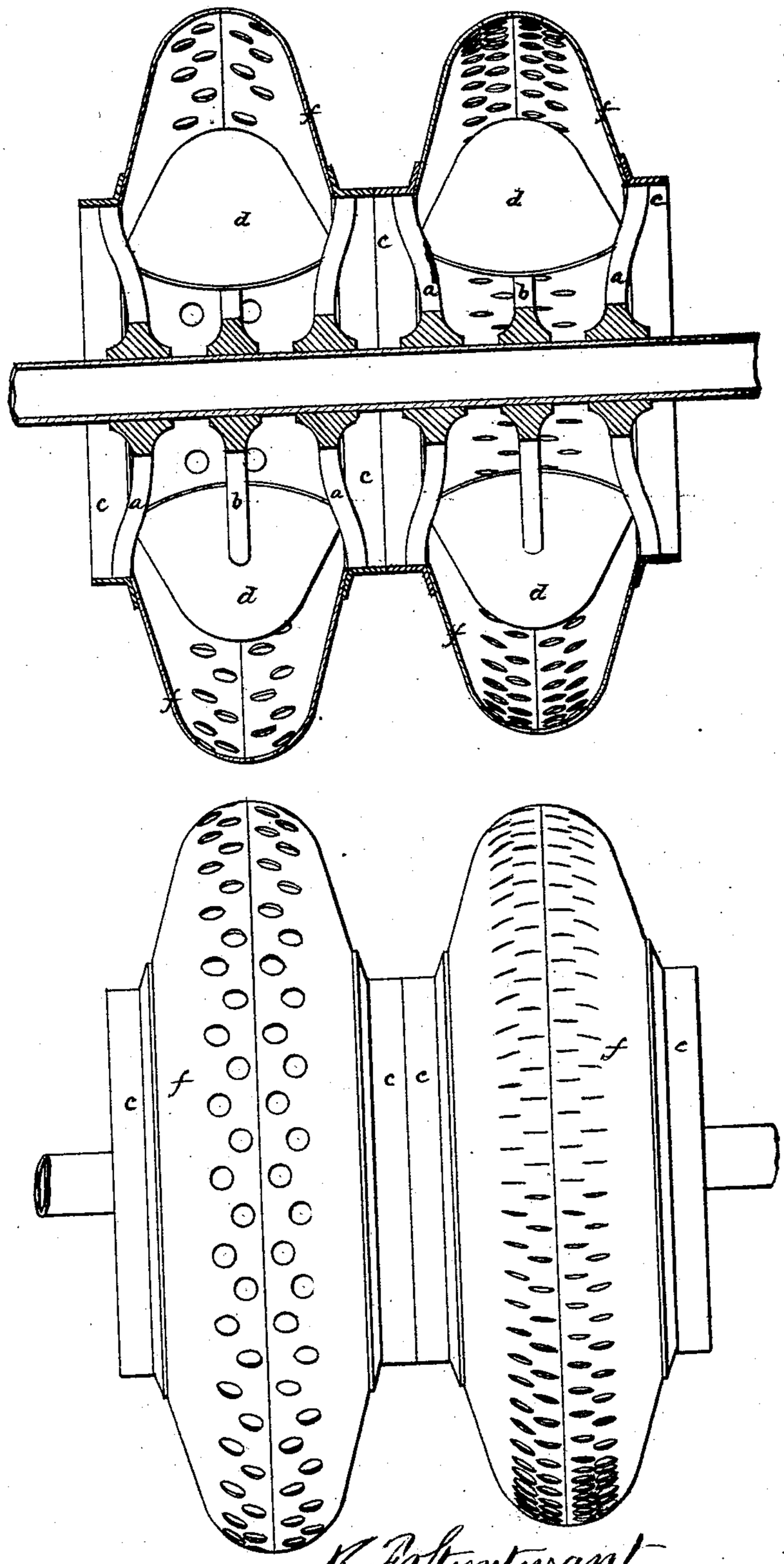
B. F. Sturtevant,

Fan Blower.

No. 100,237. Patented Feb. 22. 1870.



Witnesses { J. B. Crosby
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B. F. STURTEVANT, OF JAMAICA PLAIN, MASSACHUSETTS.

Letters Patent No. 100,237, *dated February* 22, 1870.

IMPROVEMENT IN PRESSURE-BLOWER WHEELS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, B. F. STURVEVANT, of Jamaica Plain, in the county of Norfolk, and State of Massachusetts, have invented an Improvement in Blower Wheels; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

In those centrifugal blowers the outlets of which are contracted or obstructed as in blowers used for forcing air into cupola-furnaces, &c., the escaping air is maintained under considerable pressure, such as is indicated by its sustaining a column of water about twelve inches high, more or less, in the tube of an indicating pressure-gauge, said pressure being necessary for the proper performance of the work to be done by the blower.

In the blast-wheels of centrifugal blowers as heretofore constructed and acting to expel air under considerable pressure, a portion of the effective power of the blower is lost by reason of intermittent elastic reactions of the outgoing current of air, which causes the air to shoot backward at intervals between the plate-shroudings of the fan-blades.

With a view to the improvement of the action of the pressure-blower, I have caused the peripheries of the shroudings of the blast-wheel to extend over the ends of the fans, and have perforated the shrouding for the escape of the air, so that all of the air within the wheel is rotated with the full velocity of the blast-wheel, and is thrown out therefrom with the centrifugal force due to the speed of the wheel at its circumference.

The peripheral part of the shrouding of the blast-wheel serves to separate the air in the wheel from the air in the blower-case. In the blast-wheel the pressure of the air is greatest next to the shrouding at the largest diameter of the wheel, and diminishes in pressure toward the center of the blast-wheel, while in the blower-case and the pipe therefrom, leading to the contracted discharge opening, the pressure of the air equals within a slight fraction the greatest pressure of the air within the blast-wheel.

The slight excess of pressure within the peripheral and perforated part of the blast-wheel shrouding over the pressure in the blower-case and outlet-pipe is due to the presence of the shrouding which forms a boundary, through which air of superior pressure is thrown by centrifugal force, preventing elastic reaction of the air from entering the blast-wheel through the perforations in the shrouding, so that by continuing the shrouding of a blast-wheel over the ends of the fans or blades of the wheel, and by perforating the shrouding as described, I obtain the maximum of force with the minimum of power, and a uniform delivery from the blast-wheel.

The object of my present invention is to so construct a pressure-blower wheel as to prevent access of air to the blades or fans by reaction or recoil from the outlet-pipe, such reaction being wasteful of power and injurious to the proper performance of the blower, which, to produce the best effect, should be protected from such reaction; and

My invention consists in a fan-wheel, the shroudings of which are extended over the ends of the fans or blades of the wheel, and are pierced with suitable holes, slits, or other openings, the aggregate area of which is sufficient for the outlet of the air put in motion by the wheel under pressure.

In the drawings I have shown my invention in two modifications.

In Figure 1, my invention is shown in section, and in

Figure 2, in elevation.

In both of said figures two wheels are shown for use in a blower case, the wheels being the same except in the form of the openings made in the periphery of the shroudings.

The wheels are made up of three spiders, *a a b*, rings *c c* fans or blades *d*, and shroudings *f*.

The spiders *a a* are cast into or are otherwise fixed to the rings *c*, and the spider *b* has attached to its arms the fans or blades *d*, which are also connected at their edges to the shroudings.

The shroudings are thin curved plates, which are joined to the rings *c*, and at their peripheries converge toward each other, and meet, and are joined together.

The shroudings are pierced at their peripheries with numerous holes, which may be made by punching or drilling, as shown on the left of the drawings, or the metal of the shroudings may be simply cut through and displaced, as shown at the right of the drawings, or the holes through the shroudings may be made as narrow slits, or of any other suitable form, care being taken to have the aggregated area of the openings sufficient to let the air freely out from within the fan under pressure.

I claim a blast-wheel having a series of peripheral outlets, substantially as and for the purpose specified.

Also, a blast-wheel in which the side shroudings are continued by deflection toward, and meeting or nearly meeting in the center of the wheel, so as to form a peripheral shrouding.

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