

S. E. STOKES.
Automatic Hatch Closers.
No. 229,486. Patented June 29, 1880.

FIG. 6.

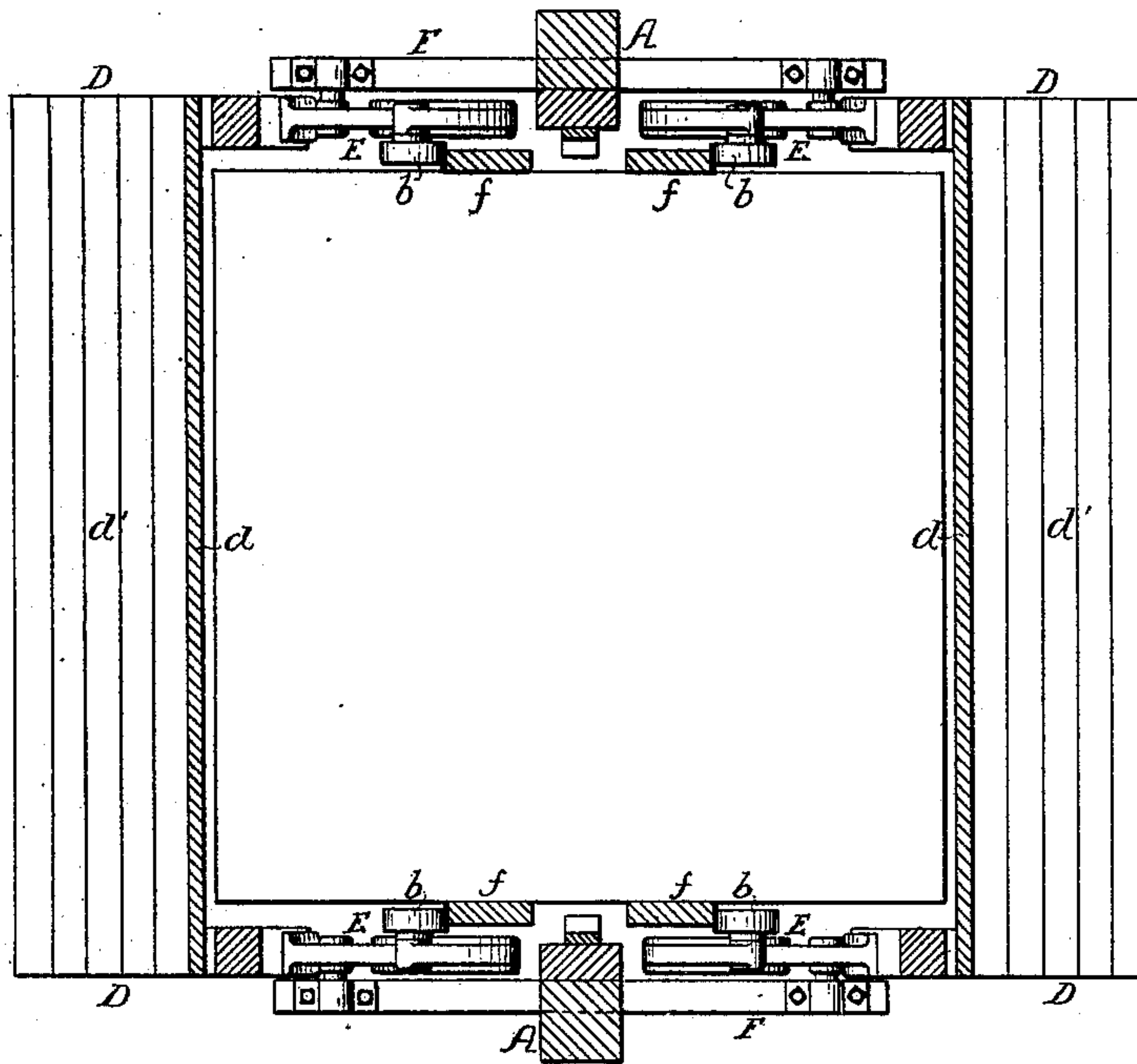


FIG. 7.

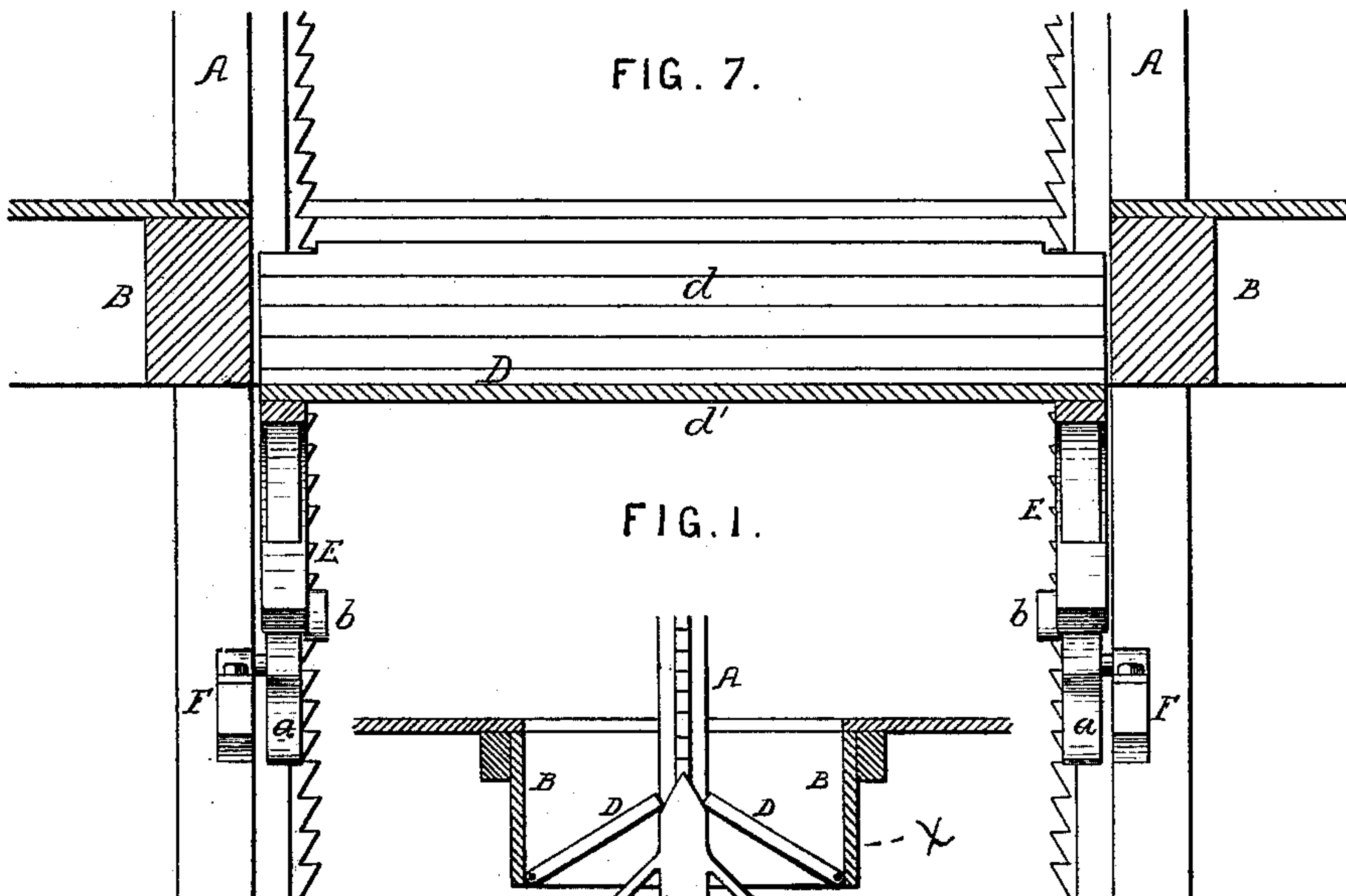
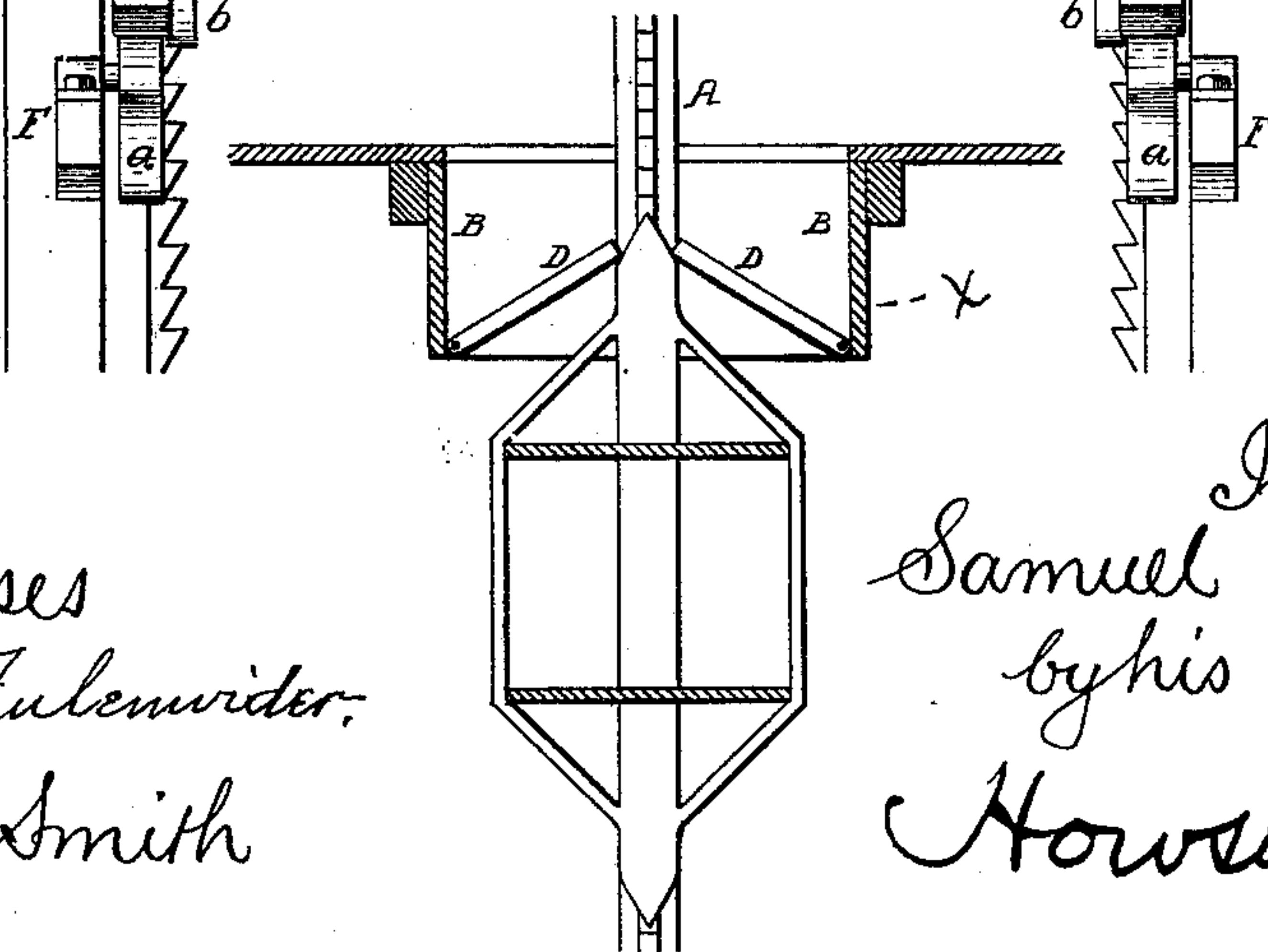


FIG. 1.



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(No Model.)

2 Sheets—Sheet 2.

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FIG. 2.

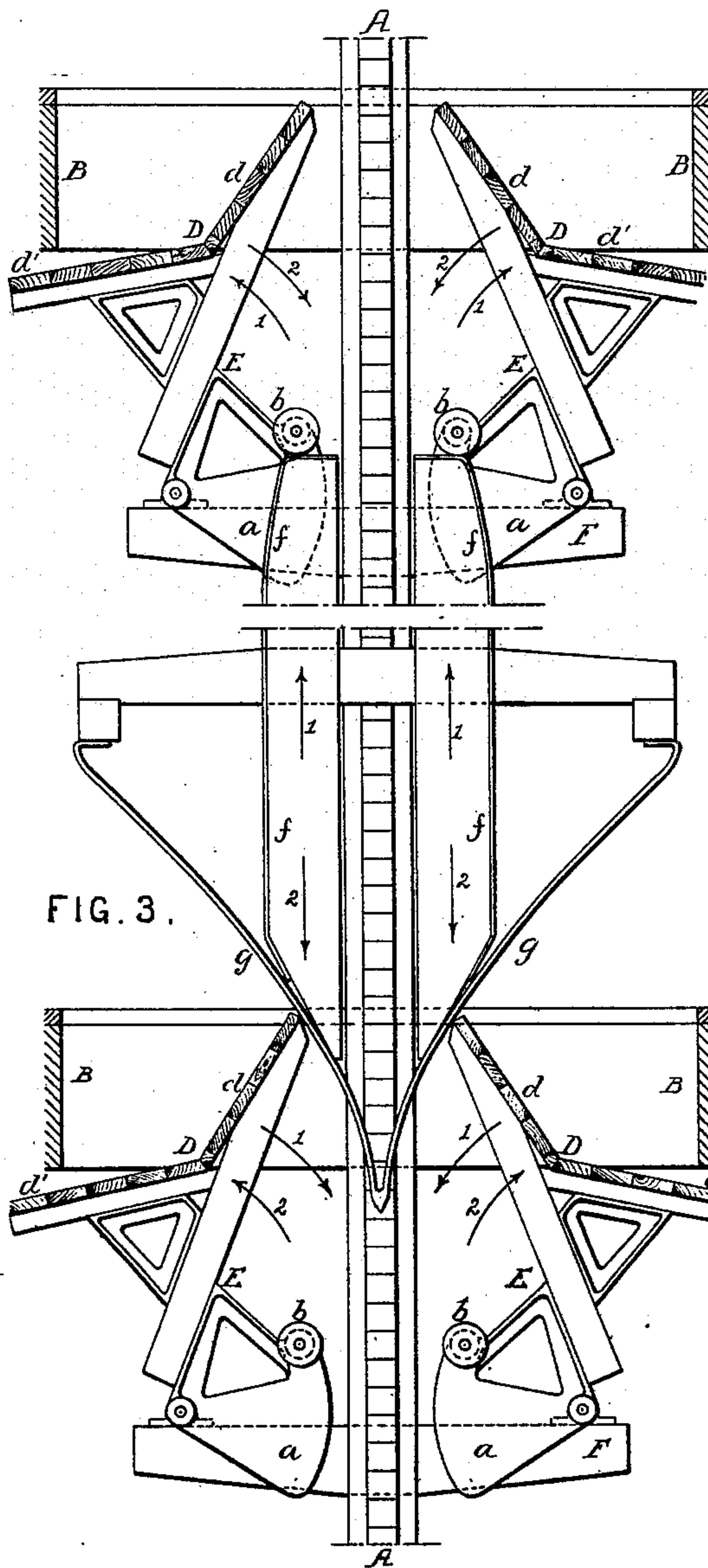


FIG. 3.

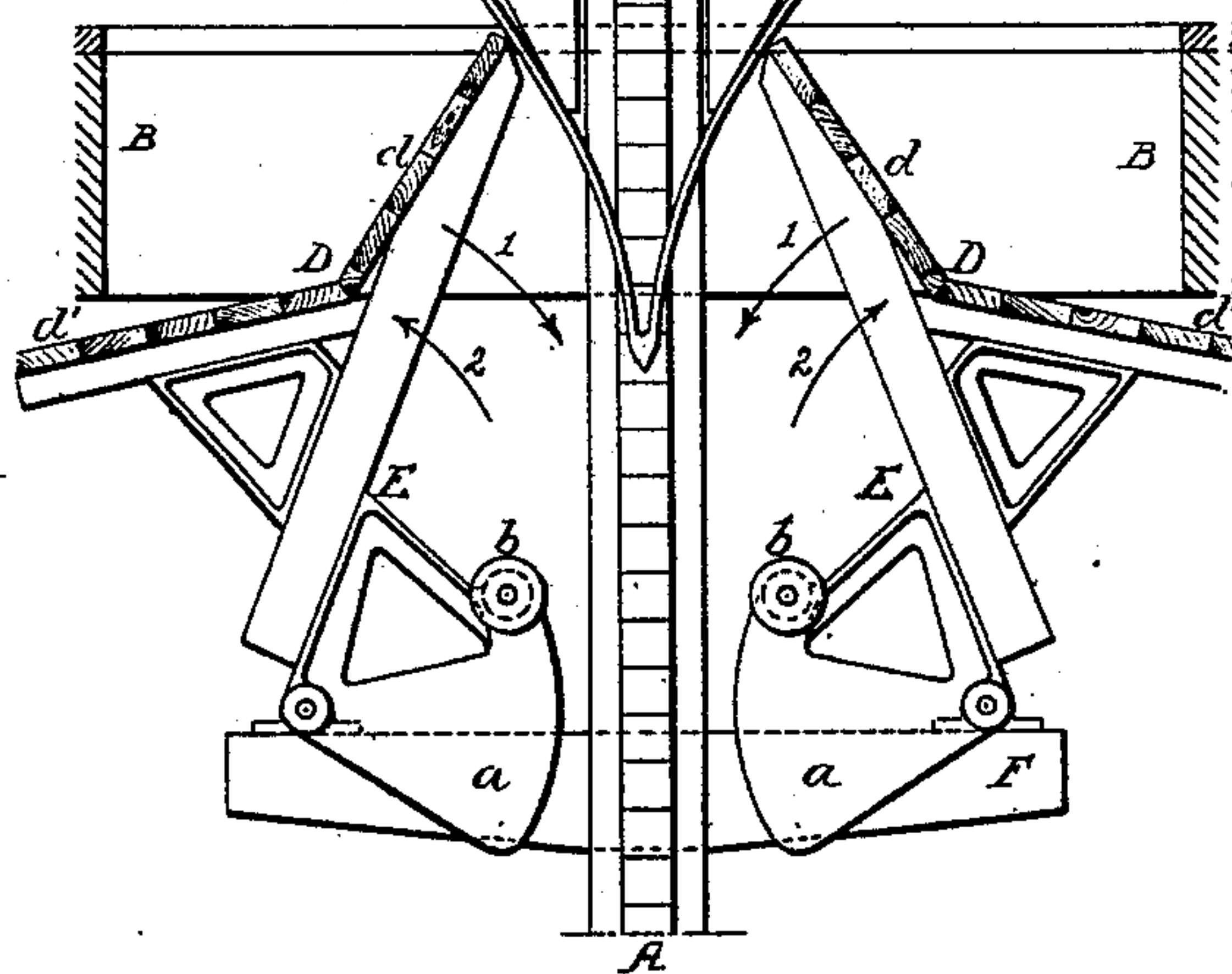


FIG. 4.

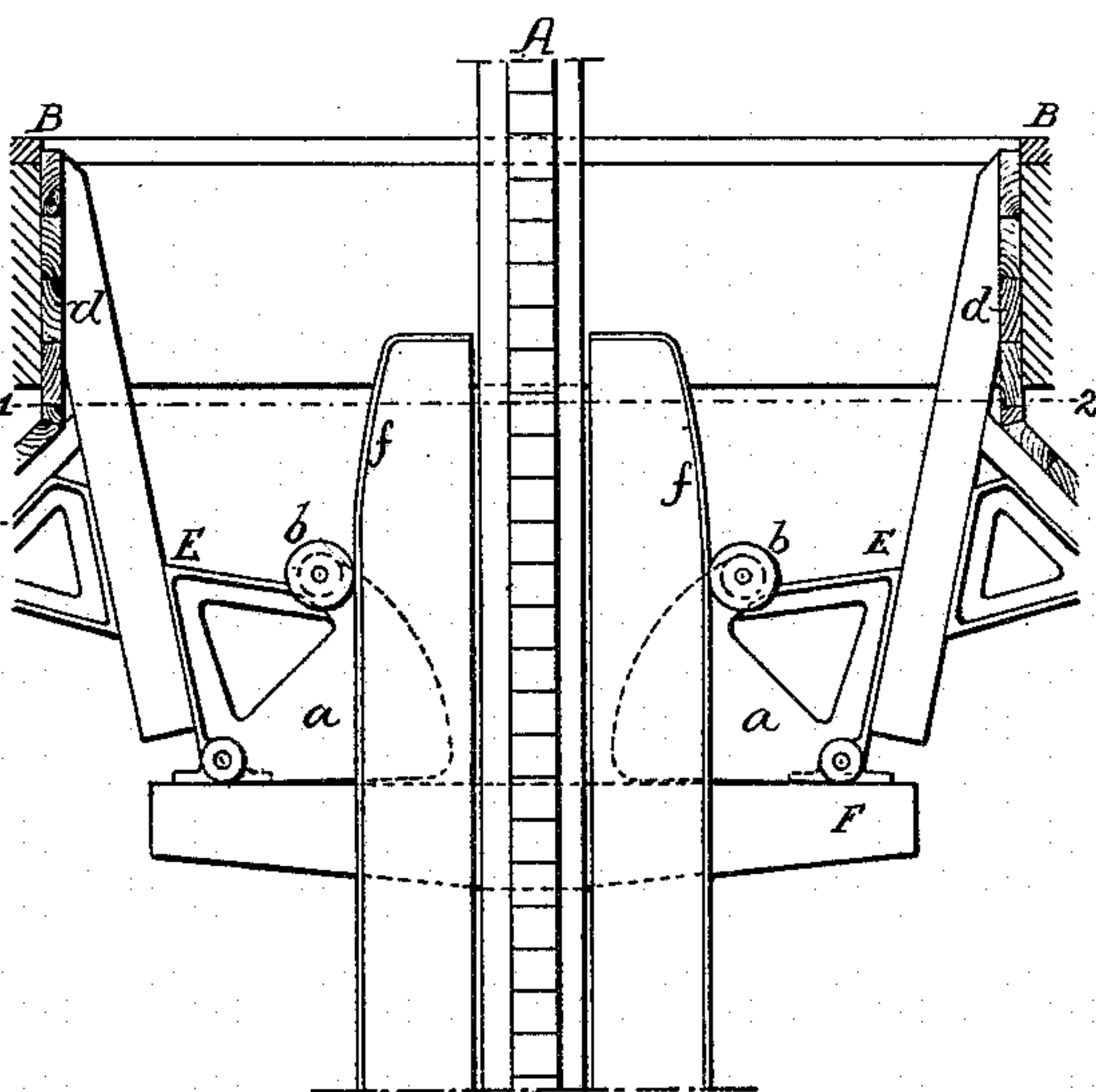
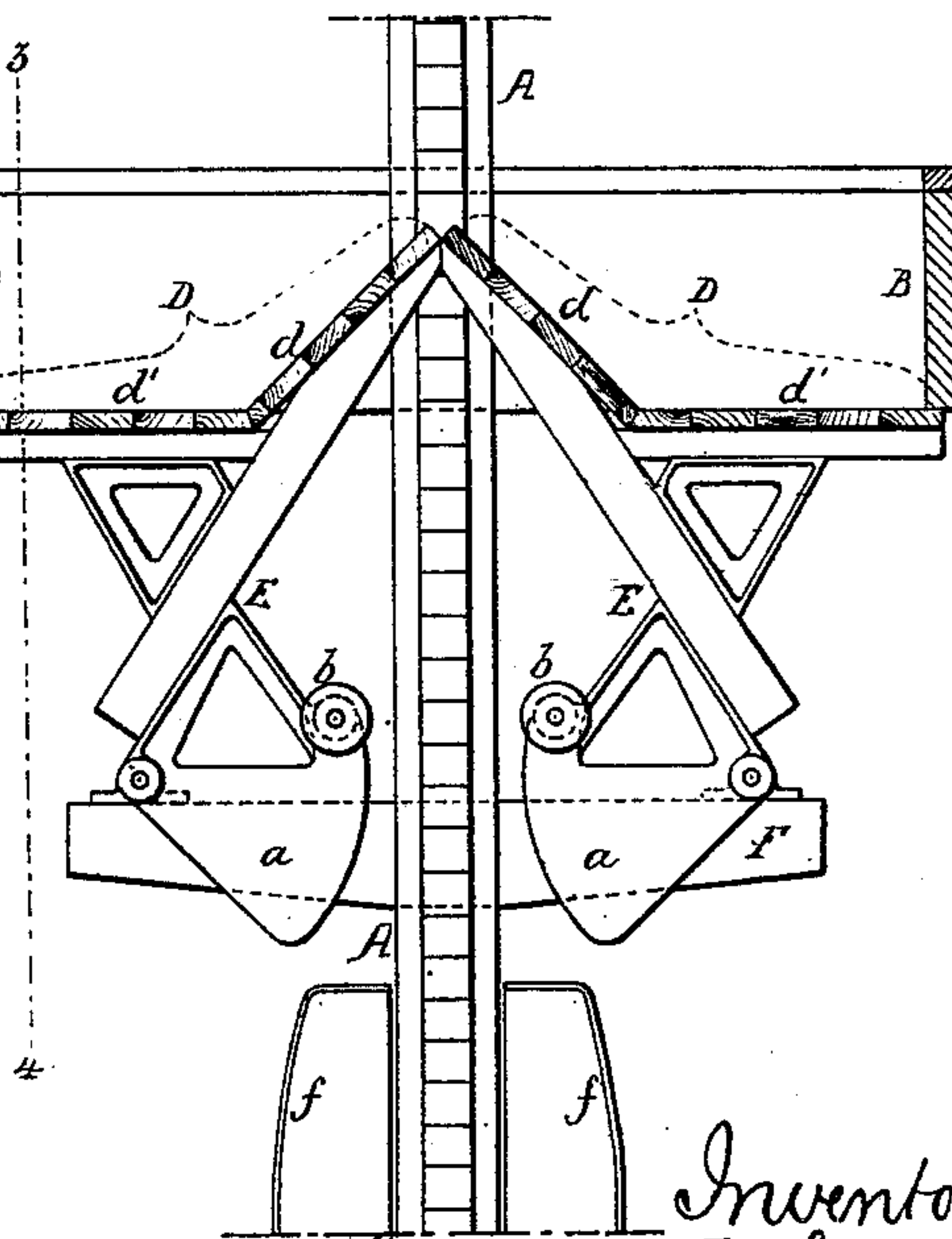


FIG. 5.



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UNITED STATES PATENT OFFICE.

SAMUEL E. STOKES, OF PHILADELPHIA, PENNSYLVANIA.

AUTOMATIC HATCH-CLOSER.

SPECIFICATION forming part of Letters Patent No. 229,486, dated June 29, 1880.

Application filed May 7, 1880. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL E. STOKES, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain

Improvements in Automatic Hatch-Closers, of which the following is a specification.

My invention relates to an improvement in that class of hatch-closing doors which are hung below the level of the floor, and are opened and closed by the action of inclined planes on the cage, in connection with certain springs or weights, hatch-closing doors of this class being shown in the patent of Thompson and Morgan, No. 15,201, June 24, 1856.

The object of my invention is to overcome certain defects heretofore existing in the construction and operation of the doors—an object which I attain in a manner too fully described hereinafter to need preliminary explanation.

In the accompanying drawings, Figure 1, Sheet 1, is a diagram representing the patented device upon which my invention is based; Figs. 2 and 3, Sheet 2, transverse sections of a hatch provided with my improved doors, and showing the manner in which the opening and closing of the same are effected; Fig. 4, a transverse section, showing the doors open and as they appear during the passage of the cage through the hatch; Fig. 5, a transverse section, showing the doors closed; Fig. 6, Sheet 1, a sectional plan on the line 1 2, Fig. 4; and Fig. 7, a vertical section on the line 3 4, Fig. 5.

The above-mentioned patent of Thompson and Morgan shows a pair of doors, D D, hinged to a quadrangular frame, *x*, extending below the floor of the room and below the ceiling of the room beneath, the doors being self-closing and being opened by inclined planes on the cage during the ascent and descent of the same. (See Fig. 1, Sheet 2.) Doors of this class are preferable to those which when closed form a continuation of the floor, and induce persons to stand on them in fancied security, while they are liable to be injured when the doors are suddenly opened by the cage, whereas the cavity formed by the sunken doors in Fig. 1 always serves as a caution not to approach the hatchway too closely. Heretofore, however, in hanging doors according to Thompson and Morgan's plan it has been considered necessary to use the closed frame-work *x*, extending

below the ceiling, in order to prevent draft through the hatch at the sides and ends of the doors, and such a frame-work is objectionable, especially in rooms having low ceilings, as it is inconvenient and obstructs the light. These objections I overcome in a manner which will be understood on reference to Figs. 2 to 7, in which—

A A represent the opposite posts of the elevator-well, B the beams surrounding one of the hatchway-openings, and D D the hatch-closing doors.

Each of the doors D is carried by the long arms of a pair of bell-crank levers, E, one of which is pivoted to a transverse beam, F, on one of the side posts, A, and the other to a similar beam on the opposite side post, the short arms of the levers being provided with weights *a*, and having anti-friction rollers *b*, for a purpose described hereinafter.

Each door D is made in two parts, *d d'*, inclined in respect to each other, the angle of inclination being such that when the doors are open the portions *d* will bear against the inner sides of the beams B surrounding the hatchway, as shown in Fig. 4, and when the doors are closed and in contact with each other the portions *d'* will bear against the lower edges of said beams, and will be in line with the ceiling of the lower room, as shown in Fig. 5.

The upper ends of the side beams, *f f*, of the cage are slightly curved, and their lower edges inclined, and the bottom of the cage has a wedge-shaped frame, *g*, as shown in Fig. 3.

When the cage ascends the upper ends of its side beams, *f*, will strike the anti-friction rollers *b* and cause the levers E to swing outward, as shown by the arrows 1, so as to open the doors D, the latter when fully opened occupying the position shown in Fig. 4, and remaining in this position while the cage is passing through the hatch, the rollers *b* moving in contact with the edges of the beams *f*.

As the cage leaves the hatchway the doors gradually close, owing to the weights *a* on the levers E, the rollers *b* following the inclined lower ends of the beams *f* and the edges of the doors bearing against the frame *g*.

When the cage descends the above-described operations are reversed, the parts then moving in the directions of the arrows 2.

It will be observed, on reference to Figs. 5 and 7, that when the doors are closed the hatchway is completely covered, no openings being presented for a draft of air from one story of the building to another, and this result is attained without the use of a closed frame extending below the ceiling, the construction of the doors D rendering such a frame unnecessary.

10 In carrying out my invention the use of the bell-crank levers and of the inclined planes or projections on the cage for automatically operating the doors D is not absolutely essential. For instance, the pivotal shafts of the doors
15 may be furnished with pinions adapted to racks on the cage, or other equivalent devices, such as will readily suggest themselves to the expert mechanic, may be employed.

I claim as my invention—

20 1. The combination of a hatchway with doors D D, each made in two portions arranged at an angle in respect to each other, and each

pivoted at a point below the hatchway-opening, as set forth.

2. The combination of the doors D D, pivoted 25 below the hatchway-opening, and each made in two parts, arranged at an angle in respect to each other, with devices, substantially as described, whereby the doors are automatically opened and closed as the cage passes through 30 the hatch.

3. The combination of the posts A, the bars F, the doors D, constructed as described, the bell-crank levers E, having weights *a*, and the cage having side bars, *f*, and frame *g*, as speci- 35 fied.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SAMUEL E. STOKES.

Witnesses:

JAMES F. TOBIN,
HARRY SMITH.