J. Entwistle,

Spinning Mule.

No. 108,467. Patented Oct. 18. 1870.

Fig. 1.

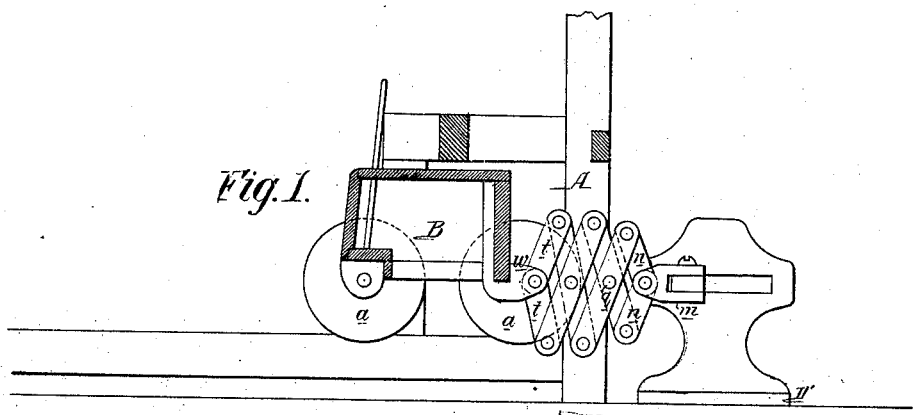
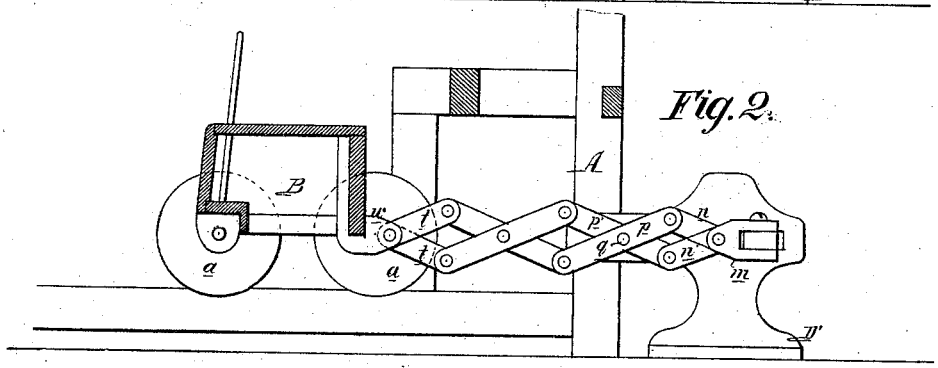


Fig. 2.



James Entwistle
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Howson and Sons

Fig. 3.

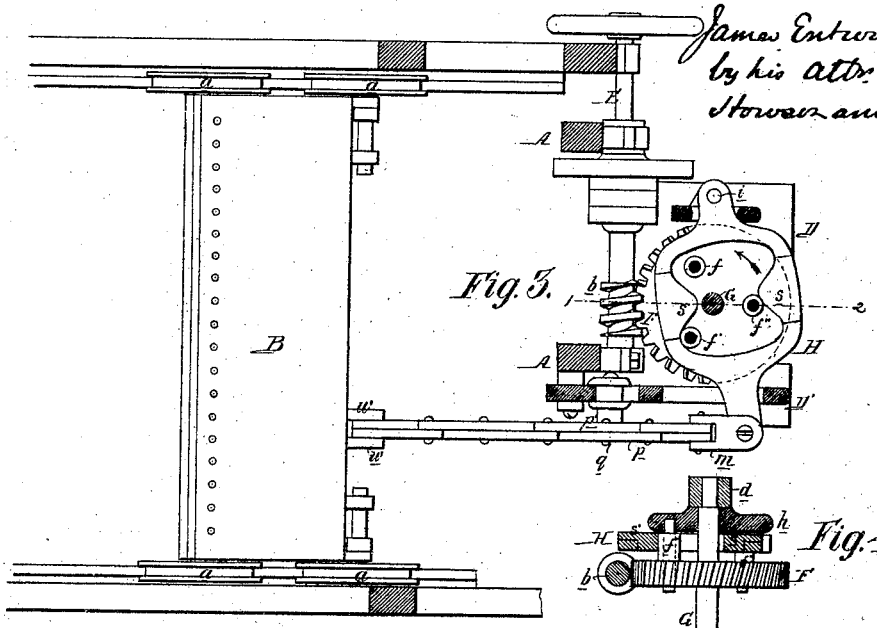
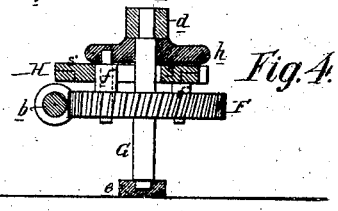


Fig. 4.



Witnesses { Wm. A. Stuart.
John Parker

United States Patent Office.

JAMES ENTWISTLE, OF CONSHOHOCKEN, ASSIGNOR TO HIMSELF AND JOHN PARKINSON, OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 108,467, dated October 18, 1870.

IMPROVEMENT IN SELF-ACTING MULES, &c., FOR SPINNING.

The Schedule referred to in these Letters Patent and making part of the same.

I, JAMES ENTWISTLE, of Conshohocken, county of Montgomery, State of Pennsylvania, have invented certain Mechanisms for Operating the Carriages of Self-Acting Mules, of which the following is a specification.

Nature and Object of the Invention.

My invention consists of certain mechanism for imparting an intermittent reciprocating motion to the carriage of a self-acting mule, the said mechanism being too fully explained hereafter to need an introductory description.

The object of my invention is to impart the desired movement to the carriage of a mule by mechanism not only of a simple and inexpensive character, but such as shall occupy comparatively little space, the saving of space in a mule-room being always a desirable object.

Description of the Accompanying Drawing.

Figure 1 is a vertical section of sufficient of a self-acting mule to illustrate my invention;

Figure 2, the same, showing the carriage in a different position;

Figure 3, a plan view; and

Figure 4, a vertical section on the line 1 2, fig. 3.

General Description.

A A A represents part of the frame-work of a self-acting mule, and

B is the usual carriage, with spindles and drum for operating the same, this carriage being provided with wheels *a a*, adapted to rails secured to the frame.

It has not been deemed necessary to refer to this carriage in more explanatory terms, inasmuch as my invention has no relation to the carriage itself, but to the mode of operating the same.

In suitable bearings secured to the frame of the mule, turns a horizontal shaft, E, furnished with the usual fast and loose pulleys, and on this shaft is a worm, *b*, gearing into a worm-wheel, F, on a vertical shaft, G.

Two standards, D and D′, are secured to the floor at the rear of the mule, and these standards are connected together at the top by a cross-bar, *d*, in which turns the upper end of the above-mentioned spindle G, the lower end of the latter turning in a suitable step, *e*. (See fig. 4.)

From the upper face of the worm-wheel F project three pins, *f f′ f″*, the pins being arranged at equal distances apart, and at the same from the center of the shaft G, and each pin projecting into and being steadied by a disk, *h*, secured to the vertical spindle G, and revolving therewith.

Between the disk *h* and the worm-wheel F is a yoke-like arm, H, which is hinged at *i* to a projection in the standard D, this arm being connected by a coupling, *m*, to the two links *n* and *n′*.

The link *n* is jointed to the lever *p*, the latter being crossed by the lever *p′*, which is jointed to the link *n′*, the fulcrum common to these levers *p* and *p′* being a stationary pin, *q*.

These levers *p* and *p′* are jointed to other crossed levers, which are connected together midway between their opposite ends, and this system of crossed levers can be continued to any desired length, precisely like the mechanical device known as "lazy-tongs," the levers being finally connected to links *t t* jointed to a projection, *w*, at the rear of the carriage B.

It will be evident that, on imparting a vibrating motion to the arm H, the carriage B will, through the medium of the system of levers described above, be caused to traverse backward and forward on its track.

It is necessary, however, in all self-acting mules, that the carriage should remain stationary at the limit of its outward movement, as well as at the limit of its inward movement, and this is accomplished by imparting an intermittent vibrating motion to the arm H.

As seen in fig. 3, the carriage has very nearly reached the limit of its outward movement, and, as the worm-wheel F is revolving in the direction of the arrow, the roller of the pin *f″* is about passing the rounded point of the projection *s* on the arm H. In the meantime the roller of the pin *f* is about to approach the projection *s′* of the arm H. Before it can reach this projection, however, the pin *f″* has passed the point of the projection *s*; hence the arm H must remain stationary during the time which elapses between the passage of the roller of the pin *f″* from the projection *s* and the arrival of the roller of the pin *f* at the projection *s′* of the said arm, and, during the same time, the carriage must necessarily remain stationary when at the limit of its outward movement.

The same operation of the rollers of the pins of the wheel F, on the projections *s s′* of the yoke-like arm H, takes place when the carriage reaches the limit of its inward movement. In other words, the desired intermittent vibrating movement of the arm H is obtained by the three pins *f f′* and *f″*, in combination with the two projections *s* and *s′* of the said arm.

The simplicity and compactness of my improved mechanism for operating the carriages of self-acting mules will be best understood by comparing it with the appliances heretofore used for that purpose; appliances not only of an elaborate and costly character, but such as occupy much more space than the machinery described above.

My invention, although intended especially for self-

acting mules, jacks, &c., can, it will be evident, be applied to any spinning-machine in which a traversing carriage is employed.

Claims.

1. The carriage B, carrying a series of spindles, and operated by the rotating wheel F, through the medium of the pins *f f′ f″*, vibrating lever H, its projections *s s′*, and the cross-levers *p p′*, all substantially as described.

2. The combination of the said system of cross-levers and a rotating wheel, E, having three pins, *f*, *f′*, and *f″*, with the yoke-like arm H having projections *s s′*, and vibrating on a pin, *i*, substantially as described.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES ENTWISTLE.

Witnesses:

WM. A. STEEL,

LOUIS BOSWELL.