

No. 850,629.

PATENTED APR. 16, 1907.

F. T. DICKINSON.
MOLD.

APPLICATION FILED DEC. 5, 1905.

3 SHEETS—SHEET 1.

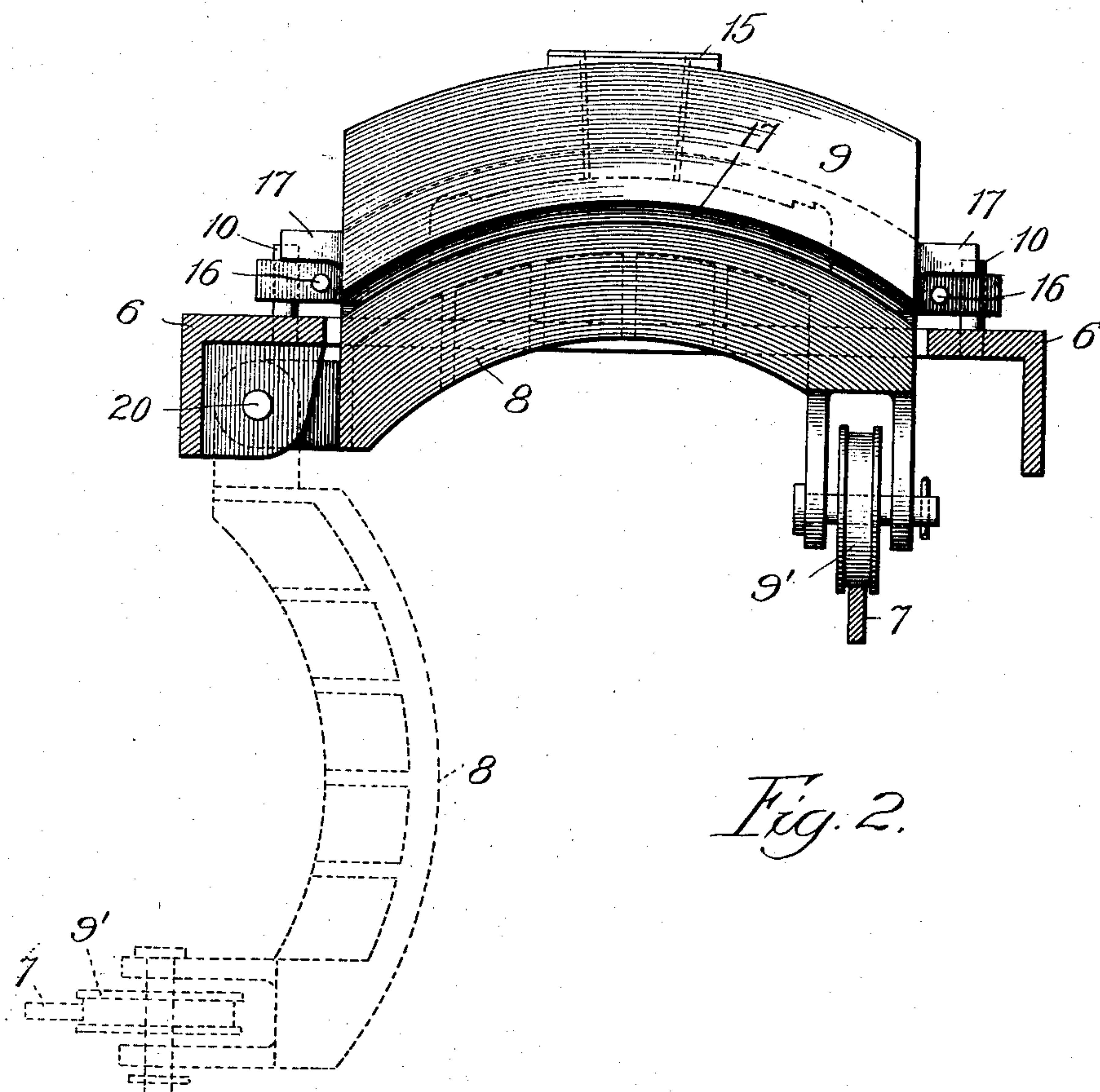
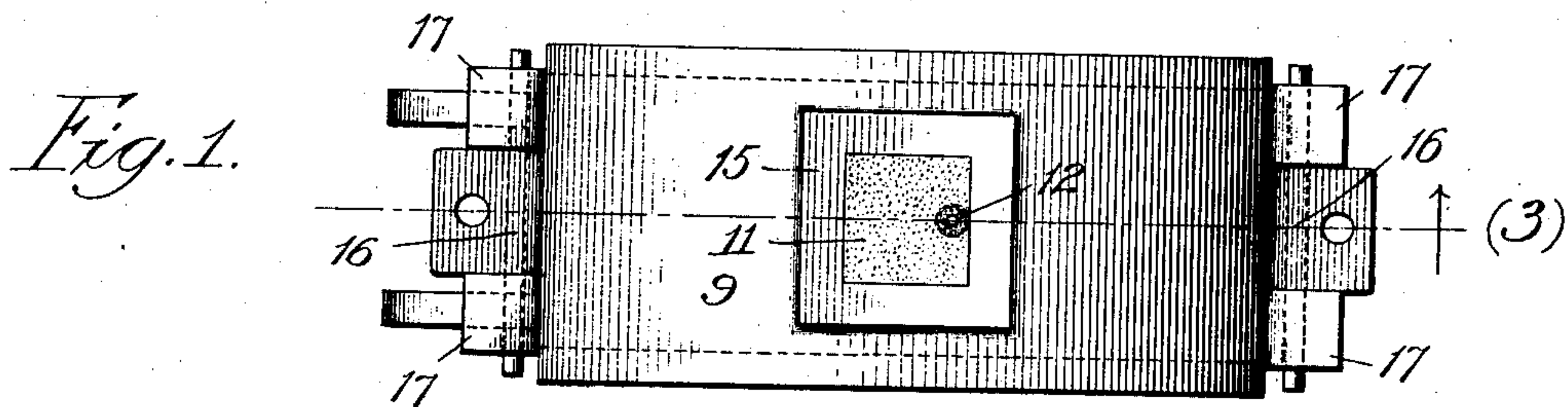


Fig. 2.

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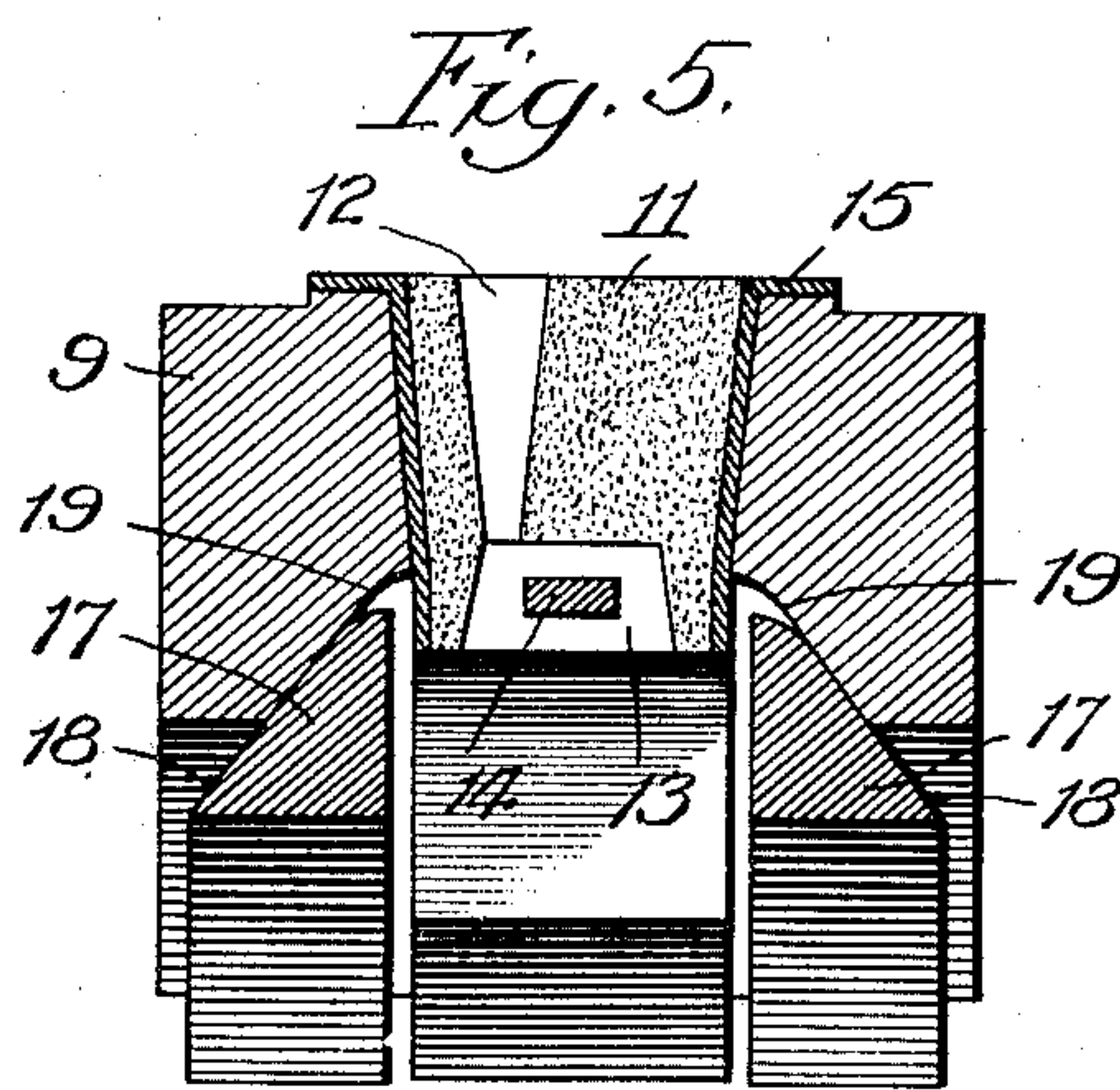
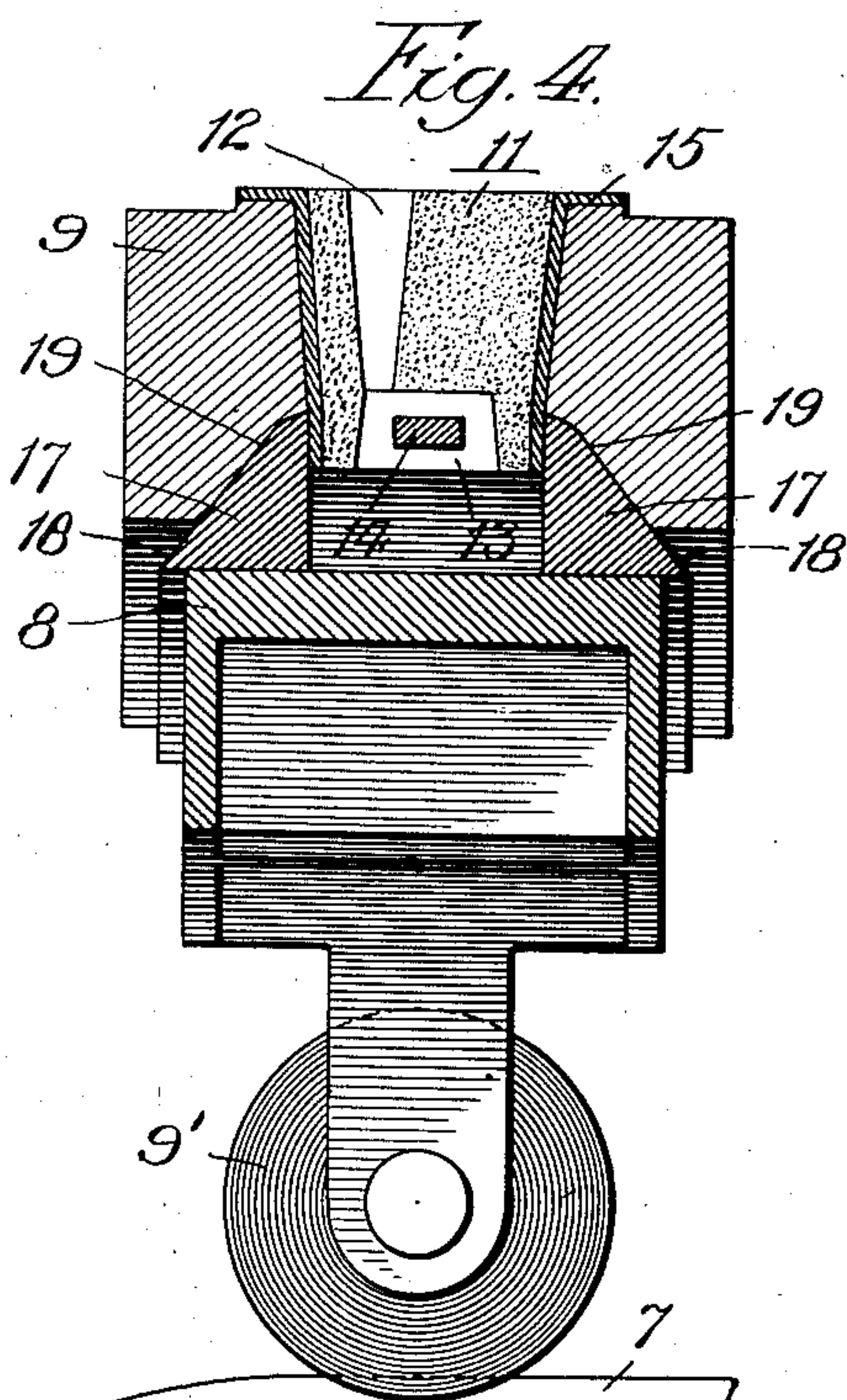
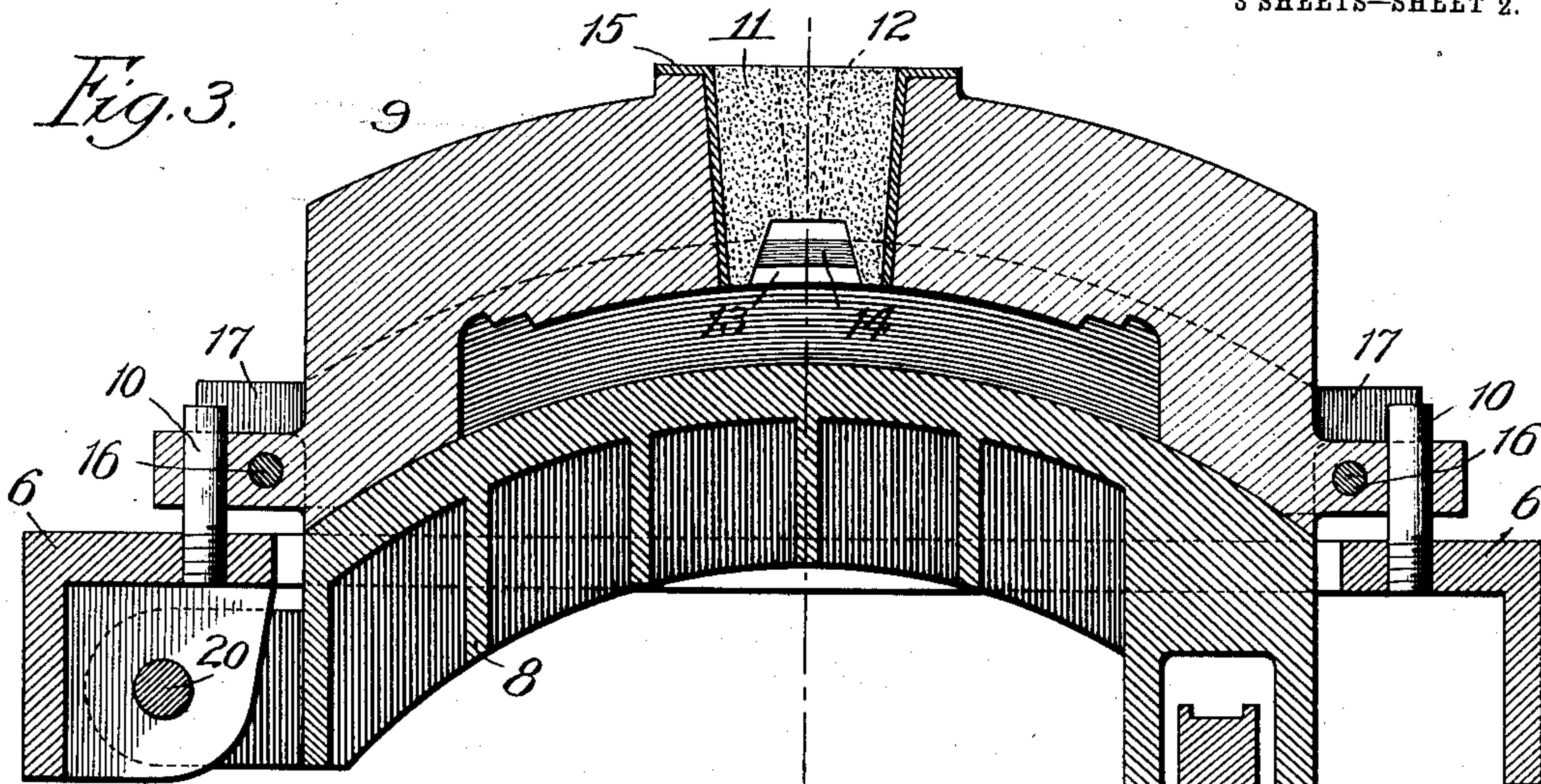
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3 SHEETS—SHEET 3.

Fig. 6.

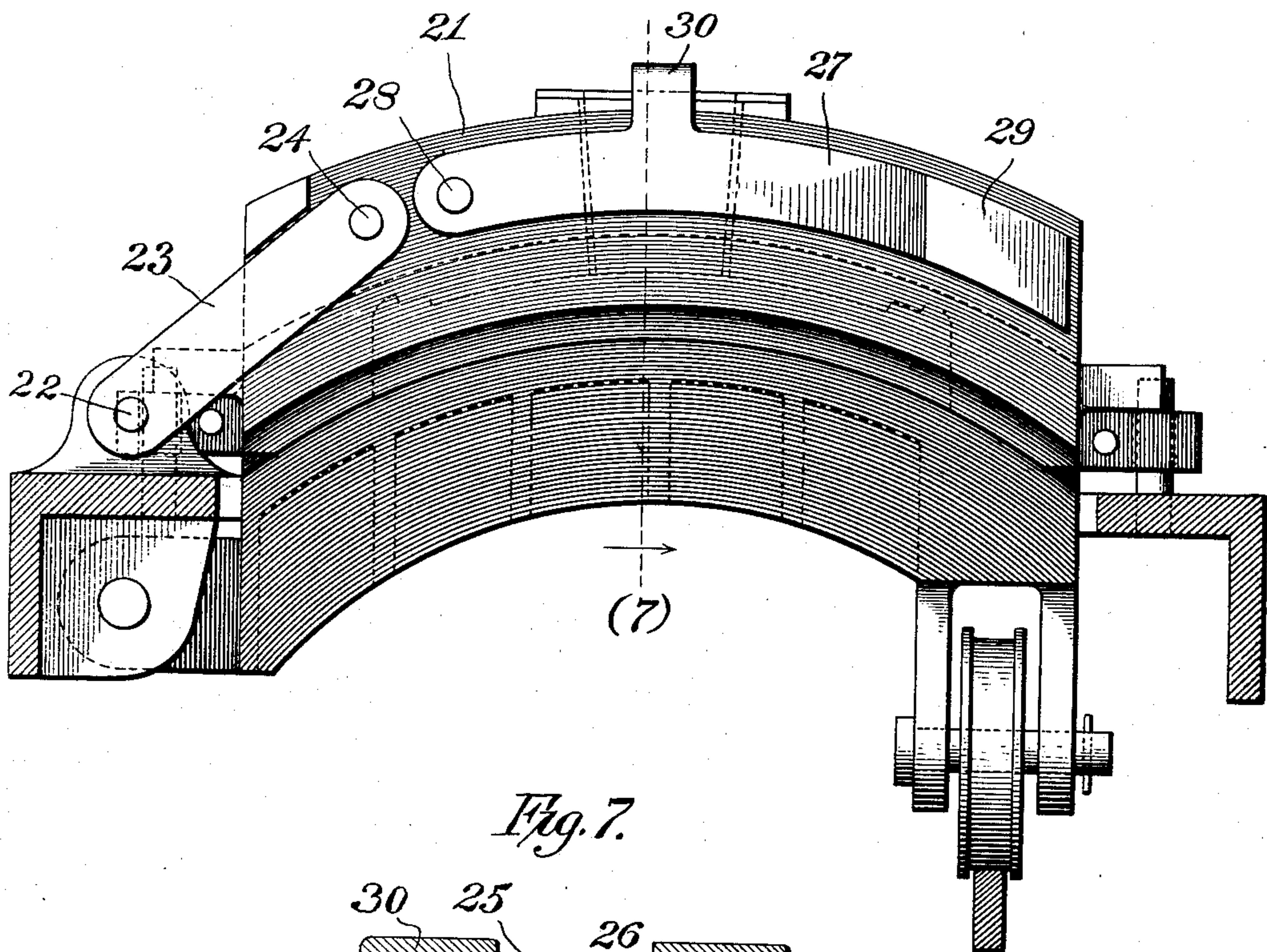
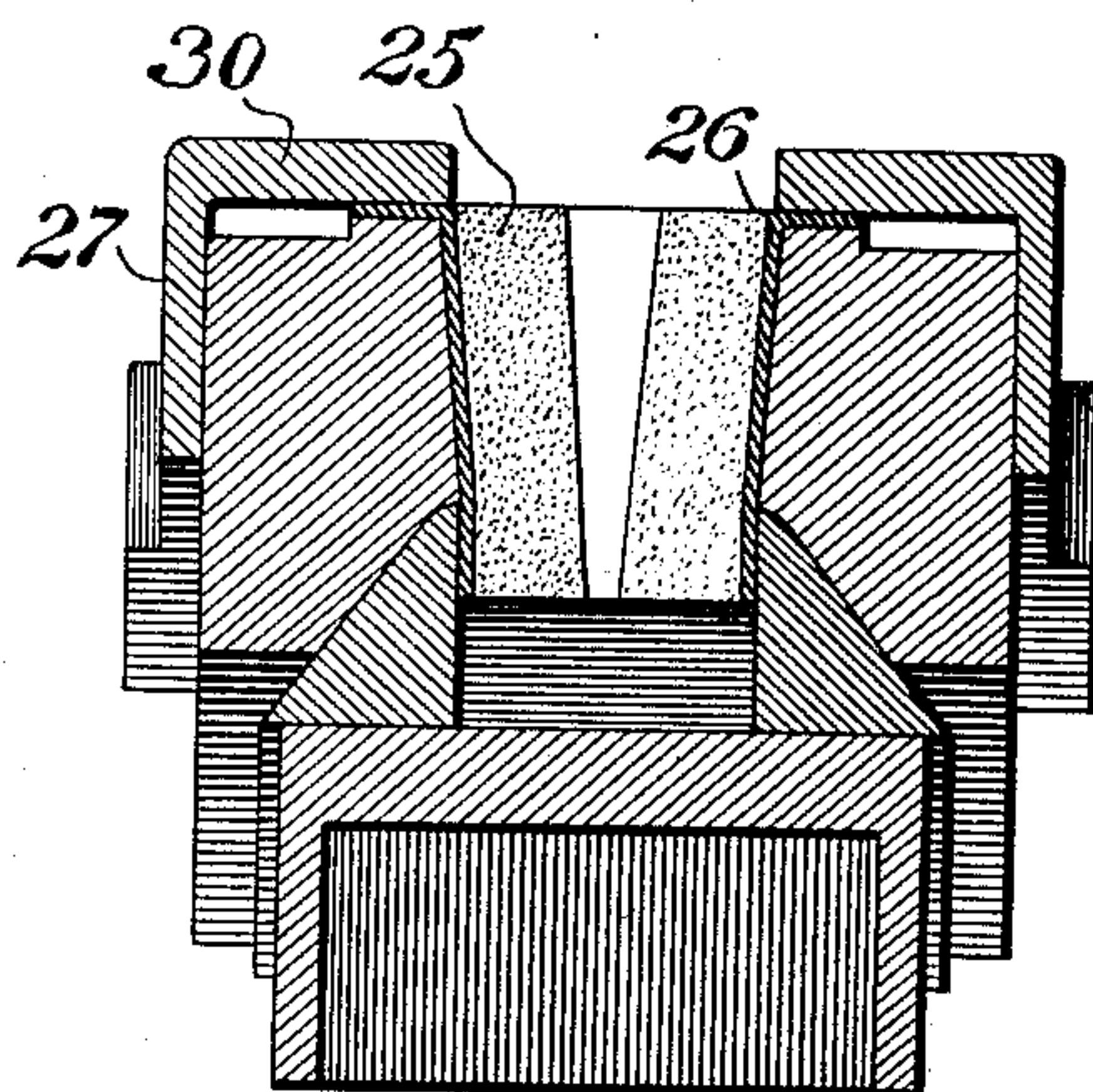


Fig. 7.



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UNITED STATES PATENT OFFICE.

FRANK T. DICKINSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO AMERICAN BRAKE SHOE & FOUNDRY COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

MOLD.

No. 850,629.

Specification of Letters Patent.

Patented April 16, 1907.

Application filed December 5, 1905. Serial No. 290,341.

To all whom it may concern:

Be it known that I, FRANK T. DICKINSON, a citizen of the United States, residing at Chicago, in the State of Illinois, have invented certain new and useful Improvements in Molds, of which the following is a specification.

The object of the invention is to provide a mold for handling small castings in which the placing of the parts of the mold is accomplished automatically, and the release of such parts and the displacement of the casting is also automatic. More particularly the invention contemplates the placing and displacing of the parts of the mold by means of a bodily relative movement of the mold and a cam track. The invention further resides in the improved combined sand and metallic mold, and in the particular means for accomplishing the result which is set forth in the claims and illustrated in the accompanying drawings, wherein—

Figure 1 is a top plan view;

Figure 2 is a side elevation showing a part of the supporting frame and the cam track in section and also showing in dotted lines the position of the lower part of the mold when in position to release the casting;

Figure 3 is a cross section on the line (3) of Figure 1;

Figure 4 is a cross section on the line (4) of Figure 3;

Figure 5 is a similar cross section showing the upper mold member and the cheek plates with the lower mold member removed to release the casting;

Figure 6 is a side view of a modified form of my invention, and

Figure 7 is a transverse section on the line (7) of Figure 6.

The object illustrated as cast, is a brake shoe, and this is what the mold is primarily intended to produce, but it is apparent that the invention may be applied to the production of many other articles and is not limited to brake shoes. The mold is of metal and the construction consists in the preferred form of an upper mold member and a swinging lower mold member operated by a cam track over which the mold moves bodily. This arrangement may be reversed, however, and the tracks made to move past the mold. The parts are so arranged that the relative

movement of the track and mold first swings the lower member up into position for pouring and then after the pouring allows the lower member to swing downward allowing the casting to fall. The swinging of the lower member also acts to bring the side or cheek plates, which are slidably mounted on the upper member, into position.

As shown in Figure 2, 6 is the frame-work upon which the parts of the mold are mounted. This frame-work is carried upon a movable carriage which may be of any form desired, and is not shown. 7 is the cam track past which the carriage moves. This track is arranged in such a way that at one part of the movement the swinging lower member of the mold 8 is held as indicated in the full lines in Figure 2, and at another portion of the movement is allowed to swing in the position shown in the dotted lines. This result is accomplished by making the track 7 horizontal for a portion of its length opposite the point of pouring, and at a distance therefrom as indicated in Figure 2, sufficient to keep the mold closed. After such horizontal portion, the track inclines downwardly and also laterally so that as the mold passes over it the lower member may swing to the position shown in dotted lines in Figure 2, after which the track curves up to a horizontal position again. The swinging mold member is provided with a roller 9 for bearing against the track. The upper portion of the mold 9 is held upon the carriage removably, by virtue of a sliding engagement with the pins 10. This part of the mold carries the principal part of the impression for the casting and has at its central part the pouring plug 11, provided with the opening 12 and the recess 13 with the cross core 14 for forming the perforated attaching means on the brake shoe. The pouring plug is of green sand carried in a removable casing 15, so that when the casting has dropped from the mold, pulling out the core 14 and destroying the plug, a new plug may be easily provided by removing the casing 15 and inserting another casing with the core plug complete therein. The use of a green sand plug or gate is also accompanied with other advantages. Ordinarily when an entirely metallic mold is used there is a tendency to clog up the gate-way, or else burn it out, thereby injuring the product. The use

of a green sand gate-way obviates these difficulties, and there is no clogging or burning out. It will also be noted that the use of the sand plug is of particular utility in the production of brake shoes, as it is desirable to obtain a body with a hardened surface which has a lug of softer and more tenacious structure, and the use of the sand plug produces this result, as the sand prevents a sudden cooling and consequent hardening of and reduction of tensile strength of the plug while the metallic body of the mold secures the hardened surface in the main portion of the shoe. The member 9 also carries the cross pins 16 on the end of which the cheek plates 17 are slidably mounted for lateral movement. As shown in Figures 4 and 5, these cheek plates are of triangular cross section having flat lower sides adapted to fit the top of the lower mold and follow its curved contour. They are provided on their upper surfaces with cam faces 18 which are adapted to contact with the cam faces 19 on the upper part of the mold 9, so that when the lower swinging mold member 8 is brought into position it will force the cheek plates laterally into proper position. The parts 17 rest upon the pins 16 when the swinging mold member 8 is down, but when such member is raised the parts 17 are raised off of the pins 16 as shown in Figure 2. As shown in Figure 4, the cheek plates are in position for pouring, while in Figure 5 they are in the release position occupied after the swinging member of the mold has been withdrawn. The swinging member 8 is hinged to the carriage at 20 and is adapted to overlap the casting and forms a support for the cheek plates 17, as shown in Figure 4. It is provided at its free ends with a roller 9', which contacts with the track and controls the movement of the swinging member.

Figures 6 and 7 illustrate a modification of my device in which instead of having the fixed upper section 9 I provide the movable section 21 pivotally secured to the frame at 22 by means of the link 23, which link is pivoted at 24. This permits the upper section to be turned upside down for examination and repair. A further modification in this form of the device resides in the means for holding the sand plug with its casing 26 down, thereby resisting the buoyant force of the fluid metal to lift the plug out of its proper place after pouring. This device may be also applied to my other form of mold, and consists of side arms 27 pivoted at 28 and provided with a part 30 which projects over the top of the mold and engages the plug and a projecting portion 29 which acts as a weight to hold the arms down on top of the plug as shown in Figure 7.

The operation of the device is as follows: Starting with the mold in open position, as shown in dotted lines in Figure 2, the carriage is moved along the track 7 which gradu-

ally changes from the position shown in dotted lines to that shown in full lines. During this movement the member 8 contacts with the cheek plates and cams them into position. In the latter position the mold is closed and the casting is poured. After sufficient cooling the carriage moves over a slanting portion of the track which is adapted to allow the mold to open to the position shown in Figure 2; thus allowing the cheek plates 17, which are held tightly in position by the member 8, to loosen up and release the casting which falls into a proper receptacle. The operation is then repeated.

Having thus described my invention and illustrated its use, what I claim as new, and desire to secure by Letters Patent, is the following:

1. In combination in a casting machine, a cam and a mold movable relative thereto, and comprising an upper molding member and another co-operating member movable downward to substantially a vertical position to permit of the discharge of the casting by its own weight and having means to co-operate continuously with the cam whereby the movable section may be operated.
2. In combination in a mold, an upper member comprising one side of the mold, a section movable relative thereto comprising the opposite side of the mold and opposing cheek plates movably mounted and adapted to be moved into position by the movement of the movable member.
3. In combination in a mold, an upper member comprising one side of the mold, a member movable relative thereto comprising the opposite side of the mold, and opposing cheek plates movably mounted and having cam surfaces adapted to co-act with the upper mold, whereby the side pieces are moved into proper position as the movable section is made to approach the upper section.
4. In combination in a mold, a section having a cam surface adjacent its face, a member movable relative thereto, comprising the other side of the mold and a cheek plate movably mounted upon one of the members and having a cam surface to co-act with the cam surface of the first section, all so arranged that a relative movement of the first two sections operates to move the cheek plate in its position.
5. In combination in a casting machine, a relatively movable cam track and mold comprising an upper mold member having a cam surface adjacent its face, a section movable relative thereto and co-acting with the cam track, constituting the lower side of the mold and a cheek piece provided with a cam surface to co-act with the cam surface on the upper mold member and movably mounted, all so arranged that a movement of the mold bodily, relative to the cam track, raises the

lower mold member and causes the cheek plate to advance in position.

6. In combination in a casting machine, a relatively movable cam track and mold comprising an upper mold section having a cam surface adjacent its face, a lower mold member hinged at the end and co-acting with the cam-track, and a cheek plate provided with a cam surface to co-act with the cam surface of the upper mold member and movably mounted all so arranged that a movement of the mold bodily successively raises the hinged section camming the cheek plate into position and then release such hinged member so that it may swing open.

7. In combination in a casting machine, a relatively movable cam track and mold comprising an upper mold member having cam surfaces adjacent its face, a lower mold member hinged at the end and co-acting with the cam track, and opposing cheek plates provided with cam surfaces to co-act with the cam surfaces on the upper mold member and slidably mounted, all so arranged that the movement of the mold relative to the cam track successively raises the hinged mold member thereby camming the cheek plates into position and then releases such hinged mold member so that it swings open.

8. In combination, a relatively movable cam rail and a mold comprising an upper mold member constituting the top and ends of the mold and having cam surfaces adjacent the face, a lower mold member extending out past the mold surface of the upper mold member and constituting the bottom of the mold, and being provided with a part to co-act with the cam track, and cheek plates with cam surfaces adapted to co-act with the cam surfaces on the upper mold member, slidably mounted and adapted to contact with the upper surface of the hinged mold member, all so arranged that a movement of the track relative to the mold will successively raise the hinged member camming the cheek plates into position and release such hinged member allowing it to swing open.

9. In combination, a mold comprising a metal body portion provided at its top with a pouring opening, a removable casing shaped to fit such opening and to support a green sand gateway plug and extending through the body portion, and a green sand gateway plug therefor.

10. In combination, a mold comprising a metal body portion provided in its top with a tapering opening, a removable externally and internally tapered casing adapted to fit and line such opening, and a green sand gateway plug fitting the casing and entirely supported thereby.

11. In combination, a mold comprising a metal body portion provided in its top with a pouring opening, a removable casing adapted to fit and line such opening, and tapering internally, and a green sand gateway plug fitting the casing and entirely supported thereby.

12. In a casting machine, in combination, a metal mold comprising an upper member and a lower movable member for releasing the casting, the upper member being provided with a pouring plug of green sand having a core fixed therein.

13. In a brake shoe casting machine in combination, a metal mold comprising an upper member and a lower movable member for releasing the casting, the upper member having a removable casing provided with a pouring plug of green sand and a baked core fixed in the sand.

14. In combination in a mold, a frame, a top section slidably engaging the frame, an arm pivotally connecting the top section and the frame, a swinging bottom section, and means for operating such bottom section.

In testimony whereof I have hereunto signed my name in the presence of the two subscribed witnesses.

FRANK T. DICKINSON.

Witnesses:

PAUL CARPENTER,
ALBERT G. MILLER.