

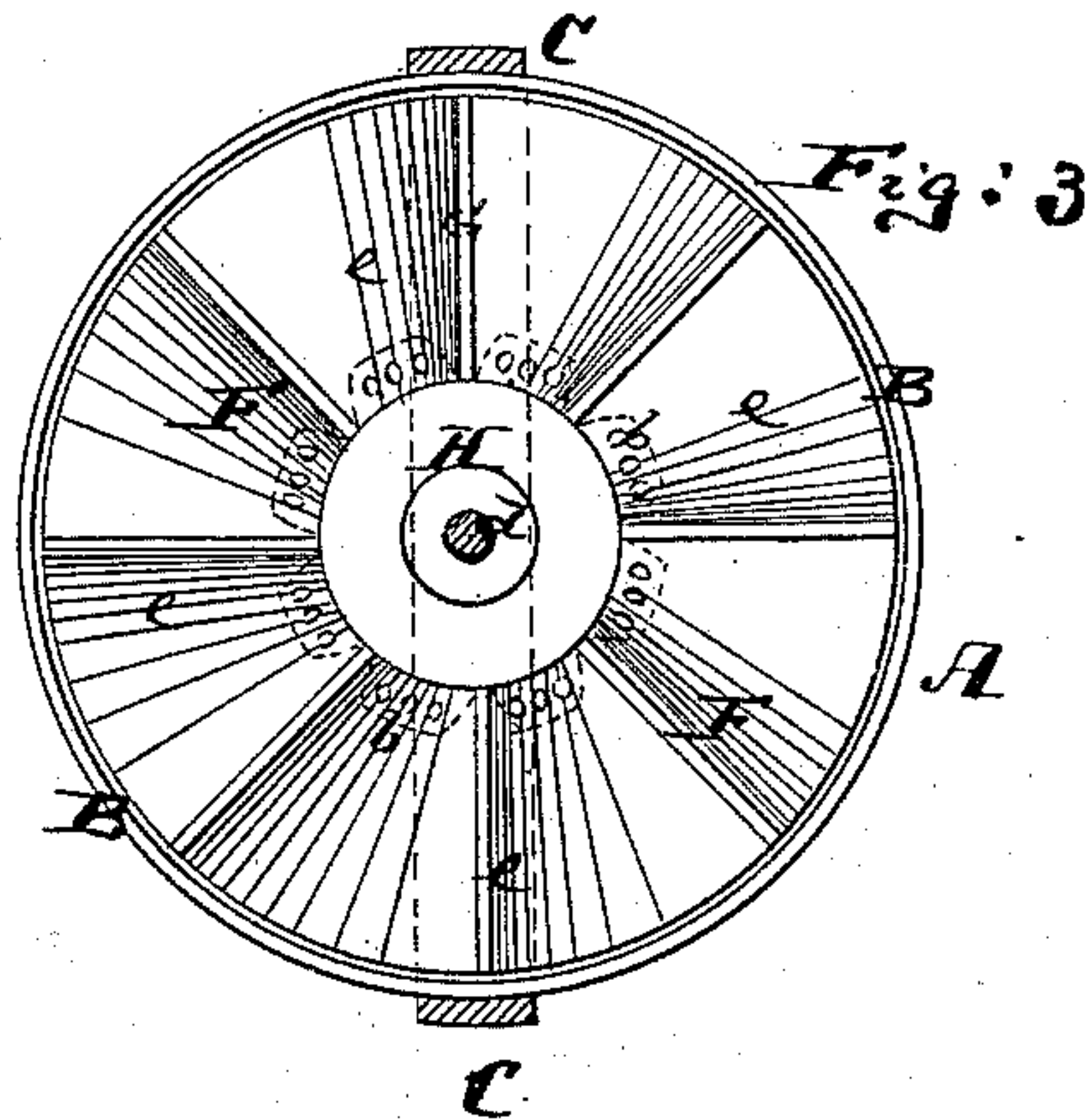
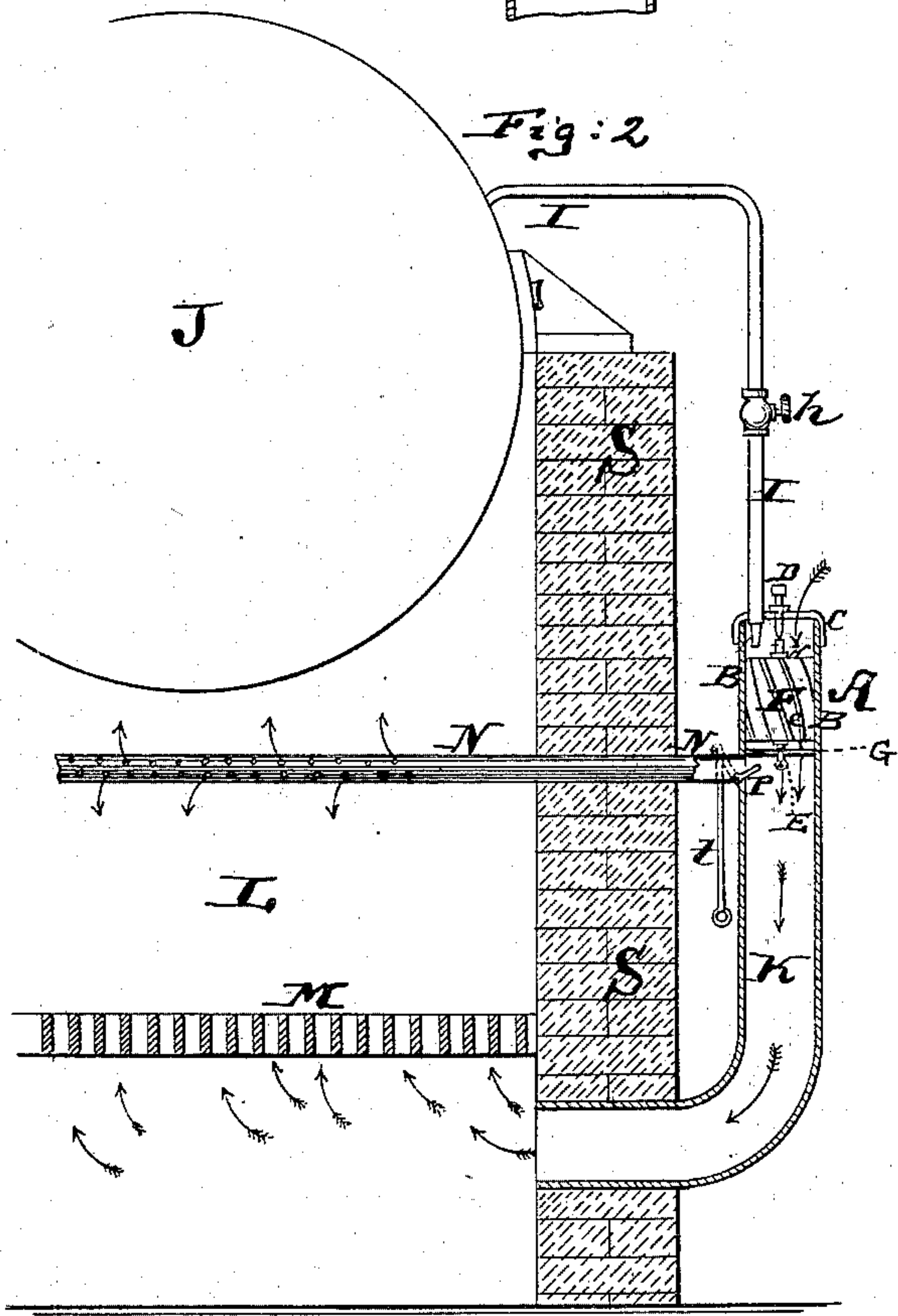
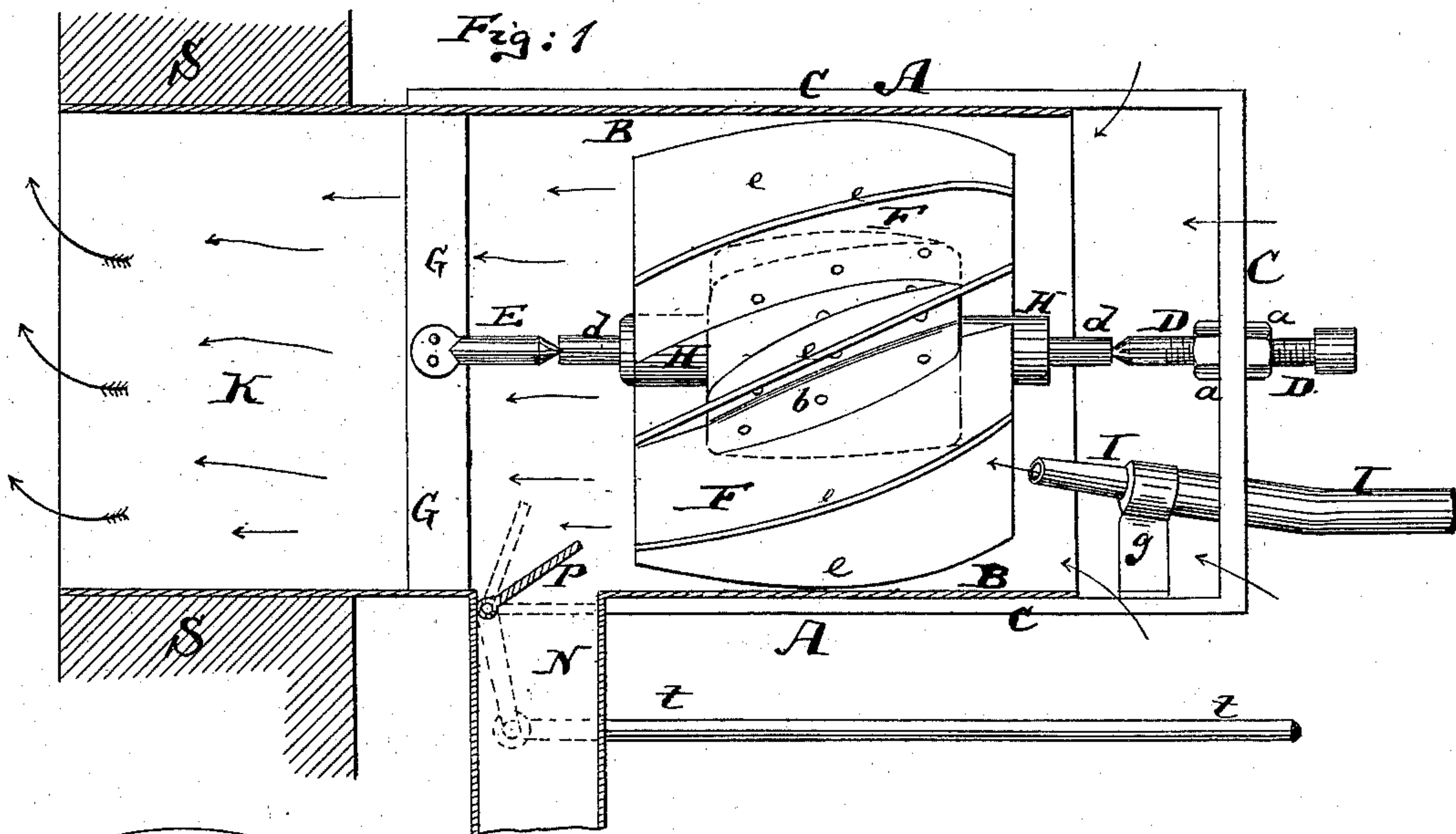
(No Model.)

J. WOODRUFF.

BLOWER.

No. 270,271.

Patented Jan. 9, 1883.



Witnesses:
Henry P. Parker
John M. Speer

Inventor:
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UNITED STATES PATENT OFFICE.

JOSEPH WOODRUFF, OF RAHWAY, NEW JERSEY.

BLOWER.

SPECIFICATION forming part of Letters Patent No. 270,271, dated January 9, 1883.

Application filed April 28, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH WOODRUFF, of Rahway, in the county of Union and State of New Jersey, have invented an Improvement in Blowers, of which the following is a specification.

Figure 1 is a vertical longitudinal section of my improved blower and its connections. Fig. 2 is a vertical section, showing the blower, furnace, boiler, and connecting-pipes. Fig. 3 is an end view of the blower with the front support of its shaft removed.

My invention relates to a blower adapted principally to throw a current of air and steam into the furnace of a steam-boiler for the purpose of facilitating combustion therein.

In the drawings the blower is shown as I intend it shall ordinarily be used—namely, in receiving a jet of steam from the boiler, mixing it with air, and throwing it into and through the furnace-fire.

The letter A represents my blower, which is constructed of a hollow outer cylinder or pipe, B, which may be part of the pipe leading from the blower to the furnace. A rectangular frame-work, C, is fastened to the cylinder B and traverses the open end of the cylinder. This frame-work C extends back some distance beyond the end of the cylinder B.

G is a cross-bar fastened firmly within the cylinder B and passing through or near the axis of that cylinder.

D and E are bearings upon which revolves the fan F. These bearings consist of short rods terminating in points or hollowed at the ends, and projecting inward toward each other from the back bar of the frame C and from the cross-bar G, respectively. The bearing E is rigidly attached to the bar G, while the bearing D is screw-threaded and provided with the nuts *a a*, so that it can be brought nearer to or farther from the bearing E, and fastened firmly by the nuts *a a* in the desired position; but instead of adjusting the position of the bearing D that of E may be made adjustable, or both. The fan F has a central axis or hub, H, which terminates in projections *d d*, each slightly hollowed at its tip, or pointed to admit and fit the points of the bearings D and E, respectively, on which the

fan F is supported and revolves. The hub H, along its middle portion, carries a series of short and stout ribs, *b b b*, set obliquely and parallel to each other around the axis of the hub. To these ribs *b b b* are bolted or otherwise firmly fastened the wings *e e e*, with curved outer edges, so as to come as close as may be to the cylinder B. The hub H, ribs *b*, and wings *e* together form a fan, which, when set upon the bearings D and E and within the cylinder B, forms an internal revolving fan within said cylinder. The parts B G C D E F, above described, constitute the blower A.

I represents a pipe supported on the standard *g* or otherwise, so that the steam or air sent through the pipe will strike against the wings of the fan F and cause the fan to revolve. The pipe I is shown in Fig. 2 as connected with the steam-boiler J, and provided with a cock, *h*, to regulate the flow of the steam.

K is a pipe extending from the lower or inner opening of the blower A through the wall S into the boiler-furnace L at a point below its grate M. Another pipe, N, leads from an opening in one side of the cylinder B into the furnace L above the grate. This pipe N has a number of perforations through that portion of it which is within the furnace, and the opening into this pipe from the cylinder B may be closed or left open to a greater or less degree by the operation of the damper P. This damper connects by a crank on its shaft with a handle, *t*, by means of which it can be readily and properly adjusted to let more or less air into the furnace above the grate.

The operation of my invention, when used in connection with a steam-jet, is as follows: When the cock *h* is opened steam rushes from the boiler J, and through the pipe I is discharged against the wings of the fan F, causing the fan to revolve on its bearings. Air is drawn in through the open upper or outer end of the cylinder B, in which the fan revolves, and is mixed with the steam and thrown out by the revolving fan through the pipe K into the furnace, and passes up through the grate-bars, stimulating the furnace-fire, and greatly aiding the process of combustion by keeping a comparatively moist atmosphere within the furnace. This combustion is further assisted

by opening the damper P by means of its handle *t*. The attendant by observing the flame can easily regulate the exact quantity of air admitted by adjusting the damper P to its
5 best position for the purpose.

I claim—

The boiler J and steam-pipe I, combined

with cylinder B, fan F, pipes K and N, and damper P, all arranged for operation substantially as herein shown and described.

JOSEPH WOODRUFF.

Witnesses:

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