No. 609,778. Patented Aug. 30, 1898.

G. J. CAPEWELL.

ROLLER BEARING.

(Application filed Dec. 22, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 4.

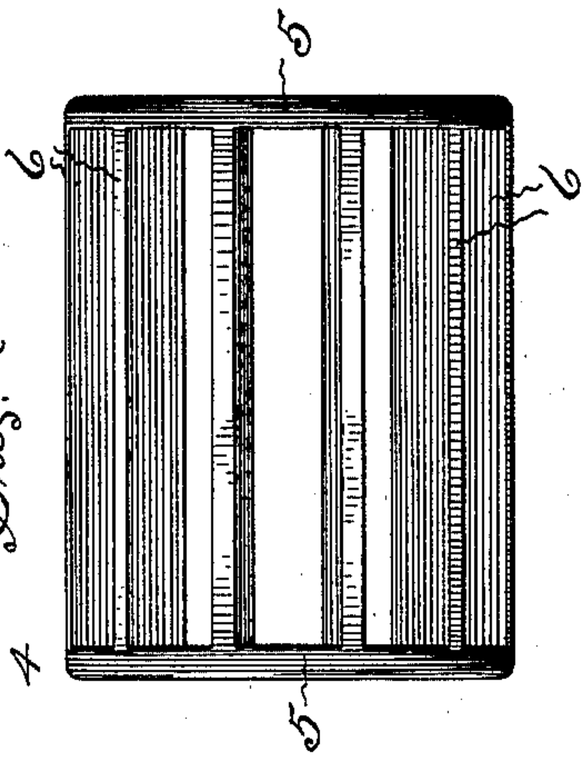


Fig. 3.

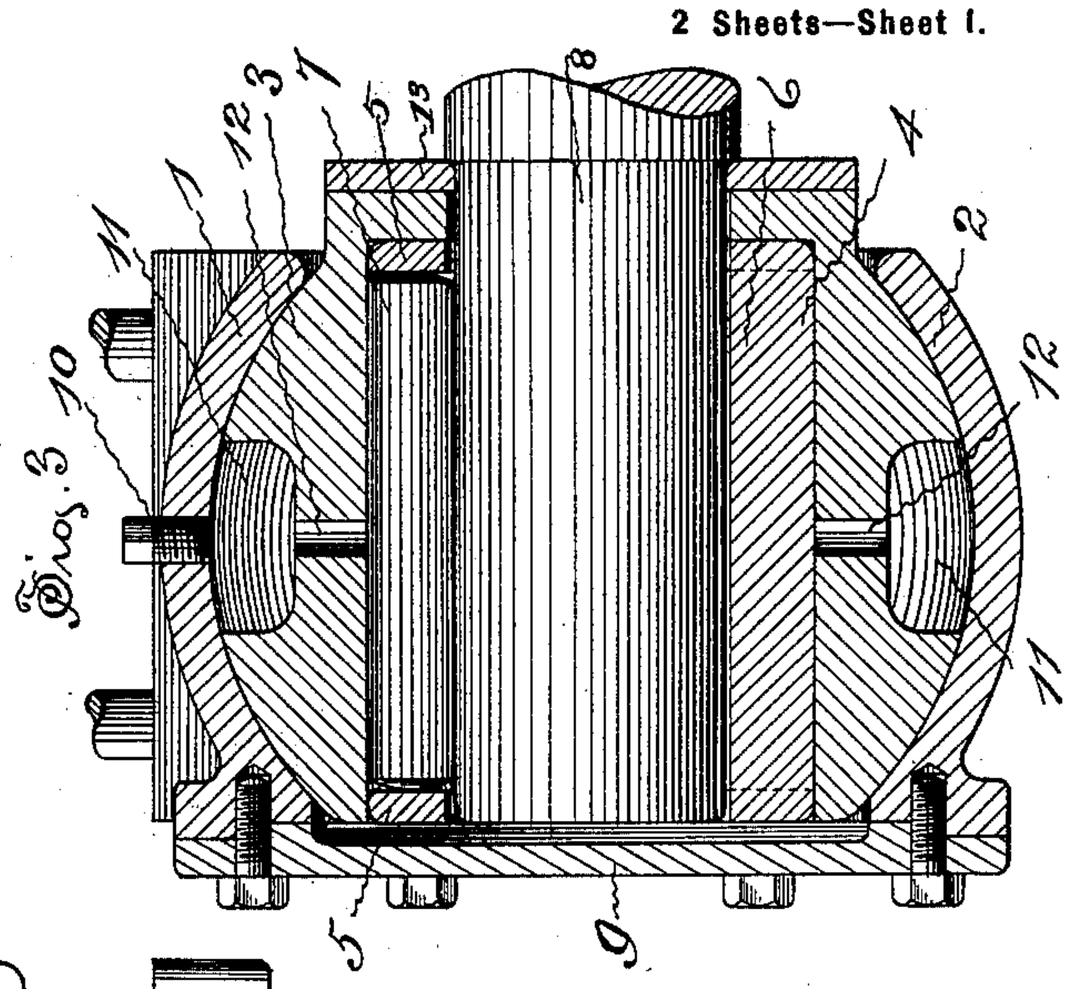


Fig. 1.

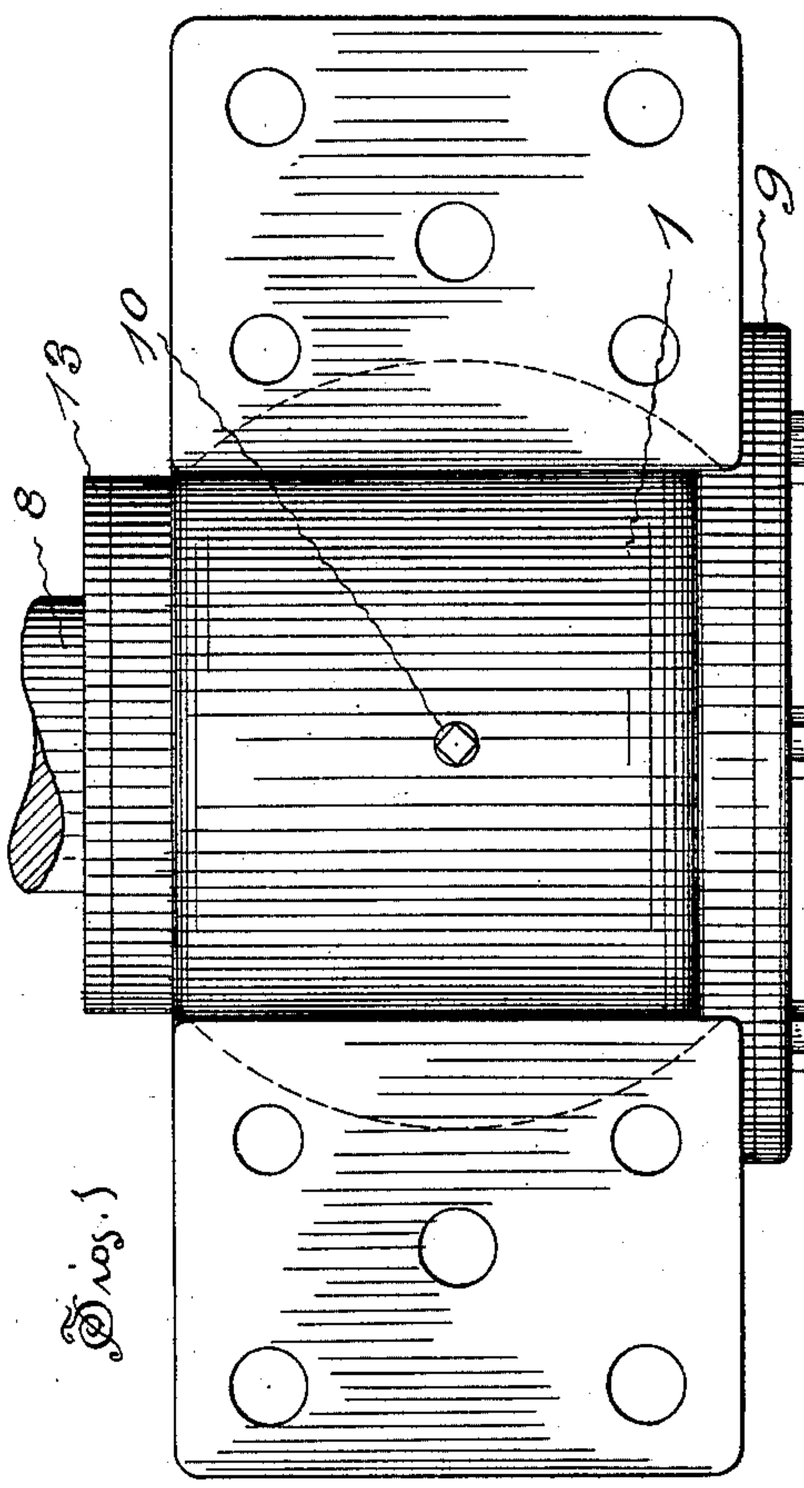
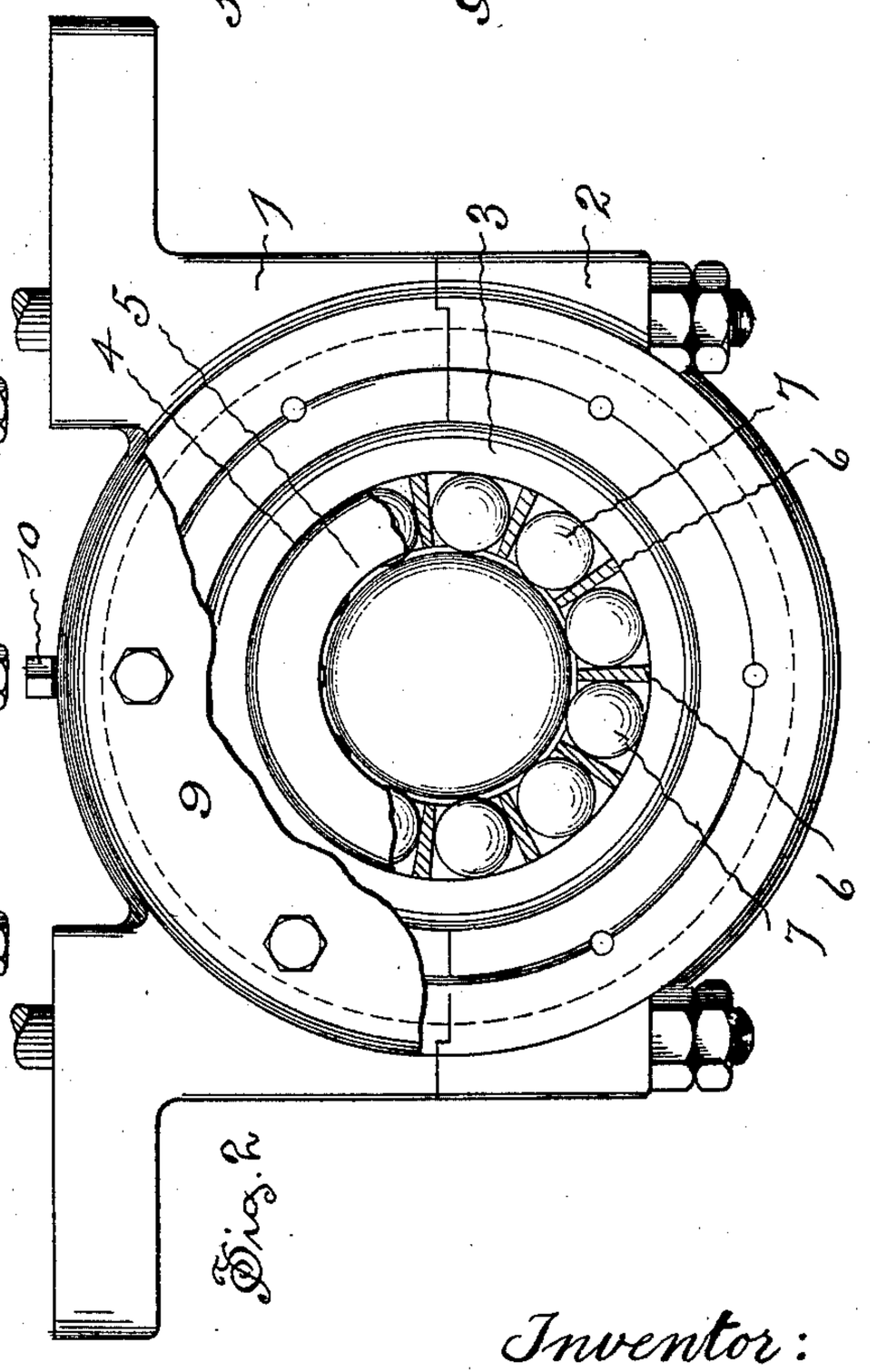


Fig. 2.



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E. J. Hyde.

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(No Model.) 2 Sheets—Sheet 2.

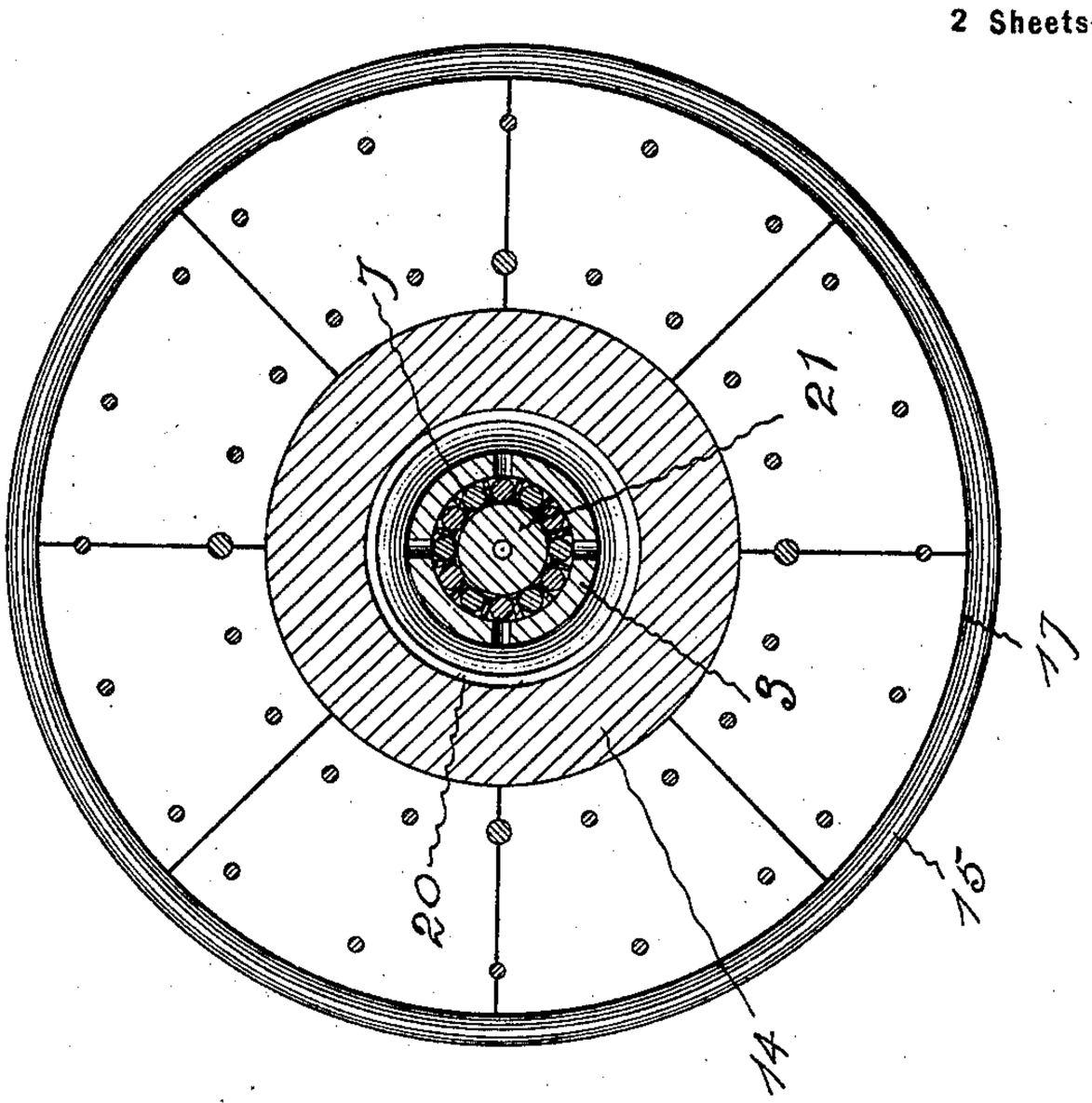

Fig. 6.

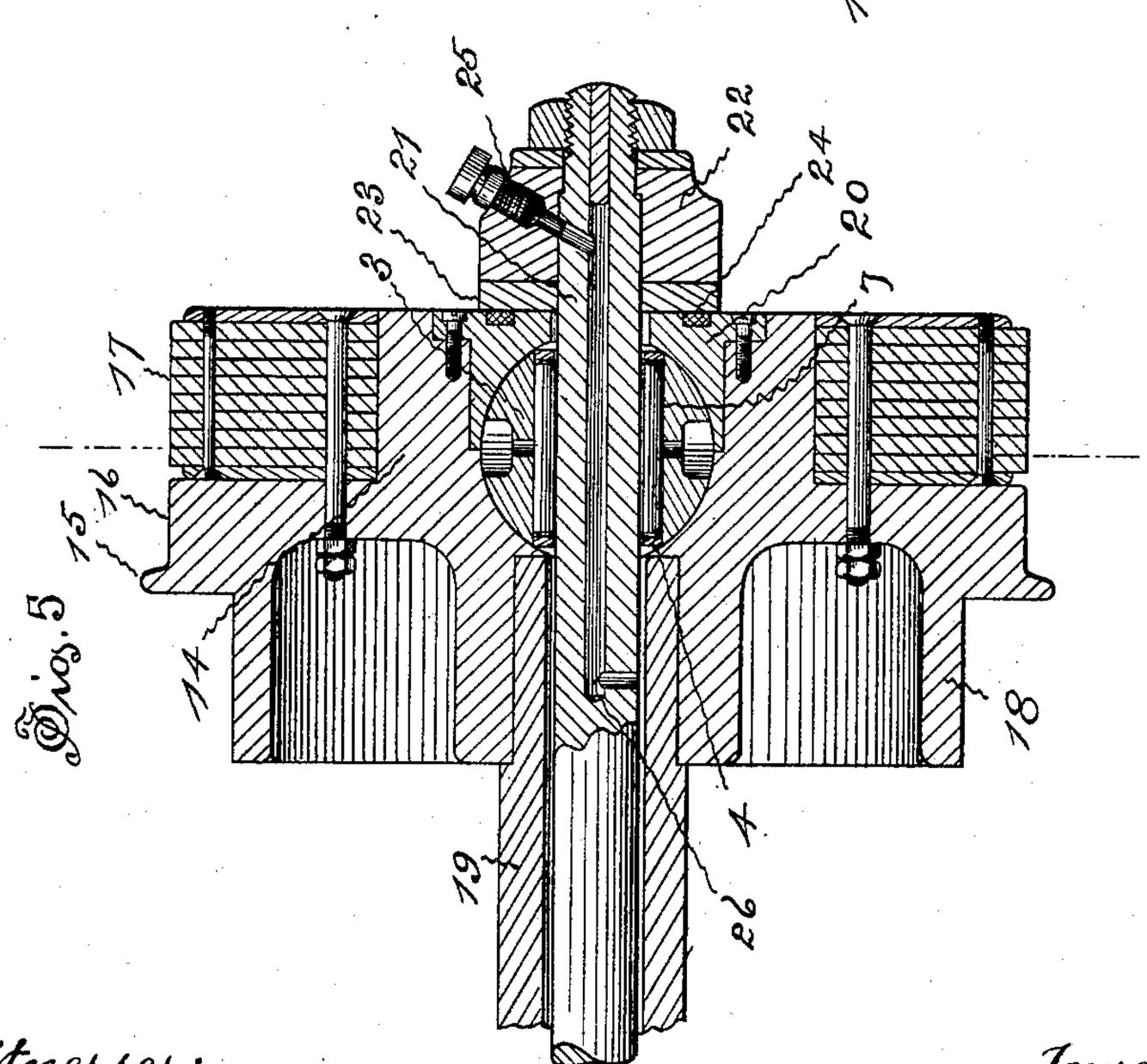

Fig. 5.

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UNITED STATES PATENT OFFICE.

GEORGE J. CAPEWELL, OF HARTFORD, CONNECTICUT.

ROLLER-BEARING.

SPECIFICATION forming part of Letters Patent No. 609,778, dated August 30, 1898.

Application filed December 22, 1897. Serial No. 662,983. (No model.)

To all whom it may concern:

Be it known that I, GEORGE J. CAPEWELL, 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 Roller-Bearings, of which the following is a specification.

This invention relates to the class of anti-friction-bearings in which the axle, shaft, or journal is supported upon or supports rollers that are loosely interposed between the relatively movable and stationary parts.

The object of the invention is to provide a simple and inexpensive bearing that is so arranged that the rollers are permitted to rock in order that they may assume the positions made necessary by any slight imperfections in workmanship or in assembling, or any springing or any bending of the axle, shaft, or journal, and thus eliminate the danger of excessive binding and undue wear which would result from such accidental displacement or disarrangement of the parts.

The embodiment of the invention herein illustrated and described has a shell, case, or frame with a recess in which there is a roller-bed that has a spherical periphery, so that it may have a slight universal movement, with rollers loosely held in the roller-bed, so as to support or be supported upon the axle, shaft, or journal that is between them, as more particularly hereinafter described, and pointed out in the claims.

Figure 1 of the accompanying drawings shows a plan of a hanger for a journal or shaft that is provided with the improved roller-bearing. Fig. 2 is a side elevation of the hanger with portions broken away to show the construction. Fig. 3 is a longitudinal section of the same. Fig. 4 is a detail view of a roller-holder that may be used with this form of bearing. Fig. 5 is a vertical section of a wheel or pulley provided with one of these bearings, and Fig. 6 is a transverse section of the same on the plane indicated by the broken line of Fig. 5.

The case, shell, or frame may have any desired outline. It may be made in the form of a hanger, as illustrated in Figs. 1 and 2, or it may be in the form of a wheel or pulley, as illustrated by Figs. 5 and 6, or it may be in the form of a pillow-block, as would be illustrated by Figs. 1 and 2 if they were drawn upside down.

The hanger shown has a base 1, that is adapted to be bolted or otherwise secured to any suitable horizontal or vertical surface, and a cap 2, that is bolted to the base. The recess between these parts when put together is spherical, and in this recess is located a spherical roller-bed 3. In the central opening in this roller-bed there is placed a roller-holder 4. The roller-holder shown has annular ends 5, that are joined by webs 6, and the rollers 7 are loosely retained in the spaces between the webs of the holder. The rollers are somewhat wider than the width of the webs, so that when bearing against the interior walls of the roller-bed they will project into the interior beyond the edges of the webs and support or rest upon the journal, shaft, or axle 8. The webs 6 are radially arranged, so that the rollers have a free movement between them without liability of their dropping or rolling into the interior out of the holder, for the spaces between the inner edges of the webs are less in width than the diameter of the rollers. The central openings through the annular ends 5 of the roller-holder are slightly larger in diameter than the axle, shaft, or journal, as is also the central opening through the ends of the roller-bed, so that the roller-bed may have a slight universal rotation independently of the axle, shaft, or journal.

Over the face of the hanger there is tightly secured a cover-plate 9, and through the wall of the hanger there is an opening provided with a plug 10, that may be removed for the injection of lubricant. In the outer walls of the roller-bed there preferably is a cavity 11 for the reception of lubricant, and from this cavity to the interior there lead passages 12 for the flow of lubricant from the cavity to the rollers. Upon the axle, shaft, or journal inside of the roller-bed there may be placed a washer 13 to exclude the entrance of dust and prevent the escape of lubricant.

With this form of bearing, if the axle, shaft, or journal becomes sprung or if the shell or case, whether used as a hanger or as a pillow-block, should be located out of line or should become slightly dislocated or untrue, the rollers can adjust themselves so as to lie flat upon the axle, shaft, or journal, for the spher-

ical roller-bed will readily move and assume such a position as will allow the rollers to take the most easy and natural positions. As a result of this, there is but exceedingly little wear and no binding of the parts when in use. This allows the use of rollers having bearing-surfaces of considerable length and which are required to sustain a heavy load—as, for instance, in railway-car axle-bearings—and the use of such for railway-cars lowers the amount of tractional resistance, saves lubricant, and reduces the liability of hot boxes.

The organization illustrated in Figs. 5 and 6 is particularly adapted for railway-car wheels. In this instance the shell, case, or frame 14 is in the form of a car-wheel with a flange 15, a metallic tread 16, and a tread 17, formed of thin segments of wood or other sound-deadening material fastened securely together. On the inside of the wheel is a hub or pulley 18. The case, in this instance, may be made in the form of an ordinary pulley, if the use to which it is to be put requires such. The wheel shown in Figs. 5 and 6 is adapted to be connected by a tube 19 with a similar wheel. In the spherical recess in the case is located a spherical roller-bed 3, that is preferably held in position by a cap 20, that is secured to the face of the case. In the interior of this roller-bed is placed a roller-holder 4, with rollers 7, that form the anti-friction-bearings interposed between the bed and the axle 21. This axle is shown as passed between the rollers and through the tubular connection for the wheels and as secured by a washer and nut to the frame-piece 22 of the structure that is to be carried by the wheel. A dust-washer 23 is placed between the frame-piece and the face of the cap with a packing 24 to insure a tight joint and prevent the entrance of dust and the escape of lubricant. In the frame-piece 22 there is a threaded opening provided with a screw-plug 25, and this opening communicates with a passage 26 in the axle. This permits the injection of lubricant in such manner that it may readily flow to the rollers. There is a cavity and passages leading to the cavity in the spherical roller-bed for the reception of a quantity of lubricant, so that this will not often require attention. With the arrangement illustrated in Figs. 5 and 6 the axle can be used to tie together portions of the frame of the structure to be carried by the wheels and the wheels can run smoothly and evenly on a track with but little friction and wear. If the axle is slightly bent or sprung or the parts are not properly manufactured or set up, the rollers can assume the necessary positions and lie flat against the axle, so as to utilize their entire length of bearing-surface, and the spherical roller-bed can adjust itself in the case to permit this.

These bearings run easily and noiselessly without binding and with but a minimum amount of wear. They will sustain a heavy load, for the bearing-surfaces can be extended and the entire length of the bearing-surfaces will be in proper contact. They are particularly adapted for long lengths of shafting, which are apt to spring or are secured to parts that are liable to change, and they are also valuable for use in railway-cars where the axles are short or are liable to spring or bend.

These bearings can be easily lubricated, and they are durable and cheap to manufacture and assemble.

I claim as my invention—

1. In a roller-bearing, in combination, a case with a spherical recess, a roller-bed having a spherical contour with an annular peripheral recess and a central perforation with passages from the recess to the perforation, said roller-bed located within and practically filling the spherical recess in the case, a roller-holder having annular ends and radial webs located within the perforation of the bed, rollers loosely retained by the holder between the webs, and a cover secured to the case and closing one side of the spherical recess, substantially as specified.

2. In a roller-bearing, in combination, a rotatable case with a spherical recess, a roller-bed having a spherical contour, located within and practically filling the spherical recess, a roller-holder having annular ends and radial webs located within the perforation of the bed, rollers loosely retained by the holder between the webs, a cover secured to the case and closing one side of the spherical recess, an axle extending through the case between the rollers, and a frame-piece supported by the axle, substantially as specified.

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Witnesses:

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