

No. 756,869.

PATENTED APR. 12, 1904.

A. K. MANSFIELD.
VALVE.

APPLICATION FILED JULY 6, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

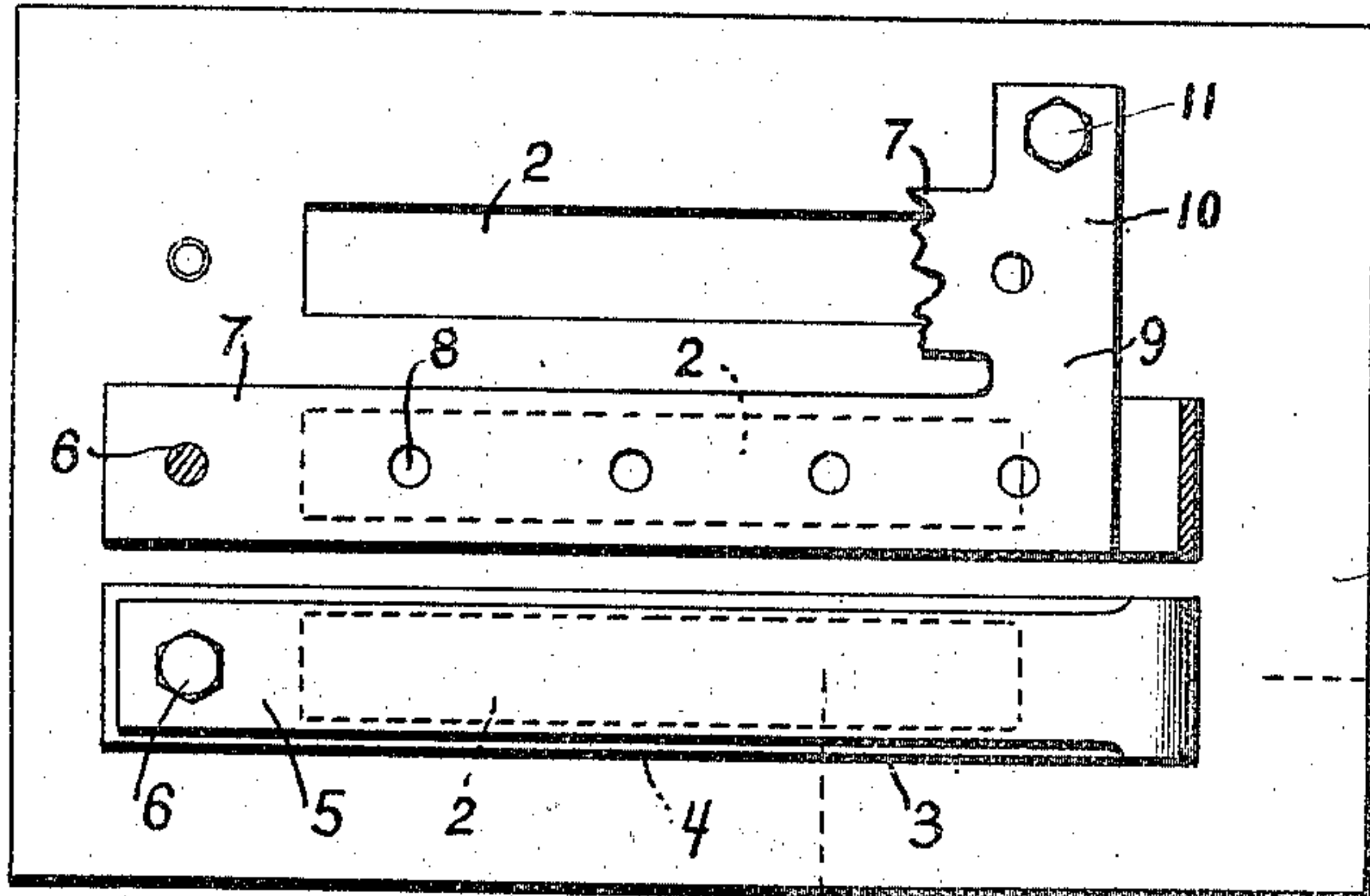


Fig. 1.

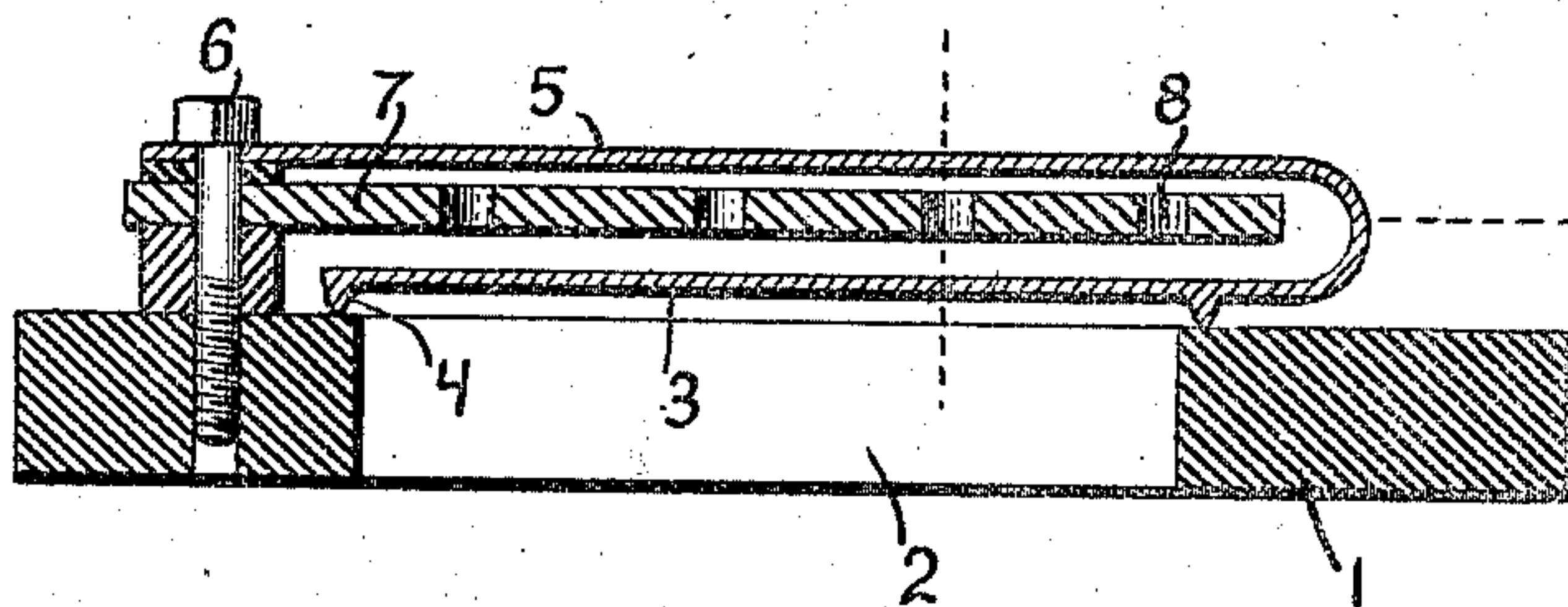


Fig. 2.

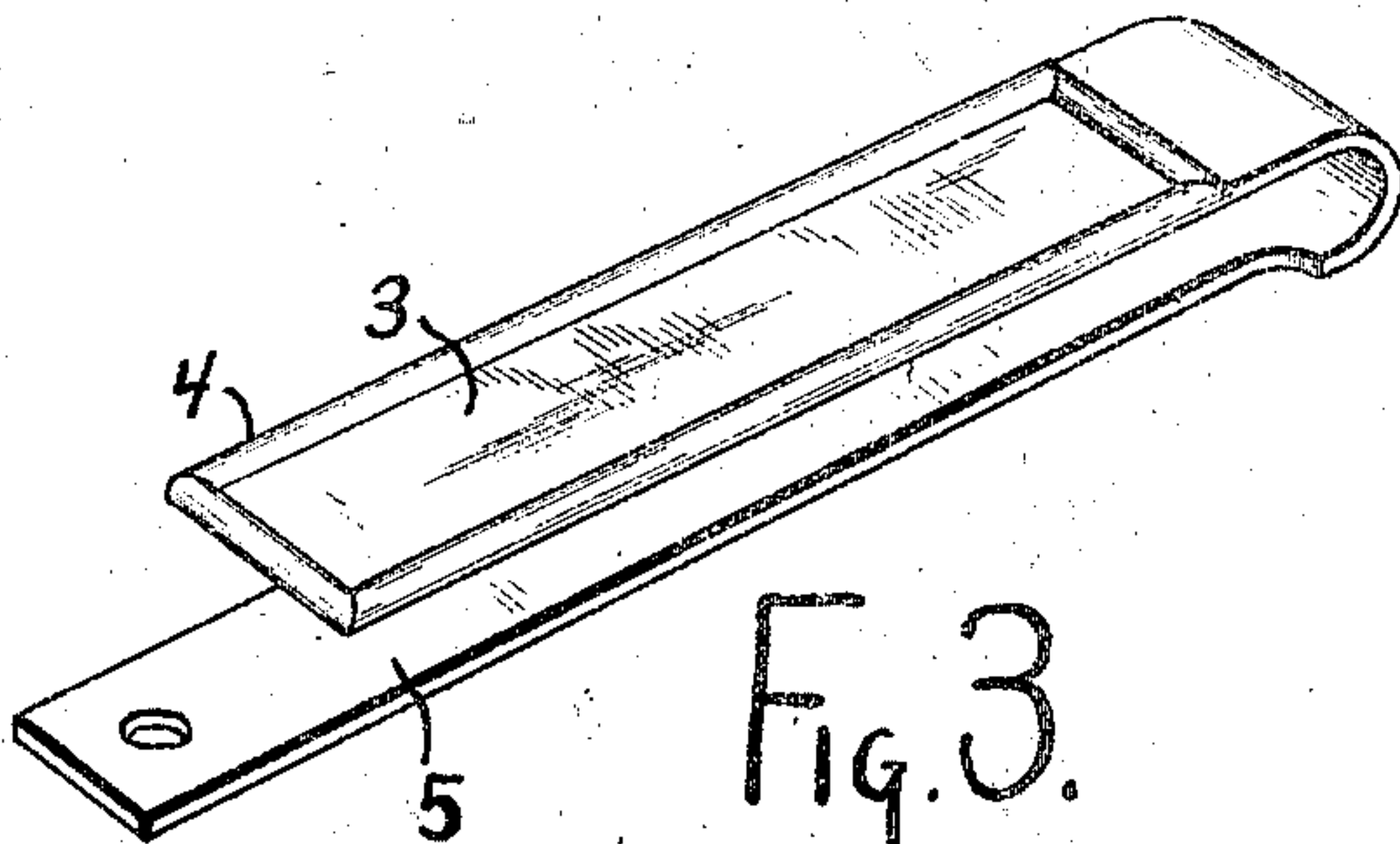


Fig. 3.

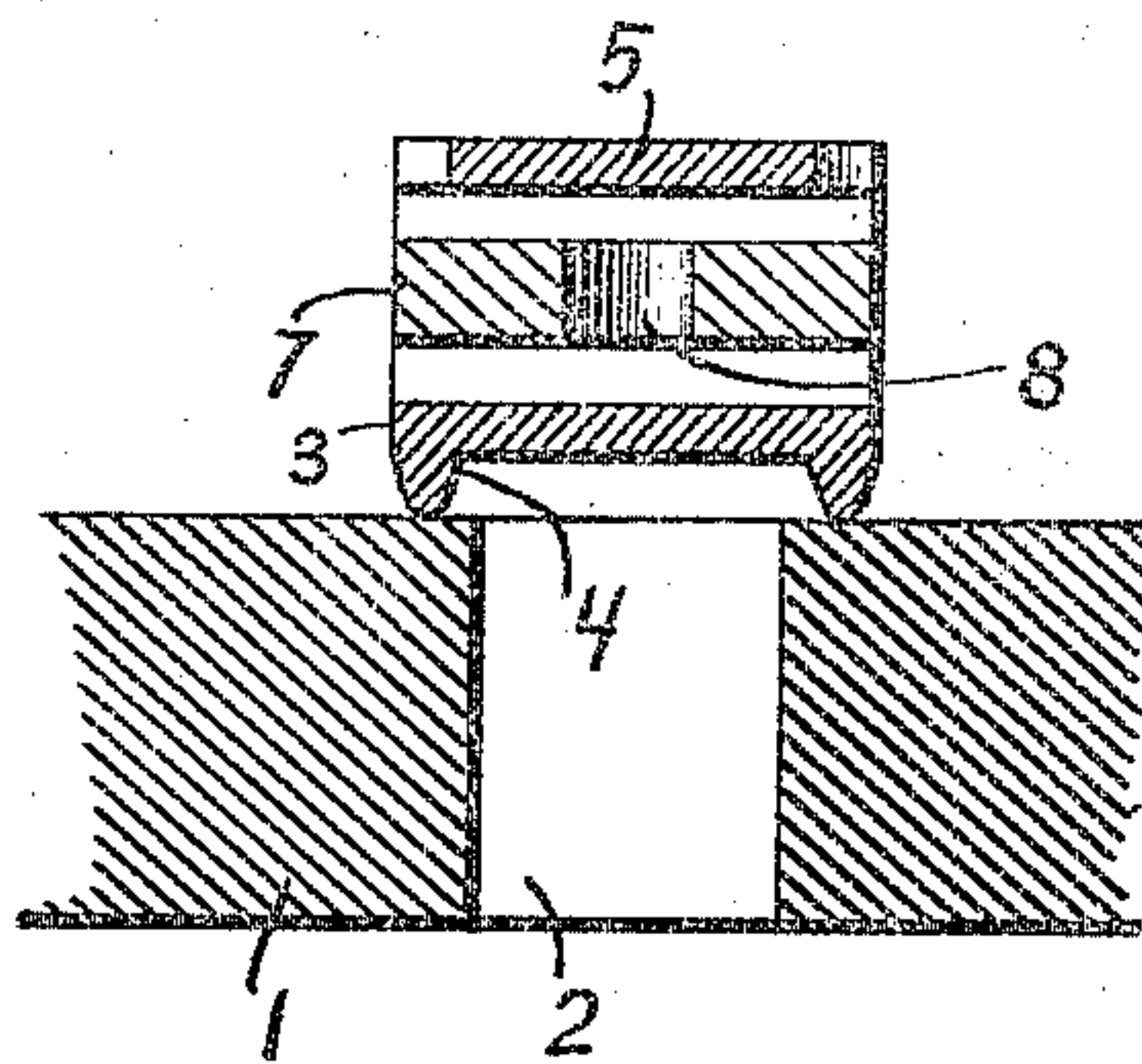


Fig. 4.

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Witnesses:

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Attorney

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2 SHEETS—SHEET 2.

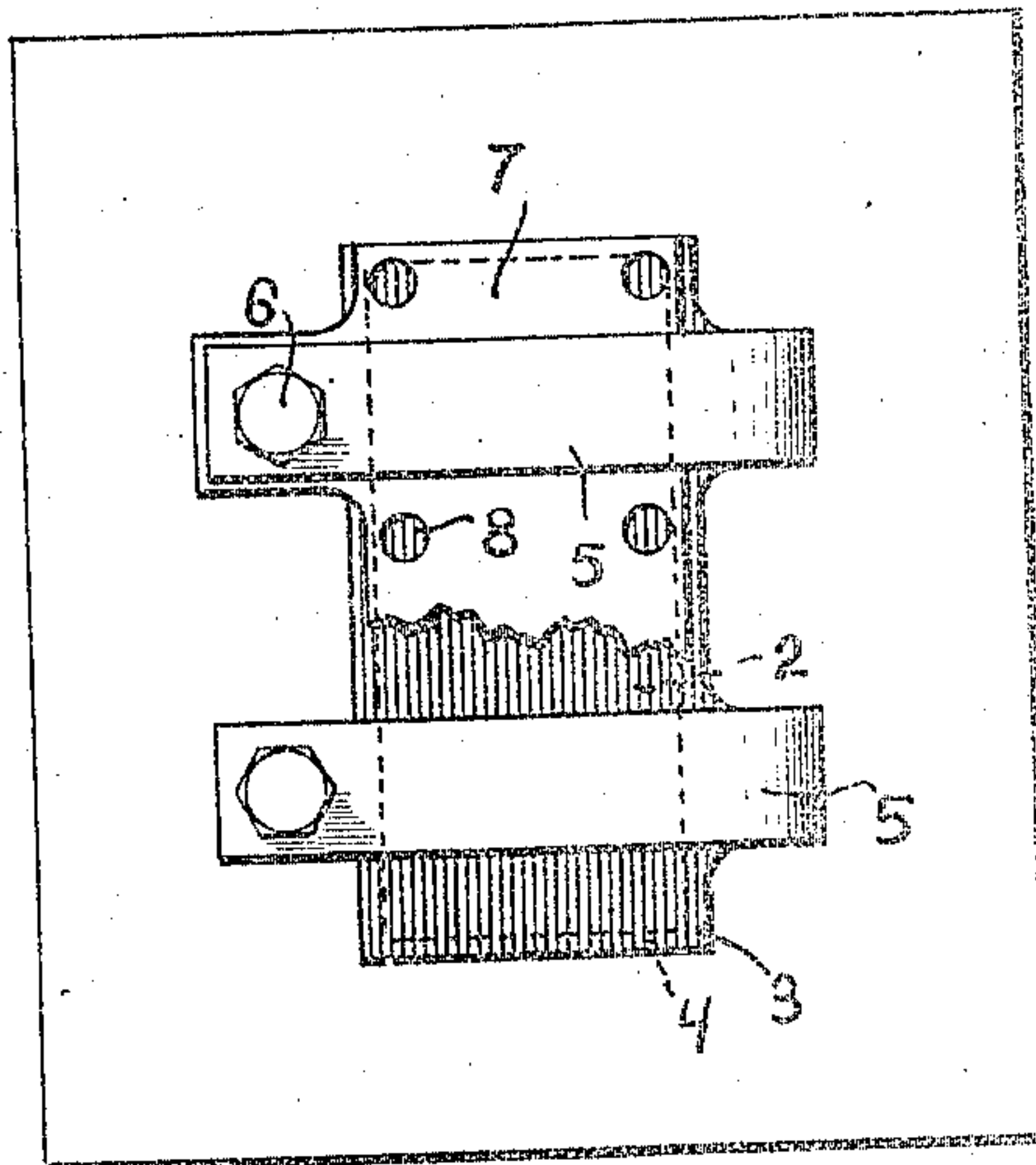


Fig. 5.

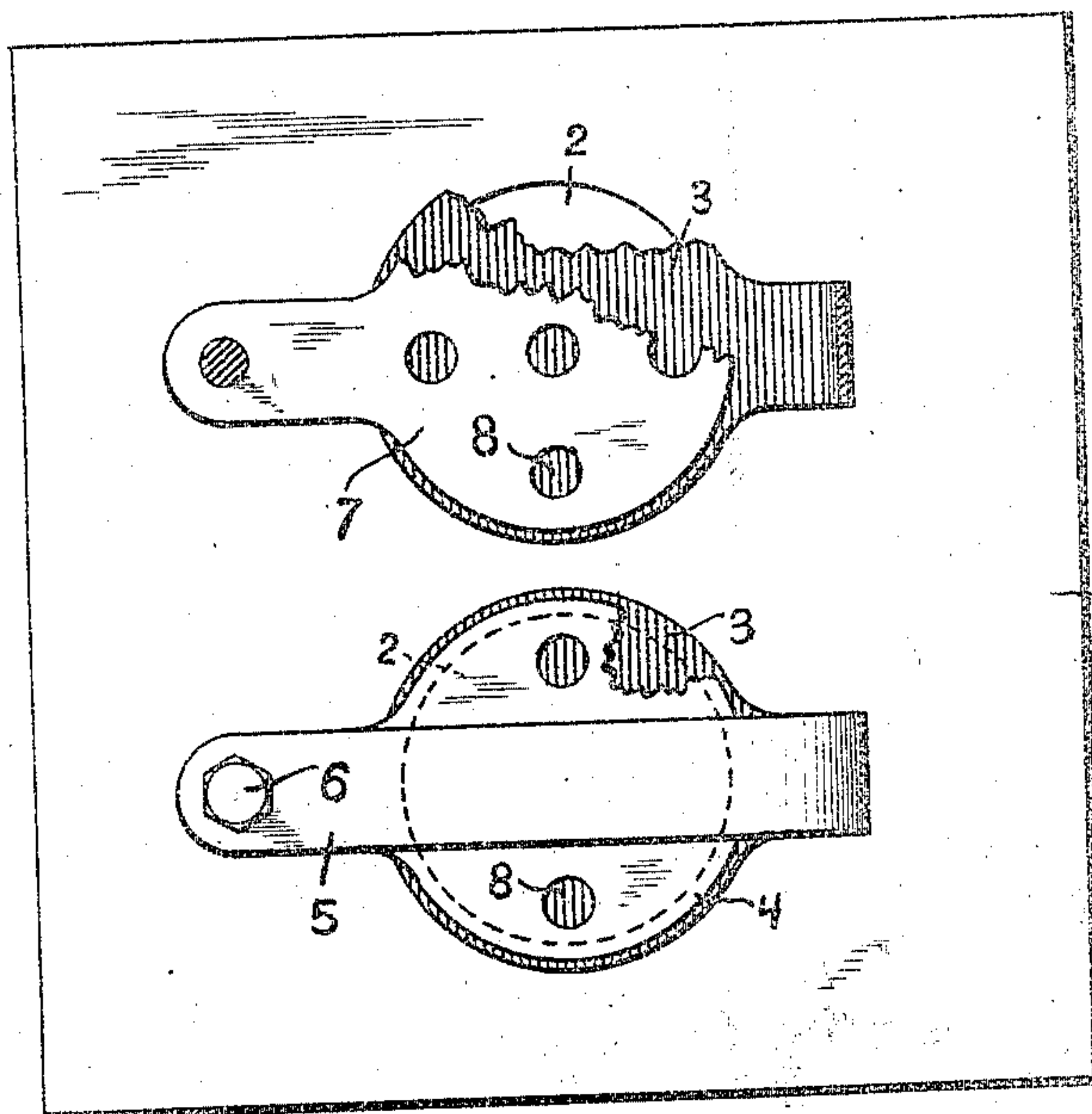


Fig. 6.

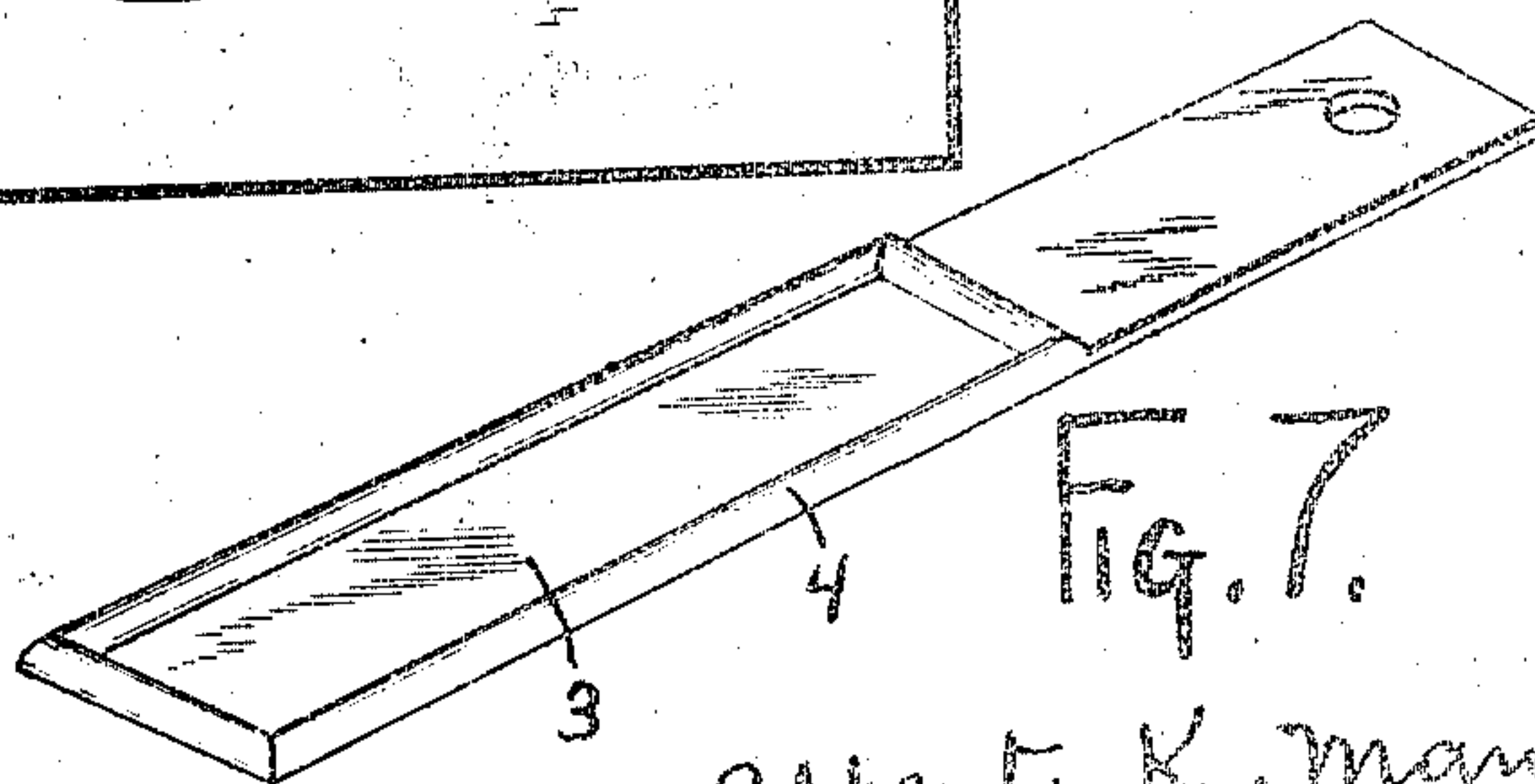


Fig. 7.

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UNITED STATES PATENT OFFICE

ALBERT K. MANSFIELD, OF SALEM, OHIO.

VALVE.

SPECIFICATION forming part of Letters Patent No. 756,869, dated April 12, 1904.

Application filed July 6, 1903. Serial No. 164,273. (No model.)

To all whom it may concern:

Be it known that I, ALBERT K. MANSFIELD, a citizen of the United States, residing in Salem, Columbiana county, Ohio, (post-office address No. 125 Lincoln avenue, Salem, Ohio,) have invented certain new and useful Improvements in Valves, of which the following is a specification.

This invention relating to improvements in valves will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a plan of a group of valves exemplifying my invention, one of the valves proper being omitted, the upper portion of another one being omitted; and the major portion of one of the guards being omitted; Fig. 2, a vertical longitudinal section of the same; Fig. 3, a reversed perspective view of one of the valves proper; Fig. 4, a vertical transverse section of one of the valves, on an exaggerated scale; Figs. 5 and 6, plans of modifications with parts broken away, and Fig. 7 a perspective view of a modification.

In the drawings, entirely ignoring Figs. 5 and 6 and 7 for the present, 1 indicates, typically, a wall of a chamber to be guarded by a valve or by valves; 2, ports therethrough, which ports may be of any desired shape or number, Fig. 1 showing the ports as long slots, three in number, and arranged parallel with each other; 3, a thin metallic plate of a form to cover the port and extend beyond all of its margins and lying parallel with and near to one surface of the wall containing the port, this plate forming the valve proper; 4, a thin continuous marginal rib projecting from that surface of plate 3 which is nearest the ported wall, this rib engaging the surface of the wall around the port and having at all points of contact with the surface of the wall a rounded or convex cross-section, so that when the valve proper closes upon the wall around the port it has only line-contact therewith; 5, a shank portion of the plate 3 bent back upon itself, this shank portion having a width less than that of the port-closing portion 3; 6, a screw rigidly securing that extremity of the shank 5 which is farthest from its bend to some supporting object holding fixed relationship

to the ported wall, preferably a portion of that wall itself, as shown in the drawings; 7, a guard-plate rigidly supported between the two portions of the valve-plate and at such distance above the port-closing portion 3 as to be engaged by the latter when it has sufficiently raised from the ported wall in the act of opening the port, thus serving as a limiting-stop for the opening of the valve, this guard-plate being held by the same screw 6 which secures the valve to its support; 8, perforations in the guard-plate to permit the movement of the passing fluid from and to the space between the guard-plate and the port-closing portion of the valve-plate as the latter is arrested by and leaves the guard-plate; 9, a bridge connecting two contiguous guard-plates at their ends nearest the bends in the valve-plates; 10, a wing projecting sideways from a guard-plate at its end nearest the bend in the valve-plate, and 11 a screw engaging such wing and the ported wall and serving as an additional securing means for the guard-plate.

The entire valve-plate is of metal, and the shank and preferably the entire valve-plate is resilient, so that the port-closing portion is at liberty to rise freely from the ported wall as far as permitted by the guard-plate. Owing to the valve-plate being bent back upon itself and rigidly supported at the end opposite its bend, the port-closing portion of the valve-plate may rise from the wall with a parallel motion, thus giving uniform valve-opening at all margins of the port. The continuous thin convex-edged rib permits of the valve closing upon the flat wall with a line-contact, insuring self-production and maintenance of tightness very soon after the valve is put into service. The narrowing of the shank of the valve-plate lessens its torsional stiffness and facilitates the seating of the valve. Fluid between the guard-plate and the valve-plate cushions the opening valve, the perforations in the guard-plate permitting the fluid to escape and to reënter the cushioning-space as the valve closes. Screws 6 and 11, in conjunction with bridge 9 and wing 10, provide for substantial support at each end of the guard-plate and for coöperative support be-

tween contiguous guard-plates; but in most cases a support at only one end of the guard-plate will be found adequate.

These valves may be used singly or in groups and may be arranged in chambers or cages, as is customary in the art. The valve-plates may have such form as to adapt them to ports of any desired shape and proportion. In Fig. 6 I illustrate the valve as adapted to ports circular in plan, and in Fig. 5 I illustrate the valve as adapted to a large rectangular port, the shank portion of the valve being here illustrated as duplicated and as being transverse to the length of the port. The peculiar advantages incident to the provision of the face of the valve-plate with the continuous narrow seating-rib can of course be availed of even if the shank of the valve-plate is not bent back upon itself, as will be understood from Fig. 7, in which the extended shank of the valve-plate is prolonged in the plane with it instead of being bent back upon it.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a valve, the combination, substantially as set forth, of a ported wall, a guard-plate rigidly supported over the port at a distance from the wall, a flexible metallic valve-plate disposed between the wall and the guard-plate and adapted to cover the port, a flexible shank projecting from the port-closing portion of the valve-plate, means for securing the extremity of the shank fixedly with relation to the wall, and a continuous thin rib projecting from the port-closing portion of the valve-plate and adapted to bear upon the wall around the port and having a convex edge bearing upon the wall.

2. In a valve, the combination, substantially as set forth, of a ported wall, a guard-plate rigidly supported over the port at a distance from the wall, a flexible metallic valve-plate disposed between the wall and the guard-plate and adapted to cover the port, a flexible shank projecting from and having a width less than the port-closing portion of the valve-plate, and means for securing the extremity of the shank fixedly with relation to the wall.

3. In a valve, the combination, substantially as set forth, of a ported wall, a guard-plate rigidly supported over the port at a distance from the wall, a flexible metallic valve-plate disposed between the wall and the guard-plate and adapted to cover the port, a flexible shank

projecting from the port-closing portion of the valve-plate and bent back over itself and the guard-plate, and means for securing the extremity of the shank fixedly with relation to the wall.

4. In a valve, the combination, substantially as set forth, of a ported wall, a guard-plate rigidly supported at its opposite extremities over the port at a distance from the wall, a flexible metallic valve-plate disposed between the wall and the guard-plate and adapted to cover the port, a flexible shank projecting from the port closing portion of the valve-plate, and means for securing the extremity of the shank fixedly with relation to the wall.

5. In a valve, the combination, substantially as set forth, of a ported wall, a guard-plate rigidly supported over the port at a distance from the wall, a flexible metallic valve-plate disposed between the wall and the guard-plate and adapted to cover the port, a plurality of flexible shanks projecting from the port-closing portion of the valve-plate, and means for securing the extremity of the shanks fixedly with relation to the wall.

6. In a valve, the combination, substantially as set forth, of a ported wall, a guard-plate rigidly supported by one of its ends over the port at a distance from the wall, a wing projecting from the guard-plate at its opposite end and serving as a supplemental support for the guard-plate, a flexible metallic valve-plate disposed between the wall and the guard-plate and adapted to cover the port, a flexible shank projecting from the port-closing portion of the valve-plate, and means for securing the extremity of the shank fixedly with relation to the wall.

7. In a valve, the combination, substantially as set forth, of a ported wall, a guard-plate disposed over the port at a distance from the wall, a flexible metallic valve-plate disposed between the wall and the guard-plate and adapted to cover the port, a flexible shank projecting from the port-closing portion of the valve-plate and bent back over itself and the guard-plate, and a screw engaging the shank and guard-plate and serving to secure them rigidly to each other and in relation to the ported wall.

ALBERT K. MANSFIELD.

Witnesses:

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I. AMBLER.