Aug. 27, 1935. C. A. KUTCHER 2,012,571

AIR CLEANER AND HUMIDIFIER

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Fig. 1.

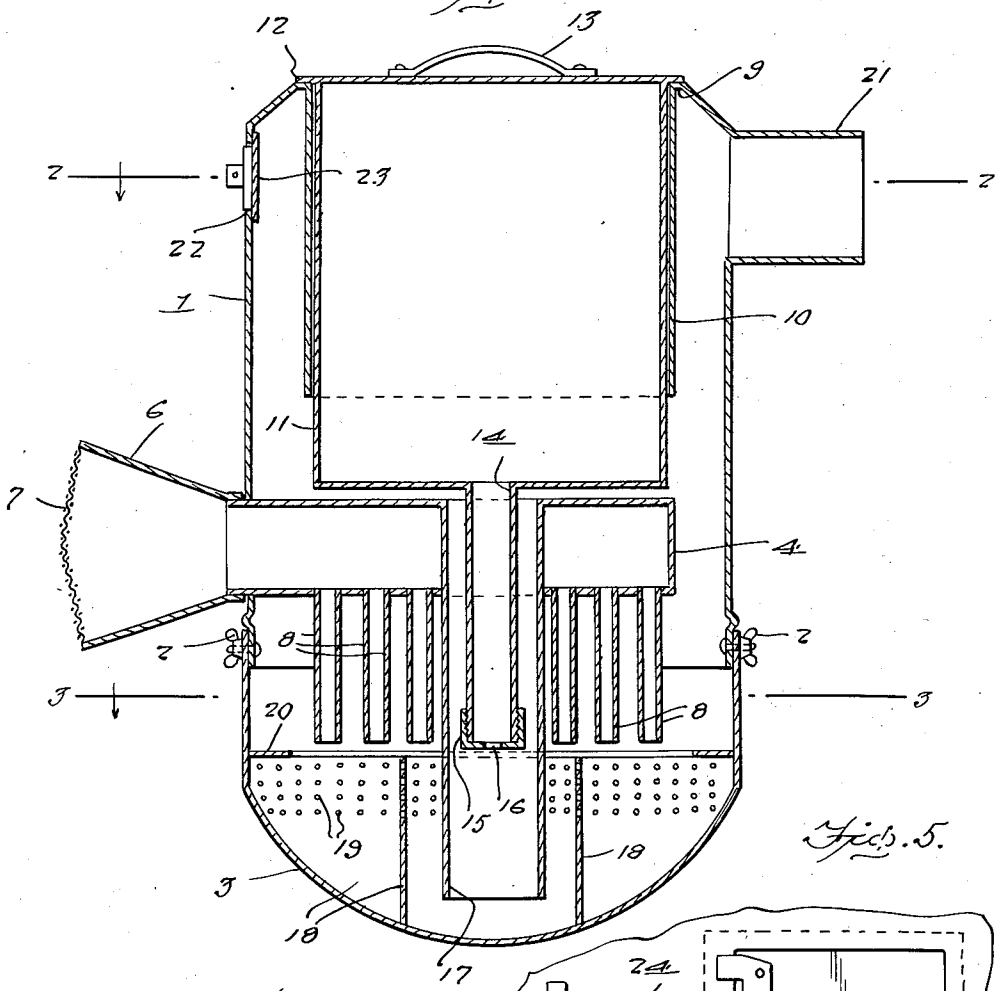


Fig. 4.

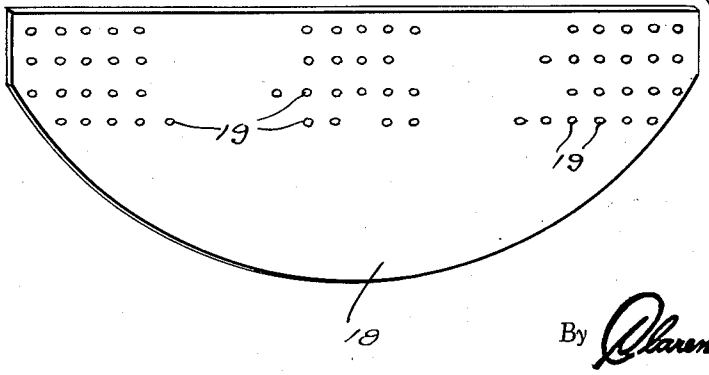
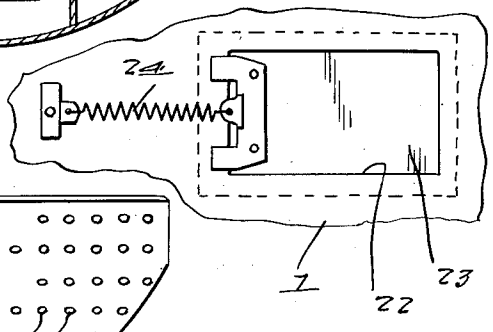


Fig. 5.



Inventor

C. A. Kutcher

By Clarence A. O'Brien

Attorney

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Fig. 2.

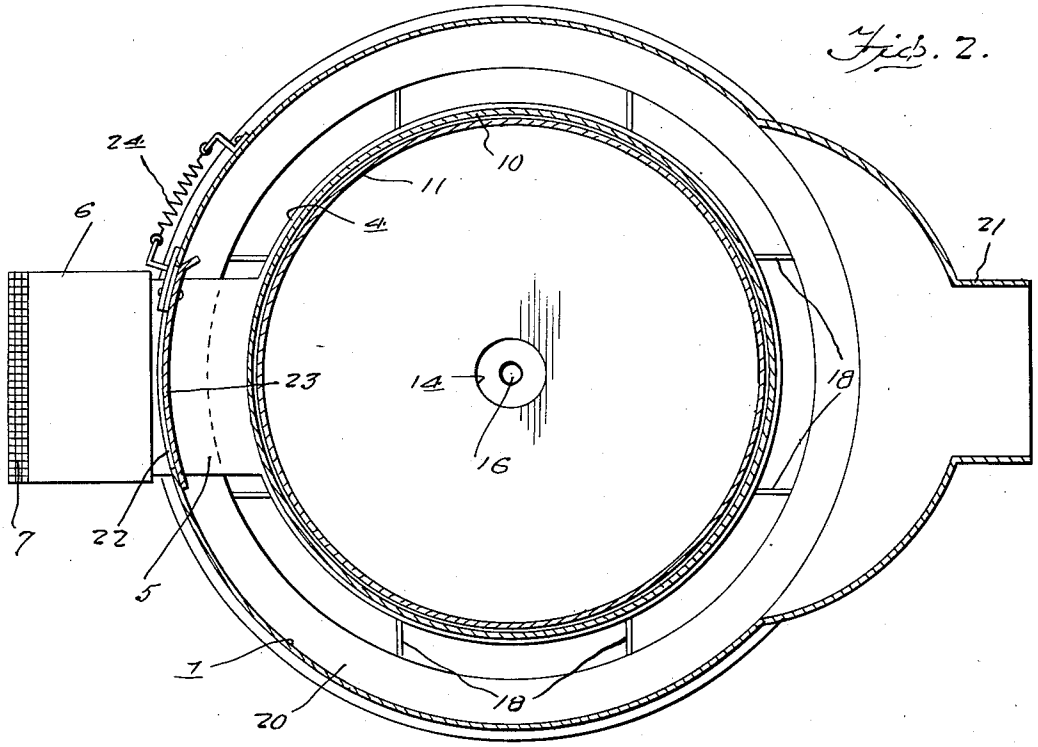
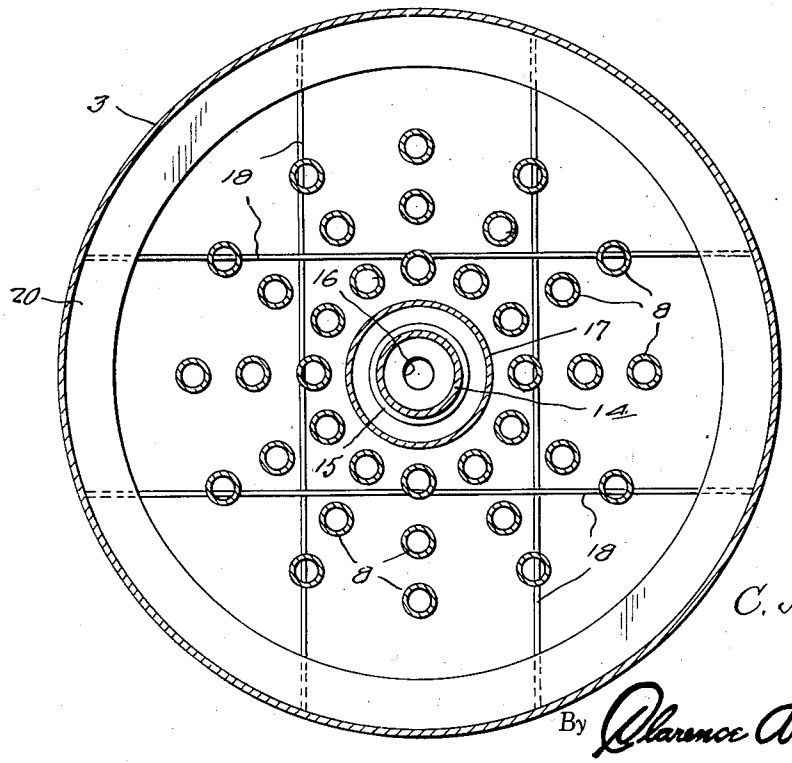


Fig. 3.



Inventor

C. A. Kutcher

By Clarence O'Brien

Attorney

Patented Aug. 27, 1935 2,012,571

UNITED STATES PATENT OFFICE

2,012,571

AIR CLEANER AND HUMIDIFIER

Charles A. Kutcher, Sheridan, Wyo.

Application October 2, 1934, Serial No. 746,586

2 Claims. (Cl. 126—124)

The present invention relates to new and useful improvements in air cleaners and humidifiers for internal combustion engines, particularly automobile engines, and has for one of its important objects to provide, in a manner as hereinafter set forth, a device of this character comprising novel means for maintaining a body of water at constant level for contact with the air.

Another important object of the invention is to provide an air cleaner and humidifier of the aforementioned character which includes a novel construction, combination and arrangement of parts for receiving the air from the atmosphere and contacting said air with the water.

Still another important object of the invention is to provide an air cleaner and humidifier for internal combustion engines which comprises means for preventing excessive splashing or agitation of the water.

A still further important object of the invention is to provide an air cleaner and humidifier which includes means for preventing the water being drawn into the carburetor of the engine under certain conditions, such as when the engine is running at high speed.

Other objects of the invention are to provide an air cleaner and humidifier for internal combustion engines which will be comparatively simple in construction, strong, durable, highly efficient and reliable in use, compact and which may be manufactured at low cost.

All of the foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in connection with the accompanying drawings wherein like characters of reference designate corresponding parts throughout the several views, and wherein:—

Figure 1 is a view in vertical section through an air cleaner and humidifier constructed in accordance with the present invention.

Figure 2 is a view in horizontal section, taken substantially on the line 2—2 of Figure 1.

Figure 3 is a horizontal sectional view, taken substantially on the line 3—3 of Figure 1.

Figure 4 is a detail view in perspective of one of the baffles.

Figure 5 is a detail view in side elevation of the safety valve.

Referring now to the drawings in detail, it will be seen that the embodiment of the invention which has been illustrated comprises a metallic casing 1 having removably secured to its open lower end, as at 2, a pan 3 for the reception of a liquid such as water in non-freezing weather and a light oil in winter or freezing weather. Mounted horizontally in the casing 1 is an air drum 4 having an intake 5 (see Figure 2) extending through the front of said casing 1. Mounted on the outer end of the intake 5 of the drum 4 is a forwardly projecting intake funnel or the like 6, the forward end of which is covered by a screen 7. The member 6 is preferably of the shape shown to advantage in Figure 1 of the drawings for the purpose of catching a large volume of air as the automobile moves forwardly and from the engine fan and directing said air under pressure into the drum 4. Depending from the drum 4 into the pan 3 are air distributing tubes 8.

Depending from the top 9 of the casing 1 into said casing in spaced, concentric relation thereto is a guide sleeve 10. The guide sleeve 10 is for the reception of an air-tight water tank 11 having a supporting flange 12 on its top for engagement with the top 9 of the casing 1. If necessary or desirable, a suitable gasket may be provided between the flange 12 and the top 9 of the casing 1. The reference numeral 13 designates a carrying handle on top of the tank 11.

Depending from the bottom of the tank 11 is a discharge filling tube 14 having threadedly mounted on its free end portion a removable cap 15 which is provided with a discharge port 16. A tubular shield 17, which depends from the air drum 4 into the pan 3, surrounds the tube 14 in spaced, concentric relation thereto, said tubular shield extending between the upper and lower plates of the drum 4, as illustrated to advantage in Figure 1 of the drawings. It will also be noted that the tubular shield 17 extends below the lower end of the tube 14 to a point adjacent the bottom of the removable pan 3.

The lower portion of the pan 3 is divided into compartments by baffles 18 the upper portions of which are perforated, as at 19, to permit the water, oil or other liquid to level itself at all times, as when the automobile is on an incline. Mounted horizontally on the upper edges of the baffles 18 is a substantially flat, annular baffle 20 which assists in preventing excessive splashing or agitation of the liquid.

The upper portion of the casing 1 is provided with an outlet 21 for connection with the air intake of the carburetor. The upper portion of the casing 1 is also provided with an air inlet opening 22 which is controlled by a swinging safety valve 23, said valve 23 being yieldingly secured in closed position by a spring 24.

In operation, the water, or oil, flows by gravity from the tank 11 into the pan 3 until the

level of the liquid in said pan closes the lower end of the discharge tube 14, thus preventing the entrance of air into the tank 11 and stopping further discharge therefrom. At this point the level of the liquid in the pan 3 will be substantially at the lower ends of the air distributing tubes 8. Air from the drum 4 passes downwardly through the tubes 8 into contact with the water and said air is cleaned and humidified simultaneously. The treated air then rises in the casing 1 around the sleeve 10 and passes through the outlet 21 to the carburetor of the engine through a suitable conduit (not shown). Of course, as the water or other liquid in the pan 3 is consumed it is constantly replenished from the tank 11. The baffles 18 and 20, as hereinbefore stated, prevent excessive splashing or agitation of the water or other liquid in the pan 3 while at the same time permitting said water or other liquid to level itself through the medium of the perforations 19. The tube 17 shields the discharge end of the tube 14 against agitated water caused by the discharge of the air from the tubes 8. Should there be a tendency to draw the water from the pan 3 into the carburetor of the engine, as when said engine is running at high speed, the safety valve 23 will swing inwardly to open position against the tension of the spring 24, thus breaking the vacuum or suction in the casing 1.

It is believed that the many advantages of an air cleaner and humidifier constructed in accordance with the present invention will be readily understood, and although a preferred embodiment of the invention is as illustrated and described, it is to be understood that changes in the details of construction and in the combination and arrangement of parts may be resorted to which will fall within the scope of the invention as claimed.

What is claimed is:—

1. An air cleaner and humidifier of the class described comprising a casing having an outlet therein, a pan, for the reception of a liquid, connected to the lower end of the casing, means for supplying liquid to the pan, baffle plates mounted vertically in the pan and having perforations in their upper portions, a substantially flat, annular baffle mounted in the pan on the baffle plates, an air drum mounted horizontally in the casing and communicating with the atmosphere for receiving air therefrom, and tubes depending from the drum for discharging the air into the liquid, said tubes terminating at their lower ends above the horizontal plane of the annular baffle.

2. An air cleaner and humidifier comprising a casing having an outlet therein, a pan, for the reception of a liquid, mounted on the casing, a liquid supply tank mounted in the casing and including a discharge tube depending into the pan, an air drum mounted in the casing and encircling the discharge tube, said air drum communicating with the atmosphere for receiving air therefrom, a tubular shield depending from the air drum into the pan in spaced, concentric relation to the discharge tube, said shield extending below the lower end of said discharge tube, and tubes depending from the drum for discharging the air into the liquid.

CHARLES A. KUTCHER.