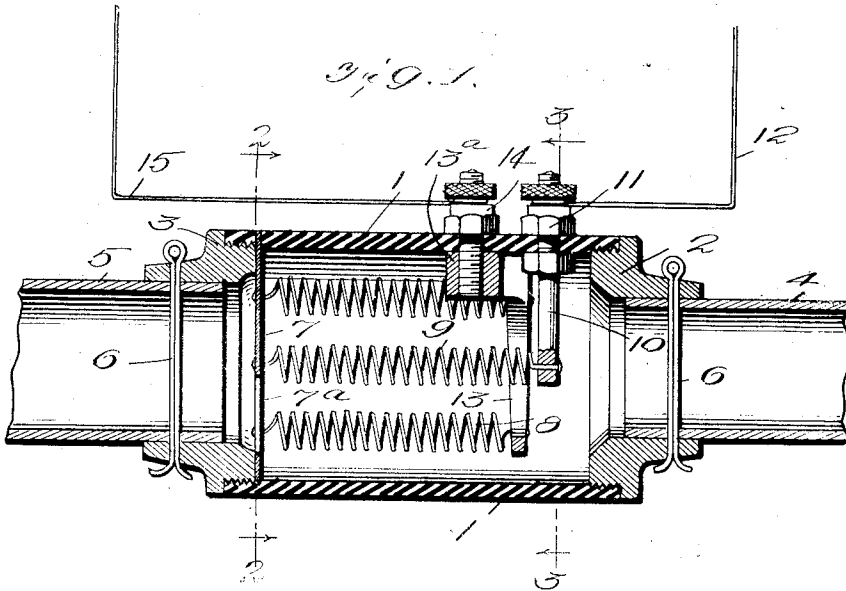
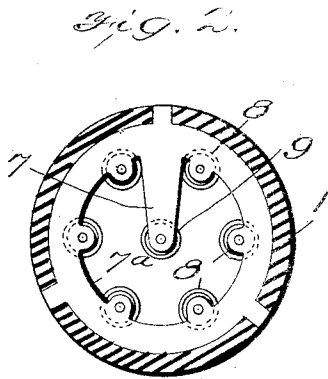
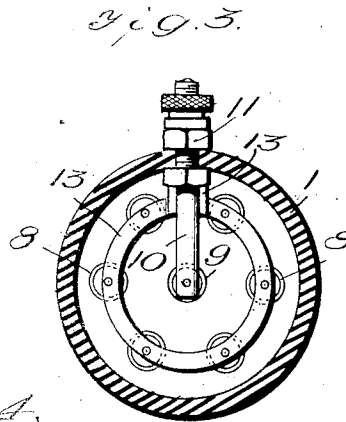
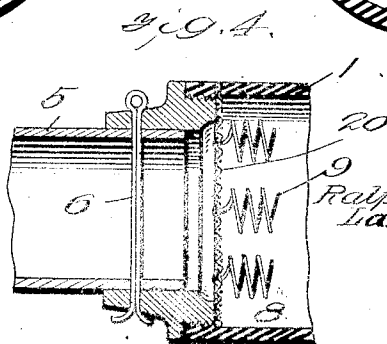


R. R. GRIMSHAW & LA MAR R. JONES.
ELECTRIC HEATER.
APPLICATION FILED JULY 27, 1916.

1,220,508.

Patented Mar. 27, 1917.



WITNESSES:
H. C. Berres
L. A. Stanley

INVENTOR
Ralph F. Grimshaw
LaMar R. Jones

BY *Munroe Hoo*
ATTORNEYS

UNITED STATES PATENT OFFICE.

RALPH R. GRIMSHAW AND LA MAR R. JONES, OF FINDLAY, OHIO.

ELECTRIC HEATER.

1,220,508.

Specification of Letters Patent.

Patented Mar. 27, 1917.

Application filed July 27, 1913. Serial No. 111,637.

To all whom it may concern:

Be it known that we, RALPH R. GRIMSHAW and LA MAR R. JONES, citizens of the United States, and residents of Findlay, in the county of Hancock and State of Ohio, have invented certain new and useful Improvements in Electric Heaters, of which the following is a specification.

Our invention relates to improvements in electric heaters, more especially in heaters designed for heating the incoming air prior to its passage through the carburetor of an internal combustion engine, and it consists in the combinations, constructions, and arrangements herein described and claimed.

An object of our invention is to provide a device which may be readily installed on the engines of automobiles and the like, without the necessity of dismantling the engine or rearranging the parts.

A further object of our invention is to provide a heating device of simple nature, which may be readily assembled or taken apart, and which is provided with a plurality of independent circuits whereby the heating effect can be intensified or lessened in accordance with the number of circuits used.

A further object of our invention is to provide novel means for holding the heating elements, said means also serving additional functions, such as baffles, strainers, means for preventing back firing, etc.

Other objects and advantages will appear in the following specification, and the novel features of the invention will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings forming part of this application, in which—

Figure 1 is a central sectional view through the device.

Fig. 2 is a section along the line 2—2 of Fig. 1.

Fig. 3 is a section along the line 3—3 of Fig. 1, and

Fig. 4 is a view of a portion of a modified form of the device.

In carrying out our invention we provide a tube 1 which is preferably made of some insulating material, as fiber, this tube being threaded at both ends to receive castings 2 and 3 respectively. The castings are provided with openings arranged to receive the ends of the pipes 4 and 5 respectively which

are held in position by means of the cotter pin 6.

Disposed at one end of the tube 1 and held in position by means of the threaded casting 3 is a plate 7 which is preferably stamped from sheet metal, this plate being provided with an opening 7^a. The plate forms a terminal for a series of coils. These coils are arranged, in the present instance, in two sets, one set consisting of a series of coils arranged in an outer circle, such as the coils shown at 8 and a central coil 9. The central coil is attached to a conducting support or arm 10 which is held to the tube by means of a binding post 11, the latter binding post being connected with one side of battery by means of conductor 12. The outer ring of coils 8 is connected with a common terminal 13 of annular shape. This terminal is provided with an extension 13^a which is held in position by means of a binding post 14. The latter is connected by means of a conductor 15 with a source of current, not shown.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. As before stated, this device is designed to heat the air before it enters the carburetor of an internal combustion engine. As will be noted, the coils are grounded at the ends where they are attached to the member 7, this member being in direct contact with the casting 3 and hence with the part 5. The two binding posts serve as the terminals of the two sets of wires or coils, one set being brought into play or both sets as desired, thereby increasing or decreasing the heating effect.

The ring 13 serves a triple function. In the first place, it is a terminal for the coils 8. In the second place, it supports the coils, and in the third place it acts as a baffle for the air which is to be heated. The making of the tube 1 of insulating material serves a double purpose, because it prevents a loss of heat and it also obviates the necessity of insulating the binding posts 11 and 14. When the air passes into the interior of the chamber 1, its passage is slower than through the pipe because of the fact that the chamber is larger, and for the further fact that it is baffled by the ring 13, by the plate 7, as well as by the coils themselves. The device is easily taken apart for repair or replacement

of the coils or other parts, and is easily assembled, and when assembled, is held rigidly in position.

In Fig. 4 we have shown a modified form of the device in which, instead of using a plate, such as that shown at 7 in Fig. 1, we make use of a screen 20. In this form of the device the screen serves a triple purpose, or rather a four-fold purpose, in that it is a common terminal or conductor for the coils 8 and 9, it tends to screen out any objects passing into the carbureter, it prevents an explosion of gas which may have accumulated in the pipe between the carbureter and the heating device, in case of short circuiting anywhere in the heating device, and it also tends to baffle the heated air in such way as to cause a mixture of the same, so that all parts of the stream of air coming through the carbureter are evenly heated.

We claim:—

1. In an electric air heating device, a cylindrical casing made of insulating material and having internally threaded ends, conducting members having threaded portions arranged to engage the threaded ends of said insulating casing and being provided with openings arranged to receive pipes, means for securing the pipes to said conducting members, a screen disposed in one end of said insulating casing and being in electrical contact with one of said threaded conducting end members, a plurality of heating coils, one of said coils being disposed centrally of said casing and the others of said coils being disposed in a circular formation around said central coil, each of said coils having electrical connection with said screen at one end, an annular conducting member secured to the inner wall of said casing and having connection with each of said circularly arranged coils, a rigid arm extending inwardly from the interior of said casing and being connected to the other coil, and means for connecting each of said coil supporting arms with a source of current.

2. In an electric air heating device, a casing, a perforated member at one end of the casing, said perforated member being of conducting material and being grounded, and a heating coil having connection at one end with said perforated conducting pipe,

and an inwardly extending conducting arm having electrical connection with the other end of the coil, said conducting arm being secured in the wall of the casing and having electrical connection with a source of current.

3. In an electrical air heating device, a cylindrical casing, a perforated conducting member secured at one end to said casing, a plurality of heating coils disposed within the casing, all of said heating coils being connected with said perforated conducting member, a plurality of binding posts carried by said casing, certain of said coils being connected to one of said binding posts, and the remainder being connected to the other binding post.

4. In an electric air heating device, a cylindrical casing made of insulating material, conducting ends for said casing being provided with openings arranged to receive pipes, means for securing said pipes to said ends, a perforated plate carried at one end of said casing, a plurality of sets of heating coils disposed within the casing, all of said heating coils being connected with said perforated plate, a plurality of binding posts carried by said casing, certain of said coils being connected with one of said binding posts, and other coils being connected to another binding post.

5. In an electrical air heating device, a cylindrical casing made of insulating material and being threaded at its ends, conducting threaded members arranged to be secured at each end of said casing, said threaded members having openings arranged to receive pipes, means for securing the pipes to said conducting members, a perforated plate carried at one end of said insulating casing, a plurality of sets of heating coils, each of said coils having electrical connection with said plate at one end, a plurality of conducting arms carried by the wall of the casing and extending inwardly, certain of said coils being connected with one of said arms, and other coils being connected with the other of the arms, and means for connecting each of said last named arms with a source of current.

RALPH R. GRIMSHAW.
LA MAR R. JONES.