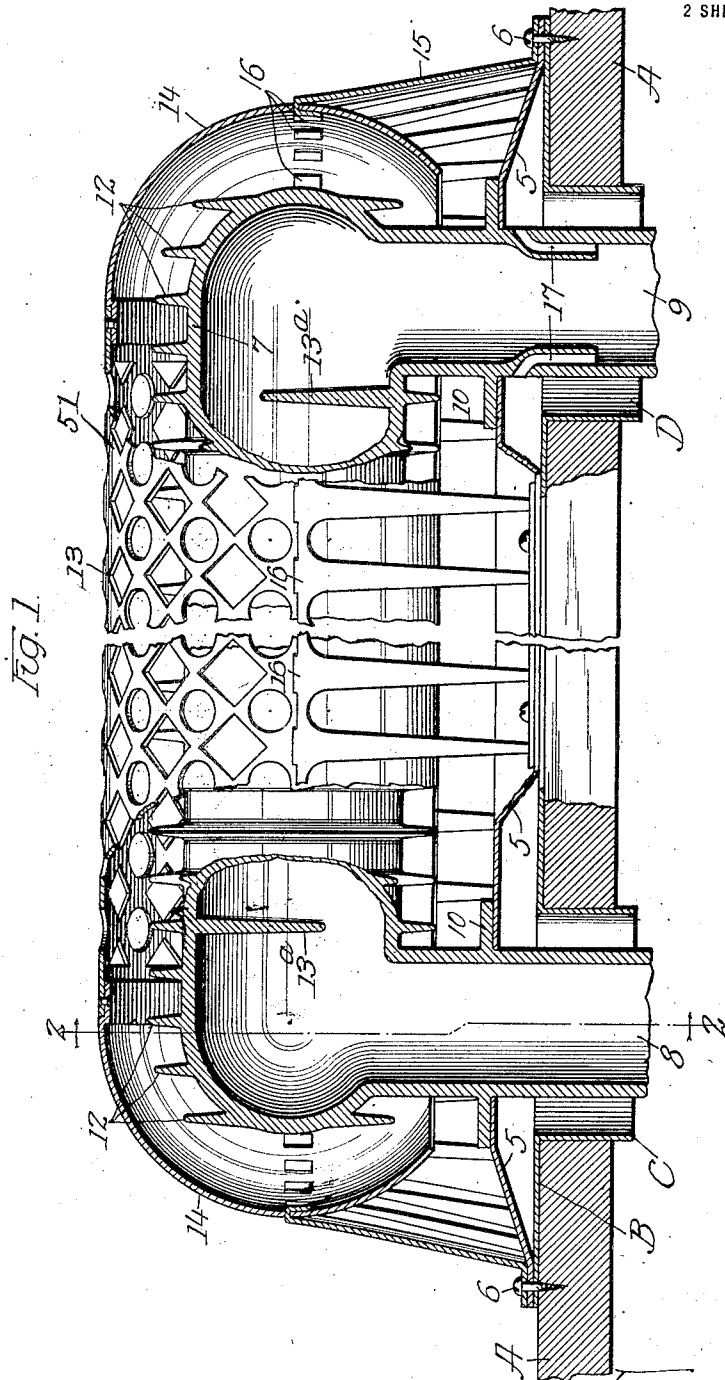


T. BOVEY.
 AUTOMOBILE HEATER.
 APPLICATION FILED OCT. 17, 1919.

1,400,518.

Patented Dec. 20, 1921.

2 SHEETS—SHEET 1.



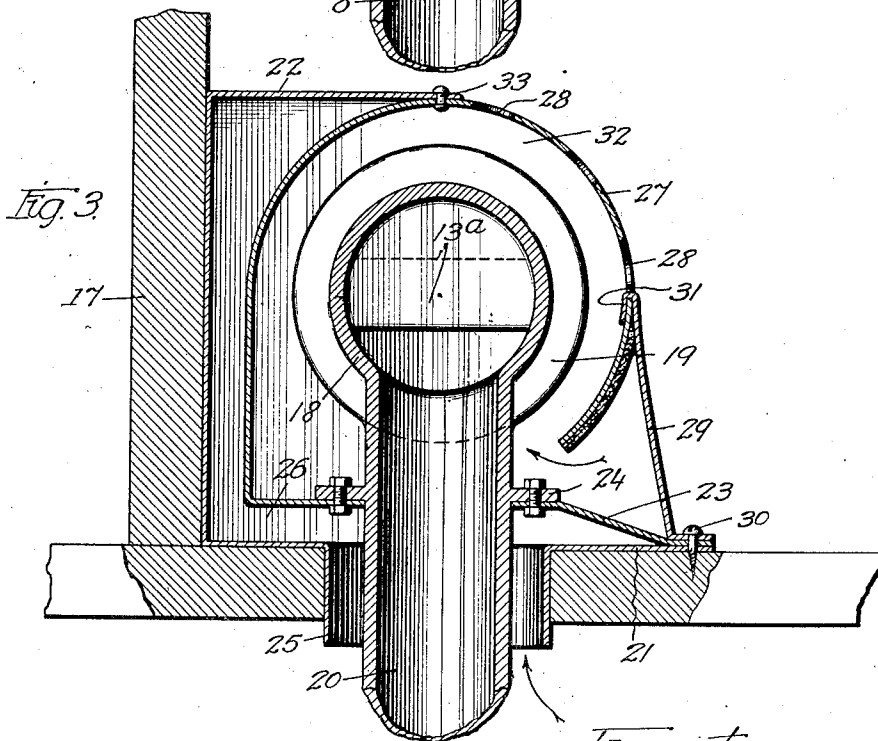
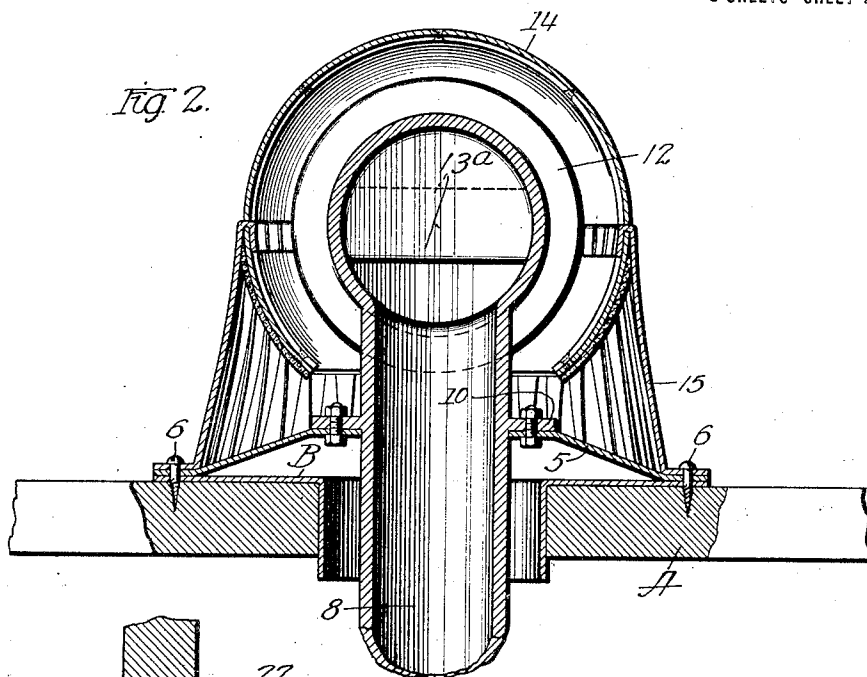
Inventor
 Thomas Bovey
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UNITED STATES PATENT OFFICE.

THOMAS BOVEY, OF CHICAGO, ILLINOIS.

AUTOMOBILE-HEATER.

1,400,518.

Specification of Letters Patent.

Patented Dec. 20, 1921.

Application filed October 17, 1919. Serial No. 331,372.

To all whom it may concern:

Be it known that I, THOMAS BOVEY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Automobile-Heaters, of which the following is a full, clear, and exact description.

My invention relates to heaters, and particularly to foot heaters for automobiles for utilizing the heated exhaust of the engines of the same.

The foot heaters heretofore extensively used in limousines or closed bodies of automobiles have been so constructed that the feet of the occupants either rested direct on the tubular element thereof through which the products of combustion from the engine flowed, or the upper part of the shoes of the passengers came directly in contact with the same and were scorched or burned.

The object of my invention is to prevent such an occurrence and also prevent the scorching or burning of the flooring of the said limousine or body where the intake and outlet of the heater passes from scorching or burning and to provide for the heating of the lower strata of air in the automobile and thus insure the raising of the temperature of the air throughout the entire limousine or body. I accomplish these results in the manner hereinafter described and illustrated in the drawings, and as particularly pointed out in the claims.

In the drawings:

Figure 1 is a side element of my improved heater showing the ends thereof and portions of the floor under the same in section.

Fig. 2 is a transverse section taken on dotted line 2, 2, Fig. 1.

Fig. 3 is a transverse section of a modified construction of said invention.

Referring to the accompanying drawings, A represents a portion of the floor of a limousine or closed body of an automobile. My improved heater consists of a transversely disposed incased tubular contrivance, the preferred form of which is placed at a convenient point in front of and parallel to the rear seat, and under the said heater, the floor is covered with a suitable metal floor-plate B which, at the inlet and outlet of the heater, is provided with integral depending tubular thimbles, C and D, respectively. These thimbles are greater in diameter than the inlet pipe and the outlet pipe of the

heater that extends vertically through the same thus surrounding said pipes with an annular air space, substantially as shown in the drawings.

The floor-plate B is, preferably, of a width and length greater than that of the heater, and a base-plate, 5, is mounted upon said plate B, the flat central portion of which is raised above the floor-plate, and between its marginal edges and this central portion it is inclined downward to its margins and provides a cool air chamber, 50, that protects the floor under the heater. When its margins are properly secured to the floor-plate by screws 6, air chamber 50 is extended from one end of the heater to the other, and the air circulates through the same.

The body 7, of the heater consists of a horizontally extending transverse metal tube and the intake pipe, 8, and the outlet, 9, thereof are of a diameter less than the thimbles C and D and up through the center of which they extend. These pipes pass through openings in the flat top of the base-plate 5, and merge into and are preferably, cast in one piece with the ends of the body 7. The openings in the base-plate through which the intake and outlet pipes, 8, and 9, pass are of a diameter just sufficient to permit their passage, and immediately above said base-plate said pipes are provided with circumferential flanges 10, 10, that rest upon the base-plate and thus support the said body.

The body 7, is, preferably, provided with a series of circumferential flanges 12, throughout its length to assist in the radiation of the heat, and if desired said body between its ends, can be provided interiorly with a series of staggered partial partitions, 13^a, that retard the too rapid passage of the current of products of combustion from one end to the other, and thus insure the thorough heating of the body.

The said body is inclosed throughout its length in a casing 13, which at no point comes in contact with the same. This casing consists of a central cylindrical section 51, and corresponding semi-spherical end sections 14, 14, and the vertical edges, of the latter are rabbeted to form seats for the lapping ends of said central section 51. The casing including both central and end sections, has its lower segment cut away immediately above the flat top of base-plate 5, and the upper half of the central-section

thereof is perforated or grilled, substantially as shown in the drawings, so that the air taken in through the open lower side of the casing can come in contact with the
 5 heated body 7 of the heater and be discharged up through the perforated upper half of the central section.

The casing is supported in its assembled position by means of a framework consisting of a sheet metal plate 15, which, preferably skirts entirely around the lower part of the casing and has its lower edges flanged outward and supported upon the marginal edges of the base-plate and secured thereto
 15 and to the floor A by the screws 6. From its lower flanges this framework inclines upward to about the horizontal plane of the axis of the body 7 of the heater, and its upper edge is provided with a series of equidistant lugs 16, that are bent inward through a suitable series of corresponding equidistant slots in the sides of the casing and bent downward against the inner surface of said casing to secure the upper edge
 20 of the framework to the same. Between its upper and lower edges the framework 15, is provided with a series of vertically disposed slots. This gives the casing of the heater the appearance of being supported
 25 by numerous legs between which the lower strata of air in the automobile can pass and be drawn into the space between the base-plate and the casing and heated in the manner hereinbefore explained.

In order to insure the circulation of air in the cool air chamber between the floor-plate B and the base-plate 5, from the intake thimble C to the outlet thimble D, I provide the outlet pipe 9, with one or more longitudinal passages 17. These passages are made in the circumferential wall of said pipe, and their upper ends open into said chamber 51, and their lower ends discharge into the bore of the outlet pipe at the point
 45 below said chamber. The exhaust from the engine discharges with considerable force up through the intake pipe, horizontally through the body of the heater and downward through outlet pipe 9, and the current
 50 caused by the discharged products of combustion sucks the air into and down through the passages 17, and thus keeps up a continuous circulation of air through chamber 51.

In Fig. 3 of the drawings, I show a modified construction of my invention, which is designed to be placed upon the floor of the limousine or body of the automobile against the forward surface of the seat 17, only a
 60 fragment of which is shown in the drawings. The body, 18, of the heater, the circumferential flanges thereof, and the intake-pipe, 20, and outlet pipe (not shown) thereof, are the same in construction as the
 65 similar parts in the preferred form of the

heater, as shown in Figs. 1 and 2 of the drawings.

The front edge of the floor-plate 21, of this modification terminates a suitable distance in front of the front-board 17 of the
 70 seat and extends back to said front-board and then vertically to the horizontal plane of the top of the heater and then extends horizontally forward to form the roof of the same. The front edge of this roof terminates at a point substantially above the
 75 center of the body of the heater. This modification of my invention also has a base-plate 23, the forward edge of which rests upon the margins of the forward edge of
 80 the floor-plate 21. From this point the said base-plate inclines upward to the horizontal plane which is separated from the floor plate and provides a raised platform upon which the circumferential flanges 24
 85 of the intake pipe and a corresponding circumferential flange of the outlet-pipe (not shown) rest and support the body of the heater in its proper assembled position. The intake-pipe 20, and said outlet-pipe extend up through integral thimbles 25, depending from the floor-plate through the
 90 floor of the automobile, and these pipes being of less diameter than said thimbles thus leave an annular space around said pipes through
 95 which the air circulates as it enters and passes out of chamber 26, as hereinbefore explained in the description of the preferred form.

The platform of base-plate 23, extends to the rear of the intake and outlet pipes until it reaches a point spaced apart from and in front of the rear vertical extension of floor-plate 21, and from this point it extends vertically upward and parallel to said vertical
 105 extension, until it reaches the horizontal plane of the axis of the body 17 of the heater whereupon it is bent in a curve struck from the center of the heater and describes a segment of a circle of approximately
 110 degrees. The curved portion of the extension of the base-plate constitutes a hood 27, the forward upper front portion of which is provided with a suitable series of perforations and the lower edge of the lower
 115 imperforate portion of which terminates a suitable distance above the lower inclined portion of base-plate, 31, and provides an opening through which the lower strata of air is drawn, which latter comes in contact
 120 with the body of the heater and is heated and then discharged through the perforations 28.

In order to support the forward portion of the hood 27, a grilled plate of sheet metal 29, similar to the supporting-frame 15 of the preferred form of the heater is used, the lower flange of which rests upon the margins of the forward edge of the base-plate and is secured to the floor by screws 30. The upper edge of this plate 29 is provided
 130

with lugs 31 that clamp and secure said grilled plate to the hood 27. This grilled plate, 29, is provided with vertical slots or openings therein of any other suitable design and it extends from end to end of the heater.

The ends of this modified form of my invention are, preferably closed, and the forward edges of the roof 22 are attached to the top of the hood 27, by means of rivets 33 or otherwise, thus completing a cool air chamber between the body of the heater and the floor and the body of said heater and the seat of the automobile.

It will be noticed that the inclined bordering portion of the base-plate is adapted to receive any dust or dirt or foreign matter that may drop onto the body and that such dirt or foreign matter will gravitate down said incline to the base of the slots in the framework 15, which latter at their lower ends terminate in squared ends out through which said dirt or foreign matter can readily be brushed or sucked out by a vacuum cleaner. Of course, some other way could be adapted to remove this dirt, but I prefer to accomplish this removal in the manner stated.

What I claim as new is:

1. A horizontally extending heater comprising a tubular body having an intake at one end and an outlet at the other end, a cool air chamber beneath and co-extensive with the same and in spaced parallel relation thereto and having an inlet at one end and a discharge opening at the other end, and means for supporting said body above said cool air chamber.

2. A horizontally extending heater comprising a tubular body having an intake pipe at one end and an outlet pipe at the other end, a cool air chamber extending longitudinally under said body and having an air inlet thimble and a discharge thimble depending therefrom through which the intake-pipe and the outlet-pipe of said body, which are of less diameter, extend, and a suitable support for said body.

3. A horizontally extending heater comprising a tubular body having an intake pipe at one end and an outlet pipe at the other end, a cool air chamber extending longitudinally under said body and having an air inlet thimble and a discharge thimble depending therefrom through which the intake-pipe and the outlet-pipe of said body extend, said pipes being spaced apart from said thimbles and said outlet pipe having a longitudinal passage therein that connects said chamber with the bore of the outlet pipe, and a suitable support for said body.

4. A horizontally extending heater comprising a tubular body having an intake at one end and an outlet at the other, a cool air chamber consisting of a floor-plate having

openings therein of greater diameter than said intake and outlet and a base-plate the portion under the said body being above and separated from the floor-plate and inclined downward therefrom to and connecting with the margins of said floor-plate; said intake and outlet pipes extending through said openings in the floor-plate and through openings provided in the raised portion of the base-plate.

5. A horizontally extending heater comprising a tubular body having an intake pipe at one end and an outlet pipe at the other, a cool air chamber, the top of which consists of a base-plate the central portion of which under said body is raised above and separated from the support thereof, said intake pipe and outlet pipe extending through the raised part of the said plate and having circumferential flanges that rest upon the raised portion of the same.

6. A horizontally extending heater comprising a tubular body having intake pipe at one end and an outlet pipe at the other, a casing therefor having an opening in the lower segment of the same that extends substantially from end to end thereof and the central portion of said casing above said body being perforated and means for supporting said casing out of contact with said body and consisting of a plate skirting around and outside of said casing, the upper edges of which are secured to the exterior of said casing and the lower edges resting upon the support of the heater and between its upper and lower edges being provided with a series of vertical slots.

7. A horizontally extending heater comprising an intake pipe at one end and an outlet pipe at the other, a casing surrounding said body from end to end and having a longitudinally extending opening in its under side through which said intake and outlet pipes extend, and means for supporting said casing; said casing consisting of two imperforated end sections and a central section, the upper portion of which above said body is perforated, and means for supporting said casing and consisting of a plate skirting around and outside of said casing, the upper edges of which are secured to the exterior of said casing and the lower edges resting upon the support of the heater and between its upper and lower edges being provided with a series of vertical slots.

8. A horizontally extending heater comprising a tubular body having an intake pipe at one end and an outlet pipe at the other, a casing therefor having an opening in the lower segment of the same that extends substantially from end to end thereof and the central portion of said casing above said body being perforated and means for supporting said casing out of contact with said body and consisting of a plate skirting

around and outside of said casing, the upper edges of which are secured to the exterior of said casing and the lower edges resting upon the support of the heater and between its upper and lower edges being provided with a series of vertical slots.

9. A horizontally extending heater comprising an intake pipe at one end and an outlet pipe at the other, a casing surrounding said body from end to end and having a longitudinally extending opening in its under side through which said intake and outlet pipes extend, and means for supporting said casing; said casing consisting of two imperforated end sections and a central sec-

tion, the upper portion of which above said body is perforated, and means for supporting said casing and consisting of a plate skirting around and outside of said casing, the upper edges of which are secured to the exterior of said casing and the lower edges resting upon the support of the heater and between its upper and lower edges being provided with a series of vertical slots.

In witness whereof I have hereunto set my hand this 13th day of October, 1919.

THOMAS BOVEY.

Witnesses:

VIOLET WARDELL,
FRANK D. THOMASON.