

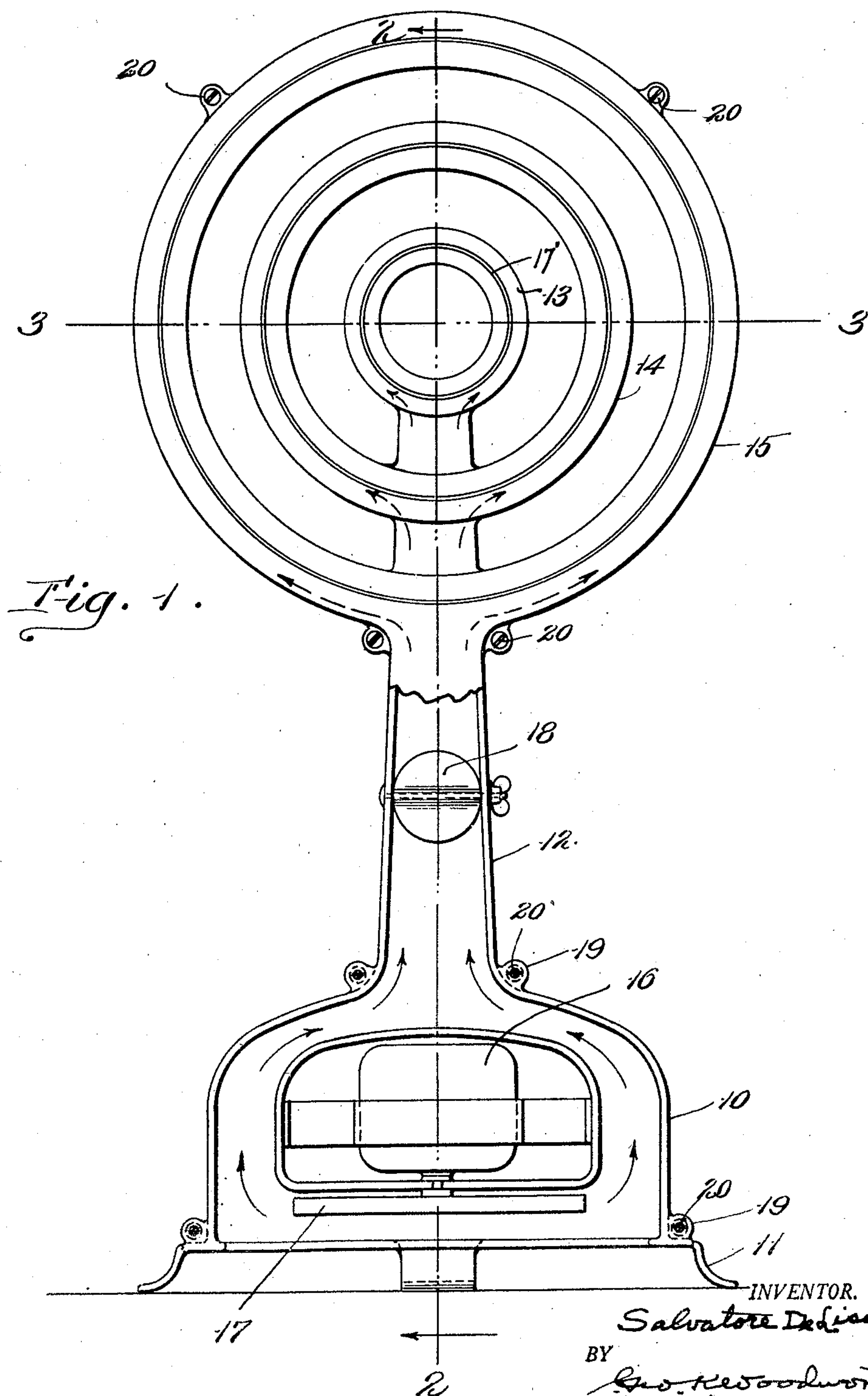
Nov. 15, 1949

S. DE LISIO  
MOTOR-DRIVEN FAN

2,488,467

Filed Sept. 12, 1947

2 Sheets-Sheet 1



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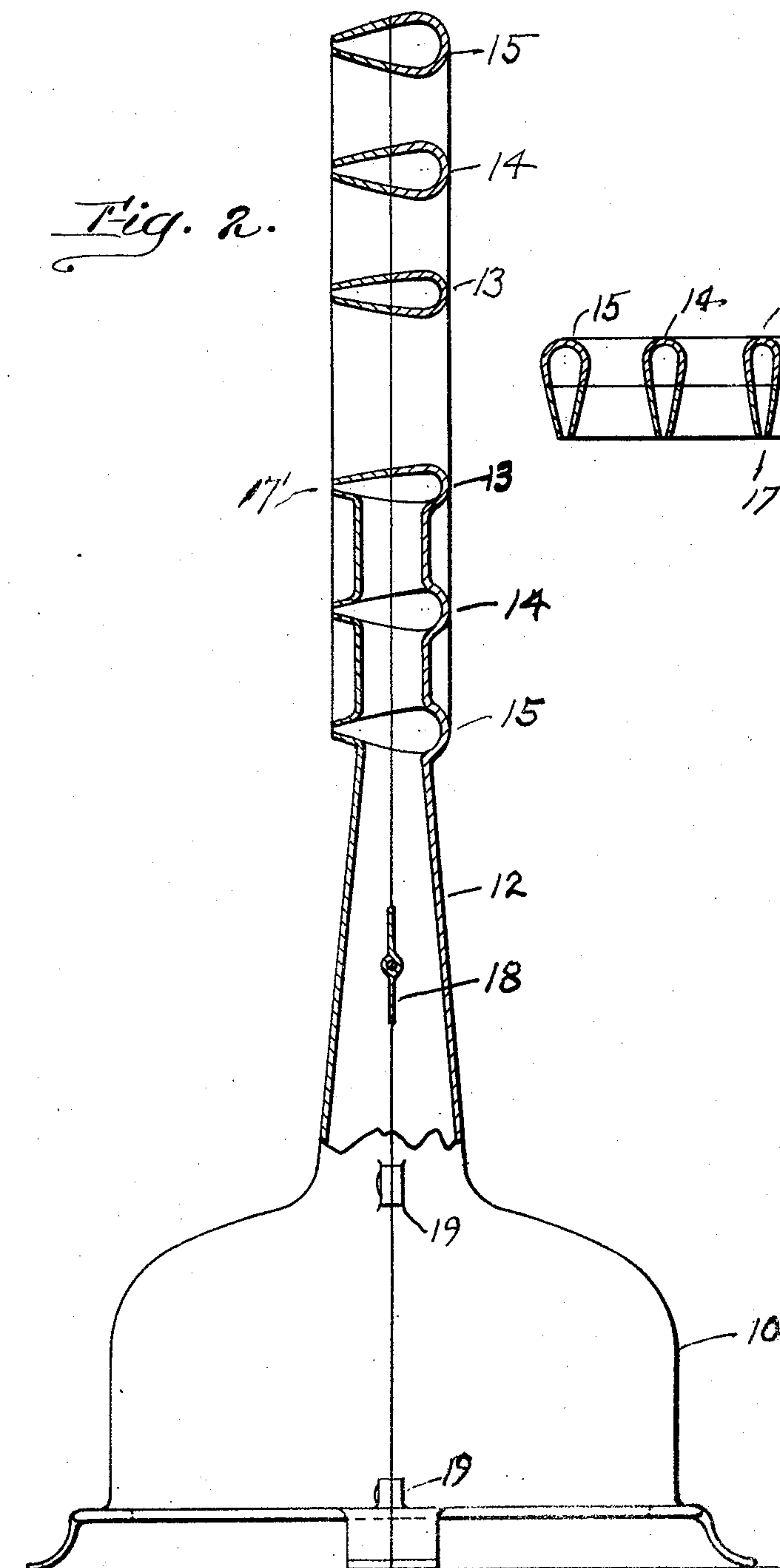
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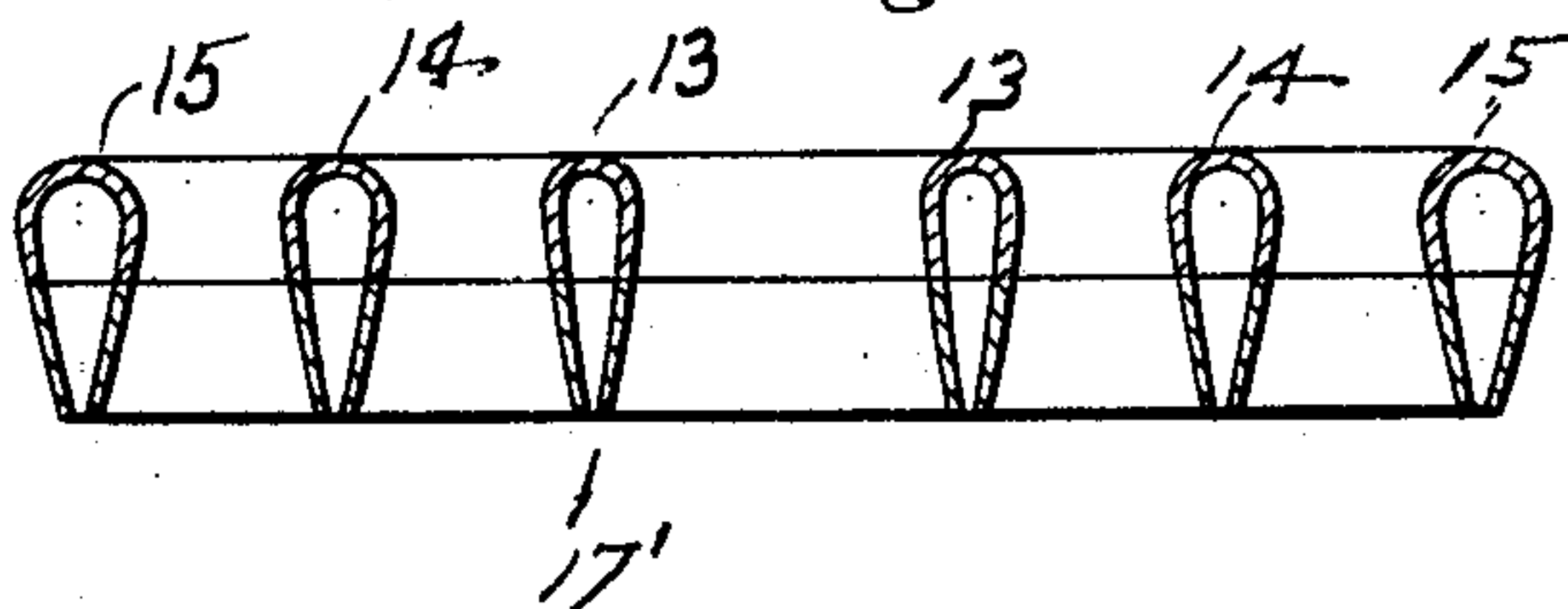
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*Fig. 2.*



*Fig. 3.*



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## UNITED STATES PATENT OFFICE

2,488,467

## MOTOR-DRIVEN FAN

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Application September 12, 1947, Serial No. 773,562

5 Claims. (Cl. 230—274)

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The object of the present invention, which relates to motor driven fans, is the provision of a fan which will be noiseless in operation, will produce a uniform flow of air which may be regulated without changing the speed of the motor, which if used as an exhaust fan requires no louvers, and in which the moving elements are enclosed, thereby providing an element of safety not found in fans now in use.

In the drawings accompanying and forming a part of this specification—

Figure 1 is a front elevation partly in section of a fan embodying my invention.

Fig. 2 is a side elevation partly in section, taken on the line 2—2 of Fig. 1, and

Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 1.

In the particular drawings selected for more fully disclosing my invention and the principle underlying the same, 10 is a hollow base member supported by legs 11, the bottom of said base member being open to the atmosphere and the upper portion terminating in a tubular portion 12 which affords a conduit between the base member and the nozzles 13, 14, 15, shown, in the present instance, as three concentric annular nozzles, although, of course, it will be understood that my invention is not limited to the number or the shape of the nozzles.

Enclosed within the base member is an electric motor 16 which drives a blower, fan, impeller, or other suitable means 17 for creating a flow of air through the conduit and to and through the nozzles.

Preferably, each nozzle has approximately the cross sectional shape indicated, viz., an oval somewhat flattened at its forward or discharge end terminating in an annular outlet 17', said annular outlet being disposed in a plane substantially at right angles to the axis of the conduit and having a cross sectional area small compared to the cross sectional areas of the rearward portions of the nozzle; in other words, the inner lateral walls of the nozzle converge forwardly so that the cross sectional areas of the nozzle progressively diminish from the rearward end to the outlet. The reason for making the nozzles in the form shown is to increase the speed of the air flow from the nozzle and secure an air jet having a velocity greater than that of the air flow in the conduit afforded by the tubular portion 12.

If a plurality of nozzles are employed, they are all similarly directed and the cross sectional areas thereof progressively increase outwardly from the innermost nozzle.

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By making the cross sectional area of the outermost nozzle, which of course has the greatest circumferential length, larger than that of either of the other two, the air pressure throughout the nozzle 15 is substantially constant, and this is true of the other nozzles. Preferably, the cross sectional areas of the three nozzles are so designed that the air pressures produced at the outlets of said nozzles are substantially equal, thereby assuring a uniform flow. The motor may be a substantially constant speed motor, and, if so, or even in any case, the speed and magnitude of the air flow may be regulated by the damper 18.

The base member and nozzles preferably are formed by die casting in the usual well known manner and the two halves may then be secured to them by bolts 19 passing through the ears 20 formed as usual on both halves of the casting, and, then, if necessary, the two parts may be welded together along the line of their junction.

As will be obvious, the fan will be noiseless in operation, as the moving elements are enclosed, and this arrangement will prevent the possibility of the contact of any portion of the body with such elements.

When my invention is used as an exhaust fan, no louvers will be required.

Having thus disclosed an illustrative embodiment of my invention, without, however, limiting the same thereto, what I claim and desire to secure by Letters Patent is:

1. An electric fan comprising in combination, a hollow base member, a blower enclosed within said base member, an annular nozzle and means affording a conduit between said base member and said nozzle, said nozzle having an annular outlet, said annular outlet being disposed in a plane substantially at right angles to the axis of said conduit and having a cross-sectional area small compared to the cross sectional area of the rearward portions of said nozzle.

2. An electric fan comprising in combination, a hollow base member, a blower enclosed within said base member, a plurality of concentric similarly directed annular nozzles and means affording a conduit between said base member and said nozzles, each of said nozzles having an annular outlet, each of said outlets being disposed in a plane substantially at right angles to the axis of said conduit and each having a cross sectional area small compared to the cross sectional areas of the rearward portions of its nozzle.

3. An electric fan comprising in combination, a hollow base member, a blower enclosed within



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said base member, a plurality of concentric similarly directed annular nozzles, the cross sectional areas of said nozzles progressively increasing outwardly from the innermost nozzle, means affording a conduit between said base member and said nozzles, each of said nozzles having an annular outlet, each of said annular outlets being disposed in a plane substantially at right angles to the axis of said conduit and each having a cross sectional area small compared to the cross sectional areas of the rearward portions of its nozzle.

4. An electric fan comprising in combination, a hollow base member, a substantially constant speed blower enclosed within said base member, an annular nozzle, means affording a conduit between said base member and said nozzle, said nozzle having an annular outlet, said annular outlet being disposed in a plane substantially at right angles to the axis of said conduit and having a cross sectional area small compared to the cross sectional areas of the rearward portions of said nozzle, and means for regulating the flow of air to said nozzle without changing the speed of said blower.

5. An electric fan comprising in combination, a hollow base member, a substantially constant

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speed blower enclosed within said base member, an annular nozzle, means affording a conduit between said base member and said nozzle, said nozzle having an annular outlet, said annular outlet being disposed in a plane substantially at right angles to the axis of said conduit and having a cross sectional area small compared to the cross sectional areas of the rearward portions of said nozzle, and means for manually varying the cross sectional area of said conduit whereby the speed and magnitude of the air flow through said conduit may be regulated without changing the speed of said blower.

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