

L. E. HIGBY.

MACHINE FOR MAKING ROPE.

No. 189,099.

Patented April 1, 1896.

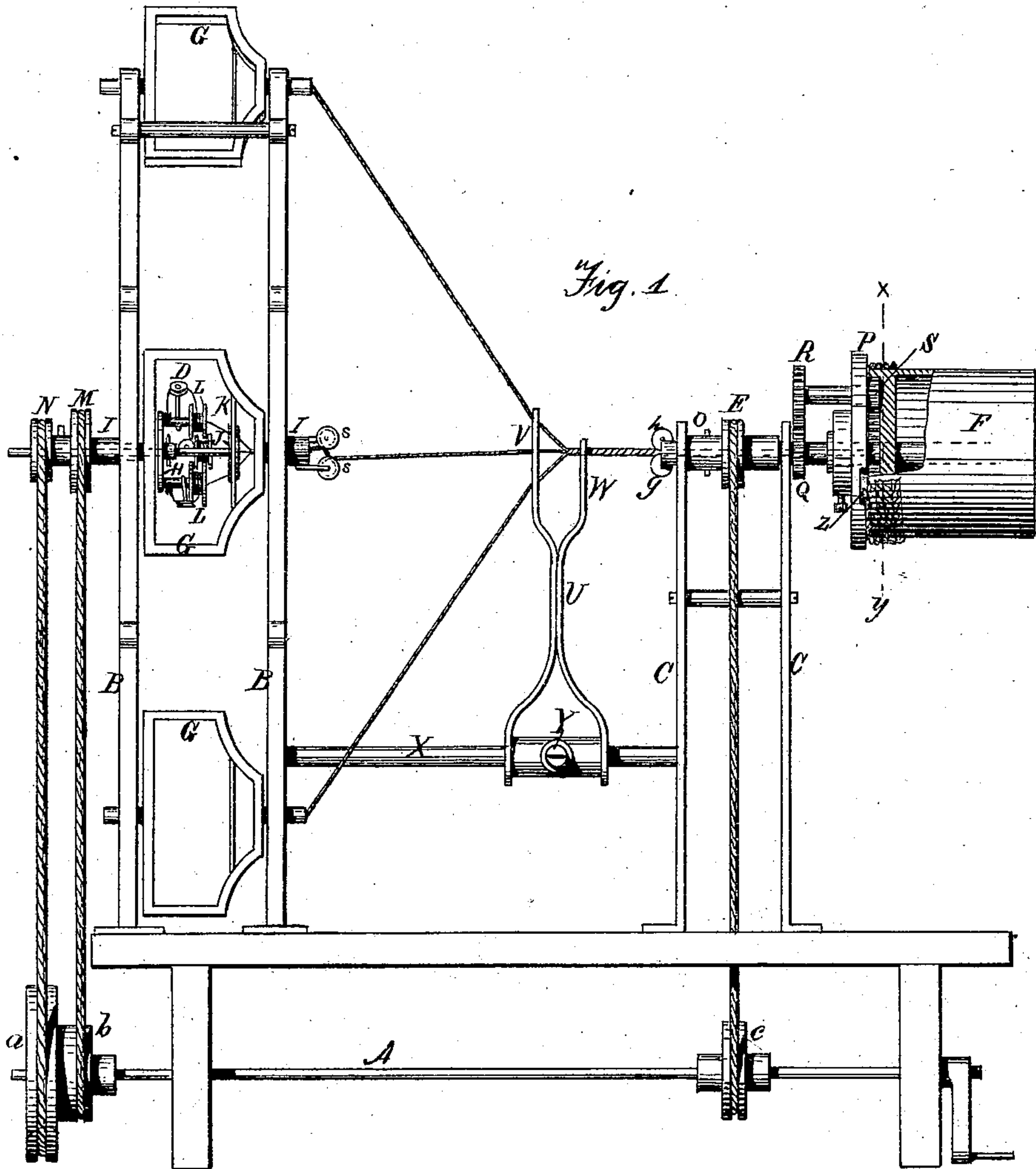


Fig. 2

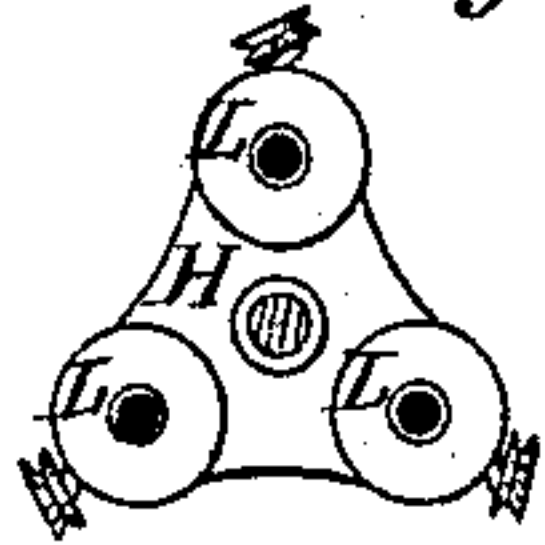
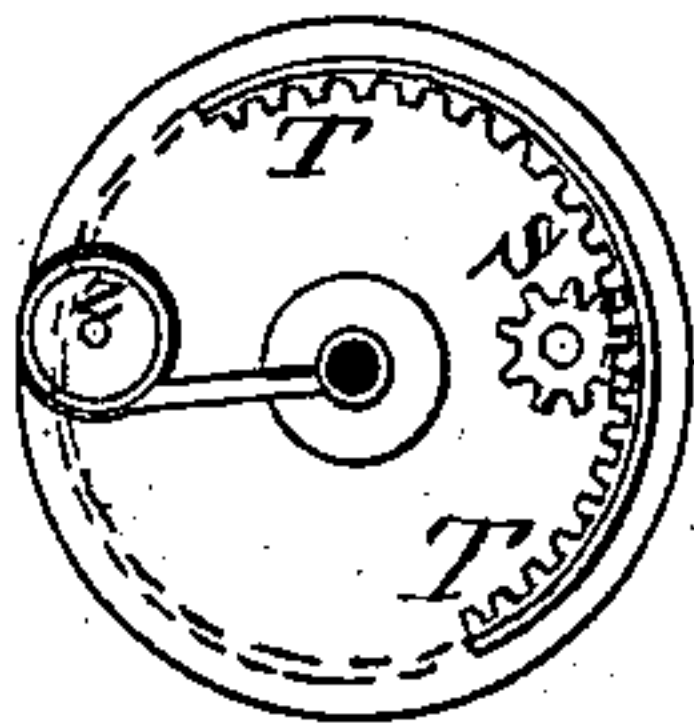


Fig. 3



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# UNITED STATES PATENT OFFICE

LUTHER E. HIGBY, OF BELLEVILLE, NEW JERSEY.

## IMPROVEMENT IN MACHINES FOR MAKING ROPE.

Specification forming part of Letters Patent No. 189,099, dated April 3, 1877; application filed July 7, 1876.

*To all whom it may concern:*

Be it known that I, LUTHER E. HIGBY, of Belleville, Essex county, New Jersey, have invented an Improvement in Machines for Making Wire and other Rope; and I do hereby declare the following to be a full and correct description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation with a part broken away, showing a section of the drum. Fig. 2 is a part of one of the reels, and Fig. 3 a section through the drum upon the line *xy*, Fig. 1.

The object of my invention is to make a machine for making rope complete by one operation. Heretofore the initials were first made and then were twisted together by a separate and distinct operation. But my machine forms the initials and twists them together, finishing the rope at one operation.

My invention consists of a series of revolving frames, each of which forms an initial, and said initials pass through a guide upon leaving the revolving frames, and are twisted into a rope and wound upon a drum, combining a mechanism for forming the initial strands with mechanism for twisting said strands into a finished rope.

In the drawings, A represents the main driving-shaft, upon which are the pulleys *a b* for driving the revolving heads, and the pulley *c* for driving the finishing mechanism and drum. B B is a frame which supports the bearings of the revolving heads D D D, and the frame C C supports the bearings of the twisting mechanism E and drum F. The frame B may support any number of revolving heads, each of which is constructed similar to the other. G is a frame revolving upon hollow bearings I in the frame B B. Within the frame G is a smaller frame, H, revolving upon an independent axis within the hollow bearing I, the outer end terminating in a plate, J, guided by the cross-piece K in the frame G. The frame or plate H carries three or more spools, L, which revolve idly upon their own axis. The frame G revolves at a much lower speed than the frame H carrying the spools L. The speed of the frames G and H is regulated by the size of the pulleys M and N and *a* and *b*. The axis of the spools L is

hollow, with an orifice in one side, near which an arm, extending outward from said hollow axle, carries a pulley, over which the wire or thread from the spool is conveyed into and through the hollow axle. In the plate J, which revolves in the cross-piece K, are holes, through which the wire or thread from the spools pass and unite in the hollow journal I. Supported in the frame C C is the twisting and finishing mechanism, which consists of the hollow shaft O driven by the pulley E. At the entrance of this hollow shaft are two grooved pulleys, *g* and *h*, which revolve with the shaft O, and receive the rope first around one then around the other, and twist the rope in a uniform manner. Similar grooved pulleys *s s* are placed upon the ends of the hollow shafts I, if desired. Upon the opposite end of the hollow shaft O is the feed or take-up drum F and rim P. The rim P revolves with the pulley E, but the drum F revolves faster, which motion is accomplished as follows: Upon the hollow shaft O is a stationary pinion, Q, which engages the cog-wheel R, and communicates motion to the pinion S, which engages in the rack T, Fig. 3, and carries the drum F. Between the frame B, bearing the revolving heads D and the finishing mechanism, is the guide U, having the arm V with a hole for the reception of each initial strand, and an arm, W, for the reception of the twisting-rope. The guide U is supported upon a cross-rod, X, and may be adjusted and held in position by the set-screw Y.

The operation of my invention is as follows: The spools L having been supplied with wire, with their ends directed over the small pulleys, and into and through the hollow axis and through the orifices in the plate J, out through the hollow shaft I, and around the pulleys *s s*, motion may be communicated to the shaft A. The several wires from the several spools L all uniting in the hollow journal I, and the heads D revolving, they must, of course, be twisted together into an initial strand, and as each revolving head in each frame G is constructed to operate in a similar manner, it is clear any number of initial strands may be made at the same time. All these initials are united in the guide U by means of the arms V and W to form the finished rope,



which is carried on between the groove-pulleys *g* and *h* into the hollow shaft *O*, and passes out beyond the rim *P* over a small pulley, *Z*, and is wound upon the drum *F*. The drum *F* being geared to revolve faster than the rope is twisted, it feeds the rope along through its various processes of uniting and twisting until the finished rope is at last wound completed upon the drum.

It will be observed that, when it is desirable to make but a single cord or initial, the frames around the spools may be geared to revolve in an opposite direction and at a high rate of speed, and so augment the twist of the cord at a rate equal to the sum of the velocities of the two revolutions, which is a very desirable result in rope making; or, if desired, the said frames may be revolved in the same direction with plates *H*, the speed of the latter being proportionally increased, the result of which would be to tighten the twist of the strand after it leaves the rollers *s s*.

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

1. The combination of the spools *L*, revolving upon hollow spindles upon the revolving

plate *H*, with guide *J*, and hollow spindle *I*, having pulleys *s s*, and arranged to revolve substantially as described.

2. The stationary guides *V* and *W*, in combination with hollow shaft *O*, having the grooved pulleys *h* and *g*, and with revolving plate *P*, and take-up or feed-drum *F*, arranged together substantially as described.

3. The drum *F*, provided with the rack *T*, in combination with the revolving plate *P*, gear-wheels *Q* and *R*, and pinion *S*, substantially as described.

4. The combination of the revolving heads *D*, carrying spool *L*, auxiliary twisting hollow spindle *I*, and guide *J*, with stationary guides *V* *W*, and a twisting device consisting of grooved pulleys *g* and *h*, hollow shaft *O*, plate *P*, and take-up drum *F*, substantially as described.

The above specification of my said invention signed and witnessed at Newark, New Jersey, this 11th day of May, A. D. 1876.

LUTHER E. HIGBY.

Witnesses:

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JNO. J. KING.