

No. 659,992.

Patented Oct. 16, 1900.

F. E. STANLEY.

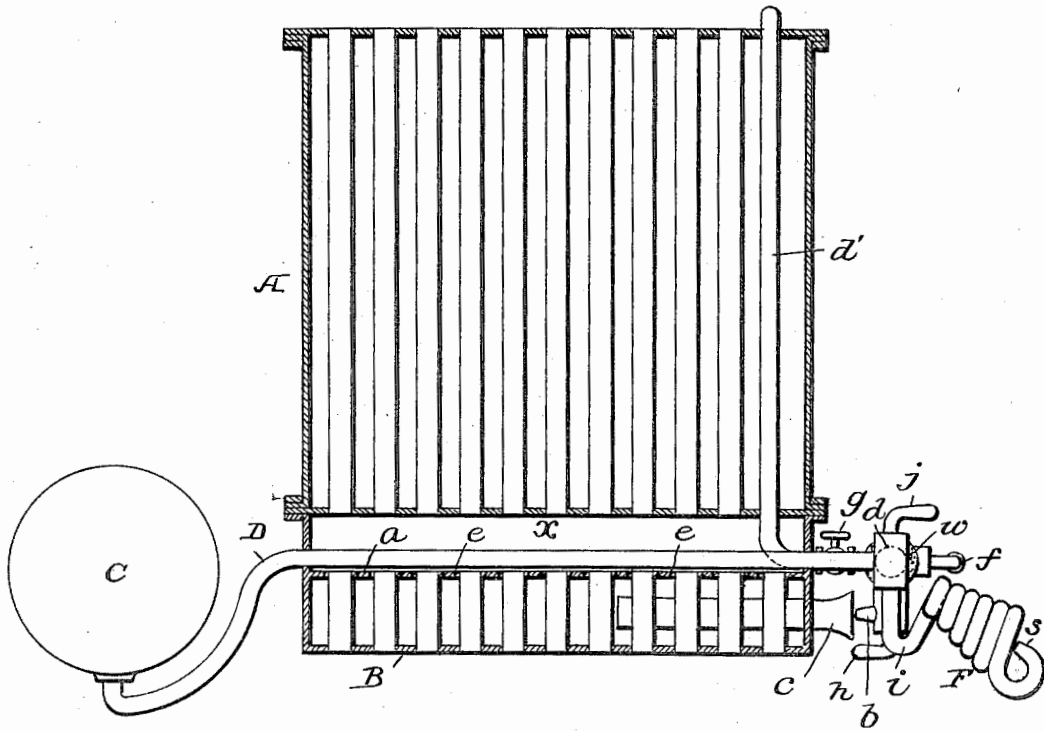
VAPOR BURNER FOR STEAM GENERATORS.

(Application filed Mar. 16, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



Witnesses

J. G. Hinkel
A. M. Gillman, Jr.

Inventor
Francis E. Stanley
by *Samuel Freeman*
Attorneys

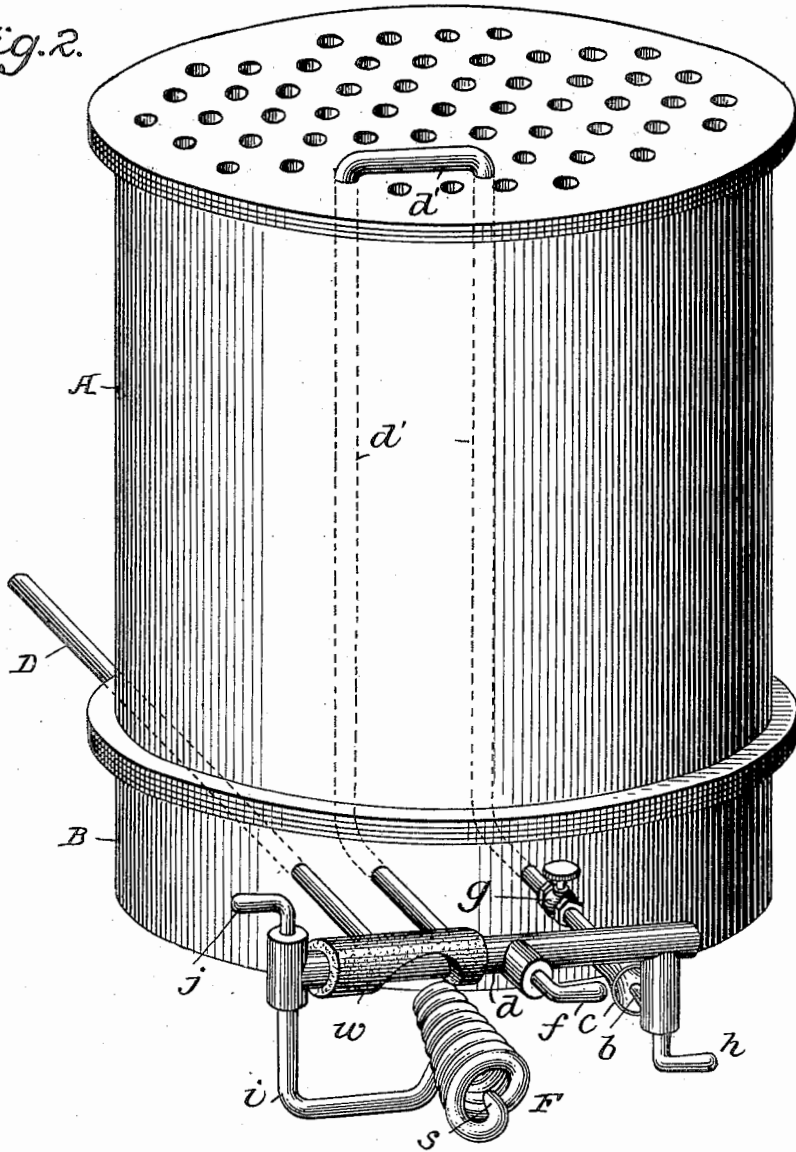
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2 Sheets—Sheet 2.

Fig. 2.



Witnesses
J. G. Hinkel
H. M. Gillman, Jr.

Inventor
Francis E. Stanley
 by *Lucas S. Truman*
 Attorneys

UNITED STATES PATENT OFFICE.

FRANCIS E. STANLEY, OF NEWTON, MASSACHUSETTS, ASSIGNOR TO THE
LOCOMOBILE COMPANY OF AMERICA, OF WHEELING, WEST VIRGINIA.

VAPOR-BURNER FOR STEAM-GENERATORS.

SPECIFICATION forming part of Letters Patent No. 659,992, dated October 16, 1900.

Application filed March 16, 1900. Serial No. 8,936. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS E. STANLEY, a citizen of the United States, residing at Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Vapor-Burners for Steam-Generators, of which the following is a specification.

My invention relates to vapor-burners to be used in connection with boilers, especially in that class of steam-generators intended for motor-vehicles; and my invention consists of means for supplying the nozzle of the burner with vapor while the main burner is lighted and also for supplying vapor primarily to light the main burner and also after the same is extinguished, as fully set forth hereinafter, and as illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation of a boiler and burner embodying my invention, and Fig. 2 is a perspective enlarged view of the conveying and heating appliances connected with the burner.

The boiler A is of any suitable character, and below the same is a vapor-burner B, with an intervening combustion-chamber *a* and a tank C, which contains oil under pressure which is supplied to the burner through a conducting-pipe D, a portion of which is arranged so as to be heated by the flame which passes from suitable openings in the top *a* of the burner.

As shown, the burner is a casing having vertical air-tubes surrounded by perforations, and a nozzle *b*, which communicates with the pipe D, is arranged opposite an air-tube *c* in the side of the burner, so that the vapor passing forcibly from the said nozzle into the said tube will carry air with it into the burner-casing, which is thus supplied with a mixture of air and vapor that issues through the openings *e* and over the top plate *a*.

It will be evident that the oil which passes to that portion of the pipe D above the burner will be heated and vaporized in this portion of the pipe, thus supplying the nozzle with the requisite vapor. It is desirable, however, to maintain a supply of vapor after the flame of the burner is extinguished—as, for instance, during any time that the motor-veh-

cle in which such boiler and burner are employed may be at rest, so that the burner can be started up after a suitable interval. For this purpose I provide an extension of the pipe D in the form of a loop *d'*, which extends from that portion *d* of the pipe D which connects with the nozzle *b*, and between the ends of the loop *d'* I place in the section *d* a cock *f*, which may be closed, so that the circuit to the nozzle *b* will include the loop *d'*, whereby the oil is caused to traverse through the said loop and is heated by the contents of the boiler and vaporized so long as the said contents may be at a sufficiently-high temperature even after the flame of the burner is extinguished. Of course in first starting up the cock *f* must be opened, and it is desirable, although not necessary, to provide a cock *g* in the loop which may be closed until this portion of the conveying-pipe is to be put into operation. A cock *h* also serves to open and close communication with the nozzle *b*.

Any suitable means may be employed for securing the initial heat in starting from the cold state to supply the vapor for the nozzle *b*. It is preferable, however, to provide some means permanently connected with the apparatus, and for this purpose I make use of an auxiliary heater F, which might be a plumber's or gas-fitter's lamp or other suitable form of heater, but which preferably is a Bunsen burner supplied with oil from the tank C. As shown, the burner communicates with the portion *d* of the conveying-pipe through a pipe *i*, a cock *j* serving to close the communication after the main burner is started.

In starting, the cocks *g* and *h* are closed, the burner F is heated by means of a taper or otherwise, and the cock *j* opened to permit the flow of a small portion of oil to the burner F, which will be vaporized by heating and issue from the nozzle *s*, the flame falling on the coils and continuing to heat and vaporize the oil, so that a flame is projected against the portion *d* of the conveying-pipe, thereby heating the oil therein, so that when the cock *h* is opened the vapor will issue from the nozzle *b*. As soon as the main burner is ignited, which may be done as soon as vapor begins to issue from the nozzle *b*, the

portion of the pipe D which is above the main burner is heated and the oil therein is vaporized, when the cock *j* may be closed, putting the auxiliary starting-burner out of operation. The cock *f* may then be closed and the cock *g* opened, so that the oil will traverse through the loop *d'* of the conveying-pipe, as well as through the other portions. When the apparatus is brought to a state of rest and the flame extinguished by closing the cock *h*, the heat of the contents of the boiler will continue to vaporize the oil in the loop *d'*, so that the main burner may be re-lighted at any time before the parts become so cold that there is no longer any vapor in the loop *d'*.

It will be seen that whether the communication is established directly with the nozzle or whether it is first with the part of the pipe which extends through the boiler and then with the nozzle the oil from the tank always flows first through that portion of the supply-pipe which extends over or is heated by the burner. This is of the utmost importance, because if the part of the pipe which was heated by the burner did not first receive the oil it would soon become so highly heated as to be burned, and this portion therefore must always remain in connection with the oil-tank and must be the first portion of the pipe to receive the oil from the tank.

While I have shown an arrangement of conveying-pipe in different sections, part of which is heated by the main burner and part of which is heated by the auxiliary burner, I do not limit myself to this arrangement, as it may be varied to a considerable extent.

In order to prevent rapid radiation of heat, especially in cold weather, I further provide the pipe, which is heated by the auxiliary burner with a wrapping *w* of asbestos or other heat-retaining material.

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

1. The combination with a supply-tank, boiler and vapor-burner for heating the same, of a nozzle for supplying vapor to the burner, and a supply-pipe in permanent communication with the tank, one part arranged to be directly heated by the burner and another succeeding part to be heated by the contents of the boiler, substantially as set forth.

2. The combination with a boiler and vapor-burner for heating the same, of a nozzle for supplying vapor to the burner, a supply-pipe communicating with the nozzle, one part ar-

ranged to be heated directly by the burner and another succeeding part to be heated by the contents of the boiler, and means for temporarily putting out of action the part heated by the contents of the boiler, substantially as set forth.

3. The combination with the supply-tank, a boiler and vapor-burner for heating the same, of a nozzle for supplying vapor to the burner, a supply-pipe communicating with the nozzle, one part arranged to be heated directly by the burner and another succeeding part to be heated by the contents of the boiler, and an auxiliary means for heating a portion of said pipe between the tank and the part extending through the boiler, substantially as set forth.

4. The combination with a boiler and vapor-burner below the same provided with a nozzle, of a supply-tank communicating with said nozzle through a pipe arranged to be heated in part by the burner, and another succeeding part arranged to be heated by the contents of the boiler, and means for directing the oil either through the part heated by the burner and directly to the nozzle or first through the part heated by the burner and then through that part of the pipe arranged to be heated by the contents of the boiler and then to the nozzle, substantially as set forth.

5. The combination with a boiler and vapor-burner below the same provided with a nozzle, of a supply-tank communicating with said nozzle through a pipe arranged to be heated in part by the burner, and another succeeding part arranged to be heated by the contents of the boiler, means for directing the oil first through the part exposed to the burner and then either directly to the nozzle or through that part of the pipe arranged to be heated by the contents of the boiler, and an auxiliary heater for a part of the pipe beyond that heated by the burner, substantially as set forth.

6. The combination of a boiler, vapor-burner below the same and nozzle therefor, an oil-tank, and a tube extending therefrom to the nozzle and arranged to be heated in part directly by the burner and a succeeding part by the contents of the boiler, substantially as set forth.

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

FRANCIS E. STANLEY.

Witnesses:

G. P. KRAMER,
W. CLARENCE DUVAL.