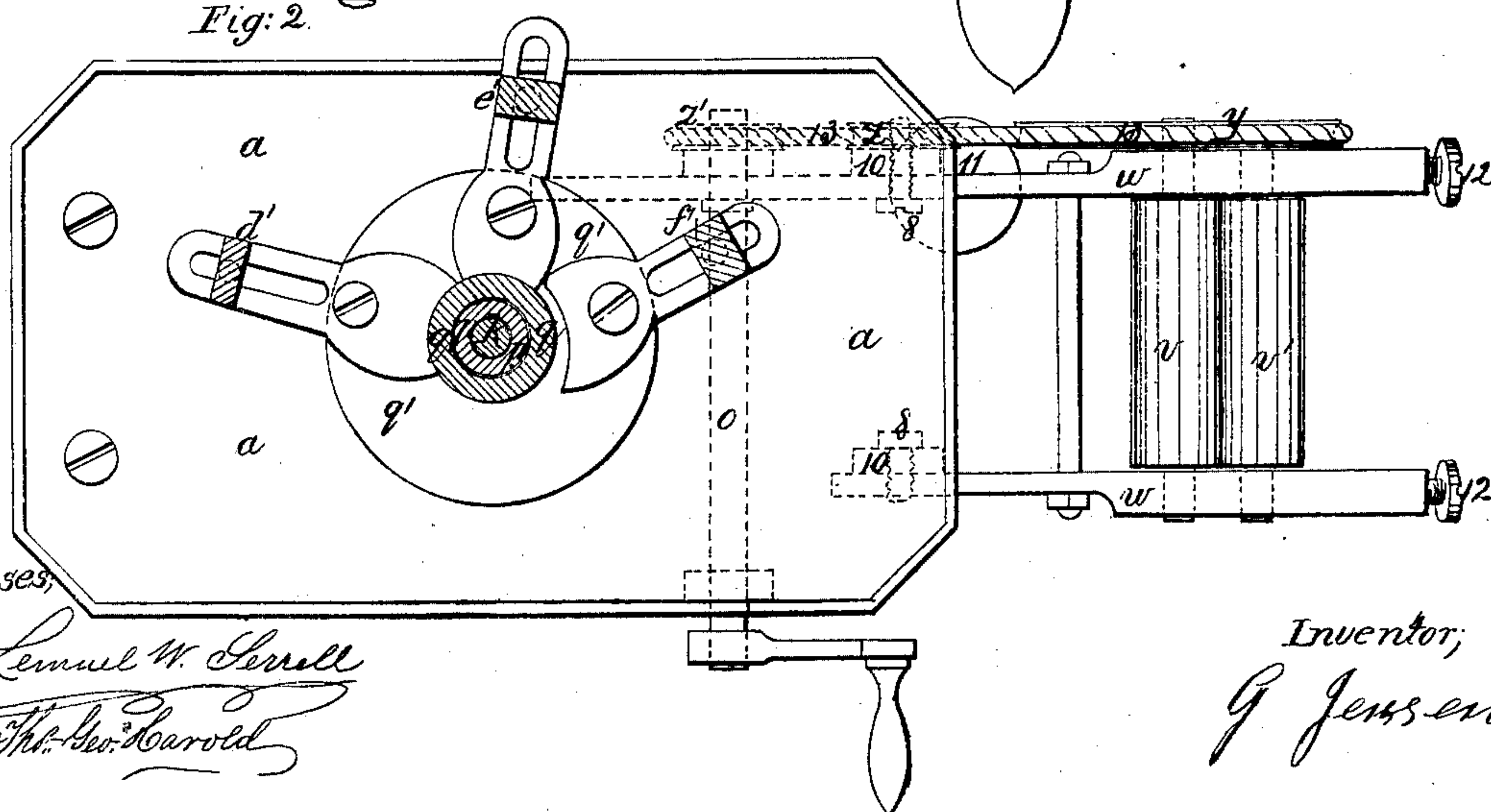
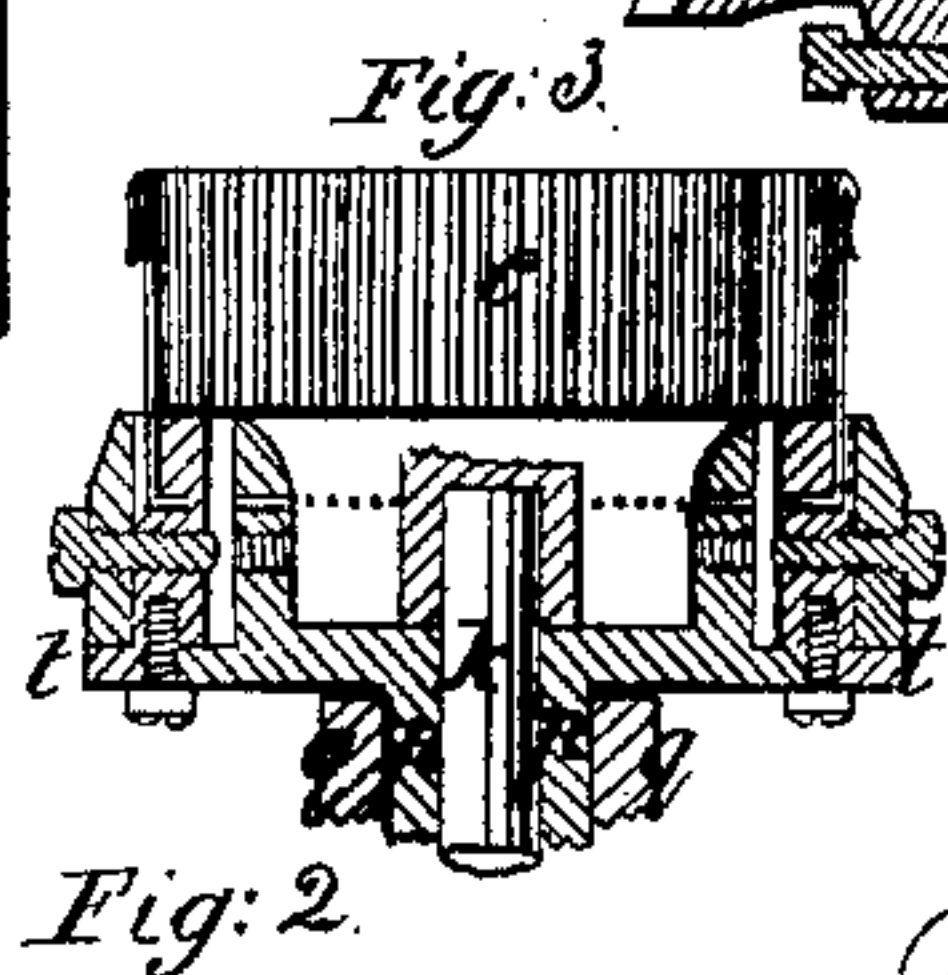
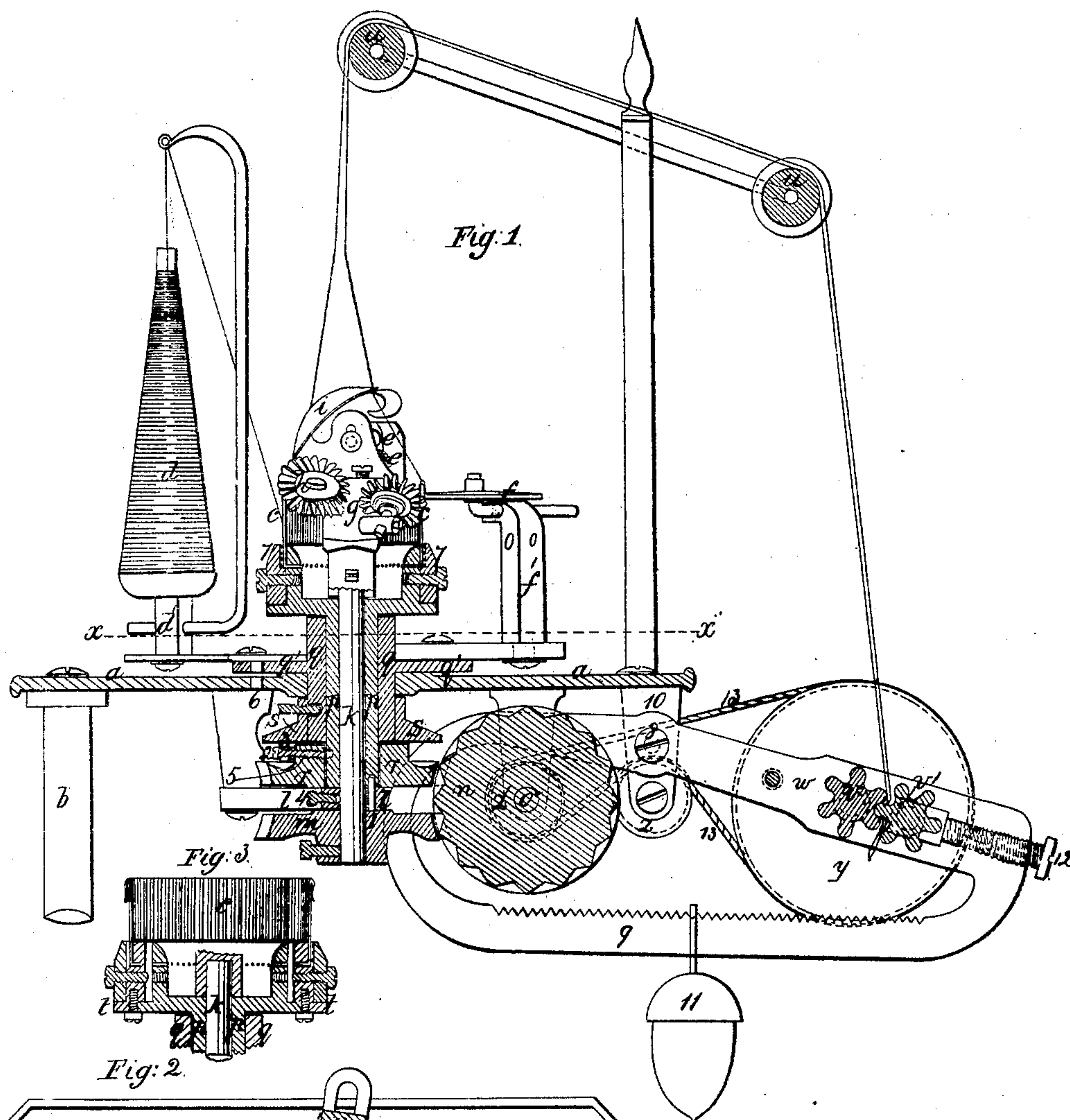


G. Jensen.
Knitting Mach.

N^o 45,501.

Patented Dec. 20, 1864.



Witnesses,

Lemuel W. Serrell
Thos. Geo. Harold

Inventor,
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UNITED STATES PATENT OFFICE.

G. JENSEN, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN KNITTING-MACHINES.

Specification forming part of Letters Patent No. 45,501, dated December 20, 1864.

To all whom it may concern:

Be it known that I, GOODMAN JENSEN, of Brooklyn, E. D., in the county of Kings and State of New York, have invented, made, and applied to use a certain new and useful Improvement in Knitting-Machines; and I do hereby declare the following to be a full, clear, and exact description of my said invention, reference being had to the annexed drawings, making part of this specification, wherein—

Figure 1 is a vertical longitudinal section of my said machine, and Fig. 2 is a sectional plan at the line *x x*.

Similar marks of reference denote the same parts.

Machines have heretofore been constructed in which the needles were arranged in a circle, and remained stationary while the bobbin of yarn, the feeding-gear, and the wheel to close the barbs traveled around the outside of such cylinder in unison with the cloth-presser and gears that traveled within such cylinder of needles. Such devices may be seen in the knitting-machine of Joseph Dalton, and in the patent granted to him May 7, 1861.

The nature of my said invention consists in an arrangement of inclined or screw gear applied to this class of knitting-machines whereby the parts are simplified and noise is avoided. I also fit my machine in such a manner that cylinders of different sizes can be employed containing a greater or less number of needles, whereby the size of stocking knitted or its fineness can be varied; and I fit my machine in such a manner that the bobbin and gears can be made to stand still while the cylinder revolves, thereby adapting my machines to manufactories where the goods are rotated as they are made; and I provide a take-up motion that is noiseless in its operation and draws the fabric off the machine as knitted, keeping a uniform tension thereon.

In the drawings, *a* is the bed sustained by the legs *b*, of any usual form. *c* is a cylinder of needles with the barbs outward. *d* is the bobbin from which the yarn passes through guides to the feeding-gear *e*, that is formed of inclined blades upon a hub that rotates upon a diagonal axis. *f* is a wheel that acts to close the barbs at the time the internal gear *g* raises the previous loop over such barbs; *h* is the delivery or landing gear that draws up the loops above the ends of the needles; and *i* is

the cloth-presser that is formed eccentric to keep a proper tension on all parts of the fabric. These parts being of a well-known construction and operating in the usual way, do not require any further description. I will therefore proceed to specify how I apply my improvements in connection with such parts.

The gears *g* and *h* are on gudgeons projecting from a head on a vertical shaft, *k*, which gudgeons may be adjusted so as to adapt the gears to larger or smaller cylinders of needles, and the shaft *k* passes through a step, *l*, below the bed *a*, where it receives a gear, *m*, formed with inclined teeth, that are acted upon by a screw-formed gear, *n*, on the shaft *o*, which shaft is driven by a crank-handle or otherwise. The cylinder of needles *c* is upon the pipe *p*, that rests upon the step *l*, and is prevented from turning by the pin *1*, that passes up through its step into the end of said pipe. This pipe *p* surrounds the shaft *k*, and is itself surrounded by the pipe *q*, which rests at its lower end on a gear, *r*, similar to the gear *m*, and also actuated by the screw form gear *n*, and said pipe *q* rotates in a bearing or journal-box formed in the bed *a*, and terminates near its upper end as a disk, *q'*, to which the standards of the bobbin *d*, gear *e*, and wheel *f* are attached.

The gear *n* is made with diagonal blades or ribs upon its surface, so as to form a section of a many-threaded screw, and located midway, so as to operate upon the gears *m* and *r* and rotate them in unison, and at the same time noiselessly. The gear *r* turns on the lower end of *p* and communicates rotation to the pipe *q* through the agency of a projecting pin, *2*, on said gear, acting upon a pin, *3*, that is introduced in a disk, *s*, that is attached on the said pipe *q*, so that the bobbin *d*, the feed-gear *e*, and closing-wheel *f* travel around the stationary cylinder of needles in unison with the gears *g* and *h*, that travel around the inside of said cylinder of needles and are rotated by the gear *m*.

If the character of work to be done or the mechanism already in use in any manufactory for drawing off the fabric requires that the said fabric be rotated, my machine can be changed with but little trouble so that the cylinder of needles *c* will revolve and the other parts remain stationary. For this purpose I take the gear *m* off the lower end of the shaft

k and screw in a screw, 4, through the step l , so as to hold said shaft k stationary. I remove the pin 2 by unscrewing it and attach the gear r to the shaft p by screwing in the screw 5, that at other times remains loosely in the hub of said gear r , and when screwed in the point of said screw should enter a hole in p , and I withdraw the pin 1. This causes the gear r to rotate the cylinder of needles and not to operate on q , and, in order to hold the bobbin d and other parts on the disk q' stationary, I introduce a pin or screw through holes in said disk q' and bed a , as at 6, Fig. 1.

Fig. 3 shows a section of a larger cylinder of needles as applied to this machine, whereby the number of stitches can be increased. For this purpose I remove the clamping segments 7, that hold the needles c , and take said needles away. I then place the ring t upon the flange of the needle-cylinder and secure it by screws introduced from below, or otherwise. By having the cylinder c adapted to the smallest number of needles the other cylinders may contain any other additional number desired, according to the size of ring t , that may be applied.

In order to allow for the introduction of different sizes of cylinders, I fit the standards d' , e' , and f' of the gear e , wheel f , and bobbin d on slotted arms extending from the disk q , whereby the said standards and the parts they carry may be moved farther away or nearer to the cylinder of needles, to act correctly upon any diameter of such cylinder of needles.

The fabric as woven passes away over the rollers $u u$, as shown by red lines, and thence goes to the take up apparatus. This take-up is composed of fluted rollers $v v'$, set in a frame, w , that is attached by and swings on screws 8 in hangers 10, and one side of this frame w

is formed with a scale-beam, 9, below it, upon which the weight 11 hangs.

The rollers $v v'$ are pressed together by springs acting upon the journal-box of v' , and themselves compressed by the screws 12; and y is a wheel on the axis of the roller v , from which a belt, 13, passes over the tightening-wheel z to a wheel, z' . (Shown by dotted lines on the shaft o .) By this arrangement a constant strain will be maintained upon the fabric, for when the knitting allows the rollers $v v'$ to descend the belt 13 will be tightened and rotate the rollers $v v'$ and roll them up on the fabric, while the belt itself is slackened by the act of thus causing the rollers to progress up the knitted fabric, and eventually ceases to turn the rollers until again tightened by the descent of said rollers resulting from the addition of knitted fabric.

What I claim, and desire to secure by Letters Patent, is—

1. The screw-formed gear n and gears m and r , in combination with the shafts k and q , for rotating the bobbin, gears, and wheels inside and outside the stationary cylinder of needles, as specified.

2. The changeable ring of needles, fitted substantially as specified, in combination with the adjustable standards e' , f' , and d' of the gear e , wheel f , and bobbin d , as specified.

3. The take-up rollers $v v'$, in combination with the belt 13, and wheels or pulleys y , z , and z' , arranged and acting substantially as specified.

In witness whereof I have hereunto set my signature this 26th day of September, A. D. 1863.

G. JENSEN.

Witnesses:

LEMUEL W. SERRELL,
THOS. GEO. HAROLD.