(No Model.) 2 Sheets—Sheet 1.

J. LOWE.

SPINNING MULE.

No. 407,783. Patented July 30, 1889.

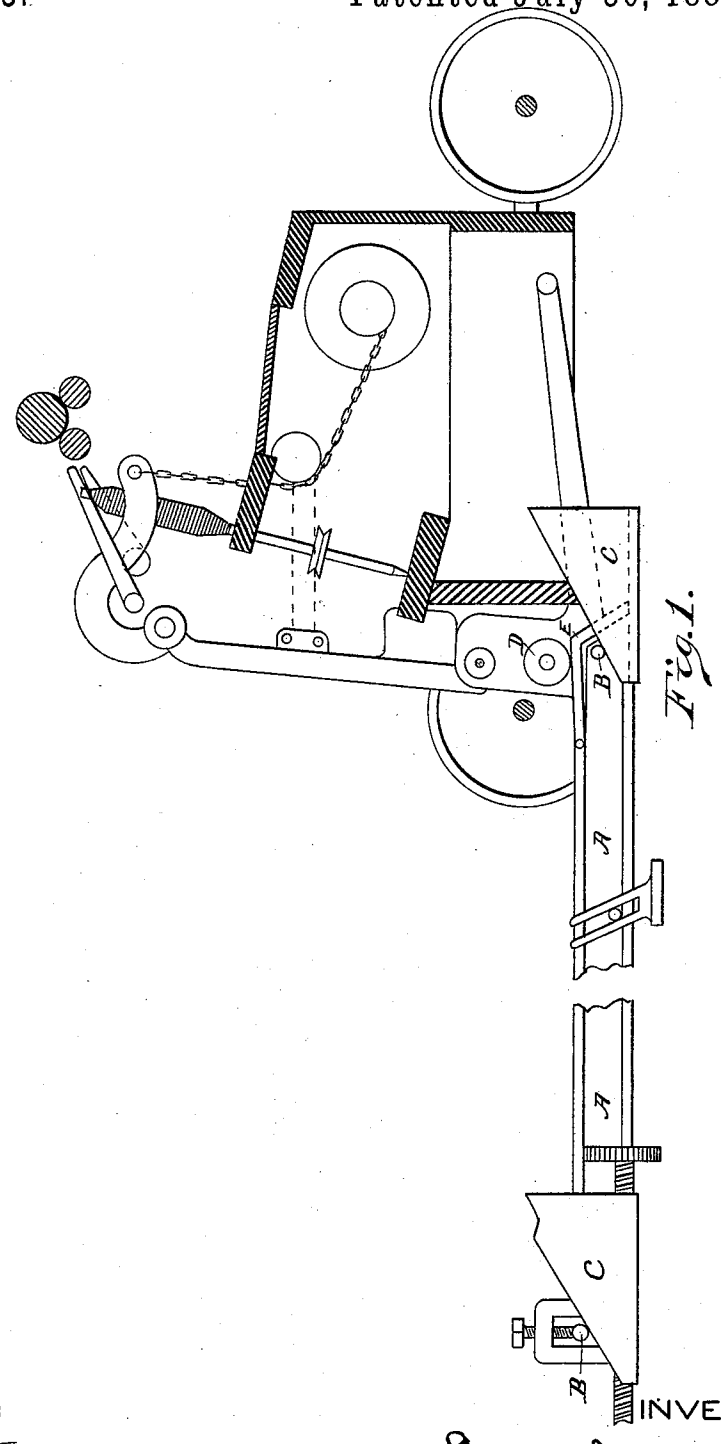


Fig. 1.

WITNESSES:
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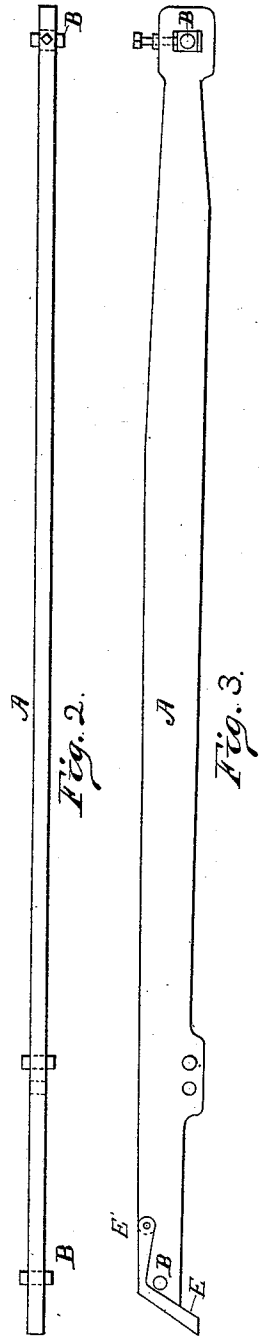


Fig. 2.

Fig. 3.

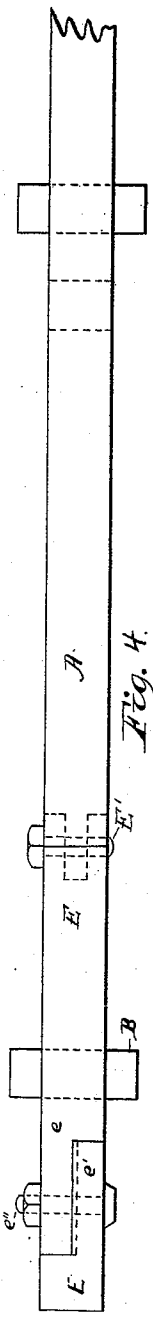


Fig. 4.

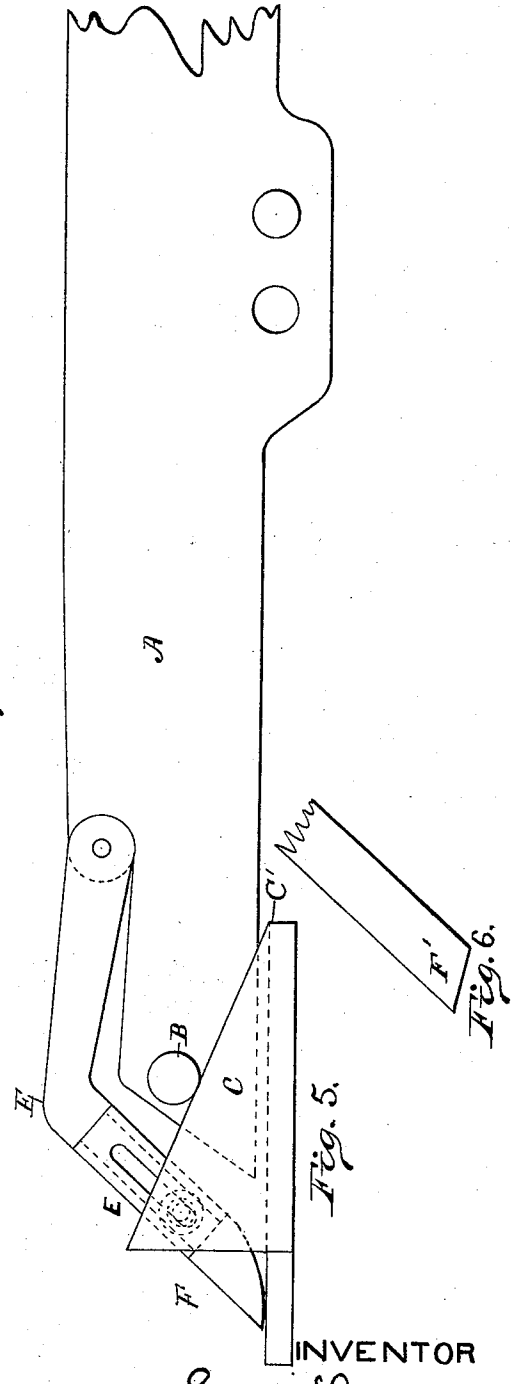


Fig. 5.

Fig. 6.

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UNITED STATES PATENT OFFICE.

JAMES LOWE, OF PHILADELPHIA, PENNSYLVANIA.

SPINNING-MULE.

SPECIFICATION forming part of Letters Patent No. 407,783, dated July 30, 1889.

Application filed October 21, 1887. Serial No. 252,981. (No model.)

To all whom it may concern.

Be it known that I, JAMES LOWE, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Spinning-Mules, of which the following is a specification.

My invention relates to the construction of a copping-rail for a self-acting mule for spinning yarns. In these machines a smooth wheel, called the "bowl," runs on the top of the copping-rail and by its height regulates the position of the faller-wires, by which wires the feed of the yarn on the cop and the shape of the cop are determined. Raising the bowl lowers the faller-wires and feeds the yarn lower on the bobbin, and vice versa. The elevation of the rail is determined by the position of the shoes—one at each end. At the beginning of the cop the shoes are run in so that the rail is raised to its highest point, and the yarn is fed to the lower end of the bobbin. As the formation of the cop progresses, the shoe is at each stroke moved out, lowering the rail, so that the feed is gradually carried to the point of the bobbin. As such rails have been generally heretofore constructed the rail at the point was flat, and at the beginning of the formation of the cop the yarn is fairly well wound on the bobbin with the rail in this form, because there is the whole upper part of the bobbin to take it up; but as the bobbin fills the yarn runs off the point, with the result on each stretch of some inches of yarn spun and not wound on the cop, this evil increasing continuously up to the finish of the cop. This yarn not being wound on the bobbin, there is that much work lost at each stretch of the mule, and each time that part of the yarn which is properly spun and should be wound off is left and is again spun, making a coarse and irregular thread. It has been sought to remove this fault by the device hereinafter described and disclaimed, but without success.

The object of my invention is so to construct the rail as to remove this defect in the working of the mule and to cause the spindle to wind all the spun yarn at each stretch up to the finish of the cop, which result I accomplish by raising the point of the rail and correspondingly relatively lowering the faller-wires at the end of the return of the mule at the latter part of the cop more and more as the cop approaches its conclusion. This is done by the attachment to the copping-rail shown in the drawings, in which—

Figure 1 is a side view of the working parts of a mule, showing a cop nearly finished and my attachment on the point of the rail. The mule shown in this drawing is that commonly known as the "Platt" mule; but my invention is equally applicable to mules of other forms. Fig. 2 is a top view of the copping-rail. Fig. 3 is a side view of the same, showing my attachment at the point. Fig. 4 is a top view of the point of the rail. Fig. 5 is a side view of the same with the shoe upon which the rail rests, showing the attachment partly raised in position for winding the latter part of the cop. Fig. 6 is a modification in the form of the point of the attachment.

A is the copping-rail.

B B are pins by which the rail is supported upon the shoe.

C C are the shoes, one side of which is shown, the other side, similar in form, being on the other side of the rail, and the two being connected by a web C′ on the bottom, which is indicated by a dotted line and forms the base upon which the shoe rests, and upon which web in the forward shoe my attachment is supported.

D is the bowl which runs upon the rail, by the elevation and depression of which the position of the faller-wires and the feed of the yarn are determined.

The other parts shown in Fig. 1 are of the ordinary form in mules of this class and a description is therefore unnecessary.

E is my attachment upon the point of the rail, consisting of a bent arm, as shown, which is connected to the rail by the hinged joint upon the pin E′.

F is an extensible device upon the lower arm of my attachment.

F′ is a modification of the form of the point of the attachment.

When at the beginning of the cop the shoes

are run in, the attachment rests upon the body of the rail and the upper surface of its horizontal arm conforms to the line of the upper surface of the rail, as shown in Fig. 3. As the shoes are moved out and the rail descends, the point of the attachment engages with a support independent of the rail, whereby the horizontal arm descends with but more slowly than the rail and forms an inclined plane relative to the body of the rail, so that when the bowl reaches the attachment in approaching the end of the return it moves up this inclined plane, which is so located and so controlled and begins at such distance from the end of the run of the bowl that by the rising of the bowl upon it the faller-wires are so lowered that each time all the yarn is fully wound on the bobbin, and at the next stretch there remains no slack yarn unwound and to be respun. This action requires different regulation with different yarns, as they may be soft or hard spun, and this regulation is attained by lengthening or shortening the lower arm of the attachment by the extensible device F and by the form of the curve at its termination. The lower arm is in two parts *e* and *e'*, moving longitudinally on each other and held in the proper position by a bolt *e''* through them. The length of this arm determines the point in the formation of the cop at which the attachment engages with its support and begins to act. A further regulation of the motion is effected by a curved termination of the arm, so that in the descent of the rail the attachment, instead of resting always upon the corner of the lower arm, rests upon one corner on its first contact with its support, and in descending rolls upon the curve whose form is made such as to produce the effect desired in the particular instance.

I am aware that there has been used heretofore an attachment to the point of the rail similar in general form to mine, and having also a support independent of the rail, but differing in construction and in the mode of support.

The difference of construction of that part on which the rail runs is only in the length of the horizontal arm of the attachment, which in that formerly used was short, being only about an inch from the hinge to the bend; but the operation of the two in spinning is entirely different.

In the device heretofore used the raising of the bowl and the depression of the faller-wires occur at the extreme end of the return, and after the spindle has practically ceased to revolve, so that the slack yarn is drawn tight by the depression of the faller-wires, but is not wound on the bobbin and upon the next stretch is loosened, and is respun and wound as though the attachment were absent, whereas in mine, which has a long horizontal arm practically as I use it about seven inches from hinge to bend, the bowl begins to rise and the faller-wires to descend while the spindle is still turning, and the yarn is all wound on and with proper adjustment is crossed upon itself, making a binder, which has not been done heretofore upon a self-acting mule.

The difference in the mode of support is that in the device heretofore used the inclined lower arm of the attachment rests on its lower side upon a pin attached to the shoe, so that in the advance of the shoe this pin moves under this inclined arm which rides up on it, and this gives to the horizontal arm on which the bowl runs a positive upward movement, which, taken in connection with the descending movement of the rail, is injurious and sometimes destructive. Whereas in mine, which rests upon its point, the difference of movement is always and only a difference of descent. In the old form the operation is begun too late and is carried to excess.

I do not claim an attachment having such a short horizontal arm and resting upon a support moving under the inclined surface of its lower arm.

I claim as my invention—

1. The combination, with the copping-rail, the bowl, and the shoe, of an arm hinged to the rail at a short distance from the end of the run of the bowl on the rail, and a support independent of the rail for maintaining the free end of the arm elevated during the descent of the rail, the upper surface of the arm, when raised from the rail during the descent of the latter, forming an inclined plane which acts upon the bowl before the close of the winding on to cause the faller-wires to direct the yarn on to the cop and insure its being wound thereon.

2. In combination with the copping-rail, the bowl, and the shoe, an arm hinged to the rail at a short distance from the end of the run of the bowl on the rail, and a support independent of the rail for maintaining the free end of the arm elevated during the descent of the rail adapted to retard the descent of the arm but not to raise it.

3. In combination with the copping-rail, the bowl, and the shoe, a bent arm hinged to the rail at a short distance from the end of the run of the bowl on the rail, and adapted to carry the bowl, and a support independent of the rail adapted to engage with the point of the arm during the descent of the rail.

4. In combination with the copping-rail, the bowl, and the shoe having a horizontal web, a bent arm hinged to the rail at a short distance from the end of the run of the bowl on the rail, and adapted to carry the bowl and to rest at its point upon the web of the shoe.

5. In combination with the copping-rail, the bowl, and the shoe, a bent arm hinged to the rail at a short distance from the end of the run of the bowl on the rail, and adapted

to carry the bowl and to rest at its point upon a support independent of the rail, and having an extensible arm.

6. In combination with the copping-rail, the bowl, and the shoe, an arm hinged to the rail at a short distance from the end of the run of the bowl on the rail, and adapted to carry the bowl and to rest at its point upon a support independent of the rail, and having a curved termination at its point.

JAMES LOWE.

Witnesses:
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