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C. G. HAWLEY

SUCTION AIR INTAKE

Filed May 4, 1925

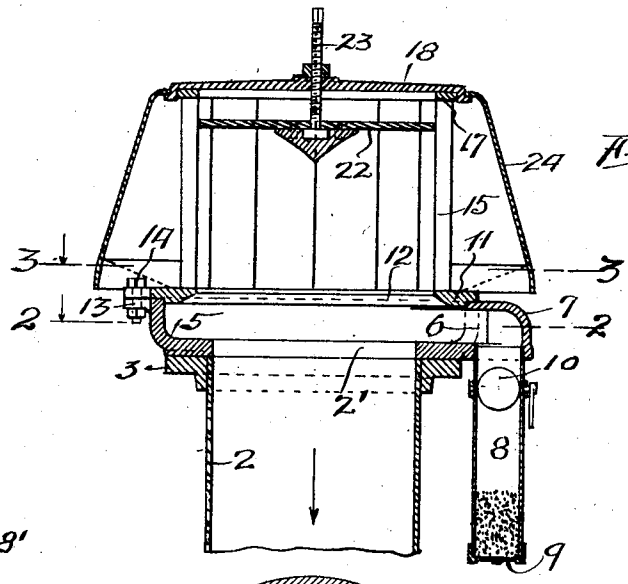



Fig. 1.

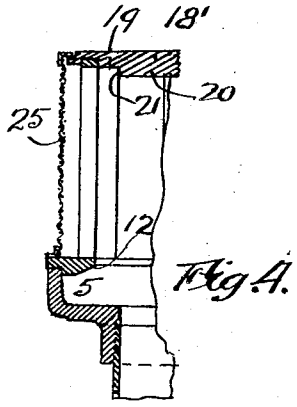



Fig. 4.

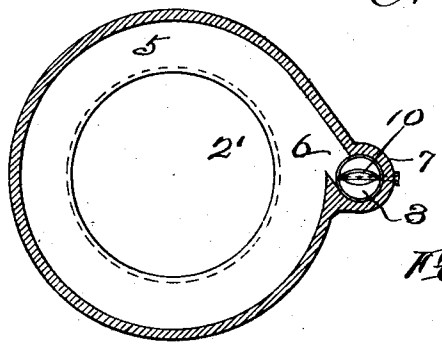



Fig. 2.

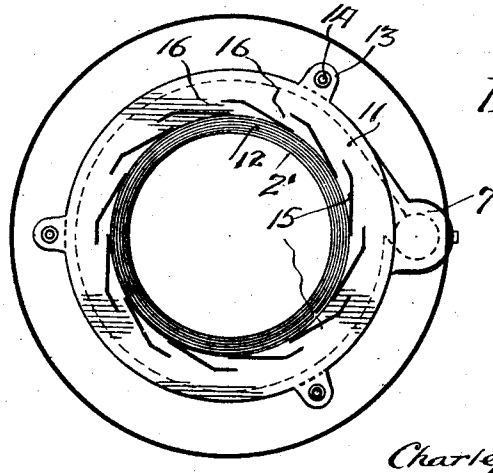



Fig. 3.

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# UNITED STATES PATENT OFFICE.

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## SUCTION AIR INTAKE.

Application filed May 4, 1925. Serial No. 27,842.

This invention relates to suction air intakes and has for its object the purification of air (and gases) going to compressors and blowers or intended to directly supply rooms in which the air must be kept pure.

The invention will be readily understood on reference to the drawings that form part of this specification, and in which:—

Fig. 1 is a vertical section of a suction air intake embodying my invention.

Fig. 2 is a horizontal section on line 2—2 of Fig. 1.

Fig. 3 is a horizontal section on line 3—3 of Fig. 1; and

Fig. 4 illustrates a modification in the upper part of the device.

All parts of this device through which the air passes are stationary. This is said to avoid confusion with various rotating devices that have been submitted for the purpose. Generally these devices are used in an upright position, resting upon the top of the air intake pipe or duct 2. As a matter of fact it can be used in an inverted position and even upon a horizontal axis. The position shown is therefore only exemplary.

The base of the device may rest upon a flange of the pipe 2 or may be threaded for attachment thereto as indicated in Fig. 4. Said base comprises a bowl 5, of larger diameter than the pipe 2. It is characterized not only by large diameter but by a tangential peripheral outlet or nozzle 6, the latter preferably terminating in an elbow 7. Depending from the latter is a dust and moisture pocket 8. At the lower end, the pocket 8 is tightly closed by a removable cap or valve 9. The part 10 represents a cut-off valve which is interposed between the pocket 8 and the bowl 5. The purpose of the valve will be described hereinafter.

Resting on the upper edge of the bowl is a wide ring 11, containing a central hole 12 that is coaxial with the pipe 2 but considerably larger in diameter. The ring may be secured to the bowl in any suitable manner as by means of the lugs 13 and bolts 14.

Upon the ring 11 I erect the circumferential series of operatively overlapping tangential tuyère blades 15 of such length and number as to provide the numerous slit-like tangential tuyères 16. The aggregate area of these tuyères 16 approximates the area of the pipe 2, and by preference exceeds that area by so much as is required to offset the friction of the air that is rapidly drawn through the tuyères. The inner edges of the tuyère blades rise substantially from the margin of the hole 12 in the ring 11 so that it may be said that like the ring the tangential tuyère ring has a diameter that exceeds that of the pipe 2.

The upper end of the tuyère ring is formed by fastening together the upper ends of the tuyère blades as by means of a top ring 17.

The upper end of the tuyère ring is closed by a top plate 18. This may partake of the form, shown in Fig. 1, or of the form shown at 18′ in Fig. 4.

The centrifugal effect of the inwardly directed tangential streams or films of indrawn air is to set the whole content of the tuyère ring and bowl 5 into very rapid rotation, and in consequence the heavier substances (dust, lint, and the like) are instantly separated and deposited against the inner surfaces of the tuyère blades. Whirling downward thereon the dust particles reach the base of the tuyère ring (the ring 11) and are forcibly thrown outward to the margin of the bowl 5; that is, all such particles whether dust or collected moisture, are thus forcibly removed from the region of the central outlet 2′ in the bottom of the bowl. The heavier substances continue to whirl in the bowl until they are discharged through the nozzle 6, thence to fall into the pocket 8. That pocket being closed at the bottom no air can either enter or escape therefrom and the heavier substances continue to collect therein.

The lower end of the pocket may be opened to discharge the dust at any time that the compressor or blower is shut down. At other times the valve 10 must be closed before the cap 9 is removed, otherwise the collected dust would be drawn up in the pocket and return to the bowl, with a possibility of its escaping therefrom and into the suction pipe 2.

The top 18′ shown in Fig. 4 is fixed. Its chief characteristics are the annular surface 19 and the relatively depressed central portion 20, leaving the dust interfering shoulder adjacent the blades of the tuyère ring. There is a natural tendency for the air admitted at the tops of the tangential tuyère to flow toward the axis of the tuyère ring, and this shoulder 21 serves to prevent the carriage of

dust particles toward that axis. The result is that as the dust particles attain the whirling motion within the top of the tuyère they are centrifugally thrust back against the tuyère blades from which position they are finally delivered downward and into the collecting bowl or race 5.

The structure 22, shown in Fig. 1, with the threaded stem 23, constitutes an adjustable tuyère top, or as it might better be termed, tuyère bottom, that being the closed end of the tuyère. By moving the part 22 up and down in the tuyère the effective length of the slit-like tuyères may be varied, the better to adjust the operation of the intake device to the operation of the compressor or blower at the lower end of the pipe 2.

When the device is used outdoors it is provided with a rainhood or shield 24. When used indoors a simple cylindrical screen 25 suffices.

As various modifications of this invention will readily suggest themselves to those who are skilled in the art, it should be understood that the invention is not limited to the precise structures hereinbefore illustrated. Instead I broadly claim the following:

1. The hereindescribed suction intake comprising a bowl having a large central outlet in its bottom and having a small peripheral outlet in combination with a closed pocket depending from said peripheral outlet, and a multiple tangential tuyère of less diameter than said bowl, but of greater diameter than said central outlet, and resting upon said bowl.

2. The hereindescribed suction intake comprising a bowl having a central outlet in its bottom and provided with a peripheral discharge nozzle, in combination with a dust pocket depending from said nozzle, a removable closure at the lower end of said pocket, a cutoff valve interposed between said pocket and said nozzle, and means for whirlingly directing air into said bowl.

In testimony whereof I have hereunto set my hand this 30th day of April A. D. 1925.

CHARLES GILBERT HAWLEY.