represents a side elevation of my improved machine for winding bobbins for quilting and other machines, showing the supporting-frame in vertical transverse section, parts broken away. Fig. 1<sup>a</sup> is a detail vertical central section of the head-section of the spindle. Fig. 2 is a plan of the parts shown in Fig. 1; Fig. 3, a front elevation, partly broken away and in section, showing a series or gang of bobbin-winding mechanisms arranged on a common supporting-frame; and Fig. 3<sup>a</sup> is a vertical transverse section of the guide-sleeve of the axially-turning bobbin-spindle and a top view of the spindle-clutch.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents the supporting-frame of my improved machine for winding bobbins for quilting and other sewing machines.

In bearings of the supporting-frame A turns a horizontal driving-shaft, B, having gear-wheels *b b*, which mesh with gear-wheels *b' b'* of vertical spindles C. The spindles C have collars *d* at their upper ends, which rest on movable guide-sleeves *d'*, that are acted upon by spiral springs *d''*, interposed between the bottom of the sleeves *d'* and the top of the frame A. The sleeves *d' d'* are guided by diametrical lugs *d<sup>3</sup>* in recesses of fixed guides *d<sup>4</sup>* of frame A, as shown clearly in Fig. 3. The

head of the spindle C above the collar *d* is made in the shape of a worm, *a*, and provided above the same with a clutch, *a'*, formed of four radial knife-edges, as shown in Fig. 3<sup>a</sup>, which "bite" into the lower end of the bobbin-spool D. The upper part of the spool D is supported by a spring-actuated block, *a<sup>2</sup>*, which is guided by a fixed socket, *a<sup>3</sup>*, that is vertically in line with the axis of the spindle, and supported at the upper part of an upright standard, A', of the machine, as shown in Figs. 1<sup>a</sup> and 3, and which presses down upon the upper end of the spool and holds the same in place. The block *a<sup>2</sup>* is provided with a button, *a<sup>4</sup>*, at the upper end of its shank, for readily lifting the same when inserting the spools and removing the bobbins. The worm *a* meshes with a gear-wheel, *e*, having a heart-shaped cam-groove, *e'*, the shaft of the gear-wheel turning in bearings of the standard A'. The cam-groove *e'* engages an anti-friction roller, *e<sup>2</sup>*, of a thread-guiding arm, E, and imparts a vertically-oscillating motion to the same. The arm E is provided at its side with a guide-eye, *e<sup>3</sup>*, and at its front end with an eye, *e<sup>4</sup>*, for guiding the thread from a large bobbin, E', supported on a spindle at the rear end of a horizontal arm, A<sup>2</sup>, to the spool D, as shown in Figs. 1 and 2. The thread-guiding arm E is further provided at its front end with a roller, *f*, that is supported in a forked bearing, *f'*, at the outer end of a band-spring, *f<sup>2</sup>*, which is attached at its rear end to the arm E. The roller *f* serves to exert a certain degree of pressure on the thread wound up on the spool D, so as to produce the even winding up of the thread. The gear-wheel *e* is further provided near its circumference with a fixed pin, *h*, that meshes with a star-wheel, *h'*, the shaft of which is supported in bearings of the upright standard A', and provided with a crank-arm, *h<sup>2</sup>*, that engages a projecting nose, *h<sup>3</sup>*, at the upper end of a latch-lever, H. A band-spring, *h<sup>4</sup>*, presses on the shaft of the star-wheel *h'*, so as to exert a certain friction on the same and prevent it from turning, except by the action of the pin *h* at each full rotation of the gear-wheel *e*. The latch-lever H is pivoted at its lower end to a recess of the guide *d<sup>4</sup>*, and pressed toward the bobbin by a spring, *h<sup>5</sup>*. A heel, *h<sup>6</sup>*, at the lower part of



the lever H engages the collar  $d$  of the spindle C, until by the successive rotations of the gear-wheel  $e$  the star-wheel  $h'$  has made a full rotation, upon which its crank-arm  $h^2$  engages the projecting nose  $h^3$  of the latch-lever H and forces the latter sidewise against the pressure of its spring, so that the heel  $h^6$  clears the collar  $d$  and releases the spindle C. The spindle C is instantly lifted by the action of the spiral spring  $d^2$ , whereby the bobbin is forced in upward direction against the tension of the spring of the upper clutch, and simultaneously the gear-wheel  $b'$  thrown out of mesh with the gear-wheel  $b$  and main shaft B, so that the axially-rotating motion of the spindle and the bobbin is instantly interrupted. This throwing out of gear of the spindle takes place when the required amount of thread has been wound up on the spool, which is regulated by the number of teeth on the star-wheel  $h'$  and the number of rotations of the gear-wheel  $e$ . A star-wheel with a smaller number of teeth corresponds to a shorter length of thread, while a star-wheel with a larger number of teeth winds up a greater length of thread on the bobbin. The thread-guiding arm E has a slot,  $i'$ , near its inner end, which is applied to and guided by a fixed pivot,  $i$ , of the horizontal arm  $A^2$ . A laterally-extending lug,  $i^2$ , of the arm E is acted upon by a spiral-spring,  $i^3$ , which is interposed between the lug  $i^2$  and the pivot  $i$ , and which tends to move the arm E in forward direction and keep the lug  $i^2$  in contact with the surface of an involute cam, I, the shaft of which turns in bearings of the arm  $A^2$ .

On the shaft of the cam I is arranged a star-wheel,  $i^4$ , that meshes with a pin,  $i^5$ , at the opposite side of the gear-wheel  $e$ , said star-wheel being turned for the distance of one tooth at each rotation of the cam-gear  $e$ , in the same manner as the star-wheel  $h'$ , so that the involute cam I is gradually turned on its axis, so as to cause the arm E to be shifted in backward direction on the pivot  $i$ , according as the eccentricity of the cam increases. This has the effect that the length of the thread-guiding arm is decreased, and consequently the oscillations of the same at the outer end enlarged. The effect of the shifting motion of the thread-guiding arm after each complete rotation of the cam-gear  $e$  is, that the thread is wound up in such a manner that the layers of thread on the spool are gradually extended and the thread wound up on the tapering ends of the spools, as shown in Fig. 1, without producing the overlapping of the threads at the ends when the direction of the thread is changed. This method of winding facilitates the unwinding of the thread without any strain or tension, so as to avoid the breaking of the thread when the bobbin is in the shuttle of the quilting-machine.

By my improved machine bobbins of any size can be wound with any required length of thread, and in a perfectly reliable manner,

as my winding mechanism is automatically thrown out of gear, so that the bobbin can be removed and a new spool inserted. For this purpose the spool is placed in position between the clutch of the spindle and the top clutch, and pressed down so that the spindle is re-engaged by its latch-lever, after which the winding up of the thread is continued.

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

1. The combination of a spindle and means for supporting, guiding, and operating the same, said spindle having a fixed clutch device, a spring-actuated friction-clutch vertically above the spindle, an oscillating thread-guiding arm, a band-spring attached at its inner end to said arm, its outer or free end being forked, a roller in the forked end of said spring adapted to bear against the yarn being wound, and means, substantially as described, for imparting motion to said arm.

2. The combination of the spindle and means for supporting and operating the same, clutches for supporting the spool in line with the spindle, an oscillating thread-guiding arm having a roller and springs for pressing the same against the yarn being wound, a worm on the spindle, a transmitting gear-wheel engaging said worm, and having a fixed pin, a star-wheel operated by said pin, a shaft upon which said star-wheel is mounted, said shaft being provided with a crank-arm, and a spring-pressed latch-lever having a heel for locking the spindle and a nose at the upper end, said nose being engaged by said crank-arm of the star-wheel shaft, so as to release the latch-lever from the spindle, substantially as set forth.

3. The combination of a spindle and means for supporting and operating the same, a collar and guide-sleeve on said spindle, a guide for the spindle, clutches for holding the spool, a worm on the spindle, a gear-wheel meshing with the worm and having a cam-groove, an oscillating thread-guiding arm having an anti-friction roller engaged by said cam-groove, a roller at the front end of the thread-guiding arm, and springs for pressing the same against the yarn being wound, a star-wheel, a crank-shaft keyed to the star-wheel, a latch-lever having a nose at its upper end and a heel at the lower end engaging the collar of the spindle, and a spring for actuating said lever, so that the spindle will be released and the winding of the bobbin interrupted by the throwing of the spindle out of gear by said nose, substantially as set forth.

4. The combination of a spindle and means for supporting and operating the same, clutches to support the spool in line with the spindle, an oscillating thread-guiding arm, and mechanism, substantially as described, whereby the thread-guiding arm is shifted longitudinally on its pivot, so as to enlarge its oscillating motion, substantially as set forth.

5. The combination of a spindle and means for supporting and operating the same, said



spindle being provided with a worm, a gear-  
wheel engaging said worm and having a cam-  
groove and pin, an oscillating thread-guiding  
arm having a slot at its inner end, a pin en-  
5 gaging said slot, a lug on said arm, an ex-  
pansive spring between said lug and pin, an  
anti-friction roller upon said arm engaging  
said cam-groove, a star-wheel engaged and  
turned intermittently by said pin of the gear-  
10 wheel, and an involute scroll on the shaft of the

star-wheel engaging said lug, so as to shift the  
arm longitudinally on its pivot and gradually  
enlarge the oscillations of its outer end.

In testimony that I claim the foregoing as my  
invention I have signed my name in presence 15  
of two subscribing witnesses.

OTTO SORGAN.

Witnesses:

PAUL GOEPEL,  
SIDNEY MANN.