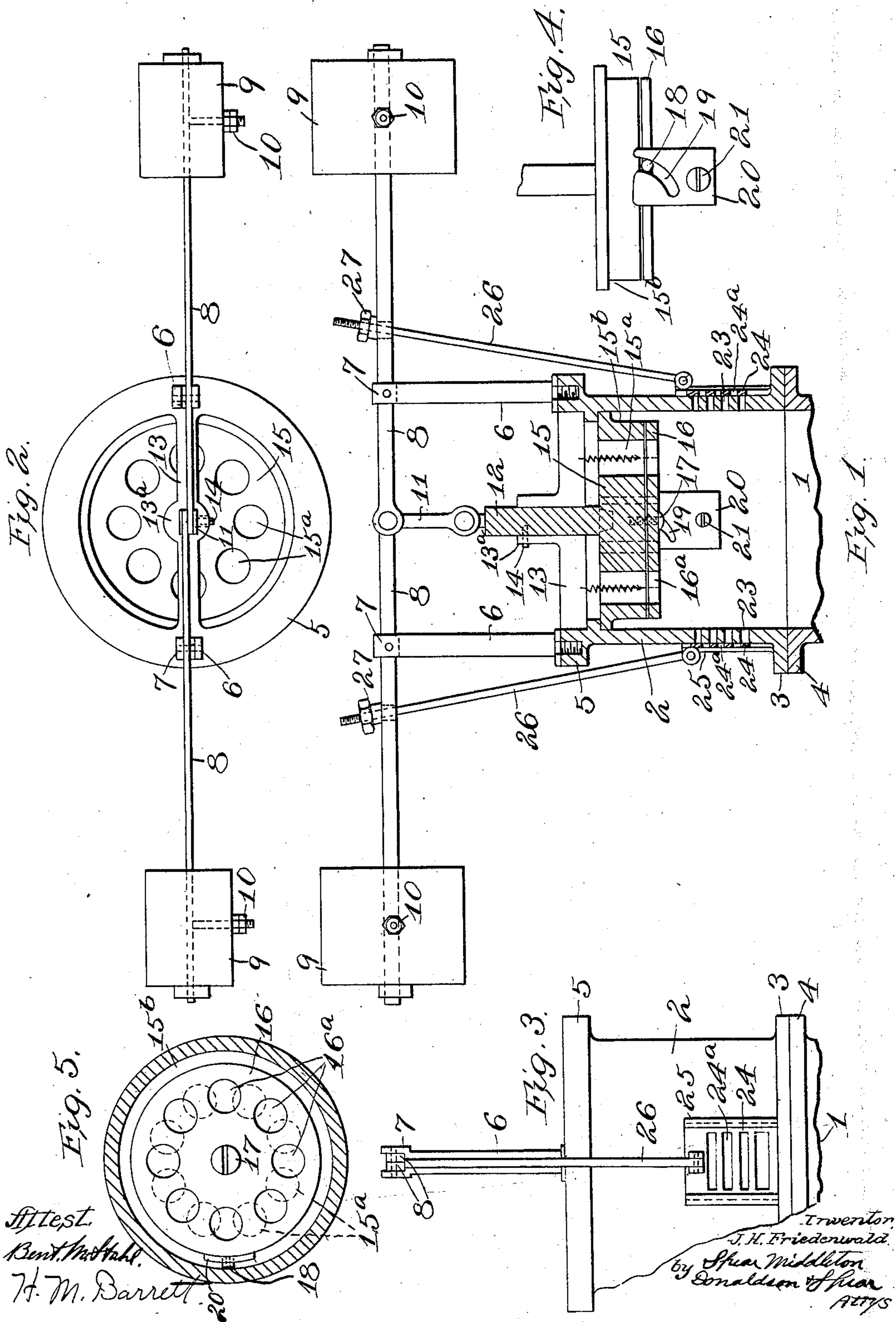


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 AUXILIARY AIR VALVE FOR CHARGE FORMING DEVICES.  
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# UNITED STATES PATENT OFFICE.

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AUXILIARY AIR-VALVE FOR CHARGE-FORMING DEVICES.

960,084.

Specification of Letters Patent.

Patented May 31, 1910.

Application filed January 3, 1910. Serial No. 536,246.

*To all whom it may concern:*

Be it known that I, JACOB H. FRIEDENWALD, citizen of the United States, residing at Baltimore, Maryland, have invented certain new and useful Improvements in Auxiliary Air-Valves for Charge-Forming Devices, of which the following is a specification.

My present invention relates to improvements in auxiliary air valves for charge forming devices, and has for its object to provide an extremely simple, durable, economical and efficient device for maintaining automatically the proper mixture.

The invention comprises the novel features of construction and arrangement and combination of parts hereinafter described and particularly set forth in the appended claims.

An embodiment of my invention is illustrated in the accompanying drawing, in which:

Figure 1 is a sectional elevation showing a portion of the air intake to a charge forming device or carbureter with my invention applied thereto; Fig. 2 is a plan view; Fig. 3 is a side elevation; Figs. 4 and 5 are views of details.

Referring by reference characters to this drawing, the numeral 1 designates the air intake of a charge forming device or carbureter which, as it may be of the ordinary or any desired construction except so far as relates to the air intake, need not be shown or described herein.

Upon the upper end of the air intake is mounted a cylindrical member 2 which may be provided with a flange 3 by which it may be bolted to the flange 4 of the mouth of the air intake.

Extending upward from the flange 5 at the top of the member 2 are a plurality of posts 6, preferably two, in the forked upper ends 7 of which are pivotally mounted levers 8 which carry at or near their outer ends weights 9. These weights are movable on the arms so as to be capable of longitudinal adjustment to suit conditions, any suitable means, such as lock nuts 10, being provided to hold them in their adjusted position.

The inner ends of the levers are connected by links 11 with a rod or plunger 12 which passes through an opening in the spider 13, which extends across the mouth of the air intake. The spider preferably

has an upwardly extending collar or flange 13<sup>a</sup> through which passes a pin 14 which engages a longitudinal groove in the plunger, thus forming a spline connection, resisting any tendency of the plunger to rotate.

To the lower end of the rod or plunger 12 is connected a head or piston 15 which accurately fits the interior of the air intake cylinder 2, and is provided with a plurality of openings 15<sup>a</sup>. A plate or disk 16 is rotatably secured to the bottom of the head or piston 15 by a screw 17 or the like, and this plate is provided with a plurality of openings 16<sup>a</sup> corresponding to the openings in the piston.

The plate or disk 16 has at one side a pin or projection 18 moving in a cam guide 19 carried by the cylinder, so that as the head and plate move vertically together rotary motion will be imparted to the plate by the engagement of the projection with this cam guide. A convenient manner of forming the cam guide is to provide the piston with a rabbet as indicated at 15<sup>b</sup> and form the cam guide in the shape of an inclined or curved groove in a plate 20 which is located more or less in said rabbet and secured to the inner wall of the cylinder by a screw 21.

The cylinder is provided at a plurality of points in its sides with ports or openings 23 over which are located vertically slidable plates or gates 24, also provided with openings 24<sup>a</sup>, these plates being guided by flanges or ribs 25 on the sides of the cylinder. These sliding plates are connected by links 26 with the weighted levers, the connection at one end of the links being made adjustable, as indicated at 27.

From the foregoing description it is thought the operation of the auxiliary air device will be readily apparent, but it may be briefly stated as follows: Under normal conditions, the action of gravity on the weights will cause them to descend as far as is permitted by the piston and sliding weights or gates, the parts resting in the position shown in Fig. 1. The parts are so arranged that when in this position only a minimum amount of air is admitted to the air intake. When, however, the suction in the air intake increases, as, for example, upon opening the throttle of an internal combustion engine to which the valve of the charge forming device is attached, this increase of suction draws the piston down, and as the piston descends, the revolving head is



given a rotary sliding movement on the face of the piston, bringing the ports of the plate more in alinement with the ports of the piston, and simultaneously the plates covering the openings of the cylinder are raised to bring the two sets of ports at the sides more into alinement, and thus admitting more air, the quantity of air admitted varying with the suction within the air intake.

10 Having thus described my invention what I claim is:

1. An auxiliary valve for charge forming devices comprising an air intake member having a part provided with an opening, an  
15 apertured plate mounted to have movement with relation to said part to vary the size of the opening, a weighted lever and a connection operating automatically under the suction of the piston to vary the size of the  
20 opening, substantially as described.

2. The combination with an air intake member of a charge forming device, of a cylindrical part having a piston mounted to move therein, a pivoted lever having one end  
25 connected to said piston and a weight carried upon the other end, a rotary plate carried by the piston, said piston and plate having ports or openings, and a pin and cam groove connection between the rotary plate  
30 and the cylindrical part, substantially as described.

3. In combination with an air intake of a charge forming device, an apertured piston adapted to reciprocate therein, posts extending  
35 upward from said cylinder part, a pair of levers pivotally mounted in the upper ends of said posts, and having their ends connected through links with said piston, weights carried by said levers, a rotary plate  
40 carried by said piston, said piston and plate having ports or openings, ports in the side walls of said cylindrical member, sliding plates having ports cooperating with said ports in the cylinder, and links connecting  
45 said sliding plates with the levers, substantially as described.

4. In combination with the air intake of a charge forming device, a cylindrical member,

a piston mounted to move therein and having a rabbet, a rotary plate mounted on said  
50 piston, said piston and said plate having cooperating ports, a plate secured to the inner wall of the cylindrical member, and projecting into the rabbet of the piston, and having an inclined guideway, a pin carried by the  
55 rotary plate engaging said guideway, and yielding means for holding the piston normally elevated, substantially as described.

5. In combination a cylindrical member having a spider at its outer end, a plunger  
60 guided in said spider and having a splined connection therewith, a piston carried by said plunger within the cylindrical member, a plate rotatably mounted upon the piston, said piston and plate having cooperating  
65 ports, means whereby the vertical movement of the piston effects rotary movement of the plate, a pair of oppositely extending levers having their inner ends linked to said  
70 plunger, and weights carried by the outer ends of said levers, substantially as described.

6. In combination a cylindrical member having a spider at its upper end, a plunger  
75 guided in said spider and having a splined connection therewith, a piston carried by said plunger within the cylindrical member, a plate rotatably mounted upon the piston, said piston and plate having cooperating  
80 ports, means whereby the vertical movement of the piston effects rotary movement of the plate, a pair of oppositely extending levers having their inner ends linked to said  
85 plunger, said cylindrical member having ports in its sides, sliding plates having apertures cooperating with said last-named ports, and links connecting said plates with the levers between their pivot points and the weights, substantially as described.

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

JACOB H. FRIEDENWALD.

Witnesses:

O. STANLEY BLOGER,  
ETHEL KING.