G. BELLON.

SUCTION BURNER.

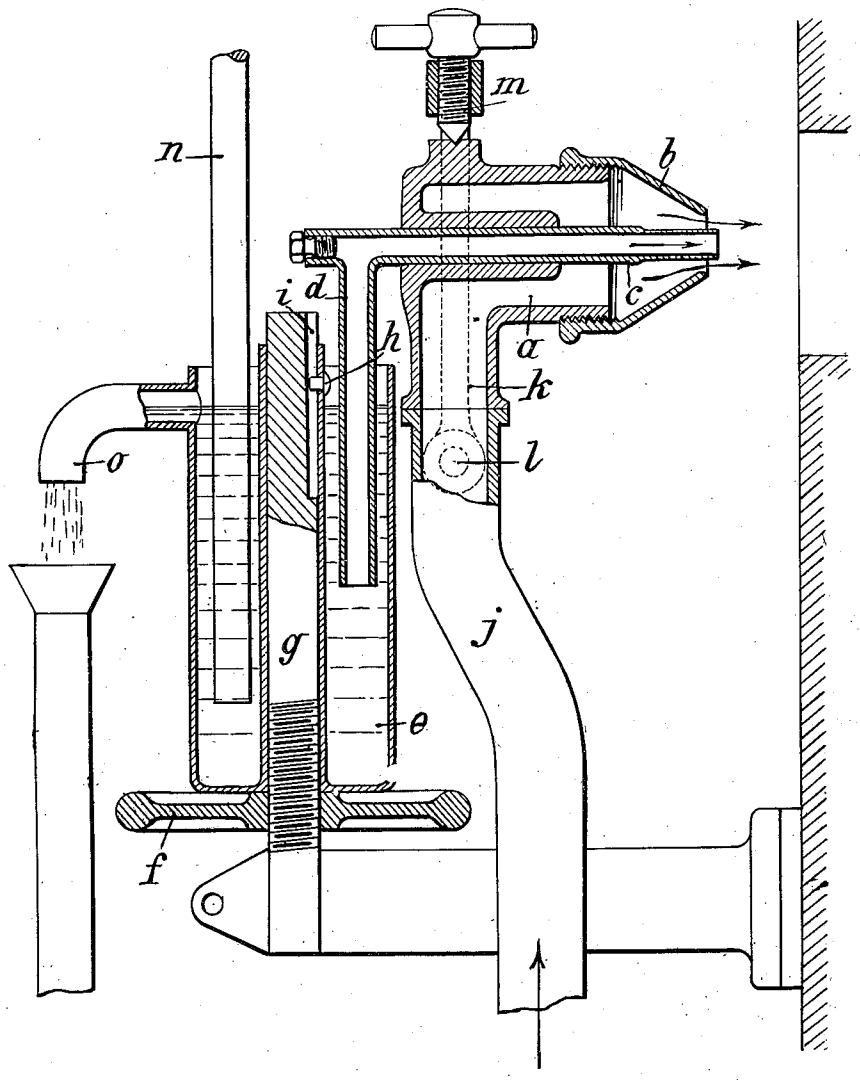
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1,369,605.

Patented Feb. 22, 1921.

2 SHEETS—SHEET 1.

Fig. 1.



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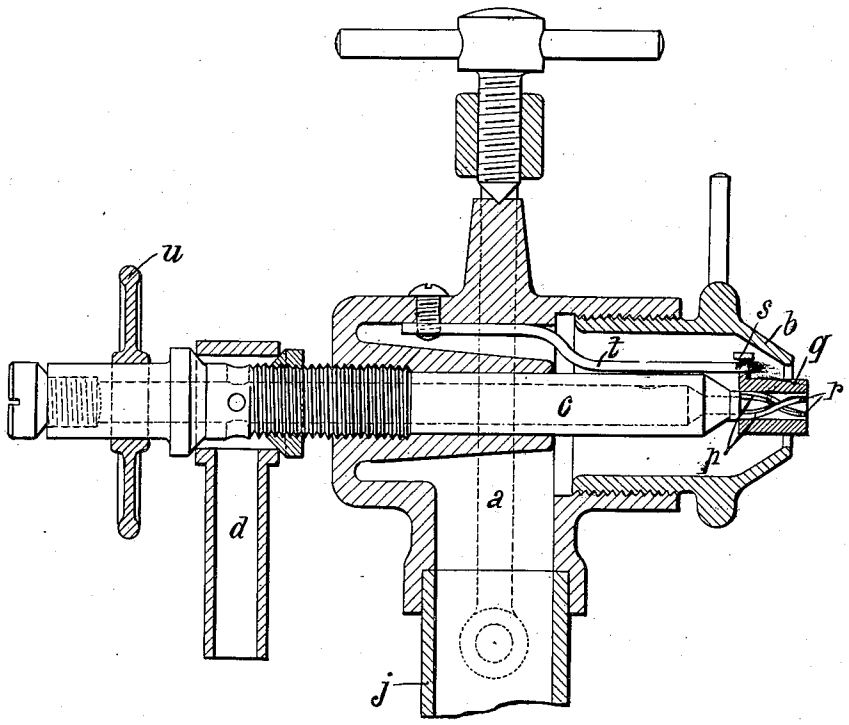
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2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

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SUCTION-BURNER.

1,369,605. Specification of Letters Patent. Patented Feb. 22, 1921.

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To all whom it may concern:

Be it known that I, GEORGES ALEXANDRE PHILIPPE BELLON, citizen of the French Republic, residing at Vincennes, 2 ter rue du Moulin, France, have invented certain new and useful Improvements in or Relating to Suction-Burners, of which the following is a specification.

Regulation of supply of oil in burners at present used in industry for firing furnaces or other similar apparatus is generally obtained by means of a cock or any similar part which acts so as to reduce the liquid vein. This process of regulation has the drawback of offering difficulties of regulation and of necessitating frequent stoppages.

The invention relates to a burner in which the driving of oil is obtained by suction of the air required for the combustion, and which does not comprise, for the regulation of the supply, any device acting on the liquid vein itself.

The invention consists in varying the height of the column of oil to be sucked in, so as to enable the oil to be drawn in more or less easily, and in varying the force of the said suction, owing to which, by the simultaneous use of these two methods, a very accurate and very wide regulation can be obtained, which can extend as far as complete stoppage of the supply.

It is obvious that this method of regulation could be carried out in practice in various ways, and therefore the construction of burner shown in the accompanying drawings is merely given by way of example.

Referring to the drawings:—

Figure 1 is a side view partly in section of my improved device.

Fig. 2 is a vertical sectional view of the burner showing means for accelerating the starting of the same.

The apparatus comprises a casing *a* provided with a cone *b*, the position of which can be adjusted by screwing and with a nozzle *c* which terminates in an oil supply pipe *d* dipping into the tank *e*. This tank rests on a hand wheel *f* tapped in the center and through it passes in the direction of its axis a rod *g* screw threaded in its bottom portion so as to control the vertical movement of the hand wheel and mounted rigidly at its base. A guide constituted by a pin *h* secured to the central sleeve e^1 of the tank *e* and traveling in a groove *i* provided in the rod *g*, prevents the tank from participating during its vertical movement to the rotation of the hand wheel *f*.

The casing *a* is mounted on the air admission pipe *j* and is firmly secured to it by means of the bracket *k* pivoted at *l*, and of the screw *m;* to dismantle the apparatus, it is sufficient to disengage the said screw *m* from its seat, on the casing *a* and to turn the latter.

Oil arrives through the pipe *n* into the tank *e* and fills the latter up to the overflow *o* from where the excess of oil is guided toward the main tank in order to be afterward raised again into the tank *e*. The conduit *k* admits air to the casing *a* whence it escapes through the cone *b* producing a vacuum in the nozzle *c*. The oil thus drawn, rises through the pipe *d* and is discharged through the nozzle *c* into the furnace where it is easily ignited.

In order to increase the supply of oil, with the cone *b* occupying the position shown in the drawing, the tank *e* is raised by means of the hand wheel *f;* the resistance to suction decreasing owing to the decrease in the height of the column of oil to be drawn in, the oil arrives in a greater quantity at the nozzle *c*.

The supply can be decreased either by advancing the cone *c*, or by lowering the tank *e*, or by the combination of these two movements.

In the first case, by exaggerating the unscrewing of the cone, for instance by making it to pass beyond the nozzle *c*, it is possible to force air into the latter, and in that way to stop completely the supply of oil.

In the second case, the height of the column of oil drawn in, increasing with the lowering of the tank, the suction takes place with greater and greater difficulty and the oil reaches the nozzle in a less large quantity.

Finally, for stopping the burner, it is sufficient to shut off the admission of air; the suction being thus suppressed, the oil which is still in the nozzle, will return to the tank through the pipe *d;* in this way, as oil can be injected into the furnace or other apparatus without assistance of air, all danger of fire is eliminated, and the reliability of working is guaranteed.

Without it being necessary to insist on it,

it is easy to understand the advantages offered by this apparatus.

It has not got any micrometric or other cocks, or any needle valve which is always liable to get choked by dirt; in spite of that, the supply of oil can be regulated in a very exact manner; no pressure acts direct on the oil, and the apparatus works with low pressure; finally, it is easy to look after, and its dismantling could be effected instantaneously.

Besides, in order to accelerate the starting of the above described burner, a propeller with adjustable pitch is arranged in the air injection tube and in line with the oil supply pipe. This propeller enables the flame to be brought nearer to or farther away from the end of the burner.

The supply tube of the pipe *c* is extended in the air injection nozzle *b* by helical blades *p* with an adjustable pitch. They engage with a fixed cylindrical sleeve *q* and are pivoted at their free end to the said sleeve *q* by means of trunnions *r* which pass through them. The outer sleeve *q* forming a guide and extending the oil supply tube *c* beyond the air injection nozzle *b*, is locked by the engagement of a projection *s* which passes through the eye of a rod *t* secured to the body *a* of the burner.

It is obvious that in moving the oil supply tube at an angle by means of the handle *u*, the oil supply tube *c* which is screwed into the body *a* of the burner, the blades *p* which are secured with their ends by means of the trunnions *r*, are given a movement of torsion to which is added according to the direction of the annular movement, a movement of extension or of thrust. The blades *p* assume therefore a helical shape, the pitch of which is a function of the angle of movement given to the oil supply tube *c*.

The flame is thus brought nearer to, or moved away from, the burner, and at the same time the angle at the apex of the cone of projection of the combustible mixture that is to say, oil and air, is modified.

It it obvious that the means for obtaining a propeller with a variable pitch is given merely by way of example, and that it would be possible to use any other arrangement producing the same result.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. A device of the kind described comprising a reservoir having an open top, a pipe extending into said reservoir for feeding liquid fuel thereto, a burner, a pipe for feeding liquid fuel from the reservoir to the burner, having a portion extending downwardly into said reservoir and having an open lower end, the lower ends of both of said pipes being adapted to be sealed by liquid fuel contained in the reservoir, and means for vertically adjusting said reservoir relatively to said pipes in order to regulate the feed of fuel to the burner.

2. A device of the kind described including a bracket provided with a vertical post having a threaded portion, a nut wheel engaging the threaded portion of said post, a reservoir resting on said wheel and having an open top, a burner having means for supplying air thereto, and a pipe supplying liquid fuel to said burner and provided with a downwardly extending vertical extension having an open lower end located within the reservoir, a body of liquid fuel contained in the reservoir and sealing the lower end of said pipe, and means for furnishing liquid fuel to said reservoir.

3. A device of the kind defined by claim 1 in which the pipe for furnishing liquid fuel to the burner is provided with a rotatable portion having a nozzle at its forward end provided with a plurality of flexible bars, a burner casing carrying a fixed cylinder, said bars being located in said cylinder, and means for pivotally connecting the forward ends of said bars to said cylinder.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

GEORGES BELLON.

Witnesses:
CLEMENT S. EDWARDS,
LUCIEN MARMAC.