R. S. BRICKEY.

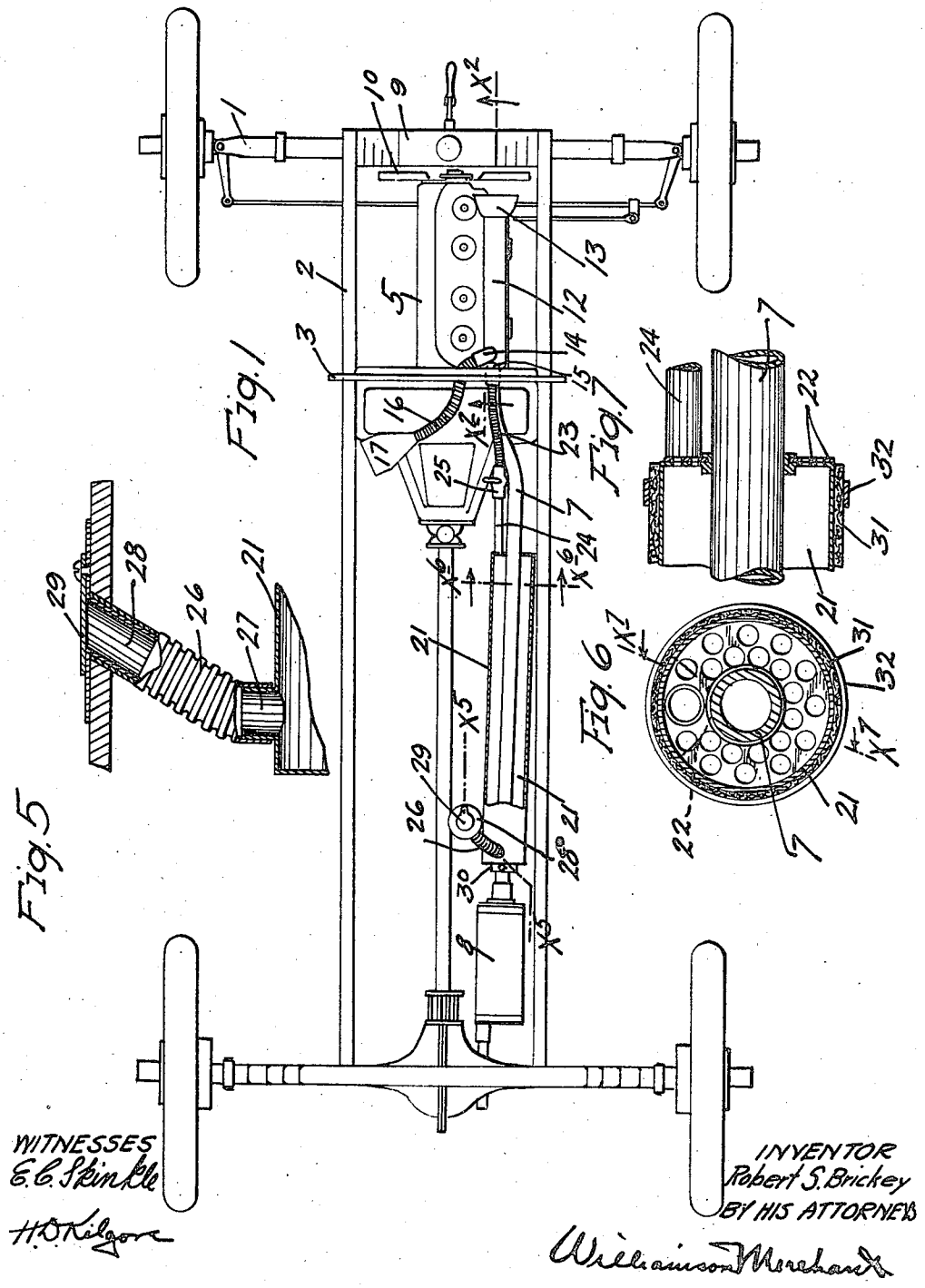
AUTOMOBILE HEATER.

APPLICATION FILED JUNE 24, 1915.

1,209,386.

Patented Dec. 19, 1916.

2 SHEETS—SHEET 1.



WITNESSES
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2 SHEETS—SHEET 2.

Fig. 2

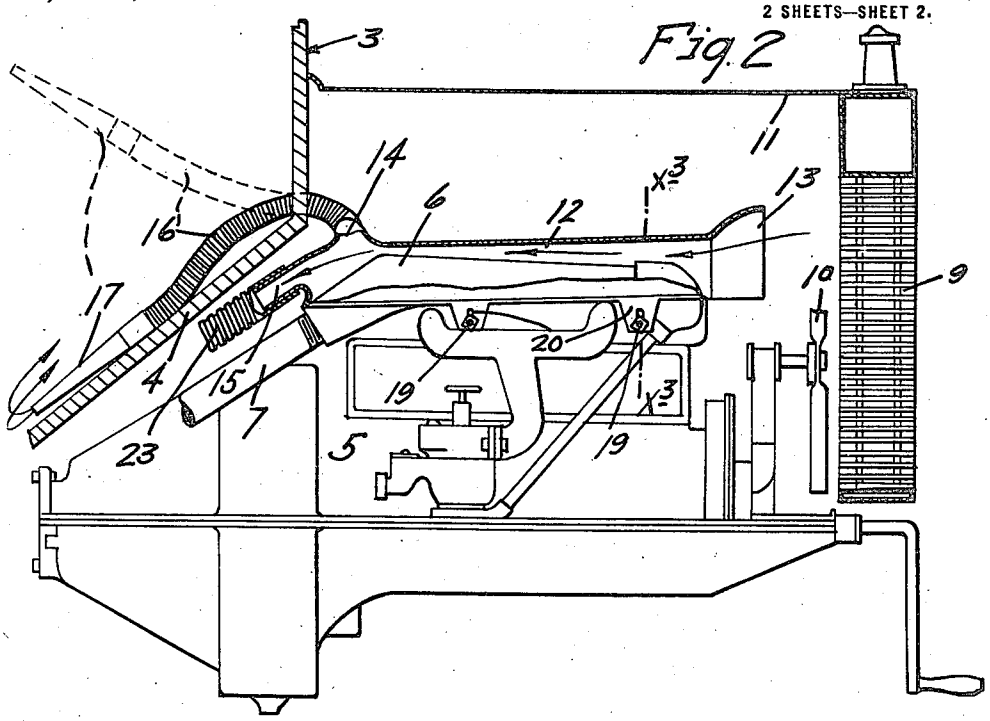

Fig. 3

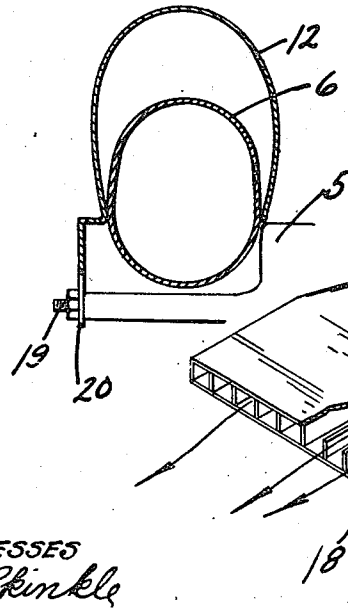

Fig. 4

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ROBERT S. BRICKEY, OF ABERDEEN, SOUTH DAKOTA.

AUTOMOBILE-HEATER.

1,209,386. Specification of Letters Patent. Patented Dec. 19, 1916.

Application filed June 24, 1915. Serial No. 36,069.

To all whom it may concern:

Be it known that I, ROBERT S. BRICKEY, a citizen of the United States, residing at Aberdeen, in the county of Brown and State of South Dakota, have invented certain new and useful Improvements in Automobile-Heaters; 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.

My invention has for its object to improve that type of automobile heaters, wherein the heat is supplied by the exhaust from the explosive engine; and, generally stated, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings, Figure 1 is a plan view of the running-gear, frame and explosive engine of an automobile to which the invention is applied; Fig. 2 is a fragmentary vertical section taken on the line x^2 x^2 of Fig. 1, on an enlarged scale; Fig. 3 is a detail view in transverse section taken on the line x^3 x^3 of Fig. 2; Fig. 4 is a perspective view of the hot air discharge nozzle and a portion of the attached hot air conduit, some parts being broken away; Fig. 5 is a detail view, partly in side elevation and partly in vertical section, taken on the irregular line x^5 x^5 of Fig. 1, on an enlarged scale; Fig. 6 is a view in transverse section taken on the line x^6 x^6 of Fig. 1, on an enlarged scale; and Fig. 7 is a detail view, partly in side elevation and partly in section, taken on the line x^7 x^7 of Fig. 6.

Of the parts of the automobile illustrated for the purpose of showing the invention applied in working position, it is important to note the running-gear 1, frame 2, dashboard 3 and footboard 4 of the body, engine casing 5, exhaust manifold 6, exhaust pipe 7, muffler 8, radiator 9, fan 10, and hood 11.

Referring now to the improved heater, the numeral 12 indicates a longitudinally extended casing open at its bottom, embracing the exhaust manifold 6 and extending thereabove. The longitudinal edges of the casing 12 are curved toward each other and closely engage the sides of the exhaust manifold 6, as best shown in Fig. 3. The casing 12 extends the full length of the exhaust manifold 6 and its forward or receiving end is provided with a flaring mouth 13, which opens rearward of the radiator 9 and a sufficient distance therefrom to permit free operation of the fan 10. The rear end of the casing 12 is closed and is provided with an upwardly and rearwardly extended primary hot air discharge nipple 14 and a rearwardly and downwardly inclined secondary hot air discharge nipple 15.

A flexible hot air conduit 16 is attached, at one end, to the nipple 14, extends through an aperture in the dashboard 3 and has secured to its other or free end a discharge nozzle 17. This nozzle 17 is adapted to loosely rest on the footboard 4 and, to prevent the same from rolling, is flattened in cross section to substantially fan-shape, as best shown in Fig. 4. To strengthen the nozzle 17 and prevent the same from crushing in case the same is stepped upon, reinforcing bars 18 connect the upper and lower sides thereof. These reinforcing bars 18 give the open end of the nozzle 17 a cellular appearance. The casing 12 is rigidly secured to the engine casing 5 by nut-equipped studs 19 on said engine casing, which project through depending slotted lugs 20 on the longitudinal edges of the casing 12.

Completely surrounding the exhaust pipe 7, just forward of the muffler 8, is a cylindrical secondary casing 21, having in its front end relatively large perforations, through which air is admitted to the casing. A perforated damper 22 is mounted on the hub of the front end of the casing 21 for oscillatory movements. This damper 22 may be oscillated to carry its perforations into registration with the perforations in the front end of the casing 21, or it may be oscillated into positions to partly or entirely close the front end of the casing 21.

A conduit comprising a flexible section 23 and a rigid section 24 connects the two casings 12 and 21. The flexible conduit section 23 is secured, at one end, to the nipple 15 of the casing 12, and the conduit section 24 is rigidly secured, at one end, to the front end of the casing 21 above the exhaust pipe 7. The two conduit sections 23 and 24 are connected by a hand valve 25, which may be turned to completely cut off the passage of hot air from the casing 12 into the casing 21, or it may be turned to govern the amount of

hot air passing through said conduit. As shown in Fig. 6, the damper 22 is notched to afford clearance for the conduit section 24 and permit a limited oscillatory movement of said valve. In actual usage of the heater, suitable operating rods may be attached, one to the damper 22 and another to the stem of the valve 25, for independently operating said damper and valve. These rods may be extended to points where they may be easily reached and operated by the driver.

Hot air from the casing 21 is delivered through a flexible conduit 26 into the body of the automobile, preferably through the floor between the front and back seats. The receiving end of the conduit 26 is loosely telescoped onto an upwardly projecting nipple 27, opening into the rear end portion of the casing, and its upper end is loosely telescoped onto a flange nipple 28. The nipple 28 extends through the floor of the automobile and is secured in position by screws, not shown, passed through its flange and into the floor of the automobile. The hot air passing through the conduit 26 may be entirely cut off or the supply reduced by a damper 29, pivotally secured to the flange of the nipple 28.

The operation of the improved automobile heater may be briefly described as follows: While the engine of the automobile is running, a certain amount of the air passing through the radiator 9 will be forced by the fan 10 into the casing 12, through its flaring mouth 13, and into the conduits 16 and 23—24. Hot air passing through the conduit 16 will be widely distributed over the footboard 4 by the fan-like nozzle 17. The hot air passing through the conduit 23—24 will be delivered into the casing 21 where it commingles with the hot air rising from the exhaust pipe 7. The hot air in the casing 21 is delivered into the automobile body through the conduit 26, under the action of the hot air, moving from the casing 12 into the casing 21, and the force of the air entering the open end of the casing 21, under the action of the traveling movement of the automobile.

It is highly important to note that the exhaust manifold 6 inclines rearwardly and upwardly and that the top of the casing 12 extends substantially horizontal. By this arrangement, a large amount of the air, in entering the casing 12 passes over the exhaust manifold 6, but is gradually forced downward thereon, until it reaches the highest point of the exhaust manifold. As it is well known, the highest point of the exhaust manifold is the hottest and often becomes red hot. The air in passing through the radiator 9 is slightly warm and, in passing through the casing 12, is gradually heated, until it reaches the highest point of the exhaust manifold 6. Here, the volume of heated air is reduced and made very hot before entering the delivery conduits 16 and 23—24. By closing the valve 25, the casings 12 and 21 may be independently operated. That is, all of the heat from the exhaust manifold 6 may be delivered into the conduit 16 and all of the heat of the exhaust pipe 7, within the casing 21, may be delivered into the conduit 26. Or the valve 25 may be partly closed to limit the amount of hot air passing from the casing 12 into the casing 21. By flexibly connecting the nozzle 17 to the casing 12, said nozzle may be set in different positions on the footboard 4, or it may be lifted up, as indicated by dotted lines in Fig. 2, so as to be out of the way, when it is necessary to remove the footboard 4. Footboards of automobiles are made removable to afford access to the engine. It is, of course, understood that the flange nipple 28 may be located at any desired point in the automobile. It is, also, evident that the improved heater may be applied to an automobile, as shown in the drawings, or it may be applied in separate units, the one including the casing 12 and the other the secondary casing 21. The flexible hot air delivery conduits 16, 23 and 26 take up all vibrations and permit independent movements of the various parts of the improved heater, which they connect. They also, make it an extremely simple matter to apply the improved heater to the automobile and to adjust the various parts thereof. The secondary casing 21 is slidably mounted on the exhaust pipe 7 and is held in different adjustments thereon by a set screw 30, carried by the hub at the rear end of said casing.

As shown in Fig. 7, the secondary casing 21 is covered with an insulating material 31 held in position by bands 32. When the automobile is standing still the damper 22 may be closed to prevent the intake of air, which would cool the air within the casing 21, to conserve the heat arising from the exhaust pipe 7.

What I claim is:—

1. The combination with the explosive engine and body of a motor driven vehicle, of an open bottom casing applied over the exhaust pipe of the engine with its sides closely engaging the sides thereof, said casing being open to the atmosphere, and a flexible hot air conduit leading from said casing, extending into said body and having at its outer end an open hot air discharge nozzle.

2. The combination with the exhaust pipe of an explosive engine, said exhaust pipe having an upwardly inclined bend, of a casing applied to the bend in said exhaust pipe and through which air passes, said casing arranged to draw the air in passing therethrough onto the highest point of the bend in said exhaust pipe.

3. The combination with the exhaust manifold and radiator of an explosive engine, said exhaust manifold being upwardly inclined with a downwardly projecting discharge end, of a casing applied to said exhaust manifold and having an open end in the vicinity of the radiator, said casing arranged to draw the air passing therethrough onto the highest point of the exhaust manifold, and a hot air conduit leading from said casing.

4. The combination with the exhaust manifold, radiator, and fan of an explosive engine, said exhaust manifold being upwardly inclined with a downwardly projecting discharge end, of a casing applied to said exhaust manifold and having an open end in the vicinity of the radiator, with said fan working between the radiator and the open end of said casing, and a hot air conduit leading from said casing, said casing arranged to draw the air passing therethrough onto the highest point of the exhaust manifold.

5. The combination with the explosive engine, radiator, and body of an automobile, of a casing applied to the exhaust manifold of the explosive engine and having an open end in the vicinity of said radiator, a hot air conduit leading from said casing and having a discharge nozzle extending into the said body, a secondary casing applied to the exhaust pipe of said engine, a hot air conduit connecting said two casings, and a hot air conduit leading from said secondary casing and arranged to discharge into the said body.

6. The combination with the explosive engine, radiator, and body of an automobile, of a casing applied to the exhaust manifold of said engine and having an open end in the vicinity of said radiator, a flexible hot air conduit leading from said casing to said body and having a discharge nozzle supported on the footboard of said body, a secondary casing applied to the exhaust pipe of said engine, a valve-equipped hot air conduit connecting said two casings, and a flexible hot air discharge conduit leading from said secondary casing and arranged to discharge into the said body.

7. The combination with the explosive engine, radiator, fan, and body of an automobile, of a casing applied to the exhaust manifold of said engine and having an open end in the vicinity of said radiator, with the fan working between the radiator and the open end of said casing, a flexible hot air conduit leading from said casing to said body and having a discharge nozzle supported on the footboard of said body, a secondary casing applied to the exhaust pipe of said engine, a valve-equipped flexible hot air conduit connecting said two casings, and a flexible hot air discharge conduit leading from said secondary casing and arranged to discharge hot air into said body.

8. The combination with the explosive engine, radiator, fan, and body of an automobile, of a casing applied to the exhaust manifold of said engine and having an open end in the vicinity of said radiator, with the fan working between the radiator and the open end of said casing, a flexible hot air conduit leading from said casing to said body and having a discharge nozzle loosely supported on the footboard of said body, a secondary casing applied to the exhaust pipe of said engine, a valve-equipped flexible hot air conduit connecting said two casings, said secondary casing having a fresh air intake, and a flexible discharge conduit leading from said secondary casing and arranged to discharge hot air into said body.

9. The combination with the explosive engine, radiator, fan, and body of an automobile, of a casing applied to the exhaust manifold of said engine and having an open end in the vicinity of said radiator, with the fan working between the radiator and the open end of said casing, a flexible hot air conduit leading from said casing to said body and having a discharge nozzle loosely supported on the footboard of said body, a secondary casing applied to the exhaust pipe of said engine, a valve-equipped flexible hot air conduit connecting said two casings, said secondary casing having a damper-equipped fresh air intake, and a flexible discharge conduit leading from said secondary casing and arranged to discharge hot air into said body.

10. The combination with the explosive engine, radiator, fan, and body of an automobile, of a casing applied to the exhaust manifold of said engine and having an open end in the vicinity of said radiator, with the fan working between the radiator and the open end of said casing, a flexible hot air conduit leading from said casing to said body and having a discharge nozzle loosely supported on the footboard of said body, a secondary casing applied to the exhaust pipe of said engine, a valve-equipped flexible hot air conduit connecting said two casings, said secondary casing having a damper-equipped fresh air intake, and a damper-equipped flexible discharge conduit leading from said secondary casing and arranged to discharge hot air into said body.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT S. BRICKEY.

Witnesses:
EVA E. KÖNIG,
HARRY D. KILGORE.