W. Joslin.

Cordage Mach.

No. 6,166 Patented Mar. 10, 1849.

Fig. 1.

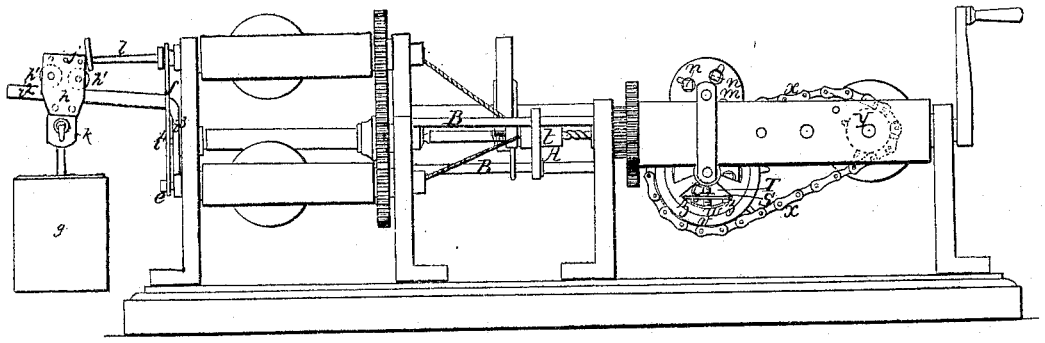

Fig. 2.

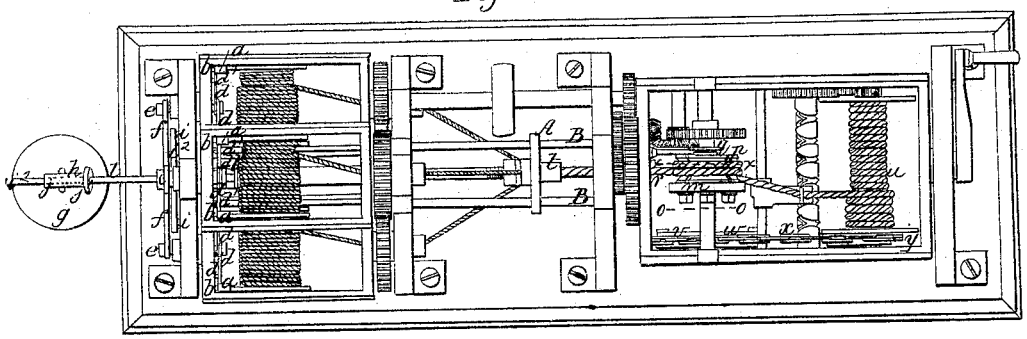

Fig. 4.

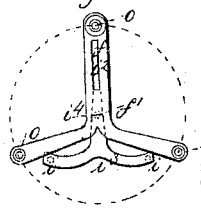

Fig. 9.

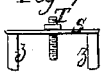

Fig. 3.

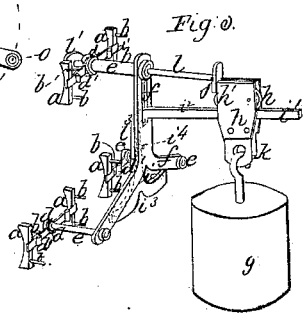

Fig. 5.

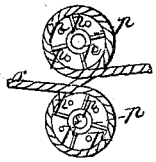

Fig. 7.

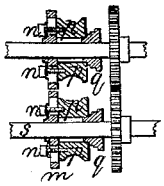

Fig. 6.

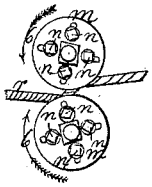

Fig. 8.

UNITED STATES PATENT OFFICE.

WILLIAM JOSLIN, OF WATERFORD, NEW YORK.

IMPROVEMENT IN ROPE MACHINERY.

Specification forming part of Letters Patent No. **6,166**, dated March 10, 1849.

To all whom it may concern:

Be it known that I, WILLIAM JOSLIN, of the village of Waterford, in the county of Saratoga and State of New York, have invented a new and useful Improvement in my patented Machine for Manufacturing Cordage, (for which I obtained Letters Patent on the 19th day of January, 1847,) and which improvements are described as follows, reference being had to the annexed drawings of the same, making part of this specification.

The improvements that I have made in my patented machine relate especially to the employment of, first, a combination of rubbers, levers, sliding connecting-rods, tri-branched connecting-plate to which the rods are attached and a tri-branched lever and sliding weight, suspended to an inclined arm of said tri-branched lever, and a movable graduating-rod for governing the descent of the weight over the inclined arm of the lever for producing the requisite degree of friction on the bobbins containing the ready or strands to be twisted into rope, for the purpose of causing the several strands always to have the same degree of tension on leaving the spools, (while the spools are constantly diminishing in diameter,) the friction of the aforesaid rubbers decreasing in the same proportion as the diameters of the bobbins decrease, caused by the weight sliding gradually toward the fulcra of the tri-branched lever and the inward movement of the graduating-rod, which constantly bears against the ready on the spools by the action of the weight pressing against it, said rod being made to move toward the center of the bobbins by the lessening of their diameters, by the unwinding of the ready or strands, which are thus prevented from kinking or unwinding faster than they should unwind; second, in the employment of two expansive pulleys, revolving with the flier, for graduating the twist of large or small rope by expanding or contracting instead of using the single hollow sliding frustum of a cone, described in my patent, which was found not to answer the desired end as well as I wished; third, in the employment of a sliding toothed band or ring placed over the periphery of a wheel on the axle of the expansive pulley, endless chain, friction-bars, spring, and screw to graduate the friction of the band for causing the reel to reel the cordage at a uniform degree of speed, while the coil of rope is constantly increasing in diameter instead of the band and pulleys described in my patent, which would not answer the purpose intended so effectually as I desired; fourth, in the employment of horizontal parallel rods arranged between the inner standard of the spool-frame and the inner standard of the flier-frame and let into the same for supporting a box or plate of the condensing-tube instead of inserting the condensing-tube into the hollow journal of the flier, by which arrangement a space is formed between the hollow journal of the flier and the condensing-tube, which enables the operator to examine the rope as it passes from the condensing-tube to the flier, and also braces the frame at points where the greatest strain exists and prevents the inward movement of the standards toward the laying-blocks and consequent derangement of the frame, caused by the tension of the strands in passing from the bobbins to the laying-block and of the rope in passing from the condensing-tube to the flier.

The rest of the machine is made like my patented machine, such as the frame, fliers, bobbins, reel, right-and-left screw and guide, gearing, &c.

Figure 1 is a side elevation of the machine. Fig. 2 is a top view. Fig. 3 is a perspective view of the rubbers, levers, connecting-rods, tri-branched plate, tri-branched lever, weight, carriage, and graduating-rod. Fig. 4 is an elevation of the tri-branched lever and plate. Fig. 5 is a vertical section of the expansive pulleys, taken on the dotted line *x x* of Fig. 2. Fig. 6 is a side elevation of same, taken on the line *o o* of Fig. 2. Fig. 8 is an elevation of the plate containing the condensing-tube, showing the end of the same and the ends of the three parallel rods for sustaining the same. Fig. 9 is a section of the apparatus for producing friction on the cogged band that slips on the wheel on one of the pulley-shafts.

Similar letters in the several figures refer to the same parts.

a a a a a a represent the rubbers for bearing against the peripheries of the heads of the bobbins or spools to produce the required friction. These rubbers should be made of

wood or other material, of any convenient size and shape for the purpose intended, and caused to press more or less against the rims of the bobbins by a combination of rubbers, actuated by a self-adjustable weight.

b b, &c., are twelve parallel guide rods or ways, on which the six rubbers move, there being two ways for each rubber. Each way is inserted permanently in the flier and must be of such length as not to run entirely through the rubber, and of a little less diameter than the hole in the rubber in which it is inserted, so that the rubber may move freely thereon. Each hole in the rubber should be equidistant from the center. A notch should be made in the straight side of the rubber at the middle for the insertion of the short end of a small lever *d*, whose fulcrum is at *d'*, which is simply a knife-edged protuberance formed on the back of the lever bearing against the inside of the flier. The long end of the lever is pierced with a round aperture, through which is passed a round rod *e*, extended also through the hollow journal of the flier and tri-branched plate *f*, having a head on each end of the rod, by which the levers are connected with the tri-branched plate *f*. This plate is represented more clearly at *f*, Fig. 4, which shows the apertures *o* through which the rods *e* pass, said apertures being equidistant on the circumference of a circle scribed from the center *f'* of the plate. The plate stands in a vertical position, and is moved horizontally toward or from the bobbins by the gravity of a weight *g*, appended to a carriage that rolls over the inclined arm i^2 of a tri-branched lever i^3, whose fulcra are two points *i i* or protuberances. On the extremities of two of the branches of the lever let into apertures in the standard of the frame, and whose bearings point against the tri-branched plate, is another protuberance i^4, fixed to the other arm near its center, or exactly opposite the center of the tri-branched plate, where it bears against said plate.

The carriage *h* is simply composed of two parallel plates *h*, between which are arranged two rollers *h' h'*, that roll upon the inclined surface or arm of the tri-branched lever, also a T-shaped bar *j*, and a perforated plate *k*, to which the weight *g* is hooked. The T-shaped bar of the carriage bears against the end of a graduating-rod *l*, which rests against the strand or ready on the spool. This gage-rod is made round and passes through a round aperture made longitudinally through the center of one of the connecting-rods *e*—namely, the largest of the three attached to the levers—in which it slides toward the spool as the strand unwinds, said graduating-rod having a flat head *l'* formed on one of its ends that rests against the strands on the bobbin, while the other end is rounded and pressed against by the plate or head *j'* of the T-bar attached to the carriage.

The object in having the tri-branched lever i^3 to act against the center of the plate *f*, to which the connecting-rods *e* of the levers of the rubbers are attached, is to make all the rubbers have the same degree of pressure on the spools. The expansive and contractile pulleys for imparting to the rope a greater or less number of twists in a given length, according to its size or diameter, are made, arranged, and operated in the following manner:

Upon the shaft that carried the hollow frustum of a cone described in my patent there is secured a cylindrical disk or plate *m*, perforated with four radial mortises to admit confining-screws *n*, which are screwed into the four quarters of a divided pulley *p*, whose periphery is made concave or channeled, in the manner of a common block-pulley, for the reception of the rope which is wound around the same, and by which it is prevented from slipping off at the ends. This expansive pulley is made of any required diameter and length and of any suitable material. The bore in the center is a little larger than the shaft on which it is placed. The female screws, into which the confining-screws *n* are screwed that fasten the four quarters of the pulley to the disk *m*, are made in the center of each segment. The confining-screws *n* have large heads, which are screwed against the side of the disk or plate *m*. A sliding notched cone or gage-stop *q* is slipped on the shaft in such position that any one of the circular steps or stops of the notched cone can be brought into the bore of the expanding pulley by first expanding the segments and moving said sliding cone toward the disk *m*. When the diameter of the pulley is to be diminished, the notched cone must be moved from the disk *m*, so as to bring a stop of smaller diameter in the bore. The segments must then be closed inward toward the center upon the stop or cone and the screws tightened. This sliding stop or notched cone not only holds the segments of the pulley in the required position, but also removes the strain from the confining-screws and makes the circumference of the pulley always a true circle concentric with the circle of the notched cone that is in the bore of the pulley. Immediately below this pulley and on a parallel shaft *s* a corresponding expansive and contractile pulley, made and operated in the same manner, is arranged, and is turned at a uniform speed with the first-named pulley by suitable cogged gearing on the shaft and in a contrary direction, as indicated by the arrows, Fig. 6. The rope *r* to be twisted is carried from the condensing-tube *t* to the top of this pulley, around which it is coiled twice. It is then carried around the upper pulley, or the one directly over it, in a contrary direction, as represented in the drawings, in two coils, and carried thence to the reel *u*. By this arrangement and construction of expansive and contractile pulleys the rope is carried from the condenser *t* in a horizontal line, or nearly so, to the drawing pulleys *p* of the fliers, in-

stead of drawing it obliquely against the mouth of the hollow journal and thereby producing much friction, as in the use of the sliding cone of my old machine.

The apparatus or combination of parts for causing the reel to wind up the cordage as fast as delivered by the pulleys and at a uniform degree of tension while the coil of rope on the reel is constantly increasing in diameter, and thereby acquiring a tendency to draw the rope faster than it can be delivered by the expansive pulleys, is described as follows: On the shaft of one of the expansive pulleys is a wheel *w*, and around this wheel is placed a circular hoop or band *v*, flanged on one side and plated on the other, whose inside diameter is equal to the outside diameter of the wheel *w*. The outer periphery of this band is armed with cogs that correspond with the links of an endless chain *x*, passed around said band, and a pulley *y* on the axle of the reel *u*, which is also armed with teeth. Radial openings are made through the rim of the wheel, into which are inserted friction-bars *z*, that press against the inner periphery of the cogged wheel or band to prevent it from slipping until a certain degree of tension is imparted to the rope by the filling of the reel. A spring S is applied to the friction-bars by means of a screw and nut T to increase or diminish the friction on the band so as to adapt the machine for various degrees of tension. The reel is set to draw and wind the rope at a certain degree of tension by the aforesaid screw T and spring S producing more or less friction on the band, as required. Should the reel, in filling up, have a tendency to draw the rope too fast, the band will slip round on the wheel and the reel will continue to draw and wind the rope as fast as it is delivered from the pulleys and no faster.

The condensing-tube *t* is inserted into a circular aperture the size of its external diameter made in the center of a tri-branched or other shaped plate A, suspended or sustained in a vertical position between the two middle standards of the frame by three parallel horizontal rods B, mortised and tenoned into the standards. This arrangement strengthens the frame at a point where it has heretofore been weak, dispenses with the necessity of inserting the condenser in the hollow journal of the flier, and produces an open space between the condenser and the hollow journal of the flier, which allows the operator to see the rope as it leaves the condenser and before it reaches the flier.

What I claim as my invention and improvement on my patented machinery for making cordage is—

1. The manner of producing and diminishing the friction on the bobbins so as to keep up a uniform strain on the strands as they are drawn off, also to prevent kinking and too fast unwinding, as hereinbefore described and represented or other mode substantially the same.

2. The employment of the sliding toothed ring and endless chain, in combination with the toothed pulley *y* and perforated wheel, friction-bars, and spring and screw for graduating the friction on the toothed band to cause the reel to wind up the rope as fast as delivered from the expansive and contractile pulleys, as above described.

In testimony whereof I have hereunto signed my name, before two subscribing witnesses, this 9th day of May, 1848.

WM. JOSLIN.

Witnesses:

WM. P. ELLIOT,

L. WASHINGTON, Senr.