

No. 606,812.

Patented July 5, 1898.

S. G. REED.

STRAIGHTWAY OR GATE VALVE.

(Application filed Jan. 9, 1897.)

3 Sheets—Sheet 1.

(No Model.)

Fig. 1.

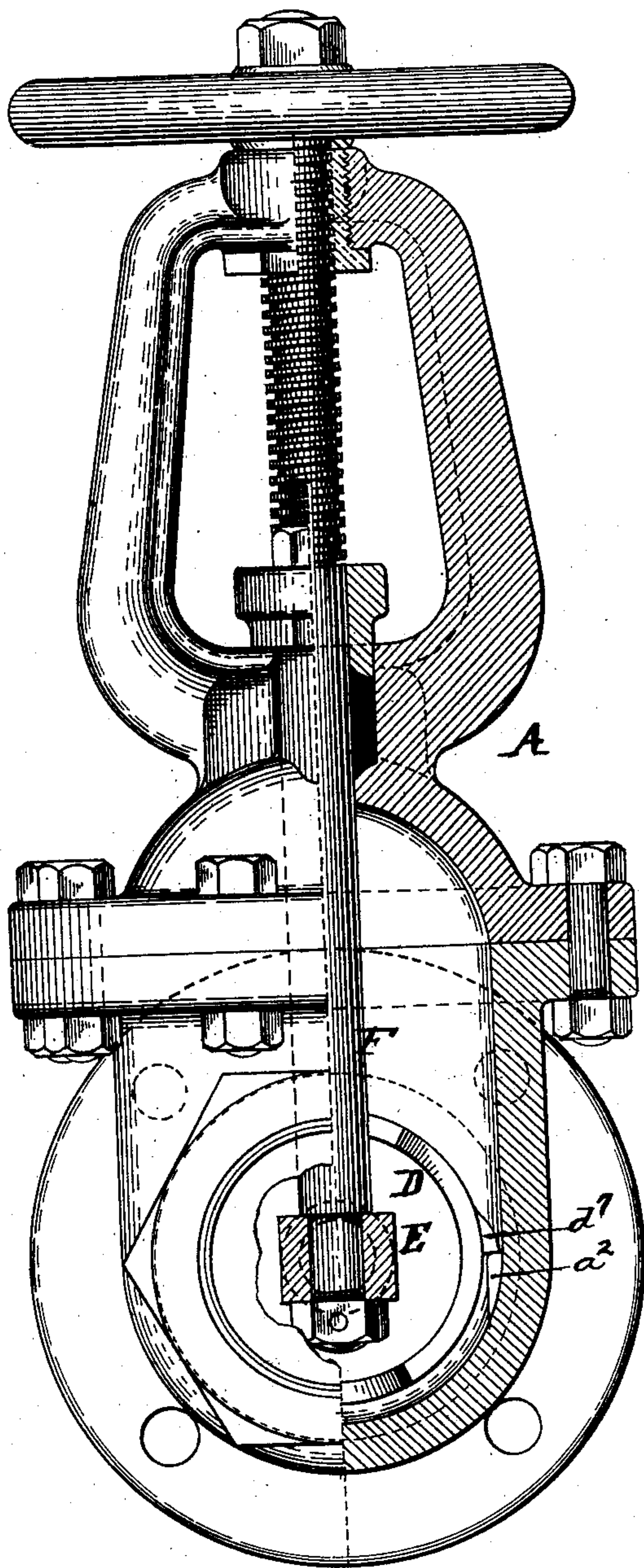
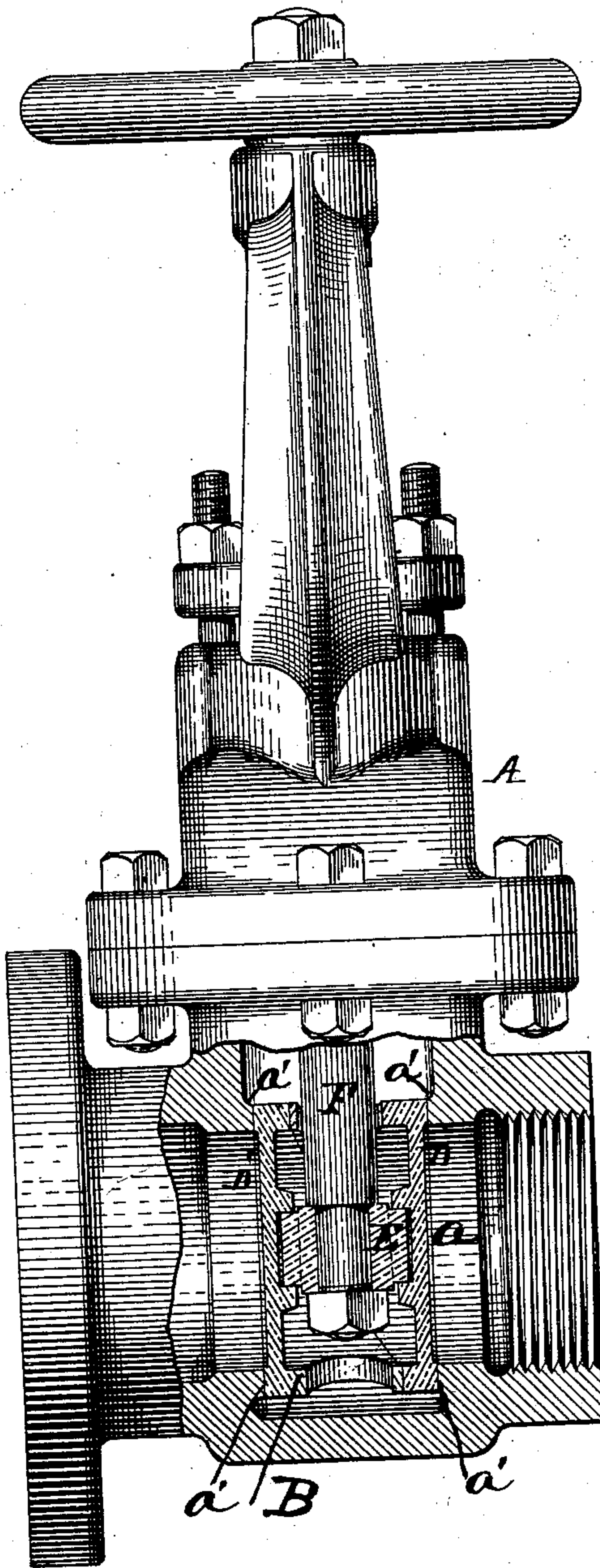


Fig. 2.



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Fig. 3.

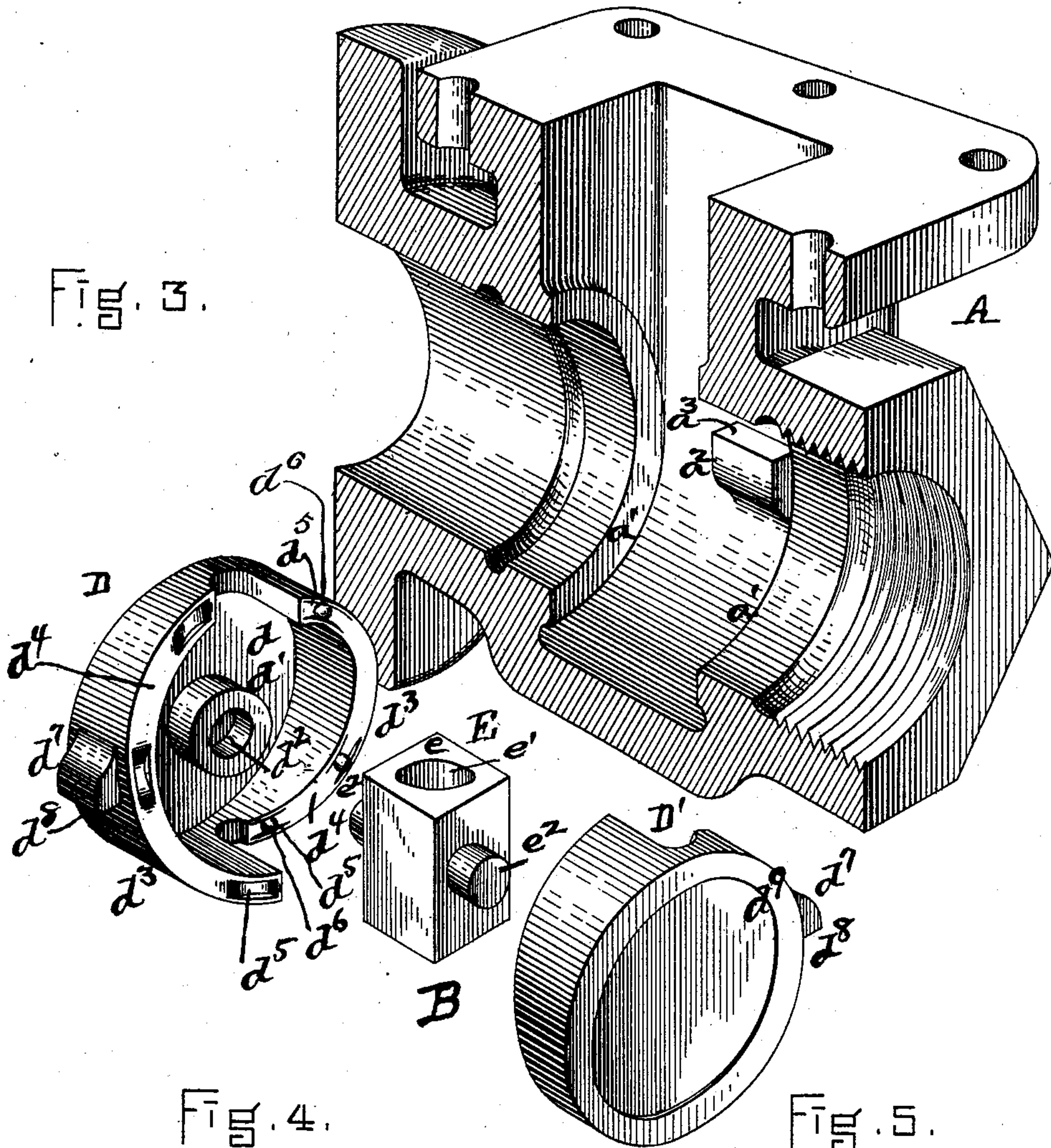


Fig. 4.

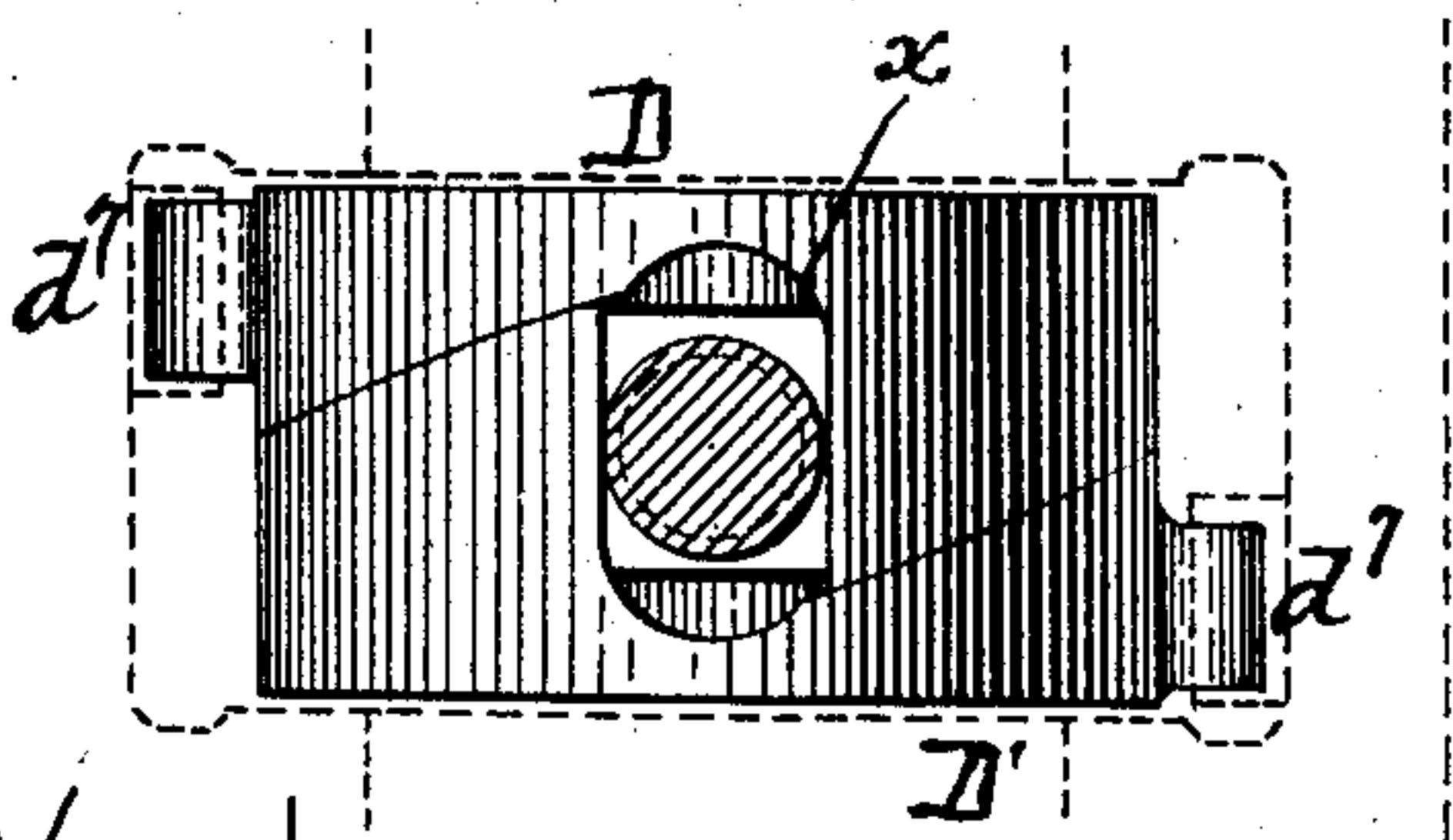
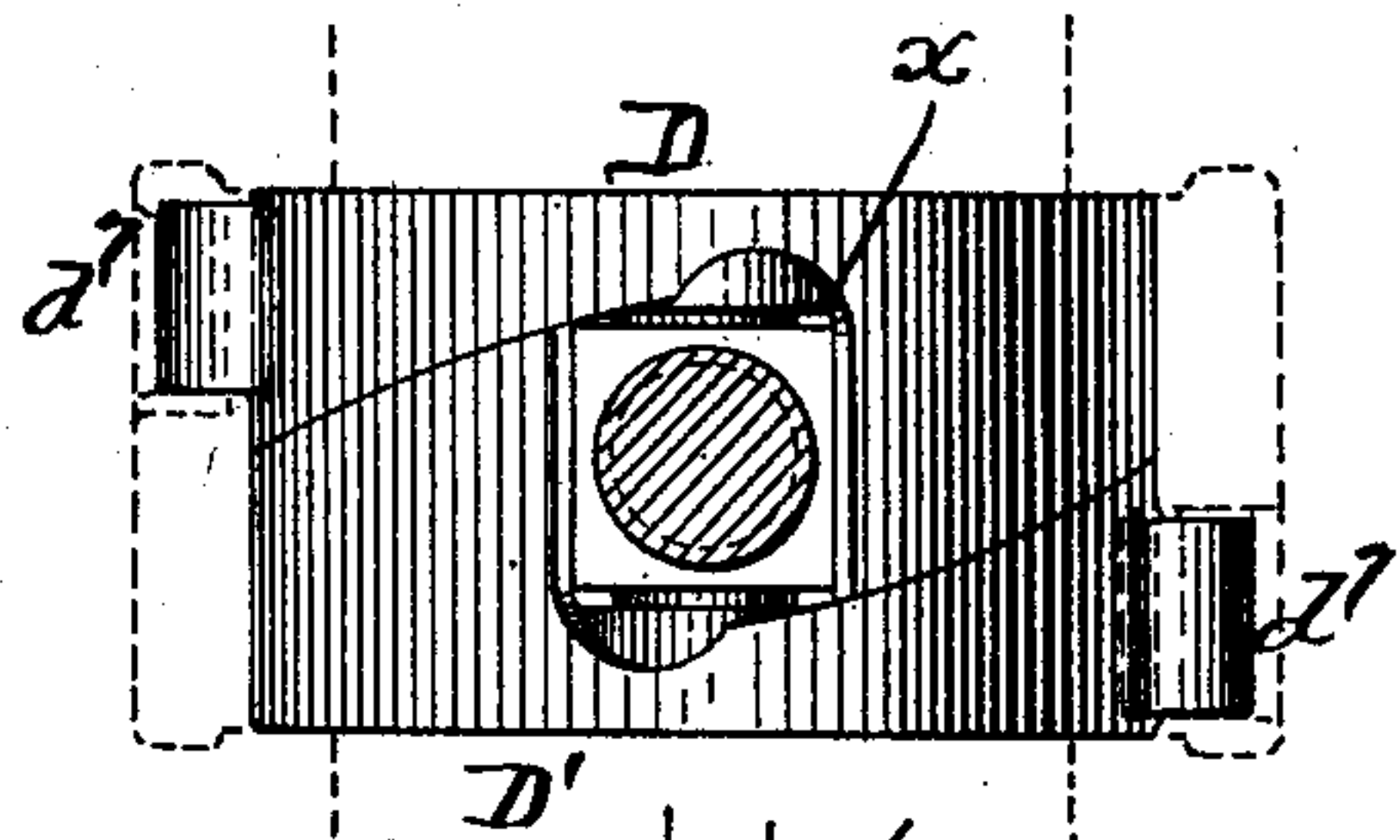


Fig. 5.



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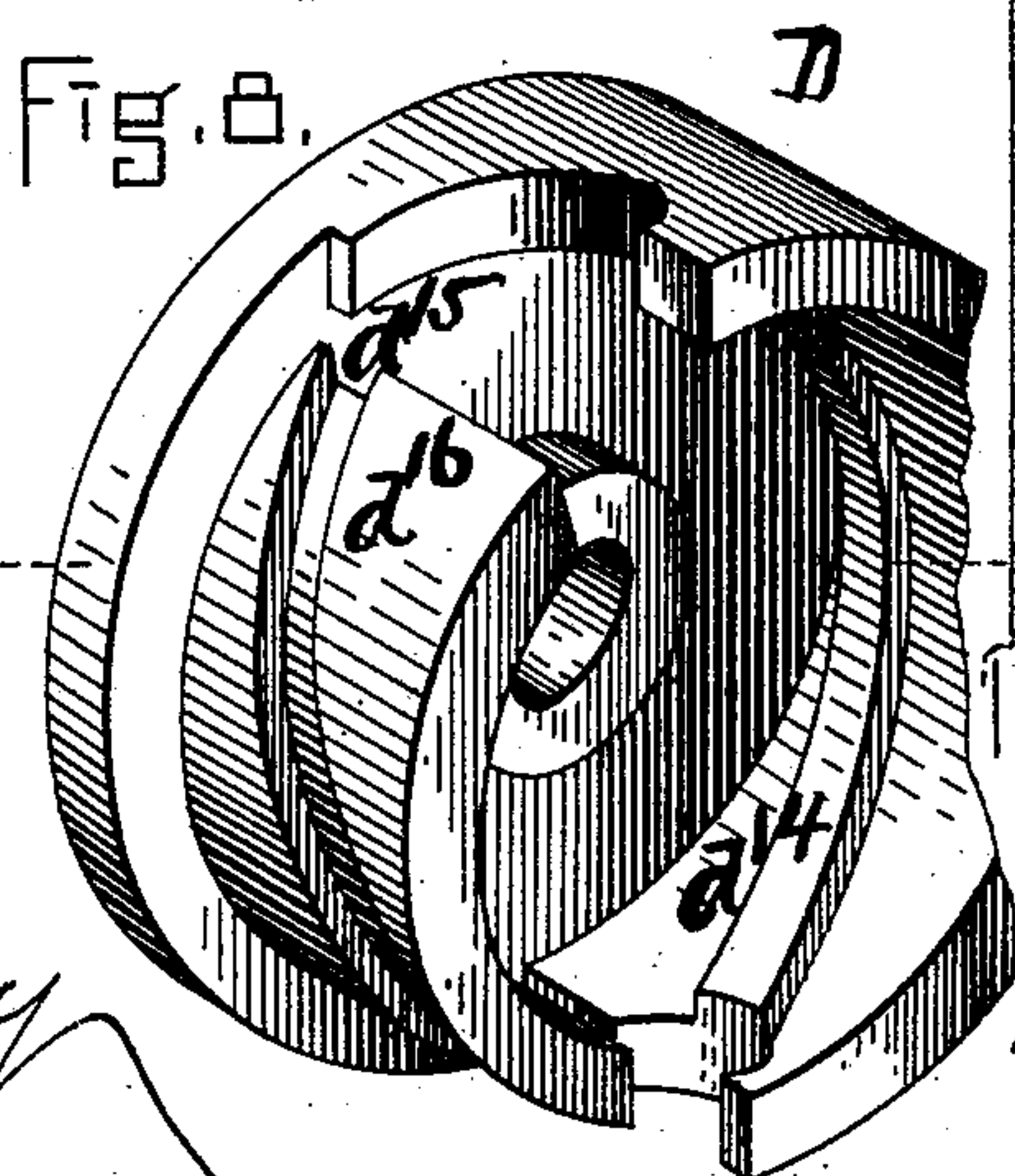
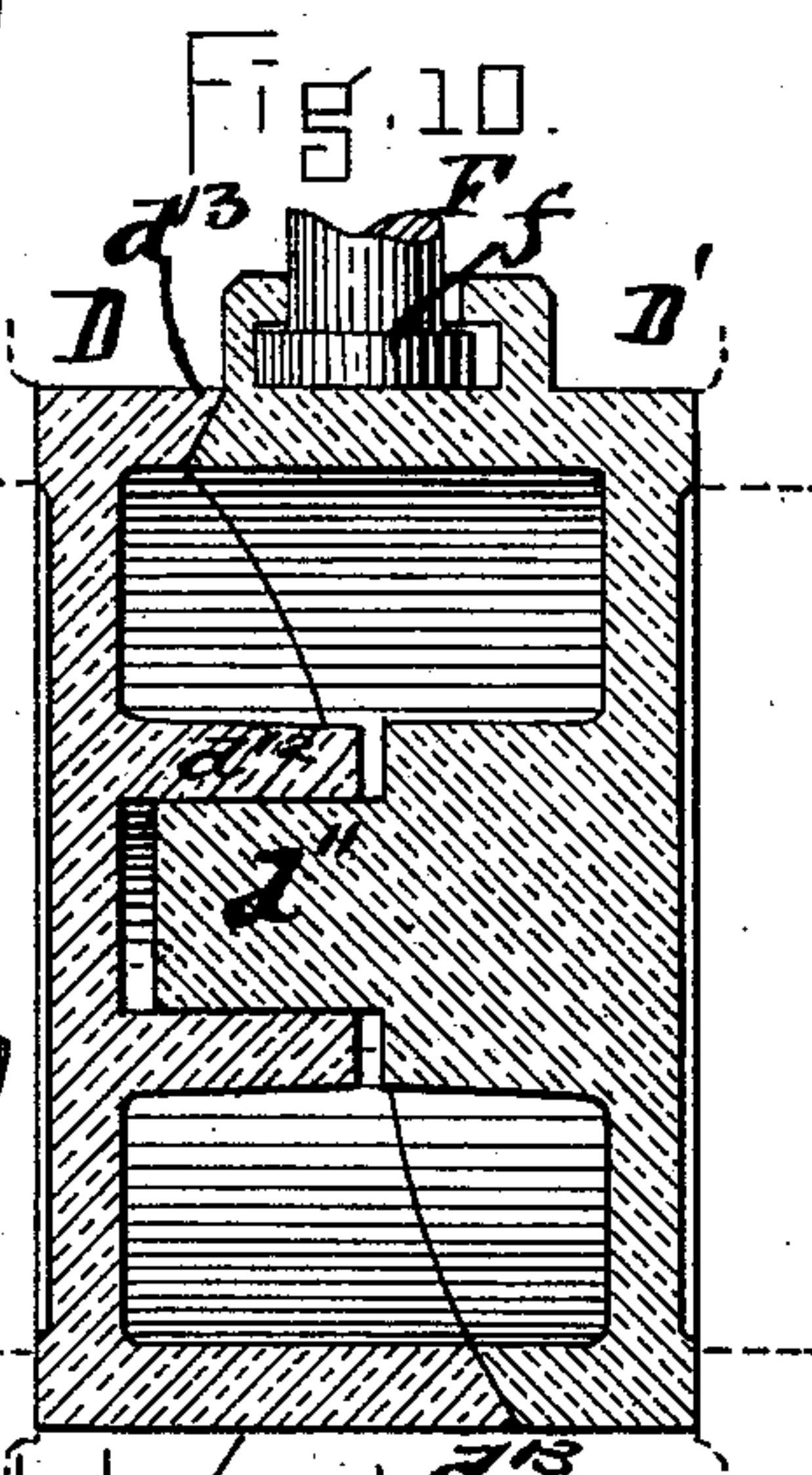
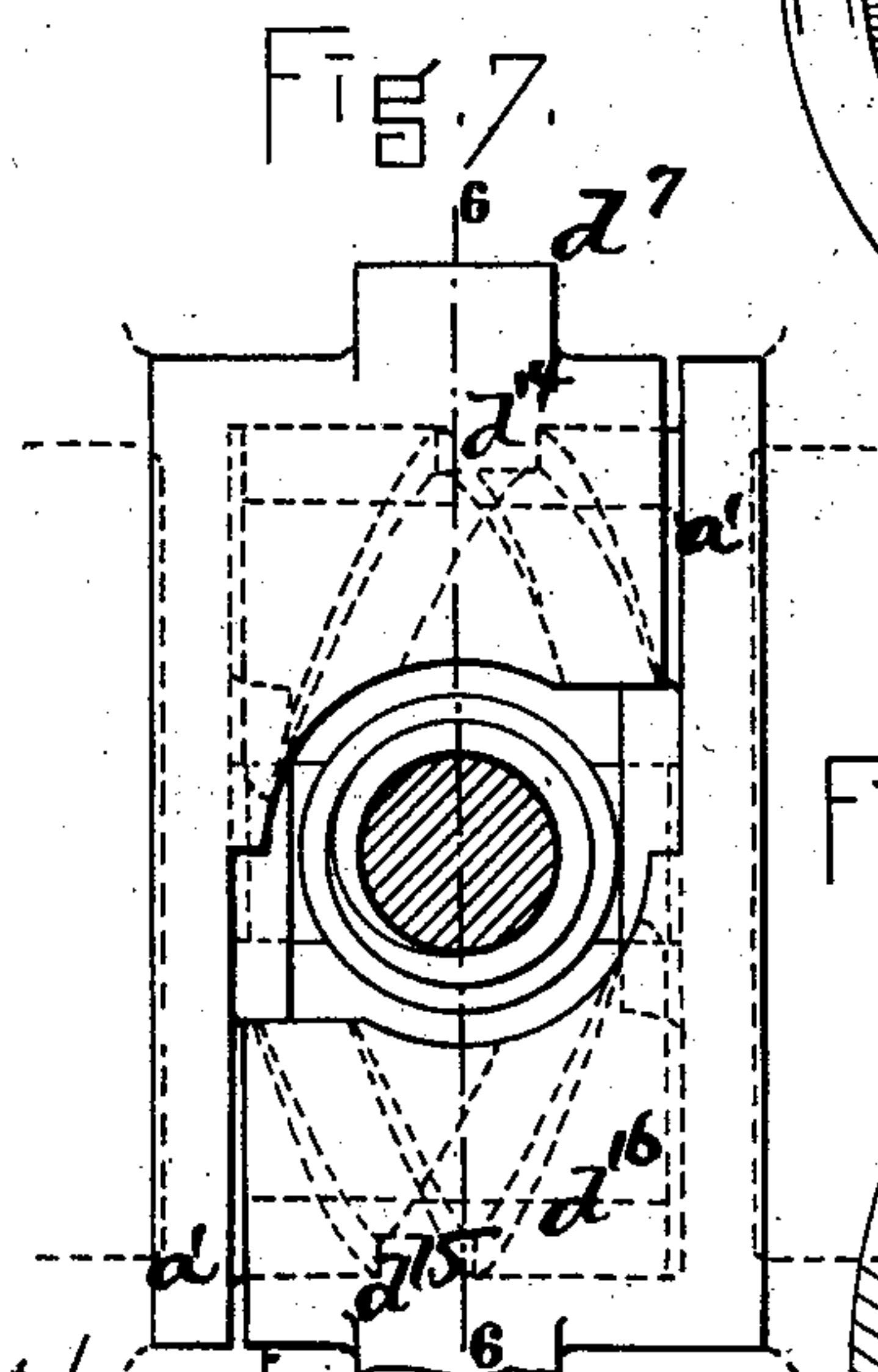
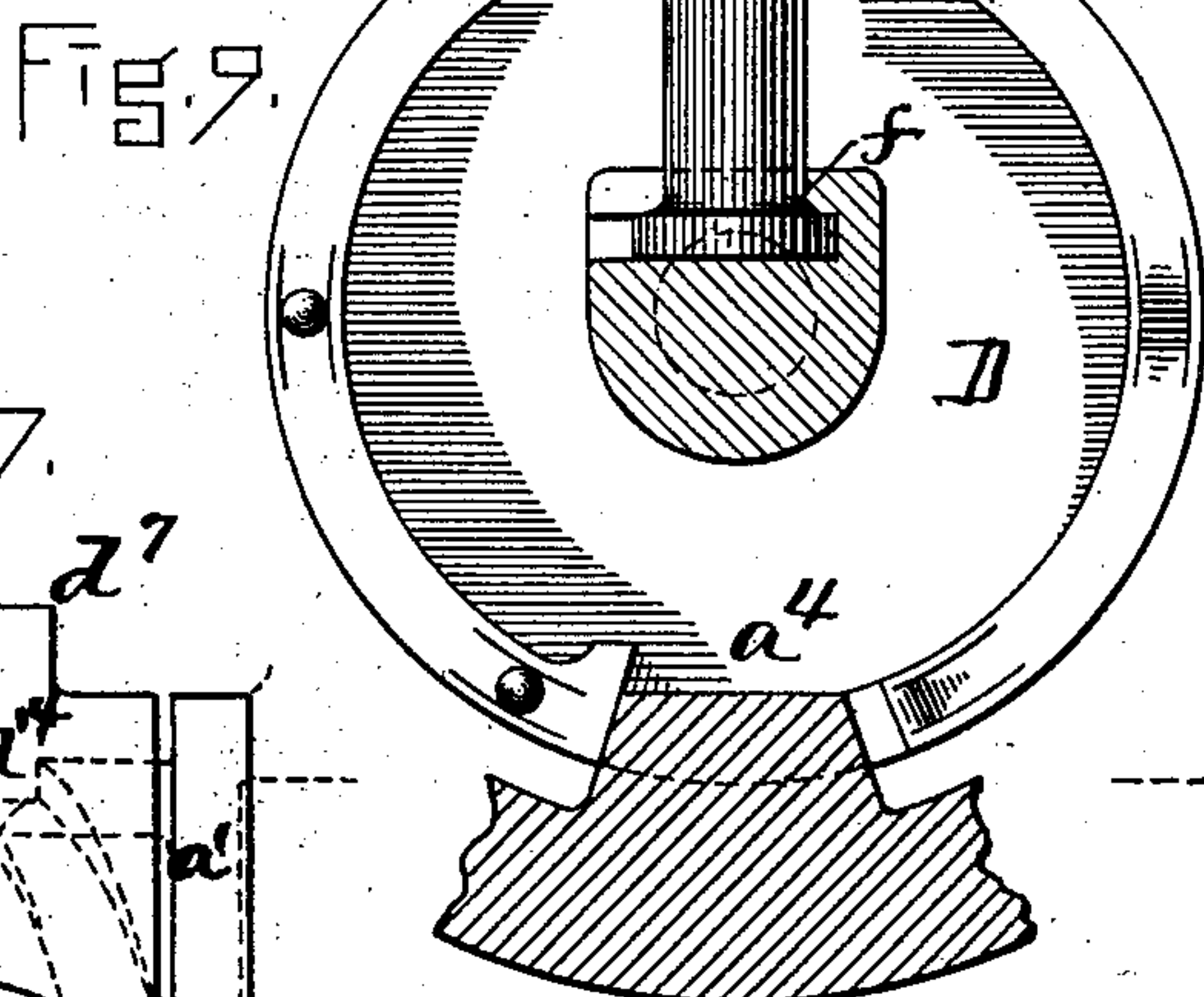
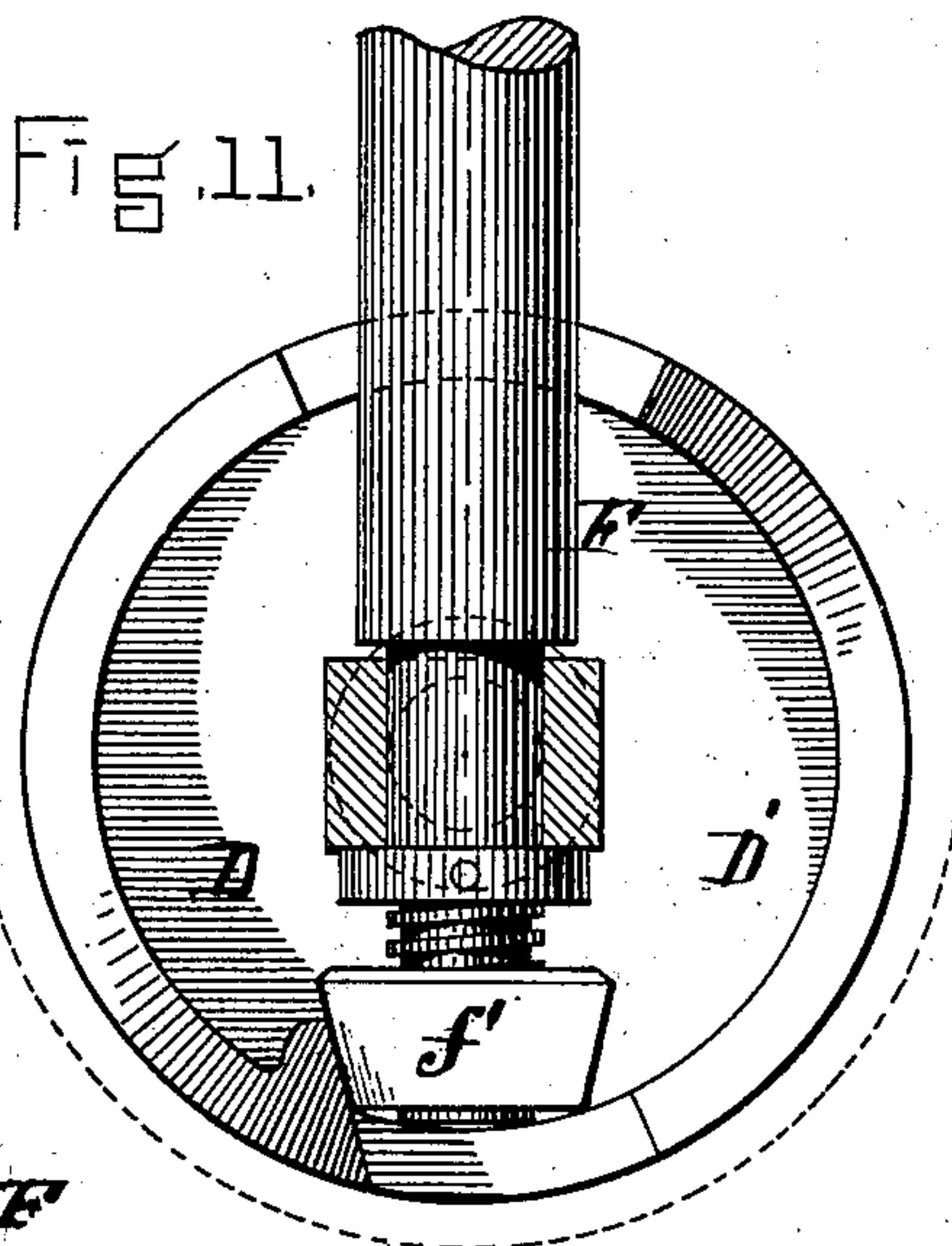
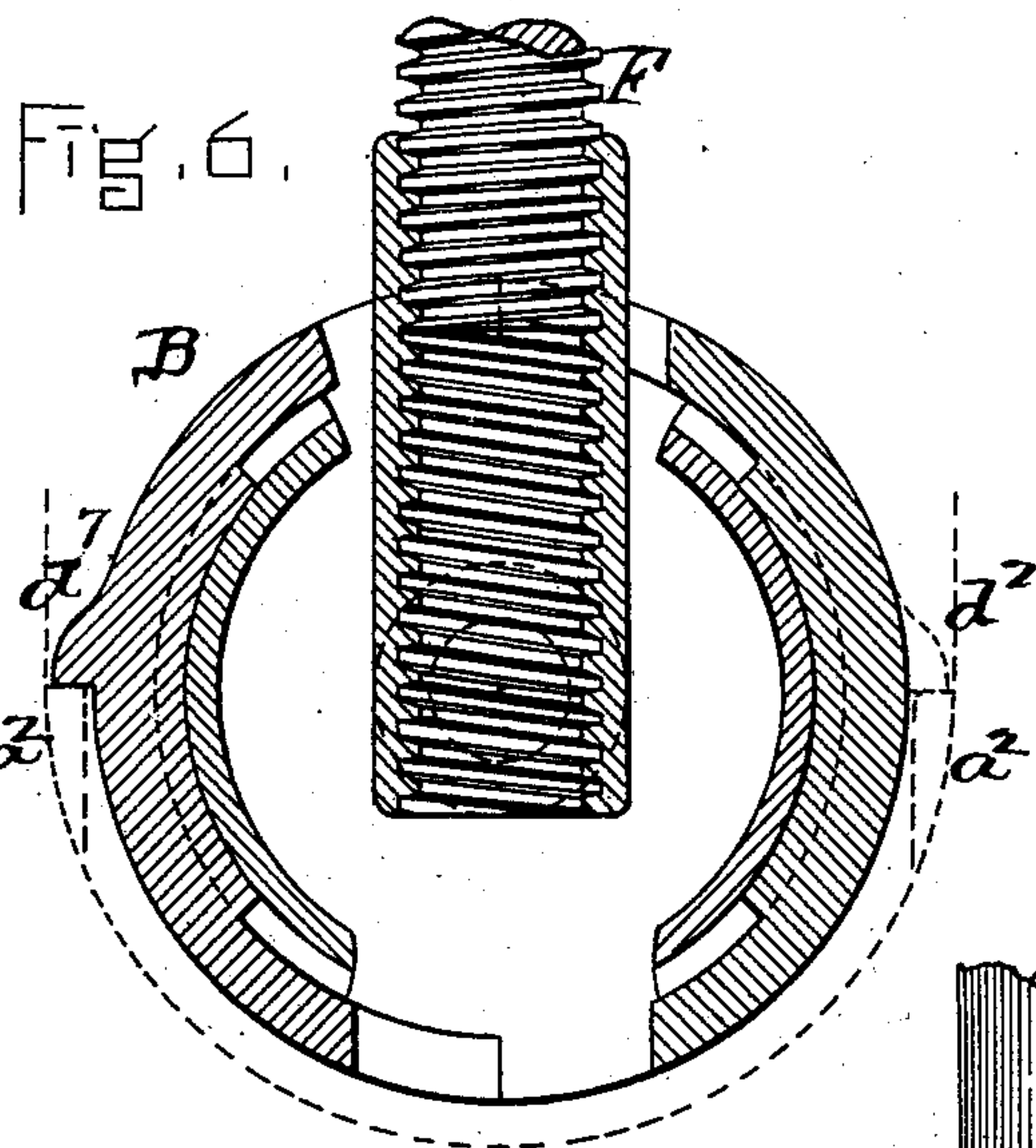
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

SAMUEL GORDON REED, OF CHELSEA, MASSACHUSETTS, ASSIGNOR TO THE CROSBY STEAM GAGE AND VALVE COMPANY, OF BOSTON, MASSACHUSETTS.

STRAIGHTWAY OR GATE VALVE.

SPECIFICATION forming part of Letters Patent No. 606,812, dated July 5, 1898.

Application filed January 9, 1897. Serial No. 618,634. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL GORDON REED, a citizen of the United States, residing at Chelsea, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Straightway or Gate Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improvement in straightway or gate valves, and has for its object the production of a valve composed of two parts and which is opened or closed by the partial rotation of these parts one upon another.

The invention consists in a valve-casing and a valve composed of two parts having spiral or cam-faced meeting edges, as will be set forth.

In the drawings, Figure 1 represents a vertical view of the device, a quarter being removed to show the internal construction. Fig. 2 represents a longitudinal section. Fig. 3 represents a longitudinal vertical section of the casing, the interior parts being in elevation. Fig. 4 shows the valve parts together or contracted. Fig. 5 shows them separated or expanded. Figs. 6 to 11 show modifications of the valve.

In the drawings the letter A represents a valve-casing of any suitable pattern and having the bore a and circumferential valve-seats $a' a'$ opposite one to the other. Just within or between these valve-seats there are made with the casing two lugs $a^2 a^2$, upon opposite sides and ends of the casing, the faces a^3 of these lugs being in opposite directions. Between the seats $a' a'$ is located the valve B, which is discal or cylindrical in form. This valve B consists of the three parts D E D'. The parts D D' being alike and complementary a description of one does for both. The part D has a flat base d , having an interior central boss d' , in which is a central circular cavity or seat d^2 . Rising from the base d on the same side as the boss d' are two circular flanges $d^3 d^3$. These flanges together nearly make a complete circle, there being a

space between their ends. The faces $d^4 d^4$ of these flanges are parts of spirals or cam-shaped. In the faces $d^4 d^4$ are made pockets d^5 , in which are placed rollers or balls d^6 . Projecting from the outside of the part D, about midway of one of the flanges d^3 , is a lug d^7 , these lugs on the two parts D D' being on opposite sides and having their faces d^8 in opposite directions. The valve is put together by inserting the trunnions $e^2 e^2$ in the seats $d^2 d^2$, the faces $d^4 d^4$ of the parts coming together, the balls d^6 bearing against the opposing face. The valve is placed in the casing A between the seats $a' a'$, the seats d^9 of the valve registering with the seats $a' a'$ and the lugs d^7 and a^2 being in the same circle. The part E consists of main portion e , which may be angular and is made with a bore e' and trunnions e^2 , projecting in opposite directions. The valve-stem F is put in place in the valve B. The stem passes through one of the openings which are formed by the spaces between the ends of the flanges $d^3 d^3$ and also passes through the bore e' of the part E and is nuted below the latter.

When the parts of the valve are as shown in Fig. 4, the valve is contracted and the valve-way is open. When they are as shown in Fig. 5, the valve is expanded and the valve-way is closed.

By operating the valve-stem F the parts D and D' are caused to be turned upon each other, the faces d^4 moving on each other and separating the parts D and D', the rolls d^6 relieving the friction and producing ease of movement. This action of the parts D and D' is induced by the lugs d^7 and a^2 contacting, which locks the parts D and D' in opposite directions, and hence they move on each other, and so moving enlarge the valve B and close the valveway, the seats b' and d^9 coming together.

Figs. 6 to 11 represent other forms of the valve D which may be used.

Fig. 6 is a longitudinal vertical section through 6 6 of Fig. 7. In Fig. 6 may be seen the lugs d^7 of the valve B, resting upon the lugs a^2 of the casing A, thus illustrating their relative position when in contact.

Fig. 8 shows in perspective one of the sec-

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tions D. (Seen in plan view in Fig. 7.) The form for rotating the disks is that of a screw-thread, as may be seen. Upon the inner side of the larger cylindrical part of the section D is a male thread d^{14} , and upon the outer side of the smaller cylindrical portion d^{16} is a corresponding female thread. The part D corresponds, although opposite, to this, so that one screws into the other, thus, in effect, uniting by a large screw the two sections. Now when the lugs d^2 (seen in Figs. 6 and 7) come in contact with the lugs a^2 of the casing and cause the parts D D' to rotate they expand or contract them by means of this screw-thread just in the same way as is done by the cam-faces d^4 , as seen in Fig. 3. In Fig. 6 is also another method of attaching the spindle to the valve so that the trunnion permits a screw-thread thereof to pass down through it instead of being turned upon a nut in the casing A.

Fig. 9 presents also another attachment of the spindle F to the trunnion connection E, it being an enlargement f , which slides into the corresponding opening in the trunnion. In this figure the sections D D' of the valve B are rotated by means of a wedge a^4 , formed at the bottom of the casing A. In this case as the valve proceeds downward, due to the spindle, the parts D D' come in contact with the sides of the wedge a^4 and are spread apart, due to the rotating of the same.

Fig. 10 represents another method of uniting the parts D D' of the valve B, in which there is a projection d^{11} , which fits into a cylindrical recess d^{12} . In this case the spindle F, with its circular enlargement f , is fitted into a stirrup or hollow projection at the top of the section D. In this figure it will be observed that the cam-faces d^4 in Fig. 3 instead of being parallel with the seats d^9 are transversely oblique thereto, as shown at d^{13} . This way of shaping the cam-faces may be applied to the form shown in Fig. 3 as well as that shown in Fig. 10. The purpose of this modification is to keep the seats d^9 of the two sections D D' in alinement or parallel to their axes when supported upon the parts d^{11} d^{12} or the

trunnion connection E. The loose connections here otherwise would permit of a sufficient movement as to allow of some distortion if not controlled by this form of cam-face. Besides in case the seats $a' a'$ of the casing A should not be in parallel vertical planes the oblique faces d^{13} of the sections D D' of the valve e will permit these sections to open variably, so that the seats d^9 d^9 will make a close contact with such seats $a' a'$.

Fig. 11 represents another modification, in which the spindle F has upon its lower end, passing through the trunnion connection, a wedge mounted thereon upon screw-threads which have a fixed relation to the screw-threads on the spindle F, which cause the valve B to rise or fall. The object of this is that when the valve is open to its highest point the wedge f' is at its highest part on the screw-threads on which it travels. Then turning downward the spindle F the wedge f' also moves downward relatively as fast as the screw-threads upon which it travels are relatively finer than the screw-threads upon the spindle, and so adjusted that when the valve B shall have come opposite to the seats $a' a'$ of the casing A, or nearly so, the wedge f' of the spindle shall have reached the sections D D' of the valve B and caused the same to separate and fill the space between said seats $a' a'$.

Having thus described my invention, what I claim is—

1. A valve, consisting of the parts, D, E, D', in combination with the valve-stem, F, as set forth.

2. The valve consisting of separable parts having meeting edges, such meeting edges being transversely oblique to the seating-faces of the valve on transverse radial lines, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

SAMUEL GORDON REED.

Witnesses:

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A. L. BOWKER.