

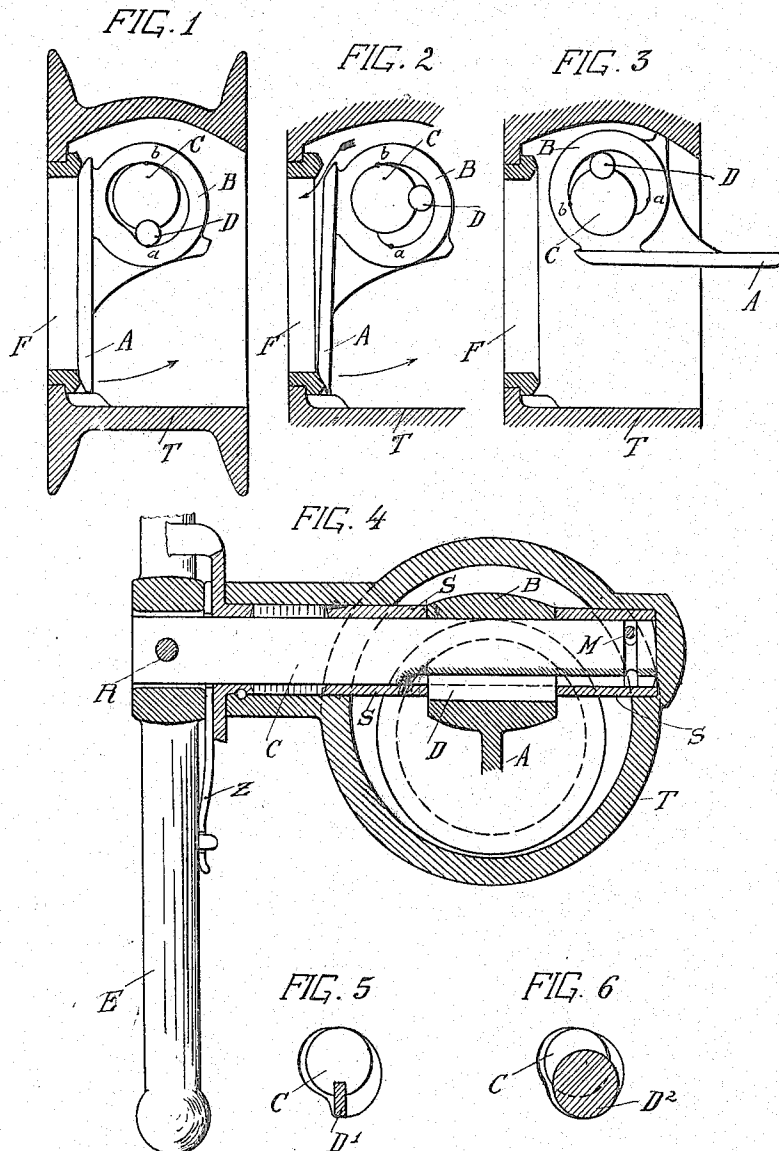
Aug. 12, 1924.

1,504,288

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FLAP VALVE

Filed March 31, 1924



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UNITED STATES PATENT OFFICE.

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FLAP VALVE.

Application filed March 31, 1924. Serial No. 703,219.

To all whom it may concern:

Be it known that I, ZDENEK VENCL, a citizen of the Czechoslovakian Republic, residing at Prague-Smichov, Vaclavka 25, Czechoslovakia, have invented new and useful Improvements Relating to Flap Valves, of which the following is a specification.

The present invention relates to flap valves and means for operating the same and has among its objects to facilitate the opening of the same.

Another object of the invention is to provide means whereby the valve itself acts as a lever in the initial opening movement.

A further object is to provide simple and effective means for actuating a flap valve.

With these and other objects in view the invention comprises novel features of construction and combinations of parts which will be hereinafter described and claimed.

According to the present invention in one of its aspects a flap valve and means for operating the same are so constructed that, when opening, the valve is first raised away from its seating by acting in the manner of a lever bearing against a point of the seating and is then swung into a plane at right angles to that of the seating.

A preferred constructional form of flap valve adapted to open in this manner comprises a valve plate having a projection near the rim of the plate adapted to receive an operating spindle disposed at right angles to the axis of the valve seating, which spindle is provided with an eccentric device such that turning of the spindle co-operates with a bore of appropriate non-circular shape in the projection on the valve plate in order firstly to raise the valve plate by lever action on the point of the seating farthest removed from the spindle, the valve meanwhile not partaking of the turning movement of the spindle, and secondly on further turning of the spindle to swing the valve plate into a position at right angles to the surface of the seating.

In the accompanying drawings Figs. 1, 2 and 3 illustrate by way of example in axial section and in three different positions one constructional embodiment of the invention and Fig. 4 is a cross sectional view.

Figs. 5 and 6 illustrate two further forms of construction.

Referring first more particularly to the construction shown in Figures 1 to 4 the

valve plate A is provided near its rim with a hub-like projection B, in the bore of which operates a spindle C rotatably mounted in the valve housing T at right angles to the axis of the opening at the valve seating so that the valve plate A is freely suspended on this spindle C between the two small pipes or bushes S (Fig. 4). The spindle C is secured against axial thrust by means of the screw M and its free end, projecting from the valve body is rigidly connected by a pin R to a hand lever E between which and a stuffing box is a spring Z mounted on the hand lever.

The bore provided in the projection B is of non-circular cross section and substantially corresponds in outline with the outline of a controlling cam. A circular portion of this outline nearest the valve plate has the same radius as the spindle C. In that portion of the outline which extends in continuation of the circular portion in the direction towards the axis of the opening of the valve seat the radius increases suddenly and reaches its maximum at the point *a*, whereupon it is gradually reduced until it reaches a point *b* substantially diametrically opposite the point *a* when it is again equal to the radius of the spindle.

In a longitudinal groove in the spindle C an eccentric device in the form of a roller D is rotatably mounted. This is of such diameter that it projects radially from the surface of the spindle C for a distance equal to half the difference between the largest and smallest radii of the bore.

In the closed position in which the valve plate A rests against the seating F (Fig. 1) the spindle C is turned in such a direction that the roller D bears against the inner surface of the bore at *a*. If the valve is to be opened, the spindle C is turned anti-clockwise by means of the lever E. During this operation the valve plate A bearing on the seating at a point farthest removed from the spindle C will first be raised from the seating surface in the manner of a lever and is thus unloaded. This continues until the circular portion of the bore bears tightly against the spindle C (Fig. 2). On further turning of the spindle C the valve plate A will be moved by the spindle C and be swung into a position at right angles to the plane of the seating surface (Fig. 3).

The roller D may be replaced by a spring D¹ seated in the spindle C (Fig. 5) or by an eccentric D² (Fig. 6).

While specific constructional forms of the invention have been herein described in detail it will be understood that the invention might be carried out by other means all coming within the scope of the appended claims.

10 What I claim is:—

1. A flap valve comprising a housing a valve plate a seating for said valve plate in said housing, a projection adjacent the rim of said valve plate formed with a non-circular bore, an operating spindle rotatably mounted in said housing at right angles to the axis of the valve seating, eccentric means on said spindle co-operating with the said bore on rotation of the spindle to raise the valve plate by lever action on the point of the said seating furthest removed from said spindle.

2. A flap valve comprising a housing a valve plate a seating for said valve plate in said housing, a projection adjacent the rim of said valve plate formed with a non-circular bore, an operating spindle rotatably mounted in said housing at right angles to the axis of the valve seating, eccentric means on said spindle co-operating with the said bore on rotation of the spindle to raise the valve plate by lever action on the point of the said seating furthest removed from said spindle the valve meanwhile not partaking of the turning movement of the spindle, and means for rotating the said spindle.

3. A flap valve comprising a housing, a

valve plate and a seating for said valve plate in said housing, a projection adjacent the rim of said valve plate formed with a non-circular bore, an operating spindle rotatably mounted in said housing at right angles to the axis of the valve seating, means for rotating said spindle, eccentric means on said spindle co-operating with the said bore on rotation of the spindle to raise the valve plate initially without causing said valve plate to partake of the rotary movement of said spindle, and then to lock said valve plate to said spindle for rotation therewith.

4. A flap valve comprising a housing, a valve plate and a seating for said valve plate in said housing, a projection adjacent the rim of said valve plate formed with a non-circular bore, an operating spindle rotatably mounted in said housing at right angles to the axis of the valve seating, means for rotating said spindle, eccentric means on said spindle co-operating with the said bore on rotation of the spindle to raise the valve plate initially without causing said valve plate to partake of the rotary movement of said spindle, and then to lock said valve plate to said spindle for rotation therewith into a position at right angles to the surface of the seating, and abutment means for preventing said plate from rotating beyond said position.

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

ZDENEK VENCL.

Witnesses:

JAN SEKYEKA,
RAUL VAMSKA.