G. W. McILRATH AND J. E. TAYLOR.

DEVICE FOR PREHEATING THE EXPLOSIVE MIXTURE IN EXPLOSION ENGINES.

APPLICATION FILED MAR. 1, 1920.

1,415,184. **Patented May 9, 1922.**

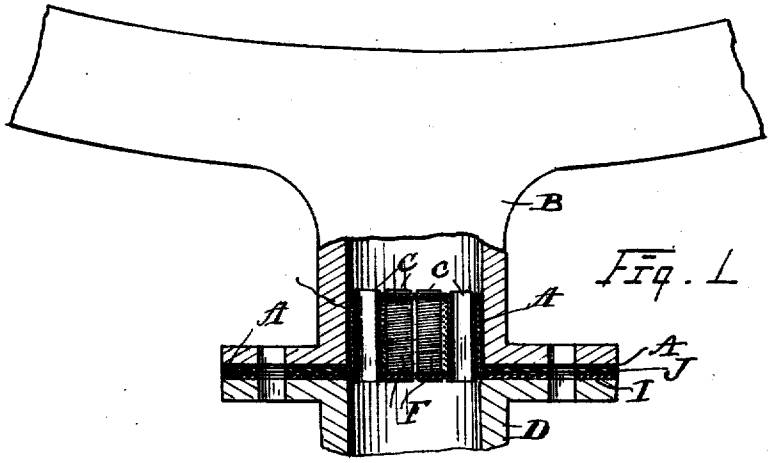


Fig. 1

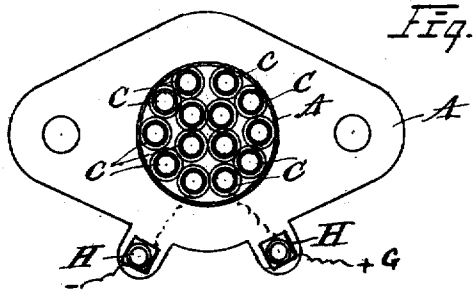


Fig. 2

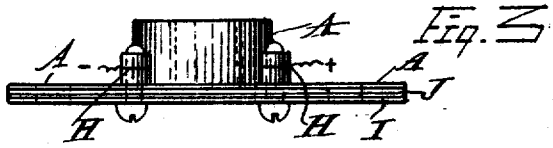


Fig. 3

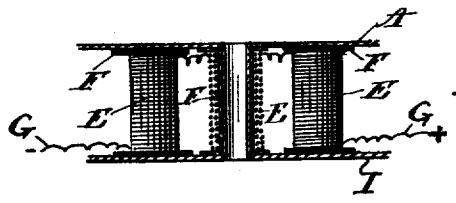


Fig. 4

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UNITED STATES PATENT OFFICE.

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DEVICE FOR PREHEATING THE EXPLOSIVE MIXTURE IN EXPLOSION ENGINES.

1,415,184. Specification of Letters Patent. Patented May 9, 1922.

Application filed March 1, 1920. Serial No. 362,553.

To all whom it may concern:

Be it known that we, GEORGE W. McILRATH and JACK E. TAYLOR, citizens of the United States, and residents of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Devices for Preheating the Explosive Mixture in Explosive Engines, of which we hereby declare the following to be a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

The objects of the invention are to provide an improved thermal device for rarefying and preheating the explosive mixture composed of commingled gas and air as it enters the intake or manifold of an explosion engine, and after passing through the carburetor, and also adapted to place the vapors in condition for instant ignition, by raising their temperature to a point just belowe that of ignition. By this means, in cold weather, the commingled gas and air will never fail to be ignited by the spark and the efficiency of the engine will be greatly augumented.

The invention comprises the employment of a multiple number of passages through which the commingled gas and air must pass to the cylinders through the inlet passages or manifold, and includes electrically operated means for heating these passages, the heat being transmitted from the walls of the aforesaid passages to the gases passing through them.

The invention includes a device, comprising a closure or head, which can be attached to the flanges of the aforesaid manifold and carburetor in such a manner as to exclude air and a multiple number of metallic tubes passing therethrough, which form passages for the commingled air and gas entering the manifold. It includes electrically heated coils, encircling the aforesaid tubes and suitably insulated therefrom, and insulating means separating the said closure, and tubes from the walls of said carburetor and manifold.

The invention is illustrated in the accompanying drawings, hereinafter more fully described and specifically pointed out in the claims. In the accompanying drawings Fig. 1 is a vertical central section of the flanged extremities of the carburetor manifold, showing the preheating element enclosed between them and the position of the several tubular passages.

It also shows the heating coils and terminals for the electric current, Fig. 2 is a plan of the preheater removed from the engine; Fig. 3 is a side elevation thereof and Fig. 4 is detail of three of the coils.

In these views A represents a metal plate, which is pressed into cup shape and closes the entrance to the manifold B; I is a botton plate, which with the cup shaped plate forms an enclosure through which pass the short metal tubes C, C.

The cup shaped plate closes the entrance to the manifold B, leading to the engine cylinders, and the tubes C, C, form the only means of communication between the carbureter D, and the manifold, and the explosive mixture must pass through them.

Encircling these tubes, are shown the heating coils E, E, mounted upon the insulating spools F, F, and the coils are connected in series in the electric circuit G, passing through terminals H, H.

The source of electricity may comprise a battery, a dynamo or other convenient generator, and an insulation is shown at J, J, preferably formed of asbestos sheets, which form an air tight gasket. Between these sheets the electric wires pass. Also the terminals are insulated to prevent the escape of the electric current to the engine casing or cylinders. Or if desired, one end of the circuit may be grounded in the engine cylinders.

The voltage of the electric current and the diameter of the wire in the coils will determine the degree of temperature produced in the metal tubes, which should be sufficiently high to raise the temperature in the explosive mixture to nearly the ignition point, so that the action of the spark will never fail to produce instant iguition.

Having described the invention what we claim as new and desire to secure by Letters Patent is:

1. The combination with the carburetor and intake passage of an explosion engine of a closure for said passage, said closure forming a hollow body formed in two portions, hollow metallic tubes connecting the ends of said closure, resistance coils encircling said tubes, insulating means between said portions of said closure, said coils passing between said insulating means.

2. The combination with the carburetor and intake passage of an explosion engine, of a closure for said passage, said closure forming a hollow body formed in two portions, hollow metallic tubes connecting the ends of said closure, resistance coils encircling said tubes, insulating means betwen said portions of said closure, said coils passing between said insulating means and insulated terminals for said coils.

3. In a device for the purpose set forth, a closure, metallic tubes passing through the opposite ends of said closure, insulated wires passing around said tubes, said closure formed in two portions, sheets of insulation secured between said portions, said insulated wires passing between said sheets, and terminals for said wires.

In testimony whereof, we hereunto set our hands this 7" day of February, 1920.

GEORGE W. McILRATH.
JACK E. TAYLOR.

In presence of—
CHAS. F. SIPE,
WM. M. MONROE.