

No. 671,933.

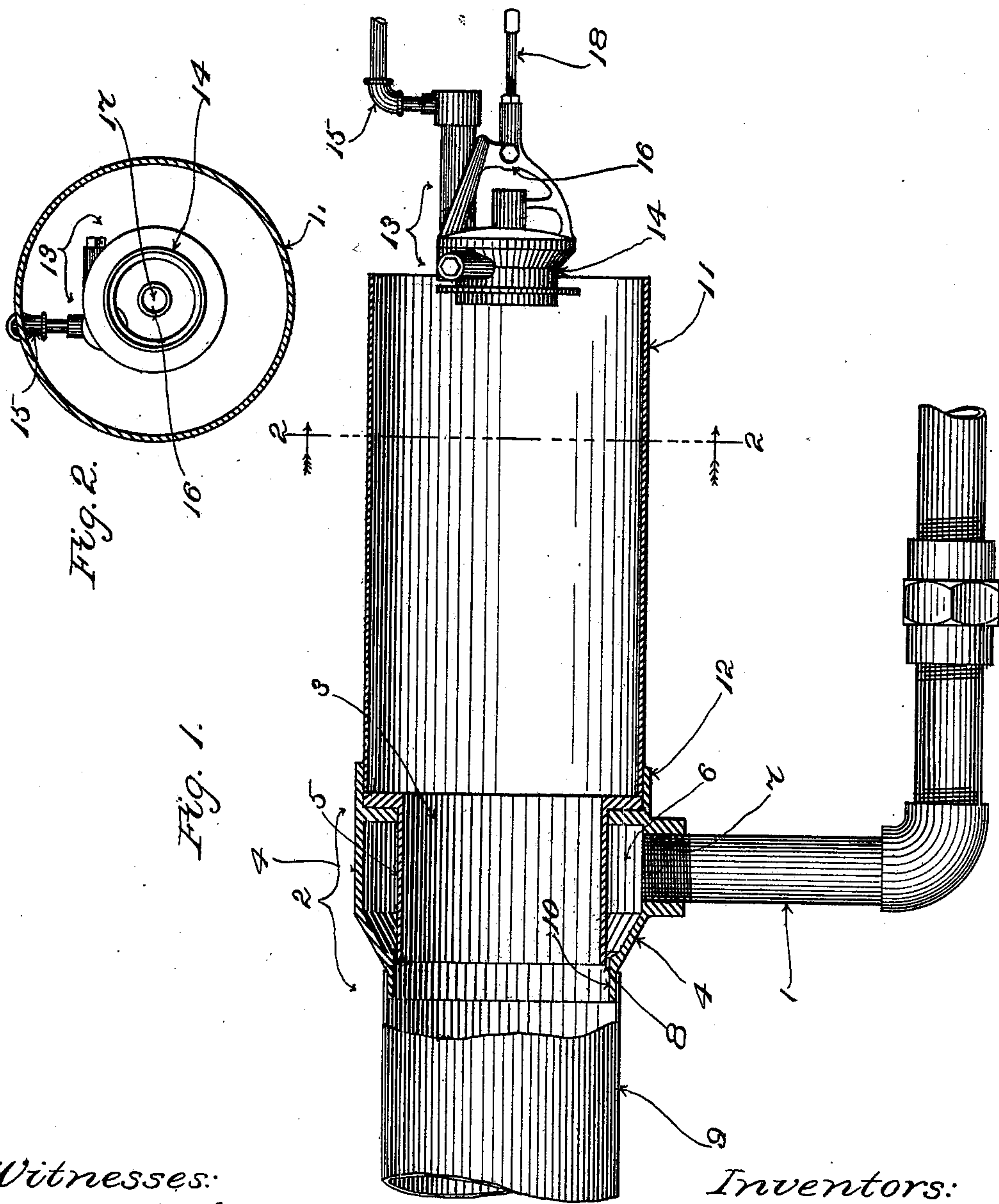
Patented Apr. 9, 1901.

F. MILNE & G. T. KILLAM.

MEANS FOR DISPOSING OF EXHAUST STEAM FROM VEHICLE MOTORS.

(Application filed Nov. 22, 1899.)

(No Model.)



Witnesses:

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UNITED STATES PATENT OFFICE.

FRANK MILNE AND GEORGE T. KILLAM, OF EVERETT, MASSACHUSETTS.

MEANS FOR DISPOSING OF EXHAUST-STEAM FROM VEHICLE-MOTORS.

SPECIFICATION forming part of Letters Patent No. 671,933, dated April 9, 1901.

Application filed November 22, 1899. Serial No. 737,856. (No model.)

To all whom it may concern:

Be it known that we, FRANK MILNE and GEORGE T. KILLAM, citizens of the United States, residing at Everett, in the county of Middlesex, State of Massachusetts, have invented a certain new and useful Improvement in Means for Disposing of Exhaust-Steam from Vehicle-Motors and the Like, of which the following is a specification, reference being had therein to the accompanying drawings.

Our invention has more especial application in connection with the steam engines or motors which are employed for driving motor-vehicles and the like. It should be understood, however, that the invention is not necessarily limited to such application, for, as will be perceived from its nature, it is adapted to be utilized elsewhere where the attainment of the same results is desired. We do not limit ourselves, therefore, wholly to any particular use or employment of the invention.

One of the most undesirable drawbacks experienced in the employment of a steam-driven vehicle is the cloud of exhaust-steam which continually escapes from the engine or motor after having performed its work.

Our invention has for its object to dispose of the exhaust-steam and prevent the same from appearing to view in the neighborhood of the vehicle or engine.

The invention consists in the novel means which we will now proceed to describe with reference to the accompanying drawings, in which latter we have illustrated one embodiment of the said means.

It should be borne in mind that the mechanical embodiments of the invention may vary in form, construction, and arrangement.

In the drawings, Figure 1 shows in vertical longitudinal section the said embodiment. Fig. 2 is an elevation of the burner shown in Fig. 1 looking from the left-hand side in said figure.

Having reference to the drawings, 1 designates a steam-pipe through which in practice the exhaust-steam from an engine (not necessary to be shown) is intended to pass.

2 designates an annular shell. The cen-

tral opening through this shell is indicated at 3, while the outer and inner concentric walls of the shell are marked 4 and 5, respectively. The space between such walls is marked 6.

Pipe 1 has the outer end thereof fitted to an opening at 7 in the outer wall 4 of the said shell 2, as shown, so as to enable it to discharge into the space 6 the exhaust-steam passing through such pipe.

In order to afford opportunity for the exhaust-steam filling the space 6 to issue from the shell 2, one or more openings are formed at or adjacent one end of the central opening 3 through the shell. The shell preferably is formed with a narrow slit, as at 8, for this purpose, the said slit being shown herein as located between the free edge of the inner wall 5 and a proximate surrounding portion of the outer wall 4. At the side of the shell on which the steam issues a pipe 9 is applied to a flange 10 of the outer wall, this pipe serving to confine the escaping steam for a distance of a number of inches beyond the outlet 8. The outer end of pipe 9 is open in order to permit free discharge of the moving contents of the said pipe. We provide the central opening 3 of the shell 2 for the purpose that as the steam issues from the outlet 8 and is carried by its own velocity along pipe 9, taking with it the air within such pipe, fresh volumes of air continually may flow through such central opening 3. For the purpose of confining the air on its way to the opening 3 and enabling us to cause the same to assume a heated state prior to passing through such opening we apply a pipe 11 to a flange 12 at the rear side of the shell. The said pipe 11 may extend to any convenient distance from the shell. For the purpose of heating the air which passes through pipe 11 in carrying our method into effect any approved means may be utilized. We have shown in the accompanying drawings a well-known form of gasolene-burner, as 13, placed at the open end of pipe 11 and arranged to direct its flame into such pipe toward the opening 3. Thus 14 designates the circular hollow part or casting of the said burner, within which the gasolene is vaporized. 15 is the gasolene-supply pipe, and 16 the jet—i. e., the

portion of the burner in which is formed the hole 17, Fig. 2, whence the vapor or gas issues to be ignited and burned.

18 is the stem of the usual valve.

5 As will be perceived, ample opportunity is left for the admission of fresh air into the open end of pipe 11 around the burner 13.

In practice the outflow of exhaust-steam at the outlet 8 produces a strong draft through the opening 3 and pipe 11. The inrush of air through the opening 3 and pipe 11 in a heated state when graduated to the right degree has been found by us in actual practice to cause the complete disappearance of such steam, so that nothing in the form of visible vapor issues from the delivery end of pipe 9, nor is there any condensed vapor visible in the neighborhood. In other words, the exhaust-steam becomes so disposed of within the pipe 9 that it does not subsequently become condensed into visible vapor on leaving the pipe 9. We have found it impossible to attain this result when only the heated products of combustion are permitted to enter pipe 11. The entrance of fresh atmospheric air into the said pipe appears to be necessary.

In some cases in lieu of employing a burner, as shown and described herein, we may employ in connection with the air-supply pipe a pipe leading into the same the products of combustion from the boiler furnace or burner, the last-mentioned pipe being arranged substantially as in the case of the burner which is shown, so as to leave ample space for the inflow of fresh air into the device.

We do not lay claim herein to our method of occasioning the disappearance of the exhaust-steam from a steam-engine, inasmuch as we contemplate claiming the same in a divisional application.

We claim as our invention—

1. The device for occasioning the disappearance of the exhaust-steam from a steam-engine, comprising essentially, an outlet for the escape of such steam, a confined space

through which said steam in escaping is free to move, and means to introduce highly-heated atmospheric air into such space to commingle with the steam therein, substantially as described.

2. The device for occasioning the disappearance of the exhaust-steam from a steam-engine, comprising, essentially, an outlet for the escape of such steam, a confined space along and through which said steam is free to drive in escaping, means to introduce atmospheric air into such space, and means to highly heat the entering current of air, substantially as described.

3. The herein-described device for occasioning the disappearance of the exhaust-steam from a steam-engine, comprising, essentially, the shell having the chamber into which the exhaust-steam flows, the outlet through which the same issues, and the central opening delivering air centrally of the said outlet, the pipe along which the commingled steam and air drive, the air-supply pipe leading to the said central opening, and means of introducing heat into the said air-supply pipe, substantially as described.

4. The herein-described device for occasioning the disappearance of the exhaust-steam from a steam-engine, comprising, essentially, the shell having the chamber into which the exhaust-steam flows, the outlet through which the same issues, and the central opening delivering air centrally of the said outlet, the pipe along which the commingled steam and air drive, the air-supply pipe leading to the said central opening, and the burner arranged in connection with the said air-supply pipe, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

FRANK MILNE.
GEORGE T. KILLAM.

Witnesses:

CHAS. F. RANDALL,
WILLIAM A. COPELAND.