(No Model.)

J. H. McQUAID.

GAS BURNER.

No. 391,175. Patented Oct. 16, 1888.

Fig. 4.

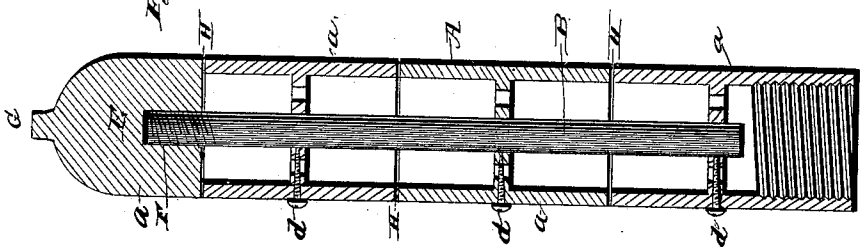


Fig. 5.

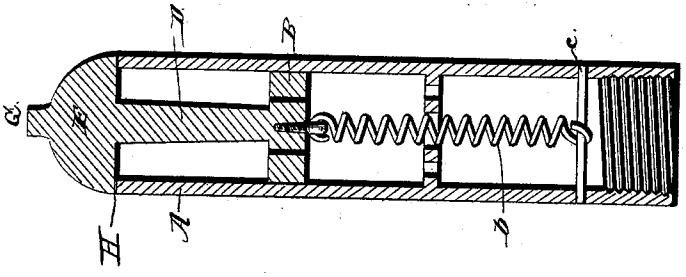


Fig. 3.

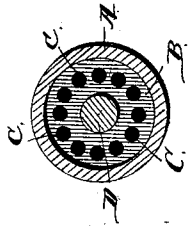


Fig. 2.

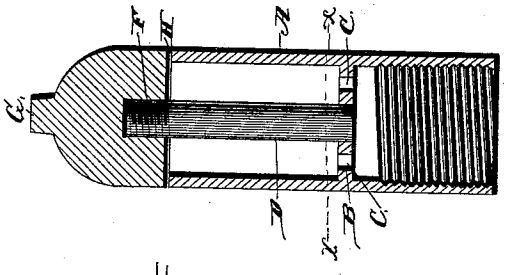
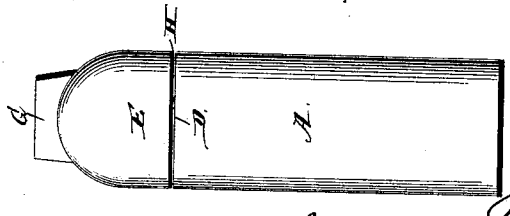


Fig. 1.



Witnesses,
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By his Attorneys
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UNITED STATES PATENT OFFICE.

JOHN HUSTON McQUAID, OF FARMERS VALLEY, PENNSYLVANIA.

GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 391,175, dated October 16, 1888.

Application filed February 25, 1888. Serial No. 265,232. (No model.)

To all whom it may concern:

Be it known that I, JOHN HUSTON McQUAID, a citizen of the United States, residing at Farmers Valley, in the county of McKean and State of Pennsylvania, have invented a new and useful Improvement in Gas-Burners, of which the following is a specification.

My invention relates to an improvement in gas-burners; and it consists in the peculiar construction and combination of devices, that will be more fully set forth hereinafter, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is an elevation of a gas-burner embodying my improvements. Fig. 2 is a vertical sectional view of the same. Fig. 3 is a transverse sectional view taken on the line *x x* of Fig. 2. Figs. 4 and 5 are vertical sectional views of modified forms of my invention.

My improved gas-burner is particularly adapted to burn gas for heating purposes; and the object of my invention is to provide means whereby as perfect a combustion of gas may be caused as is possible, and whereby the size of the flame may be regulated at will.

A represents a cylindrical tube, which is threaded interiorly at its lower extremity, and thereby adapted to be screwed to a gas-pipe. At a suitable distance from the lower end of the tube, and inclosed snugly within the same, is a plate, B, which is provided near its perimeter with a series of openings, C, arranged in the form of a circle. From the center of the plate B extends a stem, D, the outer end of which projects a suitable distance beyond the outer end of the tube, and the said projecting end of the stem is provided with screw-threads, as shown.

E represents a semi-spherical cap, which is solid, and is provided on its lower side with a threaded central recess, F, which is adapted to receive the upper threaded end of the stem D. The upper side of the cap has an angular stud, G, which is adapted to be engaged by a wrench or a pair of pinchers, and turned so as to move the said cap up or down on the threaded extremity of the stem. By this means a slight opening, H, may be formed between the end of tube A and the base of the cap, which opening may be increased or reduced in width, as will be readily understood, according to the size of the flame desired. This opening extends entirely around the burner and permits the gas, which is forced through the tube A and through the opening C in plate B, to escape and burn in the form of a thin annular flame, which generates an intense degree of heat.

In Fig. 4 I illustrate a modified form of my invention, in which the tube A is made in the form of a number of sections, *a*, which are adjustable on the central stem, B, so as to enable a number of annular slits or openings, H, to be formed between their opposing ends for the escape of the burning gas. Each section *a* has a screw, *d*, which engages the stem B, and thereby the said sections may be secured on the stem at any desired adjustment.

In Fig. 5 I illustrate another modified form of my invention, in which the cap is secured rigidly to the upper end of the stem D, and the latter has its lower end secured rigidly to the plate B, the said plate in this instance being loose in the tube A and adapted to slide back and forth therein like a piston. A coiled retractile spring, *b*, is secured to the said plate, and has its lower end secured to a pin, *c*, which passes transversely through the tube. The function of this spring is to keep the cap normally closed on the upper end of the tube and to permit the cap to be slightly forced from the upper end of the tube by the pressure of the gas in the latter when the burner is in operation, the size of the opening being automatically controlled by the varying pressure of the gas against the base of the cap.

When the burner is in operation, the flame therefrom heats the air immediately in contact therewith, and causes said heated air to rise and thereby form a partial vacuum around the flame. Cold air rushes in to fill the vacuum, and thereby supplies the necessary amount of oxygen to cause almost perfect combustion of the gas.

By altering the shape of the burner, so as to make it polygonal, star-shaped, or of other fanciful configuration in cross-section, the burner may be caused to make a flame of any desired shape; and I do not therefore limit myself to any one shape of the burner.

Having thus described my invention, I claim—

1. The gas-burner comprising the tube A, the cap at the upper end thereof, and of the same diameter as said tube, and the spring

normally closing the cap on the tube, whereby the pressure in the tube will raise the cap and cause the gas to escape between the upper end of the tube and the base of the cap, substantially as described.

2. The combination, in a gas-burner, of the series of tubes having the transverse perforated plates, the rod passed through the central openings in said plates, whereby the tubes are arranged in line with each other, the said tubes being adjustable on the rod for the purpose set forth and the adjustable cap secured to the outer end of the rod and arranged over the outer end of the outer tube, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JOHN HUSTON McQUAID.

Witnesses:
HUGH P. BRAWLEY,
WILL F. SPECHT.