No. 746,198. PATENTED DEC. 8, 1903.

G. W. SWEENEY.

ROLLER BEARING.

APPLICATION FILED AUG. 6, 1902. RENEWED MAY 2, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

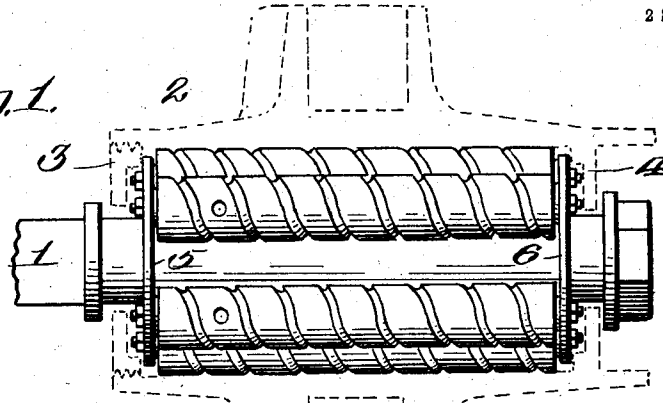


Fig. 2.

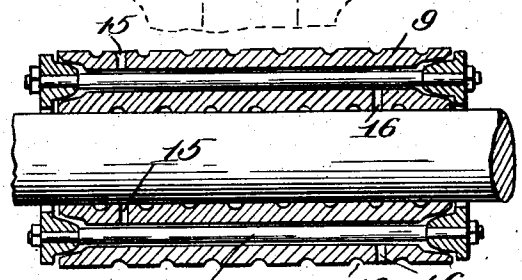


Fig. 3.

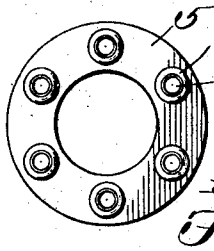


Fig. 4.

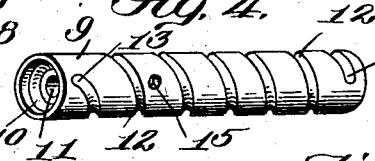


Fig. 7

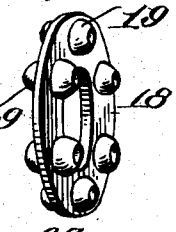


Fig. 5.

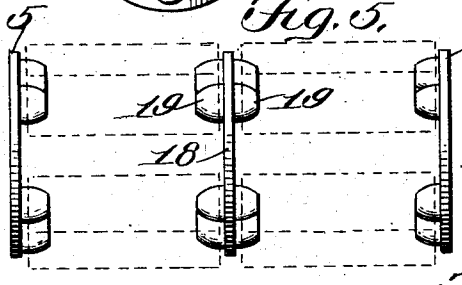


Fig. 6.

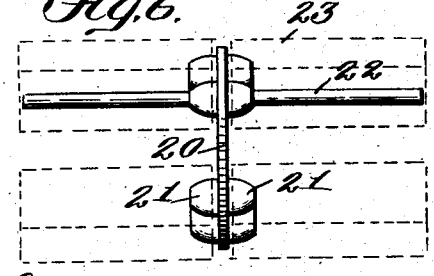
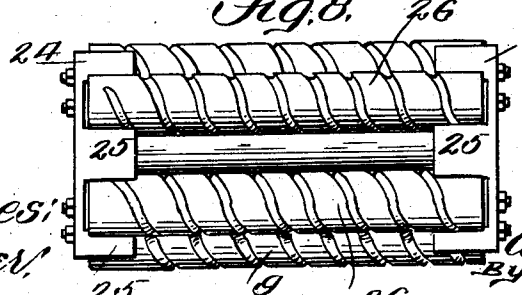


Fig. 8.



Witnesses:
C. D. Kesler.

Inventor
George W. Sweeney
By James L. Norris
Atty.

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

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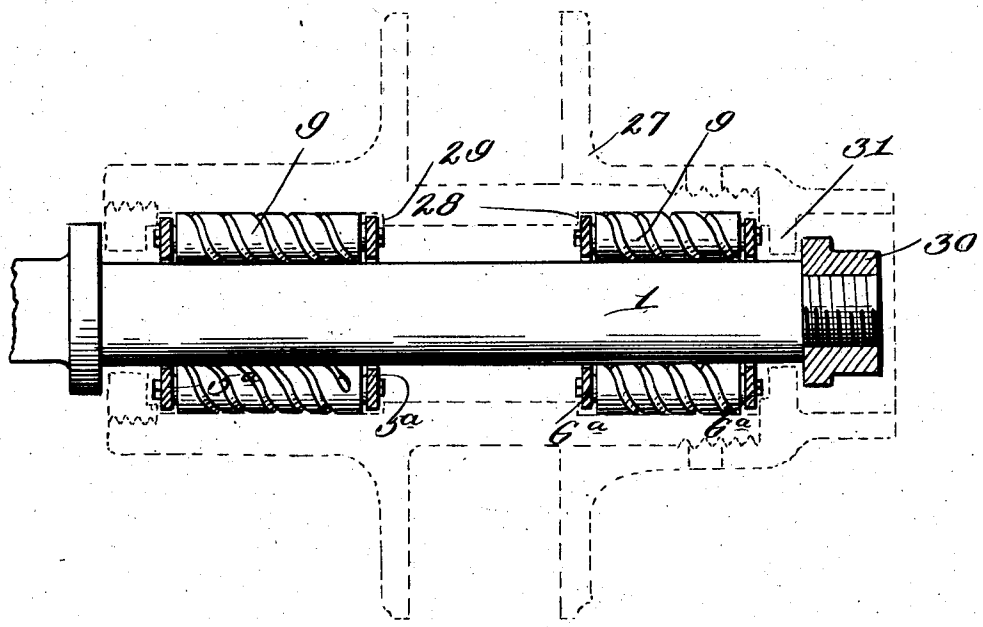
G. W. SWEENEY.

ROLLER BEARING.

APPLICATION FILED AUG. 6, 1902. RENEWED MAY 2, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. 9.



Witnesses:
C. D. Kesler.
J. B. Kesler.

Inventor
George W. Sweeney
By James L. Norris.
Atty.

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

No. 746,198. Patented December 8, 1903.

UNITED STATES PATENT OFFICE.

GEORGE W. SWEENEY, OF NEW YORK, N. Y.

ROLLER-BEARING.

SPECIFICATION forming part of Letters Patent No. 746,198, dated December 8, 1903.

Application filed August 6, 1902. Renewed May 2, 1903. Serial No. 155,426. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. SWEENEY, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Roller-Bearings, of which the following is a specification.

This invention relates to certain new and useful improvements in roller-bearings adapted for use for vehicles and machines of every description, and the object thereof is to construct a roller-bearing for preventing objectionable movement of the bearing-rollers and diminish friction, wear, and noise of the roller-bearings.

The invention further aims to construct a bearing-roller in such a manner that it can be thoroughly lubricated when set up for use.

The invention further aims to construct a roller-bearing which shall be simple in its construction, strong, durable, efficient in its operation, and comparatively inexpensive to set up.

To this end the invention consists of the novel combination and arrangement of parts hereinafter more specifically described, illustrated in the accompanying drawings, and particularly pointed out in the claims hereunto appended.

In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, wherein like reference-numerals denote the same parts throughout the several views, and in which—

Figure 1 is an elevation of my improved roller-bearing as applied to the journal of a vehicle-axle. Fig. 2 is a sectional elevation of the roller-bearing. Fig. 3 is an elevation of one of the supporting-rings for the bearing-rollers. Fig. 4 is a perspective view of one of the bearing-rollers. Fig. 5 is an elevation of the roller-bearing when set up with a three-ring formation. Fig. 6 is an elevation of a single-ring formation. Fig. 7 is a perspective view of the ring used as the middle ring in a three-ring formation and the single ring in the single-ring formation. Fig. 8 is a perspective view of a modified form, showing the supporting-rings with ribs which extend between the bearing-rollers; and Fig. 9 is a sectional view showing a modified arrangement of the parts.

For the purpose of illustrating the roller-bearing in use I have shown the same in connection with an axle-journal and a journal-box, and referring to the drawings by reference-numerals 1 denotes the axle-journal of a vehicle, and 2 the journal-box, which consists of a cylindrical shell, provided with end pieces 3 4, respectively, and supported from the vehicle in any suitable manner.

Any form of journal-box which is suitable can be employed in connection with the roller-bearing.

The roller-bearing comprises a pair of rings 5 6, respectively. Each of these rings has integral with its inner face a circumferentially-extending series of protuberances 7, which are hollow and substantially in the form of a truncated cone. Each of the rings is further provided with openings 8, which register with the openings in the protuberances 7. The protuberances 7 of one ring are arranged opposite to those of the other.

The reference-numeral 9 denotes a series of bearing-rollers. Each of these rollers 9 has at each end an inwardly-extending recess 10 of truncated cone-shaped form to correspond with the shape of the protuberances 7. The protuberances of the rings are adapted to project in the recesses 10 of the bearing-rollers. The recesses 10 terminate in a cylindrical-shaped opening 11 through the remaining portion of the bearing-roller 9. By such a construction it will be evident that the bearing-rollers are hollow, but that the inner bore of the bearing-rollers is not of the same diameter throughout. The periphery of each of the bearing-rollers 9 is formed with a spiral or other suitable groove 12, the groove starting from a point adjacent to one end of the roller and terminating at a point adjacent to the opposite end of the roller, as at 13 14, respectively. Each of the rollers is furthur provided with one or more openings 15 16. These openings extend half through the thickest portion of the roller, but are not opposite each other, or, in other words, the opening 15 extends through the thickened portion of the roller near one end thereof and terminates into the cylindrical opening 11, and the other opening 16 extends through the thickened portion of the roller—that is, the thickest part thereof near the opposite

end—and terminates in the opening 11. The bearing-rollers are each mounted upon a pair of protuberances 7, and after they are placed in such position a spindle or journal 17 is extended through the two protuberances 7 and the roller 9. By this arrangement the rollers are secured to the rings and are retained a suitable distance apart. The rollers 9 when in such position are adapted to engage with the journal 1, as the supporting-rings 5 6 therefor are mounted upon the journal 1, one supporting-ring preferably near the outer end thereof and the other supporting-ring near the inner end thereof.

The function of the spiral groove 12 in each of the rollers 9 is to carry a suitable lubricant for lubricating the journal 1 for decreasing friction. The function of the openings 15 16 is to carry a suitable lubricant to lubricate the spindle or journal 17 as well as to lubricate the walls of the truncated recesses 10 in the rollers 9. As before stated, the spiral groove 12 does not extend entirely across the periphery of each of the rollers, but terminates at a point adjacent to each end of the rollers 9. From such a construction it is evident that there are no weak edges to break on the periphery of the roller, which would be the case if the groove extended throughout the entire periphery of the roller. Therefore it is evident that a plain surface is left all around the periphery of the rollers 9 at the ends of the rollers. The truncated recesses in each end of the rollers are adapted to fit loosely the protuberances 7 on the supporting-rings 5 6, and the journals or spindles 17 of each roller 9 extends through the rings, rollers, and protuberances, as before stated. By such an arrangement when the rollers revolve they are protected from the twisting strain to which they are subjected during the operation of the journal 1. The protuberances 7 also maintain a system of separation for the rollers, as they keep them a suitable distance apart at all times and out of contact with one another, insuring a simple and durable construction to reduce friction to the minimum. The protuberances 7 on the rings 5 6 also strengthen them at their weakest part as well as support the journals 17, upon which the rollers 9 revolve.

In Fig. 5 the roller-bearing is shown as set up to what I term the "three-ring" formation—that is, in addition to the end rings 5 6 a central supporting-ring 18 is employed having each of its faces provided with cylindrical protuberances 19. Between the ring 18 and end ring 5 is arranged a series of bearing-rollers and between the other end ring 6 and the ring 18 is arranged another series of bearing-rollers. The construction of the bearing-rollers and end rings is the same as that hereinbefore referred to. Therefore the same reference-numerals are applied thereto.

In Fig. 6 is shown the roller-bearing as set up to what I term the "single-ring" formation, and it consists of the ring 20, with the protuberances 21 formed integral with each face thereof, the protuberances being of the same construction as hereinbefore referred to, and through the protuberances extends the journal or spindle 22, which projects from each of the protuberances 21 and carries on each projecting end a bearing-roller 23. The bearing-rollers 23 are of the same construction as hereinbefore referred to.

In Fig. 8 the rings 24 are provided with ribs 25, which are arranged between each of the rollers 26, the latter being of the same construction as hereinbefore referred to, and these ribs 25 are adapted to hold the rollers 26 together as well as adding strength to the roller-bearing. In this construction the spindles for supporting the rollers 25, as well as the protuberances on the rings, are also employed and are of the same construction as hereinbefore referred to.

From the foregoing construction it will be evident that a roller-bearing is provided in which the bearing-rollers are retained in parallelism, and thereby give all the advantages due to the employment of bearing-rollers without any of the disadvantages usually resulting therefrom, and it is thought the many advantages of a roller-bearing constructed in accordance with the foregoing description, taken in connection with the accompanying drawings, can be readily understood, and it will also be noted that I have devised a simple, inexpensive, and novel form of roller-bearing which can be readily set up for journals employed in vehicles, machines, and apparatus of all descriptions, and it will furthermore be evident that changes, variations, and modifications may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages, and I therefore do not wish to restrict myself to the details of construction hereinbefore described, and as shown in the accompanying drawings, but reserve the right to make such changes, variations, and modifications as come properly within the scope of the protection prayed.

In Fig. 9 of the drawings a slightly-modified arrangement of parts is shown—that is to say, there are two sets of bearing-rollers 9 arranged between the axle-spindle 1 and the inner surface of the hub 27. To receive the rollers 9, the hub 27 is provided with internal recesses, forming shoulders 28 29. The rings 5^a and 6^a are similar in all respects to the rings 5 and 6, heretofore referred to, the same being provided with the protuberances which project into the recesses in the ends of the bearing-rollers. One of the rings 5^a bears against the shoulder 29, whereas the other ring 5^a is held in place by the nut 30, screwed upon the threaded end of the spindle 1. One of the rings 6^a bears against the shoulder 28, whereas the other ring 6^a, which coöperates therewith, bears against the collar 31, which, as usual, is formed upon the axle-spindle. The operation of this form of

my invention is identical with that heretofore described, the only difference being that the rings by which the two series of rollers 9 are supported are arranged in separate and independent pairs.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a roller-bearing, a tubular peripherally-grooved roller-bearing, one end of the groove being closed, and the walls of the tube continuous in the direction of the length thereof.

2. In a roller-bearing, a bearing-roller in the form of a tube having a groove in its periphery, the ends of which terminate at points adjacent to the ends of the tube, the walls of the tube being continuous in the direction of the length thereof.

3. In a roller-bearing, a tubular bearing-roller provided in each end with a recess substantially of truncated cone-shape formation, which terminates in a cylindrical opening, the diameter of said opening being less than that of the recesses, said bearing-roller further provided with openings out of alinement with each other and which terminate in the cylindrical opening, said roller further provided in its periphery with a spiral groove, one end of which is closed.

4. In a roller-bearing, a plurality of bearing-rollers each of which is provided with a curvilinear groove having one end closed and further provided with a truncated cone-shaped recess in each end terminating in a cylindrical opening, supporting-rings provided with openings, there being cone-shaped protuberances connected with said rings and provided with openings registering with the openings of the rings, said protuberances adapted to extend into the recesses of the rollers, and spindles for connecting the rollers to the rings, each of said spindles extending through a pair of rings, a pair of protuberances and the roller arranged upon each pair of protuberances.

5. In a roller-bearing, a plurality of bearing-rollers in the form of tubes, each having a groove on its periphery, the ends of which terminate adjacent to the ends of the tube, the walls of the tubes being continuous in the direction of the length of the tube, supporting-rings for the rollers, and spindles extending through the rings and the rollers for connecting the latter to the former.

6. In a roller-bearing, bearing-rollers, supporting-rings provided with integral protuberances and openings extending through the rings and protuberances, said bearing-rollers arranged between a pair of the said rings and each mounted upon a pair of protuberances, and spindles extending through the openings in the rings and protuberances and through the rollers for connecting the latter to the rings.

7. In a roller-bearing, a plurality of annular series of bearing-rollers arranged end to end, supporting-rings therefor, one of which is located between the two series of rollers and has integral protuberances on opposite sides thereof which project into the adjacent ends of said rollers and the others of which are located at the outer end of each series of rollers and have inwardly-extending protuberances thereon which project into the adjacent ends of said rollers, and spindles extending laterally through said rings, the protuberances thereon and the rollers for connecting the latter to the rings.

8. In a roller-bearing, a plurality of annular series of bearing-rollers arranged end to end, each of said rollers provided with a groove, the ends of which terminate adjacent to the ends of the rollers, supporting-rings therefor, one of which is located between the two series of rollers and has integral protuberances on opposite sides thereof which project into the adjacent ends of said rollers and the others of which are located at the outer end of each series of rollers and have inwardly-extending protuberances thereon which project into the adjacent ends of said rollers, and spindles extending laterally through said rings, the protuberances thereof and the rollers for connecting the latter to the rings.

9. In a roller-bearing, a plurality of bearing-rollers each of which is provided with a truncated cone-shaped recess in each end terminating in a cylindrical opening, supporting-rings provided with openings, there being cone-shaped protuberances connected with said rings and which are provided with openings registering with the openings of the rings, said protuberances adapted to extend into the recesses of the rollers, and spindles for connecting the rollers to the rings, each of said spindles extending through a pair of rings, a pair of protuberances and the roller arranged upon each pair of protuberances.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

GEORGE W. SWEENEY.

Witnesses:
WM. MAIS,
TERESA KEIM.