

No. 685,779.

Patented Nov. 5, 1901.

J. A. MARSDEN.
APPARATUS FOR BURNING SULFUR.

(Application filed June 19, 1900.)

(No Model.)

2 Sheets—Sheet I.

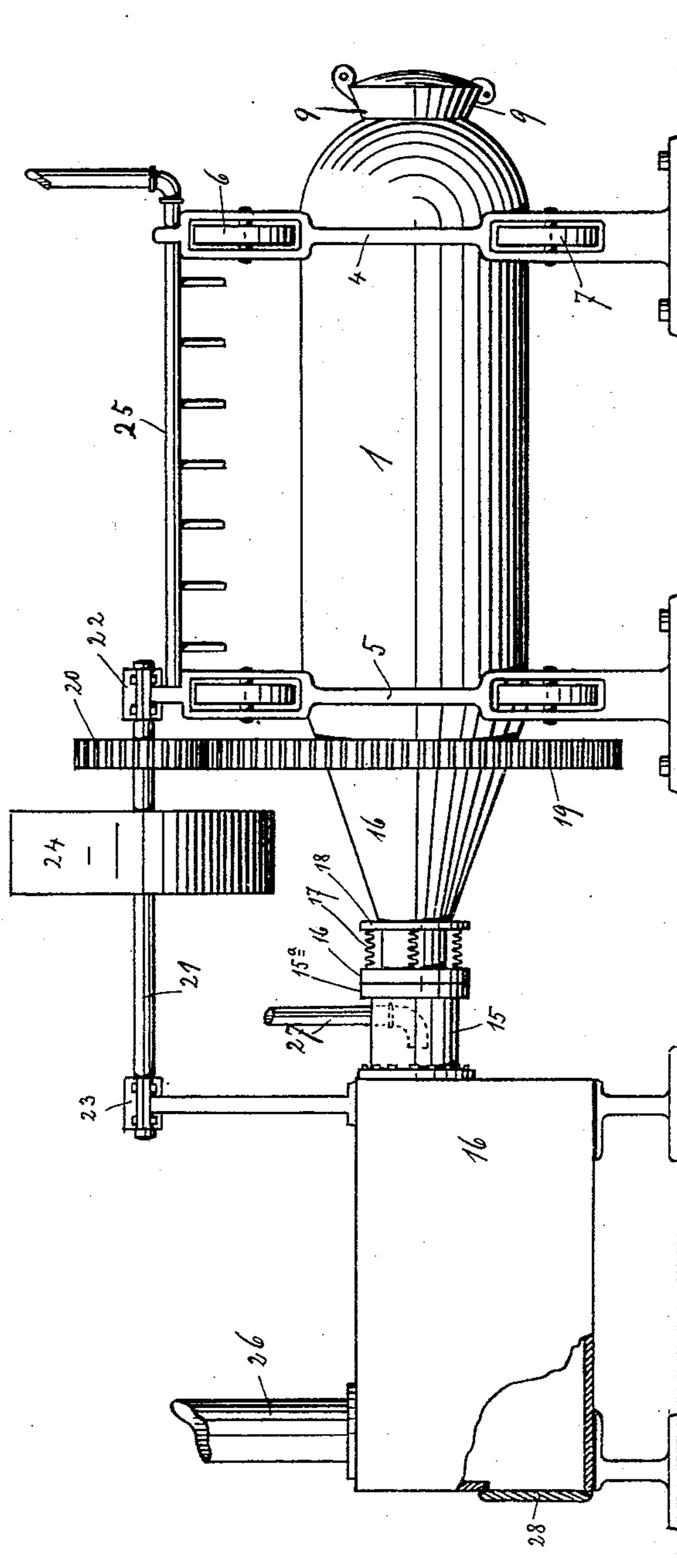


Fig. 1.

WITNESSES.
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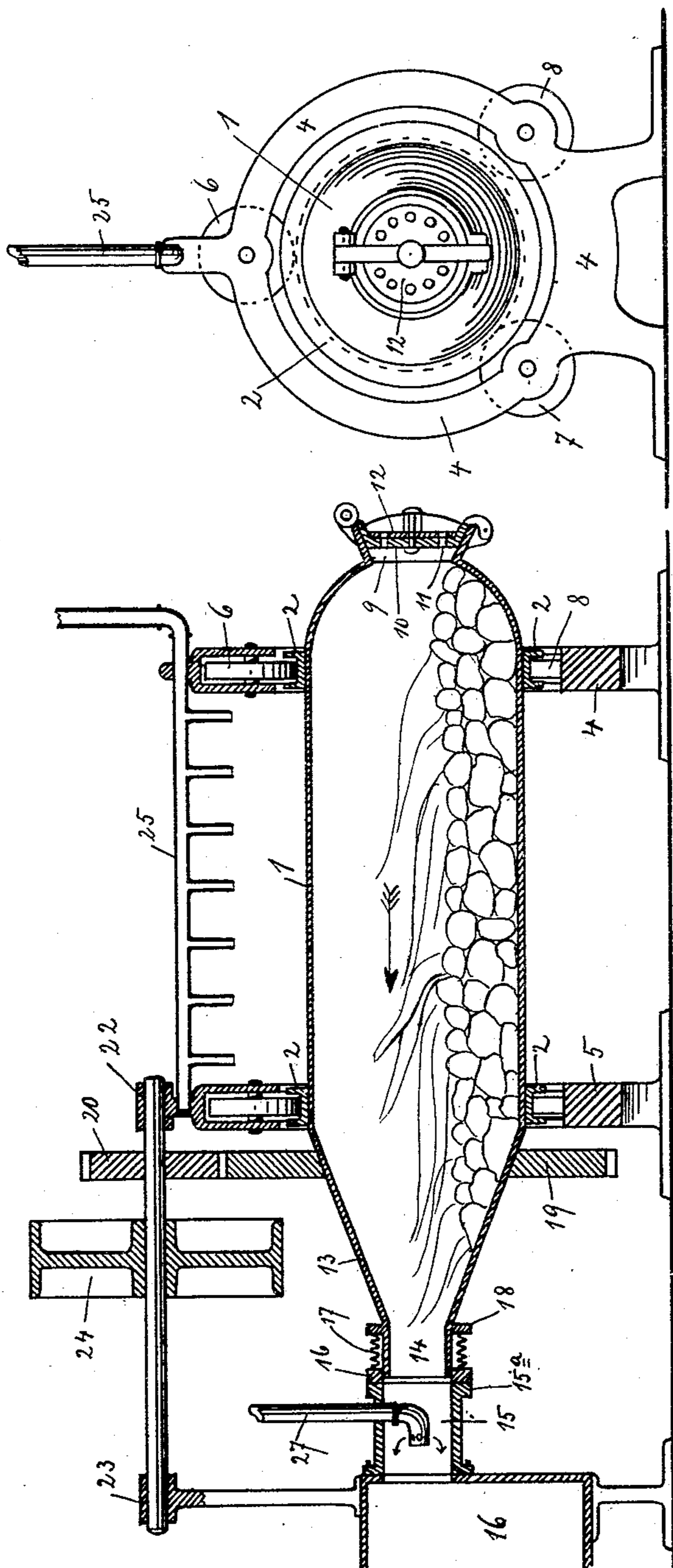


Fig. 2.

Fig. 3.

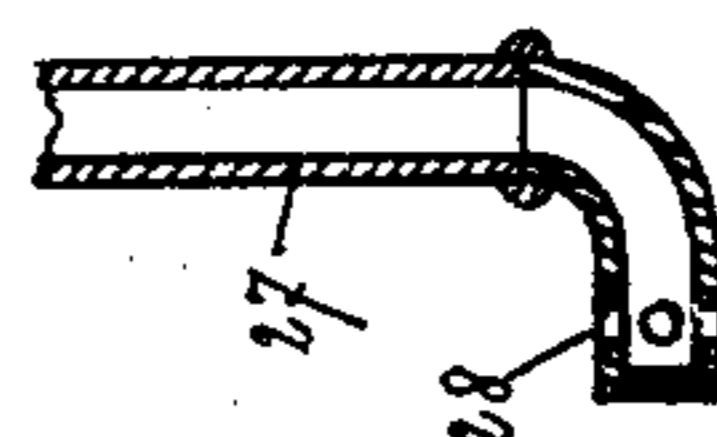


Fig. 4.

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UNITED STATES PATENT OFFICE.

JOHN A. MARSDEN, OF LYON FALLS, NEW YORK, ASSIGNOR OF ONE-HALF
TO A. R. PAUL, OF LYON FALLS, NEW YORK.

APPARATUS FOR BURNING SULFUR.

SPECIFICATION forming part of Letters Patent No. 685,779, dated November 5, 1901.

Application filed June 19, 1900. Serial No. 20,794. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. MARSDEN, of Lyon Falls, in the county of Lewis and State of New York, have invented certain new and useful Improvements in Apparatus for Burning or Oxidizing Sulfur; and I 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 numerals of reference marked thereon, which form part of this specification.

The object of my invention is to provide an apparatus for expeditiously and economically burning sulfur in the production of gas, the gas to be used more particularly for the manufacture of acids.

In the drawings, Figure 1 shows a side elevation of my improved apparatus with parts broken out to show details of construction. Fig. 2 shows a vertical central section of parts of the machine. Fig. 3 shows an end view. Fig. 4 shows details of a blast-pipe used in the construction.

Referring to the reference-numerals in a more particular description of the device, 1 indicates a rotary retort provided with encircling grooved tracks 2 2 and mounted in the frames 4 5, provided with rollers 6, 7, and 8, as to frame 4, and similar rollers in frame 5. The retort 1 is provided at one end with the circular mouth or charging-opening 9, of reduced diameter with reference to the body of the retort and axially located with reference to the body of the retort. The mouth 9 is closed by a door 10, mounted upon a hinge and having means for securing it in closed position. The door 10 is provided with a series of holes or perforations 11, providing inlets for air to the retort, and these openings are controlled by a rotary plate 12, centrally pivoted upon the outside of the door and having a series of openings corresponding with those in the body of the door. On the opposite end of the retort from the mouth the retort is provided with a conical portion 13, terminating in a cylindrical discharge end 14. At the discharge end of the retort there is located a section of pipe 15, constituting an oxidizing-chamber connecting with the

dust or settling box 16. The end of the pipe 15 adjacent to the retort is provided with a flanged end 15^a, and on the end of the retort there is provided a laterally-movable ring 16, which is held in contact with the flanged end 15^a by springs 17, interposed between the loose ring 16 and the fixed ring 18 on the end of the retort. The arrangements of these parts is such that the joint between the retort and the oxidizing-chamber 15 is maintained tight.

For giving a rotary motion to the retort there is provided on the retort a large gear-wheel 19, which is engaged by the gear-pinion 20 on the shaft 21. The shaft 21 is mounted in bearings 22 on the upper end of the frame 5, and 23 on a support from the settling-chamber 16. Power is transmitted to the shaft 21 by means of the band-wheel 24. Supported in the upper portions of the frames 4 and 5 is the sprinkler-pipe 25, adapted to direct jets of water onto the body portion of the retort. To the end of the settling-chamber 16 most removed from the retort connection there is attached the discharge-pipe 26, which is connected to a suction fan or blower. Entering the pipe or oxidizing-chamber 15, adjacent to the end of the retort, is a blast-pipe 27, having a series of radial openings 28, from which jets of air are emitted when the device is in operation. The pipe 27 connects with a blast-blower.

The operation of the device is substantially as follows: Raw sulfur or brimstone is placed in the lower portion of the retort through the charging-opening 9 when the door is open. The same is ignited and of course burns. The suction from the blower or pipe 26 causes the air to enter through the openings in the door 10 when the door is closed and furnishes the necessary oxygen for a slow combustion. The retort being rotated by means of the mechanism heretofore described, molten sulfur adheres to and is carried upon the interior surface of the retort, and as the retort makes a revolution the melted sulfur adhering to the walls of the retort is burned off or oxidized. The speed of rotation of the retort is preferably such that the melted sulfur adhering to the inner surface of the retort will completely burn off during the revolution of the retort. The gases and fumes of

the combustion pass out of the discharge end of the retort at 14. At the discharge end of the retort hot gases or fumes are mingled with a fresh supply of air entering through the discharge-openings 28 of the blast-pipe 27, where the combustion or oxidizing is fully completed, particularly with reference to any particles of sulfur that may have passed as far as this point before having become oxidized. The fumes and gases passing into the settling-chamber 16 and passing comparatively slowly through this chamber deposit the dust and foreign matter on the bottom of the settling-chamber before passing out through the pipe 26. The dust and settlings of the settling-chamber 16 may be removed from time to time through the door 28 in the end of the settling-chamber. The process when in operation is continuous—that is to say, the door 10 may be open from time to time and fresh supplies of sulfur put into the retort, preferably in small quantities. The draft-opening in the door may be adjusted to regulate the amount and speed of the combustion in the retort.

In order to prevent the body of the retort from becoming overheated, I provide the spray-pipe 25, having nozzles directed onto the body of the retort, by means of which jets of water may be directed on the retort in quantities sufficient to keep it from overheating. The cooling of the shell of the retort causes a quantity of the molten sulfur to chill more or less and adhere to the shell until it burns off during the revolution.

In addition to the advantages of a rapid and complete combustion for a sulfur-oxidizing device which I claim for this apparatus may be noted the following, which is perhaps not so obvious: In burning sulfur in a stationary retort the molten mass of sulfur can only burn on its surface at the best, and the surface soon becomes foul with volcanic dust which the sulfur contains, hindering and delaying the process and requiring trouble

and inconvenience to remove. In my apparatus the volcanic dust is carried to the top of the retort with the molten sulfur adhering to the inner surface, and as the sulfur burns off the dust falls and comes under the influence of the draft or current of air and gases passing through the retort and is thereby worked out of the discharge end of the retort.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a sulfur-burning apparatus, a horizontal, cylindrical, rotatable retort, having a substantially smooth interior surface not interfering with the flow of the molten contents and having a reduced charging-opening in one end axially located, a reduced discharge opening or outlet at the other end axially located, means for closing the charging-opening and means for producing and regulating the draft through the retort, and means for cooling the shell of the retort as it revolves, substantially as set forth.

2. In a sulfur-burning apparatus, the combination of a horizontal, cylindrical, rotatable retort having a substantially smooth interior surface not interfering with the flow of the molten contents, and having a reduced charging-opening on one end axially located, a reduced discharge opening or outlet on the opposite end, also axially located, a chamber connecting with the discharge end of the retort, means for introducing a blast of air in said chamber at the discharge end of the retort, means for producing and regulating the draft through the retort and means for externally cooling the retort as it rotates, substantially as set forth.

In witness whereof I have affixed my signature, in presence of two witnesses, this 9th day of June, 1900.

JOHN A. MARSDEN.

Witnesses:

B. REED,

JOHN GAFFNEY.