

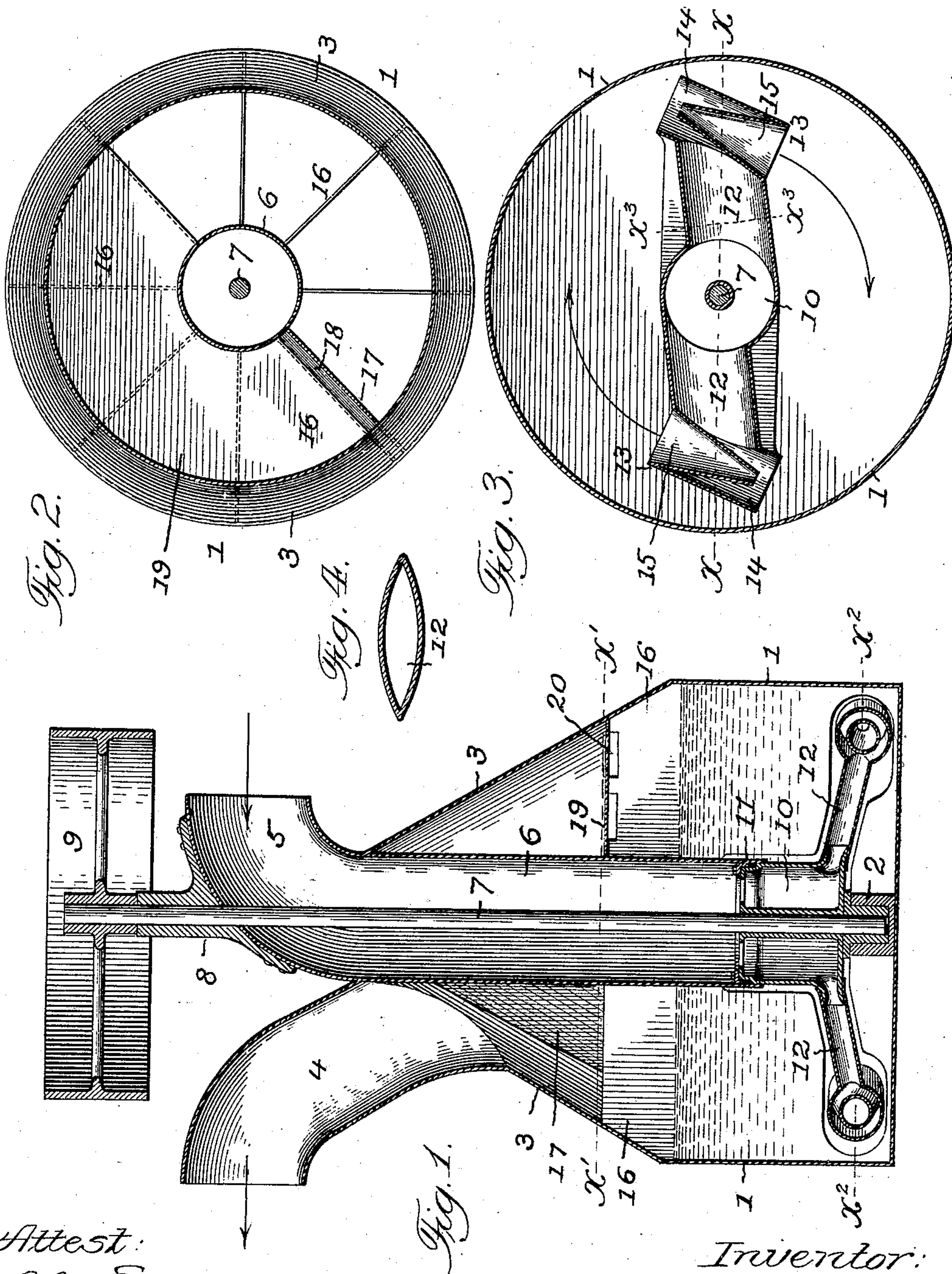
A. MATHIS.

AIR MOVER.

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928,775.

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UNITED STATES PATENT OFFICE.

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AIR-MOVER.

No. 928,775.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, AUGUST MATHIS, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Air-Movers, of which the following is a specification.

This invention relates to that class of centrifugal air movers in which a centrally supplied head carrying a series of radial hollow arms and moving in a fluid medium produces the required movement of the air with a corresponding exhaustion at one end, or a pressure at the other end in accordance with the particular application of the apparatus. And the present improvement has for its object to provide a durable and efficient structural arrangement and combination of parts adapted to move a large volume of air with a minimum expenditure of power, and with which the vortex movement of the fluid medium in which the mechanism works is materially reduced with a consequent increase in the efficiency of the apparatus, all as will hereinafter more fully appear.

In the accompanying drawings:—Figure 1, is a central vertical section on line $x-x$, Fig. 3. Fig. 2, is a horizontal section on line $x'-x'$, Fig. 1. Fig. 3, is a similar view on line x^2-x^2 , Fig. 1. Fig. 4, is a detail transverse section on line x^3-x^3 , Fig. 3, of one of the hollow tangential arms.

Similar numerals of reference indicate like parts in the several views.

Referring to the drawings, 1 represents a cylindrical casing having a fixed bottom provided with a central step bearing 2 for the hereinafter described driving shaft of the apparatus, and a cone top 3 to which the induction and eduction pipes are attached.

4 is the eduction pipe connected to the upper part of the cone top 3 of the casing and opening directly into the interior of the same as shown.

5 is the induction pipe also connected to said cone top 3, and having a central vertical extension 6, which extends down into the main body of the casing and dips into the fluid contained therein.

7 is the vertical driving shaft arranged centrally in the casing with its lower end journaled in the aforesaid step bearing 2, while its upper portion turns in a bearing

8 secured to the induction 5 and is provided with a driving pulley 9 or the like.

10 is a tubular trunk having a central hub and spider by which it is operatively connected to the aforesaid driving shaft 7. Said tubular trunk is of a diameter corresponding to that of the vertical extension 6 of the induction pipe and is connected thereto by an annular gland 11, adapted to permit a free rotation of the trunk without leakage of the air at the point of connection. The trunk and gland just described are located a distance below the surface of the fluid with which the main body of the casing is filled, with a view to aid in the prevention of air leakage at the joint between the revolving trunk 10 and the stationary induction pipe aforesaid.

12 are hollow arms extending tangentially from the trunk 10, and have a flattened elliptical form as shown in Fig. 4 with a view to afford a maximum cross-sectional area with a minimum amount of impedance to the movement of the arms through the fluid medium in which they work.

13 are suction heads arranged in tangential relation to the circular path in which they travel, and secured to the outer ends of the hollow arm 12 aforesaid. In the present improvement each of said suction heads will comprise a substantially cylindrical outer portion 14, attached to and communicating with a hollow arm 12 aforesaid, and a conical inner portion 15 connected at its wide end with the forward end of the aforesaid outer portion 14, as shown more particularly in Fig. 3. With such construction, and with the arms 12 moving in a circular path, the fluid in the main casing is forced through the inner conical portions 15, of the suction heads to produce a very effective suction at the rear ends of said heads to draw the air from the induction pipe, tubular trunk and hollow tangential arms, and effect the movement of a large body of air through said parts.

16 are a series of fixed radial partitions arranged within the main casing 1 and extending from the inner wall of the same to the vertical portion 6 of the induction pipe and to the step bearing 2. Said partitions are cut away near their lower ends in manner shown in Fig. 1, to permit the free travel of the aforesaid tangential arms and suction

heads in a circular path during the actual operation of the apparatus.

17 is a supplementary partition arranged in separated relation to one of the aforesaid partitions 16, to form a narrow vertical passage 18 between said partitions for the downward passage of the fluid, as the same washes over the hereinafter described horizontal partition. Said partition 17 preferably has a greater height than its companion partition 16 to better direct the flow of fluid into the passage 18 aforesaid.

19 is a horizontal partition arranged above the series of partitions 16, and preferably of a semi-circular form, and extending from the partition 16 adjacent to the supplementary partition 17 to another diametrically opposite as shown in Fig. 2.

20 are openings in the upper ends of the partitions 16, beneath the horizontal partition 19, for the passage of the air from one to the other of the series of subchambers formed by such partitions, and the ultimate passage of said air to the eduction pipe 4 aforesaid.

Having thus fully described my said invention what I claim as new and desire to secure by Letters Patent, is:—

1. The combination in an air mover, of a fluid containing casing, a revolving trunk arranged centrally within said casing, hollow arms extending horizontally from said trunk, suction heads arranged on the outer ends of said arms and comprising outer cylindrical portions and conical inner portions secured at their wide ends to the forward ends of the outer portions, and means for imparting rotation to the hollow trunk, substantially as set forth.

2. The combination in an air mover, of a fluid containing casing, a revolving trunk arranged centrally within said casing, hollow arms extending horizontally from said trunk, suction heads arranged on the outer ends of said arms in tangential relation to the circular path in which they travel and comprising outer cylindrical portions and conical inner portions secured at their wide ends to the forward ends of the outer portions, and means for imparting rotation to the hollow trunk, substantially as set forth.

3. The combination in an air mover, of a fluid containing casing, a revolving trunk arranged centrally within said casing, hollow arms extending horizontally from said trunk and having an oval form in cross-section, suction heads arranged on the outer ends of said arms and comprising outer cylindrical portions and conical inner portions secured at their wide ends to the forward ends of the outer portions, and means for

imparting rotation to the hollow trunk, substantially as set forth.

4. The combination in an air mover, of a fluid containing casing, a revolving trunk arranged centrally within said casing, hollow arms extending horizontally from said trunk and having an oval form in cross-section, suction heads arranged at the outer ends of said arms in tangential relation to the circular path in which they travel and comprising outer cylindrical portions and conical inner portions secured at their wide ends to the forward ends of the outer portions, and means for imparting rotation to the hollow trunk, substantially as set forth.

5. The combination in an air mover, of a fluid containing casing having a closed top and bottom, induction and eduction pipes connected to the top of said casing, the induction pipe having a vertical extension arranged centrally in the casing, a vertical driving shaft arranged centrally in said casing, a trunk arranged on the lower part of said shaft below the vertical extension of the induction pipe and connected thereto by an annular gland, a series of tangential hollow arms carried by said trunk, suction heads arranged at the outer ends of said arms, a series of radial partitions extending from the inner walls of the casing to the central vertical extension of the induction pipe, and a horizontal partition arranged above part of said radial partitions, substantially as set forth.

6. The combination in an air mover, of a fluid containing casing having a closed top and bottom, induction and eduction pipes connected to the top of said casing, the induction pipe having a vertical extension arranged centrally in the casing, a vertical driving shaft arranged centrally in said casing, a trunk arranged on the lower part of said shaft below the vertical extension of the induction pipe and connected thereto by an annular gland, a series of tangential hollow arms carried by said trunk, suction heads arranged at the outer ends of said arms, a series of radial partitions extending from the inner walls of the casing to the central vertical extension of the induction pipe, a supplementary partition arranged adjacent to one of said radial partitions, and a horizontal partition arranged above part of said radial partitions, substantially as set forth.

Signed at Chicago, Illinois, this 8th day of February 1909.

AUGUST MATHIS.

Witnesses:

ROBERT BURNS,
HENRY MOE.