

E. C. JONES & C. J. ARNOLD.

SMOKE BURNER.

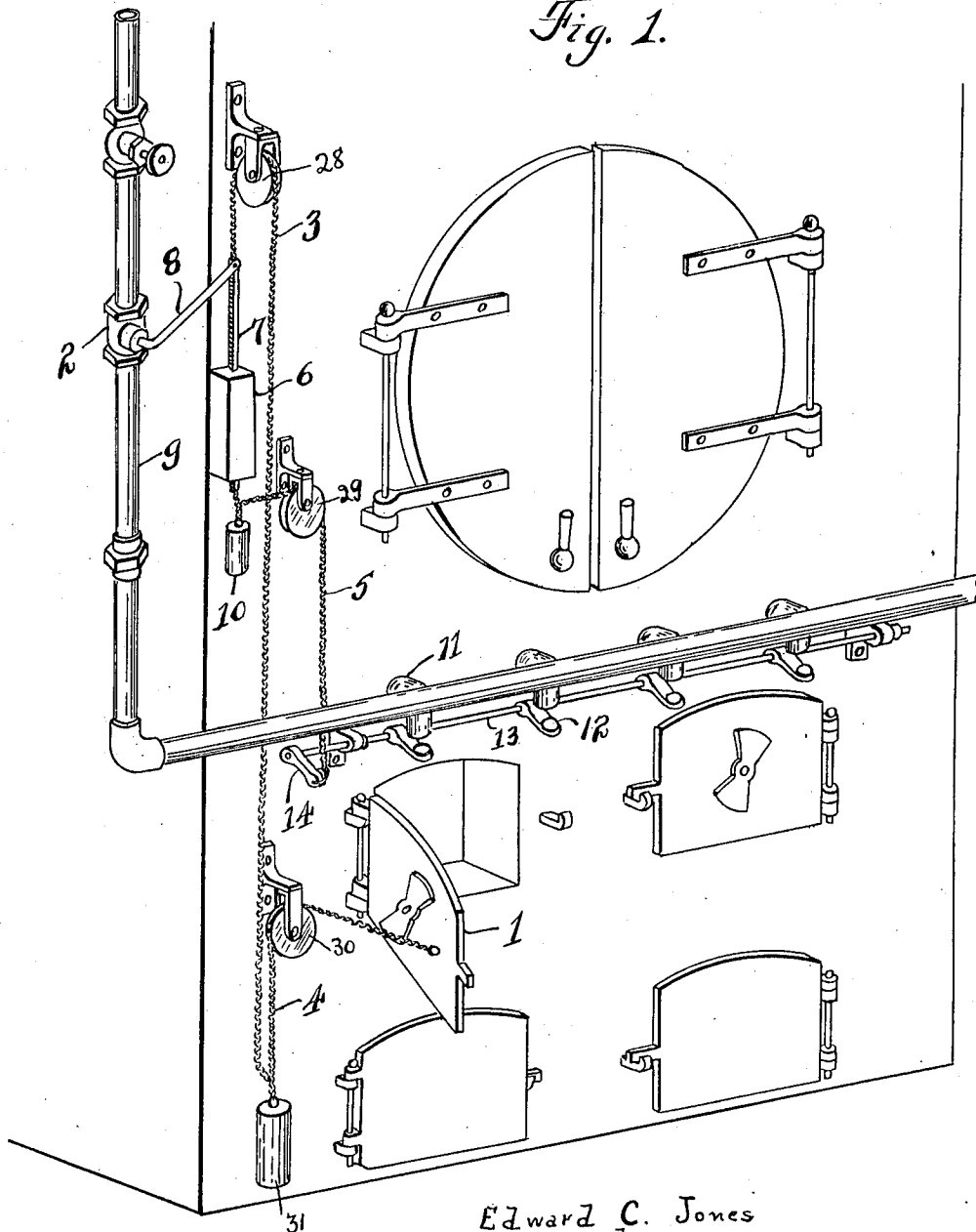
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1,019,797.

Patented Mar. 12, 1912.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

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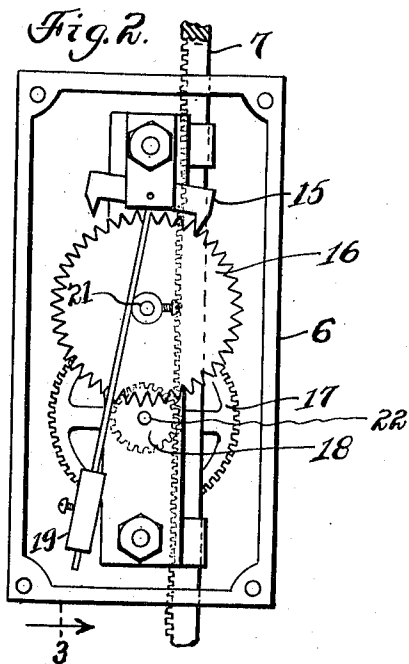


Fig. 3.

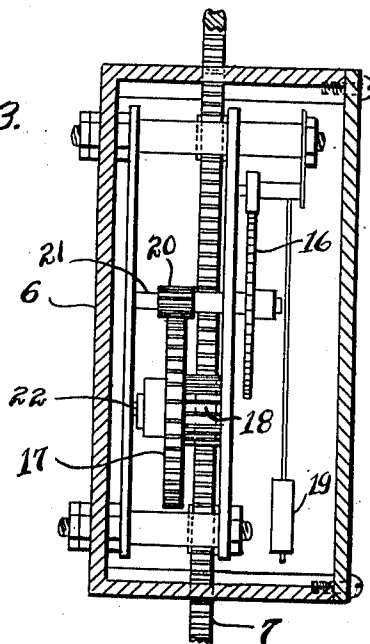
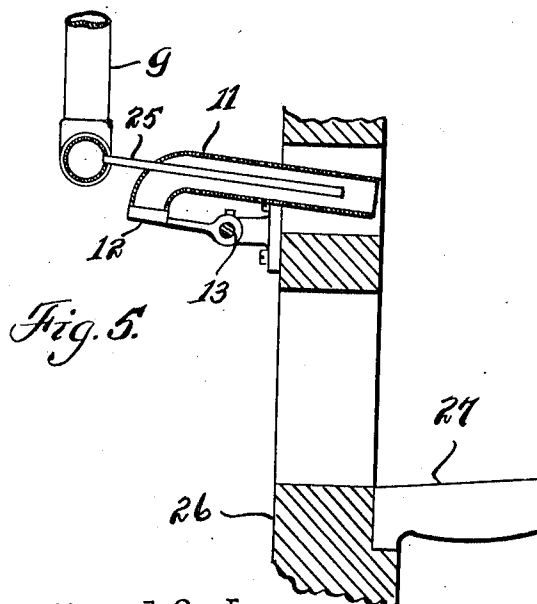
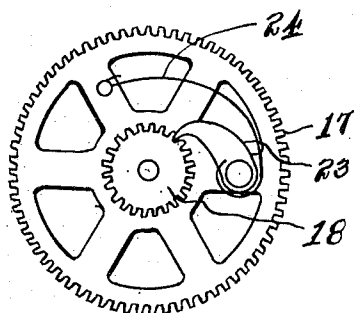


Fig. 4.



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UNITED STATES PATENT OFFICE.

EDWARD C. JONES AND CHARLES J. ARNOLD, OF LOUISVILLE, KENTUCKY.

SMOKE-BURNER.

1,019,797.

Specification of Letters Patent.

Patented Mar. 12, 1912.

Application filed June 23, 1911. Serial No. 634,948.

To all whom it may concern:

Be it known that we, EDWARD C. JONES and CHARLES J. ARNOLD, citizens of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented a new and useful Smoke-Burner, of which the following is a specification.

Our invention relates to devices for burning smoke in furnaces and to actuating mechanisms used in conjunction therewith.

It has for its object to provide an automatic means for providing oxygen to burn the smoke immediately after coal is put on the fire.

Our invention consists in novel features and parts and combinations of the same which will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment thereof is shown in the accompanying drawings, in which—

Figure 1 is a perspective of the invention; Fig. 2, a front elevation of the retarding mechanism; Fig. 3, a side elevation of the retarding mechanism, partly in section; Fig. 4, a detail of the retarding mechanism; and Fig. 5, a detail of the injecting mechanism.

Our invention consists in applying to a furnace an air injector and a mechanism operated by the door for admitting outer air to said injector, for admitting a motive agent to said injector, and for automatically shutting off said supply of outer air and said motive agent a definite period after the door has been closed. This furnishes the largest supply of oxygen immediately after new coal has been put on the fire, when the most smoke is produced.

In the present embodiment of our invention steam is conducted from the boiler to the injecting passages 11 in the front wall 26 of the furnace by the pipe 9. The passages 11 are preferably directed downward toward the grates 27 and toward the rear part of the fire. Steam is admitted to each of the passages 27 through the small pipes 25 connecting with the pipe 9. The outer ends of the pipes 11 are bent downwardly and are adapted to be covered by the caps 12, which are fastened to the rod 13 so as to swing thereon. The admission of steam to the injectors is controlled by the valve 2 in the pipe 9, operated by the lever 8.

The valve 2 and the caps 12 are operated by a mechanism consisting of three chains,

three fixed pulleys, two unequal weights, and a retarding mechanism. The main chain 3 hangs over the pulley 28. At one end is the lesser weight 10 and at the other end is the greater weight 31. Between the pulley 28 and the weight 31 the chain 3 is flexibly connected by the chain 4 with the furnace door 1. The chain 4 passes over the face of the pulley 30, which is so placed that the closing of the door 1 will cause the chain 4 to raise the weight 31. Thus the opening and closing of the door 1 operates the actuating mechanism. When the weight 31 is dropped, the weight 10 will be raised. The raising of the weight 10 allows the chain 5 to descend over the pulley 29, allowing the lever 14, to which it is connected, to descend with the caps 12, opening the outer ends of the passages 11. The raising of the weight 10 also opens the valve 2 by means of the lever 8, which is connected between the weight 10 and the pulley 28. Thus, while the door is open, the valve 2 is opened and the outer passages 11 are opened and air is being injected above the fire. It is desirable to continue this injection for some period of time after the door 1 is closed. To accomplish this result we provide the retarding mechanism 6, through which a rack 7 in the chain 3 passes. This retarding mechanism is similar to an ordinary clock mechanism, except for the arrangement whereby the rack 7 can be moved freely upward without movement of any of the balance of the mechanism.

The downward movement of the rack 7 drives the pinion 18 on the shaft 22 and also the gear wheel 17, which is independently movable on the shaft 22 and is connected to the pinion 18 by the dog 23, held in position by the spring 24. By this mechanism, when the rack 7 is moved upwardly and the pinion 18 thereby driven counter-clockwise, there is no movement of the gear wheel 17. The gear wheel 17 drives the small pinion 20 on the shaft 21 and thereby drives the toothed wheel 16, whose movement is limited by the swinging double dog 15, attached to the pendulum 19. The weight of the pendulum is adjustable up and down the rod, providing means for varying the speed of the retarding mechanism.

The rack 7 is made long enough to permit of as much movement downwardly of the weight 10 as is necessary to take up the slack of the chain 3 when the door is closed.

The lengths of the chain 5 and the lever 8 are adapted to the necessary movement to close the caps 12 and the valve 2 respectively when the weight 10 has finished its downward movement.

It is evident that our retarding mechanism, our general actuating mechanism, and their arrangements with respect to a furnace can be varied in many respects without departing from the essence of our invention. Therefore we do not limit ourselves in any respect further than is indicated in the claims which follow.

We claim:

1. In a furnace, a steam-operated gas injecting mechanism comprising a steam admission valve and an actuating mechanism comprising a pulley, a flexible connector thereover, unequal weights connected thereby on opposite sides of said pulley, means for supporting the greater weight from the furnace door, a retarding mechanism between said lesser weight and said pulley, and a lever connected with said connector and adapted to open said steam valve on movement of the connector in one direction and to close said valve on movement in another.

2. In a furnace, a steam-operated gas-injecting mechanism comprising a steam-admission valve and an actuating mechanism comprising a pulley, a flexible connector thereover, unequal weights connected there-

by on opposite sides of said pulley, a retarding mechanism between the lesser weight and the pulley, means operated by said connector for opening and closing said steam-admission valve, and a second pulley placed at approximately the altitude of the furnace door and a flexible connector thereover attached to said furnace door and variably supporting said greater weight.

3. In a furnace, a steam-operated gas-injecting mechanism comprising a steam-admission valve and an air-admission valve adapted to open by gravity, and an actuating mechanism comprising a pulley, a flexible connector thereover, unequal weights connected thereby on opposite sides of said pulley, a retarding mechanism between the lesser weight and the pulley, means operated by said connector for opening and closing said steam-admission valve, a second pulley placed at approximately the altitude of the furnace door, a flexible connector thereover attached to said furnace door and supporting said greater weight, a third pulley above said gas admission valve, a flexible connector thereover supporting said gas-admission valve and in connection with said lesser weight.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."