

(No Model.)

C. BALL.  
HYDROCARBON BURNER.

No. 547,473.

Patented Oct. 8, 1895.

*Fig. 7.*

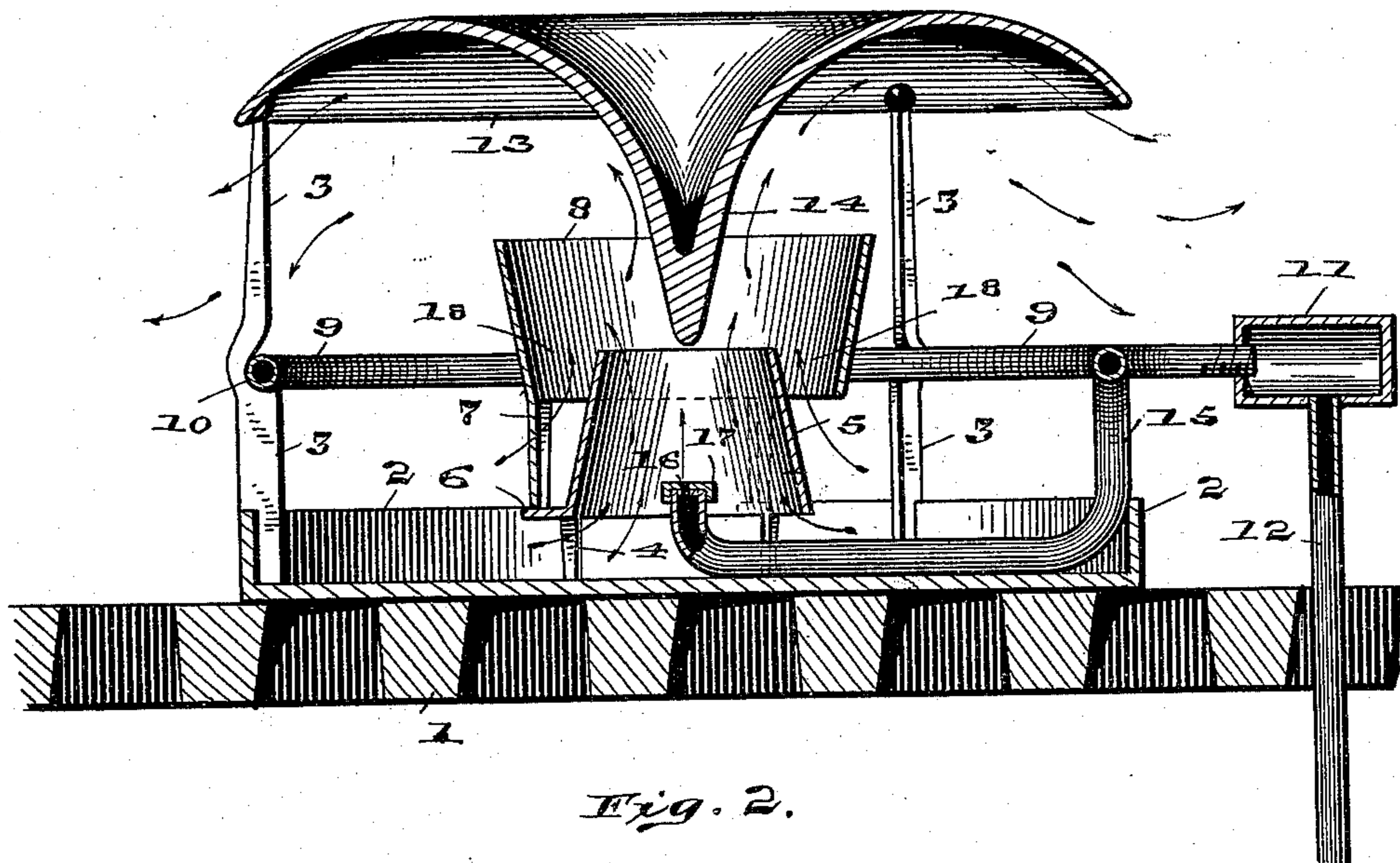
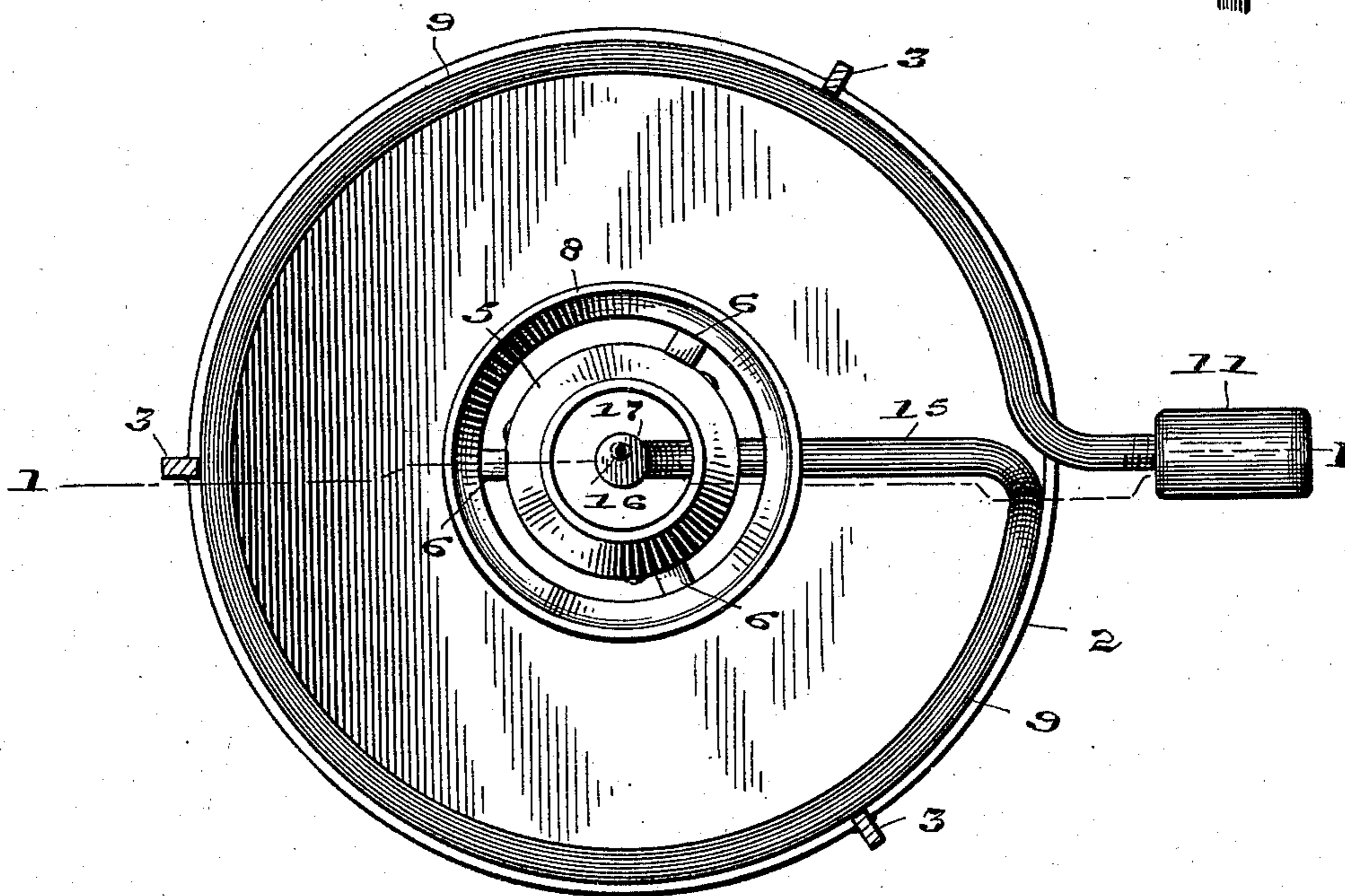


Fig. 2.



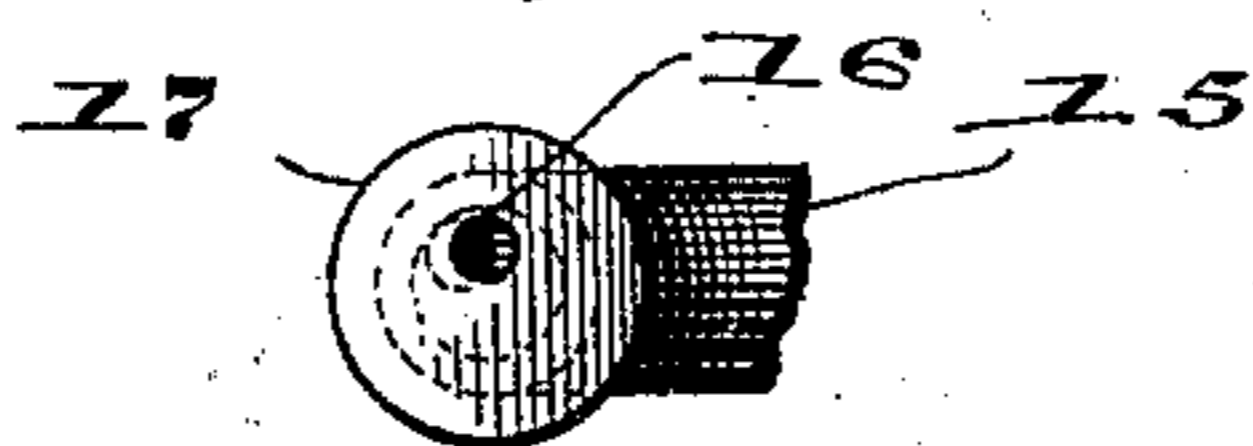
*Fig. 3*

Witnesses

H. B. Neely.  
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# UNITED STATES PATENT OFFICE.

CORTLAND BALL, OF INDIANAPOLIS, INDIANA.

## HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 547,473, dated October 8, 1895.

Application filed November 30, 1894. Serial No. 530,298. (No model.)

*To all whom it may concern:*

Be it known that I, CORTLAND BALL, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Hydrocarbon-Burners; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being made to the accompanying drawings, in which like numerals refer to like parts.

My invention relates more particularly to that class of hydrocarbon-burners designed to be used in cooking and heating stoves, but may be used for any other purpose for which the device may be adapted.

The invention consists, first, in the construction of the exit end of the vapor-pipe, which I construct so that the vent-hole may be opened to its full capacity or partially closed, thereby producing a moderate or intense heat, as may be desired. It is not to be understood that the degree of heat produced will be wholly governed by the adjustment of the vent-hole to any particular size; but a given quantity of oil will not produce as much heat with the vent-hole too large as it will when the vent-hole is just the right size, because with the vent-hole too large the vapor will not escape with force enough to carry with it into the combustion-chamber a sufficient amount of oxygen to produce perfect combustion. Therefore much of the real value of the oil will be lost by passing off in smoke and a sticky oily soot.

It consists, second, in a simple and effectual device whereby I overcome the back-pressure of the vapor which checks the flow of oil into the retort or generator, and, third, in the combination and arrangement of the several parts, as hereinafter described and claimed.

In the accompanying drawings, Figure 1 is section of Fig. 2 on a line with 1 1. Fig. 2 is a plan view with deflector and spreader removed. Fig. 3 is a detail view of end of vapor-pipe.

In detail, 1 represents a grate, upon which the burner rests.

2 is a drip-pan, which is made, preferably, annular in form and about half an inch in depth. Standards 3 and posts 4 are cast at

the same time and in their respective places solid to drip-pan.

5 is a mixer, which rests upon posts 4 and is provided with flanges 6. Said flanges are cast solid to mixer 5 and have sockets formed on their upper face. The feet of legs 7 fit in said sockets. The legs 7 are cast solid to combustion-chamber 8. The lower part of the combustion-chamber 8, as will be seen, is located about half an inch below the top of mixer 5, thereby forming the air-passage between the two.

9 is the retort or generator. One or more coils may be used.

10 are offsets in the standards 3, upon which the retort or generator 9 rests.

11 is what I call an "antipressure-chamber," the object of which is to hold a sufficient body of oil, so that it will overcome the back-pressure of the expanding vapor against the end of the supply-pipe 12, which checks the flow of the oil into the retort or generator from the oil-supply pipe.

12 is an oil-supply pipe, to which a valve is to be connected. The end of the supply-pipe 12, as will be seen, is just flush with the bottom of the antipressure-chamber 11.

13 is a deflector, and it will be observed that it has both a convex and a concave surface, the lower or under of which is concave for the purpose of more directly deflecting the flame and heat down upon the retort or generator 9.

14 is a vapor-spreader, which is cast at the same time and solid to deflector 13, making only one piece. The deflector 13 is made with sockets that fit over the top of standards 3, thereby holding deflector in its proper position and place.

15 is a vapor-pipe, through which the vapor passes from the retort or generator to the mixer 5 and from thence to the combustion-chamber 8. The end of the vapor-pipe 15 is solid and about one-fourth of an inch in thickness. A thread is cut on the outside of the solid end, and cap 17 has a corresponding thread cut on the inside. The cap 17 is then screwed down tight against the solid end, and the vent-hole 16 is made through both the cap and end of vapor-pipe. The vent-hole 16, I make just the size of it on one side of the center of cap. It will be observed that by turning the cap a

little the vent-hole may be adjusted to any desirable size. When a high degree of heat is requisite, the vent-hole should be opened to its full capacity and as much oil allowed to pass into the retort or generator as it will vaporize. If only a moderate heat be required, then the vent-hole should be adjusted accordingly and only a small quantity of oil admitted into the retort or generator. The vent-hole 16, as shown, is to be centrally located beneath the mixer 5.

The operation in starting a fire is, first, to open the valve connected to the supply-pipe 12 and let the oil into the antipressure-chamber 11, and as soon as a sufficient quantity is in the antipressure-chamber 11 it will flow from thence into and through the retort or generator 9 down into the vapor-pipe 15 and up through the vent-hole 16 into the drip-pan 2. Then the oil is to be ignited, and very soon the flames from the burning oil will heat the retort or generator, so that the oil will become vaporized, and by its own expansion will be forced through the vapor-pipe 15 and out through the vent-hole 16 into the mixer 5, where it will be infused with oxygen as it is forced through mixer 5 up against the vapor-spreader 14, which will diffuse it into the combustion-chamber 8, where it will absorb a second influx of oxygen from the air-passage 18,

and a perfect combustion will take place, sending the flames up against the deflector 13, which by its construction, as shown, will deflect the flame and heat down against the retort, thereby keeping it hot enough to vaporize the oil as fast as it flows into the retort or generator, and at the same time not hot enough to decompose and convert it into a permanent and fixed gas, which would thereby leave a residuum, which would soon fill up the retort or generator, so that in a short time it would become worthless.

Having thus fully described my invention, what I claim is—

In a hydro-carbon burner, the combination of a retort or generating coil having a central upturned gas or vapor escape, a mixing flue or shell having a contracting top, such shell surrounding the said vapor escape pipe, an air flue or mixer having a flaring top surrounding the first flue, and a flame deflector supported above and provided with overhanging edges adapted to throw the flame from the burner, down upon the retort or generating coil, substantially as set forth.

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Witnesses:

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