

No. 863,516.

PATENTED AUG. 13, 1907.

W. E. DOWNING.

CARBURETER.

APPLICATION FILED NOV. 16, 1905.

Fig. 1.

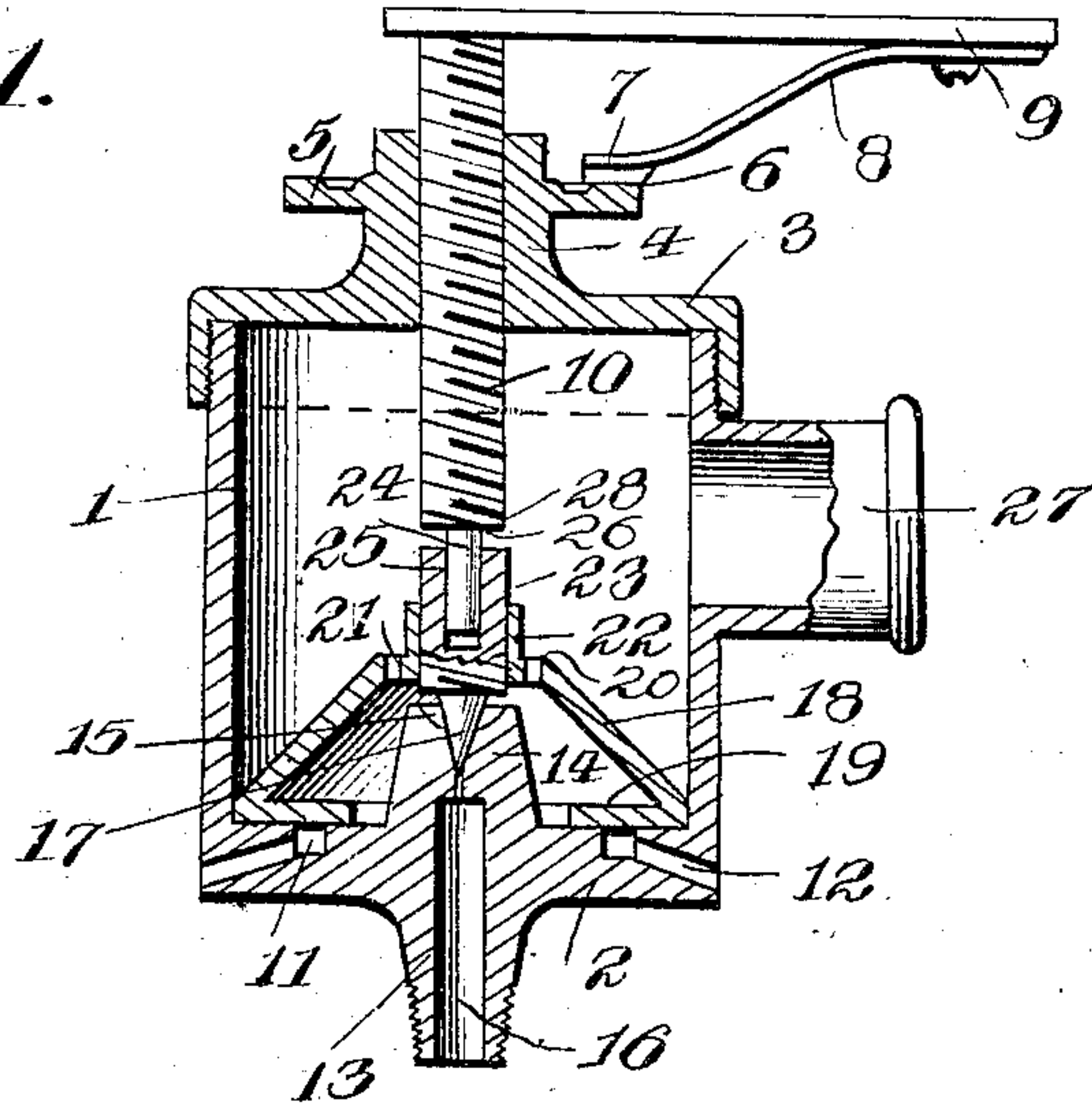


Fig. 2.

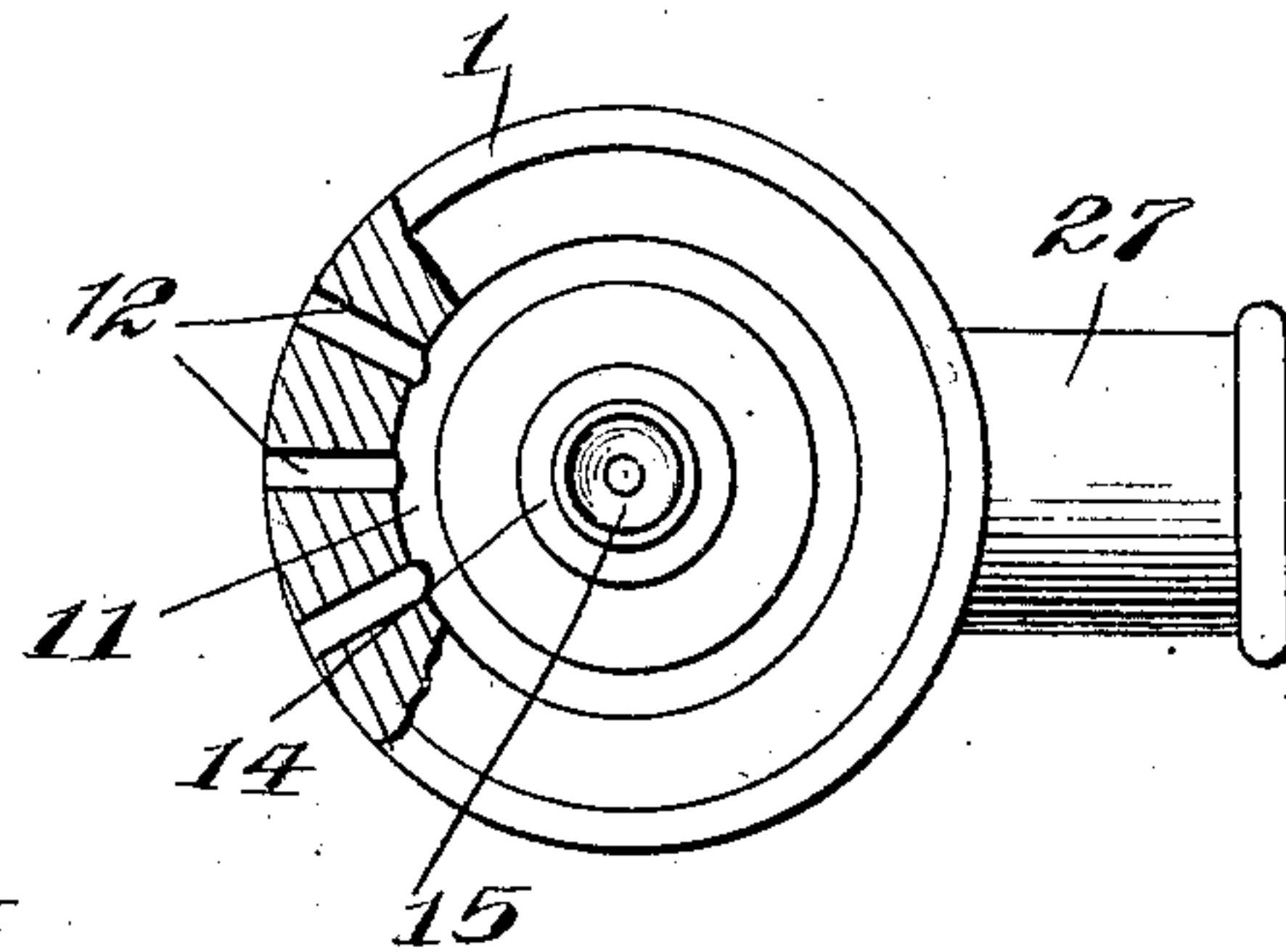


Fig. 3.

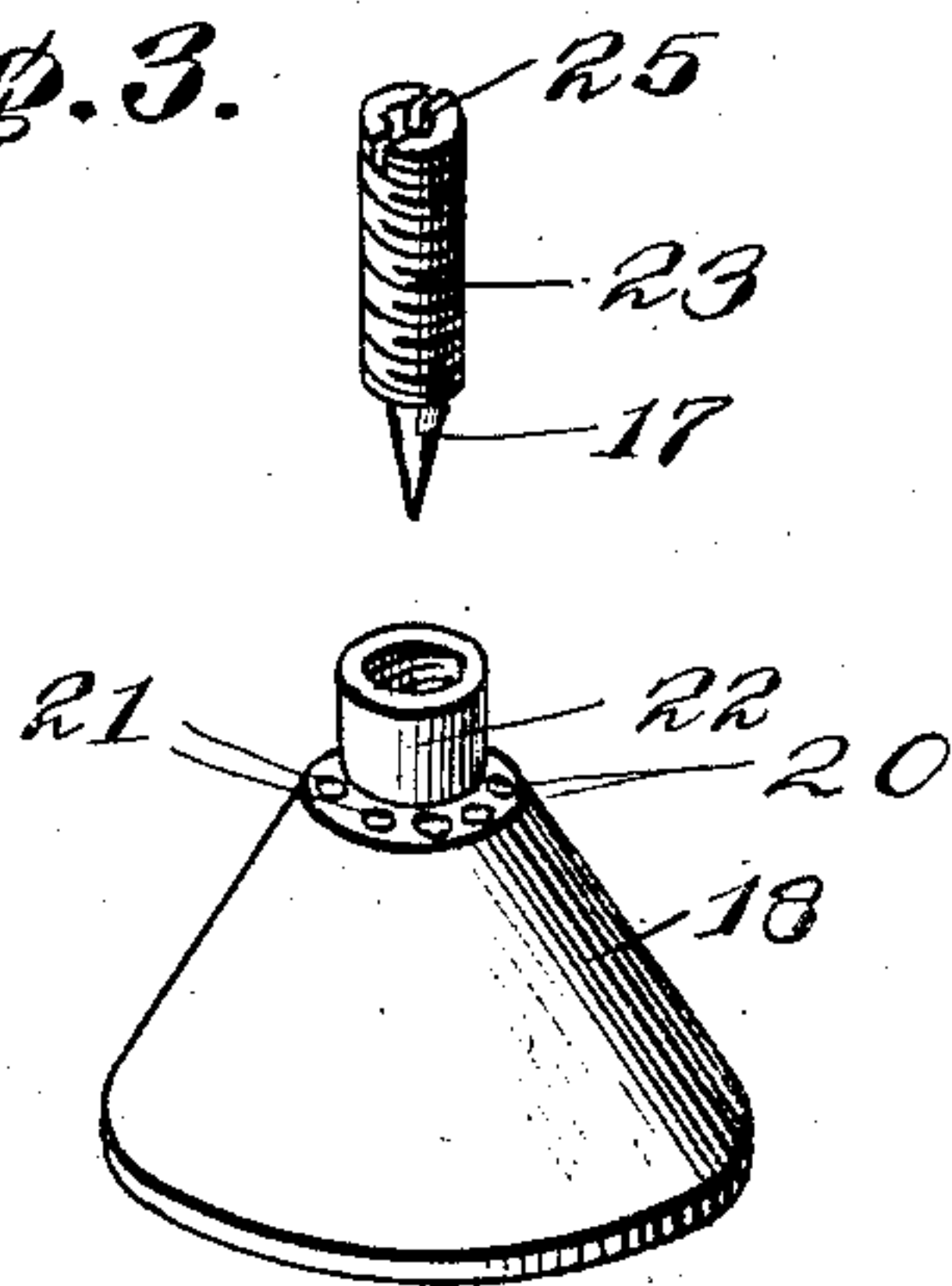
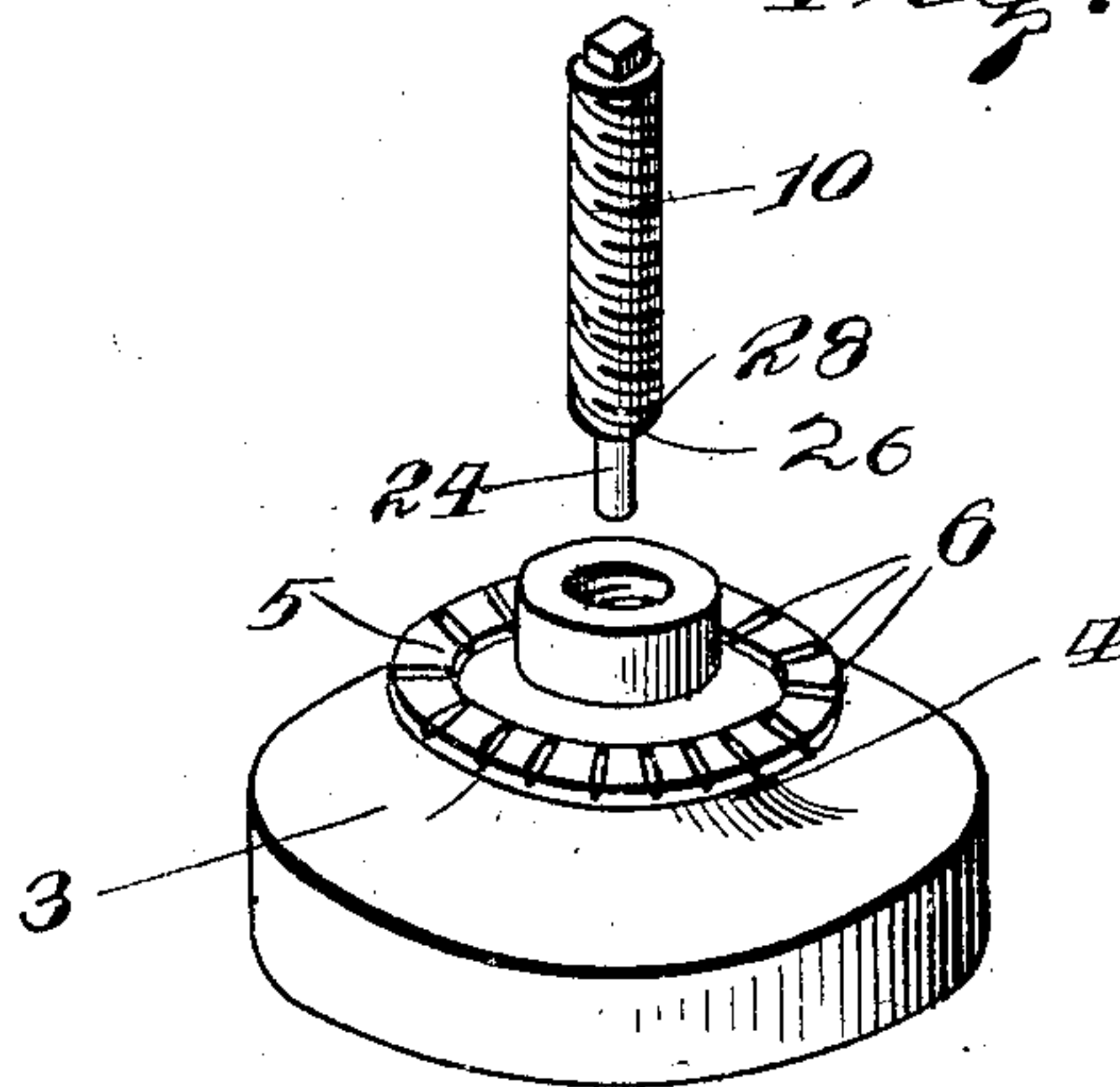


Fig. 4.



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# UNITED STATES PATENT OFFICE.

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## CARBURETER.

No. 863,516.

Specification of Letters Patent.

Patented Aug. 13, 1907.

Application filed November 16, 1905. Serial No. 287,705.

*To all whom it may concern:*

Be it known that I, WILLIAM E. DOWNING, a citizen of the United States, residing at Des Plaines, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

This invention provides a novel appliance, for enriching air or gas, with a carburetant in the form of vapor and which is particularly designed for use in connection with an explosive engine to supply a charge of gaseous mixture thereto after each explosion and upon the out stroke of the piston producing suction.

The purpose of the invention is the provision of a device of the character aforesaid which will be extremely sensitive so as to respond to the slightest suction, thereby insuring a supply of gaseous mixture embodying the constituents in predetermined proportionate quantity.

The invention further aims to devise a structure which will prevent flooding of the carbureter and insure every atom of the carburetant being taken up by the inflow of the air or gas in the process of carbureting.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result, reference is to be had to the following description and accompanying drawings.

While the invention may be adapted to different forms and conditions by changes in the structure and minor details without departing from the spirit or essential features thereof, still the preferred embodiment is shown in the accompanying drawings, in which:

Figure 1 is a vertical central sectional view of a carbureter embodying the invention. Fig. 2 is a top plan view of the casing or body of the carbureter with the cap and cooperating parts omitted and having a portion broken away. Fig. 3 is a detail perspective view of the frusto-conical or tapered valve. Fig. 4 is a detail view of the cap or upper portion of the casing showing the valve provided with a series of notches.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The body 1 of the carbureter is preferably provided with a solid bottom 2 and is closed at its upper end by means of a cap 3 from which extends a boss 4 having an outer circular flange 5 provided upon its upper side with a series of radial notches or grooves 6 for cooperation with a lug or stop 7 at the free end of a spring 8 to hold an arm 9 in the required adjusted position. The boss 4 is centrally disposed and is internally threaded to receive an externally threaded stem 10 to the upper end of which is attached the arm 9, which in turn has the spring 8 fast thereto and extended inward and provided with the lug or stop 7 for the purpose mentioned.

An annular groove 11 is formed in the upper side of the bottom 2 and a series of radially disposed openings 12 formed in the outer edge portion of said bottom communicate at their inner end with said annular groove 60 and have their outer ends extending through the edge of said bottom. A coupling 13 is pendent from the bottom 2 and is adapted to make connection with the part designed to supply the carburetant to the device. A conical boss 14 projects upward from the bottom 2 in line with the coupling 13 and its upper end is depressed, as shown at 15, so as to retain a small quantity of hydrocarbon or other carburetant. A minute opening 16 is formed in the coupling 13 and tapering boss 14 and constitutes an inlet for the hydrocarbon. The upper 70 end of the opening 16 is slightly flared to form a seat for cooperation with a needle valve 17 by means of which the inflow of the carburetant is controlled.

A valve 18 is arranged within the body or casing 1 and is preferably of frusto-conical form or upwardly 75 converged and is provided at its lower edge with an inwardly extended horizontal flange 19 which projects over the annular groove 11 and forms a closure therefor. The diameter of the base of the valve 18 is such as to correspond to the inner diameter of the body or casing 80 1, so as to secure a snug fit between the valve and casing, whereby said valve is directed in its vertical movements and a square seating thereof upon the bottom 2 assured. A shoulder 20 is formed near the upper end of the valve 18 and a series of openings 21 are provided in 85 the shoulder portion and have a vertical arrangement and communicate with the interior space of said valve. The portion 22 extended upward from the shoulder 20 is of uniform diameter and is internally threaded to receive the body portion 23 of the needle valve, said 90 part 23 being threaded within the part 22 to admit of vertical adjustment of the valve 17 as may be required. The stem 10 is reduced at its lower end as shown at 24, and this reduced portion enters an opening 25 in the upper end of the body portion 23 of the valve so as to 95 materially assist in directing the valve 18 in its vertical movements. By proper adjustment of the stem 10 the shoulder 26 at the base of the reduced portion 24 may be positioned to engage with the upper end of the valve body 23 and limit the movement or play of the 100 valve 18, or said stem 10 may be moved so as to hold the valve 18 seated and against possible movement as when the device is not in actual operation. The stem 10 when adjusted is held in the located position by the lug or stop 7 entering one of the grooves or notches 6. 105

The body or casing 1 of the carbureter is provided with a coupling 27 near its upper end and at one side thereof for adjustment to the engine in the accustomed manner. When the parts are assembled, a slight suction through the coupling 27 effects an unseating of the 110 valve 18 and the valve 17, with the result that air enters the openings 12 and is deflected inward by the hori-



zontal flange 19 and coming in contact with the hydrocarbon escaping through the opening 16, commingles therewith to form the gaseous mixture which passes out from the valve 18 through the openings 21 into the upper portion of the carbureter, thence through the coupling 27 to the required point of use. It is to be noted that the upward and converged walls of the valve 18, in conjunction with the similarly converged walls of the projection 14, causes the air to come in contact with and to take up every atom of the carburetant, thereby preventing possible flooding of the carbureter. It is further observed that the upwardly converged form or flare of the valve 18 in connection with its snug fit within the body or casing, results in the provision of a sensitive valve structure which will respond quickly to the slightest suction, thereby insuring a supply of gaseous mixture to the engine, even though the piston should be traveling slowly. This is of special advantage when starting the engine when the movement is necessarily slow.

Having thus described the invention, what is claimed as new is:

1. In a carbureter, the combination of a casing having a valve controlled inlet disposed centrally of its bottom and having an annular groove in the upper side of said bottom and provided with radial openings in the outer edge portion of said bottom in communication at their inner ends with said annular groove, and a valve of approximately frusto-conical form having an inwardly extended flange to rest upon the bottom of the casing and normally close the upper sides of said annular groove.

2. In a carbureter, the combination of a casing having a valve controlled hydrocarbon inlet disposed centrally of its bottom, a conical shaped boss projected upward from said bottom and having the said hydrocarbon inlet extended therethrough, said casing having a plurality of air

inlets around its edge portion, and a hollow valve of approximately frusto-conical form set upon the bottom of the casing and having an inwardly extended flange normally closing the inner ends of said air inlets.

3. In a carbureter, the combination of a casing provided with a centrally disposed valve controlled fuel inlet surrounded by an upwardly extended conical boss, said casing having an annular groove in the upper side of its bottom and having air inlet openings in its edge portion communicating at their inner ends with said annular grooves, and a valve of approximately frusto-conical form having an inwardly extended flange for normally closing said annular groove and having a shoulder near its upper end and a series of openings formed in said shoulder.

4. A carbureter comprising a casing having a centrally disposed inlet for the carburetant and having an annular groove in the upper side of its bottom and a series of openings in the edge portion of said bottom in communication with the annular groove, a conical boss projected upward from the bottom and having the inlet for the carburetant extended therethrough, a valve of approximately frusto-conical form provided at its lower end with an inwardly extended flange normally closing said annular groove and provided in its upper end with a shoulder in which are formed a series of openings, a hollow flanged body adjustably connected with the upper end of the first mentioned valve and provided at its lower end with a needle valve for controlling the centrally disposed inlet, a stem having screw thread connection with the upper portion of the casing and having its lower end telescoping with the said hollow valve body, an arm extended outward from the upper end of said stem, a spring connected with the outer end of the arm and having a lug at its upper end, and a flange provided with a series of notches for cooperation with said lug to hold the stem in the required adjusted position.

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

WILLIAM E. DOWNING. [L. S.]

Witnesses:

WILLIAM G. WILLE,  
E. J. MEYER.