

No. 621,030.

Patented Mar. 14, 1899.

A. W. & L. W. CASE.

PRESSURE BLOWER.

(Application filed Feb. 28, 1898.)

(No Model.)

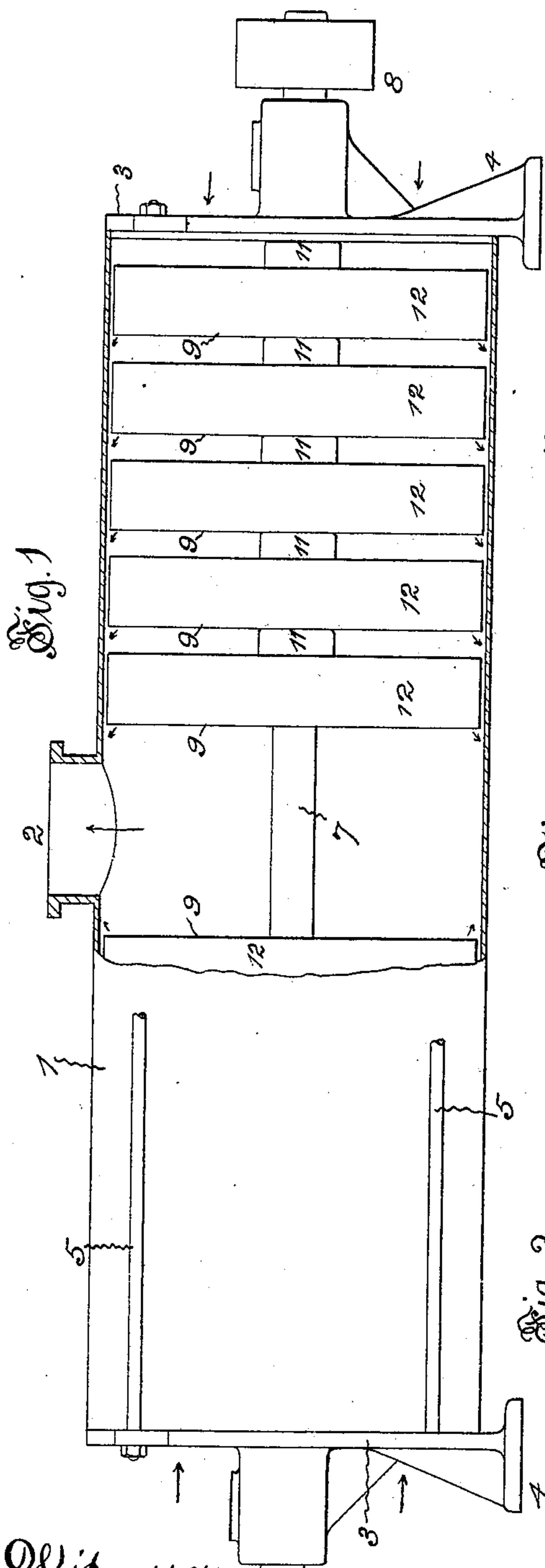


Fig. 1

Fig. 5

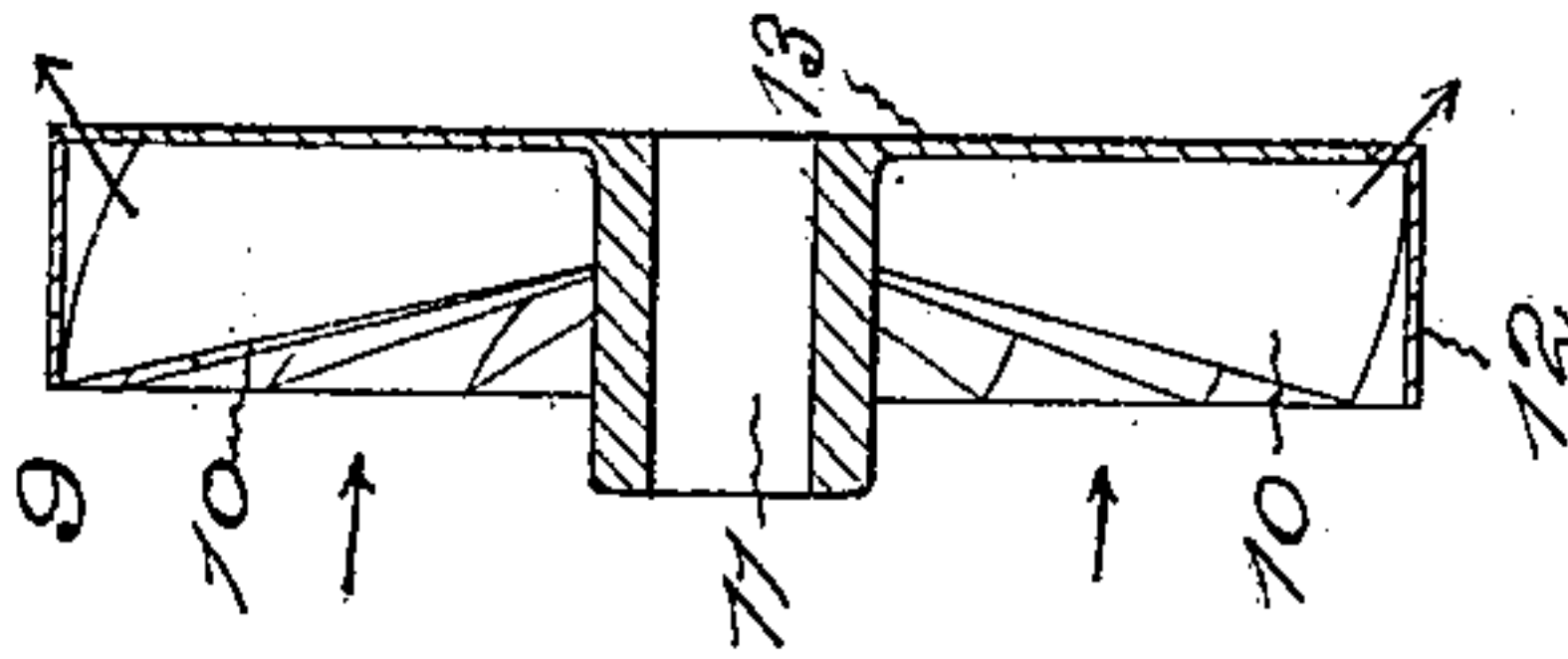


Fig. 4

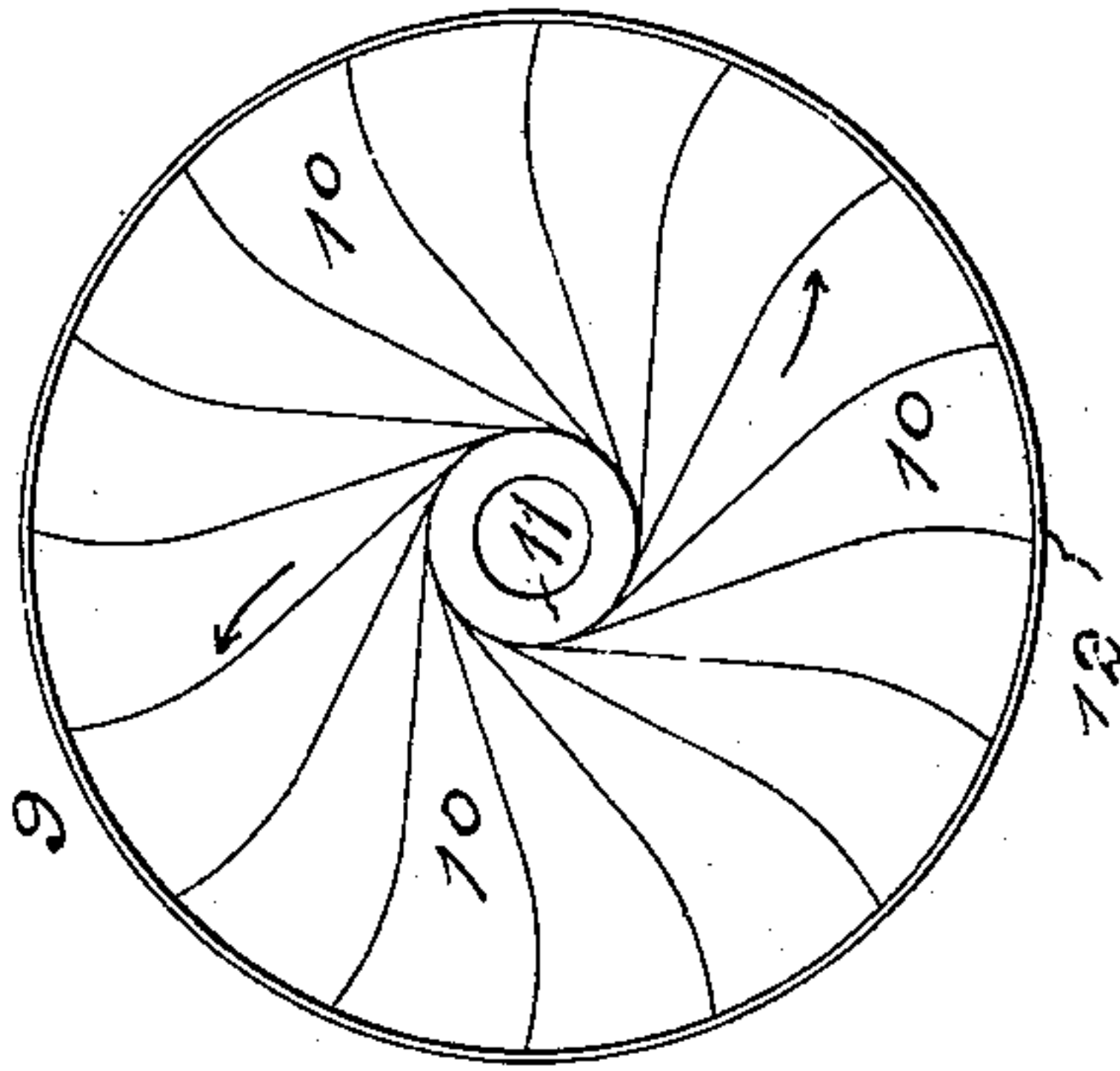


Fig. 3

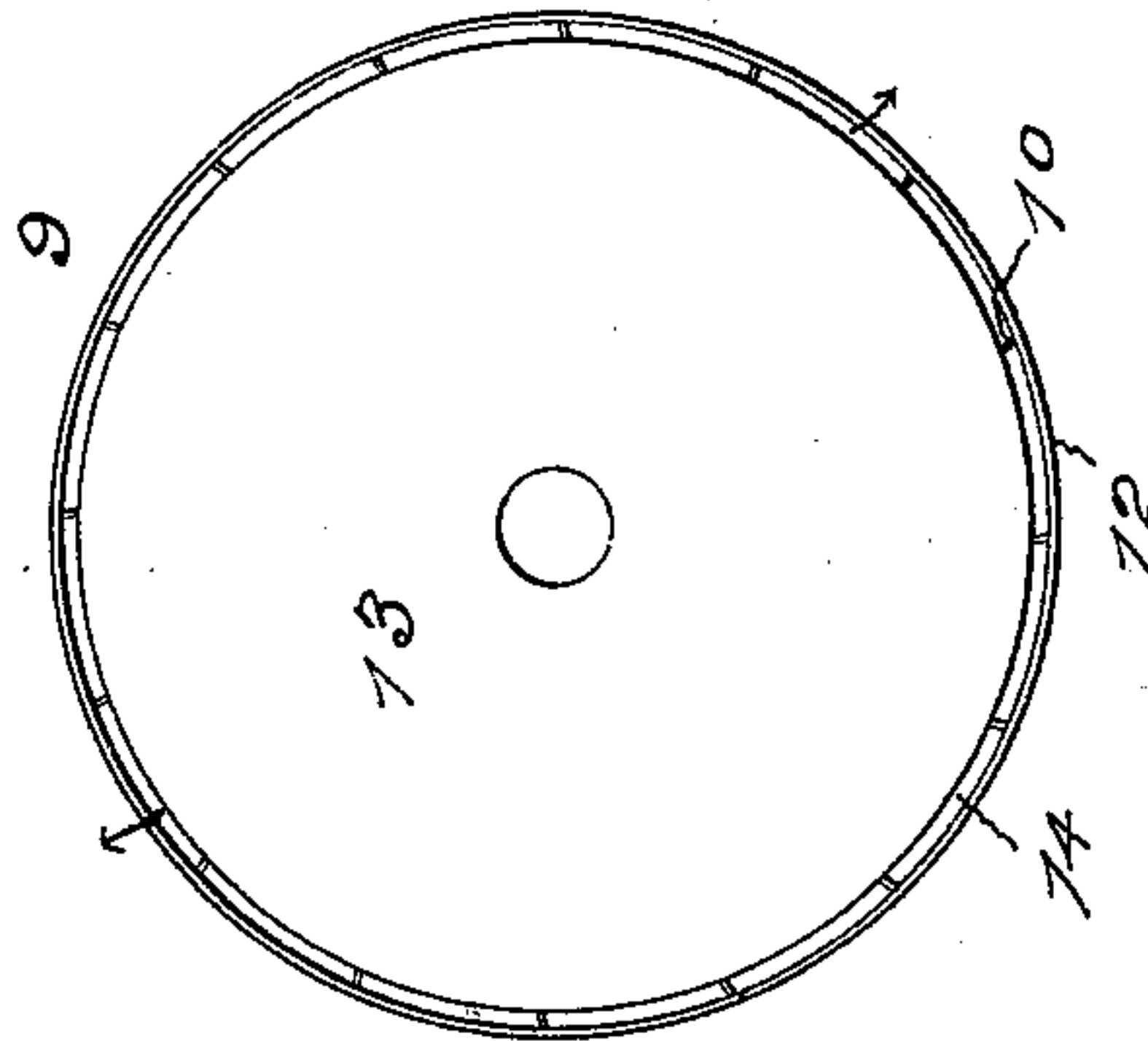
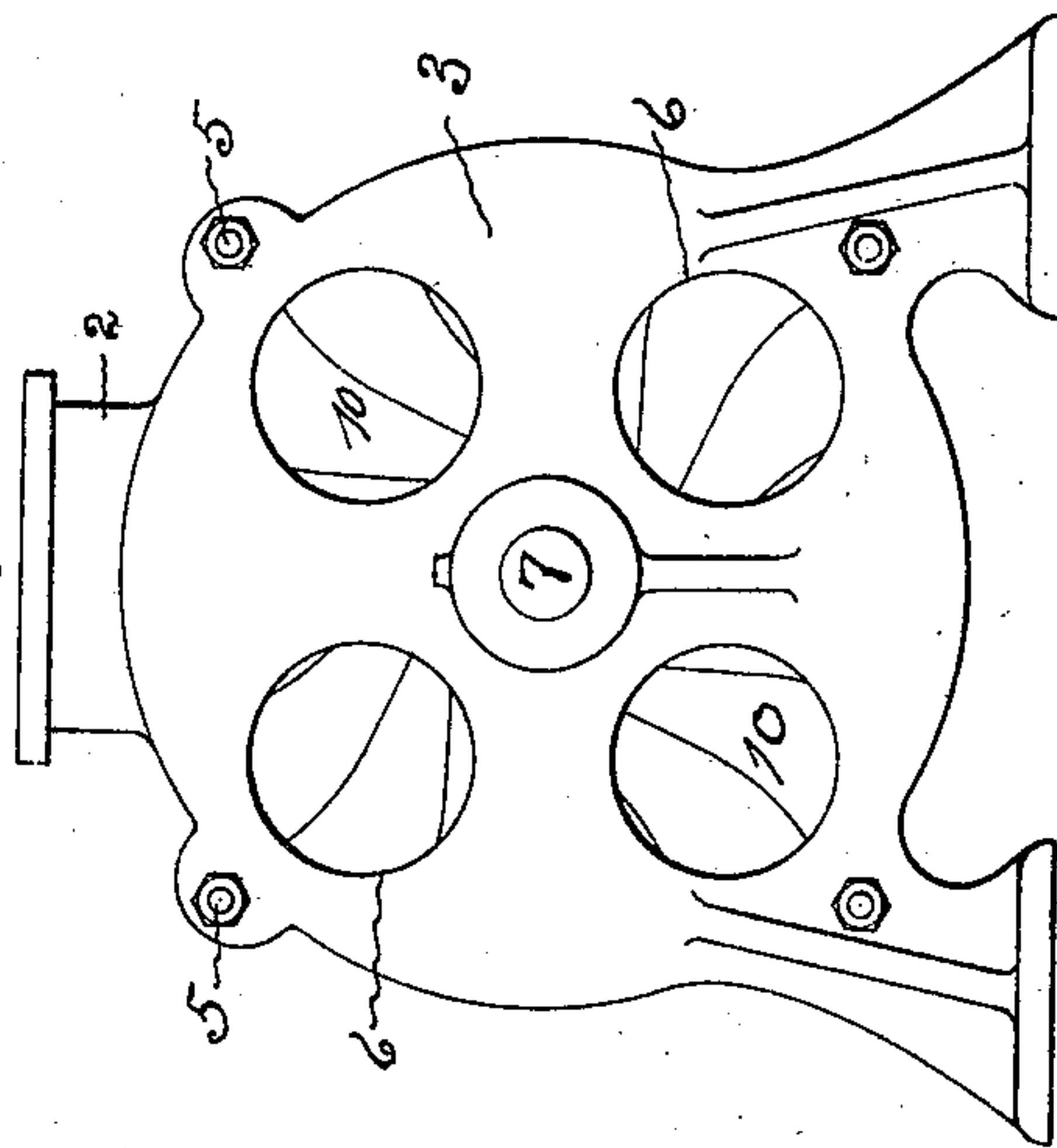


Fig. 2



Witnesses:
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UNITED STATES PATENT OFFICE.

ALFRED WELLS CASE AND LAWRENCE W. CASE, OF HIGHLAND PARK,
CONNECTICUT.

PRESSURE-BLOWER.

SPECIFICATION forming part of Letters Patent No. 621,030, dated March 14, 1899.

Application filed February 28, 1898. Serial No. 671,960. (No model.)

To all whom it may concern:

Be it known that we, ALFRED WELLS CASE and LAWRENCE W. CASE, citizens of the United States, residing at Highland Park, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Pressure-Blowers, of which the following is a specification.

This invention relates to a blower which is constructed and arranged so that by means of rotating fans a draft of air can be produced under considerable pressure.

The object of the invention is to provide a blower with an inexpensive form of fan that can be so arranged that considerable pressure for this class of machines can be obtained with a light expenditure of power.

In the embodiment of the invention illustrated by the accompanying drawings the cylindrical shell has heads that support the shell and also the bearings for the power-shaft, that is arranged to carry, on the interior of the shell, one or more fans. The fans are provided with angularly-placed wings or blades, with the spaces between them widely open on the front or the suction side, only narrowly open on the back or pressure side, and entirely closed around the periphery, as more particularly hereinafter described, and pointed out in the claims.

Figure 1 of the drawings shows a side elevation with a part cut in central section of a pressure-blower embodying the invention. Fig. 2 shows an elevation of one end of this blower. Fig. 3 shows a view of the back or pressure side of a fan used in this blower. Fig. 4 shows a view of the front or suction side of the fan, and Fig. 5 shows a diametrical section of this fan.

The cylindrical shell 1, which may be formed of any ordinary material having the requisite strength, has an outlet 2, arranged for the attachment of a conduit for the passage of the blast resulting from the action of the fans. The heads 3 of the shell, which may be provided with feet 4 for supporting the blower, are desirably connected by tie-rods 5 and provided with openings 6, which permit the free inflow of air. In the heads are located bearings for the shaft 7, that on the exterior has a driving-pulley 8, adapted to be belted to any

convenient source of power, and that on the interior carries one or more fans 9.

Any desired number of fans may be located on the shaft and they may be faced all in the same direction or part in one and part in the opposite direction. The shell is of the requisite size to just inclose the fans, and it may be placed horizontally or vertically, as desired. If there is but a single fan or if there are a number of fans all facing in the same direction, the outlet-opening must be at or near one end; but if the fans face in opposite directions, as illustrated in Fig. 1 of the drawings, the outlet-opening may be near the middle of the shell.

The fan shown has angularly-arranged wings or blades 10, that at their inner ends are attached to a hub 11 and that are connected and inclosed at their outer ends by an annular band 12. The outer ends of the blades are preferably wider than the inner ends, and the inclination is on the front edges, which are free, while the back edges are joined by a disk 13, that is nearly as large in diameter as the peripheral inclosing band 12—that is, the spaces between the fan-blades are widely open on the front or suction side and almost closed on the pressure side. As a result of this formation there is a narrow annular opening 14 around the back face of the fan, between the outer edge of the disk 13 and the back edge of the band 12, and the inner edges of these parts adjacent to this opening are preferably beveled outwardly. This arrangement of blades when the fan is properly driven draws air inwardly, forcing it between them by centrifugal force toward the periphery and by slip, due to the pitch of the blades, toward the back, and the resulting action causes the air to be forced violently forward and outward through the narrow circular discharge-slit at such an inclination as to impinge against the walls of the shell. This flow of air offers such resistance as to form an air-packing, which prevents the air from passing back around the peripheral edges of the fan, but holds it under a little pressure in condition to be drawn upon and forced forwardly by the next fan, if there is more than one fan. When the air is under some little pressure, the second fan receives it rapidly and advances it with

an increased velocity, and consequently augments the pressure. In this manner by the addition of fans the pressure can be increased to a considerable amount and the fans can be arranged so that all advance the air in the same direction or can be arranged so that some advance the air in one direction and others in the opposite direction. If the fans are arranged oppositely, the end pressures are balanced and the bearings relieved of considerable pressure. If the power-shaft is set vertically, the fans can be arranged to force the air upwardly and the end pressure utilized to overcome the effect of gravity.

The fan shown and described is very simple to form and is easily arranged in position. This blower provided with these fans is effective in operation, cheap in construction, and requires but a small amount of power.

We claim as our invention—

1. In a pressure-blower, in combination, a shell with an inlet and outlet, a shaft supported by the shell, and a fan with radial blades carried by the shaft, said fan having the spaces between its blades entirely open in front, all closed around the periphery and completely closed at the back, except for a narrow annular portion near the periphery, substantially as specified.

2. In a pressure-blower, in combination, a shell with an inlet and outlet, a shaft supported by the shell, a fan with radial blades carried by the shaft, said fan having the spaces between its blades entirely open in front and all closed, except a narrow annular portion near the periphery, on the back, and a band encircling and inclosing the peripheries of the blades, substantially as specified.

3. In a pressure-blower, in combination, a shell with an inlet and outlet, a shaft supported by the shell, and a fan carried by the shaft, said fan having angularly-arranged radiating blades that are attached at their inner ends to a cylindrical hub and at their outer

ends to a peripheral inclosing band, the spaces between the blades being entirely open in front, all closed around the periphery and completely closed at the back, except for a narrow annular portion near the periphery, substantially as specified.

4. In a pressure-blower, in combination, a shell with an inlet and outlet, a shaft supported by the shell, and a series of fans having angularly-arranged radiating blades carried by the shaft, said fans having the spaces between their blades entirely open in front, all closed around their peripheries and completely closed at their backs, except for narrow annular portions near their peripheries, substantially as specified.

5. In a pressure-blower, in combination, a shell with an inlet and outlet, a shaft supported by the shell, and a series of fans carried by the shaft and having angularly-arranged radiating blades all pitched in the same direction, said fans having the spaces between their blades entirely open in front, all closed around their peripheries and completely closed at their backs, except for narrow annular portions near their peripheries, substantially as specified.

6. A fan for a pressure-blower having angularly-arranged radiating blades that at their inner ends are attached to a cylindrical hub, that at their outer ends are connected with a peripheral inclosing band and that at their back edges are joined by a disk that is nearly as large in diameter as the diameter of the inclosing band whereby the area of space for the flow of air to the blades is much larger than the area of space for the flow of air from the blades, substantially as specified.

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