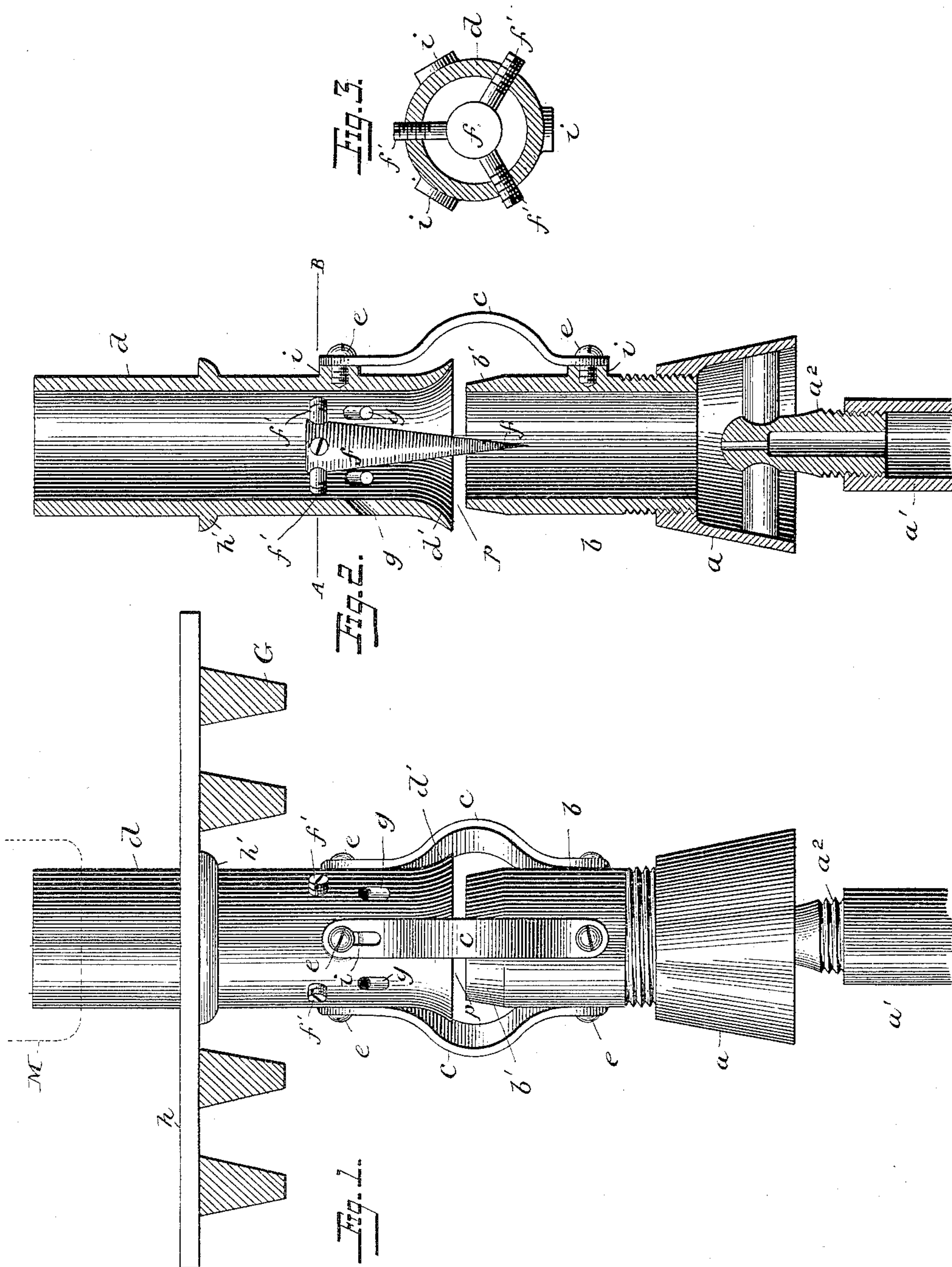


(No Model.)

W. G. TAYLOR.
FUEL GAS MIXER.

No. 424,738.

Patented Apr. 1, 1890.



Witnesses
John Hinkel.
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UNITED STATES PATENT OFFICE.

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FUEL-GAS MIXER.

SPECIFICATION forming part of Letters Patent No. 424,738, dated April 1, 1890.

Application filed December 20, 1889. Serial No. 334,375. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM G. TAYLOR, a citizen of the United States, residing at Hultont, county of Allegheny, State of Pennsylvania, have invented certain new and useful Improvements in Fuel-Gas Mixers, of which the following is a specification.

My invention relates to a fuel-gas mixer adapted for use with a burner designed more especially as a natural-gas burner for heating stoves, furnaces, grates, &c., although it may be used with other gas and for other purposes.

The object of my invention is to provide a device which shall cause a thorough mixture of the gas and air, so that there shall be a more perfect combustion of the gas, and therefore greater economy, and at the same time to eliminate the noise and smell common to the usual forms of mixers and burners, and produce a device which is simple, cheap, and effective, and not liable to get out of order.

To these ends my invention consists in a fuel-gas mixer made substantially as herein-after more particularly set forth, and illustrated in the accompanying drawings.

In the drawings, Figure 1 is a side view of a device embodying my invention shown in place for use in connection with grate-bars. Fig. 2 is a longitudinal vertical section of the mixer. Fig. 3 is a transverse section of the mixer on the lines A B, Fig. 2.

In the drawings, *a* represents a common and well-known form of air-mixer attached to the end of the gas-pipe *a'*, in which, in the present instance, is placed a gas-tip *a''*. In common practice this mixer is usually connected with the burner by a short piece of plain wrought-iron pipe, the only point where the air and the gas are brought together being in the portions *a* surrounding the burner-top.

In my invention I substitute for the ordinary pipe a construction which I am now about to describe. Mounted in the mixer *a* is a short pipe *b*, preferably made of brass, although other material may be used, and this is shown as connected to the mixer by a screw-thread. Supported above the section *b*

is another pipe *d*, preferably of the same material, and having a bell-mouth *d'*. This pipe *d* is preferably supported a short distance above the end of the pipe *b*, the top of which is also beveled, as at *b'*, to furnish an opening or passage *p* for the air between the two pipes. The upper pipe *d* may be supported in any desired manner, and I have shown a simple and effective way, consisting of the strips or bands *c*, which may be of any suitable metal secured to the section *b*, and having elongated slots at their upper ends, by which they are secured to the section *d* by means of set-screws *e*, or similar devices. At the points where these strips or bands are secured I preferably form bosses *i*, so that the screws or other fastening devices may have sufficient hold and not project into the interior of the pipes to present rough surfaces therein. These adjustable bands or strips form a substantial and practically rigid support or connection for the two pipes, and at the same time permit the unobstructed entrance of the air into the bell-mouth end of the pipe *d*.

Mounted in the pipe *d* and suitably supported in the center thereof, as by the screws *f'*, is placed a cone *f*, preferably made of steel or similar material and arranged with its axis coincident to the axis of the pipes *b* and *d* and with its point over and in line with the gas-inlet *a''*. In the pipe *d* is also provided a series of additional air-passages *g*, which are bored or formed in the pipe at an inclination to the sides thereof, so that the air entering through the passages will be caused to impinge upon the cone near its upper portion. The surfaces of the air-passages *g* and of the bell-mouthed portion and tube forming the passage *p* are polished, as are preferably all the surfaces over which the air or gas passes, and the surfaces of the cone and support-screws are also rounded, so that they produce as little friction as possible to the flow of the air or gas.

I have shown in Fig. 1 the air-mixer used in connection with the grate-bars *G*, and when so used I preferably place a plate *h*, of wrought or cast iron, upon the bars and insert the up-

per portion of the tube *d* through an opening therein, and a rib or flange *h'* may be formed on the pipe *d*, to regulate the position of the pipe with relation to the plate. This plate
 5 acts as a shield and allows the air underneath the grate to be kept cooler, and as it is found in practice that a cool air mixing with the gas produces the best and hottest flame this arrangement is desirable, and the shield serves
 10 another purpose—that is, preventing the flame from running down or igniting the gas in the mixer, which often occurs in the common form of mixers when the gas-pressure is light or the fire is turned down low.

15 The burner proper may be in any of the well-known and usual forms and sizes and is mounted upon the upper portion of the pipe *d* of the mixer above the grate, and is indicated by the dotted lines M.

20 It will be understood that while I have described what I consider to be the best embodiment of my invention, the details or construction and arrangement may be varied to suit the exigencies of any particular case
 25 without departing from the spirit of my invention.

By the use of this arrangement I am enabled to secure a thorough mixing of the air and gas, the air being brought into connection with the gas at three different circles or
 30 planes as it passes through the mixer, and the cone placed over and in line with the gas-passage serves to forcibly spread the gas and distribute it and thereby aid in the thorough
 35 commingling of the gas and air, and this results in the more perfect combustion, producing a much larger amount of heat for the same amount of gas than with the ordinary mixers. I have also found that the noise usually
 40 attendant upon the use of such mixers and burners is almost entirely eliminated, and I attribute this to the fact that there are no angles or edges for the air or gas to impinge upon, and the surfaces being smooth the
 45 usual roaring noise is not produced. The combustion being practically perfect there is

no smell or dirt due to the unconsumed portions or particles of carbon or other material.

What I claim, and desire to secure by Letters Patent, is—

1. The combination, with the ordinary air-mixer, of a tube secured thereto, a second tube supported thereon, and a cone supported in the interior of the tube to forcibly spread the gas, substantially as described. 50

2. The combination, with the ordinary air-mixer, of a tube mounted thereon, a second tube having a bell-shaped mouth supported above the first tube, a cone supported in the tube, and inclined openings in the tube adjacent to the cone, substantially as described. 55 60

3. The combination, with the ordinary air-mixer and a fuel-gas mixer consisting of two tubes connected together and having a spreading-cone and air-passages, one of the tubes being provided with a flange, of a plate adapted to be supported upon the grate-bars and bearing upon said flange, substantially as described. 65

4. A fuel-gas mixer consisting of two tubes adjustably connected together, one of the tubes supporting a cone and having inclined air-openings adjacent to the cone, substantially as described. 70

5. A fuel-gas mixer consisting of a tube *b*, having tapering end, and tube *d*, adjustably supported above the first tube by strips or bands *c*, said tube having a bell-shaped mouth and inclined air-openings *g*, and a cone *f*, supported inside the tube, substantially as described. 75 80

6. The combination, with the tubes of a gas-mixer, of a cone axially in line with the tubes, with its point toward the gas-inlet, substantially as set forth. 85

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM G. TAYLOR.

Witnesses:

JAS. MARSHALL,

FRANK M. ASHMEAD.