June 24, 1930. M. MADSEN 1,768,468

AIR PURIFIER

Filed Dec. 21, 1926

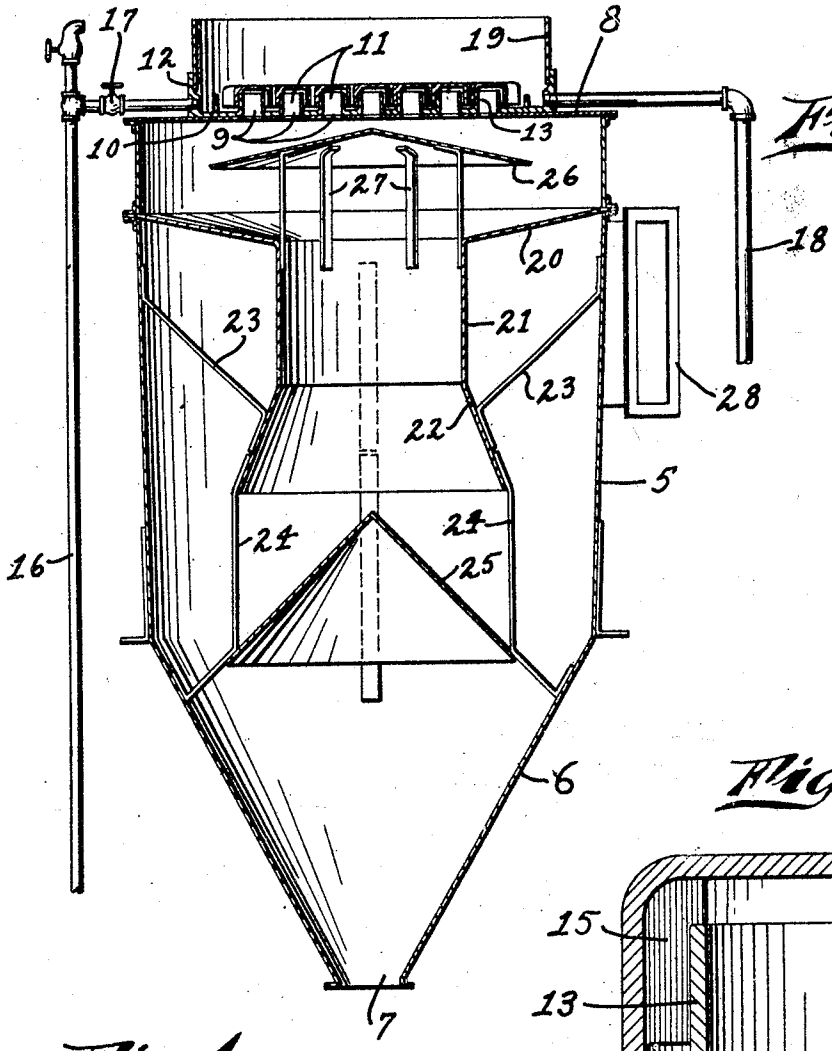



Fig. 2.

Fig. 3.

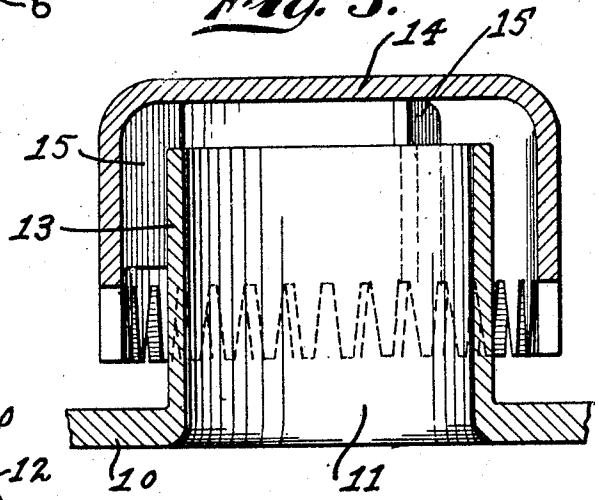
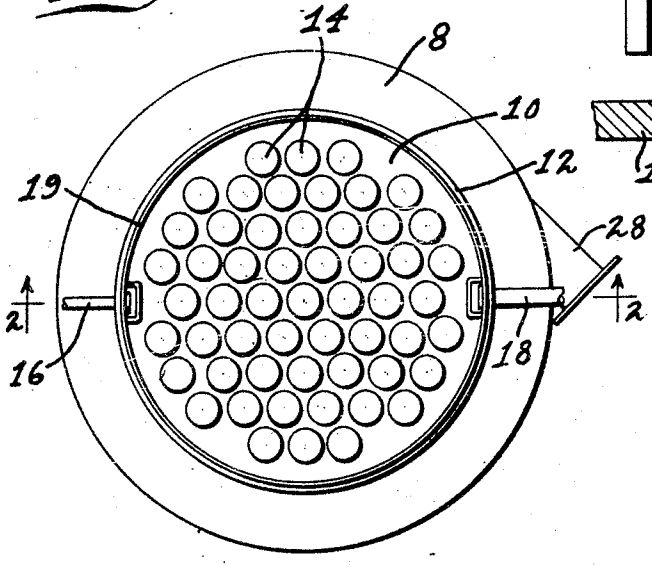



Fig. 1.




INVENTOR.
Martin Madsen
BY
ATTORNEY.

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# UNITED STATES PATENT OFFICE

MARTIN MADSEN, OF MONTEREY PARK, CALIFORNIA

## AIR PURIFIER

Application filed December 21, 1926. Serial No. 156,081.

My filter is designed to purify the air in factories, work shops, mines and other places where the air becomes impure by reason of dust, smoke and other matter carried therein and which it is desirable to have removed from the air and the object thereof is to provide a simple and efficient device for that purpose.

In the drawings forming a part of this application, Fig. 1 is a top plan of my air purifier. Fig. 2 is a vertical section on the line 2—2 of Fig. 1. Fig. 3 is an enlarged vertical section of an air outlet and cap therefor.

Referring to the drawings 5 are the vertical outside walls of the body of my purifier casing which is preferably circular and has a tapered bottom 6 with a port 7 therein. Attached to the top of body 5 is top plate 8 in which are a plurality of ports 9. Resting upon the central portions of plate 8 and attached thereto is the overflow plate 10 in which are openings 11 that register with ports 9. Around the edge of plate 10 is a flange 12 and around each opening are upwardly extending flanges 13. Caps 14 surround these flanges and are spaced from flanges 13 by lugs 15 on the inner side of the caps which rest upon the top of the flanges. There are preferably three lugs in each cap and the lower edges are preferably sawtoothed and are spaced from plate 10, as best shown in Fig. 3. By making the saw teeth deeper and caps 14 longer, lugs 15 could be omitted and the caps would rest on plate 10 and be held spaced from flanges 13 at top and sides. A water supply pipe 16 having a regulating cock 17 thereon is connected to flange 12 at a point below the tops of flanges 13. An overflow pipe 18 is connected to flange 12 at a point opposite pipe 16. A short splash pipe 19 may be attached to flange 12 to prevent the water when turned on from splashing over. By making flange 12 higher, pipe 19 may be omitted.

Within body 5 and secured thereto near the top thereof is the main deflector whose top wall 20 preferably projects inwardly and downwardly to its junction with the circular vertical body wall 21. To the lower edge of wall 21 is secured the outwardly and downwardly flaring skirt 22. Top braces 23 are attached to the skirt and body. Bottom braces 24 are attached to the skirt and to a bottom cone shaped auxiliary deflector 25 and to the bottom 6. An internal top auxiliary deflector 26 is connected to wall 21 by braces 27 and held positioned above wall 20. A body 5 has an inlet pipe 28 which opens tangentially thereinto just below wall 20.

### *Operation*

My device has a large range of uses. Assume that a workman is engaged in grinding work that produces a considerable amount of dust. One of my air purifiers would be installed just above his work. A suction force fan would also be installed close thereto with the exhaust port connected to inlet pipe 28 and properly operated. A suitable supply of water would be permitted to pass out of pipe 16 which would cause the submergence of the bottoms of caps 15. Thereafter the dust laden air would be drawn in by the fan and forced into body, 5. The centrifugal force and the frictional engagement with body 5 would cause the heaviest particles to drop down and pass out through port 7. The partially freed air would pass up through skirt 22, wall 21 and impinge against deflector 26 which would cause more of the coarser particles of dust to fall. The air with the lighter particles would pass up around 26 and out through ports 9, thence down between 13 and 15 and out through the cap teeth and up to atmosphere. In its passage between 13 and 15 it would have to pass through a thin sheet of water which would remove the finer particles of dust, and dust free air would be discharged. The ebullition caused by the air passing through the water would prevent the dirt from settling and the same would be carried out through the overflow pipe.

Having described my invention I claim:

An air purifier comprising a casing having a circular body provided with a per-

forated top and a tapered bottom, said bottom having a port; a pipe secured to said body and opening thereinto tagentially; a main deflector within and secured to said body by its top wall, said main deflector comprising an inwardly and downwardly extending top wall, a vertical tubular body secured at the top to said top wall, and a skirt secured to said tubular body at the bottom thereof and having an opening therethrough auxiliary deflectors, one above and the other below the opening through the main deflector and secured thereto and spaced therefrom; a top plate having a plurality of ports therein, each port being surrounded by an upstanding flange and resting upon and supported by the perforated top of said circular body, said ports registering with the perforations of said top, said plate having an outer upstanding flange; caps surrounding the flanges of the ports of said plate and spaced from said flanges, said caps having slitted lower edges; a water inlet pipe and overflow means secured to said port plate flange.

In witness that I claim the foregoing I have hereunto subscribed my name this 7th day of December, 1926.

MARTIN MADSEN.