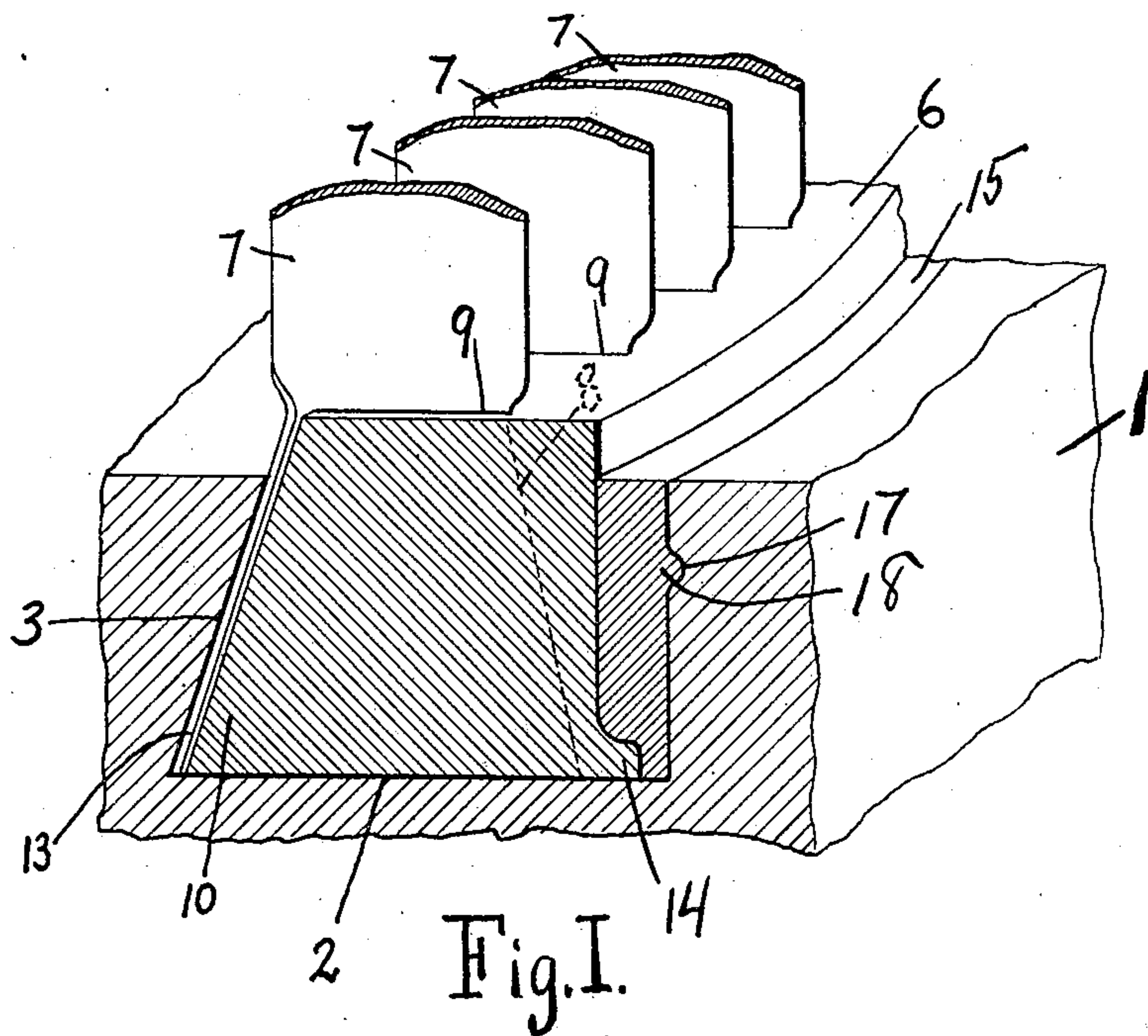
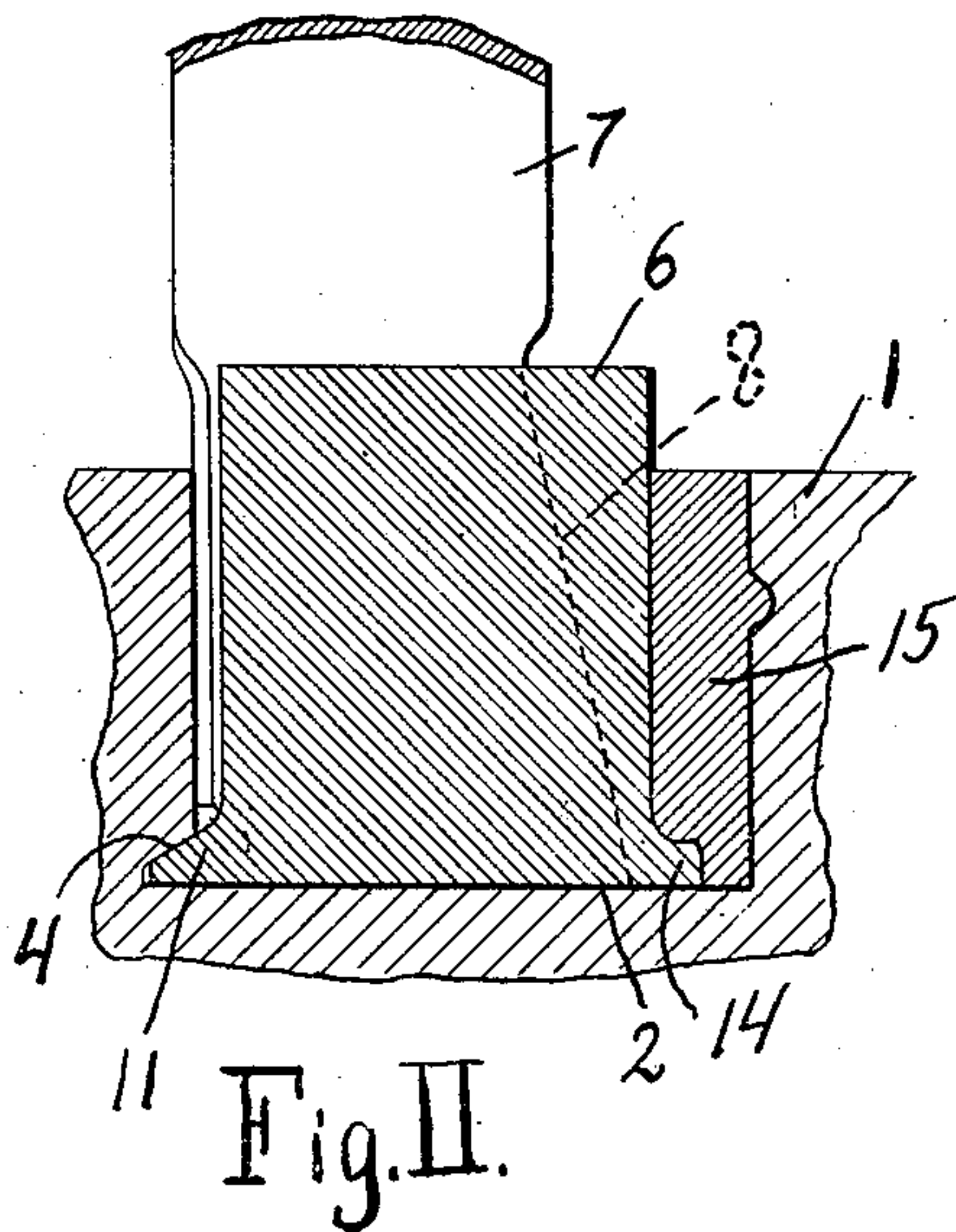
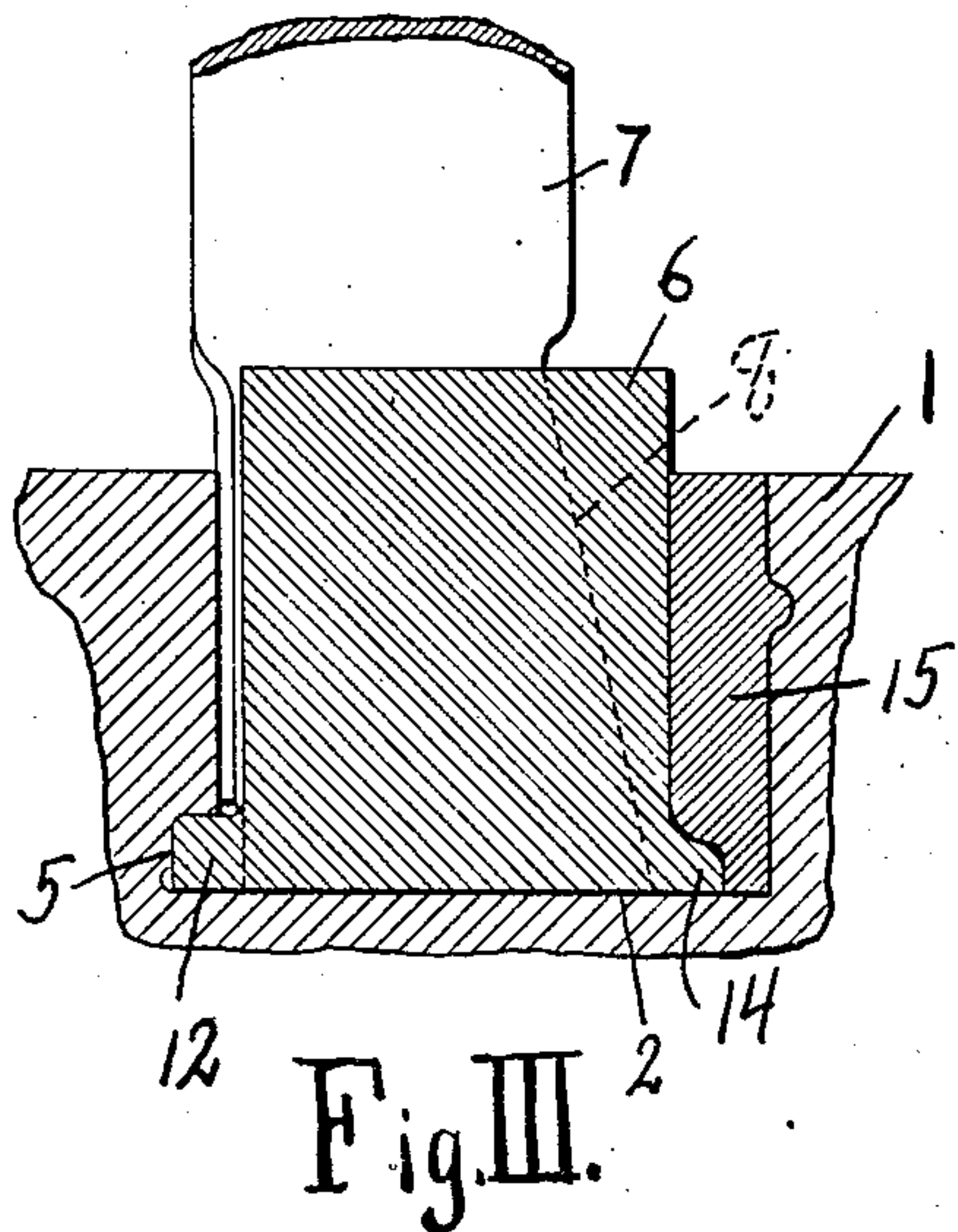


No. 875,629.

PATENTED DEC. 31, 1907.

M. ROTTER.  
BLADE FASTENING.

APPLICATION FILED OCT. 29, 1906. RENEWED MAY 27, 1907.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

MAX ROTTER, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO ALLIS-CHALMERS COMPANY, OF MILWAUKEE, WISCONSIN, A CORPORATION OF NEW JERSEY.

## BLADE-FASTENING.

No. 875,629.

Specification of Letters Patent.

Patented Dec. 31, 1907.

Application filed October 29, 1906, Serial No. 341,081. Renewed May 27, 1907. Serial No. 375,960.

*To all whom it may concern:*

Be it known that I, MAX ROTTER, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful improvements in Blade-Fastenings, of which the following is a specification.

This invention relates to fastening devices for the blades of fluid propelled engines, or for the blades of fans or pumps for propelling a fluid, and generally it relates to a fastening means which is capable of being used in any relation where it is desirable to firmly secure a plurality of somewhat similar elements to a member.

This invention relates specifically to that class of devices, as steam turbines, for example, where a plurality of blades or similar elements are assembled in a holding member and are then securely fastened within a recess provided by the blade-carrying member.

It is common in steam turbines, for example, to provide a holding member for a plurality of blades which is seated in a recess provided by the blade-carrying member, and the holding member and blades are then firmly secured in said recess by a separate calking member, piece or strip which is forced into said recess.

With the construction just stated it is not always possible to be sure that the blades or the holding member are firmly seated within the recess and retained against the bottom thereof.

It is the purpose of this invention to provide a structural arrangement of the parts so that steam turbine blades, for example, may be held in a holding member, the blades and holding member, either before or after being assembled, may be seated in a recess of the blade-carrying member, and the calking strip when forced into position will positively seat the blades and the holding member securely in said recess and against the bottom thereof so that the position of the holding member and blades within said recess with respect to the bottom of said recess, will be accurately determined during the process of inserting and driving home the calking strip.

It is a further object of this invention to provide the blade-holding member with a projection which is adapted to hook into an undercut portion provided in the recess, said projection engaging directly with the blade-

carrying member whereby security is afforded against displacement of the parts either while a calking member is being driven home, or during the subsequent use of the apparatus.

In the accompanying drawings which form a part of this specification and on which the same reference characters are used to indicate the same elements in each of the several views,—Figure 1 is a perspective of a fragment of the several parts embodying this invention. Figs. 2 and 3 are vertical sections of structural arrangements embodying this invention.

The reference character 1 represents a blade-carrying member, and in this connection it may be stated that the terms blade-carrying member, blades, holding members and calking strips, as used in this specification are used in a generic sense and are not intended to confine this invention to any specific art, the specific terms used being used as a matter of convenience, as this specific structure is particularly adapted for use in steam turbines. The member 1 is provided with a recess 2 which is undercut on one side either by a dovetailed section extending the full depth thereof, as at 3 on Fig. 1, or extending only part way of the depth thereof, as at 4 on Fig. 2, or which is but a plain recess, as at 5 on Fig. 3.

The numeral 6 represents a blade-holding member which is adapted to retain a plurality of blades 7, these blades being inserted in slots cut in said member, or otherwise formed, and the blades have their roots which are inserted in said slots so formed in any preferred way that they are locked against endwise removal from said blade-holding member when said blade-holding member is secured in the recess 2. This object is attained with the blades illustrated by the drawings by making one edge of the blade inclined, as at 8, which inclined edge of the blade fits closely against the correspondingly inclined face of the slot 9 in the blade-holding member 6.

As shown by the drawings, the blade-holding member 6 is either provided with a projecting dovetailed portion 10, as shown by Fig. 1, or a dovetailed portion 11, as shown by Fig. 2, or a simple projecting offset 12, as shown by Fig. 3, the dovetailed or offset portion in each instance being



adapted to seat in the undercut side of the recess 2 and thereby prevent the withdrawal of said blade-holding member.

It is preferred that the roots 13 of the 5 blades shall extend entirely through the blade-holding member so as to be seated against the bottom of the recess 2, but this is only for the purpose of the additional security offered by the increased depth of the 10 roots of the blades, and such a construction is a feature which is not an essential part of this invention.

The blade-holding member 6 is provided with a projection 14 located preferably at 15 the base of said blade-holding member and located on the side opposite to the projections already referred to. 15 represents a calking strip in its final position, and it will be readily seen that when the blade-holding 20 member 6 and the blades are assembled and seated in the recess 2 with the projections shown at the left hand of each of the several figures engaged with their coacting recesses, that if now the calking strip 15 be placed 25 in position it will rest against the projection 14 and on driving said calking strip home it will forcibly drive said projection 14, the blade-holding member 6, and the blades 7 down against the bottom of the recess 2, 30 thereby insuring that the parts are connected in their correct relation.

The blade-carrying member 1 may be provided in the side of said recess adjacent to the calking strip 15 with a bead or depression 35 17, into which a part of the material of the calking strip is forced, as at 18, thereby firmly locking the calking strip and the associated parts in place; the provision of such a bead is not, however, absolutely neces- 40 sary, but it affords positive protection against displacement of the parts.

What I claim is,—

1. The combination with a blade-carrying member provided with a recess having one

side undercut of a blade-holding member, 45 blades interlocked with said blade-holding member, said blade-holding member being provided with a projecting portion adapted to be engaged directly with said side within the undercut portion thereof. 50

2. The combination with a blade-carrying member provided with a recess having one side undercut of a blade-holding member, blades interlocked with said blade-holding member, said blade-holding member being 55 provided with a projecting portion adapted to be engaged directly with said side within the undercut portion thereof, and means for securing said blade-holding member in said recess. 60

3. The combination with a blade-carrying member provided with a recess having one side undercut of a blade-holding member, blades interlocked with said blade-holding member, said blade-holding member being 65 provided with two projecting portions one of which is adapted to be engaged directly with said side within the undercut portion thereof and a calking member adapted to rest upon the other of said projections and 70 retain the blade-holding member within the recess of the blade-carrying member.

4. The combination with a blade-carrying member provided with a recess having one side undercut of a blade-holding member, 75 blades interlocked with said blade-holding member, said blade-holding member projecting within the undercut portion of said side and being provided with a projecting portion upon which is adapted to bear a 80 calking member, and said calking-member.

In testimony whereof, I affix my signature in the presence of two witnesses.

MAX ROTTER.

Witnesses:

FRANK E. DENNETT,  
G. F. DE WEIN.