N. Adams.
Rope Mach.

No. 21,238. Patented Aug. 24, 1858.

Fig: 1.

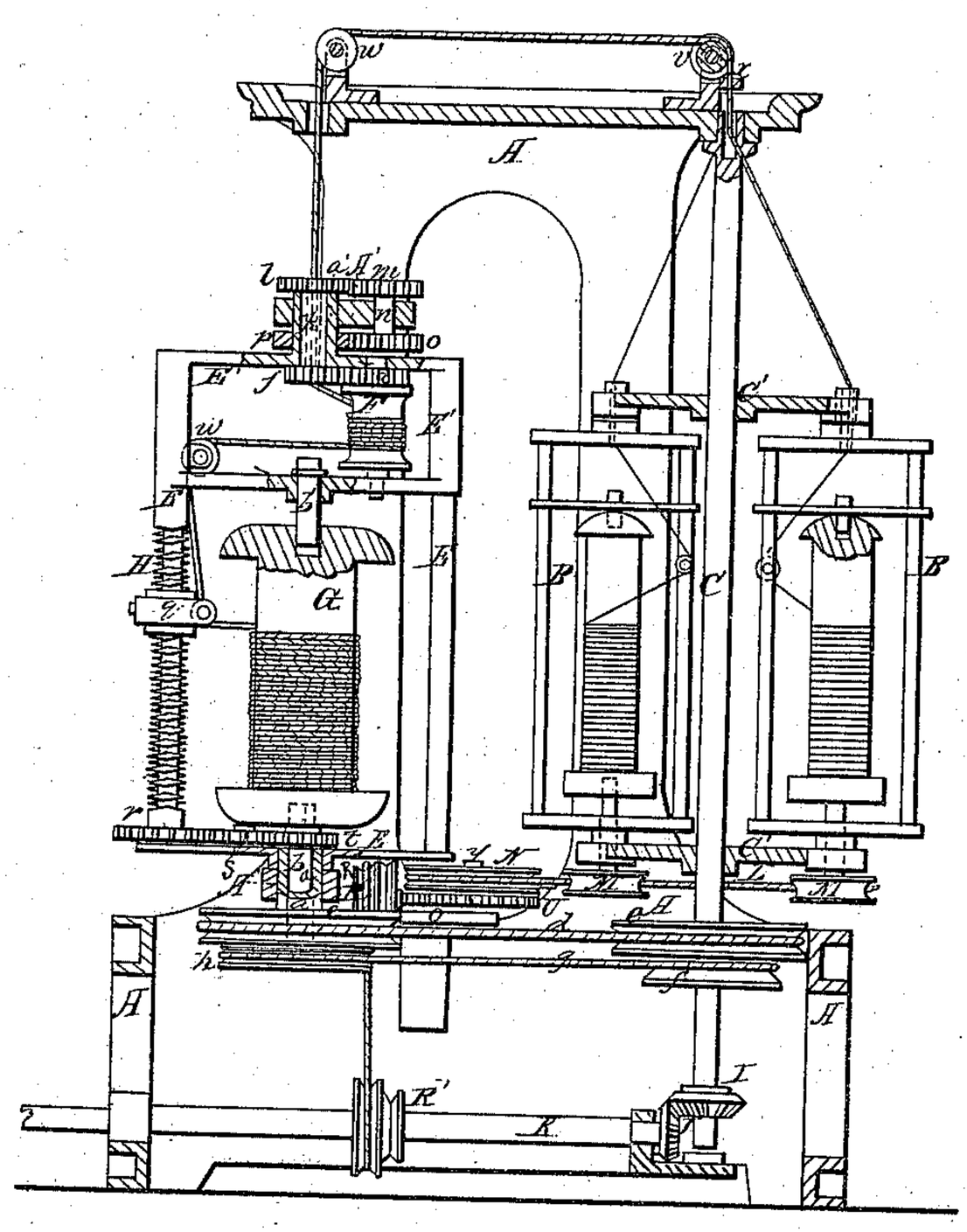
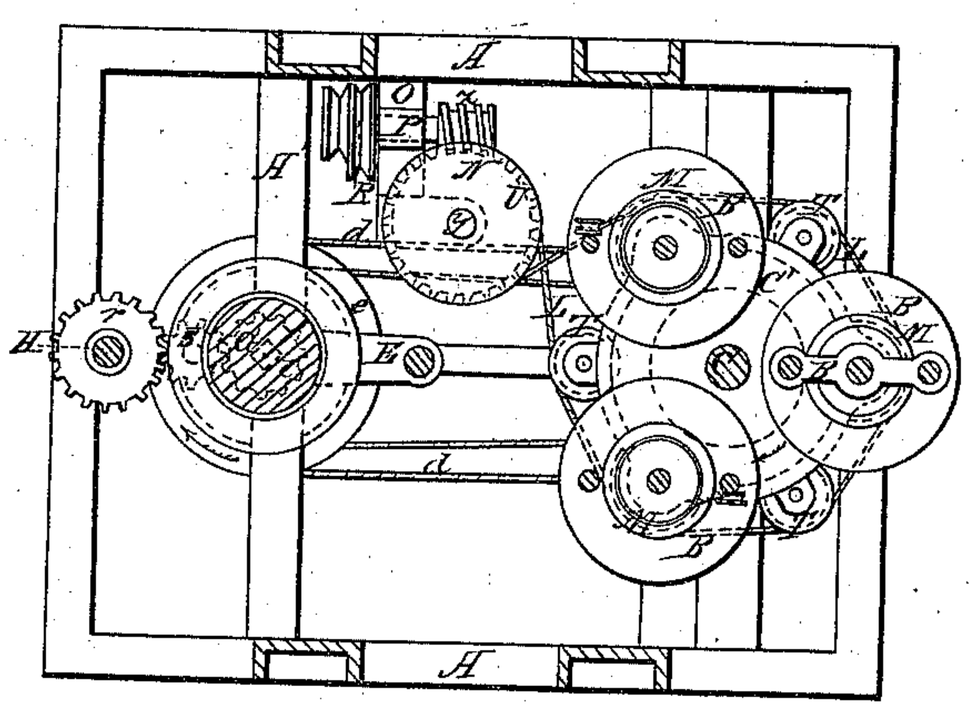


Fig: 2.



UNITED STATES PATENT OFFICE.

NEWTON ADAMS, OF LANSINGBURG, NEW YORK.

IMPROVEMENT IN MACHINERY FOR MAKING ROPE.

Specification forming part of Letters Patent No. **21,238**, dated August 24, 1858.

To all whom it may concern:

Be it known that I, NEWTON ADAMS, of Lansingburg, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Rope-Making Machinery; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical section of a rope-making machine with my improvements. Fig. 2 is a horizontal section of the same.

Similar letters of reference indicate corresponding parts in both figures.

To enable others to make and use my invention, I will proceed to describe its construction and operation.

A A A A is the framing of the machine. Near its right-hand end this frame contains bearings for an upright shaft C, which corresponds with the main laying-spindle of an ordinary sun-and-planet machine, and has secured to it the usual frames C′ C′, containing the bearings of the strand-fliers B B, and which is otherwise fitted up and furnished to make a complete sun-and-planet machine, which only differs from the other sun and planet machines in having its strand-fliers driven at a greater velocity relatively to the velocity of the main or laying spindle, which is obviously necessary, as the laying-spindle only puts a portion of the twist into the rope.

E is the revolving flier, which finishes the twist of the rope after it has been partly effected by the planetary revolution, the said flier being arranged vertically at the opposite end of the machine to the laying-spindle, and having its journals *a a′* fitted to bearings on the cross-pieces A A of the framing. The head E′ of this flier is fitted with a capstan F to take up the rope, the said capstan working on suitable bearings therein and deriving a rotary motion on its own axis from the rotary motion of the flier through a train of gearing, which will be presently described. The flier is also furnished with a reel G, which is held in place by fitting to pins *b* and *b* at the top and bottom of the flier, fitting with a square to the lower pin *b*, which passes through the lower journal *a* of the flier, in which it is fitted to turn, but confined longitudinally. The upper pin *b* drops loosely through the lower plate of the flier-head and into a hole in the center of the reel, and hence can be easily lifted out of its place to permit the easy insertion of the spool into the flier or its removal therefrom. The flier derives a rotary motion at the same speed as the laying-spindle C from a pulley *c* on the said spindle through a belt *d*, running from the said pulley to a pulley *e* on its own lower journal *a*. The reel G derives from the laying-spindle a slower rotary motion than the flier E, but in the same direction, from a pulley *f* on the said spindle through a belt *g*, running from the said pulley to a pulley *h* on the lower pin *b*.

The capstan F has secured to it a gear *i*, which gears with a smaller gear *j*, that is fast on the lower end of a short hollow spindle *k*, which passes through and works in the upper journal *a′* of the flier E, and the said hollow spindle has fast to its upper end a gear *l*, which gears with a gear *m*, that is fast on the upper end of a short spindle *n*, that works in a stationary bearing in the upper cross-piece A′ of the framing, and the said spindle *n* has secured to its lower end a gear *o*, having one tooth more than *m*, said gear *o* gearing with a gear *p*, that is fast on the flier, the said gear *n* having one tooth less than *l*, and through this train of gearing the capstan is caused to receive a slow rotary motion on its own axis.

One side of the flier E is fitted with a double-threaded traverse-screw H, on which is fitted a traverser *q* to conduct the finished rope on the reel G. This traverse-screw has secured to its lower end a gear *r*, which gears with an intermediate gear *s*, working on a stud attached to the bottom of the flier, and this gear *s* gears with a gear *t*, that is fast on the pin *b*, which carries the reel G. The rotary motion of the flier causes the traverse-screw to receive a slow rotary motion from the gearing *r s t*. Above the traverse-screw there is a guide-pulley *u*, to conduct the rope from the capstan to the traverser *q*, which guides it onto the reel G.

v w are guide-pulleys on the top of the machine to guide the partly-twisted rope from the laying-spindle C to the flier E. *x* is a sizing-tube attached to the stand of the guide-pulley *v* and standing nearly close to the top of the laying-spindle.

The operation of the flier E is as follows: The partly-twisted rope coming from the laying-spindle C through the tube *x* passes over the pulleys *v w* and from thence down through the hollow spindle *k*, which lines the top journal of the flier, and from thence to the capstan F, round which it passes several times. The rotary motion of the flier being in the proper direction—viz., in the opposite direction to that of the planetary motion of the fliers (considering the motion only relatively to the twist of the rope)—it is obvious will give the rope a twist additional to that given by the laying-spindle and planetary motion of the strand-fliers. The capstan by its rotation on its ax's derived through the train of gearing before described takes up the rope at the proper speed and delivers it over the guide-pulley *v* and traverser *q* to the pulley G, whose motion is sufficiently slower than that of the flier to cause the flier to wind the rope upon it as fast as it is delivered by the capstan.

The laying-spindle C derives its motion through bevel-gearing I J from a horizontal shaft K, arranged in bearings at the bottom of the machine.

The rotary motion of the strand spindles or fliers B B on their own axes is derived from a belt L, which passes round pulleys M M M on the lower ends of the strand-fliers, round guide-pulleys T T T, attached to the lower frame C, and round a pulley N, which works on a fixed stud *y*, attached to a bracket O, bolted to the framing, and which has attached to it a worm-wheel U, gearing with an endless screw *z*, whose shaft works in a bearing P on the top of the bracket O. The shaft of the screw *z* is furnished with a cone of pulleys R, corresponding with a cone of pulleys R′ on the driving-shaft K.

The belt L may be kept stationary by leaving off the belt from the pulleys R R′, in which case the endless screw locks the worm-wheel U and pulley L, and the pulleys M will be caused to derive rotary motion on their axes by their contact with the said belt L as they revolve with the strand-fliers round the laying-spindle, and hence the strand-fliers are caused to receive rotary motion on their axes. The pulleys M M M should be of such size that when the belt L is stationary the strand-fliers will be caused to rotate on their axes at such speed as to produce what may be considered a medium degree of strand-twist or forehard; but by providing both an open and a closed belt to run from the pulleys R′ to those R, and using one or other to give motion to the pulley N, the belt L may be made, by the action of the endless screw on the worm-wheel U and pulley N, to rotate slowly in the same direction as or in the reverse direction to the laying-spindle, and hence to cause the strand-fliers to receive a slower or faster motion on their axes and to produce a less or greater twist on the strands, as may be desired. The twist may be further varied by shifting the belts on the cone-pulleys R R′.

It is hardly necessary to remark that the fliers E could be arranged horizontally instead of vertically as represented.

I do not claim, broadly, the idea of making the fliers which carry the capstan and reel revolve when the bearings of the strand-fliers are stationary; nor do I claim the giving of rotary motion to the bearings of the strand-fliers when the bearings of the fliers which carry the capstan and reel are stationary; nor do I claim anything which is seen in W. Joslyn's patent, 1849; but

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of a revolving flier containing a capstan F and reel G with the revolving strand-fliers B B, revolving around the laying-spindle C, substantially as and for the purposes herein set forth.

2. Producing and controlling the rotary motion of the strand spindles or fliers on their own axes by means of the stationary or moving belt L, acting on pulleys on the said spindles or fliers, the pulley N, worm-wheel U, and stationary or moving endless screw *z*, the whole being combined to operate substantially as herein set forth.

NEWTON ADAMS.

Witnesses:

DANIEL KING,

DAVID H. FLACK.