

M. & S. KJELSTAD.
ROPE MAKING MACHINE.
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947,410.

Patented Jan. 25, 1910.

2 SHEETS—SHEET 1.

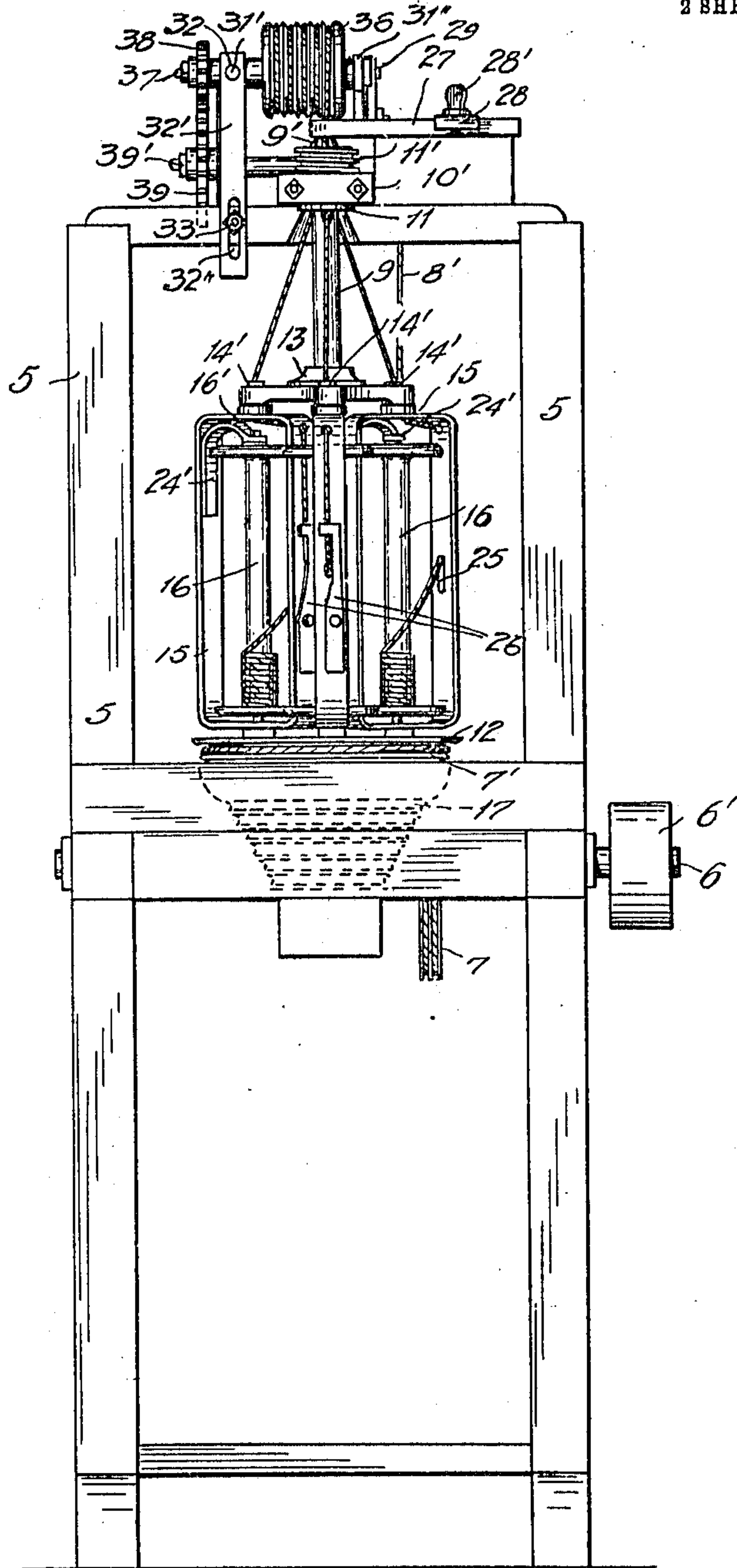


FIG. 1

WITNESSES:

Allen R Hunt
W. Duckering

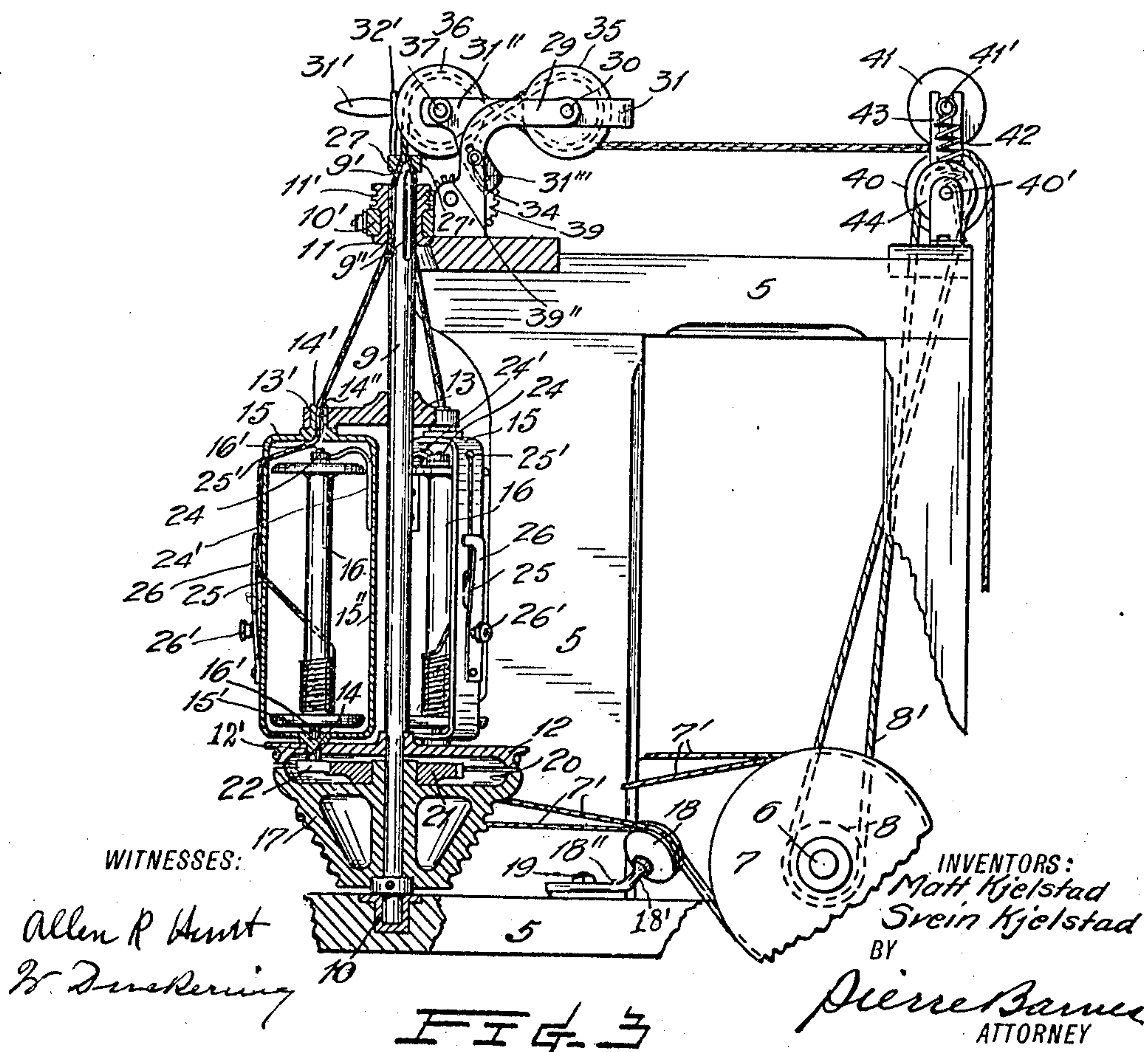
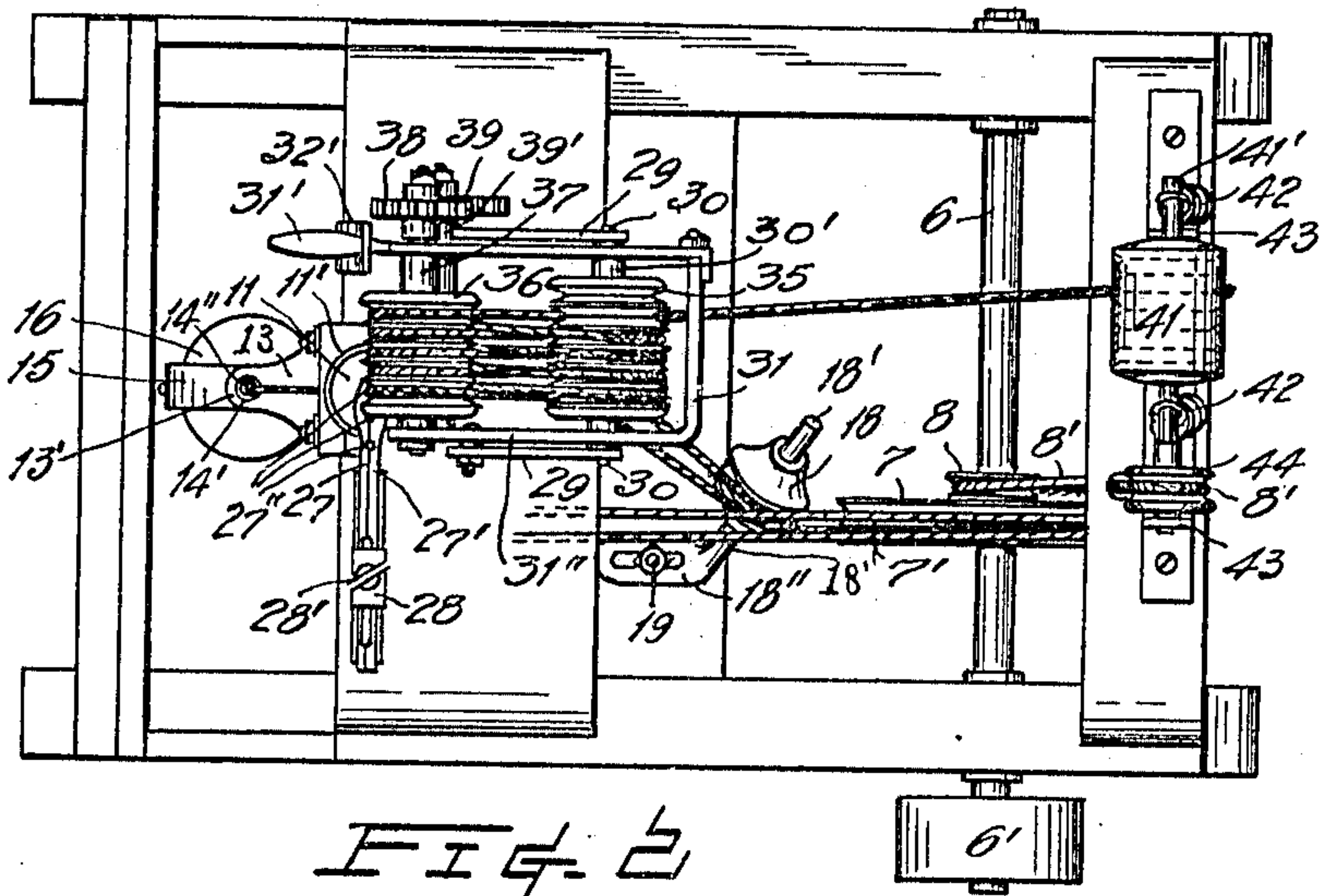
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947,410.

2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

MATT KJELSTAD AND SVEIN KJELSTAD, OF STANWOOD, WASHINGTON.

ROPE-MAKING MACHINE.

947,410.

Specification of Letters Patent.

Patented Jan. 25, 1910.

Application filed January 21, 1907. Serial No. 353,267.

To all whom it may concern:

Be it known that we, MATT KJELSTAD and SVEIN KJELSTAD, subjects of the King of Norway, residing at Stanwood, in the county of Snohomish and State of Washington, have invented certain new and useful Improvements in Rope-Making Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to machines which through the twisting and laying of a number of strands produce rope; and its object is to provide a machine of this character which will be of a simple, inexpensive and durable construction and yet capable of forming rope of a very high grade.

With these and other ends in view, the invention consists in the novel construction, adaptation and combination of parts, as will be hereinafter described and claimed.

In said drawings, Figure 1 is a front elevation of apparatus embodying our invention; Fig. 2, a plan view; and Fig. 3, a fragmentary longitudinal section of the same.

The reference numeral 5 represents the machine frame, which may be of any suitable form or construction. Journaled in bearing boxes on the frame is a shaft 6 which is driven from any suitable power source as by a belt upon the shaft pulley 6'. Fixedly mounted upon shaft 6 are grooved pulleys 7 and 8 adapted to transmit rotary motion to the operative parts of the machine through endless belts or cables 7' and 8'. At the front end of the machine is a vertical spindle 9 which is journaled in a suitable step bearing 10 and, through the medium of a bushing-sleeve 11, in a bracket box 10'. The spindle terminates at the top in a conical end 9' and from which end to a short distance below the sleeve it is provided with a plurality of longitudinal grooves 9'' through which the rope strands are conducted during the progress of the work. Fixedly secured to the spindle is a grooved pulley 12 and a spider-shaped member 13 which are bored respectively as at 12' and 13' to receive and furnish bearings for the axles 14 and 14' of rotatable carriers 15 for the spools 16. Immediately below the pulley 12 is another pulley 17, of the conical or stepped type, desirably, which is mounted upon said spindle so as to turn independently thereof. Such motion is obtained by the aforesaid

cable 7' which also serves, by engaging with the pulley 12, to rotate the spindle.

18 is a fair leading pulley to guide the cable to the respective grooves of the pulleys 12 and 17 and is arranged likewise to act as a tightener for the cable by adjustably connecting its support 18' to the frame, as by a securing bolt 19 extending through the slotted foot 18'' of support. The opposing ends of the pulleys 12 and 17 are recessed to provide a chamber 20 for the reception of a toothed pinion 21, fixedly connected to the pulley 17, and meshing with toothed-wheels 22 which are mounted upon the axles 14, the latter being prolonged into the chamber 20.

The spools 16 have end axles 16' adapted to be seated in sockets in the lower end 15' and the apertured bosses 24 of spring arms 24' which are connected with the upright members 15'' of the respective carriers. By this arrangement the spools are detachably connected with the carriers and can be inserted or removed by simply bending any of the spring arms 24 upwardly sufficiently to withdraw the spool axle which is engaged with said spool socket. The spring arms likewise act frictionally against the contacting end of the spool to prevent the spools from unwinding too freely when tension is put upon the strands in being unwound therefrom.

The strand from each spool is led through holes 25 and 25' in one of the upright members 15'' of the respective spool carriers to an axial aperture 14'' in the upper axle 14', see Fig. 3, and is acted upon by a spring 26 secured to each carrier and made adjustable by means of a thumb-screw 26' for each.

From the apertures 14'' the several strands are conducted through the aforesaid spindle grooves 9'', and thence between the jaws 27, 27' of a laying bar positioned thereabove and which jaws are separably secured to each other by a saddle piece 28, and adjustably connected to the frame by a thumb-screw 28' engaged with a screw-threaded aperture or nut bedded within the frame. Within each of the meeting faces of said jaws 27' is a plurality of opposing notches of different sizes to accommodate the different sizes of rope being made, and which are brought into position to engage with the work by moving the laying bar member transversely of the frame. Upon the top

of the frame is a standard 29 to which is tiltably connected, as by pivots 30, a U-shaped member 31, one of the legs of which terminates in a handle bar 31' extending
 5 through a hole 32 in a locking plate 32' provided with a slot 32'' through which extends a bolt 33, whereby the plate may be secured to an adjusted height corresponding with the inclination of the member 31.
 10 Upon the other arm 31'' of said member 31 is a segmental slot 31''', concentric with the pivots 30, for a locking bolt 34 extending through the adjacent portion of the standard 29 to further secure the member 31 to
 15 any adjustment. The pivots 30 are desirably formed of the protruding ends of a shaft 30' carrying a peripherally grooved drum 35, and a similarly grooved drum 36 is fixedly mounted upon a shaft 37 jour-
 20 naled in the member 31. The purpose of these drums is to furnish means for stretching the rope previously laid by winding it back and forth between and about the drums a sufficient number of times to insure ample
 25 contact to prevent slipping of the rope upon the drums as the latter are rotated. Rotation is given to one of these drums, as 36, by means of a gear wheel 38 upon its shaft 37 being driven by a pinion 39 upon a shaft
 30 39', which in turn is provided with a gear wheel 39'' driven by a worm 11' upon the spindle 9, and desirably formed upon the sleeve 11. The rope being thus led from the laying bar and about the aforesaid drums,
 35 as clearly shown in Figs. 2 and 3, and stretched is conducted between two other drums, 40 and 41, and from thence to apparatus for coiling. Of the last named drums, the drum 40 is formed with graded
 40 grooves through the proper sized one of which the rope is conducted as it leaves the machine, and is pressed into frictional contact with the drum 40 by the other drum 41 by the action of springs 42 connected to
 45 the axle 41' of the drum 41'' and tending to draw it toward the shaft 40' carrying drum 40. Both of these axles are extended through upright arms 43 of the frame.

44 is a pulley mounted upon the shaft 40' and is driven by a belt 8' from the main shaft 6.

In operation the strands are twisted to form the rope by the combined action of the rotary spindle and the planetary motion im-
 55 parted to the spools in conjunction with the resistance due to the laying bar and the

drawing effect produced by the drums 35 and 36. The action of the drums 35 and 36 would, of course, be governed by the compactness with which a particular run of
 60 rope is desired to be laid, and is regulated through the speed which is given to the drum 36, and variable through changing the gear wheel 38 for another of different diameter. Furthermore the paying out of the
 65 strands can be more or less retarded to supplement any slight variations in the lay of the rope by adjusting the tension of springs 26, as before explained.

The range of work which this machine is
 70 capable of performing is from an extremely small cord to a rope of considerable size, and while a relatively large amount of rope may be manufactured by a machine as illustrated, the same frame work would serve
 75 for a number of individual rope-making devices and all utilizing the shaft 6 in common.

What we claim, is—

A machine of the class described comprising a supporting frame, a twisting mandrel
 80 mounted for rotation in said frame and having one end provided with a plurality of longitudinally extending grooves radially disposed with respect to the axis of the mandrel, a laying device mounted upon
 85 said frame and positioned adjacent the grooved end of the shaft and associating therewith, a spider fixed to the mandrel and formed with spaced bearings, a stepped pulley surrounding the mandrel and carrying a
 90 gear, a pulley fixed to the mandrel and provided with spaced bearings in alinement with the bearings of the spider rotatable carriers interposed between the fixed pulley and spider and provided with journals extending
 95 through the bearings of the fixed pulley and further having axially bored journals extending in the bearings of the spider, gears carried by the journals which extend through the fixed pulley and meshing with the gear
 100 carried by the stepped pulley, spools rotatably mounted in the carriers, means for simultaneously operating said pulleys, and drawing means associating with said mandrel.
 105

In testimony whereof we affix our signatures in presence of two witnesses.

MATT KJELSTAD.
 SVEIN KJELSTAD.

Witnesses:

C. JOERGENSEN,
 N. CHRISTENSON.