

(No Model.)

2 Sheets—Sheet 1.

W. R. MAYOR.

SPINNING MULE.

No. 346,298.

Patented July 27, 1886.

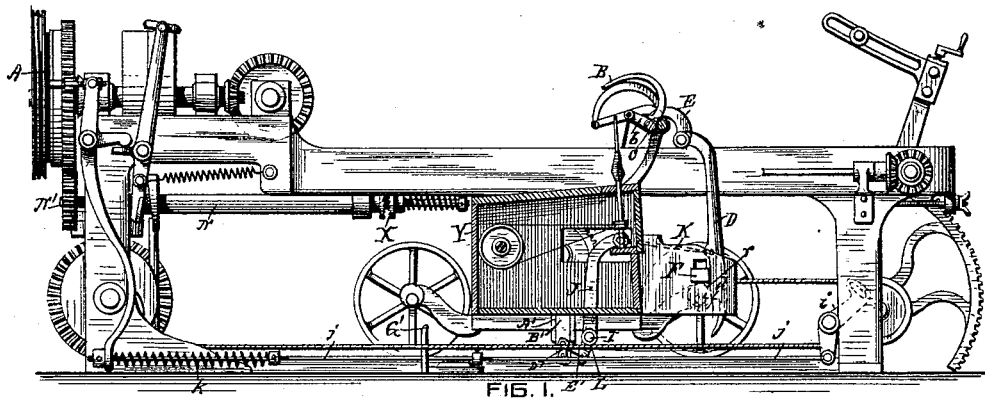


FIG. 1.

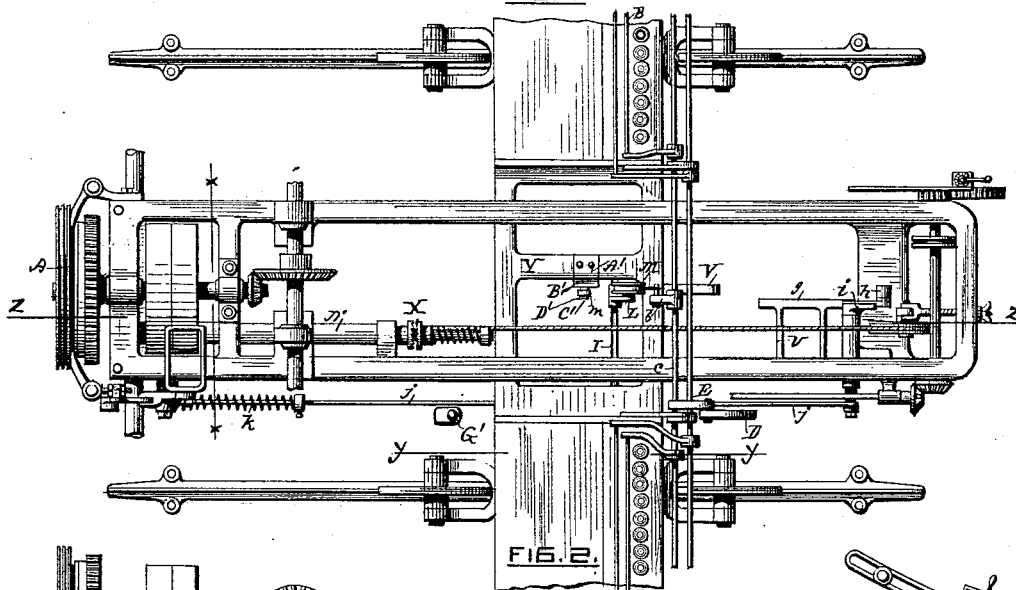


FIG. 2.

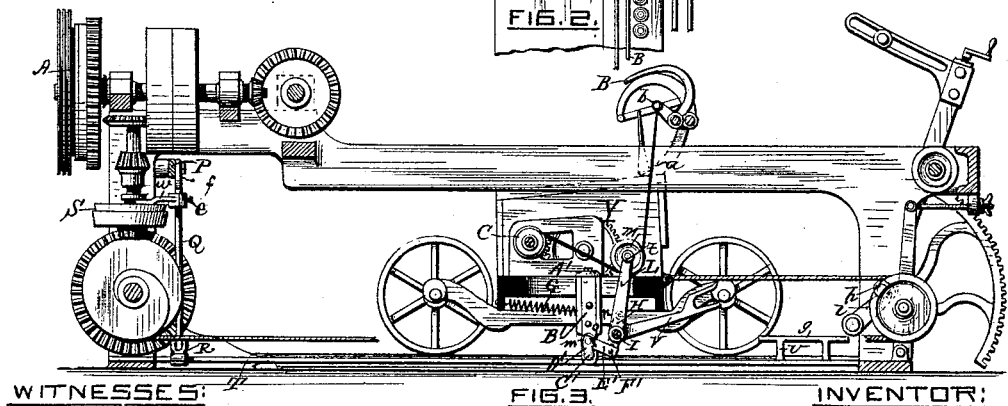


FIG. 3.

WITNESSES:

INVENTOR:

Chas. F. Schmitz
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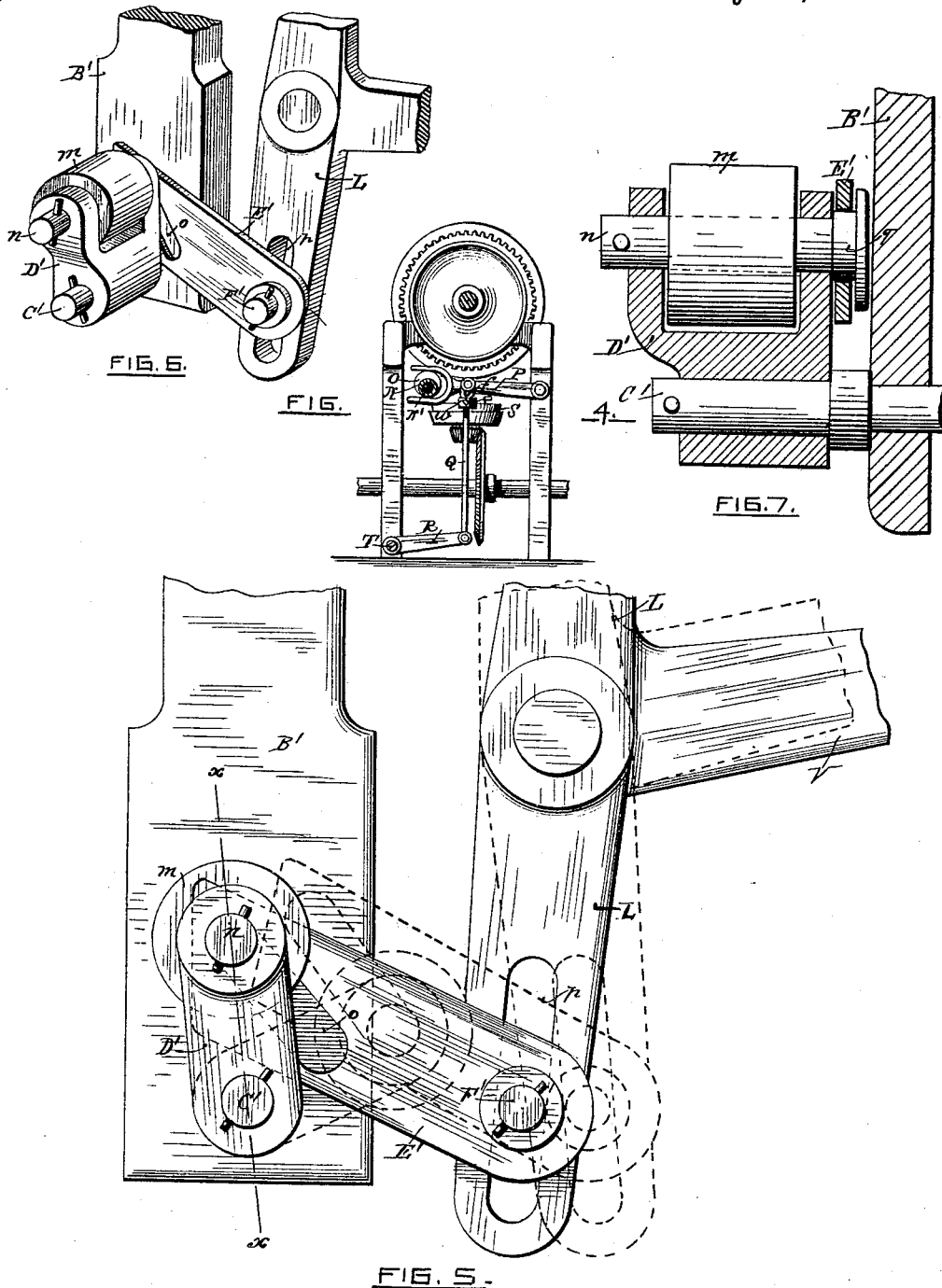
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Chas. T. Fehmelz
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UNITED STATES PATENT OFFICE.

WILLIAM R. MAYOR, OF PAWTUCKET, RHODE ISLAND.

SPINNING-MULE.

SPECIFICATION forming part of Letters Patent No. 346,298, dated July 27, 1886.

Application filed December 19, 1885. Serial No. 186,048. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. MAYOR, of Pawtucket, in the county of Providence, in the State of Rhode Island, have invented a new and useful Improvement in Spinning-Mules, of which the following is a specification.

My invention consists in an improved device for effecting the sudden engagement of the clutch which serves to impart the backward movement to the mule-carriage, and also to lessen the friction or strain upon the follower-leg in its upward movement to engage with the follower-lock.

My improvement is applicable to that class of self-acting mules described and shown in the United States Patent No. 42,048, dated March 22, 1864, to which reference is made for further description of the carriage-moving parts, which are not essential to the proper illustration of my invention, the reciprocating movement being imparted to the carriage, as usual, by means of well-known devices.

Figure 1 is a side elevation of the mule-head, and a section of the mule-carriage, taken in the line *yy* of Fig. 2, some of the well-known parts of the machine being omitted. Fig. 2 is a top view of the same. Fig. 3 is a vertical section taken in the line *zz* of Fig. 2, some of the parts being omitted. Fig. 4 is a vertical section taken in the line *xx* of Fig. 2, with the omission of some of the parts. Fig. 5 is an enlarged detail elevation illustrating my improvement. Fig. 6 is a perspective view of the same. Fig. 7 is a detail section taken in the line *xx* of Fig. 5, the friction-roller for supporting the rocker-lever and the stud *C* being shown in elevation.

In the accompanying drawings, A is the friction-clutch, which, when thrown into gear, serves to reverse the rotation of the spindles, in order to wind the yarn thereon, and also at the same time turns down the guide-follower B, which guides the yarn onto the spindle. The arm *b*, which serves to operate the guide-follower, is connected by means of the chain *a* with the cylinder C, the reversed rotation of which serves to draw the arm *b* downward, as usual in spinning-mules.

D is the follower-leg, pivoted to the curved arm E, which is secured to the guide-follower shaft *c*. The follower-leg is provided with a projecting shoulder, *d*, (shown by dotted lines

in Fig. 1,) which catches over the lock-piece F when the guide-follower is depressed, and the follower-leg, when caught over the lock-piece F, continues in this position until the yarn is completely wound upon the spindle. The follower-leg is pulled toward the lock F by means of the spring G, which is secured to a short arm, H, located at one end of the rock-shaft I, the extreme opposite end of the shaft being provided with the upright arm J, which at its upper end is connected to the follower-leg by means of the connecting-rod K. (Shown in dotted lines in Fig. 1.)

Upon the shaft I, and between the arms H and J, is secured the lever L, the upper end, *t* of which is provided with the grooved roller M, under which the chain *a* is made to pass from the arm *b* upon the guide-follower shaft to the drum C.

The cylindrical shell N on the cam-shaft N' is caused to make a sudden half-revolution at each change of the machine, and on the shell N (see Fig. 4) is placed a cam, O, which is arranged to operate a pivoted arm, P, connected by means of the downwardly-directed rod Q with the arm R, and which is also connected with the grooved hub of the sliding portion of the clutch S by means of the forked arm *w*. The arm *w* is adjustably secured to the rod Q by means of the screw *e*, the upper end of the rod Q being provided with a slot, *f*, in order to allow for the proper cam movement of the arm P without imparting a simultaneous movement to the arm *w*, which serves to engage the clutch S. The arm R is secured to the rocker-shaft T, the opposite end of which is provided with the rocker-lever U, having at its outer end the longitudinally-directed engaging-bar *g*. Upon the shaft I is also secured the fork-arm V, which at the extreme forward movement of the carriage engages with the back-off friction-roller *h* upon the slotted arm *i*, thus forcing the connected rod *j* backward and compressing the spring *k*, which subsequently serves to cause the engagement of the clutch A, which engagement will take place upon the proper revolution of the cam-clutch X, thus imparting a reverse movement to the spindles and depressing the guide-follower B preparatory to winding the yarn upon the said spindles, and upon the said depression of the guide-follower the follower-leg

will be elevated to its locking position, and will then be drawn upon the lock-piece F by means of the spring G and its connecting devices, and this locking movement of the lower-leg will cause a corresponding movement of the rocking shaft I, thus imparting a backward movement to the upper end of the lever L, and a corresponding upward movement of the fork V, which upward movement will serve to raise the arm *i*, and thus through its connections cause the disengagement of the clutch A.

Upon the reciprocating carriage Y is secured the bracket A', for holding the bar B', made vertically adjustable and having at its lower end a stud, C', upon which is loosely pivoted the supporting-arm D', provided at its upper end with the friction-roller *m*, which serves to support the rocker-lever U until the proper time for engaging the clutch S. The roller *m* turns loosely upon the pin *n*, which at the inner side of the supporting-arm D' forms a stud, *q*, adapted to enter the inclined slot *o* of the connecting-link E'. The link E' is pivoted to a stud, F', which is adjustably held in the slot *p* at the lower end of the lever L.

When the carriage Y is traveling forward, the supporting-arm D' will be held in the backwardly-inclined position (shown in Fig. 5) by means of the weight of the movable end of the link E', which operates against the stud *q* through the cam-like action of the inclined bearing side of the slot *o*, the outer end of the slot serving to form a stop against the further backward movement of the arm D', and the supporting-arm D' will be thus held when in engagement with the bar *g* of the rocker-lever; but upon the backward movement of the upper portion of the lever L and upward movement of the fork V, as hereinbefore described, the lower end of the lever L will be brought forward, and at the initial forward movement of the same the supporting-arm D' and its roller *m* will be first brought to a vertical position over its supporting-stud C', and then the continued movement of the lower arm of the lever L will bring the supporting-arm D' and roller *m* to a forwardly-inclined position, in which the downward pressure of the bearing-bar *g* of the rocker-lever will cause the sudden fall of the supporting-arm, the stud *q*, formed by the pin, passing downward along the inclined slot *o* of the connecting-link E', and by this means the consequent sudden release of the rocker-lever U will cause the clutch S to be brought into rapid and complete engagement, whereby the full power of the clutch will be instantly developed, thus preventing slipping, and consequently increasing the rapidity of the action of the machine, so that much less time will be consumed in making the change than heretofore. The backward action of the supporting-arm D' and its roller *m*, when under the pressure of the bar *g* of the rocker-lever U, (owing to the backward inclination of the sup-

porting-arm D', and also its stop-connection with the lower end of the lever L,) will tend to produce a forward movement of the arm J, which is connected by means of the rod K with the follower-leg D, and this forward tendency will serve to neutralize a portion of the resilient action of the spring G upon the follower-leg, and will thus lessen the power required to raise the follower-leg to its lock F, consequently requiring less backing-off friction in the clutch A, and increasing the rapidity of the backing-off movement. When the carriage Y has been brought to its extreme backward position, the lower end of the follower-leg D is caused to strike the upwardly-projecting stop G', which will cause the tripping of the follower-leg from its lock F, and the consequent elevation of the guide-follower, and also cause the return of the supporting-arm D' and roller *m* to the position shown by the full lines in Fig. 5, its former position, in which the sudden release of the rocker-lever was effected, being shown by the dotted lines in the same figure, and upon the subsequent reversal of the movement of the carriage the supporting-arm D' and roller *m* will first serve to support and then to trip the rocker-lever U, in order to effect the proper sudden engagement of the clutch S, as before described, the release of the rocker-lever being thus effected by means of the automatic downward movement of the supporting-arm D', which movement is limited by the inclined slot of the link E', and is thus independent of the slower movement of the lower end of the lever L.

I claim as my invention—

1. The combination, with the clutch S, rocker-lever U, and the connections between said clutch and lever, of the reciprocating carriage Y, arm D', roller *m*, slotted link E', lever L, and means for actuating the lever L, all substantially as shown and described.

2. The combination of the rocker-lever, the reciprocating carriage, the follower-leg, the locking-spring, the lock or stop for the follower-leg, the rock-shaft, the connections between said rock-shaft and follower-leg, the lever secured to the rock-shaft, the connecting-link, and the rocker-lever-supporting arm adapted for backward inclination, substantially as described.

3. The combination, with the drawing-in clutch, the rocker-lever, and the connections between said clutch and lever, of the reciprocating carriage, the follower-leg, the lock or stop for the follower-leg, the rock-shaft, the connections between said rock-shaft and follower-leg, the lever secured to the rock-shaft, the slotted connecting-link, and the rocker-lever-supporting arm, all substantially as described.

WILLIAM R. MAYOR.

Witnesses:

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JOHN S. LYNCH.