(No Model.)

A. C. LEWIS.

APPARATUS FOR MINGLING AND COMBINING GASES.

No. 378,326. Patented Feb. 21, 1888.

Fig. 1.

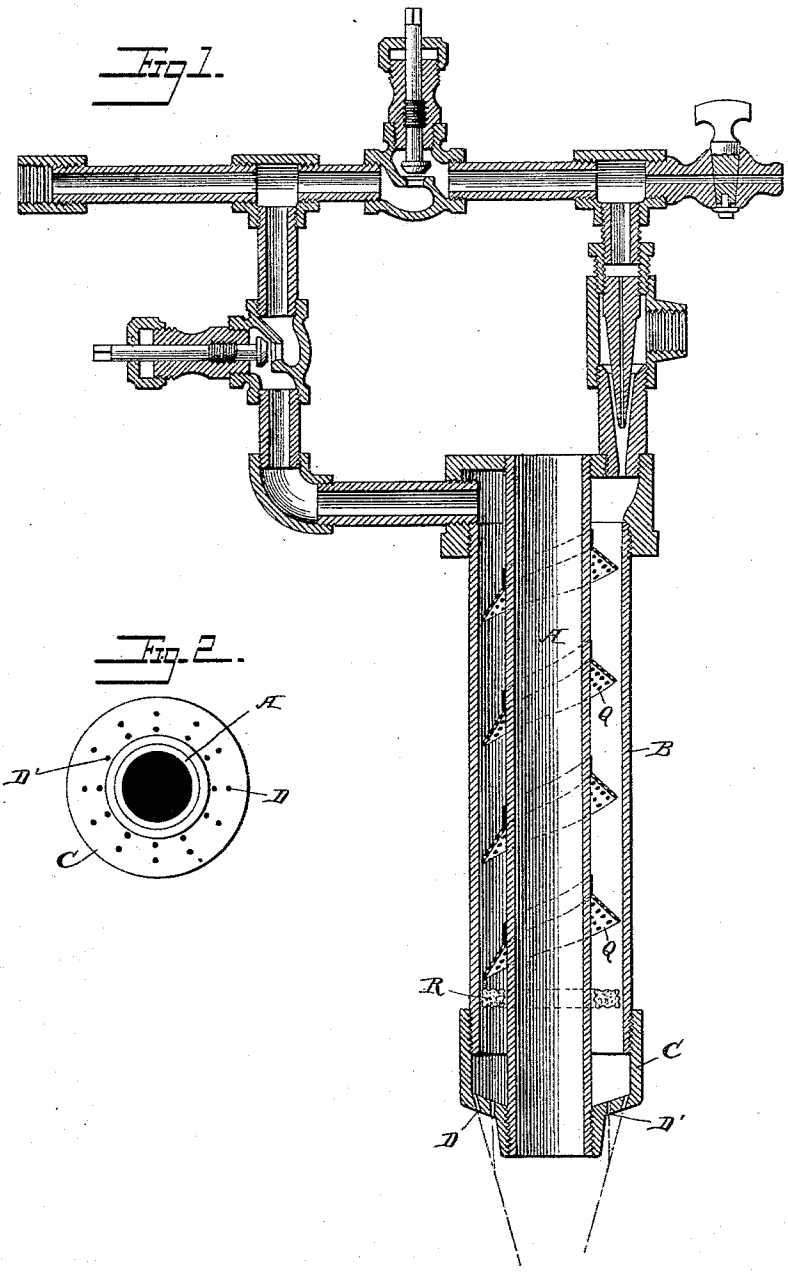


Fig. 2.

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APPARATUS FOR MINGLING AND COMBINING GASES.

SPECIFICATION forming part of Letters Patent No. 378,326, dated February 21, 1888.

Application filed January 31, 1887. Serial No. 226,029. (No model.)

To all whom it may concern:

Be it known that I, ALBERT C. LEWIS, a citizen of the United States, residing at the city of Brooklyn, and State of New York, have invented certain new and useful Improvements in Apparatus for Mingling and Combining Gases, of which the following is a description in such full, clear, concise, and exact terms as will enable any one skilled in the art or science to which my invention belongs to make and use the same, reference being had to the accompanying drawings, making part of this specification, and to the letters and figures of reference marked thereon.

Broadly considered, my invention relates to the application of the principle of mingling gases or other substances by means of converging jets or streams of the same upon each other. In an application for Letters Patent filed July 30, 1886, No. 209,508, and also an application filed on even date herewith, I have described a method of and means for thus mingling gases, and the improvement forming the subject-matter of this case may be employed in connection with the devices and method there shown, or it may be employed by itself. This device may be used for various purposes—such as, for instance, consuming the waste gases of combustion in fire-boxes, making hydrocarbon burners, manufacturing illuminating-gases, and the like. Its application, in fact, extends to all operations where it is necessary or desirable to commingle, combine, or unite gases or other materials suitable to be used therein.

In the accompanying drawings, Figure 1 illustrates a longitudinal section of my improved device, and Fig. 2 a front end view of the same.

Referring to Fig. 1, A is a tube open at both ends, the rear end thereof being broken away. Surrounding said tube is a chamber inclosed by the walls B B. From the front end of this chamber passages D D′ are pierced through the head-piece C, which passages slant at such an angle that the streams of gas projected therethrough are given a direction which will cause them to converge upon each other, as shown. In the drawings a plurality of rows of passages, D D′, are shown; but of course only one may, if desired, be employed. Leading to the chamber surrounding the tube A are pipes, or other suitable means, (not shown in the drawings,) for conveying to said chamber steam and oil in the form of exceedingly fine spray. These are mingled in said chamber and discharged therefrom in converging jets through the passages D D′.

A fuller description of the device above described and the purposes for and the manner in which it may be employed will be found in the application hereinbefore referred to.

Other gases or materials than those here described may be mingled in my improved apparatus, the principle and operation of the device being in all cases substantially the same.

For the purpose of more thoroughly and perfectly mingling the gases passed through said device, I place around the central pipe, A, a coil or flange, Q, for the purpose of communicating to the gases passing through the space between the pipes A and B a rotary motion. This flange may or may not be perforated with a series of holes, as shown. In front of said spiral flange a gauze ring, R, is preferably placed, through which the gases are forced before issuing from the injector-tube. The effect of the rotary motion imparted to the gases passing through said chamber is to cause them to strike against or impinge upon the gauze ring R at an oblique angle, thereby greatly increasing the efficiency of said gauze, which breaks up and commingles the elements passing through said injector-tube. If no gauze be used, the rotary motion imparted to the gases cause them to impinge at an oblique angle on the head-piece C and passages D D′ for the same purpose. The objects of these improvements are to break up and combine still more effectually the gases and materials issuing from said injector and to cause a more perfect intermingling in the furnace or receiver.

The improved injector-tube forming the subject-matter of this case may be employed not only in connection with the methods and apparatus hereinbefore referred to, but also in connection with and as part of my improvements in method of and apparatus for mingling and combining gases, such as is particularly illustrated and described in an application for Letters Patent filed on even date herewith.

I am aware that spirals have been employed in gas-generators for the purpose of lashing into

spray the oil, and that wire-gauze has been used for the same purpose. I am also aware that spirals have been used in devices for improving the combustion of fuel in furnaces, for the purpose of giving air or steam a whirling motion as it enters the fire-box. In my present invention it will be observed that I spray the oil by means of an injector before it enters the mixing-chamber, and that by means of the spiral gauze I cause the vaporized hydrocarbon and steam to intimately mingle, and that when the mingled oil and steam leave the mixing device they go out in direct lines, and not in a whirling or spiral path, said lines converging to a common point.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. In a device for mingling steam and oil, the combination, with a mixing-chamber, of a head-piece provided with slanting and converging perforations from which the mingled oil and steam are discharged and a gauze partition through which the vapors are driven before being discharged, substantially as described.

2. In a device for mingling steam and oil, the combination, with a mixing-chamber, of a head-piece provided with slanting and converging perforations through which the mingled oil and steam are discharged, a spiral flange for communicating to the vapors a rotary motion, and a gauze partition against which they strike obliquely and through which they are driven, substantially as described.

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