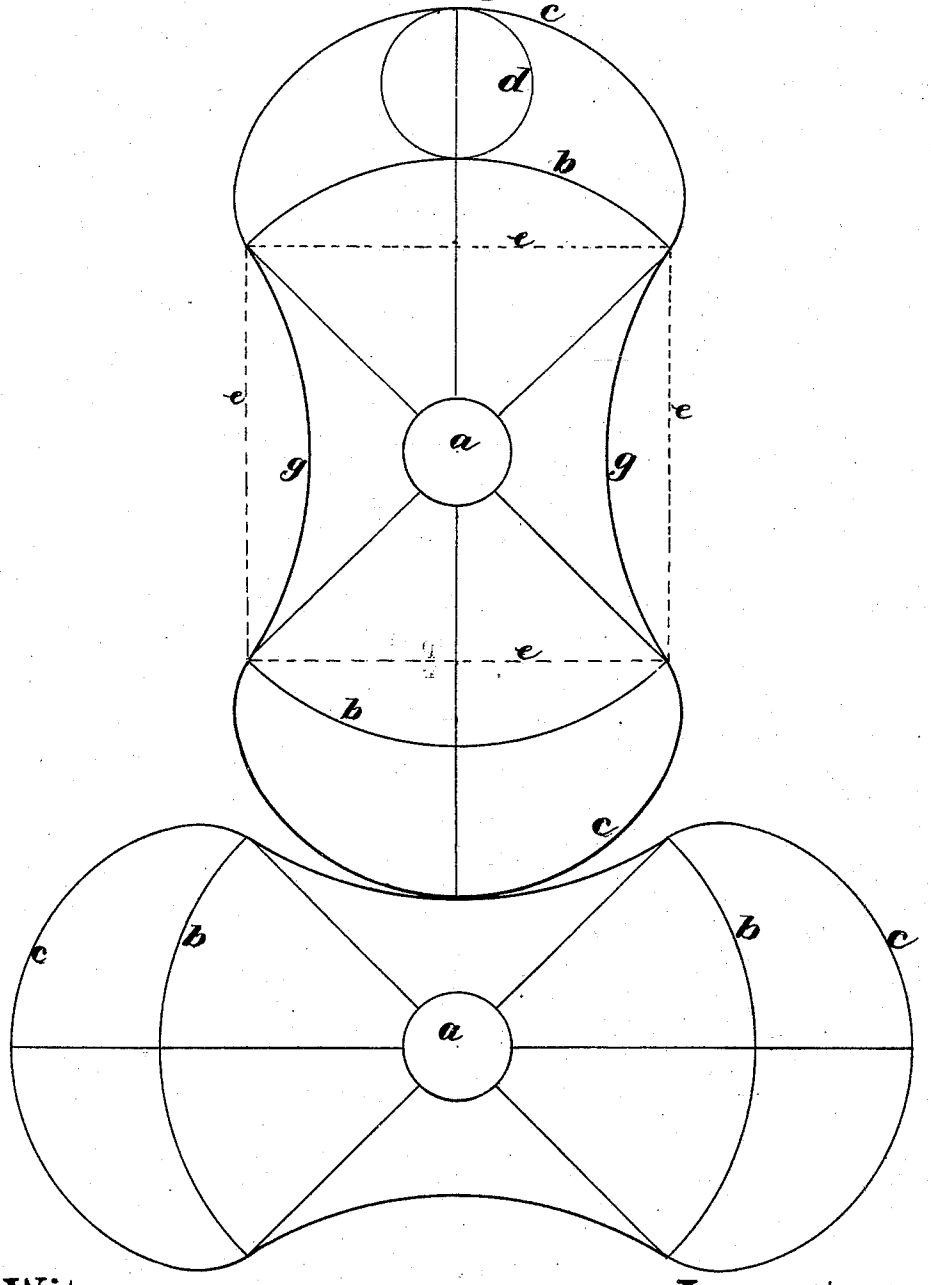
W. L. PALMER & I. W. KNOX.

Rotary Pressure Blowers.

No. 166,295. Patented Aug. 3, 1875.

Fig. 1.



Witnesses

Geo. H. Strong

C. M. Richardson

Inventors

Wales L. Palmer

Israel W. Knox.

By their Atty's

Dewey & Co.

UNITED STATES PATENT OFFICE.

WALES L. PALMER AND ISRAEL W. KNOX, OF SAN FRANCISCO, CAL.

IMPROVEMENT IN ROTARY PRESSURE-BLOWERS.

Specification forming part of Letters Patent No. **166,295**, dated August 3, 1875; application filed July 13, 1875.

To all whom it may concern:

Be it known that we, WALES L. PALMER and ISRAEL W. KNOX, of San Francisco city and county, State of California, have invented an Improved Rotary Pressure-Blower; and we do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use our said invention or improvement without further invention or experiment.

Our invention relates to certain improvements in pressure-blowers; and it consists in constructing the arms of the two pistons or drivers upon certain peculiar curves, by which we are enabled to maintain a close fit between the circumferences of the two drivers, and thus utilize our machine upon blast-furnaces, and in other places where a positive force is necessary to produce sufficient blast.

Referring to the accompanying drawing for a more complete explanation of our invention, Figure 1 is an end view or pattern of our blower-pistons.

In the construction of the so-called pressure-blowers, as heretofore made, the arcs of circles have been used to form the shapes of the drivers or pistons, and by varying the length of the chords, while the same arcs are used for the sides and ends, an attempt has been made to obtain a perfect fit between the two pistons at all points of their revolution. This has not been effected, however, and as a consequence this class of blowers have been failures wherever there has been any back pressure developed.

In order to overcome these difficulties we construct the heads and sides of our pistons upon epicycloidal curves, as follows: *a* is the center of motion of one of the pistons, and *b* is the pitch line or circle. In order to form the heads *c c* of the pistons we make a wheel or circle, *d*, the diameter of which is one-fourth the diameter of the pitch-circle. Equal chords *e e* are drawn within the pitch-circle, forming an exact square. The circle *d* is placed with its tracing-point upon the junction of any two of the chords, and is then made to revolve once upon the outside of the pitch-circle, when the tracing-point will have described the epicycloid required, and will stop at the point of junction of its chord and the next one. The opposite head *c* will be formed in the same manner. The sides *g g* of the pistons are traced by revolving the wheel *d* upon the inside of the pitch-circle upon each side, between the termini of the heads *c*, thus forming a continuous curve.

It will be found, when a blower of this construction is set up, that every point of the periphery of the two pistons will exactly meet as they rotate, and the fit will be so perfect that the machine becomes a pressure-blower capable of working against a resistance without slip or waste.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The rotating pistons, each consisting of the convex heads *c c* and the concave sides *g g*, said heads and sides being constructed upon epicycloidal curves, for the purpose of making an exact fit between the pistons as they rotate, substantially as herein described.

2. The rotating pistons, each consisting of the convex heads *c c* and the concave sides *g g*, said heads and sides being constructed upon epicycloidal curves, and having the chords of the heads *c c* and the sides *g g* of equal length, substantially as herein described.

WALES L. PALMER. [L. S.]
ISRAEL W. KNOX. [L. S.]

Witnesses:
GEO. H. STRONG,
C. M. RICHARDSON.