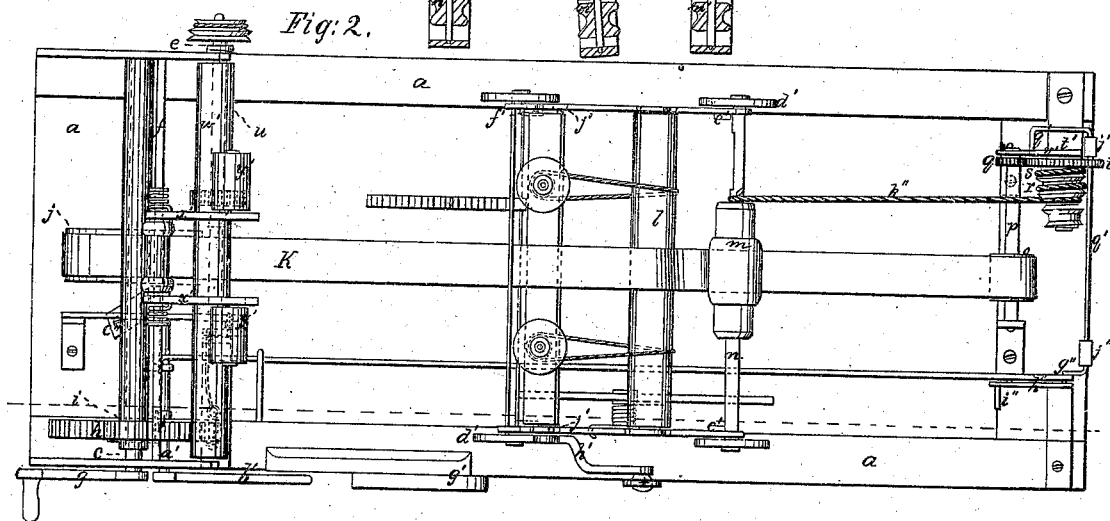
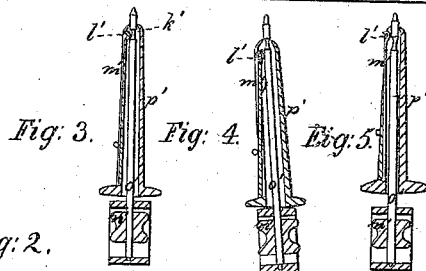
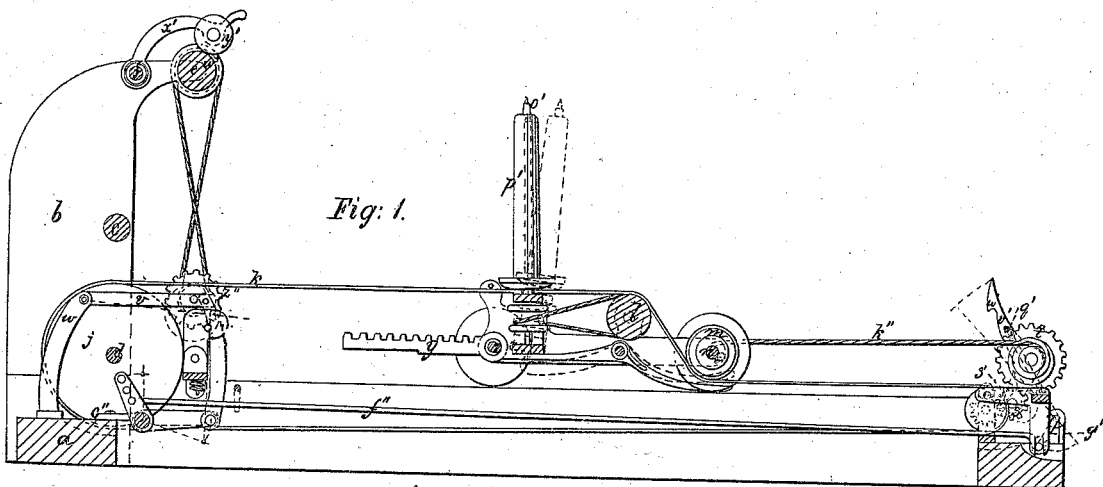


*W. Eberhard.*  
*Spinning Mach.*

N<sup>o</sup> 54,704.

*Patented May 15, 1866.*



*Witnesses:*

T. Smith  
L. E. Jones

*Inventor:*

Wm Eberhard  
by Atty Thos. D. Everett

W. Everhard.  
Spinning Mach.

N<sup>o</sup> 54,704.

Patented May 15, 1866.

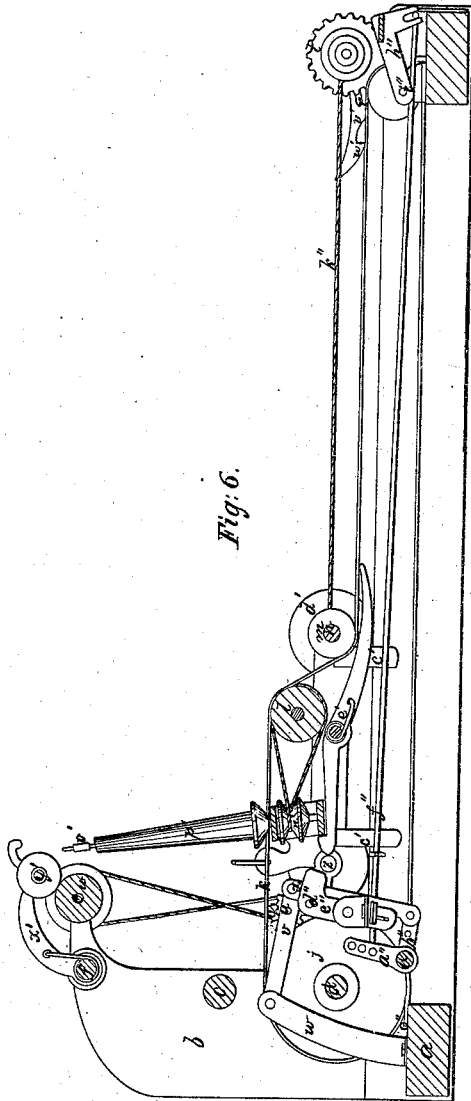


Fig. 6.

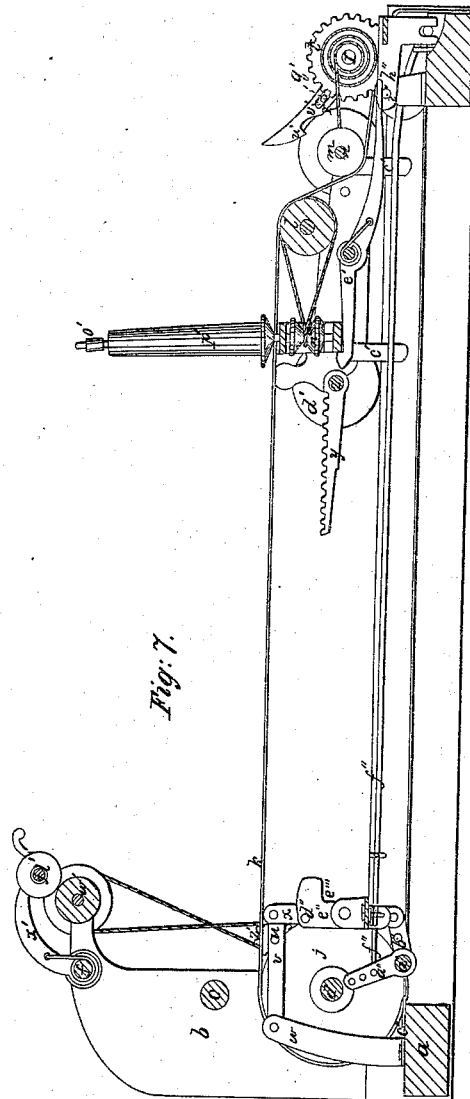


Fig. 7.

Witnesses:

J. Smith

L. E. Jones.

Inventor:

W. Everhard

by Atty. Geo. T. Conant

# UNITED STATES PATENT OFFICE.

WILLIAM EBERHARD, OF SHARON CENTRE, OHIO.

## IMPROVEMENT IN SPINNING MACHINERY.

Specification forming part of Letters Patent No. 54,704, dated May 15, 1866.

*To all whom it may concern:*

Be it known that I, WILLIAM EBERHARD, of Sharon Centre, in the county of Medina and State of Ohio, have invented a certain new and useful Improvement in Spinning-Machines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, and to the letters and marks thereon.

Figures 1, 6, and 7 of the drawings that form part of this specification are views, by longitudinal section, of a spinning-machine having my improvement as a part thereof, Fig. 2 being a top view of said machine, and Figs. 3, 4, and 5 being views, by vertical section, of the spool, spindle, and rails or horizontal bars of the spindle's frame, the carriage in Figs. 1, 6, and 7 being shown in different positions, as will be hereinafter explained.

The machine rests upon and in certain parts is attached to frame-bars, of which *a a* are horizontal, and *b b* vertical or upright. The upright bars afford bearings for the main or crank shaft *c*, the secondary or transmitting shaft *d*, and the shafts *e* and *f* of the rollers for feeding the roving or rolls, while the horizontal bars furnish bearings or supports to other parts of the machine.

The power for operating the machine may be applied to the hand-crank *g*, or, through any proper mechanical means from suitable motive power, may be conveyed to the main shaft. The power is communicated from the main shaft to the secondary shaft by a toothed wheel, *h*, gearing into a pinion, *i*, on the secondary shaft, and is transmitted from the secondary shaft, by a pulley, *j*, plain or grooved, and a band or cord, *k*, to a roller or shaft, *l*, for moving the spindles and spools, and to a roller, *m*, on shaft *n*, and to the small pulley *o* on the shaft *p*, which, by a pinion, *q*, conveys the power for rotation of the fusee or screw-cone *r* in the one direction by the pinion *s*, and in the other and opposite direction by the toothed wheel *t*.

The rollers for feeding the rolls or roving are rotated by a cord passing around a pulley on the short shaft *u* and around a pulley on the end of the shaft *e*, this short shaft having its outer bearing in an upright affixed to the horizontal bar *a* and its inner bearing in an arm, *v*, pivoted to another upright, *w*, on the

end frame-bar, *a*, and also connected to another arm, *x*. This short shaft *u* derives its motion from the toothed bar *y*, attached to the axle *z* of the carriage, acting upon the pinion *z'* on the short shaft.

The upper feed-rollers, *y' y'*, are affixed to the arms *x' x'* on the shaft *f*, and by springs that may be adjustable are pressed onto the lower roller, *w'*, so that their motion is by the friction of such pressure.

The fusee or screw-cone *r* is attached to a lever, *v'*, toothed at the inner end, *u'*, and pivoted to an upright, *t'*, which is secured to the end bar, *a*. This lever *v'* has an arm, *s'*, extending downward, to which is attached the pinion *s*. This lever has also a slot, *r'*, in which fits the curved end of the upright part of the shaft *q'*, under the movements of which the pinion *s* or the toothed wheel *t* are thrown into gear with the pinion *q* on the shaft *p*.

The spools *p'* and spindles *o'* are rotated by a cord passing around the roller or shaft *l* and around the pulleys *n'* of the spindle.

The spool has a spring, *m'*, by which it is held to the spindle with more or less force, due to the position of the spool in relation to the spindle, as is shown by Figs. 3, 4, and 5 of the drawings, thus allowing the spool to be moved around the spindle when the curved part *l'* of the spring rests in the groove *k'* of the spindle, and allowing the spool to be above the rail-bar, as shown by Figs. 3 and 5, or to be upon the rail-bar, as is shown by Fig. 4, the better adapting of the spool and spindle to each other as the functions of the two in drawing out the thread or roving, the twisting of it, and the winding of it on the spool may require. The two bars of the spindle-frame are connected together at each end, and at each end are pivoted, *j'*, in an upward projection, *i'*, of the carriage. At one end is affixed an arm, *h'*, which, in traversing over the cam *g'* on the horizontal bar *a* gives a certain movement to the rail-bars, spindle, and spools. A spring, *f'*, under the lower rail-bar acts in the direction opposite to that given by the arm *h'* and cam *g'*. A spring-catch, *e'*, is attached to one of the sides of the carriage for holding the rail-bars and spools and spindles in an upright position. The construction of the carriage is fully shown by the several figures of the drawings. It traverses on the horizontal bars, the wheels *d' d'* moving thereon and being guided by the pieces *c'* that move along the inner surface of the horizontal bars,

For the purpose of changing the position of the short shaft *u*, the spring-catch *e'*, and the gearing of the fusee or screw-cone, in order to adapt the parts to the motions required, there is an arrangement of means that are operated upon by the hand-lever *b'*. This hand-lever *b'* is connected to a shaft, *a'*, which has an upright arm, *a''*, and a horizontal arm, *b''*, the shaft having bearings in the frame-bar *a* and in a brace, *e''*, affixed to the end bar, *a*. To the horizontal bar *b''* is connected the bar or link *x*, which has a notch, into which fits the pin *d''* of the spring-bar *e''*. To the upright bar *a''* is affixed the rod *b'''*, the other end of which is connected to the crank *g''* of the shaft *q'*. Attached to this end of the shaft *q'* is a bell-crank, *h''*, having a pin, *i''*. This shaft *q'* acts as a spring upon the arm or lever *v'* of the fusee, tending to keep the toothed end of the bar *w'* downward; but as this may not in some instances be sufficient for that purpose a spring may be so connected with the shaft of the fusee as will produce this result. The bearings of the shaft *q'* are marked *j'' j''*. A cord, *k''*, is attached at the one end to the base of the fusee and at the other end to the shaft *n* of the carriage.

From this general description of the construction of the machine its operation can now be readily understood.

The position of the carriage at the commencement of the operation of the machine is shown by Fig. 6 of the drawings. The pinion *z'* of the shaft *u* is in gear with the toothed bar *y* of the carriage, and the spindles and spools are inclined toward the feeding-rollers, the arm *h* giving this inclination to the spindles by its riding upon the cam *g'*. The toothed wheel *t* of the fusee is in gear with the pinion *q* of the shaft *p*. Turning the crank to the right—toward the fusee end of the machine—gives rotation to the fusee, the cord *k''* thereof drawing the carriage, and the feeding-rollers feeding out the rolls or roving. The spindles and spools are in rotation. When the carriage has so far advanced that the end of the arm *h'* which has thereon the friction-roller *x* has passed off from the cam *g'* the spindle and spools will be relieved from the control of the arm, and by the spring *e'* will be brought to a vertical or nearly vertical position, and at about the same time the toothed bar will have passed out from gear with the pinion *z'*, and the feeding of the roving cease. The carriage moving on toward the fusee, the roving or thread will be drawn out and twisted, and when the carriage reaches near to the fusee, so that the shaft *u* will pass under the toothed end *w'* of the lever *v'*, the further rotation of the crank will cause the twisting of the thread, but not the further drawing out. When the thread has been

twisted sufficiently the parts may be put in the proper condition for the return of the carriage. This is done by elevating the lever *b'*, which will raise the arm or lever *v'*, will put the pinion *s* in gear with the pinion *q*, and will raise the arm *h''*, the pin *i''* thereof pressing up the end of the spring-catch *e'* and allowing the spools and spindles to have the inclined position through the action of the spring *f'*. This inclined condition of the spools allows of the winding up of the thread, and is indicated, as is also the position of the several parts of the machine when the carriage is on its return, by the red lines in Fig. 1 of the drawings. The upward movement of the lever *b'* also puts the short shaft *u* in position for the return of the carriage. This is effected by the arm *b''*, which raises the arm or link *x* to which the end of the shaft *u* is connected, the pin of the arm *d''* passing into a notch in *x*, and thus holding up arm *x* and shaft *u*. Fig. 7 of the drawings indicates this position of these parts.

The continued rotation of the crank *g* brings the carriage back toward the feed-rollers, and when the carriage is opposite to the cam *g'* the farther motion of the carriage produces the raising of the end of the arm *h'* and the inclining of the spools toward the rollers. When the carriage has nearly reached the end of its return movement the shaft *z* of the carriage will come in contact with the arm *e''*, passing under its front projection, *e'''*, liberating its pin *d''* from the notch in the arm *x*, so that shaft *u* will come down. The pinion *z'* being brought into gear with the toothed bar *y*, lever *b'* will fall, and the parts connected therewith, as heretofore recited, will be placed in the position for another forward movement of the carriage.

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

1. The arrangement of the fusee and the devices connected with it and the crank-shaft and the means connected therewith for giving the backward and forward motions to the carriage, as herein recited.

2. The arrangement of the lever *b'* and the means connected therewith for producing the change of gear and making and breaking the connection of the feeding apparatus with the carriage, as herein described.

3. Combining the spring *m'* with the spool and spindle, as and for the purposes herein set forth.

This specification signed this 23d day of December, A. D. 1865.

WILLIAM EBERHARD.

Witnesses:

J. A. KOHLER,  
W. C. JACOBS.