

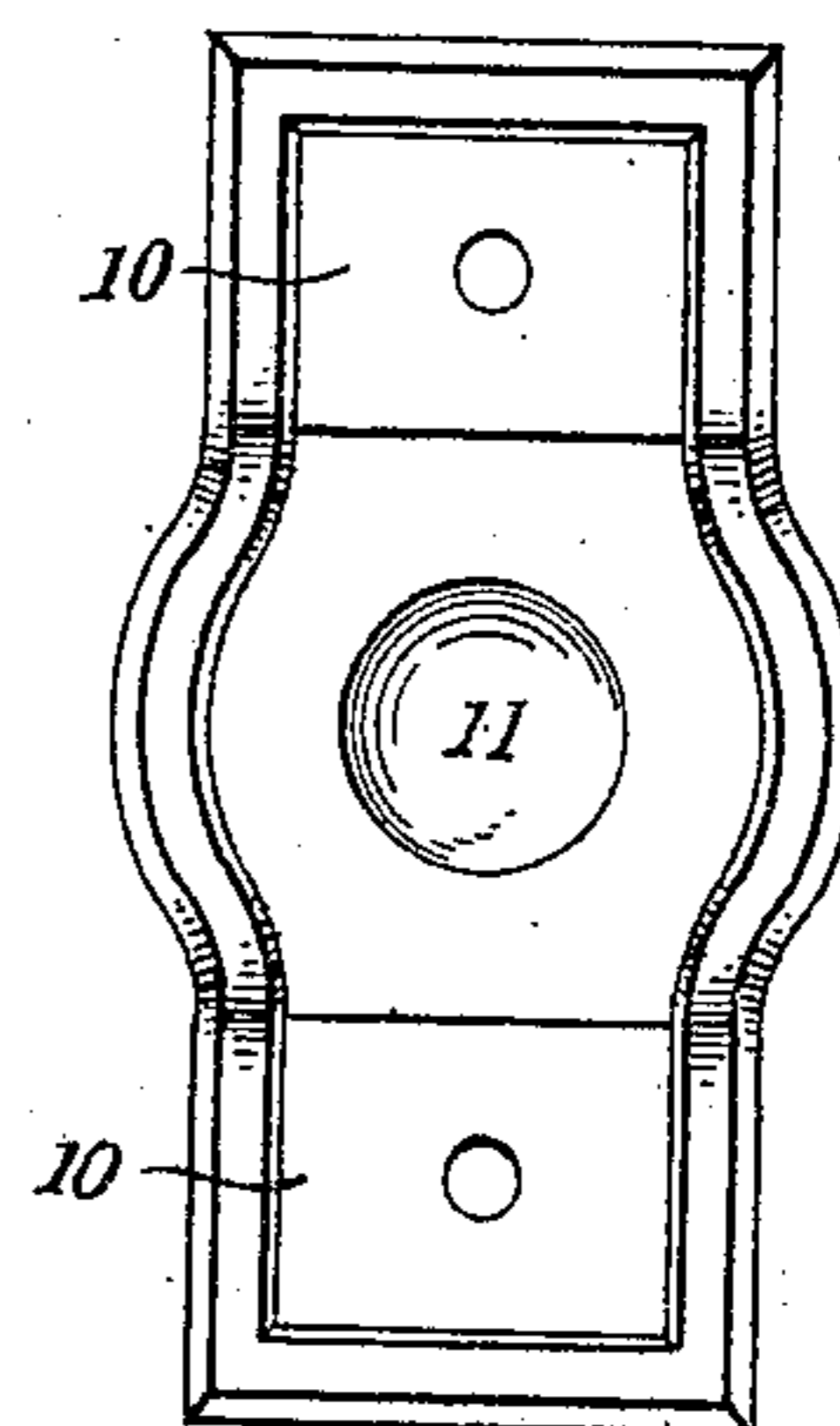
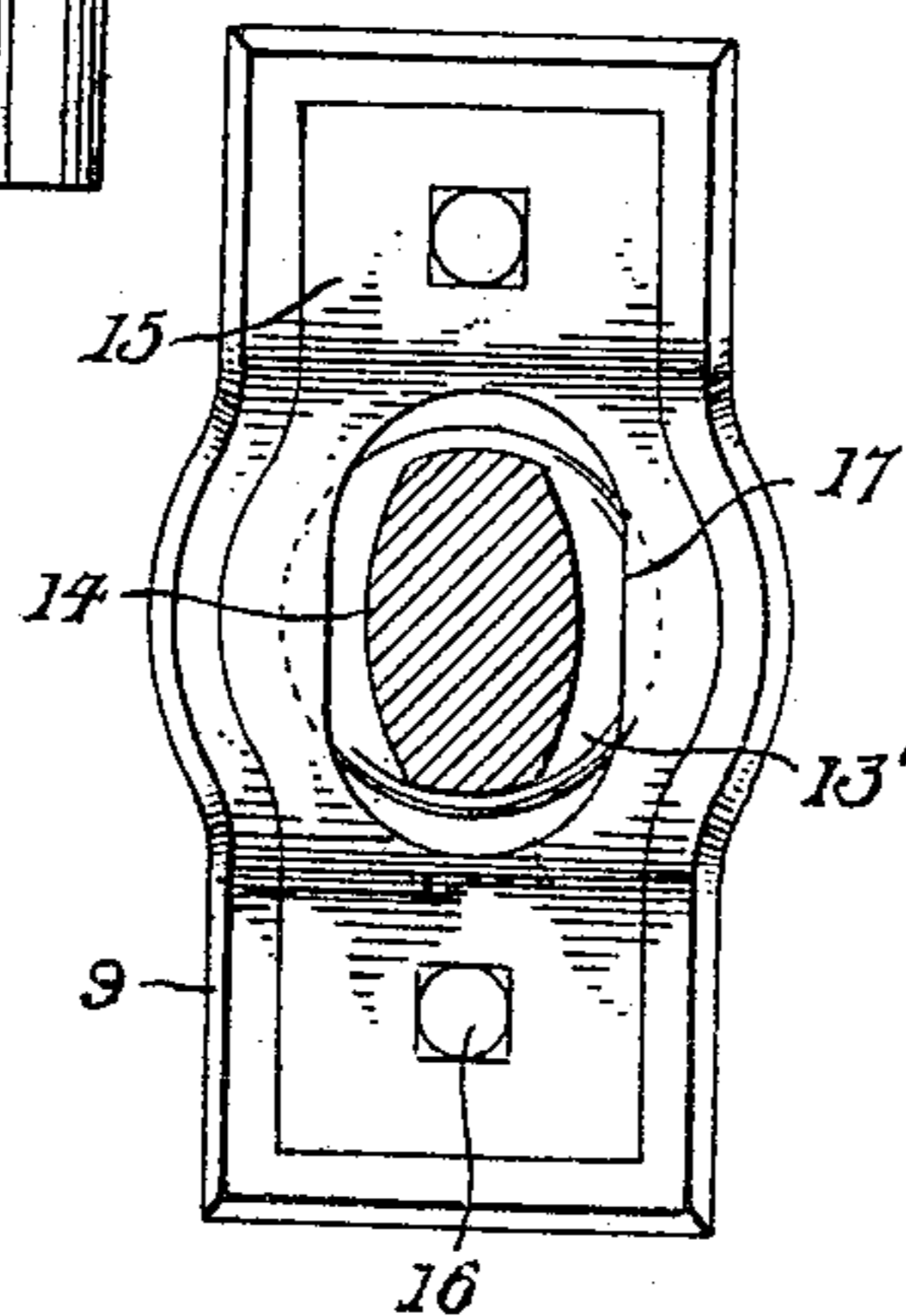
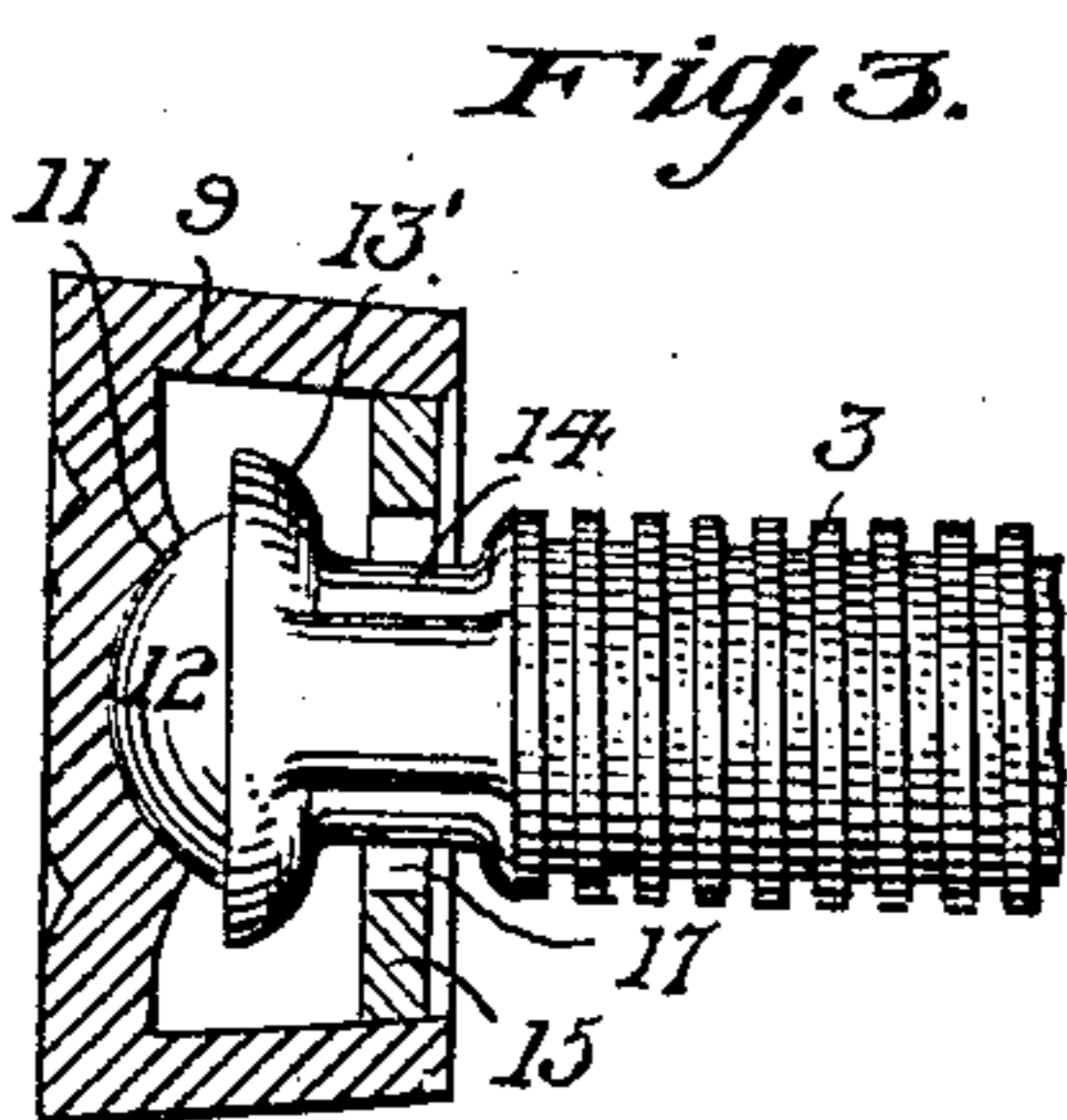
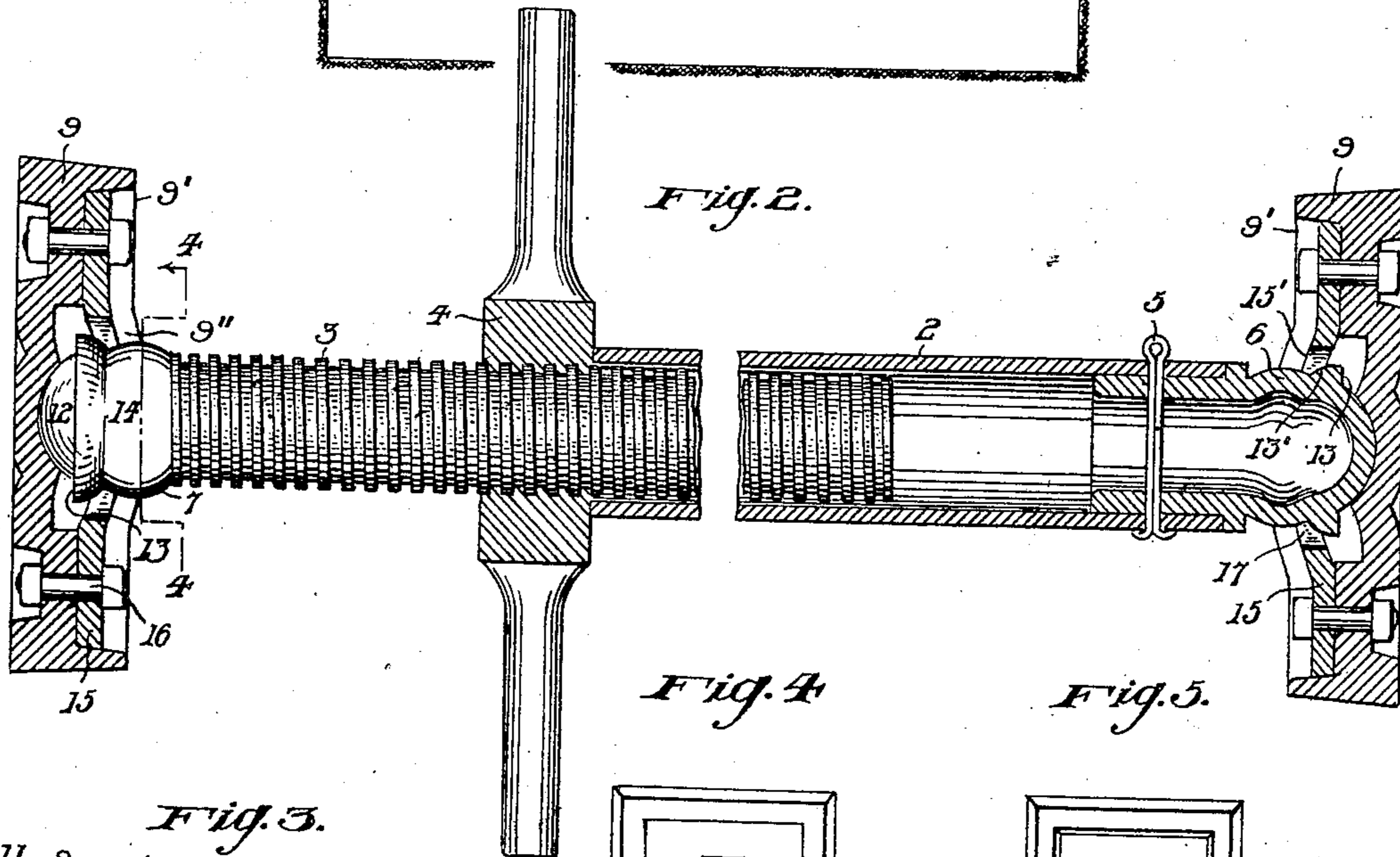
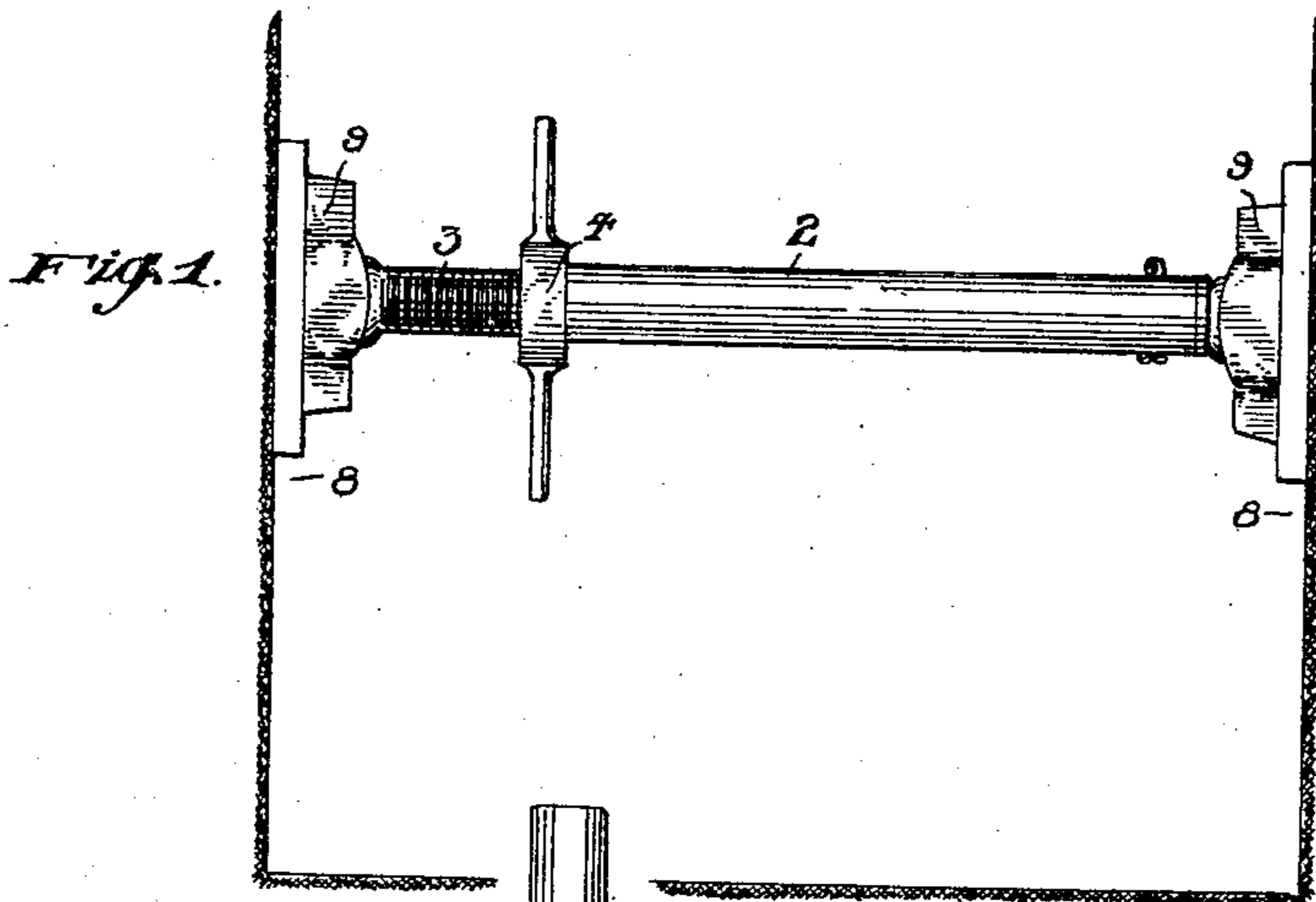
No. 886,956.

PATENTED MAY 5, 1908.

M. R. DE FRANCE & A. E. READ.

TRENCH BRACE.

APPLICATION FILED FEB. 14, 1908.



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UNITED STATES PATENT OFFICE.

MURRELL R. DE FRANCE AND ALBERT E. READ, OF BELLEVUE, PENNSYLVANIA.

TRENCH-BRACE.

No. 886,956.

Specification of Letters Patent.

Patented May 5, 1908.

Application filed February 14, 1908. Serial No. 415,841.

To all whom it may concern:

Be it known that we, MURRELL R. DE FRANCE and ALBERT E. READ, residents of Bellevue, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Trench-Braces, of which the following is a specification.

Extensible trench braces, used to prevent excavations from caving in, are subjected to very rough usage. The parts most frequently damaged are the bearing shoes, and more particularly the devices which loosely confine the shoes on the brace ends. Workmen do not ordinarily exercise care in having the shoes directly opposite each other when placing the brace, the general practice being to straighten them up with a sledge hammer after they have been expanded within the trench. This sledging is disastrous to the shoes, and particularly to the devices heretofore employed for loosely uniting the shoes and brace arms.

The primary object of this invention is to provide a shoe and securing means of such form as to withstand this rough usage, and at the same time afford an efficient connection and bearing. To this end, we so form the shoe as to completely embrace all portions of the securing device as well as the whole of the bearing end of the arm and thus effectually protect them from the sledgehammer blows. The shoes are of such substantial construction as not to be injured thereby.

In the accompanying drawings Figure 1 is an elevation of the brace in operative position. Fig. 2 is a vertical sectional view. Fig. 3 is a horizontal cross-section. Fig. 4 is an inner face view of one of the shoes with the arm securing device in position and with the arm shown in section on line 4—4 of Fig. 2. Fig. 5 is a similar view of one of the shoes with the brace arm and arm securing means removed.

The telescoping portions of the brace arms are of well known construction, 2 being the tubular arm, and 3 the threaded arm which moves freely therein, with the usual lever nut 4 operating on arm 3 and bearing against the extremity of arm 2 for expanding the brace. Tubular arm 2 detachably connects at 5 with head 6 which forms the end bearing for that arm. The exterior of head 6 which coöperates with its shoe is of exactly the same formation as head 7 forming the in-

tegral outer end of arm 3, and the shoes and shoe-securing means are of like construction at each end of the brace.

Each of the shoes 9, which bears against the shoring or temporary lining 8 of the excavation, is of general rectangular form and recessed on its inner face, the end portions of the recess being shallower than the intermediate portion to form faces 10. Within the central deeper portion of the recess in the partially spherical bearing socket 11, and fitting the same is the similarly formed extremity 12 of arm-head 6 or 7, as the case may be. The spherical surface of extremity 12 is of larger area than the socket so that the brace arm may have limited angular movement in any direction.

For loosely uniting the shoes and arms, heads 6 and 7 are formed each with a shoulder or enlargement 13 adjacent to the rounded extremity 12, and inwardly from this shoulder the head is of irregular section, having a longer diameter or greater thickness in one direction than in the direction at right angles thereto, as indicated at 14, the section somewhat resembling an oval, as clearly shown in Fig. 4. Embracing this portion of the head is securing plate 15 which fits wholly within the head recess and at its opposite ends bears against faces 10 where it is secured by bolts 16. This plate is completely surrounded by the rim-like inner portion 9' of the shoe, and hence it is fully protected on all sides.

Passage 17 through plate 15 is oval in shape and is larger than the irregular head section extending therethrough, thereby affording the brace-arm limited angular movement in any direction. But as the longer diameter of the head section 14 is greater than the width of passage 17, the arm is prevented from making a complete rotation, which if permitted would obviously interfere with the expansion of the brace effected by lever nut 4. Shoulder 13 is too large to pass through opening 17, thus preventing the parts from separating.

The central portion of plate 15 is bulged or bellied outwardly at 15' to afford sufficient room for the turning of shoulder 13, the face of the shoulder bearing against the plate, being rounded as indicated at 13', to facilitate the angular movement of the arm in its shoe bearing. Rim 9' of the shoe is enlarged at 9'' to protect the bulged portion 15' of the plate.

In practice, it frequently happens that the shoes are not alined when inserting the brace, or they may be moved out of line by slipping of the brace or the shoring. While the flexibility of the joints compensates for this without straining or injuring the brace, it is of course desirable to have the shoes directly opposite each other, so they are usually driven into alinement with a sledge hammer or similar tool. Our invention is designed especially to withstand this rough usage. The shoes are so formed as not to be injured by the sledging, regardless of the side or end struck, and as they completely inclose the securing means the latter is fully protected. Many braces of the types now in use are broken and destroyed simply because the securing means or joints are exposed, and being close to the shoes receive the destructive blows intended for the latter.

While we have here shown, described, and claimed the improvement as a trench brace, it will be understood that the device may be used in any and all forms of jacking or supporting operations where such an implement may be employed.

We claim:—

1. In a trench brace, the combination of a shoe recessed on its inner face, a brace arm bearing in the recess, a plate-like securing device entered and secured wholly within the shoe recess, said plate-like device having a passage for the brace-arm, and a shoulder on the arm within the shoe recess and back of the plate-like device and preventing outward movement of the arm.

2. In a trench brace, the combination of a shoe, a brace arm bearing at its end against the shoe, a portion of the arm near its end being non-circular in cross-section with a shoulder between said cross-sectional portion and the bearing end, and an arm-holding plate embracing the non-circular portion of the arm and secured to the shoe, the arm passage through the plate being larger than the non-circular arm section and of such shape as to prevent complete rotation of the arm without interfering with the angular movement of the latter.

3. In a trench brace, the combination of a shoe, a brace arm bearing at its end against the shoe, a portion of the arm near its end having a cross-sectional shape of greater length than width with a shoulder on the arm between said portion and its bearing end, a plate embracing said cross-sectional portion of the arm and secured to the shoe, the arm passage through the plate being of oval shape and of a size to afford the arm angular movement but holding it against complete rotation, the arm shoulder preventing movement of the bearing end of the arm outwardly through the plate passage.

4. In a trench brace, the combination of a shoe recessed on its inner face and within said recess formed with a bearing socket, a brace arm having a rounded extremity adapted to bear in said socket, the arm having a shoulder adjacent its rounded end, the arm inwardly from the shoulder being of substantially oval section, and a plate secured wholly within the shoe recess and having an oval passage through which the arm extends, said passage being larger than the oval-like section of the arm and embracing the arm in the plane of said section, the width of the oval passage being less than the longer diameter of the oval-like section of the arm to prevent complete rotation of the latter.

5. In a trench brace, the combination of a shoe recessed on its inner face, the central portion of the recess being deeper than its ends, a brace arm bearing in the central part of the recess, a plate entered wholly within the recess and secured to the inner faces of the shallow end portions thereof, the plate having a passage through which the brace arm extends, and a shoulder on the arm within the recess and back of the plate for engaging the latter and preventing outward movement of the arm.

In testimony whereof we affix our signatures in presence of two witnesses.

MURRELL R. DE FRANCE.
ALBERT E. READ.

Witnesses:

JNO. J. FITZGERALD,
J. M. NESBIT.