

(No Model.)

A. H. GREIWE.
APPARATUS FOR PURIFYING AIR.

No. 585,568.

Patented June 29, 1897.

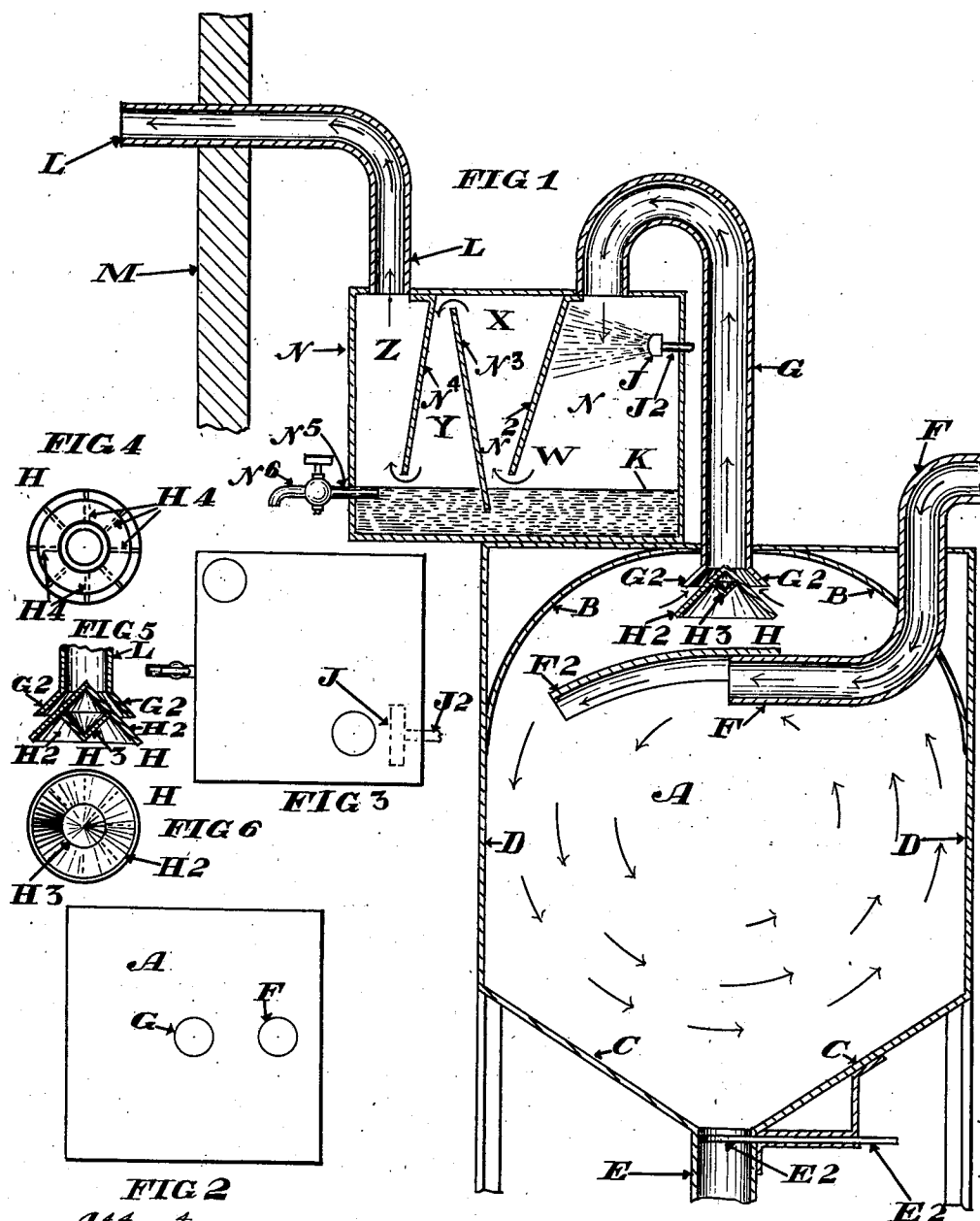


FIG 2

Attest

Charles H. Spiegel.
T. Smith

Inventor

Adam Henry Greiwe
per Wm. Hubbell Fisher
Attorney

UNITED STATES PATENT OFFICE.

ADAM HENRY GREIWE, OF CINCINNATI, OHIO.

APPARATUS FOR PURIFYING AIR.

SPECIFICATION forming part of Letters Patent No. 585,568, dated June 29, 1897.

Application filed May 7, 1896. Serial No. 590,569. (No model.)

To all whom it may concern:

Be it known that I, ADAM HENRY GREIWE, a citizen of the United States, and a resident of the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Apparatus for Purifying the Air Issuing from Buildings, of which the following is a specification.

The several features of my invention and the various advantages resulting from their use conjointly or otherwise will be apparent from the following description and claims.

In the accompanying drawings, Figure 1 is a view, partly in elevation and for the most part in central vertical section, illustrating the construction of an apparatus embodying my invention. Fig. 2 is a top or plan view of the first receptacle and shown on a diminished scale. Fig. 3 is a top view, on a diminished scale, of the second receptacle of the apparatus. Fig. 4 is a view of the dispersing device. Fig. 5 is a vertical central section of the conduit and hood or shield at the exit of the first receptacle. Fig. 6 is a bottom view of the devices shown in Fig. 5.

My invention was primarily designed to be used in connection with the air from a shoe-manufactory, and I will now describe the same in connection with such a manufactory. This description will illustrate the operation of the invention in connection with buildings and locations wherewith my invention is to be employed for the purification of air other than shoe-factories.

The air and what it carries is drawn or forced through my apparatus by suitable means. Such means as blowers or suction mechanism, &c., are too well known to need description. Such air-moving mechanism is located at any point relative to my apparatus suitable for effectively moving the air through it.

In constructing my apparatus I provide a receptacle or chamber A. The roof thereof or the inner upper portion B thereof I designedly arch. The floor C of this receptacle I make inclined to an outlet or dump delivery-conduit E. The upper end of this conduit is preferably located in the middle of the floor, and the latter inclines from every part of the wall D. At or near the bottom of the floor

and in connection with the dump-pipe E is a gate, door, or slide E² for regulating the egress of matter collected in the chamber A through the conduit E. In the upper portion of the chamber A is the outlet or terminal end of the conduit F, bringing the air and its contents from the factory or analogous place. The terminal portion of this conduit F is provided with a curved deflector F², which serves to deflect downward the air and its contents entering chamber A through pipe F. There is an upper outlet-conduit G from the chamber A. The initial end of this outlet begins at the upper portion of chamber A, substantially as shown, and connects directly with the chamber N. The conduit G, before entering this chamber N, preferably first rises and then descends and enters the roof or top of chamber N. At the inlet of conduit G is located a dispersing device H, consisting of a hood H² in the form of a wide-spreading cone and a smaller cone H³ in a reverse position set in the mid portion of the bottom of the hood H².

The lower initial end of the conduit G is provided with a flaring flange G² above the device H, and between the flange G² above and the top of the device H below the air and what it remains charged with enters the conduit G. The device H is held in place by suitable means, preferably by narrow connections H⁴, extending from the device H to the flange G².

In the chamber N is located a spraying device J, preferably horizontally elongated from side to side, as indicated by dotted lines in Fig. 3. The liquid to be sprayed by this device is conducted thereto by a suitable pipe, as J², and sprayed out in finely-divided particles, falls down through the chamber N, and collects at the bottom thereof, as indicated by the letter K. Partitions N², N³, and N⁴ are present and divide the chamber N into subchambers W, X, Y, and Z. The first partition N² stops short of the bottom. The second partition N³ stops short of the top and also admits of a place or places near its lower end where the liquid gathering in the bottom of the chamber can flow forward toward the exit-pipe N⁵. The partition N⁴ stops short of the bottom. There is present in the pipe N⁵ a suitable stop-cock N⁶ for

regulating the flow of liquid K from the chamber. This stop-cock N⁶ is usually open, the pipe N⁵ being placed at the point where the rise of the liquid in the chamber N is to be stopped. Thus the liquid cannot rise so as to cut off the passage of air from subchamber W to subchamber X, beneath the partition N², and above the liquid K, nor so as to intercept the passage of air from subchamber Y to subchamber Z, beneath partition N⁴, and above the liquid K. The number of partitions, as N², N³, and N⁴, may be varied and the number of subchambers be likewise varied.

From the chamber N (subchamber Z) extends an outlet-pipe L. The latter may be supported by a support, as M, and this may be the wall of the building in which the (my) apparatus is located or be something else. I will describe the mode in which my invention operates.

The air from the factory or mill, in the present illustrative instance a shoe-factory, and burdened with fine particles of leather, &c., and of dust, is brought into the conduit F and moved through the latter and delivered into the chamber A. By means of the location of the exit-orifice of the conduit F and the direction of the latter part of the terminal portion of said pipe and of the deflector F² and the shape of the chamber A this dirty surcharged air moves around the chamber A in a circular manner. As this air descends toward the bottom of chamber A the heavier particles of dirt and matter fall onto the bottom of chamber A and remain there, and the lighter particles, &c., in the air pass on and around and up, as indicated by the arrows, to the roof of the chamber A, and there pass through the narrow openings between the flange G² of the conduit G and the upper surface of the hood II². In reaching this or these narrow passages the freighted air for the most part is compelled to strike the under part of the device II and its velocity is lessened, and it is then compelled to pass out and back and down and up around the outer edge of the hood II². While this operation is being performed, the dust and the dirt in the air have opportunity to fall, and much of the heavier part of the same in the air will do so and will drop to the bottom of the chamber A. Thus an additional amount of the dirt and dust coming in through conduit F will be deposited at the bottom of chamber A. The inverted cone or conical center piece II³ in the under side of the hood prevents dirt and dust or incrustations from remaining on the central portion of the hood, as they would be likely to do were the sharply-concaved and deeply-recessed center left uncovered. The air much relieved of its burdens, but still charged with much that is deleterious to the lungs and also often to the roofs of the adjacent houses, passes up through the conduit G, and thence down into chamber N, and subchamber W, wherein it meets with the finely-

comminuted water or other liquid rushing from the spray-piece J and crossing the chamber. This water catches a large portion of the dust and chemical substances that may be present in the air and carries them down to the bottom of the tank and into the water or other liquid K at the bottom of the vessel or chamber N. The air, now greatly purified, passes down under partition N², and much of it comes into close contact with the water K and leaves on the latter still more of what it (the air) carries. The air rising passes up through subchamber X and over partition N³, and thence down through subchamber Y and under partition N⁴ and up through subchamber Z. In making these movements the air is not only agitated, but much additional opportunity is afforded for extraneous matter which is left in the air to fall onto the water K. The air thus now quite pure and innocuous and healthful passes up out of conduit L into the outer or other atmosphere and mingles therewith.

The air from shops, factories, and laboratories is frequently impregnated and charged with deleterious substances. These the spray and the liquid in chamber N take and leave the air quite free therefrom. For instance, in the case of shoe-factories much of the leather is impregnated with ferrocyanate of potash, used in preparing it (the leather) for the trade. This chemical is hurtful to breathe and also injures the material of the roofs of adjacent buildings with which the air from the shoe or other leather establishment comes in contact. My invention purifies the air and renders it harmless.

At suitable intervals the matter collecting in the chamber A is withdrawn from the latter. This result is readily accomplished by opening the slide E² and allowing the matter to descend onto a suitable dump or into a desired receptacle. Whatever of this material thus dumped is of value can then be obtained and utilized. So, also, the liquid running from the chamber N can be made by well-known means to surrender those matters it contains which are valuable. In the case of shoe-factories the fine remnants and scraps of leather and dust are used for various purposes in the arts, among which may be mentioned that such form the base of a composition much employed as a plastic out of which figures and models are made.

What I claim as new and of my invention, and desire to secure by Letters Patent, is—

1. In an air-purifying device, the chamber N having air-inlet G near one end, and a spraying device J, adjacent thereto, a liquid-space below, an exit-conduit N⁵ for the liquid, and an air-discharge conduit L at or near that end of chamber N opposite where the inlet G enters; and partitions as N², N³, N⁴, of which N² extends from the roof to near the upper line of the liquid, and the intermediate partition N³ extending from below the liquid-line up to near the roof, the partitions being in-

clined so as to form subchambers as W, X, Y, and Z, the chambers being broadest in the vicinity of their exit-orifices, substantially as and for the purposes specified.

5 2. In an air-purifying device, the chamber N having air-inlet G near one end, and a spraying device J, adjacent thereto, a liquid-space below, an exit-conduit N⁵ for the liquid, and
10 an air-discharge conduit L at or near that end of chamber N opposite where the inlet G enters, and partitions as N², N³, N⁴, of which N² extends from the roof to near the upper line of the liquid, and the intermediate partition

N³ extending from below the liquid-line up to near the roof, the partitions being inclined 15 so as to form subchambers as W, X, Y and Z, the chambers being broadest in the vicinity of their exit-orifices, in combination with a preliminary chamber for first extracting the heavier or coarser substances from the air to 20 be purified, substantially as and for the purposes specified.

ADAM HENRY GREIWE.

Attest:

JULIUS G. PENN,
K. SMITH.