

T. B. Smith,
Wire Twisting Machine,
No. 63,570, *Patented Apr. 2, 1867*

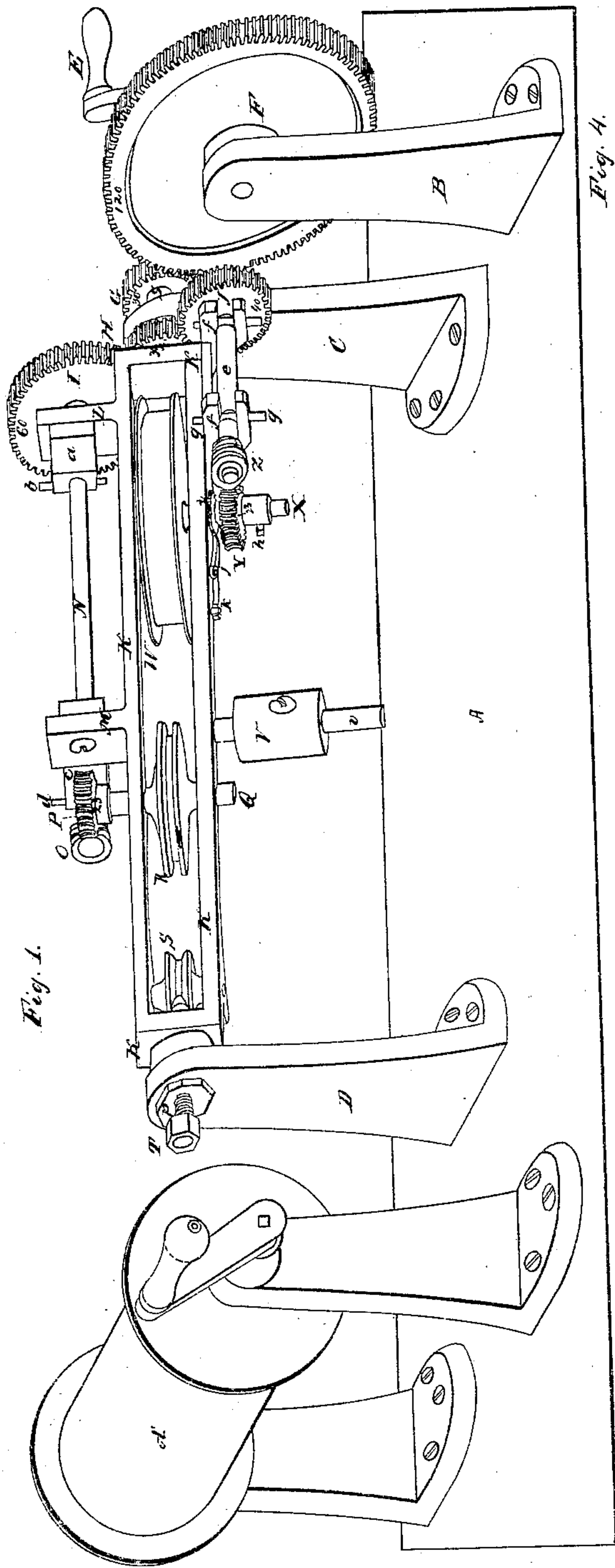


Fig. 1.

Fig. 4.

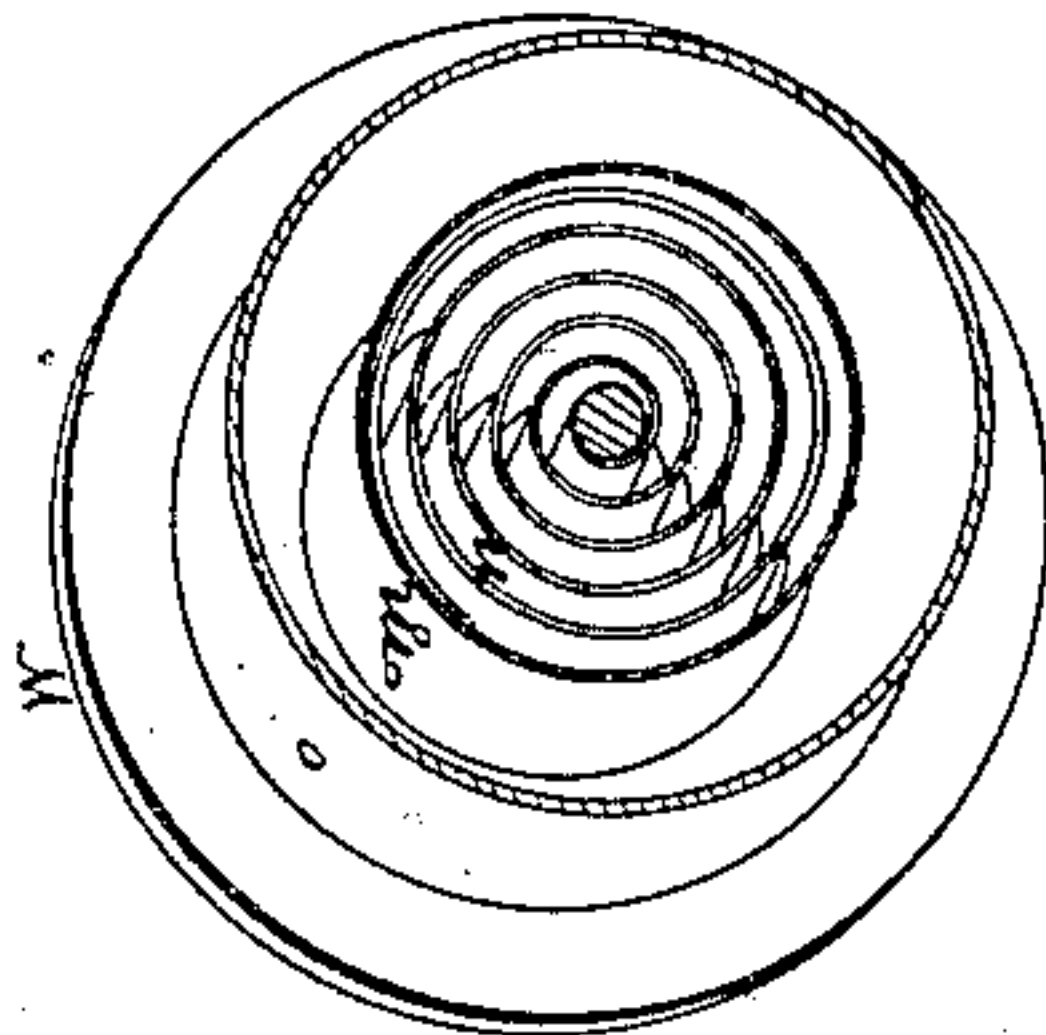


Fig. 3.

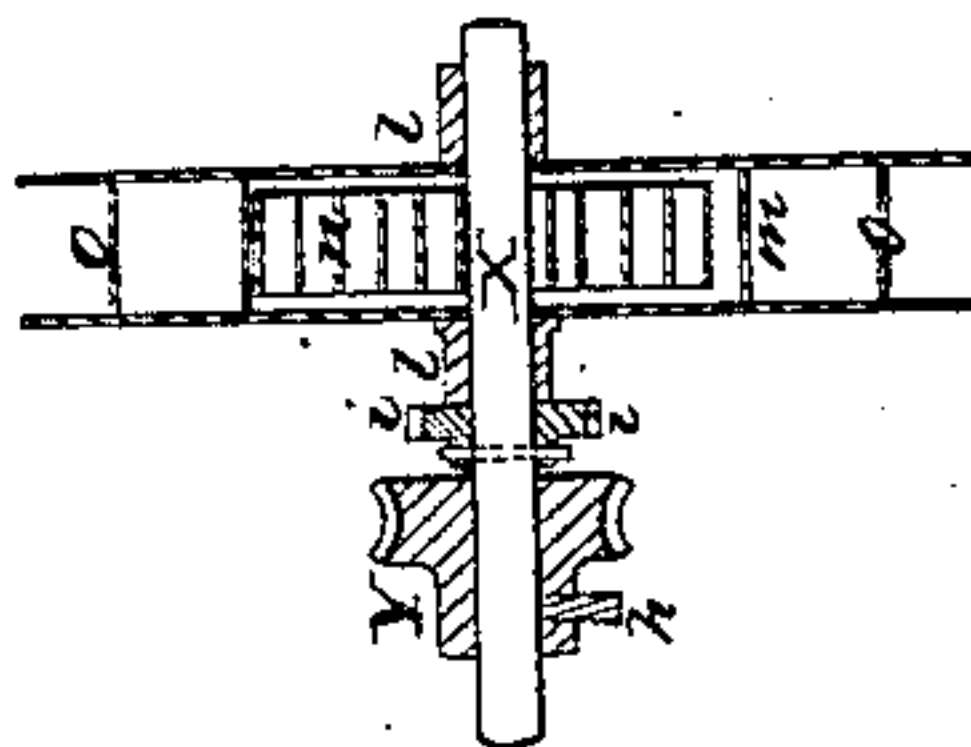


Fig. 2.

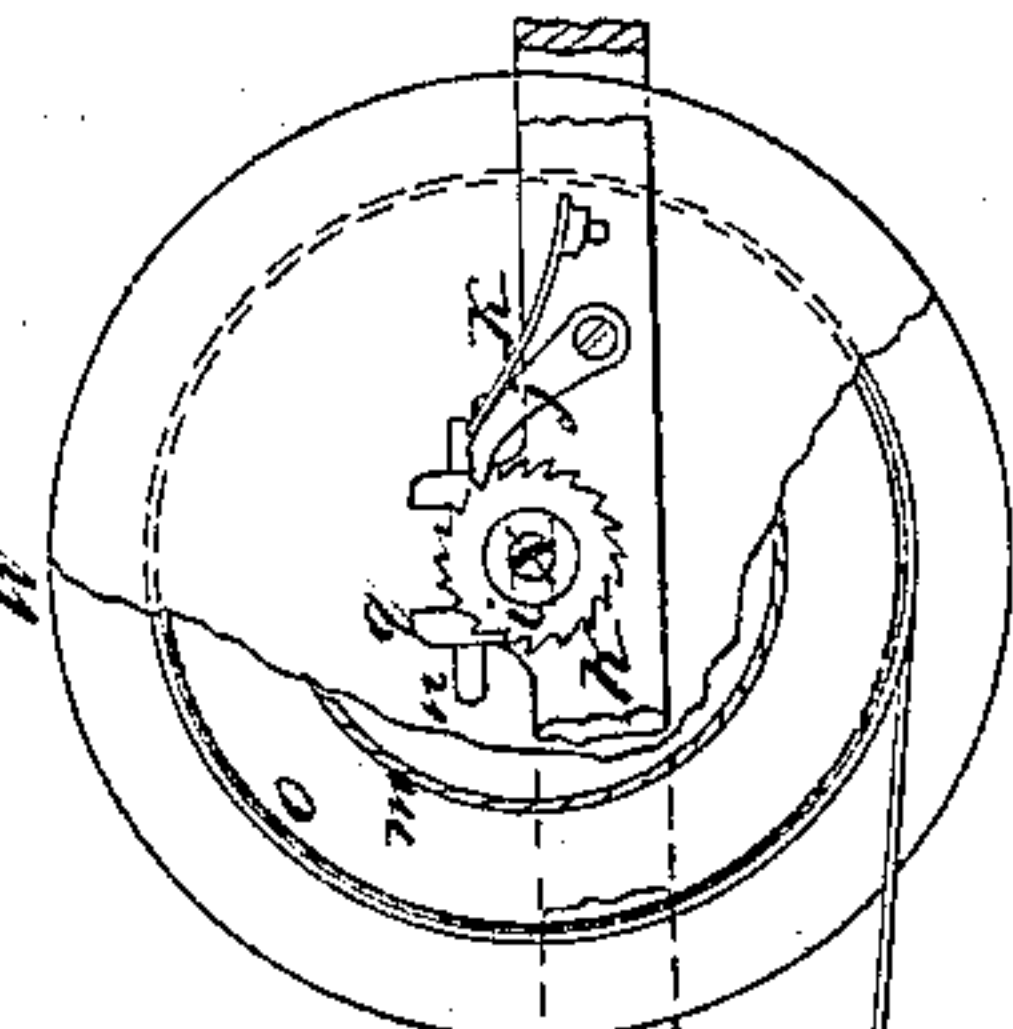
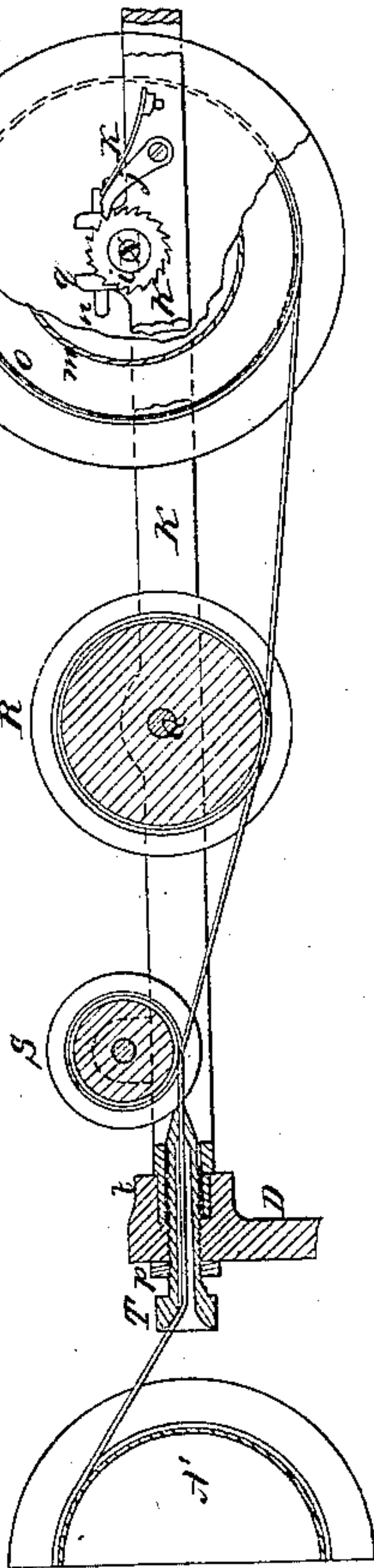


Fig. 5.



Witnesses
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Inventor
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By his Attorney
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T. BRIGGS SMITH, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO HIMSELF
AND ELMER TOWNSEND.

Letters Patent No. 63,570, dated April 2, 1867.

IMPROVED MACHINE FOR TWISTING WIRE.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, T. BRIGGS SMITH, of the city of Boston, in the State of Massachusetts, have invented a new and useful Machine for Twisting Wire; and I do hereby declare the following to be a full and correct description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of the machine complete.

Figure 2 is a longitudinal, vertical, central section of a part of the machine.

Figure 3 is a transverse vertical section of the spring drum and the parts connected therewith.

Figure 4 is a perspective view of the spring drum, with one of its sides removed, to show the interior arrangement; and

Figure 5 is an end view of the feeding die through which the wire passes to the machine.

The same part is marked by the same letter of reference wherever it occurs.

The nature of this invention consists in the peculiar construction, arrangement, and operation of a machine for imparting a permanent twist to wire, and varying the degree of twist, as may be found desirable, all as hereinafter more particularly set forth.

To enable others skilled in the art to make and use my machine, I will proceed to describe its construction and operation, referring to the drawing, whereon A marks the base of the machine, and B, C, and D the stanchions which support the operating parts. E marks a winch, which indicates the point at which power of any suitable kind may be applied to the machine to drive it. This winch turns the driving-wheel F, which has one hundred and twenty teeth, and which gears into the cog-wheel G, the latter having thirty teeth, and consequently making four revolutions to each revolution of wheel F. The shaft *s* of wheel G passes through stanchion C and wheel H, and is attached to the revolving frame K, of which it forms a journal. The wheel H, which has thirty teeth, is immovably affixed to stanchion C. The other extremity of frame K is supported and turns on journal *t*, which works in a box in the upper end of stanchion D. The rotation of the frame K imparts motion to the operative parts of the machine, all of which are connected with it. The brackets L and M support the shaft N of the cog-wheel I in journal-boxes *a c*, the shaft being confined by the pins *b d*. The wheel I has sixty teeth, and gears into the stationary wheel H, from which it receives motion when the frame K rotates, making one revolution for every two revolutions of the frame. The other end of shaft N carries worm O, which has three convolutions, and gears into worm-wheel P, which has twenty-three teeth, and which is attached to the end of the shaft Q of drawing-wheel R. A grooved spool, S, is hung in frame K, near the end at which the wire is introduced through die T, its office being to guide the wire directly through the die, and prevent its passing through at an angle. The die T is seen in section in fig. 2, and in end view in fig. 5. It has a screw-thread cut on its outer surface, by which its position in the head of stanchion D is adjusted, a nut, *p*, holding it in any position to which it may be adjusted. The outer end of die T has a flared aperture, through which the wire is introduced. Its inner end is contracted, and has an aperture of the exact size and shape of the wire to be operated upon. In the present case this aperture is diamond shaped. Hung in journals *f f*, attached to frame K, is the shaft *e* of cog-wheel J, which has forty teeth, and receives motion from the rotation of frame K by reason of its gearing into the stationary wheel H. On the opposite end of shaft *e* is worm Z, having four convolutions, and meshing into worm-wheel Y, which is fixed to shaft X by set-screw *h*. To the same shaft is attached ratchet-wheel *z*, into which plays the pawl *j*, actuated by the spring *k*. The shaft X (see fig. 3) passes through the journals *l l* of spring drum W, which are hollow to receive it, and turn on it as their axis. The drum W, (see fig. 4,) on the surface *o* of which the twisted wire is to be wound, has no connection with the operative parts of the machine except through the spring *n*, which is contained in and attached by its outer end to an interior circular box, *m*, its inner end being fastened to shaft X. V is a counterpoise, adjustable on shaft *v*, and fixed at any point on that shaft by means of a set-screw. Its purpose is to counter-balance the parts attached to the opposite side of frame K. A' marks a drum, from which the wire is wound off as it enters the machine. Its motion may be controlled by a brake of any convenient form.

The operation of the machine is as follows: The wire to be twisted is polygonal in form, and is wound from drum A', passing through die T, over wheels S and R, and attached to drum W, which, by the operation of spring *n*, keeps it at the proper tension and winds it as fast as it is twisted. The wheel S, as before

observed, guides the wire directly through the die, the wheel R draws it, and the drum W winds it. When the end of the wire has been attached to drum W, motion is given to the machine, and the revolution of frame K imparts a twist to the wire as it passes through the die. The amount of twist given to the wire will depend upon the speed at which it is drawn through the die, the rate of rotation of the frame K being constant. The rate at which the wire is drawn through the die will depend on the size of the drawing-wheel R, which may be varied at pleasure. The drawing-wheel R, it will be observed, receives motion from a gearing wholly independent of the drum W, viz, through wheel P, worm O, and wheels I and H. The drum W is turned by the spring *n*, and as it turns winds upon its outer surface the twisted wire as fast as it comes from wheel R. But as this motion depends upon spring *n* being wound up as fast as it runs down in turning the drum, I have provided for turning the shaft X, to which the inner end of the spring is attached, by means of worm Z on the end of shaft *e* of cog-wheel J, said worm gearing into worm-wheel Y attached to shaft X. The ratchet and pawl *i j* serve to retain the tension until it is needed to operate the drum. In this way the expenditure of the force of the spring is constantly compensated, and the wire is wound upon the drum at an even tension, and without straining any portion of the machine. When the drum W is full, the machine is stopped, and the wire wound off on an ordinary drum or spool in any convenient manner.

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

1. The adjustable die T, constructed and operating as described.
2. The drawing-wheel R, hung in the revolving frame K, and arranged and operated in the manner specified.
3. The drum W, hung in the revolving frame K, and constructed and operating as set forth.
4. The combination of worm-wheel Y, operated as described, with shaft X, ratchet *i*, and spring *n*, in the manner and for the purpose specified.
5. An improved machine for imparting a regular and adjustable twist to wire, constructed, arranged, and operating substantially in the manner described.

The above specification of my said invention signed and witnessed at Boston this 18th day of June, A. D. 1866.

T. BRIGGS SMITH.

Witnesses:

CHAUNCEY SMITH,

CHAS. F. STANSBURY.