July 1, 1930. H. D. CLINTON 1,769,416

SPOOL

Filed March 29, 1928

Fig. 1.

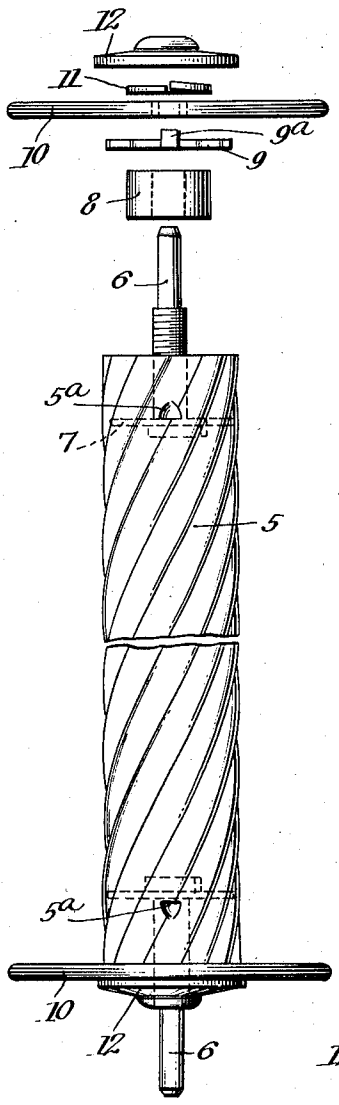


Fig. 2.

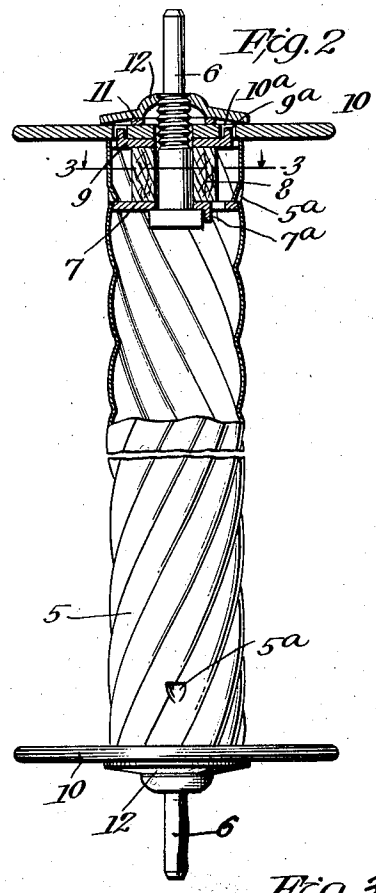


Fig. 3.

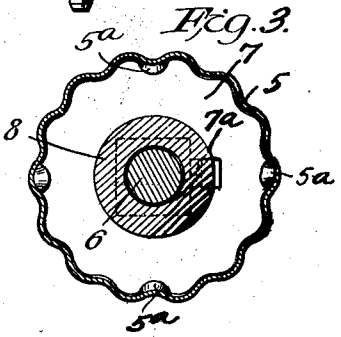
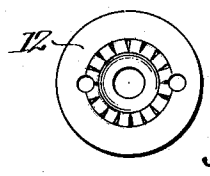


Fig. 4.



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UNITED STATES PATENT OFFICE

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SPOOL

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This invention relates to spools and especially to those of the larger and heavier types used in the textile industry. It aims to provide spools of improved construction and character adapted to endure the abusive and destructive treatment to which they are generally subjected in the mills.

The invention will be best understood from the following description with reference to the accompanying drawings, wherein a practical embodiment thereof is illustrated in the form of a "jack-spool" employed in certain mill operations under particularly destructive conditions.

In said drawings:

Fig. 1 is an elevational representation of a spool of the invention with parts at one end shown detached in relation of assembly;

Fig. 2 is an elevation of the assembled spool with the parts at one end shown sectionally;

Fig. 3 illustrates a section through the spool barrel on the line 3—3 of the preceding figure upon enlarged scale; and

Fig. 4 is a plan view of one of the parts hereinafter described.

Referring to the drawings, the barrel 5 of the illustrative spool is formed by a section of spirally-corrugated metallic tubing of minimized wall-thickness combining the advantages of lightness and strength.

An important advantage in forming the barrel of metal is that it will not be mutilated by cutting off yarn thereon as in the case of spools with wooden barrels for example, which are easily slivered, quickly mutilated and soon rendered useless.

Metal tubing with spiral corrugations is found peculiarly appropriate for spool barrels, especially for the heavier elongate spools which ordinarily vary from 30 to 80 inches in length and are rotated by drums bearing on their loading barrels. Spools having barrels of said character will always work smoothly on the driving drums, but spools having warped, mutilated or longitudinally slivered barrels will work irregularly and give rise to heavy "poundings" of the drums so that their use must be abandoned.

The diameter and wall-thickness of the tubular sections used for the barrel will of course depend upon the size and character of spools desired, but thin-wall material will ordinarily possess the necessary strength regardless of the diameter and length of the sections.

Means serving to secure heads to the barrel ends while providing gudgeons for rotatably supporting the spool are represented by bolts 6 supported in opposite ends of the barrel so as to project axially therebeyond. Said bolts having reduced end and threaded shank portions, are in this instance provided with polygonal heads for fastening inside the barrel.

The gudgeon-bolts are supported in the ends of the barrel by plate-members 7 non-rotatably fitting within the barrel on diametrical planes or at right angles to its axis. In the simplified construction shown, said plate-members are peripherally scalloped in conformity with the corrugated barrel interior and are accordingly rendered non-rotatable except with simultaneous movement longitudinally of the barrel.

In this instance the aforesaid bolts are outwardly extended through said plate-members with their heads engaging the inner sides thereof and are locked against rotation by lug-portions 7^a punched out of the body of the plate-members against the bolt heads. In effect, the bolts are thus secured to the plate-members as substantially unitary parts thereof. Obviously, they may be screwed or welded to the plate-members, or the latter may be formed as heads of the former, although the illustrated connection is considered more expedient and economic.

Movement of the bolt-carrying plate-members toward the open ends of the barrel is limited by indentations 5^a of the barrel body made at spaced points on diametrical planes near its ends. By this simple expedient, the plate-members are not only limited in outward movement, but withdrawal of the bolts is made impossible, unless the aforesaid indentations of the barrel body are forced outwardly to disengage the plate-members. The barrel is accordingly provided with self-

contained gudgeons serving to hold heads to the opposite ends thereof.

Over the gudgeon-bolts in the ends of the barrel, block-rings or washers 8 are slipped against the outer sides of the plate-members for spacing purposes as will appear.

In the extremities of the barrel, plates 9 are non-rotatably fitted with their outer faces held by said block-rings substantially flush with the barrel edges when the aforesaid plate-members are drawn to their limits of outward movement. In the form shown, said plates are peripherally scalloped in conformity with the barrel interior so as to be non-rotatable therein similarly to the plate-members, and at opposing points are punched to provide outwardly projecting lug-portions 9^a adapted to engage in applied spool heads for locking the latter against rotation independently of the barrel.

To the ends of the barrel, centrally apertured heads 10 of disc-like form are applied over the gudgeon-bolts with their inner faces abutting the barrel edges. In this instance, diametrically opposed recesses 10^a are provided in the heads to receive the extended lug-portions 9^a of the aforesaid extremital plates by which the heads are locked against rotation independently of the barrel when clamped thereagainst.

Said heads, which in "jack-spool" constructions vary from 6 to 14 inch diameters, are in this instance formed of hard vulcanized fibre, which is found to be a most suitable material because of its light and non-breakable qualities. Of course, the heads may be formed of metal, wood or other material if preferred.

Over the extended gudgeon-bolts, lock-washers 11 are placed against the outer faces of the applied heads for an obvious purpose.

Onto the threaded portions of the extended gudgeon-bolts, outer plates or nuts 12 are screwed against the outer faces of the heads so as to draw the bolts with plate-members to their outward limits of movement and press or clamp the heads firmly to the ends of the barrel, where they are held by the aforesaid underlying lock-washers. The undersides of said outer plates or nuts are advantageously notched or knurled radially as represented in Fig. 4, to provide a ratchet-like engagement with the lock-washers and insure against their becoming loosened on the bolts and relieving the pressure on the heads.

Spools of improved construction and substantially indestructible character are thus provided. Apart from the more important advantages of strength, durability and lightness, they embody the advantage of permitting removal of the head at either end without disturbing the other, as the gudgeons are independently fixed in the barrel. Moreover, the gudgeons are positively centered within the barrel and naturally assume an axial relation of extension therefrom when the heads are applied thereto in the manner described. The simplicity and superiority of the claimed spool construction over spools heretofore known and used will be readily appreciated by those familiar with the art.

As the invention comprehends various modifications of spool construction, the appended claims are not intended to limit the same to the illustrated construction alone or to the specific form and arrangement of the parts described.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A spool comprising a hollow and spirally corrugated metallic barrel, hard composition heads of disc-like form and means securing said heads to the barrel ends; said means including gudgeon-bolts and associated elements non-removably fastening the bolts inside the barrel in movable axial projection through its ends and through central apertures in the heads, and plates engaging the outer ends of said bolts in pressure contact with the outer faces of the heads to clamp the latter against the barrel ends.

2. A spool comprising a hollow metallic barrel, disc-like heads and means securing said heads to the barrel ends; said means including gudgeon-bolts with associated elements movably fastening them inside the barrel and with body portions of the latter serving to hold them non-removable from its ends.

3. A spool comprising a hollow metallic barrel, composition heads and means including gudgeon-bolts and associated elements movably but non-removably fastening said bolts within the barrel in axial projection through opposite ends thereof for securing said heads thereto.

4. A spool comprising a hollow barrel, disc-like heads and means securing said heads to the barrel ends; said means including gudgeon-bolts and associated elements non-removably fastening the bolts inside the barrel in axial projection through holes in the heads, plates non-rotatably fitted in the ends of the barrel in engagement with the heads for locking the same against rotation, and plates screwed onto said bolts at the outer sides of the heads for clamping the same against the ends of the barrel.

5. A spool comprising a hollow metallic barrel, hard composition heads and means securing said heads to the barrel ends; said means embodying gudgeon-bolts projecting beyond the ends of the barrel through holes in the heads, plate-members carrying said bolts within the barrel and held against removal therefrom by indented portions of the barrel body, plates non-rotatably fitted to the barrel ends in engagement with the heads for locking the same against rotation, blocks

spacing the aforesaid plate-members from said locking plates, and plates screwed onto the outer ends of said bolts in pressure contact with said heads and clamping the same to the barrel ends.

6. A spool comprising a hollow and spirally-corrugated metallic barrel, inflexible heads of disc-like form and means securing said heads to the barrel ends; said means embodying gudgeon-bolts extending through central apertures in the heads beyond the ends of the barrel, plate-members within the barrel carrying said bolts and held therewith against removal from the barrel ends by indented portions of the barrel body, plates non-rotatably fitted to the barrel ends in lug engagement with the heads to lock the same against rotation, spacers between the aforesaid plate-members and said locking-plates, and clamp-plates screwed onto the outer ends of said bolts against the outer faces of said heads to draw the bolts to outward extremes and bind the heads firmly against the opposing ends of the barrel.

7. A spool comprising a hollow and spirally corrugated metallic barrel, hard composition heads of disc-like form and means including gudgeons and associated plate-elements movably but non-removably fastening the bolts within and extending beyond the ends of the barrel for securing said heads thereto.

8. A spool comprising a hollow spirally corrugated metallic barrel, plate-elements fitting the barrel interiorly on diametrical planes and held against removal therefrom by indentations of the barrel near its ends, gudgeon-bolts secured against turning in said plate-elements with free and partially threaded ends extending axially beyond the barrel ends, lock-plates fitting over said bolts into the ends of the barrel and having opposed lug-portions adapted to project slightly beyond said ends, blocks spacing the aforesaid plate-elements from said lock-plates to prevent inward movement of the latter, disc-like heads abutting the ends of the barrel with said bolts extending centrally therethrough and with the lug-portions of said lock-plates engaging therein to prevent rotation independently of the barrel, lock-washers encircling the outer ends of the gudgeon-bolts, and outer clamp-plates screwed onto the threaded portions of said bolts in compression of said lock-washers against the outer faces of said heads so as to draw the bolts to outward extremes and bind the heads securely to the ends of the barrel.

9. A spool comprising a hollow barrel, disc-like heads and means securing said heads to the barrel ends; said means including gudgeon-bolts fastened inside the barrel and projecting through holes in the heads, plates fitted movably but non-rotatably in the ends of the barrel in a shouldered engagement with the heads to lock the latter against rotation, and plates screwed onto said bolts at the outer sides of the heads for clamping the same against the ends of the barrel.

10. A spool comprising a hollow spirally corrugated barrel having indentations disposed in diametrical planes near its ends, plate-members diametrically fitting the interior of the barrel between the planes of said indentations and adapted to slide movement therebetween; gudgeon-bolts carried by said plate-members in axial projection through the ends of the barrel, disc-like heads placed against the barrel ends and having central apertures through which said gudgons extend, and plates threadably engaging portions of said gudgeons and clamping the heads to the barrel.

In testimony whereof I affix my signature.

HARRY D. CLINTON.