M. MOSER.

SMOKE DISPENSER.

APPLICATION FILED OCT. 18, 1913.

1,128,177.

Patented Feb. 9, 1915.

3 SHEETS—SHEET 1.

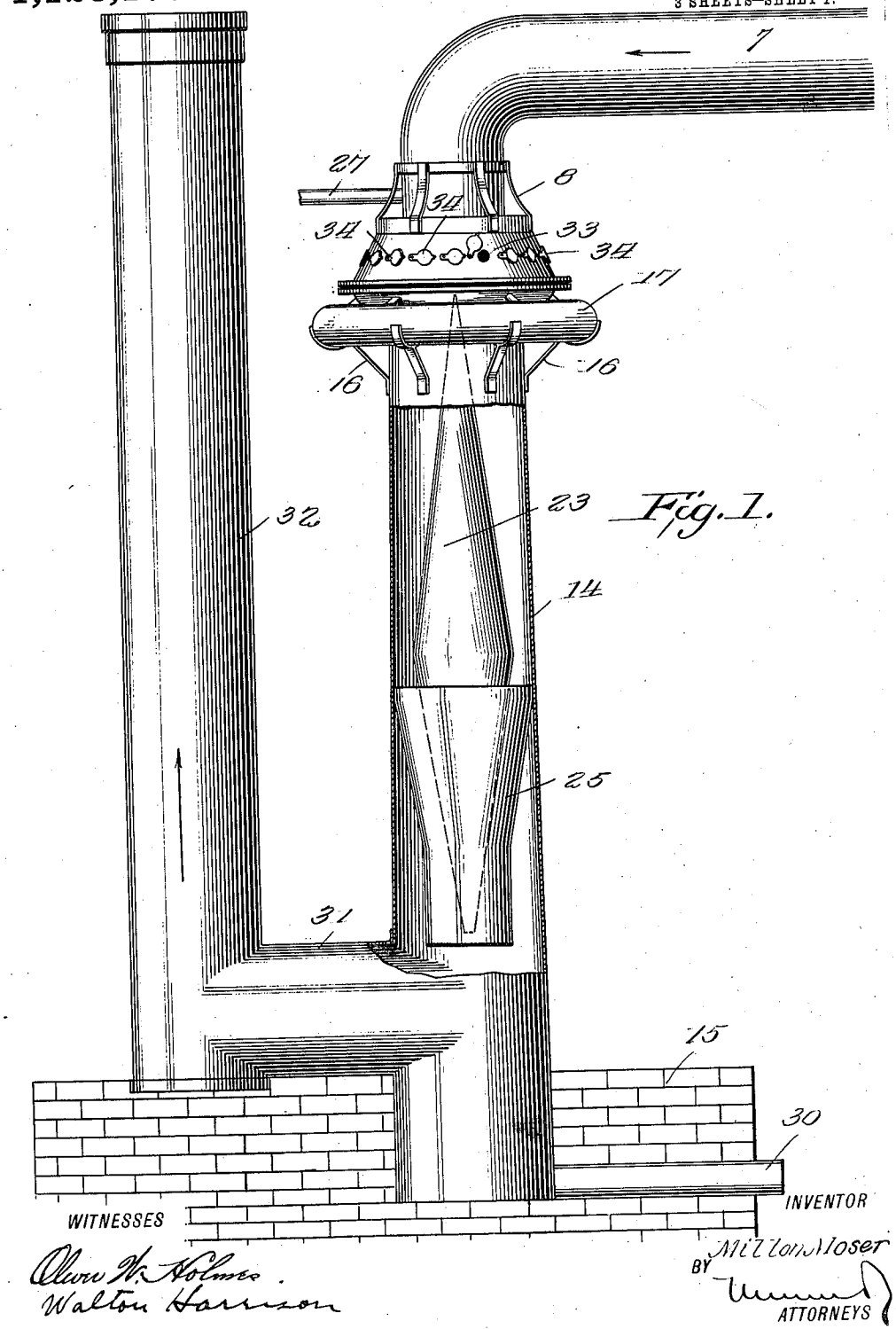


Fig. 1.

WITNESSES

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3 SHEETS—SHEET 2.

Fig. 2.

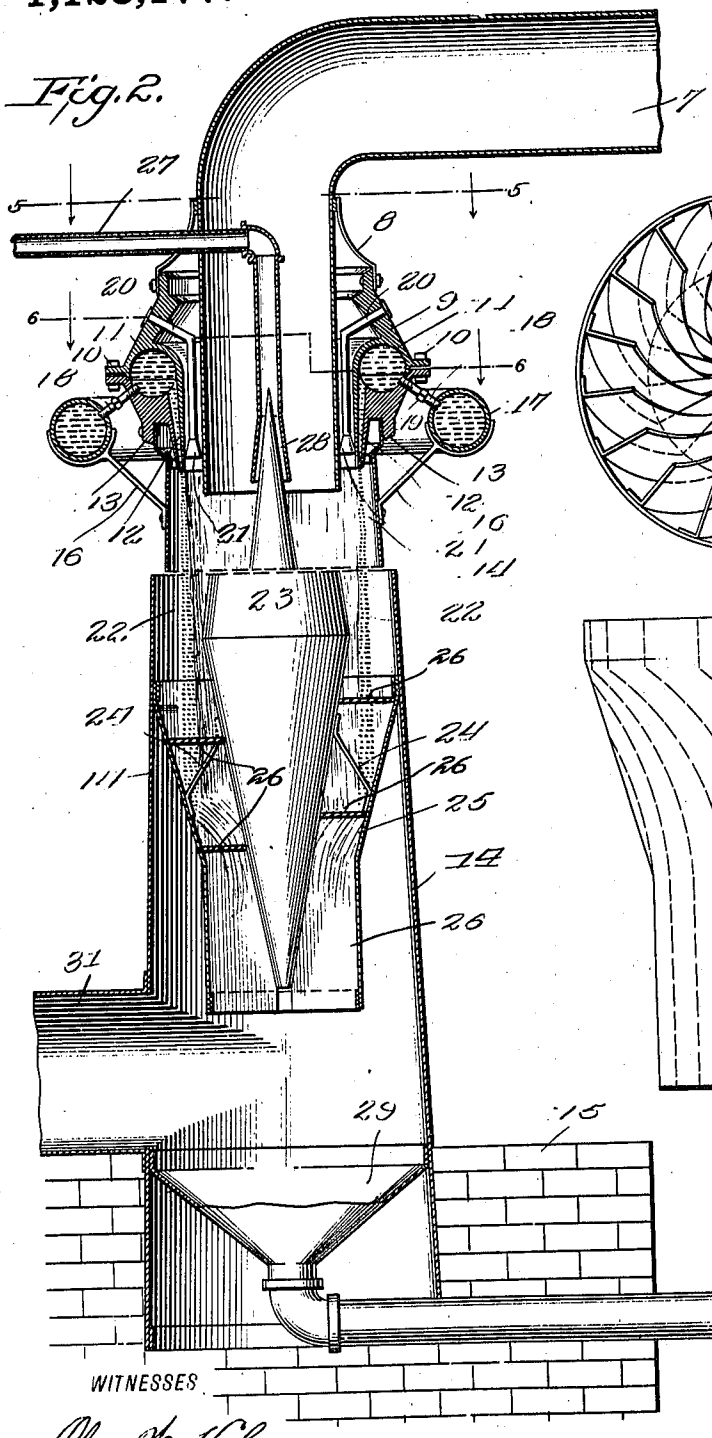
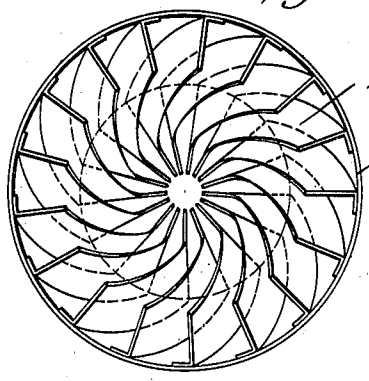


Fig. 3.



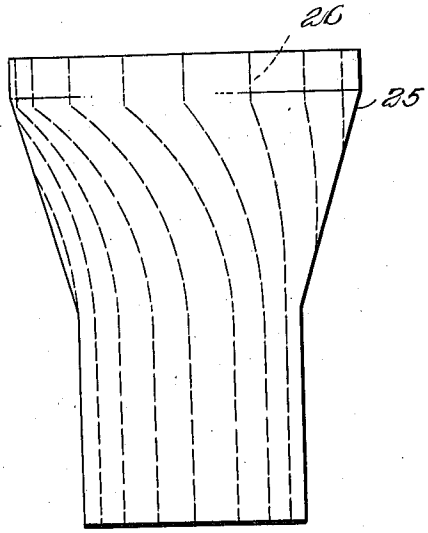


Fig. 4.

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3 SHEETS—SHEET 3.

Fig. 6.

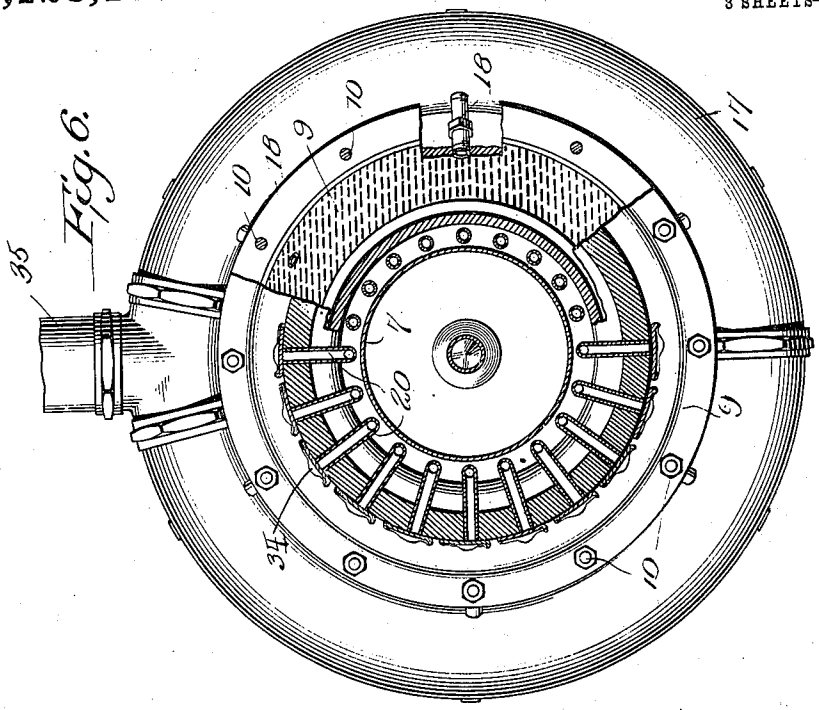
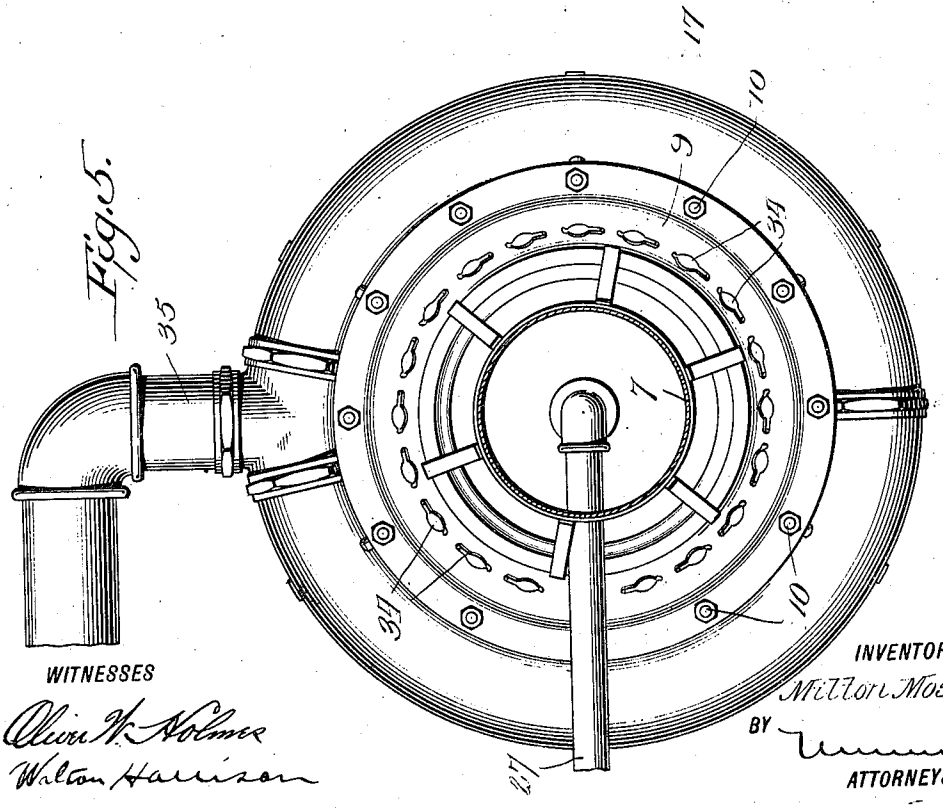


Fig. 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

MILTON MOSER, OF LADYSMITH, BRITISH COLUMBIA, CANADA.

SMOKE-DISPENSER.

1,128,177. Specification of Letters Patent. Patented Feb. 9, 1915.

Application filed October 18, 1913. Serial No. 795,911.

To all whom it may concern:

Be it known that I, MILTON MOSER, a citizen of the United States, and a resident of Ladysmith, British Columbia, Canada, have made certain new and useful Improvements in Smoke-Dispensers, of which the following is a specification.

My invention relates to smoke dispensers of the type in which the smoke, formed in a furnace or analogous structure, is brought into contact with a liquid and thus prevented from being set free in the atmosphere.

More particularly stated, I seek to produce a smoke dispenser adapted for general use, but of peculiar service in connection with smelting furnaces and other analogous devices, and so arranged as to bring the smoke into contact with water under such conditions as to cause the smoke to be absorbed by the water.

My invention further relates to saving the various waste products contained in smoke, and particularly acid fumes and metallic vapors found in the smoke of smelting furnaces, thus not only promoting economy in saving waste material, but also preventing noxious and destructive substances from being allowed to contaminate the atmosphere.

Reference is made to the accompanying drawings forming a part of this specification, and in which like letters indicate like parts.

Figure 1 is a view partly in side elevation and partly in section, showing my smoke dispenser complete. Fig. 2 is a fragmentary central section through the aspirating mechanism forming a part of my device. Fig. 3 is a detail, being a plan view of the centrifugal condenser and separator employed. Fig. 4 is a side elevation of the device shown in Fig. 3. Fig. 5 is a section on the line 5—5 of Fig. 2, looking in the direction of the arrow. Fig. 6 is a section substantially on the line 6—6 of Fig. 2, looking in the direction of the arrow.

A smoke pipe is shown at 7 and may be connected directly to the smoke stack of a furnace. Encircling a vertical portion of the pipe 7 and secured to the latter is a spider 8, and connected rigidly with this spider is a casing 9. This casing is made in halves secured together by bolts 10, and is provided with an annular passage 11. The casing is further provided with a single large annular nozzle 12, fed by the annular passage 11, and extending downwardly therefrom, as will be understood from Fig. 6. The casing 9 is further provided with an annular flange 13, which is secured upon and supported by a tower 14. This tower is of frusto-conical form and is supported upon a pedestal 15 of masonry. Mounted upon the tower 14 are a number of braces 16, and supported upon these braces is a ring 17, this ring being connected by a number of pipes 18 with the casing 9, the pipes extending directly into the annular passage 11.

The pipes 18 are each provided with an angular portion 19 and with threaded ends, so that by applying a wrench to the angular portion and turning the pipe, the ring 17 may be adjusted to some extent relatively to the casing 9. The casing 9 supports a number of air tubes 20, which extend inwardly and downwardly and at their lower ends are provided with nozzles 21.

A cylindrical jet 22 of water is continuously projected downwardly from the annular nozzle 12. A baffle 23, having substantially the form of a double cone, is located within the cylindrical jet 22, and concentric to the same. This baffle is supported upon braces 24, and these braces are supported within a casing 25. Fitted within this casing are a number of blades 26, each being comparatively wide at its bottom and narrow at its top, the peripheral tops of the blades being curved parabolically, as indicated by full lines in Fig. 3, and by dotted lines in Fig. 4.

The lower end of the baffle 23, being conical, is fitted directly against the adjacent inner edges of the lower portions of the blades 26. Encircling the upper end of the baffle 23 is a pipe 27 having a substantially funnel shaped portion 28 which is concentric to the adjacent conical surface of the baffle, as may be understood from Fig. 2.

Located within the bottom of the tower 14 is a funnel 29, and connected with this funnel is a discharge pipe 30. The funnel and discharge pipe are used for the purpose of saving the waste products, as hereinafter described. A pipe 31 is connected with the tower 14 and with a stack 32. This stack rests upon the pedestal 15 and extends upwardly therefrom and at its top opens into the atmosphere. The casing 9 is provided

with a number of openings 33, and located adjacent to each of these openings is a door 34. These doors may be opened to any desired extent by hand, independently of each other (see Fig. 1) and in this manner the capacity of the openings 33 for admitting air to pipe 20, may be controlled at will. The pipe 27 may be connected to a hydraulic supply, and used for the purpose of admitting cold water in order to cool the baffle 23 and various other parts of the tower.

The ring 17, which is essentially an annular tube, is connected with a pipe 35, through which water is supplied into the ring 17. The ring 17 is essentially a distributing ring for supplying water into the annular passage 11, this arrangement being such as to equalize the pressure in the different pipes 18, and thus insure an equal pressure of water in different portions of the annular passage 11. This also insures that substantially equal quantities of water will be discharged from different portions of the nozzle 12.

When water is supplied freely through the pipe 35 and into the hollow ring 17, so as to flow through the pipes 18 into the annular passage 11, this water is discharged in the general form of a cylindrical jet 22, as above stated. The water thus flows essentially in the form of a substantially uniform sheet having the form of a cylinder 22. The water runs down, and at the bottom of this cylinder flows into the casing 25 and is distributed between the various blades 26. At the same time that this occurs, a stream of water from the pipe 27 is distributed over the baffle 23, and flows downwardly upon the same. This supply of water ultimately reaches the blades 26.

The operation of my device is as follows: The parts being assembled and arranged as above described, and the water being turned on, in the pipe 35 and the tube 27, and the smoke from the furnace being directed through the pipe 7, this smoke is brought into minute contact with the water. The smoke as it leaves the pipe 7 is forced into the cylindrical jet 22 of water, the smoke being thus dispensed or condensed. The smoke is further forced into contact with the water as the smoke passes downwardly over the baffle 23. Any smoke not thus condensed is condensed in passing, with the water, through the casing 25. The water, being virtually spread into the form of a thin sheet, has a comparatively large surface which is brought into minute contact with the smoke. The smoke is thus absorbed by the water.

The forcible discharge of water from the nozzle 12 produces an aspirating effect upon the air contained in the casing 9, and the tower 14, so that this air is formed into a down draft. This down draft, by suction, draws smoke continuously into and through the pipe 7. As the down draft, permeated of course with the smoke and the impurities appearing as ingredients in said smoke, passes downwardly through the casing 25, it is given a whirling motion by virtue of the form of the blades 26. The water, now containing the smoke held by absorption if not in solution, drops into the funnel 29 and is discharged into the pipe 30. From the water thus discharged any valuable ingredients present may afterward be separated by evaporation or by any other suitable manner, and thus saved. The residuum of the smoke, containing mostly air and carbonic acid gas, now passes over into the stack 32 and thence makes its escape into the atmosphere.

I find that owing to the shape of the blades 26, the whirling motion they give to the down draft facilitates the absorption of the smoke by the water. I also find that a little air admitted through the air tubes 20 facilitates this purpose.

I do not limit myself to the precise mechanism shown, as variations may be made therefrom without departing from the spirit of my invention.

I claim:—

1. A smoke dispenser comprising a tower, means for discharging smoke thereinto, a conical baffle within said tower, means for discharging water in the form of a cylindrical jet within said tower, in order to cause the water to present a large surface, a casing surrounding a portion of the baffle, and curved blades in the casing and engaging the baffle.

2. A smoke dispenser comprising a smoke pipe, a casing mounted thereupon, and provided with an annular passage, a ring encircling said casing and communicating with said passage, means for connecting said ring to a water supply in order to fill said ring with water and to fill said passage from said ring, a nozzle carried by said casing and communicating with said passage, said nozzle being arranged to discharge a jet of water substantially in the form of a cylinder, a baffle disposed adjacent to said nozzle for the purpose of directing smoke into contact with said jet, a tower encircling said nozzle, mechanism connected with said tower for removing therefrom a supply of water in which smoke is absorbed, and means for discharging from said tower the residuum of said smoke.

3. A device of the character described comprising a smoke pipe, a casing encircling the same, a plurality of air tubes extending through the wall of said casing for admitting air thereinto, a plurality of doors for controlling the supply of air through said air tubes, a tower connected with said casing, means for discharging water in the

form of a cylinder in order to cause said water to spread into the form of a sheet, and mechanism for collecting the water after it absorbs ingredients from the smoke.

4. A device of the character described comprising a tower, a baffle having substantially the form of a double cone and mounted therein, a smoke pipe for discharging smoke against said baffle, means for discharging water in the form of a cylindrical jet encircling said baffle, so as to bring said water into contact with said smoke, a casing surrounding a portion of the cone, and curved blades in the casing and engaging the baffle.

5. In a device of the character described, a tower, a casing on the upper end of the tower and having an annular nozzle discharging into the tower, means for delivering water to said nozzle, a smoke pipe extending into the casing within the nozzle, air-passages between the nozzle and smoke pipe, and means in the tower for spreading the water into a thin sheet as it passes down through the tower.

6. In a device of the character described, a tower, a casing on the tower and having an annular nozzle, means for delivering water to said nozzle, a smoke pipe extending into the casing within the nozzle, a baffle in the tower below the smoke pipe, and a plurality of curved blades surrounding the baffle and contacting therewith.

7. In a device of the character described a tower, a casing on the tower and having an annular nozzle and air passages, closures for said passages, means for delivering water to the nozzle, a smoke pipe extending into the casing within the nozzle, a baffle in the tower and having conical upper and lower ends, a water pipe into which the upper conical end of the baffle extends, and a plurality of curved blades surround the lower conical portion of the baffle and contacting therewith.

8. In a device of the character described, a casing adapted to be secured to the upper end of the tower and having an annular water chamber and an annular nozzle communicating with said water chamber, a ring-like chamber surrounding the casing, and tubes connecting the said chamber and serving to adjust the ring-like chamber relatively to the casing.

MILTON MOSER.

Witnesses:
JOHN BONNET,
GRIFFITH TIMOTHY.