J. Goulding.

Spinning Mach.

No. 83,375. Patented Oct. 27, 1868.

Fig: 3.

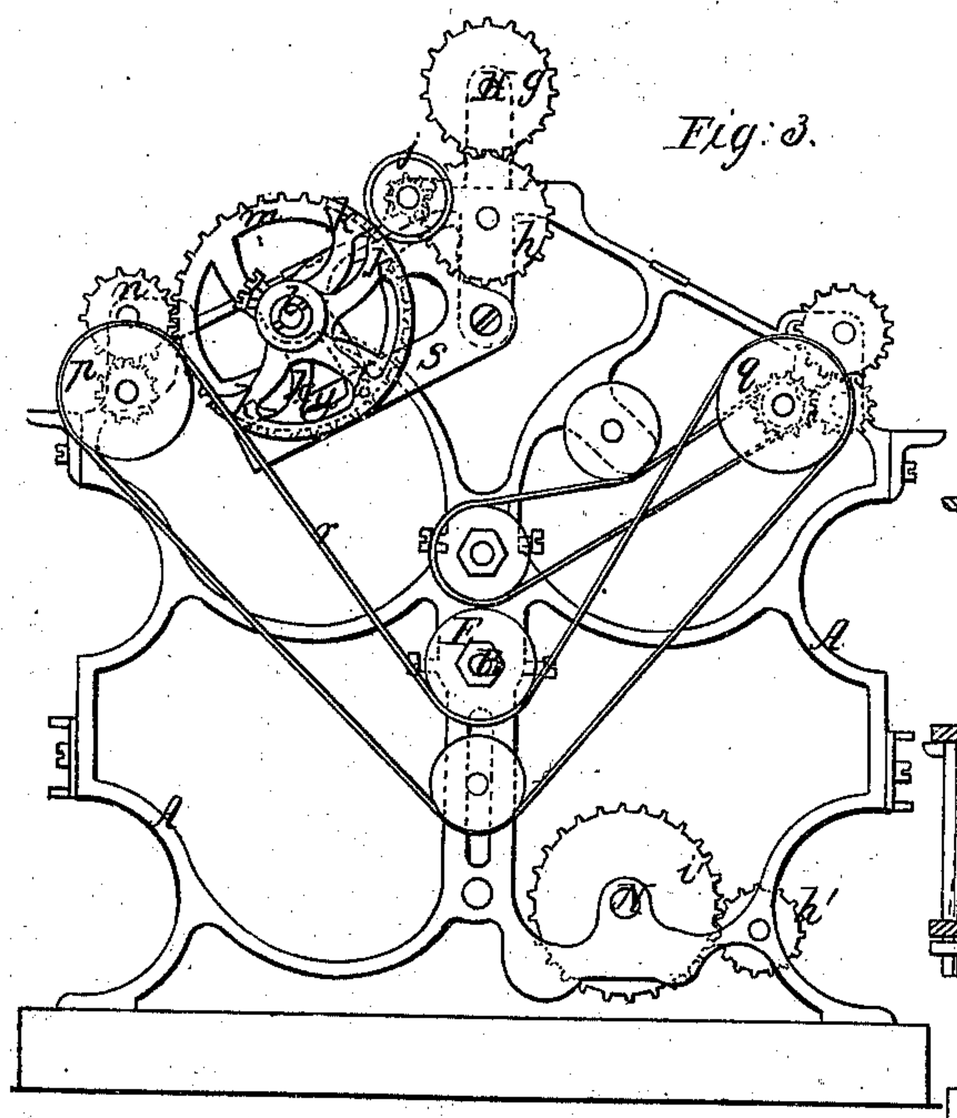

Fig: 1.

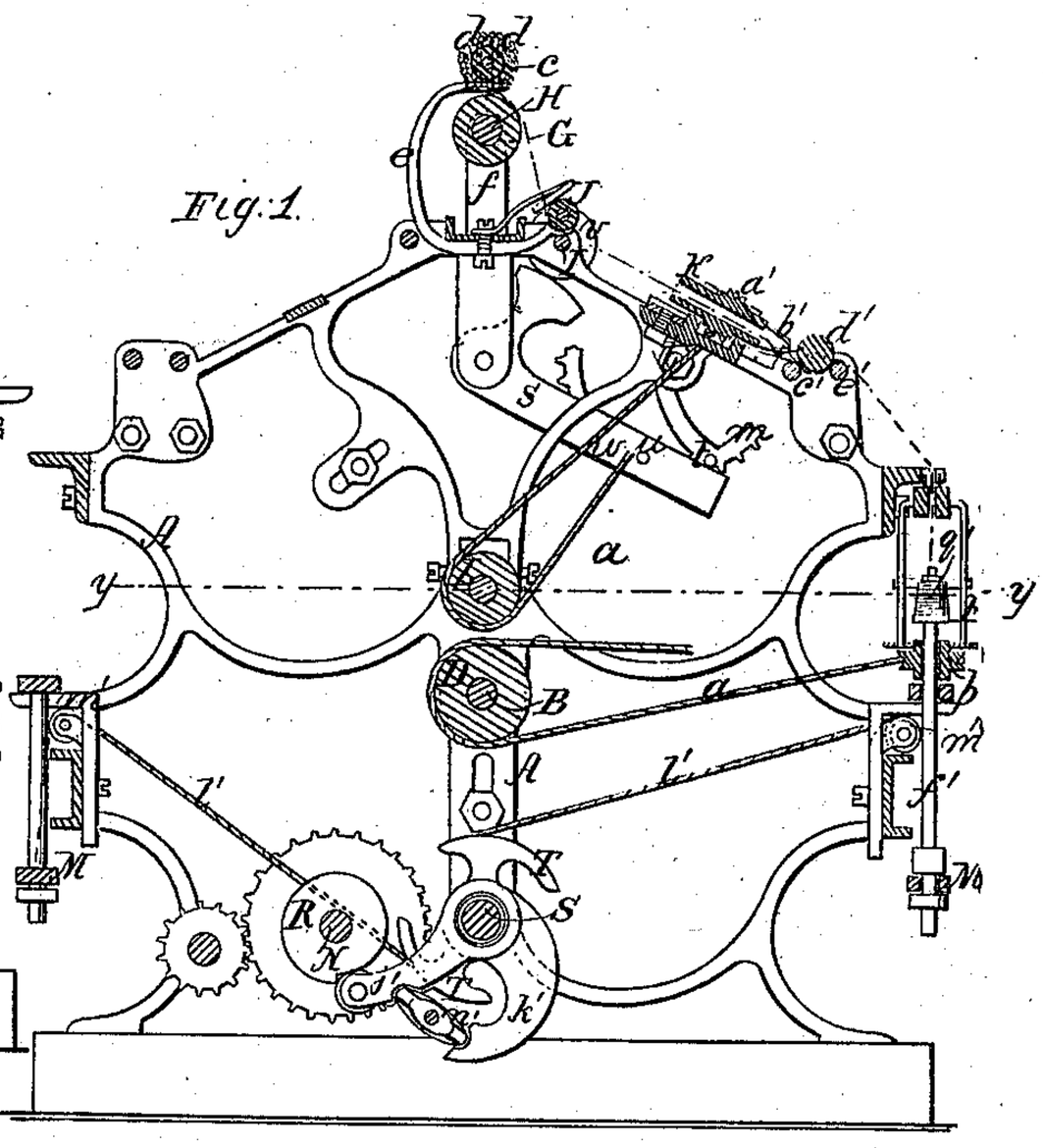

Fig: 2.

Witnesses;

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JOHN GOULDING, OF WORCESTER, MASSACHUSETTS.

IMPROVEMENT IN SPINNING-MACHINES.

Specification forming part of Letters Patent No. **83,375**, dated October 27, 1868.

To all whom it may concern:

Be it known that I, JOHN GOULDING, of Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Machines for Spinning Wool and other Fibrous Materials; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, making part of this specification, in which—

Figure 1 represents a transverse section of a machine embodying this invention, the plane of section being indicated by the line *x x*, Fig. 2. Fig. 2 is a horizontal section thereof, the line *y y*, Fig. 1, indicating the plane of section. Fig. 3 is an elevation of the same.

Similar letters indicate corresponding parts.

This invention relates to a machine in which the roving is fed at intervals to the twisting mechanism, which consists of a revolving tube, the speed of which is governed according to the amount of twist desired. The yarn or thread, after having been twisted, is taken up by spools placed on spindles which are supported by rails, which receive an automatic motion by the action of a conical cam mounted on a longitudinally-sliding shaft, in such manner that cops of the required form are produced with ease and rapidity.

A represents a frame, which forms the bearings for a shaft, B, on which are mounted a fast and loose pulley, C C′, a drum, D, and a pulley, E. From the drum D extends a series of belts, *a*, round the whirls *b* of the fliers F, which are intended to be arranged on both sides of the frame, one flier only being shown in the drawing.

The roving is received from short spools *c*, which rest, by their inherent gravity, on a drum, G, their gudgeons being placed each between two pins, *d*, which rise from curved arms *e*, extending from the top rail of the frame A, and which hold said spools in position, but permit them to bear with their full weight upon the drum G. This drum is mounted on a shaft, H, which has its bearings in standards *f*, rising from the frame A, and it (the shaft) receives an intermittent revolving motion by the following devices: On the end of said shaft is mounted a cog-wheel, *g*, which connects, by an intermediate cog-wheel, *h*, with a pinion, *i*, mounted on the feed-roller I. This roller extends throughout the whole length of the frame A, having its bearings in suitable boxes on the top of said frame, and it acts in connection with a pressure-roller, J, which bears on the roving as the same passes from the spool *c*, over the feed-roller I, to the twisting mechanism.

On the outward end of the feed-roller I, next to the pinion *i*, is also mounted an india-rubber roller, *j*, which is intended to be made as follows: On the shaft of the feed-roller is firmly secured a flange; then the rubber is slipped on and held in place by another flange, which may be secured to the first flange by two or more set-screws, or in any other desirable manner. This india-rubber roller is exposed to the action of a segment, *k*, which is mounted on a stud, *l*, secured in the frame A, and to which a revolving motion is imparted by a train of cog-wheels, *m n o*, and pulleys *p q*, to which motion is imparted by a belt, *r*, from the pulley E on the axle of the driving-drum D. This belt may, however, be replaced by a train of cog-wheels, and in practice I prefer the use of cog-wheels, since they transmit the motion without slip. As the segment revolves, its circumference bears against the circumference of the india-rubber roller *j*, and imparts to the same, together with the feed-roller I, an intermittent revolving motion.

In order to prevent the feed-roller from overrunning itself, or, in other words, to stop the feed-motion as soon as the segment *k* passes out of contact with the india-rubber roller *j*, a brake-lever, *s*, is applied, which is provided with a shoe, and which is actuated by a pin, *t*, projecting from the inner surface of the cog-wheel *m*, and acting at the proper moment on a stud, *u*, secured in the brake-lever, the relative positions of the pin *t* and stud *u* being such that the brake-shoe is forced up at the proper moment against the circumference of a disk, *v*, which is mounted on the axle of the feed-roller I.

The segment-cam *k* is made in two parts, which are secured on the hub of the cog-wheel *m* by set-screws, so that by turning one of the parts the length of the bearing-surface of the cam can be increased or diminished, and the amount of roving fed to the twisting mechanism can be regulated to suit circumstances.

The twisting mechanism consists, princi

pally, of a tube, K, or its equivalent, which rests loosely in forked bearings secured to the , and to which a revolving motion is imparted by a belt, *w*, extending from a drum, L, over a whirl, *a'*, which is secured to the tube K between its forked bearings, and also serves to prevent said tube from moving in the direction of its axis. The tube K is placed in an inclined position, and from its lower end extends a staple, *b'*. The roving, after having been passed through the tube, is wound once round one of the legs of said staple, and is then passed between the drawing-rollers *c' d' e'* to the flier F.

The drawing-rollers *c' e'* extend the whole length of the frame A, and they are placed so close together that the roller *d'* will rest loosely between them, and will serve to keep the roving or yarn in contact with said drawing-rollers. These rollers are geared together by pinions or cog-wheels, so that they revolve in one and the same direction; and on the end of one of said rollers is mounted the cog-wheel *n*, which gears into the pinion *o*, and receives the required motion, as previously described.

The motion of the drum L, from which motion is transmitted to the twisting-tube K, is produced, by belts or cog-wheels, from the driving shaft or drum D.

In practice, I prefer cog-wheels, and I provide different trains of wheels, so that the speed of the twisting-tube can be changed to suit circumstances, the feed motion of the roving being so regulated that for each revolution of the segment *k* a quantity of roving is given out sufficient to produce yarn or thread of the required thickness.

The spindles *f'* of the fliers E are supported by movable rails M, and they support the spools *g'*, on which the cops are formed.

In order to produce cops of the proper form, the rails M receive an automatic irregular rising-and-falling motion by the following mechanism: In the lower part of the frame A is arranged a shaft, N, which revolves, and also has a traversing motion in the direction of its axis. This traversing motion is produced by means of a screw-clamp, O, which is placed loosely on the shaft N, being situated between two collars, which prevent it from sliding on said shaft, leaving the shaft free, however, to revolve independent of the clamp. This clamp is provided with an internal screw-thread, which can be thrown in gear with a screw-spindle, P, to which a slow revolving motion is imparted by suitable belt or gear connection with the driving-drum. As this spindle revolves, its action on the clamp O produces the traversing motion of the shaft N. The revolving motion of said shaft is derived from a long pinion, *h'*, which is mounted on a shaft, Q, and gears into a cog-wheel, *i'*, mounted on the shaft N. The shaft Q receives motion by suitable belt or gear connection from the driving-shaft.

On the shaft N is mounted a tapering cam, R, which acts on a tappet-arm, *j'*, that is mounted loosely on the hub of a lever, *k'*, which is keyed fast to a shaft, S. This shaft turns freely in its bearings, and on it are mounted two chain-wheels or segments, T, from which extend chains *l'*, in opposite directions, over rollers *m'*, to the rails M, in such a manner that when the shaft S is turned in one direction the rails are raised, and when the shaft is turned in the opposite direction the rails are lowered.

The end of the tappet *j'* is armed with a friction-roller, and it is brought to bear against the surface of the cam R by a sliding wedge, *n'*, which is mounted on the end of a screw-rod, *o'*, and which is inserted between the ends of the tappet-arm *j'* and the lever *k'*, which arm and lever are provided with semicircular sockets to retain the wedge.

The screw-rod *o'* is geared to the screw-spindle P, and as it revolves slowly the wedge is gradually drawn in or moved out, and the end of the tappet-arm *j'* is made to follow automatically the tapering surface of the cam R. By the action of this cam on the tappet-arm the spindle-rails M are gradually raised, and cops of the required form are produced.

A hand-wheel, *p'*, secured to the end of the screw-rod *o'*, serves to withdraw the sliding wedge, and also to set the same by hand whenever it may be required.

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

1. The combination of the segment-cam *k*, in two parts, elastic roller *j*, brake-lever *s*, with its pin *u* and disk *v*, or their equivalents, for giving an intermittent feed to the roving, and so that the quantity of roving given out for each revolution of segment-cam *k* can be regulated, substantially as set forth.

2. The segment-cam *k*, in two parts, elastic roller *j*, brake-lever S, with its pin *u*, disk *v*, drum G, rollers J I, and spool *c*, in combination with the twisting-tube K, provided with a staple, *b'*, or their equivalents, to produce a counter twist to the roving, substantially as set forth.

3. The segment-cam *k*, in two parts, elastic roller *j*, brake-lever S, with its pin *u*, disk *v*, drum G, rollers J I, spool *c*, twisting-tube K, with a staple, *b'*, in combination with drawing-rollers *c' e' d'*, flier F, spindle F', bobbin *g'*, or their equivalents, to produce yarn from roving, substantially as set forth.

4. The conical cam R, or its equivalent, mounted on the traversing shaft N, in combination with the tappet-arm *j'*, lever *k'*, sliding wedge *n'*, chain-wheels T, and chain *l'*, which support the spindle-rails M, substantially as set forth.

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Witnesses:
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T. B. BEECHER.