

No. 722,973.

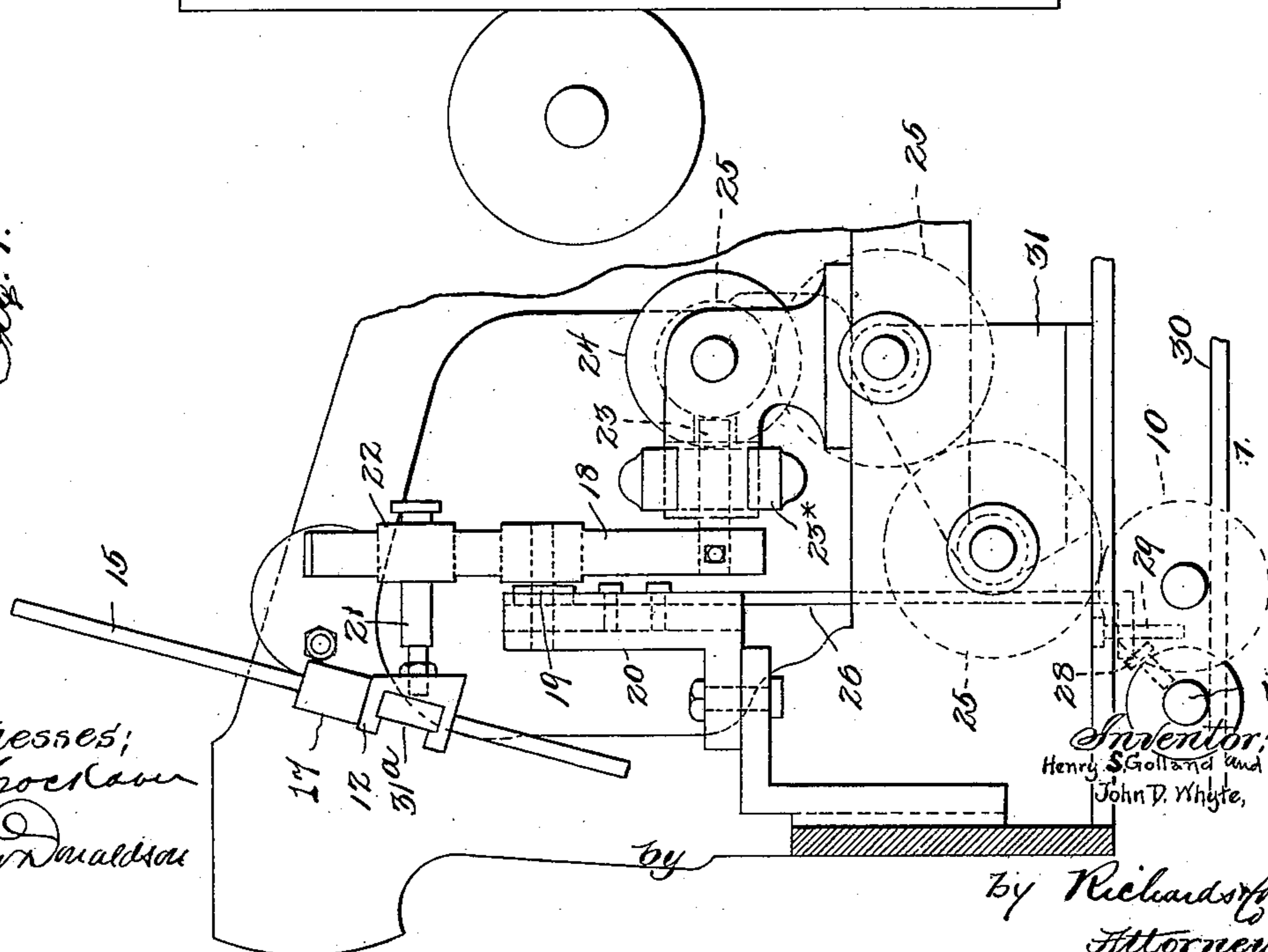
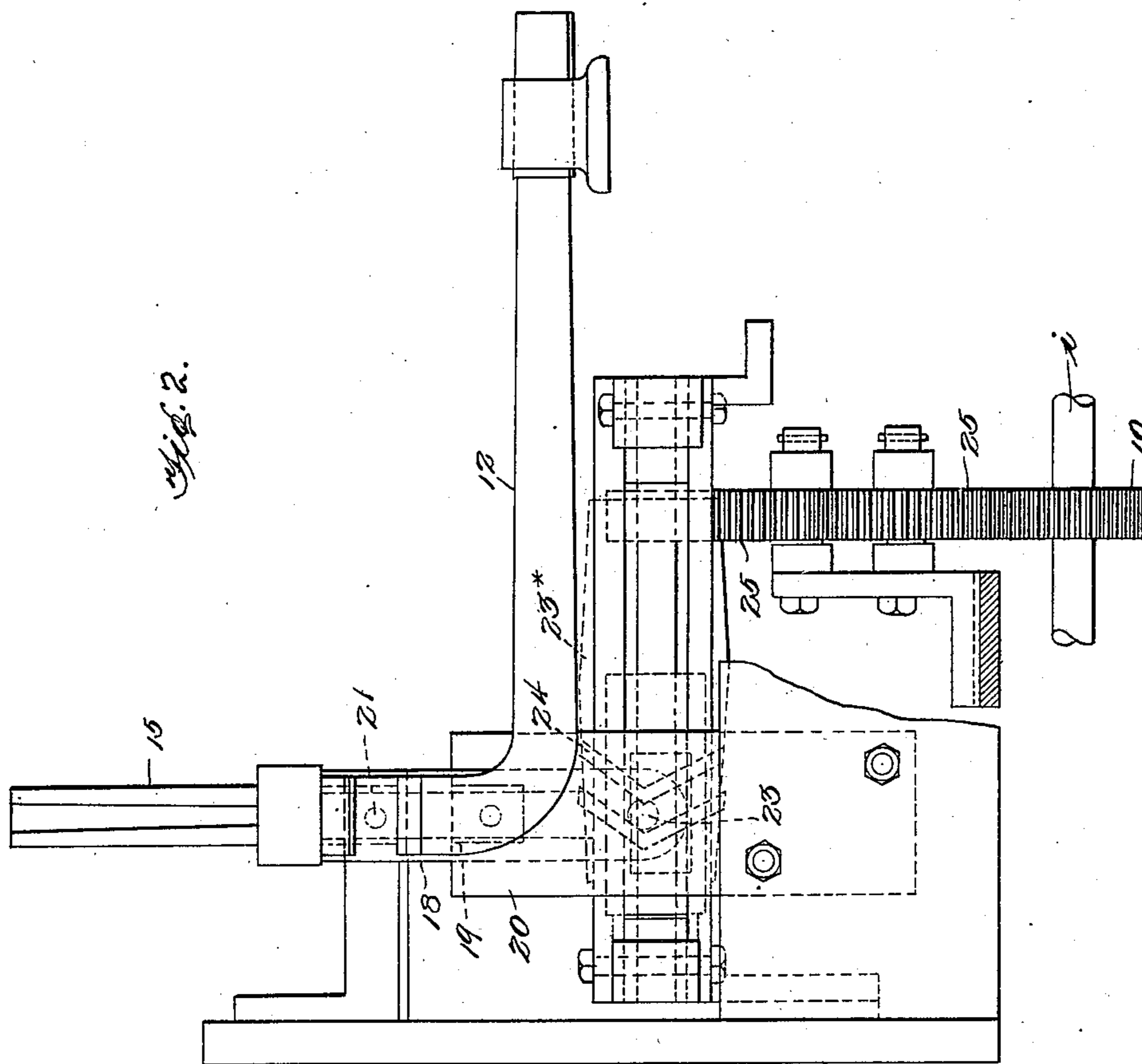
PATENTED MAR. 17, 1903.

H. S. GOLLAND & J. D. WHYTE.

SPINNING MULE.

APPLICATION FILED NOV. 6, 1902.

NO MODEL.



Witnesses;  
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# UNITED STATES PATENT OFFICE.

HENRY STAFFORD GOLLAND, OF WORSLEY, AND JOHN DEMPSTER WHYTE,  
OF MANCHESTER, ENGLAND.

## SPINNING-MULE.

SPECIFICATION forming part of Letters Patent No. 722,973, dated March 17, 1903.

Original application filed February 6, 1902, Serial No. 92,825. Divided and this application filed November 6, 1902. Serial No. 130,303. (No model.)

*To all whom it may concern:*

Be it known that we, HENRY STAFFORD GOLLAND, merchant, residing at The Gables, Broad Oak Park, Worsley, and JOHN DEMPSTER WHYTE, engineer, residing at 108 Burlington street, Manchester, in the county of Lancaster, England, subjects of the King of Great Britain and Ireland, have invented certain new and useful Improvements in Spinning-Mules, (for which we have made application in Great Britain, No. 13,915, dated July 9, 1901,) of which the following is a specification.

This application is a division of a prior application filed by us February 6, 1902, Serial No. 92,825.

This invention has reference to improvements upon a former United States Patent, No. 652,203, obtained by John Dempster Whyte for mechanism to effect the cross-winding of cops in a spinning-mule. The means for effecting this described in such prior patent were the provision of an inclined surface or guide for each thread, such guides being interposed in the space between the winding faller-wire and the spindles. When the yarn is being wound upon the spindles during the run in of the mule-carriage, the yarn guides or inclines are rapidly reciprocated a short distance, causing each thread to run up and down the surface of its guide. The threads being thus vibrated are wound upon the spindles in widely-pitched spirals, which is termed "cross-winding."

Our present invention relates to improved means for forming the cop-bottoms and for reciprocating the inclines or yarn-guides.

When commencing the build of the cops upon the spindles, we begin with a minimum traverse of the incline carrier and gradually increase such traverse, returning at each stroke to the initial starting-point of the incline carrier. We thus gradually lengthen the stroke of the incline carrier until the cop-bottom is formed, after which the lengthened stroke attained is continued throughout the building of the cops. Greatly-improved results are thus obtained in the formation of the cop-bottom.

Figure 1 shows our improved mechanism in end elevation. Fig. 2 is a side view thereof.

We employ a slide 12, mounted to slide in a horizontal path in bearings 31 and 32. This slide 12 is provided with an extension 15, secured to or forming part of the slide 12 and arranged at the same angle as the mule-spindles. Upon the extension 15 we mount a slidable part 17, to which the incline carrier is secured in any convenient manner. As the slide 12 is reciprocated it carries therewith the slidable part 17 and the attached incline carrier, the pokers of the mule raising the slidable part with attached incline carrier to effect the building of the cops in the manner disclosed in an application for patent made by us of even date herewith.

To reciprocate the slide, we provide a lever 18, mounted on a block 19, capable of sliding in a slot formed in a bracket 20 and in a slot formed in the lever 18. The slide 12 is connected by a stud 21 to the lever 18, the stud being carried by a block 22, also capable of sliding to some extent in a slot in the lever 18, so as to compensate for the curved path described by the upper end of the lever 18 when it is vibrated. The lever 18 is vibrated by a stud 23, engaging with a cam 24, the cam being revolved by a train of gearing 25 from a pinion 10, receiving motion from a rack 7 on the floor as the mule-carriage runs in and out. The stud 23 is guided and supported by a slide 23\*. The fulcrum or block 19 of the lever 18 is provided with a pendent rod 26, the bent foot 27 of which rests upon a stud 28, carried by a bowl or collar on the poker-shaft *i*. This shaft *i* is slowly revolved in the direction of the arrow to effect the raising of the pokers to which the yarn-guide carrier is secured, as explained in our prior application of even date herewith, and as this shaft *i* is slowly revolved the pendent rod 26 also slowly falls, thus lowering the slidable block or fulcrum 19 within the lever 18 and bracket 20. As the distance from the stud 21 to the fulcrum 19 of the lever is thus lengthened, the throw of the stud 21 is gradually increased, correspondingly increasing the traverse of the slide 12, by means of which the incline

carrier is actuated. When the cop-bottoms have been formed, an adjustable stud 29, carried by the foot 27 of the rod 26, comes into contact with a stop-rod 30 or any other fixed part of the mule-carriage 31, and thus prevents the further downward movement of the rod 26. The fulcrum 19 of the lever 18 then remains stationary during the remainder of the build of the cops, and the oscillations of the lever 18 and stud 21 remain constant in their length of traverse.

We declare that what we claim is—

The means for vibrating the yarn-guides and for effecting a minimum reciprocation of the yarn-guides on the commencement of a cop-bottom and gradually increasing the traverse of the yarn-guides so that a maximum traverse is attained when the cop-bottom is completed and thereafter maintaining such maximum traverse, said means consisting of a slide 12 with inclined extension 15, an in-

cline carrier sliding thereon, a lever 18 having a movable fulcrum 19 for reciprocating the slide, a cam 24 for vibrating the lever 18 a train of gearing 25 for revolving said cam a pinion 10 carried by the mule-carriage for imparting motion to the gearing 25 a rack gearing with said pinion, a pendent rod 26 secured to the movable fulcrum of the lever 18 a poker-shaft *i* and a stud 28 carried by a collar on the poker-shaft *i* for supporting the rod 26 and stop-pin 29 to limit the downward movement of the rod 26 substantially as described.

In testimony whereof we have hereunto set our hands in presence of two witnesses.

HENRY STAFFORD GOLLAND.  
JOHN DEMPSTER WHYTE.

Witnesses:

JOSHUA ENTWISLE,  
ALFRED YATES.