W. C. WESTAWAY.

CARBURETER.

APPLICATION FILED SEPT. 28, 1905.

936,064.

Patented Oct. 5, 1909.

3 SHEETS—SHEET 1.

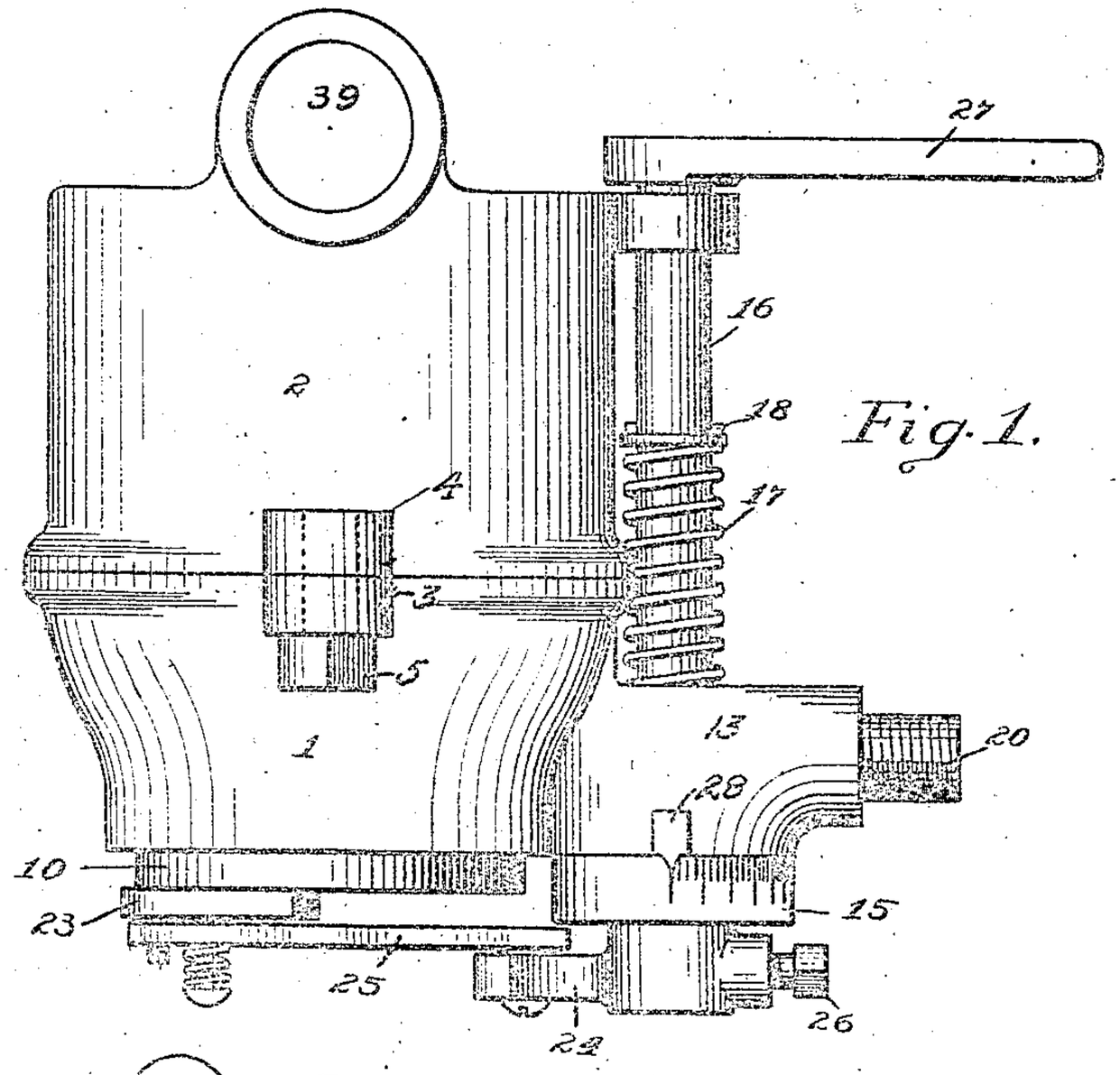


Fig. 1.

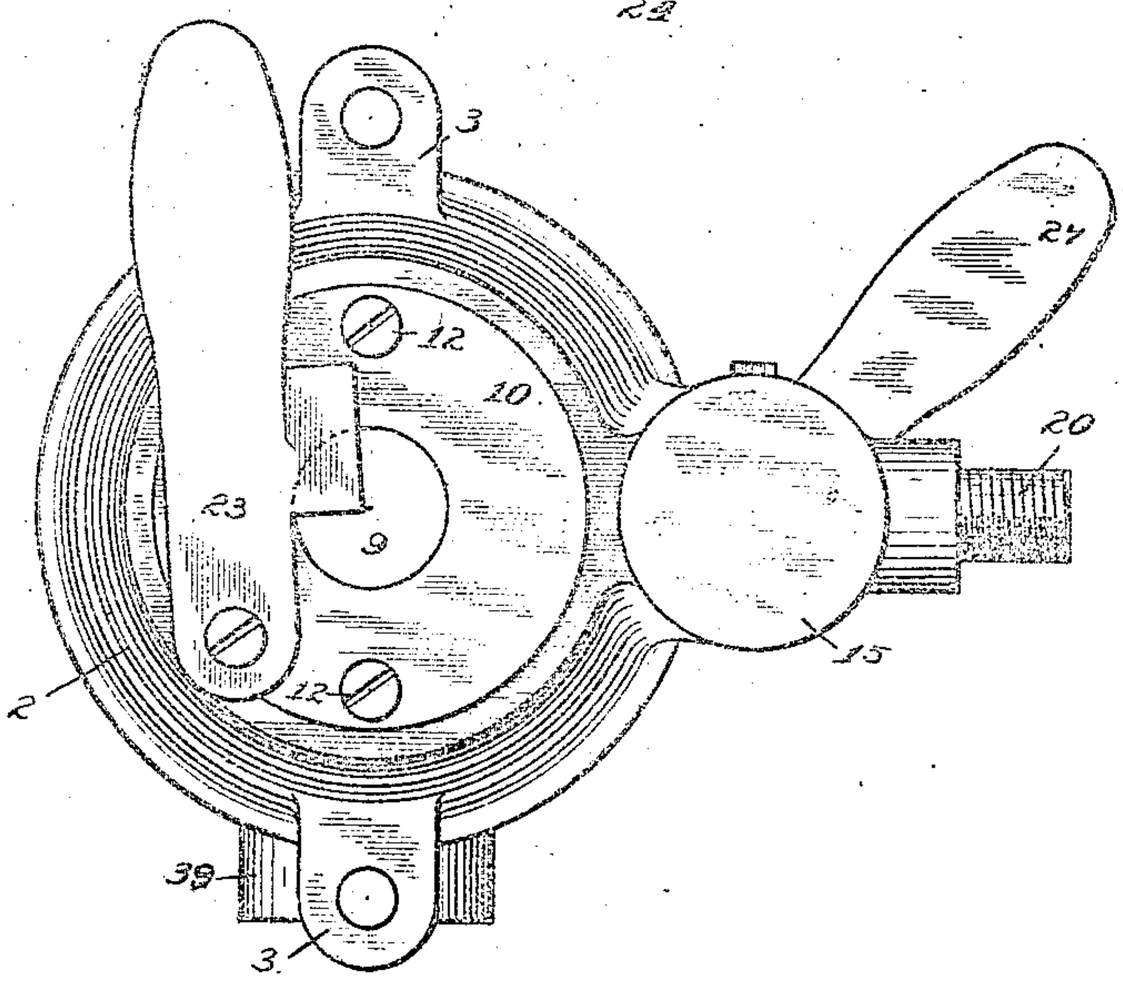


Fig. 5.

Witnesses:
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Charles L. Cook

Inventor
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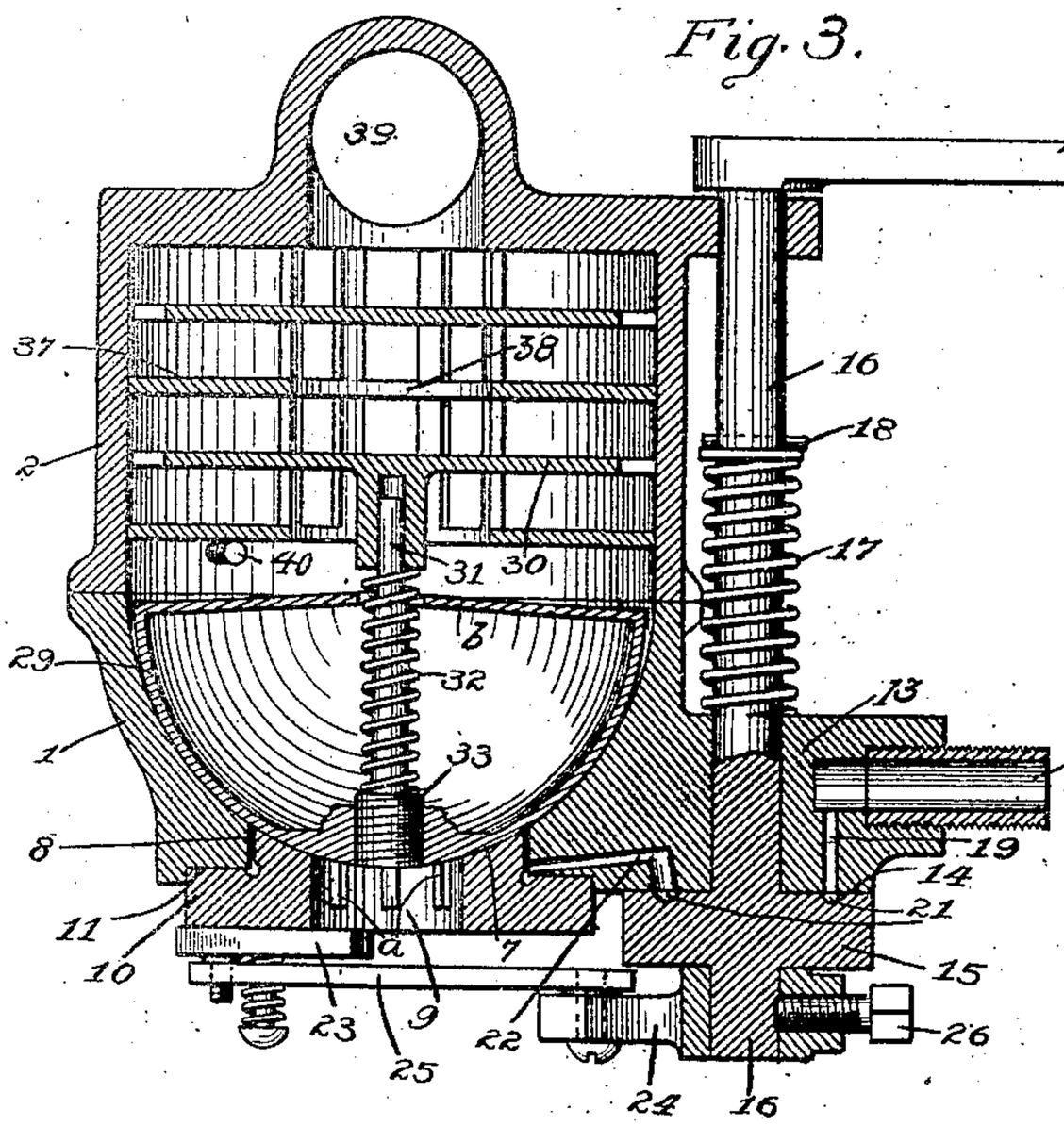
3 SHEETS—SHEET 2.

Fig. 3.



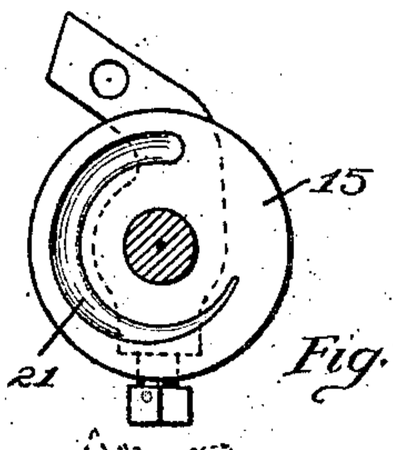




Fig. 1.

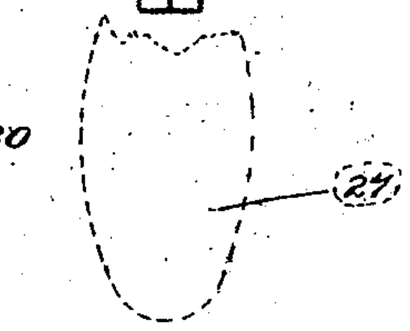
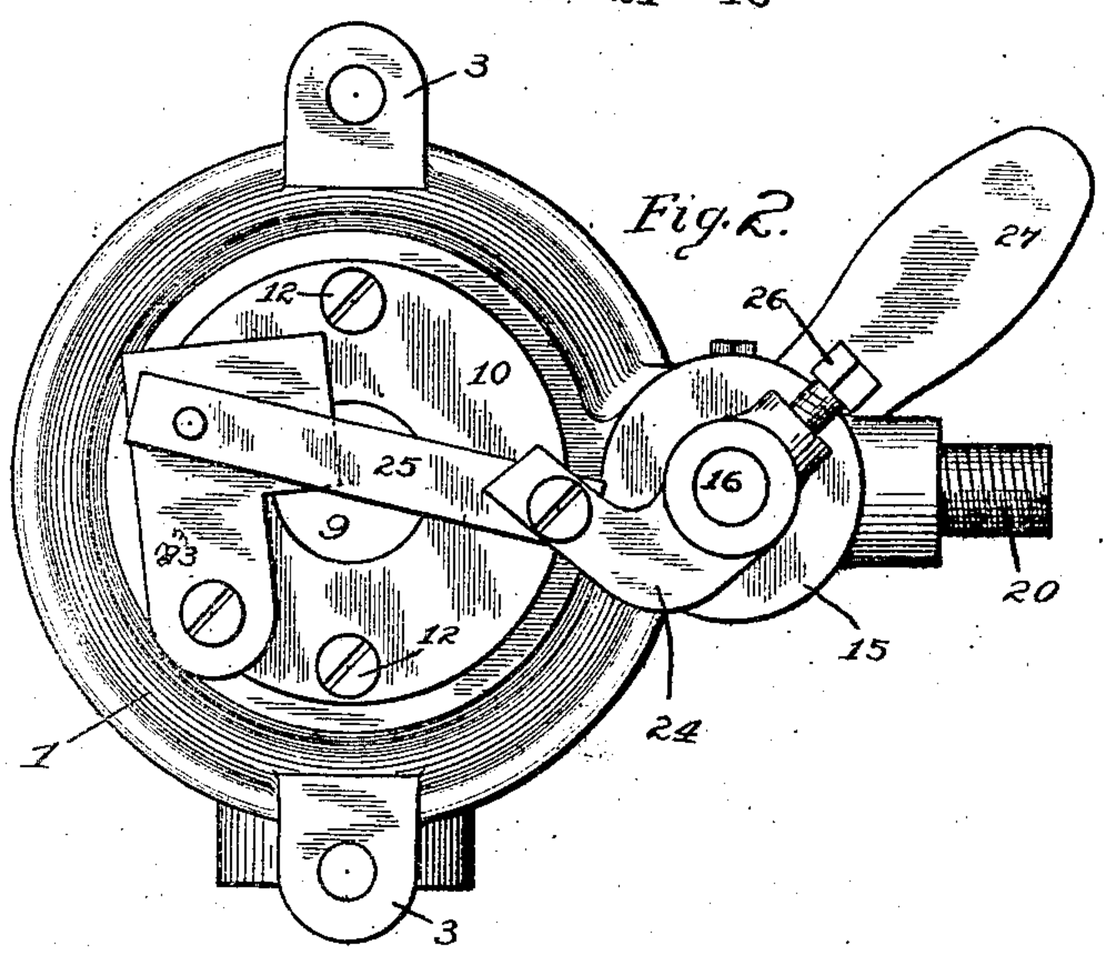



Fig. 2.




Witnesses:
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3 SHEETS—SHEET 3.

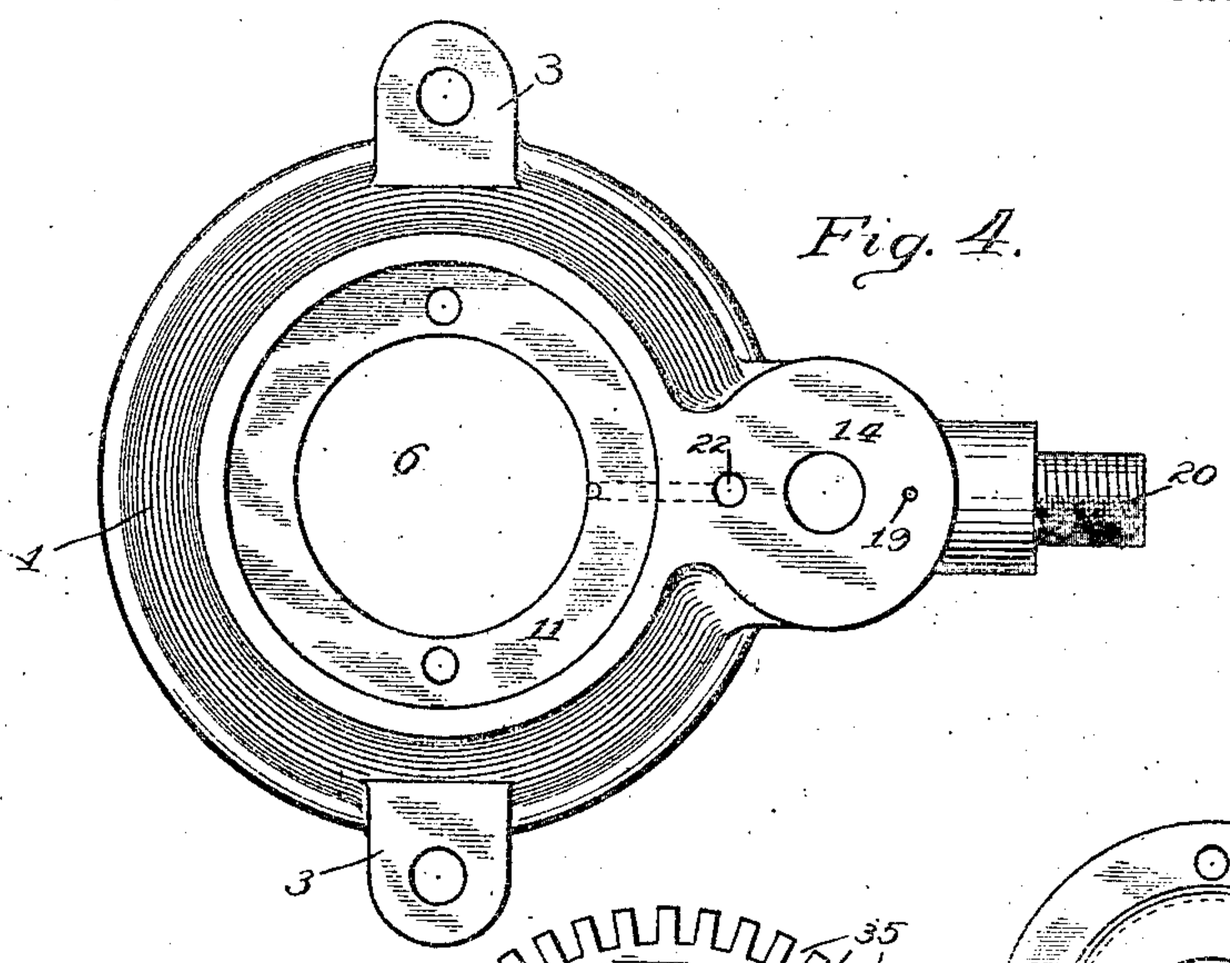


Fig. 4.

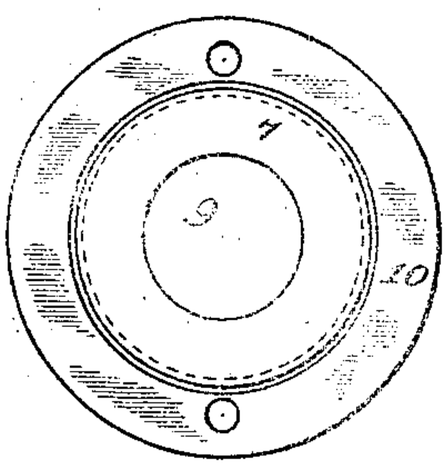


Fig. 6.

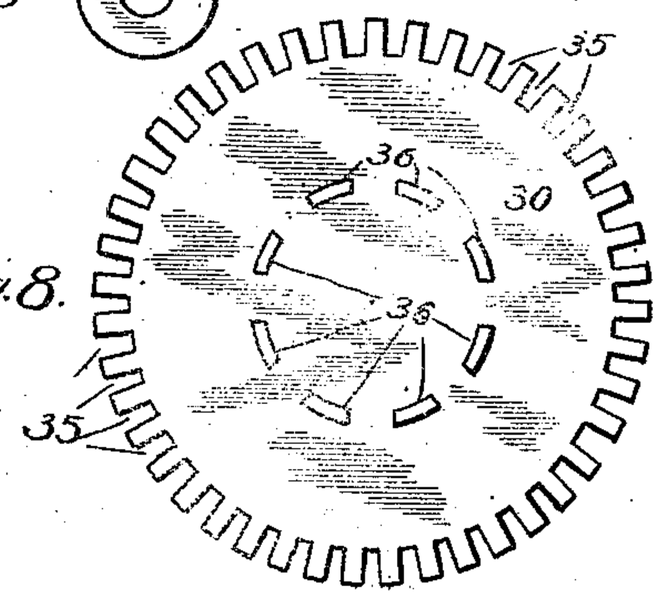


Fig. 8.

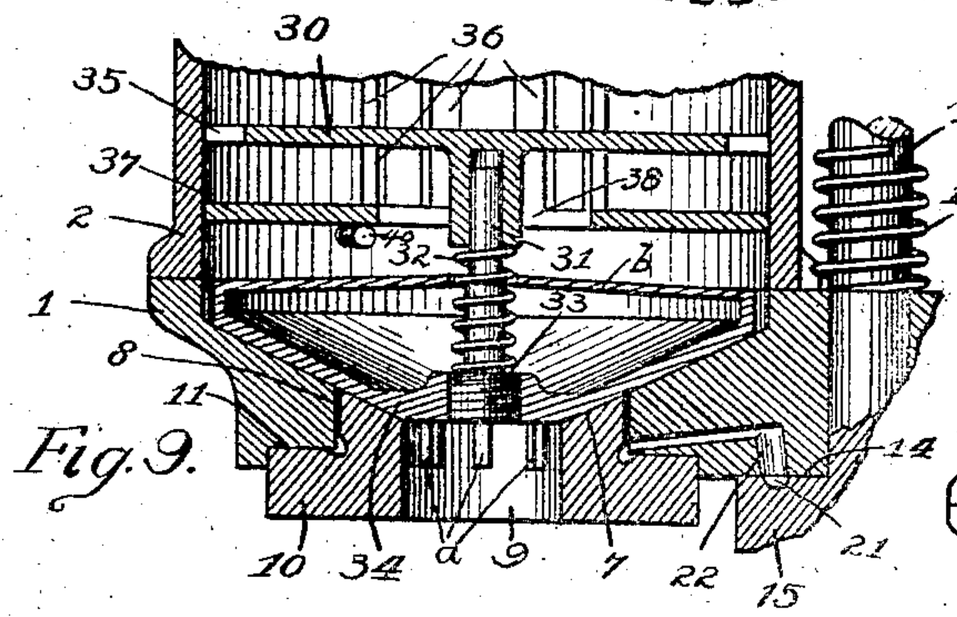


Fig. 9.

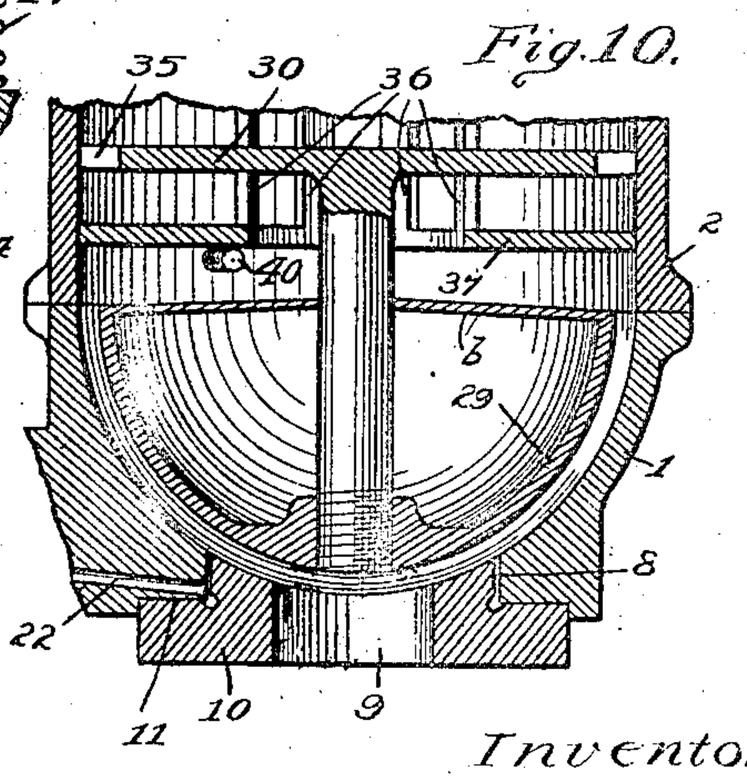


Fig. 10.

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# UNITED STATES PATENT OFFICE.

WALTER C. WESTAWAY, OF ROCKFORD, ILLINOIS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO J. W. DUNTLEY, OF CHICAGO, ILLINOIS.

## CARBURETER.

936,064. Specification of Letters Patent. Patented Oct. 5, 1909.

Application filed September 28, 1905. Serial No. 280,546.

*To all whom it may concern:*

Be it known that I, WALTER C. WESTAWAY, of Rockford, county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Carbureters, of which the following is a description.

My invention belongs to the general class of devices designed to thoroughly commingle air and a suitable liquid, such for example as a hydro-carbon, for any desired purpose, and has for its object the production of simple and efficient means for the purpose, which will thoroughly and perfectly accomplish the object sought.

To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described and more particularly pointed out in the claims.

In the drawings wherein like reference characters indicate like or corresponding parts, Figure 1 is an elevation of the preferred form of my invention. Fig. 2 is a bottom plan of the same. Fig. 3 is a central vertical section of the same. Fig. 4 is a bottom plan of the shell with valve mechanism removed. Fig. 5 is a bottom plan similar to Fig. 2, with the air and liquid valves disconnected and adapted for independent operation. Fig. 6 is a plan view of the bottom closure of the shell removed from its seat. Fig. 7 is a bottom plan view of the liquid valve. Fig. 8 is a plan view of one of the preferred forms of mixing plates, and Figs. 9 and 10 are fragmentary sectional views showing modifications of the construction and arrangement of the parts forming the lower part of the device.

In the preferred form shown in the drawings, 1 represents the base and 2 a suitable top for a shell or casing forming a mixing chamber. The two may be suitably secured together in any preferred manner. As shown the parts are provided with registering lugs, 3 and 4 connected by bolts 5. The base is formed with a preferably circular opening 6, for the reception of a similarly formed part 7 which is slightly smaller than the opening and which when in place, is spaced therefrom on all sides forming an annular inlet 8 for the entrance of the liquid hydro-carbon. The part 7 is also annular inclosing an opening 9, which serves as an inlet for the air, and is provided with an outwardly extending flange 10 constructed to be snugly seated in a corresponding recess or depression 11 formed in the base. Any suitable means may be employed to secure the part 7 in place. As shown screws 12—12, serve this purpose.

The base is preferably formed with an offset part 13 providing a valve seat 14 and a support for the rotatable liquid valve 15 whose stem 16 passes therethrough. A spring 17 resting upon the face of the offset or extension 13 and beneath a pin 18 or equivalent part on the stem serves to resiliently hold the valve to its seat. A duct 19 serves to conduct the liquid from the supply pipe 20 to the valve 15 which is provided with a groove 21 formed in its face which closing against the valve seat forms a duct for the liquid. The groove 21 is peculiarly formed it being slightly eccentric to the valve stem and gradually and regularly increased in size from one end to the other, and for convenience may be termed "an increasing spiral groove." (Fig. 7.) A duct 22 formed in the valve seat and extending from a point in the path of the groove 21 to the annular inlet 8 serves to conduct the liquid to the shell. It will thus be seen that when the valve is closed the flat face of the same covers and effectually closes the end of the duct 19. As the valve is rotated the duct 19 is first opened by the edge of the groove 21 slightly passing the same permitting but a small quantity of liquid to enter the groove which conducts it to the duct 22 by which it is finally directed to the annular inlet 8 and is regularly delivered into the shell thereby in a ring encircling the air inlet 9, for a purpose hereafter described. Further rotation of the valve serves to uncover the end of the duct by degrees and finally to bring the larger and deeper part of the groove into registry therewith thus opening the valve to its maximum capacity. It will be seen that by this construction a very efficient valve is provided by means of which perfect control of the delivery of the liquid to the mixing chamber is effected.

In the preferred form a valve of any suitable construction is employed to control the admission of air through the inlet 9. As shown a shutter valve 23, serves this purpose. It is desirable that the proportions of liquid and air may be uniformly maintained in operating the device, hence I prefer to so connect the valves 15 and 23 that they may

operate synchronously. To this end I secure an arm 24 upon the end of the valve stem 16 and connect the valve 23 thereto by a link 25 or equivalent means. It will thus be obvious that the operation of the hydro-carbon valve 15 involves the corresponding operation of the air valve. Suitable means are provided for the adjustment of the two valves relative to one another. This may be readily accomplished in any preferred manner for example by adjusting the position of the arm 24 on the stem 16, the set screw serving to firmly maintain the parts in their adjusted positions. A handle 27 secured to the stem 16 serves as means for operating the valves. If desired the valves 15 and 23 may be disconnected and be independently operatable as shown in Fig. 6, the construction previously described and clearly shown in Figs. 1, 2 and 3 is preferred however.

Any preferred means may be employed to indicate the position of the valves. As shown in Fig. 1 a part of the periphery of the valve 15 is graduated, while a finger or pointer 28 fixed to the extension 13, coöperating therewith serves this purpose.

Within the shell or mixing chamber means are provided to secure a thorough commingling of the inflowing liquid and air. In the preferred construction shown a spreader or deflector is arranged to direct the current of air in contact with the hydro-carbon flowing in through the annular inlet 8. In the form shown in Figs. 3 and 10, the base is formed semi-spherical or spheriform, and a correspondingly formed spreader or deflector 29 slightly smaller than the interior in the base coöperates therewith in the operation of the device. That is to say, the exterior of the spreader is a spherical segment. In the preferred form shown in Fig. 3, the deflector is vertically movable normally resting in such a position as to tend to close the inlets 8 and 9, and to prevent the inflow of both hydro-carbon and air.

The operation of the engine or a coöperating pump to which the device is attached, however, will tend to produce a partial vacuum in the mixing chamber, momentarily lifting the deflector and providing a narrow channel between the exterior surface of the same and the interior of the shell. The same action permits the inflowing of the hydro-carbon through the annular inlet 8, and the air through the inlet 9, the current of air being directed over the ring of fluid hydro-carbon, taking up a quantity thereof and filling the chamber with the mixture. As the deflector 29 assumes its normal position it contacts with the ring of fluid tending to spread the same out evenly into a thin film between and coating the surfaces of the proximate parts forming the channel between the deflector and the chamber. This action obviously thinly spreads the liquid hydro-carbon out over a comparatively large area comprising the exterior of the deflector and the interior of the shell over which area the regulated current of inflowing air is periodically and evenly directed at the pulsating operation of the device.

As shown in Figs. 3 and 9 a transverse plate 30 is positioned in the shell securing the end of a guide post 31 carried by the deflector, while a spring 32 positioned between a shoulder 33 on the post and the plate aids in the accurate operation of the device. Guiding extensions *a* carried on the bottom of the spreader and extending into the air inlet 9 supplement this action. Obviously the spring may be dispensed with and gravity alone be relied upon to insure the operation of the deflector. The deflector is preferably substantially closed at the top as at *b*, to prevent the accumulation of fluid therein. In practice I have found the construction described very effective and the mixture satisfactory. I have however, shown auxiliary means to aid in securing a more thorough mixture, which will be later referred to.

In the form shown in Fig. 10, the deflector 29 is supported by the plate 30 in such a manner as to be permanently separated from the base and pulsating action thereof is dispensed with. This is obviously an inferior equivalent arrangement however, since the hydro-carbon is not mechanically spread over the exterior surface of the deflector and the area of the liquid film is reduced to that extent. In the form shown in Fig. 9 the deflector 34 is formed with an exterior corresponding to the frustum of a cone, the interior of the base being correspondingly formed. Obviously the surfaces in this form are not as extensive as in the form shown in Fig. 3.

In the auxiliary mixing means mentioned the plate 30, a plan of which is shown in Fig. 8 is a plate having its periphery formed with angular channels 35 through which the carbureted air is drawn, breaking it up into a plurality of currents. This may be supplemented by vertical extensions 36 on the face of the plate which serve as supports for a second plate 37 resting thereon. The extensions are separated from one another and form openings for the carbureted air which passes through a central aperture 38 in the plate 37 and thence to the outlet and induction pipe 39 which leads to the engine, pump, or other point of delivery. In the form shown in Fig. 3, four such plates are shown. The several plates therefore act as baffles in which the current is caused to pass around the periphery of a plate and through the center of the next during which time it is constantly broken up or subdivided by the several channels which are preferably angular in outline.

It is obvious that my invention is also

adapted for use for sanitary purposes. Thus by using a liquid disinfectant or germicide and employing a suitable pump the air acts as a vehicle and the mixture may be charged into a room or other closed space or forced through fabrics or otherwise employed as desired.

Having thus described my improvement it is obvious that immaterial modifications may be made without departing from the spirit of my invention, hence I do not wish to be understood as limiting myself to the precise form and construction shown.

What I claim as new, and desire to secure by Letters Patent is:—

1. In a device of the kind described, a shell or casing inclosing a chamber having a spheriform bottom, a fluid inlet and an air inlet formed in said bottom, and an outlet near the opposite end of said casing, in combination with a spherical segmental spreader positioned within said chamber and arranged to coöperate with the walls thereof to form an annular channel from said inlets to said chamber to bring the inflowing air into contact with the inflowing liquid.

2. In a device of the kind described, a shell or casing inclosing a chamber having a spheriform bottom, a fluid inlet and an air inlet formed in said bottom, and an outlet near the opposite end of said chamber, in combination with valve mechanism for controlling said inlets, a spherical segmental spreader positioned within said chamber and arranged to coöperate with the walls thereof to form an annular channel from said inlets into said chamber to bring the inflowing air into contact with the inflowing liquid.

3. In a device of the kind described, a shell or casing inclosing a chamber having a spheriform bottom, a fluid inlet and an air inlet formed in said bottom, and an outlet at the opposite end of said chamber, in combination with valves positioned upon the exterior of said casing for controlling said inlets, a spherical segmental spreader positioned within said chamber and arranged to coöperate with the walls thereof to form an annular channel from said inlets into said chamber to bring the inflowing air into contact with the inflowing liquid.

4. In a device of the kind described, a shell or casing inclosing a chamber, provided with a liquid inlet, an air inlet, and an outlet, in combination with a valve for each inlet positioned entirely outside said casing and a spreader adapted to direct the inflowing air across said liquid inlet.

5. In a device of the kind described, a shell or casing inclosing a chamber having a spheriform bottom, a fluid inlet and an air inlet formed in said bottom, and an outlet at the opposite end of said chamber, in combination with a pair of connected valves positioned upon the exterior of said casing arranged to simultaneously operate to correspondingly control said inlets a spherical segmental spreader positioned within said chamber and arranged to coöperate with the walls thereof to form an annular channel from said inlets into said chamber to bring the inflowing air into contact with the inflowing liquid.

6. In a device of the kind described, a shell or casing inclosing a chamber having a spheriform bottom, a fluid inlet and an air inlet formed in said bottom, and an outlet at the opposite end of said chamber, in combination with a pair of connected valves positioned upon the exterior of said casing arranged to simultaneously operate to correspondingly control said inlets, a spherical segmental spreader movably positioned within said chamber and resiliently maintained in contact with the walls thereof to normally close both of said inlets and when spaced from said wall to form an annular channel from said inlets into said chamber to bring the inflowing air into contact with the inflowing liquid.

7. In a device of the kind described, a shell or casing inclosing a chamber having a spheriform bottom, an annular fluid inlet near the bottom, an air inlet positioned in the area inclosed thereby, and an outlet, in combination with a spherical segmental spreader or deflector slightly smaller than the bottom of the chamber arranged to form with the wall of the shell an annular channel to direct the inflowing current of air over the inflowing liquid.

8. In a device of the kind described, a shell or casing inclosing a chamber provided with a spheriform bottom, an annular fluid inlet near the bottom, an air inlet positioned in the area inclosed by the fluid inlet, and an outlet, in combination with a movable spreader and deflector spherical segmental in form and slightly smaller than the base of the chamber normally seated in proximity to the liquid inlet and air inlet tending to close the same and when operated to form with the wall of the chamber an annular channel to direct the inflowing current of over the inflowing fluid.

9. In a device of the kind described, a casing inclosing a chamber, provided with a liquid inlet, and air inlet, and an outlet, said liquid inlet being in the form of a narrow annular slit, inclosing said air inlet, in combination with means for controlling the flow of fluid through said inlets, and a spreader arranged to simultaneously close both inlets.

10. In a device of the kind described, a mixing chamber provided with a spheriform bottom, an annular fluid inlet formed near the bottom, an air inlet positioned in the area inclosed thereby, an outlet, and valve mechanism for the fluid inlet and the air inlet connected to operate synchronously, in

combination with a movable spherical segmental spreader and deflector normally seated in proximity to the liquid and air inlets and tending to spread the inflowing liquid into a film upon the proximate meeting surfaces of the spreader and chamber and when operated to direct the inflowing current of air between said surfaces.

11. In a device of the kind described, a shell or casing inclosing a chamber having a spheriform bottom, a fluid inlet and an air inlet formed in said bottom, and an outlet at the opposite end of said chamber, in combination with a pair of connected valves positioned upon the exterior of said casing arranged to simultaneously operate to correspondingly control said inlets, a spherical segmental spreader slightly smaller than the interior of said chamber and movably positioned within the same arranged to resiliently coöperate with the wall thereof to simultaneously close both said inlets and to form an annular channel from said inlets into said chamber when said spreader is spaced from the wall thereof to direct the inflowing air into contact with the inflowing liquid.

12. In a device of the kind described, a mixing chamber provided with a spheriform bottom, an annular fluid inlet in the bottom, an air inlet positioned in the area inclosed thereby, an outlet, and means for controlling the inflowing air and fluid, in combination with a movable spherical segmental spreader and deflector normally seated in proximity to the air and liquid inlets and when operated to direct the inflowing current of air in proximity to the liquid, and baffling means comprising a plurality of baffle plates each alternate plate being provided with channels in its periphery and the intervening plates with a central orifice dividing the inflowing current of air into a plurality of lesser currents.

13. In a device of the kind described, a mixing chamber provided with an outlet and a circular opening in its bottom, in combination with a closure for said opening comprising an annular plate inclosing an air inlet and provided with a vertical wall smaller than the opening in the shell and spaced from the wall thereof to form an annular fluid inlet and means for conducting fluid thereto.

In testimony whereof, I have hereunto signed my name in the presence of two (2) subscribing witnesses.

WALTER C. WESTAWAY.

Witnesses:
BLANCHE PARDRIDGE,
R. F. LOCKE.