

J. D. BROWN.  
MOLD AND METHOD OF MAKING THE SAME.  
APPLICATION FILED SEPT. 17, 1910.

984,346.

Patented Feb. 14, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

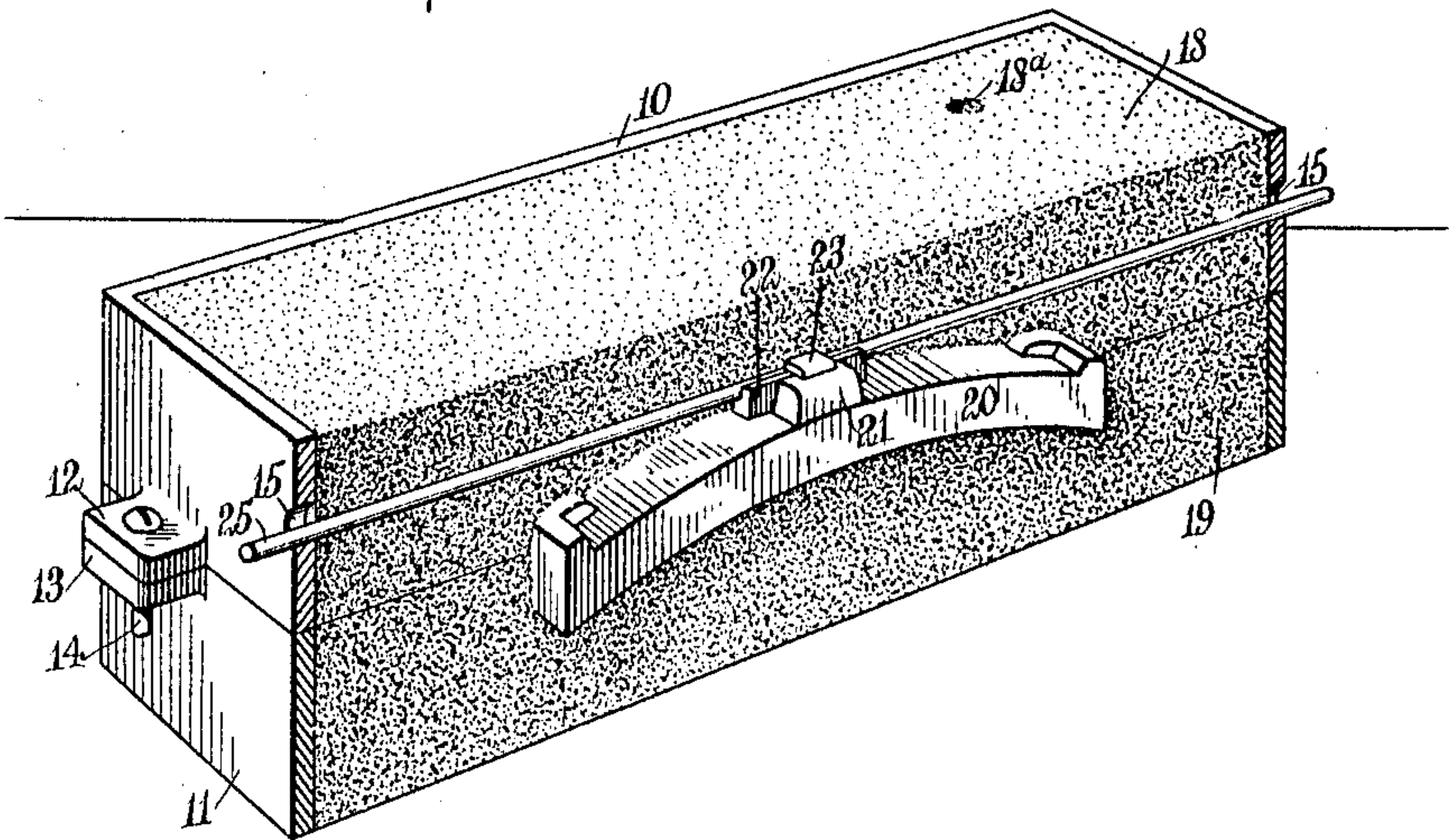


Fig. 2.

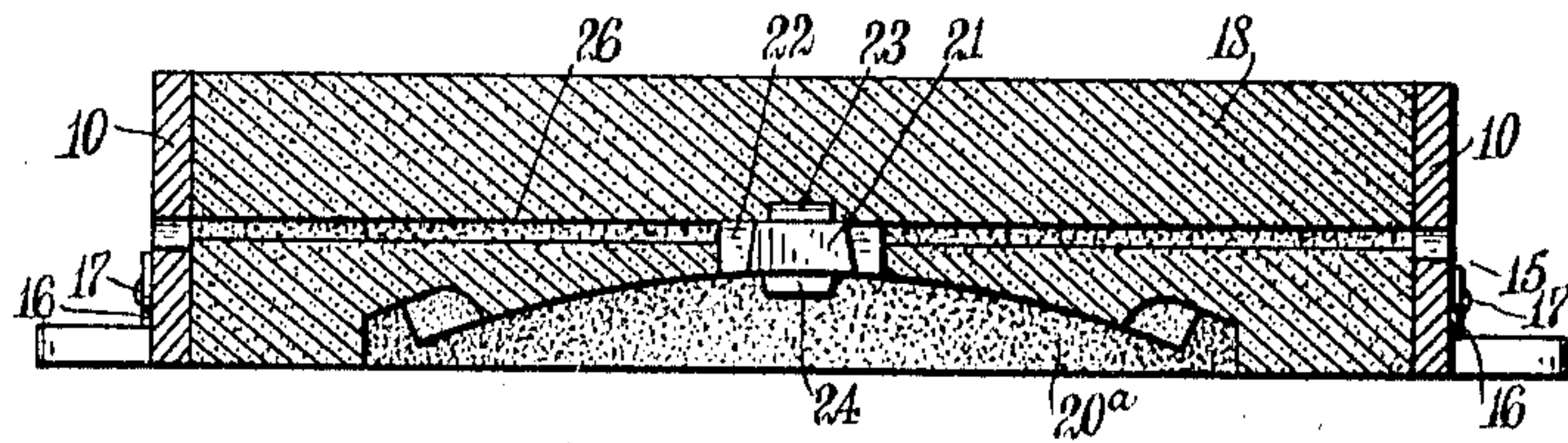


Fig. 3.

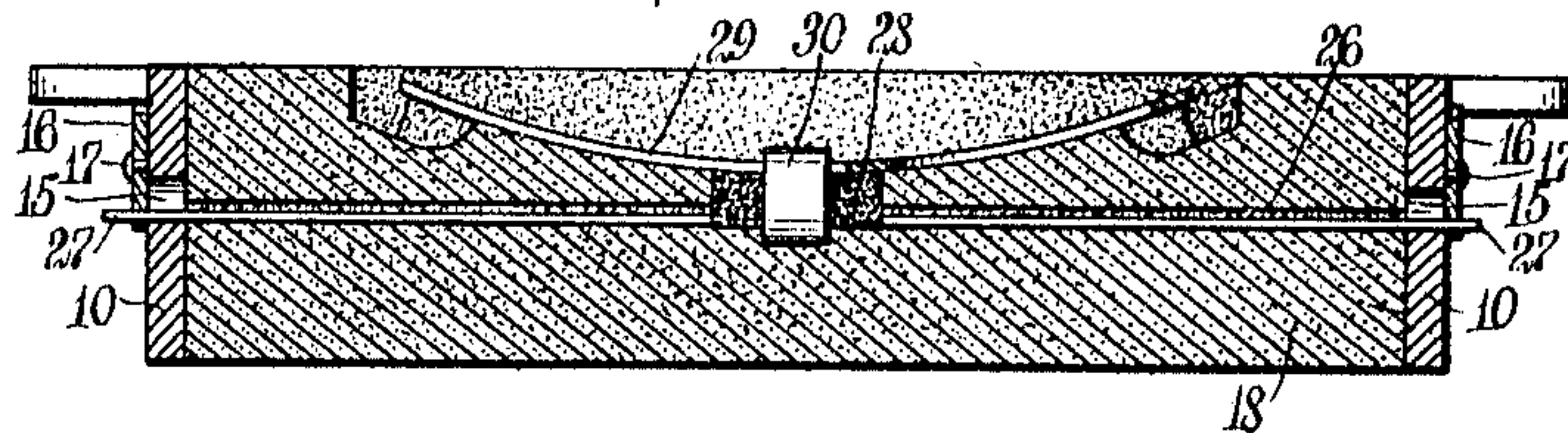
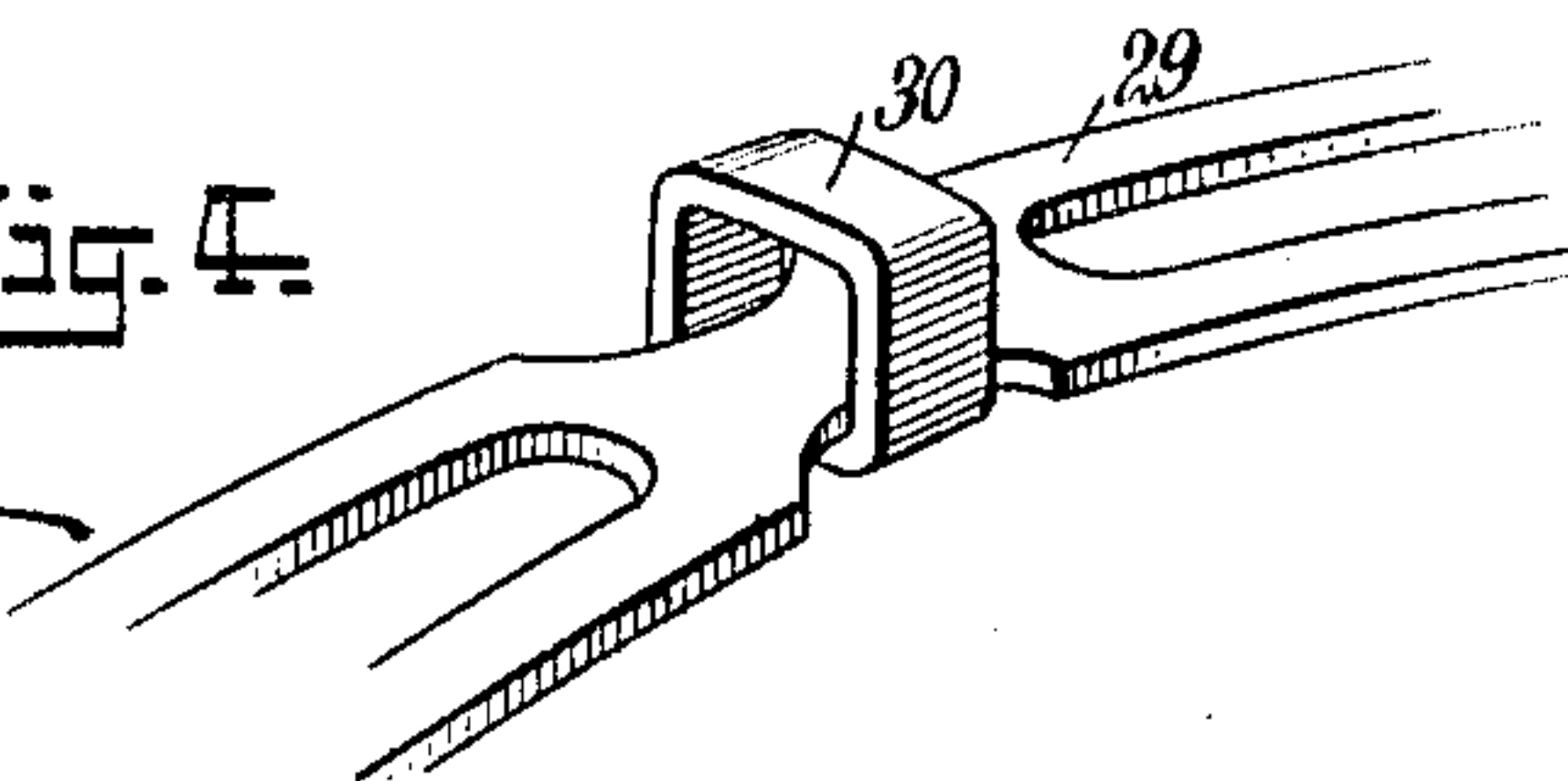


Fig. 4.

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2 SHEETS—SHEET 2.

Fig. 5.

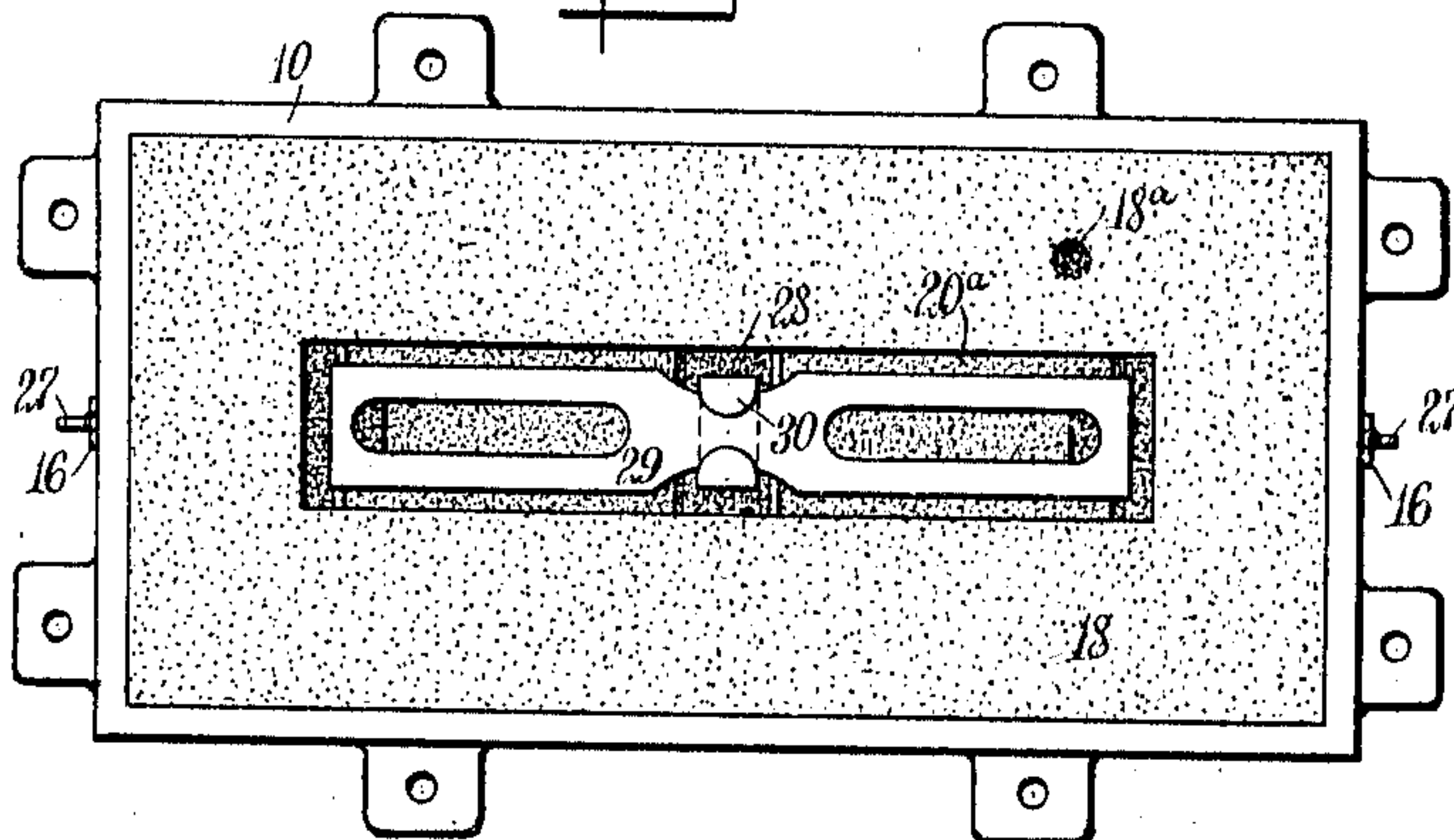


Fig. 6.

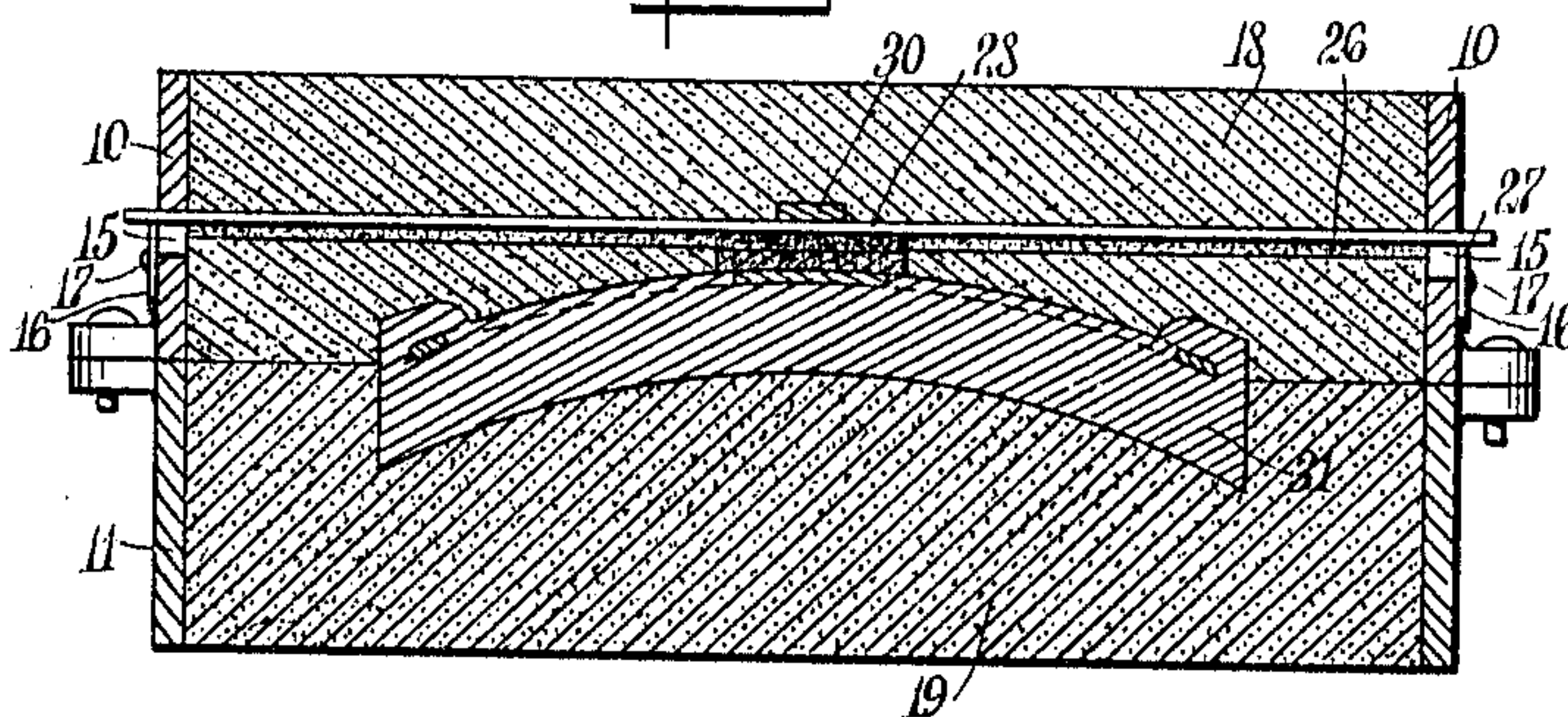


Fig. 7.

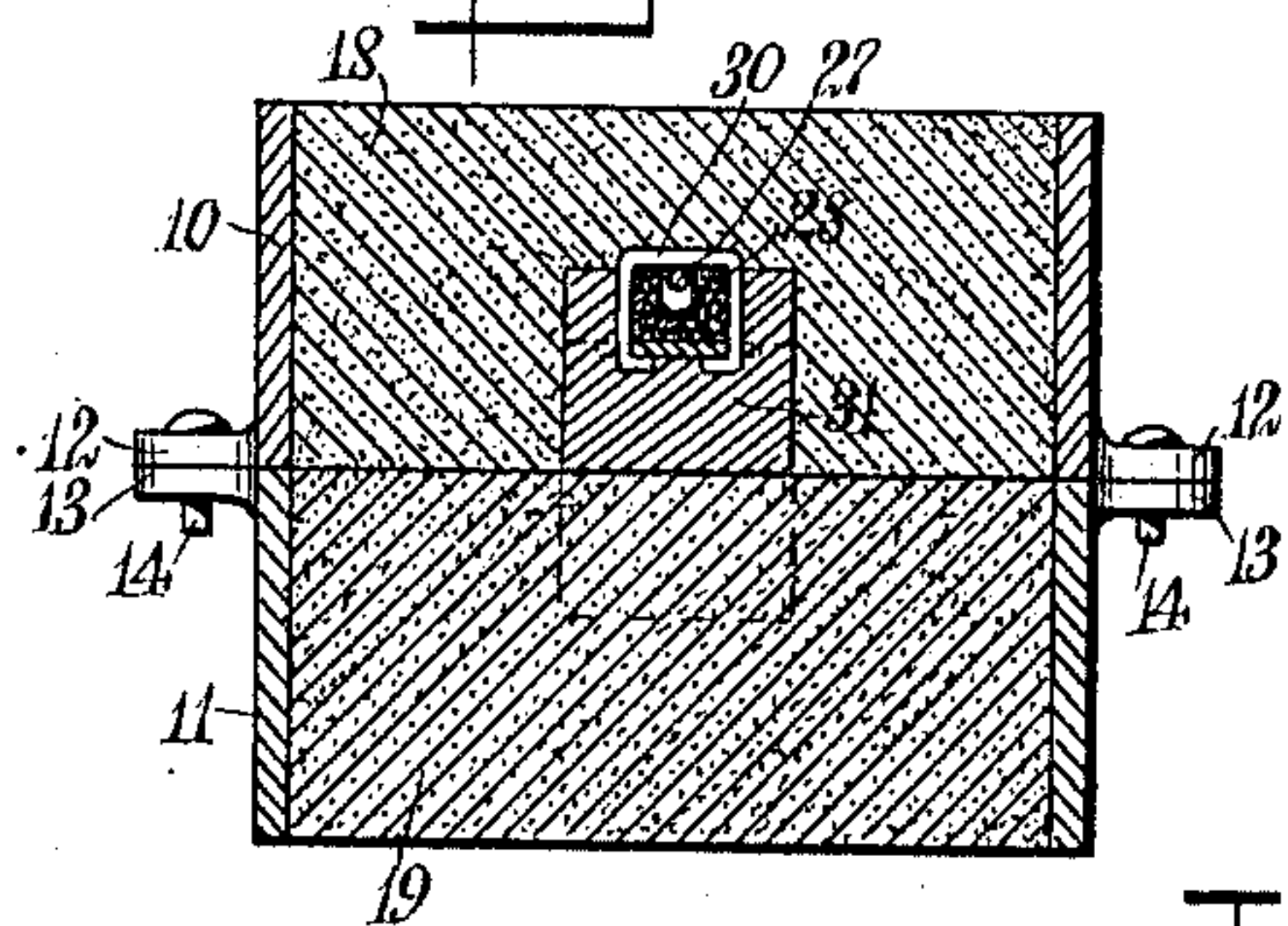


Fig. 8.

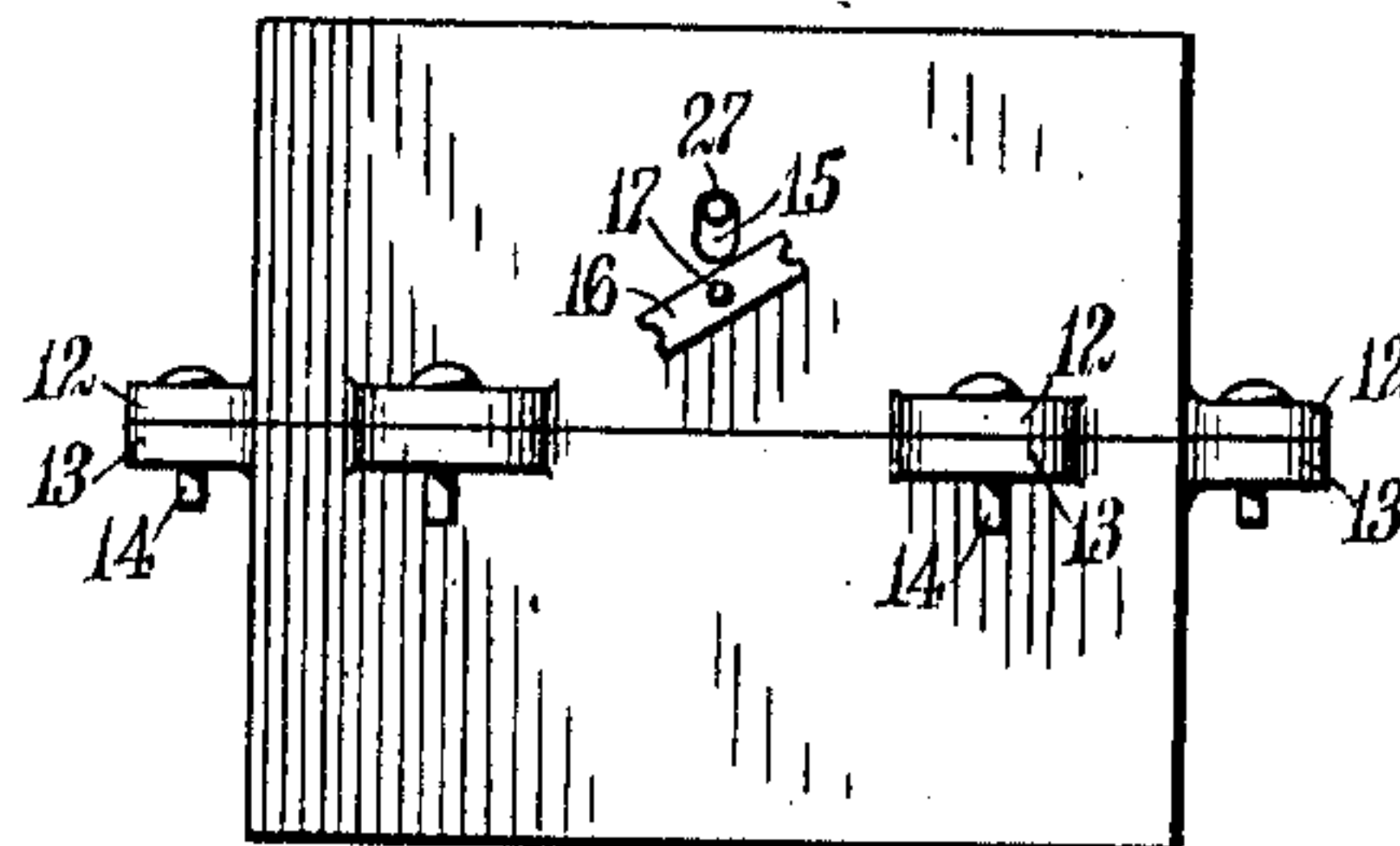
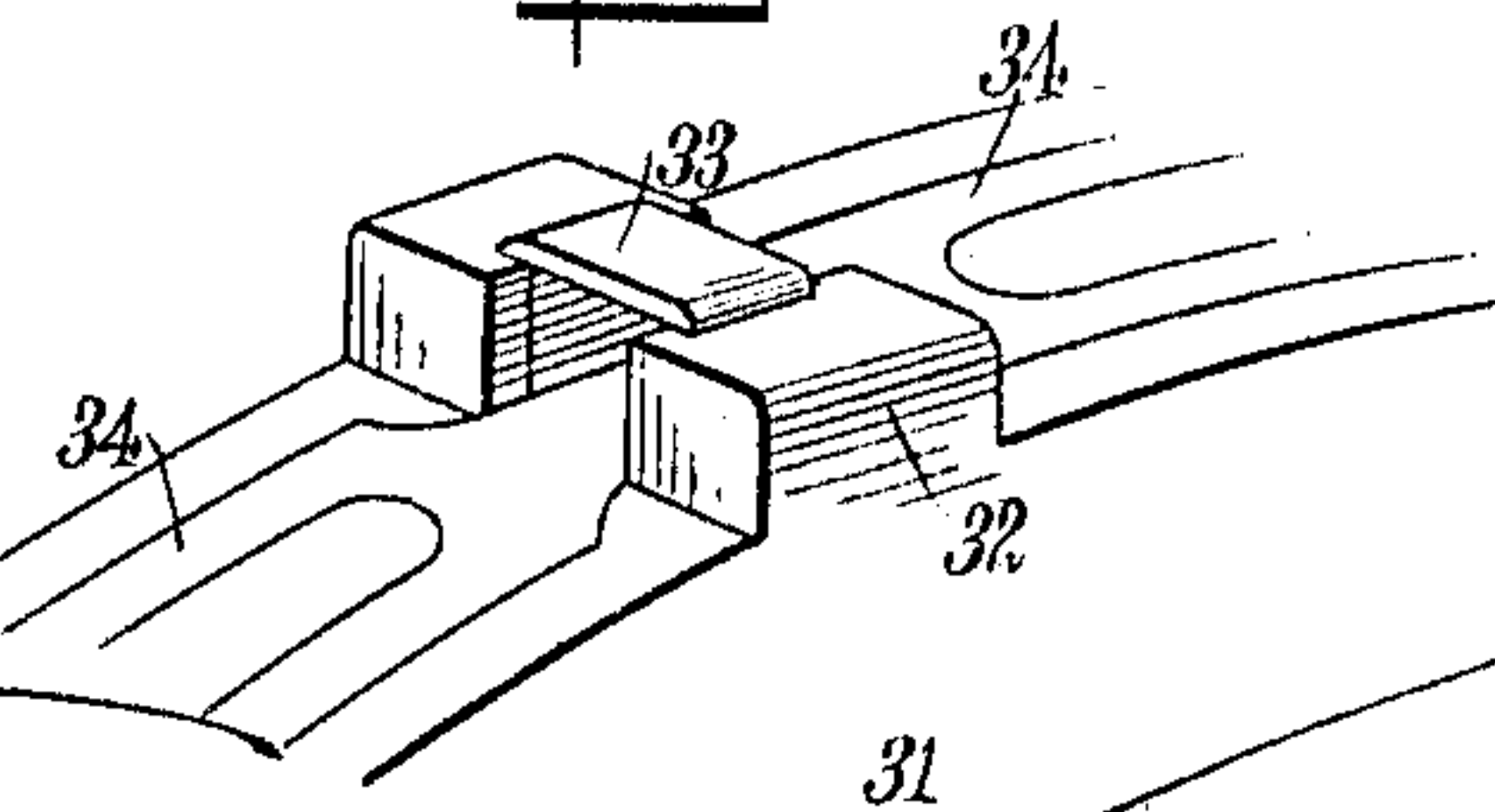


Fig. 9.



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# UNITED STATES PATENT OFFICE.

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MOLD AND METHOD OF MAKING THE SAME.

984,346.

Specification of Letters Patent.

Patented Feb. 14, 1911.

Application filed September 17, 1910. Serial No. 582,494.

*To all whom it may concern:*

Be it known that I, JOHN D. BROWN, a citizen of the United States, and a resident of Suffern, in the county of Rockland and State of New York, have invented a new and Improved Mold and Method of Making the Same, of which the following is a full, clear, and exact description.

My invention relates to molds and to a method of making the same, my more particular purpose being to give the mold such form as to facilitate its use in making metallic articles provided with preëxisting metallic parts embedded in said articles and merging therewith.

More particularly stated I seek to provide a mold especially adapted for casting brake shoes provided with metal backs previously prepared for the purpose and, by the molding operation, merged into and made integral with the shoes.

My invention further relates to special provision for holding, within the mold, the metallic back or other member to be thus united with, and merged into, the casting.

Reference is to be had to the accompanying drawing forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a fragmentary view, showing the mold partly in section and partly in perspective, as the mold appears when it contains the pattern with the molding sand packed around the same; Fig. 2 is a section through the upper half of the mold as it appears when lifted off the pattern and lower half of the mold; Fig. 3 is a section showing the upper half of the mold as inverted and the brake back or other preëxisting part temporarily supported within it, this half being now ready to be placed in its normal position upon the lower half of the mold; Fig. 4 is a perspective showing the back and its lug as they appear before the molding operation; Fig. 5 is a plan view of the structure shown in Fig. 3; Fig. 6 is a section through the mold and casting complete; Fig. 7 is a substantially central vertical cross section through the parts shown in Fig. 6; Fig. 8 is an end elevation of the device shown in Fig. 6; and Fig. 9 is an enlarged fragmentary perspective of the complete shoe.

At 10, 11 are a pair of semi-flasks, consti-

tuting together the flask of the mold. These semi-flasks are provided respectively with lugs 12, 13, the latter being held in alinement by aid of dowel pins 14 in the usual or any desired manner. The semi-flask 10 is provided at its ends with slots 15 and is further provided adjacent to these slots with buttons 16, the latter being mounted upon pins 17 and adapted to be turned by hand.

At 18, 19 are two masses of sand occupying respectively the semi-flasks 10, 11. The mass of sand 18 is provided with a mold hole 18<sup>a</sup> through which molten metal is to be poured.

At 20 is a wooden pattern, the form of which, however, does not represent precisely the form of the complete shoe, as will be understood from the further description given below. The pattern 20 is provided with an impression block 21, this impression block being separate from the pattern. The impression block is provided with various portions 22, 23 of arbitrary form, the purpose of these portions being to affect the conformity of the volume of the sand 18 in immediate proximity with them. The impression block 21 is provided with a lug 24 which fits detachably into a depression, of corresponding shape, upon the pattern 20, so that the impression block 21 may be mounted upon a pattern 20, as indicated in Fig. 1.

At 25 is a supporting rod which fits neatly within the slots 15 and may be inserted therein by passing it in the general direction of its length through these slots. This rod may be withdrawn from the semi-flask 10. For this purpose the operator merely grasps one end of the rod and draws it lengthwise outward, much after the manner of withdrawing a sword from its sheath.

At 27 is a rod of a length equal to that of the rod 25 but having a smaller diameter. For convenience I refer to the rod 25 as the "large rod" and the rod 27 as the "small rod".

At 28 is a sand core of sand mixed with a binder and previously formed and baked. This sand core has a hole extending through it in the direction of its length, and through which the rod 27 may be loosely threaded, as will be understood from Fig. 3.

At 29 is a brake back which may be of steel, iron or other ferruginous metal, which should preferably be hard and tough. This



brake back is prepared in any desired manner before the beginning of the molding operation herein described. Usually a quantity of these brake backs 29 are kept on hand  
5 ready for purposes of molding.

At 30 is a link which encircles the middle portion of the back 29 and is loose relatively to the back until fastened by casting, as hereinafter described. The link 30 is used  
10 for the purpose of forming the lug of the completed brake shoe. This completed brake shoe is shown at 31 and carries two elevated portions 32 secured together by a bridging portion 33. This shoe has also a portion 34  
15 made directly of the material of the back 29 and integral with the body of the shoe; all of these parts being, however, in the completed brake back, now rendered integral by virtue of the act of casting, as shown in  
20 Fig. 9.

In order to carry out my method, I proceed as follows: I first invert the semi-flask 11 upon a match board having a concave surface mating the convex surface of the pattern 20. I next place the pattern 20 in the  
25 semi-flask and upon the match board, the convex surface of the pattern engaging the mating concave surface of the match board. I next pack the sand 19 into this semi-flask and around the pattern so as to leave the  
30 convex surface of the pattern in engagement with and protected by the corresponding surface of the match board. The semi-flask 11, together with the sand it contains, and  
35 the match board are next turned until the semi-flask 11 is in its normal position. The match board is now lifted off the parting line approximating the position of the adjacent upper curved edges of the pattern.  
40 The impression block 21 is next placed upon the pattern; the semi-flask 10, now empty, is placed in position upon the semi-flask 11. The rod 25 is now threaded through the slots 15. The semi-flask 10 is now filled by pouring  
45 into it the volume of sand 18, this sand being packed entirely around the rod 25 and closely over the top of the pattern 20, and also over and around the impression block 21. In doing this care should be exercised  
50 that the sand is forced tightly among the various parts 22, 23 of the impression block. The mold hole 18<sup>a</sup> is next formed. This being done, the dowel pins 14 are removed, the rod 25 is pulled out, and the semi-flask 10  
55 is lifted bodily upward. The pattern 20 stays in the volume of sand 19—that is, remains with the lower semi-flask. The impression block 21, however, is lifted bodily upward with the volume of sand 18, and consequently remains with the semi-flask 10, as  
60 will be understood from Fig. 2. The semi-flask 10 being with its contents thus lifted off, is now inverted, as shown in Fig. 3, and rested upon any convenient surface. The  
65 impression block 21 is next carefully re-

moved by hand. The operator next picks up the back 29, carrying the link 30, as shown in Fig. 4, and holding the parts in the position indicated in this figure carefully inserts the sand core 28 through the  
70 link 30. This sand core 28 makes a neat fit and serves to hold the link 30 tolerably rigid relatively to the back 29. This back is now inverted and lowered into the semi-flask 10, and the smaller rod 27 is by hand threaded  
75 carefully through the hole 26, and tightened at its ends by aid of the buttons 16, so that the various parts appear as indicated in Fig. 3. The pattern 20 is now carefully removed by hand from the semi-flask 11. The semi-  
80 flask 10 is next lifted carefully over the semi-flask 11 and lowered into position relatively to the same. The dowel pins 14 are next placed in position so as to bring the semi-flasks into exact registry with each other  
85 and hold them securely. The mold is now completed and ready to receive the molten metal. It will be noted that the back 29 is supported within the mold cavity and is in such position that when surrounded by  
90 molten metal it will simply become embedded flush with the surface of the latter. In other words, when a volume of molten metal is added to the back, the aggregate thickness of the mass thus formed will be  
95 merely the thickness of the mold cavity. In effect the back is not superadded to the molten metal, but rather displaces a portion of the latter so that in the completed article the back will be practically sunken into the  
100 shoe and thus made a part thereof. The mold being in the condition thus described, the molten metal is poured in through the mold hole 18<sup>a</sup> and completely fills the cavity formerly represented by the pattern 20 and  
105 the impression block 21. The heat of the molten metal burns out the binding material within the sand core 28 and causes this core to crumble into loose sand. The molten metal coming into actual contact with the  
110 back 29 and link 30 flows around these parts and partially envelopes them, but is unable to reach the rod 27. The molten metal within the cavity now becoming cool constitutes the finished casting. The buttons 16  
115 are now turned, the rod 27 drawn out, the mold is opened and the casting removed. The casting appearing as indicated in Fig. 9, the part 34 being made of the back 29 is thus of a somewhat tougher metal than the  
120 rest of the casting.

While I show, for convenience and simplicity, only one style of flask, it will be understood that I do not limit myself on that account, as my invention may be employed in connection with any type of flask  
125 and is adapted for both hand and machine molding. Neither do I limit myself to the precise form shown for any particular part or parts.  
130



Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a mold, the combination of a flask, a rod detachably connected therewith and extending therethrough, a sand core to be connected with said rod, and a metallic member provided with a portion for engaging said sand core and with another portion for engaging said rod for the purpose of supporting said metallic member within said flask.

2. In a mold, the combination of a semi-flask provided with slots, a plurality of rods of different diameters for extending through said slots, means carried by said semi-flask for holding said rods rigidly in position one at a time, a sand core, a metallic member to be suspended from one of said rods, and means for preventing the access of molten metal to said rod.

3. The method herein described of preparing a mold for casting metallic articles, which consists in providing a pair of semi-flasks containing material capable of receiving an impression, disposing between said semi-flasks a pattern and an impression block detachably connected with said pattern, supporting said impression block temporarily in relation to one of said semi-flasks so that when the latter is lifted from the other semi-flask said impression block is lifted likewise, leaving the pattern undisturbed, next removing said impression block from the semi-flask with which it is associated, placing a sand core in the impression from which said impression block is thus removed, connecting a prearranged metallic member with said sand core for the purpose of supporting said metallic member, next removing said pattern, and finally placing the two semi-flasks together so as to leave in the material carried thereby a cavity representing the pattern and containing said metallic member.

4. The method herein described of preparing a mold for casting brake shoes, which consists in providing a pair of semi-flasks containing molding sand, forming within said molding sand and between said semi-flask a cavity capable of holding molten metal, extending a large rod through one of said semi-flasks at a point adjacent to said cavity, and supporting within said cavity and by aid of said rod a prearranged metallic back having permanently connected therewith a link and also having temporarily connected therewith a sand core for protecting said rod from excessive heat.

5. The method herein described of pre-

paring a mold for metallic articles, which consists in providing a pair of semi-flasks each containing a volume of molding sand, placing partly within said molding sand a pattern and an impression block detachably connected therewith, said impression block having a bridging portion, extending a large rod through one of said semi-flasks and underneath said bridging portion for the purpose of supporting said impression block relatively to the semi-flask through which said rod is extended, securing said rod rigidly in relation to said last-mentioned semi-flask, removing said last-mentioned semi-flask which carries with it said large rod and said impression block, withdrawing said large rod so as to leave a hole extending entirely through the sand carried by the semi-flask last mentioned, removing said impression block, providing a prearranged metallic back having a link connected with it, extending a sand core through said link, said sand core being provided with an opening, inserting said sand core and a portion of said link into the impression left when said impression block was removed, inserting a small rod through the hole formerly occupied by the large rod, said smaller rod being thus threaded through the opening in the sand core and through said link, removing the pattern, and finally placing the semi-flasks together.

6. The method herein described of preparing a mold for casting articles, which consists in producing a sand core, molding loose material so as to form a cavity partly bounded by said sand core, disposing within said cavity a prearranged metallic part to be anchored as a casting and supporting said prearranged part by aid of said sand core.

7. The method herein described of preparing a mold for casting articles, which consists in producing a non-combustible core, disposing the same within a mass of loose material, molding said loose material so as to form a cavity adjacent to said core, disposing within said cavity a prearranged metallic member having a portion partially encircling said core, and means for supporting said prearranged part of said core.

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

JOHN D. BROWN.

Witnesses:

WALTON HARRISON,  
PHILIP D. ROLLHAUS.