No. 672,803. Patented Apr. 23, 1901.

E. A. OSBORNE.

BLOWER OR PUMP.

(Application filed Dec. 19, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

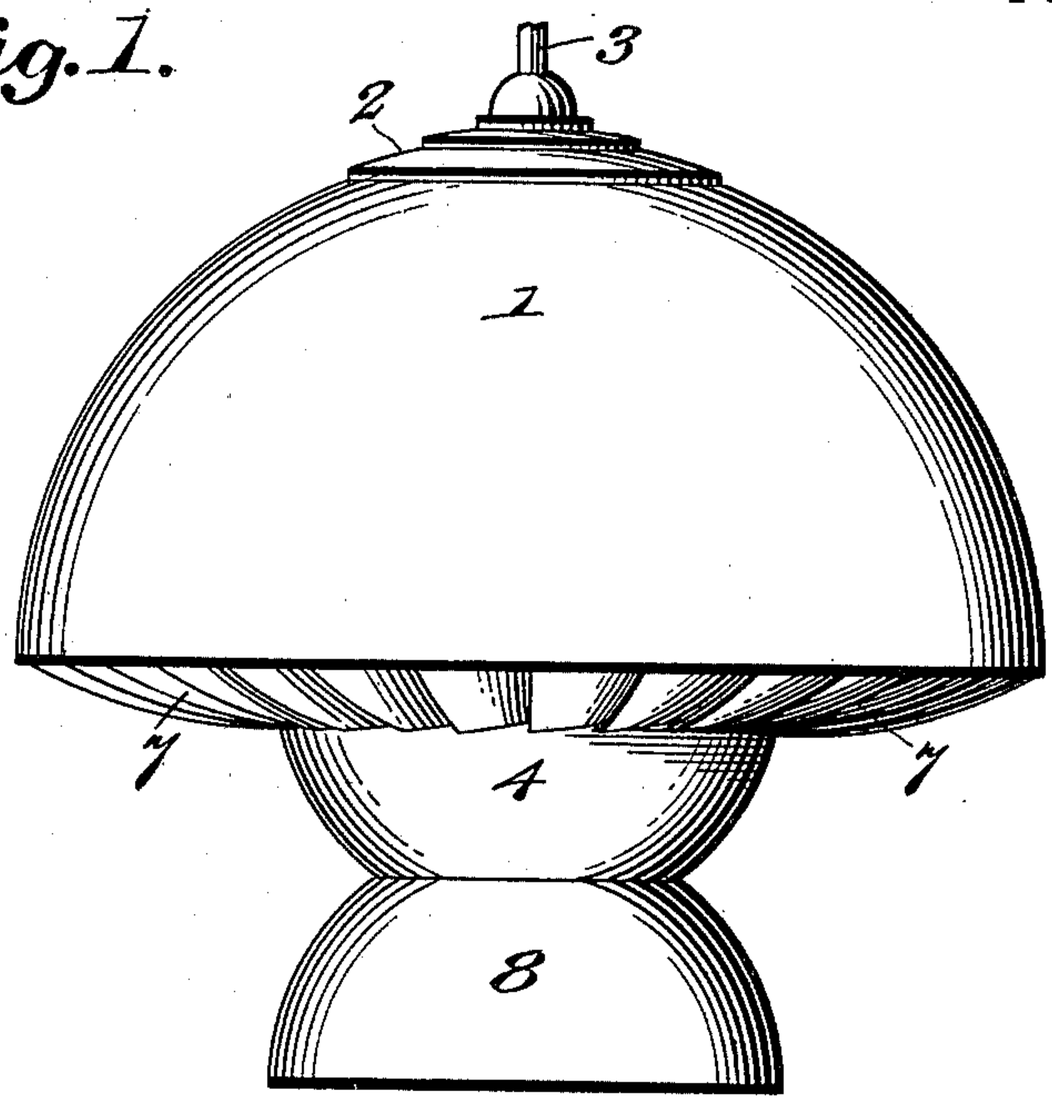

Fig. 2.

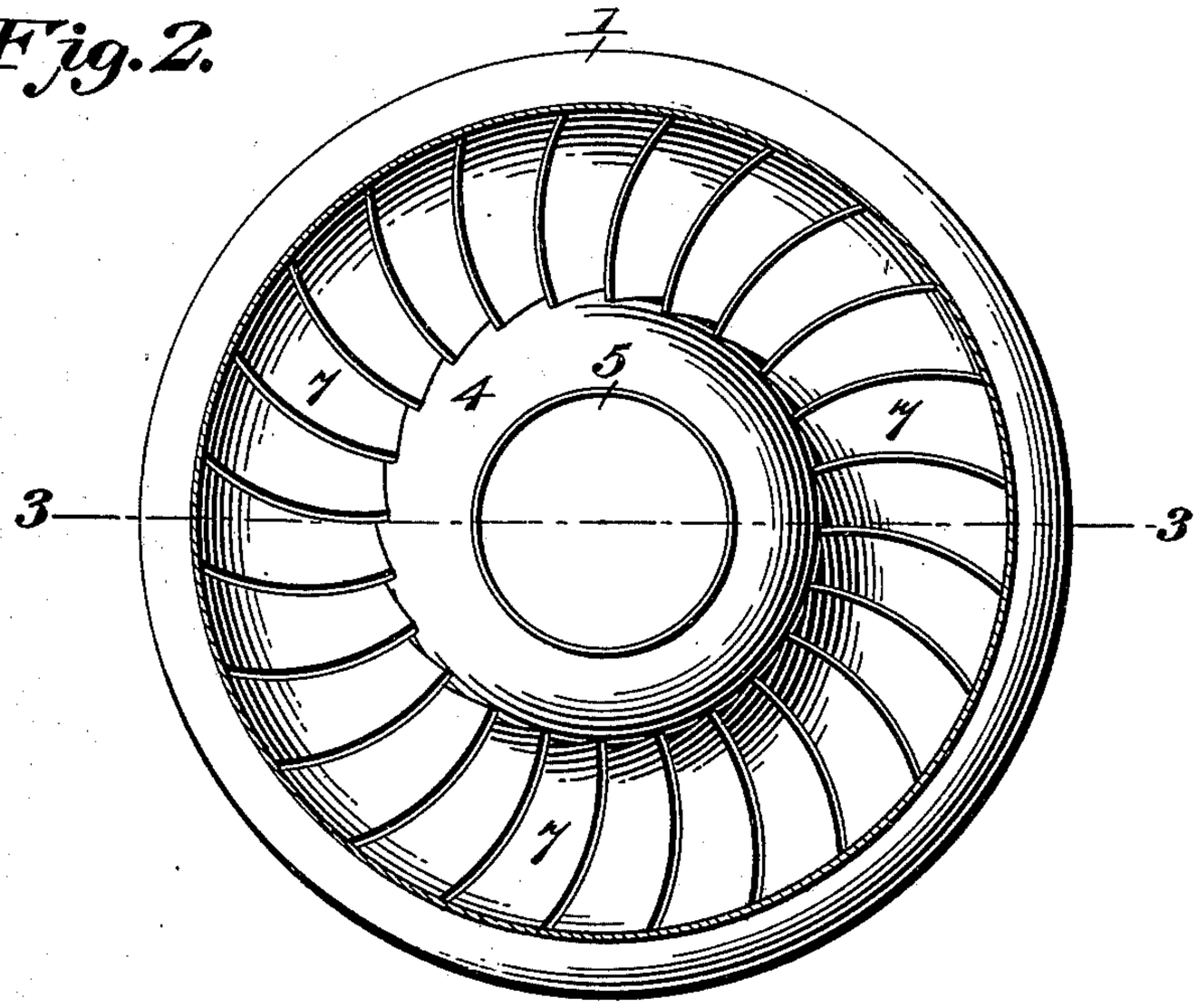

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Fig. 3.

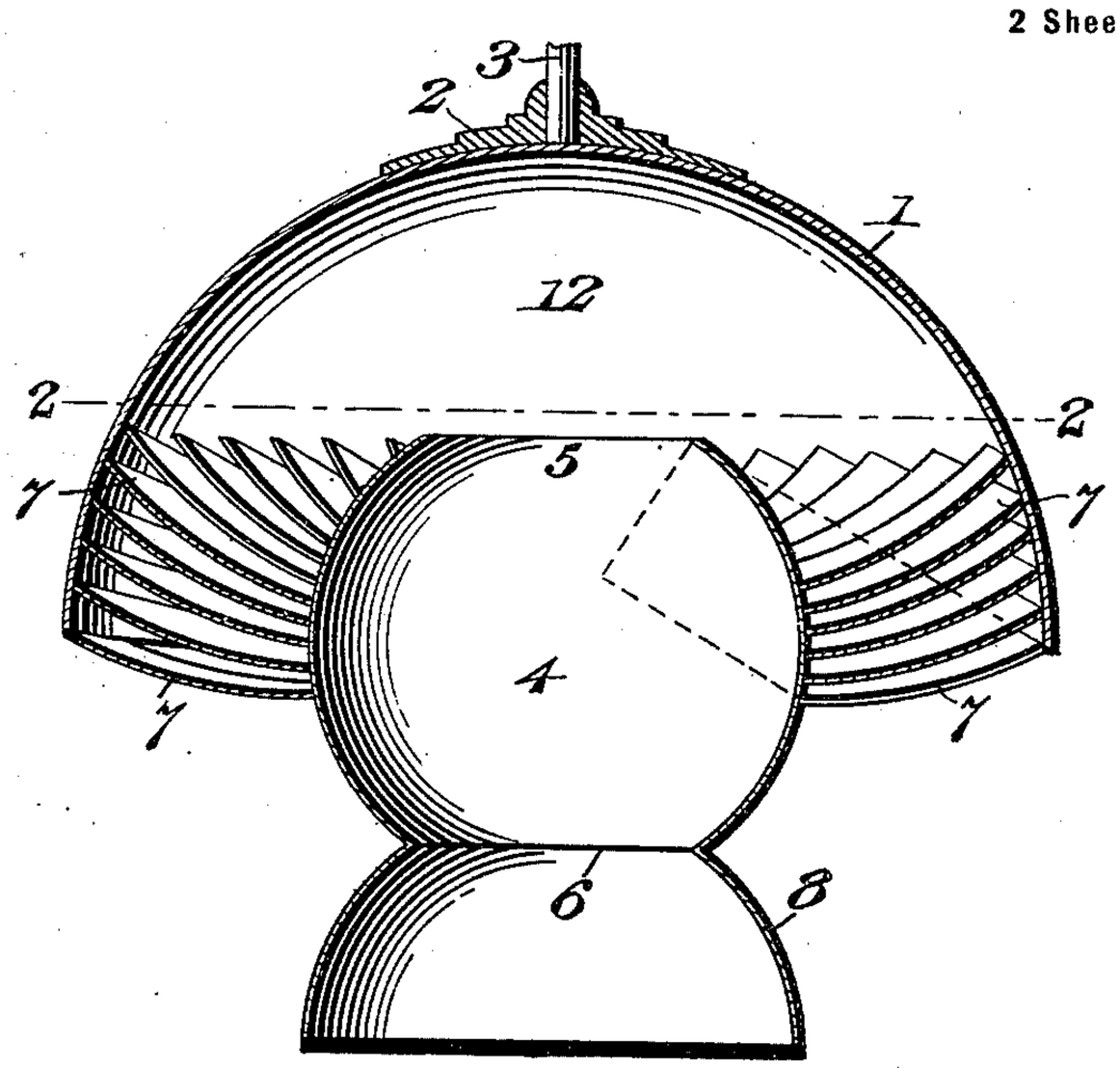


Fig. 7.

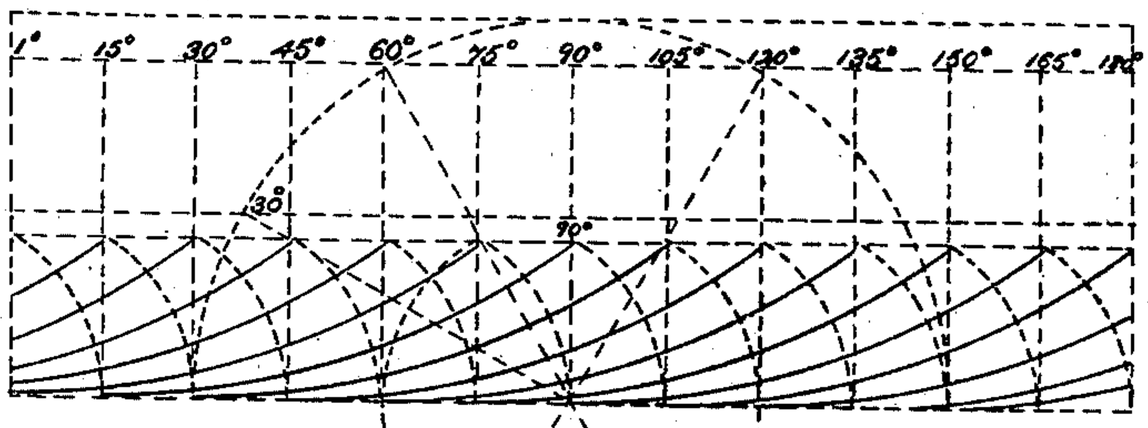


Fig. 4.

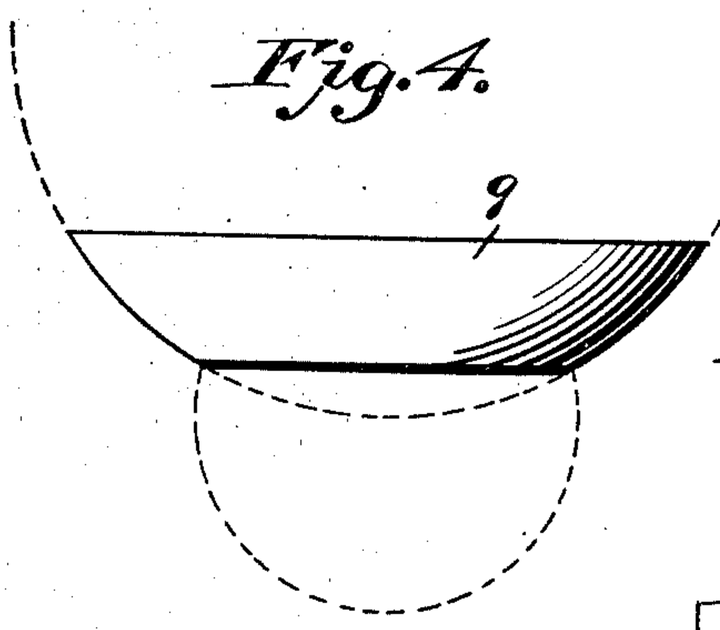


Fig. 6.

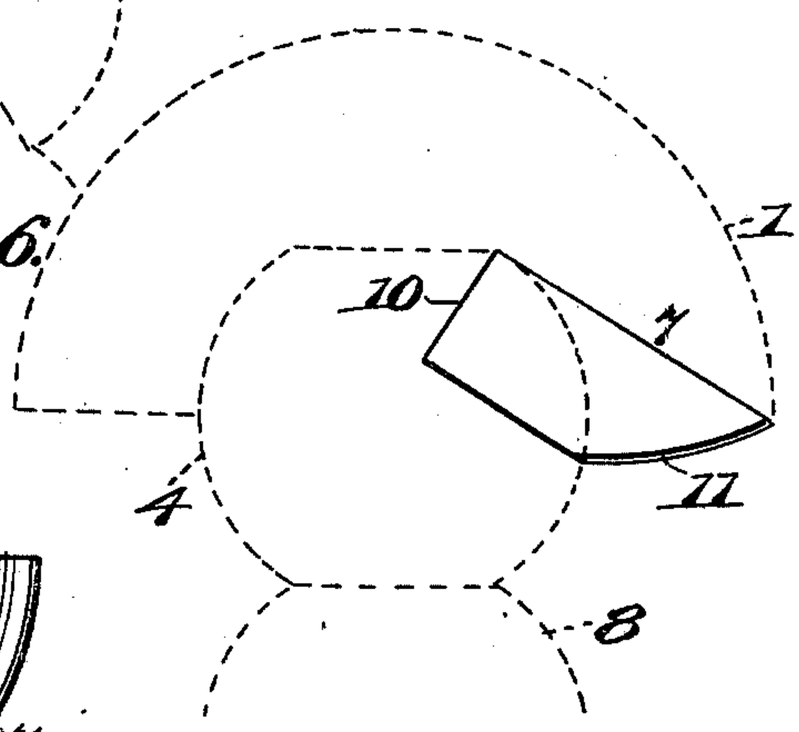
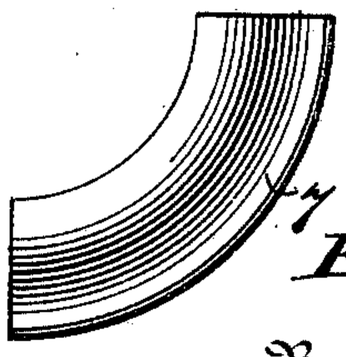


Fig. 5.



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UNITED STATES PATENT OFFICE.

EGBERT ALBION OSBORNE, OF FORT SMITH, ARKANSAS.

BLOWER OR PUMP.

SPECIFICATION forming part of Letters Patent No. 672,803, dated April 23, 1901.

Application filed December 19, 1900. Serial No. 40,431. (No model.)

To all whom it may concern:

Be it known that I, EGBERT ALBION OSBORNE, a citizen of the United States, residing at Fort Smith, in the county of Sebastian and State of Arkansas, have invented a new and useful Blower or Pump, of which the following is a specification.

This invention relates to blowers or pumps, and has for its object to provide a rotary device which is capable of operation upon any fluid, being provided with suction devices for drawing the fluid into the body or shell of the device, associated with means whereby a vortex is formed within the body and a column of fluid forced with considerable pressure outward in a line substantially parallel with the line of passage of the fluid into the body of the device. The device when acting upon air or other elastic fluid serves to gather in the air from a comparatively large area and force the same outward again in a comparatively small column and at a speed proportionate to the rapidity of operation of the device. Substantially the same operation is performed and effect produced when operating in water or other liquid, in which case, however, a less rapid operation will suffice.

The objects and advantages of the invention will appear more fully in the course of the ensuing description.

The invention consists in a blower or pump embodying certain novel features and details of construction and arrangement of parts, as hereinafter fully described, illustrated in the drawings, and incorporated in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a blower or pump constructed in accordance with the present invention, showing also the operating-shaft therefor. Fig. 2 is a cross-section taken on the line 2 2 of Fig. 3. Fig. 3 is a vertical diametrical section taken on the line 3 3 of Fig. 2. Fig. 4 is a detail view showing a segment of a sphere from which the blades of the device are produced. Fig. 5 is a plan view of one of the quadrants of the spherical segments, forming a blade. Fig. 6 is a detail view of one of the blades, showing the manner of applying the same to the inner and outer shells of the device, the shells being indicated in dotted lines. Fig. 7 is a spherical projection illustrating the extent and arrangement of the blades.

Similar numerals of reference designate corresponding parts in all the figures of the drawings.

The blower or pump contemplated in this invention comprises, essentially, a dome or hemispherical outer shell 1, the lower end of which is left open, except as hereinafter stated, and the top of which is provided exteriorly with a reinforce 2, permitting the dome to be firmly united to a driving-shaft 3, which may be propelled in any convenient way and by any preferred motive power adapted to give the requisite speed of rotation to the dome or outer shell.

Within and beneath the dome 1 is a spherical inner shell 4, cut away at opposite ends to leave inlet and outlet orifices 5 and 6, respectively. The curvature of the inner shell 4 is concentric to the curvature of the outer shell 1, or approximately so, so that the outer surface of the inner shell is approximately equidistant at all points from the inner surface of the outer shell, as illustrated in Fig. 3.

A plurality of blades 7 are interposed between the outer and inner shells and are connected permanently at their opposite or outer and inner edges to the dome 1 and inner shell 4, so that said blades are carried around with and by the dome or outer shell and serve to impart a like motion to the inner shell 4.

Connected to the discharge end of the spherical inner shell 4 is a hemispherical extension or nozzle 8, having an opening in its upper portion coinciding with the outlet-orifice 6 of the shell 4, the opposite or discharge end of the extension or nozzle 8 being left open to form an expanded discharge-mouth, from which the fluid being operated upon is expelled. The extension or nozzle 8 is permanently secured to the spherical inner shell in the relation shown in the drawings. It will thus be seen that all of the elements of the blower or pump are rigidly connected for simultaneous rotation.

Each of the blades 8 consists of a quadrangular section of a segment of a sphere. Fig. 4 illustrates the segment of the sphere struck

on the same radius as the outer shell or dome 1. This hollow segment (indicated at 9) is cut into four equal parts, one of which is illustrated in Fig. 5, and which forms, as previously stated, one of the blades 7. One edge of each blade is permanently attached to the outer surface of the inner spherical shell 4 on an oblique as well as curved line, as shown at 10 in Fig. 6, while the outer edge 11 of the blade is permanently attached to the inner surface of the outer dome or shell 1. Practical tests have demonstrated the fact that ordinarily twenty-four of such blades will produce the best results when acting either on air or water or other elastic or inelastic fluids. It has also been found best to so proportion the outer and inner shells and arrange the blades that each blade will extend through seventy-five degrees of a circle, as illustrated in the diagram view, Fig. 7. Of course the number of blades may be varied at will, as well as their dimensions, angles of inclination, &c. The specific construction and arrangement above referred to, however, has been found efficient, as thereby a vortex is formed in the concentrating-chamber 12, included within the upper portion of the dome above the suction-blades and inlet-orifice of the spherical inner shell. The blades 7 should be made of very thin material, such as sheet metal, and it is also advisable to construct the inner shell 4, the hemispherical extension or nozzle 8, and even the dome or outer shell of similar material.

The operation of the device is as follows: The device as a whole is rotated with any desired degree of rapidity by means of the shaft 3. The device rotates directly in the air or water or other fluid to be operated upon, and such fluid is sucked into the interior of the dome by means of the rapidly-rotating blades 7. In this manner a large number of whirling currents of fluid are carried inward with considerable force and, meeting within the concentrating-chamber 12, form a vortex and, combined, are projected in a column outward through the spherical inner shell and expanded discharge-mouth of the hemispherical extension of the inner shell. Where it is desired to carry the fluid to any given point, a suitable conduit may be attached to the discharge-nozzle. Where the device is to be used as a fan or blower for agitating air within an office, store, or room, the device needs nothing in the way of an attachment, as the air will be taken in through the open lower end of the dome 1 and expelled through the extension or enlargement 8 in a manner which will be readily understood. The inner spherical shell 4 and the discharge-nozzle prevent the outgoing fluid from spreading to such a degree as to render it liable to be influenced by the ingoing current. It will thus be seen that the blower or pump acts with a centripetal force to gather in the fluid with which the device is surrounded and expel the same in a solid central column.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described blower or pump will be readily apparent to those skilled in the art without further description, and it will be understood that various changes in the form, proportion, and minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. A rotary blower or pump comprising a concentrating-dome, a spherical exhaust, and suction devices interposed between the dome and exhaust.

2. A rotary blower or pump comprising a concentrating-dome, a spherical exhaust, and suction devices connecting the dome and exhaust.

3. A rotary blower or pump comprising a concentrating-dome, an open-ended spherical exhaust, and suction devices connecting the dome and the exhaust.

4. A blower or pump comprising a rotary concentrating-dome, a spherical exhaust arranged centrally thereof, and suction devices connecting the dome and exhaust.

5. A blower or pump comprising a rotary fluid-concentrating dome, a spherical exhaust arranged concentrically within the dome, and suction devices interposed between the dome and the exhaust.

6. A rotary blower or pump comprising a fluid-concentrating chamber, a centrally-arranged exhaust, and gathering-blades arranged in a circle around the exhaust, and at the entrance to the concentrating-chamber, all of said parts being connected to rotate together.

7. A rotary blower or pump comprising an open hemispherical outer shell, a spherical inner shell arranged centrally within the opening of the outer shell, and suction devices interposed between the outer and inner shells, and connecting the same for simultaneous rotation.

8. A blower or pump comprising a rotary fluid-concentrating open hemispherical shell, suction devices in the open end of the shell, and an inner shell forming an exhaust arranged centrally of the suction devices.

9. A rotary blower or pump comprising an outer dome, an inner shell forming an exhaust, suction devices between the dome and inner shell, and a nozzle connected with the inner shell and having an expanded discharge-mouth.

10. A rotary blower or pump comprising an outer dome, a spherical inner shell forming an exhaust, suction devices between the dome and the inner shell, and a hemispherical ex-

tension of the inner shell forming a discharge mouth or nozzle.

11. The combination with the outer hemispherical shell, and the spherical inner shell, of suction-blades interposed between said shells and each consisting of a portion of a segment of a hollow sphere.

12. The combination with the outer hemispherical shell, and the spherical inner shell, of interposed suction-blades, each consisting of a quadrantal section of a hollow spherical segment.

13. A rotary blower or pump comprising a concentrating-dome, a central exhaust, and suction devices interposed between the dome and exhaust, all of said parts being connected for simultaneous rotation.

14. A rotary pump or blower comprising a dome, suction devices for supplying the dome, and an exhaust-nozzle communicating with the dome, all of said parts being connected to rotate together.

15. A rotary pump or blower comprising a fluid-concentrating dome, means for supplying fluid to the central portion of the interior of the dome, and an exhaust-nozzle for receiving the fluid from the central portion of the dome and directing the same outward, the dome and exhaust-nozzle being connected to rotate together.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

EGBERT ALBION OSBORNE.

Witnesses:
A. W. BOYD,
C. S. SMART.