

# W. & J. Leach. Spinning Mach Throstle.

N<sup>o</sup> 60,202.

Patented Dec. 4, 1866

Fig. 1.

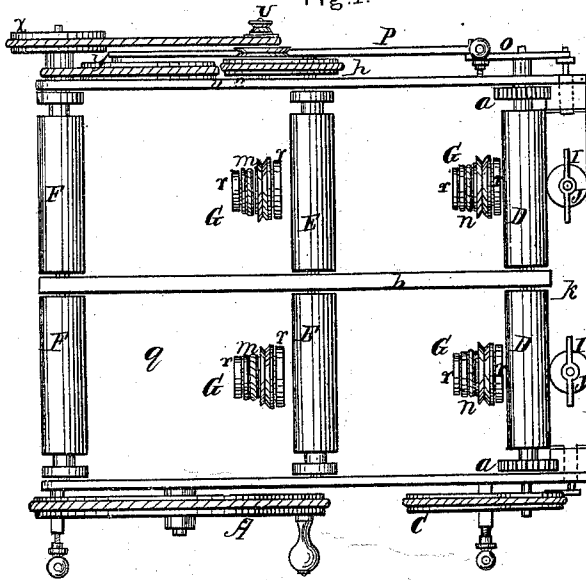
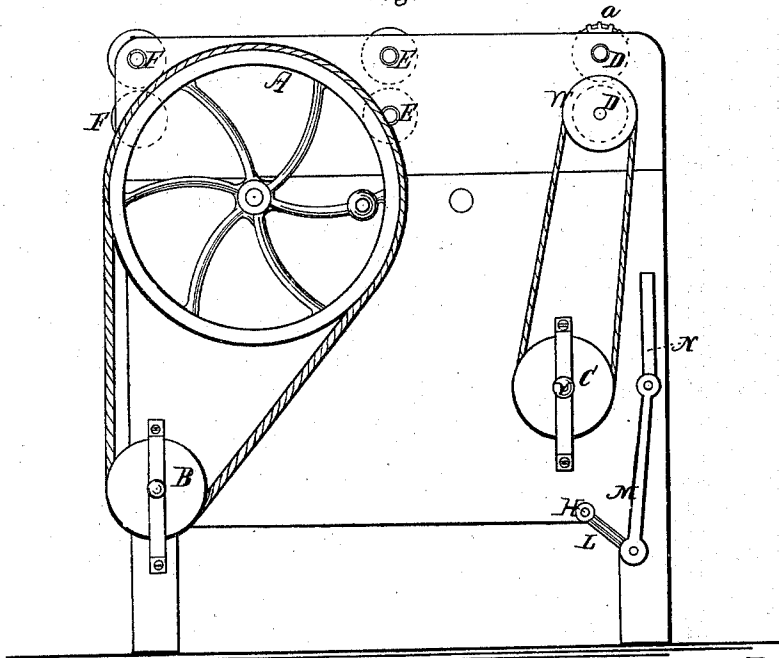


Fig. 2.



Witnesses  
*J. W. B. Huntington*  
*Wm. Brewster*

Inventors  
*Wm. Leach*  
*J. Leach*  
*Per Mumford*  
*Atty*

# W. & J. Leach. Spinning Mach Throstle.

N<sup>o</sup>: 60,202.

Fig. 3.

Patented Dec. 4, 1866.

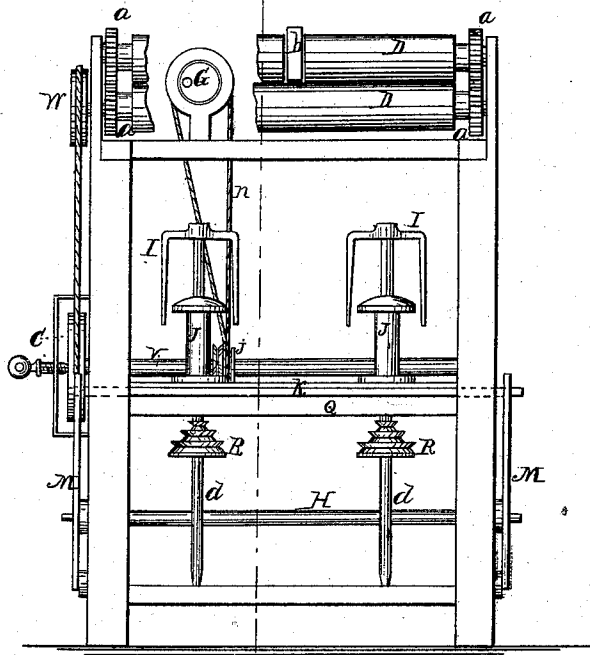
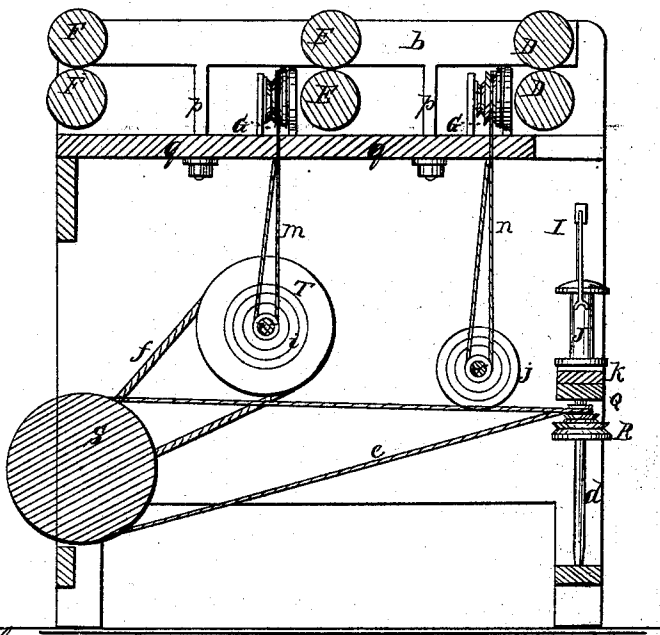


Fig. 4.



Witnesses

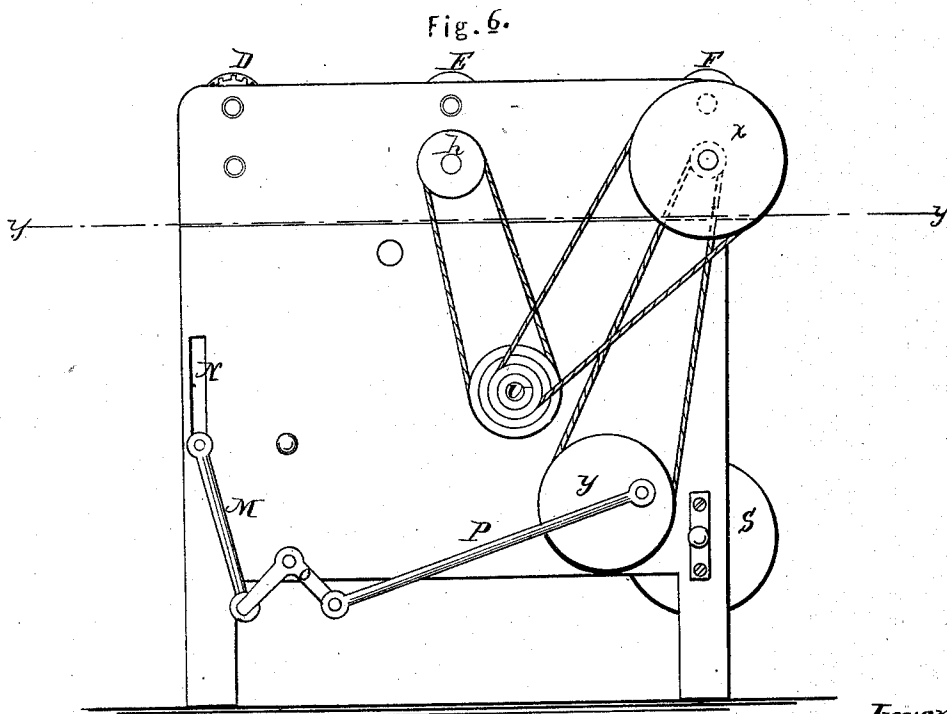
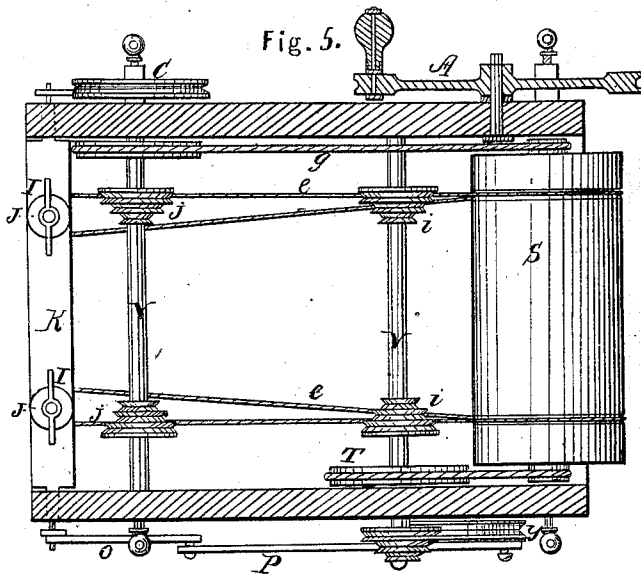
*A. B. Compton*  
*Wm. Brown*

Inventors  
*Wm. Leach*  
*Jos. Leach*  
*P. Munroe*  
*Attorneys*

# W. & J. Leach. Spinning Mach Throstle.

N<sup>o</sup>. 60,202.

Patented Dec. 4, 1866.



Witnesses  
*A. W. Blomington*  
*Wm. Brown*

Inventors  
*Wm. Leach*  
*Geo. Leach*  
 Per *Blumhro*  
*Atty.*

# United States Patent Office.

## IMPROVEMENT IN HAND-SPINNING MACHINES.

WILLIAM LEACH AND JOSEPH LEACH, OF STEWARTSVILLE, INDIANA.

Letters Patent No. 60,202, dated December 4, 1866.

### SPECIFICATION.

TO ALL WHOM IT MAY CONCERN :

Be it known that we, WILLIAM and JOSEPH LEACH, of Stewartsville, in the county of Posey, and State of Indiana, have invented a new and useful Improvement in Spinning Machines; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1, sheet I, is a plan of a machine made according to our invention.

Figure 2 is a side elevation showing the crank.

Figure 3, sheet II, is a front elevation.

Figure 4 is a vertical section in the plane indicated by the line *x*, of fig. 3.

Figure 5, sheet III, is a horizontal section on the line *y*, of fig. 6.

Figure 6 is a side view opposite to that seen in fig. 2.

Similar letters of reference indicate like parts.

The object of this invention is to produce a machine which will take the place of the old-fashioned hand-wheel, while it will not be expensive and cumbersome like the jack. The roll or sliver is introduced at the back of the machine, between drawing rollers, from whence it passes through two sets of twistors, and two other drawing rollers; in alternation, so as to stretch and twist the yarn without requiring the use of a travelling carriage as in a jack or mule. Several twistors can be placed between the different sets of drawing rollers, and consequently several threads can be drawn out at the same time. The back set of rollers are revolved with a comparatively slow motion, the middle rollers are revolved much faster, and the front rollers turn at a higher speed still, the twistors, which consist of revolving tubes placed between the several sets of rollers, serving to twist and thereby strengthen the yarn while it is being drawn out. From the front rollers the several yarns are carried downward to the flyers, which are placed on a lower part of the frame of the machine, and which wind them on spools in the usual way. The spools rest on a frame to which a vertical reciprocating motion is given, so as to cause the thread to be wound evenly on them. This improvement is applicable in spinning all kinds of fibrous materials, but it is especially meant for spinning wool. The frame which supports the machinery is rectangular, its sides being made to support the journals of the horizontal shafts and rollers. The frame is of such dimensions and form, and the devices are so made and arranged, as to fit the machine for family use, which could not be done if a travelling carriage was employed, as in the ordinary jack.

The letter *A* designates the driving pulley which gives motion to the drum or cylinder, *S*, through a band that goes around the pulley, *B*, secured to the shaft of drum, *S*, without the frame. The movements of all the other parts are transmitted from this drum by means of bands. It runs the spindles, *d*, of the spools and flyers by means of bands, *e*, (see figs. 4 and 5,) that go around one or another of several pulleys formed on the whirls, *R*, of said spindles. These pulleys on the whirls, *R*, are of different diameters, to enable the operator to change the speed of the spindle, as is necessary in changing from coarse to fine yarn, and the contrary. The drum, *S*, is similar to the tin drum or cylinder of a jack. The spools, *J*, and flyers, *I*, on the spindles are of the ordinary construction. The spools rest on a bar or platform, *K*, which is supported when in its lowest position upon the cross-piece, *Q*, of the frame. The ends of the bars, *K*, go through vertical slots, *N*, made through the sides of the frame near its front, and are there connected by rods, *M*, with levers, *L* and *O*, the latter being of elbow form, and both being keyed on the ends of a rock-shaft, *H*, which extends across the frame; motion is given to this rock-shaft through the elbow lever, *O*, and a connecting rod, *P*, which is connected by a crank-pin to the face of a pulley, *y*, whose shaft has a bearing in the side of the frame near its back part, said pulley being driven by a band from a small pulley on the shaft of the lower drawing roller, *F*. By means of this construction the bar, *K*, is raised and lowered in alternation for the purpose of carrying the spools, *J*, up and down past those arms of the flyers which deliver the yarn, and thereby cause the yarn to be wound in regular layers. The spindles, *d*, pass through the bar, *K*, and cross-piece, *Q*, and are stepped in a lower cross-piece of the frame seen in figs. 3 and 4. The shaft of drum *S*, within the frame, has two small pulleys, one at each end of the drum, bands from which drive shafts *U* and *V*, the shaft *U* being driven by the band *f*, which goes around large pulley *T*, and the shaft *V* being driven by the band *g*, shown in fig. 5. The shaft, *U*, has several pulleys of different diameters on its right hand end beyond the frame, observing fig. 3, and bands from them are made to pass around a pulley, *X*, on the shaft of the lower roller, *F*, and around a pulley, *h*, on the end of the lower roller, *E*, which pulleys are seen in figs 1 and 6. This shaft, *U*, also has two pulleys, *z*, on it

within the frame, (see figs. 4 and 5,) bands, *m*, from which go around sheaves formed on the circumference of the back twisters, *G*. Thus it is seen that the back and middle drawing rollers, *F E*, and the back twisters are driven from the same shaft, *U*. The shaft, *V*, has two pulleys, *j j*, which are connected by bands, *n*, with pulleys formed on the forward twisters. The same shaft, *V*, also drives the forward drawing rollers, *D*, by means of a band which goes around the outside pulley, *C*, of the shaft, and an outside pulley, *W*, on one end of the lower roller, *D*. The drawing rollers are geared together at the ends of the lower roller of each set as is illustrated in the case of the forward drawing rollers, *D*. The object in gearing the rollers together is to produce a steady, uniform motion, and to overcome the resistance caused by the twist in the yarn to its passage through or between the rollers. The lower rollers of each set extend across the frame, but the upper rollers of each set are divided into two parts, whose inner ends are journalled in the sides of a bar, *b*, set on its edge and extending from one end of the frame to the other above the lower rollers. The bar is supported on standards, *p p*, which rise from a platform *q*, that divides the frame horizontally. By dividing the top rollers we prevent one thread from interfering with another in their passage, each thread having a separate top roller. The top rollers rest on the lower rollers, and they may be so connected with the machine as to be capable of being lifted out at their journals. The twisters, *G*, are tubes whose ends are fitted to turn freely in standards, *r r*, which rise from the platform, *q*. Each twister has two or more sheaves that receive the bands, *m* and *n*, respectively, from their driving shafts, *U V*. The perforations through the twisters, which give them the character of tubes, are at one side of their centres, and when the twisters are revolving the axles of the perforations alternately rise up to and descend below the level of the tops of the lower rollers. The object of this construction is to cause an alternation in the tension of the yarn which is being drawn through the rollers, such tension being relieved during every revolution of the twisters, by the rising of the yarn to the level of the tops of the lower rollers owing to the eccentricity of such perforations. Although we use the drawing roller, spindle, and flyer common in spinning machinery, yet our machine differs, as far as we are aware, from any machine heretofore known, in construction and in the method of operation. As compared with a jack, we produce the drawing and twisting of the wool without the backward motion of a carriage, as in that machine. We accomplish these results by introducing two sets of twisters alternately between three sets of drawing rollers placed at such distances apart as to make the required draw and twist upon the condensed roll of sliver. We consider this an improvement, because the motions of the operative parts are continuous and constant, and consequently the thread is more even than when made by piecemeal, as in the jack and in other spinning machines having a moving carriage. Furthermore, we save the great labor and care required of the spinner in machines where the threads are drawn out and wound on the spindles a few yards at a time. Our machine produces a good thread by simply turning the crank on the driving pulley, and therefore the long practice and care necessary to spin skilfully on the common domestic spinning-wheel are not here required, but children and feeble persons can work our machine with ease. It is especially useful in spinning wool, but it will also spin cotton, it being only necessary to vary the speed according to the nature of the material operated upon.

In operating the machine, the operator sits or stands at the right-hand back corner, where the driving-wheel is placed. This wheel, which may be turned by a crank, or by a treadle, gives motion to the drum, and through it to the rest of the machine, as above stated. The back drawing rollers are turned at a comparatively slow speed. The slivers are fed in between them, going thence toward the front of the machine, passing through the back twisters and thence between the middle rollers, which turn about seven times faster than the back rollers, thereby causing the slivers to be both twisted and stretched. The slivers pass thence through the front twisters and between the front rollers, which latter revolve about one-third faster than the middle rollers, so as to make an additional stretch on the yarn, while the twisters prevent them from breaking. One foot of sliver by these operations becomes stretched to eight or ten times its original length, and when it is delivered from the front rollers, the spindle puts the necessary twist on it while the flyer winds it on the spool, whose reciprocations up and down cause the thread to be properly distributed in winding. As the last inch or so of the sliver approaches the back rollers, a fresh sliver is attached to it and the back twister effectually connects them together, thus continuing the operation indefinitely. The speed at which the rollers are driven can be varied in any convenient way, by speed-pulleys or other devices.

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

1. As an improvement in a hand-spinning machine the arrangement of two sets of twisters to each thread, each twister having three or more grooves, for the purpose of varying the amount of twist to suit different kinds of wool, and the same being placed immediately behind the front and middle rollers, so as to retain the twist close up to said rollers in the manner as and for the purpose specified.

2. We also claim raising and lowering the spools *J*, by means of the platform *K*, the connecting rods *P* and *M*, the levers *O L*, and the rock-shaft *H*, substantially as described.

WILLIAM LEACH,  
JOSEPH LEACH.

Witnesses:

WILLIAM T. COLLINS,  
JULIUS C. MILLER.