

No. 645,928.

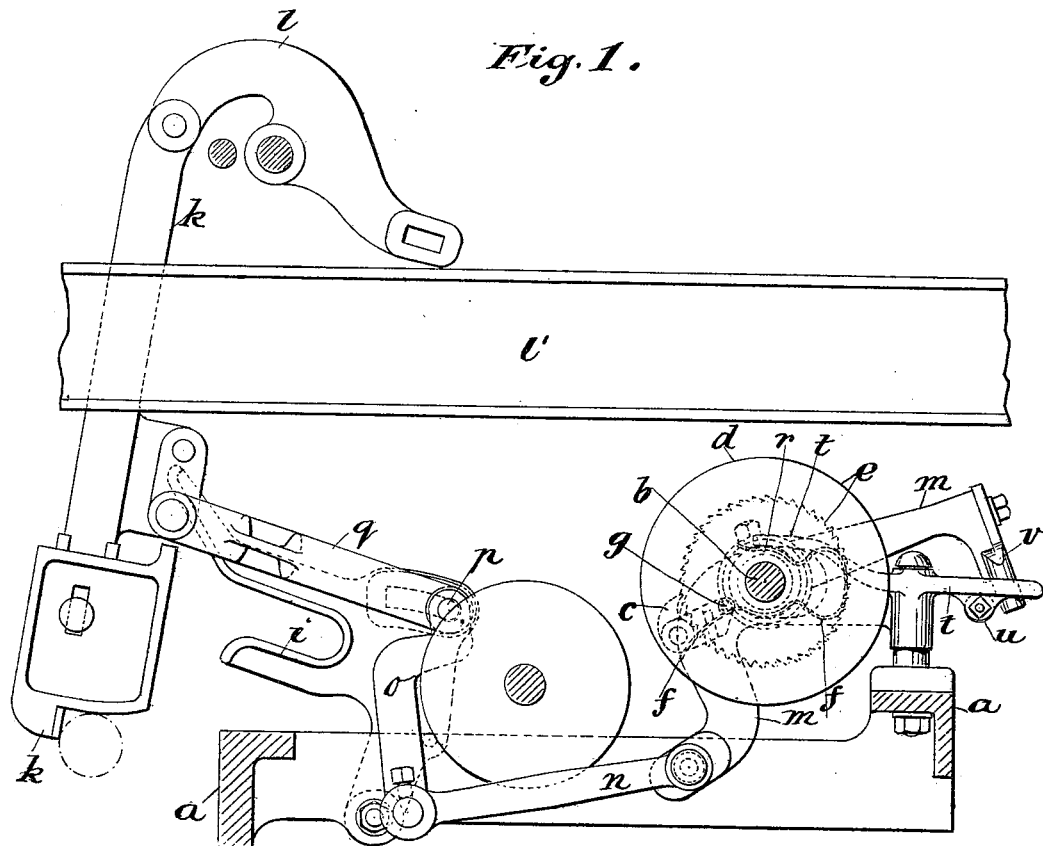
Patented Mar. 20, 1900.

J. PICKFORD.  
SELF ACTING MULE FOR SPINNING.

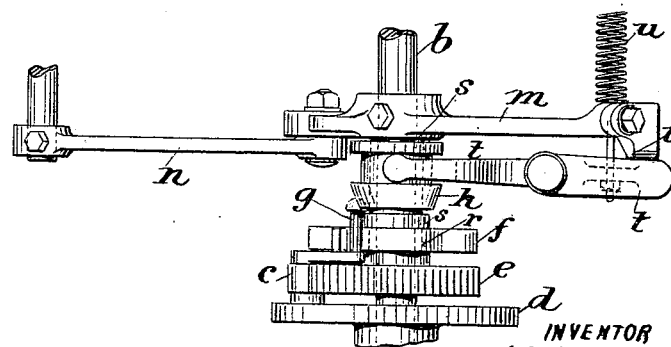
(Application filed Sept. 29, 1899.)

(No Model.)

2 Sheets—Sheet 1.



*Fig. 2.*



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(No Model.)

2 Sheets—Sheet 2.

Fig. 3.

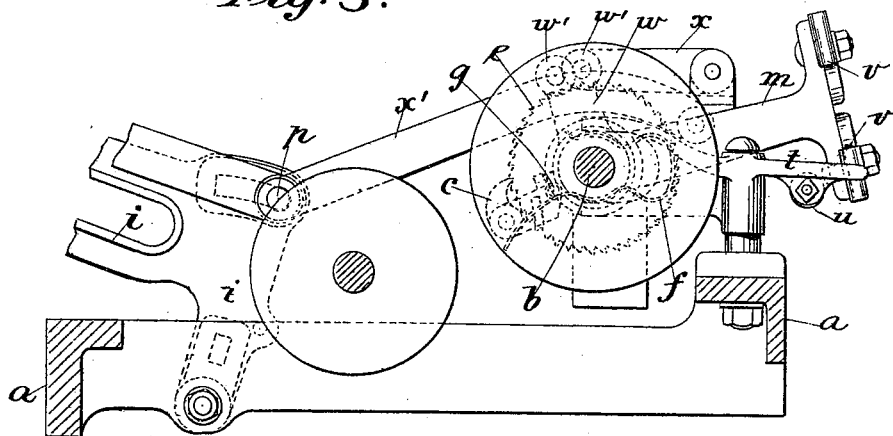


Fig. 4.

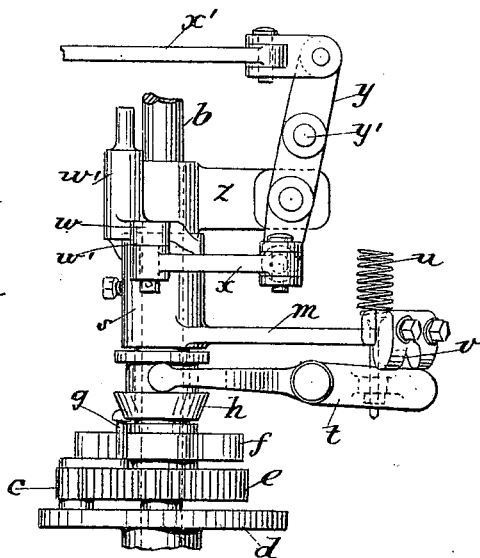
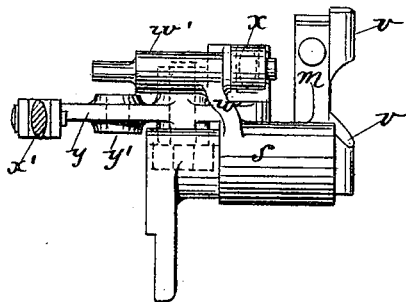


Fig. 5.



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# UNITED STATES PATENT OFFICE.

JAMES PICKFORD, OF OLDHAM, ENGLAND.

## SELF-ACTING MULE FOR SPINNING.

SPECIFICATION forming part of Letters Patent No. 645,928, dated March 20, 1900.

Application filed September 29, 1899. Serial No. 732,094. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES PICKFORD, a subject of the Queen of Great Britain, residing at 12 Vigo street, Lees road, Oldham, in the county of Lancaster, England, have invented new and useful Improvements in Self-Acting Mules for Spinning, (for which I have made application for a patent in Great Britain, No. 20,150, bearing date the 23d day of September, 1898,) of which the following is a specification.

My invention relates to improvements in self-acting mules for spinning, and has for its object to simplify and render more reliable in action the means which operate the ratchet-wheel click on the winding-plate employed upon the tin-roller shaft. I attain this object by the mechanism illustrated in the accompanying two sheets of drawings, in which—  
Figure 1, Sheet I, is a vertical section through the square of the mule; and Fig. 2, a plan of a portion of Fig. 1, showing my improvement applied. Fig. 3, Sheet II, is a vertical section through the square of the mule; Fig. 4, a plan, and Fig. 5 a side view, of a modification of the invention.

Similar letters refer to similar parts throughout the several views.

In carrying out my invention and referring to Fig. 1, *a* is the square, *b* the tin-roller shaft, *c* the ratchet-wheel click, *d* the winding-plate carrying the ratchet-wheel click *c*, *e* the winding-on ratchet-wheel, *f* the winding-click spring, *g* the peg on the winding-click, *h* the cone or cam, *i* the faller-locking or fish-mouth lever, *k* the boot-leg, *l* the faller-sector, and *l'* a portion of the frame of the head-stock of the mule, which parts so far are old.

Upon the tin-roller shaft *b* I employ the winding-click-locking lever *m*, which I actuate from any suitable part of the mule, effecting the locking of the faller—for instance, from the boot-leg *k*—by means of the arm *n*, one end of which is jointed to the inner end of the winding-click-locking lever *m* and the other end fixed to a lever *o*, connected to the stud *p* of the locking or fish-mouthed lever *i*, and by the arm *g*, connected to the latter and the boot-leg *k*. The winding-click-locking lever *m* when moved oscillates on the tin-roller shaft *b* and causes, through the medium

of the click-spring *f*, which is mounted in a groove *r*, formed in the boss *s* of the ratchet-wheel-winding-click-locking lever *m*, the click *c* to engage with the winding-on ratchet-wheel *e*, as is well understood, before the commencement of the inward run of the carriage and as shown in Fig. 1.

Upon the boss *s* of the ratchet-wheel or winding-click-locking lever *m* I mount the winding-click-holding-out cone or cam *h*, which is operated by the forked lever *t*, placed under the influence of a spring *u*, secured thereto and to the square *a* of the carriage, which spring causes the fork-lever *t* to slide the cone or cam *h* against the peg *g* of the ratchet or winding-click *c*, and thereby prevents the latter from engaging with the winding-on ratchet-wheel *e* until it has been released by the withdrawal of the cone or cam *h*. The end of the ratchet-wheel or winding-click-locking lever *m* I form or furnish with a projection or incline *v*, adapted to operate the cone or cam fork *t*. The oscillation of the click-locking lever *m* simultaneously liberates and brings, by means of the said fork-lever *t* and cone or cam *h*, the click *c* into gear with its ratchet-wheel *e*, the position of the click-locking lever *m* shown in the drawings being that when the click has been liberated and brought into gear with the winding-on ratchet-wheel *e*.

By the use of the cone or cam *h* I prevent the winding-click *c* from going into gear before the proper time, and by means of the click-locking device described I secure the engagement of the said click with the winding-on ratchet-wheel *e*, thereby preventing the winding-click *c* going into gear before the locking of the faller and insuring its prompt engagement when required on the lock of the faller and before the commencement of the inward run of the carriage.

According to a modification of my invention I may dispense with the aforesaid lever *o*, Fig. 1, and form the boss *s* of the ratchet-wheel-click-locking lever *m* (see Sheet II) with an arm *w*, which I connect by means of a link *x* to a double-ended lever *y*, fulcrumed to the bracket *z* and connected by a rod *x'* to the stud *p* of the faller-locking or fish-mouth lever *i*.

In order to render my improvement ap-

plicable for mules wherein the tin roller is adapted to rotate right or left, I employ upon the ratchet-wheel-click-locking lever *m* two projections or inclines *v v* in lieu of only one, 5 and the arm *w* I form with two bosses *w' w'* and the lever *y* with a stud-hole *y'*, so that the link *x* may be employed at either side of the fulcrum of the lever *y* (see more particularly Fig. 4) and one or the other of the said 10 projections or inclines *v v* thus brought into operation with the fork-lever *t* in accordance with the direction in which the tin roller revolves.

What I claim as my invention, and desire 15 to secure by Letters Patent, is—

1. In self-acting mules, the combination of the tin-roller shaft, the winding-on ratchet-wheel thereon, the winding-plate also on said shaft, the click on the winding-plate, and 20 having the pin *g*, the cone *h* movable longitudinally of the tin-roller shaft and arranged to engage the pin on the click, the fork-lever for operating the cone, and a click locking and liberating lever pivoted on the tin-roller 25 shaft and having a groove formed in its boss

for the reception of the click-spring with its end terminating adjacent to the end of the fork-lever and provided with an incline on its end, the incline on said end for operating the fork-lever and means for operating the 30 click-locking lever when the faller is locked, substantially as described.

2. In self-acting mules the winding-ratchet *e*, the winding-click, the click-locking lever *m* 35 furnished with two projections or inclines *v, v*, and having an arm *w* with two bosses *w' w'* in combination with a rocking lever *y* and link *x*, the latter being adapted to connect the said click-locking lever with the said rock- 40 ing lever on either side of the fulcrum of the latter so as to bring one or the other of the said projections or inclines into operation all substantially as and for the purpose set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

JAMES PICKFORD.

Witnesses:

ALFRED BOSSHARDT,  
STANLEY E. BRAMALL.