R. J. WALTHER.

PULLEY BUSHING.

APPLICATION FILED DEC. 1, 1911.

1,126,321. Patented Jan. 26, 1915.

FIG. I.

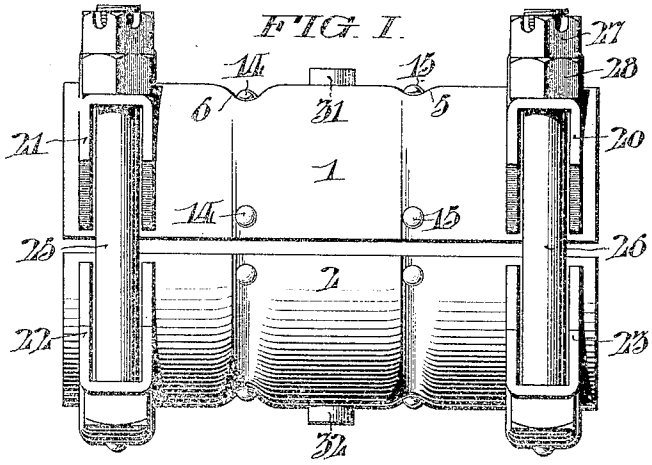


FIG. II.

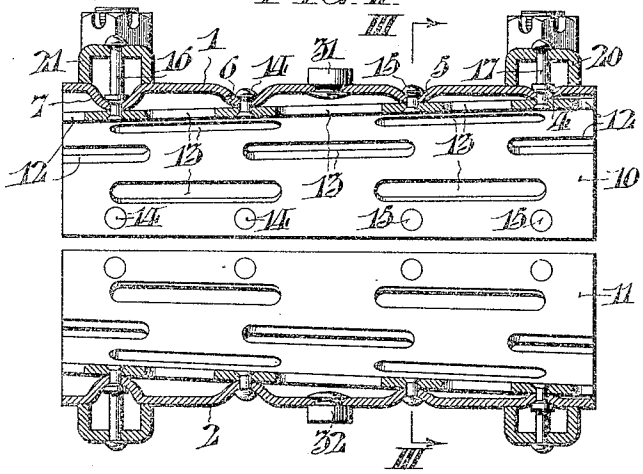
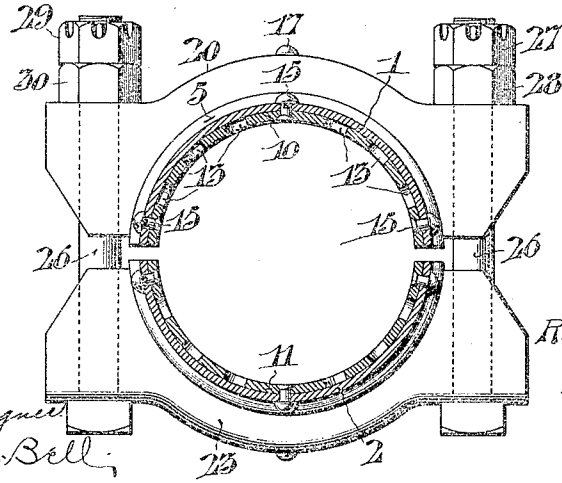


FIG. III.



Witnesses

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THE NORRIS PETERS CO. PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

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PULLEY-BUSHING.

1,126,321. Specification of Letters Patent. Patented Jan. 26, 1915.

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To all whom it may concern:

Be it known that I, RICHARD J. WALTHER, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Pulley-Bushings, whereof the following is a specification, reference being had to the accompanying drawings.

In said drawings, Figure I, represents an exterior view, in side elevation, of a bushing embodying my invention. Fig. II, is an axial longitudinal section thereof. Fig. III, is a transverse section on the line III, III, of Fig. II.

It is not deemed necessary to illustrate the pulley whose hub embraces the bushing, nor the shaft embraced by the latter, as their construction and relation to the bushing are well understood.

The drawings show my invention in one specific form, the type selected being a bushing which is adapted to be applied to a tapering shaft, but it must be understood that the invention is not necessarily thus limited.

The bushing comprises external and internal shells respectively constructed as follows. The external or casing shells, 1, and 2, respectively, are semicylindrical and are preferably made of sheet steel pressed into the desired shape. The internal surface of each casing shell is provided with a plurality of inwardly projecting circumferential ribs arranged substantially at right angles to the axis of the bushing, in this instance, said ribs are four in number, those on the upper shell being indicated at 4, 5, 6, and 7, respectively. Said circumferential ribs may be conveniently constructed by pressing the metal of the casing shell inwardly, the corresponding depressions being visible on the exterior of the casing. These ribs are relatively narrow, *i. e.*, their cross section is of short extent in the direction of the axis of the bushing, and hence the intermediate external bearing surfaces are of relatively long extent in an axial direction. The structure thus formed is strengthened by the ribs, while the intermediate portions present a true cylindrical external bearing surface for the pulley hub.

It will be noted that in the instance shown the inward extension, or depth of these circumferential ribs, varies progressively from one end of the bushing to the other, the rib indicated by the numeral 4, being the shallowest, and the one indicated at 7, being the deepest, while those indicated at 5, and 6, respectively, have such depths that their extreme innermost portions lie in a straight line drawn from the innermost portion of the rib 4, to that of the rib 7.

The circumferential ribs on the lower casing shell 2, are similar in number, location and relative dimensions to those of the upper shell so that they need not be described in detail.

The internal shells 10, and 11, preferably of sheet steel, are mounted within and embraced by the respective halves of the casing. These internal shells are similar to one another and may be constructed as follows: Referring to the upper one marked 10, it will be seen that in this instance its form is a section of the frustum of a hollow cone, whose pitch is such that its exterior surface coincides with the line previously referred to as the line of innermost extension of the ribs 4, 5, 6, and 7, upon the casing shell 1. The internal surface of the shell 10, is flush, and therefore, adapted to fit closely upon a shaft, and the external surface (in this instance flush also) is adapted to abut uniformly against the inner extremities of the ribs. Said inner shell is substantially coextensive in longitudinal extent with the region of extent of the ribs upon the outer shell, and the metal of said inner shell is, as shown, of substantial body, so that it distributes upon the shaft the strain of compression locally applied through the ribs at longitudinal intervals only. The internal shell 10, is also preferably provided with a number of elongated slots, such as 12, and 13, the slots 12, extending out at the respective extremities, while the slots 13, are inclosed. These slots are preferably arranged in the staggered relation indicated in the drawings, and increase the elasticity of the internal shell.

At circumferential intervals the internal shell 10, is secured to the casing shell 1, by means of rivets 14, 15, 16, and 17, located in the several ribs. Near each extremity of the casing, clamping yokes are provided, as indicated respectively at 20, 21, 22, and 23. These yokes are preferably made of pressed steel, and have the U-shaped cross section indicated. They are arranged in opposing pairs, so as to embrace the shells of the cas-

ing, being conveniently secured thereto by means of certain of the rivets which secure the internal shells to the casing shells. Thus, referring to the yoke-pieces 20, and 21, which are uppermost in the drawings, it will be seen that the rivets 16, and 17, which are located near the respective extremities of the casing shell 1, extend not only through the internal shell 10, and the casing shell itself, but also through the yoke pieces and hold them in position. The yoke pieces are provided with threaded clamping bolts 25, and 26, having nuts and jam nuts 27, and 28, 29, and 30, whereby the yokes may be drawn together, thus directly clamping the bushing upon a shaft having the proper configuration.

As before stated, in the embodiment shown, the bushing is intended for use upon a tapering shaft, whose surface is coincident with the inner surface of the internal shells 10, and 11, but the pitch of these may be varied to accommodate the device to a shaft having any desired taper, and obviously, to a cylindrical shaft, the several ribs 4, 5, 6, and 7, in this last instance, being similar to one another in extent of inward projection.

One or more bosses such as 31, and 32, may be rigidly mounted upon the external casing by means of inwardly projecting stems, whose inner ends are riveted as shown. Said bosses are located in the interspace between the clamping devices and are adapted to register with and enter corresponding holes formed in the hub of a pulley. They thus serve to prevent the pulley from shifting its position with relation to the bushing, which latter is itself directly secured to the shaft.

Having thus described my invention, I claim:

1. In a two-part bushing, the combination of; a pair of casing shells, each having a plurality of inwardly projecting narrow circumferential ribs whose inner extremities are in substantial alinement, and having long cylindrical external bearing surfaces between said ribs; a pair of internal shells each having a flush internal surface, and having an external surface which is adapted to abut against said ribs; and means whereby the two parts of the bushing may be directly secured to a shaft.

2. In a two-part bushing, the combination of; a pair of casing shells each having a plurality of inwardly projecting narrow circumferential ribs whose inner extremities are in substantial alinement, and having long cylindrical external bearing surfaces between said ribs; a pair of internal shells each having a flush internal surface, and an external surface which is adapted to abut against said ribs, and being provided with longitudinally extending slots; and means whereby the two parts of the bushing may be secured to a shaft.

3. In a two-part bushing, the combination of; a pair of casing shells each having a plurality of inwardly projecting narrow circumferential ribs whose inner extremities are in substantial alinement, but increase in inward projection progressively from one end of the shell to the other end thereof, and having long cylindrical external bearing surfaces of equal radial projection, between said ribs; a pair of internal shells each having a flush internal surface, and an external surface which is adapted to abut against said ribs; and means whereby the two parts of the bushing may be secured to a shaft.

4. In a two-part bushing, the combination of; a pair of casing shells each having a plurality of inwardly projecting narrow circumferential ribs whose inner extremities are in substantial alinement, and having long cylindrical external bearing surfaces between said ribs; a pair of internal shells each having a flush internal surface, and an external surface which is adapted to abut against said ribs; clamping devices arranged at the extremities of the casing shell whereby the two parts of the bushing may be directly secured to a shaft, while providing an interspace for attachment of a pulley; and an externally projecting boss rigidly mounted upon each casing shell at a point intermediate between said clamping devices.

5. In a two-part bushing, the combination of; a pair of casing shells, each having a plurality of inwardly projecting narrow circumferential ribs whose inner extremities are in substantial alinement, and having long cylindrical external bearing surfaces between said ribs; a pair of internal shells each having a flush internal surface, and having an external surface which is adapted to abut against said ribs; means for permanently securing each internal shell to its correlative casing shell; a pair of yoke pieces adapted to embrace each casing shell and permanently attached thereto near the respective extremities thereof; and clamping bolts whereby one member of each pair of yoke pieces may be drawn toward the corresponding member of the other pair, to directly secure the bushing to a shaft.

In testimony whereof, I have hereunto signed my name at Philadelphia, Pennsylvania, this eighteenth day of November 1911.

RICHARD J. WALTHER.

Witnesses:
JAMES H. BELL,
E. L. FULLERTON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."