

(No Model.)

J. S., T. A. & E. R. WALKER.

ROTARY FAN APPARATUS.

No. 353,994.

Patented Dec. 7, 1886.

Fig. 1.

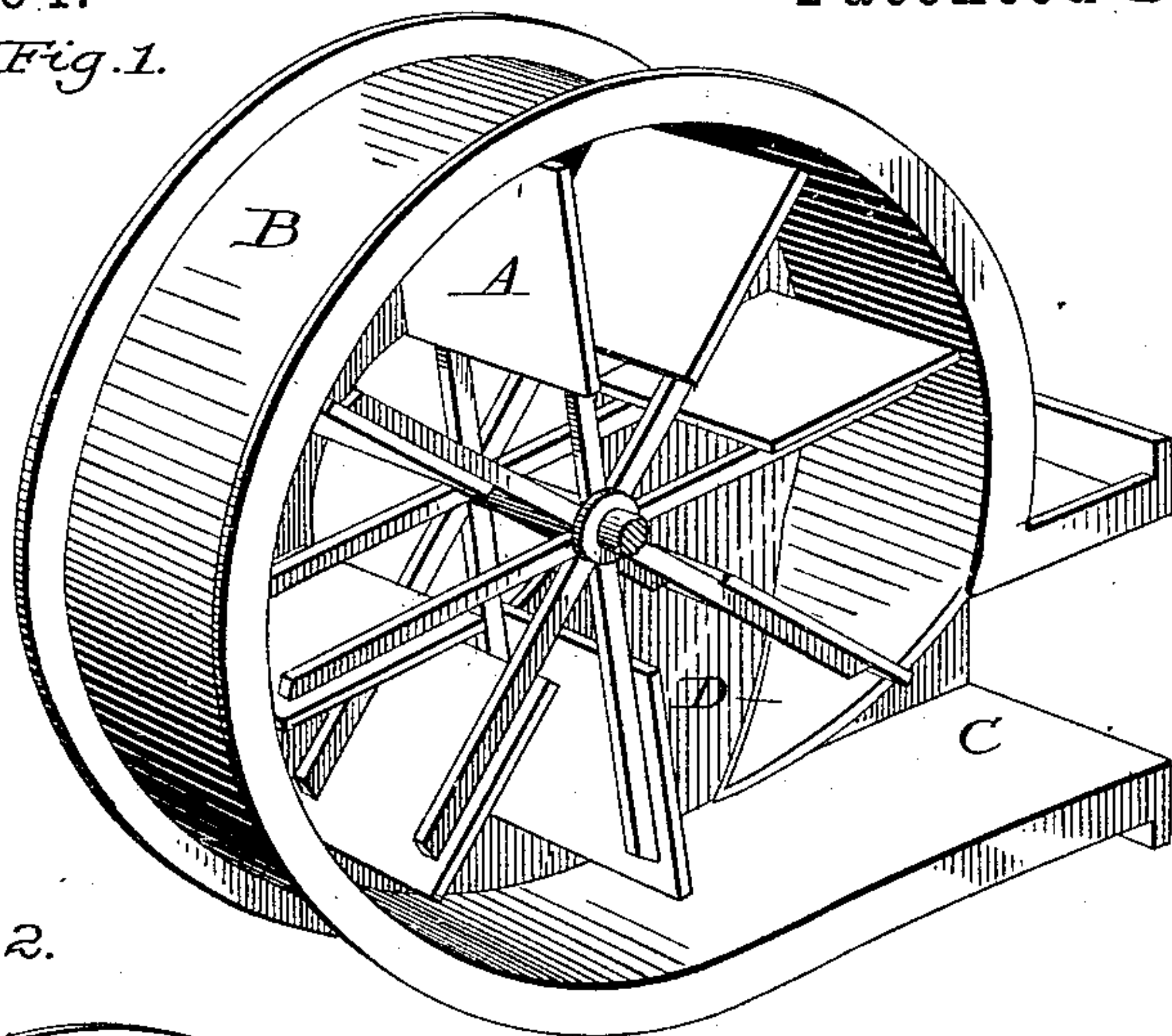


Fig. 2.

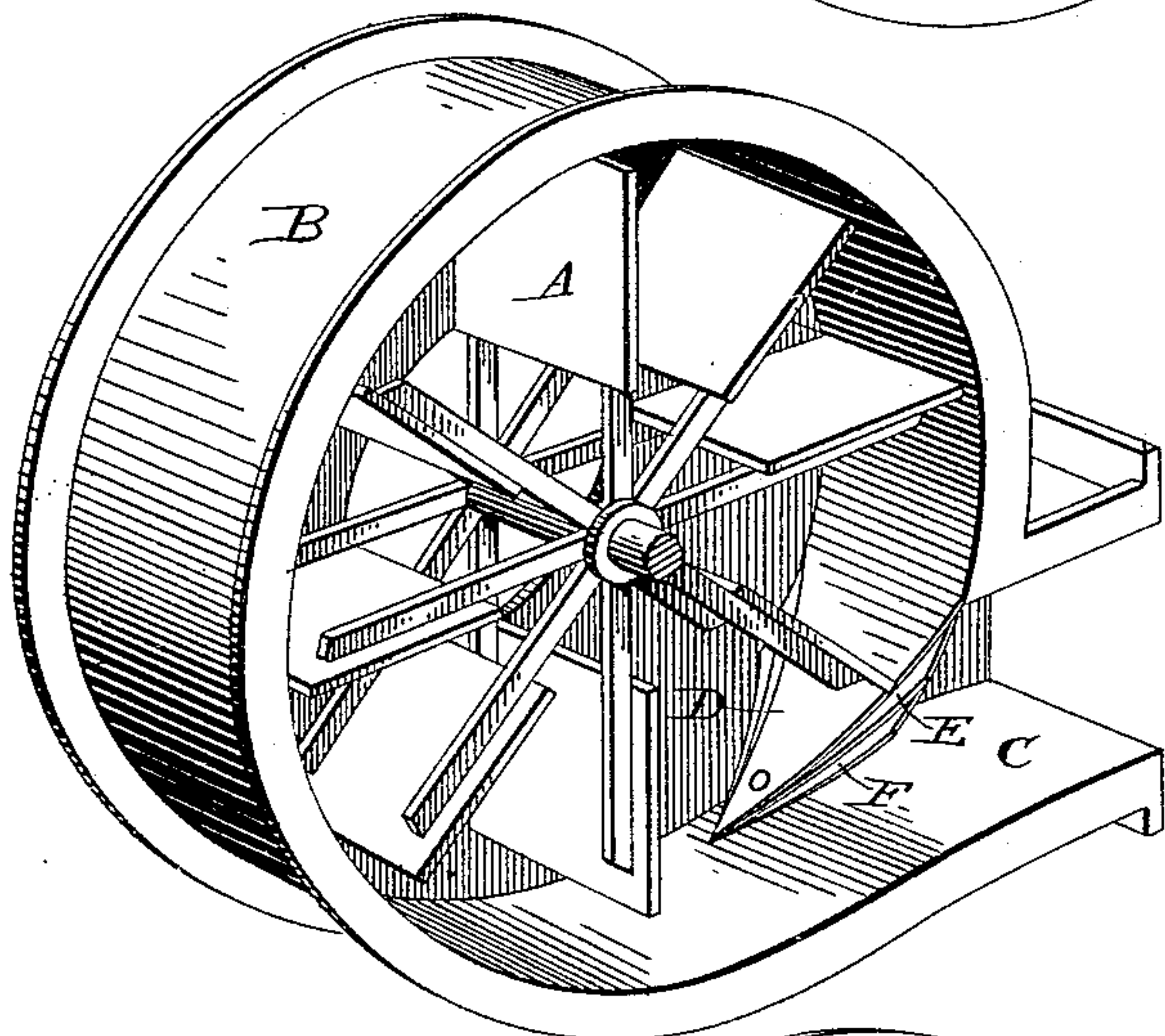


Fig. 4.

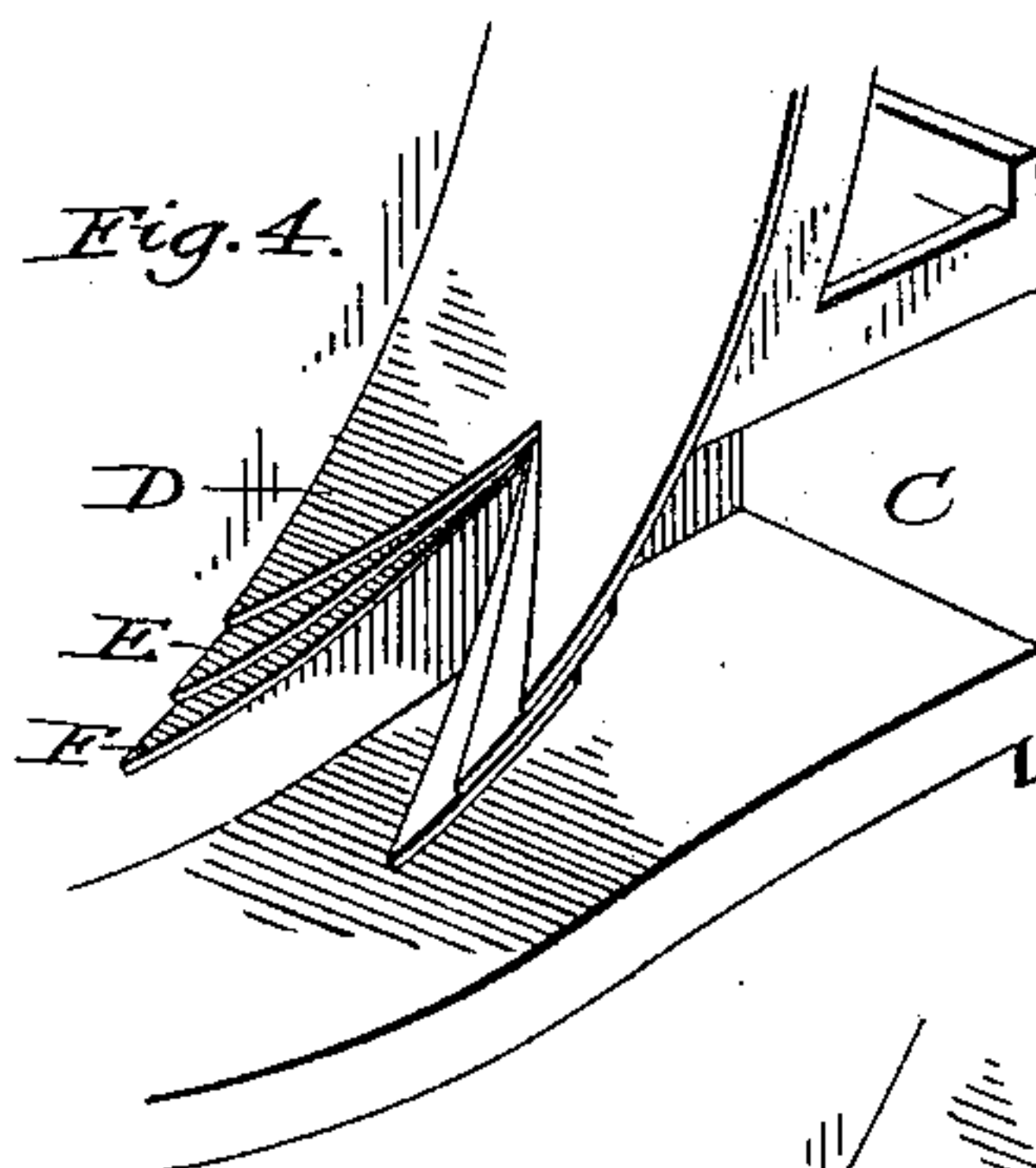


Fig. 5.

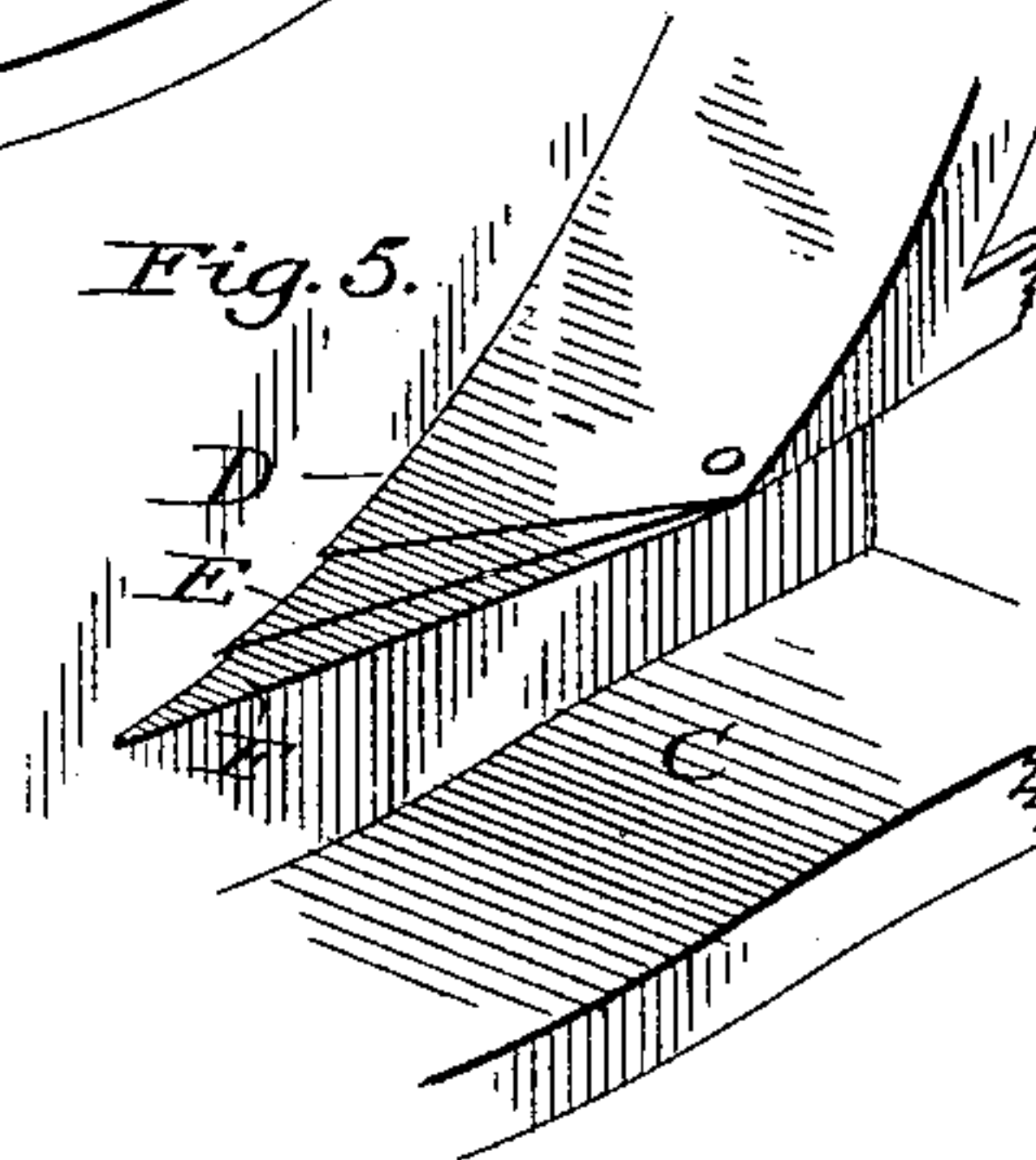
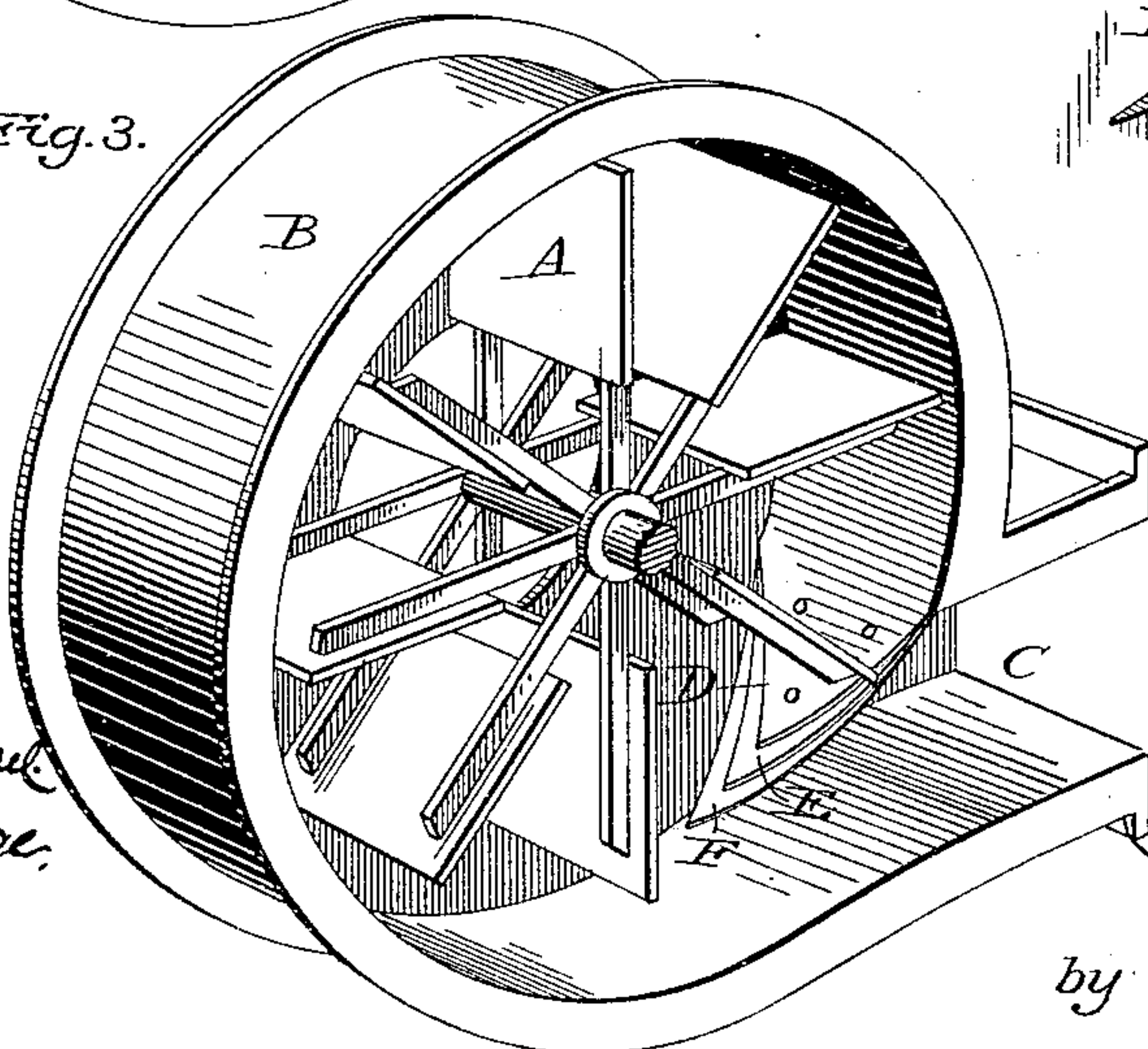


Fig. 3.



Witnesses:

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# UNITED STATES PATENT OFFICE.

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## ROTARY-FAN APPARATUS.

SPECIFICATION forming part of Letters Patent No. 353,994, dated December 7, 1886.

Application filed November 20, 1885. Renewed November 6, 1886. Serial No. 218,214. (No model.) Patented in England January 24, 1885, No. 1,051, and in Belgium June 26, 1885, No. 69,409.

*To all whom it may concern:*

Be it known that we, JOHN SCARISBRICK WALKER, THOMAS ASCROFT WALKER, and EDWIN ROBERT WALKER, subjects of the Queen of Great Britain, residing at Wigan, in the county of Lancaster, England, have invented certain new and useful Improvements in Rotary-Fan Apparatus, (for which we have received Letters Patent in England, dated 24th January, 1885, No. 1,051, and in Belgium June 26, 1885, No. 69,409,) of which the following is a specification.

The object of this invention is to reduce as far as possible the noise and vibration usually caused by rotary fans. In most of these the air in its exit is driven against the edge of what is sometimes known as the "shutter," forming one side of the chimney or channel into which the air is delivered by the fan. The edge of this shutter is usually in a direction parallel with the shaft of the fan or face of the blades. The vane therefore instantly ceases to deliver the air into the chimney or outlet along the whole of its edge at once. Now, we find that by so shaping the shutter that the air passing into the chimney or outlet is cut off gradually, as by making what we may call the "cutting-edge" at an angle to the face of the fan-blade, we can to a very large extent, if not entirely, get rid of the objectionable noise and vibration. A single long incline, or two inclines meeting at the center, give good results; but it is evident that these forms may be considerably varied so long as the impact is gradual and not upon the whole cutting-edge simultaneously. We prefer to make the distance occupied by the incline or inclines somewhat greater than the distance between two blades, so that the following blade may be opposite the commencement of the incline before the blade next in advance of it has entirely left the incline; but this length is variable according to the circumstances under which the fan works, and differs especially according to the load on the fan.

Referring to the drawings, Figures 1, 2, and 3 are perspective views, partly in section, of

a fan, and with our improvements applied thereto; and Figs. 4 and 5, views illustrating certain modifications.

In these, A is the fan; B, fan-case; C, outlet; D, improved shutter. As already stated, this shutter is required to be longer sometimes than others. We prefer, therefore, to make the edge of a series of segments, E E, bolted to the actual shutter. There can either be kept change-pieces to vary the size of the shutter, or third pieces, F, (shown in Figs. 3, 4, and 5,) can be united to these in a similar manner.

In Figs. 1, 2, and 3 the shutter is shown as adapted to a fan fed from each side, and in which the shutter is deepest in the center. In Fig. 4 it is shown for a similar case, but with the shutter concave instead of convex. Fig. 5 shows another arrangement of a shutter. The fan may be fed with air from one or both sides.

We would further remark that while one slope, as in Fig. 5, or at most two slopes, as in Figs. 3 and 4, would be preferable, there could be several sharper triangular teeth instead of one more obtuse one; or curves could be used instead of straight lines, the main point required being to so arrange the shutter-edge that the fan shall pass different parts of it at different times, and shall gradually pass it, instead of passing any large part of it at the same instant.

It will be obvious that where no shutter is employed the orifice can be made with the edge that is met by the fan-blades in their course formed at an oblique angle to the edges of the blades.

In the following claims we wish the word "shutter" to be understood as including this portion of the fan-case orifice in those cases where there is little or no shutter proper.

We claim as our invention—

1. In combination with the fan-blades A, having faces approximately parallel with the shaft, a tongue or shutter, D, having one or both edges at an angle to the shaft, substantially as and for the purpose set forth.

2. In a fan-case, the shutter D, constructed

with its edge at an oblique angle to the edges of the fan-blades, substantially as described.

3. In combination with a shutter of a fan, or its equivalent, the edge of the fan-case, a series  
5 of removable pieces, E, capable of being bolted to the shutter to form a continuation thereof, whereby the obliquity of the shutter-edge may be varied at pleasure.

In testimony whereof we have signed our

names to this specification in the presence of 10  
two subscribing witnesses.

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Witnesses:

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