June 5, 1934. W. BIXBY 1,962,086

YARN SPOOL FOR TUBE FRAMES

Filed March 31, 1930

Fig. 1.

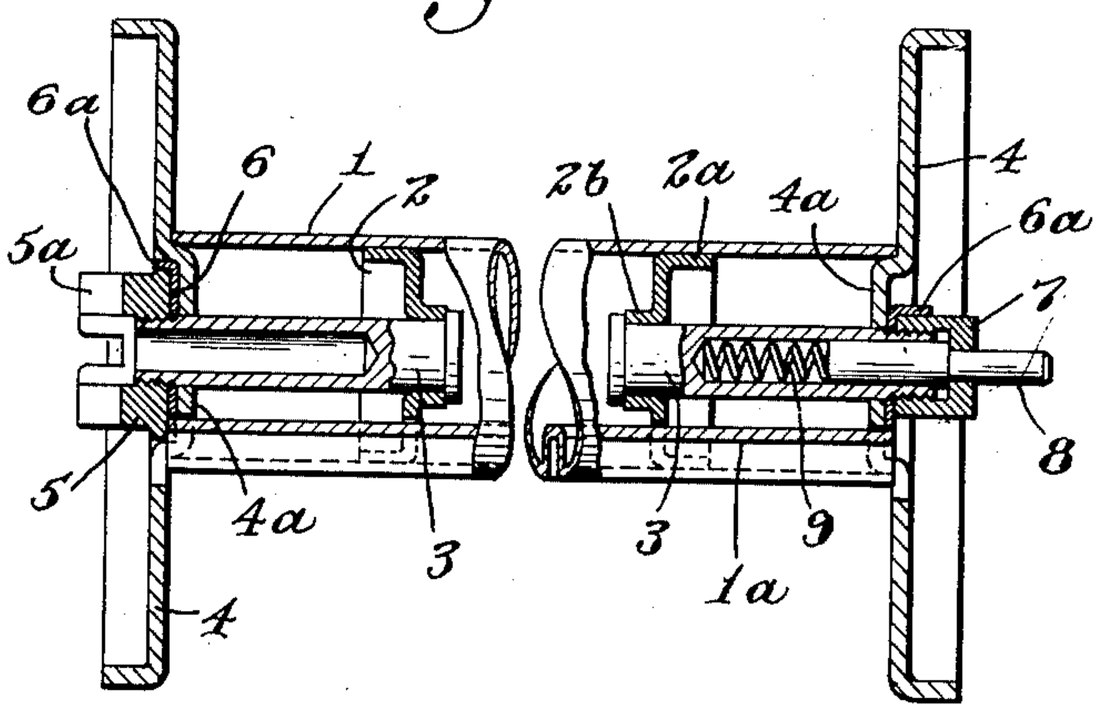


Fig. 2.

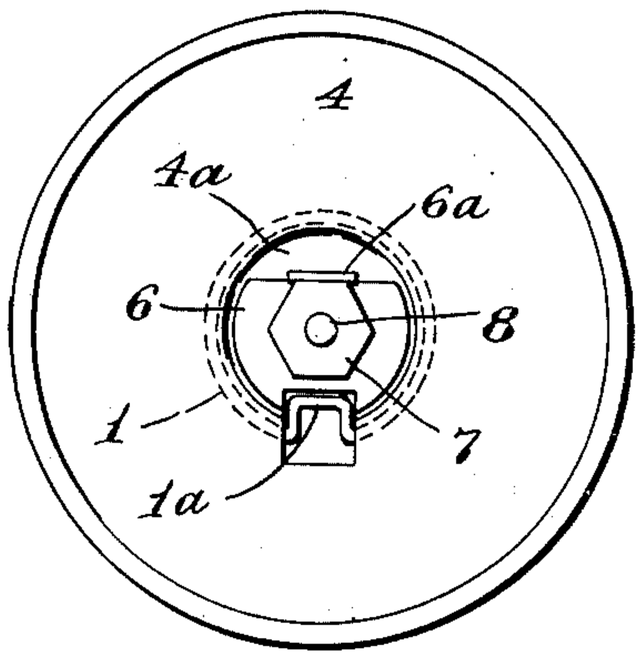


Fig. 3.

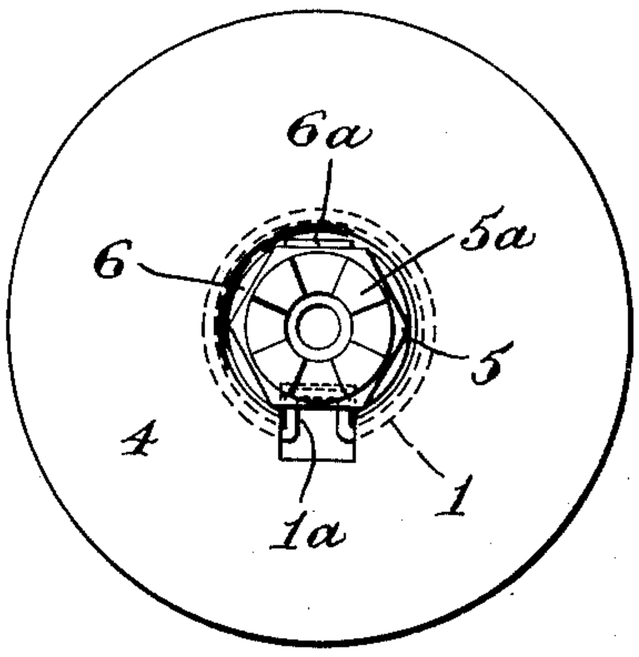


Fig. 4.

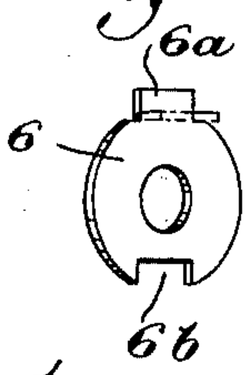
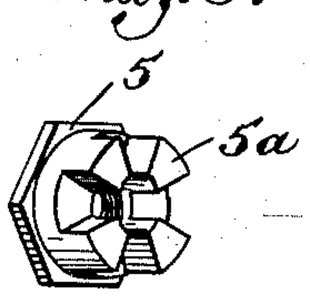


Fig. 5.



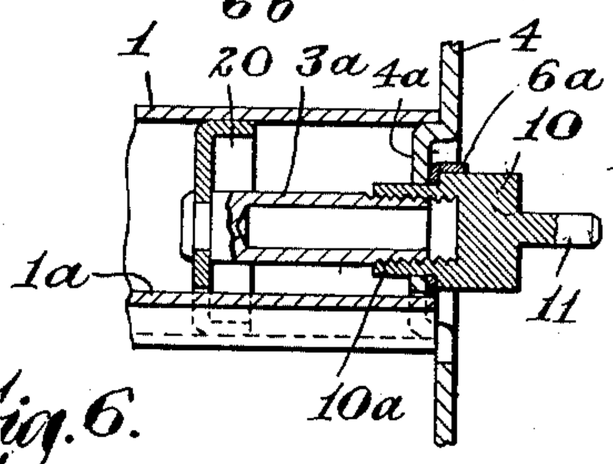
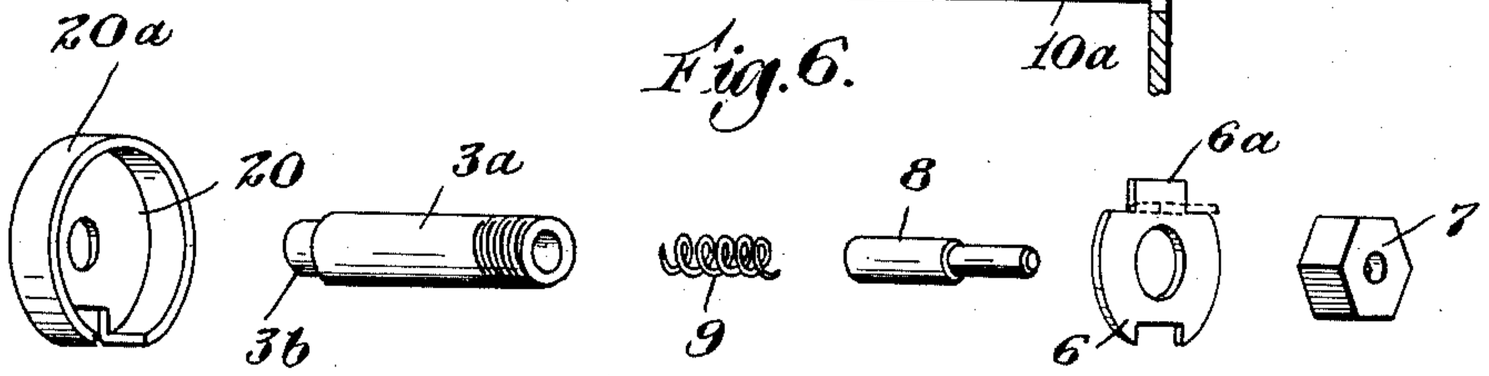


Fig. 7.

Fig. 6.



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UNITED STATES PATENT OFFICE

1,962,086

YARN SPOOL FOR TUBE FRAMES

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Application March 31, 1930, Serial No. 440,466

6 Claims. (Cl. 242—124)

This invention relates to yarn spools and is intended more especially for use in Axminster tube frames and embodies certain improvements by which a complete interchangeability of yarn spools may be effected in a carpet mill.

In the process of weaving Axminster rugs the pile of the fabric is introduced into the woven structure by means of tube frames carrying one or more pattern spools. The vari-colored yarns are wound in predetermined order on the spools to reproduce the desired pattern in the rug. Oftentimes, however, the same pattern is used in a single width of carpet that is used in a wide or seamless rug and, since the end bearings of a single spool tube frame are very much smaller than the intermediate spool bearings of a seamless or multiple spool tube frame, the same pattern spool can not be used in both tube frames so that the carpet mill must necessarily carry a large number of spools having duplicate patterns but capable of use only in one type of tube frame and in one position only of a multiple spool tube frame.

By making these pattern spools so that their bearing journals can be easily and reliably changed to adapt them to single and multiple spool tube frames and to different positions in the latter results in great advantage to the rug manufacturer.

In my earlier co-pending application patented May 27, 1930, No. 1,760,809, I disclosed a construction intended for such use and having features of interchangeability and the present invention is an improvement over the construction shown in my aforesaid application.

Generally speaking, the present invention, as distinguished from the former improvement, comprises a spool barrel inside of whose end portions are permanently fastened anchoring members provided with integrally secured co-axial studs dimensioned to project outside the barrel ends, combined with annularly shouldered end heads and external clamping nuts having detachable threaded engagement with the projecting ends of the studs and provided with bearing members adapted to fit the desired bearing to permit complete interchangeability of bearing nuts of different dimensions to suit particular bearing bracket requirements. This and other features of the invention will be particularly described in the following specification and will be defined in the claims hereto annexed.

In the accompanying drawing I have illustrated a simple and reliable construction embodying the principles of this invention, in which

Fig. 1 is a central section through the end portions of a yarn spool containing my improvement, the middle portion of the barrel being broken away.

Fig. 2 is an end elevation of the right hand end of the spool.

Fig. 3 is an end elevation of the left hand end of the spool.

Figs. 4 and 5 are detail views, respectively, of the locking washer and the clamping nut journal member adapted for use in the middle bearing bracket of a tube frame.

Fig. 6 is a perspective view of the various parts entering into the described construction in unassembled relation.

Fig. 7 is a central section through one end portion of a spool showing a modified form of clamping nut journal member for use in the end bearing bracket of a tube frame.

In the form of my invention, as illustrated in Fig. 1, the spool barrel 1 is of cylindrical form and is provided with a longitudinal inset hollow rib 1^a forming a receiving groove for the yarn clamp, that holds the initial ends of the pattern yarns when they are wound on the spool.

Inside the hollow end portions of the barrel 1 are permanently secured anchoring members 2 in the form of a flanged disc, whose outer flange 2^a is spot welded or otherwise integrally secured inside the barrel and whose interior flange 2^b forms a bearing for the reception of a longitudinal co-axial stud 3, which is inserted therein and is preferably integrally secured thereto with its outer end projecting beyond the adjacent end of the barrel.

The spool end head comprises a flanged disc 4 having an annular shoulder at 4^a to telescope snugly inside the open end of the barrel 1. This offset or shouldered portion is centrally apertured to receive the stud 3, which has its outer projecting portion threaded to receive a clamping nut 5. To increase the range of interchangeability, this anchoring stud is preferably made hollow. The nut 5 is of polygonal shape and is formed with a cylindrical bearing portion or boss, which is notched to leave symmetrical teeth to interlock with similar teeth on the next adjacent spool. This type of journal with interlocking teeth is much favored in multiple spool tube frames. To securely lock the head and the journal nut against rotative displacement with relation to the barrel and to each other, I provide a washer comprising a disc 6 adapted to be interposed between the polygonal portion of the nut and the offset central area of the end head.

This disc is provided with a projecting tongue 6^a that, after assemblage, is bent down against the adjacent flat face of the nut. At its opposite side the disc is provided with a notch 6^b to receive the inset hollow rib 1^a, which projects through a corresponding notch in the inwardly offset portion 4^a of the end head, as shown in Fig. 1. The bent tongue 6^a prevents the nut from rotating, while the washer is anchored by its rib and slot engagement with the barrel. The notch in the offset member 4^a prevents the rotative displacement of the head of the barrel.

For the bearing journal to fit the end bearing bracket of a tube frame, which is provided with only a small aperture, I provide a polygonal nut 7 which carries an extension pintle 8 dimensioned to fit the small bearing aperture in the end bracket of the tube frame. This pintle 8 may be in the form of a shouldered plunger projecting through the clamping nut 7, which is normally thrust outwardly by a helical spring 9 inserted in the bore of the stud 3. The pintle may also be made as an integral extension 11 of a polygonal clamping nut 10, as shown in Fig. 7. This nut likewise is held against rotative displacement or unscrewing by means of a lock washer 6, similar to that already described.

Since, in different tube frames the row of tuft tubes end at varying distances from the end of the carrier bar to which the end bearing bracket is secured, it is sometimes desirable to space the end of the spool at varying distances from the end bearing bracket to avoid too great obliquity of travel of the yarn ends at the extreme end of the spool to the nearest tuft tubes. With either form of pintle nut construction this distance may be varied by using a nut 7, or 10, of different axial lengths, thereby spacing the end of the spool at different distances from the end bearing bracket through the agency of the abutting shoulder formed by the end face of the nut.

Instead of the duplicate flange form of anchoring member or disc 2, shown in Fig. 1, I may omit the inner flange and form the transverse or body portion of the anchoring member 20 as a flat disc. In this case the integrally secured stud 3^a will have a reduced end 3^b which, after insertion through the central aperture of the disc 20, is riveted or headed down securely against the face of the disc. The outer flange 20^a will be retained as the attaching or anchoring means for integrally securing the anchoring member inside the barrel.

From the foregoing description, it will be seen that by merely changing the external clamping nuts the same yarn spool may be placed in any position in a multiple spool tube frame, or may be adapted for use in a single spool tube frame. Furthermore, by substituting different lengths of pintle-carrying clamping nuts, the spacing of the end head from the end bracket of the tube frame may be varied to suit.

When it is desired to remove either of the interchangeable clamping nuts, the tongue 6^a having direct engagement with the external face of the nut may be bent up to allow rotation of the nut, or sufficient torque may be applied by a wrench to force this tongue upward to allow rotation and removal of the respective nuts for interchange. Since the projecting studs are permanently united to the anchoring members, either by riveting, spot welding, or equivalent methods, the rotation of the stud itself is not permitted, and the simple construction of locking washer shown affords a direct connection between the barrel and the clamping nut, giving complete security against rotative displacement under the repeated shocks and jars to which the tube frame and its spools are subjected in their travel into and out of weave position.

What I claim is:

1. In a yarn spool for tube frames, the combination with a cylindrical sheet metal barrel having cylindrically flanged anchoring members integrally united to the barrel inside its opposite ends, co-axial studs integrally united to said anchoring members, the outer ends of said studs being threaded to be engaged by a clamping nut, centrally perforated end heads having telescopic shouldered engagement with the open ends of the barrel, a clamping nut adapted when screwed on said stud to tightly clamp the end heads against the barrel ends, said nut being provided with an outwardly projecting journal member dimensioned to fit a correspondingly dimensioned bearing of the tube frame, and means interposed between the nut and the end head to positively lock the nut against rotative displacement.

2. In a yarn spool for tube frames, the combination with a cylindrical barrel of sheet metal tubing having anchoring members integrally secured inside its opposite ends, co-axial studs integrally united to said anchoring members the outer ends of said studs being threaded to be engaged by a clamping nut, centrally perforated end heads having telescopic shouldered engagement with the open ends of the barrel, a clamping nut adapted when screwed on said stud to tightly clamp the end heads against the barrel ends, said nut being provided with an outwardly projecting journal member dimensioned to fit a correspondingly dimensioned bearing of the tube frame, and means whereby the nut and the barrel and the head are positively interlocked against rotative displacement in relation to the barrel.

3. In a yarn spool for a tube frame, the combination with a cylindrical barrel having anchoring members integrally secured inside its opposite end portions, co-axial studs integrally secured to said anchoring members and having threaded ends projecting outside the open ends of the barrel, centrally perforated end heads having shouldered engagement with the open ends of the barrel to centralize the heads against the barrel, clamping nuts adapted when screwed on said studs to tightly clamp the end head against the barrel end, and a slidable journal pintle projecting through the central portion of said nut and normally thrust outward by a spring seated in the nut-engaging stud.

4. A yarn spool for tube frames embracing in its construction, a barrel containing fixed cylindrically flanged anchoring members welded to the barrel inside its opposite end portions, co-axial studs projecting outwardly from said members and integrally united therewith, centrally apertured end heads, interchangeable clamping nuts detachably engaged with said studs to secure and clamp the end heads firmly, but detachably, against the respective barrel ends, said nuts respectively being provided with outwardly extending journal members dimensioned to fit bearings of different size, and means interposed between the end heads and the nuts to positively, but detachably, lock the respective nuts against rotative displacement, said locking means having direct engagement respectively with the nut, with the heads and with the barrel.

5. A yarn spool for a tube frame embracing in its construction a tubular metallic barrel, metal-

lic anchoring discs provided with peripheral cylindrical flanges snugly fitting the interior of the barrel and integrally united therewith at a distance from the opposite ends of the barrel, central axially disposed studs permanently secured at their inner ends to the respective anchor discs and having their outer ends threaded, end heads having their central areas perforated and inwardly offset to form annular shoulders having telescoping centralizing engagement with the opposite ends of the barrel, detachable clamping nuts having threaded engagement with the outer ends of the respective studs to clamp the end heads against the ends of the barrel, each clamping nut being provided with a cylindrical journal member adapted to be rotatably mounted in an exterior supporting bearing of the tube frame, and an exterior locking washer interposed between the nut and the opposing area of the head to form interlocking engagement between the nut and the barrel structure to positively prevent loosening of the nut.

6. In a yarn spool for a tube frame, the combination with a tubular barrel having flanged anchoring discs integrally secured inside its opposite end portions, co-axial hollow studs permanently secured to the central portion of said anchoring discs and having their outer ends threaded, end heads whose central portions are perforated and inwardly offset to form annular shoulders having telescopic centralizing engagement with the ends of the barrel, a removable bearing pintle slidably mounted in the tubular stud and normally thrust outward by a thrust spring pressing against its inner end, a clamping nut having threaded engagement with the outer threaded end of the stud for clamping the head against the adjacent end of the barrel, a washer interposed between the clamping nut and the end head and forming an interlocking engagement between the nut and the barrel to prevent rotation of the nut, said nut being also provided with a coaxial aperture to permit projection of the yielding pintle beyond its outer face while limiting such outward movement to a predetermined point.

WALTER BIXBY.