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J. M. SEYMOUR, Jr.

BLOWER OR FAN.

APPLICATION FILED AUG. 17, 1903.

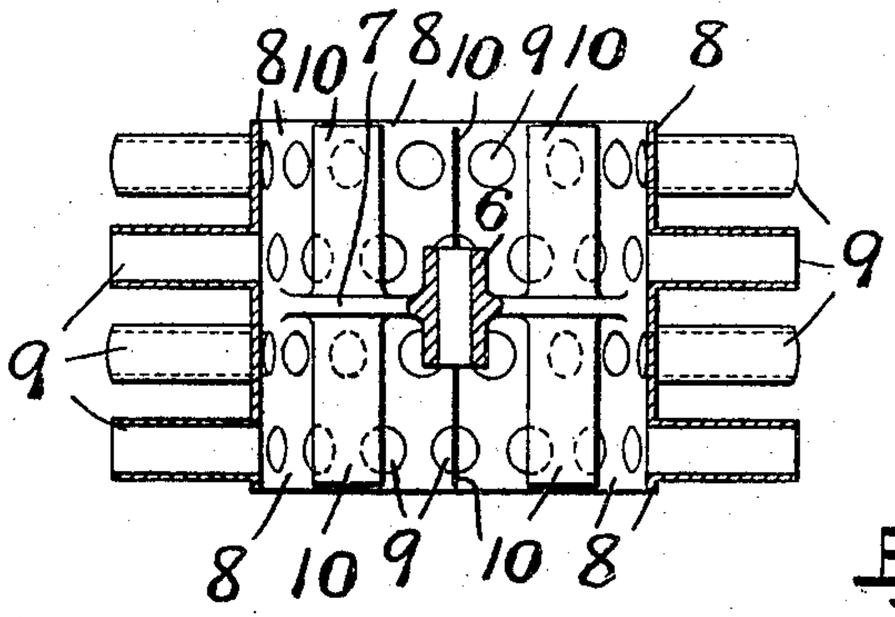

Fig. 3

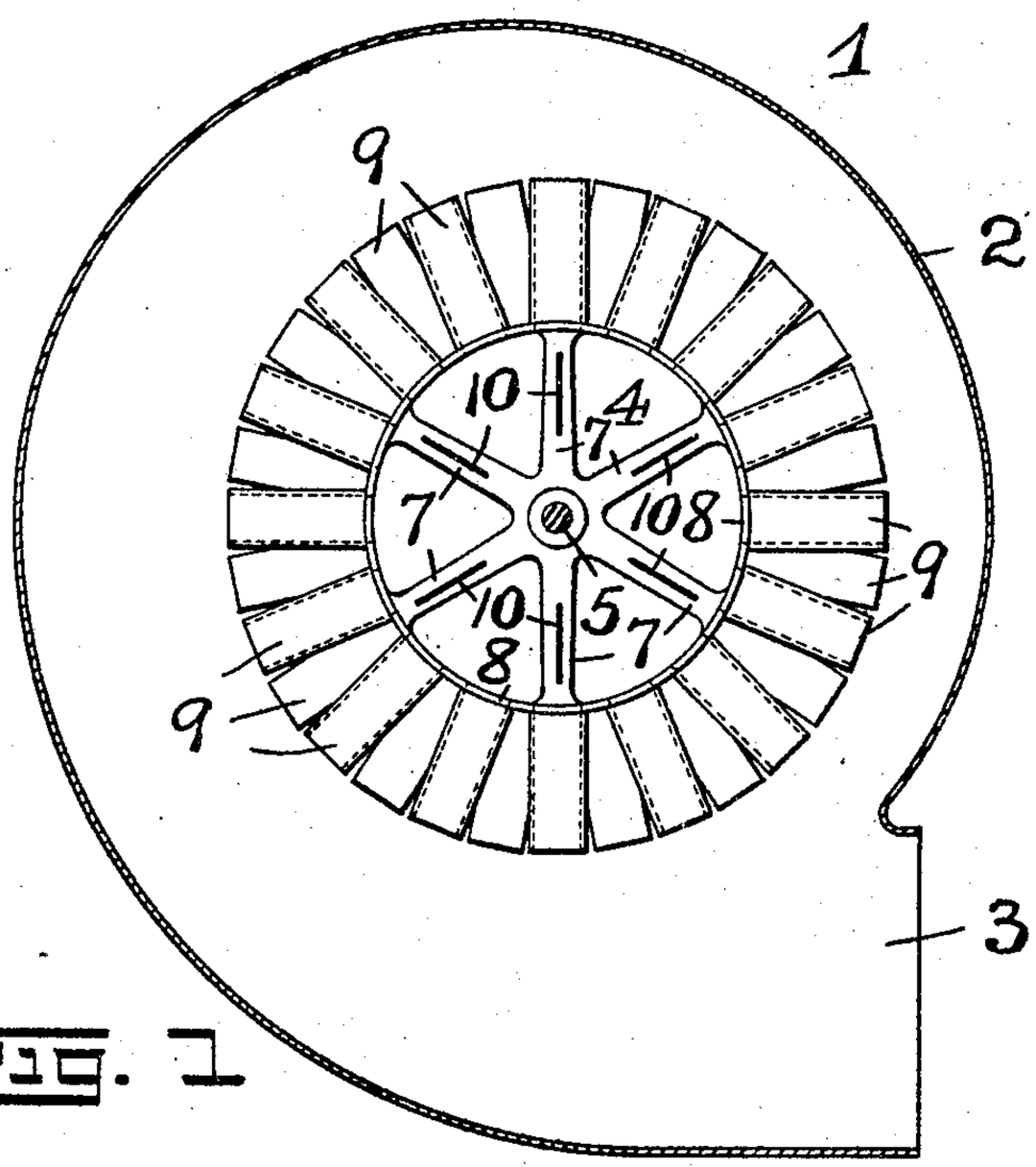

Fig. 1

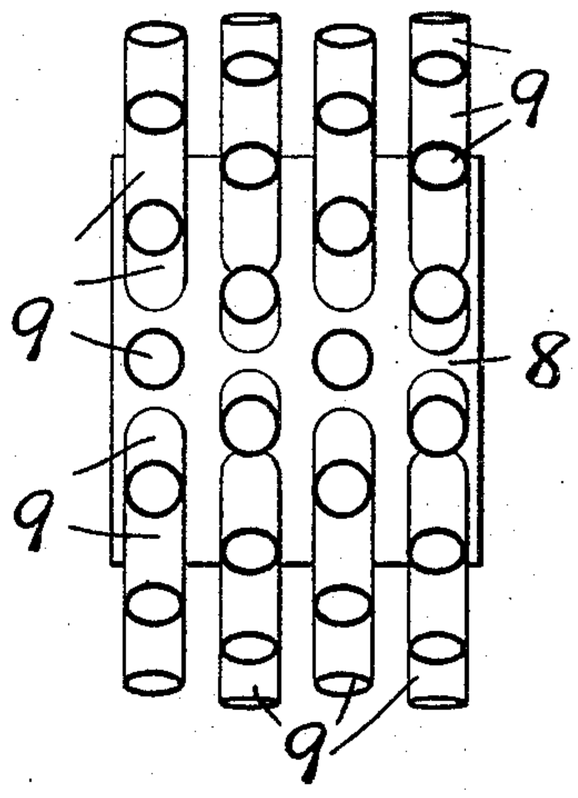

Fig. 2

Witnesses:

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UNITED STATES PATENT OFFICE.

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BLOWER OR FAN.

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To all whom it may concern:

Be it known that I, JAMES M. SEYMOUR, JR., a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Blowers or Fans; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

This invention has reference, generally, to improvements in blowers or fans, and the present invention relates more particularly to a novel centrifugal blower or fan for delivering air or other media under pressure or by sucking it out of a receptacle, acting in that case as an exhaust-fan.

The invention therefore has for its principal objects the production of a simply and durably constructed blower or fan comprising mainly a cylindrical wheel or similar revolving body having hollow or tubular vanes, each vane being provided with a discharge-opening concentric with said wheel or similar revolving body through which air or other media may pass and be discharged from a discharge opening or nozzle of the casing or shroud of the blower or fan.

Other objects of the present invention are the production of a blower or fan having greater efficiency than the efficiency of the ordinary fan provided with solid vanes and, furthermore, the production of a fan which is noiseless in its operation and positive in its action at all speeds.

The principal construction of the blower or fan is such that by revolving a number of tubes around a common center, such as a hollow hub or wheel, each tube being securely expanded into holes or openings in the peripheral surface or plate-like portion of the revolving body, the air on entering the center of the hollow hub or wheel is caught, preferably, on a number of lateral vanes extending from the arms or spokes of the wheel to produce a rotary action of the air inside the wheel, causing the air to revolve at the same rate or approximately the same rate as the inside of the peripheral and cylindrical surface plate or rim of the wheel. The centrifugal action caused by the revolving wheel forces the air violently into the inner open ends of a multiple series of radially-extending tubes, said tubes being straight and of uniform diameters, the said tubes delivering the air radially into the inclosing casing or shroud of the blower or fan, and the multiple series of tubes acting in the manner of blades which finally drive the air from the discharge opening or nozzle of the blower or fan.

The invention consists, therefore, in the novel construction of blower or fan hereinafter set forth; and, furthermore, the invention consists in the novel construction and combination of the component parts of the blower or fan, all of which will be more fully described in the following specification and then finally embodied in the clauses of the claim which are appended to and which form an essential part of the present specification.

The invention is clearly illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a blower or fan embodying the principles of the present invention, the casing or shroud of the same being represented in longitudinal vertical section. Fig. 2 is a top edge view of the fan, and Fig. 3 is a horizontal section of the same.

Similar characters of reference are employed in all of the said above-described views to indicate corresponding parts.

Referring now to the said drawings, the reference character 1 indicates the complete centrifugal blower or fan for delivering air under pressure from an inclosing casing or shroud 2 through a discharge outlet or nozzle 3 or for sucking the air out of a receptacle, as will be understood. The said casing 2 is also provided with the usual inlet 4 and a central shaft 5. Upon that portion of the said shaft 5 between the opposite sides of the said casing 2 is arranged and secured thereon in any suitable manner the fan-wheel embodying the main features of my present invention. This fan-wheel consists, essentially, of a hub 6, provided with radial spokes or arms 7, and a cylindrical wheel-face or plate 8. This plate or wheel-face 8 may be cast integral with the said arms or spokes 7 and is provided with any number of suitably-disposed holes in which are arranged and secured the lower end portions of suitably-constructed tubes 9, which are arranged in multiple series and extend radially from the plate or wheel-face 8, the said tubes providing hollow vanes of uniform diameters, and the said tubes having their discharge-openings equidistant from the central axis of the shaft of the fan-wheel. Another method is to drill a flat plate

full of holes, then rolling the plate around the spokes or arms, to provide a cylinder, having a perforated peripheral surface, in the perforations of which the inner ends of the said tubes are arranged and expanded. These tubes may be of various lengths, as may be required for the purpose of handling air in different volumes and at different pressures. Suitably connected with the said arms or spokes 7 are lateral vanes 10, as will be clearly seen from an inspection of Figs. 1 and 3.

The construction and principle of my novel fan are such that when the air enters the opening 4 in the casing 2, the area of said opening 4 being equal to the area bounded by the said wheel-face 8, it is admitted to the center of the wheel and is caught upon the lateral vanes 10, which extend from the arms or spokes 7. These vanes 10 produce a rotary action of the air upon the inside of the wheel, causing the air to revolve at the same rate or approximately the same rate as the inside of the wheel-face or the steel or other suitable plate in which the radial tubes 9 are expanded. The centrifugal action caused by the revolving wheel throws the air violently out of the tubes 9 at their outer ends into the casing or shroud 2, the outsides of the tubes then acting as vanes to throw or propel the air around the interior of the said casing or shroud 2 and finally expelling it from the discharge opening or nozzle 3, as will be clearly evident.

The tubes 9 for high-pressure work are made long, giving a longer column of air in the tubes to be rotated, while for low-pressure work the wheel proper is of a greater diameter and the tubes are made proportionately shorter.

By the construction and arrangement of the various parts as above set forth I have produced a blower or fan of greatly-increased efficiency and one in which the air is made to freely enter the inner ends of the tubular vanes, producing a fan which is noiseless in its operation and positive in its action.

I am aware that some changes may be made in the arrangements and combinations of the parts without departing from the scope of my present invention. Hence I do not limit my invention to the exact arrangements and combinations of the parts as described in the foregoing specification and as illustrated in the accompanying drawings, nor do I confine myself to the exact details of the construction of the said parts.

Having thus described my invention, what I claim is—

1. A blower or fan, comprising a central revolving body arranged to take in air, multiple series of tubes, said tubes being straight and extending radially from said revolving body, and said tubes being of the same diameter, all arranged to deliver the air radially from their discharge ends, substantially as and for the purposes set forth.

2. A blower or fan comprising a central revolving body arranged to take in air, lateral vanes connected with said body, multiple series of tubes, said tubes being straight and extending radially from said revolving body, and said tubes being of the same diameter, all arranged to deliver the air radially from their discharge ends, substantially as and for the purposes set forth.

3. A blower or fan, comprising a hub, radially-extending arms connected with said hub, a cylindrical wheel-face or plate at the free ends of said arms, said wheel-face or plate being provided with holes, multiple series of tubes having their inner ends secured in the holes of said wheel-face or plate, said tubes being straight and extending radially from said wheel-face or plate and said tubes being of the same diameter, all arranged to deliver the air radially from the discharge ends of said tubes, substantially as and for the purposes set forth.

4. A blower or fan, comprising a hub, radially-extending arms connected with said hub, and lateral vanes extending from the said arms, a cylindrical wheel-face or plate at the free ends of said arms, said wheel-face or plate being provided with holes, multiple series of tubes having their inner ends secured in the holes of said wheel-face or plate, said tubes being straight and extending radially from said wheel-face or plate and said tubes being of the same diameter, all arranged to deliver the air radially from the discharge end of said tubes, substantially as and for the purposes set forth.

5. A blower or fan, comprising a central revolving body arranged to take in air, multiple series of tubes, said tubes being straight and extending radially from said revolving body, and said tubes being of the same diameter, all arranged to deliver the air radially from their discharge ends, all combined with a fan-casing fitting closely to the sides of said central revolving body, said casing being provided with an air-inlet and an air-outlet, substantially as and for the purposes set forth.

6. A blower or fan comprising a central revolving body arranged to take in air, lateral vanes connected with said body, multiple series of tubes, said tubes being straight and extending radially from said revolving body, and said tubes being of the same diameter, all arranged to deliver the air radially from their discharge ends, all combined with a fan-casing fitting closely to the sides of said central revolving body, said casing being provided with an air-inlet and an air-outlet, substantially as and for the purposes set forth.

7. A blower or fan, comprising a hub, radially-extending arms connected with said hub, a cylindrical wheel-face or plate at the free ends of said arms, said wheel-face or plate being provided with holes, multiple series of tubes having their inner ends secured

in the holes of said wheel-face or plate, said tubes being straight and extending radially from said wheel-face or plate and said tubes being of the same diameter, all arranged to deliver the air radially from the discharge ends of said tubes, all combined with a fan-casing fitting closely to the sides of said central revolving hub, said casing being provided with an air-inlet and an air-outlet, substantially as and for the purposes set forth.

8. A blower or fan, comprising a hub, radially-extending arms connected with said hub, and lateral vanes extending from the said arms, a cylindrical wheel-face or plate at the free ends of said arms, said wheel-face or plate being provided with holes, multiple series of tubes having their inner ends secured in the holes of said wheel-face or plate, said tubes being straight and extending radially from said wheel-face or plate, and said tubes being of the same diameter, all arranged to deliver the air radially from the discharge ends of said tubes, all combined with a fan-casing fitting closely to the sides of said central revolving hub, said casing being provided with an air-inlet and an air-outlet, substantially as and for the purposes set forth.

In testimony that I claim the invention set forth above I have hereunto set my hand this 14th day of August, 1903.

JAMES M. SEYMOUR, Jr.

Witnesses:

Fredk. C. Fraentzel,

Geo. D. Richards.