

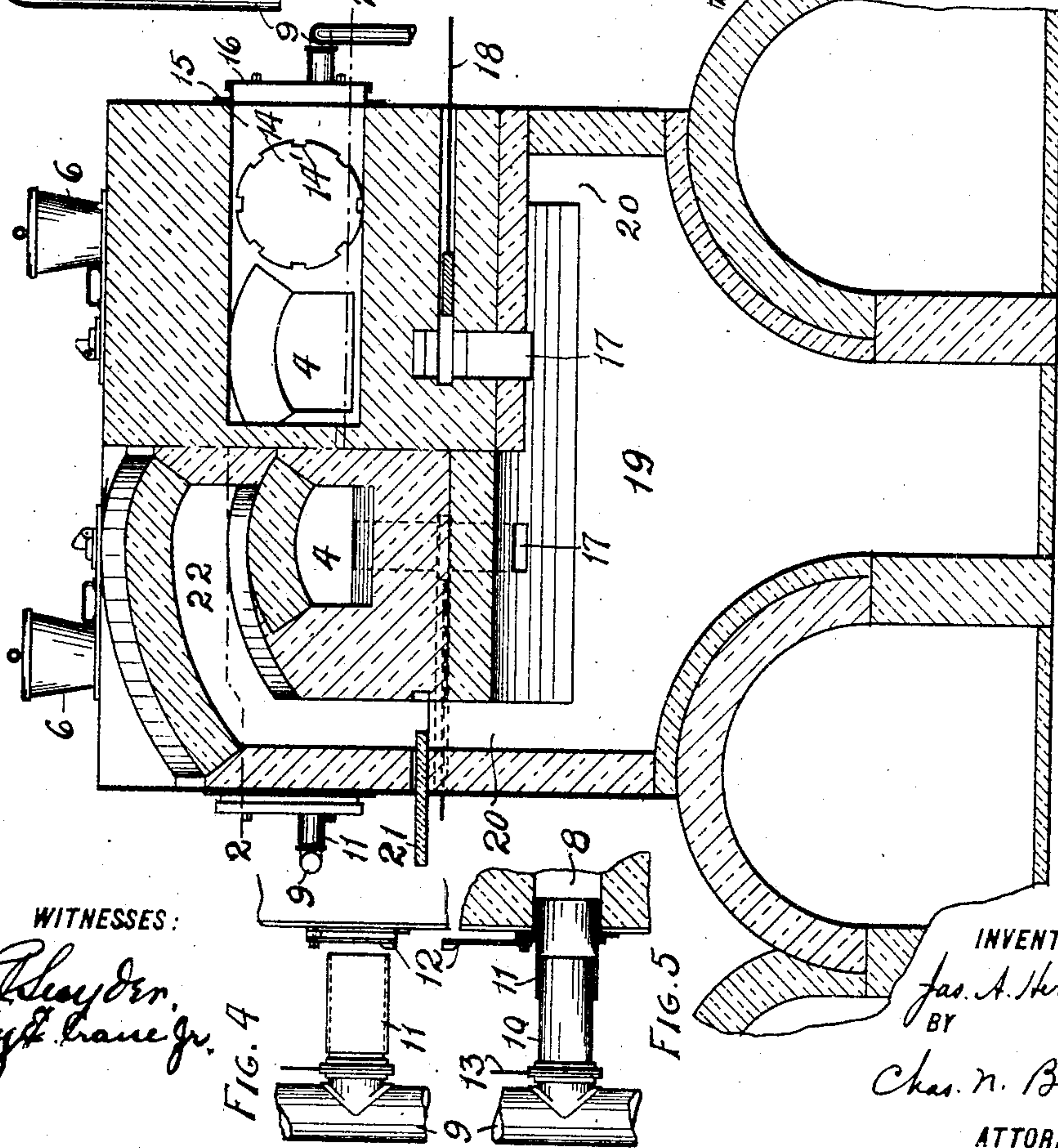
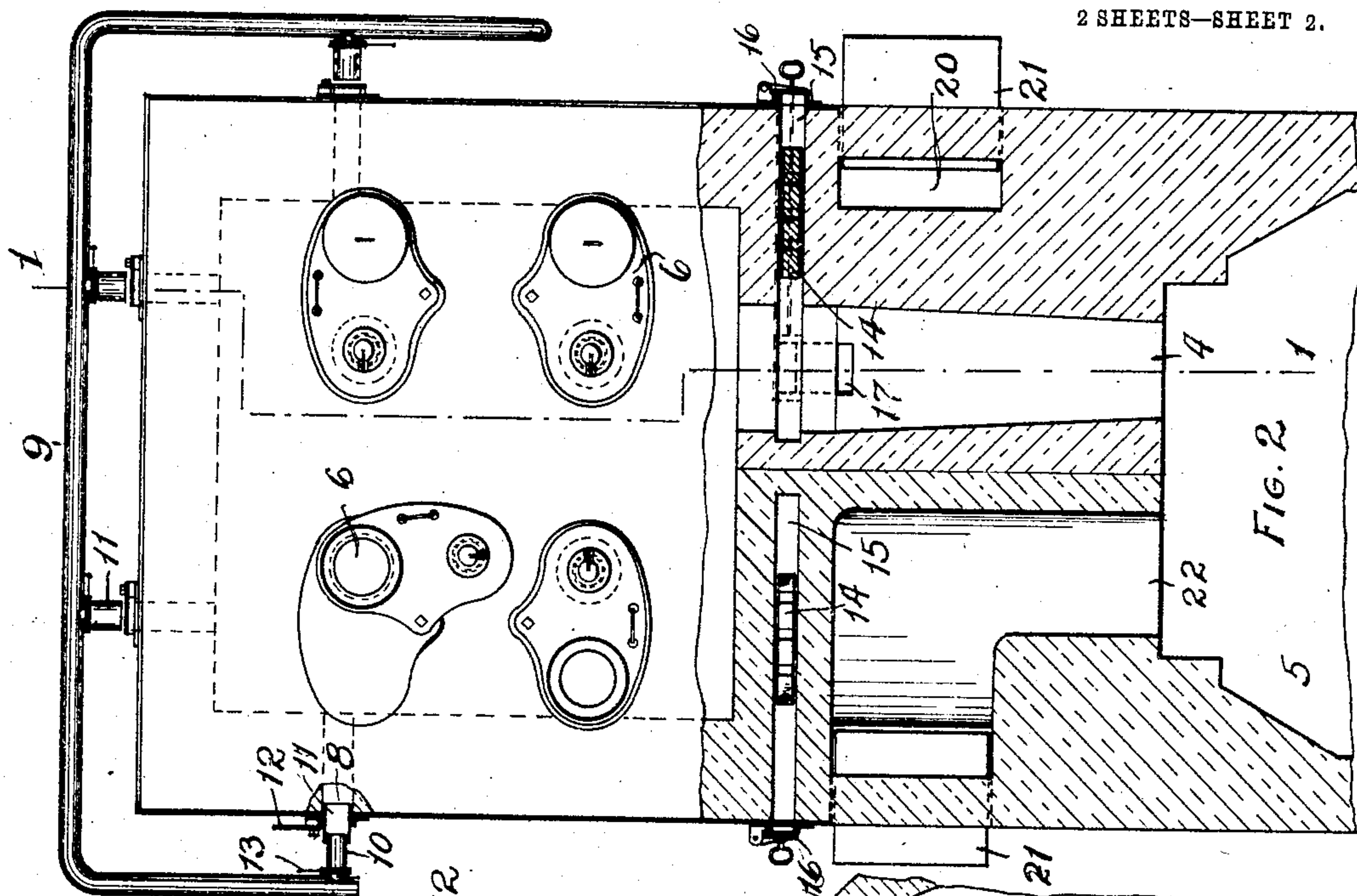
No. 786,032.

PATENTED MAR. 28, 1905.

J. A. HERRICK.
SYSTEM FOR THE COMBUSTION OF GAS.

APPLICATION FILED JUNE 2, 1904.

2 SHEETS—SHEET 2.



WITNESSES:
Wm. H. Brown Jr.

FIG. 4

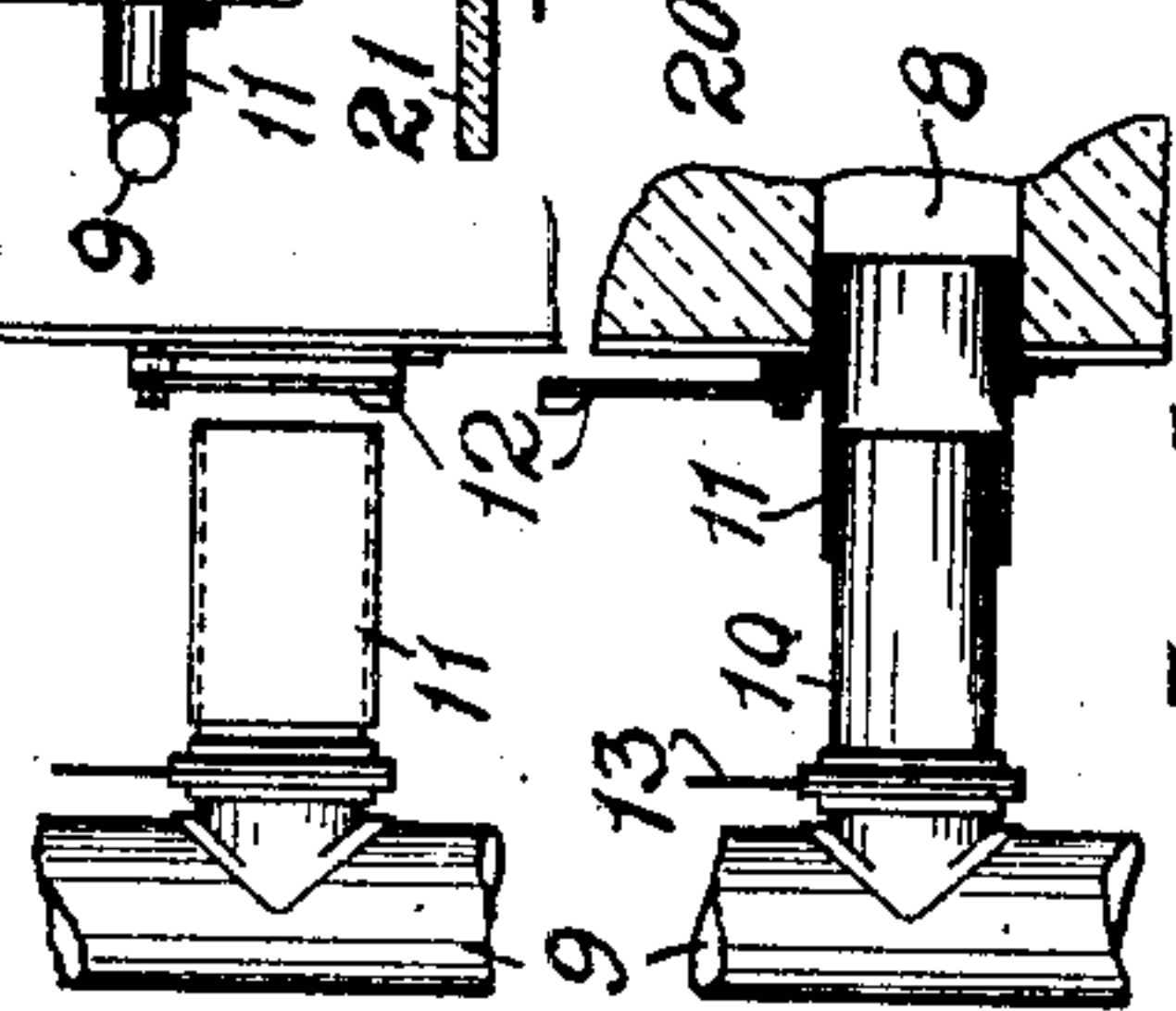
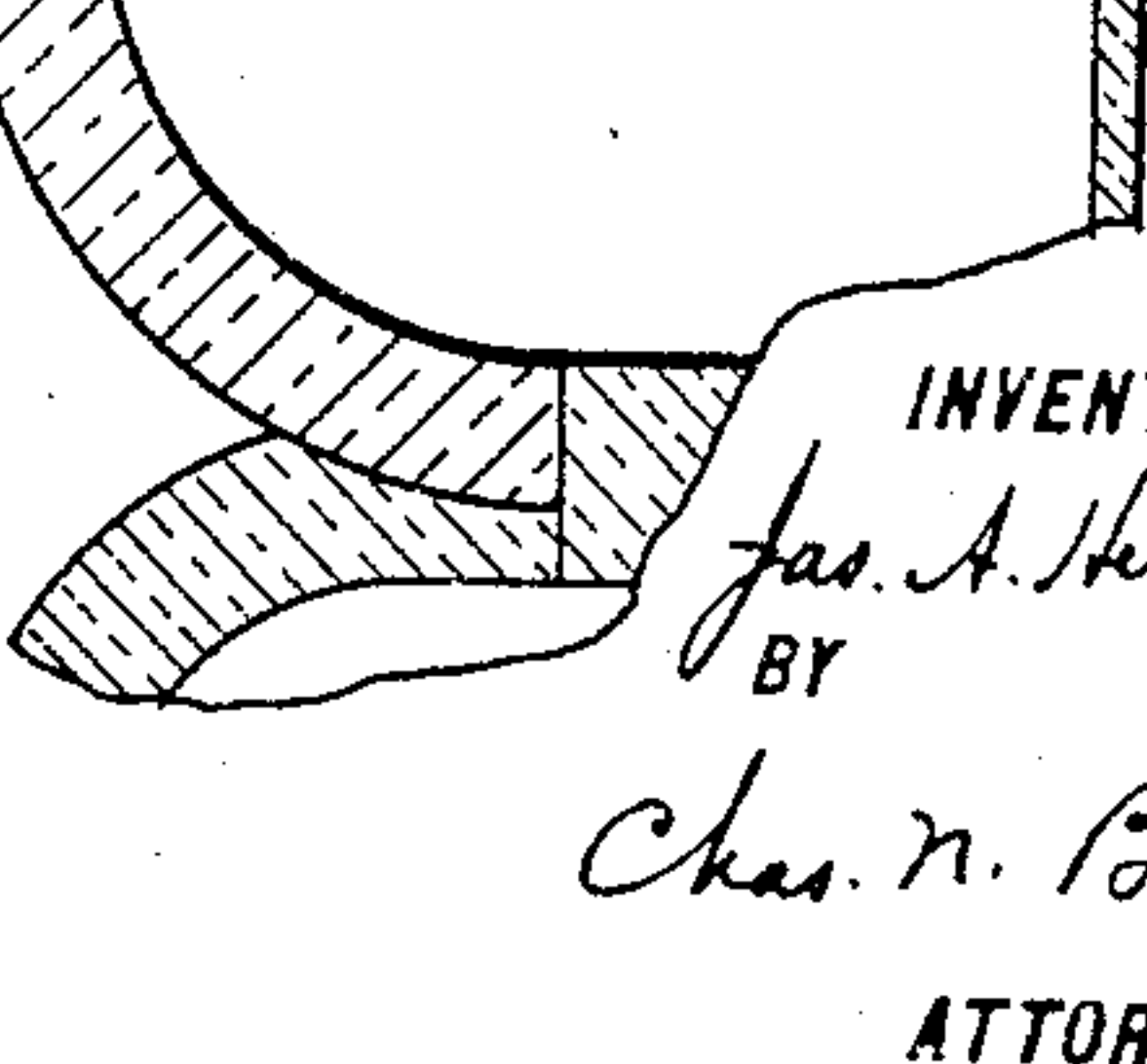


FIG. 5



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SYSTEM FOR THE COMBUSTION OF GAS.

SPECIFICATION forming part of Letters Patent No. 786,032, dated March 28, 1905.

Application filed June 2, 1904. Serial No. 210,825.

To all whom it may concern:

Be it known that I, JAMES A. HERRICK, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented an Improved System for the Combustion of Gas, of which the following is a specification.

This invention relates to the combustion of gas for use in furnaces, and is designed to provide increased heating efficiency and fuel economy.

In former systems employed for producing and burning gas the products of distillation are not thoroughly gasified nor oxidized so as to produce the highest efficiency and economy obtainable in the furnace, soot and tarry matters depositing along the flues and in the regenerators, where a considerable amount of combustion takes place with loss of energy that should be expended in the furnace-chamber. In the present invention air is introduced into the gaseous products distilled from solid fuel and collected at the top of the producer, partial oxidation is effected, and the gasification of the heavier products is facilitated. The burning gases expanded in the producer-top are carried into the furnace-chamber through contracting ports, into which heated air flows to further the combustion and increase the temperature of the gases prior to their combination with air from the regenerators in the furnace-chamber.

In the accompanying drawings, Figure 1 is a vertical sectional view taken on the line 1 1 of Fig. 2, representing a combined gas-producer and furnace for the practice of my invention. Fig. 2 represents a top plan and partial sectional view taken on the line 2 2 of Fig. 3 of the same. Fig. 3 represents a vertical sectional view, the left half being taken on the line 3 3 and the right half on the line 3' 3' of Fig. 1. Fig. 4 represents a top plan view of a section of the mechanism for introducing air into the top of the producer, and Fig. 5 represents a top plan and partial sectional view of a second position of the mechanism for introducing air into the top of the producer.

In the preferred embodiment of my invention as shown in the drawings the gas-pro-

ducer casing 1 is directly connected with the end wall 2 of a furnace, the top 3 of the producer communicating by the contracting gas-ports 4 with the furnace combustion-chamber 5. The producer, provided with the usual fuel-inlets 6 and blast mechanism 7, has the air-ports 8 through its walls near the top. A blast-pipe 9 has the branches 10, with the longitudinally-movable sleeves 11 thereon, adapted for making connection with the ports 8, the ports having the valves 12 and the branches having the valves 13 for closing their respective passages, by which a regulated quantity of air can be introduced into the top of the producer under pressure or otherwise. The ports 4 are provided with the dampers 14, rolling in the ways 15, having their outer ends covered by the caps 16, the dampers having the peripheral notches 14' for the engagement of a hook to operate them in regulating the flow of gas through the ports. Ducts 17, controlled by the sliding dampers 18, lead from the regenerator-chamber 19 and discharge into the ports 4, providing means for introducing a regulated quantity of heated air into the burning gas flowing through the ports. Passages 20, controlled by the dampers 21, lead from the regenerator-chamber 19 up the sides of the furnace to the main air-ports 22 above the gas-ports and discharging therewith into the furnace-chamber 5, the air-ports contracting from their inlets to their outlets.

It will now be understood that a regulated quantity of air is introduced into the gas accumulating in the top of the producer and partial combustion effected, a temperature being produced that gasifies the heavy products of distillation. This burning gas is carried under pressure through the gas-ports, regulated to pass the amount of gas desired, where a regulated quantity of heated air is introduced to further the combustion, which is completed by the introduction of air from the regenerators through the main air-ports.

The gas-ports and air-ports are each contracted from their inlets to their outlets, and the outlets of the air-ports are wider than the outlets of the gas-ports, so that the streams of air envelop and intersect the streams of gas,

effecting a more perfect intermixture and combustion thereof, carrying the resulting flame farther into the furnace and producing an improved heating effect.

5 Having described my invention, I claim—

1. In a system for burning gas, a gas-producer, means for introducing air and burning ungasified matter in the top of said producer, a furnace-chamber, a passage leading from
10 said gas-producer to said furnace-chamber, a regenerator-chamber, and a passage leading from said regenerator-chamber to said furnace-chamber, substantially as specified.

2. In a system for burning gas, a gas-producer having means for introducing air and
15 gasifying ungasified products of combustion, said means comprising a blast-pipe exterior to said producer, a furnace-chamber, a passage leading from said producer to said chamber, a regenerator-chamber, and a passage
20 for conducting hot air from said regenerator-chamber to said furnace-chamber, substantially as specified.

3. In a system for burning gas, a gas-producer having a port in the upper part thereof
25 for supplying air thereto, a blast-pipe having a part adapted for connection with said port, a furnace-chamber into which said producer discharges, and a regenerator which discharges
30 into said furnace-chamber, substantially as specified.

4. In a system for burning gas, a gas-producer, means for effecting combustion of ungasified matter in the top of said producer, a
35 furnace-chamber, a gas-passage leading from said gas-producer to said furnace-chamber, a regenerator, an air-passage leading from said regenerator to said furnace-chamber, and an air-duct leading from said air-passage to said
40 gas-passage, substantially as specified.

5. In a system for burning gas, a gas-producer, means for effecting combustion of ungasified matter in the top of said producer, a furnace-chamber, a gas-passage leading from
45 said gas-producer to said furnace-chamber, means for throttling the gas in said gas-passage, a regenerator, an air-passage leading from said regenerator to said furnace-chamber, an air-duct leading into said gas-passage,
50 and means for throttling the air in said air-duct, substantially as specified.

6. In a system for burning gas, a gas-producer, means for effecting combustion of ungasified matter in the top of said producer, a furnace-chamber, a gas-passage leading from
55 said gas-producer to said furnace-chamber, means for throttling the gas in said gas-passage, a regenerator, an air-passage leading from said generator to said furnace-chamber, means for throttling the air in said air-pas-
60 sage, an air-duct leading into said gas-passage, and means for throttling the air in said air-duct, substantially as specified.

7. In a system for burning gas, a furnace-chamber, a downwardly-extending gas-pas-
65 sage leading to and contracting toward said chamber, an air-passage extending in substantially the same direction, said air-passage leading to and contracting toward said chamber, and being disposed above said gas-pas-
70 sage so as to cause the air to partially envelop the gas, and a regenerator connected with said air-passage, substantially as specified.

In testimony whereof I have hereunto set my hand, this 28th day of May, 1904, in the
75 presence of the subscribing witnesses.

JAMES A. HERRICK.

Witnesses:

JOHN THIEL,

UTLEY E. CRANE, Jr.