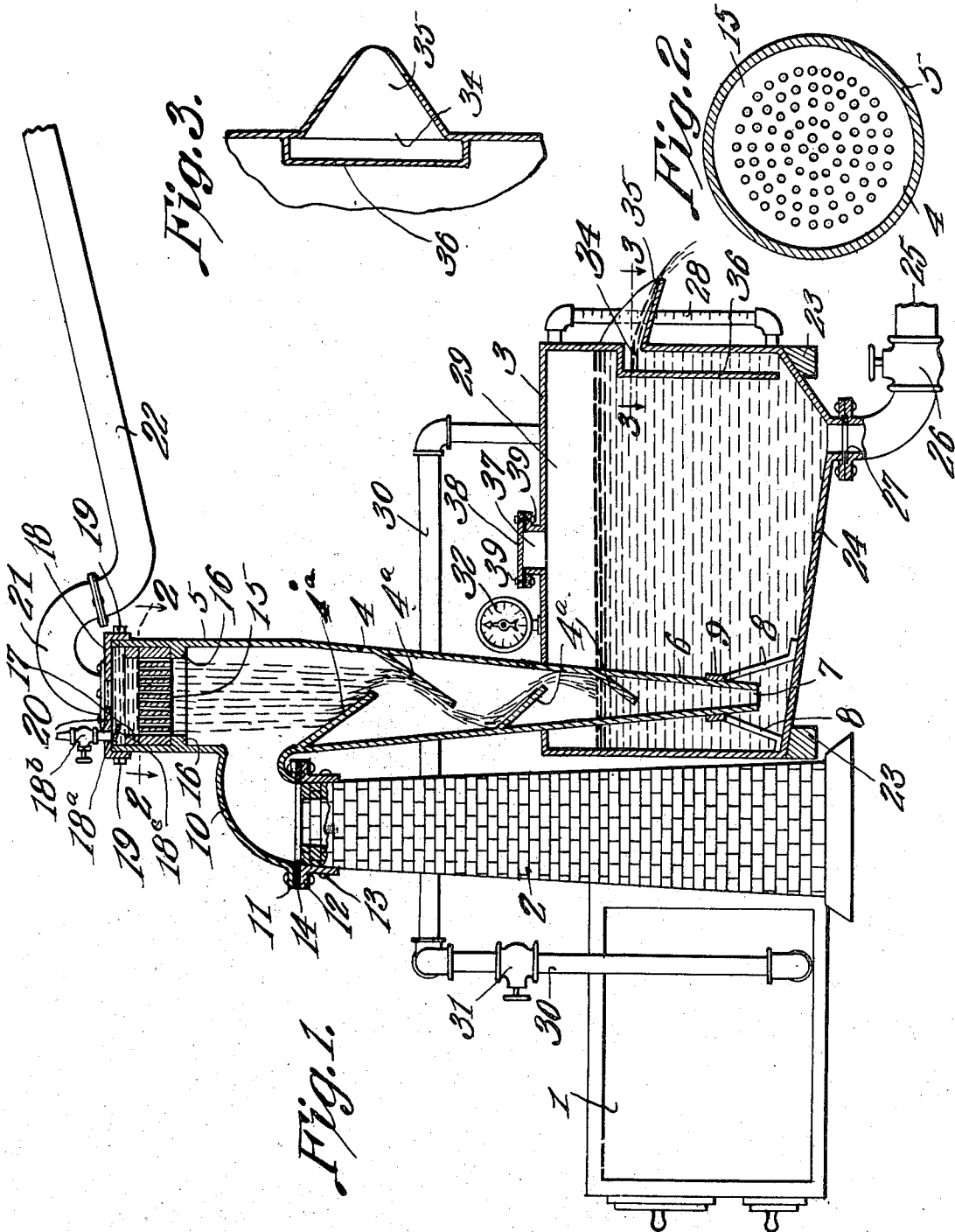


F. WHITE.
SMOKE NEUTRALIZER.
APPLICATION FILED OCT. 19, 1910.

1,027,951.

Patented May 28, 1912.



Witnesses

J. R. Tomlin
R. S. Badwell.

Frank White
Inventor

by *Cashworth*
Attorneys

UNITED STATES PATENT OFFICE.

FRANK WHITE, OF ANGELS CAMP, CALIFORNIA.

SMOKE-NEUTRALIZER.

1,027,951.

Specification of Letters Patent.

Patented May 28, 1912.

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To all whom it may concern:

Be it known that I, FRANK WHITE, a citizen of the United States, residing at Angels Camp, in the county of Calaveras and State of California, have invented a new and useful Smoke-Neutralizer, of which the following is a specification.

It is the object of this invention to provide a smoke washer for smelters and the like, embodying novel means for delivering the water whereby the smoke is washed, novel means for disposing of the heavier particles which may be held in suspension by the smoke, and novel means for handling the gases which pass through the washer.

The device herein disclosed, is designed for use under conditions which render desirable, the particular combination of parts hereinafter described, and under conditions which demand the specific mode of operation set forth. The structure aims to minister to particular needs, both as to structure and as to method of operation, and with this specific end in view, I have not hesitated to sacrifice high efficiency, the degree of the efficiency being immaterial, compared with other advantages which the structure presents to those with whom the structure and method of operation are of primary importance.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings,—Figure 1 shows the invention in vertical longitudinal section, parts being depicted in elevation; Fig. 2 is a horizontal section upon the line 2—2 of Fig. 1; and Fig. 3 is a fragmental section on the line 3—3 of Fig. 1.

In the drawings, a portion of a furnace is shown, and denoted by the numeral 1, the furnace communicating with a stack 2. To the top of the stack 2, a flanged plate 12 is secured, as shown at 13, a gasket 14 resting upon the plate 12, the gasket and the plate supporting the flange 11 of an elbow 10, secured to or formed integrally with an upright, conical discharge pipe 4, the larger end 5 of which is upwardly extended above

the stack 2, the smaller end 6 of the discharge pipe entering a closed-top tank 3, suitably supported, as shown at 23, the outlet 7 of the discharge pipe being positioned in close relation to the conical bottom 24 of the tank 3, the discharge pipe being supported by means of braces 8, united at their lower ends with the bottom 24 of the tank, and at their upper ends united with a ring 9, surrounding the lower portion of the discharge pipe.

Located within the discharge pipe 4, and positioned between the top of the stack 2 and the outlet 7 of the discharge pipe, are perforated, inclined baffle plates 4^a, discharging one upon the other. In the larger end 5 of the discharge pipe 4, and preferably positioned above the elbow 10, is a shoulder 16, supporting a screen 15, held in place by a removable ring 17. The upper end of the discharge pipe 4 is closed by a cap 18, held in place by means of clamp bolts 19 or the like. In the cap 18 there is an air vent pipe 18^a, supplied, upon the exterior of the cap 18, with a cut off valve 18^b, there being a flap valve 18^c, located within the discharge pipe, and closing, outwardly, over the inner end of the air vent pipe 18^a. By means of bolts 20 or the like, a curved pipe connection 21 is secured to the cap 18, the connection being united with an inclined water supply pipe 22.

To the apex of the conical bottom 24 of the tank 3, a water discharge pipe 25 is secured, the pipe 25 being suitably packed, as shown at 27, where it unites with the bottom of the tank. In the discharge pipe 25 there is a cut off valve 26. To one end wall of the tank 3, an arched plate 36 is secured, this plate defining, together with the end wall of the tank, a passage, the passage having an outlet 34 through the end wall of the tank, discharging upon an inclined spout 35. A pipe 30 communicates at one end with the upper portion of the tank 3, the pipe 30 at its other end, communicating with the furnace 1. This pipe 30 is provided with a suitable valve 31, so that the return of air and gases from the tank to the furnace, may be manually controlled. The tank 3 may be equipped with a suitable gage glass 29, so that the height of water in the tank may be determined. There is upon the top of the tank 3, a pressure gage 32, operable by the gases which may accumulate in the pressure space 29, existing

between the water in the tank and the top of the tank. The tank 3 has a hole 37, closed by a cover 38, held in place by suitable locking mechanism 39.

5 The operation of the device as hereinbefore described, is as follows. The products of combustion, proceeding from the furnace 1, will enter the stack 2, and pass, through the elbow 10, into the discharge
10 pipe 4. The water, entering the discharge pipe 4 through the water supply pipe 22, will pass through the screen 15, and become finely divided. This body of finely divided
15 liquid, falling in the discharge pipe 4, will create a draft in the discharge pipe, the products of combustion delivered into the discharge pipe from the furnace, being carried downwardly through the outlet 7 of
20 the discharge pipe. The heavier material, carried in suspension in the smoke, will form a slime upon the bottom 24 of the tank, which slime may, from time to time, be drained away through the pipe 25, by opening the valve 26, the conical bottom 24
25 facilitating a discharge of the slime into the pipe 25. The water, rising through the passage defined by the arched plate 36 and the adjacent end wall of the tank, will flow through the outlet 34 upon the spout 35,
30 the water thus finding its way out of the tank. The lighter portions of the smoke, rising through the water in the tank 3, will be thoroughly washed, the lighter portions of the smoke passing through the pipe 30
35 into the furnace 1. As air is continually supplied to the furnace 1 for combustion purposes, the pressure of this air, added to that of the gases entering the furnace by way of the pipe 30, will continually in-
40 crease. As will be understood readily, the cover 38 may be temporarily loosened, if desired, in order to provide a vent for the tank 3.

When the operation hereinbefore de-

scribed is carried out, smelter and other 45
smokes may be cleansed readily of their harmful material, the gas passing through the pipe 30 being innocuous, after receiving a thorough washing in the discharge pipe 4, and in the tank 3. When it is desirable so 50
to do, the heavier portions of the smoke may be saved for commercial use or for analysis, by draining away the slime from the bottom 24 of the tank.

Having thus described the invention, what 55
is claimed is:—

An apparatus for removing the solid particles from the products of combustion of a furnace, and for effecting an intermittent oxidization of the carbon monoxid therein, 60
the apparatus comprising a furnace; a tank having a water outlet and a lower outlet for the slime; a pipe receiving the products of combustion from the furnace and entering the tank, the pipe having a discharge 65
end located within the tank below the water outlet and above the slime outlet; means for supplying water to the pipe; a pipe entering the tank above the water outlet and communicating with the furnace to return 70
the gaseous products of combustion thereto and to effect an oxidization of the carbon monoxid; a gage for indicating the back pressure in the tank; and a valve in the slime outlet adapted to be closed to main- 75
tain the water in the tank above the discharge end of the first specified pipe, and to be opened to drain the tank below said discharge end and below the water outlet, thereby to relieve the back pressure in the 80
tank.

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

FRANK WHITE.

Witnesses:

F. GORMAN,
WM. D. POOLE.