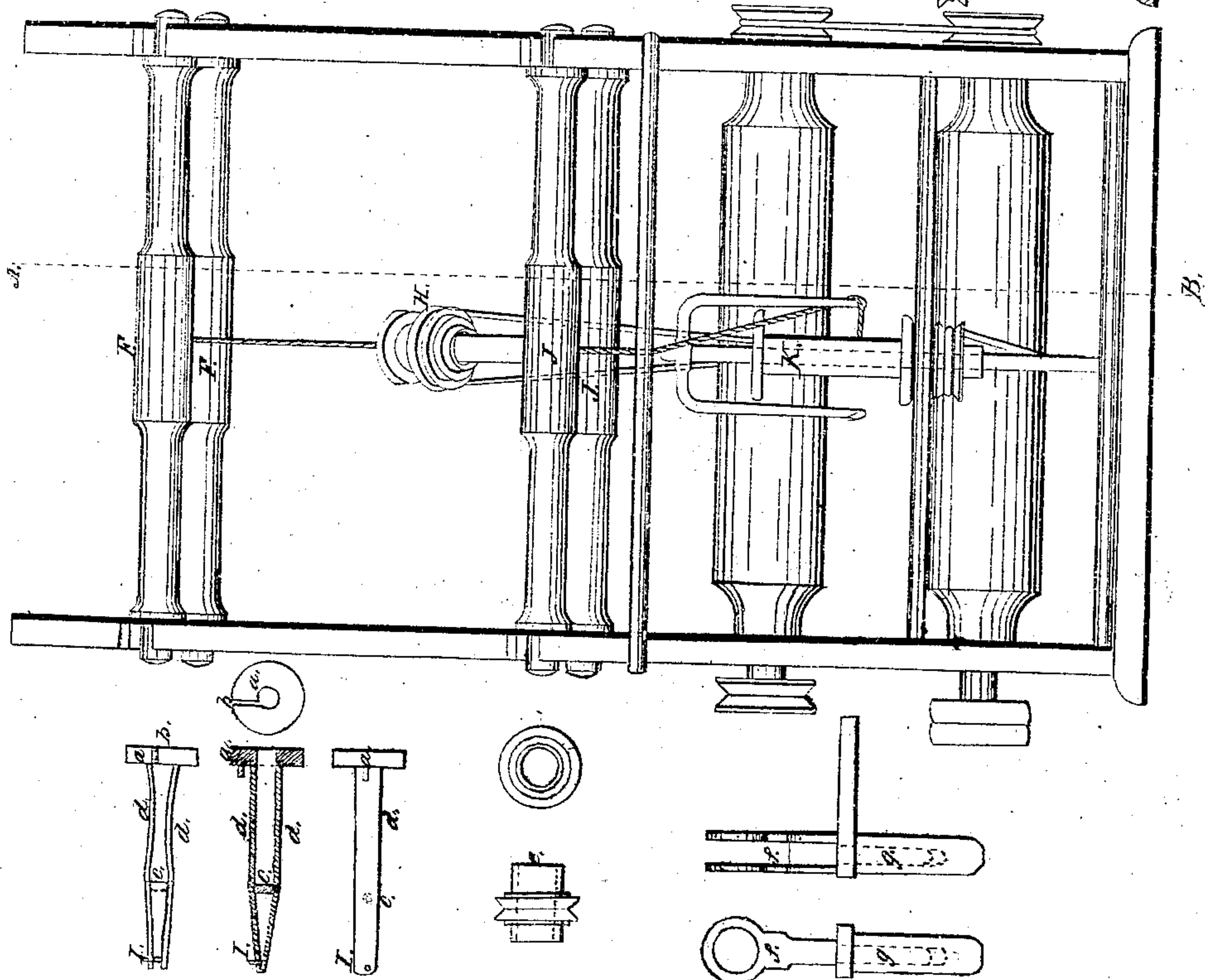
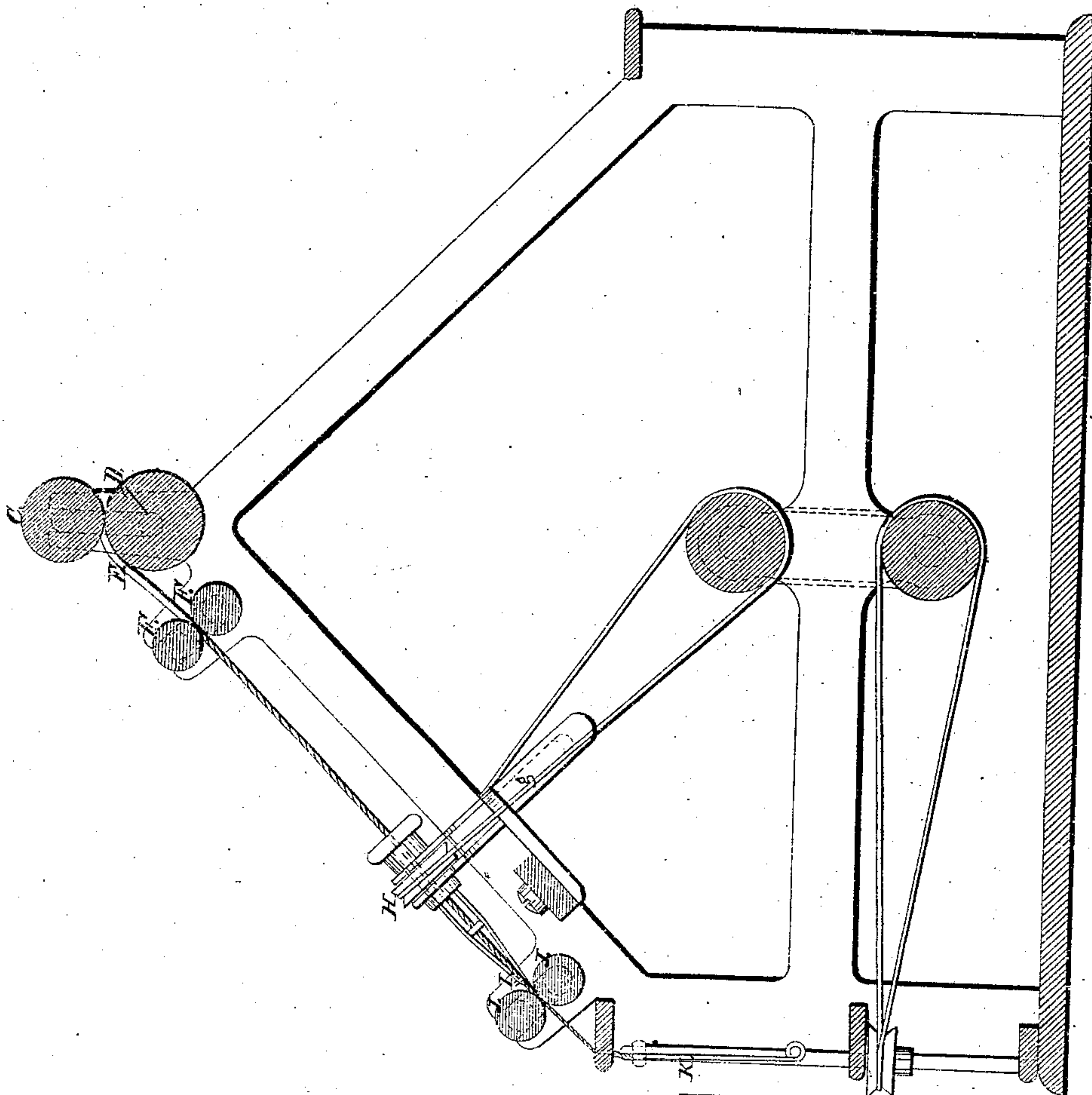


H. SILVER.  
MACHINE FOR SPINNING.

No. 9,391.

Patented Nov. 9, 1852.





# UNITED STATES PATENT OFFICE.

HARVEY SILVER, OF LOWELL, MASSACHUSETTS.

## TWISTING-TUBE FOR THE FORMATION OF ROVING.

Specification of Letters Patent No. 9,391, dated November 9, 1852.

*To all whom it may concern:*

Be it known that I, HARVEY SILVER, of Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Spinning, and that the following is a full, clear, and exact description of the principle or character which distinguishes my invention from all other things before known or used and of the method of constructing and using the same.

My invention is particularly applicable to that process in spinning wherein the roving to be spun is stretched or drawn when it has a twist. This is usually the case in the spinning of woolen yarn and although applicable to other material I propose to describe the apparatus as applied to that.

In the ordinary process of woolen manufacture the roving is delivered to the spinning machines in the form of a small strand of woolen fibers having no twist. In my improved method of spinning, this roving is first passed between delivering rolls and thence along a distance of two or three feet and passed between drawing rolls, which by having a greater velocity than the delivering rolls, stretch the roving. After the roving has passed the drawing rolls it is twisted by an ordinary spindle and flies, by means of a ring and traveler or any other well known means. If the roving between the delivering and drawing rolls has no twist in it, it will be frequently broken, so that it would render it inexpedient to use, and also by the twisting of the roving to a certain extent the twist first runs to the smaller part of the roving, which thus becoming firm will resist the stretch and oblige it to take place in the larger parts, thereby evening the thread or yarn. It is therefore necessary that there should be a certain quantity of twist in the roving at the time it is drawn or stretched.

It is the object of my invention to produce this twist in such a manner as to be practically useful.

I am aware that tubes as commonly constructed through which the roving is passed have been used between the delivering and drawing rolls upon roving while being stretched, for the purpose of giving a twist to the roving, and also I am aware that belts running in opposite direction with thin surfaces nearly in contact and the roving between them have been used for the same pur-

pose. Therefore I do not claim to have invented the giving a twist by the tube or belt in such a connection. But in all constructions of tubes which have hitherto been used the necessary friction to give the requisite twist while the roving is in the act of passage through the tube has been derived by passing the roving through a crooked channel in the tube or by giving it a turn around a flier on the tube. These means are sufficient when the roving is not to be stretched in the transit, but when it is necessary to draw the roving it is found to be necessary to place the twisting tube near the drawing rolls and it may here be said that in the twisting of roving which has each end confined between rolls no actual twist in one direction can be produced throughout its entire length; but I have discovered that if the roving is in motion by being drawn along by rolls and the point where the twist is given is very near (say within an inch) of the drawing rolls, a twist in one direction will exist between the delivering rolls and the tube, but between the tube and the drawing rolls there will be no twist. This arises from the circumstance that the twist which ought to be between the tube and the drawing rolls is being continually destroyed by the twist in an opposite direction, which is continually being drawn past the point where the twist is given. This being the case the roving will constantly be breaking between the tube and the drawing rolls with tubes as ordinarily constructed. The tubes I use for this purpose are so constructed that the necessary friction to give the necessary friction to turn the roving and at the same time allow the roving to be drawn through them is caused by the compression of two surfaces together by a spring. By this means I am able to bring the frictional point which turns the roving so near the bite of the drawing rolls that the fibers of the material will all reach this short distance and then the roving will not break at that place. When this is accomplished and the point of the twisting tube is near enough to prevent breakage, I find that if the tube is fixed in position there is no practical means of mending in a new or broken strand without displacing the drawing rollers.

The principal part of my invention consists in the means of obviating this difficulty and in rendering this mending inconvenient and practical. This I accomplish



in two ways. One consists in supporting the tube in such a manner that it can be turned in its direction so that the point of it will be in a position that a hook can be passed  
 5 between the bosses of the rolls and run through the tube and by it the roving drawn in through the tube. The other method consists in having the revolving tube in two  
 10 parts, one part being a ring having a whirl around which the band to drive it is passed and the other part a tube having the frictional surfaces attached to it and so made as to enter into the whirl and be capable of being taken out and replaced while the whirl  
 15 is in motion and thereby mend in the roving without stopping the running of the machine.

In the accompanying drawings, which form a part of this specification, the same  
 20 parts are designated by the same letters in all the figures.

Figure 1 is a front elevation of a spinning frame of one spindle with my improvements attached. Fig. 2 is a vertical section of the  
 25 same through A, B, of Fig. 1. Fig. 3 represents the detachable tube with its frictional nippers. Fig. 4 represents the whirl into which the detachable tube enters. Fig. 5 represents the bearings and their supports  
 30 in which the whirl is held and allowed to revolve and the manner of supporting them so that the direction of the tube can be changed.

The roving being upon the spool C, Fig. 3, and resting upon the revolving drum D is  
 35 unrolled from the spool and delivered at E to the pair of rolls F, F, from which it passes to the tube H, which has a rotary motion of which the roving is in the axis.  
 40 There are spring frictional nippers at I which press together sufficient to give a counter twist to the fibers and at the same time allow the roving to be drawn between them by the drawing rolls. In this way the  
 45 roving which is between the delivery and drawing rollers is stretched when it has the twist given by the tube in it. From the rolls J J the roving passes to the flier and spindle and is twisted in the usual manner  
 50 into yarn. The tube H is made in two parts one of which is represented at Fig. 3 and is constructed of a ring of metal (a) having a slot (b) in its side and a pair of thin springs extending from it and meeting at  
 55 the point I. Between these springs at (c) is a small stud which keeps them apart at that point. Now when this apparatus is pinched by pressure upon the parts (d d) the jaws at I will be opened and a sliver of  
 60 roving can be laid in at the slot b and between the jaws at I conveniently. This tube I call the pincer tube and is made to enter into the whirl (e), Fig. 4, and be revolved by it. This whirl (e) is a piece of metal hav-  
 65 ing a hole through it and a groove around

it suitable for a band which is to give it a rotary motion and is supported in bearings, as seen at H in Fig. 2 and more distinctly shown at Fig. 5. When a strand of roving  
 70 is to be mended in, it is passed between the rolls F F, the pincer tube is taken from its whirl, pressure between the thumb and finger of one hand at the part d d and the roving laid in with the other hand. Then  
 75 the loose fibers entering from the point of the tube may be pulled off. When a sufficient quantity of roving has been delivered from the delivering rolls the pincer tube is to be dropped into its whirl. The fibers projecting from the pincer tube will be caught  
 80 by the rolls J, J, drawn through and then can be mended in upon the spindle in the usual manner. Another construction and adaptation for the purpose of mending in a  
 85 broken strand is represented if we consider the pincer tube and whirl to be in one piece. When this is the case the bearings of the whirl f, f, Fig. 5, are to be supported upon  
 90 an axis which is at right angles to the axis of the tube and is accomplished by extending the strand forming the bearing and making it round, so as to enter into a socket, as shown at g, Figs. 2 and 5 in dotted lines. This allows the point of the pincers to turn  
 95 sidewise so that they can be directed to that part of the rolls between the bosses, which being smaller at this place a hook on the end of a wire can be passed between the rolls and through the revolving tube and the roving  
 100 being attached to the hook can then be passed between the rolls and be drawn down without stopping the revolution of the tube or the frame.

Having thus fully described my invention and its adaptation what I claim as new  
 105 and desire to secure by Letters Patent is—

1. The construction and use of tubes for giving countertwist to roving by having a slot in the side in such a manner that the  
 110 roving can be laid into the tube without the use of a hook as described.

2. The construction arrangement and use of tube for giving counter twist to roving in such a manner that without disengaging the  
 115 driving apparatus the tube can be so turned on its support that a hook can be passed between the bosses of the rolls through the revolving tube to draw the roving into the tube without stopping the parts as described.

3. The construction and use of tubes for  
 120 giving counter twist to roving by making them in two parts into one of which the roving can be adjusted and then dropped into the other giving it the necessary rotary motion to form the twist.

HARVEY SILVER. [L. s.]

Witnesses:

M. C. BRYANT,  
 S. BARTLETT.