No. 676,769. Patented June 18, 1901.

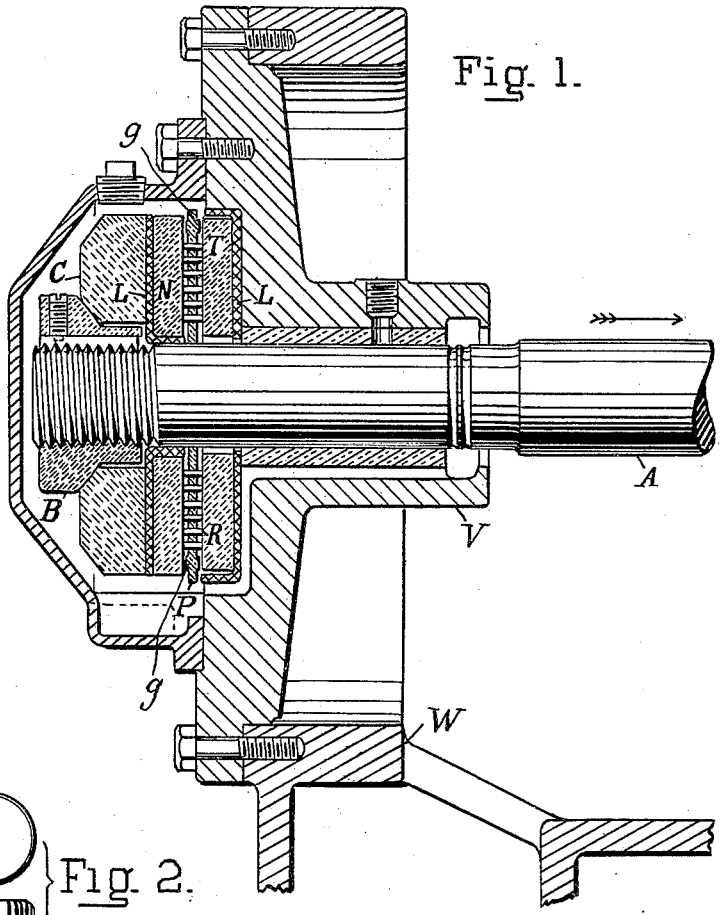
C. R. PRATT.

THRUST BEARING.

(Application filed Jan. 15, 1898.)

(No Model.)

Fig. 1.



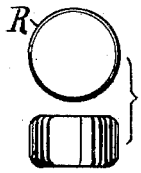


Fig. 2.

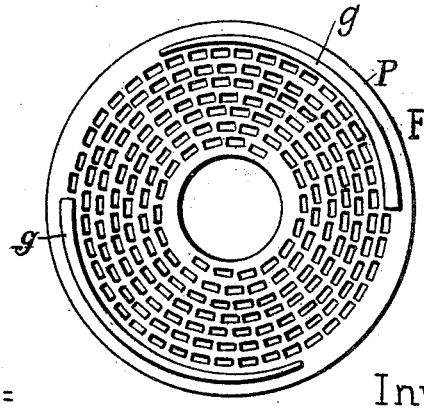


Fig. 3.

Witnesses:

Samuel W. Balch

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UNITED STATES PATENT OFFICE.

CHARLES R. PRATT, OF MONTCLAIR, NEW JERSEY, ASSIGNOR TO THE SPRAGUE ELECTRIC COMPANY, OF NEW JERSEY.

THRUST-BEARING.

SPECIFICATION forming part of Letters Patent No. 676,769, dated June 18, 1901.

Application filed January 15, 1898. Serial No. 666,739. (No model.)

To all whom it may concern:

Be it known that I, CHARLES R. PRATT, a citizen of the United States of America, and a resident of Montclair, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Thrust-Bearings, of which the following is a specification.

The invention consists in providing between the stationary thrust-plate and the revolving thrust-plate cylindrical rollers which are caged in holes cut through an intermediate plate, herein called a "cage-plate," the holes being so placed that the rollers will lie with their axes of rotation on radii of the shaft and preferably lie in one or more spirals, so that the paths of the faces of the cylinders shall overlap.

In the accompanying drawings, which form a part of this specification, Figure 1 is a cross-sectional view of my improved bearing on a vertical plane passing through the axis of the shaft, the shaft itself being shown in elevation. Fig. 2 is an end and side view of one of the cylindrical rollers. Fig. 3 is a front view of the cage-plate.

The shaft A, along which the thrust acts in the direction indicated by the arrow, is journaled in a bushing in a bearing-block V. This block is a flanged cylinder-head which fits into an opening in framework W, mounted upon a suitable base. The shaft is provided with a threaded end, onto which a nut B is screwed and keyed fast. This nut bears against a thrust-block C, the two forming a ball-and-socket joint. The revolving thrust-plate N, the stationary thrust-plate T, and the intermediate cage-plate P, with its rollers R, lie between the thrust-block C and the bearing-block V, separating them, as shown. A plate of lead or other suitable soft material L is interposed between the revolving thrust-plate N and the shaft A and the thrust-block C. A similar plate L lines the cavity in the bearing-block V, into which the stationary thrust-plate T fits.

The cage-plate P is provided with holes, in which the rollers R are caged. These holes are shown in Fig. 3 as laid off in two spirals, which are started at the two opposite ends of a diameter. The thrust or outward crowding of each roller is therefore balanced by the thrust of a corresponding roller on the opposite side, and the rollers being in spirals they are at different and graded distances from the axis of the bearing, so that the wear will be distributed over the entire surface of the thrust-plates. Outside of the outer holes and continuing each of the spirals are two lugs *g g* on each side of the cage-plate to keep it properly positioned between the thrust-plates. Each roller is held to its own circular path and with its axis radial to the axis of the main shaft, so that its natural path of rotation will always be tangent to the circles on which it travels on the two thrust-blocks at the point of contact, and this is accomplished by merely caging each roller between the four flat walls of rectangular holes in the cage-plate and relying on the flat ends of the rollers for the purpose without the use of trunnions or other guides for the rollers. The omission of trunnions permits the rollers to adjust themselves freely to the surfaces of the thrust-plates.

Mechanical difficulties have heretofore prevented the employment of cylindrical rollers between the parallel faces of thrust-plates, owing to the fact that the inner and the outer edges of the rollers must revolve at the same speed, although they travel on circles of different diameter. There is consequently a slippage at one or both edges. In developing this invention it has been found that this slippage is not of consequence with rollers traveling in circles of four inches in diameter and over if the tread is narrowed to about five thirty-seconds of an inch. In practice it is found convenient to make the rollers under the above conditions of one-half inch diameter and one-quarter of an inch wide, the corners being rounded to secure the narrow tread. The rollers are cut from cold-drawn tool-steel and are case-hardened.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. A thrust-bearing comprising a main shaft, thrust-plates, cylindrical rollers between the thrust-plates, and a cage-plate by which the rollers are positioned in spirals in balanced relation to each other, substantially as described.

2. A thrust-bearing comprising a main shaft, thrust-plates, cylindrical rollers between the thrust-plates, the rollers being without trunnions and having flat ends by which they are held with their axes radial to the main shaft, and a cage-plate between the thrust-plates in which the rollers are caged, substantially as described.

3. A thrust-bearing comprising a shaft, thrust-plates and a cage-plate intermediate to the thrust-plates, the cage-plate having spirally-arranged holes therein, and the thrust-plates being separated by short cylindrical rollers caged in the holes in the cage-plate without the use of trunnions, the axes of the rollers being radial to the shaft, substantially as described.

Signed by me at New York city this 13th day of January, 1898.

CHAS. R. PRATT.

Witnesses:
THOMAS EWING, Jr.,
SAMUEL W. BALCH.