

G. A. STEBBINS.
SULFUR BURNER.

APPLICATION FILED MAR. 9, 1909.

934,700.

Patented Sept. 21, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

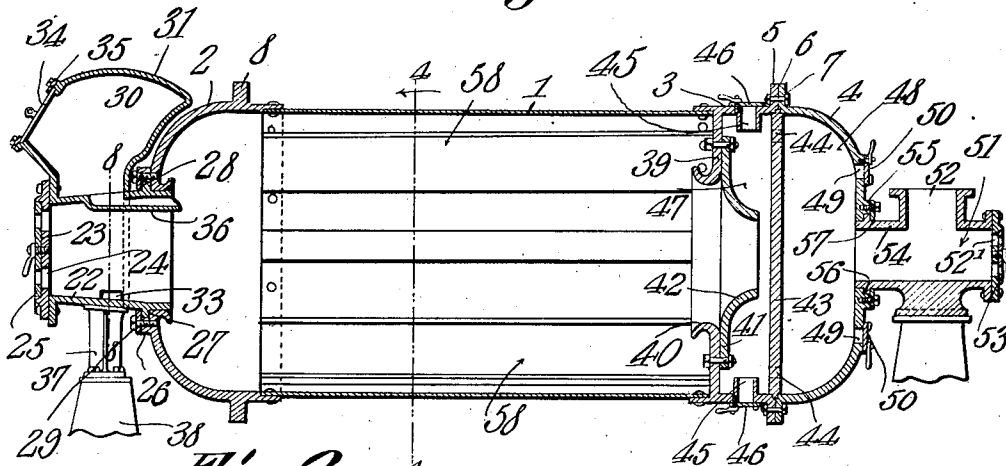


Fig. 2.

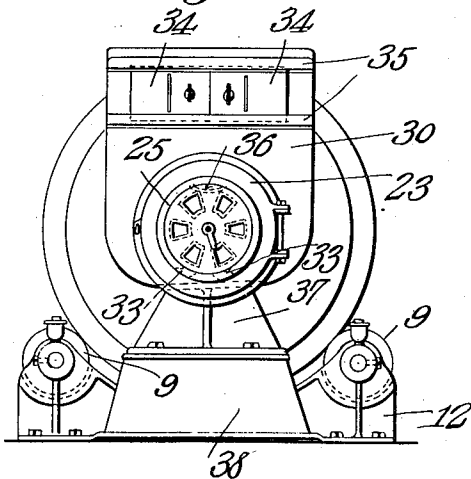


Fig. 3.

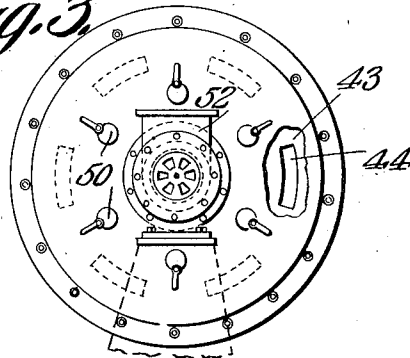


Fig. 5.

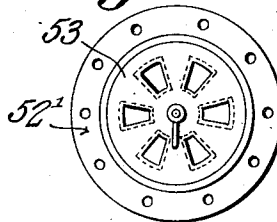
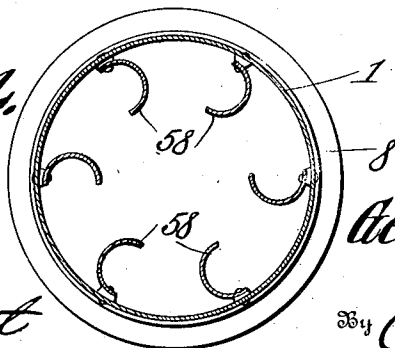


Fig. 4.



Witnesses:

E. H. Harnett
R. M. Elliott

Inventor,
George A. Stebbins.

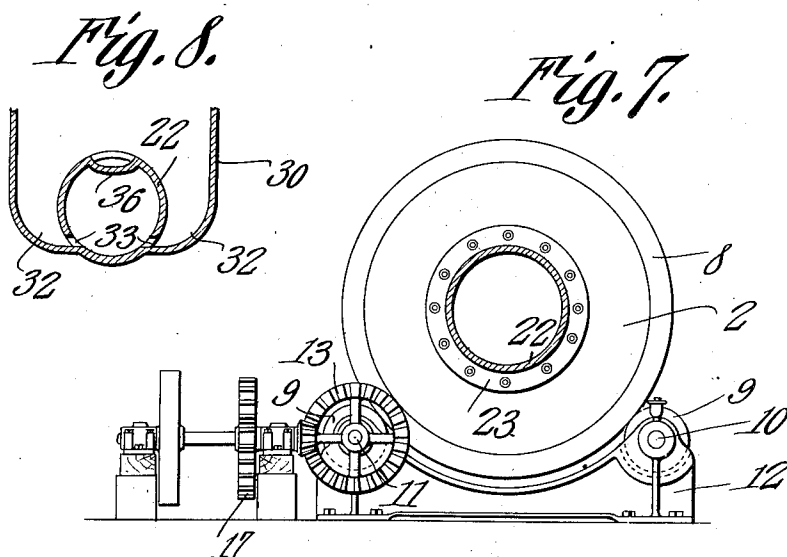
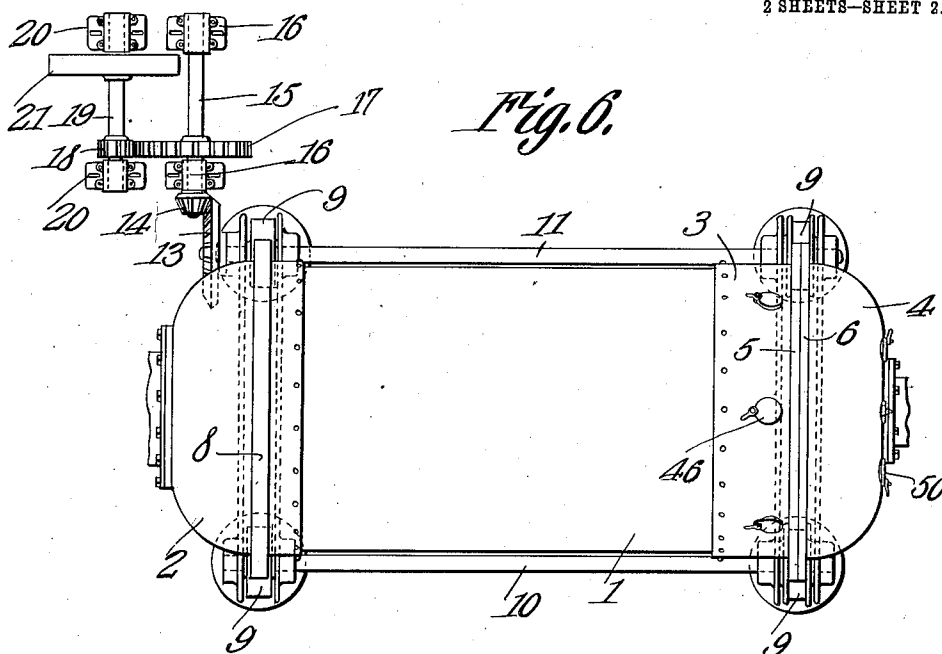
By *Ca Snow & Co.*
Attorneys.

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2 SHEETS—SHEET 2.



Witnesses:

E. J. Hammett
R. M. Elliott

Inventor,
George A. Stebbins.

By *C. A. Snow & Co.*
Attorneys.

UNITED STATES PATENT OFFICE.

GEORGE ALFRED STEBBINS, OF WATERTOWN, NEW YORK.

SULFUR-BURNER.

934,700.

Specification of Letters Patent. Patented Sept. 21, 1909.

Application filed March 9, 1909. Serial No. 482,270.

To all whom it may concern:

Be it known that I, GEORGE A. STEBBINS, a citizen of the United States, residing at Watertown, in the county of Jefferson and State of New York, have invented a new and useful Sulfur-Burner, of which the following is a specification.

This invention relates to sulfur burners, and is designed as an improvement upon an apparatus of this character for which I received Letters Patent of the United States, dated December 15, 1908, No. 906,574.

One object of the present invention is, in a ready, practical, continuous and certain manner, automatically to supply molten sulfur, as requisite, to the burner, and to effect this without opening the door at the front end of the machine, whereby the air supply to the burner will be maintained constant at all times, with the result that the quality of sulfur dioxid produced will be uniform in character.

A further object is to improve and render more efficient the air supply controlling means at the rear of the burner, whereby to secure the most perfect oxidation of the gases.

A still further object is to dispense with the ordinary stationary chamber or so-called combustion-box in which heretofore the regulation and oxidation of the gases has been effected, and in lieu thereof to provide a single revolving cylinder constructed in such a manner as to insure the proper mixture of the air with the sulfur dioxid under the temperature prevailing within the burner, this having been found to be the most favorable and efficient way to secure perfect oxidation.

With the above and other objects in view, as will appear as the nature of the invention is better understood, the same consists in the novel construction and combination of parts of a sulfur burner, as will be hereinafter fully described and claimed.

In the accompanying drawings forming a part of this specification, and in which like characters of reference indicate corresponding parts, Figure 1 is a view in vertical longitudinal section through a sulfur burner constructed in accordance with the present invention. Fig. 2 is a front elevation. Fig. 3 is a rear elevation. Fig. 4 is a transverse sectional view on the line 4—4 of Fig. 3, and looking in the direction of the arrow thereon. Fig. 5 is a detail view, on an enlarged scale, of a damper arranged at the rear of

the apparatus. Fig. 6 is a top plan view, showing the mechanism for revolving the burner. Fig. 7 is a front elevation partly in section, displaying more clearly the connection between the burner and its driving mechanism. Fig. 8 is a transverse sectional view, on an enlarged scale, taken on the line 8—8 of Fig. 1.

The cylinder 1 may be of the usual or any preferred construction, the front end of which is closed by an outwardly dished head 2, and its rear end by a similarly shaped head, comprising two sections 3 and 4, each of which is provided with a peripheral flange 5 and 6 respectively, held firmly assembled by bolts 7. These two flanges and a flange 8 on the head 2 form tracks that are designed to engage rollers 9 carried by shafts 10 and 11 mounted in suitable bearings on the base 12. The shaft 11 carries a bevel gear 13 which meshes with a bevel pinion 14 carried by a countershaft 15 journaled in suitable bearings 16. The shaft 15 carries a gear 17 that meshes with a pinion 18 carried by a shaft 19 journaled in bearings 20, the latter shaft having keyed to it a pulley 21 that is driven by a belt (not shown) from a suitable source of power, and transmits motion through the train of gears and pinions described to the shaft 11, which in turn revolves the cylinder.

Projecting through a central opening in the head 2 is a throat-piece 22 which is of truncated cone shape, and is closed at its outer and smaller end by a hinged door 23 which is provided with a series of draft openings 24 arranged in a circle and controlled by an annular rotary damper 25 of the usual or any preferred construction. The head 2 is provided with an annular outstanding flange 26 defining a seat to receive a circumferential flange 27 on the throat 22, and to hold the latter flange in the seat, an annulus 28 is provided which is held assembled with the flange 26 by bolts 29. By this arrangement the throat and head 2 will be operatively combined and a seal will be provided to check the escape of gases. Surrounding the throat, and preferably cast integral therewith is a hopper 30, the top 31 of which is preferably curved, and the sides of which are vertical and curved inward at their lower ends and form in conjunction with the throat two sulfur receiving compartments 32 that communicate with the under side of the throat through openings

33. The mouth of the hopper is closed by slide doors 34 that work in guides 35 in the walls of the mouth. The bottom of the hopper is formed by the upper wall of the throat and the latter is provided with a trough or chute 36 that projects into the head 2, as clearly shown in Fig. 1. The throat and hopper are supported by a pedestal 37 mounted upon a concrete or other base 38.

The section 3 of the rear head includes an annular partition 39 of the same diameter as the cylinder and provided at its center with an opening, the walls of which are flared or curved inward to define a mouth 40. Secured to the rear side of the partition is a removable baffle plate 41 having a central opening the walls of which are flared or curved outward to define a mouth 42 arranged concentric with and of less diameter than the mouth 40.

Beyond the partition 39 is arranged a plate 43 provided near its periphery with a plurality of orifices 44. This plate is held in operative position by being clamped between the two flanges 5 and 6 in any preferred manner.

The section 3 is provided with a plurality of inwardly projecting nozzles 45 the inlet ends of which are controlled by dampers 46, thereby to permit air in regulated quantity to be supplied to the chamber 47 formed by the partition 39 and plate 43.

The chamber 48 formed by the plate 43 and head section 4, is provided in its end with a plurality of orifices 49 passage through which is controlled by dampers 50.

The gas from the chamber 48 discharges into a chamber 51 having an extension 52 with which connects the pipe or flue that conducts the gas to the place of use. The rear end of the chamber is provided with a plate 52' having ventilating orifices that are controlled by a damper 53.

To connect the neck 54 of the chamber 51 with the head 4, the latter is provided with an outstanding flange 55 defining a seat in which fits a circumferential flange 56 formed on the neck 54, an annulus 57 bolted to the flange 55 operating to hold the parts from disconnection and also to form a seal to prevent escape of gas.

It will be noted by reference to Fig. 1 that the orifices 44 of the plate 43 are disposed close to its periphery, and this arrangement will operate to check or retard the escape of gases to the chamber 48, thus to secure effective initial oxidation, which will, in many cases be perfect. This retardation of the gases is further accentuated by disposing the mouth 42 of the baffle plate at its center, as this will compel the gases to travel the greatest distance possible before escape to the adjacent chamber.

The means for picking up the molten sul-

fur and dropping it through the air zone consists of a plurality of longitudinally disposed buckets 58 shown in Fig. 4 that are semi-circular in cross section and are bolted to the inner wall of the cylinder. But a single series of these buckets is herein shown, but it is to be understood that two series, oppositely disposed relatively to each other may be employed, as shown in the patent referred to.

In operation, the sulfur is placed in the hopper and ignited, and as soon as it begins to melt, it runs down the trough 36 and discharges into the cylinder, while the portion that passes to the compartments 32 escapes through the openings 33 to the cylinder. As the cylinder revolves, the buckets pick up the molten mass and drop it through the current of air supplied through the draft openings 24. The gases pass through the cylinder and through the opening in the baffle plate and into the chamber 47 where if further oxidation is required, this may be secured by operating the dampers controlling the nozzles 45. From the chamber 47 the gases pass through the openings 44 to the chamber 48, where further oxidation may be secured by means of the dampers 50. Thence the gases pass to the chamber 52 where they may be subjected to still further oxidation by operating the dampers 53, and finally escape to the place of use.

The provision of the dampers 53 is merely precautionary, as in effect perfect oxidation has been secured by the time the gases reach the chamber 52.

From the foregoing description, it will be seen that by the employment of the hopper provision is made to secure the most perfect oxidation, and also to render unnecessary the opening of the front of the cylinder, whereby the product will be of uniform character, owing to the fact that the supply of air remains constant.

The improvements herein described while simple in character, will be found thoroughly efficient for the purpose that is designed, and will cooperate in the production of a highly novel, practical, and commercially successful sulfur burner.

What is claimed is:—

1. A sulfur burner comprising a cylinder, a throat projecting into the cylinder through one end of the same, means for supplying air through the throat, and a hopper inclosing the throat and communicating with both the upper and lower portions thereof.

2. A sulfur burner comprising a rotatable cylinder, a stationary throat opening therein and provided with a feed-trough in its upper side and with air-feed controlling means, and a hopper surrounding the throat and communicating with the lower portion of the same and with the feed trough in the upper side thereof.

3. A sulfur burner comprising a rotatable cylinder, means for independently and continuously supplying air and sulfur to one end thereof, and means within the cylinder at the opposite end thereof for retarding the escape of gases and for effecting their thorough oxidation.

4. A sulfur burner comprising a rotatable cylinder provided at its forward end with independently operating means for supplying air and sulfur thereto and at its rear end with a plurality of oxidizing chambers each of said chambers having regulable air feed controlling means.

5. A sulfur burner comprising a rotatable cylinder provided at its forward end with independently operating means for supplying air and sulfur thereto, and at its rear end with means for retarding the escape of gases and for effecting successive oxidations thereof.

6. A sulfur burner comprising a rotatable cylinder, a stationary throat opening therein and provided with a feed trough and with air feed controlling means, and a hopper inclosing the throat and defining in conjunction therewith sulfur receiving compartments at the sides of the throat that communicate with the lower portion of the same.

7. A sulfur burner comprising a rotatable cylinder provided at its forward end with means for supplying air and sulfur therewith, of an orificed baffle plate located adjacent to the rear end of the cylinder, an orificed partition arranged back of the baffle plate and forming in conjunction therewith a pair of chambers, and means for supplying air in regulable quantities to either of the chambers independently of the other.

8. A sulfur burner comprising a rotatable cylinder provided at its forward end with means for independently supplying air and sulfur thereto, of a central orificed baffle plate located adjacent to the rear end of the cylinder, a circumferentially orificed partition arranged back of the baffle plate and forming in conjunction therewith a pair of chambers, and means for supplying air in regulable quantities to either of the chambers independently of the other.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

GEORGE ALFRED STEBBINS.

Witnesses:

JAMES MOORE CHILES,
EMILY NIELSON HATCH.