(No Model.)

F. H. RICHARDS.

TRACK BEARING.

No. 551,196. Patented Dec. 10, 1895.

Fig. 1.

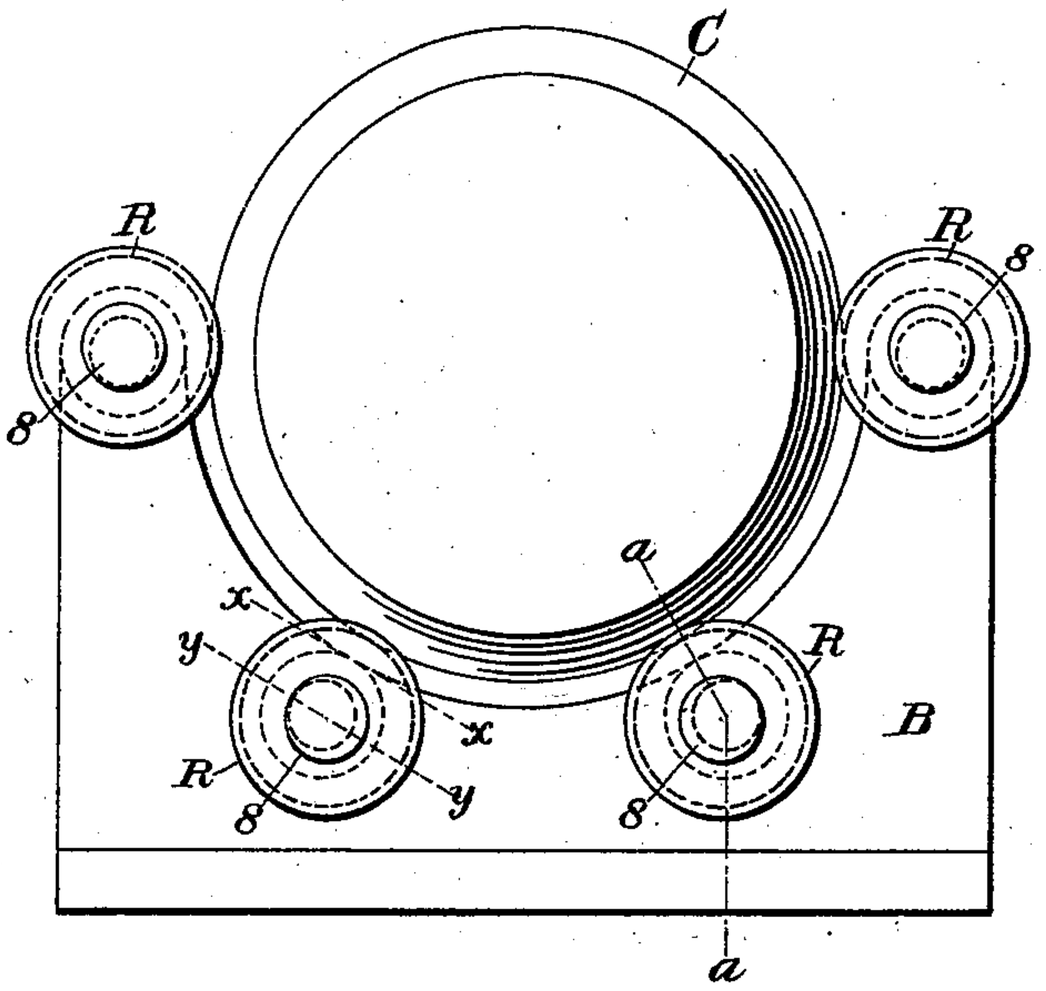


Fig. 2.

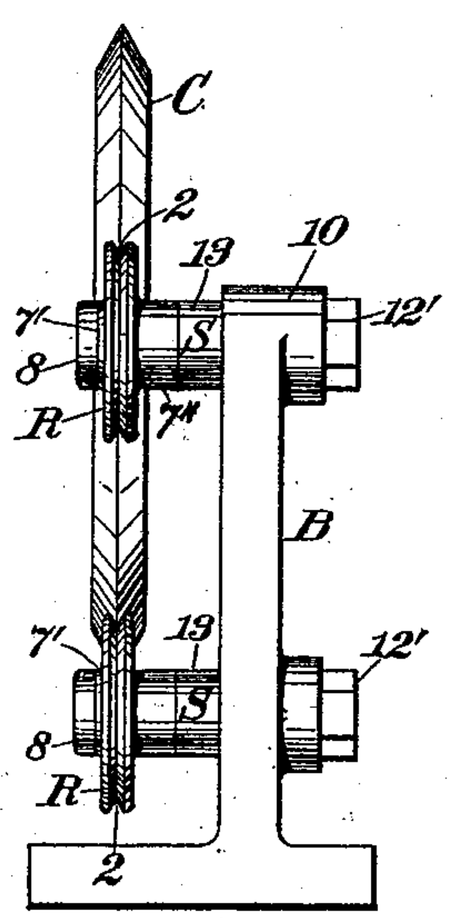


Fig. 3.

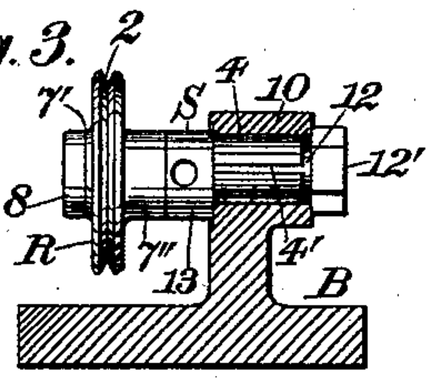


Fig. 6.

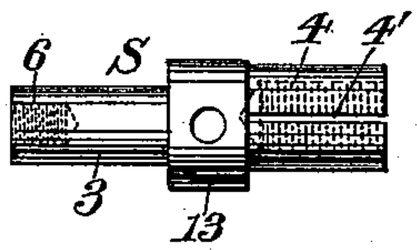


Fig. 7.

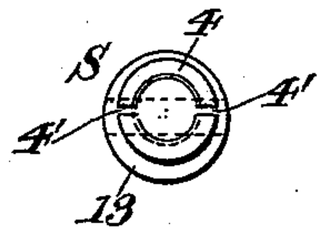


Fig. 4.

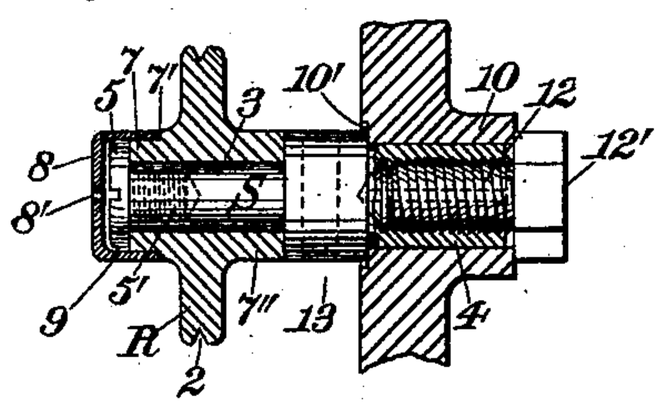


Fig. 5.

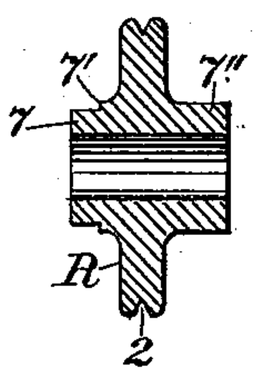
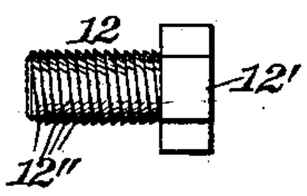


Fig. 8.



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UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF HARTFORD, CONNECTICUT.

TRACK-BEARING.

SPECIFICATION forming part of Letters Patent No. 551,196, dated December 10, 1895.

Application filed August 18, 1894. Renewed May 22, 1895. Serial No. 550,277. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Track-Bearings, of which the following is a specification.

This invention relates to track-bearings and means for adjusting the same, the object being to provide an adjustable track roll or bearing adapted for use in machines and devices where a moving track or part—such, for instance, as a wheel—is to be peripherally supported and adjusted in position.

In the drawings accompanying and forming a part of this specification, Figure 1 is a side elevation of an apparatus embodying my present invention. Fig. 2 is an end elevation of the apparatus as seen from the right hand in Fig. 1. Fig. 3 is a cross-sectional view in line *a a*, Fig. 1. Fig. 4 is an enlarged sectional side view of the track-roll and its connected parts in the preferred form thereof. Fig. 5 is a central longitudinal section of the track-roll drawn in projection with Fig. 4. Fig. 6 is a side view of the roll-stud. Fig. 7 is an end view of the same as seen from the right hand in Fig. 6 and illustrates the eccentric position of the supporting-journal of the roll-stud. Fig. 8 is a side view of the clamping-screw for holding the stud in place against its shoulder and for expanding the supporting journal or shank of the stud within its bearing in the frame of the apparatus.

Similar characters designate like parts in all of the figures.

In the preferred form thereof, herein shown and described, my invention comprises a track-roll revolubly mounted upon a stud having an expansible hub eccentrically disposed relatively thereto, and means for expanding said hub within a corresponding aperture or bore in the member carrying the track-roll and its stud, and for locking and clamping said stud in position after the track-roll has been properly adjusted.

A supporting frame or base B is shown herein as provided with four similar track-rolls, designated in a general way by R, carried by four similar studs, designated in a like manner by S, and supporting upon their peripheries a revoluble wheel or annulus C. This wheel C may be any revoluble part of a machine having a circular periphery, and required to be supported peripherally for a revolving movement—such, for instance, as a bobbin-carrier or loop-taker of a sewing-machine, to which my invention is especially applicable. The outer edge of the wheel C is herein shown as of angular form, constituting a species of circular track, which engages and runs in the corresponding V-shaped grooves or channels 2 of the several rollers R.

Each of the rolls R is shown as supported on the journal end 3 of an eccentric stud or carrier, such as S, the opposite end or shank 4 of said stud being formed eccentrically to said journal end, as best shown in Figs. 6 and 7. The roll is held in place upon the journal 3 by means of a screw 5, the threaded end 5′ of which is screwed into the correspondingly-threaded hole or recess 6, formed in the end of said journal portion of the stud, as clearly shown in Figs. 4 and 6. The screw 5 and the outer end 7 of the roll hub are shown as covered by the cap 8, fitting closely over said end 7 of said roll-hub and engaging the shoulder 7′ thereof. This cap is also shown as having a central or diametrical opening 8′, through which the necessary supply of oil may be injected for lubricating the bearing-surfaces.

It will be noticed (see Fig. 4) that the interior diameter of the cap 8 is greater than that of the screw-head 5 and very much greater than the diameter of the journal 3, upon which the roll is supported. Hence the said cap forms an enlarged space or pocket, surrounding the head of said screw, and in front of the end of the journal portion 3 of the stud for containing oil for lubricating the working surfaces of the roll-hub and the stud-journal. By means of this organization of the parts a very plain external contour for the outer end of the device is obtained, which will prevent the catching of loose material, such as cloth or thread, upon the end of the roll-hub or its adjusting-screw, and will also prevent the lodging of dust or other particles upon the working surfaces, thereby preventing interference with the perfect operation of the machine by external agencies. Moreover, a relatively large oil-pocket is formed and the

roll is made practically self-lubricating for a long period of time, since the centrifugal force exerted by the rotation of the roll, especially if said roll is rotating at a relatively-high speed, tends to throw the oil outward into the pocket, rather than through the oil-hole in the center of the cap, and thus forms a ring or layer of oil upon the annular inner face of the cap, which is forced, by the rotation of said roll, through the annular space 9 and against the end of the journal 3, and is compressed between the bearing-surfaces of said journal and the roll-hub, thus insuring the proper lubrication thereof. It will be seen that the outer diameter of the inner open end of the cap 8, where it abuts against the shoulder 7′ of the roll-hub, is coincident with that of said shoulder, so that a continuous surface is formed, having no projecting portions or shoulders to be caught by cloth or thread or a similar substance.

For holding the track-roll carrier or stud S in place in the supporting-framework B, the shank 4 of said stud is shown as eccentrically bored and interiorly threaded, and as also divided by cuts or slots at 4′, so as to be capable of diametrical expansion. Said stud-shank is shown in Figs. 3 and 4 as extending nearly but not quite through its bearing 10 in the frame B, so that the clamp-screw 12, by the action of its head 12′ on the frame B, draws the stud S into the frame and against the shoulder 10′ of the bearing 10, so as to hold the said stud firmly and accurately in the required longitudinal position. As shown in Figs. 4 and 8, said clamp-screw has its thread of wedge-section preferably formed at an angle of thirty degrees or less measured from the axis of the screw, so that on tightening up the screw, as shown in Figs. 3 and 4, said thread acts as a wedge to expand the expansible shank 4 of the stud with great force within the bore of the frame B, which shank is interiorly threaded, also, with threads of wedge-section corresponding to the threaded portion 12″ of the clamp-screw. Each thread upon the screw, when said screw is rotated, tends to override the preceding thread, and thus a continuous wedging force or equalized transverse pressure is exerted upon the expansible shank throughout the length of its interiorly-threaded bore, to spread the same in diametrical direction, so that, whatever may be the positions of the roll and the stud longitudinally with respect to the frame B and its bearing 10, this wedging action will be effective to expand the shank of the stud upon the turning of the clamping-screw, and will thus bind said stud securely in any position to which the roll may be adjusted. By means of this construction and organization of the parts the stud is not only held longitudinally in any desired position, but is secured laterally with great rigidity, and is moreover firmly maintained against rotation in the frame by the clamp-screw expanding its shank against the surface of the bearing in said frame.

When it is required to adjust the position of the wheel or member C, one or more of the roll-studs S are unclamped by loosening the clamp-screw 12 thereof, when said studs may be turned in their supporting-bearings 10 in the frame, and moved toward and from one another as may be required for properly adjusting the track or wheel carried thereby. As the journal end 3 and the shank 4 are eccentrically disposed with respect to one another, and as the shank is maintained by the bearing in the frame against lateral movement, the said journal end of course is movable eccentrically in lateral direction with respect to said shank, and is correspondingly movable with relation to the track or wheel supported by the rolls. It will be observed, moreover, that the line of eccentricity of the roll, with respect to its stud, is parallel in all positions thereof, with the tangent to the circle describing the periphery of the wheel or member supported thereby at the point of contact of said member and roll. This is indicated in Fig. 1, where $x\ x$ designates the tangent to the wheel at the point of contact and $y\ y$ the line of eccentricity of the roll. As soon as the studs and their rollers have been properly adjusted with relation to the track or wheel C, they are reclamped in position by the wedge-screws 12 expanding their shanks into rigid engagement with the frame. The inner end of the stop member 13 of the stud will usually be engaged against the shoulder 10′ of the frame B; but should it be necessary to adjust the roll in longitudinal as well as in lateral direction the wedge-threads of the clamping-screw will exert sufficient force upon the wedge-threads of the divided shank to bind said shank securely against the walls of the bearings 10, and thereby lock the stud in place. The inner end 7″ of the roll-hub abuts against the outer end of the stop member 13 of the stud and conforms to the contour thereof in substantially the manner hereinbefore described with reference to the outer end of said hub.

It will be understood that any desired longitudinal adjustment of the roll with respect to the stud may be obtained and maintained by the adjusting-screw 5, thus providing a means for compensating for wear between the journal-surfaces. The stop member 13 of the stud is shown herein as preferably formed with a transverse aperture for the reception of a pin or tool for holding the stud while the clamping screw 12 is being tightened or loosened.

The improved track-bearing apparatus herein described is adapted for use upon any machine where a revoluble member is to be peripherally supported, and especially where very accurate lateral and longitudinal adjustment of said member is necessary. It is especially adapted to be employed upon sew-

ing-machines which have peripherally-supported bobbin carriers or shuttles.

Having thus described my invention, I claim—

1. The combination with a revoluble member to be peripherally supported, of a series of rolls suitably mounted and adapted to carry said member and one or more of them supported on an eccentrically-disposed bearing adjustable toward and from said member, and means for holding and releasing such support or supports, substantially as described.

2. The combination with a revoluble member to be peripherally supported, of a series of rolls adapted to carry said member, and a series of supports for said rolls: one or more of said supports comprising a roll-carrier adjustable toward and from said revoluble member and having an expansible shank, a bearing for said shank, and means for expanding said shank into engagement with said bearing and releasing it therefrom, substantially as described.

3. The combination with a revoluble member to be peripherally supported, of a series of rolls adapted to carry said member, and a series of supports for said rolls; one or more of said supports comprising a roll-carrier adjustable toward and from said revoluble member and having an expansible internally-wedge-threaded shank, a bearing for said shank, and a wedge-threaded screw engaging the internal-threads of said shank and adapted to expand the shank into engagement with said bearing and release it therefrom, substantially as described.

4. The combination with a revoluble member to be peripherally supported, of a series of rolls adapted to carry said member, and a series of supports for said rolls; one or more of said supports comprising a roll carrier adjustable toward and from said revoluble member and having an expansible shank and a journal, an adjusting screw working in a longitudinally-threaded bore in said journal, a cap inclosing said screw and the end of the roll-hub and having an oil-space surrounding the head of said screw, a bearing for the shank, and means for expanding said shank into engagement with said bearing and releasing it therefrom, substantially as described.

5. The combination with a carrier having an expansible revoluble shank and a journal disposed eccentrically thereto, of a bearing, and means for exerting an equalized transverse pressure upon said shank throughout the length thereof and thereby locking said shank within said bearing, substantially as described.

6. The combination with the carrier having an expansible internally-wedge-threaded shank, of a bearing, and a screw having wedge-threads engaging the internal threads of said shank and adapted to ride down the wedge-faces of said internal threads and force the same outward to expand the shank into engagement with the bearing, substantially as described.

7. The combination with a carrier having an expansible revoluble internally-wedge-threaded shank and a journal exposed eccentrically thereto, of a bearing, and a screw having wedge-threads engaging the internal threads of said shank and adapted to ride down the wedge-faces of said internal threads and force the same outward to expand the shank into engagement with the bearing, substantially as described.

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