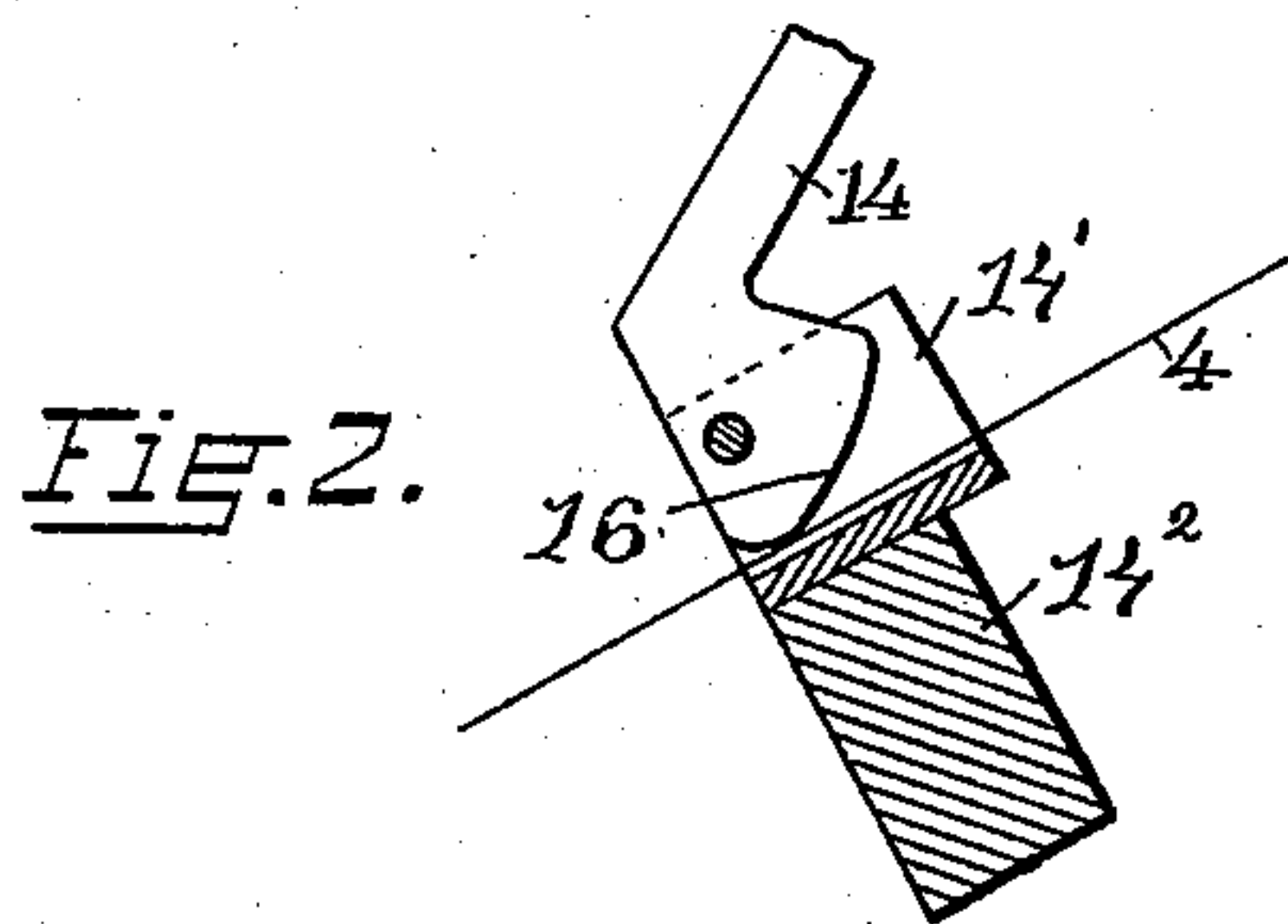
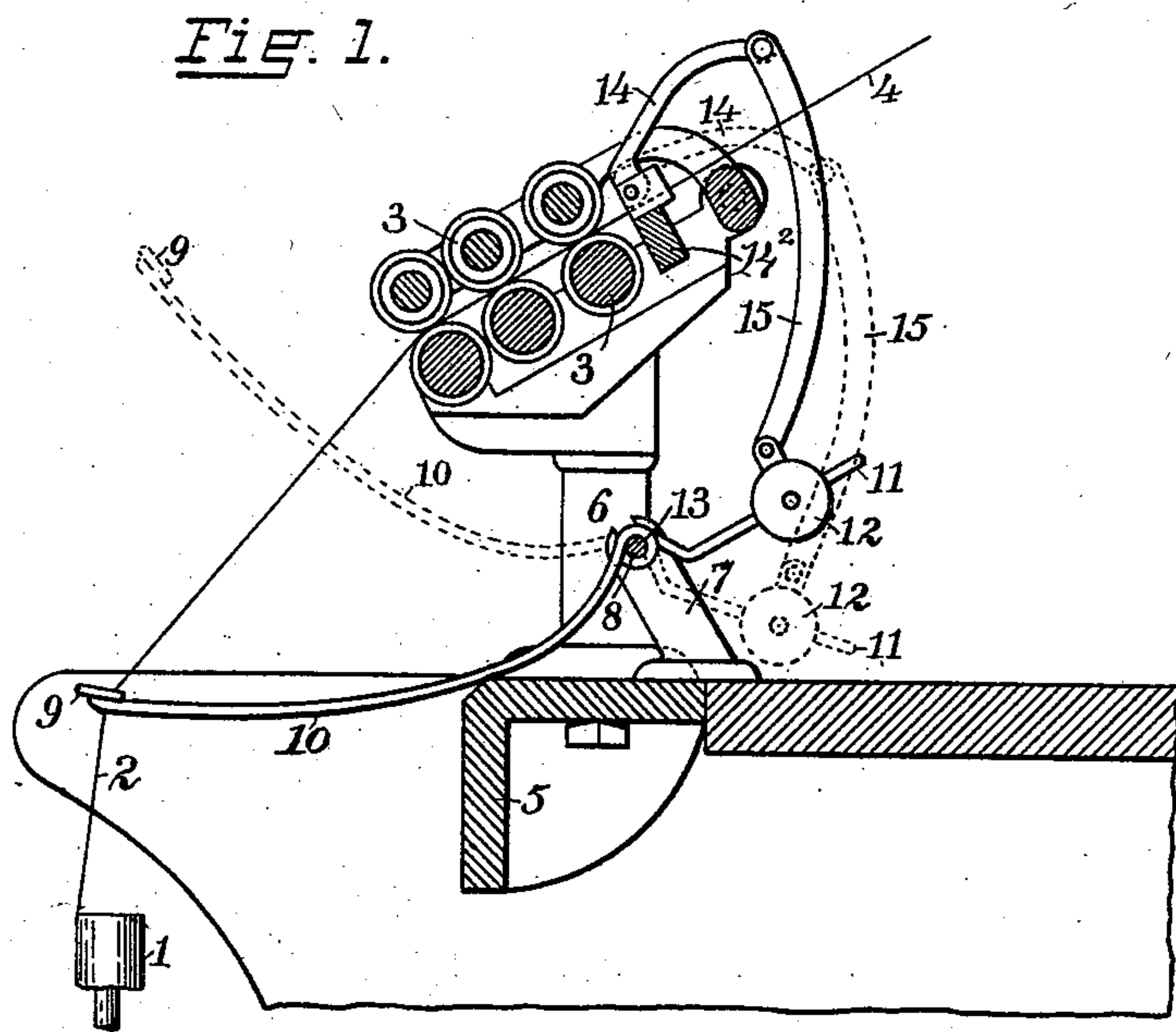


(No Model.)

F. S. CULVER.  
SPINNING MACHINE.

No. 556,307.

Patented Mar. 10, 1896.



WITNESSES:

M. F. Bligh.  
Chas. H. Luther

INVENTOR:

Frederick S. Culver,  
by Joseph A. Miller & Co.,  
Attys.

# UNITED STATES PATENT OFFICE.

FREDERICK S. CULVER, OF TAUNTON, MASSACHUSETTS, ASSIGNOR OF  
ELEVEN-TWENTIETHS TO WILLIAM C. LOVERING, OF SAME PLACE,  
AND GEORGE DRAPER & SONS, OF HOPEDALE, MASSACHUSETTS.

## SPINNING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 556,307, dated March 10, 1896.

Application filed May 9, 1895. Serial No. 548,625. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK SLOCUM CULVER, of Taunton, in the county of Bristol and State of Massachusetts, have invented  
5 certain new and useful Improvements in Spinning-Machines; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this  
10 specification.

In spinning-machines the drawn-out roving delivered from the drawing-rolls extends from the front rolls to the twisting and winding device a considerable distance, and it passes on  
15 its way through a guide-eye placed perpendicular over and above such device.

In the modern spinning-machine the guide-eye through which the roving passes to the drawing-rolls is mounted on a roving-rod  
20 placed parallel with and close to the rear rolls. To this roving-rod reciprocating motion is usually imparted, so as to vary the point of delivery of the roving to the drawing-rolls, prevent the local wearing of the  
25 drawing and top rolls and secure the even wearing of the same over a larger surface. On account of the rotary motion of the traveler, the ballooning of the roving and inherent weak places, the roving frequently breaks  
30 and requires to be pieced up. If the roving continues to run into and between the drawing-rolls, it accumulates during a break and is wasted. To avoid this waste, stop-motions have been designed which cut off or break the  
35 roving before it enters the rear rolls; but with such devices the piecing up of the broken roving would become difficult and require more time, for the separated roving would have to be inserted into the guide-eye on the roving-  
40 rod and fed in between the rear roll and top roll, so as to be carried between the rolls to the front before the same can be connected with the thread drawn off from the bobbin.

One object of this invention is to stop the  
45 roving, so as to prevent the making of waste and hold the roving so that the drawn-out sliver will retain its connection with the rear roll and will as soon as it is released be automatically carried forward between the draw-

ing-rolls and delivered for the ready piecing  
50 up of the thread.

The invention consists in the peculiar and novel construction of the automatic stop mechanism, by which the thread-guide is connected with a roving-clamp carried by the  
55 reciprocating roving-rod, so that when the yarn breaks the thread-guide will rise and operate the roving-clamp, thereby arresting the passage of the roving through the drawing-rolls, and when the thread-guide is depressed  
60 the roving will be released and automatically pass through the drawing-rolls and thereby facilitate the piecing of the roving with the thread.

The invention further consists in the construction of the roving-clamp and its relation  
65 to the back rolls, whereby the roving is clamped within the length of the staple, so that the clamped staple extends to the bite of the back rolls; and the invention further consists in the peculiar and novel construction  
70 of the roving-clamp, whereby the draft of the drawing-rolls on the roving exerts a strain on the roving-clamp and holds the roving with increasing pressure, as will be more fully described hereinafter, and more particularly  
75 pointed out in the claims.

Figure 1 is a sectional view of part of a spinning-machine frame, showing the guide-wire and its support and an automatic roving  
80 stop-motion in the normal position in solid lines and in the position when the roving is stopped in broken lines. Fig. 2 is an enlarged view of the stop-cam in connection with the roving-rod.  
85

Similar numbers of reference indicate corresponding parts throughout.

In the drawings, 1 designates the bobbin; 2, the yarn passing from the drawing-rolls to the bobbin; 3, the set of drawing-rolls; 4, the  
90 roving; 5, the front beam of the spinning-machine frame; 6, the post supporting the drawing-rolls; 7, a bracket forming the support of the rod 8. On this rod, which extends from end to end of the spinning-machine, the arm 10 is pivotally secured, the  
95 front end of which is provided with the guide-eye 9, which in the normal position is verti-



cally over the center of the spindle and bobbin and serves to guide the yarn to the twisting and winding device—that is to say, the ring-traveler. The arm 10 extends rearward of the bearing-rod 8 and forms the extension 11, on which the weight 12 is adjustably secured, the sleeve or coil 13 forming the fulcrum-bearing of the arm 10 on the rod 8.

The lever 14 is pivotally secured near its cam-shaped end in the guide-eye 14', which is connected to the roving-rod 14<sup>2</sup>, as is shown more clearly in Fig. 2. The free end of the lever 14 is connected with the weight 12 or arm 11 by connecting-rod 15. An important feature is that the connections between the guide-wire and the roving-rod are made flexible or jointed to permit the usual short reciprocation of the roving-rod.

To enable others skilled in the art to carry out my invention I will now more fully describe the object and the operation of the same.

The guide-wires are mounted on the rod. In the normal position of the parts, as shown in solid lines, the yarn passing through the guide-eye 9 to the twisting and winding device of the spinning-machine holds the arm 10 in the position shown in solid lines in Fig. 1, bearing on the front beam 5. The roving 4 passes through the guide-eye 14' between the cam end of the lever 14 and the bottom surface of the guide-eye and then to and between the rear rolls and thence to the drawing-rolls. The rear rolls only feed—that is, control—the supply of the roving and turn with a surface speed only equal to the speed of the roving, and these rear rolls are only sufficiently weighted to secure the delivery. The middle rolls and the front rolls are driven at successively higher speeds so as to draw out the roving, and these are much more heavily weighted, so that they each hold the roving firmly and permit the drawing out of the roving to the desired thinness to form the number of yarn desired.

When the yarn between the front rolls and the bobbin breaks, the front end of the arm 10 is released from the strain of the yarn passing through the guide-eye 9, the weight 12 causes the lever to tilt, and the connecting-rod 15 draws down the lever 14, the whole taking the position shown in Fig. 1 in broken lines. During the movement of the lever 14 the cam-surface 16 bears with increasing pressure on the roving and arrests its movement. The shape of the cam-surface insures its gripping the roving firmly, but without breaking it. The cam-face turns in the direction in which the roving is drawn by the rolls, and when the cam-face comes into contact with the roving the draft of the rolls on the roving tends to draw the cam-face toward the lower surface of the roving-guide to clamp the roving with increasing pressure. The rear rolls do not materially affect the roving, because the sliver is clamped close to the rear

rolls within the length of the staple of the sliver, so that the sliver will not be parted between the clamp and the rear rolls; but between the rear and the middle rolls the strain on the roving separates the same into a long tapering sliver.

The operative seeing one of the yarn-guides raised conspicuously above all the others, draws a length of yarn from the bobbin and passes it into the guide-eye 9, thus depressing the arm 10 and releasing the sliver. Inasmuch as the sliver has remained threaded through the guide-eye 14' and between the rear rolls it is at once fed along, and the action of the rolls is so rapid that the roving will be delivered by the front roll ready for piecing up almost immediately after the guide-wire is depressed, the operative, therefore, not having to wait any noticeable time. By this arrangement not only is the waste of fiber prevented, but much of the time heretofore required in piecing up is also saved.

When the spinning-machine is stopped for doffing, all the guide-eyes are at once raised, because when the spindles slow down the travelers stop, thus making a slackness in the thread which relieves the tension. The arms 10 are so counterbalanced that they will purposely rise when the frame is stopped without any threads being necessarily broken. In this position the whole front of the frame is open and can be doffed with great facility.

I do not wish to confine myself to the exact construction of the various parts herein shown and described, as various modifications may be made without materially changing the nature of my invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a spinning-machine, the combination with the drawing-rolls and the reciprocating roving-rod, of the lever 14 pivoted to said roving-rod and having the cam-shaped end 16, the counterweighted pivoted yarn-guide 10 11, and the link 15 connected with the lever 14 and the weighted end of the yarn-guide, whereby upon the breakage of the yarn the yarn-guide actuates the lever 14 and causes the cam 16 to tightly grasp and hold the roving in close proximity to the rear rolls, substantially as described.

2. In a spinning-machine, the combination with the drawing-rolls, the roving-rod adapted to reciprocate and carrying a roving-guide, a fixed support, and the counterweighted arm, supporting the yarn-guide, pivoted on said fixed support, of a clamping-lever pivoted on the roving-guide, and a flexible connection between the said clamping-lever and the arm supporting the yarn-guide, whereby the clamping device is adapted to move with the roving-rod while the yarn-guide retains the required position with relation to the spindle, and the whole will operate to stop the delivery of the roving by clamping the same near



the rear roll when the yarn breaks, substantially as described.

3. In a spinning-machine, the combination with the drawing-rolls, and the reciprocating roving-rod provided with a roving-guide for the passage of the roving, of a cam mounted upon the roving-guide close behind the bite of the rear rolls and co-operating with the roving-guide, a yarn-guide connected to the cam and adapted to move the same in the direction of the moving roving on the breakage of the yarn, to thereby clamp the roving in the roving-guide and resist its passage through the rolls until released, substantially as described.

4. In a spinning-machine, the combination with the drawing-rolls and the reciprocating roving-rod, of a clamping device moving with the roving-rod, a yarn-guide normally stationary over the spindle and moving in a vertical direction on breakage of the yarn, and connections between the clamping device and said yarn-guide whereby the moving of the yarn-guide causes the clamping device to clamp the roving, substantially as described.

5. In a spinning-machine, the combination with the drawing-rolls and reciprocating roving-rod, of a clamping device attached to the roving-rod within the length of the fiber be-

ing drawn from the bite of the rear rolls, a yarn-guide supported upon the frame of the machine over the spindle, and connections between the clamping device and yarn-guide whereby on the slacking of the yarn the yarn-guide will automatically move upward away from the spindle and when the yarn breaks the clamping device will arrest the passage of the yarn through the drawing-rolls, the yarn-guide being returned to position by the piecing of the yarn.

6. In a spinning-machine, the combination with the drawing-rolls, of a spindle or bobbin, a yarn-guide normally stationary above the spindle and forming the only obstruction to twisting between the spindle and the rolls, a roving-clamp located close behind the drawing-rolls, and connections between the thread-guide and roving-clamp whereby the roving is delivered to the rolls when the thread-guide is depressed and its delivery is stopped when the same is elevated, substantially as described.

In witness whereof I have hereunto set my hand.

FREDERICK S. CULVER.

Witnesses:

M. F. BLIGH,

JOSEPH A. MILLER, Jr.