C. Z. MATTISON.

Spinning-Machine.

No. 162,246. Patented April 20, 1875.

FIG. 1.

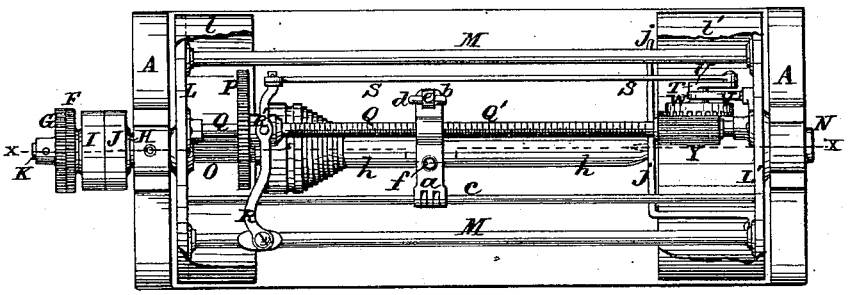


FIG. 2.

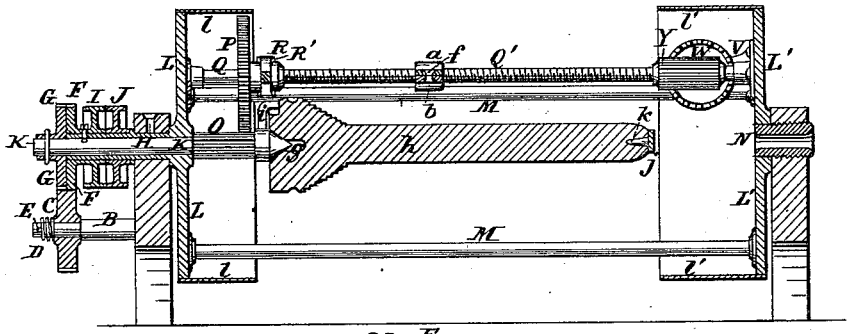
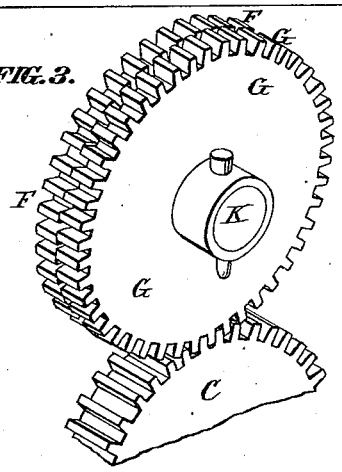


FIG. 3.



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CHARLES Z. MATTISON, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN SPINNING-MACHINES.

Specification forming part of Letters Patent No. **162,246**, dated April 20, 1875; application filed October 10, 1874.

To all whom it may concern:

Be it known that I, CHARLES Z. MATTISON, of St. Louis, St. Louis county, Missouri, have invented a certain Improved Spinning-Machine, of which the following is a specification:

This is an improvement on my spinning-machine, for which a patent issued, dated 29th September, 1874.

My present improvement consists, first, in the device to cause the differential rotation of the bobbin and the flier, to cause the winding of the yarn. In this the spindle is secured to a spur-wheel, and the flier is secured to another spur-wheel, beside the first, but having either a less or greater number of cogs. Another spur-wheel, turning freely on its arbor, engages with both of the others, which gives to them a differential rotation, and causes the bobbin and flier to rotate at slightly different speeds, so as to cause the winding of the yarn upon the former.

The second part of my improvement consists in the device for winding the yarn on the bobbin in the condition of a number of overlapping cones, so that it shall be properly arranged for unwinding therefrom. In this a sleeve, to which the bobbin is secured, is cut with cogs having considerable length, and engaging a spur-wheel fixed on a screw-shaft, running from end to end of the flier, and carrying at the other end a spur-gear cylinder or spur-wheel with long cogs, engaging a crown-wheel that carries a crank, connected by a rod to a lever, by which the screw-rod receives endwise reciprocation. The screw-rod passes through a screw-clutch having an eye, through which the yarn passes. The rotation of the screw carries the clutch gradually to the point of the bobbin, to wind the yarn thereon, and the crank upon the crown-wheel gives the clutch the necessary reciprocating motion to wind the yarn in the proper conical layers upon the bobbin.

In the drawings, Figure 1 is a top view with parts broken away. Fig. 2 is an axial section at line *x x*. Fig. 3 is an enlarged perspective view of the differential gearing.

A is the stand. B is an arbor giving bearing to the spur-wheel C, that turns freely thereon, and is kept steady by a spiral spring, D, and pin E. The wheel C engages with two spur-wheels, F and G, which are side by side. The cogs in the wheel F are two, fewer in number than those of the wheel G, and as they both engage the wheel C, the rotation of the wheel F is somewhat quicker than that G. The object of this is to cause the flier (to which the cog-wheel F is connected) to rotate a little faster than the bobbin, (to which the wheel G is connected,) so as to wind the yarn upon the bobbin. H is a sleeve, to which the cog-wheel F is fixed, and beside the wheel F is a fast pulley, I, on which is a driving-belt. Beside the fast pulley I is a loose pulley, J, on which the belt runs when the machine is at rest. The sleeve H has journal-bearing in the frame A, and to it is attached a disk, L, connected to another disk, L′, by rods M, the latter disk being centrally perforated, and carrying a tubular journal or gudgeon, N, through which passes the sliver or roving. The gudgeon N has bearing in the frame A. *l l* are inwardly-projecting flanges on the disks L L′. Upon the spindle K is a cog-wheel, O, having considerable length, to allow of the longitudinal reciprocation of the cog-wheel P, with which it engages. The wheel P is fast upon a shaft, Q, turning in bearings in the disks L L′, and having endwise reciprocation, to distribute the yarn upon the bobbin. R is a lever, pivoted to one of the bars M, and having an aperture, R′, through which passes the shaft Q. The lever is between the hub of the wheel P and a fixed collar, so that the oscillation of the lever causes the endwise reciprocation of the shaft. The end of the lever is connected by a rod, S, to the crank T upon a shaft, U, turning in bearing V, and carrying a crown-wheel, W, engaging with a cog-wheel, Y. The cog-wheel Y is long, as shown, to allow the endwise reciprocation of the shaft without disengaging the wheels W and Y from one another. The central part Q′ of the shaft Q is screw-threaded, and turns in a split nut, the threads being made upon the inner sides of the bars *a b*, which are hinged together upon a slide rod, *c*, extending from the disk L to that L′. The bars *a b* are held together by a pin and lug, *d e*, on the part *b*, as shown. As the shaft Q turns, the screw-

thread Q′ carries the thread-bar *a b* gradually along toward the point of the bobbin to wind the yarn upon it, the yarn passing through an eye, *f*. The end of the spindle K enters a central recess, *g*, in the rear of the bobbin *h*, and the pin *i* upon the spindle also enters a recess in the bobbin, to cause its rotation with the spindle. *j* is a spring-arm, attached to the disk L′, and having an arbor, *k*, entering a central cavity in the point of the bobbin, to hold it in place upon the point of the spindle. The bobbin may be removed when filled, or at any time, by drawing back the spring-arm *j*, so as to draw the arbor-pin *k* from the bobbin.

The operation is as follows: The sliver or roving passes through the tubular gudgeon N and eye *f* to the bobbin. The flier-frame L L′ M, rotating with somewhat greater speed than the bobbin, causes the yarn to wind thereon, which it does by a system of overlapping cones (so as to be easily unwound) by means of slow forward travel of the thread-carrier along the shaft Q, and the reciprocation of the thread-carrier with the shaft. When the bobbin is full it is taken out and another put in, and the split nut opened and the thread-carrier moved back to the rear of the bobbin. In place of the fast and loose pulleys I and J, may be a single pulley (preferably grooved for a round band) turning freely on the sleeve H, and connectable by a clutch with the wheel F. The pulley is moved on the shaft, to engage or disengage the clutch, by a usual lever.

I claim as my invention—

1. The combination of the wheels C, F, and G, when the wheels F and G vary as to the number of teeth, and are connected, respectively, with the bobbin and flier-frame, so as to give positive rotation to both and at different speeds.

2. The combination of cog-wheels O and P, a shaft, Q, with cog-barrel or wheels Y and W, crank T, rod S, and lever R, substantially as and for the purpose set forth.

3. The combination of the cog wheels O and P, screw-shaft Q Q′, thread-carrier *a b*, with split nut engaging the shaft, wheels W and Y, crank T, rod S, and lever R, all constructed and operating substantially as and for the purpose set forth.

CHARLES Z. MATTISON.

Witnesses:

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ROBERT BURNS.