No. 868,726. PATENTED OCT. 22, 1907.

W. L. TOBEY.

MACHINE FOR MAKING ROPE.

APPLICATION FILED DEC. 21, 1906.

Fig. 1.

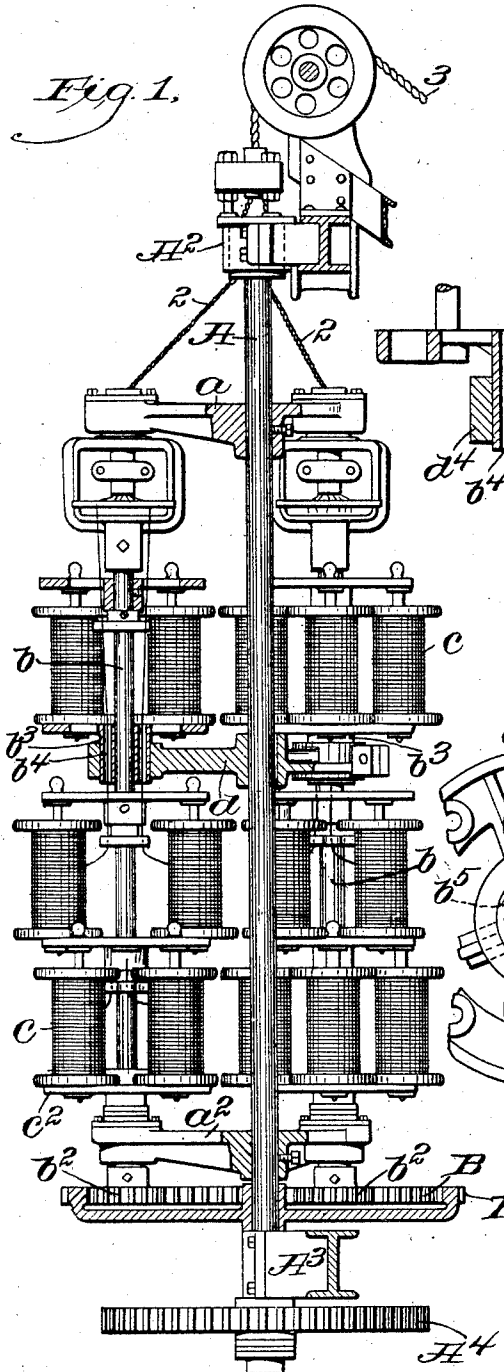


Fig. 2.

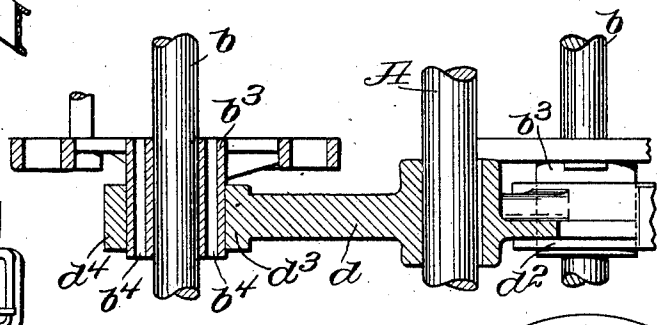
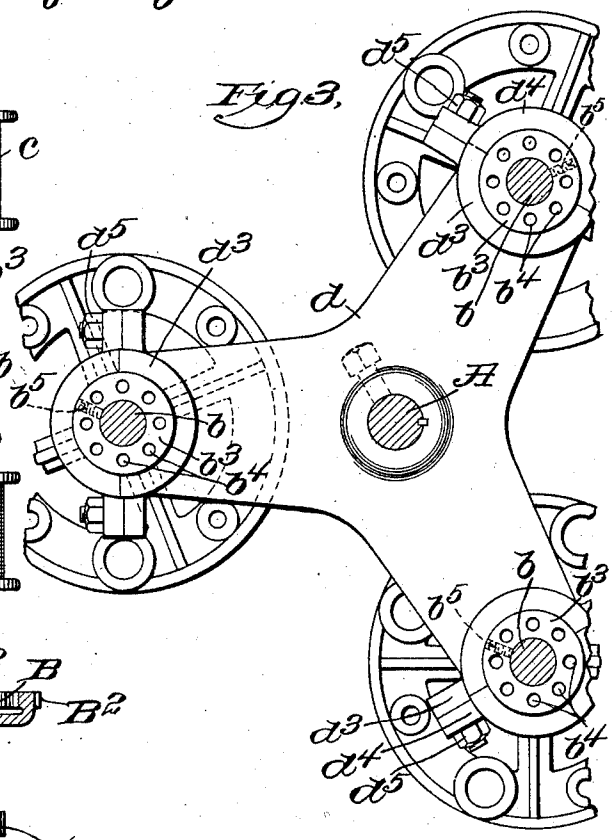


Fig. 3.



Witnesses:
Jas. J. Maloney.
Margaret F. Rooney.

Inventor:
William L. Tobey.
by J. P. and H. J. Livermore
Attys.

UNITED STATES PATENT OFFICE.

WILLIAM L. TOBEY, OF WINTHROP, MASSACHUSETTS.

MACHINE FOR MAKING ROPE.

No. 868,726. Specification of Letters Patent. Patented Oct. 22, 1907.

Application filed December 21, 1906. Serial No. 348,899.

To all whom it may concern:

Be it known that I, WILLIAM L. TOBEY, a citizen of the United States, residing in Winthrop, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Machines for Making Rope, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The present invention relates to a rope laying and forming machine, and is embodied in a machine of that type in which the strands of the rope are each made up of a number of threads, the threads being twisted to form the strands, and the strands being twisted to lay the rope at one operation. In this construction, the strands converge from the rotating fliers by which they are formed towards the laying head where the rope is laid, the fliers being rotated to form the strands, and, at the same time, bodily revolved in the opposite direction around the axis of the main shaft which carries the laying head.

The main strands of the rope are made up of varying numbers of threads, each of which is fed from a bobbin. In order to obtain a high speed machine, it is desirable that these bobbins which, taken as a whole, must revolve around the axis of the finished rope to lay the strands formed from the threads, should be compactly arranged in order to reduce the power required to revolve them, it being desirable, therefore, to arrange them in tiers, there being comparatively few bobbins supported on each tier. In the construction shown, the bobbins are mounted upon tables, one above another, each table with the bobbins thereon being mounted on a rotating flier shaft so as to perform the primary twisting operation upon the threads, it being desirable, when a large number of threads are to be used, to multiply the bobbin supports rather than to multiply the number of bobbins on each support, and thereby to keep the diameter of the whole flier as small as possible. It is found, however, that when the flier shafts are of considerable length to accommodate a number of bobbin tables one above another, the revolving movement, when a high speed is attained, tends to create centrifugal force and to throw the fliers laterally outward at the middle, thus causing the flier shafts to bind in the end bearings, even if they are not actually sprung or bent.

In order to obviate this difficulty, the machine embodying the invention is provided with one or more supplemental bearings for the flier shafts secured to the main rotating shaft and projecting laterally therefrom into alinement with the main or end bearings for the fliers, the male members of said bearings being provided with openings through which the threads from the lower bobbins are led upward to the forming head. It is practicable in this way to produce a high speed machine capable of handling a large number of threads by simply multiplying the bobbin holders without increasing the number of bobbins on each holder to such an extent as to make the main rotating part of the machine unwieldy or out of proportion.

The invention is shown as embodied in a machine in which each strand is made of twelve threads which are drawn from three sets of four bobbins each, each set being mounted upon an independent bobbin holder or table. In this construction the supplemental bearing is interposed between the second and third bobbin holders, it being obvious that such supporting members might be multiplied, if necessary, or placed in any position desired with relation to the bobbin holders.

Figure 1 is a vertical section, partly in elevation, with parts broken away, of a machine embodying the invention, the driving gears, &c., being mainly omitted, since they form no part of the present invention; Fig. 2 is a partial vertical section, on an enlarged scale, showing the supplemental bearing member and the parts carried thereby. Fig. 3 is an underneath plan view of Fig. 2.

The main shaft A is provided above and below with bearings A^2 and A^3, and also is provided with supporting spiders a and a^2 at opposite ends, these spiders affording upper and lower end bearings for the flier shafts b. The upper spider a constitutes a spreader for the strands 2 which are to be twisted into the rope 3, these strands being revolved around the axis of the rope through the rotation of the shaft A. Each of the strands 2 is made up of a number of threads which are also twisted in the operation of the machine to form the strands, these threads being supplied from bobbins c mounted in groups one above the other upon supports or tables c^2 connected with the flier shafts b which are arranged to rotate in their bearings so s toa twist the threads into the strands 2. The main shaft A is shown as provided with a driving gear A^4 to produce the rotation thereof, while the shafts b are each shown as provided with a gear b^2 arranged to mesh with an internal gear B which may be stationary or rotatable at such speed as will produce the desired opposite rotary motion of the flier shafts.

In the construction shown, the gear B is provided with external gear teeth B^2, so that the said gear can be independently rotated at any desired speed.

In the operation of the machine, the strands 2 are revolved around the shaft A, the flier shafts b and the bobbins c carried thereby also bodily revolving with the said strands. The flier shafts b, however, are also rotated in the opposite direction so as to revolve the bobbins independently and twist the threads fed therefrom to form the strands.

As will be seen from the foregoing description there is a tendency, if a machine is run at high speed, for the revolving shafts b which carry considerable weight, to spread, owing to centrifugal force. Such spreading

will naturally tend to spring the shafts, causing the same either to bend permanently, or to bind in the bearings at the upper and lower ends. In order to counteract this tendency, the machine embodying the invention is provided with one or more supplemental bearing members d connected with the shaft A, and arranged to support the flier shafts b at a point or points intermediate between the ends thereof. In the construction shown, in which a twelve-thread strand machine is illustrated, a single supplemental bearing member d is employed, each flier having three bobbin supports holding four bobbins each. In this construction, the supplemental bearing is located between the second and third bobbin support from the lower end of the machine, this position being approximate to the middle of the shafts b.

Since the bobbin supports c^2 rotate with relation to the several bearing members for the shafts b, including, of course, the supplemental bearing d, it is essential that the threads from the lower bobbins should be provided with guides stationary with relation to the bobbin supports themselves. For this purpose, each shaft b is provided with a male bearing member b^3 provided with openings b^4, there being a number of openings equivalent to the number of bobbins mounted below the bearing d, the female bearing portion d^2 surrounding the bearing member b^3, instead of being directly in contact with the shaft b. In the construction shown, the member b^3 consists of a perforated hub or boss secured to the shaft b by means of a set screw b^5 (Fig. 3), while the supplemental bearing member or spider d has a half bearing d^3 formed at the end, the bearing proper being completed by means of another half member d^4, the two half members being clamped together around the portion b^3 by means of bolts or caps crews d^5.

What I claim is:

In a rope laying and forming machine, the combination with a main rotating shaft carrying the laying head, of oppositely rotating strand forming fliers and shafts therefor revoluble around the axis of said main shaft, end bearings for said flier shafts carried by said main shaft, and supplemental bearings for said flier shafts revoluble around the axis of and carried by said main shaft and located between and in alinement with said end bearings, the male members of said supplemental bearings being provided with openings for the bobbin threads, substantially as described.

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

WILLIAM L. TOBEY.

Witnesses:
HERBERT M. DULEY,
ROGER P. TOBEY.