

C. B. REDRUP.
COUNTERBALANCING DEVICE FOR VALVES.
APPLICATION FILED JUNE 15, 1911.

1,029,461.

Patented June 11, 1912.

Fig. 1.

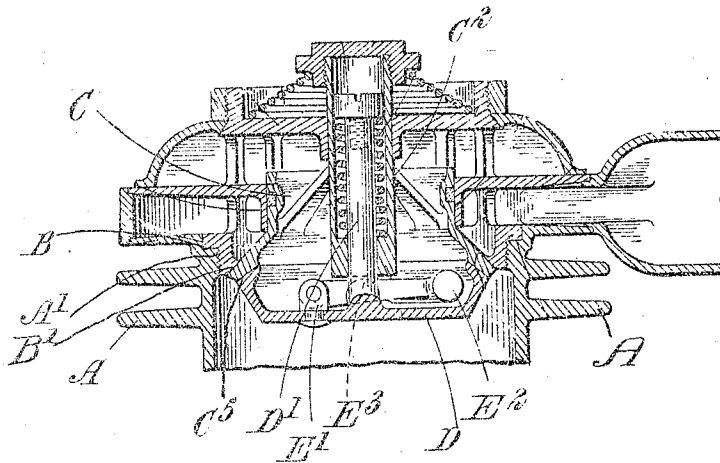
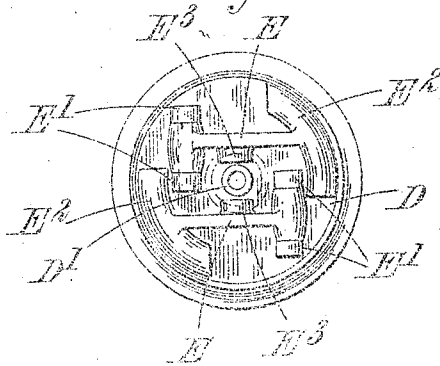


Fig. 2.



Witnesses
Edwin M. Bell

Inventor
C. B. Redrup
Attorneys: T. A. & J. W. Redrup
Washington, D. C.

UNITED STATES PATENT OFFICE.

CHARLES BENJAMIN REDRUP, OF CARDIFF, ENGLAND.

COUNTERBALANCING DEVICE FOR VALVES.

1,029,461.

Specification of Letters Patent.

Patented June 11, 1912.

Application filed June 15, 1911. Serial No. 633,336.

To all whom it may concern:

Be it known that I, CHARLES BENJAMIN REDRUP, a subject of the King of England, residing at Canton, Cardiff, county of Glamorgan, Wales, England, have invented certain new and useful Improvements in Counterbalancing Devices for Valves, of which the following is a specification.

The invention relates to a counter-balancing device for a valve for use with internal combustion engines of the rotating cylinder type.

According to the present invention there is employed with a suction valve recessed on one side, a counter-balance device mounted in the recess so that it may lie at the same distance from the axis of rotation as the valve and consequently be affected by centrifugal action in a degree properly proportioned to that operating upon the valve.

The invention further relates to various details of construction hereinafter fully described and whereof the novel features are pointed out in the claims.

In the drawings accompanying this specification which illustrate one method of carrying out this invention:—Figure 1 is a central section through the complete valve parallel with its axis of movement, and Fig. 2 is a plan of the suction valve.

Like letters indicate like parts throughout the drawings.

A represents an engine cylinder which is one of a group carried by a rotating crank-chamber. The cylinder is screw-threaded at A¹ to receive the screw-threaded end of a cylindrical casing B, which is provided with a seat B¹. Within the casing B is mounted a mechanically operated mushroom exhaust valve C adapted to seat at B¹ and having a central hollow guide C², in which is slidably mounted the stem D¹ of a suction inlet valve D which is adapted to seat on the seat C² formed on the valve C.

The valve D is recessed or dished on its upper side and in this recessed portion two arms E are mounted. One end of each arm is pivoted to ears E¹ fixed to the valve and the other end of each arm is weighted by a segmental portion E². On each arm is a lug E³ that lies opposite the base of the hollow guide C² of the valve C. The arms are so disposed that the weighted end of one lever is opposite the hinged end of the

other and the two segmental portions lie on opposite sides of the valve stem D¹.

The counter-balance device operates to insure that the valve D will always open under the same degree of suction. Where the counter-balance device is placed at some distance from the mass of the valve it is to control, it is difficult to so construct it as to properly control the valve at all speeds. By placing the weighted arms E, however, in a recessed portion of the valve they are equally affected with the valve by centrifugal action and therefore can be readily adjusted to properly counteract the centrifugal effect. By pivoting the two arms on the valve itself they can be firmly secured without interfering with the stem D¹ which is liable to be broken when these devices are pivoted to it, and as the arms tend to rise under centrifugal action the lugs E³ press against the end of the hollow guide C² which is fixed relatively to the seating of the valve D and is sufficiently stout to allow the levers to operate against it in this manner without damage.

What I claim as my invention and desire to secure by Letters Patent is:—

1. For internal combustion engines of the rotating cylinder type the combination with a suction valve recessed on one side, of a counter-balance device mounted in the recess for the purpose described.

2. For internal combustion engines of the rotating cylinder type the combination with a suction valve recessed on one side, of arms pivotally connected to the valve within the recess, for the purpose described.

3. For internal combustion engines of the rotating cylinder type the combination with a suction valve recessed on one side, of arms pivotally connected to the valve at opposite points within the recess and carrying weights at their free ends, substantially as described.

4. For internal combustion engines of the rotating cylinder type the combination with a suction valve recessed on one side, of arms pivotally connected to the valve at opposite points within the recess and carrying weights at their free ends, and means for limiting the centrifugal movement of the arms, substantially as described.

5. For internal combustion engines of the rotating cylinder type, the combination with a suction valve recessed on one side, of a

stem fixed to the valve, a hollow guide for the stem, arms having one of their ends pivotally connected to the valve and arranged in the recess, weights carried by the free ends of the arms, and lugs projecting from the arms and adapted to engage the guide for limiting the centrifugal movement of the arms, substantially as described.

6. For internal combustion engines of the rotating cylinder type the combination with a suction valve recessed on one side, of arms

pivotally connected to the valve at opposite points within the recess and carrying weights of segmental form at their free ends, substantially as described.

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

CHARLES BENJAMIN REDRUP.

Witnesses:

A. M. HAYWARD,
HARRY B. BRIDGES.