D. E. JOHNSTON & J. W. COOPER.

AUXILIARY AIR INLET DEVICE FOR EXPLOSIVE ENGINES.

APPLICATION FILED MAY 16, 1913.

1,118,865. Patented Nov. 24, 1914.

Fig. 1.

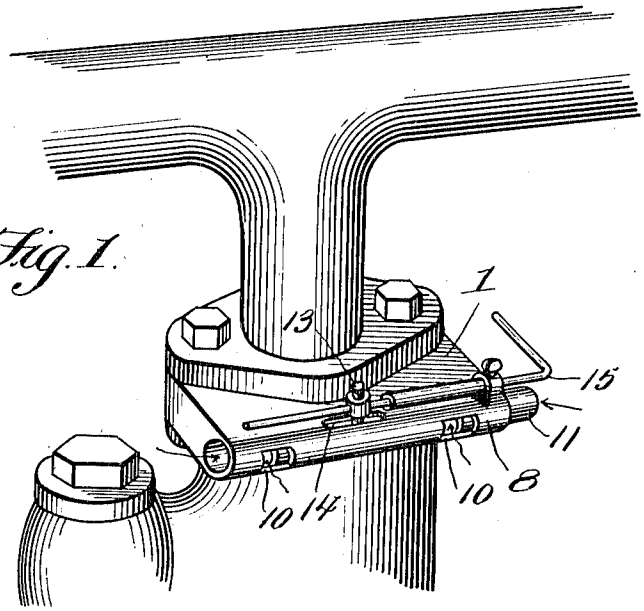


Fig. 3.

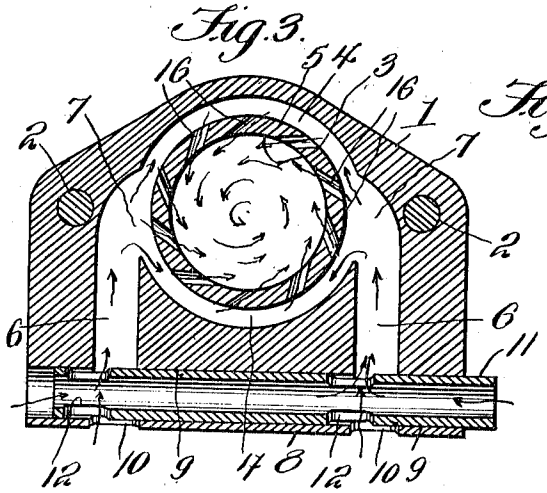
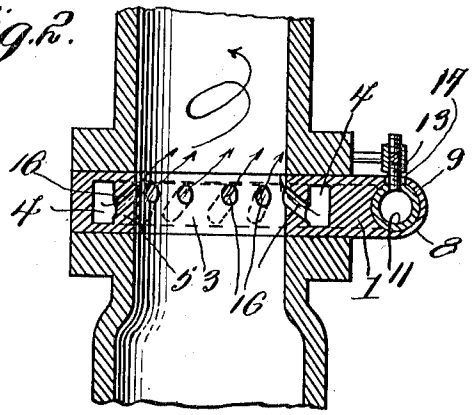


Fig. 2.



Witnesses

J. L. Wright

D. W. Gould

Inventors

Donald E. Johnston

James W. Cooper

By Victor J. Evans

Attorney

UNITED STATES PATENT OFFICE.

DONALD E. JOHNSTON AND JAMES W. COOPER, OF LOS ANGELES, CALIFORNIA.

AUXILIARY AIR-INLET DEVICE FOR EXPLOSIVE-ENGINES.

1,118,865. Specification of Letters Patent. Patented Nov. 24, 1914.

Application filed May 16, 1913. Serial No. 768,122.

To all whom it may concern:

Be it known that we, DONALD E. JOHNSTON and JAMES W. COOPER, citizens of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Auxiliary Air-Inlet Devices for Explosive-Engines, of which the following is a specification.

The invention relates to an improved air control for explosive engines, in the use of which air in regulatable quantities may be introduced into the gas stream between the carbureter and manifold or at other appropricate place to provide for the ready governing of the richness of the mixture in accordance with the speed or load demands on the engine.

The main object of the present invention is the provision of an auxiliary air control in the use of which air of any desired quantity can be introduced into the gas stream delivered to the manifold by the suction pull of the engine, the specific construction of the air control of this improvement insuring an even distribution of the air in its delivery to the gas stream to permit a thorough intermingling with the consequent obvious advantages.

The invention in its preferred form of details will be described in the following specification, reference being had particularly to the accompanying drawings, in which:—

Figure 1 is a broken perspective view illustrating the application of our improvement to the intake pipe of the explosive engine. Fig. 2 is a vertical section of the same. Fig. 3 is a central horizontal section through the auxiliary air control.

Referring particularly to the accompanying drawings, the improved auxiliary air control comprises a body 1 preferably of a more or less flat form, the body at appropriate points being formed with openings 2 to provide for securing the body in proper position between the carbureter and the mainfold. The particular formation of the body by the manner of this attachment in place is unimportant so far as the invention is concerned, and we contemplate any desired variation in this respect to accommodate the devices to different types of connections.

The body is formed with an opening 3 of appropriate size and shape to accurately register with the bore of the sections of the intake pipe when the device is in place, so that the body forms no interruption to the free passage of the gas stream from the carbureter into the manifold. Concentric with the opening 3, the body is further formed with a channel 4, said channel being arranged wholly interiorly of the body and so spaced from the opening 3 as to provide an annular wall between the opening and channel.

Opening from one edge of the body and extending in spaced parallel relation across the body are passages 6 which latter are also arranged interiorly of the body except for their open ends. The passages 6 are arranged on opposite sides of the channel 4 communicating with the latter at diametrically opposed points through lateral throats 7.

The edge of the body through which the passages 6 open is preferably of cylindrical form as at 8 and longitudinally cored at 9 transverse the passages 6, the wall of the cylindrical portion 8 in line with the respective passages having openings 10. Slidably mounted in the bore 9 of the cylindrical guide end 8 of the body is a hollow sleeve like valve member 11, which at appropriate points is formed with diametrically opposed openings 12 whereby the passages 6 may, when the slide valve is in proper position be placed in open communication with the atmosphere through the openings 10. The slide valve is of hollow construction throughout and open at the ends, and is further provided intermediate the openings 12 with a pin 13 passing through a slot 14 in the wall of the cylindrical guide member 8, said pin beyond the guide member being adapted to be connected with any suitable type of manually controlled lever, as for example, a wire 15 leading to the control lever within convenient reach of the driver.

The opening 3 in the body of the control device is in communication with the channel 4 by a series of minute perforations 16 formed in the wall 5, and these perforations extend through the wall at approximately 45° to the line diametrically of the opening 3 and passing through either end of the perforations. Furthermore the openings incline at about the same degree from the horizontal, that is inclining upwardly from the channel 4 to the opening 3 with relation to the direction of travel of the gas stream

from the carbureter to the manifold. Considered circumferentially of the wall the openings 16, which will hereinafter be termed delivery ports, have the same relative inclination and in the same direction, that is from any particular perforation the succeeding perforations incline in the same general direction circumferentially of the wall.

The openings 12 in the slide valve are preferably of the full size of the passages 6, and as said valve is readily adjustable longitudinally of the guide member 8, it is obvious that the degree of air entering the passages 6 can be readily controlled, it being understood that in any open position of the slide valve the air can enter the pasages 6 from the valve by admission at the ends of the valve or through the valve by admission through the openings 10. In this way there are four air inlets to the body. The air so admitted will enter through the passages 6 and throats 7 to the channel 4, and as these throats communicate with the channel at diametrically opposite points, it is obvious that the air so delivered to the channel will be clearly distributed in both directions beyond the throats and that therefore in practice, no one of the delivery ports will admit a greater quantity of air to the gas stream than another. Furthermore by the peculiar arrangement of the ports, that is their angular disposition, the air drawn in through the suction action of the engines is directed at such angular relation to the gas stream as to necessarily impart a whirling movement thereto. By the necessarily uniform admission of air through the delivery ports and the resultant whirling action imparted to the gas stream a practically complete and thorough intermingling of the admitted air and gas stream is insured and hence what is known in practice as a complete mixture secured. This is essentially important as it prevents an imperfect and therefore improper mixture reaching the engines as under such circumstances the advantages gained from the auxiliary air control would be largely nullified or of little benefit.

What is claimed is:—

An auxiliary air control comprising a plate member adapted to be secured intermediate the sections of piping for the passage of the fluid, said plate being formed with an opening uniform with and registering with the openings in the pipe sections, and with a channel surrounding and spaced from said opening, the wall intermediate the channel and opening being formed with a series of ports establishing direct communication between said channel and opening, said ports being approximately tangential to the wall and approximately at an angle of 45° from the horizontal, the plate being further formed with spaced ports establishing communication between the atmosphere and said channel at diametrically opposite points, and means for controlling admission of the atmosphere to said last named ports.

In testimony whereof we affix our signatures in presence of two witnesses.

DONALD E. JOHNSTON.
JAMES W. COOPER.

Witnesses:
E. E. Boss,
H. A. Van Dorn.