

No. 859,128.

PATENTED JULY 2, 1907.

C. E. SWENSON.
OIL BURNER.
APPLICATION FILED SEPT. 8, 1905.

2 SHEETS—SHEET 1.

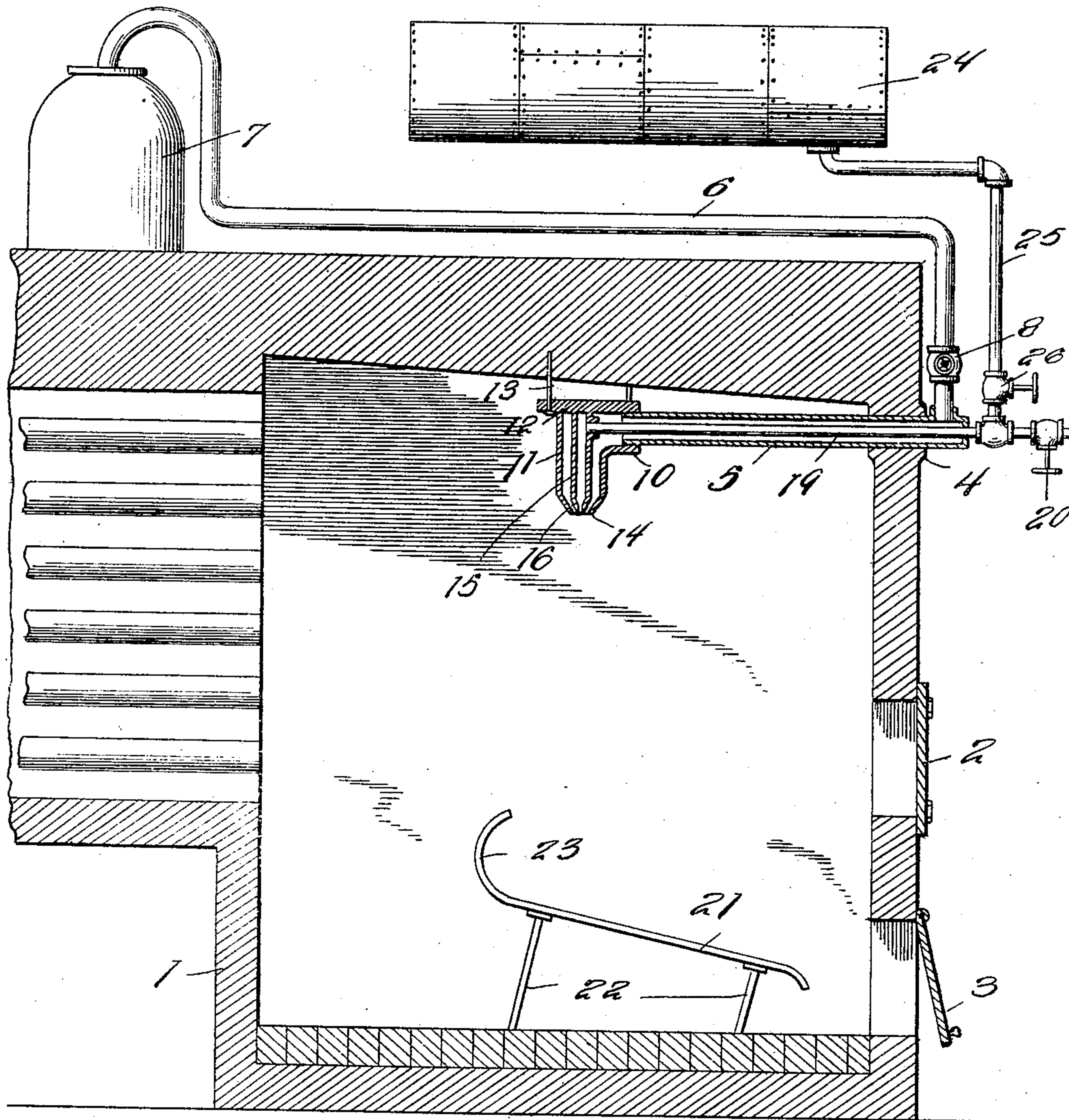


Fig. 1.

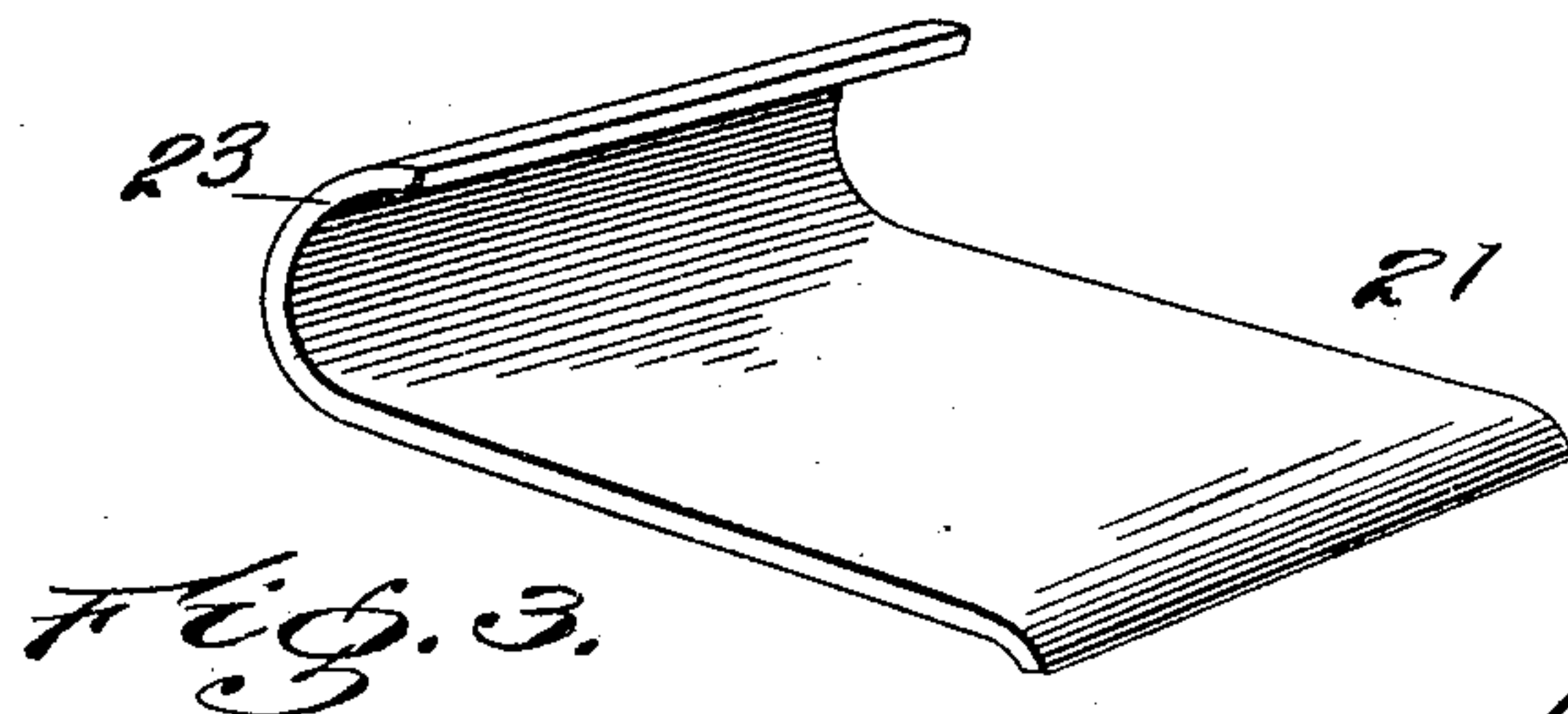


Fig. 3.

Witnesses
G. R. Thomas
H. C. Jones

Inventor
C. E. SWENSON
By *Charles Chandler*
Attorneys

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2 SHEETS—SHEET 2.

Fig. 2.

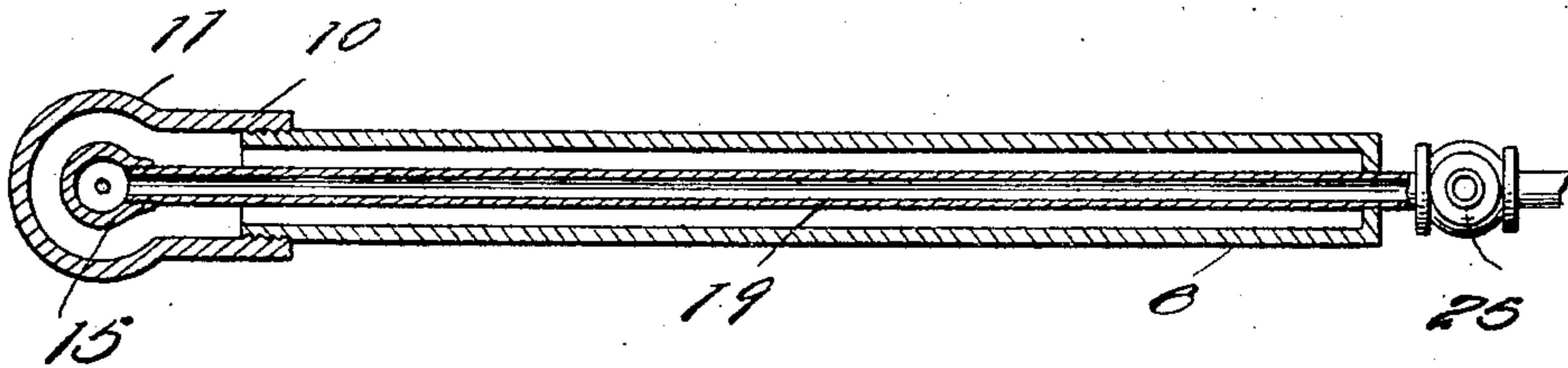


Fig. 4.

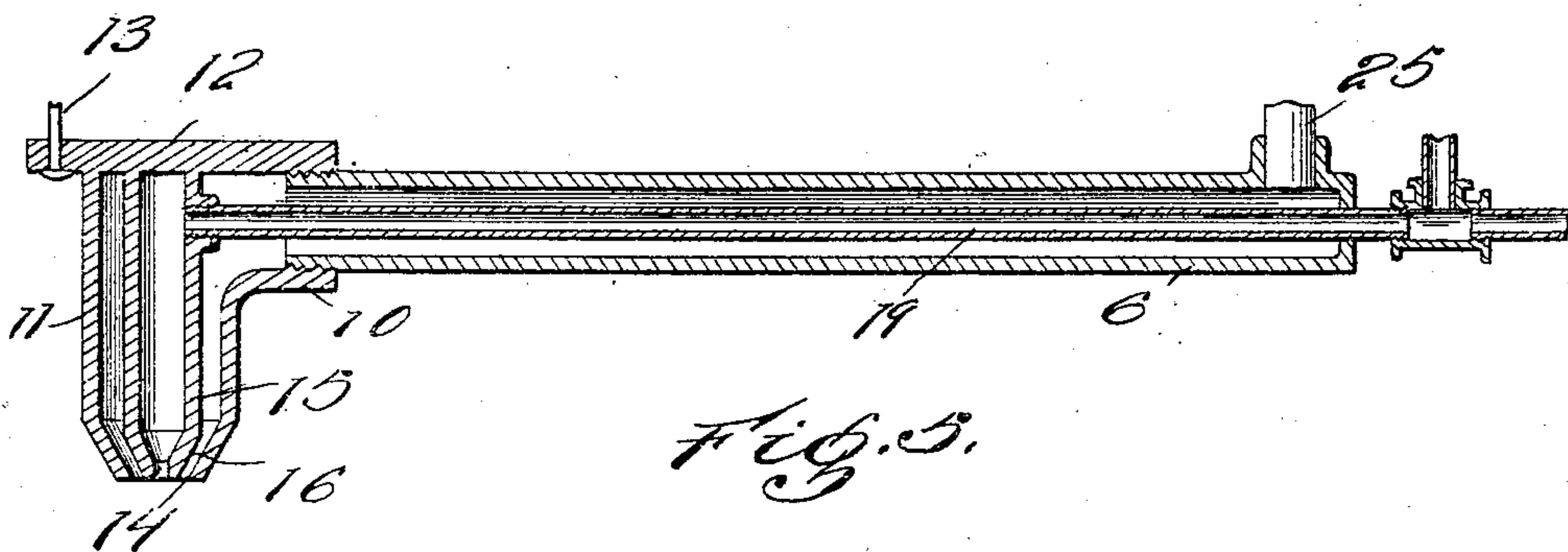
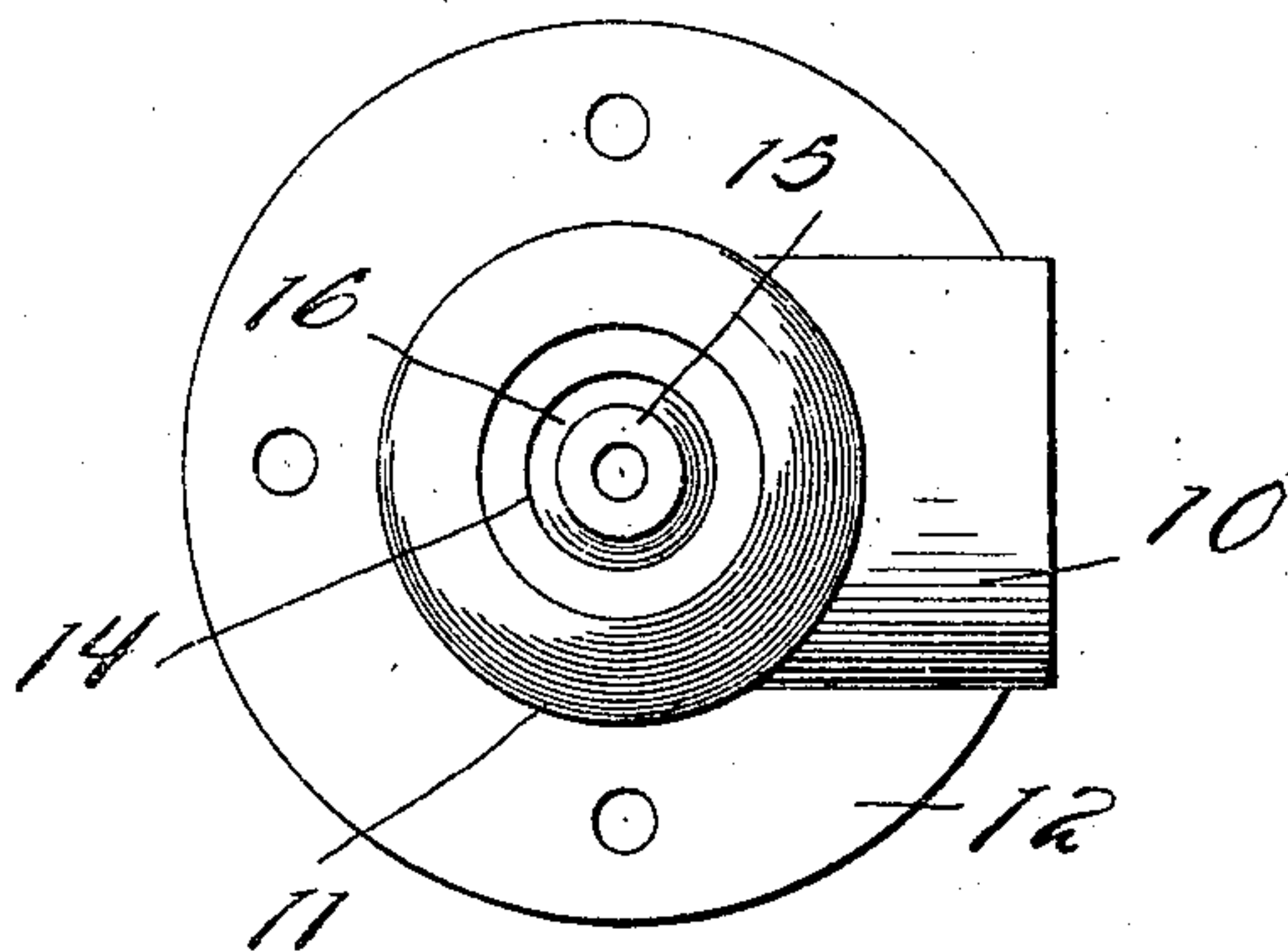


Fig. 5.

Witnesses

G. R. Thomas
F. C. Jones

Inventor
C. E. SWENSON

By *Charles Thomas*

Attorneys

UNITED STATES PATENT OFFICE.

CHARLES E. SWENSON, OF CHARLIE, TEXAS.

OIL-BURNER.

No. 859,128.

Specification of Letters Patent.

Patented July 2, 1907.

Application filed September 8, 1905. Serial No. 277,529.

To all whom it may concern:

Be it known that I, CHARLES E. SWENSON, a citizen of the United States, residing at Charlie, in the county of Clay, State of Texas, have invented certain new and useful Improvements in Oil-Burners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

10 This invention relates to hydrocarbon burners.

One object of the invention is to provide a hydrocarbon burner embodying such characteristics that choking thereof is positively prevented.

15 Another object of the invention resides in the provision of a hydro-carbon burner of such character that corroding of the nozzle thereof is prevented, and in which the fluids are warmed to the proper degree before commingling with one another for combustion purposes.

20 A still further object of the invention is to provide a hydro-carbon burner of such character as to insure a spreading of the gases throughout the furnace with which the burner is associated and to also provide means for entering salt water into the oil conveying 25 pipe.

With these and other objects in view the present invention consists in the combination and arrangement of parts as will be hereinafter more fully described, shown in the accompanying drawings and more particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size and minor details may be made, within the scope of the claims, without departing from the spirit, or sacrificing any of the advantages of the present invention.

35 In the drawings: Figure 1 is a vertical sectional view through the furnace illustrating my burner associated therewith; Fig. 2 is a detail view, illustrating the burner in horizontal section; Fig. 3 is a detail view of the fluid receiving plate arranged in the bottom of the 40 furnace. Fig. 4 is a detail plan view illustrating the circular opening surrounding the nozzles; and Fig. 5 is an enlarged detail sectional view of the burner.

Referring now more particularly to the accompanying drawings, the reference character 1 designates a furnace 45 having the fuel opening 2 and the draft door 3 with an opening 4 in the upper front end of the furnace, near the top wall of the same. Fitted in the opening 4 and extending interiorly and exteriorly of the front wall of the furnace, is a steam pipe 5 communicating with the 50 outer end of which and exterior of the furnace is the steam pipe 6, which may or may not communicate with a dome shaped steam boiler 7 located upon the top of the furnace. If desired, the pipe 6 might communicate with some other steam generating source or with 55 an air compressor (not shown). The inner end of the pipe 5 is exteriorly screw-threaded for the reception

of the interiorly screw-threaded boss 10 of the steam nozzle 11, which latter has its flanged portion 12 pierced by a fastening 13 designed to support the steam nozzle at the top of the furnace 1 with its outlet 14 directed 60 downwardly and centrally of the furnace.

The steam nozzle 11 has an internal circular wall 15, the free end of which is beveled as at 16 to provide a small circular space or outlet between its beveled end and the correspondingly beveled end of the nozzle 11, 65 the circular wall 15 terminating evenly at its lower end with the lower end of the nozzle 11 and having a perforation or outlet at its lower end, the said wall 15 forming an oil nozzle for the discharge of oil from the oil pipe 19 under pressure, the oil pipe having its inner 70 end screw-threaded for engagement with the oil nozzle 15, as shown. It will be observed that the oil pipe 19 is arranged centrally of and within said pipe 5 and that it projects beyond the outer end of the latter and is provided with a valve 20. 75

If the steam is taken from the boiler 7 of the furnace, it is obvious that it is dry and it is super-heated before reaching the nozzle by passing through the pipe 5 whose greater portion is arranged at the top of the furnace. It is obvious, also, that since oil passes through the pipe 80 19, which latter is located within the steam pipe 5, that the oil is also heated to the proper degree before reaching the nozzle 15. Now as the steam and oil are passing to their respective nozzles, atmospheric air is sometimes let into the oil pipe at the salt water valve 26, which 85 air carries heavy gritty oil along more evenly to the oil nozzle 15. Of course the atmospheric air is let into the oil pipe when tank 24 has no salt water in it or when the pipe 25 is not connected to said tank. By the peculiar formation and arrangement of the nozzles 11 and 15, the 90 discharge of steam at high velocity is insured. As soon as the steam and air and oil leave the respective nozzles, they being released in spray form, a collusion follows and the consequent commingling of air, steam and oil creates a vaporization of combustible fluid capable of 95 causing a bright flame of such character as to be well adapted for heating or other purposes without the annoyance caused by soot and smoke resulting from the combustion of coal and similar fuel.

Disposed within the furnace 1 at the bottom thereof 100 is a downwardly directed plate 21, which is supported upon suitable legs 22, the upper end of the plate 21 being curved upwardly as at 23. This plate is provided when solid fuel is not employed, and when it is desired to get up steam without the use of solid fuel the oil 105 valve is operated to permit oil to drip on to the inclined plate 21, where a small saturated oil rag in lighted form may be thrown. As soon as the plate 21 becomes hot, water, preferably salt water may be led into the oil pipe 19 from the tank 24 disposed above the top of the fur- 110 nace through the pipe 25 and valve 26, which latter may commingle with the oil in the proportion of about

one part to two or three parts of oil. It might be stated, however, that as a general proposition, the salt water is used only when steam or compressed air cannot be obtained. In other words, compressed air may be used
 5 instead of steam. It will be observed that the draft opening at the base of the furnace is partly above and partly below the lower edge of the inclined plate 21 which causes the surplus oil or oil and water to run over the end of the plate to cause a flame underneath the lat-
 10 ter as well as above it, resulting in the plate becoming very hot. When the oil or combined oil and water strikes the plate it is shattered and turned into gas at once, making a bright, greenish flame with crackling noise free from soot. It may be stated that the com-
 15 mingling of salt water with the oil causes a chemical effect of such character as to provide for the positive consumption of the fluid to prevent soot, clinkers, residue etc.

It has been stated above that the pipe 6 could or
 20 could not be in communication with the steam boiler 7. I will therefore state that the steam could be supplied to the pipe 6 through some other source (not shown); or if desired, compressed air might be directed through the said pipe instead of steam. However, as
 25 heretofore stated, it is to be understood that in the use of compressed air, salt water may not be used.

From the foregoing it will be understood that the steam salt water, oil and air are super-heated before reaching the nozzles that choking of the nozzles is pre-
 30 vented; that oil is conveyed from its nozzle at high velocity which meets or concentrates with the steam at the proper distance below the burner as not to retard the proper flow or suction of atmospheric air and oil,

the oil being subjected to a violent concussion that thoroughly atomizes or shatters it to atoms for mixture 35 with the volatile gases contained in the steam and air, thereby causing prompt ignition and the most perfect combustion and economical consumption of the fuel fluid. Another feature of importance is that the noz-
 40 zles are directed downwardly from the top of the furnace toward the bottom thereof to provide for a proper spreading of the flame in order to prevent the damaging effect of a concentrated white heat against boiler plates etc.

What I claim is:

The combination with a furnace, of a fluid supply pipe extending thereinto at the top thereof; a boiler mounted upon the top of said furnace and connected with the outer end of said supply pipe; an oil supply pipe arranged within said fluid supply pipe and extending therebeyond 50 at its outer end; a plate secured to the inner face of the furnace top and provided with depending outer and inner nozzles formed integral therewith and arranged in spaced relation to each other, said outer nozzle being in com-
 55 munication with said fluid supply pipe and said inner nozzle with said oil supply pipe; an inclined plate mounted upon the furnace bottom directly beneath said nozzles, said furnace having a draft opening formed in one of its side walls in line with said inclined plate; a salt water tank mounted above the top of the furnace; and a pipe 60 connection between said tank, and the outer end of said oil supply pipe, to admit salt water into the latter simultaneously with the oil.

In testimony whereof, I affix my signature, in presence of two witnesses.

CHARLES E. SWENSON.

Witnesses:

H. T. CANFIELD,
 T. T. REESE.