D. W. DUDDERAR.

HEATING APPARATUS FOR MOTOR VEHICLES.

APPLICATION FILED JAN. 21, 1913.

1,091,816.

Patented Mar. 31, 1914.

2 SHEETS—SHEET 1.

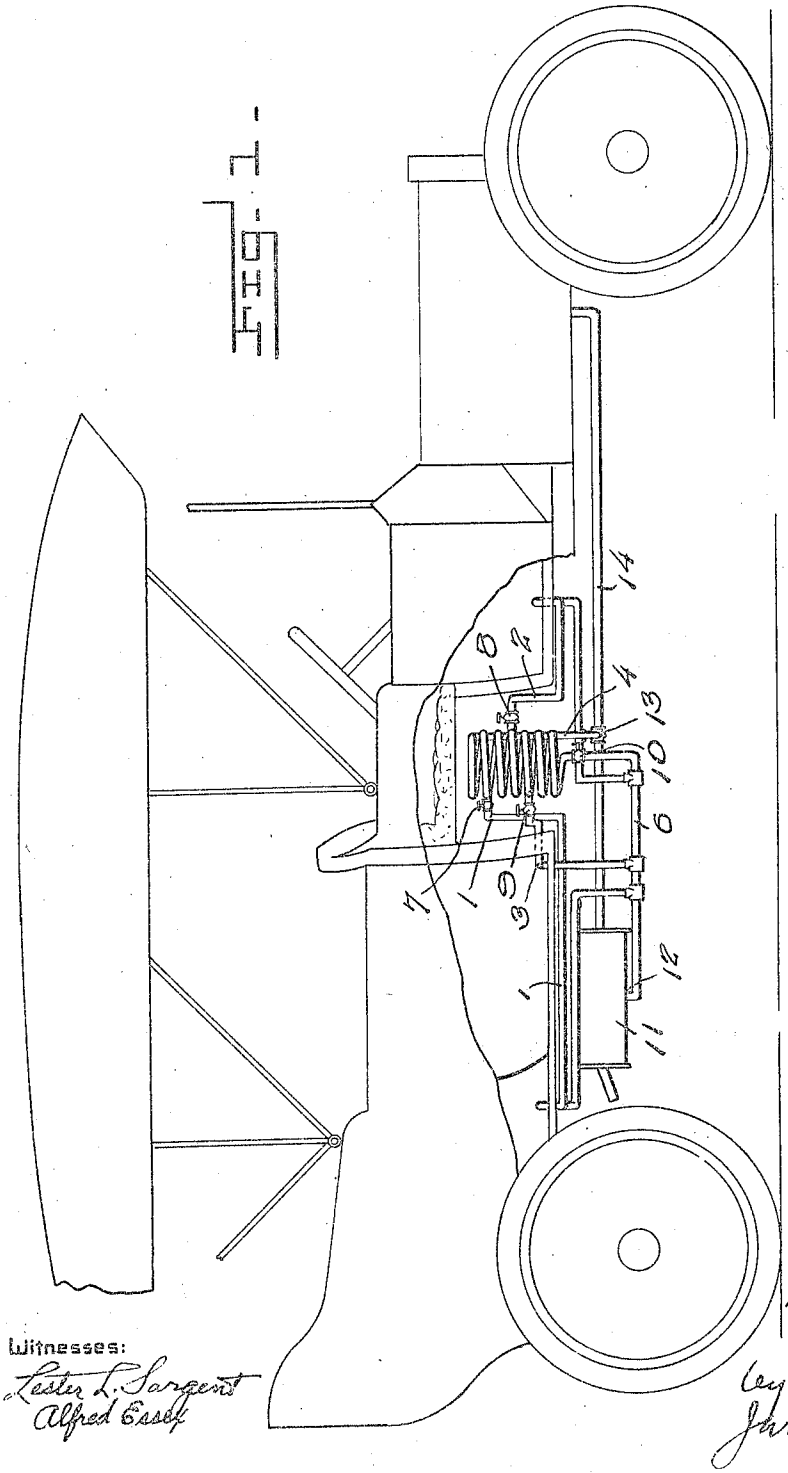


Fig. 1.

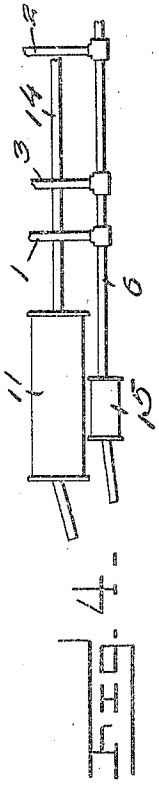


Fig. 4.

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2 SHEETS—SHEET 2.

Fig. 2.

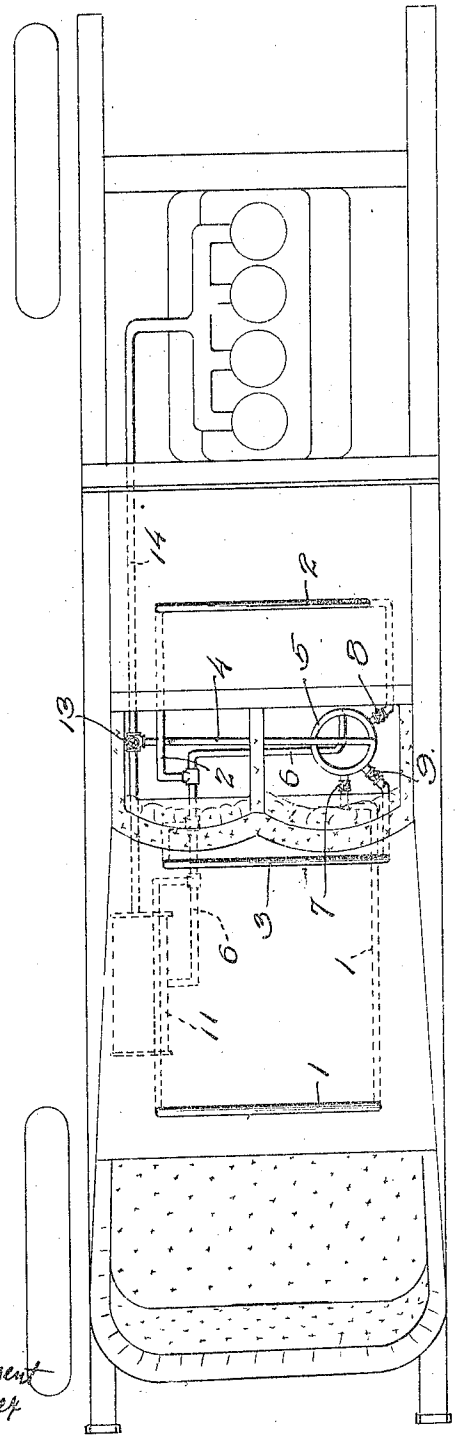
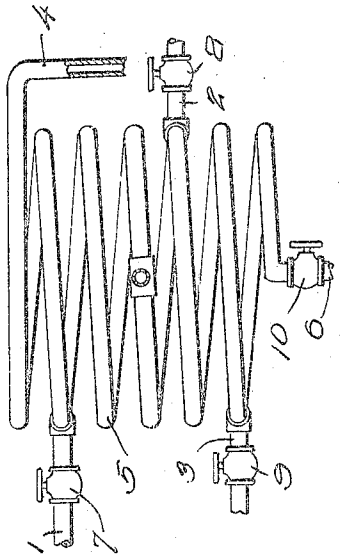


Fig. 3.



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UNITED STATES PATENT OFFICE.

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HEATING APPARATUS FOR MOTOR-VEHICLES.

1,091,816. Specification of Letters Patent. Patented Mar. 31, 1914.

Application filed January 21, 1913. Serial No. 743,349.

To all whom it may concern:

Be it known that I, DANIEL W. DUDDERAR, a citizen of the United States, residing at Mount Airy, in the county of Carroll and State of Maryland, have invented certain new and useful Improvements in Heating Apparatus for Motor-Vehicles, of which the following is a specification.

My invention has for its objects the utilization of engine exhaust for heating purposes; to provide an improved type of heating apparatus designed to utilize and dispose of the products of combustion from an internal combustion engine; to provide heating apparatus of a new type for motor vehicles, so constructed and arranged as to heat any part of the vehicle desired; to provide apparatus of such construction and arrangement that heat may be diverted to any desired part of the car, and from one portion of the car to another without causing any more back pressure than the regular muffler; and thus improve upon previous motor vehicle auxiliary heating mechanisms.

In the accompanying drawings forming a part of this specification, Figure 1 represents a side elevation of an automobile equipped with my invention; Fig. 2 is a top plan view of the same; Fig. 3 is a detail of the coil and its connected auxiliary heating pipe; Fig. 4 is a detail showing a modification of the exhaust mechanism in which an auxiliary muffler is utilized.

14 represents the exhaust pipe extending from the engine to the muffler, as is customary in this art.

4 represents a heater pipe provided for the purpose of conveying the exhaust from the exhaust pipe to the heating apparatus instead of permitting it to travel directly to the muffler.

5 represents a radiator coil connected with the heater pipe.

6 represents the radiator-coil exhaust pipe, which terminates in the muffler 11.

11 represents the muffler, and 12 indicates a side port provided in the muffler in order that the radiator-coil exhaust pipe may connect therewith, thus shortening the distance through the muffler for the gases from the heating apparatus to travel.

1 represents an auxiliary car-heating pipe leading from the radiator coil and having its juncture with the coil at a portion thereof near (relatively, nearest) the engine exhaust. 2 represents another auxiliary car-heating pipe having its juncture with the radiator coil at a point farther along in the coil, and thus at a greater distance from the exhaust pipe 14. 3 represents another auxiliary car-heating pipe having its juncture with the radiator coil still farther from exhaust pipe 14. It is to be understood that the number of these auxiliary heating pipes is not limited to any particular number, but may be increased or decreased, as desired, without departing from the principle of the invention. Their disposition over the vehicle is also subject to great variation, depending on the vehicle to which the heating apparatus is applied. The auxiliary heating pipes may be carried or extended to any desired portion of the motor vehicle and returned to form a juncture with the radiator-coil exhaust pipe, as illustrated in the drawings.

There is an essential difference in the length of the auxiliary heating pipes. This is governed by their relative point of juncture with the radiator coil. Thus, pipe 2 is of less length than pipe 1. Pipe 2 opens out of the radiator coil at a part of the coil located a greater distance from the connection of the radiator coil with exhaust pipe 14 than the part of the coil with which auxiliary heating pipe 1 connects, reference being had to the distance which the heated gases must travel from the engine to the auxiliary heating pipes. And likewise auxiliary heating pipe 3 (or any subsequent pipe or pipes auxiliary to the radiating coil, which might be provided) must be of still less length, according as the point of juncture of such pipe (or subsequent pipes, if provided) with the radiator coil is located more distantly from the connection of the radiator coil with the pipe conveying the exhaust gases to the radiator coil.

7, 8 and 9 are suitable valves provided at (or near) the juncture of the auxiliary heating pipes 1, 2, and 3, respectively, with the radiator coil.

10 is a suitable valve provided in the radiator coil exhaust pipe and positioned at a little distance from the radiator coil preferably, it being required only that the valve be located somewhere between the point where the last of the auxiliary heating pipes opens out of the radiator coil and the point nearest the radiator coil, in the radiator-

coil exhaust pipe where an auxiliary heating pipe returns to and connects with the radiator-coil exhaust pipe.

11 represents the muffler.

12 represents a port in the side of the muffler into which the radiator-coil exhaust pipe opens. It will be understood that port 12 is provided because it is unnecessary or undesirable for the exhaust gases that have passed through the radiator coil to pass through the entire length of the muffler. It is also within the contemplation of my invention, should that be desirable, to provide a small special or auxiliary muffler 15 for the exit of the exhaust gases from the radiator-coil exhaust pipe, in lieu of connecting that pipe with a side port 12 in the ordinary muffler. Obviously exhaust gases that have first passed through the convolutions of the radiator coil and auxiliary heating pipes will require less muffling than those that pass directly from the engine to the muffler. (See Fig. 4 illustrating a modification of my invention with auxiliary muffler 15.)

13 represents a suitable valve, preferably a wing valve, positioned at the juncture of heater pipe 4 and exhaust pipe 14 and governing the diversion of the exhaust gases to the heater pipe 4 and also controlling their admission to the muffler directly from the engine.

In operation, valve 13 when closed so as to shut off communication with heater pipe 4 from exhaust pipe 14 leaves exhaust pipe 14 unobstructed so that the exhaust gases follow the usual direct path to the muffler. When, however, it is desired to utilize the heating apparatus, valve 14 is shifted so as to obstruct the course of the exhaust gases direct to the muffler and to provide an unobstructed course for their passage into the heater pipe 4. Obviously the exhaust gases may be either wholly or only in part diverted to the heating apparatus, subject to the regulation of valve 13. When the heated gases are diverted into the heater pipe 4 they travel therethrough into the radiator coil. Assuming valves 7, 8 and 9 which govern the admission of heat to the auxiliary heating pipes to be closed, the heated gases travel through the radiator coil and thence through the radiator-coil exhaust pipe, valve 10 in that member being open for the purpose, and thence into the muffler. When, however, it is desired to heat a part of the car distant from the radiator coil, say the farthest distant portion of the car, valve 7 governing the admission of heated gases into the first auxiliary heating pipe would be opened, thus diverting the heated gases through auxiliary heating-pipe 1—this being the longest of the auxiliary heating pipes—and therethrough to the radiator-coil exhaust pipe 6, in which auxiliary heating-pipe 1 terminates, and thence to the muffler. Valve 10 in the radiator-coil exhaust pipe 6 would be closed when valve 7 was opened, thus forcing the heated gases to travel through the auxiliary heating pipe or pipes, depending on whether one or more of the valves in the aforesaid pipes were open or closed. Assuming that it be desired to heat the entire car, valve 10 in the radiator-coil exhaust pipe 6 would be closed and valves 7, 8 and 9 would be opened, thus forcing the heated gases through the various auxiliary pipes extending to all portions of the motor vehicle and thence finding their exit through the radiator-coil exhaust pipe 6 to the muffler and thence to the atmosphere. If it be desired to heat that portion of the motor vehicle to which auxiliary heating pipe 3 extends, and no other parts of the car, valve 9 in auxiliary heating pipe 3 would be opened, and valve 10 in the radiator-coil exhaust pipe and also valves 7 and 8 in auxiliary heating pipes 1 and 2 would be closed, thus forcing the heated gases through auxiliary heating pipe 3. The valves in the auxiliary heating pipes, it will be understood, are independently controlled and for this purpose any suitable type or types of valves, and, when desirable, any suitable valve-operating mechanism may also be provided, so that any one individual auxiliary pipe may be utilized independently for heating that portion of the vehicle over which it extends; or, any combination of two or more of the auxiliary heating pipes may be utilized for heating those portions of the motor vehicle to which they extend; or if desired, the radiator coil alone may be utilized.

What I claim is:

1. In a motor vehicle, the combination with a radiator coil of a heater pipe for conducting exhaust gases thereinto, heat-controlling valve mechanism in the heater pipe, a radiator-coil exhaust pipe connected with the radiator coil, exhaust controlling valve mechanism in the radiator-coil exhaust pipe, and a plurality of independent valve-controlled auxiliary heating pipes connected with the radiator coil at one end and with the radiator-coil exhaust pipe at the other end and extending from different points in the radiator coil to portions of the motor vehicle which it is desired to heat, the aforesaid auxiliary heating pipes being longer or shorter one than another, relatively to their point of juncture with the radiator coil, so as to provide a conduit of substantially equal length through any auxiliary pipe from the source of supply of the heated gases to the point of termination of the auxiliary heating pipes in the radiator-coil exhaust pipe, whereby heated gases may be diverted to any auxiliary heating pipe without causing additional back pressure and retarding the engine.

2. The combination with a radiator coil of means for supplying heated gases thereto, fluid-controlling valve mechanism connected therewith, a radiator-coil exhaust pipe connected with the radiator coil, a valve in the radiator-coil exhaust pipe, a plurality of auxiliary heating pipes extending from various portions of the radiator coil to the radiator-coil exhaust pipe, the aforesaid auxiliary heating pipes being of variant length so that the conduits provided by the respective pipes in connection with that provided by the radiator coil in advance of their respective point of juncture with the radiator coil are of substantially equal length, exhaust controlling valve mechanism independently operative for controlling said auxiliary pipes, and muffling mechanism in communication with the radiator coil exhaust pipe.

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

DANIEL W. DUDDERAR.

Witnesses:

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