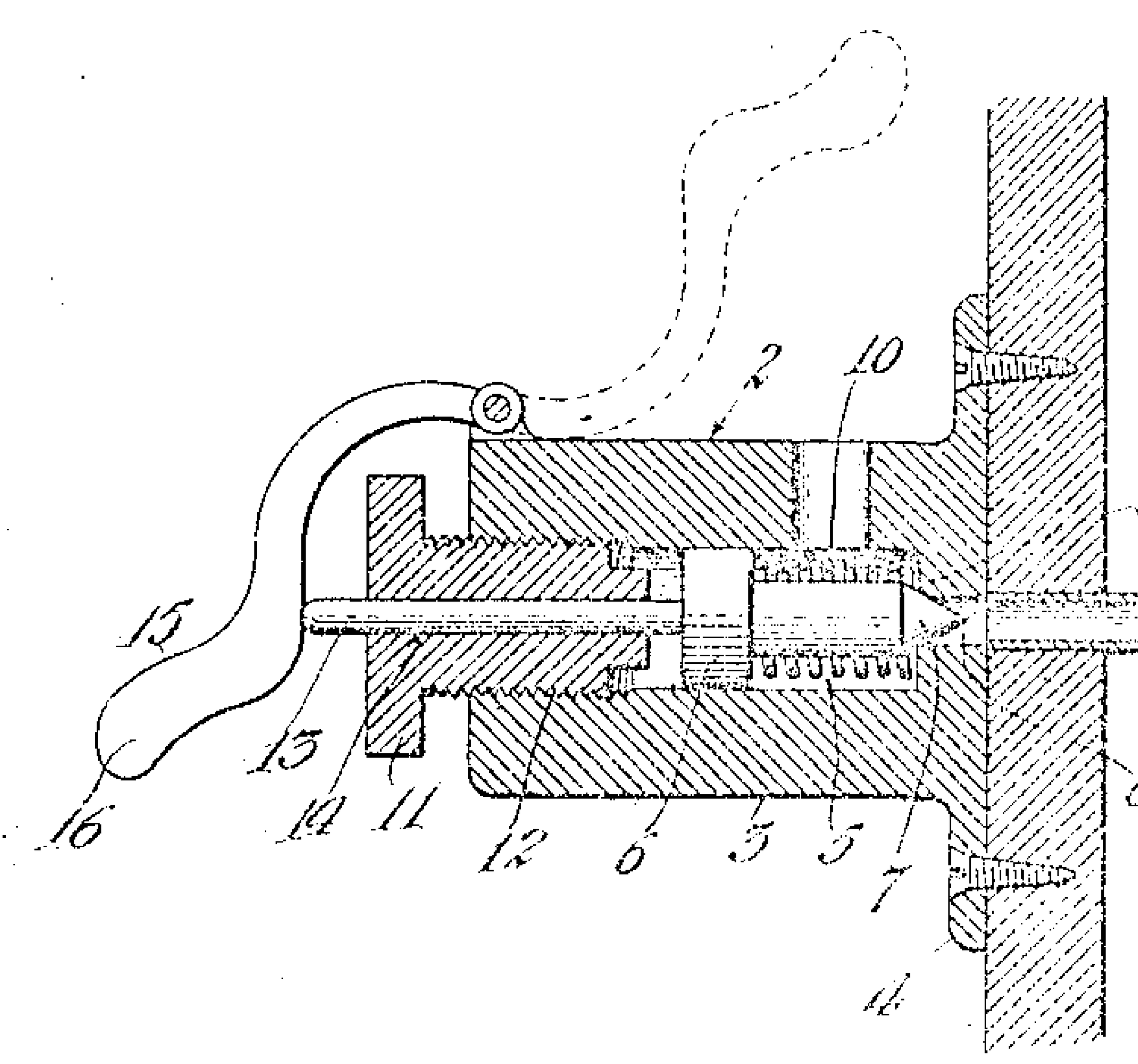
A. C. STEWART.
CONTROLLER FOR CARBURETERS.
APPLICATION FILED APR. 27, 1908.

916,214.

Patented Mar. 23, 1909.

Fig. 1.



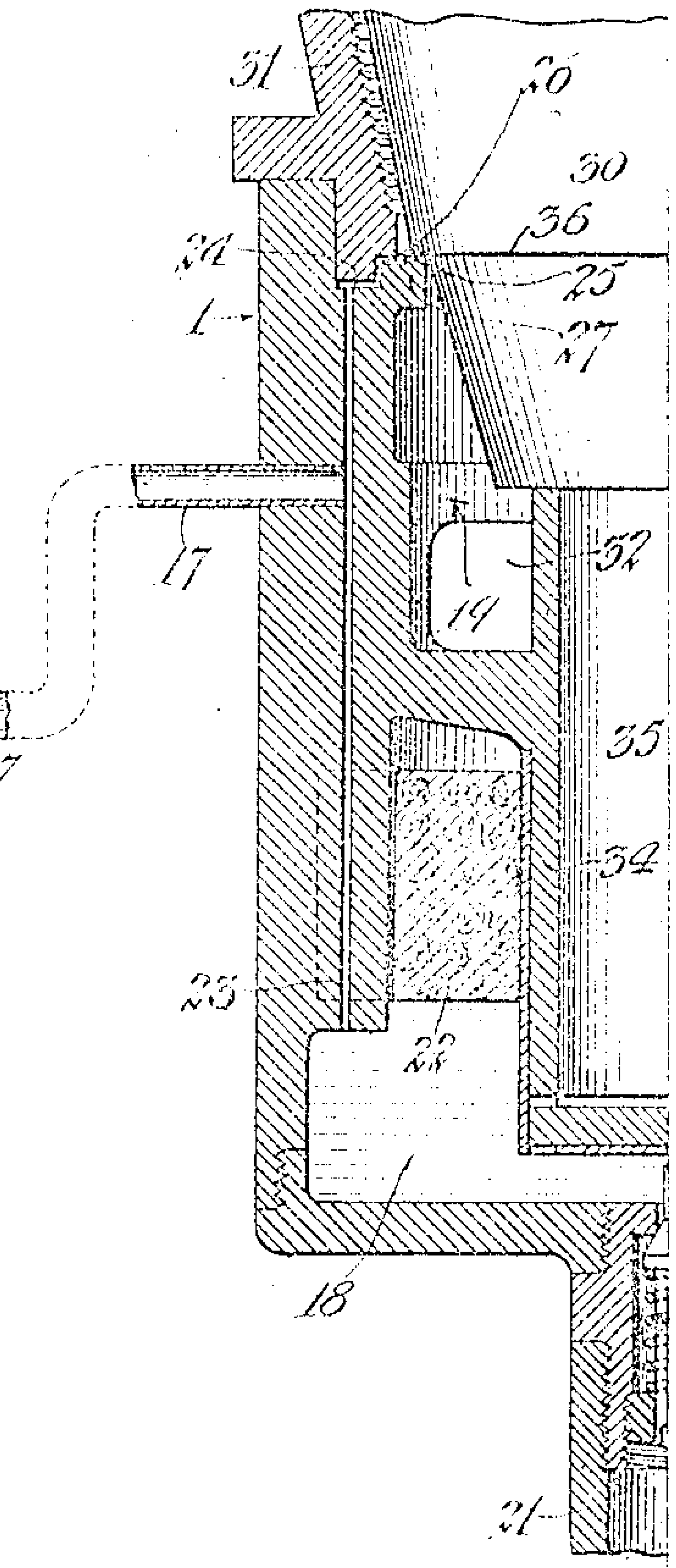


Fig. 2.

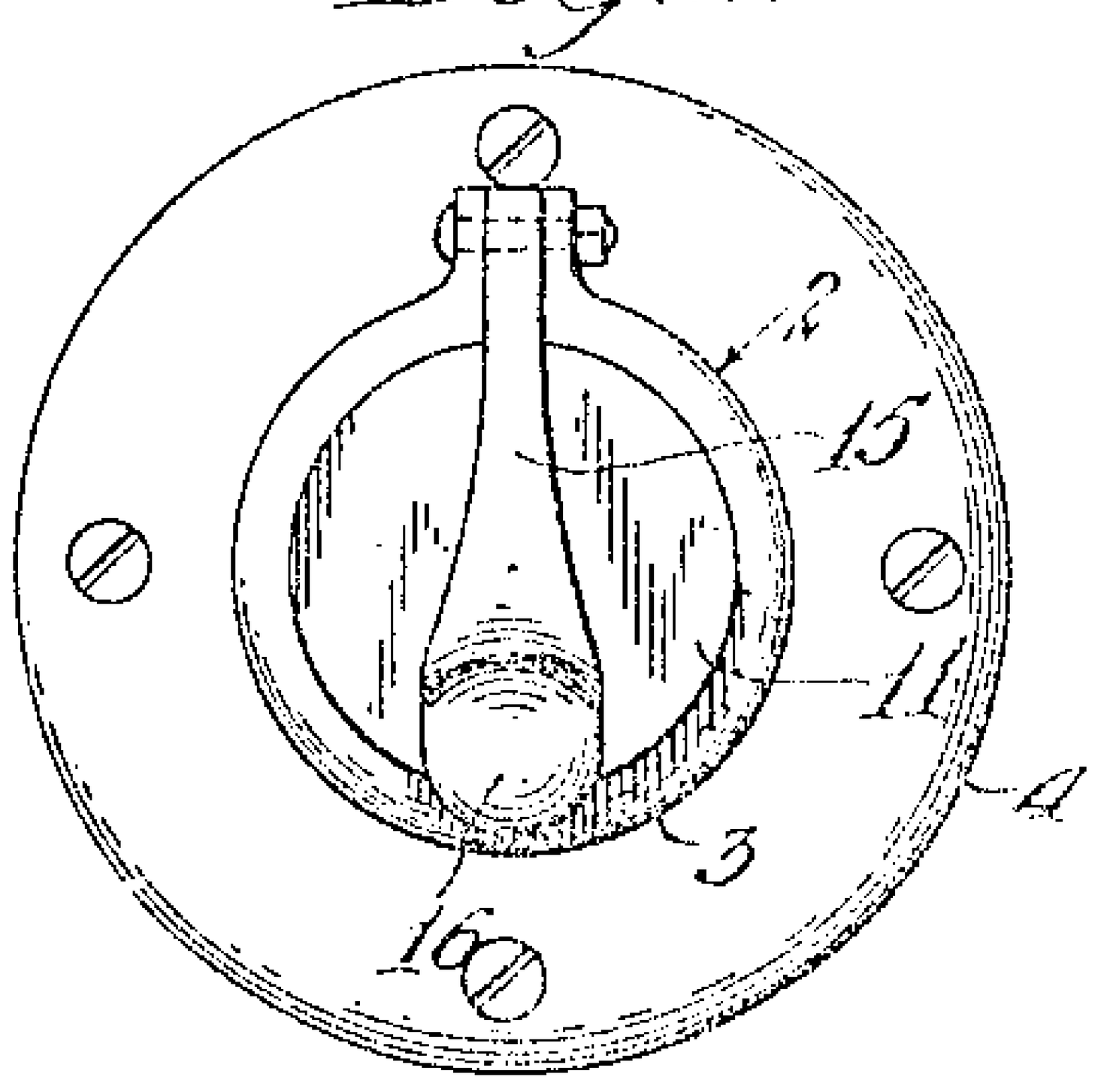
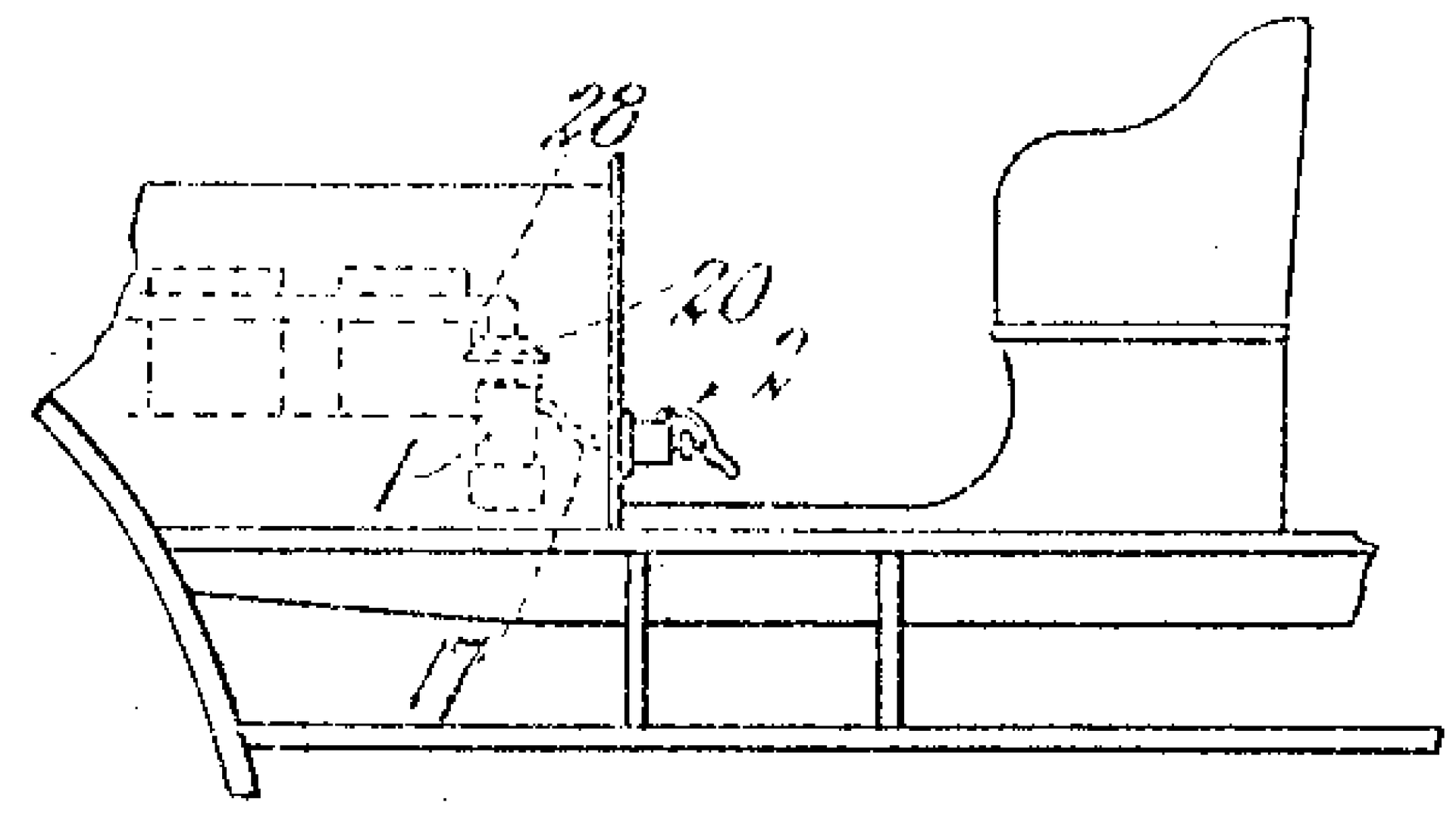


Fig. 3.



Witnesses:-
Louis W. Gratz.
Frank L. Graham

Inventor
Alfred C. Stewart
by Townsend, Lane & Hackley,
Attys.

UNITED STATES PATENT OFFICE.

ALFRED C. STEWART, OF LOS ANGELES, CALIFORNIA.

CONTROLLER FOR CARBURETERS.

No. 916,214. Specification of Letters Patent. Patented March 23, 1909.

Application filed April 27, 1908. Serial No. 429,562.

To all whom it may concern:

Be it known that I, ALFRED C. STEWART, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Controller for Carbureters, of which the following is a specification.

This invention relates to means for modifying the action of a carbureter for varying the mixture from a given definite condition to another definite condition as to richness.

The invention is particularly intended for use in connection with a carbureter for internal combustion engines, which automatically maintains a definite and uniform mixture under all conditions of suction, such a carbureter being disclosed and claimed in my application, Serial No. 403,812, filed Nov. 25, 1907, and the object of the invention in such connection is to provide means whereby the carbureter can be immediately and easily changed from a condition of maximum capacity of the internal combustion engine, to a condition of maximum efficiency or vice versa. It has been found desirable to provide the carbureter of definite capacity, without provision for graduated adjustment, thereby preventing unskilled persons from tampering or interfering with the apparatus, so as to render it inoperative: and to provide for most general conditions and for starting ability, it is usual to make or set the apparatus originally for proper supply of mixture to give maximum capacity. Under certain conditions, however,—for example, when speed has been attained and the engine is running light, such setting of the carbureter involves waste of fuel and it is desirable to change the condition of the carbureter to supply less fuel, and it is also desirable to make the change by a single definite operation, so that the regulator, having been once set, the operator need not exercise any care in the gaging of the operation.

In the accompanying drawings:—Figure 1 is a vertical section of the regulator, in connection with the carbureter, only so much of the carbureter being shown as is necessary to explain the invention. Fig. 2 is an end elevation of the regulator device. Fig. 3 is a side elevation of part of an automobile, showing the application of the invention thereto.

The carbureter 1 may be of the type shown in my prior application aforesaid, and the controller 2 consists of means for pneumatically controlling the action of the carbureter, by changing the condition of suction therein.

Controller 2 comprises a casing 3 provided with means such as flange 4 for attachment to a suitable support, said casing having a cylindrical recess 5, in which slides the enlarged head 6 of a valve plug 7, the inner end of which is tapered or conical to seat into a valve opening 8 in the inner end 9 of the casing. A spring 10 surrounds the valve plug and extends between the head 6 thereof and the inner end 9 of the casing, so as to tend to press the plug to open position. A screw plug 11 is screwed into the outer end of the recess 5, which is screw threaded at 12 to receive it, and the valve head 6 has a stem 13 extending through a bore 14 in said screw plug, and projecting beyond the plug to enable operation thereof by suitable means. I prefer to use, for operation of the valve stem, a foot piece adapted to be kicked or knocked over, the same consisting of a lever 15 pivoted to the casing 3 and adapted to hang down with its end portion resting against the valve stem, the lever being weighted as at 16 at the end, and the pivot of the lever being located inwardly from the center of gravity of the lever, so as to cause the lever to tend to press the stem inwardly. But by kicking the lever up it will be thrown over to the dotted line position, resting on top the casing and the valve plug will then be forced to its outer or open position by the spring 10. A pipe 17 connects the opening 8 of the controller with a part of the carbureter at which there is a condition of suction determining the rate of feed of gasolene.

In the form of carbureter here shown, the carbureter casing 1 is formed with an oil chamber 18 in its lower part, an air chamber 19 above the oil chamber and a suction chamber 20 at the top:—see Fig. 3. The gasolene is supplied from a pipe 21 to the oil chamber 18, through a valve 21, controlled by a spring and by a float 22, in such manner that the oil in the oil chamber is maintained at a definite level. A duct 23 formed in the casing of the carbureter leads from the oil chamber at a point below the level of liquid therein, to an annular channel 24 at the upper part of the casing, and the control pipe 17 leads from said duct. The upper chamber member 20, fastened onto the casing 1 has a shoulder 26 extending

over the lip 27 of channel 24, to form between the lip and channel, an orifice 25. A connection shown at 28 in Fig. 3 extends from the upper chamber 20 of the carbureter to an internal combustion engine, so that a condition of suction exists in the said chamber 20. An automatic valve 30 formed as a frusto conical shell extends adjacent to the wall 31 of the upper member of the carbureter, to form an annular constricted mixing passage, said valve having a shoulder 36, seating on top the lip aforesaid to control the flow of air from the air chamber 19 which communicates with the outer air through air inlet opening 32. Valve 30 has a stem 35 working in tubular guide 34, which also serves as a dash pot. The wall portion 31 is corrugated to increase the mixing effect.

Normally the regulator will be in position shown in full lines in Fig. 1, the valve thereat being closed. Under these conditions the suction of the engine is exerted at each stroke, on the gasolene within duct 23, drawing a full supply of gasolene to the orifice 25 in accordance with the demands of the engine, the amount of oil drawn in at 25 and of air drawn in between the valve shoulder 36, and the lip 27, being in correspondence so that a mixture of definite and uniform richness is supplied to the engine, suitable, for example, for operating it with maximum capacity. But when the load is light and full speed has been attained, a full supply of rich mixture, or a mixture suitable for operation at maximum capacity, is not necessary, and to obtain increased efficiency, the operator kicks over the regulator lever 15 to throw it to dotted line position. The regulator valve 7 is then opened by its spring 9, and a pneumatic connection is thus established from the gasolene duct 23 to the outer air. This operates to diminish the condition of suction in the said duct, and diminishes the uplift of gasolene to the orifice 25. Less gasolene will therefore pass to the mixture and the latter will be poorer. The screw plug 11 is set to such position that under these conditions the mixture will be adapted for operating the engine with maximum economy. A certain amount of air will also pass into the mixture from pipe 17 through the duct 23, but this will generally be inconsiderable in comparison with the quantity of air passing at the main carbureter valve 30; the capacity of the controller valve and its pipe being small compared to the capacity of the main valve, so that in this case also there will be a definite relation between the amount of oil and of air supplied.

As the controller valve is movable freely between limits, no noticeable time or trouble is required for its operation, the necessary adjustment of the limit stop having been effected beforehand once and for all. The pipe or tube 17 may be quite small so that it may be bent around to bring the controller to any desired position;—for example, the controller may be placed on the dash, as shown in Fig. 3, or it may be placed in any convenient position in the vehicle or plant.

What I claim is:—

1. The combination with a carbureter having a suction chamber and an oil duct, a valve exposed to the suction chamber and controlling flow of oil and air thereinto in definite correspondence, and a pneumatic controller comprising a valve opening to the outer air and a pipe leading therefrom to the oil duct to relieve to a definite extent the condition of suction in the duct.

2. The combination with a carbureter having a suction chamber and an oil duct, a valve exposed to the suction chamber and controlling flow of oil and air thereinto in definite correspondence, and a pneumatic controller comprising a valve opening to the outer air and a pipe leading therefrom to the oil duct to relieve to a definite extent the condition of suction in the duct, and means for adjustably determining the opening movement of the valve.

3. The combination with a carbureter having a suction chamber and an oil duct, a valve exposed to the suction chamber and controlling flow of oil and air thereinto in definite correspondence, and a pneumatic controller comprising a valve opening to the outer air and a pipe leading therefrom to the oil duct to relieve to a definite extent the condition of suction in the duct, and means for adjustably determining the opening movement of the valve, a freely movable lever operating to automatically close said valve and a spring acting to automatically open the valve when released from said lever.

In testimony whereof, I, have hereunto set my hand at Los Angeles, California, this 14th day of April 1908.

ALFRED C. STEWART.

In presence of—
ARTHUR P. KNIGHT,
FRANK L. A. GRAHAM.