

2 Sheets—Sheet 1.

No. 415,025.

Patented Nov. 12, 1889.

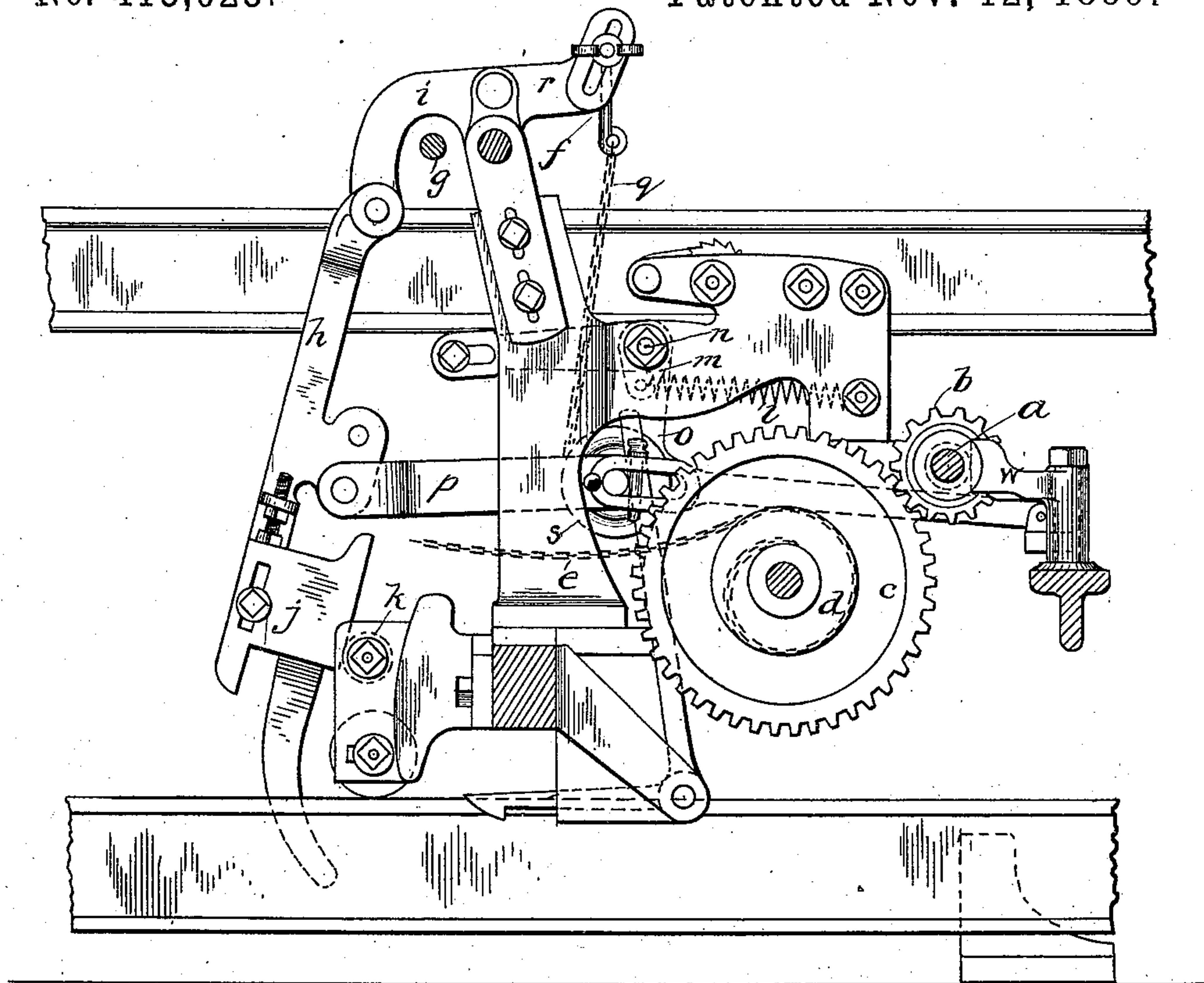


Fig. 1.

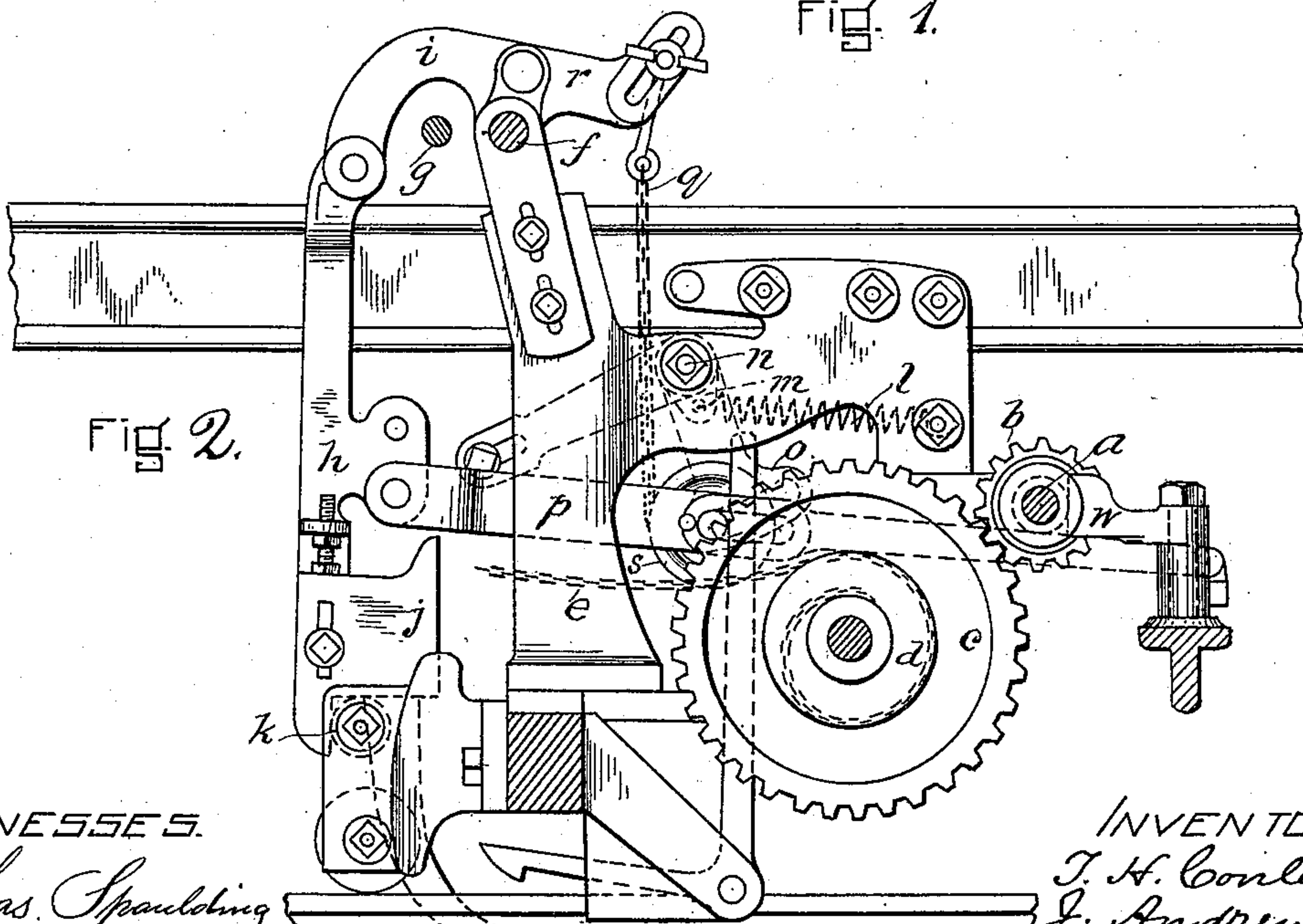


Fig 2.

WITNESSES.

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*INVENTORS.*

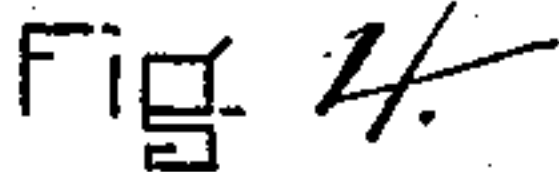
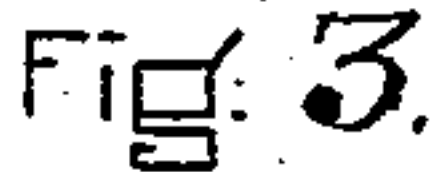
T. H. Corley.  
J. Andrews.

Wright, Brown & Crossley.  
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# UNITED STATES PATENT OFFICE.

THOMAS H. CONLEY AND JAMES ANDREWS, OF WARE, MASSACHUSETTS.

## SPINNING-MULE.

SPECIFICATION forming part of Letters Patent No. 415,025, dated November 12, 1889.

Application filed September 15, 1888. Serial No. 285,455. (No model.)

*To all whom it may concern:*

Be it known that we, THOMAS H. CONLEY and JAMES ANDREWS, of Ware, in the county of Hampshire and State of Massachusetts, have invented certain new and useful Improvements in Spinning-Mules, of which the following is a specification.

In the operation of spinning-mules it is essential to the production of perfect yarn that the follower and winding mechanism should operate in absolute unison—that is, that the winding mechanism should be set in operation simultaneously with the descent of the guide-follower and cease operation the instant that the follower is unlocked, and to accomplish this desideratum by improved devices is the object of our invention.

Our invention will first be described in view of the annexed drawings, forming a part of this specification, and then pointed out in the claims hereto appended.

Of the drawings, Figure 1 represents a side elevation, partially in section, of so much of a mule-carriage and its equipments as is necessary to explain the nature and design of our improvements, the latter being shown in connection therewith and the winding mechanism as out of operation. Fig. 2 is a view similar to Fig. 1, the winding mechanism being represented as in operation. Fig. 3 is a plan view of substantially the parts shown in Fig. 1. Fig. 4 is a detail view of parts shown in Fig. 3 and hereinafter more particularly referred to.

The same letters of reference designate the same parts or features wherever they occur.

In the drawings, *a* designates the tin cylinder-shaft—that is, the shaft by which the band-cylinder for operating the spindles is driven. Upon shaft *a* is loosely arranged a gear *b*, the teeth of which engage the teeth of a gear *c*, connected with the winding-drum *d*, around which the winding-chain *e* is coiled.

*f* designates the guide-follower shaft, and *g* the shaft of the counter-follower, which shafts are equipped with follower-wires and their supports, as usual.

*h* designates the follower-leg, which is pivoted at its upper end to an arm *i*, secured to the guide-follower shaft *f*. The follower-leg is provided on its lower end with an offset block *j*, which is adapted to catch over the

bowl or roller *k* (shown in dotted lines in Figs. 1 and 2) when the guide-follower is depressed and the winding mechanism is in operation, as seen in Fig. 2, or be moved off from said bowl or roller when the guide-follower is raised and the winding mechanism is out of operation, as seen in Fig. 1. The follower-leg is drawn toward the bowl or roller *k* by means of a spring *l*, connected at one end to the frame of the carriage, and at the other to the free end of a short arm *m*, secured on a rock-shaft *n*, to which is also connected an arm *o*, which is connected by means of a link-strap *p* with the follower-leg *h*.

*q* designates the backing-off chain, attached at one end to the free end of the backing-off finger *r*, connected with the guide-follower shaft *f*, said chain *q* passing around a pulley *s* and attached to the backing-off snail *t* on the tin drum-shaft *a*.

The construction and arrangement of parts so far described are such as are usually employed in a large class of cotton-spinning mules, though it will appear obvious that the precise form and relationship shown of said parts are not essential to our invention, nor, indeed, are all of the parts so far mentioned concerned in our improvements.

As has already been indicated, gear-wheel *b* is constructed to turn loosely on shaft *a*, and connected with said gear and turning with it is a clutch part *u*, adapted to be engaged and driven by a clutch part (called, for the sake of convenience in this description, a “sliding” clutch part) *v*, splined on the shaft *a*, so as to turn the same, but movable longitudinally thereon, so as to engage and be disengaged from the clutch part *u*, the two parts *u* and *v* comprising the clutch-box, by which the winding mechanism is put into and thrown out of operation. The clutch-box is so formed that the winding mechanism will be set in operation the moment the sliding part *v* is brought into engagement with the part *u* and be put out of operation the instant the two parts are separated.

*w* is a lever (here shown as a bell-crank lever) fulcrumed on the frame of the carriage, one end of which lever extends into a groove formed in the sliding clutch part *v*, and the other is connected by means of a link *x* with



a pin or spindle *y*, upon which the pulley *s* is journaled, and which connects the arm *o* and link *p*, as hereinbefore described.

5 With this explanation it will be understood that when the guide-follower descends to guide the yarn in position on the cops and the follower-leg is moved by spring *l* to the position shown in Fig. 2, which is commonly called by mule-spinners the "locking" of the  
10 follower, lever *w* will be operated through the medium of connecting-links *p x*, so as to slide clutch part *v* into engagement with part *u*, as shown in Fig. 4, immediately setting the winding mechanism in operation, and when the  
15 guide-follower rises or is unlocked and the follower-leg is moved from the position shown in Fig. 2 to that shown in Fig. 1 lever *w* will be so operated as to separate the two clutch

parts *u v*, as shown in Fig. 3, and so put out of operation the winding mechanism.

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What we claim is—

The combination, with the follower-leg and winding-drum, of the spindle-operating shaft, gear *b* thereon, gear *c*, connected with the winding-drum, clutch parts *u v*, lever *w*, en- 25 gaging one of said clutch parts, link *x*, arms *o* and *m*, spring *l*, and link-strap *p*, as set forth.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 8th day of 30 September, A. D. 1888.

THOMAS H. CONLEY.  
JAMES ANDREWS.

Witnesses:

EPHRAIM MOULSON,  
JAMES MAHONEY.