

H. D. HIBBARD.

FASTENING FOR SAFE OR VAULT PLATES.

(Application filed Oct. 31, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 3.

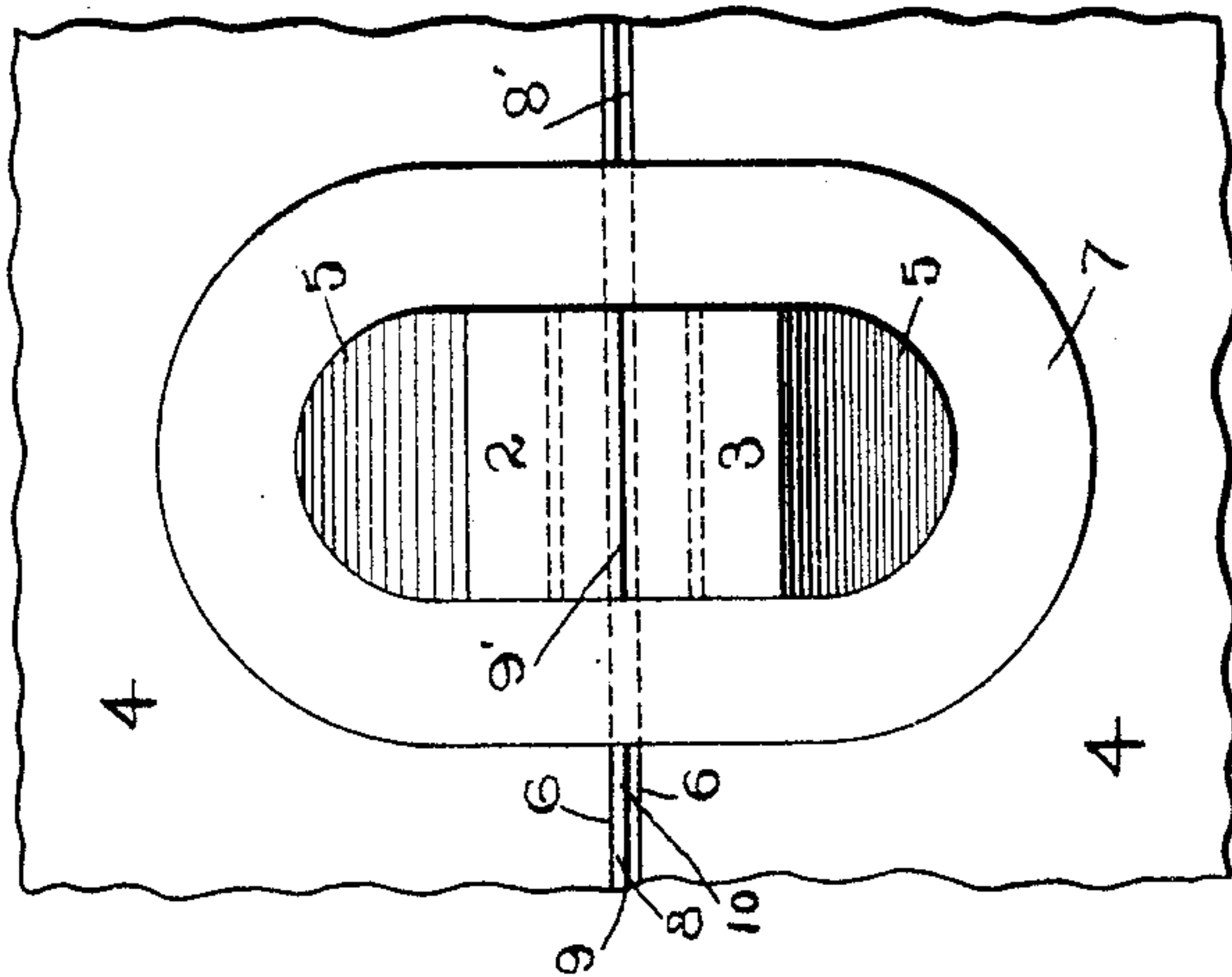


Fig. 2.

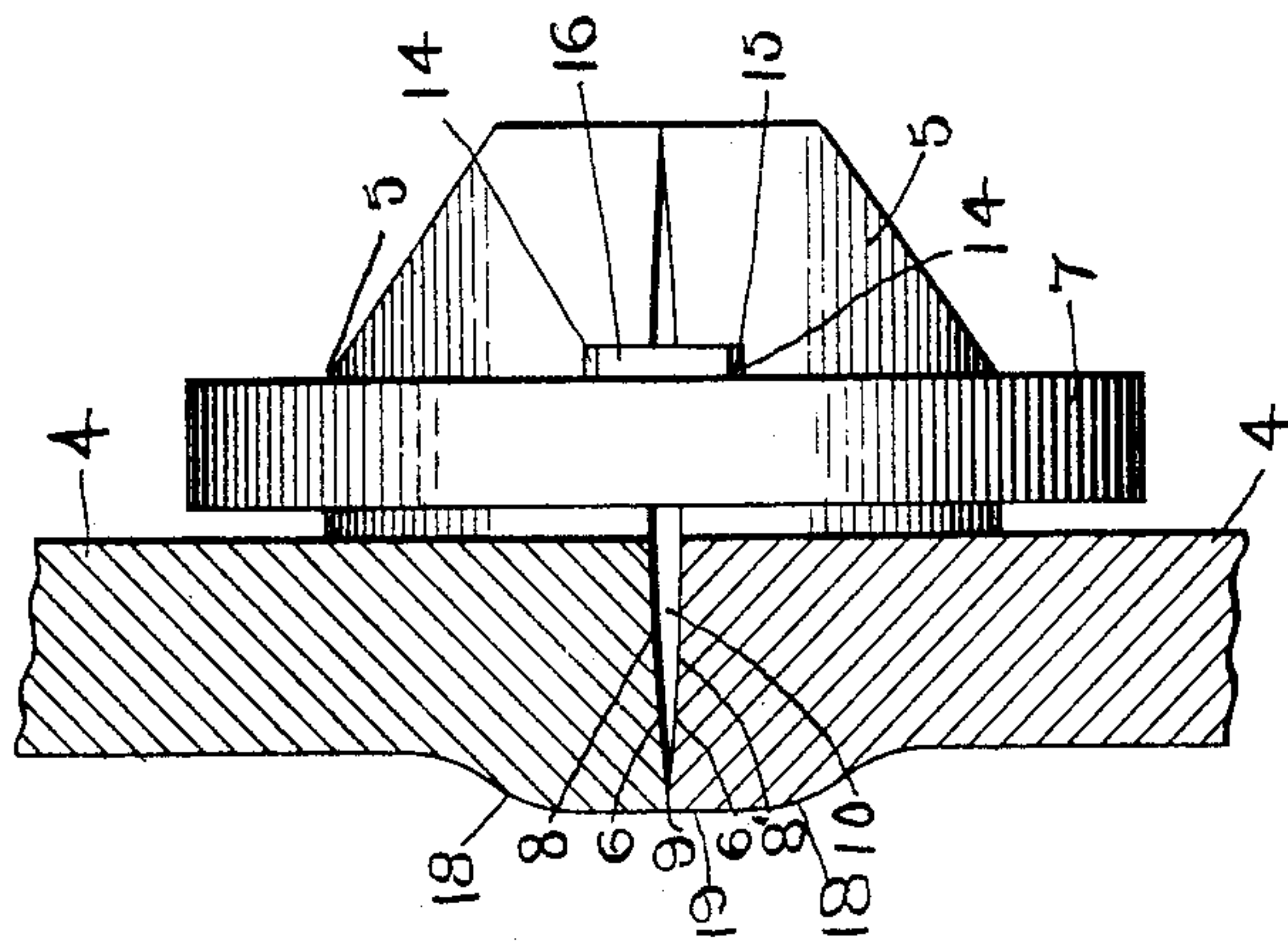
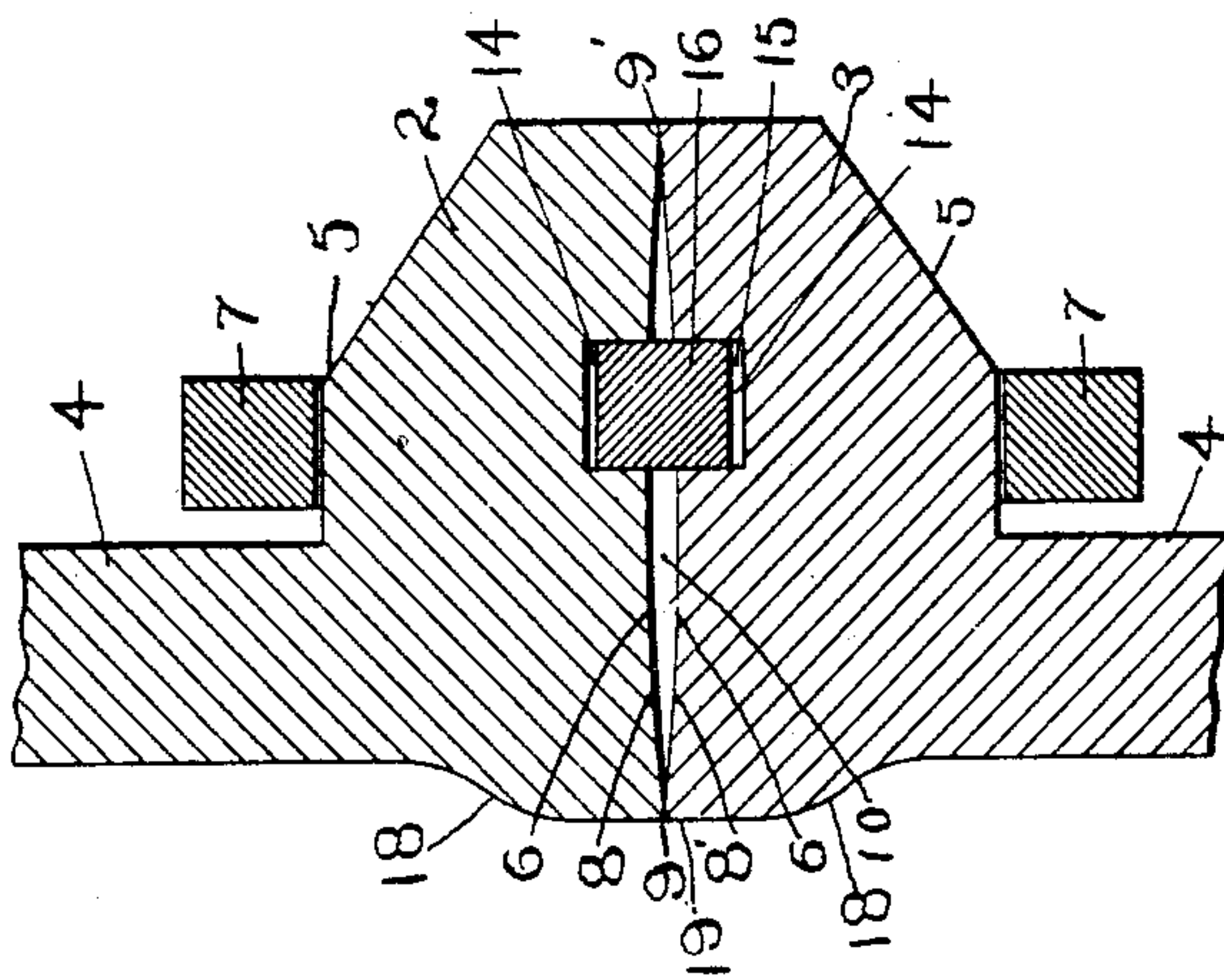


Fig. 1.



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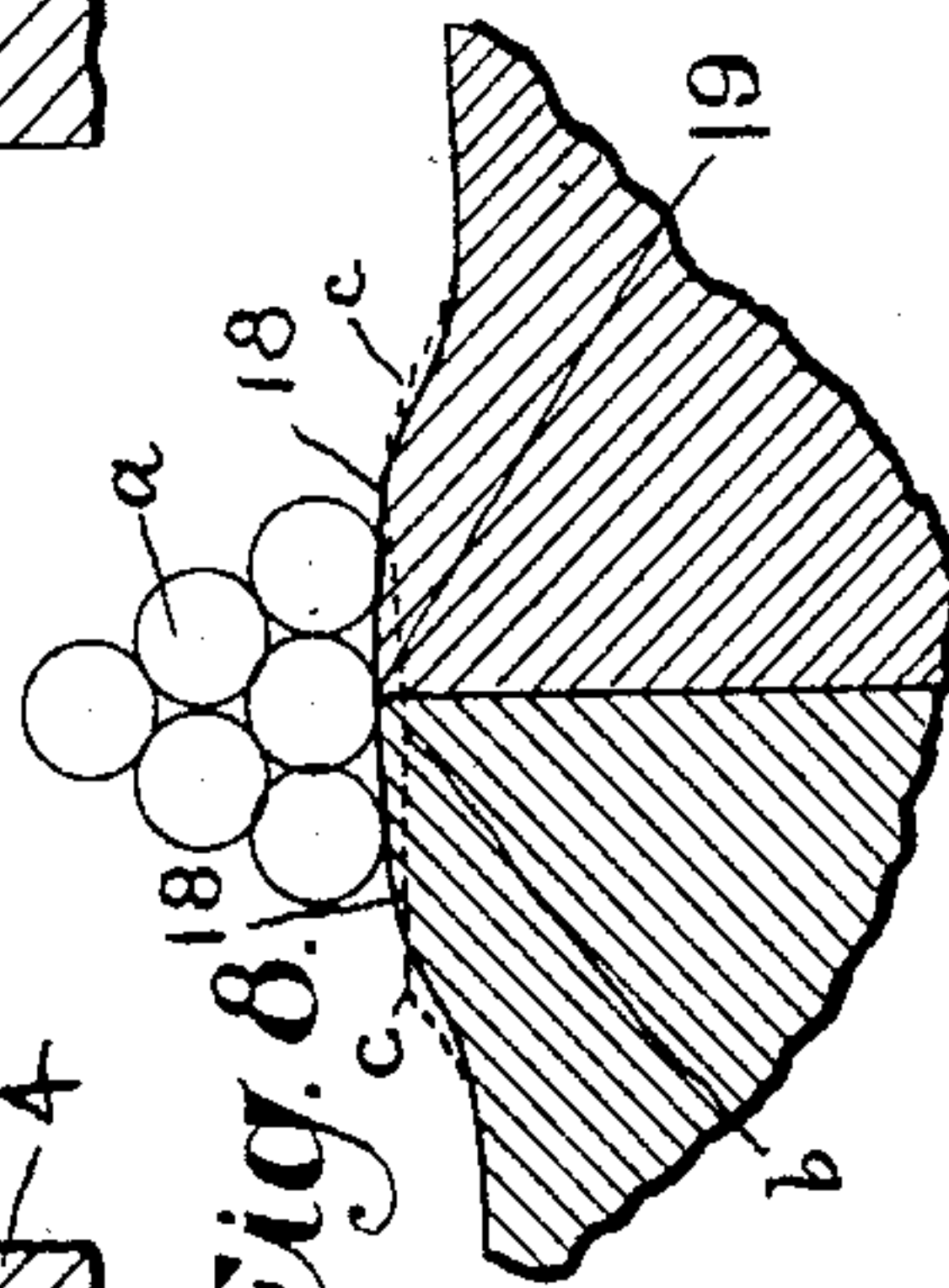
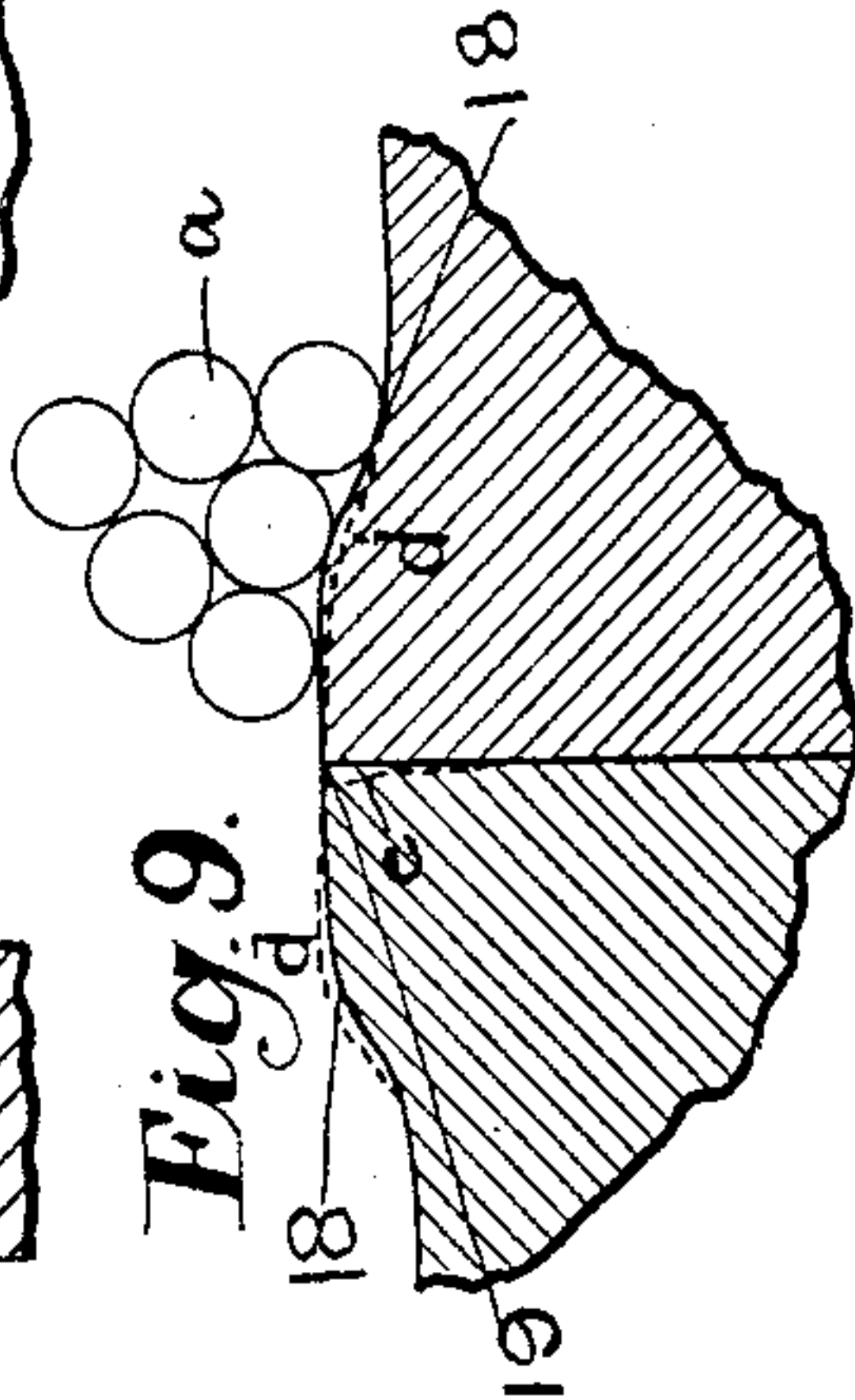
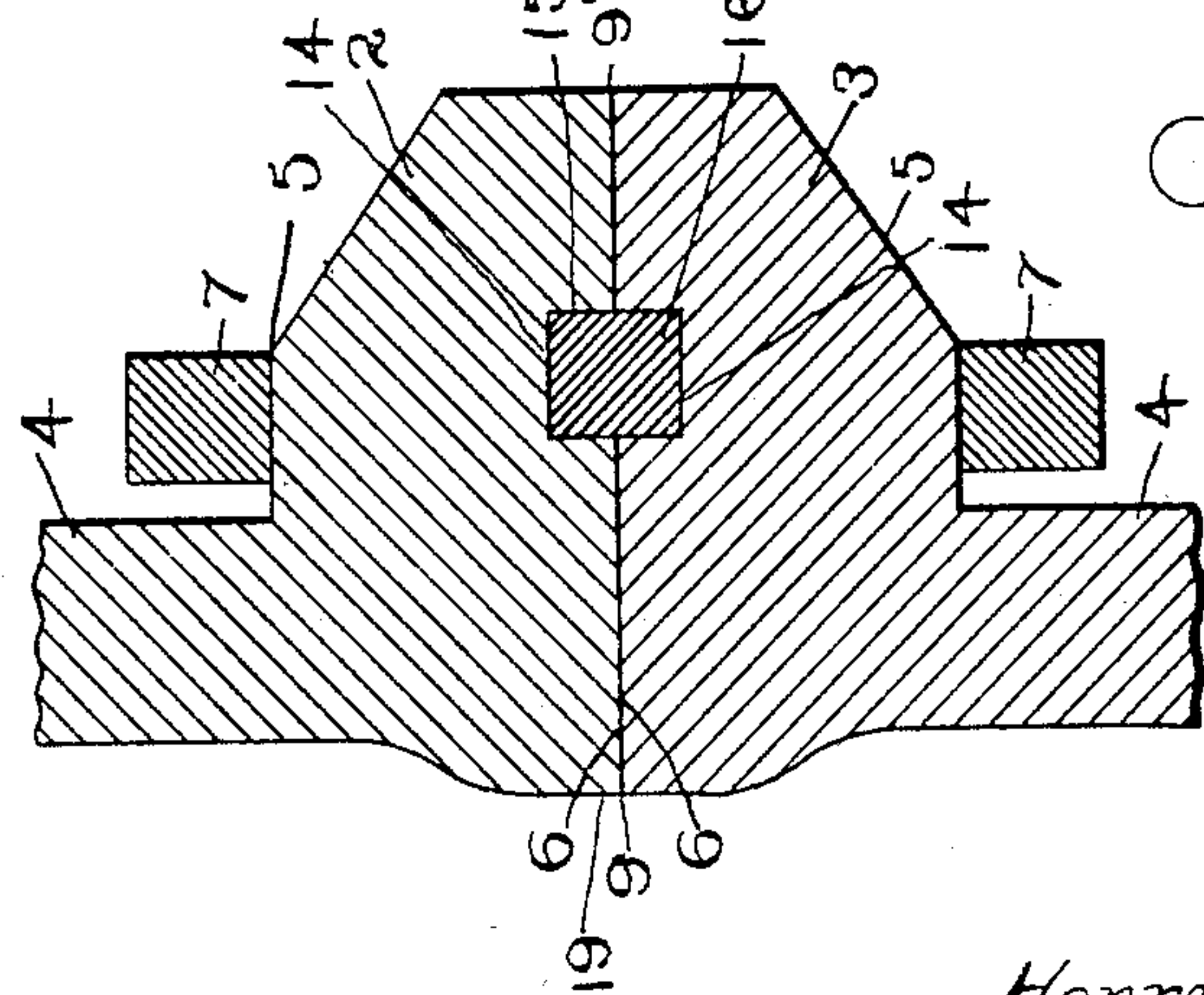
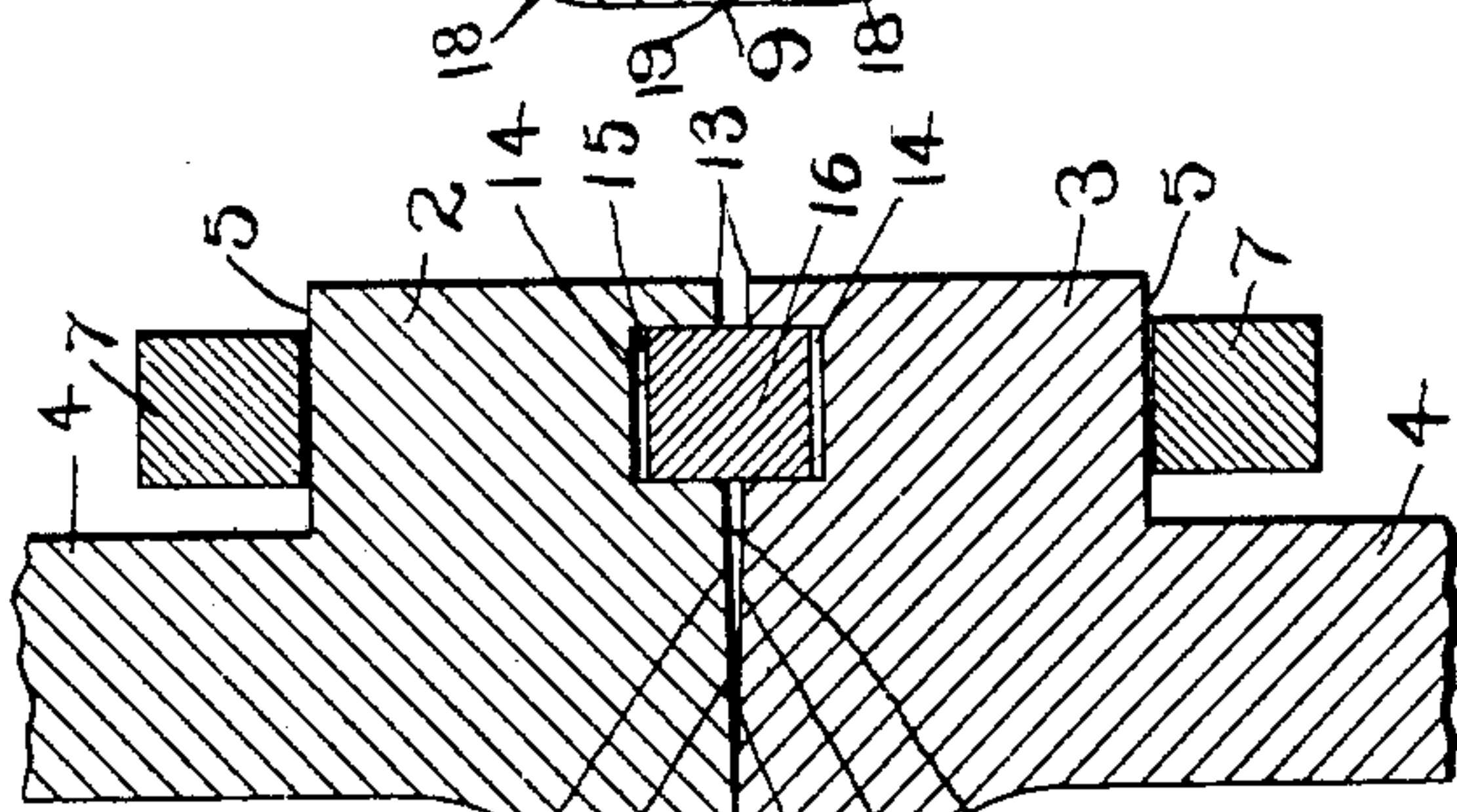
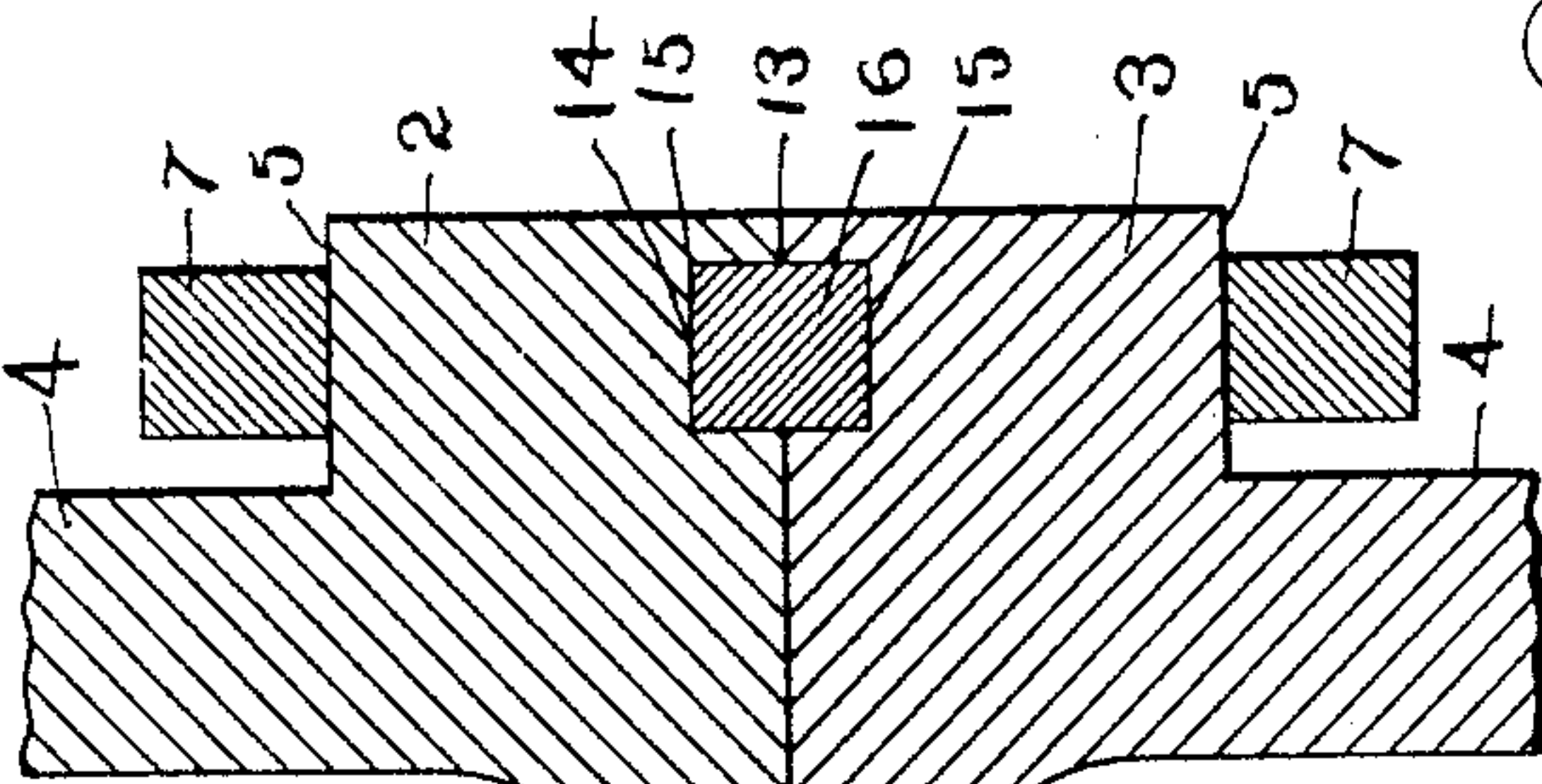
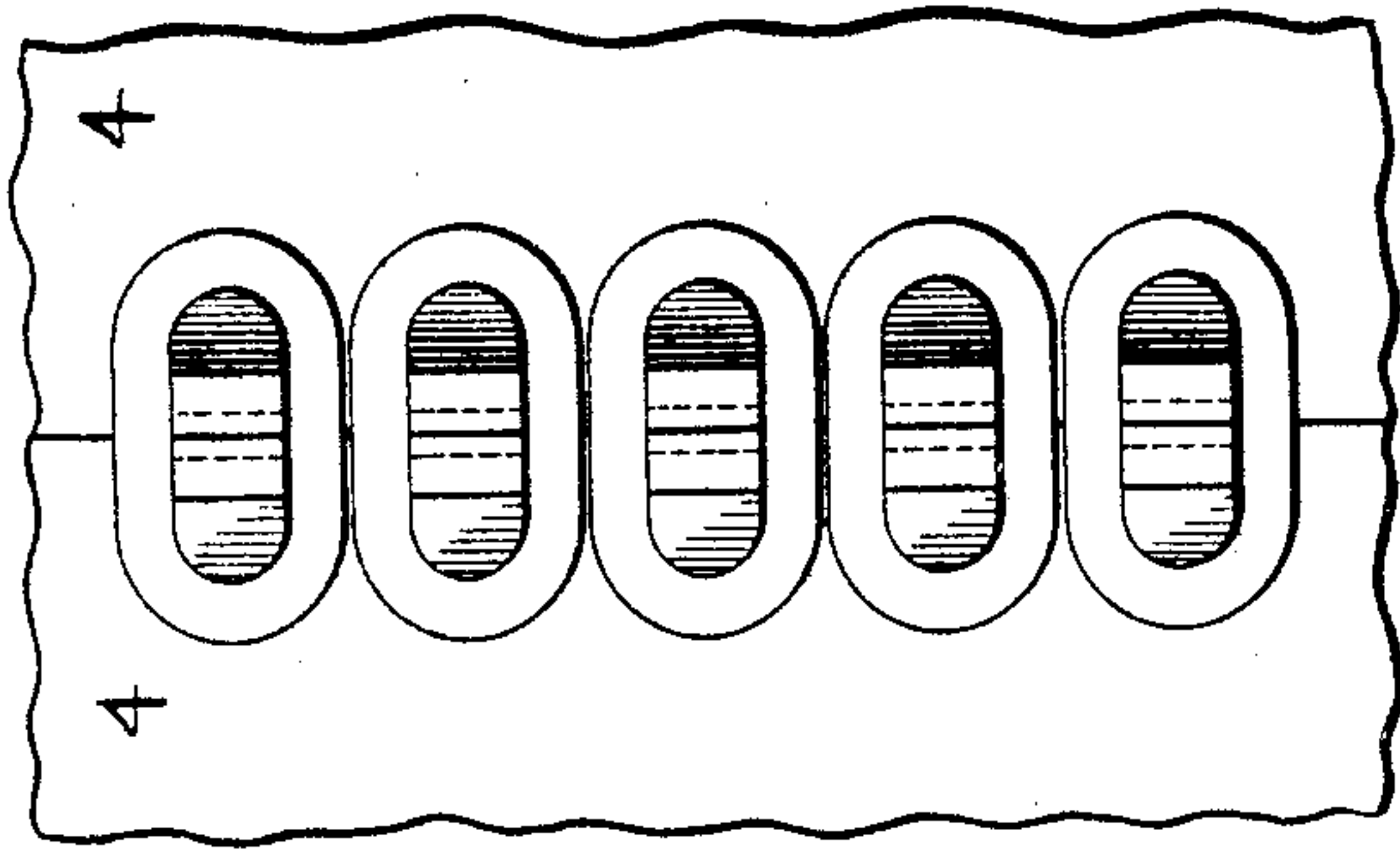
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(Application filed Oct. 31, 1900.)

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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

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FASTENING FOR SAFE OR VAULT PLATES.

SPECIFICATION forming part of Letters Patent No. 679,371, dated July 30, 1901.

Application filed October 31, 1900. Serial No. 34,988. (No model.)

To all whom it may concern:

Be it known that I, HENRY D. HIBBARD, a citizen of the United States, residing in Plainfield, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Fastenings for Safe or Vault Plates, of which the following is a specification.

This invention relates to fastenings for safe or vault wall components or plates, one object being to provide an improved fastening for holding together a plurality of wall components or plates of safes or vaults of composite construction, the present fastening being an improvement upon that shown and described in my contemporaneously-pending application, Serial No. 10,471, filed March 28, 1900, and which eventuated in a patent dated November 27, 1900, No. 662,433, and is adapted for use with various kinds and forms of safes or vaults or may be used with the different constructions thereof shown and described in my contemporaneously-pending applications, Serial Nos. 7,967, 7,968, and 7,969, filed March 9, 1900, now Patents Nos. 662,430, 662,431, and 662,432, respectively, dated November 27, 1900.

A further object of the invention is to provide, in connection with the fastening shown and described in my said contemporaneously-pending case, Serial No. 10,471, now Patent No. 662,433, a method of increasing the resistance of the components or plates to such fastening, whereby such plates are clamped under a very high initial resistance, which must be first overcome before the components can be separated in any attempt to force an entrance into the joint.

A further object of the invention is to provide at the joint formed by a pair of plates an exteriorly-located increased portion or bead, which is capable of yielding under an explosive charge to preserve at all times a metal-to-metal contact of the joint-surfaces of the plates, and so prevent the opening of the joint, and consequently the introduction of nitroglycerin thereinto, as set forth in connection with the bead located around the doorway in my contemporaneously-pending application, Serial No. 696,394, filed November 4, 1898, now Patent No. 662,429, dated

November 27, 1900, this bead being preferably obtained in the present instance by providing each plate adjacent to its free edge with an exteriorly-located flange or projection of metal.

In the drawings accompanying and forming part of this specification, Figure 1 is an enlarged sectional view of a pair of wall components or plates in position to be clamped together by the coupling. Fig. 2 is a sectional view of the plates in position to be clamped together by the coupling, which is shown in side elevation. Fig. 3 is an end view of this improved fastening. Fig. 4 is a sectional view similar to Fig. 1, but illustrating the plates or wall components clamped together under high tension. Fig. 5 is a sectional view illustrating a modification of this improved fastening means, the plates being in position to be clamped together. Fig. 6 is also a sectional view of this modification, showing the plates or wall components clamped together under high tension. Fig. 7 is a view of a series of these improved fastening devices connecting a pair of wall components or plates, and Figs. 8 and 9 are diagrammatical views illustrating the action of the protecting-bead of yielding metal formed by the flanges located around the exterior free edges of the plates or components.

Similar characters of reference indicate corresponding parts in the different figures of the drawings.

In practice any desired number of these improved fastenings may be used, according to the size and character of the members or plates to be united, and such fastenings may be located any desired distance apart. In the form thereof herein shown and described and which may be the preferred form thereof, if desired, this improved fastening comprises a plurality of projections 2 and 3, shown in the present instance as a pair thereof, rigid, as, for instance, integral with a pair of safe or vault members or plates 4 to be secured together. In practice each plate is usually provided with a plurality of projections located at its inner side adjacent to each free edge and which are in position to register with similar projections carried by a companion member or plate. These projections may be of

any desired shape; but in one form thereof herein shown they are illustrated as wedge-shaped with rounded exterior surfaces 5 and flat inner faces 6. To clamp the projections
 5 together under high tension, so as to resist the opening of the joint, a retaining device is provided which comprises a coupling member. This coupling member is shown in the present instance comprising a link 7, shrunk
 10 onto said projections, whereby the joints are formed under high pressure—that is to say, the edge faces of the plates or members are drawn together with great force—thereby giving a high initial resistance, which it will be
 15 readily seen must be first overcome before such members or plates can be separated in the slightest degree to force an entrance into the joint.

In accordance with the present improvement the wall components or plates are made of considerable thickness and of material suitable for resisting attacks—such, for instance, as unmachineable metal. In practice I prefer to cast the plates of “manganese steel,”
 25 by which I mean the metal produced and treated in accordance with the Hadfield patented processes. For the purpose of increasing the resistance of the plates to the action of the coupling device, and thereby rendering
 30 such coupling device more effective, I make the contiguous walls 8 and 8' of such plates and projections slightly diverging, (shown greatly exaggerated in the drawings for the purpose of illustration,) so that on assembling
 35 such plates or wall members together the outer faces 9 of such plates will bear against each other. It is well known that even the most resistant metals are, notwithstanding their great resisting qualities, somewhat flexible, and in the present improvement this fact
 40 is utilized to secure a superior fastening for sectional safes or vaults.

In the form of fastening shown in Figs. 1 to 4 the diverging faces 8 and 8' are shown
 45 slightly inclined—as, for instance, curved or concaved from the free ends of or from a point adjacent to the free ends of the projections 2 and 3 to the outer sides of or to a point adjacent to the outer sides of the wall plates or
 50 components, while in the form shown in Figs. 5 and 6 the contiguous faces 8 and 8' of the plates and projections are shown as diverging from each other from the outer side of or from a point adjacent to the outer side of such
 55 wall components or plates toward the ends of the projections. When the safe-plates or wall components are assembled edge to edge and have the construction shown in Fig. 1, such components will bear upon each other
 60 along their outer edges, as at 9, and in that form of the improvement shown in said figure will also bear at the inner ends of their projections, as at 9'; but owing to the diverging formation of the surfaces 8 and 8' there
 65 will be when the plates are assembled a slight space 10 between the plates and projections along such contiguous edges. On applying

a tension device to the projections, which tension device may consist of a bolt or an encircling or inclosing device or any means
 70 adapted for the purpose, the pressure of such tension device forcibly brings the surfaces 8 and 8' together, so as to close the space or opening 10 between the same, and thereby
 75 bring the edges of the plates and projections into a very forcible bearing one upon the other. (See Fig. 4.) It will of course be understood that the said tension device must be of a relatively powerful character and able to slightly deflect the plates as required for
 80 closing the joint. By this improved fastening it will thus be seen that the greatest amount of force of one plate is brought against the other along the outer portion 9 of the joint, so that the faces of the components are
 85 drawn together with excessive pressure at the point where an attack must first be made, and consequently an increased obstacle is thus offered against burglarious entry.

In practice it is preferable to locate the tension or clamping device (shown in the present organization as a shrunk-on link) substantially midway between the ends of the joint, whereby the projections 2 and 3 constitute levers the free ends of which form a
 95 fulcrum, so that an effective means is obtained for reducing the tendency of any force applied to the outer sides of the plate at the joint to open the levers within the link when this form of clamping means is used, and thus
 100 permit the joint to open.

In some constructions of safes or vaults the form of fastening shown in Figs. 5 and 6 may be preferred to that shown in Figs. 1 to 4. In this form the surfaces at the inner part 12 of
 105 the projections 2 and 3 meet before the surfaces at the free ends 13 of such projections come into contact, whereby the tendency which might exist to some extent of the tension bolt or link to break off the projections
 110 is materially reduced or avoided.

For locking the wall components or plates in a fixed position or alinement relatively to each other and so prevent the forcing of one plate inwardly independently of its companion
 115 plate means independent of the clamping device is provided, and for this purpose each of the projections is shown provided in its inner face with a recess or slot 14, which when in communication with a similar recess or slot
 120 of its companion projection forms a keyway 15 for the reception of a key 16, by means of which the projections and the members or plates formed as a part thereof may be located in proper alinement and in a fixed position
 125 relatively to each other, so that the possibility of forcing one plate inwardly independently of its companion plate is prevented.

By this organization it will be seen that it is practicable to make safes, vaults, and strong
 130 boxes of highly-resistant material and of a composite construction which, it is believed, will be practically as strong as an integral structure, since when shrunk-on links are

used they will become, to a certain extent, integral with the projections. When the plates are large and heavy, it will be seen that by providing a number of these improved fastenings located side by side at the desired intervals or in juxtaposition, as it is deemed desirable, it is believed that it will be found practically impossible to separate the plates even by the use of high explosives, and when the material of the plates is not machineable in any practicable manner it follows that there is provided a structure which, although it is formed of sections or plates, has nevertheless all the advantages and burglar-resisting qualities of an integral safe. Furthermore, since the outer surfaces of the plates at the point 9 are the parts which are brought together with the greatest force it is believed that the possibility of opening the joint for the introduction of nitroglycerin is eliminated, especially when such joint is protected in the manner about to be described.

In my contemporaneously-pending application, Serial No. 696,394, filed November 14, 1898, now Patent No. 662,429, dated November 27, 1900, I have shown and described a method of preventing the opening of the joint around the door, this method consisting in providing an increased portion or flange located around the door, the metal of which flange will yield under the action of an explosive charge while preserving a metal-to-metal contact of the jamb and door edge.

In the present instance I preferably provide each of the wall components or plates on its outer surface and adjacent to its free edge with a projection or flange 18 of metal cooperating with a similar projection or flange of a companion plate to form an increased portion or bead 19, adapted to yield under the action of an explosive charge, so that the effect of such charge acts on and is taken up by the bead, and consequently has little appreciable effect on the main wall of the plates.

This action is illustrated in Figs. 8 and 9, the full lines showing the normal position of the metal before the charge is fired and the dotted lines the position after such firing. In Fig. 8 is illustrated the condition of the metal after an explosive charge—such, for instance, as sticks of dynamite—is fired directly on the joint, while in Fig. 9 is illustrated the condition of the metal after an explosive charge is fired at one side of such joint. In Fig. 8 it will be seen that the metal of the yieldable bead has yielded after the firing of such explosive charge, so that it is compressed or slightly flattened at one point into the position shown by dotted lines *b*, while bulged or projected laterally at *c*. Since there is no resisting-wall of metal to prevent the bead yielding laterally, as would be the case if the plate was as thick at all points as at the part having the bead, it follows that the effect of the charge is merely to compress the metal at the joint *b* without in the least tending to open

the joint. In Fig. 9 the action of the explosive charge at one side of the joint forces the metal into the position shown in the dotted lines *d* and moves the joint-surfaces from their normal positions to that shown by dotted line *e*, and although such joint is dislocated and moved laterally nevertheless the surfaces forming such joint still remain in metal-to-metal contact, with the joint water-tight. From the foregoing it will be seen that by the provision of this bead, preferably formed in the present instance of a pair of flanges, and therefore comprising what might be properly designated as a "duplex bead," there is provided an increased portion of metal, which is capable of yielding or flowing laterally under an explosive charge, thereby to prevent the force of such charge from being exerted on the main part of the wall. By providing a yielding portion of metal I am enabled to provide a joint which will resist all attempts to introduce nitroglycerin therein.

While the metal of the bead will yield under an explosive charge in substantially the manner indicated, it nevertheless is of sufficient resistance so that it will not yield when the tension device is applied. Moreover, by the provision of this bead the bearing-surfaces of the plates are materially increased, especially at those points where the projections are located, so that a larger area of metal is provided over which the shocks of the charges are distributed, and consequently the efficiency of the fastening means is materially increased, since the increased area over which the shocks of an explosive charge are distributed renders such shocks less effective on the projections and links.

I claim as my invention—

1. A pair of safe or vault plates or members each having located on its exterior adjacent to its free edge a projection or flange, said flanges cooperating to form a yielding bead adapted to yield under the effect of an explosive charge while preserving a metal-to-metal contact of the joint-surfaces of such plates; and means for maintaining the edges of such plates in contact.

2. An improved joint for safes or vaults formed by assembling a pair of safe or vault plates or members each having located on its exterior adjacent to its free edge a projection or flange, said flanges cooperating to form a yielding bead adapted to yield under the effect of an explosive charge while preserving a metal-to-metal contact of the joint-surfaces of such plates, each of said plates also having an inwardly-extending projection; and means for clamping such projections together.

3. A pair of safe or vault plates or members each having located on its exterior adjacent to its free edge a projection or flange, said flanges cooperating to form a yielding bead adapted to yield under the effect of an explosive charge while preserving a metal-to-metal contact of the joint-surfaces of such plates,

means for maintaining the edges of the plates in contact; and means for locating said plates in alinement.

4. An improved joint for safes or vaults formed by assembling a pair of safe or vault plates or members each having located on its exterior adjacent to its free edge a projection or flange, said flanges cooperating to form a yielding bead adapted to yield under the effect of an explosive charge while preserving a metal-to-metal contact of the joint-surfaces of such plates, each of said plates also having an inwardly-extending projection; and means for clamping such projections together, and comprising a link shrunk onto said projections.

5. An improved joint for safes or vaults formed by assembling a pair of safe or vault components edge to edge, each having on its exterior adjacent to its free edge a flange or projection, such flanges forming a yielding bead adapted to yield under the effect of an explosive charge while preserving a metal-to-metal contact of the joint-surfaces of such plates, each of said components also having an inwardly-extending projection, the contiguous faces of said components and projections diverging to form a space intermediate such faces; and means for applying tension to such projections, thereby to bring said contiguous faces into engagement and close up such space.

6. A safe or vault component or plate fastening comprising, in combination with a plurality of wall plates or components set edge to edge, a member or projection rigid with each of said plates and located on the interior of the safe or vault when such plates are assembled in such structure, the contiguous faces of such projections and of the plates diverging so as to form a space; and means for drawing or clamping said contiguous faces together with great force thereby to close up such space and hold the plates under tension.

7. A safe or vault component or plate fastening comprising, in combination with a plurality of wall plates or components set edge to edge, a member or projection rigid with each of said plates and located on the interior of the safe or vault when such plates are assembled in such structure, the contiguous faces of such projections and of the plates diverging so as to form a space; and means shrunk on said projections for drawing or clamping said contiguous faces together with great force thereby to close up such space and hold the plates under tension.

8. A safe or vault component or plate fastening comprising, in combination with a plurality of wall plates or components set edge to edge, a member or projection rigid with each of said plates and located on the interior of the safe or vault when such plates are assembled in such structure, the contiguous faces of such projections and of the plates diverging so as to form a space; and means shrunk on said projections at a point sub-

stantially midway between the outer faces of said plates and the inner ends of said projections for drawing or clamping said contiguous faces together with great force thereby to close up such space and hold the plates under tension.

9. A safe or vault component or plate fastening comprising, in combination with a plurality of safe or vault plates or wall components set edge to edge, a projection rigid with each of said plates and located on the interior of the safe or vault when such plates are assembled in such structure, the opposing faces of said projections and of the plates adjacent thereto diverging to form a space; means for locating said plates in fixed position or alinement relatively to each other, and comprising a key located in a keyway formed intermediate said projections; and means shrunk on said projections for drawing or clamping said contiguous faces together and closing up said space.

10. A safe or vault component or plate fastening comprising, in combination with a plurality of safe or vault plates or components set edge to edge with the outer edges of the joint-surfaces of such plates in contact, and with a space intermediate such point of contact and the inner faces of such plates, means for drawing said plates together so as to close up such space and hold the plates under tension.

11. A safe or vault component or plate fastening comprising, in combination with a plurality of safe or vault plates or components set edge to edge with the outer edges of the joint-surfaces of such plates in contact, and with a space intermediate such point of contact and the inner faces of such plates, means comprising a device shrunk onto parts of such plates for drawing them together so as to close up such space and hold the plates under tension.

12. A safe or vault component or plate fastening comprising, in combination with a plurality of safe or vault plates or components set edge to edge with the outer and inner edges of the joint-surfaces thereof in contact with a space intermediate such points of contact, means for drawing said plates together thereby to close up such space and hold such plates under tension.

13. A pair of safe or vault plates or members having their outer contiguous faces substantially flush, one of said plates having a flange or projection adapted to yield under the effect of an explosive charge while preserving a metal-to-metal contact of the joint-surfaces of such plates; and means for maintaining the edges of such plates in permanent contact.

14. A pair of safe or vault plates or members having their outer contiguous faces substantially flush, one of said plates having a flange or projection adapted to yield under the effect of an explosive charge while preserving a metal-to-metal contact of the joint-

surfaces of such plates; means for maintaining the edges of such plates in permanent contact; and means for locating the plates in alinement.

5 15. An improved joint for safes or vaults formed by assembling a pair of safe or vault plates or members with their outer contiguous faces substantially flush, one of said plates having a flange or projection adapted to
10 yield under the effect of an explosive charge while preserving a metal-to-metal contact of the joint-surfaces of such plates, such joint-surfaces having contact adjacent to the outer sides of the plates and diverging toward the
15 inner sides thereof to form a space; and means for drawing such joint-surfaces together to close up such space.

16. A pair of safe or vault plates or components having projections located at one side

thereof with a part of their opposing faces 20 normally out of contact; means for drawing the faces of such projections together; and means for maintaining the plates in alinement and assembled so as to permit all parts of such faces to be drawn into contact. 25

17. An improved joint for safes or vaults formed by assembling a pair of safe or vault plates or members having a bead located on one side of such plates at the joint thereof, and also having projections located at the opposite side of such plates and formed so that 30 a part of their opposing faces are normally out of contact; and means for drawing such faces together.

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