March 16, 1926. 1,576,524

J. A. MARK

VALVE

Filed May 9, 1925

Fig. 1.

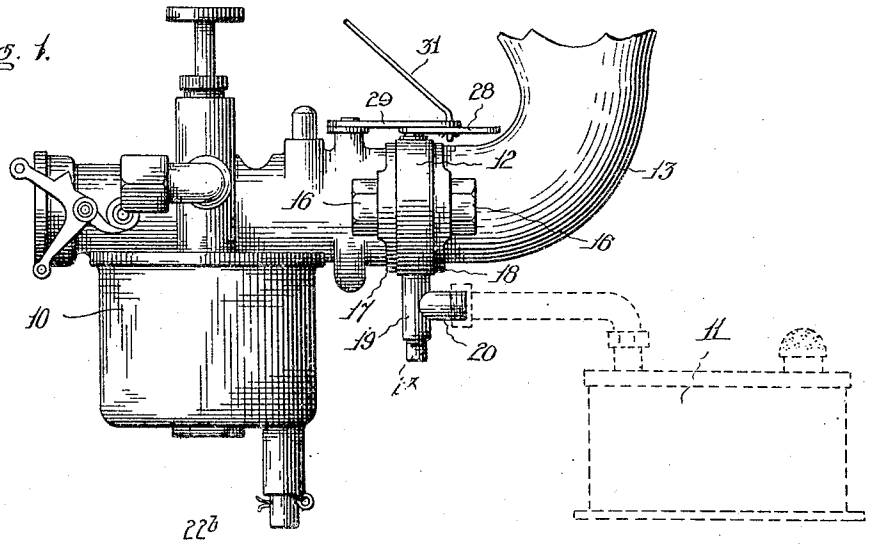


Fig. 2.

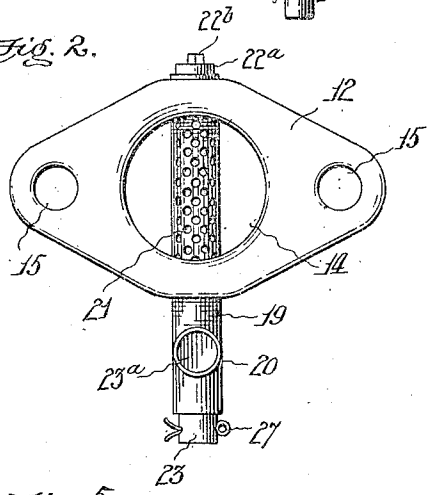


Fig. 3.

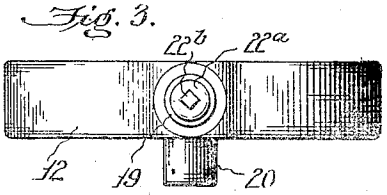


Fig. 4.

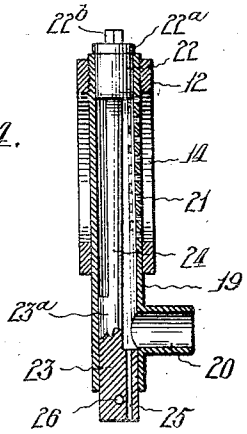
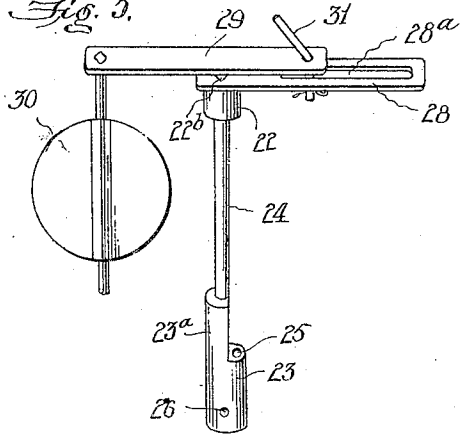


Fig. 5.



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UNITED STATES PATENT OFFICE.

JAMES A. MARK, OF MADISON, KANSAS.

VALVE.

Application filed May 9, 1925. Serial No. 29,189.

To all whom it may concern:

Be it known that I, JAMES A. MARK, a citizen of the United States, residing at Madison, in the county of Greenwood and State of Kansas, have invented certain new and useful Improvements in Valves, of which the following is a specification.

My invention is an improvement in valves of that particular type which are employed in connection with the manifold intake pipe of internal combustion engines for the purpose of admitting an additional quantity of air to the mixture from the carbureter.

The primary object of my invention is to provide a valve of this general type which in the present instance is especially adapted for use in connection with a tank through which the air passes on its way to the valve and intake pipe, and which may be used independently of the tank as a simple air-intake valve.

A further object of my invention is to provide an improved form of valve connected to the means for operating the damper in the supply pipe so as to be operated in conjunction therewith; the particular construction of the valve forming an effective means for admitting the required amount of air, or an admixture of air and gas from the tank, to effect an economy in the running of the engines as well as produce a more efficient mixture or charge.

With these principal objects in view my invention contemplates a form of valve comprising a tubular casing having an inlet opening at its lower end and discharge apertures through one side thereof, in connection with a turning plug formed of end members closing the ends of the casing and a stem connecting said members; the plug-member at the lower end of the casing being cut away at one side on a line with the inlet to cooperate therewith in opening and closing the valve; all as hereinafter particularly described and more specifically set forth in the appended claims.

In the accompanying drawings:—

Figure 1 is a side elevation illustrating the application of my invention in connection with a carbureter.

Fig. 2 is a front view of the valve, including the coupling by which it is attached between the carbureter and manifold.

Fig. 3 is a plan view thereof.

Fig. 4 is a vertical sectional view through the valve and coupling, and

Fig. 5 is a perspective view of the valve-plug and means for operating the same.

As Figure 1 of the drawings is principally for the purpose of illustrating the application of my invention it will be understood that the carbureter, 10, is of a well known or conventional type, and that the tank 11, indicated by dotted lines, is employed in some instances to charge the air with a chemical or gas before it reaches the valve for admission to the manifold intake pipe.

In carrying out my invention the valve, hereinafter particularly described, is carried by a coupling 12 interposed between the carbureter 10 and manifold intake pipe 13, said coupling being of an ordinary form or a thick plate elongated in shape with a central opening 14 therethrough and holes 15 at its ends, the latter receiving the bolts, as 16, by which said coupling is attached to the flanges 17 and 18 on the adjoining ends of the carbureter and intake pipe respectively. The central opening through the coupling corresponds in size with the contiguous openings in the carbureter and intake pipe, and in the present instance the tubular casing 19 of my improved valve extends diametrically through this opening and also through the upper and lower ends of the coupling with the lower portion of said casing depending below the coupling and provided with an inlet at one side in the form of a tubular branch or coupling member 20. The tubular casing is passed upwardly through the coupling and threaded through the opening in the upper end thereof, as illustrated in Fig. 4, to securely connect the parts together, and that part of said tubular casing which is located in the opening through the coupling is provided with a plurality of discharge apertures 21 in the side thereof towards the manifold intake pipe so that the valve will discharge in the direction of the flow from the carbureter. The valve-plug consists of end members or plugs 22 and 23 connected by a stem 24, and is rotatable in the valve-casing, said end members or plugs closing the upper and lower ends of the casing, with the upper part of the member or plug 23 cut away at one side on a line with the inlet-opening 20 so that in open position of the valve the air may pass into the casing between the plug-members and be discharged through the apertures 21; that portion, as 23ª, of

the upper part of the plug-member 23 not cut away serving to close the inlet when the rotatable plug is turned from the position shown in Fig. 4. To provide an air-inlet independent of the inlet-opening 20 which will feed air through the valve irrespective of the position of the valve-plug with respect to said inlet-opening there is a small passage 25 extending longitudinally through the plug-member 23 from the lower end thereof, said passage opening into the casing at the upper end of the reduced portion of said plug-member. To retain the valve-plug seated within the tubular casing the lower plug-member thereof is extended below said casing and the extension provided with a transverse aperture 26 to receive a cotter-pin 27; it being noted by reference to Fig. 4 that the upper plug-member is provided with an integral collar 22^a bearing on the upper end of the tubular casing, and this plug-member is also provided with an upwardly-projecting squared boss 22^b to which the valve-operating arm 28 is attached.

The valve hereinbefore described is operated by the rod 31 which operates the shutter 30 in the pipe leading from the body of the carbureter 10, and for this purpose the arm 28 attached to the rotatable valve-plug is provided with an elongated slot 28^a through which the lower end of the rod 31 is extended from the operating-arm 29 attached to the shutter; whereby the valve and shutter will be operated simultaneously; that is to say when the shutter or damper 30 is opened and closed by manipulation of the rod 31 the valve will be likewise opened and closed, being adjusted so that the suction through the valve will feed the required amount of air or chemically-charged air from the tank with relation to the flow governed by the damper.

As hereinbefore stated the valve is particularly adapted for use in connection with a chemical tank through which the air is drawn by suction and delivered to the inlet opening 20 passing therefrom into the valve-casing from which it is discharged or sprayed through the apertures 21 into the mixture from the carbureter so as to thoroughly commingle therewith, the passage 25 through the lower plug-member 23 at the same time feeding a small supply of cool air from the atmosphere into the valve. In this manner the efficiency of the gas mixture or charge to the engines is increased at a saving of fuel or a more economical operation, and there is also a direct cooling effect on the engines with a decrease in the formation of carbon. It will be understood, of course, that the tank will contain oils or suitable chemicals which will permeate the air as it is drawn by suction through said tank on its way to the valve which serves to effectually discharge or spray the supplemental elements into the mixture from the carbureter.

I claim:—

1. A valve for use in connection with a tank to supply a supplemental charge to the mixture from the carbureter comprising a coupling having an opening registering with the manifold intake pipe, a tubular valve-casing extending through the coupling and having a plurality of apertures in one side thereof discharging into the manifold intake pipe, connections between the tank and valve, and a turning plug consisting of plug-members closing the ends of the tubular casing and a stem connecting said plug members, one of said plug-members being cut away on a line with the inlet opening in the valve-casing.

2. A valve for use in connection with a tank to supply a supplemental mixture to the mixture from the carbureter, comprising a coupling having an opening registering with the manifold intake pipe, a tubular valve-casing extending through the coupling and having a branch beyond the coupling and a plurality of apertures in the body portion thereof discharging into the manifold intake pipe and a turning plug within the tubular casing consisting of plug-members closing the ends thereof and a stem connecting said plug-members, one of the plug-members being cut away at one side on a line with the aforesaid branch to provide for opening and closing the inlet opening to the valve and having an extra air-passage leading from the atmosphere into the valve; together with means for operating the valve simultaneously with the damper in the pipe of the carbureter.

3. A valve attachment for the manifold intake pipe of an internal combustion engine comprising a coupling adapted to be interposed between the carbureter and manifold and having an opening therethrough on a line with said manifold, a tubular valve casing extending through the coupling and having an inlet-opening beyond the coupling and a plurality of apertures in the body thereof discharging into the manifold intake pipe, and a turning plug within the tubular casing consisting of plug-members closing the ends thereof and a stem connecting said plug-members, one of the plug-members being cut away at one side on a line with the inlet opening and having an extra air-passage leading from the atmosphere into the valve; together with an operating-arm attached to one end of the turning-plug.

JAMES A. MARK.