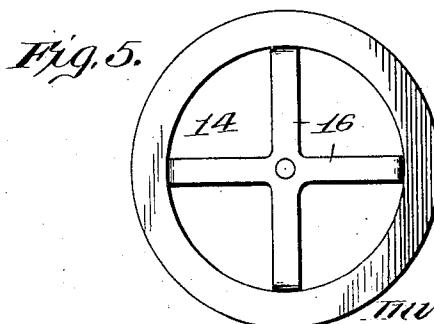
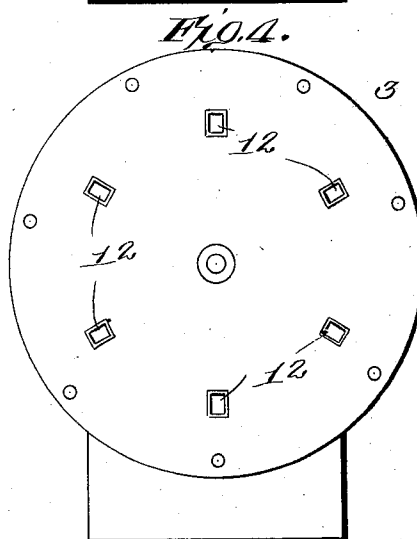
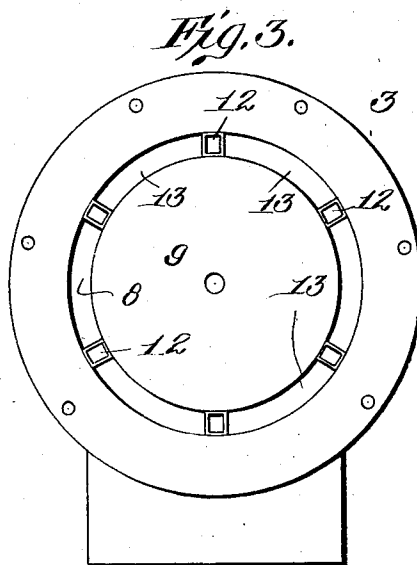
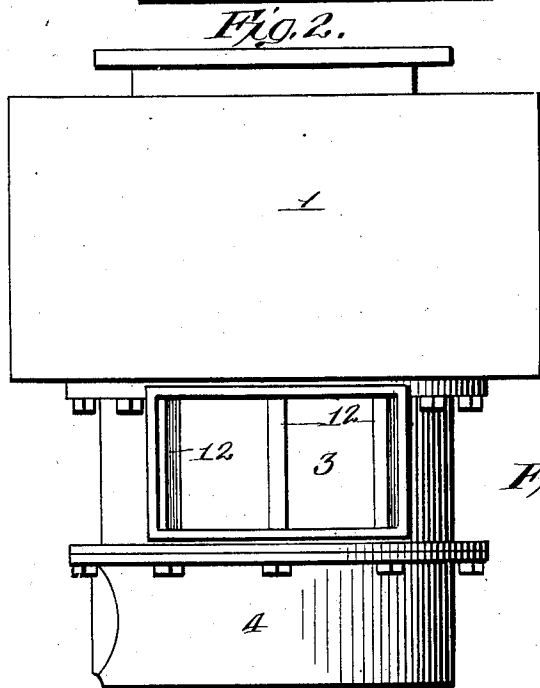
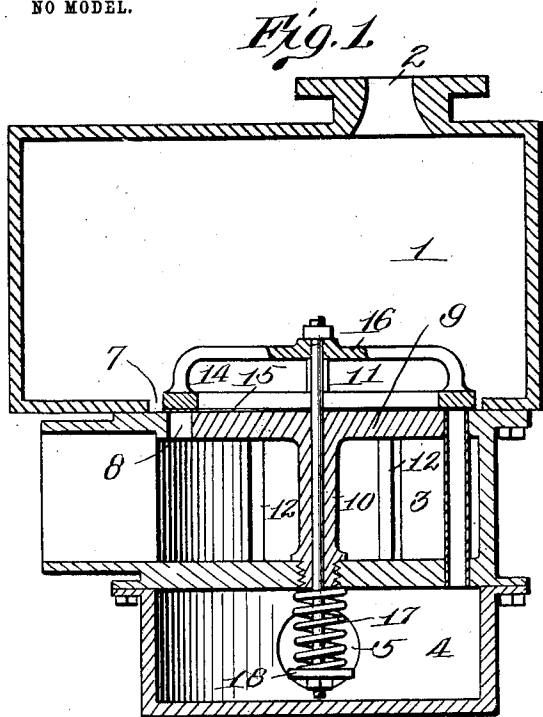


T. CHARLTON.
AIR AND GAS MIXER FOR EXPLOSIVE ENGINES.

APPLICATION FILED AUG. 27, 1902.

NO MODEL.



Witnesses:
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UNITED STATES PATENT OFFICE.

THOMAS CHARLTON, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO CHARLES R. DALLAS, OF PITTSBURG, PENNSYLVANIA.

AIR AND GAS MIXER FOR EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 733,902, dated July 14, 1903.

Application filed August 27, 1902. Serial No. 121,248. (No model.)

To all whom it may concern:

Be it known that I, THOMAS CHARLTON, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Air and Gas Mixers for Explosive-Engines, of which the following is a specification.

This invention relates to air and gas mixers for explosive-engines, and the object of the invention is to provide a simple and effective apparatus of this character wherein the thorough admixture of the gas and atmospheric air is assured with practically no waste of the gas.

The improved device includes a mixing-chamber, gas-conveying passages connecting the gas and mixing chambers, and a valve arranged to control said air-inlets and the outlets of said gas-carrying passages. In the present case the gas-carrying passages consist of the bores of tubes uniting the gas and mixing chambers the delivery ends of which are arranged in alternation with said air-inlets. I provide a number of these tubes and a corresponding number of air-inlets, by reason of which the inflowing air and gas are divided into small bodies, so as to thereby insure their intimate association when they enter the mixing-chamber. The area of the air-inlets and the outlets of the gas-conveying passages may be varied to suit the particular gas with which it is intended to operate the engine to which the improved mechanism is connected. The valve in the present case for controlling the admission of air and gas into the mixing-chamber is of annular form, so that such air and gas can pass along opposite sides of the same in order to secure the rapid commingling of the former.

In the drawings accompanying and forming a part of this specification I have illustrated an embodiment of the invention.

Referring to said drawings, Figure 1 is a vertical central sectional elevation of a valve mechanism including my improvements. Fig. 2 is a side elevation as seen from the left in Fig. 1. Fig. 3 is a top plan view with the mixing-chamber and valve removed. Fig. 4 is a bottom plan view of the air-chamber. Fig. 5 is a top plan view of the valve.

Like characters refer to like parts throughout the several figures.

Referring more particularly to Fig. 1, the numeral 1 indicates a chamber into which gas and air are admitted and admixed, the same, therefore, constituting a mixing-chamber. This chamber is adapted to be connected with an explosive-engine of some suitable kind, it having in its upper side a discharge-port 2 for the delivery of the mixture of gas and air to the compression or explosion side of the cylinder (not shown) of such engine.

To the under side of the mixing-chamber is connected in some suitable manner the chamber 3, and as air is received thereinto from the atmosphere I will term the same an "air-chamber."

Below the air-chamber is fastened the gas-chamber 4, having an induction-port 5 for the admission of gas, which may be of any kind suitable for the purpose. The intermediate or air chamber 3 is open at one side, as at 6, for the admission of atmospheric air.

The bottom of the mixing-chamber 1 has a relatively large circular opening 7, which is closed by the top of the air-chamber 3. The top of the air-chamber has an annular slot 8 of less diameter than the opening 7; but the slot and opening, it will be seen, are concentric.

The formation of the slot 8 divides the top of the air-chamber 3 into two parts, the inner one, 9, being of circular or disk form and constituting a head for the centrally-bored shank or body 10, which depends therefrom, and the bore of the shank extends through the disk or head 9 and receives the stem 11 of a valve, hereinafter more particularly described. The lower end of the shank 10 is fitted into an opening or perforation in the top of the gas-chamber 4.

Arranged in annular order about the shank 10 are the vertically-disposed tubes 12, the upper ends thereof extending into the circular slot 8, so as to bring the upper edges of said tubes flush with the corresponding surface of the top of the air-chamber 3 in order to insure a proper seating of the valve. The lower ends of these tubes fit perforations in the bottom of the air-chamber 3, which, it will be seen, is in the nature of a dividing-

wall between the air and gas chambers. Said tubes convey the gas from the gas-chamber to the mixing-chamber. The spaces 13 between the upper or outlet ends of the tubes 5 12 constitute air inlets or ports, and these tubes the outlets of which constitute gas-inlets for the mixing-chamber and spaces are arranged in alternation, and there being a number of each the air and gas prior to their 10 entrance to the mixing-chamber 1 are separated into small bodies, so that when they do enter the mixing-chamber they can more readily unite.

The valve for controlling the admission of 15 air and gas into the mixing-chamber 1 includes a ring or valve proper, 14, adapted to simultaneously cover the outlets of the tubes 12 and the air-inlets 13, the working surface of the valve being provided with a gasket or packing 20 15, of rubber or other material, serving its usual purpose. A spider 16 has its radial arms connected with the valve-ring 14 and constitutes a part of the valve, the stem or rod 11 of the valve extending through the central hub of the spider and being connected 25 therewith in some suitable manner and depending therefrom. The stem or rod, it will be remembered, is disposed in the bore of the shank 10, and it will be seen that it extends 30 below said shank and receives the coiled spring 17, bearing, respectively, against the bottom of the air-chamber 3, and a stop, which may consist of a collar 18, suitably connected with said valve-stem. The purpose 35 of the spring 17 is to close the valve-ring and also hold the same normally against its seat, or closed, said valve being opened by and on the suction stroke of the piston of the cylinder with which the appliance is connected.

40 When the valve-ring 14 is lifted or opened, the air and gas will be simultaneously admitted in the desired proportions into the mixing-chamber, and as they flow into such chamber they pass along opposite sides of 45 said ring, so as to rapidly bring them into association with each other.

The air of course is taken into the air-chamber 3 directly from the atmosphere through

the opening 6 in said chamber and passes into the mixing-chamber through the ports 50 13, while the gas from the gas-chamber 4 flows through the tubes 12 into said mixing-chamber.

The several parts may be made of the materials usually employed for like purposes in 55 this art, and they may be arranged in any suitable way, for as to these points and others I am not limited. The mechanism may be employed with advantage in connection with different types of explosive-engines. 60

Having described my invention, what I claim is—

1. The combination of a mixing-chamber, a gas-chamber and an intermediate chamber, the wall between the air-chamber and the 65 mixing-chamber having an annular slot, gas-conveying tubes connected at one end with the gas-chamber and at the other ends being fitted in said annular slot, the spaces between the outlets of the tubes constituting air-in- 70 lets, the outlets of said tubes constituting gas-inlets, and the air-inlets and gas-inlets being annularly arranged, and an annular valve for controlling said air and gas inlets.

2. The combination of a mixing-chamber, a 75 gas-chamber and an intermediate air-chamber, the wall separating the mixing and air chambers having an annular slot to thereby form an inner circular member, the latter having a broad shank fitted into the wall be- 80 tween the air and gas chambers, gas-conveying tubes fitted at one end in the annular slot, the spaces in the slots between the outlets of such tubes constituting air-inlets and the outlets of said tubes constituting gas-in- 85 lets for the mixing-chamber, and a valve for controlling the air and gas inlets having a stem fitted in the bore of said shank.

In testimony whereof I have hereunto set my hand in presence of two subscribing wit- 90 nesses.

THOMAS CHARLTON.

Witnesses:

GEO. W. REA,
F. B. KEEFER.