

No. 779,418.

PATENTED JAN. 10, 1905.

C. E. FOSTER.
MOTOR VEHICLE.

APPLICATION FILED JULY 5, 1902.

4 SHEETS—SHEET 1.

Fig. 1.

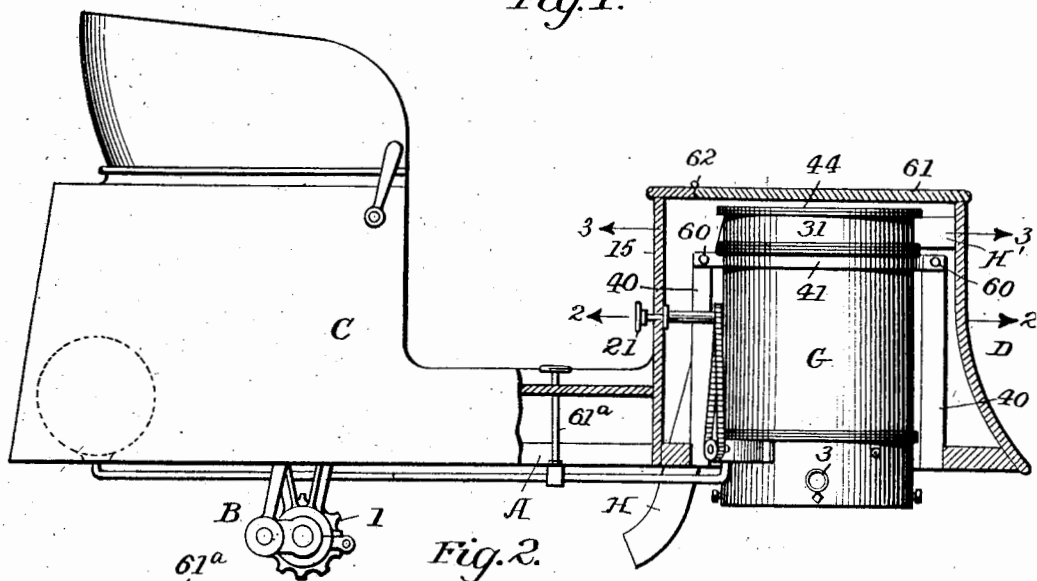
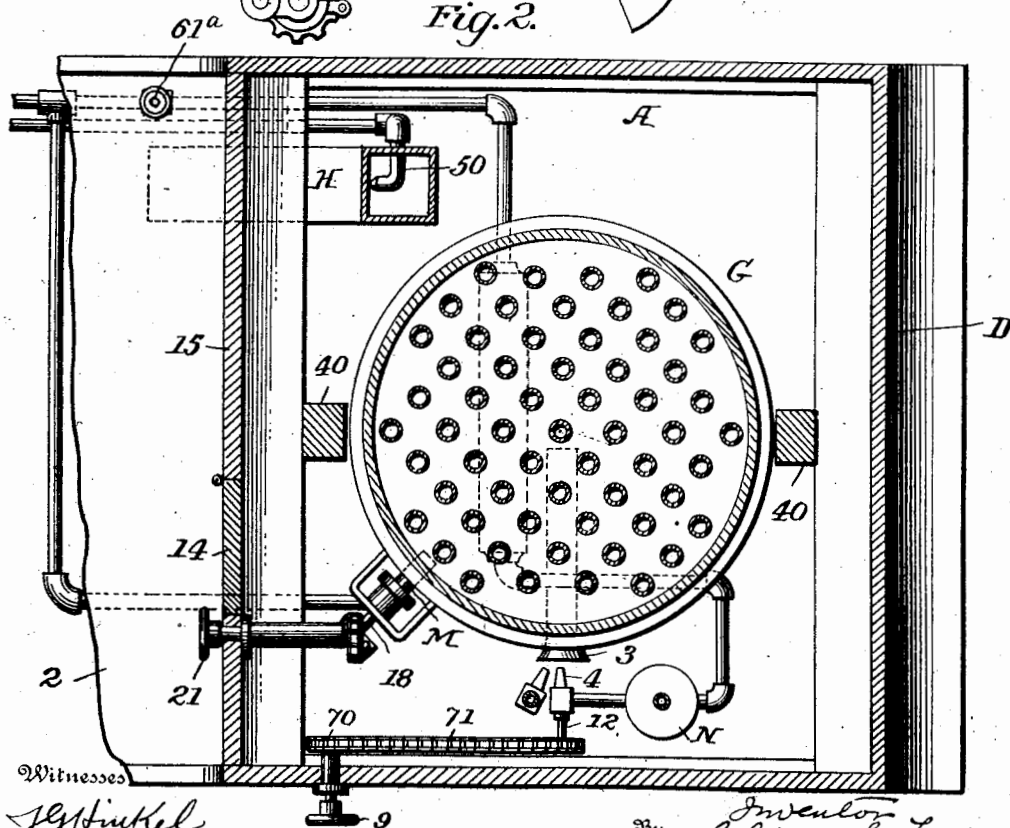


Fig. 2.



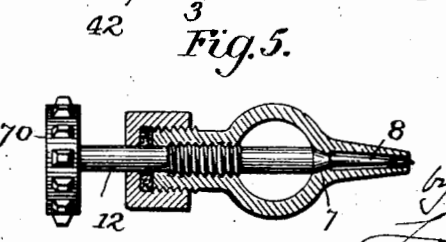
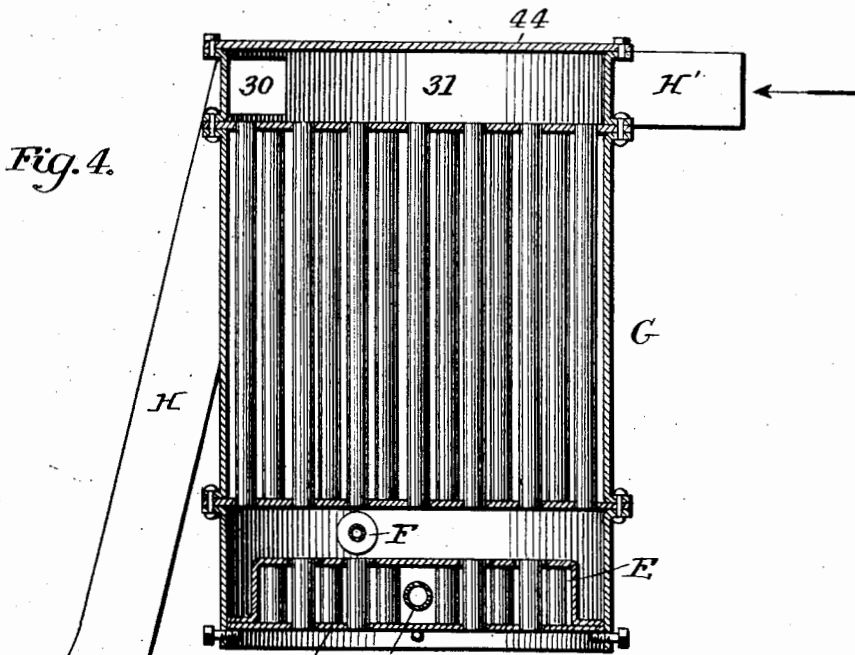
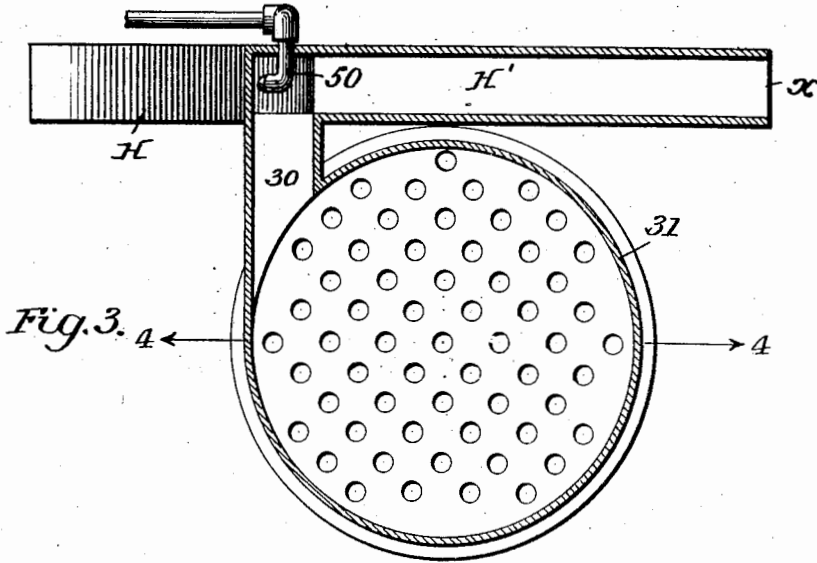
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APPLICATION FILED JULY 6, 1902.

4 SHEETS—SHEET 2.



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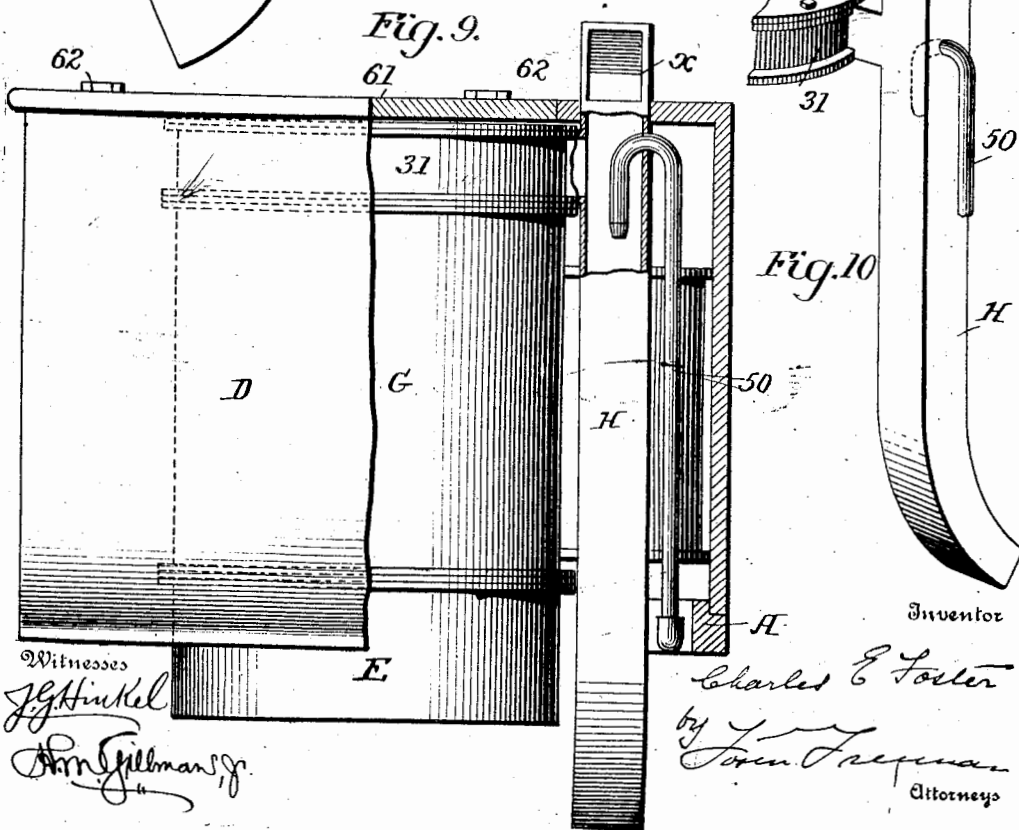
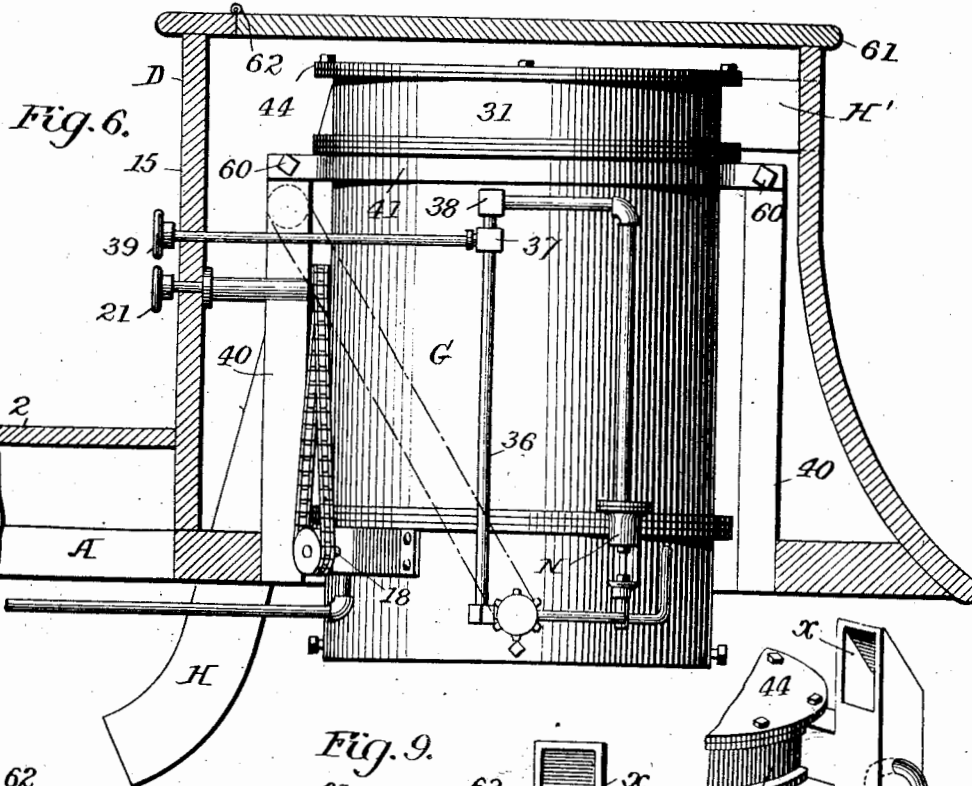
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MOTOR VEHICLE.
APPLICATION FILED JULY 5, 1902.

4 SHEETS—SHEET 3.



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MOTOR VEHICLE.

APPLICATION FILED JULY 5, 1902.

4 SHEETS--SHEET 4.

Fig. 7.

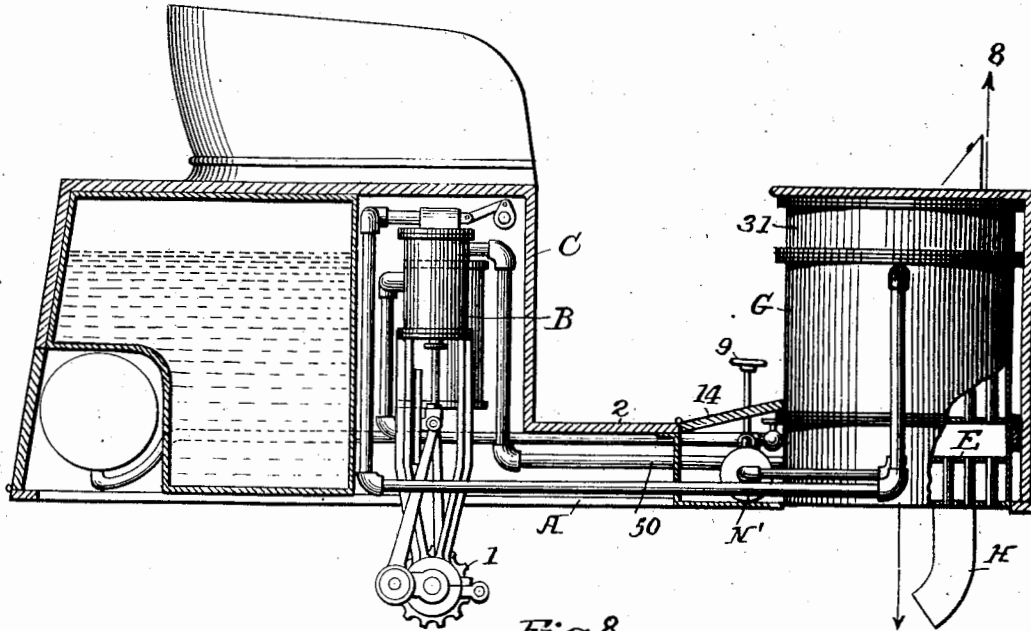
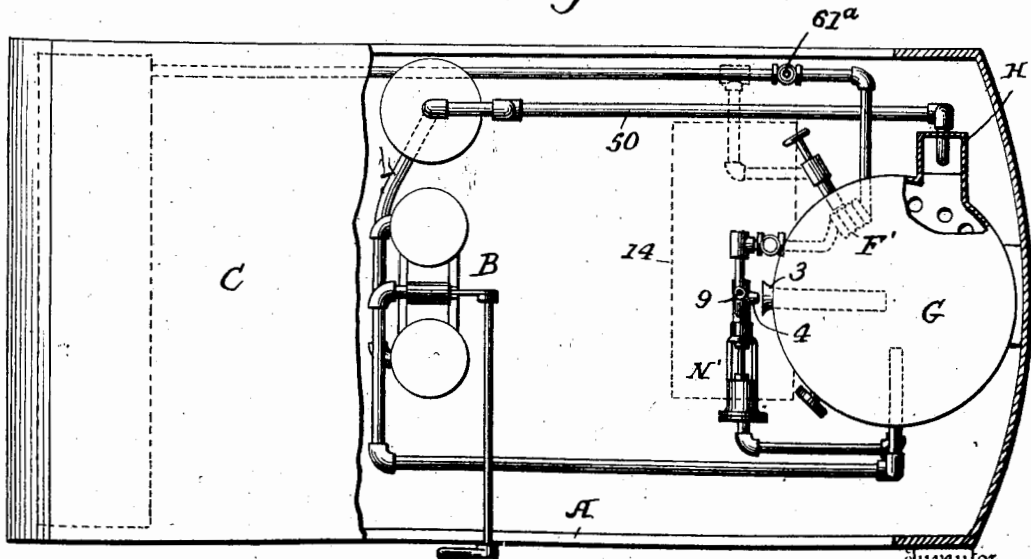


Fig. 8.



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UNITED STATES PATENT OFFICE.

CHARLES E. FOSTER, OF WASHINGTON, DISTRICT OF COLUMBIA.

MOTOR-VEHICLE.

SPECIFICATION forming part of Letters Patent No. 779,418, dated January 10, 1905.

Application filed July 5, 1902. Serial No. 114,492.

To all whom it may concern:

Be it known that I, CHARLES E. FOSTER, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Motor-Vehicles, of which the following is a specification.

My invention relates to the power-generating appliances of motor-vehicles and to means whereby to facilitate the operation and regulation thereof, as fully set forth hereinafter and as illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section of sufficient of a motor-vehicle to illustrate my invention. Fig. 2 is an enlarged sectional plan on the line 2 2, Fig. 1. Fig. 3 is an enlarged sectional plan on the line 3 3, Fig. 1. Fig. 4 is a vertical section on the line 4 4, Fig. 3; Fig. 5, an enlarged sectional view of one of the nozzles and valves; Fig. 6, an enlarged vertical elevation of the boiler and in section through the casing. Fig. 7 is a sectional elevation of a motor-vehicle, showing my improvements in connection with a different arrangement and details of different construction; Fig. 8, a plan in section of Fig. 7; Fig. 9, a part transverse section on the line 8, Fig. 7; Fig. 10, a perspective view showing the arrangement of flues in Figs. 7, 8, and 9.

The frame A is constructed to rest on springs (not shown) supported on the usual running-gear driven in any suitable manner from the driving wheel or pinion 1 of the motor-engine B. Preferably the motor B, generator G, its heater or burner, and auxiliary parts are all mounted on the frame A independently of the body C, which can be detached to permit access to the parts.

It is common to place the generator and burner below or back of the operator's seat, and as there are various causes which interfere with the action of the auxiliary devices (mixing devices, pilot, &c.) it is necessary for the operator to leave his seat and inspect or adjust said devices at frequent intervals. To avoid this, I place said devices forward of the operator, the generator G being supported in a forward position on the frame, the burner E below the same, the mixing-tube

3 and nozzle 4 (or other vapor-supplying means) adjacent to the burner and visible to the operator, and where a torch or pilot light is used, the bunsen M or its equivalent is also arranged so that its operation may be visible to the operator. Inasmuch as it is possible for the flame in some cases to be driven downward or to escape below the generator, there would be great danger of accidents if means were not adopted to prevent them, and I therefore isolate the burner and its adjuncts from the seat by extending the platform 2 to the generator, as shown in Figs. 7 to 10, or to the rear side 15 of the body-box D, which in the construction of the other figures incases the generator. I thus wholly isolate the burner from the seat, but allow of requisite inspection of the parts by providing a door 14 either in the platform, as in Figs. 7 to 10, or in the side 15 of the box D, in the other figures, which door may be readily opened by the operator whenever it is required to inspect the parts adjacent to the burner.

The nozzle 4 is supplied from the vaporizer through a pipe, the flow through which is controlled by a regulator N or N', as usual.

In order to properly control the action of the mixer, pilot-light, &c., I provide means whereby the adjusting devices (valves, &c.) may be shifted by the operator without leaving the seat. Thus the valve 12, controlling the flow of vaporized fuel to the mixing-tube, is moved by means of a hand-wheel 9, which may be on the vertical stem of the valve itself, as in Figs. 7 and 8, or with a sprocket-wheel 70, a chain 71 from which passes to a sprocket-wheel on the valve-stem. Where there is a pilot-light, the valve-stem 18, Figs. 2 and 6, may be controlled from a hand-wheel 21 by means of sprockets and a chain, as shown, or otherwise, or it may be accessible on lifting the door 14, Figs. 7 and 8.

To prevent clogging of the nozzles, the valves thereof, as the valve 7 of the mixer, may be provided with a needle 8, which extends forward through the nozzle when the valve is closed, so that if any particle has lodged in the nozzle it will be crushed or expelled.

The vaporizer may be a cylinder F, as in 100

the construction of Figs. 2 and 4, or a coil F', as in the construction of Fig. 8, and the pilot or torch may serve to start the action of the vaporizer by injecting its flame thereon.

5 It will be noted that the bunsen or heater for the vaporizer F or F' is supplied with oil directly from the supply-pipe which supplies the vaporizer independently, and in this connection I use a bunsen M, which is suitably
10 heated before starting, so as to vaporize the fuel. This arrangement insures the operation of the bunsen before the oil is turned into the vaporizer, so that after the latter is fully heated by the bunsen the oil may be turned
15 into the vaporizer and a supply of gas for the main burner secured without flooding, while the action of the bunsen or heater M is not dependent upon that of the vaporizer. A valve having a stem 61^a suitably arranged
20 controls the flow to the vaporizer.

To prevent the gases flowing upward from the burner to the top of the generator, either when running or when at rest, with the wind passing to the rear, I provide means whereby
25 any rear drafts result in aiding the downward flow of the gases to a point below the platform. Thus I provide a down-flue H, preferably inclined toward the rear at the lower end, which communicates through an opening
30 30 with the interior of a hood 31 above the generator, and I arrange a port *x* in a prolongation H' of the flue open toward the front, so as to receive air-currents passing to the rear to conduct them past the opening 30 and
35 into the tube H, thereby causing a downdraft in the latter even when the vehicle is at rest. When the vehicle is in motion, there is a strong draft through the port *x* and into the flue H and insures a downdraft when the engine is
40 not operating. When the engine is in action, the exhaust passes to a nozzle 50, arranged to project a current downward through the flue H, as heretofore.

The port *x* may be in the side of a flue H',
45 extending vertically above the hood, as in Figs. 7 to 10, or at the end of a flue extending forward horizontally, as in the construction of the other figures, and the latter being
50 preferable and the horizontal part of the flue being tangential to the hood and communicating with a port 30, arranged nearer the rear part of the hood, as best shown in Figs. 2, 3, and 4, thus insuring that the air passing
55 in from the front will go directly to the flue H without any tendency to enter the hood.

Great difficulties have been encountered in efforts to prevent gases from "burning back" in the burners—that is, the flame passes inward through the burner-openings and the
60 gases ignite inside the burner and quickly destroy the latter. I prevent this by maintaining a greater pressure at all times (during operations) within the burner than above the same. This may be done by injecting air or
65 steam into the burner. Preferably a steam-

pipe 36 conducts steam to a nozzle 35, arranged to inject the steam into the mixing-tube, and thus facilitate by its heat the vaporizing of the oil when not sufficiently heated. The oxygen of the steam or air also aids combustion, especially when kerosene or other fuel
70 rich in carbon is used. A hand-wheel 39 accessible to the operator serves to adjust the steam-valve 37, and as steam at but two or three pounds pressure is sufficient to maintain the requisite pressure in the burner a reducing-valve 38 is arranged in the steam-pipe
75 and properly adjusted.

The generator is preferably suspended between uprights 40 by yokes 41, extending under the upper flange of the generator, the ends of the yokes being detachably clamped to the uprights by bolts 60.
80

To avoid the necessity of removing the burner-casing 42 when the burner is to be inspected or to clean the boiler-tubes, I support the burner so as to be detachable from the casing, which is fixed to the boiler. Thus I extend screw-bolts through the casing below the burner, which can be removed after withdrawing the mixing-tube and screwing out said bolts. To further facilitate cleaning the boiler-tubes and afford access to parts within the hood without removing the latter, I provide it with a detachable cap 44. When a body with a box D is used, the top 61 is hinged at 62 to permit the cap 44 to be removed.
85

Without limiting myself to the precise construction and arrangement of parts shown and described, I claim—
100

1. The combination with the body, seat and platform of a motor-vehicle, of a casing forward of the platform, a boiler arranged within the casing, a burner below the boiler, and devices for controlling the supply of burning mixture accessible from above the platform, substantially as set forth.
105

2. The combination with the body, seat and platform of a motor-vehicle, of a boiler and vapor-burner arranged forward of the seat, the burner below the platform, with a guard extending between the platform and the burner to prevent the passage of flame from the burner above the platform, substantially as set forth.
110

3. The combination with the body, seat and platform of a motor-vehicle, of a boiler forward of the seat above the platform, burner extending below the platform, a guard between the burner and the platform, and devices for supplying the burner with air and vapor and for regulating the supply from above the platform, substantially as set forth.
115

4. The combination with the body, seat and platform of a motor-vehicle, of a boiler forward of the seat, a vapor-burner below the boiler and having its air-inlet below the platform, mixing devices below the platform, and means for regulating the same from above the platform, substantially as set forth.
120

5. The combination with the body, seat and
125

platform of a motor-vehicle, of a boiler forward of the seat, a vapor-burner below the boiler and having its air-inlet below the platform, means for vaporizing the oil, and for
5 supplying and regulating the flow of vapor and for mixing the vapor and air, all arranged below the platform, and adjusting means accessible from above the platform, substantially as set forth.

10 6. The combination with the body and seat of a vehicle having a platform in front of the seat, of a boiler and burner arranged forward of the seat, a hood above the boiler, and a flue open at the front and extending from the
15 hood downward to a point below the platform, substantially as set forth.

7. The combination with the body and seat of a vehicle having a platform in front of the seat, of a boiler and burner arranged forward
20 of the seat, a hood above the boiler, a flue extending at an angle from the hood downward to a point below the platform and open at the front, substantially as set forth.

8. The combination with the body and seat
25 of a vehicle having a platform in front of the seat, of a boiler and burner arranged forward of the seat, a hood above the boiler, a flue extending from the hood downward to a point below the platform, an opening at the front
30 of the flue, and an exhaust-pipe leading to a nozzle arranged to project the exhaust-steam downward in said flue, substantially as set forth.

9. The combination with the boiler and
35 burner of a motor-vehicle, of a flue open at the front tangential at the upper part to the hood, and communicating therewith and continued downward below the boiler, substantially as set forth.

40 10. The body of a motor-vehicle provided at the forward end with a casing and a generator arranged within the casing and burner below the generator, and a seat behind the generator and burner, the platform and the rear side of
45 the casing forming a partition between the generator, burner and the seat, substantially as set forth.

11. The body of a motor-vehicle provided
50 with a platform and at the forward end with a casing and a generator arranged within the casing and burner below the generator, the casing and platform arranged to form a partition between the seat and the generator and burner, and means accessible from the seat for
55 regulating the flow of fuel to the burner, substantially as set forth.

12. The combination with the body, seat,
60 and engine of a motor-vehicle, of a steam-generator and burner therefor arranged forward of the seat, a casing isolating the generator and burner from the seat, means for regulating the action of the burner, and devices accessible from the seat for actuating said means, substantially as set forth.

13. The combination with the body, seat,
65 and engine of a motor-vehicle, of a steam-generator and burner therefor arranged forward of the seat, a casing isolating the generator and burner from the seat, and a flue open at the front of the casing for receiving a horizontal
70 current of air and conducting the products of combustion from above the generator to a point below the platform, substantially as set forth.

14. The combination with the body, seat,
75 and engine of a motor-vehicle, of a steam-generator and burner therefor arranged forward of the seat, a casing isolating the generator and burner from the seat, an opening in the casing, and a flue open at the front communi-
80 cating with said opening and with the space above the boiler and extending downward below the platform, substantially as set forth.

15. The combination with the body, seat,
85 and engine of a motor-vehicle, of a steam-generator and burner and mixing devices therefor arranged forward of the seat, a casing isolating the generator and burner and appliances from the seat, and an opening in the casing provided with a door, substantially as
90 set forth.

16. The combination with the body of a motor-vehicle, of a generator supported at the front of the body, a hood above the generator, and a flue tangential to the hood and communi-
95 cating laterally therewith and open at the forward end and extending downward below the body, substantially as set forth.

17. The combination with the body of a motor-vehicle, of a boiler arranged on the platform forward of the seat, a burner isolated
100 from the seat, a mixing-tube and Bunsen burner, regulating means therefor arranged below the platform, and means for conducting the products of combustion from above
105 the boiler to a point below the platform, substantially as set forth.

18. The combination with the body, seat and platform, of a boiler and vapor-burner
110 arranged in front of the vehicle and burner-casing below the boiler, and means for connecting the burner so as to be detachable from the casing, substantially as set forth.

19. The combination with the body, seat and platform of a vehicle, of a boiler at the
115 front of the vehicle and a burner and burner-casing below the burner, means for connecting the burner so as to be detachable from the casing, a hood above the boiler, and a removable cap for the hood, substantially as set
120 forth.

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

CHARLES E. FOSTER.

Witnesses:

F. L. FREEMAN,

H. M. GILLMAN, Jr.