

(No Model.)

2 Sheets—Sheet 1.

C. W. CROSSLEY.

APPARATUS FOR THE PROPULSION, MOVEMENT, AND SUCTION OF AIR,
FLUIDS, AND GASES.

No. 336,215.

Patented Feb. 16, 1886.

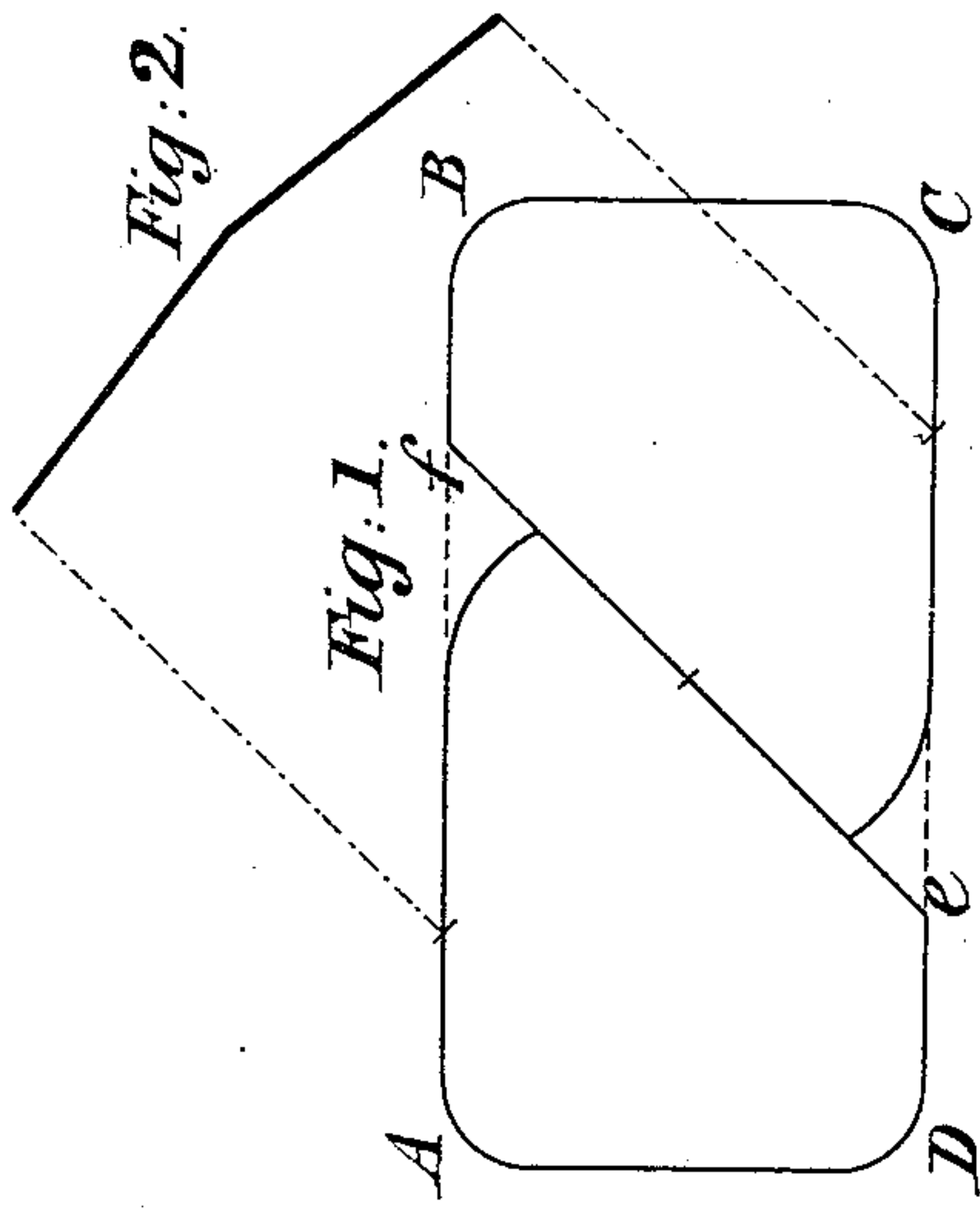
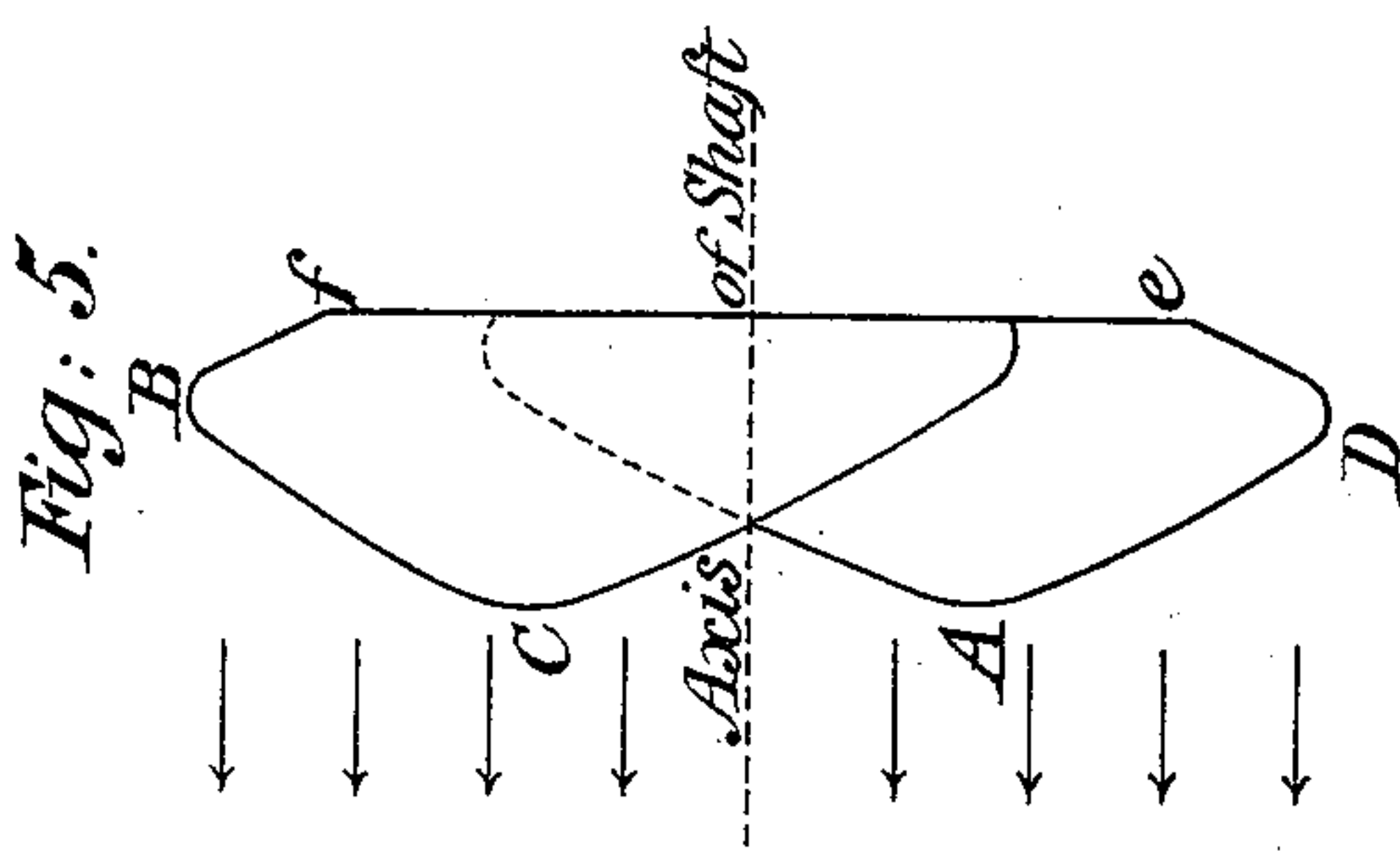
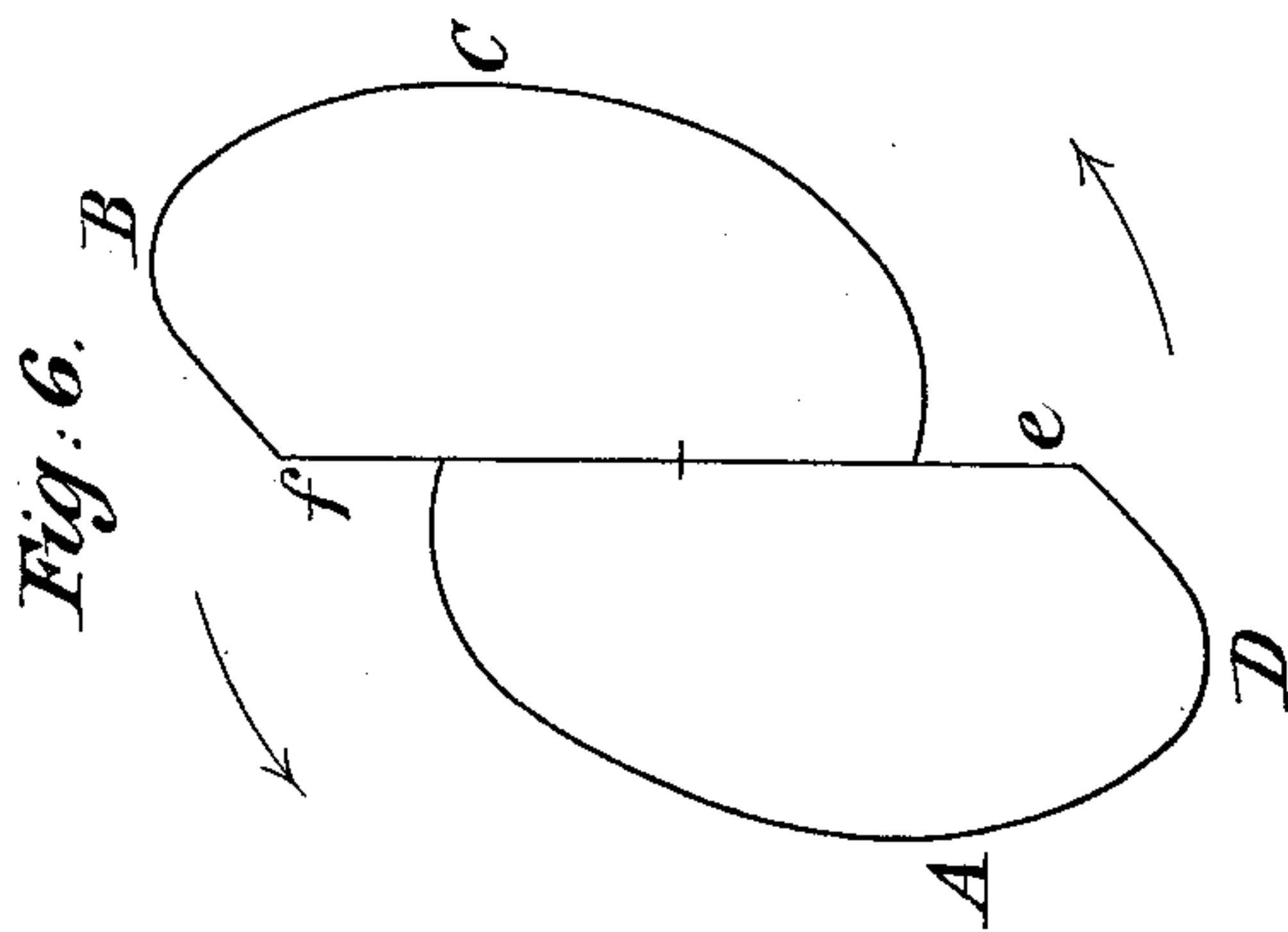
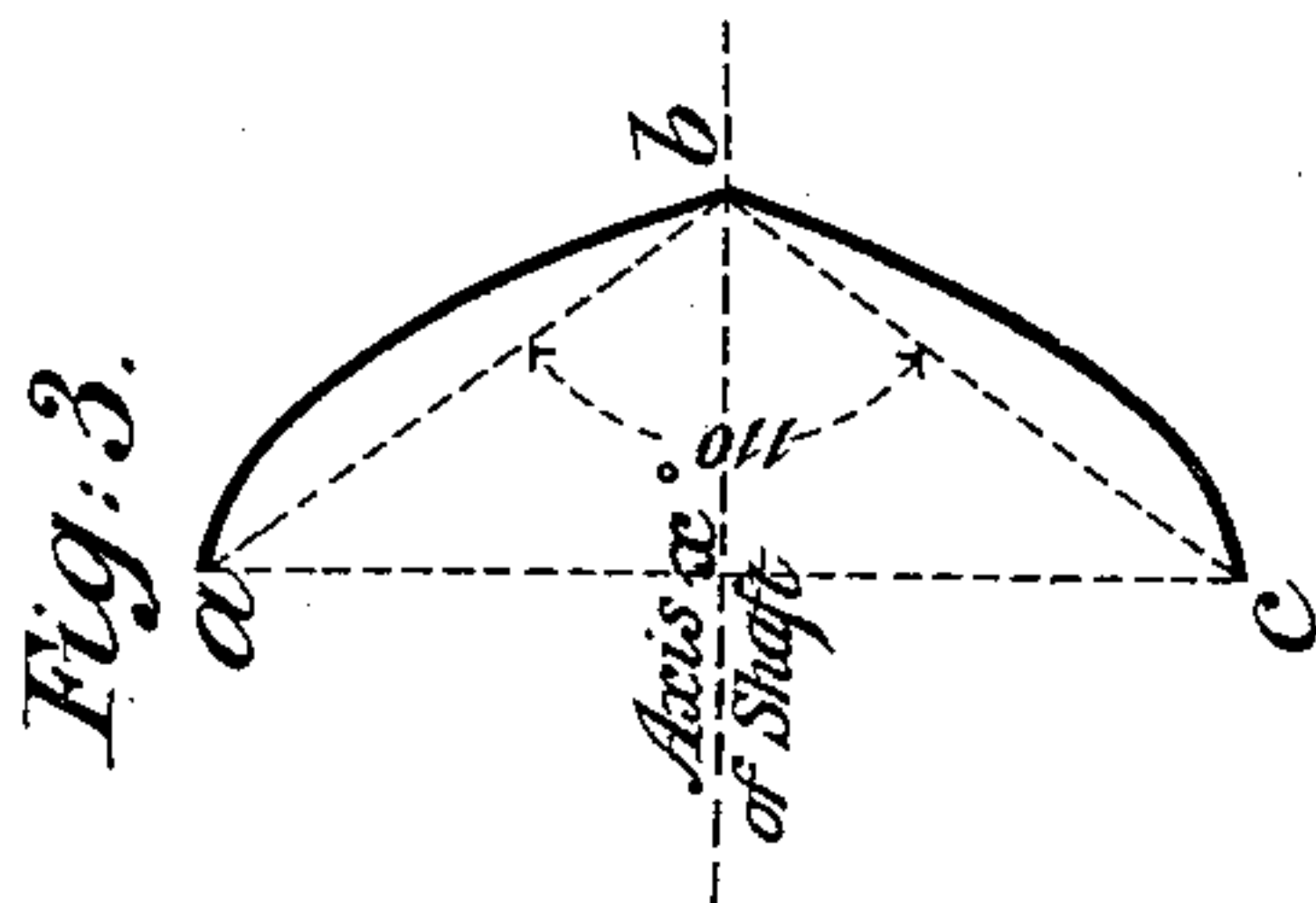
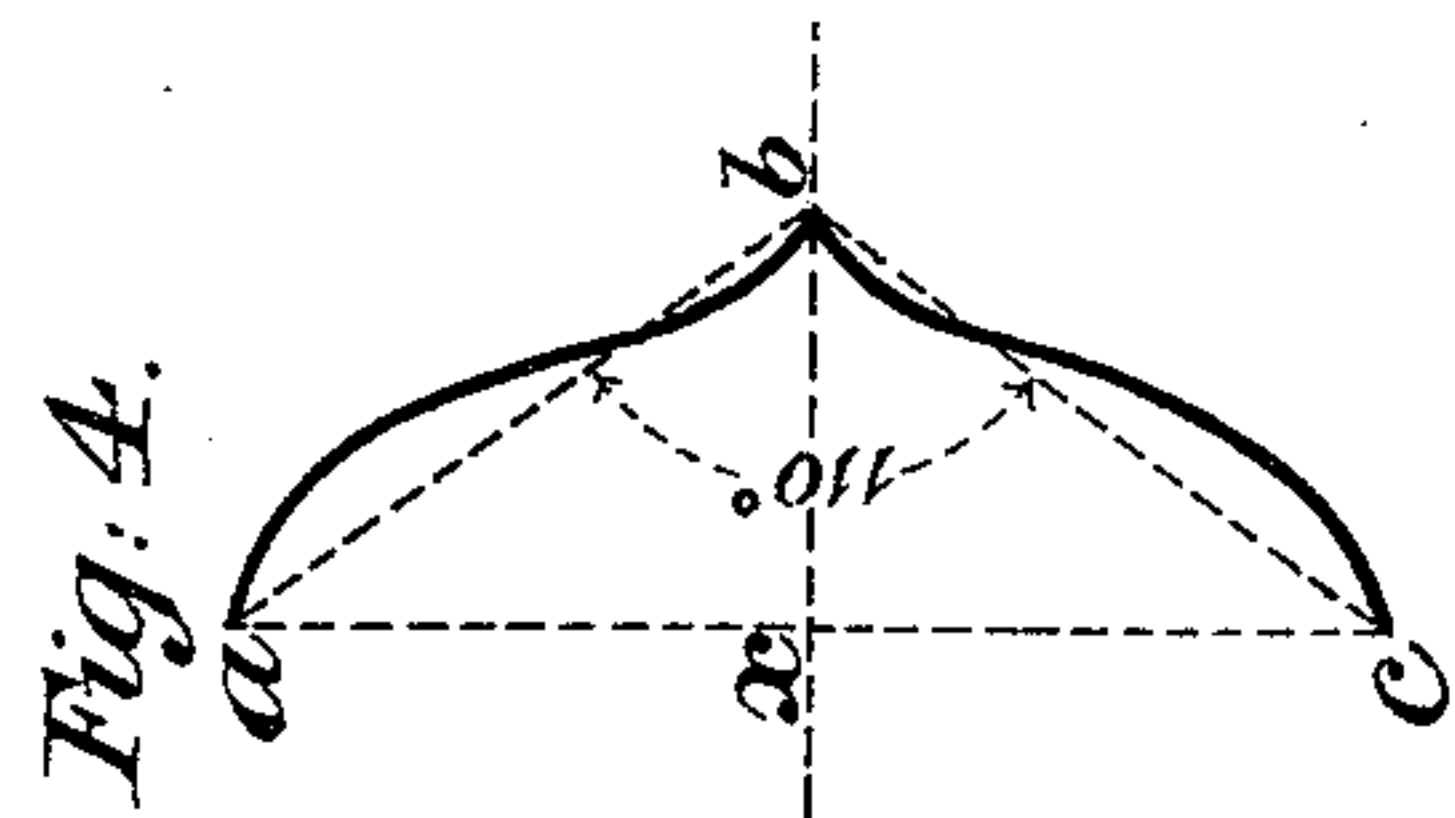
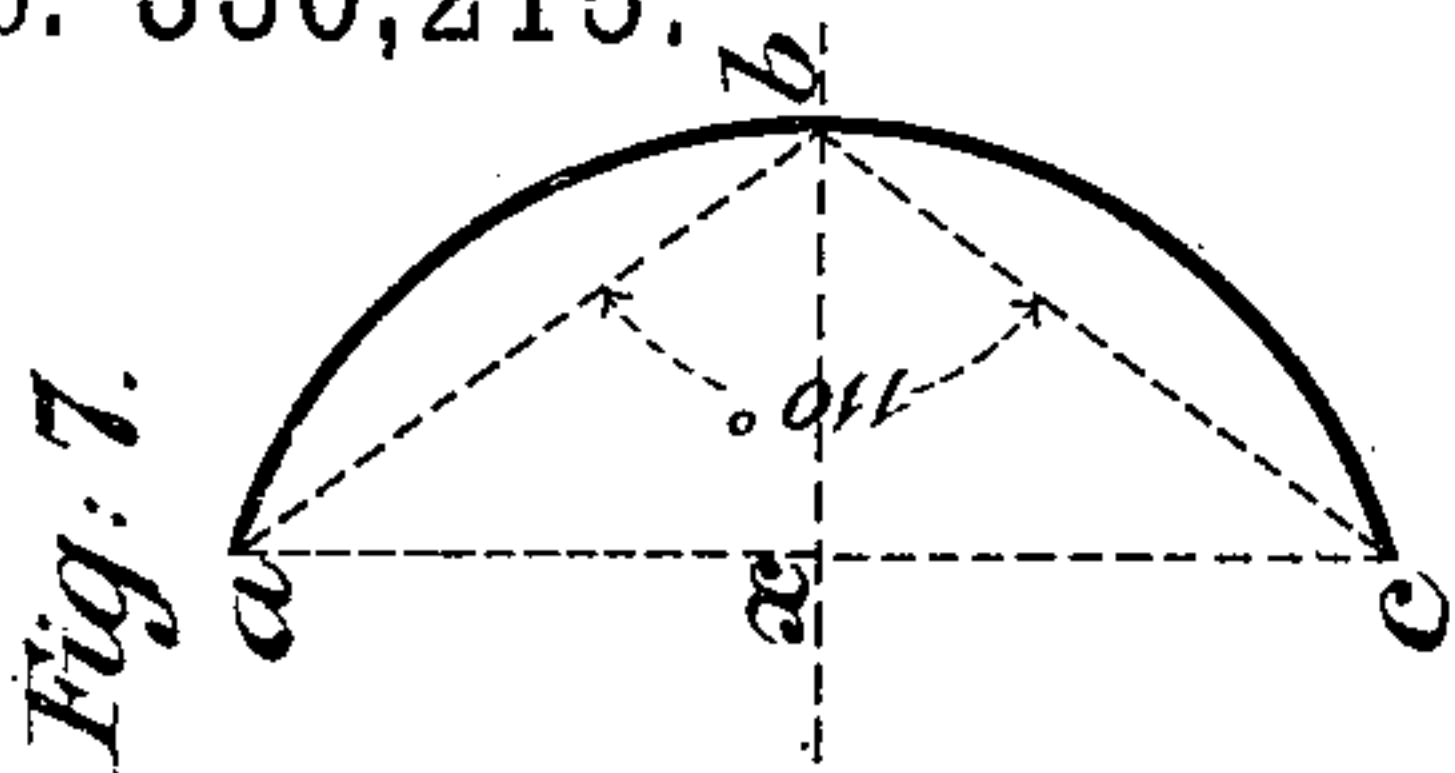


Fig. 1.

Witnesses

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J. Stair

Inventor

Clarence W. Crossley
per Lemuel W. Serrell atty.

(No Model.)

2 Sheets—Sheet 2.

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fig. 8.

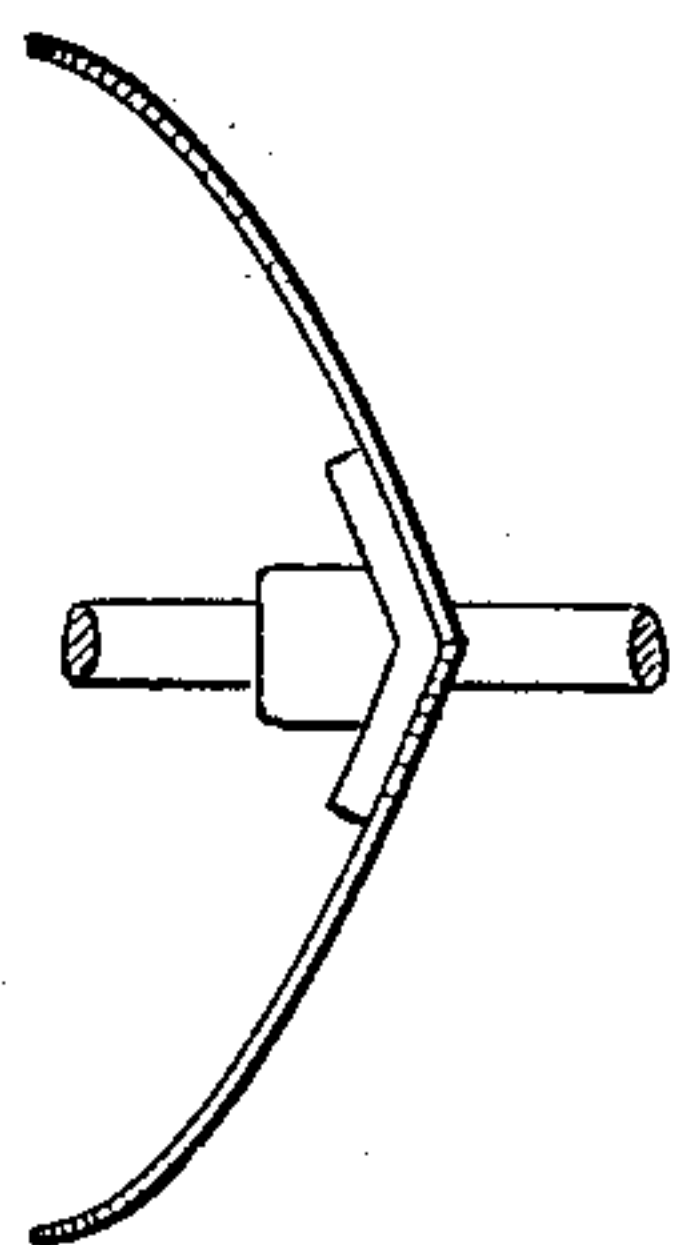
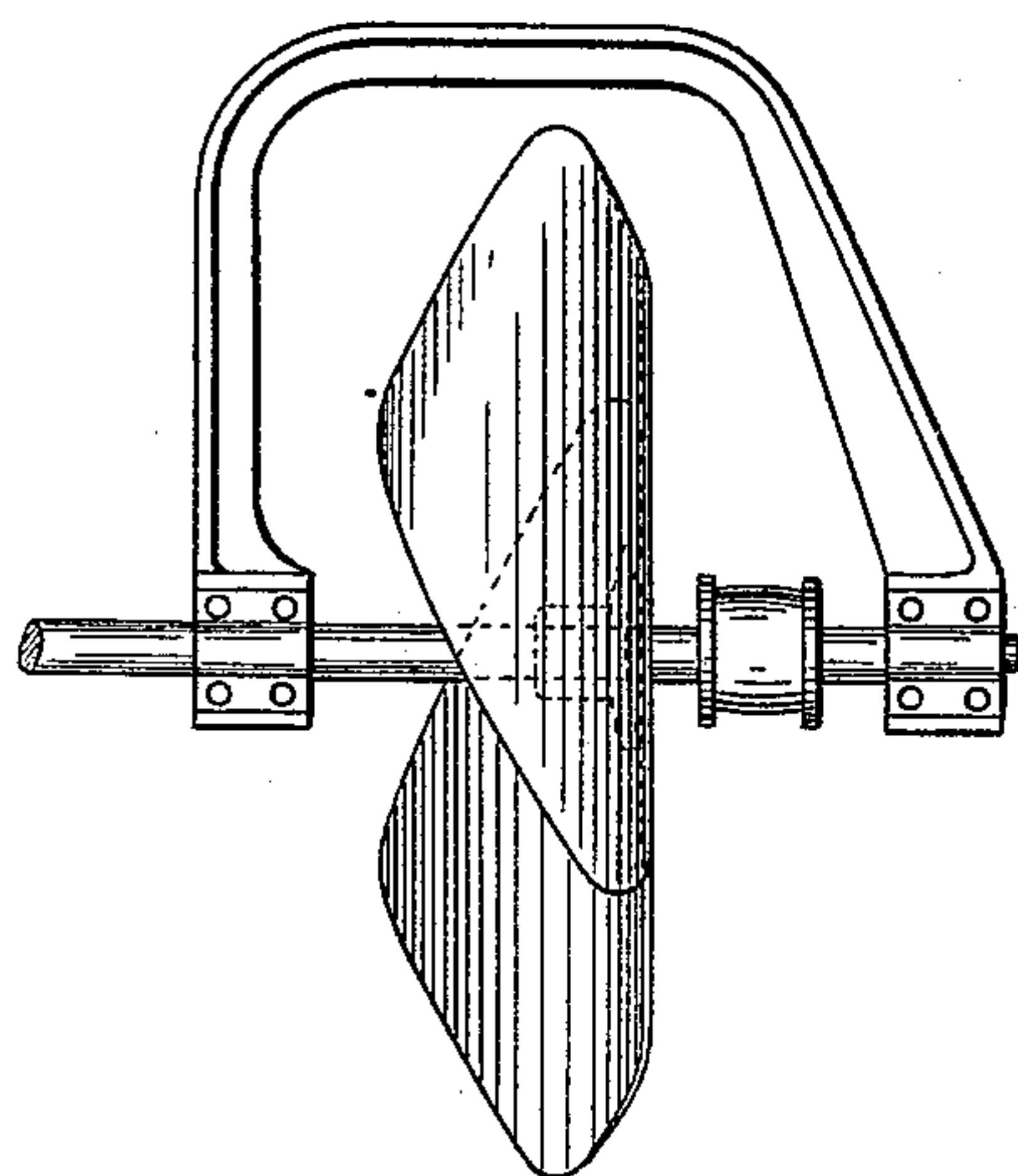


fig. 9.

Witnesses

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UNITED STATES PATENT OFFICE.

CLARENCE WILLIAM CROSSLEY, OF LONDON, COUNTY OF MIDDLESEX,
ENGLAND.

APPARATUS FOR THE PROPULSION, MOVEMENT, AND SUCTION OF AIR, FLUIDS, AND GASES.

SPECIFICATION forming part of Letters Patent No 336,215, dated February 16, 1886.

Application filed June 12, 1885. Serial No. 168,468. (No model.) Patented in England July 14, 1884, No. 10,108, and in Belgium May 22, 1885.

To all whom it may concern:

Be it known that I, CLARENCE WILLIAM CROSSLEY, a subject of the Queen of Great Britain and Ireland, residing at London, in the county of Middlesex, England, draftsman, have invented a new and useful Improvement in Propelling Apparatus for the Movement of Air, Fluids, and Gases, of which the following is a specification.

My invention relates to an improved apparatus for the propulsion, suction, and movement of air, fluids, and gases, and will be readily understood on reference to the accompanying drawings, in which—

Figures 1, 2, 3, 4, 5, 6, and 7 are diagrams illustrating the sheet of metal forming the propeller-blade and the manner in which it is cut and bent, together with modifications of the shape into which said blade may be bent, Figs. 5 and 6 showing, respectively, a side and face view of the blade. Fig. 8 is a side view illustrating a complete propeller, and Fig. 9 a plan of the same.

I form my improved propeller by taking a piece of sheet metal of greater length than breadth—such, for instance, as is shown by A B C D, Fig. 1. The length may be about twice the width. This piece of sheet metal I bend slightly upon a line, *ef*, passing diagonally across its breadth, so as to make two equal or similar portions, into which the line divides it. A section at right angles to *ef* will therefore appear, as shown in Fig. 2. The angle that the line *ef* makes with the base-line C D across the face of the metal sheet may be about forty-five degrees. The equal or similar portions A *f e* D and B *f e* C, having been thus bent slightly toward each other, are then curved so that they approach still nearer to one another, as shown in diagram, Fig. 3, or in the modification, Fig. 4, although I prefer the form shown in Fig. 3. The angle included within *c b a*, Fig. 3, may be about one hundred and ten degrees, and the height from *b* to *a* about one-half the width of A D or B C, Fig. 1. The curve of the blade may be continuous throughout, or it may vary at different parts of the surface of each of the above-mentioned equal or similar portions. The

piece of metal forming the blade, having been thus bent and curved, will appear in side view as shown by Fig. 5, in elevation as shown by Fig. 6, and in plan or section as shown by Fig. 3 or 4.

The curving of the surfaces of the equal or similar portions A *f e* D and B *f e* C is a very important feature of my invention, for if they be kept flat when bent toward each other there is a very marked reverse or return current of the air or other medium in which the apparatus is working; but by curving them this return current is almost, if not entirely, done away with.

Instead of bending the piece of sheet metal on a line passing at an angle across its breadth, this line may be an imaginary one, and the curvature of each of the equal or similar portions may extend each side of the imaginary line at a constant or varying rate over the two equal or similar portions. A section in this case would appear similar to Fig. 7. The two equal or similar portions may also be made of separate pieces of sheet or cast metal, curved as desired, and joined together at the line *ef*, or one may be hinged to the other at the line *ef*, so as to allow of their being adjusted by suitable means to vary the angle between them.

Having formed the apparatus of sheet metal, as above described, I fasten it to or on a shaft or spindle (see Figs. 8 and 9) in such a manner that the axis of the shaft will pass through the line *ef*, crossing the breadth of the piece of metal, and will also bisect the angle included between the two equal or similar portions, which have been made to approach each other in the above-described manner.

In Figs. 3, 4, 5, and 7 of the accompanying drawings the position of the axis of the shaft or spindle is shown (by a dotted line) as horizontal, and the line *ef*, as seen in side view at Fig. 5, is shown at right angles to the axis. The shaft may be supported in bearings in the usual way, and rotated by any suitable means in the direction of the arrows, as shown in Fig. 6, in order to give motion to the air or other medium in the direction of the arrows, as shown in Fig. 5.

The above-described apparatus may be

wholly or partially surrounded by a cylindrical or conical case.

I do not confine myself to the precise details, relative proportions, or dimensions, or to the
5 precise angle or angles herein described or shown, as the same may be varied without departing from the invention.

I claim as my invention—

10 The improved apparatus for the propulsion or movement of air or other fluids, consisting of a revolving shaft and a plate of sheet metal that is affixed to said shaft, and is longer in one direction than the other, and having the two portions or blades at an obtuse angle to

each other, the line of the angle between the
15 blades being diagonal to the plate, and the end portions of each blade curved toward each other, substantially as specified.

In witness whereof I have hereunto signed my name in the presence of two subscribing
20 witnesses.

CLARENCE WILLIAM CROSSLEY.

Witnesses:

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