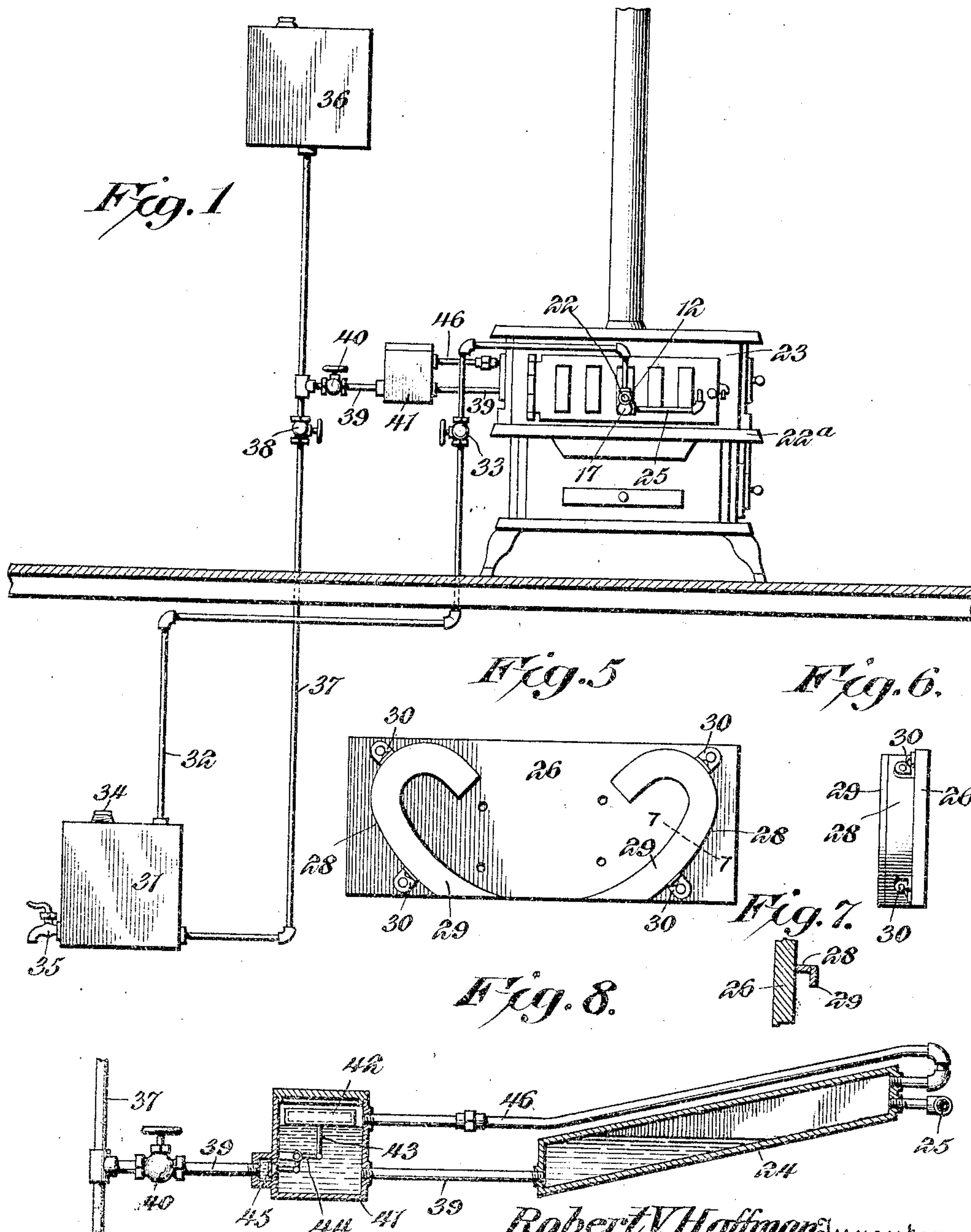


No. 876,457.

PATENTED JAN. 14, 1908.

R. V. HOFFMAN.
HYDROCARBON BURNER.
APPLICATION FILED JAN. 19, 1907.

2 SHEETS—SHEET 1



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2 SHEETS—SHEET 2.

Fig. 2.

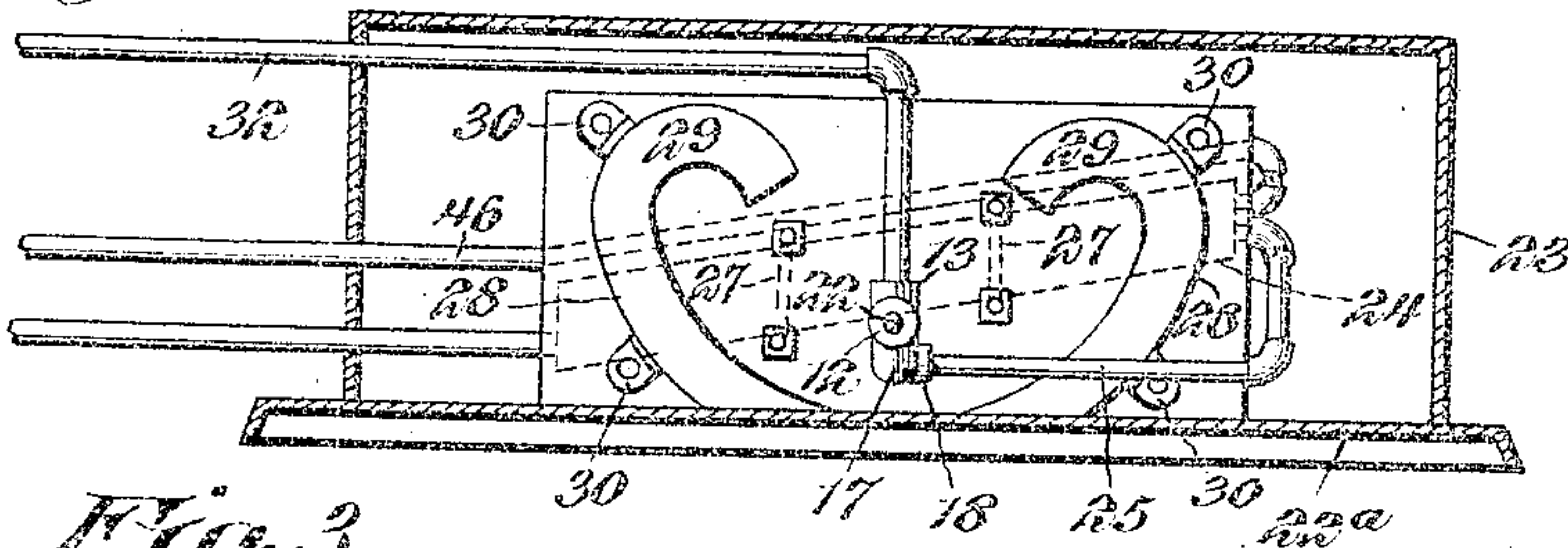


Fig. 3.

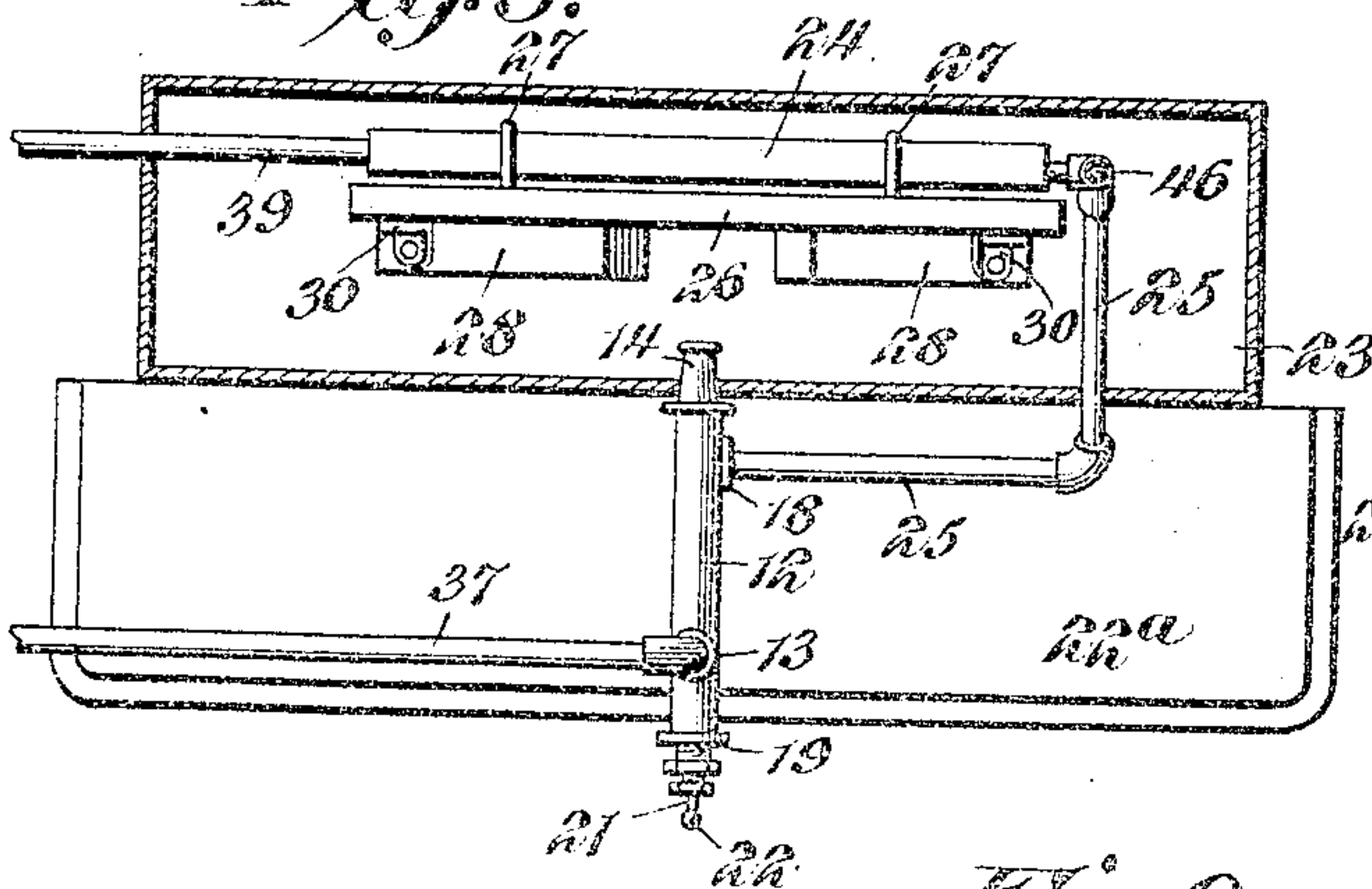


Fig. 4.

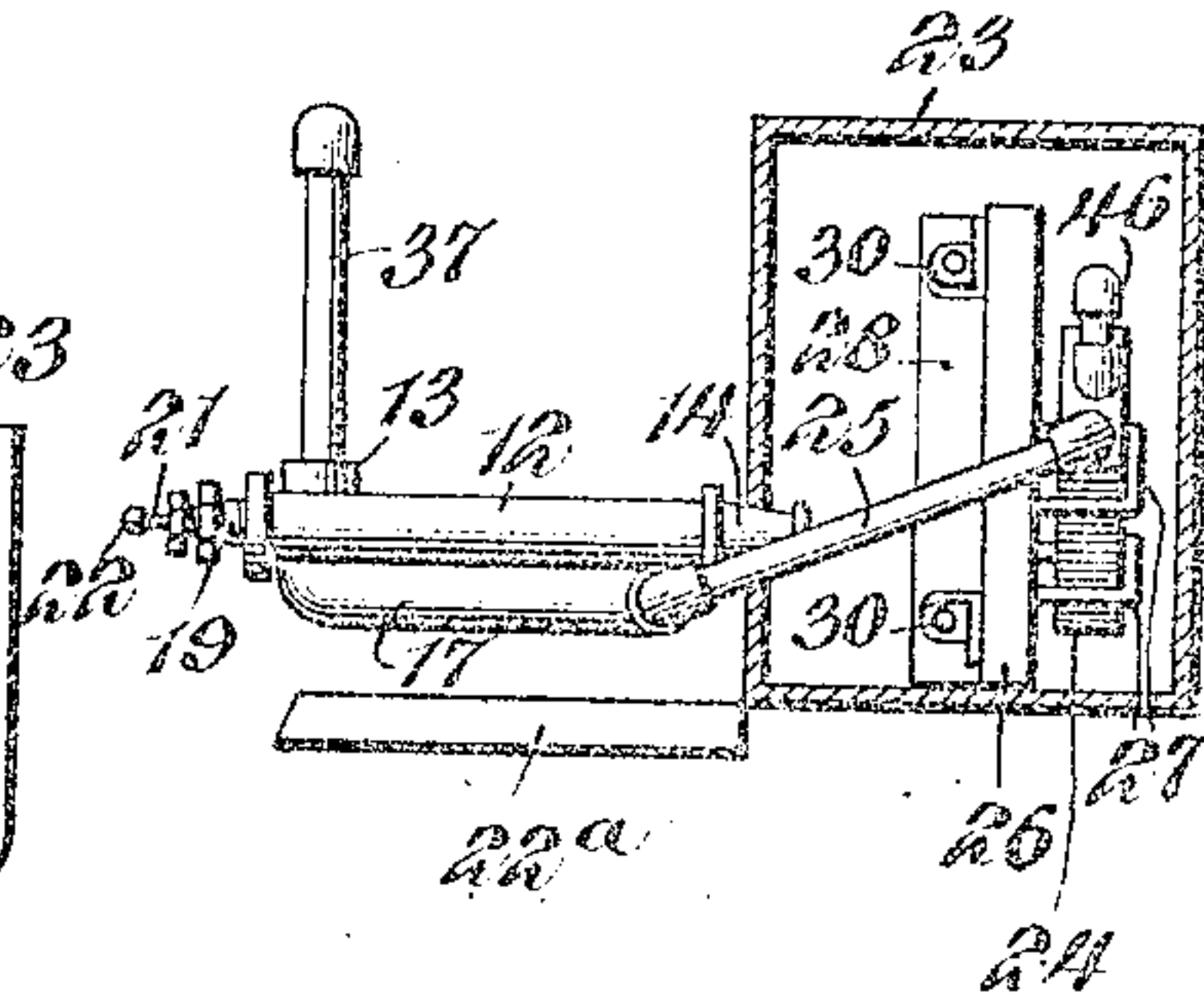


Fig. 9.

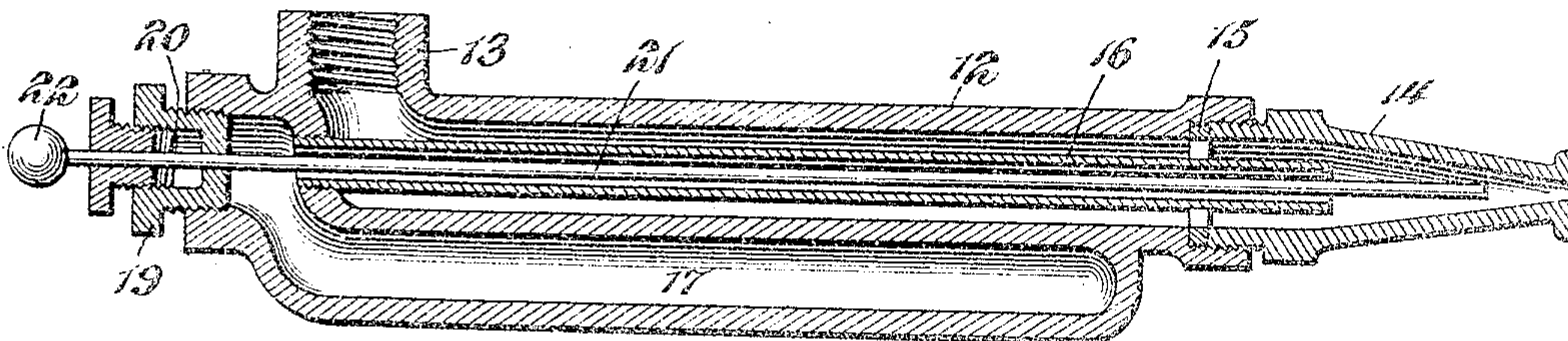


Fig. 10.

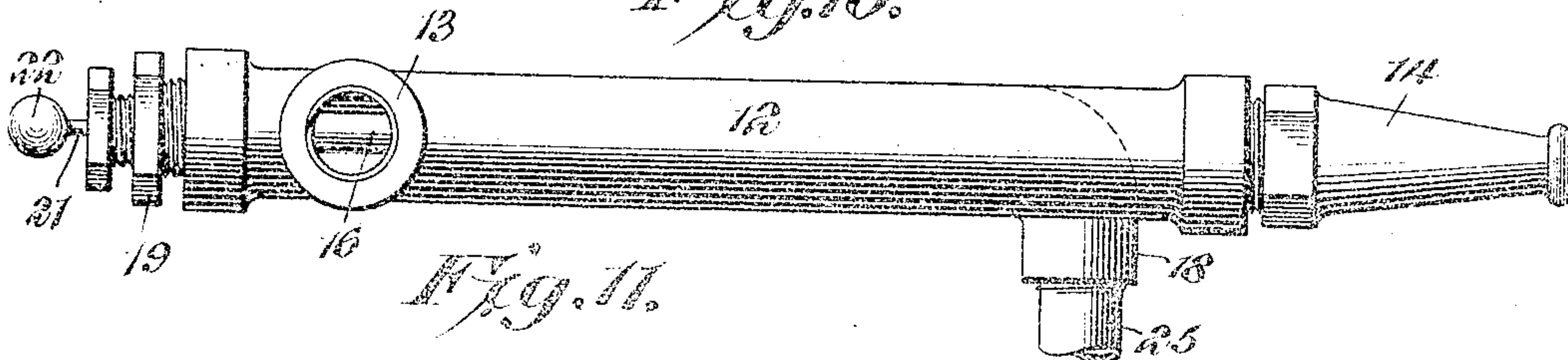
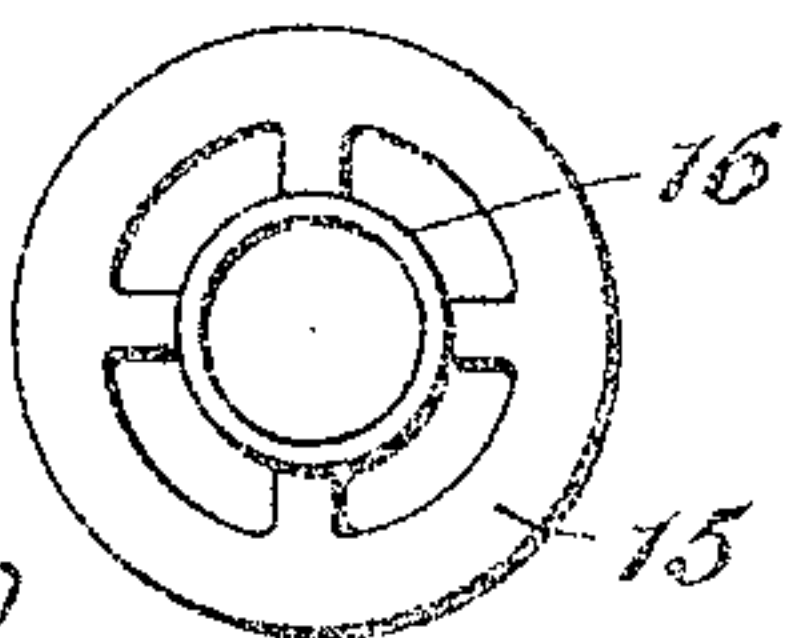


Fig. 11.



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UNITED STATES PATENT OFFICE.

ROBERT V. HOFFMAN, OF BRENHAM, TEXAS, ASSIGNOR OF ONE-HALF TO W. F. HERMANN, OF BRENHAM, TEXAS.

HYDROCARBON-BURNER.

No. 876,457.

Specification of Letters Patent.

Patented Jan. 14, 1908.

Application filed January 19, 1907. Serial No. 353,101.

To all whom it may concern:

Be it known that I, ROBERT V. HOFFMAN, a citizen of the United States, residing at Brenham, in the county of Washington and State of Texas, have invented a new and useful Hydrocarbon-Burner, of which the following is a specification.

This invention relates to hydrocarbon burners, and more particularly to burners of that type used for domestic purposes, such as cooking and heating.

One of the principal objects of the invention is to provide a simple but effective system of a novel nature that can be readily installed, and is easily understood and controlled.

A further object is to provide a burner in which steam is employed, to provide a steam generator that is automatic in its character, is heated by the burner, and yet protected from injurious action by the flames therefrom, and will not require constant attention and regulation in order that the steam supplied to the burner may be properly proportioned to the fuel delivered.

The preferred form of construction is illustrated in the accompanying drawings, wherein:

Figure 1 is a front elevation of the complete apparatus showing the same applied to an ordinary kitchen range. Fig. 2 is a sectional view through the fire box, showing the burner and associated parts. Fig. 3 is a horizontal sectional view showing said parts in top plan. Fig. 4 is an end view of the mechanism. Fig. 5 is a front elevation of the target and muffler. Fig. 6 is an end view of the same. Fig. 7 is a detail sectional view on the line 7-7 of Fig. 5. Fig. 8 is a sectional view through the steam generator and regulating valve. Fig. 9 is a longitudinal sectional view through the burner. Fig. 10 is a top plan view of the same. Fig. 11 is a detail view of the spider located within the burner, and showing the inner nozzle therein.

Similar reference numerals designate corresponding parts in all the figures of the drawings.

In the embodiment disclosed, a burner is employed, comprising an outer casing 12, having an upstanding nipple 13 at one end, and having a nozzle 14 threaded into its other end, said nozzle also constituting a clamp for a spider 15 that is removably fitted into the end of the casing in which the nozzle

is threaded. Located longitudinally within the casing, is an inner nozzle 16, the discharge end of which passes through the spider 15, and is located in the nozzle 14, the diameter of such discharge end being greater than the diameter of the discharge orifice of the nozzle. The rear end of the inner nozzle 16 is in communication with a steam channel 17 formed in one wall of the casing 12, and having an offset nipple 18 disposed contiguous to the front end of the casing. The rear end of the casing 12 is provided with a plug 19, carrying a stuffing box 20, through which slidably extends a cleaning rod 21, having an exposed knob 22. This cleaning rod 22 extends longitudinally through the inner nozzle 16, and is movable through the discharge end thereof and into the discharge orifice of the nozzle 14.

The burner, as shown in Figs. 1-4 inclusive, is preferably located over the hearth 22^a of a stove, with the nozzle 14 projecting into the fire box 23 of said stove, and arranged within said fire box in line with the discharge end of the burner, and disposed transversely thereof, is a steam generator 24. The steam generator, as clearly shown in Figs. 2 and 8, is in the form of a boxing, set at an inclination, the top and bottom walls being inclined, the end walls being preferably vertical. A steam conduit 25 extends from the upper end of the generator 24, and is connected to the nipple 18 of the steam conducting channel 17 of the burner. Interposed between the steam generator 24 and the discharge nozzle 14 is a target plate 26 that is clamped to the steam generator by clip bolts 27 that pass through said plate and surround the generator, thereby supporting the latter in its inclined position. The front face of the target plate 26 that is opposed to the discharge nozzle 14 of the burner, is provided with outstanding muffler walls 28 disposed in spaced relation, and on opposite sides to the longitudinal axis of the burner, these muffler walls being oppositely and inwardly curved, as shown, and having inwardly extending flanges 29 on their outer edges. The walls 28 are secured to the plate in any suitable manner, as for instance, by brackets 30.

An oil reservoir 31, located at any desired place, either inside or outside the house, has a pipe 32 extending from its upper end and connected to the nipple 13 of the burner. Thus the interior of the outer casing 12 con-

stitutes an oil channel within which extends the steam nozzle 16. A controlling valve 33 is located in the pipe 32, preferably in convenient relation to the stove. The reservoir 31 is provided at its upper portion with a filling opening closed by a cap 34, and a draw-off cock 35 is connected to its lower portion. A water reservoir 36, arranged in any desired position, but in a higher plane than the reservoir 31, and burner has a water conduit 37 connected to its bottom, said water conduit also being connected to the lower portion of the oil reservoir 31. A controlling valve 38 is located in the pipe 37.

Leading from the pipe 37 is another pipe 39 that is connected to the lower end of the steam generator 24, and has a controlling valve 40 arranged therein. A casing 41 is also located in the pipe 39, and arranged therein, is a float 42 having a link connection 43 with one arm of a bell crank 44, the other arm of this bell crank lever being connected to a valve 45 that controls the inlet of water to the casing 41, through the pipe 39. A steam pipe 46, connected to the upper end of the inclined generator 24, also has a connection with the upper end of the casing 41.

The valves 38 and 40 may be left open at all times, except during the filling of the oil or hydrocarbon reservoir 31, in which case, the valve 38 must be closed. It will be evident that if the reservoir 31 is filled with oil or other hydrocarbon, and the reservoir 36 is filled with water, said water, if the pipes 37 and 39 are open, will pass into the lower portion of the reservoir 31, and through the pipe 39 into the steam generator 24. The level of the water in the latter is regulated by the float 42, but when said water reaches a predetermined level, the float 42 will close the valve 45. As soon as the level falls, the float 42 will also fall, thereby opening the valve 45, and permitting the inflow of water until the predetermined level is again reached. Thus, the said level is automatically maintained at all times. In starting the burner, the valve 33 is opened, and thus the water from the reservoir 36 will displace the oil in the reservoir 31, and force it through the pipe 32 to the burner. A preliminary heating of the generator 24 is effected by any suitable means, and as soon as steam is generated, the same will pass through the pipe 25, and the inner nozzle 16, thus drawing the oil with it, and expelling it through the nozzle 15. If therefore, the expelled vapor is ignited, it will burn freely, and the flames will be projected against the target 26. Experience has demonstrated that the walls 28 will practically eliminate the sound ordinarily caused by the combustion of the oil and steam, and moreover the target prevents the flames from impinging against the generator 24, and thus injuring the same.

It will be evident that as soon as the

burner is in operation, the entire apparatus will operate automatically, for as fast as the water in the generator is changed into steam, fresh water will be supplied to the lower end of the generator. This is an exceedingly important feature of the invention, for in the inclined generator, the cold water is introduced at the bottom, and as the temperature rises, it will gradually rise to the top until turned into steam.

From the foregoing, it is thought that the construction, operation, and many advantages of the herein described invention will be apparent to those skilled in the art, without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. In a system of the character described, the combination with a burner having a discharge end, of means for supplying fuel to the burner, and a target disposed in line with the discharge end of the burner, said target comprising a plate having a flat face disposed in spaced relation and in opposition to said discharge end, and spaced outwardly curved muffer walls projecting directly from said face longitudinally of the burner and having their free edges disposed on opposite sides of the longitudinal axis of the burner and in spaced relation to the discharge end thereof.

2. In a system of the character described, the combination with a burner having a discharge end, of means for supplying fuel to the burner, and a target disposed in line with the discharge end of the burner and having spaced outwardly curved muffer walls on the face that is opposed to said discharge end, said walls having oppositely and inwardly extending flanges along their free edges and being disposed on opposite sides of the longitudinal axis of the burner.

3. In a system of the character described, the combination with a steam generator, of a burner for projecting a flame towards the generator, a connection between the steam generator and burner, means for supplying fuel to the burner, a target interposed between the discharge end of the burner and the generator and constituting a guard for the latter, and outstanding muffer walls on the face of the target that is opposed to the discharge end of the burner, said walls being spaced from the burner and extending longitudinally of said burner on opposite sides of its longitudinal axis.

4. In a system of the character described, the combination with a steam generator, of a burner for projecting a flame towards the

generator, a connection between the steam generator and burner, means for supplying fuel to the burner, a target interposed between the discharge end of the burner and the generator and constituting a guard for the latter, and outstanding muffler walls on the face of the target that is opposed to the discharge end of the burner, said walls being spaced from the burner and extending on opposite sides of its longitudinal axis, said walls furthermore having flanges on their free edges that extend toward each other and are disposed in spaced relation to the discharge end of the burner.

5. In a system of the character described, the combination with an elongated burner body having a rear discharge end and including vaporizing means, of a fuel supply pipe connected to the body, a target plate located in rear of the discharge end of the burner body and transversely thereof and in the path of the flame from said body, a steam generator set at an inclination behind the target transversely of the burner and having its central portion in line with the path of flame from said body, means for supplying water to the lower end of the generator, and

means for conducting steam from its upper end to the burner body, said target constituting a guard that protects the generator from contact with the flame from the burner.

6. In a system of the character described, the combination with a burner having a discharge end, of means for supplying fuel to the burner, a steam generator located in line with the path of flame from the discharge end of the burner and having inclined top and bottom walls, means for supplying water to the lower end of the steam generator, a steam conduit connecting the upper end of said generator and the burner, and a target located across the path of flame from the burner and interposed between the burner and generator, said target constituting a guard that protects the generator from contact with the flame from the burner.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ROBERT V. HOFFMAN.

Witnesses:

W. F. HERMANN,
C. W. WINKELMANN.