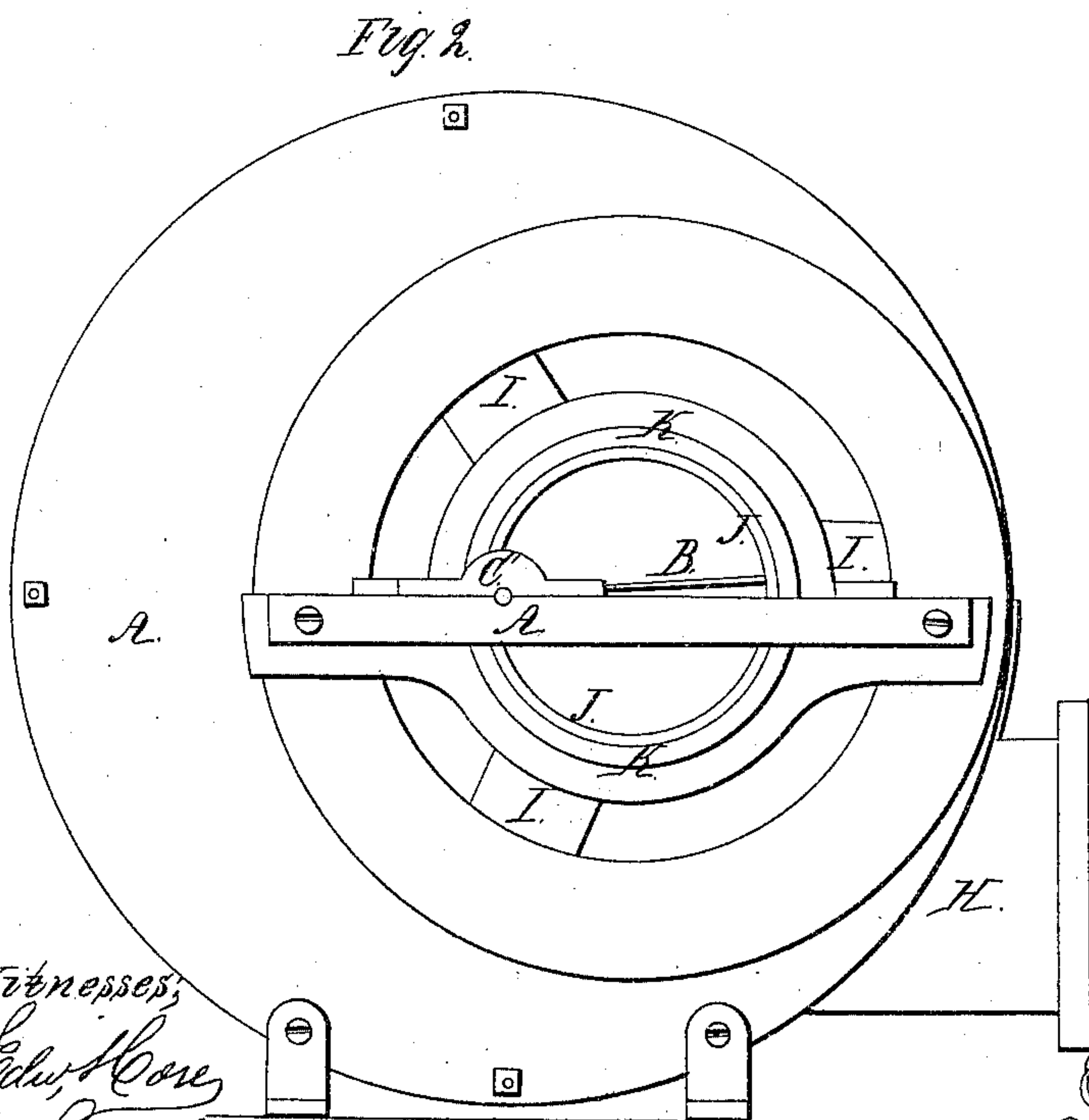
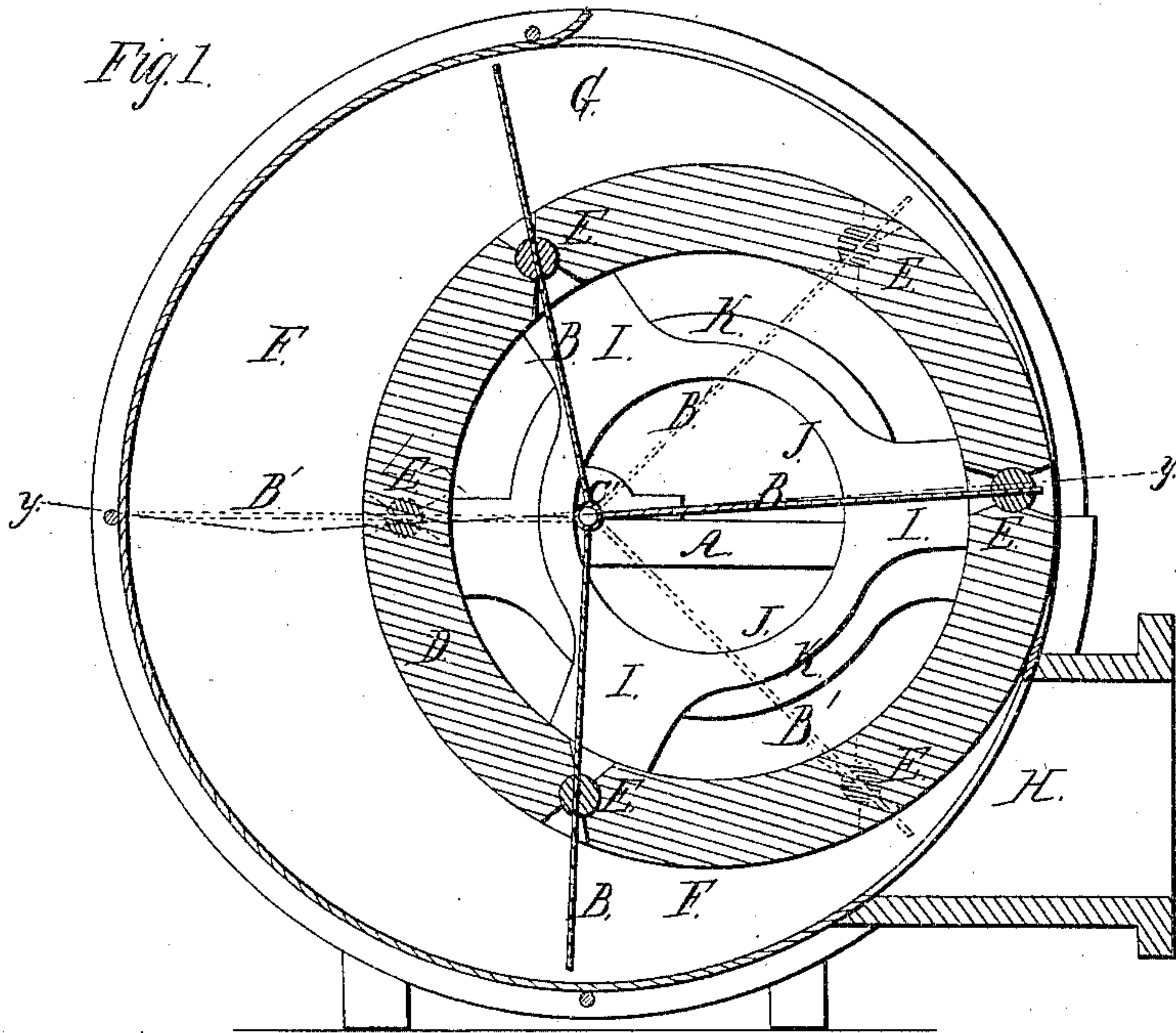


P. W. MACKENZIE.
BLOWING APPARATUS.

No. 44,809.

Patented Oct. 25, 1864.



Witnesses,
Chas. Edw. Hore
James T. Graham.

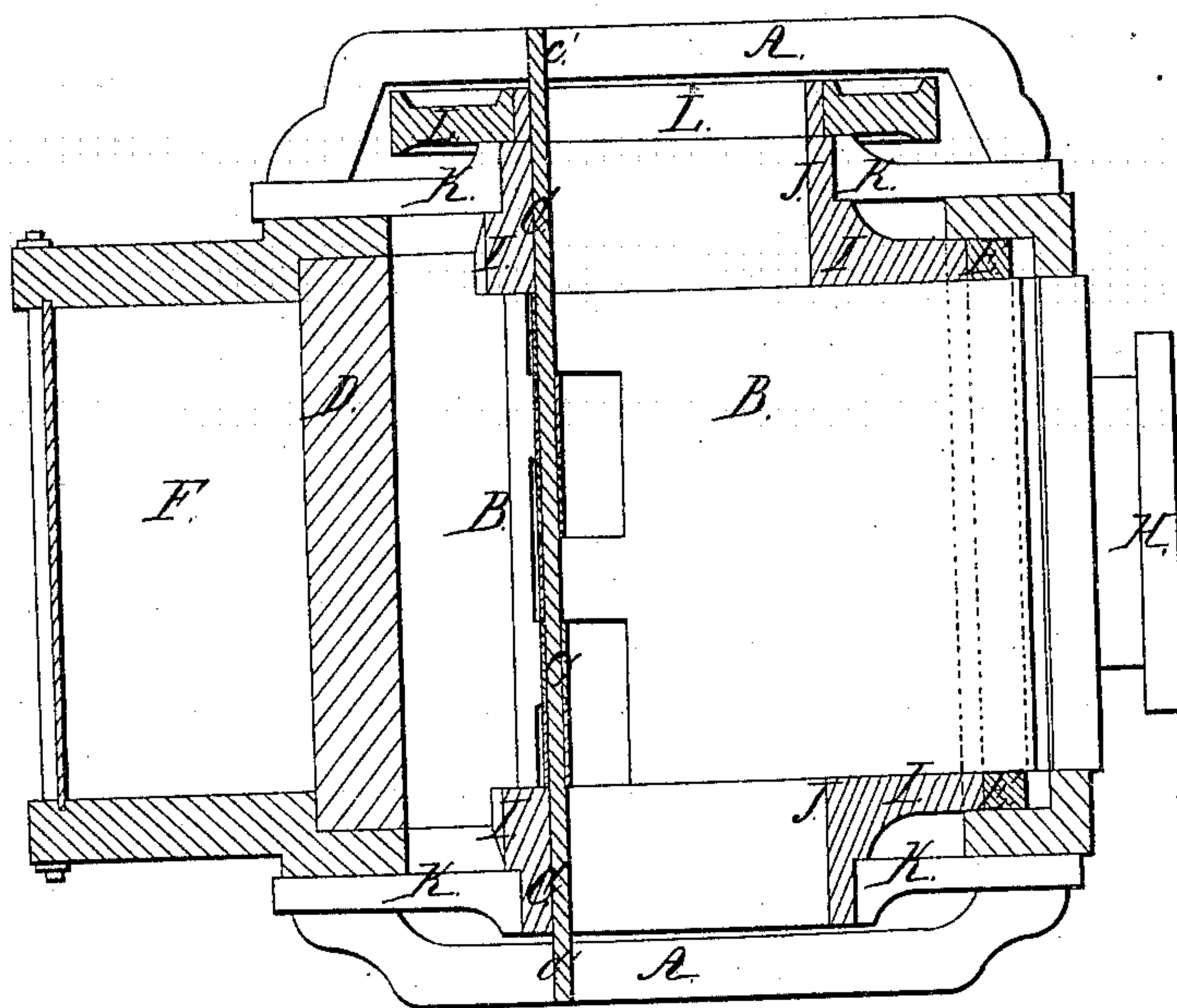
Inventor,
P. W. Mackenzie
By *Thos. P. Cow*
Atty

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Fig. 3.



Witnesses;

*Chas. Edw. Moore,
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By Wm. D. Brown
Att'y.*

UNITED STATES PATENT OFFICE.

PHILIP W. MACKENZIE, OF JERSEY CITY, NEW JERSEY.

IMPROVEMENT IN BLOWING APPARATUS.

Specification forming part of Letters Patent No. 44,809, dated October 25, 1864.

To all whom it may concern:

Be it known that I, PHILIP W. MACKENZIE, of Jersey City, in the county of Hudson and State of New Jersey, have invented a certain new and useful Improvement in Machinery for Blowing Blasts of Atmospheric Air, and for Other Purposes; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, in which—

Figure 1 is a vertical longitudinal section of the machine. Fig. 2 is a side view of the same, and Fig. 3 is a horizontal longitudinal section through the line *y y*.

My invention consists of an improvement in the arrangement of the bearings and shaft of the revolving drum and fans of a machine for blowing blasts of air, in the manner herein-after more fully described.

A is the frame which supports and contains the apparatus. B are the fans, supported by the axle or shaft C and C', and caused to revolve by the revolution of the drum D. At B' the fans are shown (in red lines) in another position. One of said fans B may be keyed or otherwise fastened to the shaft or axle C, so as to cause the said shaft to revolve in its bearings at the points designated by the letter C'. The other fans are loosely attached to the shaft in order that by their oscillation they may adapt themselves to the continuous change of angle at which they pass through the drum D. One of the objects of this arrangement is to enable the attendant, when the machine is run continuously day and night, to oil the bearings. If the fans were permitted to revolve on the shaft C instead of compelling the shaft to revolve in its bearings, the oil would have to be applied within the machine, and could not be applied without stopping it; but by this arrangement all the friction within the machine arises from the slight oscillations of the unfastened fans, and is very

slight and requires no application of oil, or only at long intervals.

E is the cylindrical packing through which the arms or fans of the blower pass. F is the chamber through which the air received at the opening G is conducted to the discharging-spout H, and thence to the furnace, or wherever the blast is required. I are the arms or frame-work by which the drum D is connected with its axle J. The axle J is hollow, and of such size as to surround and inclose within it the axle or shaft C of the fans B. The axle J revolves within the hub or bearings K, which said hub or bearings are stationary and are secured to the frame A of the machine. To one end of the axle J there is attached a pulley, L, by means of which motion is communicated to the drum D, and consequently to the fans B.

By the application of power to the pulley L motion is communicated to the drum D, which, by its revolution, carries round with it the fans B. The position of the shaft or axle C at one side of the center of the hollow axle J and drum D causes, when the said axle J and drum D are in motion, the fans B of the blower to gradually project beyond the circumference of the drum D, and then to gradually recede, so as to conform accurately to the air-chamber F, and thus to conduct all the air within the air-chamber F to the spout K and discharge it therefrom.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

The combination of the hollow axle J and the straight shaft C with the fans B and the drum D, substantially as and for the purpose set forth.

P. W. MACKENZIE.

Witnesses:

D. C. BIRDSALL,
JAMES T. GRAHAM.