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G. H. DINGMAN
VENTILATING APPARATUS

2,515,950

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Fig. 1.

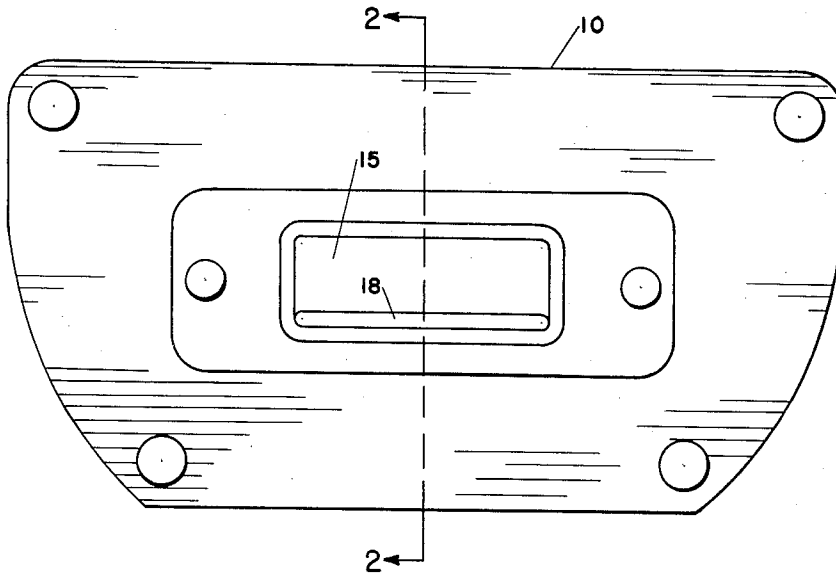


Fig. 2.

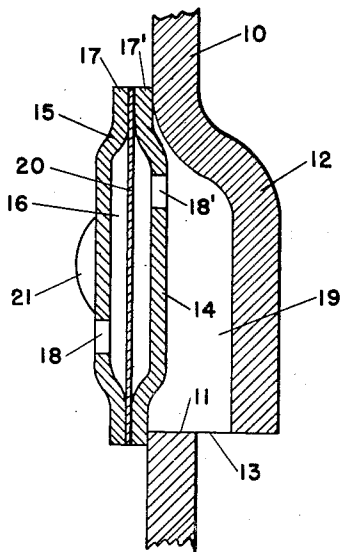
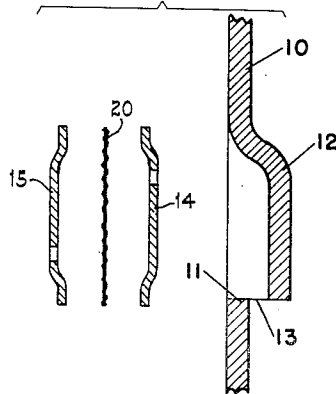


Fig. 3.



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VENTILATING APPARATUS

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5 Claims. (Cl. 98—1)

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This invention relates to ventilation, and particularly to the ventilation of machinery. It finds valuable use in the structure of magneto casings, and in the casings of exothermic machinery or of machinery that is liable to burn or to be enveloped in flame occasionally, and in such use serves a valuable protective function.

It is an object of the invention to construct a ventilator for machinery casings, adapted to a wide variety of other and similar employments, that is capable of ventilating the machinery and of releasing excess heat while restraining flame from passing through the ventilator.

Another object is to construct a ventilator capable of performing the indicated functions and of being assembled from simple parts that can be easily dismantled for cleaning.

The objects of the invention are accomplished, generally speaking, by constructing in the wall of the space to be ventilated a plurality of interconnected chambers adapted to reduce the velocity of hot gases passing therethrough without reducing their rate of discharge, having an additional flame arresting function, and constituting a pneumatic maze. A preferred structure for accomplishing these objects is described in the specification and illustrated in the drawing as a ventilator for a magneto casing, but it is to be understood that the particular use constitutes no limitation.

The above and further objects and novel features of the invention will more fully appear from the following detailed description when the same is read in connection with the accompanying drawings. It is to be expressly understood, however, that the drawings are for purposes of illustration only and are not intended as a definition of the limits of the invention, reference for this latter purpose being had primarily to the appended claims.

In the drawings, wherein like reference characters refer to like parts throughout the several views,

Fig. 1 is a vertical elevation of a casing member having a centrally located ventilator of the type described;

Fig. 2 is a vertical section on the line 2—2 of Fig. 1; and

Fig. 3 is an exploded view of the parts of the ventilator, in end elevation.

In the drawing the numeral 10 indicates a section of a magneto casing wall having a slit 11 and a portion 12 above the slit, offset to provide an orifice 13 of considerable length and gas flow capacity. This orifice faces downwardly as

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shown in the drawing but could be faced in any other direction to serve the needs of a particular construction, as for instance being faced rearwardly on a moving body to provide suction. Gas may pass to the space within the bulge 12 through the slot 13, or it may be discharged therefrom. In each instance its motion will be mainly parallel to the casing wall as it leaves the slot.

A double chamber and pneumatic maze is made by attaching over the hollow of the bulge a chamber having an inner plate 14 and an outer plate 15, which are spaced apart to form a chamber 16 by offset edge flanges 17, 17'. These plates are identical and may be conveniently made by a stamping process. In each of them is a slot, indicated by numerals 18, 18', which are arranged in offset relation to each other and to the slot 13, providing a pneumatic maze that must be traversed by the gases, and orifices receiving and discharging gases in different directions.

Thus, in Fig. 2 gas travelling from left to right enters the slot 18 horizontally, suffers a 90 degree change in direction and travels the height of chamber 16, changes direction 90 degrees to pass through slot 18' and again 90 degrees to travel the depth of chamber 19 between bulge 12 and plate 14, being discharged at an angle to its direction of entry. This different angle of entry and discharge tends to overcome the fault that arises when inlet and outlet are identically directed and are made ineffective by equal pressure in the one direction.

The chamber 16 is of such size that the velocity of the gases that enter it from orifice 13 is reduced. The chamber 19 is of even greater size. This system of chambers is calculated to reduce the velocity of hot gases proceeding through the ventilator so that the temperature of an explosion flame will be reduced to a relatively harmless degree inside the ventilator.

In order to further provide against the passage of flame the flanges 17—17' hold clamped between them a wire screen 20. This screen divides the chamber 16 and acts as a flame barrier. It is preferably made of phosphor bronze wire cloth of about .0045 in. wire diameter having about 30% open area. This may be accomplished by a weave of about 100 x 100 mesh, and openings of about .0055 in. Total thickness of the screen is about .009 in. plus or minus .003 in.

The chamber 16 is assembled as a unit and attached over the bulge 12 by rivets 21 or by more easily removable bolts. The bolts are preferred in cases where the passages of the screen act as a filter and become clogged, being thus easily

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removed for cleaning. Screw threaded studs may be mounted on and project from the casing, upon which the chamber 16 is attached by nuts.

The advantages of the invention are material. The structure is simple, cheap to make, and easy to assemble or dismantle. It acts both as a ventilator and as a fire trap. The arrangement and size of the orifices, the directional changes in the maze, the screen and its construction, and the chamber sizes all contribute to the efficient performance of the unit.

Although only a single embodiment of the present invention is herein illustrated and described, it is to be expressly understood that the invention is not limited thereto. Various changes may be made in the design and arrangement of the parts and in the materials used without departing from the spirit and scope of the invention, as will now be apparent to persons skilled in the art. For a definition of the limits of the invention, reference is had primarily to the appended claims.

What is claimed is:

1. Ventilating apparatus for a casing or the like comprising a wall having a bulge forming a recess in one face thereof and a slot at one edge of said recess whereby the latter is open to the other face of the wall, a chamber assembly comprising a pair of plates having peripheral flanges in face-to-face relation and center portions shaped to form a first chamber between the plates, and means for securing said assembly to said wall across said recess and forming the latter into a second chamber, the inner plate of said pair constituting a wall between said chambers and having a slot therein connecting said chambers adjacent the edges thereof opposite said first-named slot and the other of said plates

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having a slot therein extending across the other edge of said first chamber.

2. Ventilating apparatus as defined in claim 1 wherein the bulge forming the outer wall of said second chamber is an offset integral part of the wall of the casing.

3. Ventilating apparatus as defined in claim 1 wherein the center portions of said plates are oppositely bulged to form said first chamber.

4. Ventilating apparatus as defined in claim 3 wherein said plates are substantially identical stampings assembled in opposed face-to-face relation with the slots therein at opposite edges of the chamber formed therebetween.

5. Ventilating apparatus as defined in claim 3 wherein the chamber assembly comprises a metallic screen extending across said first chamber and having the periphery thereof securely clamped between the peripheral flanges of said plates.

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