

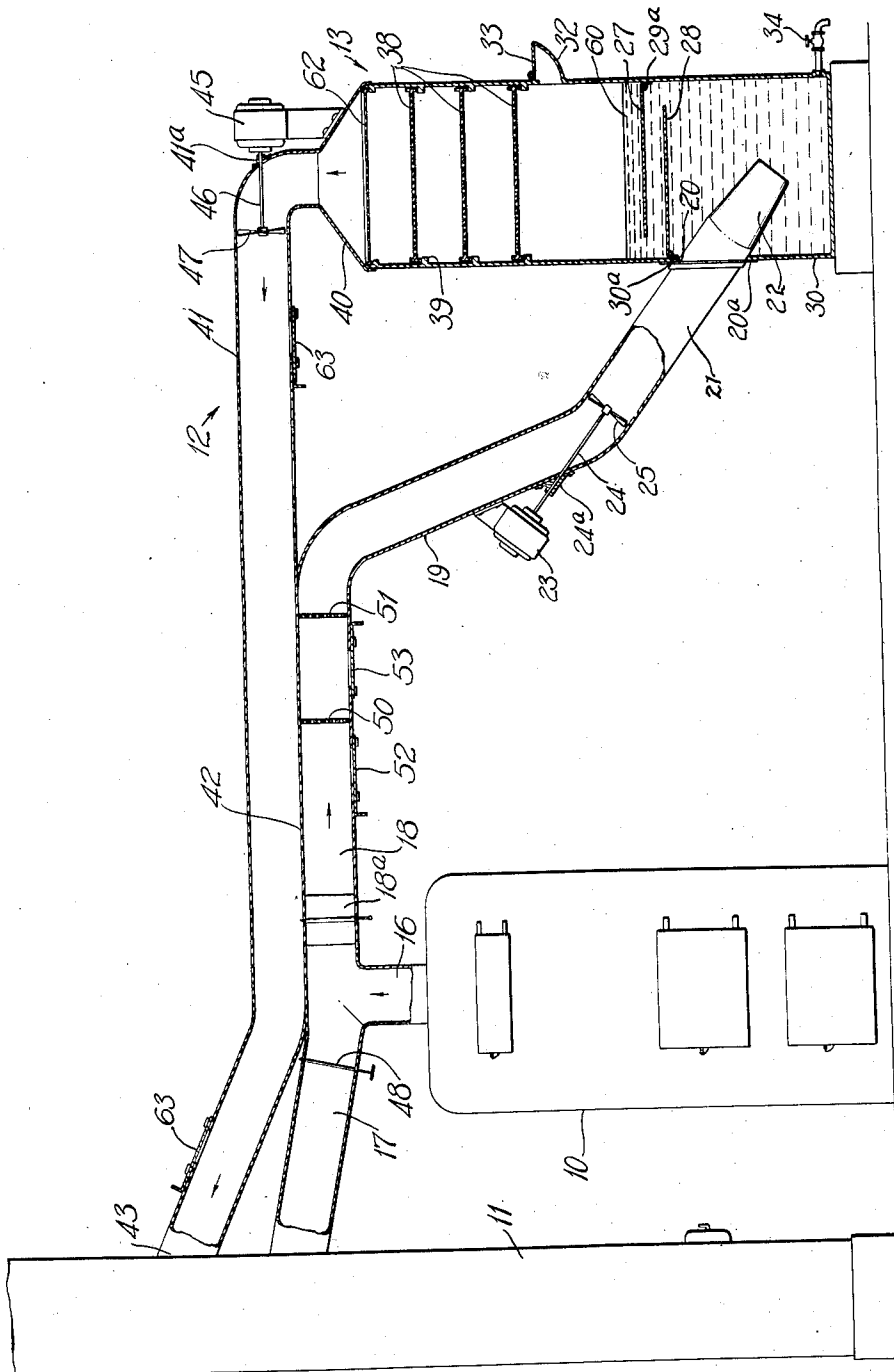
July 3, 1934.

M. D. GILBERT

1,964,794

SMOKE TREATING APPARATUS

Filed Oct. 20, 1931



INVENTOR.

Meyer D. Gilbert

BY *Wm. J. Finckelstein*
ATTORNEY

UNITED STATES PATENT OFFICE

1,964,794

SMOKE TREATING APPARATUS

Meyer D. Gilbert, New York, N. Y.

Application October 20, 1931, Serial No. 569,901

4 Claims. (Cl. 183—13)

This invention relates to smoke treating apparatus and is particularly directed to apparatus for eliminating the harmful and obnoxious gases and particles, such as the sulphur dioxide, carbon monoxide, and the like substances, commonly present in the smoke issuing from coal and oil burning furnaces and which pollute the air.

Among the objects of this invention is to provide a compact and rugged apparatus of the character described, which shall be comparatively inexpensive to manufacture and install, comprise few and simple parts, smooth and positive in operation and practical and efficient to a high degree in use.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of application will be indicated in the following claims.

In the accompanying drawing, in which is shown one of the various possible illustrative embodiments of this invention,

The figure is a side elevational view of my apparatus with parts shown in cross-section.

Referring now in detail to the drawing, 10 designates a furnace and 11 the smoke stack therefor, equipped with apparatus 12 embodying the invention for eliminating the harmful particles and gases and otherwise purifying the smoke so as to remove the air polluting substances, and gases therefrom.

The apparatus comprises a tank or chamber 13 and means for circulating the product of combustion from the furnace to said tank and from said tank back to the smoke stack 11. To this end there extends upwardly from the furnace 10, a pipe 16 communicating with the combustion chamber for receiving the smoke and gases from said chamber. A pipe 17 serves to interconnect the pipe 16 with the smoke stack 11. Communicating with said pipe 16 is a substantially horizontal pipe or conduit 18 from which extends a downwardly inclined pipe or conduit section 19 leading into the tank 13. Extending from said pipe portion 19 into said tank 13, through an opening 20 formed therein, is a pipe portion 21 preferably terminating in an end portion 22 of substantially elliptical cross-section. Mounted on the pipe section 19 or on any other suitable support is a motor 23 having a shaft 24 extending into pipe portion 21 through a suitable bearing 24a and to the outer end of said shaft

is attached a fan 25 adapted to draw the smoke from the furnace and blow the same into the tank. A flange 20a serves to seal the opening 20 to render the tank water-tight.

Mounted within said tank 13, are a plurality of baffles 27 and 28 hinged to the side walls 29 and 30 of the tank, as at 29a, 30a, respectively. The tank may be provided at about the mid-height thereof, with a mouth portion 32 having a door or closure 33, to permit the introduction of liquid into said tank. A draw-faucet 34 may be provided at the bottom of the tank for draining the liquid therefrom. A plurality of parallel apertured shelves or trays 38 may be removably mounted on shelves 39 within the tank, said shelves being removable from the tank for cleaning and replacement, through any suitable door on said tank. The top of the tank may be closed by a conical hood 40 to the top of which is attached a pipe or conduit 41, communicating with the interior of the tank, and running alongside the pipe 18. Preferably the pipe sections 18 and 41 have a common wall 42 to permit heat to readily pass from pipe 18 to said pipe 41, so that the treated smoke issuing out of the smoke treating apparatus as it passes through the conduit 41 is reheated and thus further purified and attenuated before it issues into the air. The pipe 41 is preferably connected as at 43 with the smoke stack 11. A motor 45 mounted on a tank 13 is provided with a shaft 46 extending into the pipe 41 through a bearing 41a, and attached to the end of said shaft 46 is a fan 47 adapted to draw the smoke and the like products from the tank, and blow the same through the pipe 41 into the smoke stack 11.

A damper 48 interposed in the pipe 17 serves to cut off direct communication between the furnace and the smoke stack whereby the smoke may be made to circulate through the pipe 18, the tank 13, and the pipe 41. A damper 18a interposed in pipe 18, adjacent pipe 16, serves to cut off flow of smoke to the tank as for example, when damper 48 is opened to permit the smoke to pass directly to the smoke stack. A pair of spaced screens or apertured discs 50 and 51 may be interposed in the pipe 18 for catching particles in the smoke, and said screens may be cleaned by means of sliding valves 52 and 53 mounted adjacent said screens.

The solution 60 in the tank may comprise any suitable substances, preferably oxidizing agents such as sulphuric acid, potassium permanganate, lime and the like chemicals, and water for changing the carbon monoxide gases to carbon dioxide

gases and the like purposes. On the shelves 38 there may be placed charcoal, calcium oxide, calcium chloride, or the like chemicals for purifying and absorbing the gases. The level of the solution is preferably slightly above the upper baffle 27 so as not to unduly restrict or retard circulation of the smoke and gases through the tank.

It will now be seen that with the damper 48 closed, and damper 18a open, the smoke will flow in the direction of the arrows on the drawing, through pipe sections 18, 19, 21 and 22, to the bottom of the tank and circulate through the solution 60 around the baffles 27, 28. The treated smoke and like gases may then pass upwardly through the apertures of the trays 38, thus coming in contact with the chemicals thereon. A screen 62 preferably of fabric at the upper end of the tank serves to further eliminate small particles from the smoke. With the motors 23 and 45 operating, the fans serve to force the smoke through the liquid and through the trays 38 thus insuring a proper circulation. One or more small valve openings 63 may be formed in the pipe 41 and serve to admit air into the said pipe. The direction of passage of the gases, it will be noted, is such as to draw air into said pipe through the open valve 63. The treated smoke and gases within the pipe 41, will be heated by the smoke and gases in the pipe 18 to further purify the gases and maintain the proper temperature within the smoke stack 11 to insure a proper draft.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved, and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiment set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawing, is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In apparatus for treating smoke, a tank

adapted to hold smoke treating solutions in the bottom portion thereof, means for feeding smoke into the bottom of the tank, comprising a pipe having a nozzle inclined downwardly and extending into the tank through the side wall thereof, and a pair of baffle plates hinged to opposite wall portions of said tank and disposed above said nozzle.

2. In apparatus for treating smoke, a tank adapted to hold smoke treating solutions in the bottom portion thereof, means for feeding smoke into the bottom of the tank, comprising a pipe having a nozzle inclined downwardly and extending into the tank through a side wall thereof, and a pair of baffle plates hinged to opposite wall portions of said tank and disposed above said nozzle, and means for forcing the smoke through said pipe into said tank, said last named means comprising a motor mounted on the outside of said pipe and having a shaft extending into said pipe, and fan blades at the end of said shaft and within said pipe.

3. In apparatus for treating smoke, a tank adapted to hold smoke treating solutions in the bottom portion thereof, means for feeding smoke into the bottom of the tank, comprising a pipe having a nozzle inclined downwardly and extending into the tank through a side wall thereof, and a pair of baffle plates hinged to opposite wall portions of said tank and disposed above said nozzle, the end of said nozzle being flattened to provide a narrow nozzle opening.

4. In apparatus for treating smoke, a tank adapted to hold smoke treating solutions in the bottom portion thereof, means for feeding smoke into the bottom of the tank, comprising a pipe having a nozzle inclined downwardly and extending into the tank through a side wall thereof, and a pair of baffle plates hinged to opposite wall portions of said tank and disposed above said nozzle, and a plurality of apertured trays adapted to carry smoke treating chemicals removably mounted in the upper portion of said tank.

MEYER D. GILBERT.

50

125

55

130

60

135

65

140

70

145

75

150