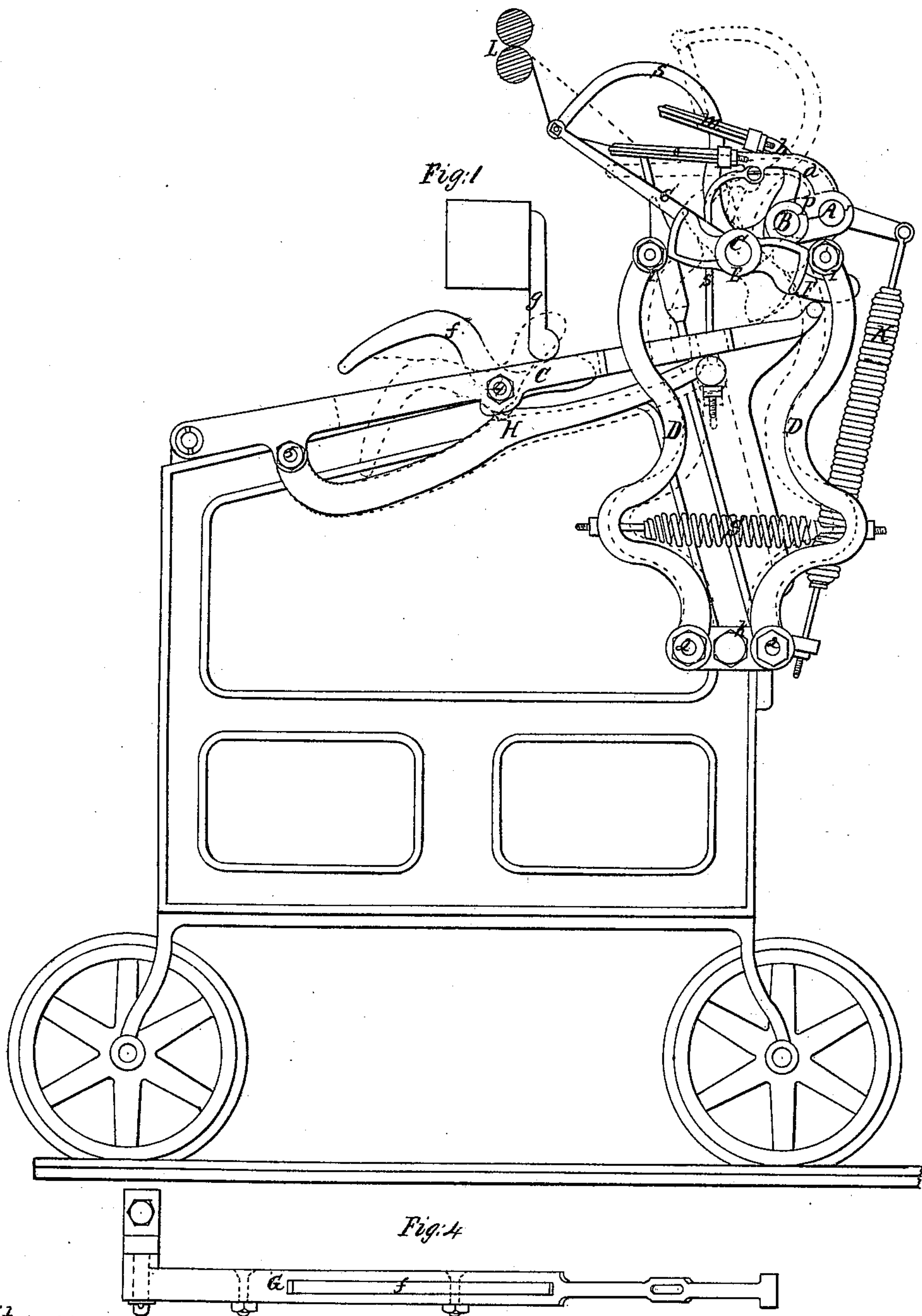


Wier & Grover
Spinning Mule.

N^o 14,988.

Patented May 27, 1856.



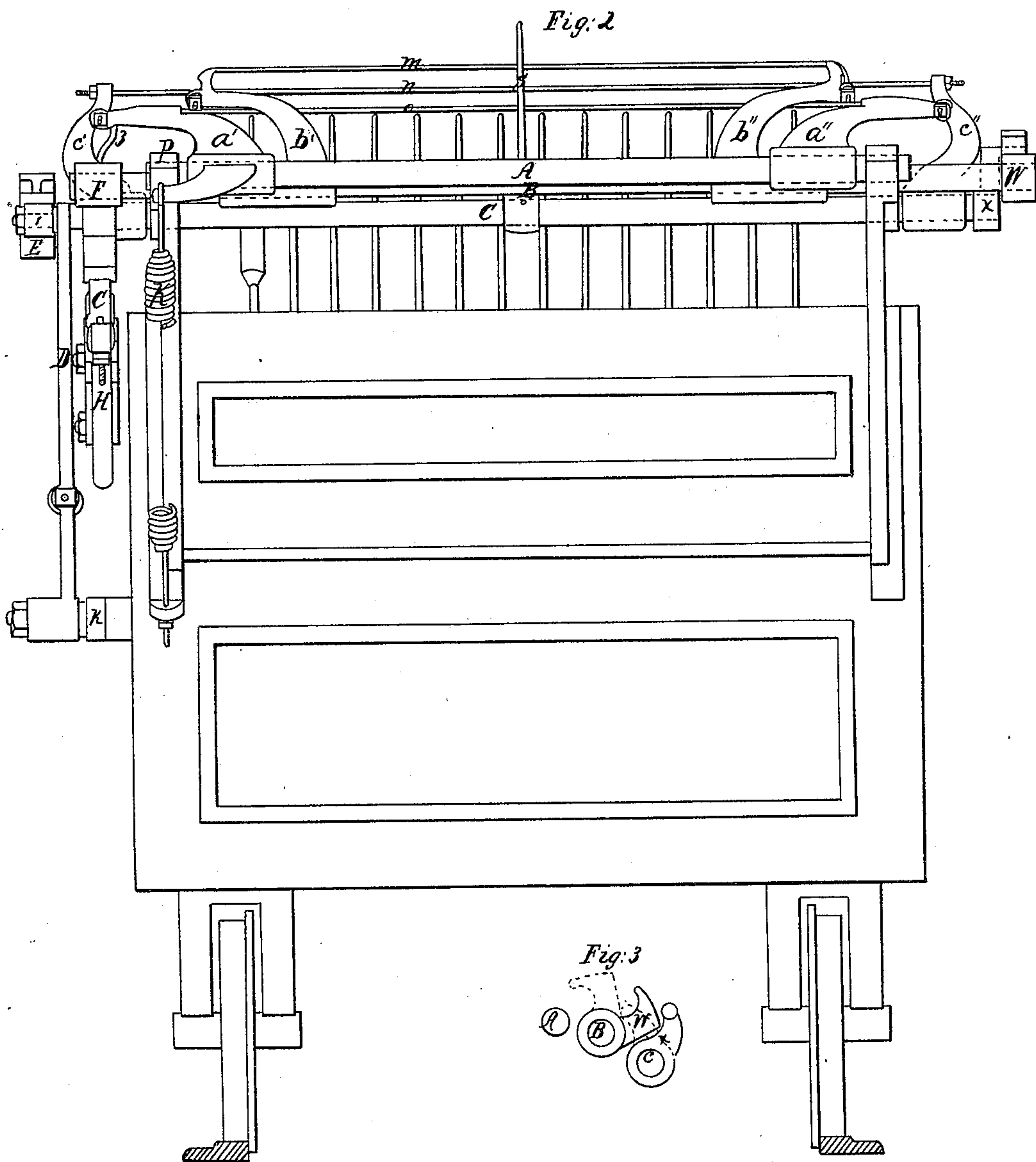
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UNITED STATES PATENT OFFICE.

WM. W. WIER, OF CHICOPEE, AND W. GROVER, OF HOLYOKE, MASSACHUSETTS.

SELF-ACTING MULE.

Specification of Letters Patent No. 14,988, dated May 27, 1856.

To all whom it may concern:

Be it known that we, WM. W. WIER, of Chicopee, and, WM. GROVER, of Holyoke, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements on Mules for Spinning Cotton or other Fibrous Substances; and we do declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a view of the foot end of a mule carriage with the improvements attached. Fig. 2 is a front view of the carriage. Fig. 3 is a view of some parts at the head end of carriage. Fig. 4 is a top view of some parts at the foot of carriage.

Similar letters and figures of reference indicate like parts in all the figures.

The nature of our improvements consist in applying to mules for spinning cotton and other fibrous substances, an additional faller; that we denominate a third faller (the two fallers now used being known as front faller, and back or counter faller,) for the purpose of preventing kinks forming in the yarn when the front faller rises, by resting on the yarn at the side of the counter faller, opposite the front faller and with sufficient weight to keep the yarn moderately tight; consequently as the front faller rises from the yarn, the third faller falls and keeps straight the yarn that would otherwise have been left slack to form into kinks by the rising of the front faller.

To enable others skilled in the art to fully understand and construct our improvement we will proceed to describe it, first however referring to parts well known and understood, to which it will be necessary to refer in the description.

A represents the back or counter faller shaft, and B the front faller shaft; *b' b''*, front faller fingers; *a' a''*, back faller fingers; K, spring attached by the top and to the back faller finger *a'* and to the carriage by the lower end; *o*, back faller wire; *m*, front faller wire; F, cam on shaft B, to hold down the back or counter faller against the tension of spring K, while the carriage is running out (heretofore by a single lever similar to lever G connected with counter faller finger *a'* by the wire link, *s*). *g*,

stand attached to roller beam to bring down and hold lever G, until cam F, is brought into the proper position to hold it, by the rising of the front faller.

Having referred to parts in the drawings well known and understood, we will now proceed to describe the parts embraced by our improvements; and the parts above referred to, are not to be understood as being embraced thereby; when referred to in the following description.

C represents the third faller shaft supported in suitable bearings attached to the stands forming the bearings for front, and counter faller shafts. The best position for the third faller shaft we have found to be, to place the center of it at the intersection of a circle formed with a radius of one and three quarter inches, from the center of shaft B, by a horizontal line, seven eighths of an inch below the center of said shaft.

n, represents the third faller wire supported by the fingers *c'*, *c''*, and *s*, fastened upon shaft C. The faller wire is tightened by screw nuts against the fingers *e' e''* in the usual manner.

E, is a double cam, fastened to shaft C, having two equal concentric parts of equal radius, one directly opposite the other, for the largest diameter; and two equal concentric parts of equal radius, for the smallest diameter; the larger diameter at right angles to the smaller.

D, D, are fingers having rolls *i, i*, at the top ends, and hung by the lower ends on studs 2, 2, attached to the carriage, with the rolls *i, i*, resting against cam E.

S, is a draw spring, to each end of which, a wire with a screw thread thereon, is attached, that pass through the fingers D, D, and have a screw nut upon the outside, with which, to adjust the spring S to any degree of tension required.

W is a cam on front faller shaft at the head end, of the carriage, the face of which, forms a tangent to the circle of the smallest diameter of the cam.

x is an arm, or finger, on third faller shaft C, having a pin in the outer end that stands parallel with faller shafts. The cam W, and arm *x*, are of such length, that when the front faller is put down, the cam shall continue to act against the pin in *x*, until

the third faller is nearly down to the yarn; at which time the end of the cam should pass by the pin; the end of the cam being made concentric, and of such extent that the third faller cannot be raised, while the front faller is down. We have found it necessary to produce the best results from the application of the third faller, to wind the yarn up to the top of the spindles when the front faller rises, instead of leaving it about three quarters of an inch below as heretofore. We also find it an advantage to bring it up where the third faller is not used. This we accomplish by suddenly raising the counter faller about level with the top of the spindles just before the front faller rises; and about the time the yarn is losing the control of the counter faller; and it becomes necessary to hold it by some fixed object, at which time it has heretofore been brought down and held in the position for the carriage to run out, (as seen by the dotted lines Fig. 1) which is about three quarters of an inch below the top of the spindles.

The mechanism employed for raising the counter faller, is as follows. G is a lever hung by one end at the back side of the carriage, with the other end resting on cam F, on shaft B, (when the front faller is up.) In this lever is a slot through which the latch *f* passes and is hinged on the bolt 4. There is also a slot through which the wire link 3—connected with counter faller finger *a'*—freely passes.

H, is a lever hinged to lever G, by the bolt 5 at one end, with a hole through the other end to receive the link 3; and a screw nut upon the end of the link with which to adjust the counter faller to the proper height. The latch *f*, and lever H, are so formed, that when the latch is in the position shown by the full lines Fig. 1, the outer end of lever H, shall be up against the lever G; and when the latch is in the position shown by the dotted lines Fig. 1, the levers H, and G, shall be forced apart about three eighths of an inch at the end where the link 3 passes through; and as the end of lever G, is then against the cam F, it will be seen that the lever H, must be depressed, and that the counter faller, must also be depressed the same extent at the point of connection with link 3.

The advantage of raising the yarn to the top of the spindles when the front faller rises; is, "the ends" are not so liable to "nip off" at the point of the spindles when they begin to revolve for another stretch, and will bear more weight upon them to keep them straight. When it is necessary to counterbalance part of the weight, of the third faller, we put a small pulley on the shaft, to which we attach a strap having a weight at the lower end.

Operation: The drawings represent the carriage, "in, to the beam," the front faller up from the yarn, and the back, or counter faller raised to the top of the spindles; and the motions for running the carriage out about to commence operating. As the spindles commence to revolve, and the carriage to move out, the third faller is drawn up by the yarn until nearly in line with the top of the spindles, and bite of the rolls; when the points of the cam E, formed by the meeting of the concentric and eccentric parts, pass the center of the rolls *i i*; and they being drawn against the cam by the spring S, the cam and all the parts attached to the third faller shaft, are immediately thrown into the position shown by the dotted lines Fig. 1; that being the proper position for them while the carriage is running out. As the carriage continues to move outward the elevated end of the latch *f*, is brought in contact with the stand *g*, depressing the latch and lever H until the latch will pass under the stand, and bringing down the counter faller to the proper position for it, while the carriage is running out. When the carriage is out and the spindles have backed off, the front faller is put down to wind the yarn on the spindles as the carriage runs in; and by the action of the cam W against the pin in the arm *x*, the third faller is also put down, and remains on the yarn until the carriage returns to the position shown in the drawings, Fig. 1. The counter faller is controlled by the yarn until the carriage is nearly in, at which time the front end of the latch, being elevated, is brought in contact with the stand *g*, depressing the latch and bringing the stand and lever G in contact; whereby the lever is held down, so as to just clear the cam F, when the front faller rises; but allowing the lever H and counter faller to rise sufficient to bring the faller wire level with the tops of the spindles. As soon as the carriage starts out, the lever is released from the stand *g*, and is then held down by the cam F. It is not essential that the third faller should be brought on to the yarn when the front faller is put down; as it can be brought on at any time previous to the rising of the front faller; and produce the effect sought; but does no harm to be on, and less mechanism is required to bring it on then; than at any other time.

This description of our improvements is adapted to the mule, known as, "Mason's self acting mule;" but can easily be adapted to other mules; and we claim the privilege of applying them to mules now in operation.

We claim—

1. The application to mules, of the faller

C; herein denominated a 'third faller'; operated by the mechanism herein described; or the equivalent thereof; when used in combination with a faller and counter faller
5 substantially as described, and for the purpose specified.

2. We also claim, the combination and arrangement, of the levers G, and H and latch

/ substantially as described, and for the purpose specified.

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WM. GROVER.

Witnesses:

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JONA R. CHILDS.