(No Model.) 2 Sheets—Sheet 1.

J. A. MURPHY.

TRAVERSE MOTION FOR BOBBINS IN WINDING MACHINES.

No. 472,383. Patented Apr. 5, 1892.

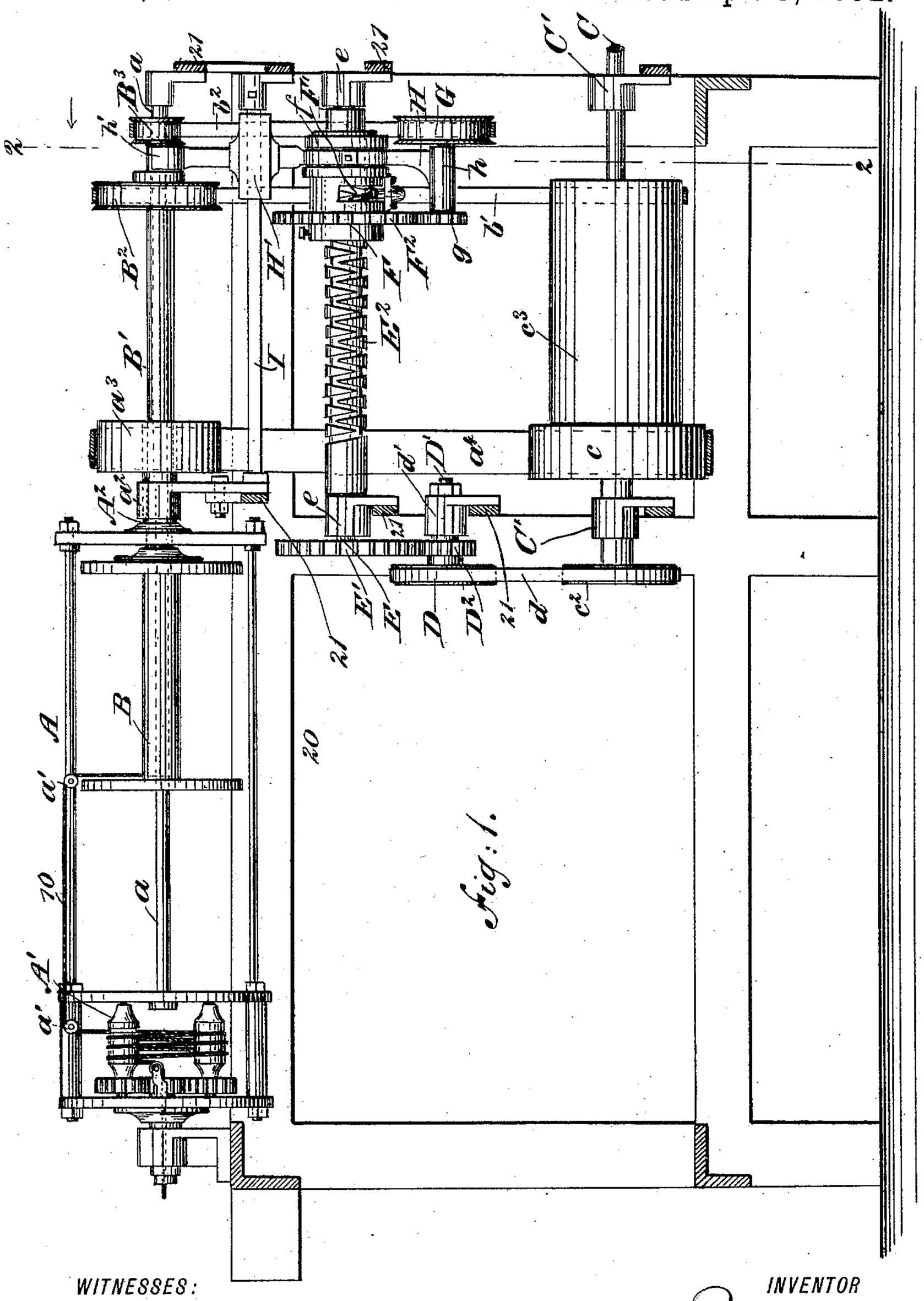

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig: 4.

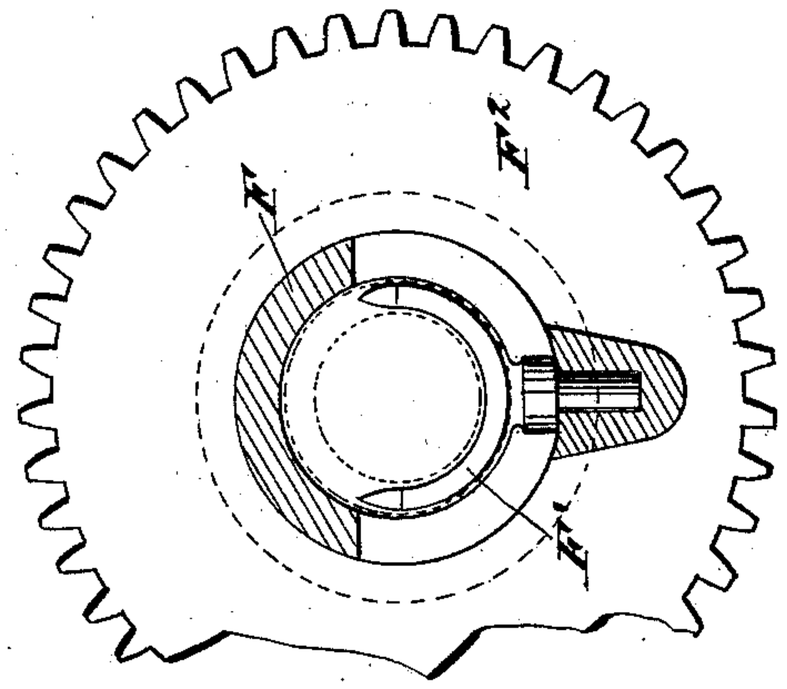


Fig: 2.

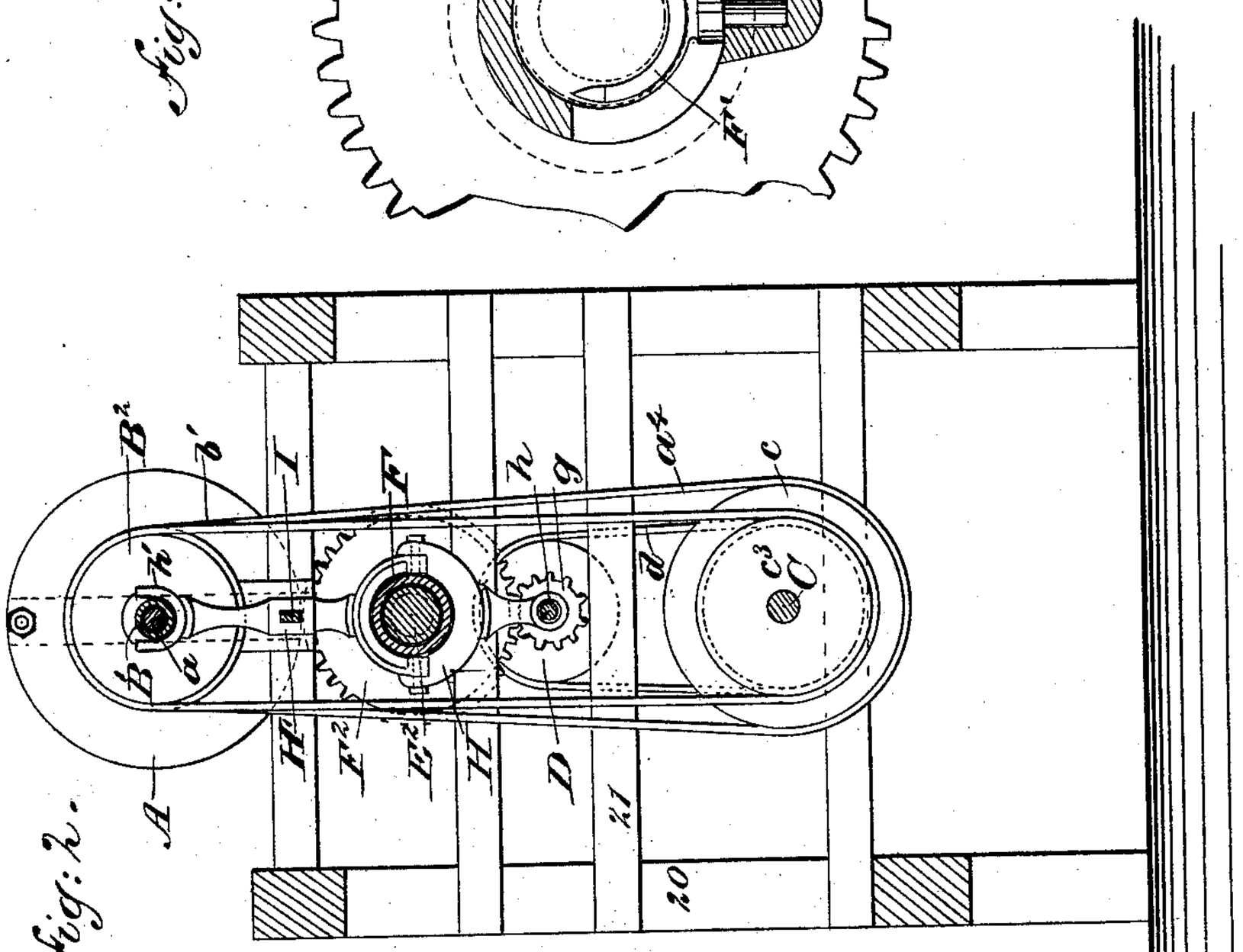
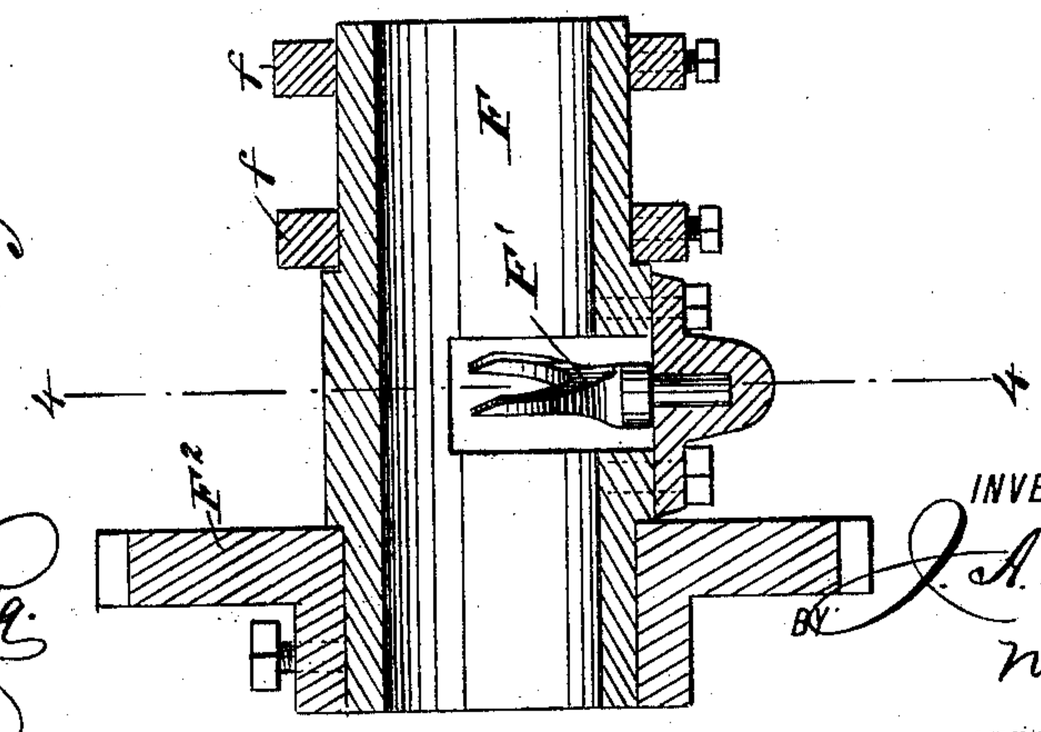


Fig: 3.



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UNITED STATES PATENT OFFICE.

JUNIUS A. MURPHY, OF NEW ORLEANS, LOUISIANA.

TRAVERSE-MOTION FOR BOBBINS IN WINDING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 472,383, dated April 5, 1892.

Application filed May 21, 1891. Serial No. 393,544. (No model.)

To all whom it may concern:

Be it known that I, JUNIUS A. MURPHY, of New Orleans, in the parish of Orleans and State of Louisiana, have invented a new and Improved Traverse-Motion for Bobbins in Winding-Machines, of which the following is a full, clear, and exact description.

The invention relates to means for causing a bobbin to traverse the flier in winding cord or yarn on the bobbin; and the object of the invention is to provide a means for automatically controlling the traverse movement of the bobbin to the end that the cord or yarn will be wound thereon in parallel or close coils throughout.

In winding-bobbins carried by fliers the traverse-motion is now generally adjusted so that the coils or windings of one layer are close or parallel; but as the diameter increases the bobbin is shifted in the flier more rapidly than the cord or yarn is wound thereon, so that the coils are not close parallel ones; but the yarn is instead wound in spirals of gradually-longer pitch in the successive layers.

In my invention the cord is closely wound in parallel coils throughout, the bobbin being shifted exactly in proportion to the rapidity with which the yarn is wound thereon, as hereinafter fully explained.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar reference characters indicate corresponding parts in all the figures.

Figure 1 is a side elevation of a flier and bobbin having my improved traverse-motion applied thereto. Fig. 2 is a transverse section on line 2 2 in Fig. 1. Fig. 3 is a longitudinal sectional view of the shifting nut, and Fig. 4 is a cross-sectional view thereof on line 4 4 in Fig. 3.

The flier A is provided with the bobbin B, which is fitted loosely on the spindle a in the usual manner, and to said bobbin the cord or yarn 10 leads from the capstan-barrels A′ over guide-pulleys a' a', as usual.

In practice, as is well known, the cord or yarn 10 is fed with regulated speed from the capstan A′, and the bobbin and flier both revolve in the same direction, the speed of the bobbin being the slower and depending on the rapidity with which the yarn or cord is fed thereto. Further, traverse-motions have been provided heretofore in which the bobbin was shifted laterally by a non-rotating nut, which was actuated by a reversing feed-screw—that is, a feed-screw having right and left threads cut through or over each other.

In my invention the shifting nut, as well as the feed-screw, is rotated and in a like direction, and the difference in rotation of the bobbin and flier dictates the difference in rotation between the feed-screw and nut, and consequently dictates the amount of traverse movement imparted to the bobbin.

The flier A at one end is secured to the short hollow shaft A^2, which has a bearing in the bracket a^2 and carries a pulley a^3. The bracket a^2 and similar brackets forming bearings for the shafts hereinafter mentioned are supported from cross-bars 21 of the frame 20. Any other suitable bearings may be provided in practice. The pulley a^3 is driven by a belt a^4 from a pulley c on the driving or main shaft C, which has its bearings in the brackets C′ C′.

The hollow shaft B′, which carries the bobbin B, extends through the shaft A^2 and carries the pulleys B^2 B^3, of which the pulley B^2 receives a belt b' from a long pulley c^3 on the driving-shaft C, said belt acting merely as a drag to the bobbin, and not as a driving-belt. The shaft C is further provided with a pulley c^2, from which a belt d passes to the pulley D on a short shaft D′, which has a bearing in the bracket d'. On the shaft D′ is a pinion D^2, which meshes with a gear-wheel E′ on the shaft E, which is supported in brackets e, and on said shaft E is formed or secured the reversing feed-screw E^2, of the usual form.

The shifting nut F is fitted on the feed-screw E^2, and consists of a sleeve having the swiveled fork F′, which rides in the threads of the said feed-screw. The shifting nut is provided with a gear-wheel F^2, which meshes with and is driven by a pinion g, the shaft of which carries a driving-pulley G, driven by a belt b^2 from pulley B^3, and said shaft has a bearing in the sleeve h on the lower end of the yoke H. The yoke H is secured to the shifting nut between collars f and is formed with a block H′, which rides on the slide I, formed on the frame 20. Above the block H′ the yoke H is provided with a fork h', which is received between the pulleys B^2 B^3 on the hol-

low shaft B′ of the bobbin, said fork serving to shift the bobbin in response to the movement of the nut.

The reversing feed-screw in practice is not practical with threads of a less pitch than one to the inch, and hence the screw and nut are back-geared.

In operation if the flier and bobbin are rotated at the same speed the nut and feed-screw will rotate at the same speed also, and there can be no traverse movement of the nut. In winding, however, as the bobbin falls back a revolution relatively to the flier the nut will back one-eighth of a revolution relatively to the feed-screw, and consequently the nut and bobbin will be shifted one-eighth of an inch, which corresponds to the diameter of the material being wound. The same amount of traverse motion will be thus imparted to the nut and bobbin regardless of the increasing diameter of the bobbin, as it is the relation of the bobbin and flier that dictates the fraction difference between the nut and screw. In effect, therefore, the feeding of the material automatically governs the shifting nut through the medium of the bobbin, and when a yarn or cord of a different diameter is to be wound the extent of back gear is varied accordingly by replacing the pulleys D and G, for instance, to give the proper relative speed to the nut and feed-screw. For instance, if the screw has a thread of one-inch pitch then a difference of one turn between the nut and screw would result in a movement of one inch. Therefore, when the flier and bobbin differ one turn the nut would move the bobbin-tube forward one inch, which would be too much for a yarn one-eighth of an inch in diameter. Now, to get the nut to move but one-eighth of an inch at each time the bobbin and flier differ one turn I would have to put in pulleys G D, that would drive the nut and screw one-eighth the speed of the flier and bobbin. Then a difference of one whole turn between the flier and bobbin would only result in one-eighth of a turn in the nut, which would amount to one-eighth-of-an-inch movement. Other movements in the nut may be obtained by using other sizes of pulleys.

The invention is specially useful for winding bobbins; but it is evident that the nut controlled by the bobbin and cord, as explained, may be utilized for shifting other devices than bobbins.

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

1. In a traverse-motion for bobbins, the combination, with the flier and bobbin-spindle, of a rotary feed-screw having a fixed speed relatively to the flier and a nut thereon having a fixed speed relatively to the bobbin-spindle, and connections between the bobbin-spindle and nut, whereby the changing relations of the bobbin-spindle and flier will result in a difference in speed between the screw and nut, substantially as described.

2. The combination, with the flier, the bobbin, and the drive-shaft to which the two are belted, of a feed-screw parallel with the bobbin-spindle, driven from the drive-shaft and having right and left threads, a rotary reciprocating nut traveling on the feed-screw and connected with the bobbin-spindle to slide it, and gearing connecting the said nut with the bobbin-spindle to rotate it therefrom, substantially as set forth.

3. The combination, with the flier, the bobbin-spindle, the feed-screw having right and left threads, and mechanism for rotating them, of a rotary reciprocating nut having a fork engaging the threads of the screw, a reciprocating standard or yoke connected with the nut and bobbin-spindle, and a shaft carried by the yoke and geared to the nut and to the bobbin-spindle, substantially as set forth.

4. An improvement in traverse-movements for twisting-machines, consisting of a screw and nut, in combination with a flier and bobbin-spindle, but separate therefrom, a yoke connecting the nut and bobbin-spindle, gearing for rotating the screw, and gearing for rotating the nut from the bobbin-spindle, and removable pulleys on said screw and nut-operating gearing, whereby pulleys of different sizes may be interchanged therefor, substantially as set forth.

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