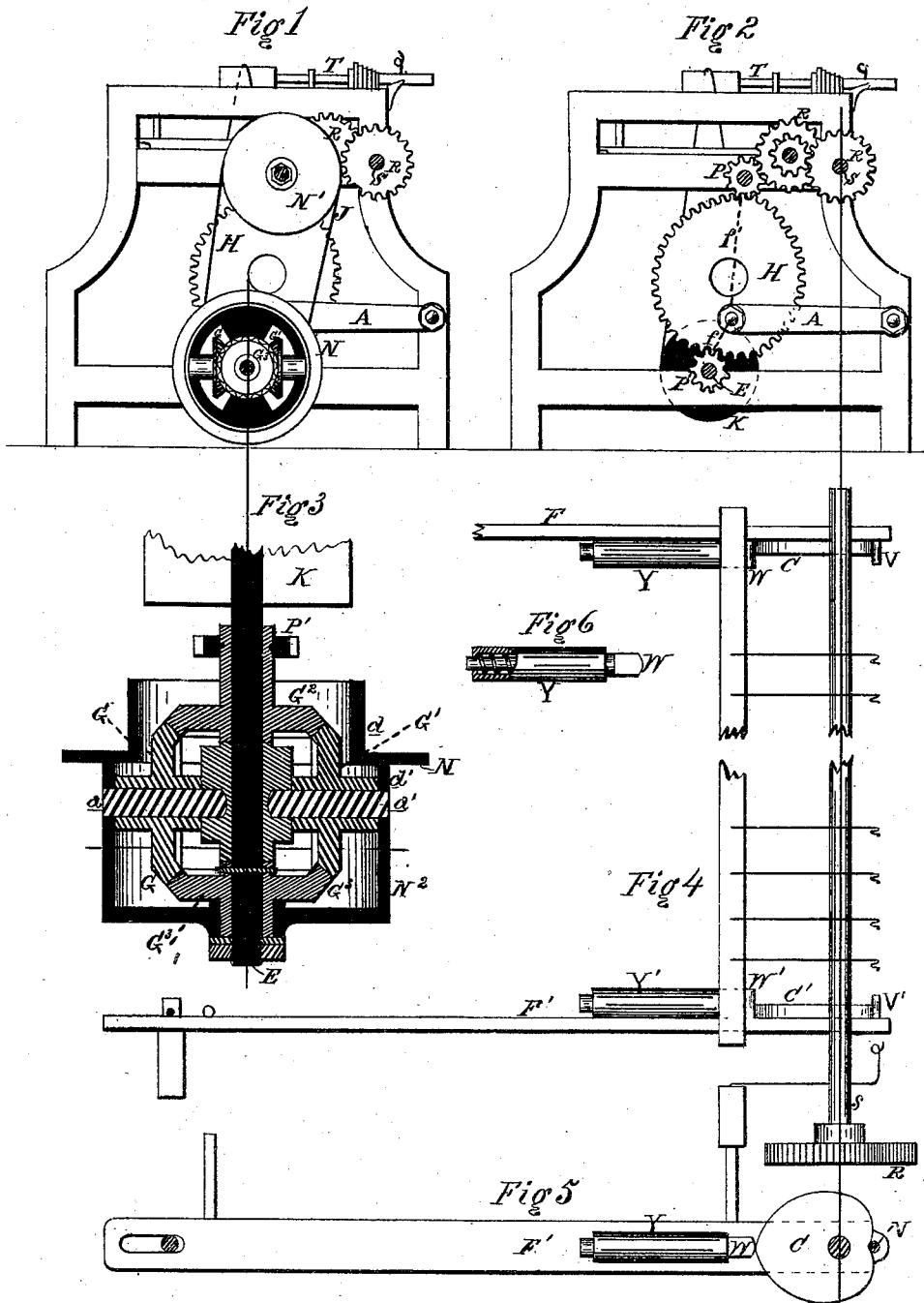


F. H. Morrill,

Bobbin Winder.

No. 113,325

Patented Apr. 4. 1871.



Witnesses.

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Letters Patent No. 113,325, dated April 4, 1871.

IMPROVEMENT IN MACHINES FOR WINDING BOBBINS.

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

I, FRANKLIN H. MORRILL, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Machine for Winding Bobbins, of which the following is a specification.

Nature and Objects of the Invention.

This invention relates to certain improvements on the machine patented by me under date of September 21, 1869, No. 95,034, in which a variable rotary motion is given to the bobbins through a heart-shaped gear, the object of which is to cause the bobbins to revolve slower while the yarn is passing onto the base of the cone part, and with increased velocity while passing to the apex of the cone part of the bobbins.

In my former patent a difficulty was experienced with the belt which communicates motion to the spindle-driving cylinder. This belt was liable to slip and lose motion as the speed increased, and, consequently, cause a lost motion of the bobbins, thus preventing the yarn from winding as closely and firmly as desirable. To overcome this I dispense with the said belt, and employ a series of compound gear-wheels, so arranged, in connection with the heart-shaped gear, as to produce an increased number of revolutions of the cylinder and spindles while the heart-gear is making one. The traverse mechanism is arranged in such a manner as to move slower while the yarn is passing over the large part of the bobbin, and faster when passing over the small part thereof.

Description of the Accompanying Drawing.

Figure 1 is an end elevation of a bobbin-frame with my improvement applied.

Figure 2 is a similar view of the same with portions of the gearing removed.

Figure 3 is a sectional view enlarged of the compound gearing used.

Figure 4 is a plan view of the traverse motion enlarged.

Figure 5 is a side view of a portion of the same.

Figure 6 is a detached view of a sliding bolt used in connection with the traversing-bars.

General Description.

The heart-shaped gear H is applied to the swinging arm A, and is located between the pinions P and P', fig. 2, one placed above it and the other on the shaft E, immediately below it.

The pinion P transmits motion, through the gearing R R, to the shaft S of the traversing-frame.

The mechanism for producing a more positive motion, and to compensate for the lost motion, which might otherwise occur with the belt before alluded to,

consists of the bevel-gear wheels G, G¹, G², and G³, which are placed in the interior of a driving-pulley, N, fig. 3.

The axes *a* and *a'* of the wheels G and G¹, which are at right angles to the axes of the wheels G² and G³, are secured to the hub and to the rim of the pulley; and the wheel G², provided on its hub with the pinion P', is placed loosely on the shaft E, while the wheel G³ is keyed to and revolves with the shaft.

The pulley N is made with double faces, *d* and *d'*, of a large and small circumference, over one of which, *d'*, is passed the belt for giving motion to the machine; and on the face *d* is placed an intermediate belt, J, which also passes over a pulley, N¹, and communicates motion to the pinion P, fig. 2, secured to its hub.

A loose pulley, N², fig. 3, is also placed on the shaft E, and upon it the driving-belt is to be shifted at will.

Motion is transmitted from the pinion P through the gearing R R to the shaft S of the traversing-frame.

The said shaft has secured on it two heart-shaped cams, C and C', figs. 4 and 5, which are located between a fixed and movable point, placed on the inside of each of the traversing-bars F and F'.

The compound gear, arranged as shown at fig. 3, will produce rapid revolutions of the cylinder K and the spindles T, while the heart-shaped gear is moving the pinion P' at a slow rate of speed.

The pulley N is driven at the same rate of speed under all circumstances, and the pinion P', which plays into the teeth of the heart-gear, and is loose on the shaft E, receives a motion through the belt J, pulley N¹, pinion P, and heart-shaped gear, and conveys it, by means of the bevel-gear G², to the wheels G, G¹, and G³.

When the heart-shaped gear, during its revolutions, has reached the position shown in fig. 2, it will be seen that the leverage *f*, between the center of motion of it and the pinion P', will be small, while the leverage *f'*, between the pinion P and the center of motion, will be greater; consequently, the speed of the pinion P' will be increased, which will therefore cause the gear-wheels G and G¹ to revolve faster on their own axes *a* and *a'*, thus revolving the shaft E and cylinder K faster than at other times. The thread is now winding onto the small part of the cone on the bobbin.

When the leverage is greater between the pinion P' and the center of motion of the heart-gear the pinion will be caused to revolve more slowly, which produces a decreased number of revolutions of the bevel-wheels G and G¹; and as these wheels not only revolve on their own axes, but are carried around in the same direction with the pulley N, (which is loose on the shaft,) they will cause a decreased number of revolutions of the shaft E and cylinder K. The traversing-bars are now

traveling at a slower speed, and the yarn is winding upon the large part of the bobbins.

The cams C and C' placed on the shaft S of the traversing-frame, as shown in figs. 4 and 5, work between fixed studs, V and V', and movable bolts, W and W', placed on the inside of the traversing-bars F and F'.

The sliding bolts W and W' are surrounded by coiled springs placed in casings Y and Y', secured to the inside of the bars F and F'. They thus form movable points, which are constantly in contact with the cams as the bars slide in and out.

The object in arranging these points thus is to allow a free movement of the cams between the studs V and V' and movable bolts W and W', said cams being of such a shape as to give a gradual increase of speed to the traversing-bars and thread-guides, to correspond with the increasing revolutions of the bobbins while the thread is passing from the large part of the cone on the bobbin to the small part thereof.

The coiled springs surrounding the bolts W and W' are of sufficient elasticity to hold the bars F and F' backward, and, at the same time, to permit the

bolts to yield sufficiently to allow the cams to pass freely around.

The fixed studs V and V' are thus also retained constantly in contact with the revolving cams, and, as they (the cams) turn from the heel to the point upon the said studs, they produce a gradual increased motion of the traversing-bars, and a decreased motion as they turn from the point toward the heel.

I claim as my invention—

1. The compound gear-wheels G, G¹, G², and G³, and pulley N, arranged as described, on the shaft E, in combination with the heart-shaped gear H, pinions P P', pulley N¹, and belt J, in the manner and for the purpose herein specified.

2. The combination, with the cams C C' and traversing guide-bars F F', of the fixed studs V V', sliding bolts W W', and casings Y and Y', as and for the purpose herein described.

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Witnesses:

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