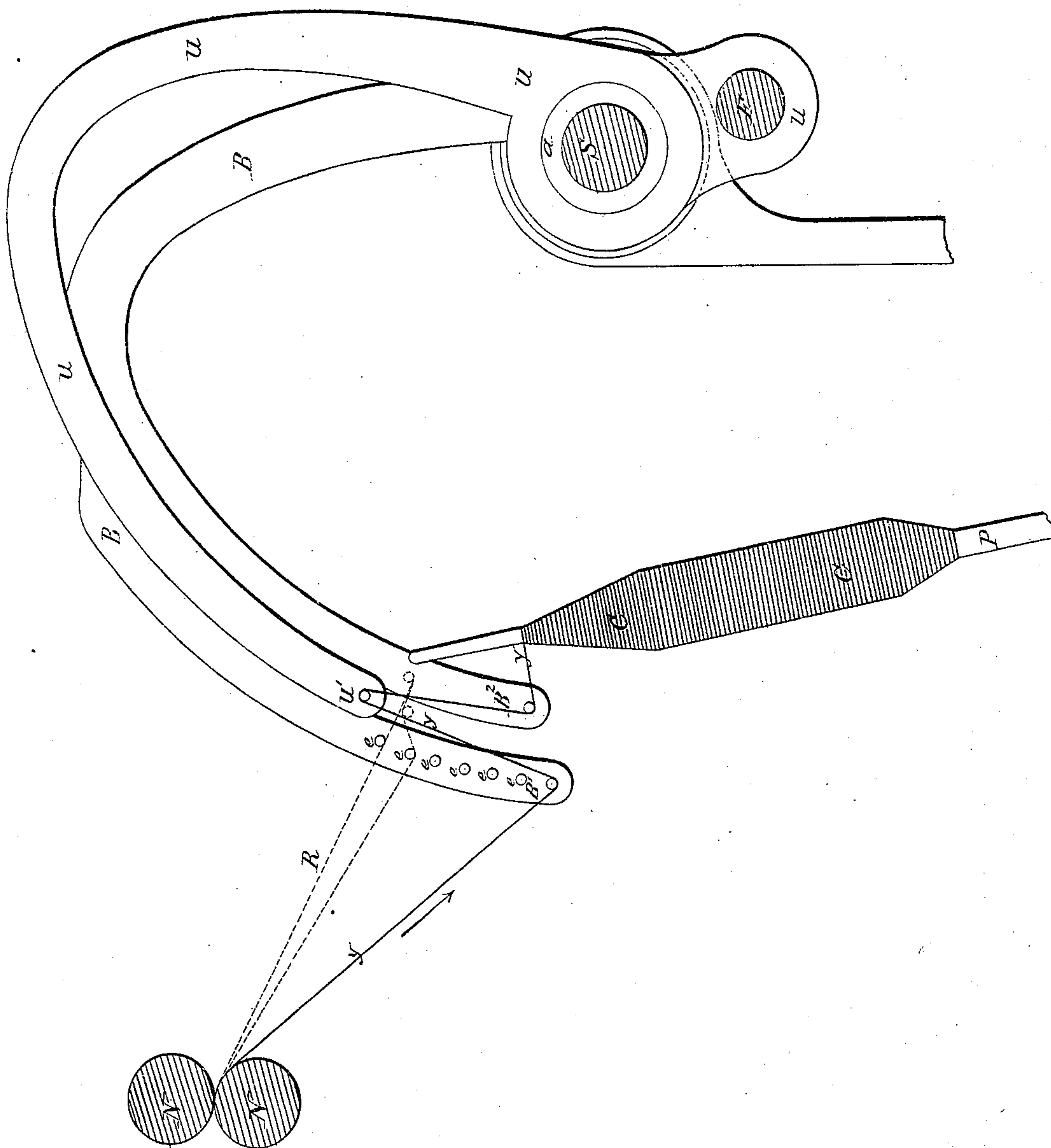


J. B. Smith.
Self-Acting Mule.

N^o 92,382.

Patented Jul. 6, 1869.



Witnesses
Moses M. Gray
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JOHN BURNS SMITH, OF COHOES, NEW YORK.

Letters Patent No. 92,382, dated July 6, 1869.

IMPROVEMENT IN MULES FOR SPINNING.

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

To all whom it may concern:

Be it known that I, JOHN BURNS SMITH, of Cohoes, in the county of Albany, and State of New York, have invented a new and useful Improvement in Self-Acting Mules; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which my invention is represented by a longitudinal vertical section of the mule, only those parts being shown which are necessary to illustrate the nature of my improvements.

This invention consists in certain improvements in the operating-mechanism of self-acting spinning-mules, hand-spinning mules, "twiners," "jacks," "billies," and other spinning and twisting-machines, whereby the machine is caused to hold the yarn in a better state of tension while winding on the spindle, and, on the other hand, the yarn is relieved from undue strain at the time that the faller commences its descending movement.

In the drawing—

C represents the cop.

P, the mule spindle.

N N, the delivering-rollers.

S, the "faller-shaft."

F, the vibratory-rod, which operates all the under fallers.

B, one of the "building fallers," pivoted on the shaft S, and having its opposite end bifurcated.

u, one of the "under or counter fallers," pivoted either on the shaft S, or on a hub or collar, *a*, of the adjacent building-faller, and rocked by the action of rod F.

u', the faller-wire, holding the yarn in tension.

y y, the spun yarn, which the machine is winding upon the cop.

B¹ B², the tension wires of the building-faller, operating in conjunction with the parts C *u'* N, to hold the yarn at the proper tension during the building of the cop.

All who are familiar with the art are well aware that the function of the building-faller is to apply the yarn to the cop in such a manner that the latter shall be properly formed, the building-faller being simply a curved guiding-arm, which moves up and down, holding the yarn at its end.

As thus constructed, a great difficulty has heretofore been experienced from the fact that the greatest tension of the yarn being between the end of the faller and the cop, when the faller reached the upper limit of its movement and began to return, it suddenly increased the tension to such a degree as to frequently break the yarn.

A glance at the drawing will show that this difficulty is completely obviated by my invention, since in my machine, at the moment that the building-faller is

ready to descend and bear more heavily upon the yarn, the under faller *u* drops the rod *u'* and slackens the tension between the parts C and N.

At the same time the two fallers B *u* may be so adjusted to each other, by means of springs, weights, or otherwise, that the faller *u* will not allow too much tension, but will yield only when a greater than ordinary strain comes upon the yarn, and only to that degree necessary to save the yarn.

On the other hand, too little tension at this point, in the process of building the cop, renders the upper end of the cop soft, and impairs its usefulness for weft or filling.

I therefore provide, in the outer fork of the faller B, a series of holes, *e e e*, each adapted to receive the rod B¹.

It is evident that the higher up the rod B¹ is adjusted, the less will be the length of the bight B¹ *u'* B² of the yarn, and the less control will the under faller have over the tension.

If, for example, the rods B¹ B² were so adjusted that when the yarn was winding upon the upper end of the cop, it would extend in a straight line from the cop to the rollers N N, as shown in red at R; then the machine would operate as if there were no under or counter faller, and only one faller wire, B².

Between the adjustments of the yarn, as shown by the red and dark lines, there may be any desired variety of adjustment, so that the tension of the yarn can be perfectly regulated and controlled at all points of the faller movement.

It is obvious that by the employment of the forked building-faller, and the use of the two rods B¹ B², around which the yarn is adjusted, as shown in the drawing, the strain upon the yarn between the faller and the rollers N, is considerably diminished.

In practical operation this is found to save breaking the yarn to a very material extent.

The under fallers being mounted loosely on shaft S, and the series being connected together by the vibrating rod F, the two fallers and the rods B¹ B² *u'*, have a concentric movement with each other.

Having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the bifurcated faller B with the vibrating faller *u*, and the rods *u'* B¹ B², all constructed to operate in connection with each other, substantially as and for the purposes specified.

2. The series of adjusting holes *e e e*, when arranged in the outer fork of the building-faller B, in connection with the wires B¹ *u'* B², substantially as and for the purposes set forth.

JOHN BURNS SMITH.

Witnesses:

MOSES M. KAY,

GEORGE MAINE.