

No. 697,962.

Patented Apr. 22, 1902.

J. M. ANDERSEN.

RAIL BOND.

(Application filed Feb. 10, 1902.)

(No Model.)

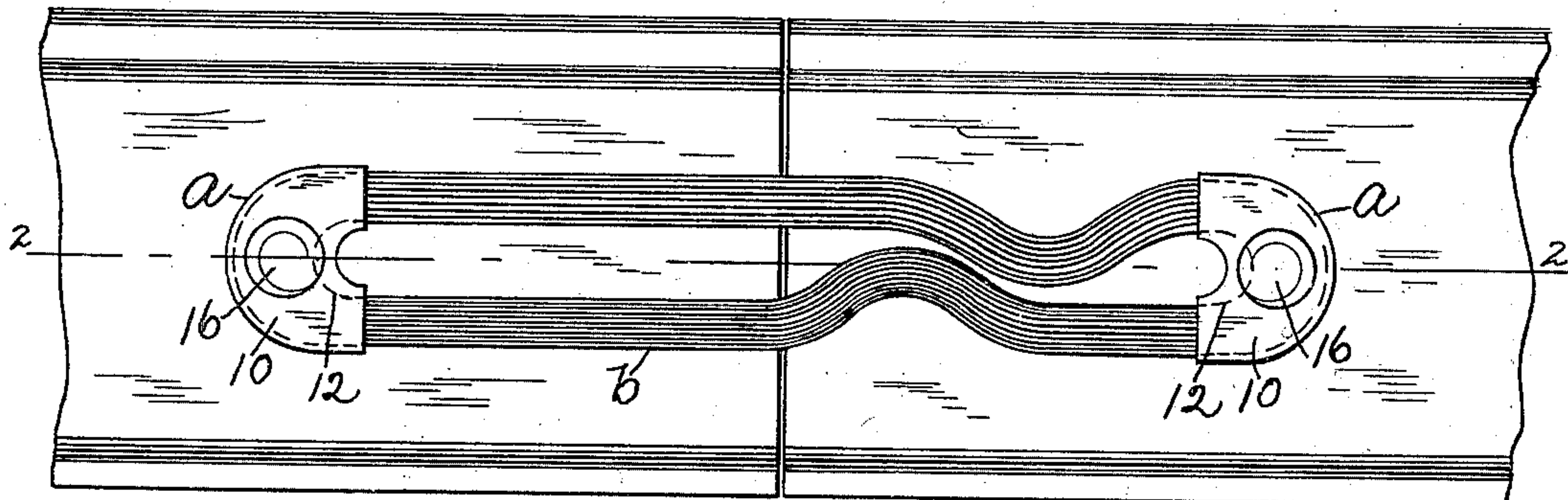


Fig. 1.

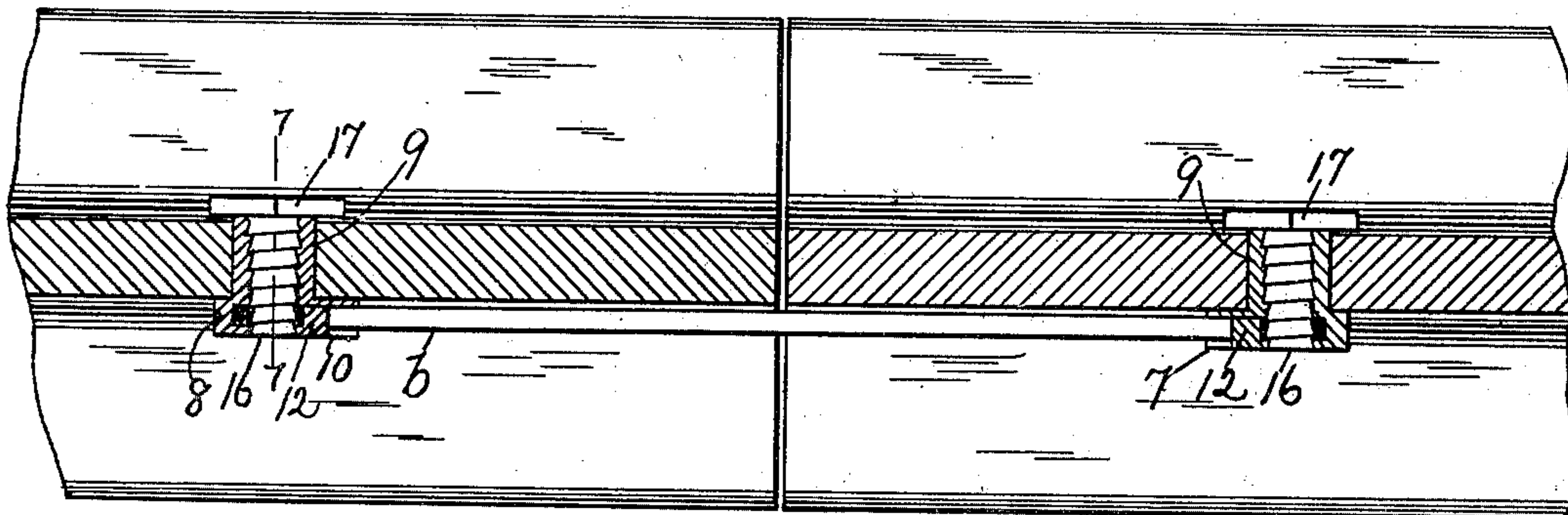


Fig. 2.

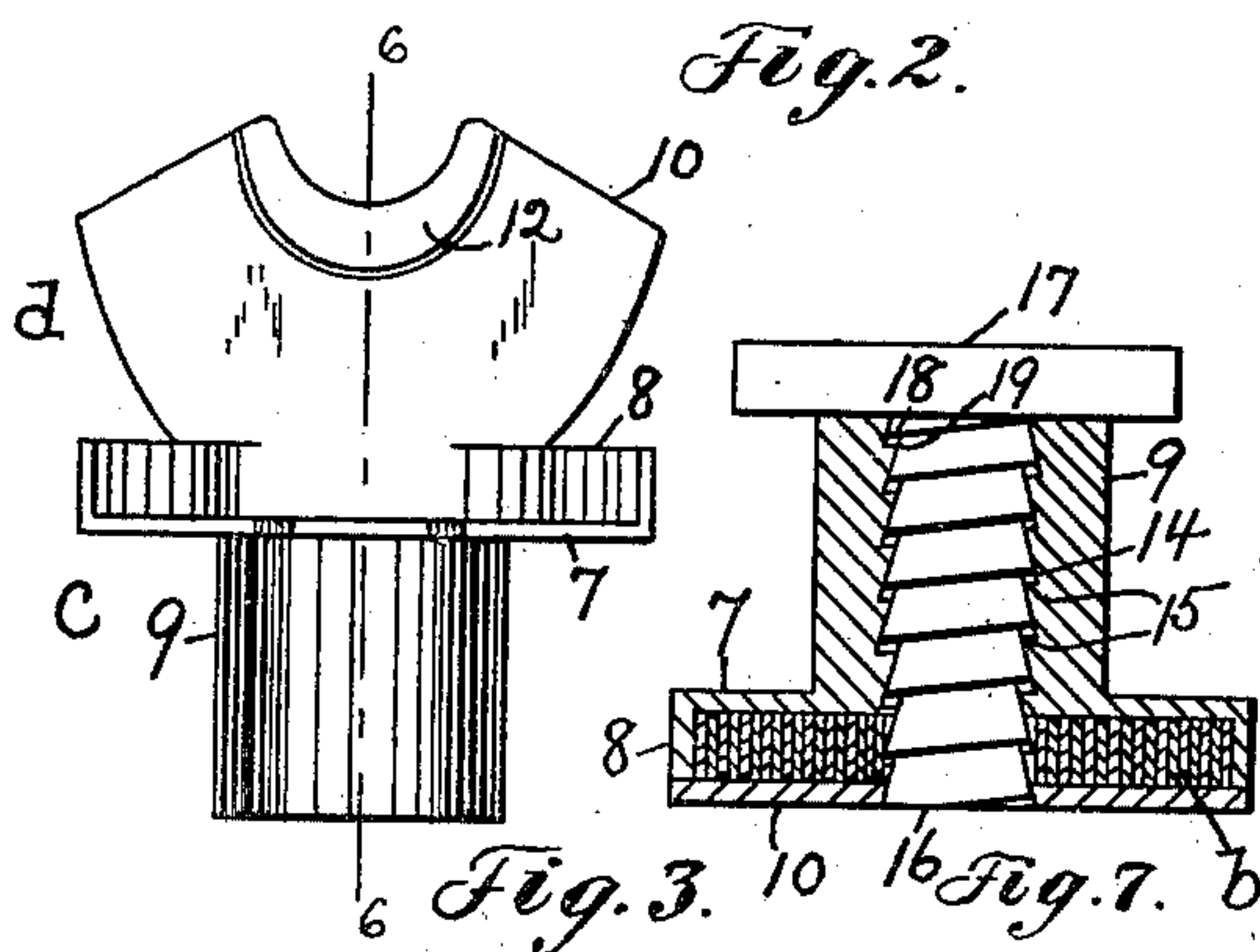


Fig. 3.

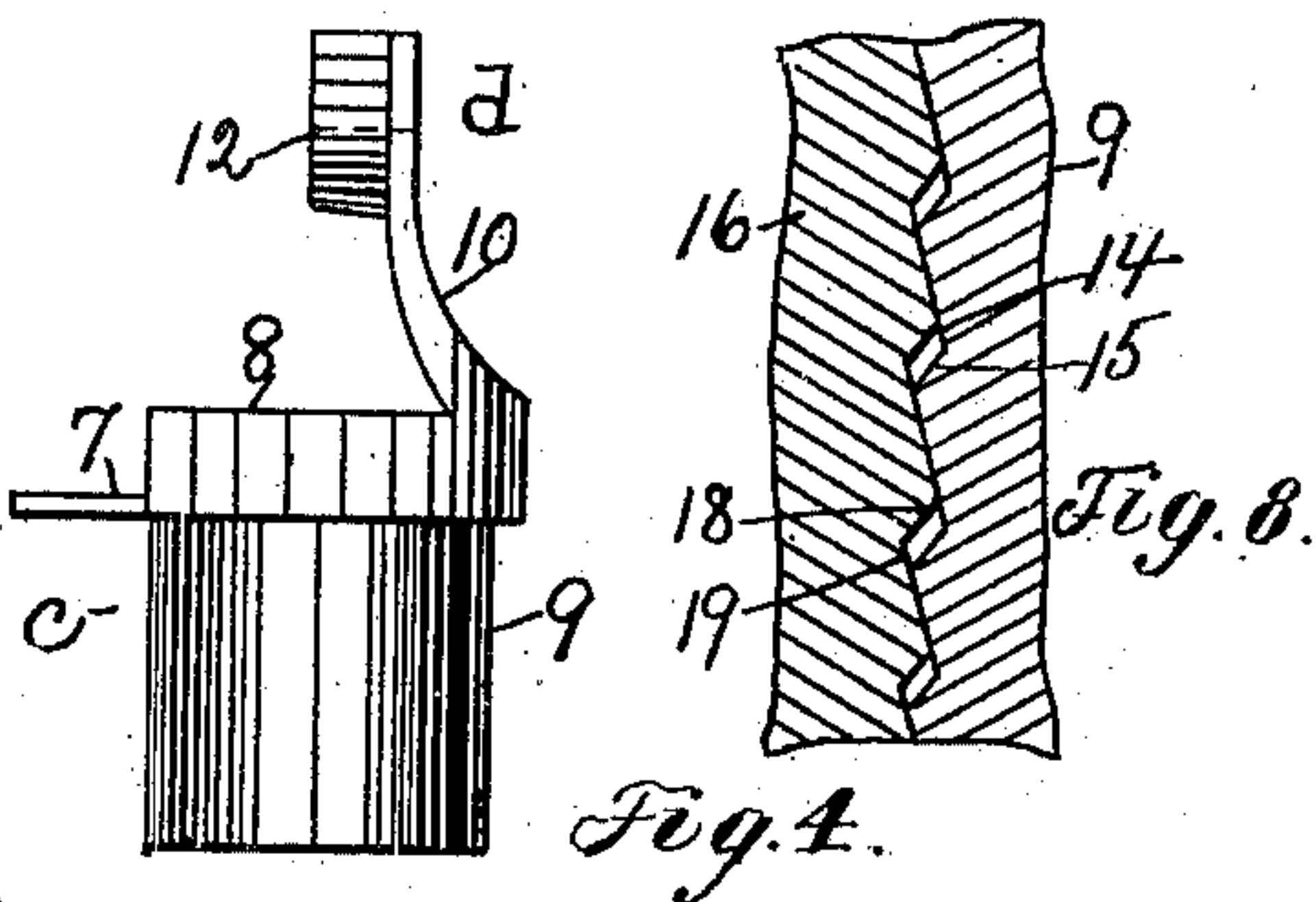


Fig. 4.

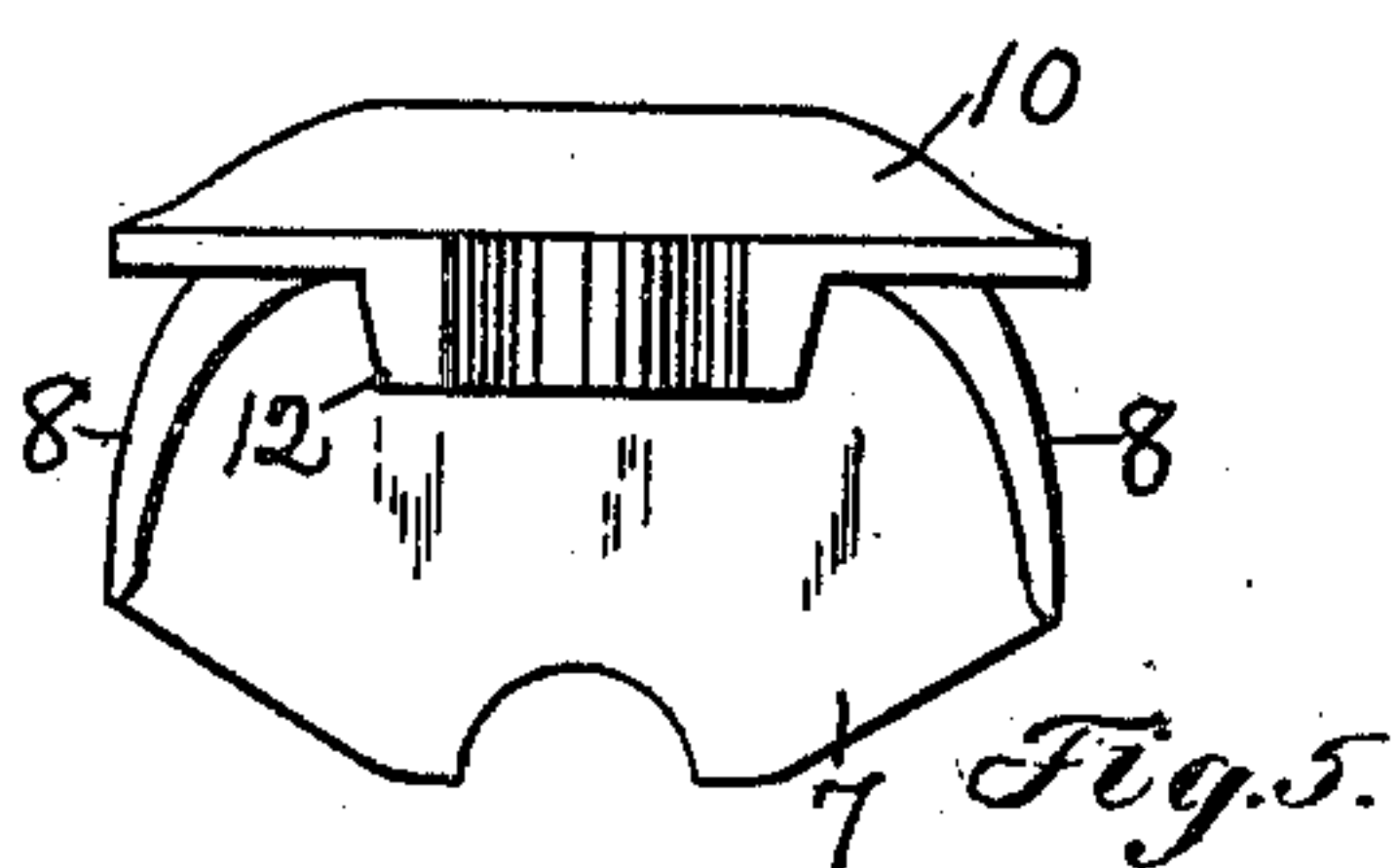


Fig. 5.

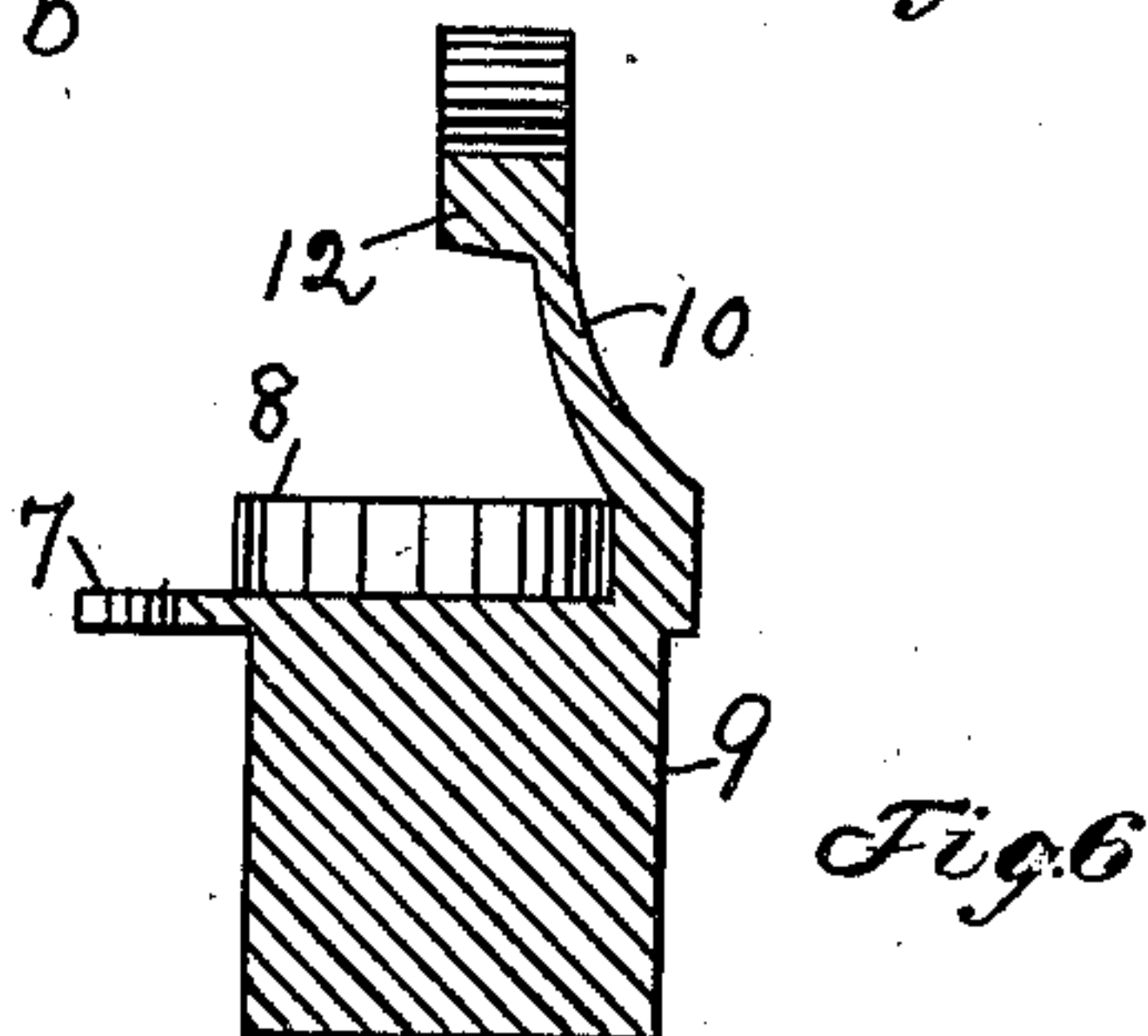


Fig. 6.

Witnesses.  
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# UNITED STATES PATENT OFFICE.

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## RAIL-BOND.

SPECIFICATION forming part of Letters Patent No. 697,962, dated April 22, 1902.

Application filed February 10, 1902. Serial No. 93,279. (No model.)

*To all whom it may concern:*

Be it known that I, JOHAN M. ANDERSEN, a citizen of the United States, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Rail-Bonds, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

10 This invention relates to a rail-bond for electric-railway systems, and has for its object to provide a simple and efficient bond with which a superior electrical connection of the rails may be effected. For this purpose I employ a bond-terminal comprising  
15 two members between which the bonding or connecting conductor is secured, as will be described, so as to obtain a good electrical connection between the said conductor and  
20 the said terminal. The bond-terminal is also provided with a boss which is adapted to be inserted into and preferably through a hole in the rail and is provided with a threaded opening or socket, the threads of which are  
25 provided with faces of unequal length, which are engaged by a bolt or screw having screw-threads of corresponding shape, the longer faces of the screw-threaded bolt acting on the  
30 longer faces of the screw-threads of the socket to expand or enlarge the diameter of the hollow boss and force it into close and intimate contact with the rail, as will be described. These and other features of this invention will be pointed out in the claims at the end of  
35 this specification.

40 Figure 1 is a side elevation of a rail-bond embodying this invention; Fig. 2, a section on the line 2 2, Fig. 1; and Figs. 3 to 8, inclusive, details of the bond-terminal to be referred to, Fig. 6 being a section on the line 6 6, Fig. 3, and Fig. 7 being a section on the line 7 7, Fig. 2, on an enlarged scale.

45 The rail-bond embodying this invention comprises two terminals *a* and a bonding-conductor *b*, preferably composed of a wire wound into the form of a coil. The terminals *a* comprise two members *c* *d*, between which the ends of the bonding-conductor *b* are firmly secured, as will be described. The members  
50 *c* *d* may and preferably will be made as herein shown, the member *c* consisting of a sub-

stantially flat portion 7, provided on one face, which may be designated the "top" face, with a substantially semicircular flange 8 and on its other or lower face with a boss or projection 9. The member *d* comprises, as shown, 55 a substantially semicircular piece 10, which is cast integral with the member *c*, with the rear portion of the piece 10 attached to the back portion of the flange 8, the piece 10 normally extending upward from the said flange, as represented in Figs. 4 and 6, and having extended from its front face, near the top thereof, a substantially semicircular lug or projection 12 of a depth or thickness sub- 60 stantially equal to the height of the flange 8, so that when the member *d* is bent or pressed down upon the member *c* the piece 10 will rest upon the top of the flange 8 and the projection or lug 12 will rest upon the top piece 7 of the member *c*. This position of the member *d* may be termed its "closed" position, and when in said position the lug or projection 12 forms a locking or anchoring projection for the bonding-conductor *b*, the bent 65 end of which is laid on the top of the member *c* before the member *d* is closed thereon. After the bent or rounded end of the conductor *b* is placed in position between the members *c* *d* the latter are fluxed and subjected 80 to heat and pressure, so as to firmly unite or weld the two members together and form a solid bond-terminal, with the end of the bonding-conductor securely fastened between them. By providing one member of the bond-terminal with the flange 8 and the other member with the locking lug or projection 12 the terminals can be cast in one piece with a minimum amount of labor and at a minimum expense. 90

The boss 9 of each terminal is provided with an opening which may and preferably will extend through the terminal and through the bonding-conductor, as shown in Fig. 2, and the said opening is provided with screw- 95 threads, each of which is composed of faces 14 15 of unequal length, the longer face 14 extending in the direction of the length of the boss. The screw-threaded opening in the boss is designed to receive the threaded shank 100 16 of a bolt or screw 17, the threads on the shank 16 comprising faces 18 19 of unequal



length, the longer face 19 extending in the direction of the length of the shank and constituting the expanding face of the thread on the shank. When the threaded shank 16 is inserted into the threaded opening in the boss, both faces of the thread on the shank engage corresponding faces of the thread in the opening in the boss, and the said shank is inserted into the said opening after the manner of an ordinary screw or bolt. When, however, the head of the bolt or screw engages the end of the boss or the rail and the bolt or screw is further turned in the act of screwing it into the boss, the longer inclined faces of the threads on the shank of the bolt move down on the longer inclined faces of the threads in the opening after the manner represented in Fig. 7, thus wedging or forcing the metal of the boss outward and expanding it into close and intimate contact with the walls of the opening in the rail through which the boss is extended. During the expanding action referred to the shorter faces of the screw-thread on the shank 16 are withdrawn from engagement with the shorter faces of the thread in the opening in the boss, as represented in Fig. 7. These shorter faces may be made substantially at right angles to the longitudinal axes of the boss and shank, in which case substantially the entire length of the shank of the bolt or screw is utilized for expanding purposes; but I do not desire to limit my invention in this respect, as good results may be obtained with a screw in which the shorter faces of the thread are inclined at an angle to the longitudinal axes of the shank and boss, after the manner represented in Fig. 8. It will thus be seen that by means of the expanding terminal screw or bolt the diameter of the terminal boss is enlarged and its outer circumference is forced into close intimate contact with the rail, thus insuring at this point a reduction to a minimum of resistance due to poor contact of the terminal with the rail, while the manner above described of connecting the bonding-conductor *b* with the terminal reduces to a minimum resistance due to poor electrical connections between these parts.

As a result of the invention above described a superior electrical bonding of or connection between the rails is obtained at a minimum expense.

The conductor *b* may be composed of a single wire wound into the form of a loop or elongated coil, as represented in Fig. 1, and each part of the loop may be bent or corrugated, as shown, or it may be of any other suitable form.

I claim—

1. In a rail-bond, the combination with a

bonding-conductor, of a bond-terminal comprising cooperating members normally separated for the reception of the bonding-conductor and one of which is provided with a locking projection to engage said bonding-conductor when said members are secured in their closed position, substantially as described.

2. In a rail-bond, the combination with a bonding-conductor, of a bond-terminal comprising two members between which said bonding-conductor is secured, one of said members having a flange projecting from one face and a boss from its opposite face, and the other member having a locking projection adapted to be engaged by the bonding-conductor and to lock the same against longitudinal movement, substantially as described.

3. In a rail-bond, the combination with a bond-terminal having a boss provided with a threaded opening, the threads of which comprise faces of unequal length, the longer faces extending in the direction of the length of the said opening, of a screw or bolt having a threaded shank, the threads of which are composed of faces of unequal length, the longer faces extending in the direction of the length of the shank and cooperating with the longer faces of the thread in the opening in the boss, substantially as and for the purpose specified.

4. A bond-terminal for rail-bonds made in a single piece and comprising two members normally open or separated at one end, one of said members having a flange projecting from one face and a boss or projection extended from the opposite face, and the other member having a locking projection or lug on its face adjacent to the first member, substantially as described.

5. In a rail-bond, the combination with a bond-terminal comprising two members, one of which has a flange projecting from one face and a boss projecting from the other face and provided with an opening having an expanding screw-thread composed of faces of unequal length, and the other member having a locking projection or lug, of a screw or bolt having a shank provided with an expanding screw-thread composed of faces of unequal length which cooperate with the screw-threaded opening in said boss, substantially as described.

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

JOHAN M. ANDERSEN.

Witnesses:

JAS. H. CHURCHILL,  
J. MURPHY.