(No Model.)

W. B. WRIGHT.

INJECTOR BURNER.

No. 371,158. Patented Oct. 4, 1887.

Fig. 1.

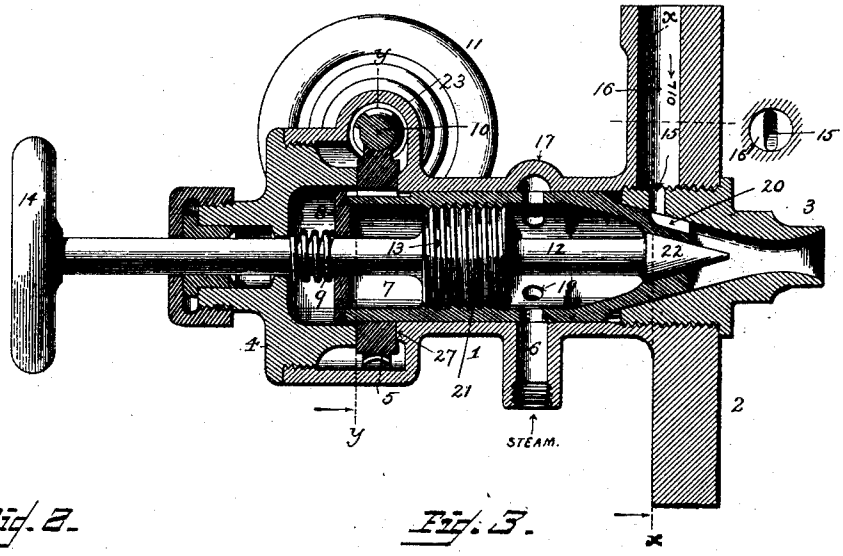


Fig. 2.

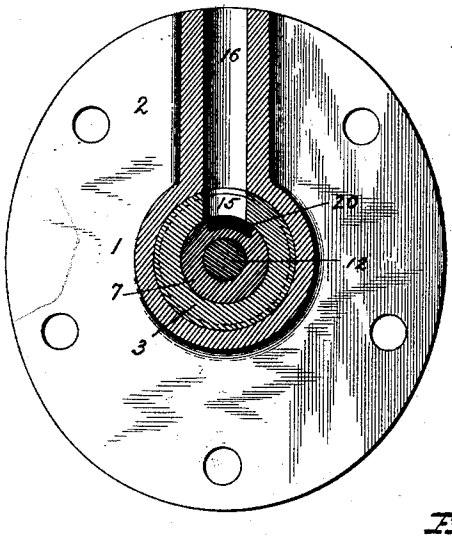


Fig. 3.

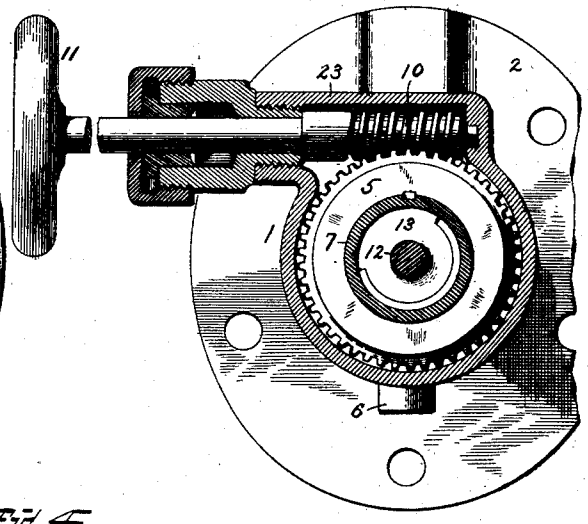
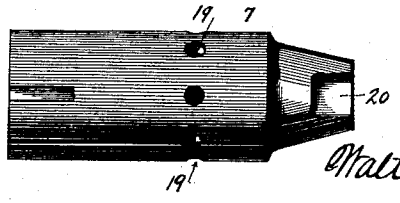


Fig. 4.



Witnesses
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Walter B. Wright,
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By his Attorneys, Dodger Son.

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UNITED STATES PATENT OFFICE.

WALTER BLAKE WRIGHT, OF CHICAGO, ILLINOIS, ASSIGNOR TO WILLIAMS & WRIGHT, OF TROY, NEW YORK.

INJECTOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 371,158, dated October 4, 1887.

Application filed May 26, 1887. Serial No. 239,478. (No model.)

To all whom it may concern:

Be it known that I, WALTER BLAKE WRIGHT, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Injector-Burners, of which the following is a specification.

My invention relates to what are known as "injector-burners," designed for use in connection with hydrocarbon-furnaces; and it consists in various features and details of construction, hereinafter set forth and claimed.

Referring to the accompanying drawings, Figure 1 is a vertical longitudinal sectional view through my improved injector. Fig. 2 is a vertical sectional view on the line *x x* of Fig. 1. Fig. 3 is a similar view taken on the line *y y*, and Fig. 4 is a detail view.

Referring again to the drawings, 1 indicates the case or shell of the injector-burner as a whole, provided at one end with an oval or elliptical plate, 2, which is bolted to the end of the retort, as is usual. The body of the injector 1 is hollow from end to end, as is clearly shown in Fig. 1, and screwing into the inner end is a discharge-nozzle, 3, (shown in Figs. 1 and 2,) said nozzle 3 having a tapering or conical discharge-orifice. This nozzle 3 is provided on its upper side with a hole or opening, 15, of the form shown in Figs. 1 and 2, said hole or opening communicating with the oil-supply passage or channel 16 formed in the plate 2, as also shown in said figures. The body 1 is closed at its outer end by a cap, 4, which is provided with suitable packing-glands to prevent the escape of steam. It will be noticed, however, that the end of the body 1, into which the cap 4 is screwed, is enlarged somewhat in diameter, this construction forming a shoulder, 27, between which and the inner end of the cap 4 a worm-wheel, 5, hereinafter referred to, is held in position.

Formed in the body 1, about midway between its ends, is the steam-inlet 6, (shown in Fig. 1,) the body 1 being also provided or formed with a slight circumferential swell or enlargement, 17.

7 indicates a hollow valve, which is turned to fit accurately within the shell 1, said hollow valve being provided with a series of lateral openings, 19, that permit the steam to pass from the steam-inlet 6 or enlargement 17 into the interior of the valve. The forward end or nose of the hollow valve 7 is tapered externally to fit into the corresponding taper of discharge-nozzle 3, and the nose of the hollow valve is provided with a slot or depression, 20, in its upper face, which is of the same width, approximately, as the hole or opening 15 in the nozzle 3, with which the depression is designed to register. The rear end of the hollow valve 7 is closed by a plate, 8, and is held to its seat in the shell or casing by means of a spring, 9, interposed between the outer face of the plate 8 and the inner face of the cap 4, as shown in Fig. 1, said plate rotating with the hollow valve 7 or remaining at rest while said valve rotates, as may be found desirable. The plate 8 will preferably be made detachable for the reason that it lessens the cost of manufacture; but as it is only for the purpose of affording a bearing for the spring 9, its construction may be varied considerably without departing from the spirit of my invention.

The worm-wheel 5, hereinbefore referred to, is mounted upon the end of the hollow valve 7, as clearly shown in Figs. 1 and 3, said wheel being prevented from rotating upon or independently of the valve by means of a key seated in the hollow valve and the worm-wheel, as shown in Fig. 1.

The key may be made fast to the worm-wheel 5 or to the valve 7, as desired; but in any event the construction should be such as to permit the valve to slide freely back and forth through the worm-wheel, in order that the spring 9 may operate to keep the valve to its seat as the valve expands or contracts. The worm-wheel is prevented from moving upon the valve 7 by reason of its being clamped between the shoulder 27 and the inner end of cap 4. This wheel 5 meshes with a worm, 10, which is mounted in a transverse enlargement, 23, of the shell or body 1, as shown in Figs. 1 and 3, the shaft of said worm being extended outward and provided with a hand-wheel, 11, by which it may be turned.

About midway of the length of the hollow valve the latter is provided on its interior with a screw-thread, 21, while its forward end or nose is provided with a tapered opening or outlet, which is adapted to receive the tapered nose 22 of a valve-stem, 12, as shown in Figs. 1 and 2. The valve-stem 12 is provided with a hub or enlargement, 13, threaded externally to screw into the interior of the hollow valve 7, and is provided at its outer end with a hand-wheel, 14, by which it may be turned.

From the foregoing description it will be seen that by turning the stem 12 so as to bring its tapering nose 22 into or out of the seat formed for it in the end of the hollow valve 7 the amount of steam discharged from said hollow valve may be accurately regulated.

It will also be observed that by turning or rotating the screw 10 and worm 5, and consequently the valve 7, to which the worm is secured, the slot or depression 20 at the forward end of said valve may be made to register with the hole 15 to a greater or less extent, or it may be turned so far to either side of said hole as to effectually prevent the escape of any oil whatsoever.

Upon reference to Figs. 1, 2, and 4, it will be seen that a channel of uniform depth is at all times afforded for the discharge of the oil, regardless of the width of said discharge. It is found in practice that the oblong opening possesses material advantage over an annular opening of the same capacity, as it is less liable to become clogged up with sediment.

Heretofore it has been customary to provide injector-burners with a hollow valve adapted to fit into a circular valve-seat, the oil being admitted about all sides of the valve; but such a plan is objectionable, because of the clogging of the opening by sediment in the oil when the valve is adjusted close to its seat. Under my construction this difficulty is overcome, as I have at all times a passage or outlet of uniform depth, only the width of the passage being varied to regulate the oil-supply.

I make no broad claim herein to the worm-wheel and worm for operating the hollow valve, as that idea is embraced in an application filed by me March 3, 1887, Serial No. 229,599, the present invention, so far as it relates to the means for operating the hollow valve, being restricted to the precise arrangement shown and claimed.

Having thus described my invention, what I claim is—

1. In combination with case or shell 1, provided with discharge-nozzle 3, steam-inlet 6, and oil-inlet 15, a hollow valve, 7, provided with steam-inlets 19 and a longitudinal slot or depression, 20, a valve-stem, 12, mounted within the hollow valve 7, and means for rotating the valve 7, all substantially as shown and described.

2. In combination with case or shell 1, having steam-inlet 6 and oil-inlet 15, a conical discharge-nozzle, 3, a hollow valve, 7, provided with steam-inlets 19 and with a tapered end, a longitudinal depression, 20, formed in the outer face of the conical end, a conical discharge-outlet also in the end of the hollow valve, means for rotating the hollow valve, and a valve-stem provided with a tapered nose, 22, to fit into the discharge-outlet of the hollow valve, all substantially as shown.

3. In combination with case or shell 1, having steam and oil inlets 6 16, a discharge-nozzle, 3, a hollow valve, 7, provided with a longitudinal slot or depression, 20, an opening, 15, elongated at right angles to the axis of the valve and serving to convey the oil from the oil-inlet 16 to the depression 20, a valve-stem, 12, mounted within the hollow valve, and means for rotating the hollow valve, all combined and arranged substantially as shown.

4. In combination with case or shell 1, having steam and oil inlets and a discharge-nozzle, a hollow valve, 7, provided with a central steam-discharge outlet and with a longitudinal depression, as 20, to register with the oil-inlet, a worm-wheel, 5, secured to said hollow valve, a worm, 10, mounted in the casing to engage with said worm-wheel, and a valve-stem, 12, mounted within the hollow valve and arranged to regulate the discharge of steam therefrom.

5. In combination with case or shell 1, provided with suitable steam and oil inlets, a discharge-nozzle, a shoulder, as 27, and a transverse enlargement, as 23, a hollow valve, as 7, provided with an internal stem, 12, a worm-wheel, 5, secured upon the valve 7, adapted to turn therewith and resting against or in proximity to the shoulder 27, a worm, 10, mounted in the enlargement 23 to mesh with the worm-wheel, and a cap, as 4, screwing into the end of the shell or case and serving to retain the worm-wheel in position.

6. In an injector-burner, the combination, with the case or shell 1, constructed substantially as shown and described, of the hollow valve 7, provided with a stem, 12, and with a loose end plate, 8, a spring, 9, interposed between said plate and the case or shell 1, and means for rotating the hollow valve.

7. In an injector-burner, the combination, with the case or shell 1, constructed substantially as shown, of the hollow valve 7, the screw-stem 12, and worm-gearing 5 10, located wholly within the casing, for rotating the hollow valve.

8. In an injector-burner, the combination, with a case or shell provided with suitable oil and steam inlets and a discharge-nozzle, of a hollow valve mounted therein and means for rotating the same, a spring arranged substantially as shown to hold the valve to its seat, and a valve-stem adjustable within the hollow valve.

9. In an injector-burner, the combination, with a case or shell provided with suitable oil

and steam inlets and a discharge-nozzle, of a hollow valve mounted therein, a worm-wheel encircling the hollow valve and mounted within the shell, (the valve being free to slide through the worm-wheel,) and a spring bearing upon the end of the hollow valve, all substantially as shown.

In witness whereof I hereunto set my hand in the presence of two witnesses.

WALTER BLAKE WRIGHT.

Witnesses:
CHAS. L. ALDEN,
N. DAVENPORT.