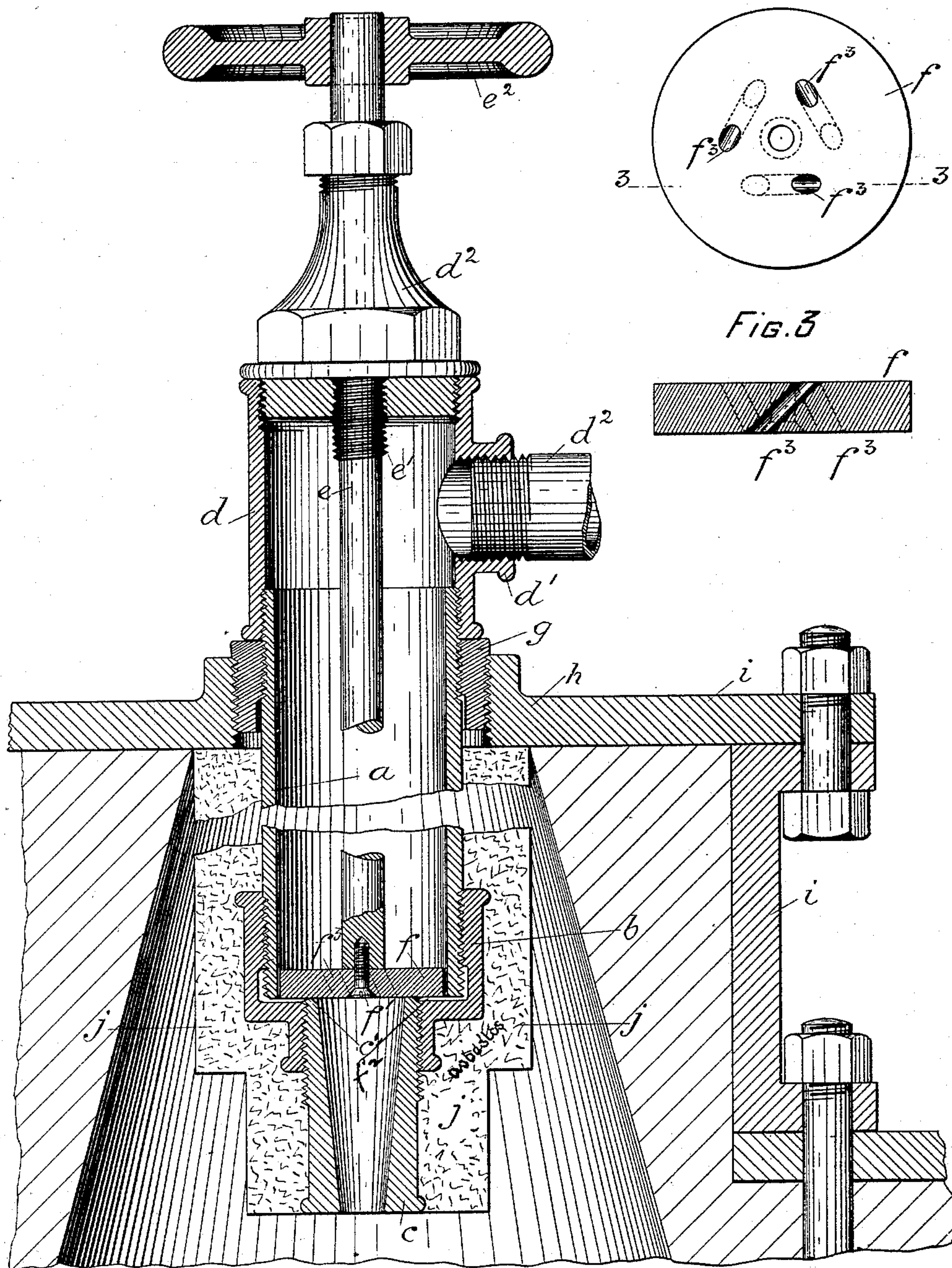


C. R. COLLINS.  
OIL SPRAYING DEVICE.

Patented Nov. 1, 1892.

*Fig. 2.*



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ATT'Y.



# UNITED STATES PATENT OFFICE.

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TO THE UNITED GAS IMPROVEMENT COMPANY, OF SAME PLACE.

## OIL-SPRAYING DEVICE.

SPECIFICATION forming part of Letters Patent No. 485,257, dated November 1, 1892.

Application filed June 22, 1892. Serial No. 437,553. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES RUSSELL COLLINS, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Oil Spraying or Atomizing Devices for Gas Apparatus, of which the following is a specification.

My invention relates, in general, to apparatus for the production of carbureted water-gas, and it relates more particularly to certain improvements in the device for injecting oil or other liquid hydrocarbons into the water-gas.

The principal objects of my present invention are, first, to obviate waste of the liquid hydrocarbon and to hasten, facilitate, and finally attain a more perfect carburation of the water gas than has hitherto been possible; second, to provide a simple, durable, efficient, and comparatively-inexpensive device for economically injecting liquid hydrocarbons into a supply of water-gas in such manner that the same is thoroughly and completely carbureted; third, to so construct and arrange the various parts of the device as that the same may be readily detached and cleaned or repaired and subsequently assembled for use, and, fourth, to provide means for adjusting the operative parts of the device in order to compensate for expansion, contraction, and wear of the parts thereof.

My invention, stated in general terms, consists of an oil spraying or atomizing device for gas apparatus comprising a sectional casing, a diaphragm provided with inclined apertures for imparting rotary motion to the jets or streams of liquid hydrocarbon as they are discharged from the casing, and means for adjustably seating said diaphragm, and my invention further consists of the improvements hereinafter described and claimed.

The nature, objects, and scope of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, and in which—

Figure 1 is a view, partly in side elevation and partly in central section, of an oil spraying or atomizing device embodying features

of my invention in application to the wall of a chamber in a gas apparatus. Fig. 2 is a top or plan view, drawn to an enlarged scale, of the diaphragm illustrated in Fig. 1, showing inclined apertures therein for imparting rotary motion to the escaping jets or streams of liquid hydrocarbons, and Fig. 3 is a section taken on the line 3 3 of Fig. 2.

Referring to the drawings, the main casing of the oil spraying or atomizing device comprises a tube *a*, externally threaded at the respective extremities thereof, a nipple *b*, mounted upon one extremity of the tube *a*, a nozzle *c*, inserted into the nipple *b*, and an internally-threaded thimble *d*, mounted upon the other extremity of the tube *a* and provided with a T-union *d'* and with a detachable stuffing-box *d''*.

*e* is a spindle provided with an exterior thread *e'*, engaging a thread cut or otherwise formed upon the internal wall of the stuffing-box *d''*, and with a hand-wheel *e''*, accessible from the outside of the main casing, in order that the spindle *e* may be shifted backward and forward or upward or downward in the main casing of the device by the simple operation of turning the hand-wheel *e''* in one direction or the other, as required.

*f* is a diaphragm detachably connected with the spindle *e* by means of a screw *f'* and adapted to be firmly seated upon the internal edge *c'* of the nozzle *c*, that is for this purpose permitted to extend through the nipple *c*, as shown in Fig. 1.

*f''* are inclined apertures drilled or otherwise formed in the diaphragm *f*. The number and relative dispositions of these apertures *f''* may be varied and the inclination thereof may be increased or diminished, the object being to cause a rotary motion to be imparted to the jets or streams of liquid hydrocarbon as they are discharged through the nozzle *c*.

*g* is a bushing mounted upon the exterior of the casing of the device and adapted to afford means whereby the same may be conveniently secured to place.

In use the T-union *d'* is connected with a pipe *d'''*, communicating with a suitable supply of liquid hydrocarbon, (not shown,) and the bushing *g* is screwed or otherwise inserted



into a suitable aperture  $h$ , formed in one of the walls  $i$  of a chamber to which water-gas is supplied and in which it is carbureted, and a covering of asbestos or analogous substance or material  $j$  is preferably applied to the external portions of the casing subjected to the heat of the gas.

The mode of operation of the hereinabove-described oil spraying or atomizing device is as follows: Oil or other liquid hydrocarbon under pressure enters the main casing through the T-union  $d^3$  and after passing through the perforated diaphragm  $f$  escapes through the nozzle  $c$  into the carbureting or other chamber. In its passage through the perforations  $f^3$  of the diaphragm  $f$  the supply of oil is broken up into jets or streams and the inclination of the perforations  $f^3$  causes a rotary motion to be imparted to the jets or streams as they issue from the nozzle  $c$ . This rotary or spiral motion of the issuing jets or streams is important, because it insures the thorough carburation of the gas and prevents the deposition of liquid hydrocarbon upon the walls of the carbureting or other chamber. By these means the quality of the carbureted gas is improved and a material economy in liquid hydrocarbon is effected. The exterior casing is exposed to a considerable degree of heat, and consequently expands and contracts. However, the diaphragm  $f$  may be constantly maintained firmly to place in contact with its seat  $f^2$  by means of the hand-wheel  $e^2$  and spindle  $e$ , so that leakage of the liquid hydrocarbon around the diaphragm  $f$  is completely obviated. Inasmuch as the respective parts of the spraying or atomizing device are all detachable, it follows that they may readily be removed and repaired or cleaned and that the diaphragm  $f$  may be detached and replaced by another diaphragm having a greater or less number of apertures disposed at a greater or less inclination, as may be required.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An oil spraying or atomizing device for gas apparatus, comprising a tube having a nipple connected therewith and a nozzle applied to the nipple, a thimble mounted on the tube and provided with a stuffing-box and union, a spindle, and a diaphragm or plate provided with transversely ranging and inclined apertures for imparting rotary motion to jets or streams issuing from the device, substantially as and for the purposes set forth.

2. The combination, with a carbureting-chamber, a casing extending into said chamber, an oil-supply, and pipe connections between said oil-supply and casing, of a diaphragm or plate provided with inclined apertures ranging transversely of said plate or diaphragm for imparting rotary motion to jets or streams of a liquid and a spindle detachably connected with said diaphragm, substantially as and for the purposes set forth.

3. An oil spraying or atomizing device for gas apparatus, comprising a tube, a nipple detachably connected with one extremity of the tube, a nozzle applied to the nipple, a thimble mounted upon the other extremity of the tube and provided with a stuffing-box and a T-union, an adjustable spindle, and a diaphragm provided with inclined apertures for imparting rotary motion to jets or streams of liquid hydrocarbon, substantially as and for the purposes set forth.

4. In combination, a carbureting-chamber, a casing extending into said chamber, an asbestos covering applied to said casing, an oil-supply, pipe connections between the oil-supply and casing, and a diaphragm provided with inclined apertures for imparting rotary motion to jets or streams of oil, substantially as and for the purposes set forth.

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

CHARLES RUSSELL COLLINS.

Witnesses:

THOMAS M. SMITH,

RICHARD C. MAXWELL.