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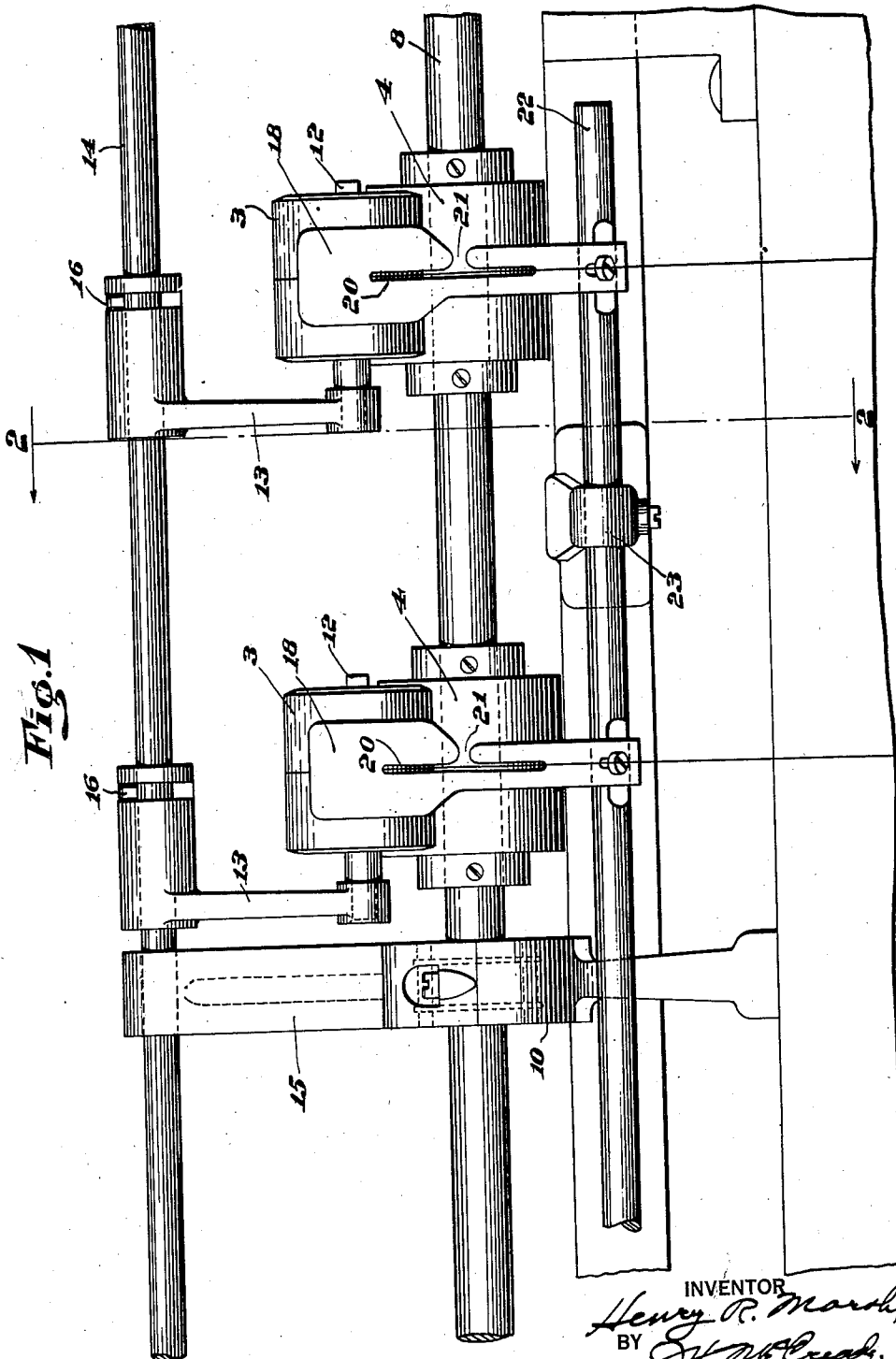
H. R. MARSH

2,306,342

TWISTER FRAME

Filed April 27, 1940

3 Sheets-Sheet 1



INVENTOR

INVENTOR
Henry R. Marsh
BY *[Signature]*

BY

BY *E. H. Cready,*
ATTORNEY.

ATTORNEY

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H. R. MARSH

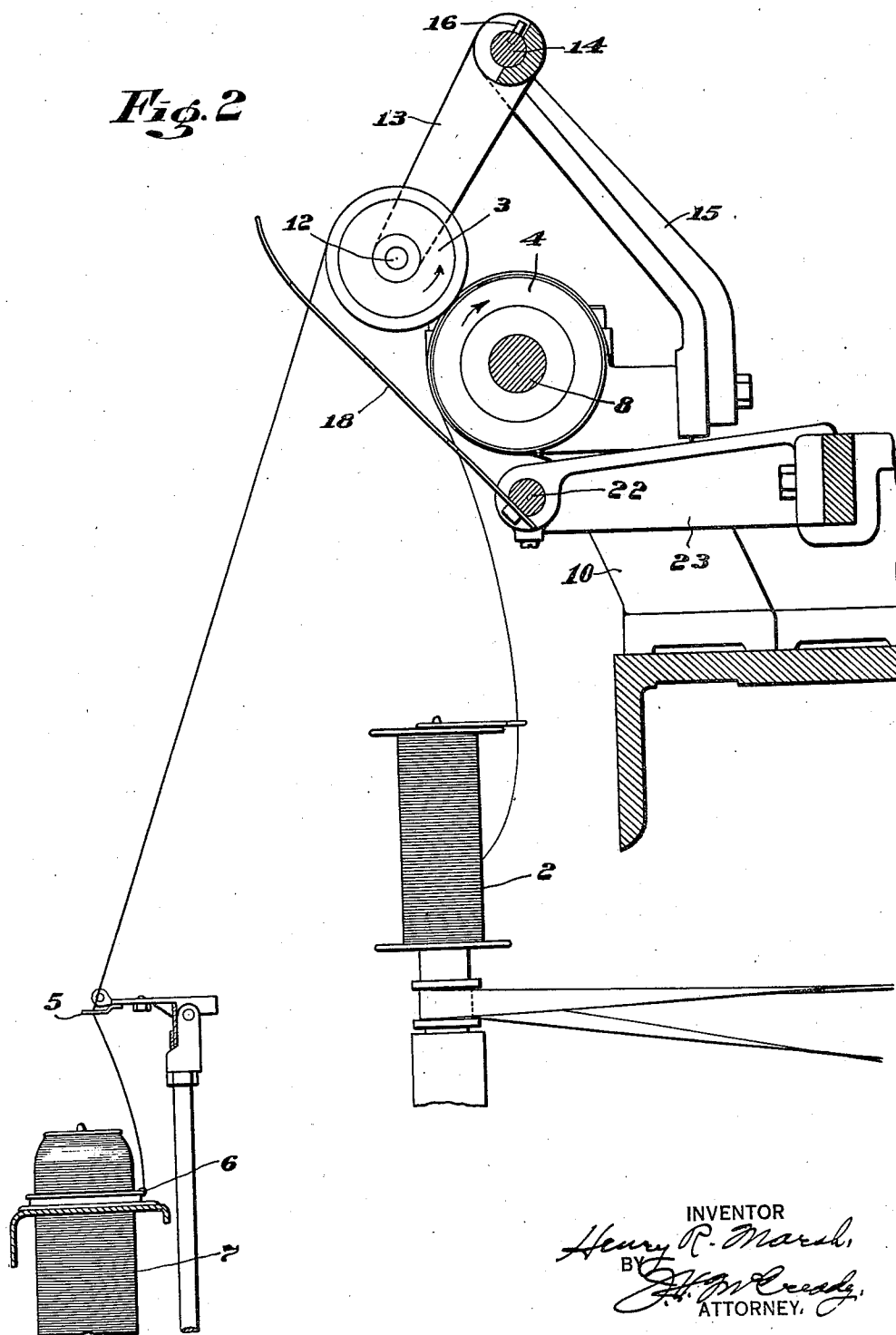
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Fig. 2



INVENTOR
Henry R. Marsh
BY *J. M. Cready*
ATTORNEY.

Dec. 22, 1942.

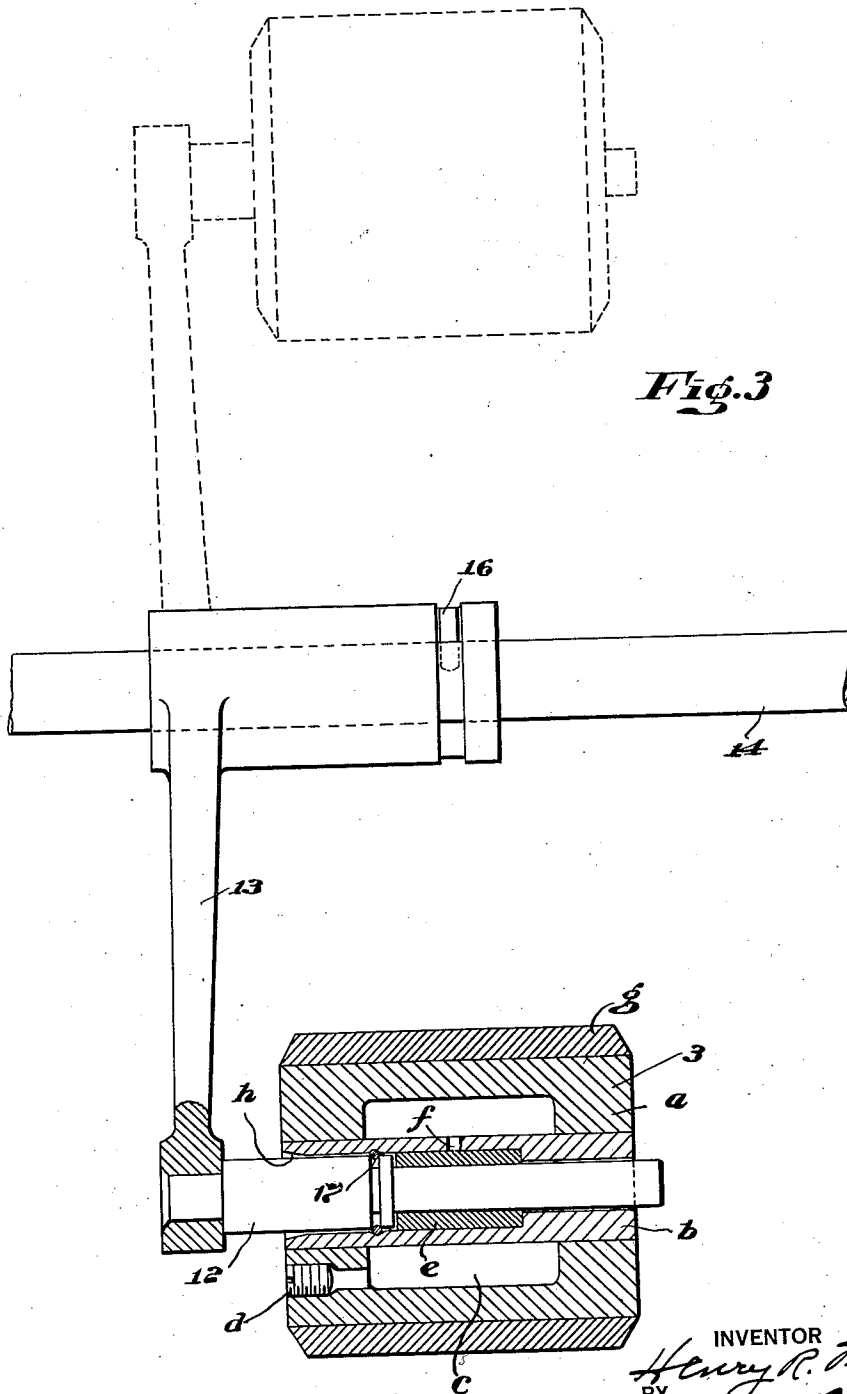
H. R. MARSH

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INVENTOR
Henry R. Marsh,
BY
J. W. Coady,
ATTORNEY.

UNITED STATES PATENT OFFICE

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TWISTER FRAME

Henry Robert Marsh, Waltham, Mass., assignor
to Saco-Lowell Shops, Boston, Mass., a corpo-
ration of Maine

Application April 27, 1940, Serial No. 332,044

5 Claims. (Cl. 57—90)

This invention relates to twister frames of the general type in which one or more strands of yarn are drawn from a source of supply and are led upwardly over a guiding device of some kind and then downwardly to a twisting unit. Machines of this type find an important application, for example, in the twisting of rayon yarn.

Such a guiding device as that above referred to may consist of a pair of rolls, the yarn passing between them and more or less around one of them, so that they serve to draw the yarn to be twisted from the supply and to feed it toward the twisting mechanism. These rolls are arranged one above the other, the lower roll being driven and the upper roll simply resting on it by gravity. In the event that the yarn breaks, it is very likely to wind around the lower roll, in which case considerable time is required in removing the accumulation so produced and starting the machine up again. In any event, it is necessary for the operator to lift the upper roll out of place, to piece up the ends, pass the yarn around the top roll, and then replace it. These are time consuming operations.

The present invention deals especially with these conditions. It aims to devise a guiding and feeding mechanism for the yarn with which the work of piecing up can be performed more quickly and with less effort and in which the danger of the yarn winding around the driven roll will be materially reduced.

The nature of the invention will be readily understood from the following description when read in connection with the accompanying drawings, and the novel features will be particularly pointed out in the appended claims.

In the drawings,

Figure 1 is a front elevation of units at the upper part of a twister frame with which this invention is more especially concerned;

Fig. 2 is a sectional view approximately on the line 2—2, Fig. 1; and

Fig. 3 is a side view, partly in section, showing details of one of the top rolls and the supporting means therefor.

Referring first to Fig. 2, a supply spool is there shown at 2 mounted on a driven spindle, and the yarn to be twisted is drawn from this spool and led between upper and lower rolls 3, 4 and thence moving downwardly through the guide 5 and the traveller 6 where it is wound into the yarn package 7. As above indicated, this general arrangement is common, and the present invention deals more particularly with the mounting

and arrangement of the rolls 3 and 4 and the parts immediately cooperating with them.

Referring more particularly to Figs. 1 and 2, it will be observed that the lower rolls 4 are mounted on a horizontal shaft 8 which is driven from some convenient source of power, the shaft being supported in suitable bearings or stands, one of which is shown in Fig. 1 at 10. The upper roll 3, instead of being supported directly over the lower roll 4, is mounted to engage the latter at the forward side thereof. It is supported on a stub shaft 12 carried by an arm 13 which is pivoted on a horizontal rod or bar 14 parallel with the shaft 8 and supported above it by means of brackets 15. It is free to swing through approximately 180°, such movement being limited, however, by a pin 16 fixed in the bar 14 and working in a semi-circular slot cut in the hub or boss portion of the arm 13.

The roll itself is of novel form comprising a hollow steel or cast iron body *a*, Fig. 3, having a pressed fit with a central tubular portion *b*, these parts thus providing a chamber *c* adapted to hold a supply of oil or other lubricant. A filling opening in the body *a* is normally closed by the plug *d*. Pressed into the larger portion of the bore in the part *b* is a bearing bushing *e* preferably made of some porous bearing material such as that known commercially as Oilite, and an aperture *f* admits oil from the chamber *c* to the outer surface of the bushing *e* where it diffuses slowly through the porous structure of the bushing *e* and thus lubricates the surface bearing on the journal portion of the shaft 12. The outer surface of the body *a* preferably is covered with some yielding material such as those used in covering drawing rolls, but which also is capable of withstanding the action of any acid or other chemical constituent carried by the yarn. For example, certain rayons carry chemicals which will attack many of the covering materials. Covers made of some of the modern plastics, such as Koroseal, Neoprene, Nylon, and others, are suitable for this purpose since they are highly resistant to the action of oils and to certain of the chemicals above referred to. They also work well on yarns made of the common textile fibers, such as cotton, wool, silk, and the like. Such a cover is indicated in Fig. 3 at *g*.

When a wind-up occurs on the roll 3 it is desirable to remove it from its support in order better to unwind or cut off the material so wrapped around it. Accordingly, in the construction shown the shaft 12 is grooved to receive a snap ring 17 which normally is seated in a shallow

groove in the central portion *b* of the roll. This holds the roll on the shaft with ample firmness for normal operation but permits its instant removal merely by grasping the roll and pulling it axially off the shaft. It may be as quickly returned by pushing it back over the shaft again, the left-hand end surface of the bore in the roll being tapered, as shown at *h*, Fig. 3.

In order to control the yarn effectively, a guide 18, best shown in Fig. 1, is associated with each pair of rolls. This member may conveniently be made of sheet metal and it is provided with a relatively long vertically disposed slot 20 from which another slot 21 opens laterally to facilitate the entrance of the yarn into the main slot 20. This guide is secured to the flattened portion of a bar 22 which, in turn, is held in its operative position by a series of brackets 23.

Assuming that the machine is in operation and that the yarn breaks, the operator stops the spindle from which the yarn is drawn and that to which the broken end has been running, by means of brakes provided for this purpose, ties the ends together and then swings the upper roll 3 outwardly and guides the yarn around it, at the same time slipping it through the lateral slot 21 in the guide 18. She then holds the yarn reasonably taut while starting up the spindles again.

The fact that the upper roll 3 around which she guides the yarn is in front of the lower driven roll 4, facilitates this operation both because it enables her to keep the yarn easily out of contact with the lower roll while she guides it around the upper roll, and also because this position makes it easier for her to perform these operations than is the case with the more common relationship of the rolls. If during this operation the yarn touches the periphery of the lower roll while there is any slack in it, it is very likely to be carried through the bite of the rolls and to produce a snarl or another break. Consequently, it is important to keep the yarn out of contact with the lower roll until the operator is ready to start up the spindles.

A further factor facilitating this piecing up or threading up operation is that the top roll 3 is supported at one end only, the other end, and in fact, the entire surface of the roll, being free and unencumbered by the presence of any supporting devices, so that the operator can readily guide the yarn around it. At the same time the slot 21, Fig. 1, through which she guides the yarn into the main slot 20, is at the same side of the main body of the guide as the free end of the roll 3. As shown in Fig. 1, both are at the right-hand side of the guide so that it is a simple matter to thread the yarn through the slot 21 at practically the same time that it is passed around the periphery of the upper roll. As indicated in Fig. 2, the portion of the strand running to the bite of the rolls 3 and 4 is guided in the lower part of the slot 20, while that running from the upper roll to the traveller is guided in the upper part of said slot.

Usually the guide plate 18 is positioned very close to the surface of the upper roll 3 at the forward side thereof, somewhat closer than as shown in Fig. 2, so that there is just a comfortable clearance between these two parts. Preferably, also, the upper end of the guide is bent upward somewhat and is given a slight curve around the periphery of the upper roll; and this guide cooperates in a novel manner with the roll to control a broken end in such a way as to cause it to

wind up around the upper roll rather than the lower one. Usually when an end breaks, the break occurs between the upper roll and the traveller. Both rolls are revolving at this time, continuing to draw yarn from the supply spool 2. That part of the yarn between the break and the traveller is quickly drawn down through the traveller and wrapped around the package 7, but the part above the break is left free. Generally the action is for the slack between this free end and the roll to be pressed by the guide against the peripheral surface of the top roll where it will wind up on the upper roll. As a general rule the guide prevents the upper part of the broken end from whipping out and attaching itself to an adjacent strand which has not been broken, and while its control of the latter end is not always the same, the usual result is to make this end wind around the upper roll. Very likely the tacky character of the thermoplastic material with which the upper roll is covered contributes to this result since the fibrous yarn adheres more readily to this surface than to the smoother surface of the bottom metal roll. Such a windup usually is observed shortly by the operator who thereupon proceeds to stop the two spindles involved, remove the yarn so wound on the top roll, to piece up the ends, guide the yarn around the upper roll, and then start up the spindles again in the manner above described. This arrangement is, however, of very substantial advantage over those heretofore in use, so far as I am familiar with them, in directing the wind-up primarily to the upper roll and facilitating the piecing up operation.

While I have herein shown and described a preferred embodiment of my invention, it will be evident that the invention may be embodied in other forms without departing from the spirit or scope thereof.

Having thus described my invention, what I desire to claim as new is:

1. In a twister frame of the type in which the yarn to be twisted is drawn upwardly from a supply package, fed around a guide and then travels downwardly to a twisting device, the combination of two approximately horizontal rolls cooperating to draw the yarn from said supply, means for driving one of said rolls, means supporting one of said rolls for movement into and out of contact with the other, and a relatively stationary guide positioned in front of said rolls and having a vertically disposed yarn guiding slot therein open laterally for the entrance thereto or the removal therefrom of the yarn to be twisted.

2. In a twister frame of the type in which the yarn to be twisted is drawn upwardly from a supply package, fed around a guide and then travels downwardly to a twisting device, the combination of two rolls cooperating to draw the yarn from said supply, means for driving one of said rolls, means supporting one of said rolls for movement into and out of contact with the other while leaving one end of the roll so supported free for the guiding of the yarn around it by hand, and a relatively stationary guide positioned in front of said rolls and having a vertically disposed yarn guiding slot therein open laterally for the entrance thereto of the yarn to be twisted, such opening in said guide being positioned at the same side of the guide as the free end of said roll.

3. In a twister frame of the type in which the yarn to be twisted is drawn upwardly from a

supply package, fed around a guide and then travels downwardly to a twisting device, the combination of approximately horizontal upper and lower rolls cooperating to draw the yarn from said supply and to feed it toward said twisting device, means for driving the lower of said rolls, means supporting the upper of said rolls for movement into and out of contact with the lower roll, and means located in front of and closely adjacent to the peripheral surface of said upper roll for guiding a broken end into contact with the peripheral surface of the latter roll where it will be wound up on it.

4. In a twister frame of the type in which the yarn to be twisted is drawn upwardly from a supply package, fed around a guide and then travels downwardly to a twisting device, the combination of upper and lower rolls cooperating to draw the yarn from said supply and to feed it toward said twisting device, means for driving the lower of said rolls, means supporting the upper of said rolls for movement into and out of contact with the lower roll, and a relatively stationary guide positioned in front of said upper roll and closely adjacent to it and having a guiding slot for the passage of the yarn running from said upper roll to said twisting device, said guide presenting a relatively large area opposed to the

peripheral surface of said upper roll where it serves to guide a slack loose end portion of yarn into contact with the top roll in position to be wound up on it.

5. In a twister frame of the type in which the yarn to be twisted is drawn upwardly from a supply package, fed around a guide and then travels downwardly to a twisting device, the combination of two approximately horizontal rolls positioned one above and at the forward side of the other and cooperating to draw the yarn from said supply, means for driving the lower of said rolls, and a pivoted arm supporting the other of said rolls for movement in an approximately vertical plane into and out of contact with the forward side of its companion roll, said arm having a stub shaft projecting therefrom on which said movable roll is mounted, whereby the latter roll is supported at one end only, means for holding the latter roll releasably on said shaft to permit the withdrawal of the roll over the free end of the shaft, and means for guiding the yarn to and from said upper roll comprising a plate positioned in front of and close to said upper roll and having a vertically disposed yarn guiding slot therein open laterally for the entrance thereto of the yarn to be twisted.

HENRY ROBERT MARSH.