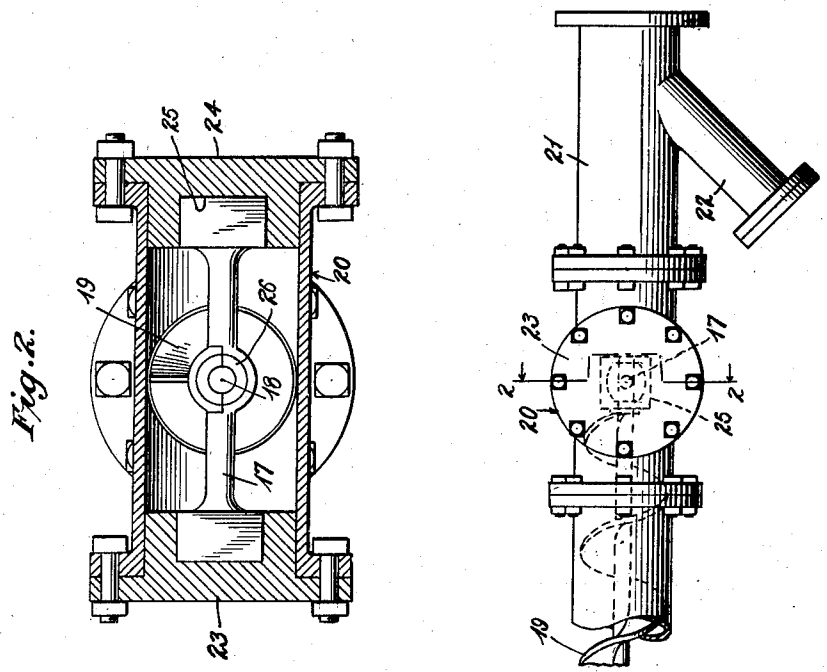
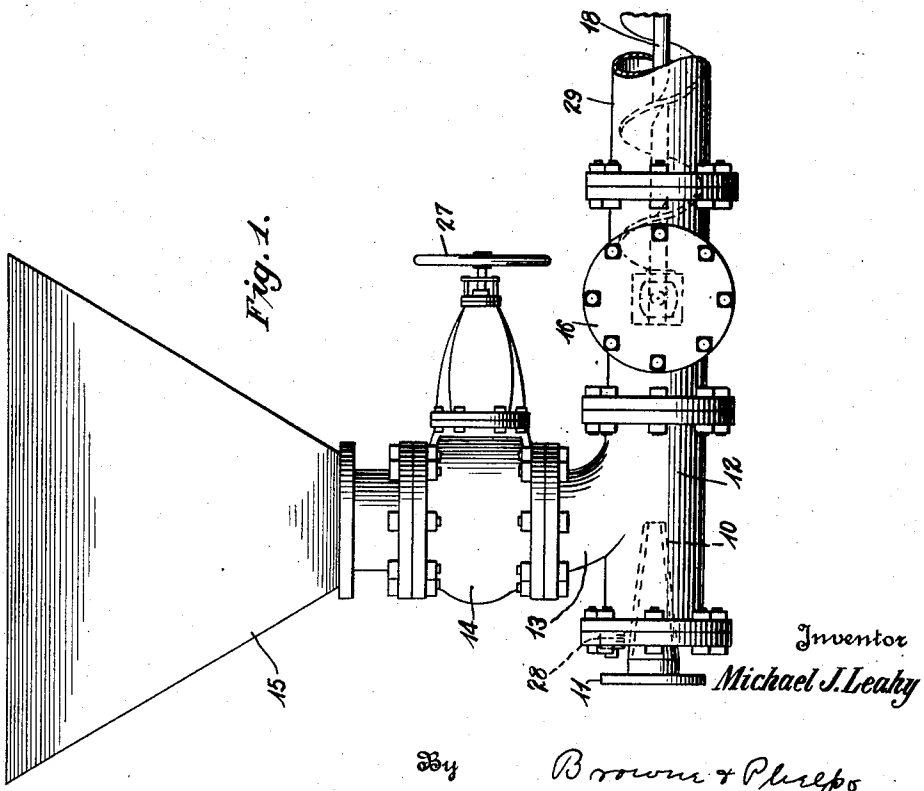
June 30, 1931. M. J. LEAHY 1,812,795

SULPHUR BURNER

Filed Jan. 18, 1930 2 Sheets-Sheet 1





Inventor
Michael J. Leahy

By Brown & Phelps
Attorneys

June 30, 1931. M. J. LEAHY 1,812,795

SULPHUR BURNER

Filed Jan. 18, 1930 2 Sheets-Sheet 2

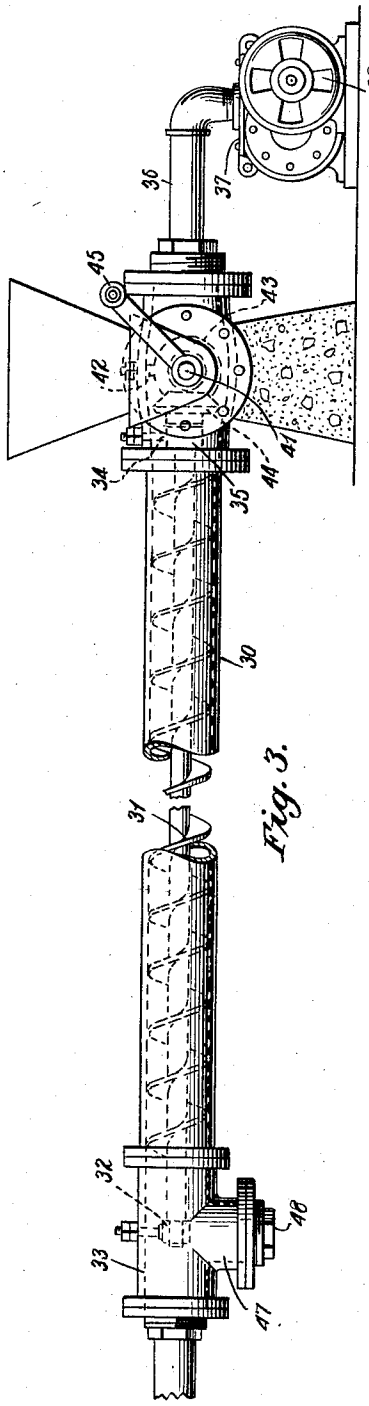


Fig. 3.

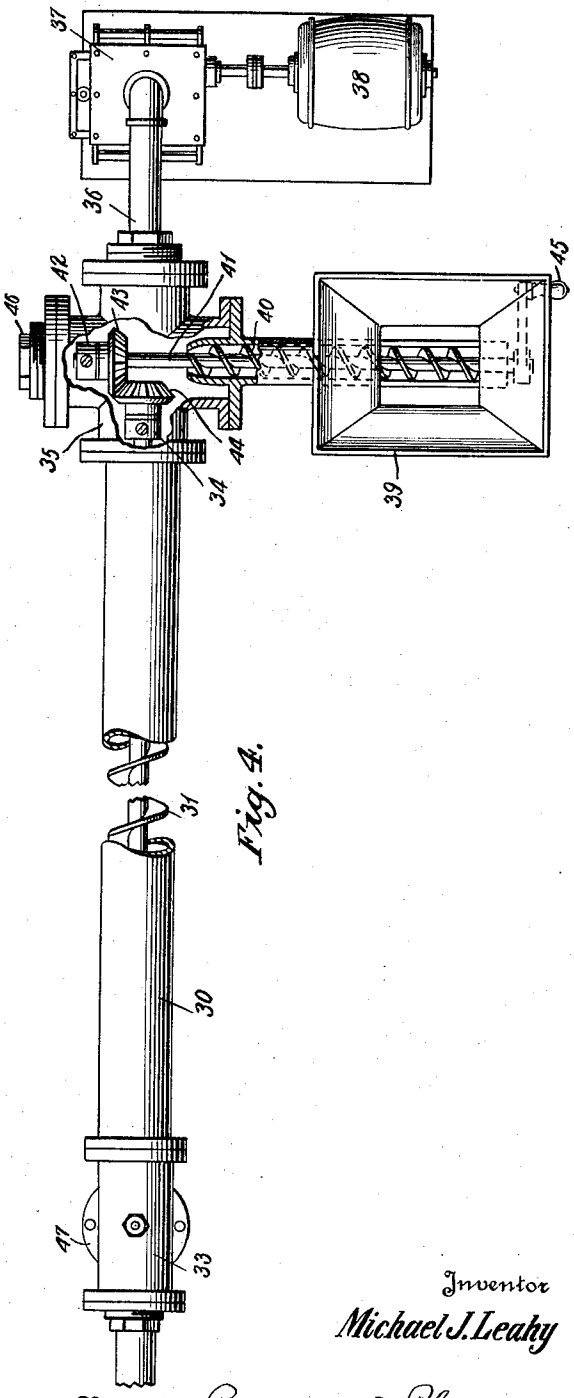


Fig. 4.

Inventor
Michael J. Leahy

By Brown & Phelps

Attorneys

Patented June 30, 1931

1,812,795

UNITED STATES PATENT OFFICE

MICHAEL J. LEAHY, OF MUNCY, PENNSYLVANIA

SULPHUR BURNER

Application filed January 18, 1930. Serial No. 421,786.

The invention relates to sulphur burners and has as an object the provision of such a device for use in producing oxides of sulphur, as sulphur dioxide.

It is an object of the invention to provide a burner which will completely oxidize the sulphur.

It is a further object of the invention to provide a burner which will require no power to operate with the exception of that required to provide a blast of air.

It is a further object of the invention to provide a burner which will produce large quantities of gaseous sulphur oxides and allow any incombustible material to fall therefrom in its passage from the burner.

Further objects of the invention will appear from the following description when read in connection with the accompanying drawings showing illustrative embodiments of the invention and wherein:—

Fig. 1 is a side elevation partly broken away to show the interior parts and to shorten the figure;

Fig. 2 is a vertical section upon an enlarged scale on line 2—2 of Fig. 1; and

Figs. 3 and 4 are a side elevation and a plan view respectively, each partly broken away, illustrating a modified form of the invention.

As shown the device comprises a burner in the form of an injection nozzle 10 which may be attached to an air blast means at flange 11, the burner projecting into a Y fitting 12. To feed sulphur to the air blast of the burner the branch 11 of the Y is shown as secured to a valve body 14 which in turn carries a hopper 15 for sulphur supply. The Y 12 is shown as attached to a bearing carrying member 16 in which an arm 17 is mounted, in which arm is journaled one end of the shaft 18 of a spiral conveyor 19 which is freely revoluble in the bearing and the other end of which shaft is journaled in a like bearing carried in a second bearing housing 20. To the housing 20 there is attached a second Y 21 having a downwardly directed branch 22.

The members 16 and 20 are shown as provided with closures 23, 24 carrying non-cylindrical recesses in which are seated the ends 25 of arms 17 shown as substantially cubical in the embodiment chosen for illustration, between which the arm 17 extends and which is provided at its central portion with a split journal 26 for reception of shaft 18. It will be understood that the bearings in members 16 and 20 are similar.

The valve body 14 contains a valve of any suitable character, which may be an ordinary sliding gate valve controlled by a hand wheel 27.

In operation the air blast is turned on at 11 and the valve in casing 14 is opened to allow sulphur to fall by gravity and to be drawn downwardly by the injecting action of the blast through burner 10 whereupon a screw plug 28 may be removed and a torch inserted for ignition of the sulphur, after which the screw plug 28 may be replaced and the blast increased. The sulphur will be burned in the Y 12 and its ignition will continue after it passes through the tube 29 housing the conveyor 19 and due to the checking of the movement of the gases and the mixing thereof by impact against the plates of the conveyor 19, complete combustion may take place.

Some of the sulphur will become melted and fall to the bottom of tube 29 in a molten condition and will be swept forwardly by revolution of the conveyor 19 as it burns. The conveyor 19 will be caused to revolve by impact of the blast against it. Any incombustible material contained in the sulphur will fall into the branch 22 of the Y 21 from which it may be withdrawn from time to time.

In the modification of Figs. 3 and 4 the combustion chamber or tube 30 has a spiral conveyor mixing device 31 revolubly mounted therein as upon a bearing 32 housed in T 33 and bearing 34 housed in the fitting 35. To supply a blast of air to the combustion tube in this form of the device, there is shown the nozzle 36 which may be in the form of a plain pipe which is connected to one branch of fitting 35 and leads from a blower 37 driven by motor 38.

To supply sulphur to this form of burner there is shown a hopper receptacle 39 delivering to a conveyor screw 40 which in turn de-

livers the sulphur to the fitting 35 to be picked up by the air blast and fed to the tube 30.

To drive the conveyor 40 the shaft 41 of the conveyor screw 40 which is mounted in a bearing 42 in the fitting 35 has keyed thereto a bevel gear 43 in mesh with a bevel gear 44 carried by the shaft of the conveyor screw 41. To manually operate the screw 40 when starting the device into operation, there is shown a hand crank 45 keyed upon the end of shaft 41. A removable plug 46 is shown whereby access may be had to the interior of the fitting 35.

In this form of the device there is shown also a sump 47 provided by way of a branch of the T 33 having a removable plug 48 whereby incombustible material gathering in the sump 47 may be removed from time to time as is found necessary.

In this form of the device the blast of air causes revolution of screw 41 and feeds the burning sulphur into the tube 30. The revolution of the conveyor 31 is caused to actuate the feed screw 40 to supply sulphur to the burner and the operation of the device is otherwise similar to the form shown in Figs. 1 and 2.

In operation the burner is found to give a very complete combustion of sulphur and to operate with very little expenditure of power. Among important advantages secured by the invention are that the spiral conveyor in the combustion tube not only removes incombustibles from the combustion chamber but presents a large surface to the blast. The turns of the spiral become coated with molten, burning sulphur. The air blast exerting pressure against these turns to cause revolution of the conveyor is thus brought into intimate forcible contact with this burning sulphur to provide a very efficient oxidation thereof. Also the blower is handling only pure air at atmospheric temperature which has no corrosive action upon the blowing apparatus. Moreover the air being at a relatively low temperature requires supply of a less volume than the heated air which is moved by former forms of apparatus.

Minor changes may be made in the physical embodiment of the invention within the scope of the appended claims without departing from the spirit of the invention.

I claim:

1. A sulphur burner comprising, in combination, a tubular member, a nozzle for introducing air under pressure axially of said member, a sulphur hopper arranged above and opening freely to the space about said nozzle to deliver sulphur to the injecting action of said nozzle and means to control delivery of said sulphur.

2. A sulphur burner comprising, in combination, a fitting, a tubular member connected axially of said fitting, an air blast nozzle entering said fitting axially of said tubular member, a sulphur hopper connecting to a remaining branch of said fitting having a delivery opening adjacent the end of said nozzle and means for controlling flow of sulphur from said hopper into said fitting.

3. A sulphur burner comprising, in combination, a tubular combustion chamber, a spiral conveyor revolubly mounted in said chamber, a fitting connected to said chamber, an air blast nozzle projecting into said fitting axially of said chamber and means connected to a remaining branch of said fitting to supply sulphur to the air blast passing through said nozzle.

4. A sulphur burner comprising, in combination, a tubular combustion chamber, a spiral conveyor revolubly mounted in said chamber, a fitting connected to said chamber, an air blast nozzle projecting into said fitting axially of said chamber, means connected to a remaining branch of said fitting to supply sulphur to the air blast passing through said nozzle, and a member connected to the outlet of said combustion chamber having means to receive incombustible material passing from said chamber with the products of combustion of the sulphur.

5. A sulphur burner comprising, in combination, a combustion chamber, a spiral conveyor revolubly mounted in said chamber, means for producing a blast of air into said chamber to cause revolution of said conveyor and for combustion of sulphur, a sulphur supply receptacle, means to feed sulphur from said receptacle to said air blast and means to actuate said feed means from said conveyor.

6. A sulphur burner comprising, in combination, a tubular combustion chamber, a spiral conveyor revolubly mounted in said tube, a three-way fitting having one branch connected to said tube, air blast means delivering to a second branch of said fitting and spiral conveyor feed means delivering to the third branch of said fitting, gear means housed in said fitting for actuation of said feed means by said first named spiral by revolution caused by said blast and a receptacle for supply of sulphur to said feed means.

7. A sulphur burner comprising, in combination, a tubular combustion chamber, a spiral conveyor mounted for revolution therein, a four way fitting having one branch connected to said chamber and the opposite branch connected to sulphur feed and blast means, plugs closing the remaining opposite branches, an arm with its ends supported by said plugs and a journal bearing for said conveyor carried by said arm.

8. A sulphur burner comprising, in combination, a combustion chamber, a spiral conveyor revolubly mounted in said chamber, means for producing a blast of air into said chamber to cause revolution of said con-

veyor and for combustion of sulphur, a sulphur supply receptacle, means to feed sulphur from said receptacle to said air blast, means to actuate said feed means from said conveyor, and manually actuated means for initiating action of said feed means.

MICHAEL J. LEAHY.