

No. 780,593.

PATENTED JAN. 24, 1905.

F. BURGER.  
OIL BURNER FOR STEAM BOILERS.

APPLICATION FILED AUG. 28, 1901.

2 SHEETS—SHEET 1.

Fig. 1.

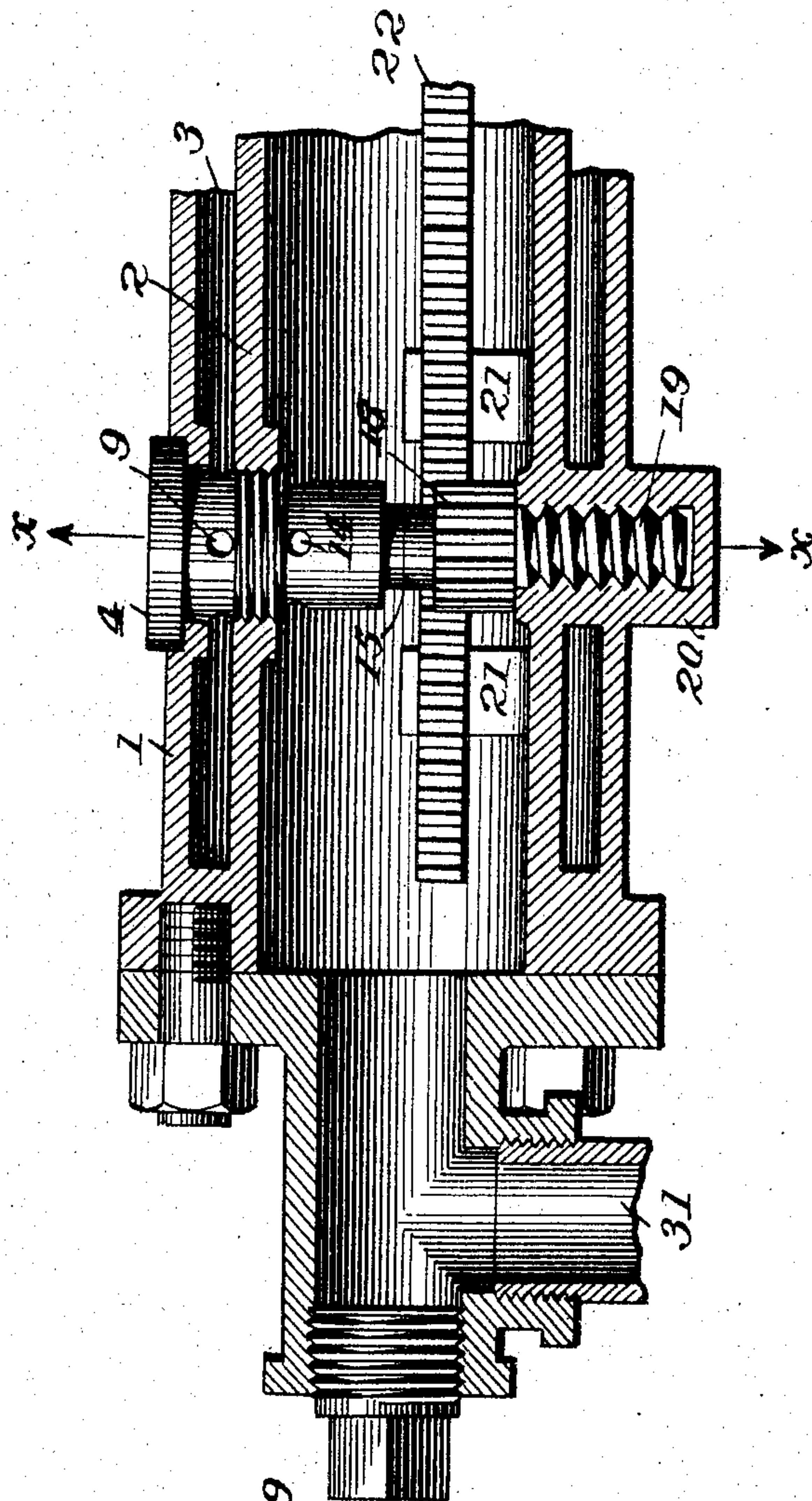
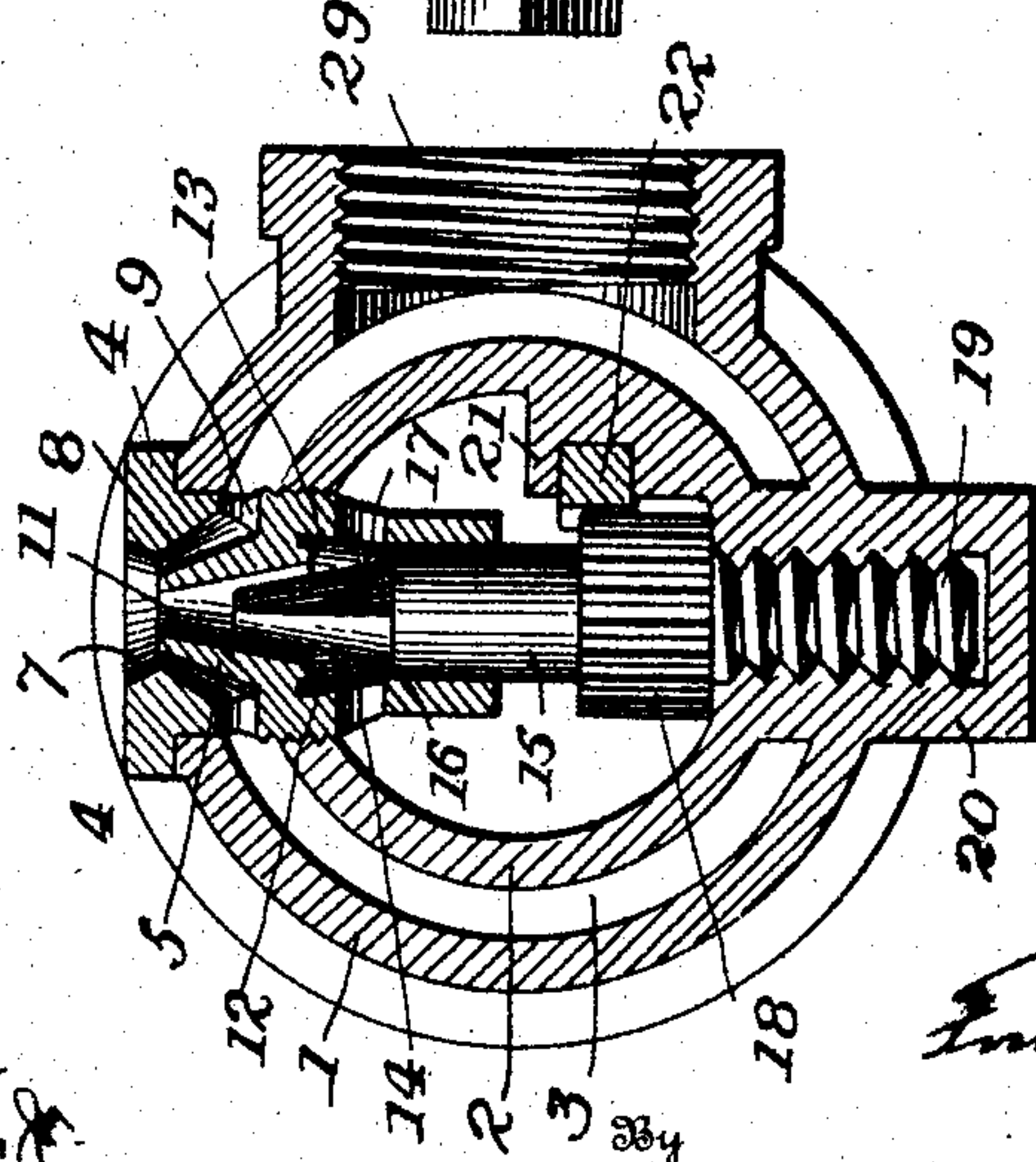


Fig. 2.



Witnesses

*J. Hinkel*  
*Wm. Gilman*

Inventor

*Framy Burger*

*Freeman*

Attorneys

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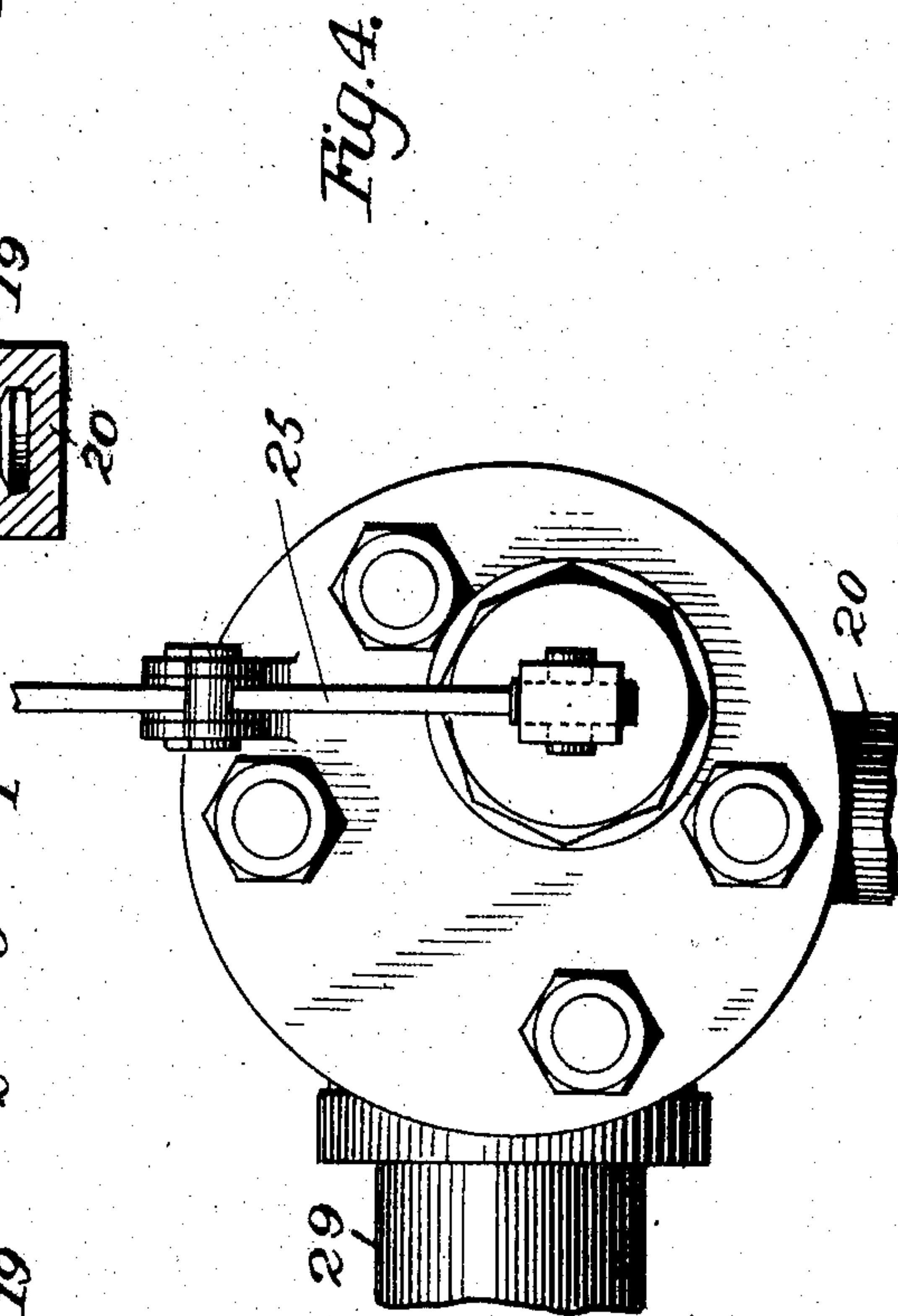
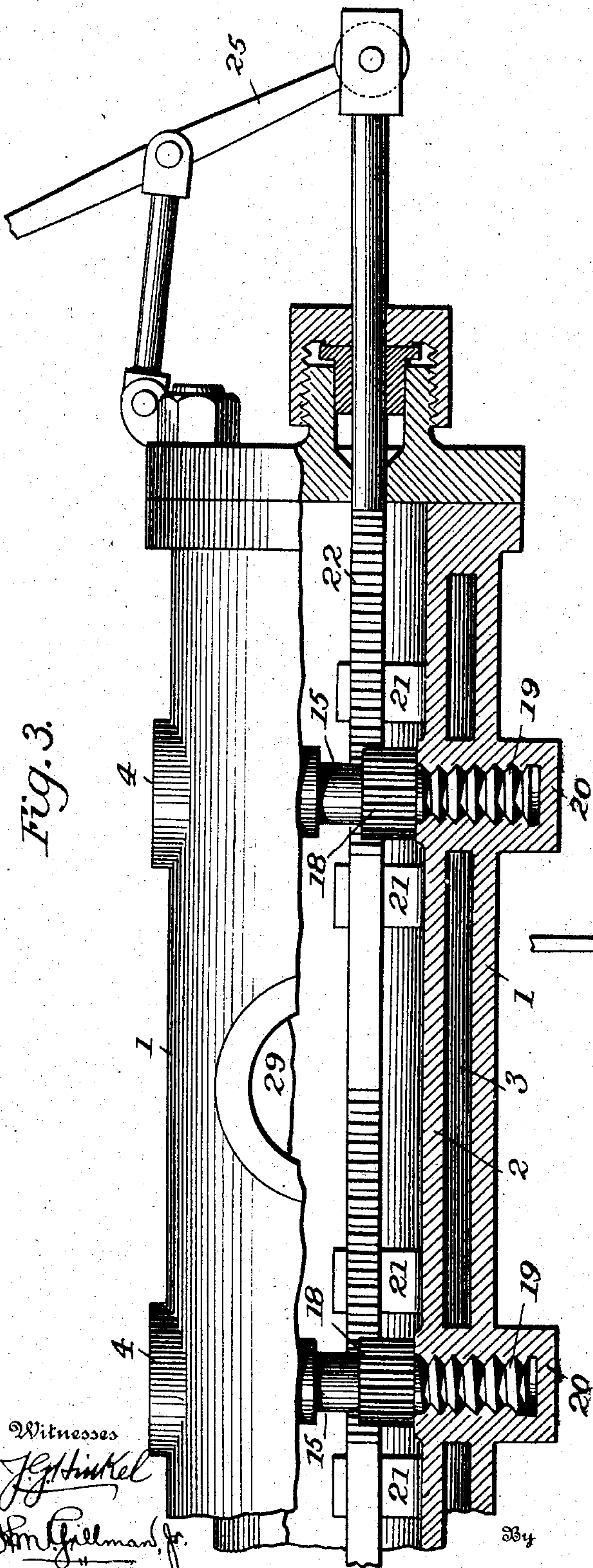
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J. G. Hinkel  
Sam. Gillman, Jr.

Inventor

Frank Burger  
Foster & Freeman,  
Attorneys



# UNITED STATES PATENT OFFICE.

FRANZ BURGER, OF FORT WAYNE, INDIANA, ASSIGNOR OF THREE-FOURTHS TO HENRY M. WILLIAMS, OF FORT WAYNE, INDIANA.

## OIL-BURNER FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 780,593, dated January 24, 1905.

Application filed August 28, 1901. Serial No. 73,604.

*To all whom it may concern:*

Be it known that I, FRANZ BURGER, a citizen of the United States, residing at Fort Wayne, in the county of Allen and State of Indiana, have invented certain new and useful Improvements in Oil-Burners for Steam-Boilers, of which the following is a specification.

My invention relates to hydrocarbon-burners, as well to the construction of single burners as to clusters of burners, which may be used for heating steam-boilers and for other analogous purposes.

The object of my invention is to provide a single burner or cluster of burners which operates economically owing to efficient regulation and which is convenient for utilization in the connections above specified.

My invention consists, primarily, in the arrangement of the parts of the burner, together with the means for regulating and cleaning the same; and it further consists in the arrangement of a cluster of burners suitable for heating a boiler wherein simultaneous regulation may be obtained of all the burners.

My invention is more particularly set forth in its many details and mode of operation in the accompanying specification and drawings, in which—

Figure 1 is a sectional side view of a part of the whole burner. Fig. 2 is a transverse view on the line *x x*, Fig. 1, partly in section, through a nozzle, showing the cleaning and regulating means in the nozzle. Fig. 3 represents the outer end of the cluster of burners, partly in section, showing a means for simultaneously regulating the nozzles. Fig. 4 is an end view of the whole burner.

Referring to the drawings, 1 represents a casing of any suitable character or shape, but preferably of the form shown, with an inner casing 2 and a chamber 3 between the two, forming, as hereinafter to be described, an air-conduit, air entering the same through an opening 29. The space within the inner casing 2 is adapted to form a hydrocarbon-conduit, while connected to the casing are suitable burners, of which there are preferably a plurality to form a cluster suitable for heating purposes. Hydrocarbon enters the hy-

drocarbon-inlet by an aperture 31, and the burners are connected to the air and hydrocarbon conduits.

Each burner consists of suitable nozzles, as shown a burner consisting of a nozzle 4 having an outwardly-flaring opening 7 and an outer portion consisting of an upper projecting collar 4', while a second nozzle 5 is situated within the first nozzle 4, and an annular conical space 8 inwardly increasing in width is situated between the outer portion or collar 4' and the second or inner nozzle 5. The inner nozzle is preferably provided with a conical aperture 11, while beneath the same and communicating therewith is provided an enlarged chamber 12 of any suitable form, preferably cylindrical, serving as a valve-chamber for a reciprocating valve 15, provided with shoulders 16 and carrying a cleaner 17, in this instance shown as a cleaner for the hydrocarbon-nozzle 5 and made angular in form and conical to substantially fit the conical aperture 11.

The valve-chamber 12 is shown provided with shoulders 13, forming a valve-seat against which the shoulders 16 on the valve are adapted to seat when the valve is raised. Suitable apertures 9 connect the annular space 8 with the air-conduit 3, while suitable apertures 14 connect the valve-chamber with the hydrocarbon-conduit. As will be seen, hydrocarbon—as, for instance, in the form of an oil, with the valve in the position shown in Fig. 2—will enter the valve-chamber through the inlets 14 and will pass out through the nozzle 11, where it is mingled with the air entering under pressure through the air-conduit and out through the nozzle 4, at which point the gases are ignited.

In order to operate the valve 15, I prefer the means to be described. The valve-stem 19 is screw-threaded and adapted to fit a screw-threaded socket in the portion 20 of the casing, while a pinion 18 is connected with the valve-stem and engages a rack 22, sliding in the portion 21 of the inner casing. It will readily be seen that by sliding the rack 22 the valve 15, and with it the cleaner 17, will be raised or lowered, regulating the supply of



hydrocarbon and cleaning the hydrocarbon-nozzle when necessary. In order to operate the valve or a plurality of valves of a cluster in the same casing, any suitable means may  
 5 be provided; but as shown a rounded portion of the rack is extended through the casing and connected by means of a lever 25 to be reciprocated. By connecting the rack with the pinions on all of the burner valve-stems  
 10 the burners may be simultaneously regulated, or, in other words, the supply of hydrocarbon thereto may be regulated, while they may be simultaneously cleaned. Suitable means are provided for connecting the nozzles to the  
 15 casing, as shown the central portion 6 being screw-threaded and adapted to fit a screw-threaded portion of the inner casing 2, so that the nozzles may be screwed firmly down with the collar 4' pressing tightly against the  
 20 outer casing 1 to form a tight joint.

Without limiting myself to the precise construction and arrangement of parts shown, I claim as my invention—

1. The combination with a casing provided  
 25 with air and hydrocarbon supply conduits, of a nozzle connected thereto having a second conical hydrocarbon-nozzle within the same and provided with an upper projecting collar having a conical opening, an annular conical  
 30 space, inwardly increasing in width, situated

between said collar and the hydrocarbon-nozzle and having apertures communicating with the air-conduit, a cylindrical enlargement below the second nozzle, provided with shoulders forming valve-seats and apertures communicating with the hydrocarbon-supply conduit, a regulating-valve in said cylindrical enlargement, furnished with shoulders adapted to seat on said valve-seats and also furnished with a tapered angular cleaner for cleaning  
 35 the hydrocarbon-nozzle, and means for operating said valve and cleaner, substantially as set forth. 40

2. The combination with a casing containing air and hydrocarbon conduits, of a plurality of burners therefor having nozzles connected respectively to the air and hydrocarbon conduits, valves for each burner for regulating the supply of hydrocarbon to the burners, screw-threaded valve-stems and sockets  
 50 therefor, pinions on the valve-stems engaging a rack for simultaneously operating all the valves, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two  
 55 scribing witnesses.

FRANZ BURGER.

Witnesses:

GEO. D. CRANE,  
 ANNA BRUNNER.