

March 6, 1951

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VENTILATING APPARATUS

2,544,379

Filed Nov. 15, 1946

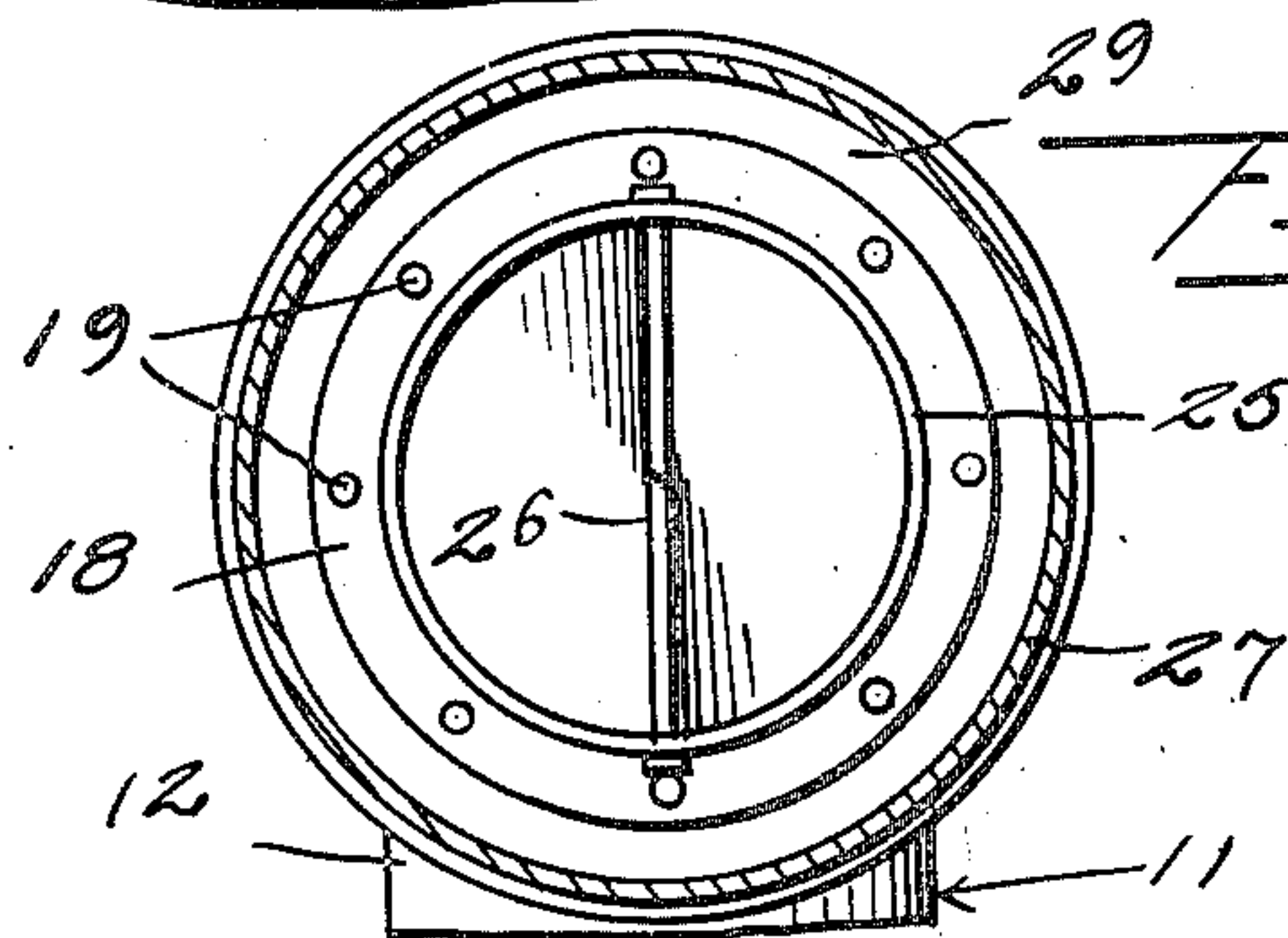
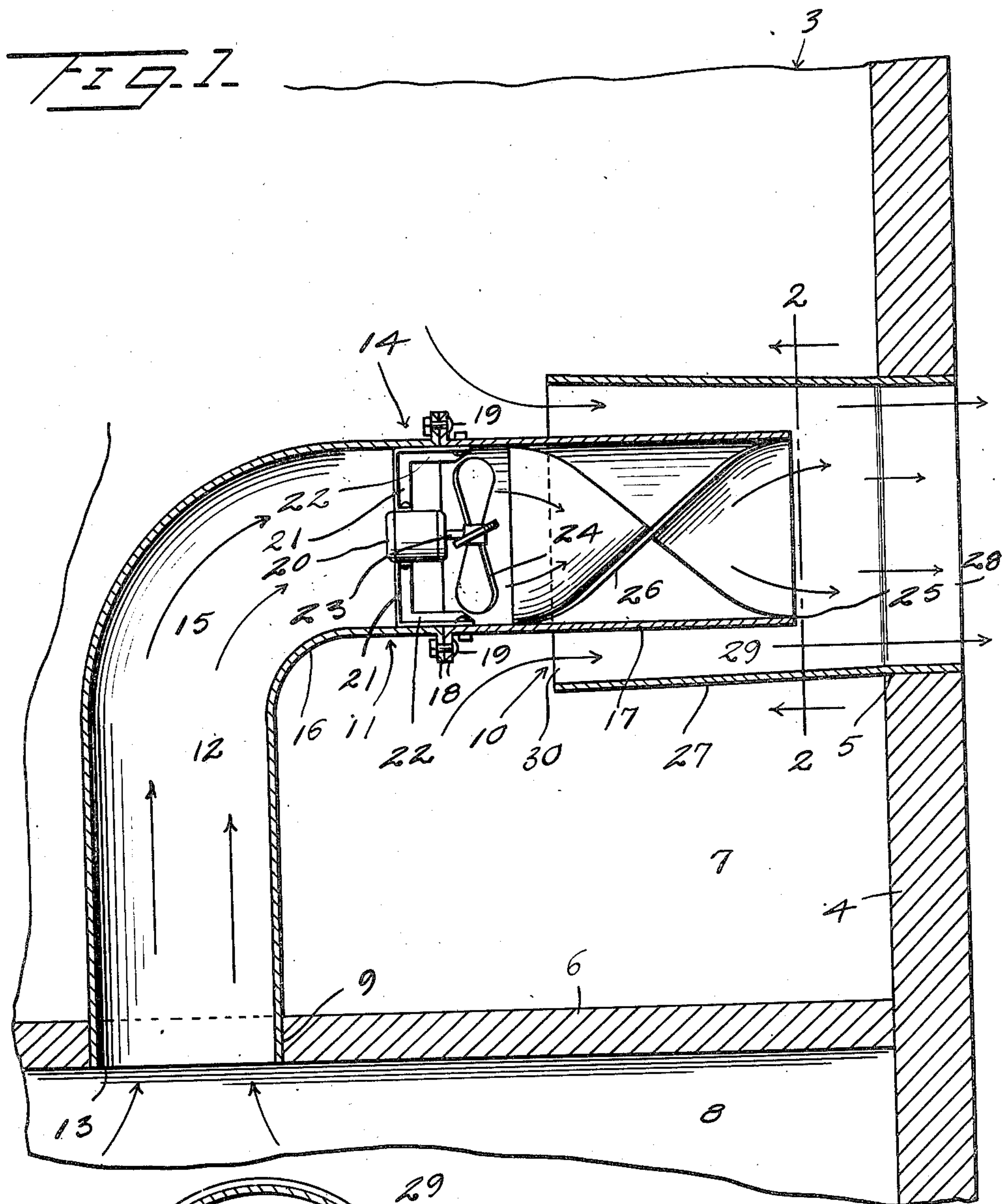


Fig. 2.

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UNITED STATES PATENT OFFICE

2,544,379

VENTILATING APPARATUS

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Application November 15, 1946, Serial No. 709,901

3 Claims. (Cl. 98—43)

1

This invention relates to novel apparatus of extremely simple construction and which is especially adapted for use for ventilating enclosures and more particularly for exhausting hot or stale air therefrom.

A primary object of the present invention is to provide a ventilating apparatus of extremely simple construction and which may be utilized for extracting air either from a plurality of separate chambers of an enclosure or from a plurality of remote points within a single chamber.

Various other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawing, illustrating a preferred embodiment thereof, and wherein:

Figure 1 is a longitudinal, substantially central sectional view through a preferred embodiment of the apparatus and illustrating a preferred adaptation thereof, and

Figure 2 is a cross sectional view of the apparatus taken substantially along a plane as indicated by the line 2—2 of Figure 1.

Referring more specifically to the drawing, a portion of an enclosure is illustrated in Figure 1 and designated generally 3 and includes an outside wall 4 having an opening 5 therein, communicating with the atmosphere. In the preferred embodiment of the application of the apparatus, hereinafter to be described, the enclosure 3 includes a combination floor and ceiling 6 separating an upper chamber 7 from a chamber 8 located directly therebeneath. The chamber 7, for example, might constitute the attic of a dwelling and the chamber 8 a room located on the floor, directly beneath the attic 7. The ceiling and floor 6 is provided with an opening 9 forming a communicating passage between the chambers 7 and 8.

The ventilating apparatus, designated generally 10 and comprising the invention, includes a substantially L-shaped conduit, designated generally 11 which includes a leg 12 having an open outer end 13 which is mounted in the opening 9 so as to substantially fill the same. The leg 12 is disposed in substantially a perpendicular position within the upper chamber 7 and is connected with the other leg, designated generally 14, of the conduit 11 by an arcuate portion 15. The conduit portion 14 is disposed substantially at a

2

right angle to the portion 12 and extends from the arcuate portion 15 in a direction toward the opening 5 of the wall 4. The conduit portion or leg 14 is composed of separate conduit sections 16 and 17 having adjacent flanged ends 18, the outwardly extending flanges of which are secured in abutting engagement by detachable fastenings 19. The conduit portion 16 constitutes an integral part of the conduit portions 12 and 15 and the conduit portion 17 forms a separate detachable section thereof.

A suitable motor, such as an electric motor 20, is disposed in the conduit portion 16 adjacent its open end and is supported therein by brackets having radial arms 21, fastened at their adjacent ends to the motor, and longitudinally extending arms 22 which extend from conduit portion 16 into conduit portion 17 and which are bolted in portion 17. The members 21, 22 are preferably formed of angle iron. The bracket means 21, 22 supports the motor 20 and its driven shaft 23 substantially axially of the conduit leg 14; said shaft 23 extending into the conduit section 17 and having a fan 24 keyed thereto and disposed for rotation in the conduit section 17. It will be obvious that the motor 20, though disposed in section 16 is supported by conduit section 17. The conduit section 17, between the fan 24 and its open outlet end 25, contains a helical or spiral vane 26 of a width substantially equal to the internal diameter of the conduit section 17.

A sleeve 27 of substantially greater diameter than the conduit 11 has an open outer end 28 mounted in and substantially closing the opening 5 of the wall 4; said sleeve 27 extending inwardly of the chamber 7 from the opening 5 and having the inner portion thereof surrounding and disposed substantially concentric to the outer portion of the conduit section 17. The sleeve 27 is of a substantially greater internal diameter than the external diameter of the conduit section 17 to combine therewith to form an annular passage 29, one end of which opens into the sleeve 27 toward the open end 28 and the opposite end of which forms an annular opening 30, defined by a portion of the section 17 and the inner end of the sleeve 27.

From the foregoing it will be readily obvious that when the motor 20 is energized or in operation that the shaft 23 thereof will be revolved in

3

a clockwise direction, looking from left to right of Figure 1, for revolving the fan 24 in the same direction to cause said fan to expel air therefrom toward the open end 25 of the conduit 11. This will create a suction in the conduit leg 12 for drawing air through the open end 13 thereof from the chamber 8 which air, as indicated by the arrows in Figure 1, will be drawn from the conduit end 13 toward its opposite end 25, and in passing through the conduit section 17, beyond the fan 24, the air will be subjected to a swirling action in passing around the surfaces of the vane 26, so that the air when expelled from the conduit end 25 will be whirling or revolving as it passes through the sleeve 27 and is expelled through the open end 28 thereof to the atmosphere. This whirling or revolving motion of the air within the sleeve 27 will create a vacuum or suction within the annular passage 29 thereof which will tend to draw air inwardly of said passage 29 through its annular open end 30 and from the upper chamber 7, so that the apparatus 10 will function for extracting air from both the chambers 7 and 8 and for expelling it to the atmosphere through the outlet end 28 thereof.

Obviously, the apparatus 10 could be utilized for extracting air from two chambers located on substantially the same level, in which case the conduit 11 could be disposed in substantially a horizontal plane and the ceiling and floor 6 would in such case constitute a vertical partition or wall. Likewise, if desired, the ventilating apparatus 10 could be located in the lower of two chambers and with the conduit leg 12 thereof extending upwardly and opening upwardly into the chamber thereabove.

Also, the apparatus 10 could be located in a single chamber in which case the ceiling 6 would be omitted or the reference character 6 could designate a supporting bracket for supporting the inlet end 13 of the apparatus. When so used, it will be readily obvious that the leg 12 could be extended in length for extracting air from remote portions of a relatively large chamber and the conduit 11 could obviously be straight instead of curved.

Various other modifications and changes are contemplated and may obviously be resorted to, without departing from the spirit and scope of the invention as hereinafter defined by the appended claims.

I claim:

1. A ventilating apparatus comprising a sleeve adapted to be mounted at one end thereof in an opening of an outside wall of an enclosure and opening at said end to the atmosphere, said sleeve having an opposite inner end opening into a first room of the enclosure, a conduit of substantially smaller external diameter than the internal diameter of said sleeve having an outlet end disposed within the inner end of the sleeve and substantially concentric thereto, the outlet end of said conduit terminating within the sleeve and in spaced relationship to the ends of the sleeve, said conduit extending from the inner end of the sleeve and having an opposite inlet end opening into a second room of the enclosure, a driven fan disposed within said conduit adjacent its outlet end and adapted to impel air therethrough from the inlet end thereof and to expel the air therefrom into said sleeve and toward the first mentioned, outlet end thereof, said outlet end of the conduit and sleeve combining to form a nozzle for drawing air into the sleeve from the first room through the inner end thereof and for causing the air to

4

be impelled through the length of the sleeve and ejected therefrom to the atmosphere and means located in said conduit to cause the air ejected therefrom to pass through the sleeve in a whirling motion for increasing the suction in the inlet end of the sleeve, said means comprising a helical vane disposed in the conduit and extending from adjacent the fan to the outlet end thereof, and said vane being of a width substantially equal to the internal diameter of the conduit.

2. A ventilating apparatus comprising a sleeve adapted to be mounted at one end thereof in an opening of an outside wall of an enclosure and opening at said end to the atmosphere, said sleeve having an opposite inner end opening into a first room of the enclosure, a conduit of substantially smaller external diameter than the internal diameter of said sleeve having an outlet end disposed within the inner end of the sleeve and substantially concentric thereto, the outlet end of said conduit terminating within the sleeve and in spaced relationship to the ends of the sleeve, said conduit extending from the inner end of the sleeve and having an opposite inlet end opening into a second room of the enclosure, a driven fan disposed within said conduit adjacent its outlet end and adapted to impel air therethrough from the inlet end thereof and to expel the air therefrom into said sleeve and toward the first mentioned, outlet end thereof, said outlet end of the conduit and sleeve combining to form a nozzle for drawing air into the sleeve from the first room through the inner end thereof and for causing the air to be impelled through the length of the sleeve and ejected therefrom to the atmosphere and means located in said conduit to cause the air ejected therefrom to pass through the sleeve in a whirling motion for increasing the suction in the inlet end of the sleeve, said means comprising a helical vane disposed in the conduit between the fan and outlet end thereof, the outlet end portion of the conduit and the inlet end portion of the sleeve being coaxially disposed to form a straight annular passage having an annular inlet end.

3. In a ventilating apparatus, a sleeve adapted to be mounted at one end thereof in an opening of an outside wall of an enclosure and opening at said end to the atmosphere, said sleeve having an opposite inner end opening into a first room of an enclosure, a conduit of substantially smaller external diameter than the internal diameter of said sleeve having an outlet end disposed within the inner end of the sleeve and substantially concentric thereto, the outlet end of said conduit terminating within the sleeve and in spaced relationship to the ends of the sleeve, said conduit extending from the inner end of the sleeve and having an opposite inlet end opening into a second room of the enclosure, a driven fan disposed within said conduit adjacent its outlet end and adapted to impel air therethrough from the inlet end thereof and to expel the air therefrom into said sleeve and toward the first mentioned, outlet end thereof, said outlet end of the conduit and sleeve combining to form a nozzle for drawing air into the sleeve from the last mentioned, inner inlet end thereof and for causing the air to be impelled through the length of the sleeve and ejected therefrom to the atmosphere, and means located in said conduit to cause the air ejected therefrom to pass through the sleeve in a whirling motion for increasing the suction in the inlet end of the sleeve, said means comprising a helical vane disposed in the conduit and extend-

ing from adjacent the fan to the outlet end thereof, said vane being of a width substantially equal to the internal diameter of the conduit, said conduit being formed of detachably connected sections including an outlet section containing the fan and vane, said vane being disposed between the outlet end of said outlet section and the fan, and a bracket supporting the fan secured in the outlet section and projecting into the adjacent end of the other section of the conduit.

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