

G. J. DORMAN.
CARBURETER.
APPLICATION FILED MAR. 24, 1909.

985,515.

Patented Feb. 28, 1911.

2 SHEETS—SHEET 1.

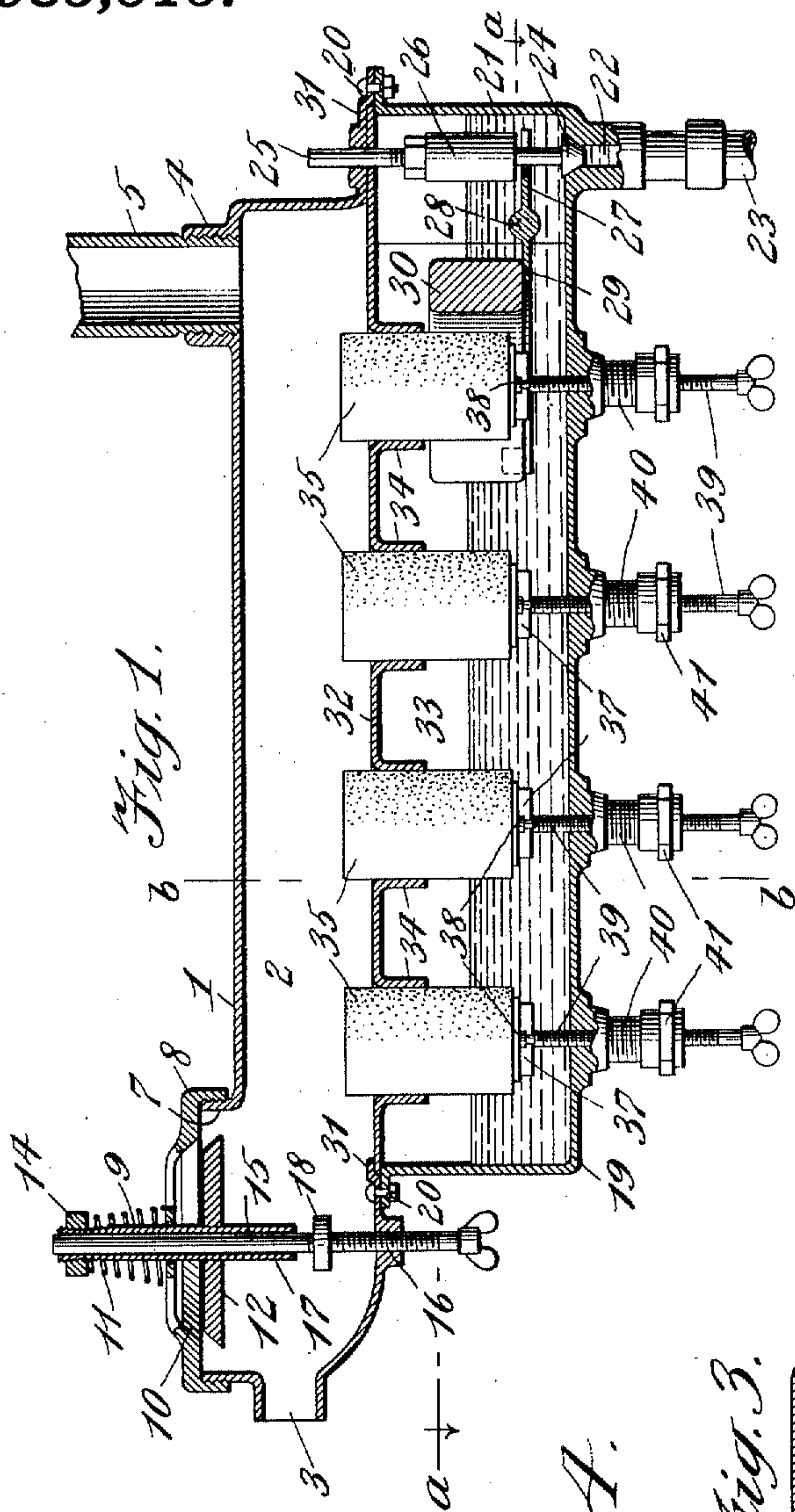


Fig. 1.

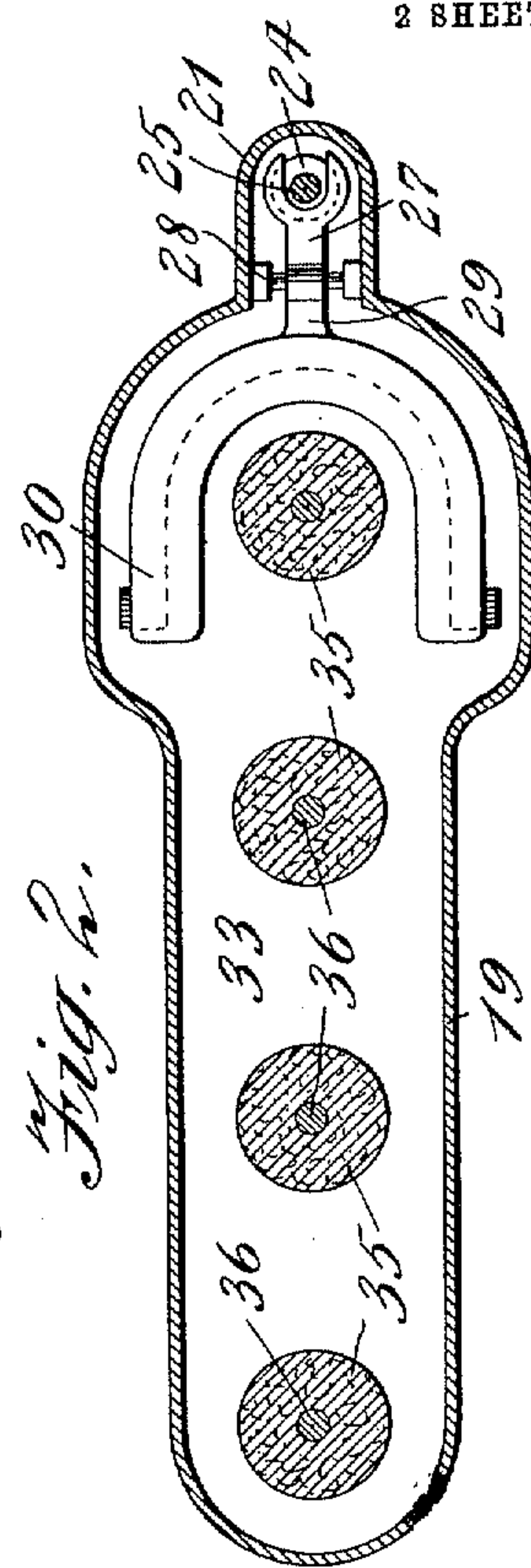


Fig. 2.

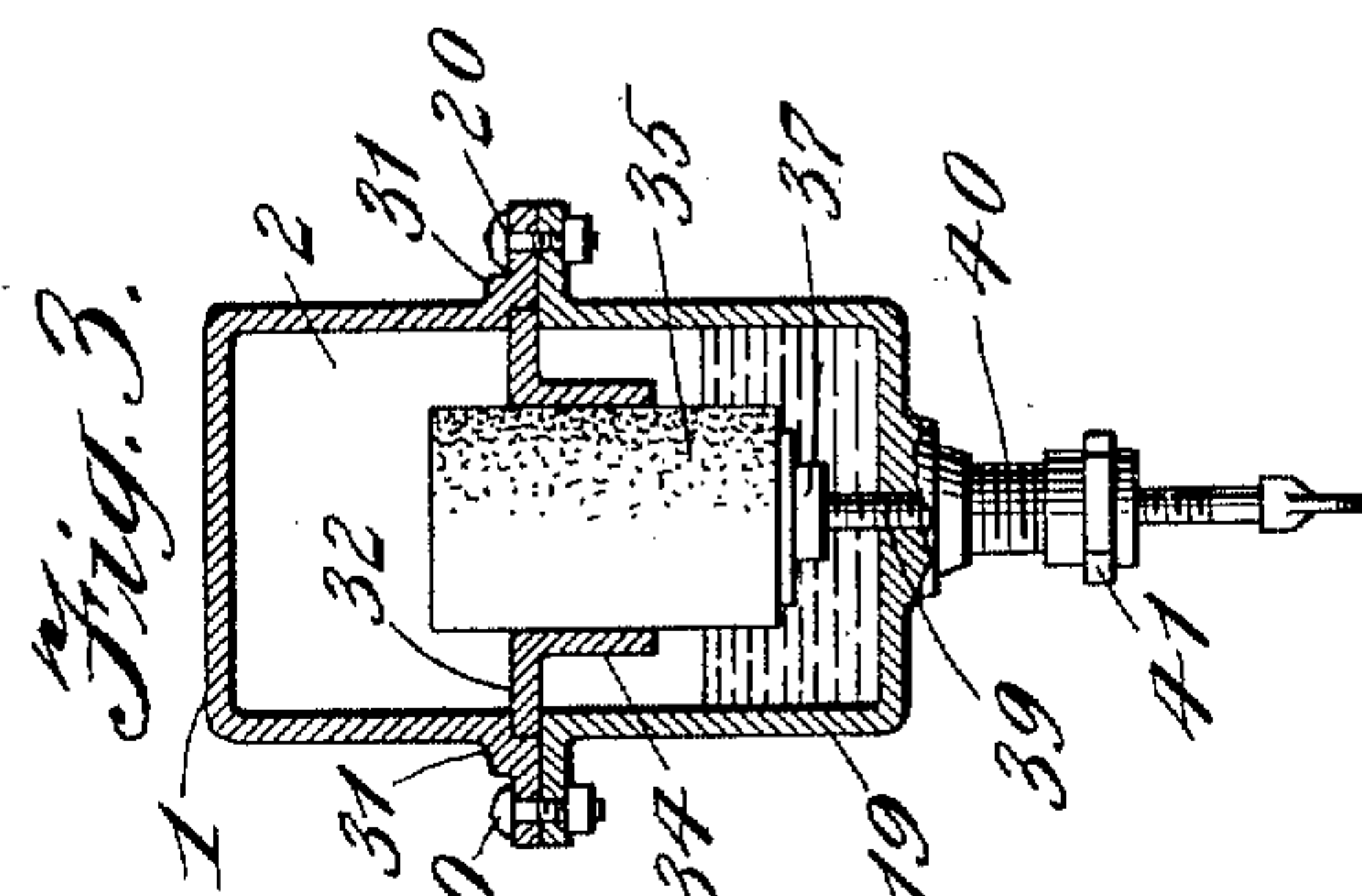


Fig. 3.

Fig. 4.



WITNESSES

Geo. C. Cheney
A. F. Connell

INVENTOR

Gerald J. Dorman

BY

W. H. Dwyer
ATTORNEYS

G. J. DORMAN.

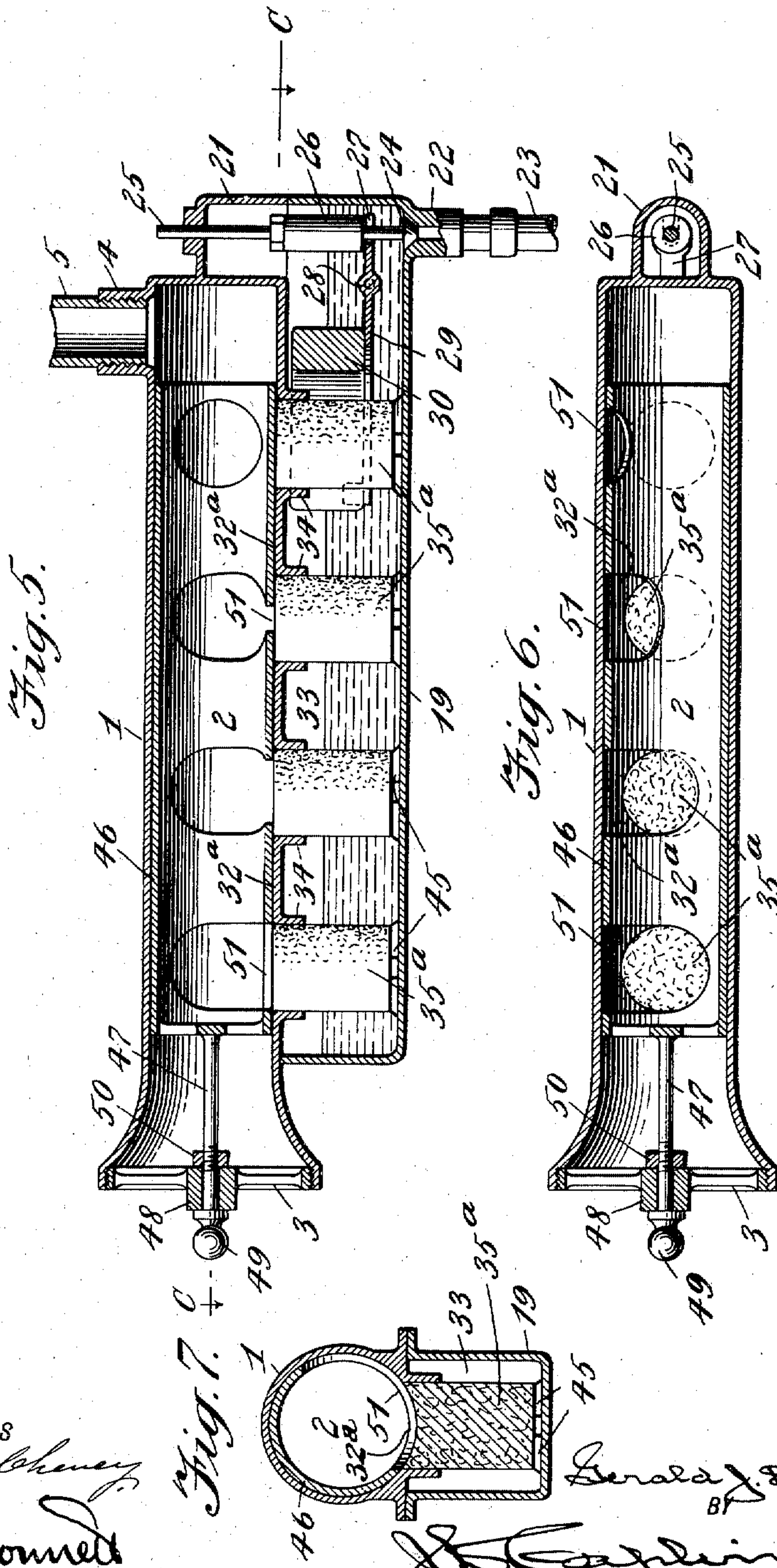
CARBURETER.

APPLICATION FILED MAR. 24, 1909.

985,515.

Patented Feb. 28, 1911.

2 SHEETS—SHEET 2.



WITNESSES
Geo. L. Cheney
A. F. Connel

INVENTOR
Gerald J. Dorman
 BY *[Signature]*
 ATTORNEYS

UNITED STATES PATENT OFFICE.

GERALD J. DORMAN, OF BROOKLYN, NEW YORK.

CARBURETER.

985,515.

Specification of Letters Patent.

Patented Feb. 28, 1911.

Application filed March 24, 1909. Serial No. 485,518.

To all whom it may concern.

Be it known that I, GERALD J. DORMAN, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain Improvements in Carbureters, of which the following is a specification.

This invention relates to certain improvements in carbureters or vaporizers, and more particularly in that class of such devices which are adapted for use in connection with internal combustion engines, and the like, for producing a combustible gas or mixture for operating the same, and the object of the invention is to produce a carbureter or vaporizer of this general character of a simple and comparatively inexpensive nature, and of a light and compact structure, by means of which a substantially perfect or complete vaporization of the fuel is attainable, whereby greater economy in the consumption of fuel, and material advantages in the operation of the engine in connection with which the improved carbureter or vaporizer is employed, are assured.

The invention consists in certain novel features of the construction, and combinations and arrangements of the several parts of the improved carbureter or vaporizer, whereby certain important advantages are attained, and the device is rendered simpler, less expensive and otherwise better adapted and more convenient for use, all as will be hereinafter fully set forth.

The novel features of the invention will be carefully defined in the claims.

In order that my invention may be the better understood, I will now proceed to describe the same with reference to the accompanying drawings, which serve to illustrate several forms of carbureter or vaporizer embodying my improvements, wherein—

Figure 1 is a vertical section taken longitudinally or axially through one form of the carbureter embodying my improvements; Fig. 2 is a sectional plan view taken horizontally through the carbureter illustrated in Fig. 1, the plane of the section being illustrated by the line *a—*a** in Fig. 1; Fig. 3 is a sectional view taken transversely and vertically through the device in the plane indicated by the line *b—*b** in Fig. 1; Fig. 4 is an enlarged detail view, partially in section showing one of the absorbent fuel conductors comprised in the improved carbureter; Fig. 5 is a vertical sectional view

somewhat similar to Fig. 1, but illustrating another formation of the improved carbureter according to my invention; Fig. 6 is a horizontal section taken longitudinally through the mixing chamber of the carbureter shown in Fig. 5, the plane of the section being indicated by the line *c—*c** in said figure, and Fig. 7 is a transverse section taken vertically through the carbureter shown in Figs. 5 and 6.

Referring first to Figs. 1 to 4, I have therein shown my improved carbureter provided with a metallic casing or shell comprising an upper part or member 1, wherein is produced an elongated mixing chamber 2 which is horizontally directed and adapted for the flow of air for admixture with the fuel vapor as will be hereinafter explained, the said upper part or member 1 having at one end an air inlet 3 through which a constant air supply is admitted to said mixing chamber 2 in a well known way and having its opposite end provided with an upwardly directed nipple 4 adapted to receive a pipe connection 5 leading to the engine, so that the suction of the engine may be exerted through said mixing chamber in a well known way for drawing the fuel charge into the combustion chamber of the engine. At the end of the upper part or member 1 whereat the air inlet 3 is located is produced an auxiliary air admission port or inlet 7, which is adapted for the admission to the mixing chamber 2 of a variable auxiliary air supply for admixture with the fuel vapor within said mixing chamber, the said auxiliary air supply being varied in unison with the requirements of the engine according to the suction exerted within said mixing chamber during operation. The means for variably controlling such auxiliary air supply herein shown comprises a spider 8 extended across the port or inlet 7 and having screw connection with the casing member 1, and a valve 12 within the end of the chamber 2, and normally drawn upward into closing engagement upon a seat 10 produced around the spider 8, said valve 12 being provided with an upwardly directed tubular stem 9, which is engaged for sliding movement through a bearing at the center of the spider 8 and has its upper end screw-threaded for engagement with an adjusting nut 14, a spring 11 coiled around the upwardly extended extremity of the stem 9 having its lower end engaged upon the spider and its

upper end engaged beneath the said nut 10 so that its tension may be conveniently adjusted by means of said nut in order that the pressure with which the valve is held to its seat may be controlled. 15 represents a guide pin or member which is extended upwardly through the bore of the tubular valve stem 9 so as to guide the valve during its vertical movements, and this guide pin 10 has at its lower end screw-threaded engagement, as shown at 16 with the lower wall of the casing member 1 and is provided with a handle outside the casing whereby it may be conveniently turned in order that said 15 guide pin may be vertically adjusted within the chamber 2, and said guide pin is provided within said chamber 2 with an annular enlargement or shoulder 18, which is adapted for engagement with the lower end 20 of a pendent extension 17 of the valve stem in order that the descending or opening movement of the valve 12 may be conveniently limited, the vertical adjustability of the guide pin 15 permitting the extent of 25 permitted opening of the said valve to be conveniently varied. The shell or casing of the device, as shown in these views also comprises a lower part or member 19, adapted to be joined with the upper part or member 30 1, the said parts or members being provided with similar outwardly directed flanges extended around their meeting edges and adapted to be fitted flush one upon the other and connected by means of bolts or the like 35 fastenings, as clearly shown at 20 in the drawings, and at one end, the said lower casing member or part 19 is provided with a reduced valve chamber 21, at the lower part of which is arranged a nipple 22 wherewith 40 a fuel supply pipe 23 is adapted for connection, a fuel passage being produced through said nipple so that the fuel from the pipe 23 is adapted to be admitted to the valve chamber 21 under control of a valve 24 which is 45 adapted to seat itself, when moved downwardly, upon a valve seat produced around the oil inlet at the lower part of the valve chamber 21 in a well known way. This valve 24 has an upwardly directed stem 25 50 the upper end of which is guided in the upper part of the valve chamber 21 and has its extremity extended outside the same so that the valve may be cleared when necessary. The valve stem 25 also carries a vertically adjustable stop or enlargement 26, 55 having screw connection therewith, and beneath the shoulder afforded at the underside of said stop 26 is engaged the forked end 27 of a float lever pivoted at 28 and 60 having its opposite end 29 connected with a float 30 arranged for vertical movement within a float chamber produced at one end of the lower casing member 19 and herein shown as formed by widening that end of 65 said member 19, the arrangement of the

parts being such that the fuel from the supply pipe 23 is admitted to the interior of the fuel chamber 33 within the lower casing member until such time as the rising of said float permits the valve 24 to resume its seat 70 and thereby cut off further supply of fuel until such time as the fuel level within the fuel chamber falls sufficiently to permit the valve to be again opened by the descent of the float 30. By this arrangement of the 75 parts, to which I make no claim herein, a substantially constant level of the fuel is maintained at all times within the fuel chamber, and such level is capable of variation at will by merely adjusting the collar 80 26 vertically along the valve stem 25.

The lower part of the upper casing member 1 is provided around its flanged portion adjacent to the member 19 with an inwardly directed seat or chamfer 31, wherein is 85 adapted to be engaged the marginal portion of a partition or diaphragm 32, which is horizontally extended across the device and affords a division between the mixing chamber 2 within the upper casing member, and 90 the fuel chamber 33 within the lower casing member 19, and when the parts are assembled, as shown in Figs. 1 and 3, the upper edge portion of the lower casing part 19 95 has engagement beneath said marginal portion of the partition or diaphragm 32 in such a way as to hold the same securely in position within said seat or chamfer 31. If desired, a suitable packing may also be held 100 in the joint between the parts so as to prevent leakage of fuel therethrough in case the device be exposed to jolting as when used upon an automobile or other vehicle.

As shown in Figs. 1 and 3, the partition or diaphragm 32 is provided at suitable intervals along the length of the device, with 105 a plurality of circular openings, and with annular flanges 34, 34 pendent from its lower surface and surrounding said openings, and affording passages communicating 110 between the mixing chamber 2 of the upper casing member, and the fuel chamber 33 within the lower casing member 19, and 35, 35 represent a plurality of cylindrical plugs or conductors, herein shown as formed from 115 absorbent felted material, which are capable of vertical sliding movement within the passages produced within the flanges 34, 34, and which serve, as will be hereinafter explained, to conduct the liquid fuel by capillary action, from the fuel chamber 33 120 within the lower casing member to the mixing chamber 2 within the upper casing member 1, so that such fuel may be exposed to the air drawn through said mixing chamber 125 during suction of the engine in order to assure effective vaporization of the fuel and its admixture with the air supply, the upper surfaces of said fibrous or absorbent conductors 35, 35 being exposed to such an 130

extent as may be necessary, to the air supply in chamber 2 according to the requirements of the engine.

I have herein shown the improved carbureter provided with means for conveniently adjusting the plugs or conductors 35, 35 vertically within the mixing chamber in order that the extent to which the fuel is exposed to the air supply may be varied according to the requirements of use, and where such plugs or conductors are formed from fibrous or felted substance, it is desirable that they be reinforced in some manner in order to prevent them from being compressed and to insure effective adjustment thereof, for which reasons I have herein shown the plugs or conductors provided with screws 36 extended axially through them, such screws having deep threads engaged within the fibrous or felted substance so as to afford an effective reinforcement for the same, and having their lower extremities connected with collars or enlargements 37 arranged beneath the conductors or plugs and having undercut apertures 38, open at their sides for the introduction of enlargements at the upper ends of stems 39 pendent beneath the several plugs or conductors in axial alinement therewith, and having their lower parts screw-threaded for engagement with nipples 40 at the lower part of the lower casing member 19, their lower extremities being passed through stuffing boxes 41 at the lower ends of said nipples 40, and provided with handles whereby they may be conveniently turned for effecting the vertical adjustment of the plugs or conductors 35, 35 within the annular flanges 34, 34 of the partition or diaphragm 32.

By this arrangement a detachable connection is afforded between the stems 39, 39 and the collars 37, 37 at the lower ends of the plugs or conductors 35, 35, so that the latter may be conveniently detached from their stems for purposes of repair or cleaning when the casing members are separated, and the construction is also such as permits of convenient adjustment of the plugs or conductors so that their lower ends may dip to any desired depth within the fuel in the fuel chamber 33 while their upper ends are capable of being exposed to any desired extent to the air supply flowing through the mixing chamber 2 of the upper casing member, effective control of the proportions of fuel and air being thereby possible. Where the plugs or conductors are adjusted to an extreme upper position, the adjustment of the collar 26 upon the valve stem 25 may be utilized to insure a proper depth of the fuel around the lower ends of said plugs.

In the practical use of the device, the air being drawn through the mixing chamber 2 of the upper casing member by the suction exerted during operation of the engine, is

brought into intimate contact with the fuel elevated by capillary action from the fuel chamber 33 within the lower casing member, and exposed upon the surfaces of the plugs or conductors 35, 35 within the mixing chamber so that a substantially perfect vaporization of the fuel is insured, and the carrying of unvaporized fuel into the combustion chamber of the engine under the suction exerted thereby is effectively prevented, the valve 12 opening at each draft from the combustion chamber in order to assure such an air supply as may be necessary for proper dilution of the fuel charge.

In Figs. 5, 6 and 7 I have shown another formation of carbureter or vaporizer embodying my improvements wherein the upper casing member 1 is made in tubular form, so that its lower side affords a partition or diaphragm 32^a in lieu of the corresponding part shown in the preceding views, for separating the tubular mixing chamber 2 of the upper member from the fuel chamber 33 of the lower casing member 19, the said lower side of the upper casing member being perforated with a series of circular apertures and being provided with pendent annular flanges 34, 34 surrounding the same and adapted to be directed within the fuel chamber when the parts are assembled, so as to permit the passage through them of the cylindrical fibrous or absorbent plugs or conductors 35^a, 35^a, the upper surfaces of which are adapted to be extended flush with the wall of the chamber in member 1 so that the fuel elevated thereby may be vaporized by contact of the air supply thereon, while their lower ends are adapted to dip within the fuel supplied to the fuel chamber 33, being supported above the bottom of the fuel chamber upon ribs or projections 45, which insure contact of the fuel at the undersides of said plugs or conductors. Within the cylindrical bore of the upper casing member 1 is provided a cylindrical hollow or tubular valve 46, adapted to fit accurately to the walls of the casing member, and the internal hollow or bore of this valve member 46 forms the mixing chamber 2 through which the air is drawn from the air inlet 3 during the suction exerted by the engine. One end of said valve has connection with a stem 47, axially alined therewith and arranged for turning movement within a bearing 48 at the center of a spider extended across the air inlet 3, the inner part of said stem having a shoulder 50 engaged upon the inner part of said bearing to prevent endwise movement of the valve in one direction, and the outer part of the stem being provided with a handle or enlargement 49 by means of which the valve may be conveniently turned or adjusted, the said handle or enlargement having engagement upon the outer side of the bearing 48 so as to pre-

vent endwise movement of the valve in a reverse direction. The valve member 46 is provided in its walls with a series of apertures or ports 51, 51, which, when the said valve member is turned are adapted to be moved in and out of registry with the apertures through which the upper surfaces of the plugs or conductors 35^a, 35^a are exposed at the lower side of the upper casing member, whereby it will be seen that by turning said valve member the fuel exposed for vaporization may be effectively controlled and regulated. These ports or apertures 51, 51 are herein shown as made of graduated sizes, measured around the periphery of the valve member, and their corresponding ends are in staggered or spiral relation at one side of the valve member, being inclined to the length thereof, as clearly shown in Figs. 5 and 6 so that they may be successively moved in and out of registry with the upper ends of the plugs or conductors 35^a, 35^a during the turning of the valve member, whereby a convenient and effective regulation of the exposure of the plugs or conductors to the air supply may be attained.

From the above description it will be seen that the carbureter or vaporizers constructed according to my invention are of an extremely simple and comparatively inexpensive nature and are particularly adapted for use by reason of the substantially perfect or complete vaporization of the charge attainable in practice, and of the convenience with which the proportions of fuel and air may be varied to meet the varying requirements of service, and it will also be obvious from the above description that the device is susceptible of considerable modification without material departure from the principles and spirit of the invention, and for this reason I do not desire to be understood as limiting myself to the precise formation and arrangement of the several parts herein set forth in carrying out my invention in practice.

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

1. A carbureter having a mixing chamber for the passage of air, a chamber to contain liquid fuel, a perforated part extended between said chambers and provided with a pendent flange surrounding its perforation, a solid absorbent conductor extended between said chambers dipping within the

liquid fuel and capable of operation to convey such fuel from the fuel chamber to the mixing chamber, said conductor being accommodated within the bore provided by the pendent flange and a support for the absorbent conductor carried by the floor of the fuel chamber contacting with the end surface of the conductor within the fuel chamber to permit circulation of the fuel beneath the absorbent conductor.

2. A carbureter having a mixing chamber for the passage of air, a chamber to contain liquid fuel, a perforated part extended between said chambers and provided with a pendent flange surrounding its perforation, a solid absorbent conductor extended between said chambers dipping within the liquid fuel and capable of operation to convey such fuel from the fuel chamber to the mixing chamber, said conductor being accommodated within the bore provided by the pendent flange and projections carried by the walls of the fuel chamber contacting with the end surface of the absorbent conductor within the fuel chamber to permit circulation of the fuel beneath the absorbent conductor.

3. A carbureter having a mixing chamber for the passage of air, a chamber to contain liquid fuel, a perforated part extended between said chambers and provided with a pendent flange surrounding its perforation, a solid absorbent conductor extended between said chambers dipping within the liquid fuel, and capable of operation to convey such fuel from the fuel chamber to the mixing chamber, said conductor being accommodated within the bore provided by the pendent flange and a support for the absorbent conductor carried by the floor of the fuel chamber contacting with the end surface of the conductor within the fuel chamber to permit circulation of the fuel beneath the absorbent conductor, and a valve member movable in the mixing chamber and having a port adapted for registry with the perforation of the part extended between the chambers.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

GERALD J. DORMAN.

Witnesses:

A. F. CONNETT,
J. D. CAPLINGER.