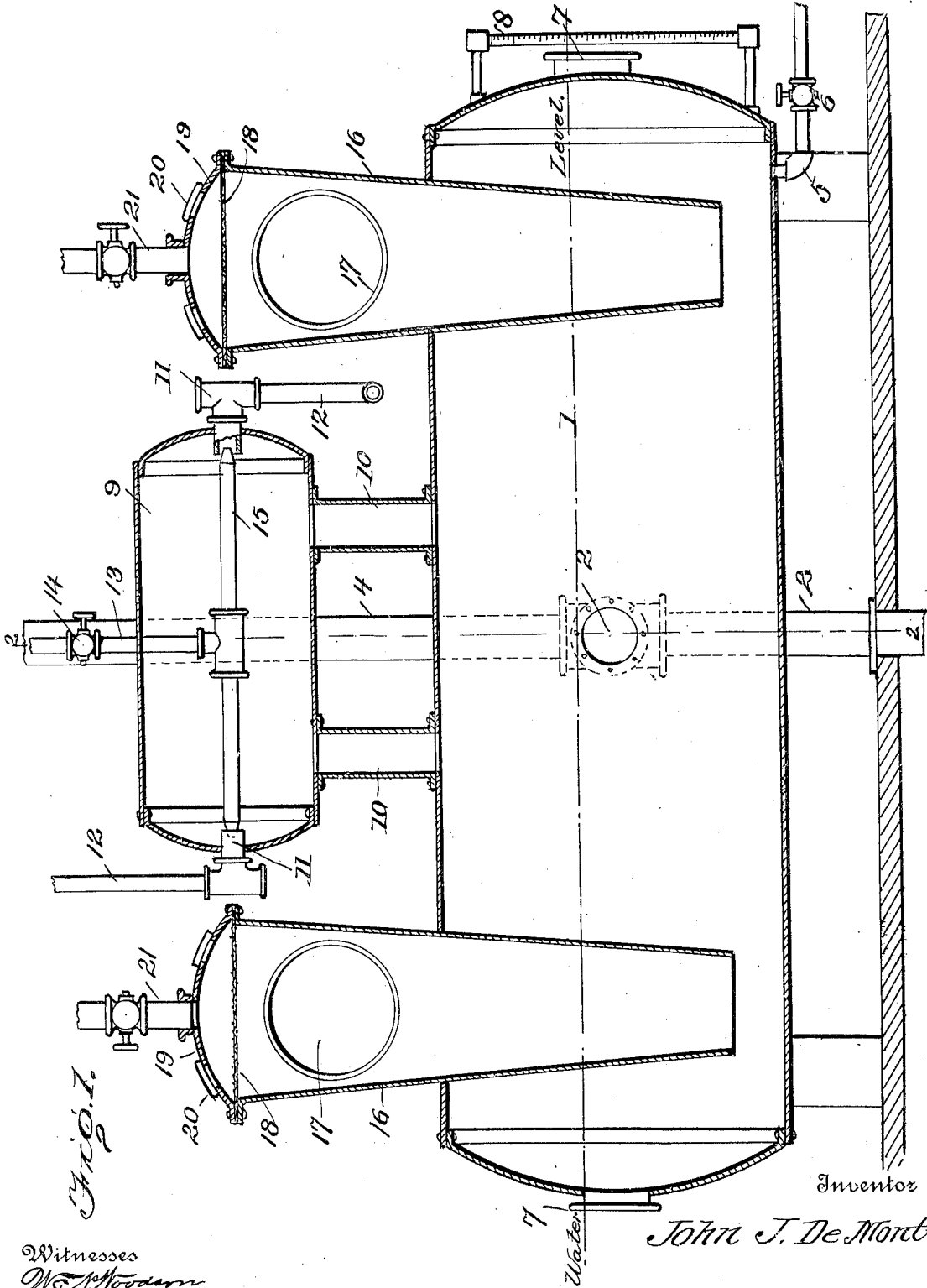


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SMOKE CONSUMER AND FUME ARRESTER.
APPLICATION FILED MAR. 16, 1912.

1,056,011.

Patented Mar. 18, 1913.

2 SHEETS—SHEET 1.



Inventor

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Witnesses

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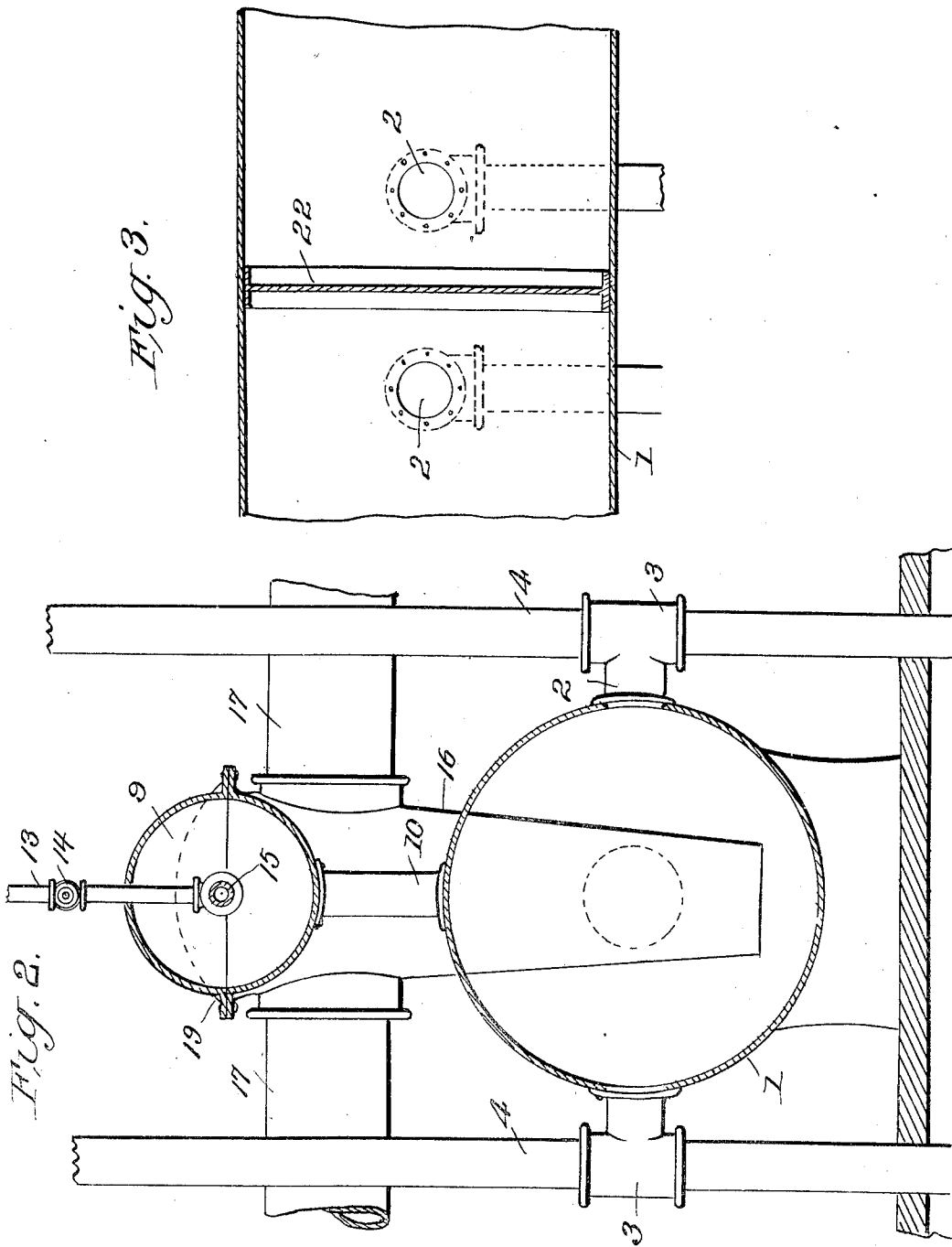
Edmund Speer

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UNITED STATES PATENT OFFICE.

JOHN J. DE MONT, OF BAYONNE, NEW JERSEY.

SMOKE-CONSUMER AND FUME-ARRESTER.

1,056,011.

Specification of Letters Patent.

Patented Mar. 18, 1913.

Application filed March 16, 1912. Serial No. 684,262.

To all whom it may concern:

Be it known that I, JOHN J. DE MONT, citizen of the United States, residing at Bayonne, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Smoke-Consumers and Fume-Arresters, of which the following is a specification.

This invention relates to apparatus for arresting smoke and fumes arising from furnaces of various kinds and has for its object the provision of a simply constructed apparatus by which the obnoxious fumes and smoke arising from manufacturing plants, smelters, garbage crematories, and similar establishments will be diverted from their ordinary escape through the outer end of the smoke stack, and subsequently treated so that the heavier particles will be precipitated and the gases and fumes purified.

The invention consists in certain novel features which will be hereinafter fully described and then particularly claimed, and is illustrated in the accompanying drawings, in which:—

Figure 1 is a longitudinal section of a fume arrester embodying my improvements. Fig. 2 is a transverse section on the line 2—2 of Fig. 1. Fig. 3 is a detail sectional view showing a slight modification.

In carrying out my invention I employ a receiving tank or drum 1, which may be of any desired form and dimensions, determined by the capacity of the furnace or furnaces to which it is attached and the conditions surrounding its location. This drum is preferably provided at its sides with outlets or discharge tubes 2 leading into a sewer or other place of deposit. The outlets 2 are open and are located at about the horizontal plane of the center of the drum, so as to maintain a uniform level within the drum and permit the scum and matter rising to the surface of the water to pass automatically and continuously through the outlets and be carried off to the sewer. The outlets 2 are provided with unions 3 from which rise vent tubes 4 which may extend to any desired height and are open at their upper ends to permit the escape of air and thereby prevent combustion within the sewer or other body or conduit, into which the waste matter is discharged. At the bottom of the drum or receiving tank I provide a drain

pipe 5 which is normally closed by a valve 6 and which may be opened to drain off the contents of the tank when it is desired to clean the same. The tank is provided with heads of ordinary construction at its opposite ends and in each head I provide a man-hole 7, through which access may be had to the tank to remove the sediment which may collect at the bottom of the same. A gage tube 8 is also provided on the end of the tank or other convenient point, so that the water level within the tank may be always known and the flow of water into the tank regulated to prevent the same rising above the outlets.

Above the receiving tank 1, I provide a gas collecting tank 9 which communicates with the receiving tank through short pipes or hollow standards 10, which also serve as supports for the gas collecting tank. Outlet tubes 11 are secured in the opposite ends of the tank 9 and gas conveying pipes 12 lead from the said outlet tubes to any point where it is desired to use the gases or to further treat the same, as may be demanded. An air supply pipe 13 leads into the gas collecting tank 9 and is equipped with a valve 14 whereby the flow of air may be set up or arrested and regulated according to circumstances. The lower end of this air supply pipe 13 is equipped with laterally extending nozzles 15 which have their ends arranged concentrically within but spaced from the ends of the outlet tubes 11, so that when the flow of air is set up through the pipe 13, the air under pressure will escape from these nozzles 15 with considerable velocity and thereby create a siphonic action so that the gas within the tank will be drawn into the outlet tubes and caused to pass through the conveying pipes 12.

At the ends of the receiving tank 1 and entering the same through the top thereof, I provide downwardly tapered flues 16 which terminate within the tank and near the bottom thereof, as clearly shown. The flues 17, leading from the furnace or smelter, communicate directly with the interior of the downwardly extending flue 16 at the upper end thereof so that the smoke and fumes will pass through the said flues 17 and 16 directly into the receiving tank and be discharged at the bottom thereof. The number of flues 17 will, of course, be com-

mensurate with the number of furnaces in the plant equipped with my apparatus and the dimensions of the several parts will be determined by the same conditions. At the upper end of each flue 16, above the points of connection of the flues 17 therewith, I provide a screen 18 and over the said screen I secure a dome or cap 19 equipped with hand-holes 20 to facilitate the removal of any matter which may collect upon the screen. Secured centrally to the dome or cap 19 is a water pipe 21 through which water is supplied to the apparatus.

The water coming through the pipe 21 under pressure will be discharged upon the screen 18 with considerable force and will be broken up by the screen into a number of fine streams or jets so that the water will escape below the screen in the form of a spray flowing at a high speed. A suction will consequently be created through the downwardly extending flue 16, by which the fumes and smoke will be drawn through the flue 17 and into the receiving tank and the draft through the furnace also accelerated. The water and the products passing through the flue 17 will, of course, be discharged against the bottom of the receiving tank and will be collected therein, the gases being separated from the heavier particles and rising through the tubes 10 into the gas collecting tank, whence they will be drawn off through the pipes 12, as before described. The water will rise in the tank to the level of the outlets 2 and will then flow slowly through the same and pass off to the sewer or be otherwise disposed of. The screen 18 at the upper end of the inlet flue 16 not only serves to break up the body of water into a fine spray, but also arrests any foreign matter which may be in the water, so that said matter will not pass into the tank and become commingled with the more valuable particles which are caught therein. The spray of water coming in contact with the heated gases or smoke from the flues 17 will suddenly cool the same and precipitate the particles of unconsumed carbon and other heavier matter which will be collected at the bottom of the receiving tank, while the lighter gases will arise to the top of the tank and pass through the tubes 10, as stated.

The residuum or heavier particles settling in the receiving tank frequently contain valuable matter and after a sufficient quantity thereof has been accumulated in the tank it may be removed through the manholes 7 and suitably treated to separate and save the valuable portions. The light waste matter will form a scum upon the surface of the water in the tank 1 and will pass out continuously through the outlet tubes 2 and this movement of the waste matter will be facilitated by reason of the inlet flues being located at the ends of the tank, while the gas outlets are located at an intermediate point of the tank, and consequently there is a circulation from the flues inwardly toward the gas outlets, and the waste outlet 2 is located approximately in the line of this circulation or draft.

My apparatus is exceedingly simple in its construction and the arrangement of its parts so that it may be installed in any plant at a low cost. By the use of my apparatus the obnoxious and deleterious fumes and smoke rising from smelters and similar structures will be prevented from escaping into the open air and will be treated so that the injurious effects upon surrounding vegetation and property will be entirely overcome, and the valuable matter which has been permitted to pass off with the fumes and lost may be recovered.

In Figs. 1 and 2 I have shown the outlet tubes 2 as arranged at the center of the receiving tank and on opposite sides of the same. It may sometimes be desirable to arrange the tank so that one set of flues may be shut down, while the other set is permitted to operate and in this event a transverse partition 22 may be secured within the drum at the center of the same and the outlet tubes 2 arranged at opposite sides of the said partition.

Having thus described my invention, what I claim as new, is:—

1. In an apparatus for the purpose set forth, the combination of a receiving tank, inlet flues at the ends thereof terminating near the bottom of the same, water supply pipes communicating with said flues through the upper ends thereof, a gas collecting tank above the receiving tank and communicating therewith at an intermediate point of its length, gas conveying pipes leading from the said gas collecting tank, and an air injector extending into the said tank, and arranged to discharge into the gas conveying pipes.

2. In an apparatus for the purpose set forth, the combination of a receiving tank, flues entering the same to supply smoke and fumes thereto, a gas collecting tank communicating with the receiving tank, gas outlet tubes in the said collecting tank, and an air blast pipe equipped with nozzles disposed concentrically within but spaced from the ends of said gas outlet tubes.

3. In an apparatus for the purpose set forth, the combination of a receiving tank, flues passing through the top of the tank at the ends thereof and terminating near the bottom thereof to supply smoke and fumes thereto, means at the tops of said flues to create suction therethrough, a waste outlet

on the side of said tank, a gas collecting
tank disposed above the receiving tank, hol-
low standards supporting said gas collect-
ing tank upon the receiving tank and form-
5 ing means of communication between the
same, and gas conveying tubes leading from
the gas collecting tank.

In testimony whereof I affix my signature
in presence of two witnesses.

JOHN J. DE MONT. [L. S.]

Witnesses:

D. E. DE MONT, .

CHARLES WILLIAM MAHNKEN.