No. 818,625. PATENTED APR. 24, 1906.

H. HOWARD.

STEAM DRYING APPARATUS FOR MOTOR VEHICLES.

APPLICATION FILED JUNE 21, 1899.

Fig. 1.

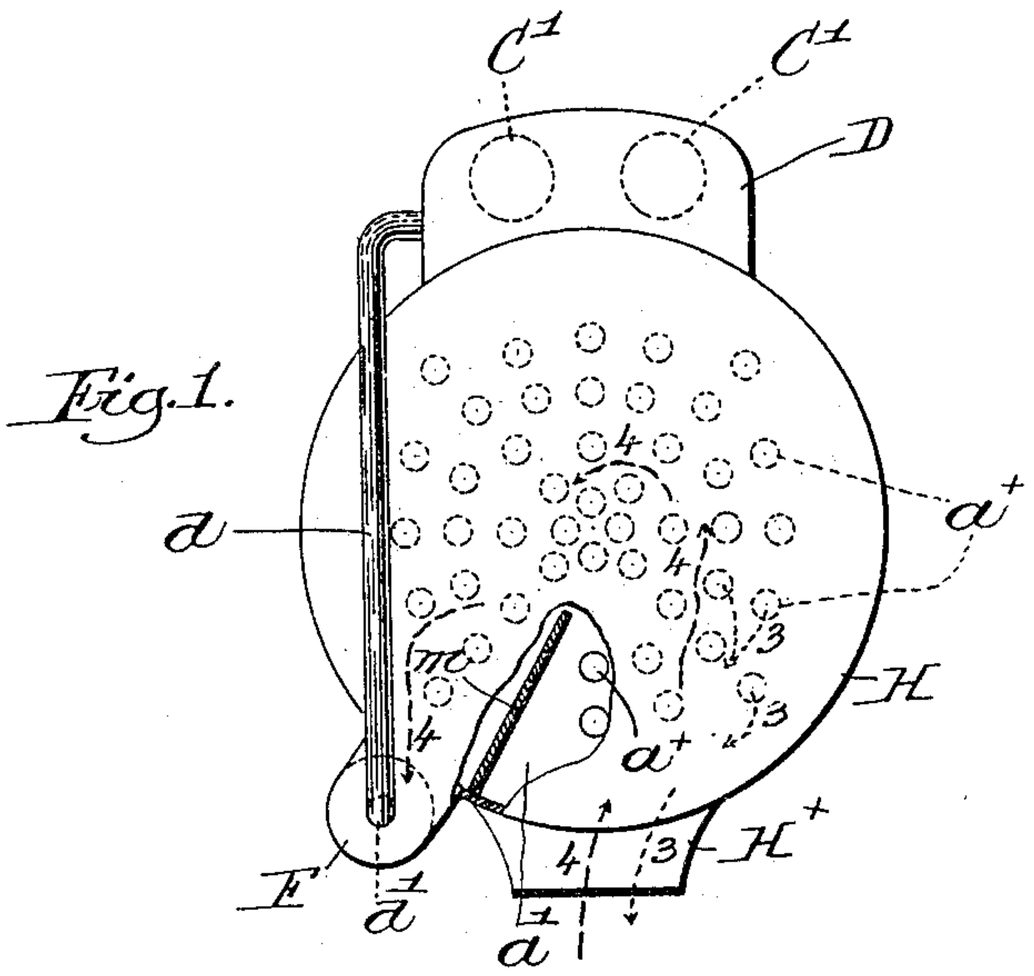
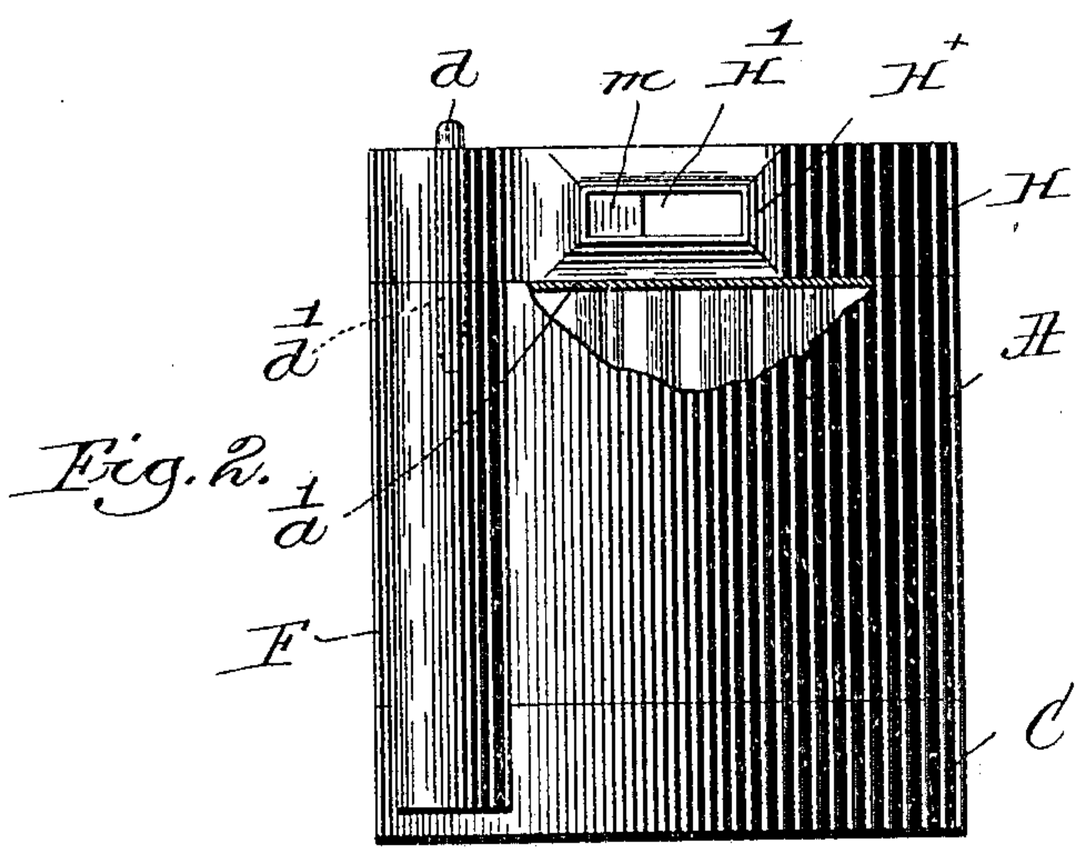


Fig. 2.



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UNITED STATES PATENT OFFICE.

HENRY HOWARD, OF BROOKLINE, MASSACHUSETTS.

STEAM-DRYING APPARATUS FOR MOTOR-VEHICLES.

No. 818,625. Specification of Letters Patent. Patented April 24, 1906.

Application filed June 21, 1899. Serial No. 721,316.

To all whom it may concern:

Be it known that I, HENRY HOWARD, of Brookline, county of Norfolk, and State of Massachusetts, have invented an Improvement in Steam-Drying Apparatus for Motor-Vehicles, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object the production of simple and effective means for drying the exhaust-steam in motor-vehicles using steam as a motive power, whereby the steam is discharged into the atmosphere in a practically invisible condition, thus overcoming the annoyance and inconvenience of clouds of vapor accompanying the vehicle when in motion.

Figure 1 is a top or plan view, partly broken out, of a steam boiler and engine with one embodiment of my steam-drying apparatus applied thereto; and Fig. 2 is a side elevation of the apparatus shown in Fig. 1, the shell of the boiler being partly broken out.

I have herein illustrated my invention as applied to an upright boiler A, having fire-tubes $a^{\times}$ and a combustion-chamber C of any suitable construction—such, for instance, as shown and described in United States Patent No. 601,218, dated March 22, 1898, the boiler therein shown being provided with an attached engine, the cylinders C′ being herein shown by dotted lines, Fig. 1, inclosed in a jacket D, which is connected with the boiler. Such a motor is well adapted for use with motor-vehicles on account of its compactness, power, rapid steaming capacity, and strength and simplicity of construction; but while I have illustrated my invention in connection with such motor its use is not restricted thereto, as it will hereinafter appear that my steam-drying apparatus is equally well adapted for use with other steam-motors.

It is well known that the admixture of air, especially hot air, with steam will serve to dry the latter in proportion to the heat of the air, dissipating the condensed particles to such an extent that they become substantially invisible. To this end I provide a mixing-chamber, shown as a hood H, surmounting the boiler, and into which the products of combustion and other gases pass from the flues $a^{\times}$, the upper tube-sheet a', Fig. 1, forming the bottom of the hood in the present instance. The hood is provided with an air-intake H′, shown as located in the side of the hood, which may be built out, as at $H^{\times}$, if desired, the opening H′ being of sufficient size to admit a large volume of air. An escape-flue F for the products of combustion is shown as arranged at the side of the boiler and preferably downturned, as in the patent referred to, the upper end of the flue communicating with the hood H.

The exhaust-steam from the engine is led by a pipe *d* to such a point that when the engine is in operation the exhaust will exert a draft in the flue, and this is conveniently accomplished by turning the discharge end of the pipe *d* into the flue, as at *d′*, pointing toward the exit end thereof.

It will be noticed that the intake H′ and the opening from the hood to the flue are quite near together, and to prevent the direct passage of the incoming air to the flue I prefer to use a deflector *m*, interposed between the intake and the flue-inlet, extending from the top to the bottom of the hood and projecting toward the center of the hood.

When steam is being raised, the products of combustion pass into the hood H and out through the opening H′, following the shortest path, as indicated by dotted arrows 3, Fig. 1; but after steam has been raised and the engine is in operation the exhaust creates a draft from the hood H into the flue F. This acts to draw air through the intake H′ into the hood, wherein it is mixed with and heated by the products of combustion and passes therewith into the flue, as indicated by the dash-line arrows 4, Fig. 1. The heated air and the hot products of combustion thus mix with and act upon the exhaust-steam, drying out the latter before it escapes from the flue, so that there is practically no visible vapor at the outlet of the flue.

The deflector *m* prevents the direct passage of the air from the intake to the flue, so that the air is mixed with and heated by the products of combustion to a greater or less degree before it comes in contact with the exhaust.

In motor-vehicles the cooler air entering the hood tends to lower the temperature of the heated gases, which is a convenience particularly in passenger-vehicles, as the motor is usually located below the seat thereof.

My invention is not restricted to the precise construction and arrangement herein shown, as the same may be modified or rear-

ranged in various particulars without departing from the spirit and scope of my invention.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

In combination, a steam boiler and engine, a hood or casing to receive the products of combustion and having an air-inlet, a down-turned escape-flue communicating with and forming the outlet for the hood, an exhaust-outlet leading from the engine and arranged to create a draft in the flue, the products of combustion passing through the flue, and the air drawn thereinto through the hood by the draft, both acting to dry the exhaust, and a deflector in the hood between the air-inlet thereof and the entrance to the flue from the hood.

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

HENRY HOWARD.

Witnesses:
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