

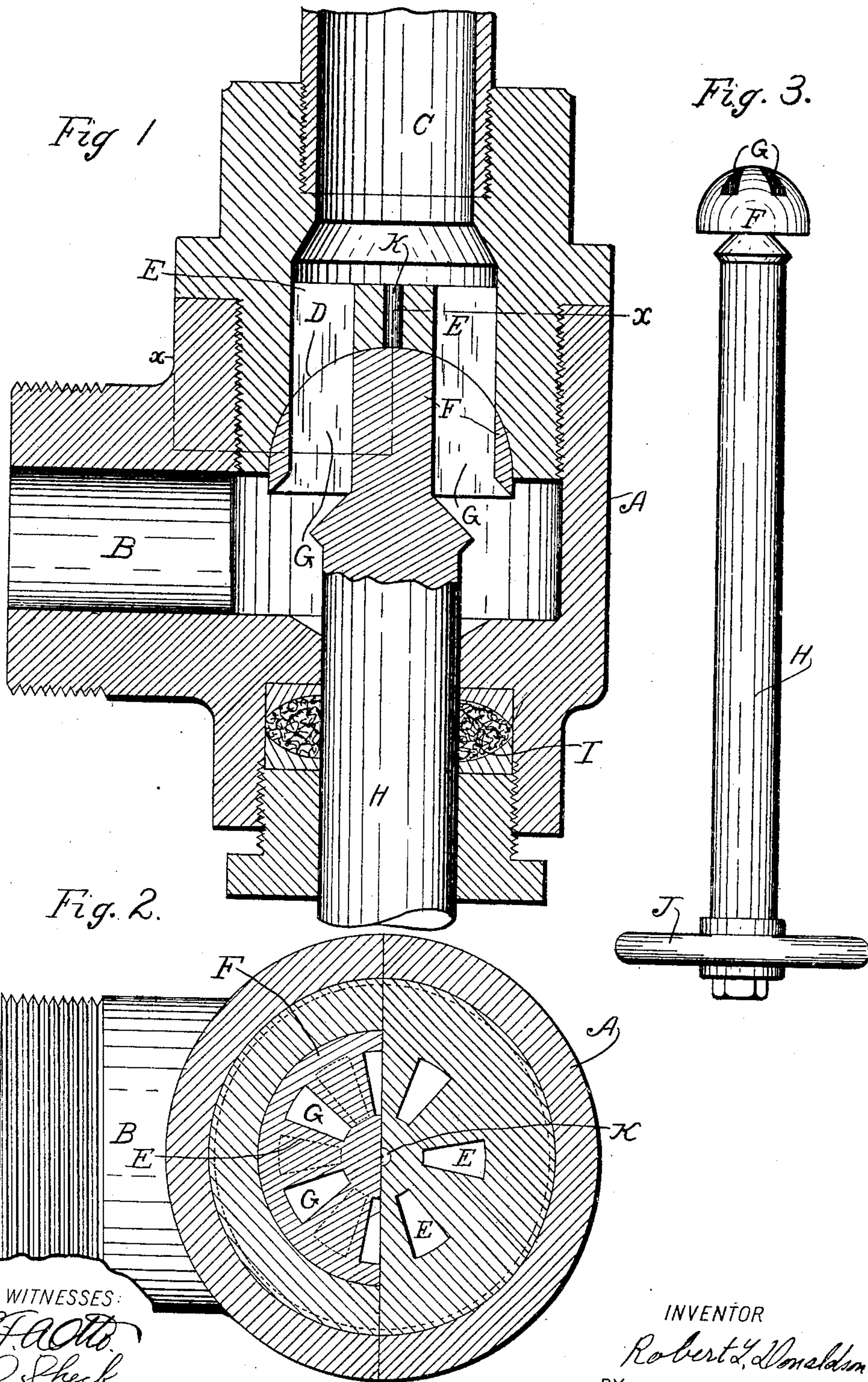
No. 805,531.

PATENTED NOV. 28, 1905.

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ROTARY VALVE.

APPLICATION FILED DEC. 19, 1903,



WITNESSES:
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ROBERT L. DONALDSON, OF MILWAUKEE, WISCONSIN; THERESA ANNA DONALDSON ADMINISTRATRIX OF SAID ROBERT L. DONALDSON, DECEASED.

ROTARY VALVE.

No. 805,531.

Specification of Letters Patent.

Patented Nov. 28, 1905.

Application filed December 19, 1903. Serial No. 185,772.

To all whom it may concern:

Be it known that I, ROBERT L. DONALDSON, a citizen of the United States, residing at Milwaukee, county of Milwaukee, and State of Wisconsin, have invented new and useful Improvements in Rotary Valves, of which the following is a specification.

My invention relates to improvements in rotary valves.

The object of my invention is to provide a form of rotary valve which will not bind and in which the wear of the valve and seat will be equal at all points.

In the following description reference is had to the accompanying drawings, in which—

Figure 1 is a sectional view of my improved valve drawn on the axis of the valve-stem. Fig. 2 is a sectional view drawn on line *xx* of Fig. 1. Fig. 3 is a detail view of the valve and valve-stem reduced.

Like parts are identified by the same reference characters in all the views.

A is a valve-casing, of which B and C are the inlet and outlet passages.

D is a concave valve-seat provided with ports E, and F is a valve fitting said seat and provided with ports G, adapted to register with the ports E of the valve-seat when the valve is in one position of adjustment. The ports G and E when in registry connect the inlet and outlet passages. The valve is actuated—*i. e.*, rotated—upon its seat by means of a stem H, which extends through an ordinary stuffing-box I and is provided with an exterior handle J. The surface of the valve-seat is concave spherical, and that portion of the valve which contacts with the seat is convex spherical with the curved portion of the valve extending backwardly from the seat, preferably to the rear face of the valve, so that the wear of the valve upon its seat will not form a shoulder in the seat, but will maintain the original contour. The valve is preferably hemispherical in form, and the seat is adapted to receive nearly the entire valve. The seat is provided with an aperture K in the central axial line of valve rotation. With this construction the wear of the contacting valve face and seat will be equal at all points, for the movement is in direct proportion to the contacting area, except at the axial center, at which point there is no contact, owing to the provision of the aperture K.

It will be observed that a valve of the de-

scribed form combines the merits of a tapered plug-valve with those of an ordinary flat valve. The sides of the valve near its rear face are substantially parallel with the stem, while the center of the face is at right angles to the stem, the sides converging inwardly at a uniform curve, terminating in a substantially flat face at the center, while the outer rear portions of the valve-face have but a slight inward taper. This portion of the valve is prevented from binding, however, by the central portion of the face, which has a substantially flat bearing on the seat around the aperture K. The pressure upon the valve is of course on lines parallel with the valve-stem, and therefore nearly parallel with the outer contacting surface of the valve-seat. The travel of the corresponding portion of the valve is, however, greater than at the center, and experiments which I have conducted demonstrate that a valve constructed in this manner will wear at all points with absolute uniformity, the amount of wear being in direct proportion to the pressure and distance traveled at any given point and the difference in the distance traveled compensating exactly for the difference in pressure at all points on the contacting surface of the valve.

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

1. The combination of a valve-casing provided with a substantially hemispherical valve-seat; a substantially hemispherical valve adapted to fit the seat; and means for rotating said valve on an axis projected from the center of the seat, said valve and seat having axially-extended ports adapted to be brought into and out of registry by the rotary movement of the valve, and said valve being exposed to pressure in the direction of its seat and free to move in that direction.

2. The combination with a substantially hemispherical valve-seat, of a substantially hemispherical valve adapted to fit the seat, and means for rotating said valve on an axis projected from the center of the seat; said valve and seat having ports between its axis and equatorial line adapted to be brought into and out of registry by the rotary movement of the valve; said valve being free to move in the direction of its seat to take up the wear of the contacting faces.

3. The combination with a substantially

hemispherical valve-seat, of a substantially
hemispherical valve adapted to fit the seat,
and means for rotating said valve on an axis
projected from the center of the seat; said
5 valve and seat having ports between its axis
and equatorial line adapted to be brought into
and out of registry by the rotary movement
of the valve, and said seat being formed with
an aperture in the axial line of valve rotation;

said valve being free to move in the direction 10
of its seat to take up the wear of the contact-
ing faces.

In testimony whereof I affix my signature in
the presence of two witnesses.

ROBERT L. DONALDSON.

Witnesses:

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