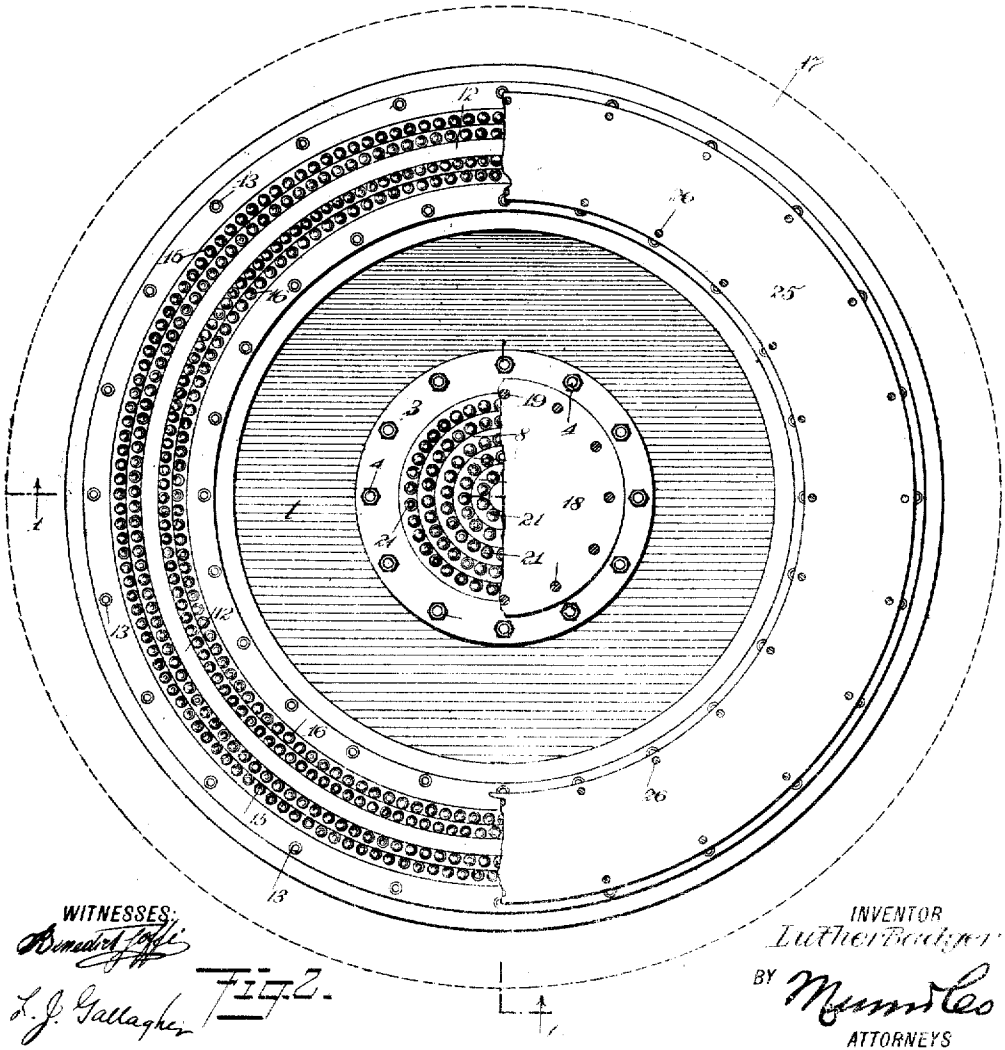
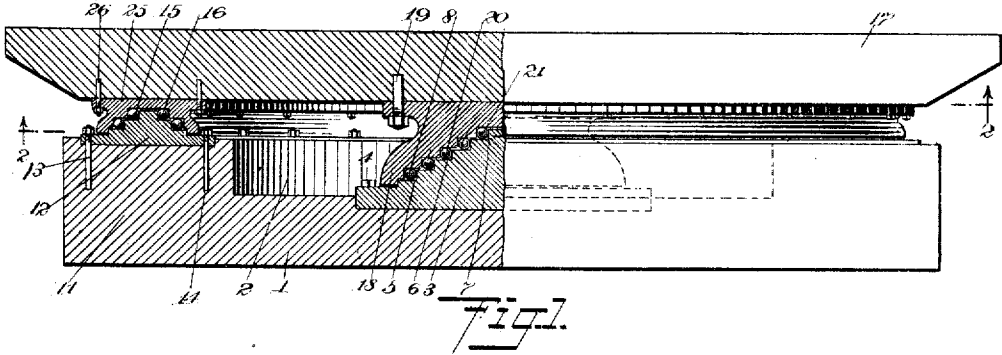


L. BADGER.
 BALL BEARING PIVOTED AND BALANCED DEVICE.
 APPLICATION FILED MAR. 3, 1911.

1,023,609.

Patented Apr. 16, 1912.



WITNESSES:
Remond & Co.
 L. J. Gallagher

INVENTOR
 Luther Badger
 BY *Mumfles*
 ATTORNEYS

UNITED STATES PATENT OFFICE.

LUTHER BADGER, OF ST. JOHNS, OREGON.

BALL-BEARING PIVOTED AND BALANCED DEVICE.

1,023,609.

Specification of Letters Patent.

Patented Apr. 16, 1912.

Application filed March 3, 1911. Serial No. 611,993.

To all whom it may concern:

Be it known that I, LUTHER BADGER, a citizen of the United States, and a resident of St. Johns, in the county of Multnomah and State of Oregon, have invented a new and Improved Ball-Bearing Pivoted and Balanced Device, of which the following is a full, clear, and exact description.

My invention relates generally to a pivoted and balanced construction embodying the use of ball bearings as set forth in my co-pending application No. 529,529.

More particularly my invention comprises a construction adapted to structures which are rotatably pivoted, and such as are generally found in draw-bridges, turn-tables, or hoisting cranes.

The object of my invention is to provide an efficient construction whereby friction may be materially lessened and the operation of the parts rendered more efficient.

Reference is to be had to the accompanying drawings forming a part of this specification, in which like characters of reference denote corresponding parts in all the views, and in which—

Figure 1 is a partly sectional view of a rotatable structure embodying my invention, taken on the line 1—1 of Fig. 2. Fig. 2 is a horizontal sectional view taken on the line 2—2 of Fig. 1.

A suitable foundation structure 1, preferably circular in outline, and having the central portion thereof recessed, as at 2, is provided at its center with a bed plate 3 rigidly secured thereto by means of suitable bolts 4, the bed plate being also circular in outline and having a plurality of stepped portions 5, 6, 7, formed therein, on which a plurality of balls 8, are adapted to rest; it will be understood that these stepped portions extend around the bed plate and that the number of steps may be varied at will. The outer portion 11 of the circular foundation 1 is provided at its upper surface with the annular ring 12 secured to the foundation by suitable bolts 13, 14, this annular ring being also provided with a series of steps on which a plurality of balls 15, 16, are adapted to rest.

The rotatable member is designated as 17 and this member is also substantially circular in outline and of sufficient thickness for the use to which it is to be put. On its under face and at its central portion, it is

provided with a cap member 18 suitably secured in place by means of bolts 19; this member is also provided with a series of steps 20, 21, which lie in the same vertical planes as the steps 6, 7, on the bed plate 3 and these steps are adapted to rest on the balls carried on these steps; the bed plate and the cap member are cooperating elements and the bed plate may be said to be of convex formation and the cap member of concave formation. Adjacent its outer edge, the rotatable member, or table 17, is provided with a cap member 25 also of circular formation, secured to the said table by suitable bolts 26, this cap member being provided with a series of steps equal in number to the steps on the cooperating annular ring or bed plate 12; from Fig. 1 it will be noted that the steps on the member 25 are in engagement with the balls carried on the steps of the member 12, this construction being an enlarged modification of the pivot structure shown at the center.

It will be observed that all bearing contact is made through the inter-position of balls which are freely rotatable along the various steps as the member 17 is turned and that there is no contact save this rolling one, which thereby lessens the friction and increases the efficiency of the construction.

It is obvious that the ball bearing pivot at the center of the structure may be dispensed with, if desired, and the turning of the member 17 with respect to the foundation 1 may be effected wholly through the outer circular or annular ball bearing members. It is also to be particularly noted that the height of each of the steps shown is less than the diameter of the balls resting on these steps, and, furthermore, that the width of the steps is substantially greater than the diameter of these balls so that all pressure or weight from the moving member to the stationary one is transmitted through the balls and not through any fixed part. It is also to be noted that by making the bed plate 3 of stepped formation, whereby a structure somewhat frusto-conical is obtained, that the position of the cap 18 thereon is fixed and that there is no danger of these members becoming displaced relatively to each other.

It is obvious that the size of the different parts may be varied, the number and size of the balls may also be varied, depending

on the use to which the construction is put, without departing from the spirit of the appended claim.

5 Having thus described my invention, I claim as new, and desire to secure by Letters Patent:—

10 In a construction of the class described, a foundation member substantially circular in outline, a bed plate of integral construction at a central portion, the said bed plate being provided with a plurality of circular concentric steps, the outer portion of the said foundation member being provided with an annular ring of integral construction, the 15 ring having concentric steps, together with a rotatable member having a concave cap at the central portion provided with circular concentric steps in its concave surface, and

rotatable balls in engagement with the said steps and the steps on the said bed plate, the 20 outer portion of the said rotatable member being provided with a circular member of concave construction having a plurality of circular concentric steps on the concave portion, together with balls resting between the 25 said steps of the said ring and the steps on the concaved portion of the said circular member whereby a substantially frictionless balanced construction is produced.

In testimony whereof I have signed my 30 name to this specification in the presence of two subscribing witnesses.

LUTHER BADGER.

Witnesses:

FRANK N. SANDIFUR,
EUGENE S. WRIGHT.