No. 639,775. Patented Dec. 26, 1899.

W. S. ROGERS.

ROLLER THRUST BEARING.

(Application filed Aug. 26, 1899.)

(No Model.)

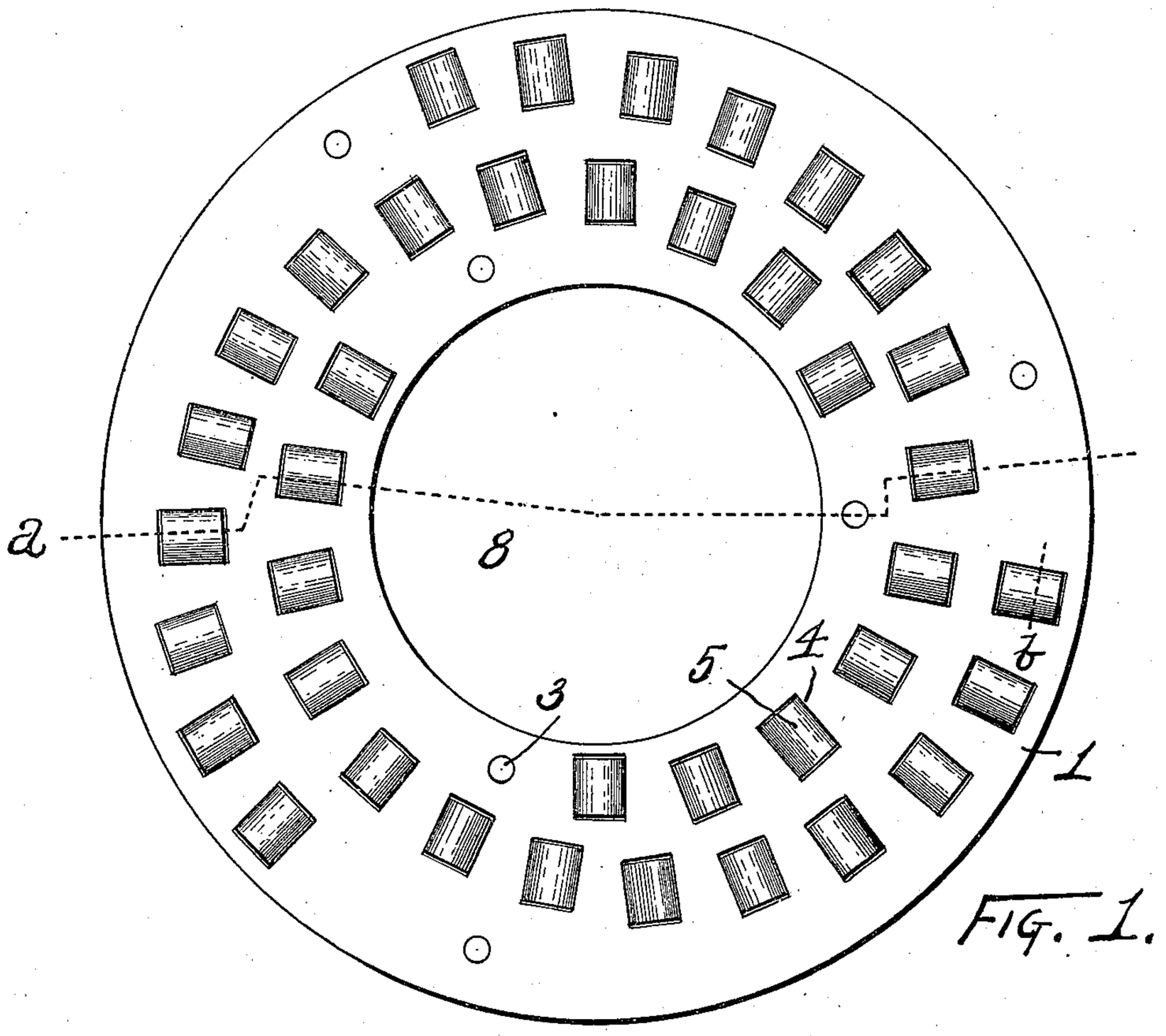

FIG. 1.

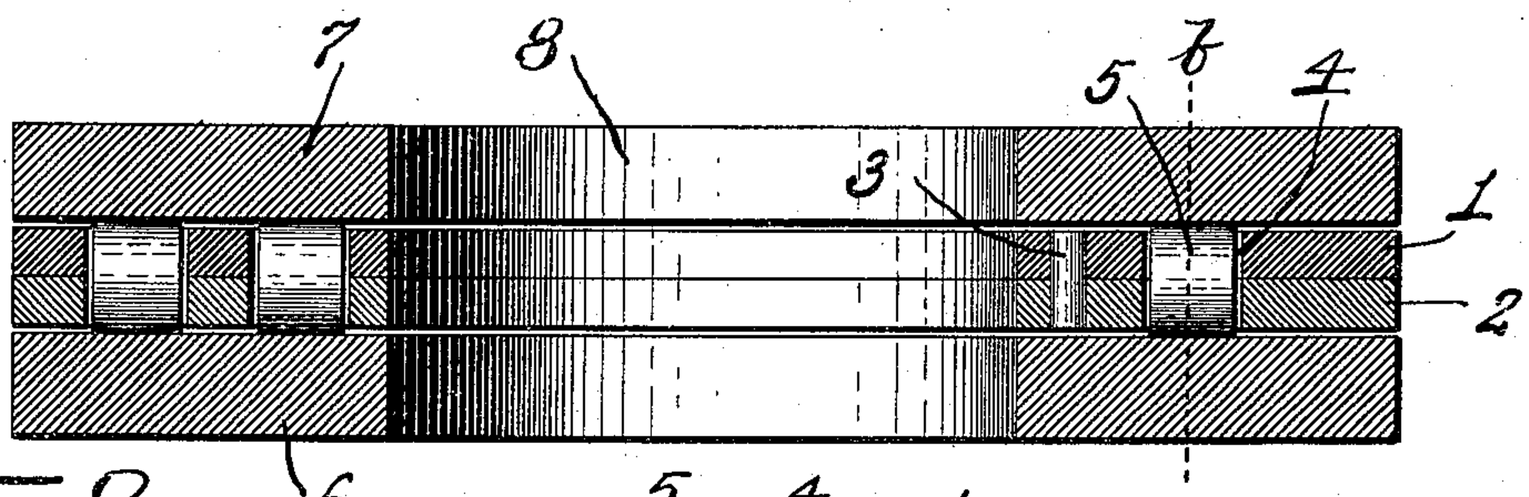

FIG. 2.

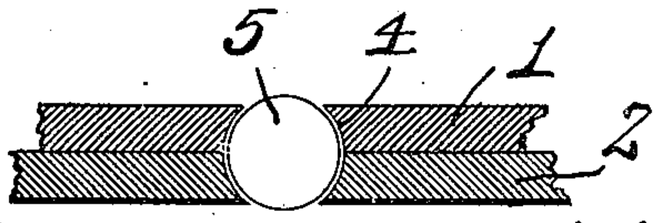

FIG. 3.

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UNITED STATES PATENT OFFICE.

WINFIELD S. ROGERS, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE BALL-BEARING COMPANY, OF SAME PLACE.

ROLLER THRUST-BEARING.

SPECIFICATION forming part of Letters Patent No. 639,775, dated December 26, 1899.

Application filed August 26, 1899. Serial No. 728,538. (No model.)

To all whom it may concern:

Be it known that I, WINFIELD S. ROGERS, of Boston, Suffolk county, Massachusetts, have invented certain new and useful Improvements in Roller Thrust-Bearings, of which the following is a specification.

This invention, pertaining to improvements in roller thrust-bearings, will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a plan of the roll-disk of my improved bearing; Fig. 2, a diametrical section thereof in the plane of line *a* of Fig. 1 in conjunction with the thrust-surfaces between which the roll-disk operates; and Fig. 3 a section through a portion of the roll-disk in the plane of line *b* of Figs. 1 and 2.

In the drawings, 1 indicates a metallic disk, and 2 a second similar disk, the two disks being secured together face to face and forming the roll-disk; 3, a series of pivots permanently uniting the two disks together; 4, a series of mortises extending through the compound roll-disk, these mortises having concave side walls and having their axes radial to the axis of the roll-disk, the mortises of the series being disposed at differing radial distances from the axis of the roll-disk, so that in radial relation the mortises of the series break joint with each other or overlap, so that between the inner end of the first mortise of the series to the outer end of the last mortise of the series there is no radial point in the roll-disk which would not sweep across a mortise of the series, the illustration showing such series of mortises in triplicate, each series circumferentially overlapping the other, the arrangement thus presenting the aspect of three overlapping spiral segments, each formed by a series of the mortises; 5, a cylindrical roll disposed in each mortise, the length of the roll being sufficiently less than that of the mortise to prevent binding and the diameter of the roll being sufficiently greater than the thickness of the compound roll-disk to permit the periphery of the roll to project somewhat from each face of the roll-disk, the distance between the concave side walls of the mortise being such as to embrace the roll without binding it; 6, a disk disposed at one face of the roll-disk and having its face engaged by the rolls projecting therefrom, this disk 6 constituting one of the roll-tracks and typifying either the fixed abutment of the bearing or a disk interposed between the rolls and such fixed abutment and free to turn with reference to the rolls and such fixed abutment; 7, a similar disk disposed at the opposite face of the roll-disk and similarly engaging the roll and constituting the other roll-track and typifying either the rotary element of the bearing or a loose disk interposed between the roll-disk and such rotary element of the bearing, and 8 an aperture through the disk-roll and through disks 6 and 7 and intended to permit the presence of a shaft in case the bearing is designed for use as a thrust collar-bearing on a shaft, this aperture being of course not necessary if the bearing be employed as a step-bearing, requiring no shaft to pass through it.

The rolls and the first surfaces engaged by them, as typified by the disks 6 and 7, should be formed of hard steel. The axes of the mortises 4 lie in the plane of the joint of separation between disks 1 and 2, so that the compound roll-disk acts as a cage for the rolls. If the bearing is to be used as a thrust-bearing upon a collared shaft, then the roll-disk will be bored to fit loosely upon the shaft and the rolls will engage the surface of the shaft-collar and the surface of the bearing which receives the abutting thrust, or preferably the disks 6 and 7 will be employed between the rolls and the collar and abutment bearing, respectively. The number of mortises and rolls will of course depend upon the size of the disk and the nature of the duty imposed upon the bearings—the greater the number of rolls the greater the ability of the bearing to withstand a heavy thrust. If the bearing is to be employed as a step-bearing under a shaft not required to project through it, then the roll-disk need not be bored, and any of the usual step-boxes or supports may be employed in preventing its lateral displacement.

Bearings of this general character have been employed in which balls were held in a compound disk similar to my roll-disk; but such bearings have in practice proved incapable of withstanding heavy thrust-pressures,

the balls crushing under pressures not at all interfering with the easy working and long durability of my bearing. Bearings of this general type have also been constructed provided with conical rollers held in mortises in the roll-disk, the rolls being engaged by conical thrust-surfaces. In other words, the lines of contact between the rolls and the thrust surfaces were disposed focally with reference to the intersection of the axes of the roll-disk and of the rolls. Theoretically it would appear that the conical arrangement just referred to was correct and that the cylindrical rolls and flat thrust-surfaces of my bearing were wrong; but practice has demonstrated that the cylindrical-roll arrangement is greatly superior to the conical-roll arrangement as regards easy running and as regards durability.

I claim as my invention—

1. In a roller-bearing, the combination, substantially as set forth, of a disk having through it a series of rectangular mortises with their major axes radial to the axis of the disk, the mortises of the series being arranged at varying radial distances from the axis of the disk, a cylindrical roll loosely disposed in each of said mortises and adapted to engage the end and side walls thereof, and a flat disk disposed at each side of said disk and engaging said rolls.

2. In a roller-bearing, the combination, substantially as set forth, of a disk having through it several series of rectangular mortises with their major axes radial to the axis of the disk, the mortises of each series being arranged in spiral order and the several spiral series overlapping each other, a cylindrical roll disposed loosely within each mortise and adapted to engage the end of the side walls thereof, and a flat disk at each side of said disk and engaging said rolls.

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