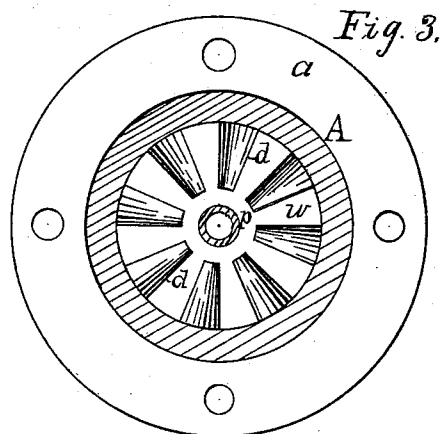
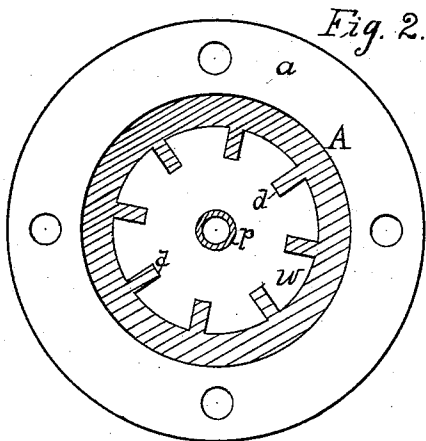
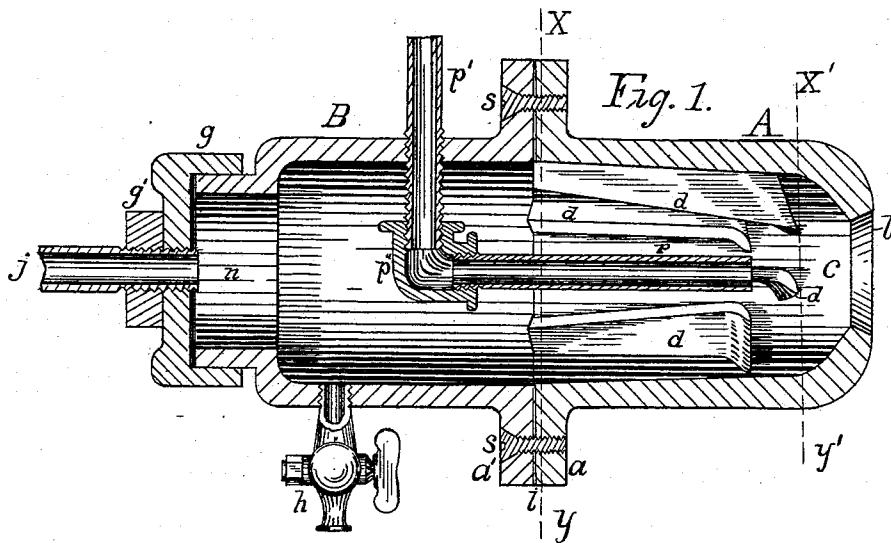


(No Model.)

C. T. COATES & W. R. HELTON.
OIL BURNER.

No. 475,297.

Patented May 24, 1892.



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OIL-BURNER.

SPECIFICATION forming part of Letters Patent No. 475,297, dated May 24, 1892.

Application filed August 3, 1891. Serial No. 401,452. (No model.)

To all whom it may concern:

Be it known that we, CLINTON TREAT COATES and WALTER R. HELTON, citizens of the United States, residing at Terre Haute, in the county of Vigo and State of Indiana, have invented certain new and useful Improvements in Oil-Burners; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

Our invention relates to that class of oil-burners in which the crude oil is vaporized by a blast of steam or compressed air; and the objects of our improvements are to provide, first, a burner that will thoroughly vaporize the oil, and, second, one that can be manufactured at small expense and at the same time be strong and substantial. We attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a sectional view of the entire burner, showing the interior. Fig. 2 is a cross-sectional view taken upon the line X Y in Fig. 1, showing the several ribs *d* and the steam or air ways *w* at that point. Fig. 3 is a cross-sectional view of the burner, taken upon the line X' Y' in Fig. 1, showing the ends of the several ribs and the steam or air ways *w*.

Similar letters refer to similar parts in both views.

The letter A indicates the body of the burner and consists of a dome or cup-shaped casting of cast-iron or any other suitable material, and, as shown in Fig. 1, is curved or rounded at the outer end, while at the opposite end it is raised into a broad and strong flange *a*. The outer end of A is perforated, and said perforation is beveled outward, thus forming the convex orifice *b*, which acts as a nozzle for the burner.

The letters *d d* indicate metallic ribs, which are cast upon the inside of the body A. These ribs are arranged at equal intervals around the inner wall of the burner, as shown in the drawings, and are strong flat partitions, which divide the interior of the burner into a series of longitudinal steam or air ways *w w*. The

ribs *d d* stand out from the inner wall of the body A in planes, all of which pass through the center of the burner, and at the end nearest the nozzle they are all curved laterally, and all in the same cyclical direction, as shown in Fig. 1, thus causing a current of steam or air which passes between the different ribs to take a cyclical direction, as shown by the arrows in Fig. 1, and to circulate around in the space *c*, which is left between the ends of the ribs and the nozzle of the burner. At the end nearest the nozzle *b* the ribs are of such height that there is just room enough for the oil-pipe *p* to pass between them; but the height decreases gradually toward the opposite end about one-half; also, the ribs vary alternately in length, the shorter set extending just to the end of the pipe *p*, while the longer set extends a short distance beyond the end of the pipe *p*. The steam or air ways *w w*, formed between the wall of the burner and the ribs, are necessarily wedge-shaped, as shown in Figs. 2 and 3. Thus the steam or air is compressed into a smaller space as it passes forward.

The letter B indicates a cylindrical casting, which is of the same diameter as A. At one end this cylinder is furnished with a strong flange *a'*, which is the counterpart of the flange *a* of A, to which it is firmly fastened by a series of screws *s s*. At the opposite end of the cylinder its diameter is decreased, and a neck *n* is formed to receive a strong metal cap *g*. The cap *g* fits tightly over the neck *n* of the cylinder B and makes it steam-tight. The cap *g* is perforated at its center in order that the supply-steam pipe *j* may pass through it into the cylinder B. The cylinder B is furnished with a drain-cock *h*, by means of which any waste matter may be drawn off, and is also perforated upon its upper side to receive the oil-supply pipe *p'*, which is joined to the pipe *p* by means of an elbow *p''*. In order that the joint may be perfectly steam-tight, we place a strong strip or washer *i*, of asbestos or any other suitable material, between the flanges *a* and *a'*. The cap *g*, as shown in Fig. 1, is used when steam is used as a blast; but when we desire to employ air as a blast we simply remove the cap *g* and the steam-supply pipe *j* and slip the end of a closely-fit-

ting blast-pipe over the neck *n*. The outer surface of the neck *n* may be threaded to receive similar threads upon the inside of the cap *g* or blast-pipe, or any other convenient means of joining the same may be employed.

To operate our burner, we fasten it in such position that the flame issuing from the nozzle will spread over the greatest portion possible of the boiler or other contrivance which is to be heated. Then we admit a stream of oil through the oil-pipe *p* and turn on the blast of steam or air, which passes through the ways *w*. The blast takes up the oil and dashes it into a vapor, with which it unites and blows out through the nozzle *b* in the form of a gas, which when ignited burns with an intense heat. The curvature at the end of the ribs causes the blast to whirl violently around in the space or cavity *c*, thus completely atomizing the oil which it takes with it.

We are aware that prior to our invention oil-burners have been used wherein the oil was vaporized by and united with a whirling blast of steam or air. We therefore do not claim such features, broadly; but

What we do claim as our invention, and desire to secure by Letters Patent, is—

1. The combination, in an oil-burner, of a dome-like body *A* furnished with the ribs *d*, the cavity *c*, the nozzle *b*, and a flange *a*, the oil-pipe *p*, said pipe *p* being open at its forward

end and connected with the supply-oil pipe *p'* at the opposite end by means of the elbow *p''* with the cylinder *B*, said cylinder being furnished with a flange *a'*, a neck or throat *n*, and a drain-cock *h*, a cap *g*, and a blast-pipe *j*, all substantially as set forth and described.

2. The combination, in an oil-burner, of a dome-like body *A* furnished with the ribs *d*, which are situated at equal intervals around the inner wall of the body *A* in planes which pass through the axis of the burner and are curved laterally at their front ends, the cavity *c* and the nozzle *b*, situated at the forward end, and the flange *a* at the opposite end, with a cylinder *B*, said cylinder *B* being furnished at its forward end with a flange *a'*, which is screwed firmly to the flange *a*, and at the other end with a cap *g* and a blast-pipe *j*, the oil-pipe *p*, extending through the wall of *B* and connected with the oil-pipe *p*, which extends forward between the ribs *d* of *A*, all substantially as and for the purposes set forth and specified.

In testimony that we claim the foregoing as our own we affix our signatures in presence of two witnesses.

CLINTON TREAT COATES.
WALTER R. HELTON.

Witnesses:

A. MCGREGOR,
GEORGE M. DAVIS.