

UNITED STATES PATENT OFFICE.

WILLIAM MILLSPAUGH, OF MIDDLETOWN, NEW YORK.

IMPROVEMENT IN FILES.

Specification forming part of Letters Patent No. **210,799**, dated December 10, 1878; application filed September 3, 1878.

To all whom it may concern:

Be it known that I, WILLIAM MILLSPAUGH, of Middletown, in the county of Orange and State of New York, have invented certain new and useful Improvements in Files; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The nature of my invention consists in providing a file with a hole or opening through its heel, for the purpose of preventing the file from cracking while being tempered, as will be hereinafter more fully set forth.

In the annexed drawing, to which reference is made, Figure 1 is a perspective view of a file embodying my invention. Fig. 2 is a longitudinal section of the same.

It is well known by manufacturers of files that in the very last stage of making files—namely, in the tempering of the same—a comparatively great number of them crack at the heel, thus causing considerable loss, not only in material, but also in the time and labor already expended on such files. The reason that files crack at this point is on account of the unequal contraction and expansion. When the end of the file-blank is heated for the purpose of forging the tang it is heated down a suitable distance for that purpose, the rest of the blank, of course, remaining cold. Then when the file is heated for hardening purposes the reverse end of the file is heated up to the point that the file had previously been heated for forging the tang. One end is heated in a coal-fire for forging, and the reverse end heated up to the same point in a liquid bath, hence the unequal condition or nature of the steel; and when plunged into the hardening-bath the file is very hot up to within an inch of the shoulder, and the balance of the file

comparatively cool. This often causes the file to crack, such crack, as a rule, starting from the last tooth or last cut made.

Files cannot well be, and are never, heated uniformly the whole length, as the temperer has to use tongs to place them in the bath, and has to frequently remove them from the bath to note the color or degree of heat; hence the heel does not come in contact with the liquid.

To obviate this difficulty of cracking is the object of my invention; and to this end I make in the heel B of the file A a hole or opening, *a*, of any suitable size and shape, this opening extending into the file to a point beyond where the file is cut.

This opening compensates for the unequal contraction and expansion, so as to prevent cracking; and with such opening, even should the file crack from one edge, the crack will only extend to the opening, leaving the other side perfectly faultless; and the file, notwithstanding the crack on one side, will be sufficiently strong and durable for all practical purposes.

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

In a file, the heel formed with opening *a*, extending into the file beyond where the file is cut, and the outer edges of the heel solid or intact, whereby the contraction and expansion in tempering are provided for to prevent cracking, and in any event to prevent cracking entirely across the heel of the file, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

WM. MILLSPAUGH.

Witnesses:

FRANK GALT,
C. L. EVERT.

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No. 210,800.

Patented Dec. 10, 1878.

Fig. 1.

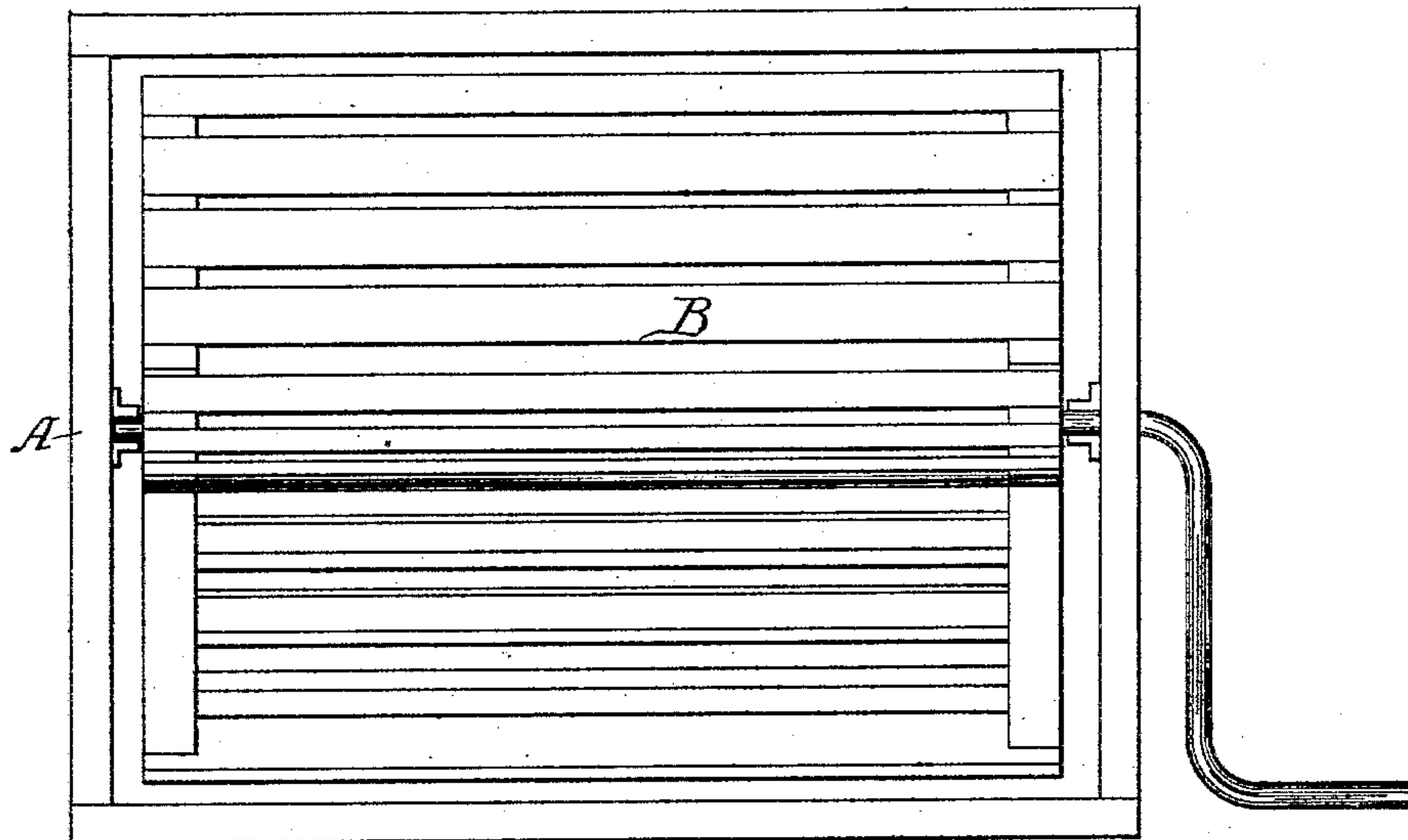
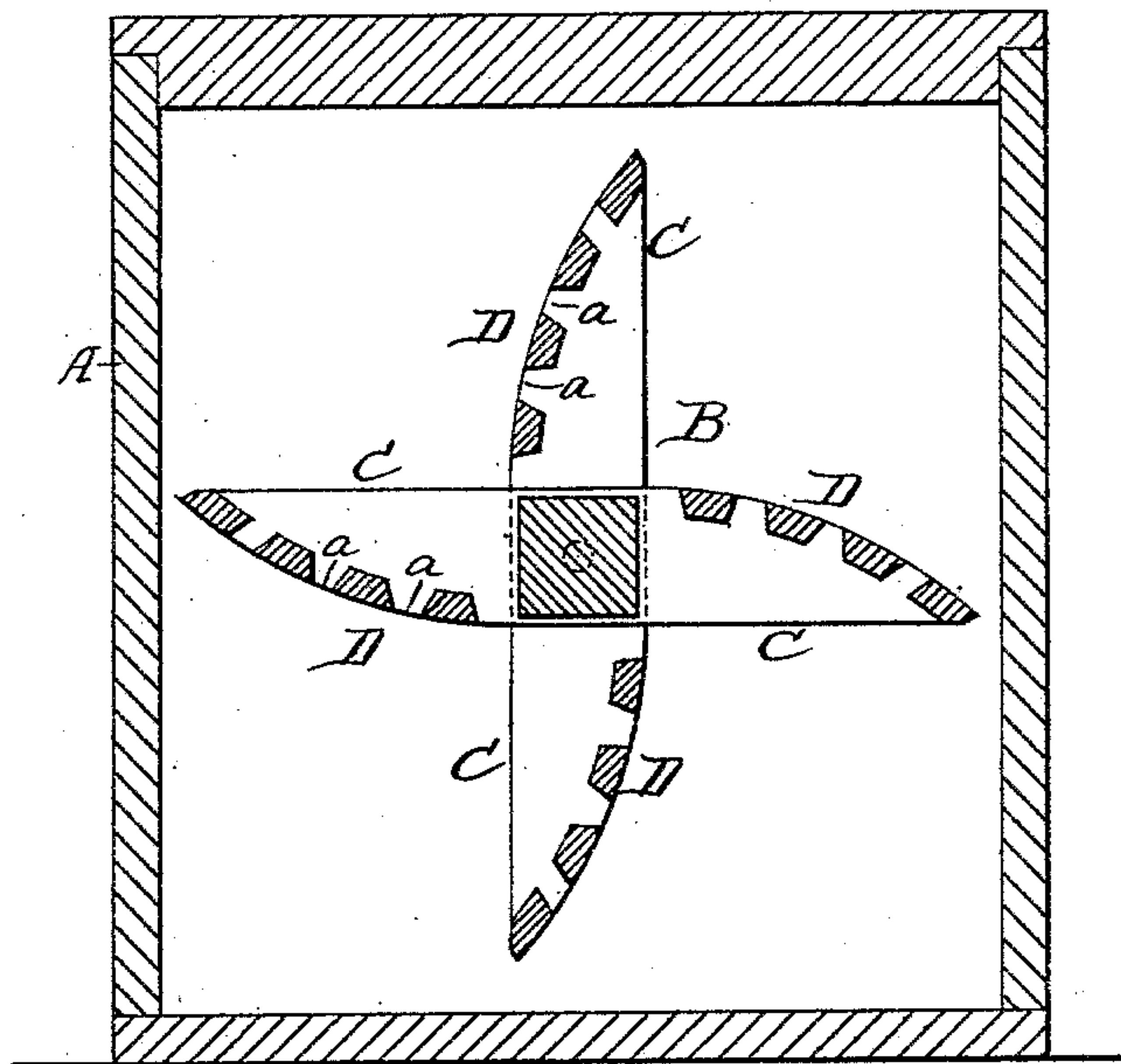


Fig. 2.



Witnesses:

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by

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