

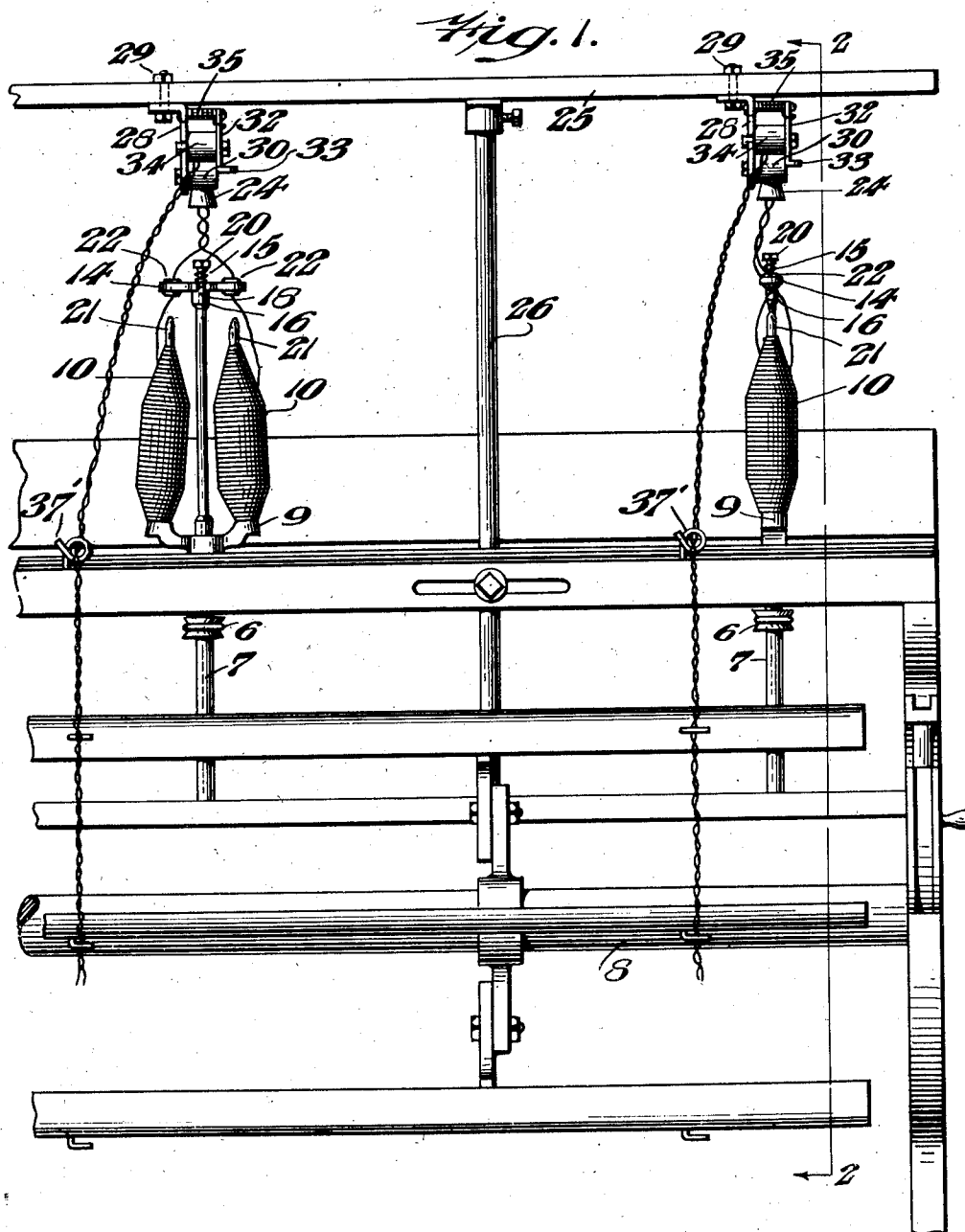
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W. SPINK
YARN TWISTING DEVICE

Filed May 2, 1927

3 Sheets-Sheet 1



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Oct. 9, 1928.

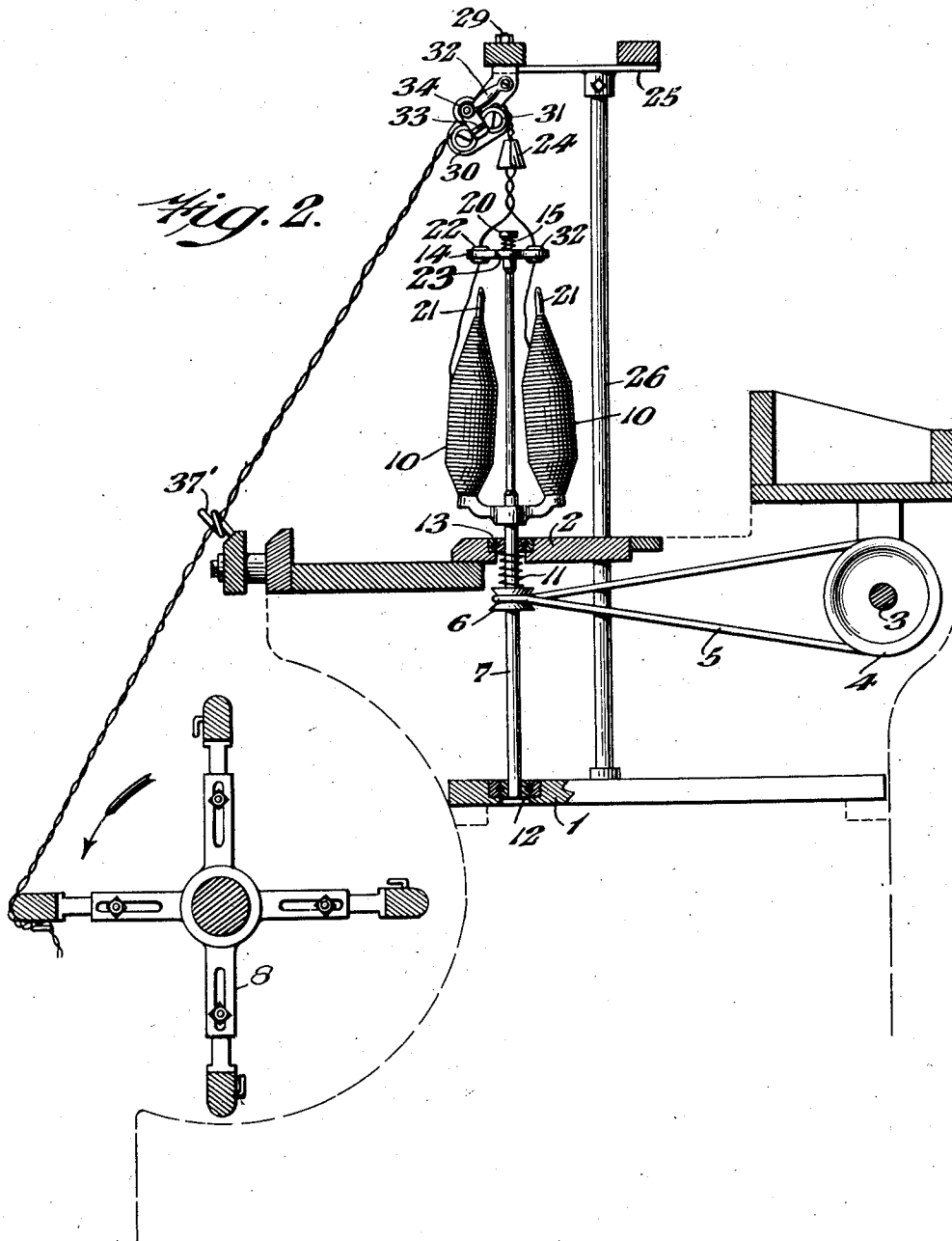
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YARN TWISTING DEVICE

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3 Sheets-Sheet 2



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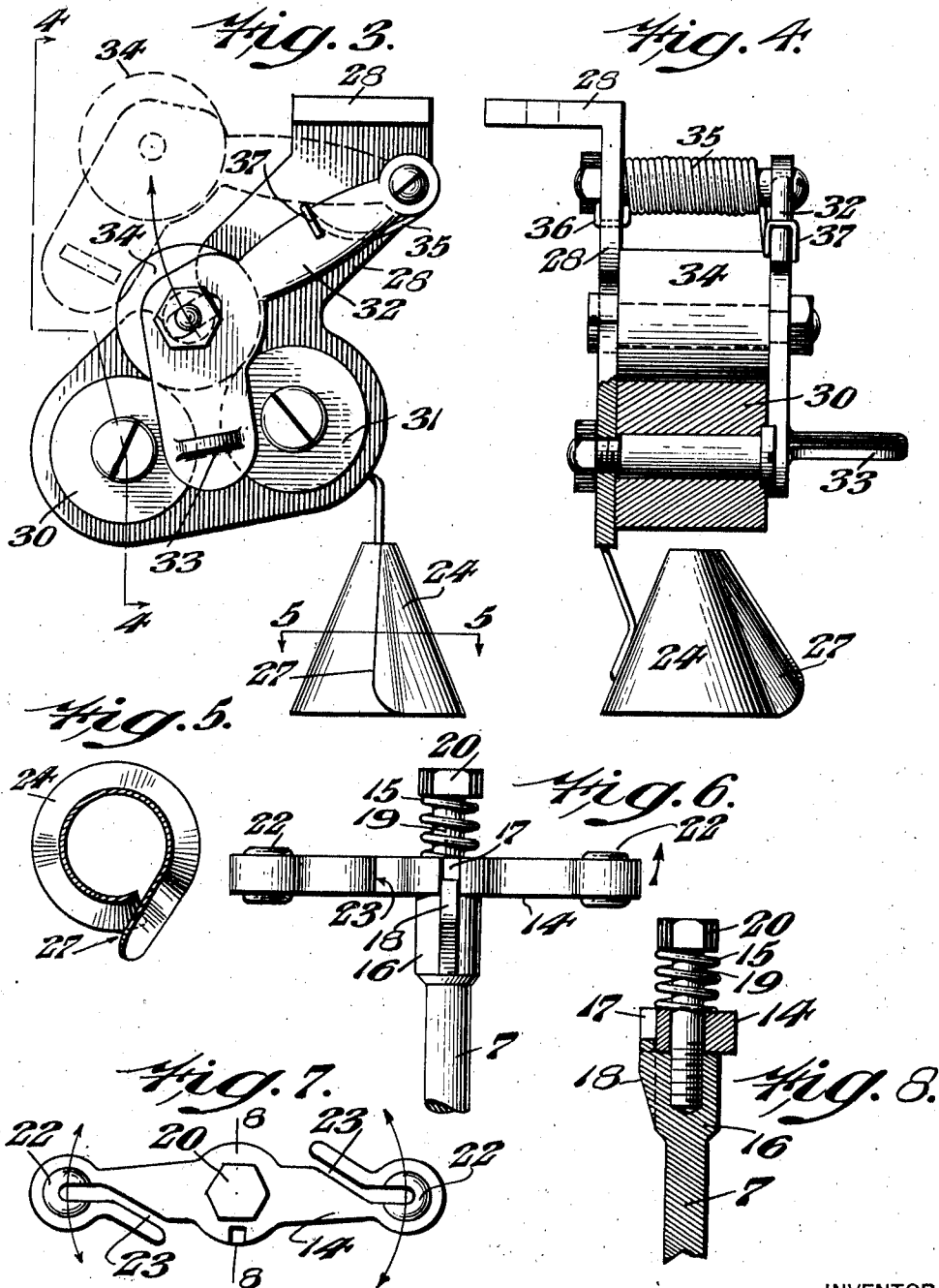
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YARN TWISTING DEVICE

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE.

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YARN-TWISTING DEVICE.

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This invention, generally stated, relates to reel or twisting machines for twisting two or more strands of yarn and reeling the same, and has more especial relation to the provision of means whereby the cops may be readily removed from their carriers at will; also in the provision of a tension device for the twisted yarn; and in the provision of means whereby two or more strands of yarn may be twisted and reeled simultaneously upon the same machine.

The principal object of the present invention may be said to reside in the provision of means whereby the cops may be moved from their respective spindles readily and in an expeditious manner.

A further object of the present invention is to provide means whereby two or more strands of yarn may be twisted for presentation to a hanker device, and reeled simultaneously with said twisting operation upon the same machine.

A still further object of the present invention is to provide a tension device co-operative in connection with said twisting device, whereby the twisted yarn is presented to a hanker device in proper form.

Other and further objects of the present invention reside in the provision of general details of construction and in the arrangement and combination of parts for attaining the results sought by the foregoing objects.

The invention consists of the novel construction hereinafter described and finally claimed.

The nature, characteristic features and scope of the invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof, and in which:

Fig. 1, is a fragmentary view in front elevation illustrating certain portions of the mechanism for operating the cops for feeding twisted yarn to the hankers.

Fig. 2, is a fragmentary view principally in section, taken upon the line 2—2 of Fig. 1.

Fig. 3, is a view in end elevation of the tension device shown in Figs. 1 and 2 in detached relation.

Fig. 4, is a view in section taken upon the line 4—4 of Fig. 3.

Fig. 5, is a view in horizontal section taken upon the line 5—5 of Fig. 3.

Fig. 6, is a fragmentary view in elevation hereinafter referred to.

Fig. 7, is a top or plan view of Fig. 6.

Fig. 8, is a view in section taken upon the line 8—8 of Fig. 7.

For the purpose of illustrating my invention I have shown in the accompanying drawings one form thereof which is at present preferred by me, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of the instrumentalities as herein shown and described.

Referring to the drawings, the reference number 1 designates what is termed in the trade a spindle rail; 2 designates a cop-rail; 3 designates a shaft upon which is mounted a pulley 4 for driving through the instrumentality of a belt 5 the pulley fixed to the cop shaft 7. The reference numeral 8 designates a so-called hanker upon which the twisted yarn is wound. All of the above described parts are of conventional type and form no part of the present invention. Each cop shaft 7, of which there may be any number, has fixed thereto a member 9 adapted for the support of cops 10, whereby the cops 10 in revolution of the shafts 7 are rotated in a well understood manner. Between the cop-rail 2, which is fixed, and the pulley 6, which is fixed to shaft 7, is arranged a tension spring 11, see Fig. 2. In this connection it is to be noted that each cop shaft 7 has antifriction connection as at 12 and 13 with the supports 1 and 2. Located immediately above the cops 10 upon each shaft 7 is the device shown in Figs. 6, 7, and 8. This device, which is horizontally arranged in the form of a bar 14, is vertically movable with respect to the cop shaft 7 under the tension of spring 15. In other words, normally the device 14 is pressed by means of the spring 15 down upon the collar 16 which is fixed to the cop shaft 7. In the drawings the collar 16 is shown as being integral with the cop shaft 7. However, by moving the bar 14 in the direction of the

arrow in Fig. 6 against the tension of spring 15, the notched part 17 of the bar 14 may be disengaged from the lug 18 of the collar 16, so that the bar 14 may be rotated around its vertical axis to become disaligned from the cops 10 which position it previously occupied. In this connection it is to be noted that there is in screw-threaded relation with each cop shaft 7, a bolt 19 having a head 20, and between the head 20 and the top of the bar 14 the spring 15 is positioned. Thus, by lifting the bar 14 against the spring 15 it is possible to move the bar 14 around its vertical axis. When the bar 14 is thus moved around its vertical axis so that the notch 17 no longer engages the lug 18 the bar 14 rests upon the top edge of the lug 18 so that the bar 14 may be positioned at any desired angle with respect to the cop shaft 7. Thus, a cop 10 may be readily removed from its spindle 21 because of the fact that the bar 14 may be partially rotated around its vertical axis so as to be out of alignment with the cops 10. Each bar 14 is provided with an eye 22 for the passage therethrough of yarn from a cop 10. Each eye 22 has leading thereto a slotted part 23, as clearly shown in Fig. 7.

The yarns passed from the cops 10 through the eyes 22 are caught in the funnel 24 which has fixed relation with respect to the top rail 25 of the twisting machine said rail being supported by means of a standard 26 from the spindle rail 1. This funnel 24 is slotted as at 27, see Fig. 4, so that in the revolution of the cops 10 and the bar 14 or thread guide, the yarn from the cops may be readily introduced into the funnel. The guide 24 is made of a funnel or cone shape, with the narrow or pointed position thereof nearest the tensioning device and its wider portion near the cops, so as to converge the relatively divergent threads passing upwardly through the eyes of guides 22 and to direct the plurality of threads being twisted to a common point or focus which materially aids in the twisting operation. Furthermore, the cone shaped guide 24 while effectively guiding the yarn threads at the same time affords a liberty of movement and tends to prevent entanglement, as will be apparent. During the passage of the yarn from the cops 10 to the funnel 24 the yarn is twisted, as clearly shown in Figs. 1 and 2, and from thence passes to a tension device, a description of which will now be given, it being understood that the funnel 24 is part of the tension device. The reference numeral 28 designates an angular bracket fixed as at 29 to the top rail 25. This angular bracket 28, which is clearly shown in Figs. 3 and 4, carries a pair of pivotal rollers 30 and 31, which are freely rotatable. Having pivotal connection with the bracket 28 is an arm 32 provided with a finger piece 33. Pivotal

carried by the arm 32 is a roller 34 normally adapted to impinge upon the peripheries of the rollers 30 and 31, this position being clearly shown in Fig. 3. The roller 34 is maintained in abutting position with the rollers 30 and 31 by means of the spring 35, see Fig. 4, one end of which is connected as at 36 to the bracket 28, and the opposite end of which is connected as at 37 to the arm 32. This provides a very simple, efficient, and comparatively inexpensive tension device, and the twisted yarn passing over the rollers 30 and 31 and under the tension roller 34 passes through eye 37' upon the cop-rail 2 to the hanker device 8, all of which is clearly shown in Fig. 2. In this connection it is to be noted that while a description has been given of but one set of cops and a single tension device, and although two sets are shown in Fig. 1 of the drawings, it is to be understood that the number of cop shafts 7 together with cops and tension devices may be increased or diminished as practice may dictate.

Heretofore it has been the practice to take two cops and put them on a twisting machine, and after the yarn has been twisted, it was necessary to put them on a reeling machine.

By my invention, I take care of both the above steps in one apparatus, whereby there is a saving of \$.04½ per pound in the twisted yarn, and I can in addition get up to 40 turns of twist to ten inches.

What I claim as new, is:

1. In apparatus of the character stated, a cop-carrying shaft including cops therefor, means for rotating said shaft, a spring pressed, normally locked yarn-guide having eyes in alignment with the vertical axes of said cops, said guide being carried by said shaft, means whereby said yarn-guide may be lifted for movement about its vertical axis so that said eyes are out of alignment with respect to the vertical axes of said cops, a reel, yarn tensioning means intermediate said cops and reel, a cone shaped guide intermediate said cops and tensioning means, and a fixed eye for guiding the twisted yarn from said yarn guide to said reel, said reel being carried by said apparatus.

2. In apparatus of the character stated, a cop-carrying shaft including cops therefor, means for rotating said shaft, a spring pressed, normally locked yarn-guide having eyes in alignment with the vertical axes of said cops, said guide being carried by said shaft, means whereby said yarn-guide may be lifted for movement about its vertical axis so that said eyes are out of alignment with respect to the vertical axes of said cops, a fixed, vertically slotted, cone-shaped yarn guide above said cops, adapted to receive the twisted yarn, a pair

of lower rollers, and a movable, spring pressed tension roller positioned above said guide and coacting with said lower rollers for tensioning the yarn passing through said cone-shaped guide.

3. In apparatus of the character stated, a cop-carrying shaft, including cops therefor, means for rotating said shaft, a spring pressed, normally locked yarn-guide having eyes in alignment with the vertical axes of said cops, said guide being carried by said shaft, means including a lug upon said shaft for co-action with a slot upon said guide whereby said yarn-guide may be lifted for movement about its axis so that said eyes are out of alignment with respect to the vertical axes of said cops, an upper, movable, spring pressed tension roller positioned above said guide, and a pair of lower idler rollers mounted on fixed bearings and coacting with said upper roller for tensioning the yarn, and a cone-shaped yarn guide positioned between said cops and rollers.

4. In apparatus of the character stated, a cop-carrying shaft including cops therefor, means for rotating said shaft, a spring pressed, normally locked yarn-guide having eyes in alignment with the vertical axes of said cops, said guide being carried by said shaft, and being provided with yarn-guide slots arranged tangentially with respect to said eyes, horizontally considered, means whereby said yarn-guide may be lifted for movement about its axis so that said eyes are out of alignment with respect to the vertical axes of said cops, and yarn tensioning means positioned above said yarn guide including a pair of lower rollers and an upper, movable, spring pressed roller coacting with said lower rollers.

5. In a device of the character stated a top rail, a bracket fixed to said rail, a pair of lower rollers operatively mounted upon said bracket, a yarn guide having a vertical slot therein to facilitate the insertion of yarn threads thereinto, said guide being fixed to said bracket and being cone shaped for converging a plurality of divergent threads guided thereby, a spring-pressed upper roller also carried by said bracket and normally in engagement with the first mentioned rollers, and means for manually shifting said spring-pressed roller from engagement with said first mentioned rollers.

6. In a device of the character stated a top rail, a bracket fixed to said rail, a pair of lower rollers operatively mounted upon said bracket, a vertically slotted funnel-like guide to accept yarn, said guide being suspended from said bracket, an upper spring-pressed roller also carried by said bracket and normally in engagement with the first mentioned lower rollers, an arm pivotally supported with respect to said bracket and carrying said upper roller, and means for manually shifting said spring-pressed roller from engagement with said first mentioned rollers.

7. In a device of the character stated, means for supporting and rotating a plurality of cops, a tension device above said cops comprising a bracket, a support therefor, a pair of lower rollers carried by said bracket, a spring pressed arm pivotally mounted on said bracket, an upper roller carried by said arm and positioned between said lower rollers and a vertically slotted cone shaped guide intermediate said cops and bracket and supported from the latter.

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