(17.) JOHN RINEK. 2 Sheets--Sheet 1.

Strand Twisting Machine for Rope Walks.

No. 122,653. Patented Jan. 9, 1872.

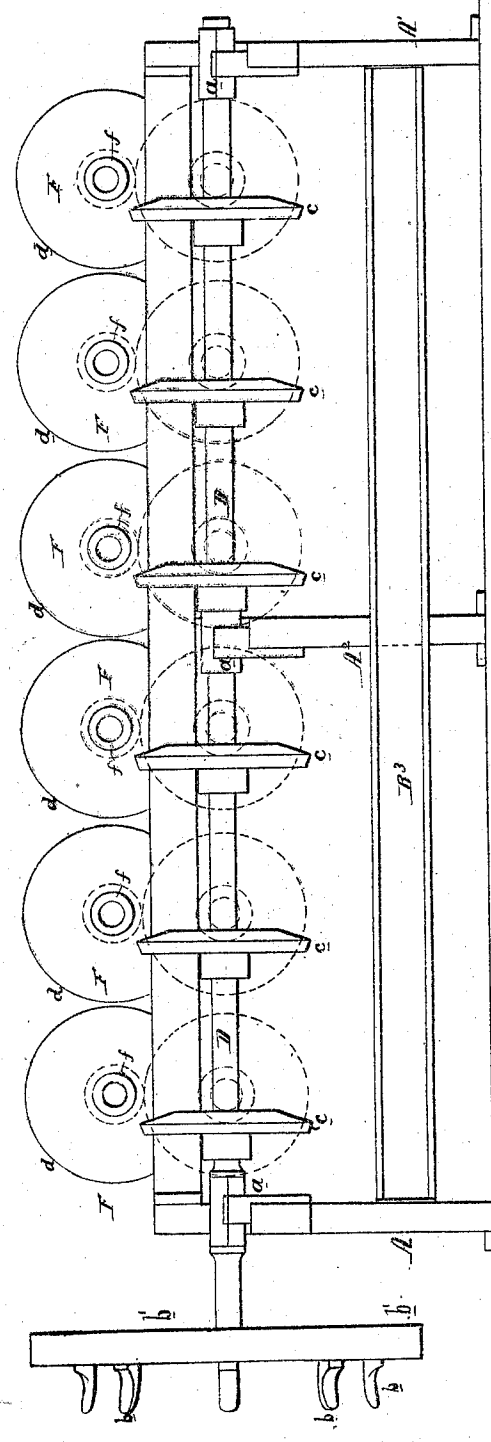

FIG. 1.

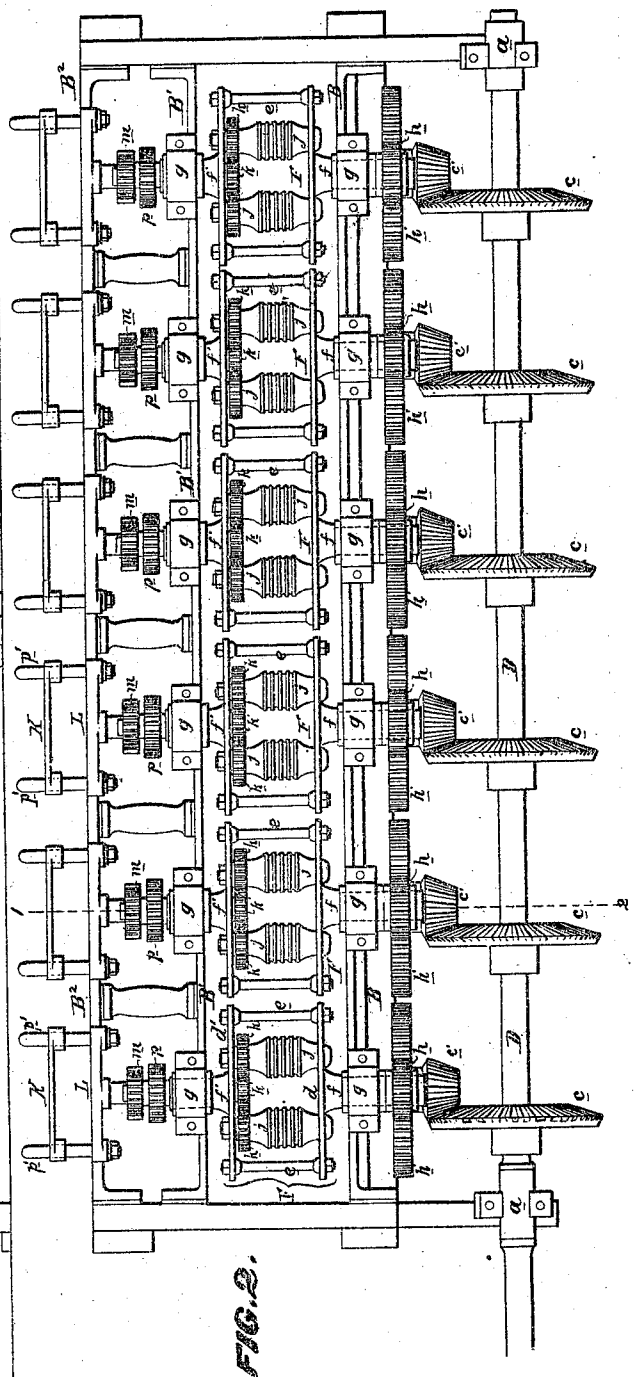

FIG. 2.

Witnesses:-

A. L. Porter

Fitz Bowen.

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By his attys.
Howson & Son

(17.) JOHN RINEK. 2 Sheets--Sheet 2.

Strand Twisting Machine for Rope Walks.

No. 122,653. Patented Jan. 9, 1872.

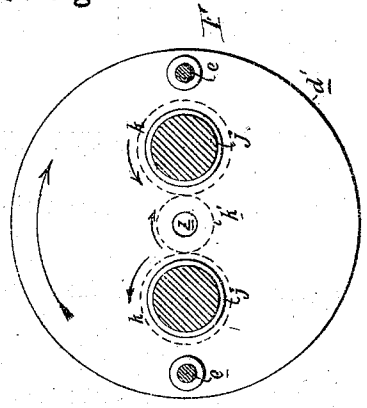

FIG. 4.

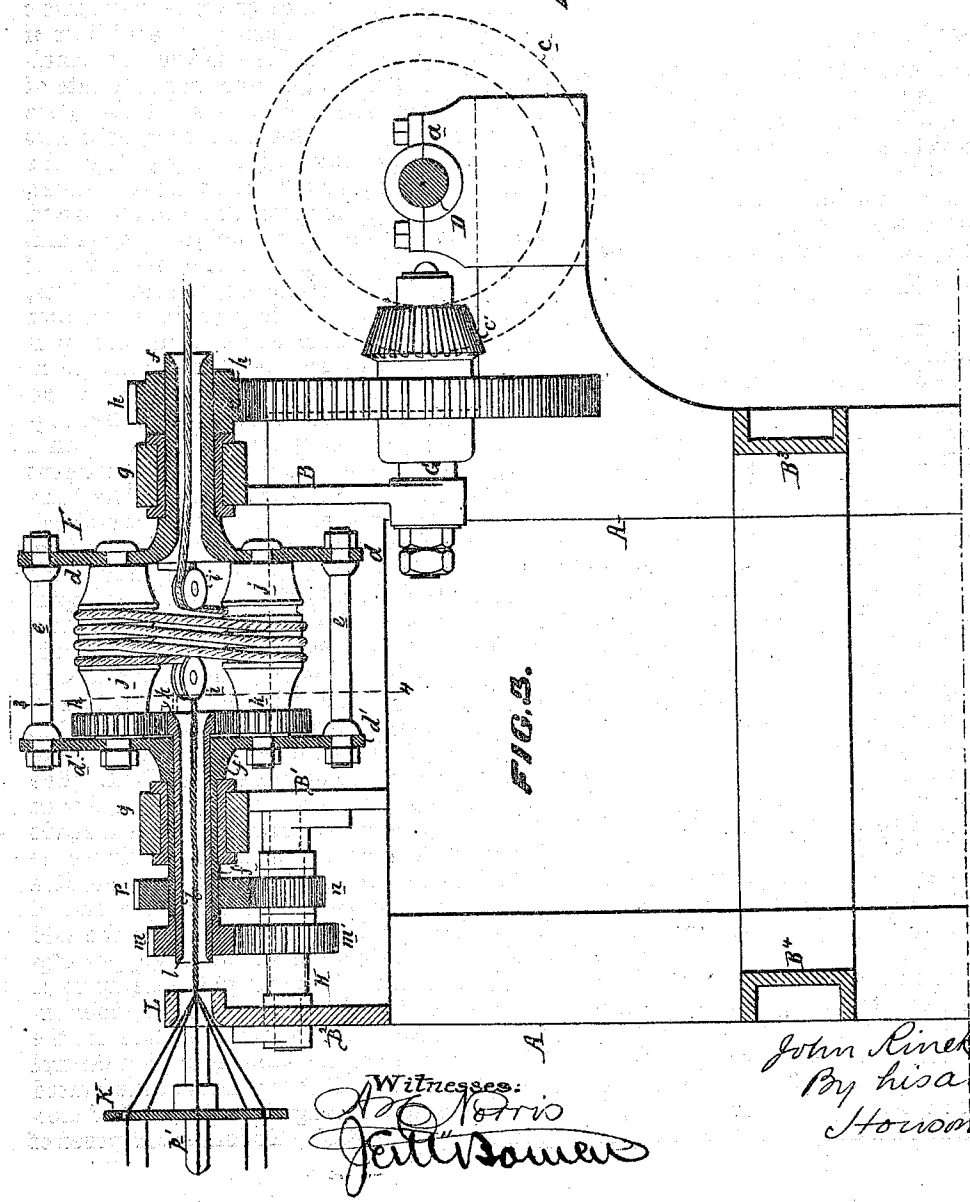

FIG. 3.

Witnesses:
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UNITED STATES PATENT OFFICE.

JOHN RINEK, OF EASTON, PENNSYLVANIA.

IMPROVEMENT IN STRAND-TWISTING MACHINES FOR ROPE-WALKS.

Specification forming part of Letters Patent No. 122,653, dated January 9, 1872.

SPECIFICATION.

I, JOHN RINEK, of Easton, county of Northampton, State of Pennsylvania, have invented an Improved Strand-Twisting Machine for Rope-Walks, of which the following is a specification:

Nature and Object of the Invention.

My invention consists of a strand-twisting machine provided with a number of simultaneously-operating fliers arranged at one end of a rope-walk, and combined with a hauling-machine, as fully described hereafter, so that any desired number of strands, of any thickness and degree of twist, and of exactly the same length, can be simultaneously formed.

Description of the Accompanying Drawing.

Figure 1, Sheet 1, is a front elevation of my improved strand-twisting machine; Fig. 2, a plan view of the same; Fig. 3, Sheet 2, a transverse section on the line 1 2, Fig. 2, drawn to an enlarged scale; and Fig. 4, a sectional view of one of the fliers on the line 3 4, Fig. 3.

General Description.

The fixed portion of the machine consists of the end and center frames A A^1 and A^2 connected together by horizontal bars B, B^1, B^2, B^3, and B^4, and in suitable bearings *a a a*, formed in the brackets which project outward from the front of this fixed frame, turns the main driving-shaft D, furnished at one end with a chain-wheel or pulley, *b*, and fly-wheel, *b'*; and furnished, also, with a clutch, not shown in the drawing, by which the shaft may be thrown out of gear with the driving-pulley. On the driving-shaft, at regular distances apart, is a number of bevel-wheels, *c*, from each of which motion is communicated, through the gearing hereinafter described, to one of a number of fliers, F, there being, in the present instance, six of the latter, but this number may be increased or diminished according to the number of strands which it is desired to form and twist simultaneously by the machine. Each flier consists of two circular plates or disks, *d* and *d'*, connected together by rods *e e*, and from these disks extend the short tubular spindles *f* and *f'* of the flier, each of which turns in a suitable bearing, *g*, of the fixed frame. On the front portion *f* of each flier-spindle is a pinion, *h*, which gears into a large cog-wheel, *h'*, on a short spindle, G, turning in the fixed frame, and on the said spindle there is also a small bevel-wheel, *c'*, gearing into one of the larger bevel-wheels *c* of the driving-shaft. Through the medium of this gearing all of the fliers are turned simultaneously and at a high and uniform rate of speed by the single driving-shaft D. (See Figs. 2 and 3.) Within each flier, at points directly opposite the open flaring ends of the tubular spindles *f* and *f'*, are fixed two sheaves, *i i'*, which direct the sliver or strand onto and off of two capstans, *j j*, which are hung to and arranged to turn within the flier. Each of these capstans has at one end, within the flier, a small cog-wheel, *k*, which gears into a smaller wheel, *k'*, at the inner end of a tubular spindle, *l*, the latter extending through and turning in the tubular spindle *f'* of the flier, and being provided, at its outer end, with a cog-wheel, *m*, which gears into a wheel, *m'*, on a short spindle H, capable of vertical adjustment in the fixed frame toward or from the flier-spindle, and furnished with another cog-wheel, *n*, which gears into and receives its motion from a cog-wheel, *p*, on the said flier-spindle. By means of this gearing the inner tubular spindle *l* is turned in the same direction but at a somewhat greater speed than the flier, this motion of the said spindle being transmitted to the capstans *j j*, which are consequently turned in the opposite direction at the same time that they are carried round with the flier, the object of which will be hereafter described. (See arrows in Fig. 4.) A plate, K, perforated with a number of holes through which the threads which are to form the strands are drawn, is secured to rods *p' p'* of the fixed frame, at a point directly opposite the rear open end of the tubular spindle of each flier, and the said plate is made adjustable upon its supporting-rods, so that it may be brought close up to or be moved outward from a plate, L, which intervenes between the perforated plate and the end of the flier-spindle, and through a central opening in which all of the threads are caused to pass before entering the said tubular flier-spindle. (See Fig. 3.) The sliver composed of

the threads drawn through the plates K and L, and which is to be twisted, in order to form a strand, is passed through the inner tubular spindle *l*, as shown in Fig. 3; thence over the sheave *i*, and several times around the grooved capstans *j*, and thence over the sheave *i'*, by which it is guided into the front portion *f* of the tubular flier-spindle, from which it finally passes. The sliver is twisted within the tubular spindle *l*, owing to the motion of the flier, and it is at the same time drawn through the latter at a slow but uniform rate of speed by the independent movement of the capstans *j j*, the strand thus produced, of whatever length, being of the most even character throughout.

It will be evident that the degree and character of the twist given to the strand will depend upon the rapidity with which it is drawn through the flier by the capstans *j j*, and this can be regulated with the utmost nicety by imparting any required degree of speed to the said capstans by means of the change-wheels on the adjustable shaft H. The latter is so arranged upon the frame that it can be disconnected and wheels of any diameter substituted for the wheels *m'* and *n*, shown in the drawing, the shaft being adjustable in the frame toward or from the flier-spindle, so that it may be properly set to suit the different diameters of wheels employed.

By means of this arrangement, which is a most important feature of the machine, strands of different diameters and of different degrees of twist, suitable for various kinds of rope, can be formed.

Another important feature of the machine is the arrangement upon the same of a number of simultaneously-operating fliers, as this enables any desired number of strands, precisely alike in every respect and of the same length, to be simultaneously produced, the rope formed from such strands being consequently of a much more perfect and even character than those made in the usual manner from separately-formed strands.

In operating the machine it is arranged at one end of a rope-walk, and the several strands as they emerge from the tubular spindles of the fliers are drawn away and carried down the walk by what is commonly known as a hauling-machine, which receives its motion from an endless band, rope, or chain, passing round the pulley *b* of the forming-machine and running the whole length of the walk, the hauling-machine being so operated by this endless band that it shall throw the same amount of turn in each strand that the fliers do, and thus avoid further twisting or untwisting of the said strands.

When strands of the whole length of the walk have been thus formed the motion of the forming and hauling machine is stopped and the strands are then disconnected and thrown over on that side of the walk called the laying-ground, where they are laid together, the several strands formed being of an exact length, and ready to be formed into rope.

In the ordinary method of forming the twist is given to the strands by a hauling-machine instead of by a flier, rotating at the same speed as and operating in conjunction with the hauling-machine. The objection to this plan of twisting by means of the hauler is that when the strand is drawn out to a considerable length, it is apt to become stretched and twisted very unevenly; whereas in my machine the flier, which is the twisting device, is always at a uniform distance from the point at which the threads are fed, and the strand is drawn along at a uniform rate of speed by the hauler, the consequence being, as before described, that the strands are perfectly uniform throughout.

Claims.

1. The combination, with the flier of a strand-twisting machine and with the capstans *j j* of the same, of the adjustable shaft H and its change-wheels, all substantially as and for the purpose specified.

2. The combination, in a strand-twisting machine, of two or more fliers, F, a hauling-machine, and a single driving-shaft, D, operating both fliers and the hauling-machine, whereby all the fliers are rotated and all the strands drawn out at the same speed, so as to produce a series of strands uniform throughout.

3. The combination, substantially as herein described, of a flier with a hauling-machine.

4. A strand-twisting machine, arranged at one end of a rope-walk, provided with a number of simultaneously-operating fliers, F, and operating in conjuction with a hauling-machine, and with the mechanism described, or its equivalent, for operating the hauling-machine in unison with the fliers, substantially as herein set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN RINEK.

Witnesses:
WM. A. STEEL,
HARRY SMITH.

(17)