

(No Model.)

W. F. TURNBULL.
SELF OPERATING JACK OR MULE.

No. 295,957.

Patented Apr. 1, 1884.

Fig. 3.

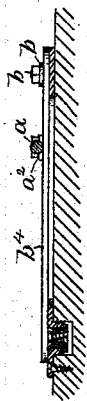


Fig. 1.

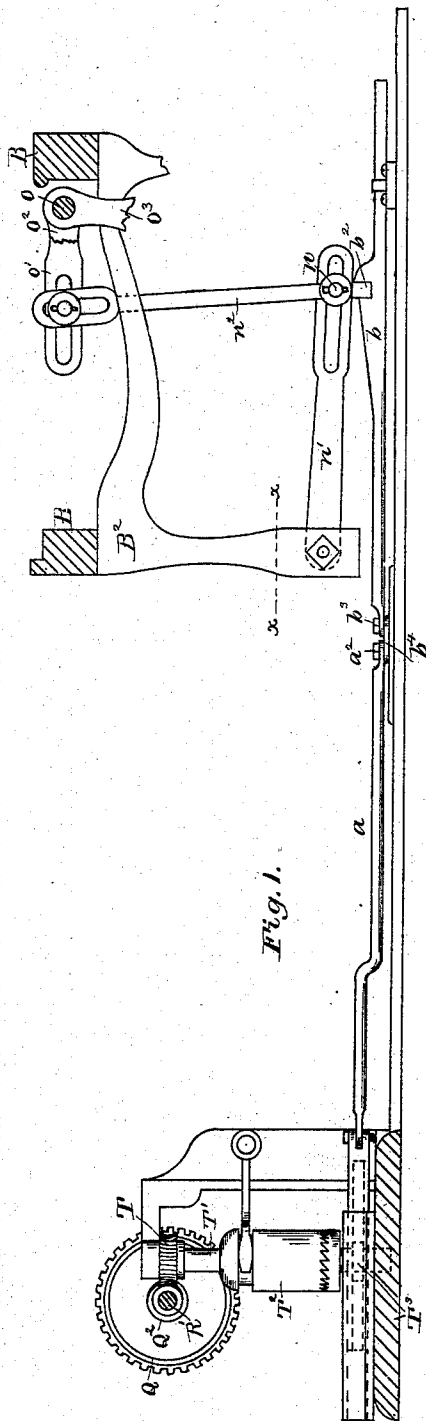
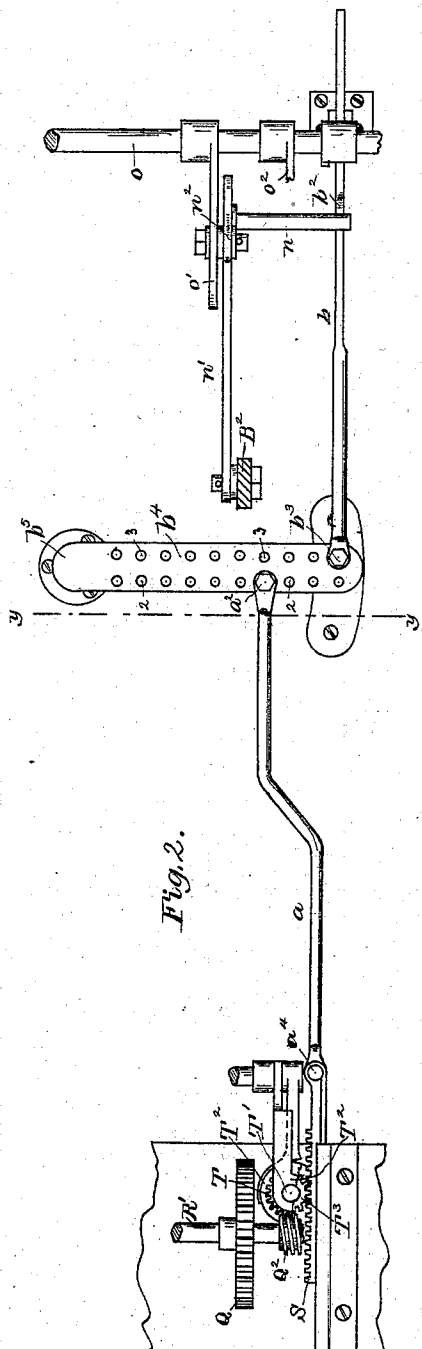


Fig. 2.



Witnesses
Frederick D. Swell
W. A. Lighter.

Inventor
William F. Turnbull,
by Crosby Gregory
Atty.

UNITED STATES PATENT OFFICE.

WILLIAM F. TURNBULL, OF NORTH ANDOVER, MASSACHUSETTS, ASSIGNOR
TO THE DAVIS & FURBUR MACHINE COMPANY, OF SAME PLACE.

SELF-OPERATING JACK OR MULE.

SPECIFICATION forming part of Letters Patent No. 295,957, dated April 1, 1884.

Application filed March 30, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. TURNBULL, of North Andover, county of Essex, State of Massachusetts, have invented an Improvement in Self-Operating Jacks or Mules, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The invention herein contained is an improvement on the McGovern jack, represented in United States Patent No. 113,784, dated April 18, 1871; and it has for its object to enable the speed of the carriage to be made fast or slow during that portion of the inward movement of the carriage while the yarn is being twisted. In the patent referred to, a long rod, provided with a rack and a hook, is moved toward the head-stock by a loose pinion engaged by a clutch on a short upright shaft deriving its movement from a worm on a gear, loose on the drawing-out scroll-shaft, the latter gear being driven in unison with the main shaft. As this rod is drawn toward the head-stock it draws with it the carriage. The hook at the end of this rod engages a stud on an arm pivoted on a bracket on the carriage. This stud during the outward movement of the carriage engages the hook of the long rod and draws the latter away from the head-stock, thus placing the same in position to operate the carriage when it is to be started in, and move it while the yarn is being twisted. By the rod used in the said jack the speed of the carriage during the commencement of its inward run must remain the same, and variations in speed cannot be made to adapt the movement of the carriage to the size of the yarn, it being necessary for the most perfect work to increase the speed of the carriage as the yarn increases in diameter. To do this is the chief object of this my invention; and in the present embodiment thereof I have divided the long rod referred to and shown in the said patent, and have placed between its severed ends a radius-bar secured to the floor or fixed with relation to the carriage, and have made the ends of the said rod adjustable as to their points of connection with the said radius-bar,

whereby I am enabled to regulate the speed of the carriage while running in and twisting the yarn, to correspond with the diameter thereof.

Figure 1 represents in partial sectional side elevation a sufficient portion of a jack, taken in connection with the mechanism illustrated in the said patent, to enable one conversant therewith to understand my invention. Fig. 2 is a plan or top view of Fig. 1, the framework of the carriage being omitted except that part of it below the dotted line *xx* in Fig. 1, the said figure also showing the clutch and worm-wheel or gear above it partially broken away; and Fig. 3 is a section on the dotted line *yy*, of Fig. 2.

The loose pinion T^3 , shown in Fig. 1 in dotted lines, the clutch T^2 , shaft T^1 , small wheel or gear T , worm Q^2 , the carriage B , bracket B^1 , lever n' , stud n , rod or link n^2 , arm o' , rock-shaft o , arms o^2 and o^3 , gear Q , shaft R' , and rack S , are all substantially as in the said patent, and each may be operated as in the said patent; but instead of the rack S forming a rigid part of the long rod, as in the said patent, I have pivoted the said rack to a part of the rod. In the patent referred to the long rod is marked S' . In this my invention I have changed the construction of such rod by dividing it to form parts S , a , and b . The part b is provided with a hook, b^2 , to engage the stud n , as did the hook on the long rod S' in the said patent. The end of the part b nearest the head-stock is pivoted upon a stud, b^3 , adjustably attached to a radius-bar, b^4 , pivoted at its end, b^5 , to the floor. The radius-bar b^4 has a series of holes, 2, either of which may receive a pin, a^2 , by which to connect the part a with the said radius-bar in an adjustable manner, and the opposite end of the part a is pivoted to the rack S by a pin, a^1 . The purpose of the parts S , a , b , b^4 and their co-operating devices is to move the carriage B , to compensate for the shortening of the yarn by reason of the twist put into it; and I therefore denominate the parts S , a , b , b^4 as the "easing-up" devices, they easing up the tension on the twisted yarn.

I have shown the easing-up device or connection between the head-stock and carriage,

as made adjustable, and the speed of the carriage may be regulated by connecting the part *a* to the radius-bar *b*¹ more or less remote from its pivot, the farther the pin from the
5 pivotal point of the radius-bar the slower the movement of the carriage, and vice versa. By moving the pin *b*³ into one of the holes 3 of the radius-bar *b*¹ nearer its pivot, the distance traversed by the carriage is lessened and its
10 speed is reduced, and vice versa. The speed of the carriage coincides exactly with the speed of the rack *S* when the said rack and the parts *a b* are in direct line.

Having shown the easing-up device applied
15 to one well-known form of jack, I desire it to be understood that the same may be applied, with slight modifications as to the rack and hook to other forms of jacks or mules.

Prior to this my invention I am not aware
20 that the carriage, or a part connected therewith, has ever been temporarily engaged by a hook or other movable connection, and been drawn in positively for a short distance, or
25 such device being made adjustable, to thereby

enable the speed of the inward movement of the carriage to be varied according to the diameter or size of the yarn being spun.

The speed of the carriage may be accelerated or retarded by adjusting the pins in the holes 30 of the arm *b*¹.

I claim—

The radius-bar and the part *b*, adapted to engage a stud made movable with the carriage, combined with the part *a*, connected with the
35 said radius-bar, and with suitable means to draw the said part *a* toward the head-stock, the point of connection of the radius-bar with one or both of the said parts being adjustable, whereby the speed of the inward movement of
40 the carriage while twisting the yarn may be regulated according to the size of the yarn, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two sub-
45 scribing witnesses.

WILLIAM F. TURNBULL.

Witnesses:

WILLIAM E. HEALD,
EBEN A. BALDWIN.