

2 Sheets—Sheet 1.

# YARN SEPARATING DEVICE FOR SPINNING MACHINES.

Patented July 20, 1886.

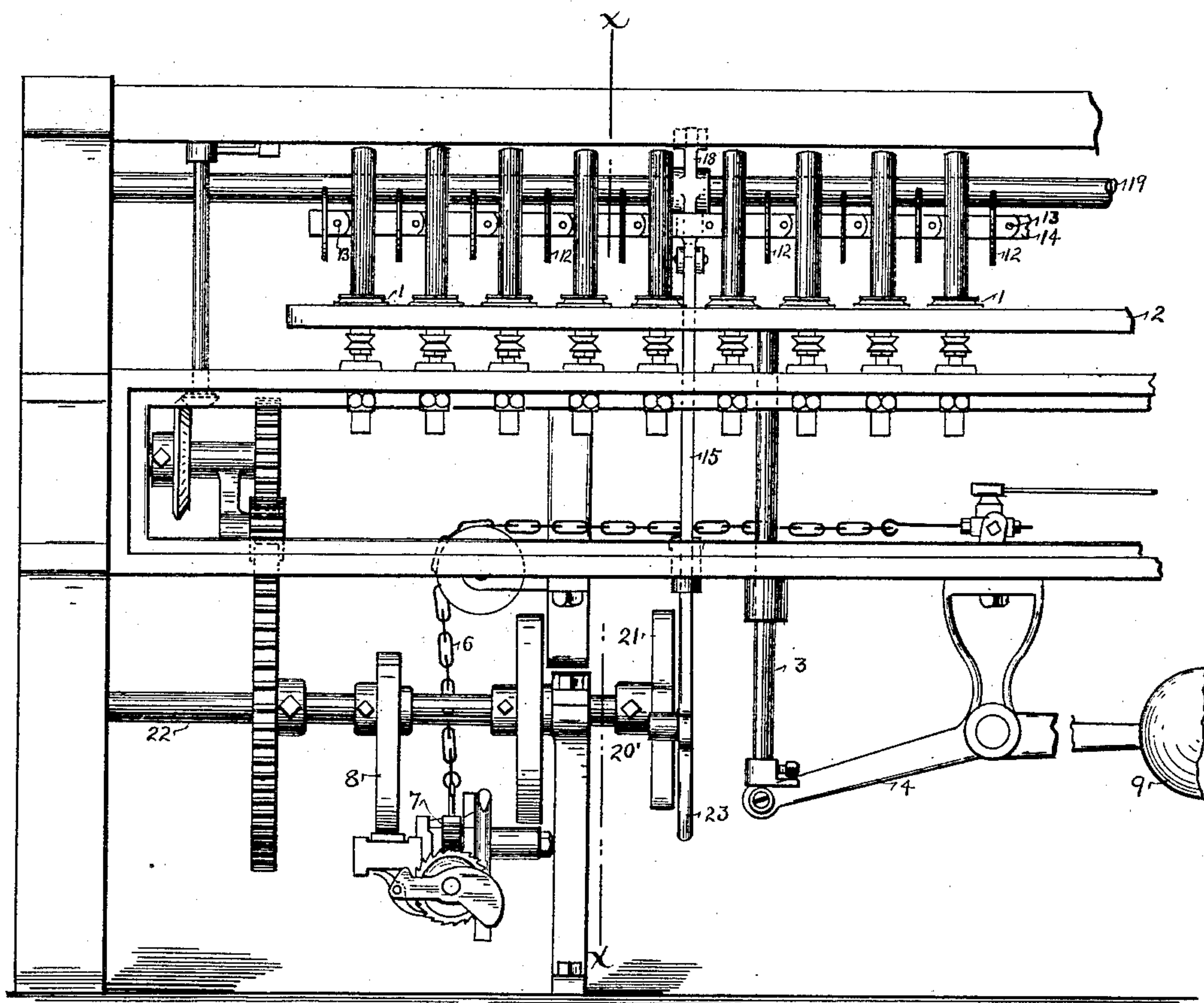


Fig. 1.

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Loren W. Penney  
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(No Model.)

2 Sheets—Sheet 2.

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YARN SEPARATING DEVICE FOR SPINNING MACHINES.

No. 345,888.

Patented July 20, 1886.

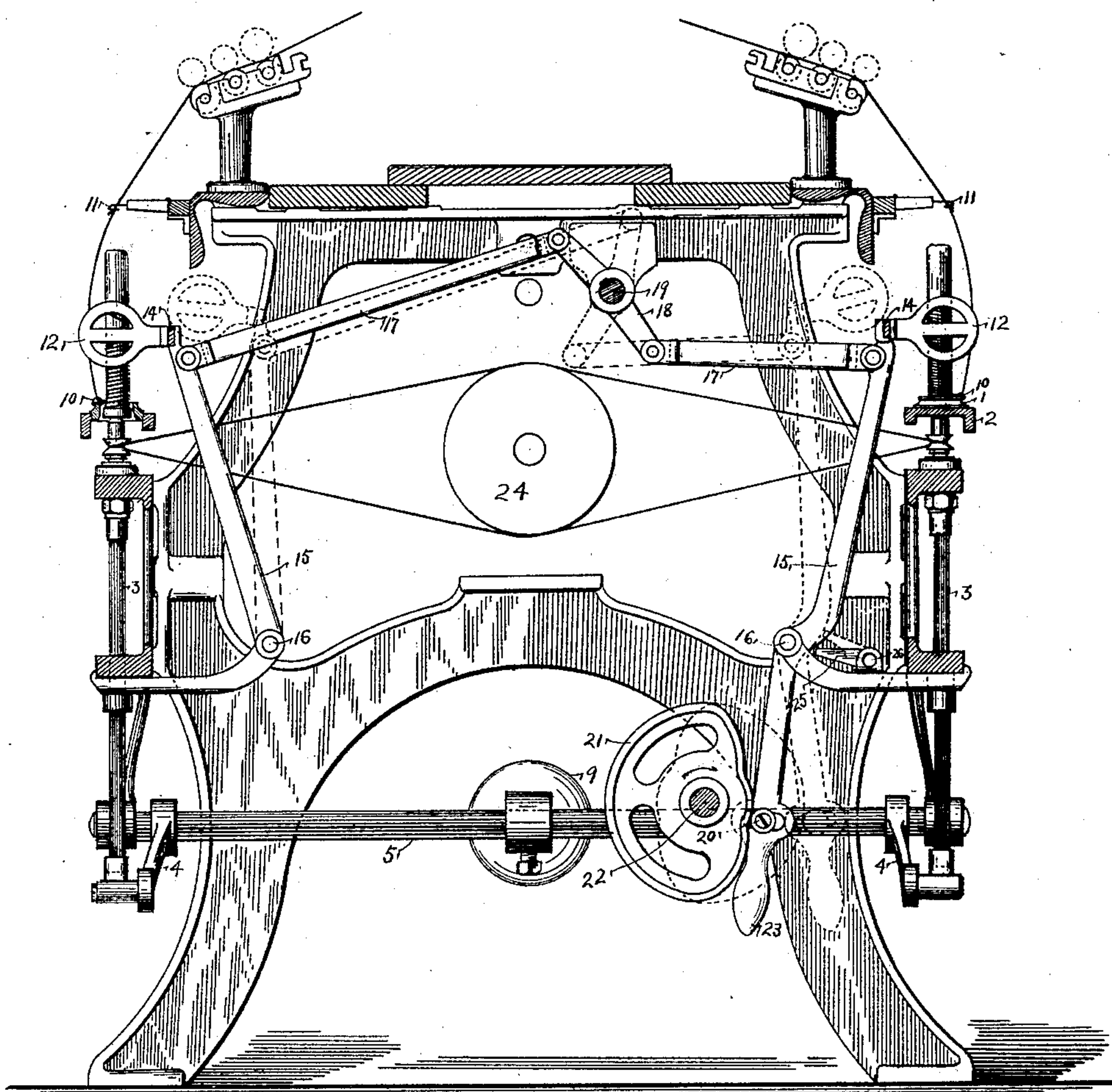


Fig. 2.

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# UNITED STATES PATENT OFFICE.

EDWIN H. CUMMINGS, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO THE  
LOWELL MACHINE SHOP, OF SAME PLACE.

## YARN-SEPARATING DEVICE FOR SPINNING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 345,898, dated July 20, 1886.

Application filed April 19, 1886. Serial No. 199,314. (No model.)

*To all whom it may concern:*

Be it known that I, EDWIN H. CUMMINGS, a citizen of the United States, residing at Lowell, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Yarn-Separating Devices for Spinning-Machines, of which the following is a specification.

My invention is especially valuable when applied to ring-spinning frames, and relates to that part of the machine which is intended to keep the adjacent threads which are being spun from breaking each other.

The object of my invention is to provide an effectual means of keeping these adjacent threads from striking each other, which shall not be troublesome to the operator of the machine, and which shall not injuriously affect the motion of any other part of the machine.

My invention is illustrated in the accompanying drawings, of which Figure 1 is a side elevation of parts of a ring-spinning frame; and Fig. 2 is an elevation, partly in section, at the line *xx* of Fig. 1, and looking toward the right at the said section. In Fig. 2 are also shown the drawing-rolls and thread-boards of the machine, as well as the spindle driving drum, all of which were omitted in Fig. 1 in order that other portions of the machine might be more clearly shown.

This machine is shown as spinning bobbins of warp-yarn, and the yarn is guided upon the bobbins by the ring-travelers working upon the rings 1, fixed to the ring-rail 2. The ring-rail is caused to move up and down by the rods 3, actuated by the arms 4 upon the shaft 5. The shaft 5 is caused to rock a certain amount by the chain 6, that is attached to the lever 7, which is in turn actuated in one direction by the cam 8 and in the opposite direction by the weight 9, all in the usual manner.

On account of the rapid rotation of the spindles of the machine the yarn has, when the spindle revolves, a tendency to fly out as far as possible from the bobbin, the yarn forming between the ring traveler 10 and the thread-guide 11 a figure somewhat resembling a balloon. If the speed of rotation is increased, this balloon-shaped figure will increase in di-

ameter if other things remain unchanged. On the other hand, if a ring-traveler is used which has a greater resistance to being dragged around upon the ring than the one previously in use, this balloon-shaped figure will be less in diameter. The high rates of speed at which spindles are now driven and the character of the yarn which is usually spun are such that this balloon-shaped figure made by the yarn as the spindle revolves would naturally be several inches in diameter. It is consequently necessary, in order to keep the adjacent threads from striking each other, to either place the spindles a little farther apart in the spinning-frame than the diameter of this balloon-shaped figure, or to interpose something between the spindles which will prevent the threads from striking each other.

On account of the desirability of getting as many spindles as possible upon a given area of the floor, it is usually the practice with spinners to use some device to keep the threads from striking each other, and several more or less objectionable methods have hitherto been adopted. One of the best-arranged devices for this purpose is that patented by James Doyle, No. 202,420; but I have found that in using that device the weight of the separators, which rest upon the ring-rail during a portion only of the time, is apt to spring the said rail at the moment when they first come in contact with it. The rail recovers its normal shape when the separators leave the rail, and both at this time and at the time when the separators first come in contact with the rail an irregularity is caused in the shape of the bobbin that is being formed, and this irregularity causes an injury to the yarn on account of the irregular drag of the ring-traveler when it passes that part of the bobbin.

A separator arranged as shown in the drawings has been found to obviate the difficulty just mentioned, and it possesses, in addition, the merit of being so arranged that it can at any moment be easily moved and retained out of the way while the frame is being doffed, or when any repairs are to be made, and as easily replaced in its normal position again at the proper time. In this mechanism the separator-plates 12 are held by screws 13 or other



suitable means to the bars 14 on both sides of the frame, when the frame has spindles upon each side. The bars 14 are supported by the rocking arms 15, which are in turn supported at their lower ends by pins 16 passing through them and through supports that are carried by the frame of the machine. The rocking arms 15 are connected by the rods 17 to levers 18, which are placed at suitable positions upon a shaft, 19, that extends nearly the whole length of the machine, and is supported by pieces fastened to the frame thereof. One of the arms 15 is extended below the pins 16, upon which it rocks, and to it is fastened the truck 20, which works upon the surface of the cam 21. The cam 21 is supported by the shaft 22, which is placed in the machine primarily for the purpose of driving the heart-shaped cam 8, that actuates the ring-rail, as hereinbefore described.

The cam 21, being shaped substantially as shown in Fig. 2, causes, during each revolution of the shaft 22, the whole series of separator-plates and the parts connected therewith to alternately take the positions shown by the full and dotted lines in that figure. The cam 21 is so placed upon the shaft 22 that when the ring-rail is in its lowest position the separator-plates shall be fully forward, and when the ring-rail is at its upper position the separator-plates shall be in their extreme backward position. The cam 21 is so shaped that, while the separator-plates are always between the spindles when the ring-rail is so low that the ballooning of the threads would be sufficient to cause them to interfere with each other if not prevented, the separator-plates themselves never come in contact with the ring-rail, nor in any way interfere with its motion by springing it or otherwise.

It is evident that the separator-plates, synchronously moving with the ring-rail, may be equivalently actuated from any part of the usual train of mechanism between the driving-drum 24 and the shaft 22, which is not liable to be changed in the working of the spinning-frame.

In order to dispense with the necessity of using anything for the especial purpose of causing the truck 20 to remain in contact with the cam 21, I prefer to so dispose the weight of the separator-plates and their supporting-bars with respect to the supporting-pins 16 that they shall always tend to fall outward from the middle of the machine, although I am aware that a weight or spring might be equivalently adapted to retain this truck in contact with the cam, and the mode of suspending the separator-plates correspondingly changed.

It will be noticed that by the arrangement of the rods 17 with the levers 18 and the shaft

19, I am enabled to cause the separator-plates on each side of the machine to move inward toward and outward from the middle of the machine simultaneously, and all by a single cam.

When for any purpose it is desirable to remove the separator-plates from between the spindles, as it is in doffing, they are placed in their extreme backward position by means of the handle 23 or otherwise, and retained there by the pawl 25, that is pivoted upon the pin 26, being raised to the position shown by the dotted lines in Fig. 2. To replace the separator-plates in their normal position it is then only necessary to push the bar 14 or any of its convenient attachments gently toward the middle of the frame, when the pawl 25 drops into the position shown by the full lines in Fig. 2, where it is entirely out of the way of the motion of the rocking arm 15.

I do not claim as my invention any part of the mechanism for actuating the spindles or the ring-rail; but

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

1. The spindles and means of driving the same, combined with the ring-rail and means of actuating it, the rings and travelers, the separator-plates and their supporting-bar, the rocking arms, and the cam 21, actuating the said separator-plates, through the said bar and rocking arms, synchronously with the motion of the ring-rail and out of contact therewith, substantially as described, and for the purposes set forth.
2. The spindles and means of driving the same, combined with the ring-rail and means of actuating the same, the rings and travelers, the separator-plates, the rocking arms, the means of supporting the separator-plates upon the said rocking arms, the means, as set forth, of connecting the separator-plates upon both sides of the machine to each other, the cam that actuates the said separator-plates, and means of supporting and rotating the said cam synchronously with the motion of the ring-rail, substantially as described, and for the purposes set forth.
3. The separator-plates and their supporting-bar, combined with the rocking arms 15 and supports therefor, the shaft 19, the levers 18, supported upon the said shaft, the rods 17, the cam 21, and a means of supporting and rotating the same, and the truck 20, fixed upon an extension of one of the rocking arms 15, and working upon the surface of the said cam, substantially as set forth, and for the purposes specified.

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Witnesses:

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AARON BLANCHARD.