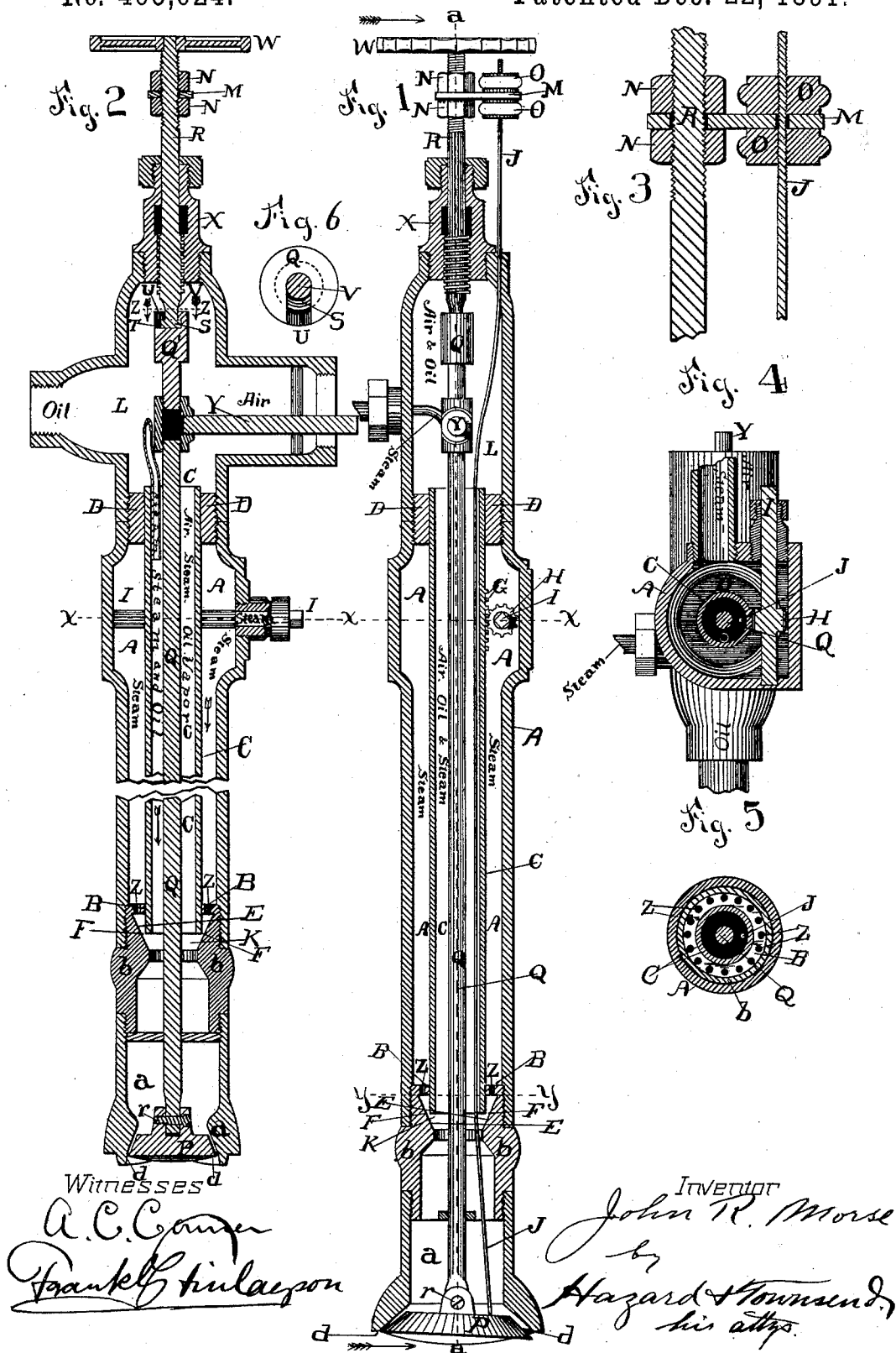


(No Model.)

J. R. MORSE.
HYDROCARBON BURNER.

No. 465,624.

Patented Dec. 22, 1891.



UNITED STATES PATENT OFFICE.

JOHN R. MORSE, OF LOS ANGELES, CALIFORNIA.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 465,624, dated December 22, 1891.

Application filed April 28, 1888. Serial No. 272,116. (No model.)

To all whom it may concern:

Be it known that I, JOHN R. MORSE, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Improvement in Hydrocarbon-Burners, of which the following is a specification.

Several difficulties arise in the use of these hydrocarbon-burners as now constructed. In case the amount of power required is variable, as in locomotive-boilers, where great power is required for a time to climb a grade and immediately afterward no power whatever is required by reason of a downgrade, it becomes necessary that the flame be under the control of the engineer, so that he can develop great power when required and can immediately reduce it when no longer needed. Another difficulty arises in setting the burner so that it will distribute the flame to the desired part of the furnace. It often occurs that the flame will be directed more toward one side than the other by variation of draft or other causes, thus tending to heat one part of the boiler excessively, while the other side does not receive a proper amount.

The principal object of my invention is to avoid these difficulties.

Another object is to increase the convenience of construction and operation of certain parts. I accomplish this by means of the device described herein, and illustrated in the accompanying drawings, in which—

Figure 1 is a horizontal longitudinal mid-section of my improved burner, showing the operating mechanism in full. Fig. 2 is a vertical longitudinal mid-section on line *a a*, Fig. 1, looking in the direction indicated by arrows. Fig. 3 is a detail section illustrating the connection between the valve-stem and the valve-adjusting rod. Fig. 4 is an elevation and cross-section of the burner on the line indicated by *x x*, Figs. 1 and 2. Fig. 5 is a cross-section of the burner on the line indicated by *y y*, Fig. 1. Fig. 6 is a cross-section on line *z z* in Fig. 2.

The volume of the flame is regulated by enlarging and diminishing the vent around the end of the mingling-tube, and I will first describe the means employed for this purpose. These means are clearly illustrated in Figs. 1,

2, and 4. The mingling-tube C is mounted in guideways B D, so that it can be moved back and forth endwise. When it is moved toward the conical walls E of the chamber K, the opening F between its end and the walls of the chamber is gradually closed, and when it is moved backward the opening enlarges.

In the drawings, the longitudinally-movable tube C is provided with a short toothed rack G, with which a toothed wheel H engages. The wheel H is mounted upon a shaft I, journaled within the outer steam-chamber A. One end of the shaft I extends up through the walls of the chamber A. The end of the shaft is shown as being angular in cross-section, so that it may be turned by a wrench. It may, however, be provided with a hand-wheel or other means for turning it. When it is desired to diminish the power of the flame, the amount of oil and steam allowed to enter the burner is reduced, and then the shaft I is turned so as to move the tube C forward, thus reducing the size of the opening F and increasing the velocity of the steam escaping therethrough. When it is desired to increase the power of the flame, the amount of steam, air, and oil allowed to enter the burner is increased, and the tube C is then moved back to increase the opening F and allow the steam to pass through in a larger volume, thereby reducing the velocity of the jet until the desired result is secured.

For convenience in putting the burner together the air and oil chamber L and the steam-chamber A are screwed upon the plug D, which forms the guide for the rear end of the mingling-tube.

The mingling-tube is fitted steam-tight into the plug D, which forms a partition between the air and oil chamber L and the steam-chamber A.

In order to enable me to change the direction of the blaze, I hinge the burner-tip valve P, which closes the mouth of the burner upon its stem Q, so that it will swing laterally, and I provide means for swinging it to give it different angles with the axis of the burner, thus partially closing the opening on one side of the mouth *d* of the burner and at the same time enlarging the opening on the other side thereof. The pivot *r* is shown in Figs. 1 and 2.

The means I employ for turning the valve and holding it rigid in the position desired is illustrated by Figs. 1 and 3, and consists of a stiff stub steel rod J, which is attached on the inside of the burner to one side of the valve P and passes back through the mingling-tube and air and oil chamber and out at the rear of the burner, and is there adjustably attached to the rear part R of the valve-stem.

Fig. 3 shows in detail the means used by me for connecting the rod J and the stem R. M is a brace, through the ends of which the stem R and rod J are passed. The hole through which the stem passes is large enough to allow the stem to turn freely therein. The brace M is held in place by two nuts N N, so that it cannot slip along the stem. The nuts are not screwed tightly against the brace and the stem R can be turned without turning the brace M. O O are thumb-nuts screwed upon the rod J on either side of the brace M. By screwing these nuts back and forth the rod J will be thrown forward or back, thus changing the position of the valve P. The valve P may be moved back and forth without changing its angle with the valve-stem.

I adjust the flame by turning on the required amount of oil and steam through the various pipes, setting the tube C in the position to give the best results, and I then turn the hand-wheel W until the opening at the front of the burner is of the desired size for the flame required. Then if the flame is not properly distributed in the fire-box I adjust the rod J by means of the nuts O until the valve P sets at such an angle as to distribute and direct the flame as desired.

In order to allow the rear part R of the valve-stem to be easily uncoupled from the front part Q, I provide the swivel illustrated in Figs. 2 and 6.

S is a head turned on the end of the stem R.

T is a chamber in the rear end of the front part Q of the valve-stem.

U is a slot in Q to admit the neck V, on which the head S is mounted. The slot and chamber open at the under side of the stem, and by raising the stem Q it may be disengaged from R when desired, and the valve-body X may then be unscrewed and it and the rear part R of the stem may be removed.

Z are the passages between the steam-chamber and the chamber K. *a* is the tip of the burners. *b* is the collar connecting the burner-tip *a* and the outer steam-chamber A.

Y represents a sliding rod arranged to prevent the valve-stem from turning.

Now having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the air, oil, and steam pipes, the burner-tip, the valve-stem, the valve hinged thereon in the mouth of the burner, and the rod J, having one end attached to the valve and the other end adjustably connected with the valve-stem.

2. In a hydrocarbon-burner, the combination of the air, oil, and steam pipes, the valve-stem, the valve P, hinged upon one end thereof, the rod J, having one end attached to one side of the valve, the brace M, and nuts O O and N N.

3. The combination of the burner-tip *a*, the collar *b*, air, oil, and steam pipes, valve-body X, the valve-stem, the valve hinged upon one end thereof, the rod J, attached to one side thereof, and means for attaching the other end of the rod to the stem and moving it back and forth with relation to the stem.

JOHN R. MORSE.

Witnesses:

JAS. R. TOWNSEND,
A. C. CARNER.