

**No. 696,961.**

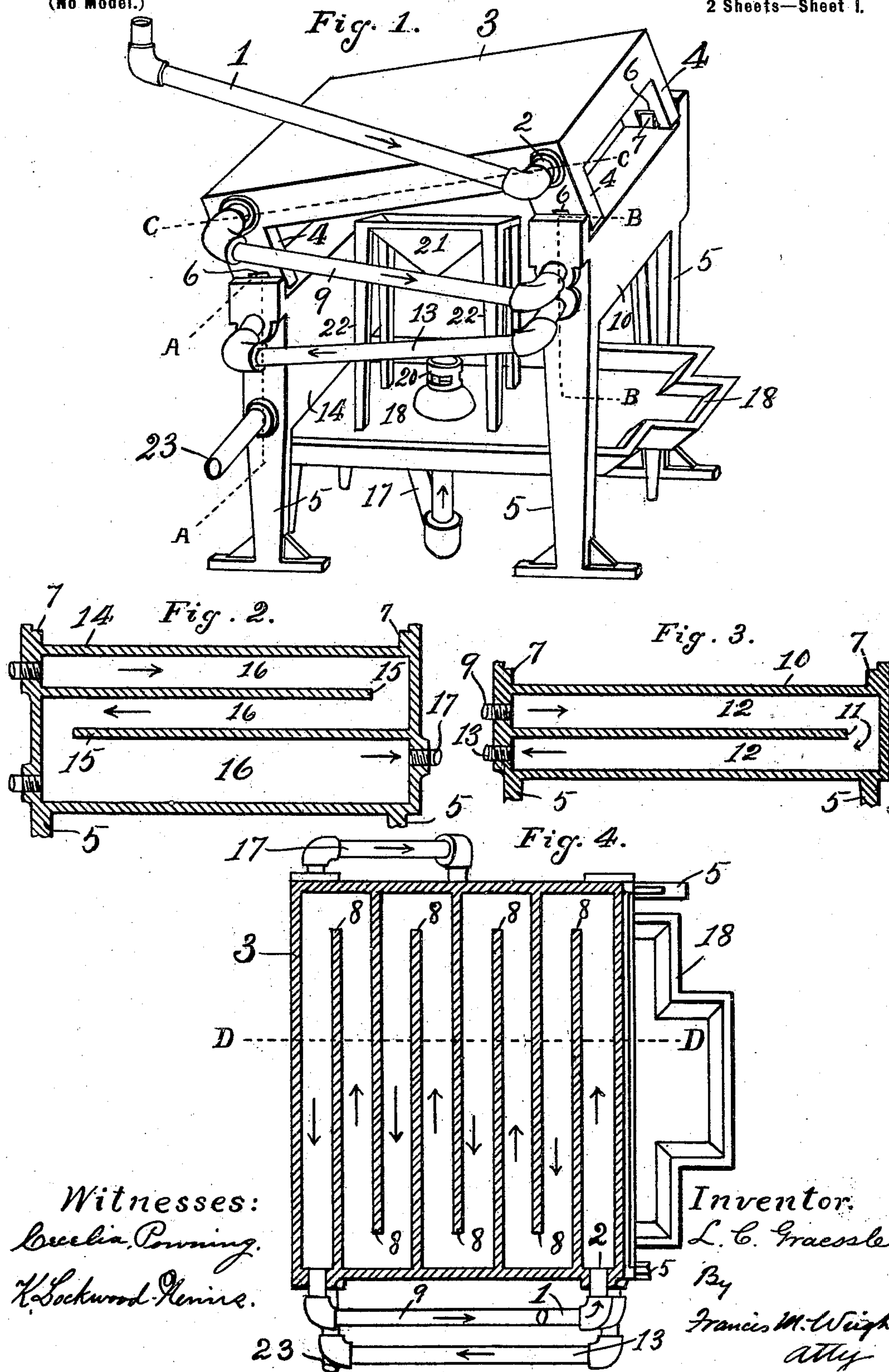
**Patented Apr. 8, 1902.**

**L. C. GRAESSLE.**  
**HYDROCARBON BURNER.**

(Application filed Oct. 11, 1901.)

(No Model.)

**2 Sheets—Sheet 1.**



No. 696,961.

Patented Apr. 8, 1902.

L. C. GRAESSLE.  
HYDROCARBON BURNER.

(Application filed Oct. 11, 1901.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 6.

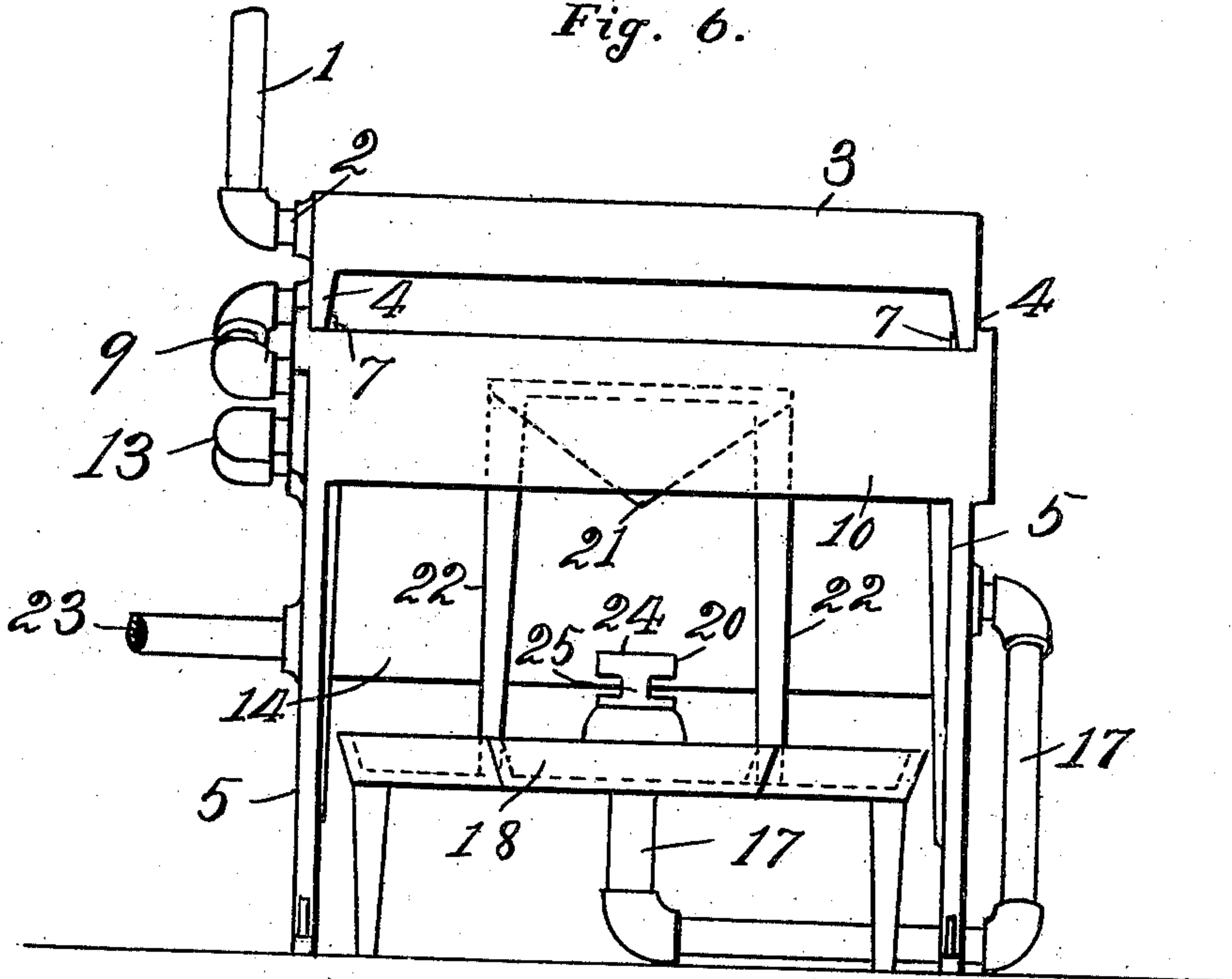


Fig. 7.

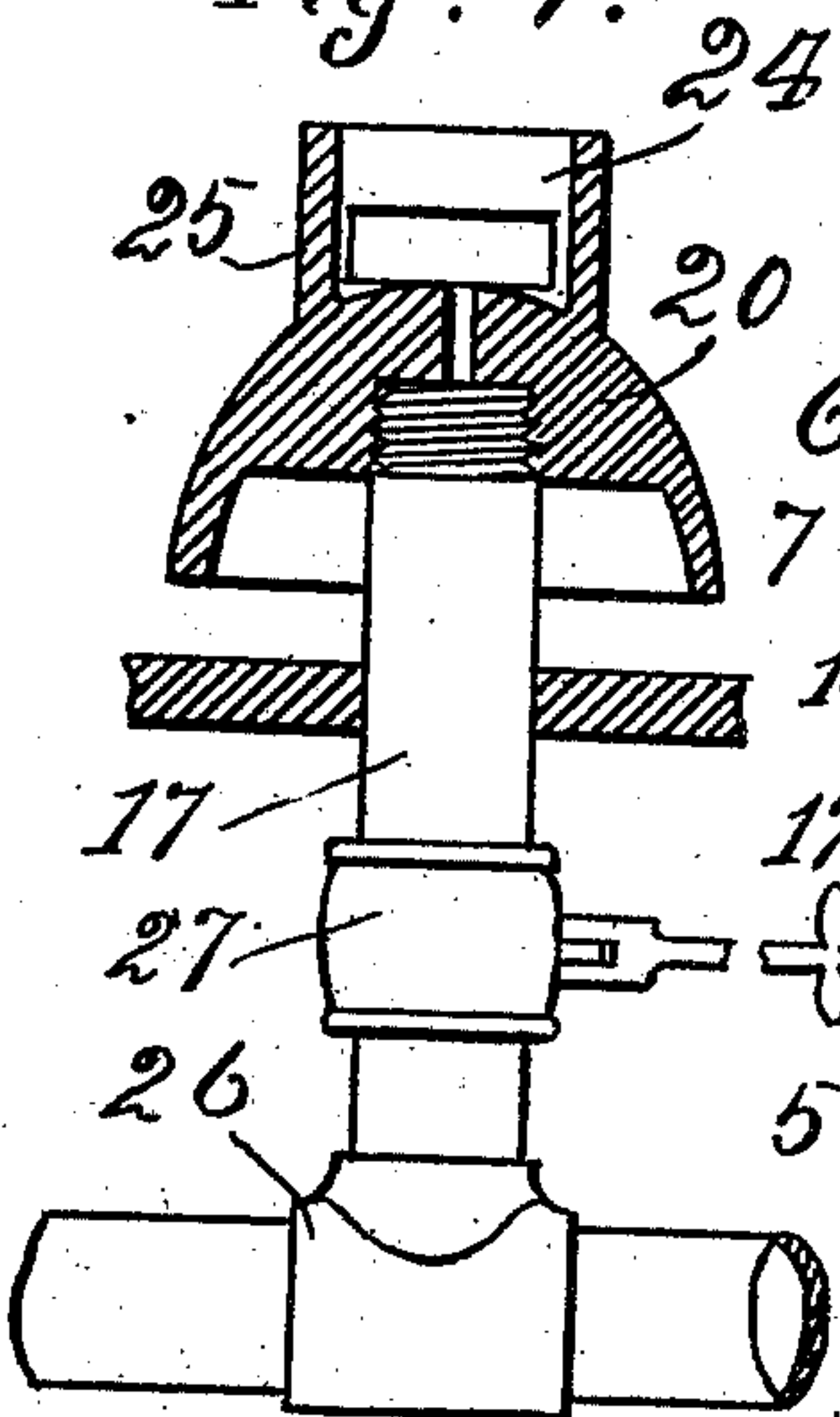


Fig. 5.

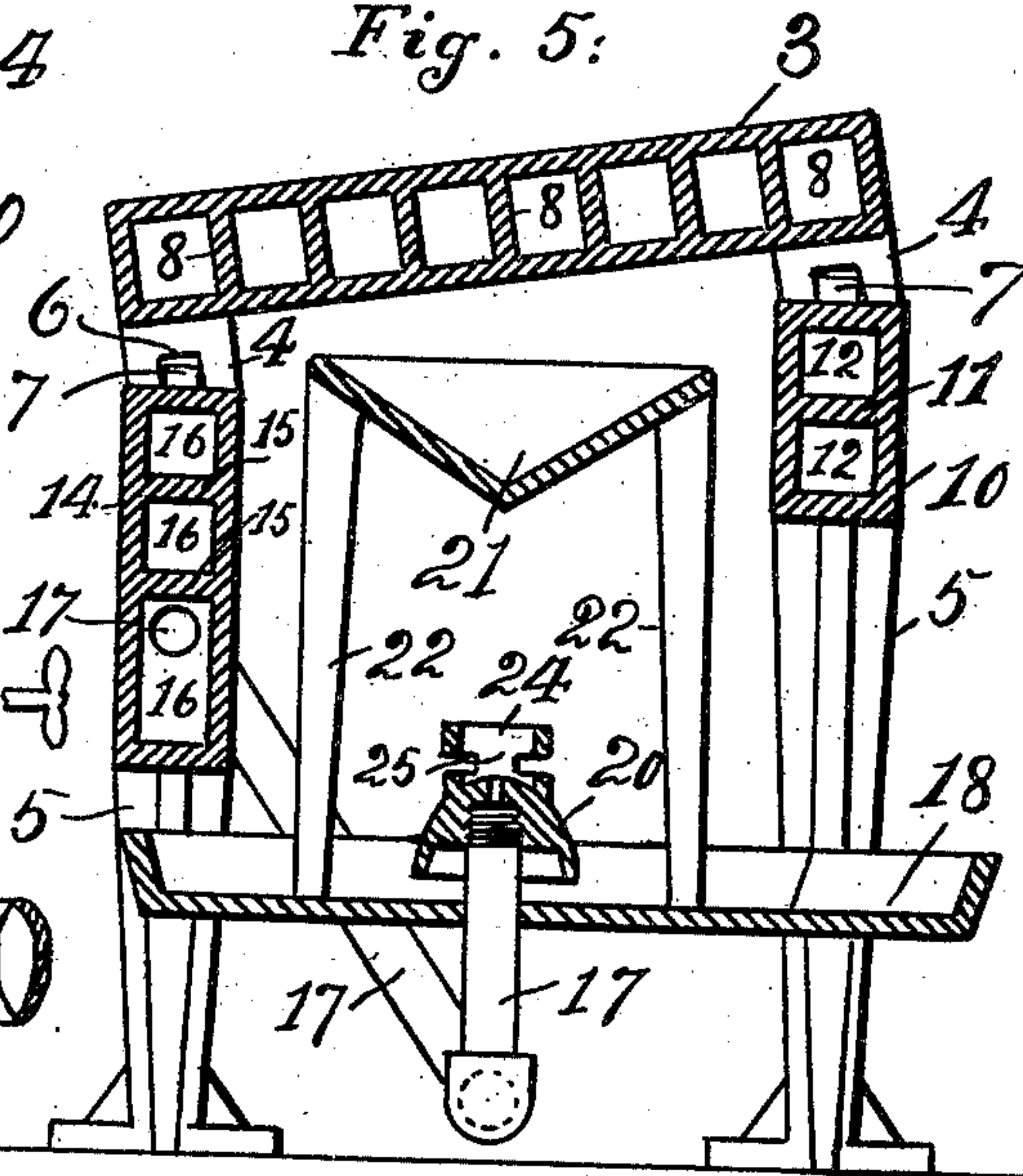
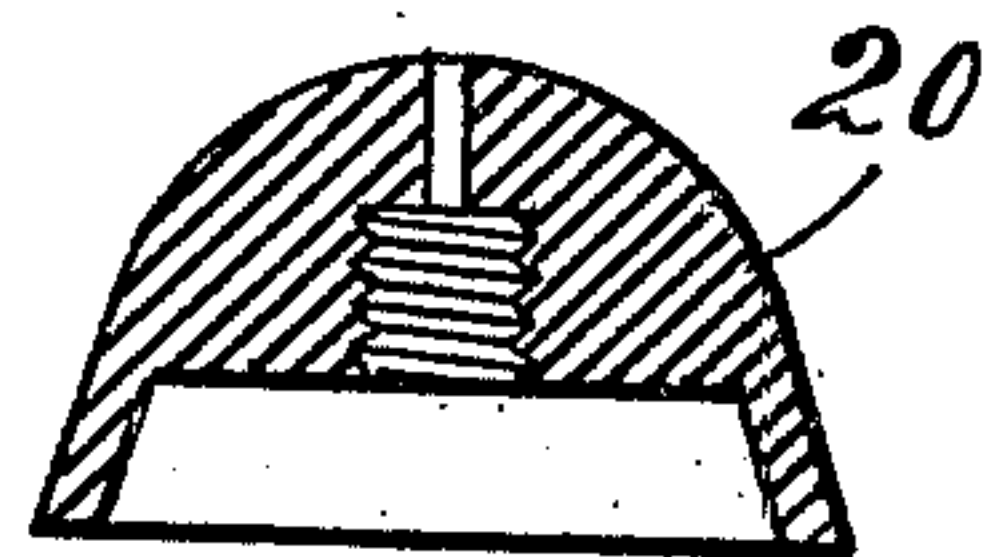


Fig. 8.



Witnesses:

Lucia Paving  
H. Lockwood Nevins.

Inventor

L. C. Graessle

By Francis M. Wright.  
attys.



# UNITED STATES PATENT OFFICE.

LIZZIE C. GRAESSLE, OF SAN JOSE, CALIFORNIA.

## HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 696,961, dated April 8, 1902.

Application filed October 11, 1901. Serial No. 78,387. (No model.)

*To all whom it may concern:*

Be it known that I, LIZZIE C. GRAESSLE, a citizen of the United States, residing at San Jose, in the county of Santa Clara and State of California, have invented certain new and useful Improvements in Hydrocarbon-Burners, of which the following is a specification.

My invention relates to an improved hydrocarbon-burner for vaporizing oil and burning the same in domestic stoves or ranges, the object of my invention being to provide an apparatus of this character which shall vaporize the oil as completely as possible and burn the vapor so produced with as little smoke as possible. It is especially adapted for use with crude oils, thereby saving the expense of refining and supplying a very cheap fuel for domestic purposes. The invention may be also used industrially in connection with steam-boilers, if desired; but it is specially valuable for use in households, in which the employment of steam to vaporize the oil is not practicable.

My invention therefore resides in the novel construction, combination, and arrangement of parts for the above ends hereinafter fully specified, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view of my improved apparatus. Fig. 2 is a section on the line A A of Fig. 1. Fig. 3 is a section on the line B B of Fig. 1. Fig. 4 is a section on the line C C of Fig. 1. Fig. 5 is a section on the line D D of Fig. 4. Fig. 6 is a side view. Fig. 7 is an enlarged section through the burner proper, and Fig. 8 is a similar view of a modified form of burner.

Referring to the drawings, 1 represents the oil-supply pipe, which conducts the oil to the apparatus from any suitable tank or receptacle. (Not shown.) Said pipe 1 discharges at 2 into the upper gas-retort 3, which is removably supported by legs 4 upon standards 5, said legs 4 having sockets 6, arranged to fit over lugs 7 on said standards. The retort is so supported on said standards as to have a downward slope from the side at which the oil enters to that from which the oil and gas are discharged and is divided by partitions 8, extending alternately from opposite ends of the retort to a short distance from the other end, and thus forming a tortuous conduit for

the oil to traverse from the upper to the lower side of said retort. The retort 3 being exposed to the heat of the burning gas, the oil is thereby partly vaporized, and the resulting gas and the remainder of the oil flow out of said retort 3 by means of a pipe 9 and discharge into the upper end of a lateral retort 10, likewise divided by a partition 11 into a tortuous conduit 12. The gas and oil enter said lateral conduit at one end of the apparatus, returning by the conduit to the same end, and are thence conducted by a pipe 13 to a second lateral retort 14 at the opposite side of the apparatus, the retort 14 being likewise divided by two partitions 15 into a tortuous conduit 16. The three retorts 3 10 14 being exposed to the flame of the burning gas, the oil is by this time vaporized as completely as possible, and the resulting gas passes from the retort 14 into a pipe 17 and is thereby conducted underneath the oil-pan 18, through the center of which it passes upward and is connected to a burner 20. The flame of the gas issuing from said burner impinges against the lower side of a spreader 21, supported by legs 22 upon the oil-pan, and by this means is caused to impinge upon the sides of the lateral retorts 10 and 14, and is thence deflected against the under side of the upper retort 3. It is by this means that said retorts are so thoroughly heated as to vaporize the crude oil to the fullest extent possible. The flames of the burning gas then ascend and are utilized in the ordinary way for cooking or heating.

When crude oil having an asphaltic base is vaporized and burned with my improved form of burner, there is a residuum of asphaltum which cannot be vaporized, but remains in a liquid condition. This asphaltic residuum will sink to the bottom of the lowest retort 14, through which it can be drawn when desired by means of the waste-pipe 23.

In Figs. 7 and 8 I have shown two forms of burners proper which may be employed with my device. In Fig. 7 said burner consists of an inverted-cup-shaped body screwed onto the end of the pipe 17, through which the gas issues, so that the lower rim of said cup is at a sufficient height above the bottom of the oil-pan 18, said burner having above said cup-shaped body a ring 24, supported by stand-



ards 25. The whole of this burner proper is cast in one piece. In the form shown in Fig. 8 the burner is of an inverted-bowl-shaped form and is screwed in the same manner as 5 above into the upstanding end of the pipe 17, but does not have the ring or the standards. In the upstanding portion of the gas-pipe 17 may be inserted, as shown in Fig. 7, a T 26 with a valve 27 to convey a portion of the gas 10 to a distant place for other purposes. To start the generation of gas from the crude oil, a small quantity of oil is burned upon the oil-pan 18, so as to heat the retorts sufficiently to generate gas therein.

15 I claim—

1. In a hydrocarbon-burner, the combination of oppositely-facing standards, lateral retorts carried by said standards, a sloping upper retort supported on said standards and 20 having partitions extending alternately from opposite sides thereof to form a tortuous conduit therein, an oil-pan between the standards, an oil-supply pipe connected to the upper end of the upper retort, a pipe leading 25 from the lower end of said retort to the upper portion of one of the lateral retorts, a pipe leading from the lower portion of the lateral retort to the upper portion of the opposite lateral retort, a pipe leading from the lower end 30 of the conduit in said latter retort below the oil-pan and then extending upwardly there-through, a burner mounted on the end of said latter pipe, and a spreader standing on said oil-pan above said burner, and having up-

wardly-flaring sides to spread the flames 35 against the sides of the retorts, substantially as described.

2. In a hydrocarbon-burner, the combination of oppositely-facing standards, lateral retorts carried by said standards having vertical conduits formed therein, a sloping upper retort removably supported on said standards and having partitions extending alternately from opposite sides thereof to form a tortuous conduit therein, an oil-pan between the stand- 40 ards, an oil-supply pipe connected to the upper end of the upper retort, a pipe leading from the lower end of said retort to the upper portion of one of the lateral retorts, a pipe leading from the lower portion of the lateral 50 retort to the upper portion of the opposite lateral retort, a pipe leading from the lower end of the conduit in said lateral retort below the oil-pan and then extending upwardly there-through, an inverted-cup-shaped burner 55 mounted on the end of said latter pipe, and a spreader standing on said oil-pan above said burner, and having upwardly-flaring sides to spread the flames against the sides of the retorts, substantially as described. 60

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

LIZZIE C. GRAESSLE.

Witnesses:

WILL M. BEGGS,  
HARLEY A. HARDINGE.