

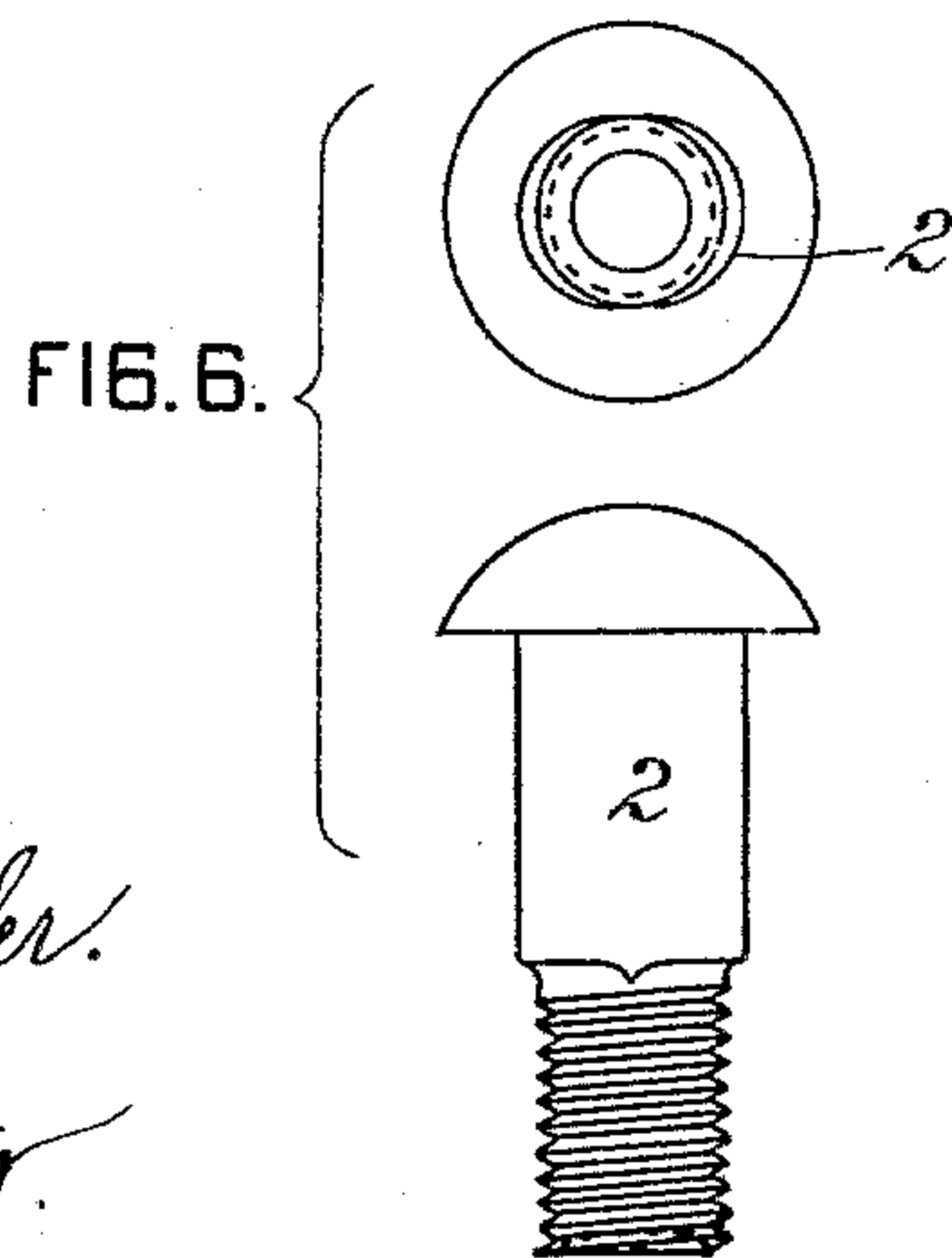
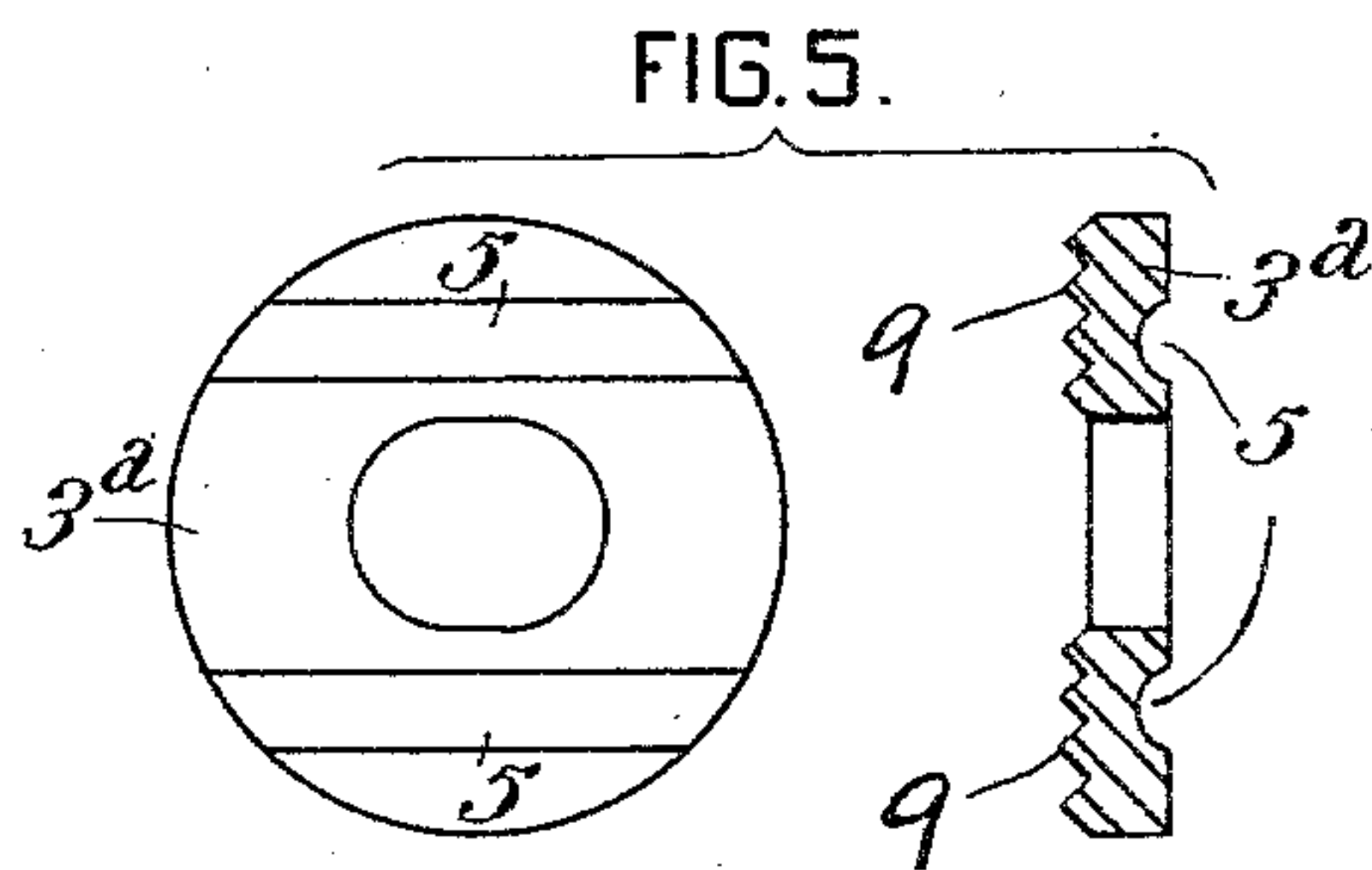
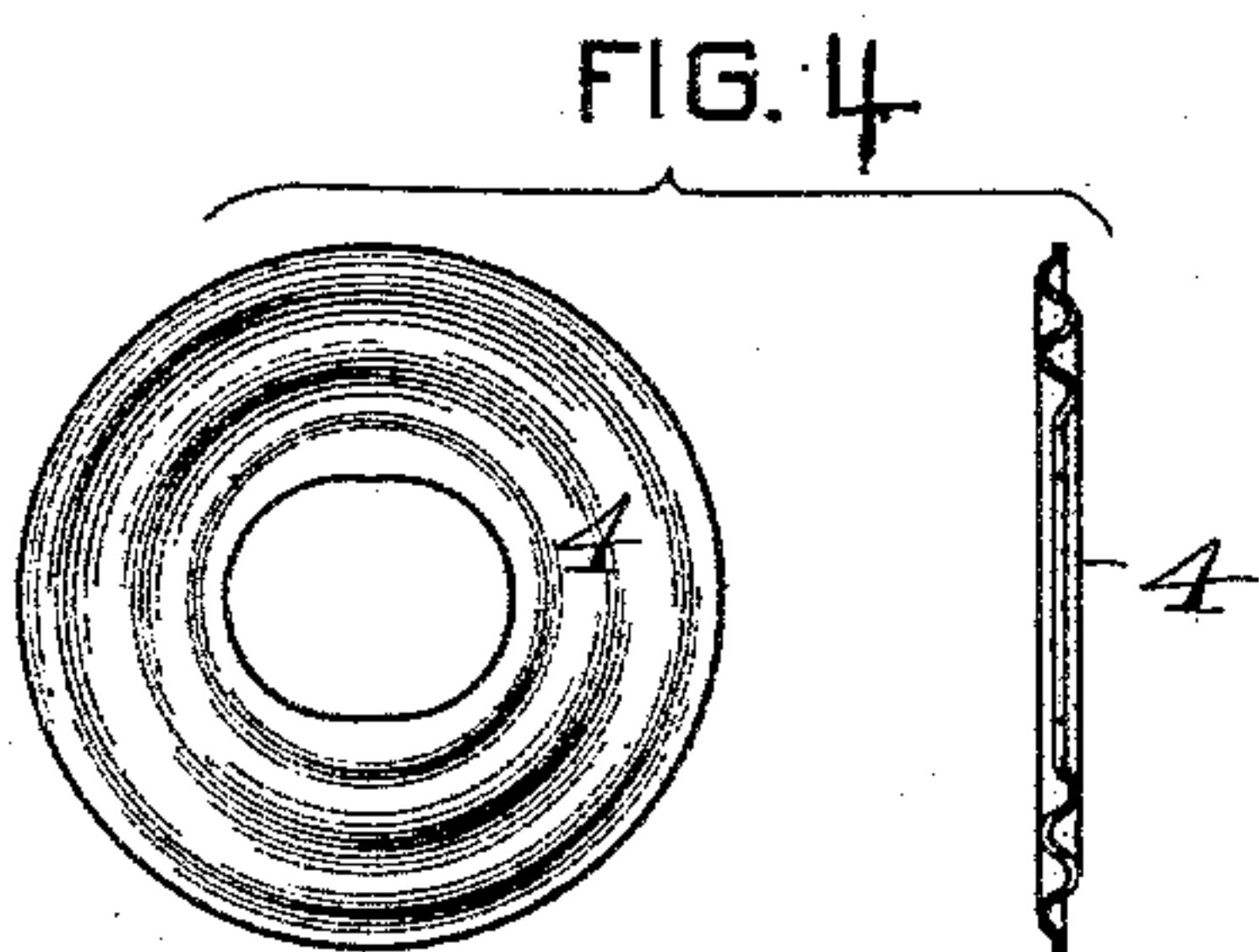
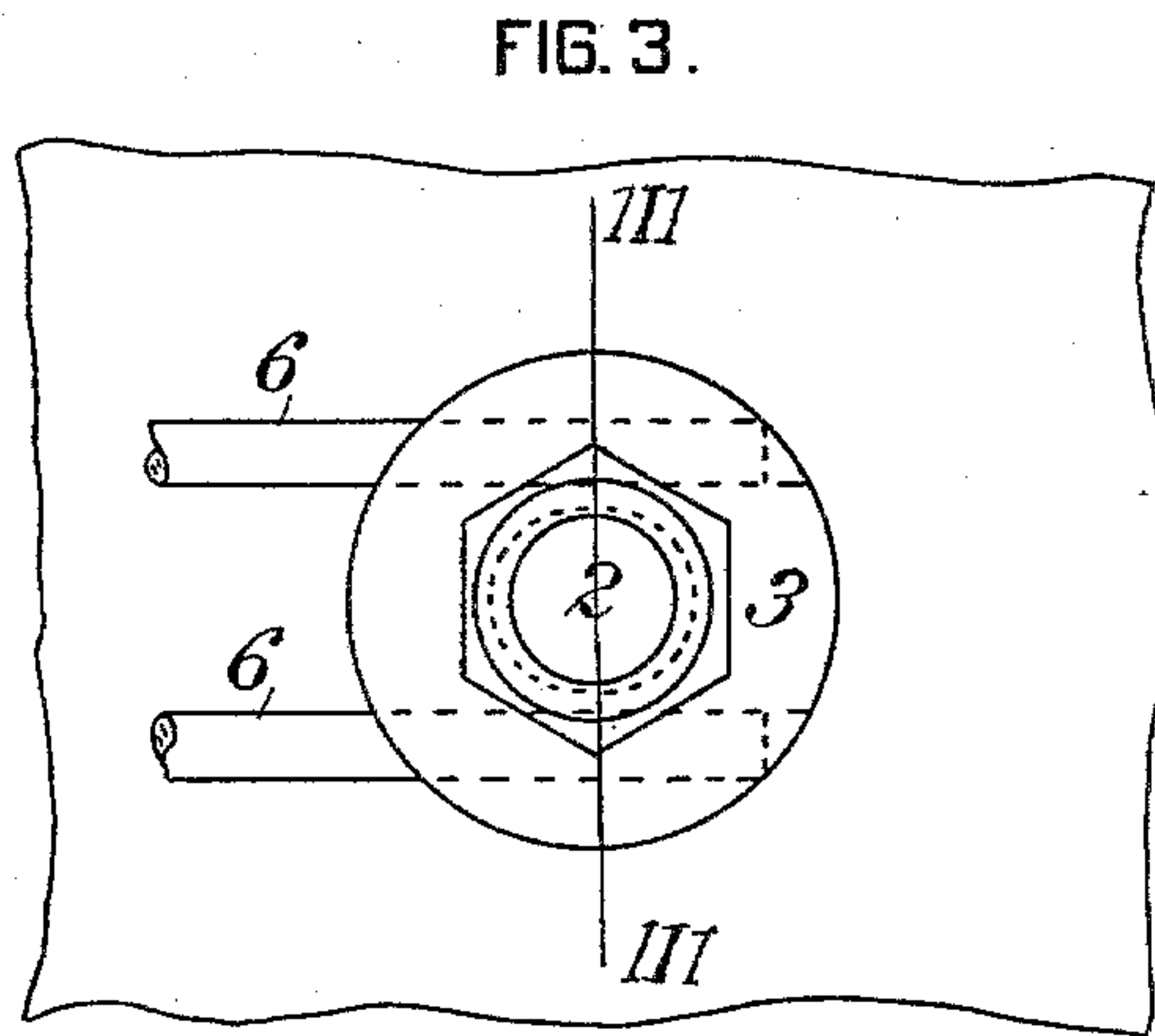
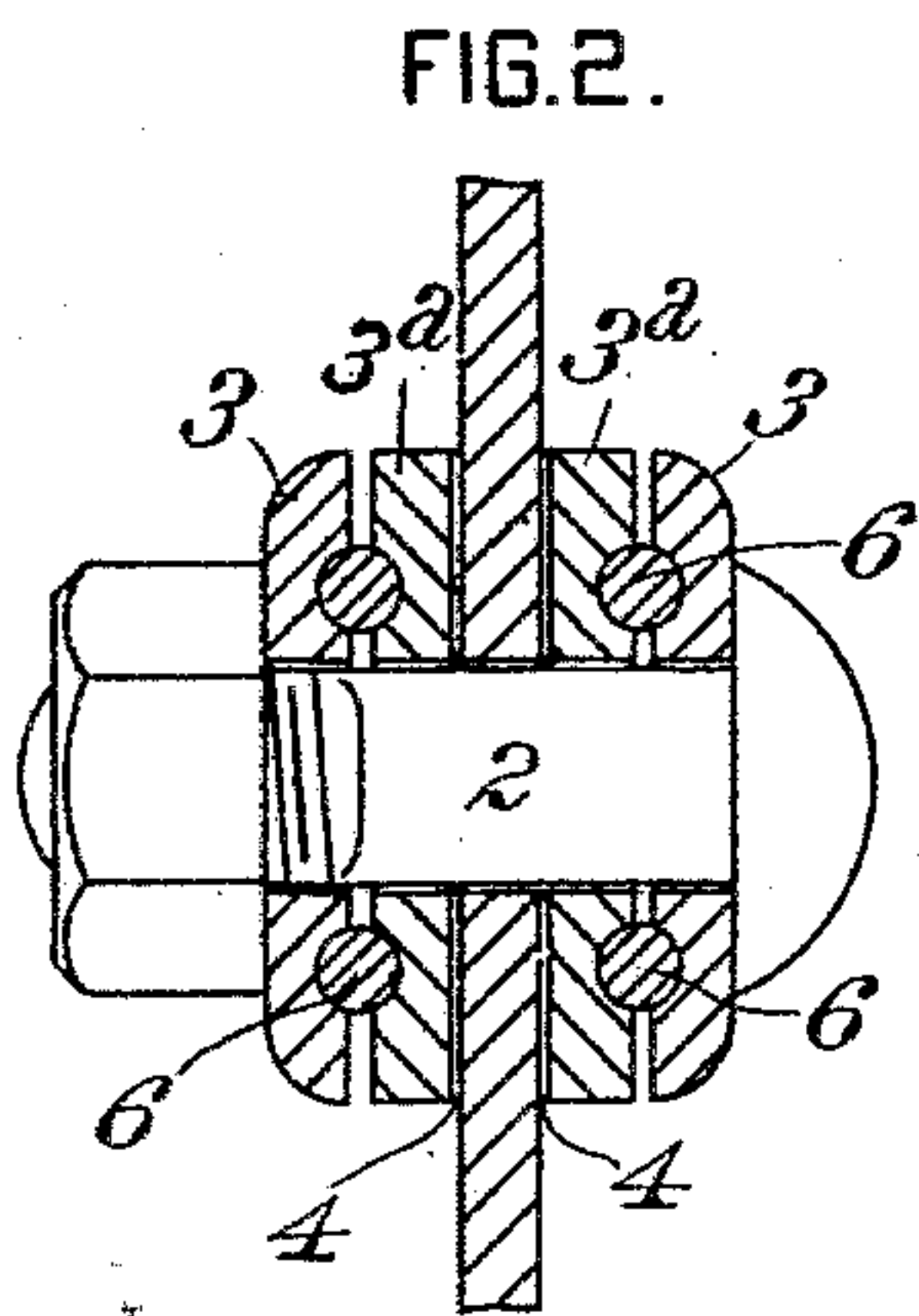
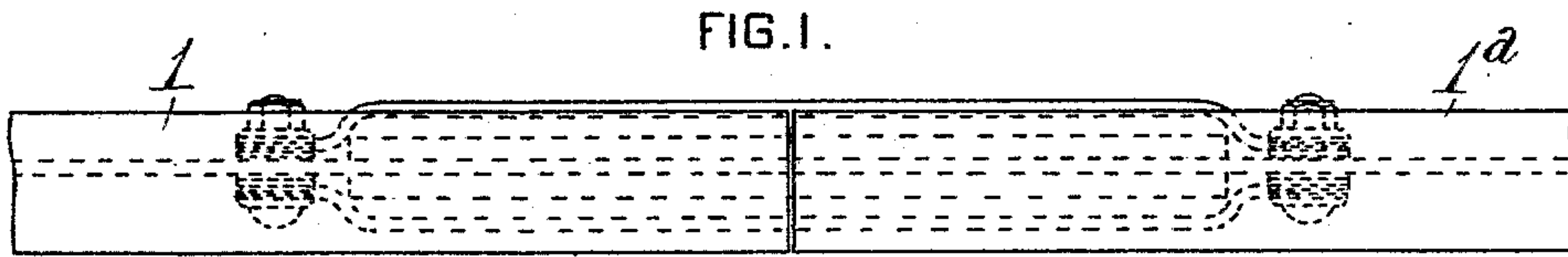
(No Model.)

2 Sheets—Sheet 1.

J. BRYAN.
BOND CONNECTOR FOR RAILS.

No. 566,709.

Patented Aug. 25, 1896.



WITNESSES:
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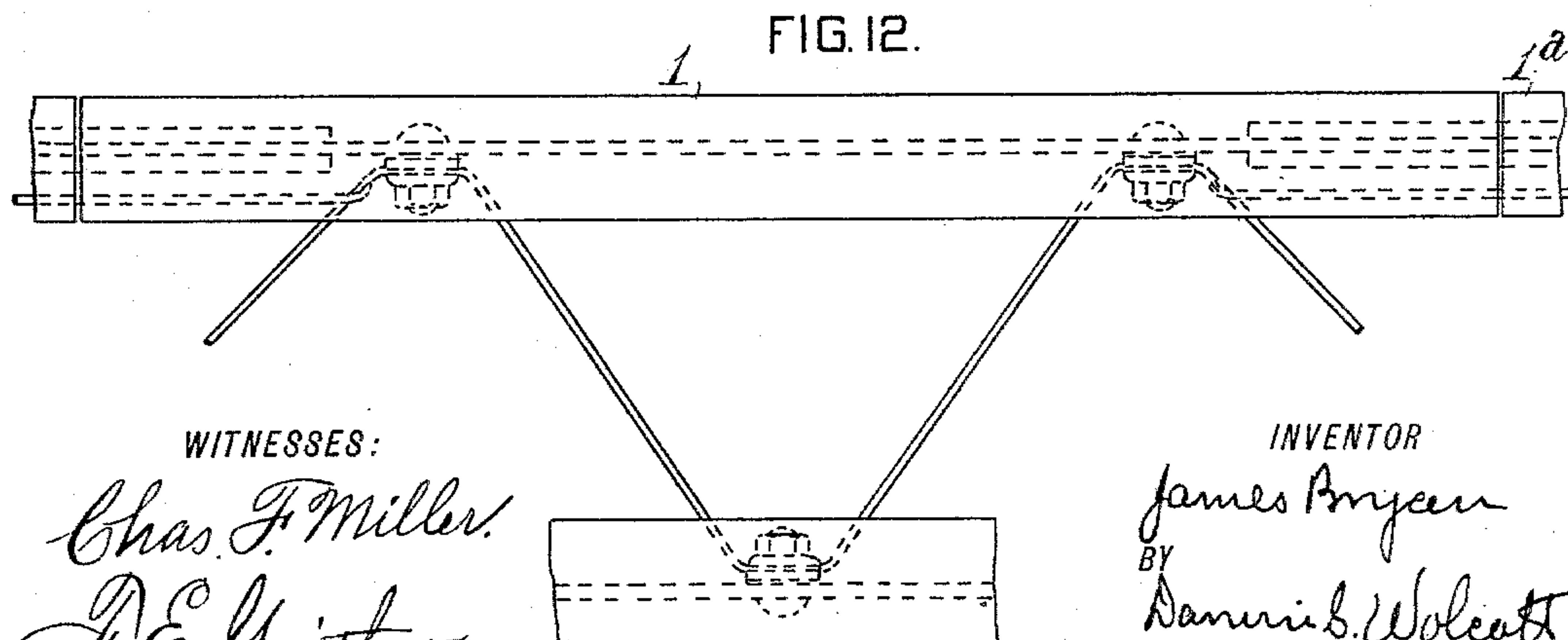
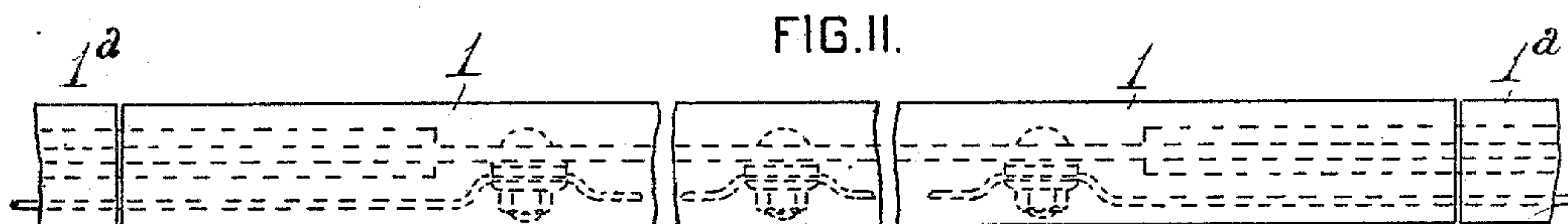
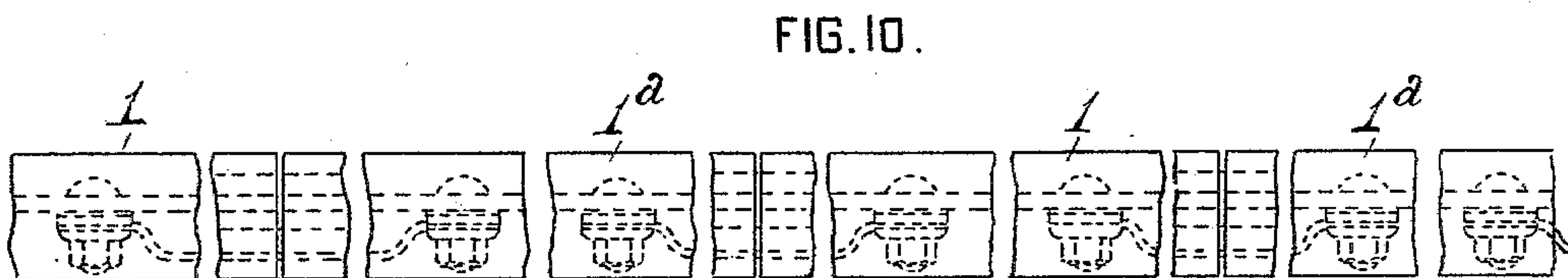
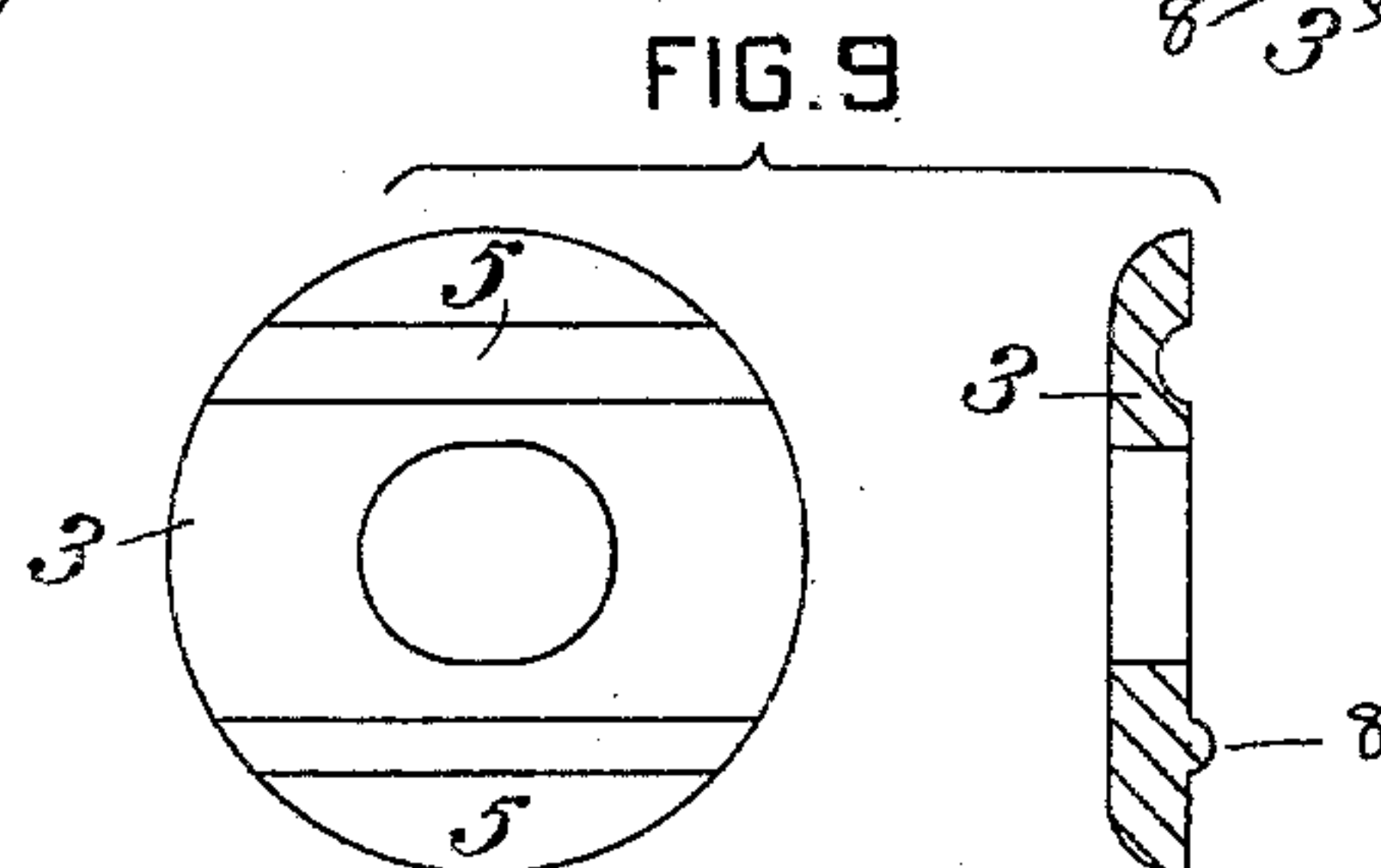
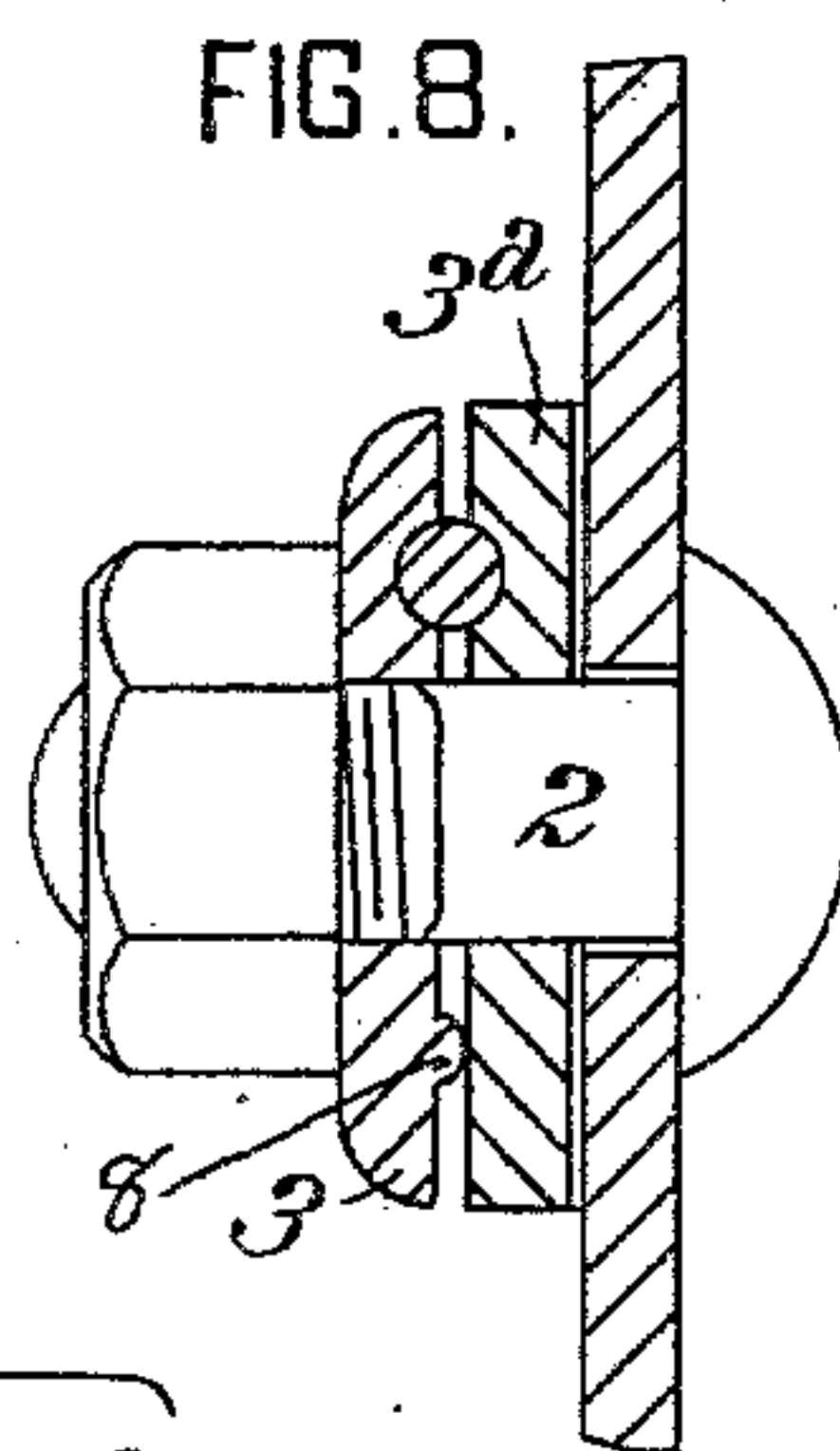
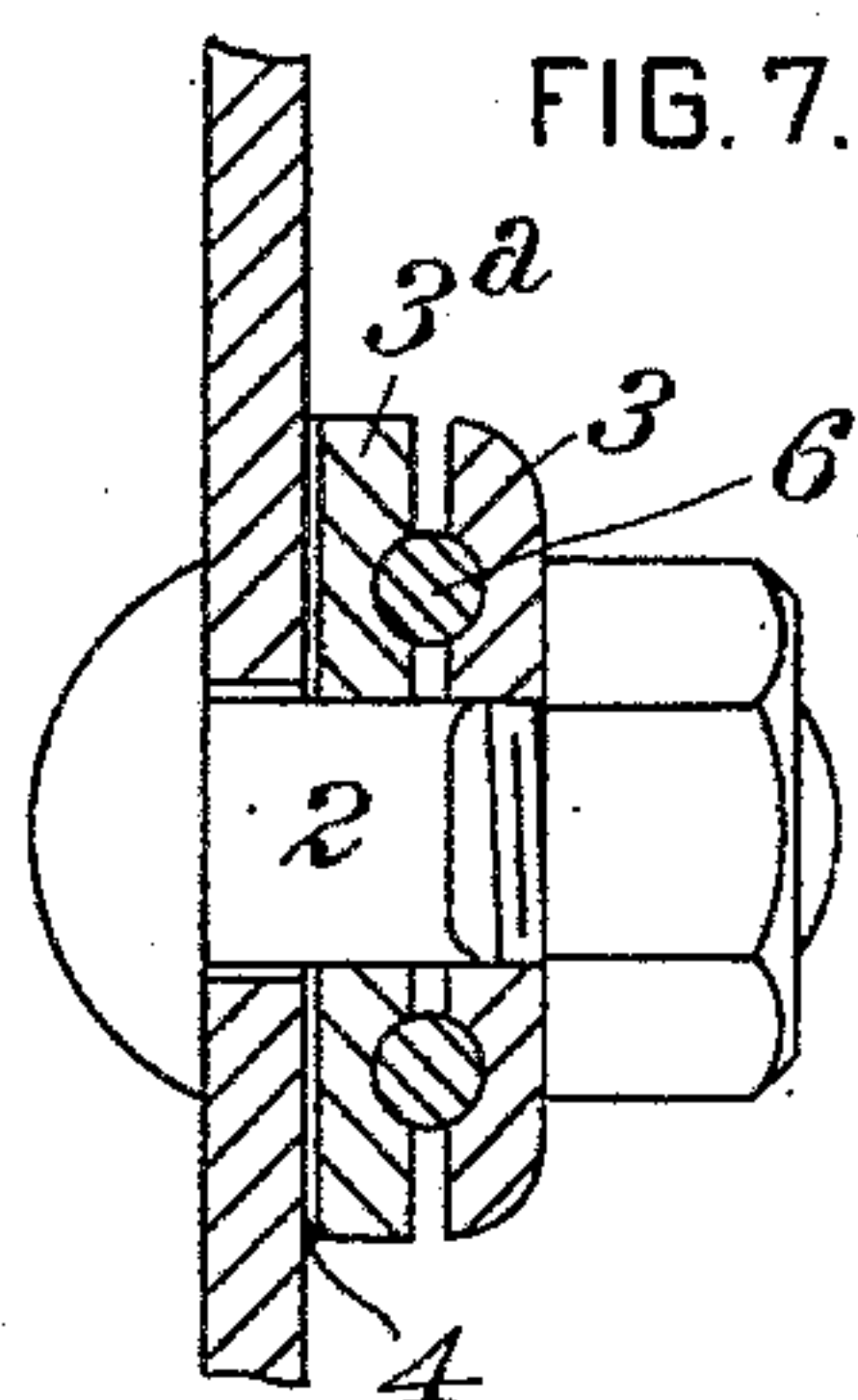
(No Model.)

2 Sheets—Sheet 2.

J. BRYAN.
BOND CONNECTOR FOR RAILS.

No. 566,709.

Patented Aug. 25, 1896.



UNITED STATES PATENT OFFICE.

JAMES BRYAN, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO WILLIAM MORRIS GREENWOOD, OF ALLEGHENY, PENNSYLVANIA.

BOND-CONNECTOR FOR RAILS.

SPECIFICATION forming part of Letters Patent No. 566,709, dated August 25, 1896.

Application filed May 21, 1896. Serial No. 592,379. (No model.)

To all whom it may concern:

Be it known that I, JAMES BRYAN, a subject of the Queen of Great Britain, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Bond-Connectors for Rails, of which improvements the following is a specification.

The invention described herein relates to certain improvements in that class of devices employed for electrically connecting the adjacent end of railroad-rails generally known as "bond-connectors," and has for its object such a construction of connector as will permit of a good electrical contact being formed and maintained between the rails and the several parts of the connector, and the latter shall have a current-carrying capacity approximately equal to that of the rail.

It is a further object of the invention to provide a bond-connector which can be employed for attaching a continuous wire to the rail independent of the bond-wires at points intermediate of the rail ends or at the points at which the bond-wires are attached.

In general terms the invention consists in the construction and combination substantially as hereinafter described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a plan showing the adjacent ends of two rails having my improved bond-connector applied thereto. Fig. 2 is a sectional view, the plane of section being indicated by the line III III, Fig. 3. Fig. 3 is a side elevation, the connector applied to the web of the rail. Fig. 4 illustrates the washer in side and edge views. Fig. 5 illustrates one of the clamping-plates by similar views. Fig. 6 shows end and side elevations of the bolt. Figs. 7 and 8 are sectional views of modifications of my improvement. Fig. 9 shows side and edge views of one of the clamping-plates used in the construction shown in Fig. 8; and Figs. 10, 11, and 12 are plan views of rails, showing different arrangements of bonds and continuous wires.

In the practice of my invention holes, preferably elliptical or angular in outline, are formed through the webs of adjacent rails 1 1^a, said holes being by preference located near the ends of the fish-plate for the reception of

bolts corresponding in cross-section to the contour of the holes in the rails. Before inserting the bolts 2 in the holes in the webs, clamping-plates 3 3^a and washer 4 are slipped onto the bolts, which are then inserted in the holes. On the projecting ends of the bolts are placed another washer 4 and clamping-plate 3^a and 3 in the order named. The clamping-plates 3^a are formed of any suitable conducting material, preferably bronze or brass, and are provided on one face with one or more grooves 5, which form seats for the reception of the bond-wires 6.

The washers 3 may be formed of iron, steel, bronze, or brass, or other suitable rigid material, and are preferably provided with grooves on one face to form seats for the bond-wires. The washer 4 is preferably formed of soft copper or other suitable good conducting metal which will flow under pressure, so that the washer will form a close contact with the web of the rail and the plain face of the clamping-plate 3^a, thereby forming a joint which will exclude air and moisture. In order to facilitate the formation of the close contact of the washer with adjacent surfaces, the washer is preferably corrugated concentrically, as when the corrugations are flattened the bearing portions rub against the walls with which they are in contact, and in that way form a more perfect electric joint.

Before the parts are assembled and applied to the rail, as stated, the surfaces of the web of the rail around the holes therethrough are cleaned, removing all dirt and oxid, and the surfaces of the washer, the inner surfaces of the clamping-plates 3^a, and the walls of the seats 5 for the bond-wires are also carefully cleaned. The bond-wires 6, which are preferably formed of copper, are then placed in the seats 5 of the clamping-plates, the surfaces of the wire being carefully cleaned and the nuts 7 screwed up tight, thereby forcing the clamping-plates tightly against the bond-wires, and so compressing the washers as to cause their surfaces to conform closely with the surfaces of the web of the rail and the inner faces of the clamping-plates 3^a.

The washers, inner clamping-plates, and the bond-wires are made of such a size as to have a current-carrying capacity approxi-

mately equal to that of the rails, the difference in conductivity between the metal of the rails and the material of which the connecting device is formed being taken into consideration.

Where heavy currents are employed, it is preferred to adopt the construction shown in Figs. 1, 2, and 3, wherein four wires form the bonds, or three of the wires may be used as rail-to-rail connectors, and the fourth groove in the clamping-plates may be employed for connecting the continuous wire to the rails.

Where the current is comparatively light, the construction shown in Fig. 7 may be employed, both wires serving as rail-to-rail connectors, or one wire as such connector and the continuous wire placed in the other groove.

In Figs. 8 and 9 is shown a construction for connecting rails by a single bond-wire or for the connection of the continuous wire to the rails independently of the rail-to-rail connection.

Fig. 10 illustrates a number of rails connected rail to rail by my improved device, and in Fig. 11 is shown the manner of connecting the rails to each other and to the continuous wire, the latter being connected to the rail near its ends and also at an intermediate point. In Fig. 12 the continuous wire is connected to the rail on one side of the track at the same points as the rail-to-rail connections and to an intermediate point on the opposite rail.

Where two wires are found sufficient to carry the current, only one set of clamping-plates and a single washer are employed, as shown in Fig. 7, and when a single wire is sufficient the construction shown in Fig. 7 may be used, a short section or dummy wire being placed in one of the grooves in the clamping-plates; but it is preferred in such cases to use the construction shown in Figs. 8 and 9, wherein the clamping-plates are formed with a single seat or groove, and one of the plates is provided with a rib or projection 8, which will bear upon the opposite plate, holding the two plates approximately parallel.

In lieu of employing an independent soft-metal washer as a connection between the rail and the holder for the bond-wire, the plate or holder may be formed with a soft or malleable metal face or may be formed entirely of soft or malleable metal. In such construction it is preferred to form the inner face of the plate or holder with concentric ribs or ridges 9, which will flatten out and form a tight joint with the rail.

It is characteristic of my improvement that the bond or continuous wire is connected by a good electrical joint with a holder, which in turn is electrically connected to the rail by a body of soft or malleable metal adapted to form, in addition to its electrical function, a tight hermetic joint between the holder and plate, thoroughly excluding air and moisture.

I claim herein as my invention—

1. In a bond-connector for rails, the combination of a plate or holder, provided with a seat for a bond-wire, soft or easily-malleable metal interposed between the plate and rail, and a bolt for attaching the plate to the rail and pressing the metal against the rail, substantially as set forth.

2. In a bond-connector for rails, the combination of plates adapted to clamp the bond-connector between them, soft or easily-malleable metal arranged between one of the plates and the rail, and a bolt for securing the plates to the rail and compressing the bond-wire and the malleable metal, substantially as set forth.

3. A bond-connector for rails, having in combination two annular clamping-plates, one of said plates being provided with one or more transverse seats for the reception of bond-wire, a malleable-metal washer adapted to be interposed between one of the clamping-plates and the rail, and a bolt for attaching the clamping-plates and washer to the rail and forcing the clamping-plates against the interposed bond-wire, substantially as set forth.

4. A bond-connector for rails, having in combination two annular clamping-plates, one of said plates being provided with one or more transverse seats for the reception of bond-wires, a corrugated malleable-metal washer adapted to be interposed between one of the clamping-plates and the rail, and a bolt for attaching the clamping-plates to the rail and forcing them against an interposed bond-wire, substantially as set forth.

5. In a bond-connector for rails, the combination of plate provided with a seat for a bond-wire, a malleable-metal washer adapted to be interposed between the rail and the plate, and a bolt for attaching the plate to the rail and compressing the washer between the rail and plate, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JAMES BRYAN.

Witnesses:

DARWIN S. WOLCOTT,
F. E. GAITHER.