

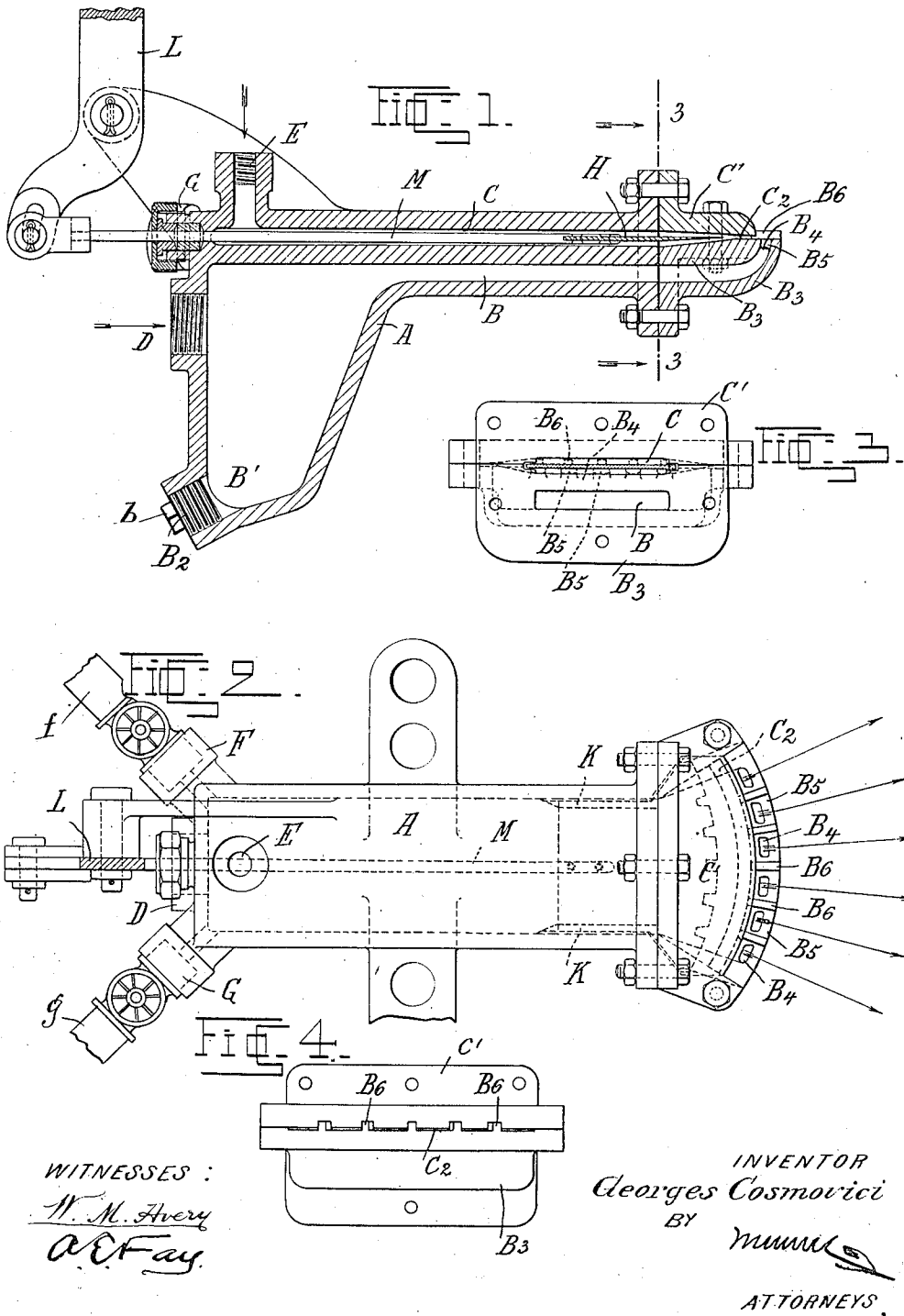
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BURNER.

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910,178.

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UNITED STATES PATENT OFFICE.

GEORGES COSMOVICI, OF BUCHAREST, ROUMANIA.

BURNER.

No. 910,178.

Specification of Letters Patent.

Patented Jan. 19, 1909.

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To all whom it may concern:

Be it known that I, GEORGES COSMOVICI, director of the Roumanian state railways, subject of the King of Roumania, residing at Bucharest, in the Kingdom of Roumania, have invented a new and Improved Burner; 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.

This invention relates to burners for burning liquid fuels, and more especially crude petroleum and its residues in furnaces whereby both the fuel and the sucking medium (steam, air or the like) are supplied by two superposed chambers.

According to the invention the outlet of the gas chamber is widened towards the front-end, whereby the issuing vapor sheet and hence the flame are discharged in fan-form which form permits of distributing the flame over the whole fire-box. By provision of outwardly diverging bridge-pieces in the front-end part of the fuel conducting chamber the issuing liquid-sheet and the fan-like flame can be divided into several branches, the space between these branches growing continually wider towards the front on account of the divergency of the fore-mentioned bridge-pieces, the air having access into the interior of the flame between the branches, thereby insuring complete combustion of the burning fuel without requiring a strong draft or the production of a long flame. These features are of great importance for locomotives and tubular boilers.

In liquid-fuel burners of known constructions the liquid-fuel, usually issuing through a nozzle, is finely divided by a jet of steam or air so that the flame forms a hollow cone to which the air has access only along the surface and consequently a complete combustion of the liquid fuel is not arrived at. It has been found frequently necessary to introduce a supplementary amount of air into the flame cone, or to arrange an incandescent wall within the reach of the flame, to insure better combustion, nevertheless such arrangements have the great disadvantage of producing smoke and soot.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in

which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a longitudinal sectional elevation of the burner; Fig. 2 is a plan view of the same; Fig. 3 is a cross section of the same, on the line 3—3 of Fig. 1, looking in the direction of the arrow and Fig. 4 is a front view of the burner-outlet part.

The casing A is preferably flat in cross section and is provided in a well known manner with superposed chambers B and C of which the lower one B serves for admission of liquid fuel and the upper one C for conducting the sucking medium (steam, air and the like). The rear end of the chamber B preferably is enlarged near the entrance-port D of the liquid fuel in a downward direction, to form a pocket B' for the accumulation of the water contained in the liquid-fuel. The pocket is provided with an outlet B² which as shown in the drawing is closed by a plug b. The forward end of the chamber B is in the form of a mouth B³ having an upwardly extending outlet B⁴ the liquid fuel being thereby discharged in an upward direction. The outlet B⁴ is divided into several branches by interposed stays B⁵ diverging outwardly or arranged radially with regard to the arc-shaped end of the burner and by this arrangement the discharged liquid is divided into narrow branches which are kept apart by the ribs B⁶, arranged upon the stays B⁵ and projecting upwardly and outwardly beyond the outlet plane. The space between the ribs B⁶ is growing continuously wider in the direction of the ejected steam and the vapor sheet rushing over the outlet plane of the liquid fuel takes up the fuel by suction, atomizes it over a large surface and may even be divided in a similar manner into several branches.

The gas chamber C arranged above the fuel chamber B has a narrow outlet C² which grows wider towards its front end, the issuing flat vapor sheet spreading out in a fan-like shape and permitting of being distributed over the whole space wherein combustion takes place if the divergency of the lateral walls of the casing be suitably chosen. The burner tip consists of two parts, the fuel duct B³ and the superposed detachable steam duct C' which are connected by bolts.

The vapor or air-jet, discharged from the outlet in the shape of thin branches, sweeps

over the liquid fuel pressed up to the borders of the outlet-opening, taking up the fuel and extending in shape of a fan, the produced flat flame filling hereby completely the fire-box.

To allow the cleaning of the outlet C² which sometimes becomes choked by impurities and the like, a knife H is horizontally and slidably arranged in the gas chamber C and shaped in accordance to the inner space of the burner outlet and guided in grooves provided in the chamber C. The horizontal displacement of the knife H may be effected, for example, by means of a lever L engaging a rod M carrying the said knife, the operation of the said lever governing a forward or backward movement of the knife, the forward movement making the knife enter into the outlet C² and thereby remove outwardly the deposited impurities. Of course provisions may be made for an automatic and continuous movement of the knife during the operation of the burner.

When steam is shut off, the steam left in the chamber C condenses; in order to provide an outlet for the water due to condensed steam, the rear end of the chamber is provided with a boss F with which is connected a valve pipe *f*, which also serves to admit air. The steam left in the chamber C while condensing, when being shut off, is liable to draw in liquid-fuel by way of the outlet C² and in order to prevent this it is sufficient to shut off the oil inlet and then to let the water escape through the opening B², out of the pocket B', the water having been separated from oil, the large heating surface of the flat chamber C assisting such separation. To a boss G at the rear end of the chamber B, is connected a valve pipe *g* to permit of cleaning this chamber, of blowing out the separated water and also of heating before starting the operation. In order to adjust the length of the flame, it is sufficient to replace the detachable part B³ C' by another suitably shaped part of differing width.

What I claim as my invention, and desire to secure by Letters Patent, is:

1. A liquid fuel burner having a fuel chamber and a superposed steam chamber, each chamber having a separate fan-shaped outlet, the outlets being in the same plane and the fuel outlet having diverging stays whereby the liquid fuel is divided into several branches, substantially as described.

2. A liquid fuel burner having a fuel

chamber and a superposed steam chamber each chamber having a separate fan-shaped outlet and the first outlet having diverging stays provided with outwardly diverging ribs projecting into the mouth of the steam-chamber, substantially as described.

3. A liquid fuel burner having a fuel chamber and a superposed steam chamber, and a burner tip for said chambers, detachably secured to said chambers and provided with separate, fan-shaped steam and fuel outlets, the fuel outlet being subdivided by outwardly diverging ribs, substantially as described.

4. A liquid fuel burner having a fuel chamber and a superposed steam chamber and a removable burner tip for said chamber provided with fan-shaped steam and fuel outlets, said burner tip being formed of an upper and a lower part, the lower part carrying upwardly protruding and outwardly diverging ribs, substantially as described.

5. A liquid fuel burner comprising a flat body having a fuel chamber and a superposed steam chamber, each having a fan-shaped outlet, the fuel chamber extending from the rear end of the steam chamber beyond the forward end of the same and having its rear end enlarged forming a downwardly extending pocket having a water outlet, substantially as described.

6. A liquid fuel burner having a fuel chamber and a superposed steam chamber, each having a fan-shaped outlet, in combination with a fan-shaped cleaning blade in the steam chamber and working in the outlet thereof to keep the same clean, a reciprocable rod to which the blade is secured, and means for moving the said rod forward and backward, substantially as described.

7. A liquid fuel burner comprising a steam duct, a reciprocable cleaning blade in the said steam duct, a fuel duct having a downwardly extending pocket at the rear end thereof, and a removable burner tip provided with separate outlets for the steam and the liquid fuel, the fuel outlet having stays carrying upwardly extending and outwardly diverging ribs, substantially as described.

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

GEORGES COSMOVICI.

Witnesses:

FERGE DONATE,
ALFRED G. SERNENT.