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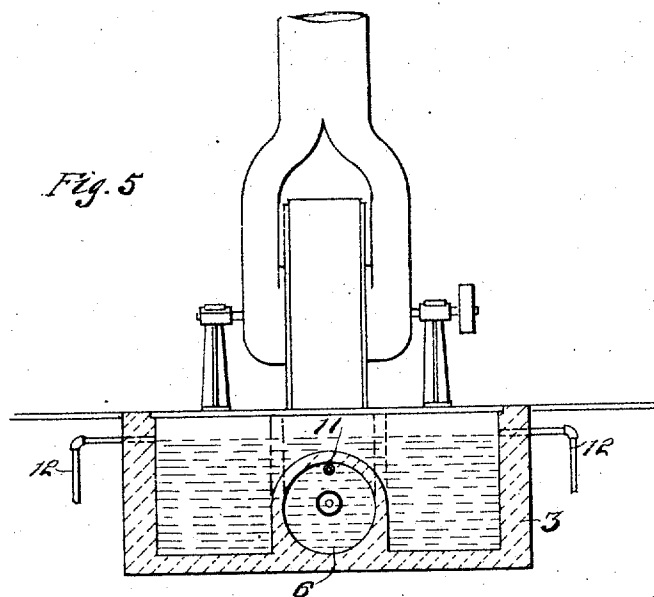
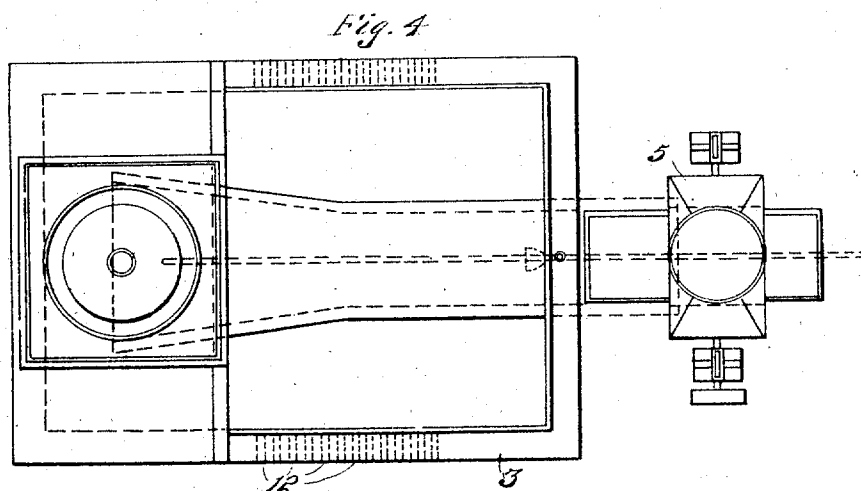
Fig. 342</

O. M. FOSTER.
GAS OR SMOKE WASHER.
APPLICATION FILED JULY 11, 1911.

1,026,666.

Patented May 21, 1912.

2 SHEETS-SHEET 2.



WITNESSES

Julius H. Knecht
James L. Bradley

INVENTOR

O. M. Foster
by atty Paul Lynne

UNITED STATES PATENT OFFICE.

OLIVER M. FOSTER, OF ELKHART, INDIANA, ASSIGNOR, BY MESNE ASSIGNMENTS, OF ONE-FIFTH TO S. K. DICKERSON, ONE-FIFTH TO D. R. MACBAIN, AND ONE-FIFTH TO DE WITT C. MOORE, ALL OF CLEVELAND, OHIO, AND ONE-FIFTH TO CHARLES E. SCHAFF, OF CHICAGO, ILLINOIS.

GAS OR SMOKE WASHER.

1,026,666.

Specification of Letters Patent.

Patented May 21, 1912.

Application filed July 11, 1911. Serial No. 637,981.

To all whom it may concern:

Be it known that I, OLIVER M. FOSTER, a citizen of the United States, residing at Elkhart, county of Elkhart, and State of Indiana, have invented certain new and useful Improvements in Gas or Smoke Washers, of which the following is a specification.

The invention relates to apparatus for removing the free carbon and other substances in the gaseous products of combustion from locomotives, furnaces and the like, and other similar uses. The primary objects of the invention are; the provision of an improved apparatus which will completely wash the gases, leaving them free from objectionable substances and entirely eliminate all appearance of smoke; and the provision of a smoke washing apparatus of simple and compact construction in which there are no parts liable to get out of order, and which may be readily cleaned when necessary. One embodiment of the invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a general side elevation showing the smoke washer in longitudinal section; Fig. 2 is an enlarged transverse section through the liquid supply pipe in the washer; Fig. 3 is a longitudinal section on an enlarged scale through the steam cleaning pipe employed in the pipe for carrying the gases to the washing apparatus; Fig. 4 is a plan view of the apparatus; and Fig. 5 is a transverse section through the apparatus on the line V—V of Fig. 1.

As described the apparatus is shown as installed in an engine house for taking care of the products of combustion from locomotives, but this apparatus is of general application and may be utilized to care for the smoke or gases, or both, from furnaces of all kinds.

As shown in the drawings, 1 is the locomotive having its stack temporarily connected with the conduit or supply pipe 2 leading from the smoke stack to the smoke washer. Such pipe 2 preferably extending around the engine house, and arranged so as to be connected with any desired number of smoke stacks; 3 is the washer tank having an outlet stack 4; and 5 is a fan or equivalent apparatus for forcing the products of combustion from the conduit or supply pipe 2 through the washing apparatus.

As indicated in Figs. 1 and 5, the tank 3 is provided with a passage-way 6, having a restricted outlet end 7, and having its rear end connected with the outlet from the fan 5, so that the gases of combustion from the conduit or supply pipe 2 are forced or induced from one end of the passage-way 6 to the other. The passage-way is preferably submerged in the water or fluid of the tank, so that the smoke or gases in passing there-through are forced to make their way through a substantially solid body of water, thus insuring a thorough washing of such smoke or gases. The tendency of the smoke or gases while moving through the passage-way 6 is to find their way along the upper wall thereof, and in order to secure a thorough agitation of the water in the passage-way and insure the complete washing of the smoke or gases, the pipe 8 for supplying an agitating fluid is provided, which pipe preferably has a bell-shaped nozzle 9. The steam delivered into the passage-way 6 through nozzle 9 under pressure not only tends to violently agitate the water, but also tends to secure a saturation of the gases which might otherwise be carried in the large bubbles which travel through the passage-way. The contraction of the passage-way at its outlet end 7 causes the fluid as it passes out of the passage-way to converge, thus still further tending to break up any large bubbles of smoke or gas and secure the proper mixture of such with the fluid in the passage-way.

In order to prevent the smoke or gases from escaping too rapidly through the stack 4, the baffle device 10 is provided; such baffle device serving to collect the gases as they escape from the surface of the water, and tending to make such smoke or gases to flow backward through the spray at the surface of the water, thus insuring a further intimate mixture of the gases with the water, and giving a further washing of such smoke or gases.

A spray of water is supplied to the passage-way 6 by means of the pipe 11, which pipe, as indicated in Fig. 2, is provided with a plurality of spraying holes, so that, at those portions of the passage-way where the water is forced away from the upper wall, the gas is further washed by the spray, such

spray also serving to supply the tank with the additional amount of water necessary. The outlet pipes 12 take care of the overflow, and are made of sufficient size to permit the water with the scum of tar products thereon to pass out in case it is not desired to save such scum as a by-product. If it is desired to save the tar products and remove them from time to time by skimming, the openings 12 may be made very small, or, provided with a screening device.

In order to free the conduit or supply pipe 2 from soot or other products which may accumulate therein, pipe 13 is provided, extending within the conduit or supply pipe 2, such pipe having a plurality of forwardly directed holes 14, as indicated in Fig. 3. A blast of steam or air may be sent through this pipe 13 from time to time as necessary, thus cleaning the walls of the conduit or supply pipe 2.

While the above description specifically refers to the use of water, other fluids used alone or in combination may be used.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is the following:—

1. In combination in a gas washer, a tank provided with a cleaning liquid, a substantially horizontal passage-way lying below the surface of the liquid in the tank and filled with liquid therefrom, means for forcing the gases of combustion through the liquid in the passage-way, and means for supplying steam under pressure to the liquid in the said passage-way.

2. In combination in a gas washer, a tank provided with a cleaning fluid, a substantially horizontally extending passage-way lying adjacent the surface of the liquid in the tank but beneath such surface and having its ends open, the outlet end of the passage-way communicating with the liquid in the tank and lying beneath the surface thereof whereby the passage-way is filled by water from the tank, means for supplying

steam to the passage-way, and means for forcing the gas to be washed into the inlet end of the passage-way and throughout the length of such passage-way and through the outlet end thereof into the liquid of the tank.

3. In combination in a gas washer, a tank provided with a cleaning liquid, a passage-way lying beneath the surface of the liquid and having its outlet end opening into the tank below the surface of the liquid and filled with water from such tank and its inlet end connected to the gas supply passage, means for supplying steam to the passage-way, a spraying means in the passage-way, and means for supplying a fluid thereto.

4. In combination in a gas washer, a tank provided with a cleaning liquid, a passage-way lying beneath the surface of the liquid in the tank and filled with liquid therefrom, means for forcing the gases of combustion through the liquid in the passage-way, and means for supplying steam under pressure to the liquid in the said passage-way at a point intermediate the ends of the passage-way whereby the bodies of gas passing through the said passage-way are broken up and saturated.

5. In combination in a gas washer, a body of liquid, means for forcing the gas to be washed into and through the body of liquid, and means intermediate the entrance and exit sides of the body of liquid and separate from and independent of the last mentioned means for supplying steam under pressure to the said body of liquid to agitate such liquid and break up and saturate the bodies of gas passing therethrough.

In testimony whereof I have hereunto signed my name in the presence of the two subscribed witnesses.

O. M. FOSTER.

Witnesses:

H. R. DORY,
E. C. HARDY.

Correction in Letters Patent No. 1,026,666

It is hereby certified that the name of the third-mentioned assignee in Letters Patent No. 1,026,666, granted May 21, 1912, upon the application of Oliver M. Foster, of Elkhart, Indiana, for an improvement in "Gas or Smoke Washers," was erroneously written and printed "DeWitt C. Moore," whereas said name should have been written and printed *De Witt C. Moon*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 16th day of July, A. D., 1912.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.

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In testimony whereof I have hereunto signed my name in the presence of the two subscribed witnesses.

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Signed and sealed this 16th day of July, A. D., 1912.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.

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