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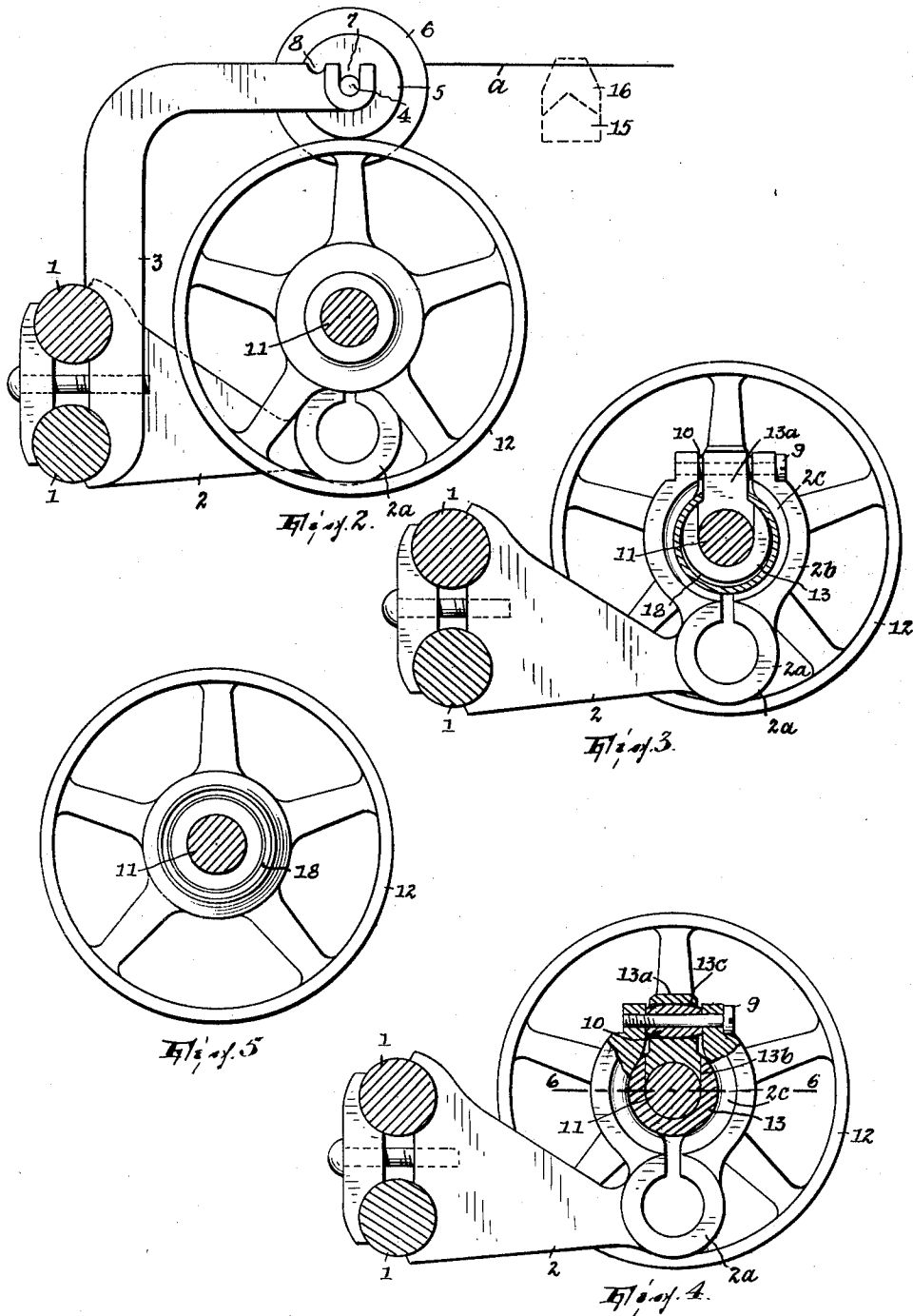
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WINDING MACHINE

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WINDING MACHINE

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8 Claims. (Cl. 308—72)

This invention relates to winding machines and it is explained herein by reference to a winding machine of the class in which the rotary elements to receive the windings rest in peripheral contact with and so are rotated by wheels fixed on a rotated horizontal shaft. In these machines the shaft is usually supported at several points in its length and heretofore the brackets or other supports therefor had to be formed and also fitted in place with the utmost care in order that their bearings for the shaft would be perfectly aligned; much time was therefore expended in installing the brackets for reception of the shaft. One object of the invention is to provide brackets or equivalent supports for the shaft in which the bearings thereof for the shaft will be self-aligning, and another object is to facilitate the assembly of the shaft with the bearings by constructing the latter so as to admit the shaft transversely of itself. Where a bracket happens to be opposite a spool or bobbin of one of the mentioned rotary elements a troublesome fault heretofore has been that a hanging thread or yarn from the spool would become wound around the shaft and the wound mass work its way into the bearing, frequently actually cutting or otherwise injuring the same. Another object is to equip the machine with means which will make it impossible for the yarn to become wrapped around the shaft, much less to reach the bearing.

In the drawings,

Fig. 1 is a front elevation of a fragment of so much of a winding machine containing the invention as is necessary to illustrate the same, certain parts appearing in section;

Figs. 2, 3 and 4 are sections on line 2—2, 3—3, and 4—4, Fig. 1;

Fig. 5 is a left side elevation of the right-hand driving wheel in Fig. 1;

Fig. 6 is a section on line 6—6, Fig. 4;

Fig. 7 is a perspective view of a bearing device; Figs. 8 and 9 show the reel guard means; and Figs. 10 and 11 show a modification of the invention, Fig. 10 showing certain parts mainly in longitudinal section and Fig. 11 showing said parts in section on line 11—11 of Fig. 10.

Fixed supporting means are formed by the following parts: A pair of horizontal rods 1 forming parts of the winding machine frame, a series of brackets 2 clamped to these rods and in which, as will appear, the mentioned rotated shaft is supported, and a series of brackets 3 also clamped to the rods and projecting forward at a higher elevation than brackets 2.

According to the usual practice, each bracket

3, which supports the adjoining ends of two adjoining spindles 4 having driving whirls 5 and carrying the yarn-receiving spools 6, is notched at 7 for reception of said spindles when the rotary yarn receiving elements which they and the spools form are being driven, and at 8 for reception of said spindles when said elements are at rest.

Each bracket 2 has a split annular portion 2a both ends of which at the split are extended as arcuate clamping portions or jaws 2b having a common center and formed with internal cross-sectionally rounded arcuate ribs 2c and one of which is bored and the other tapped at their terminals in the same transverse line to receive a screw 9 on which is a spacing sleeve 10 between the said terminals, which is in effect tapered toward both ends and is actually convex in longitudinal section. Each bracket forms a clamp member.

11 is the shaft whereby the said rotary elements are driven and 12 the driving wheels fixed thereon, one for each of said elements.

Each of the bearings for this shaft, arranged in the brackets 2, of which there are usually one at each end of the machine and a suitable number between according to the length of the machine, is constructed as follows: A cylindrical piece 13 having a lengthwise bore of the same diameter as the shaft and having an exterior tongue 13a is split on two longitudinal lines 13b both sides of the tongue spaced a distance at least equal to the diameter of the shaft, so that the piece is in two sections, one of which is U-shaped and the other has the tongue. The tongue has a transverse bore 13c to receive the spacing sleeve 10. The sectional bearing 13 is of wood (as arguto, which as known resists frictional wear and makes lubrication unnecessary), whereas of course the bracket 2 is of metal. In installing the shaft the U-shaped sections of the bearings are fitted thereto and passed through the opening between the terminals of the jaws 2b of the clamp members or brackets, whereupon the tongued sections are placed in position as in Fig. 4 with the spacing sleeves fitted to their bores 13c and between terminals of said jaws, and finally the screws 9 are entered into said jaws and through the spacing sleeves and screwed up tight. The interior diameter of ribs 2c of the jaws, when the latter are drawn up sufficiently to clamp the spacing sleeve, is slightly less than the exterior diameter of the tubular section of the bearing 13, wherefore when the screw sets up clamping pressure on the bearing said ribs

become somewhat impressed therein to hold them securely. In the assembling each bearing is thus initially allowed, before the screw is tightened, to adjust or true itself to the shaft independently of the bracket, as where the bracket is not in some respects in absolute right-angular relation to the shaft, so that when the screw is tightened the bearing becomes clamped in proper relation to the shaft. The spacing sleeve 10 limits the clamping action of the jaws 2b on the bearing, so that the screw may not be unintentionally manipulated to an extent where said jaws would cause the bearing to unduly compress the shaft and thus set up friction incident to such compression. The bearing not only has universal movability in the sleeve but the double-tapered sleeve affords it a universal connection with respect to the screw 9. I might omit the tongue and depend on the clamping pressure of the other section to hold the section having the tongue, but it is better that the latter section be held positively from working endwise by some such means as 9-10.

One or both ends of the shaft may be equipped with collars 14 flanking a bearing of one of the brackets 2 to hold the shaft against endwise displacement.

At 15 (Fig. 2) is indicated a thread-guide rail carrying a thread guide 16 and assumed to be traversed by any well known means lengthwise of and for the full length of the spools 6.

To prevent the yarn or thread *a* becoming wrapped around the shaft in those instances where a bracket 2 is opposite a spool and the consequent possibility of the yarn working into the corresponding bearing and to accomplish this without encroaching upon useful space and by means simple in construction and readily assembled with the machine I provide a housing or thread-guard means which, generally defined, is as follows: Assume the shaft and a driving wheel 12 to be a rotary spool-driving element having such wheel as a circumferential enlargement thereon and adjacent which, opposite the spool, is one of the bearings for said element. The guard means extends around said element and from one to the other of such enlargement and the part 2 comprising the bearing and is held against rotation with said element by said part. If, as usually happens, the bearing stands wholly between the ends of the mass being wound on the spool or otherwise so that each end thereof is subject to possible admission of yarn thereto which becomes wrapped around the shaft, then such guard or housing means may be duplicated, one being placed at each side of the part 2 comprising the bearing. In the example, which shows the preferred construction, the housing or guard means is a tube 17 having a notch 17a in one end of a size to receive the tongue 13a. The circumferential enlargement (12) of the driving element is formed in its face adjoining the part 2 with a circumferential groove 18 concentric with the axis of said element and which receives the plain end of the tube, the other end of the tube receiving the tubular section of the bearing (which projects from the bracket, as shown) and its notch 17a receiving the tongue 13a and so holding the tube against rotation. Since the ends of the tube are in effect lapped with respect to portions of the bearing and said enlargement (12) the possibility of a depending thread finding its way to the shaft is entirely eliminated. In this example the tube is of greater inside diameter and less outside diameter than

the inside and outside diameters of the groove, whereby it rides on the enlargement at 19 without chatter or other noise which I find attends any attempt to make it snugly fit either diameter of said groove. When the bearing stands wholly between the ends of the mass being wound another such tube 20 may be placed between said part 2 and the adjacent enlargement.

In Figs. 10 and 11 the tube, here designated 21, is set at its ends in counterbores 22 and 23 in the enlargement 12 of the driving member and in the bearing and it has an arm 24 attached thereto which may bear on the top of the shaft 1 to hold the tube from rotation. This construction avoids notching the tube to receive the tongue 13a of the bearing and permits making it of smaller diameter.

Having thus fully described my invention what I claim is:

1. In a winding machine, means to support a rotary shaft comprising a clamp member having its clamping portion adapted to embrace the shaft and provided with an interior narrow cross-sectionally rounded rib arranged to extend around the shaft, and a substantially exteriorly cylindrical bearing member for the shaft arranged in the clamp member and adapted to be gripped at its cylindrical exterior surface by the rib under the clamping pressure of the clamp member, said clamp member permitting the bearing member upon being so gripped to retain any position it is caused by the shaft to assume in the clamp member.

2. In a winding machine, means to support a rotary shaft comprising a clamp member having its clamping portion adapted to embrace the shaft and provided with an interior narrow rib arranged to extend around the shaft, and a substantially cylindrical bearing member for the shaft arranged in the clamp member and formed of yielding material and adapted to be impressed by the rib under the clamping pressure of the clamp member.

3. In a winding machine, means to support a rotary shaft comprising a clamp member having an opening whereby to admit the shaft into the clamp transversely of such shaft, and a substantially tubular bearing member for the shaft arranged in the clamp member with its axis extending through the plane of clamping pressure thereof and split from its bore to its periphery in two substantially parallel planes separated by the shaft into two sections, said clamping member exerting clamping pressure on said sections through said planes.

4. In a winding machine, means to support a rotary shaft comprising a clamp member having an opening whereby to admit the shaft into the clamp transversely of such shaft, and a substantially tubular bearing member for the shaft arranged in the clamp member with its axis extending through the plane of clamping pressure thereof and split in substantially parallel longitudinal planes from its bore to its periphery and toward said opening into two sections, the section of the bearing member between said planes being held compressed by the clamping member between those portions of the other section of said bearing member which flank the first section.

5. In a winding machine, means to support a rotary shaft comprising a pair of clamping jaws, a tubular bearing member for the shaft universally adjustable in said jaws and having a substantially radially projecting part, and means,

holding said part against displacement lengthwise of the shaft and having said part universally movable relatively thereto, for exerting clamping pressure on the jaws.	
5 6. In a winding machine, means to support a rotary shaft comprising a pair of clamping jaws having an opening whereby to admit the shaft to the space between the jaws transversely of the shaft, a tubular bearing member for the shaft universally adjustable in the jaws and having a section thereof adjoining said opening removable and projecting into the opening, and means, holding said section against displacement lengthwise of the shaft, to exert clamping pressure on the jaws.	80
10 7. In a winding machine, means to support a rotary shaft comprising a pair of clamping jaws having an opening whereby to admit the shaft to the space between the jaws transversely of the shaft, a tubular bearing member for the shaft universally adjustable in the jaws and having a section thereof adjoining said opening removable and projecting into the opening, means, holding said section against displacement lengthwise of the shaft, to exert clamping pressure on the jaws and means to limit the movement of said jaws together under the clamping pressure of the second-named means.	85
15 8. In a winding machine, means to support a rotary shaft comprising a pair of clamping jaws having an opening whereby to admit the shaft to the space between the jaws transversely of the shaft, a tubular bearing member for the shaft universally adjustable in the jaws and having a section thereof adjoining said opening removable and projecting into the opening, means, holding said section against displacement lengthwise of the shaft, to exert clamping pressure on the jaws and means to limit the movement of said jaws together under the clamping pressure of the second-named means.	90
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