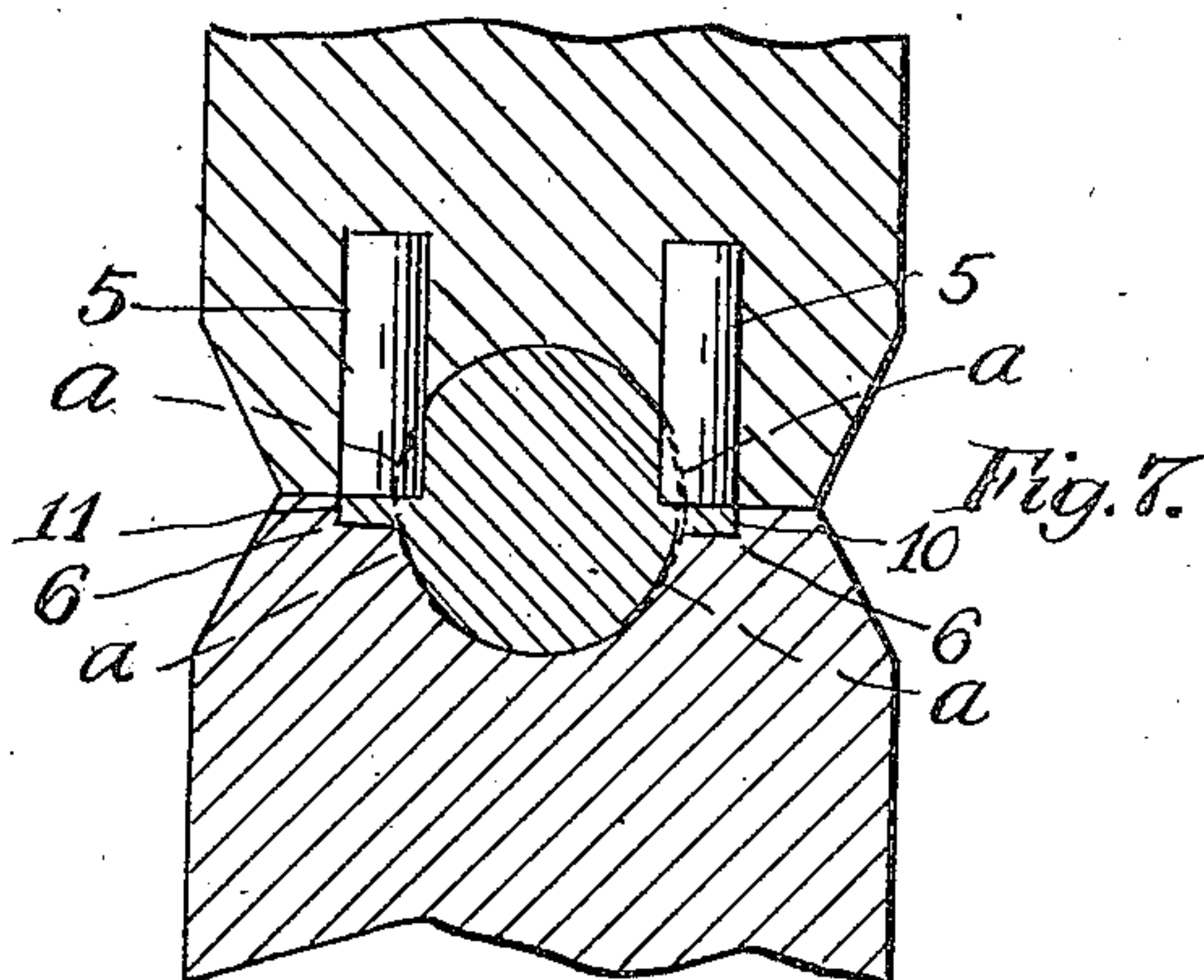
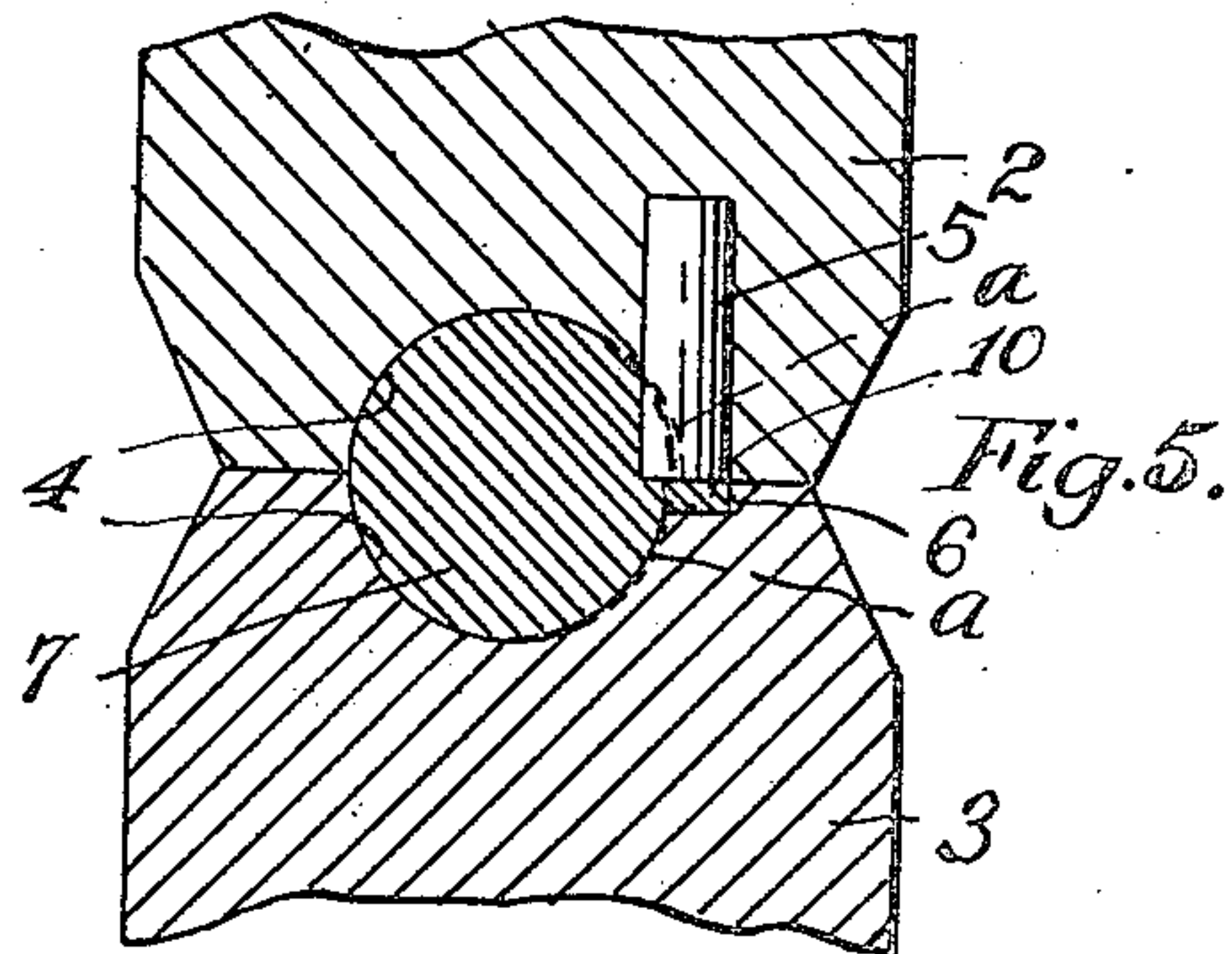
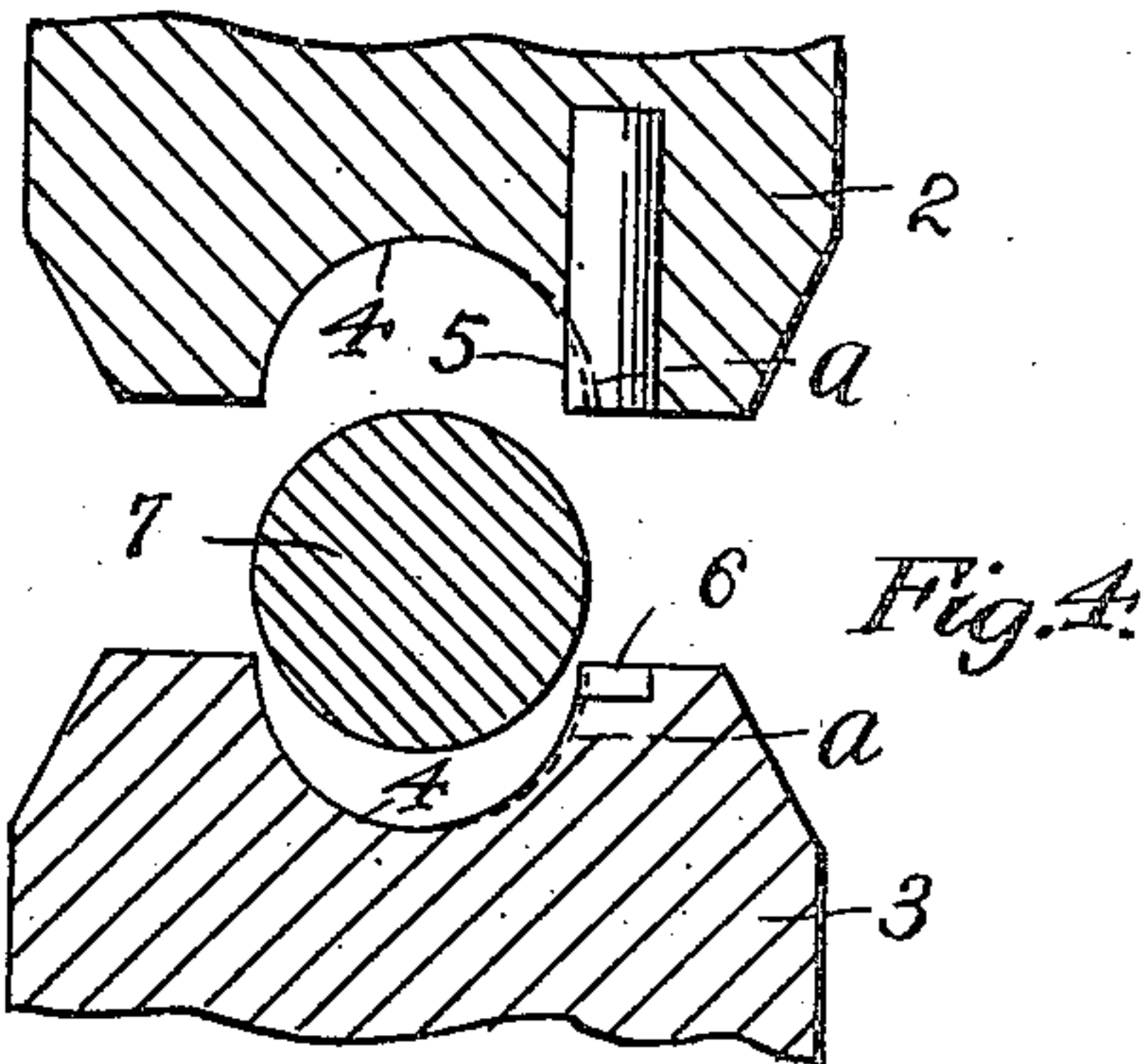
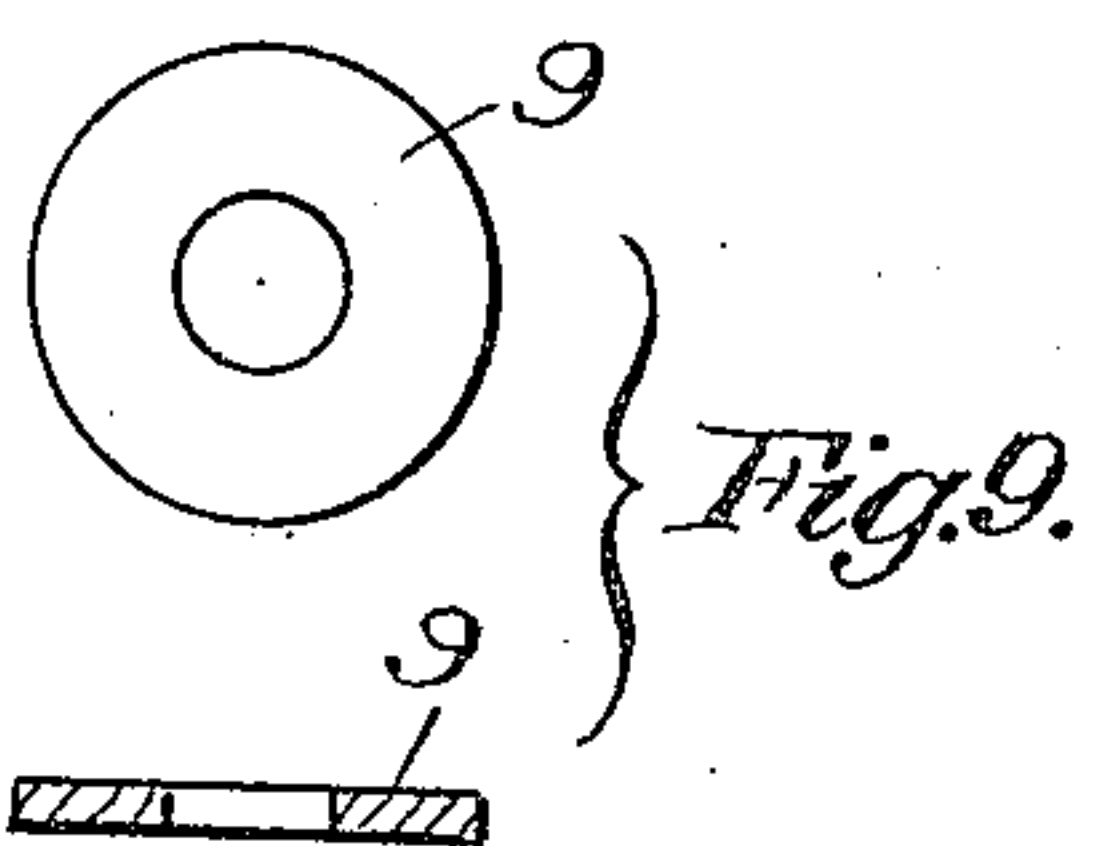
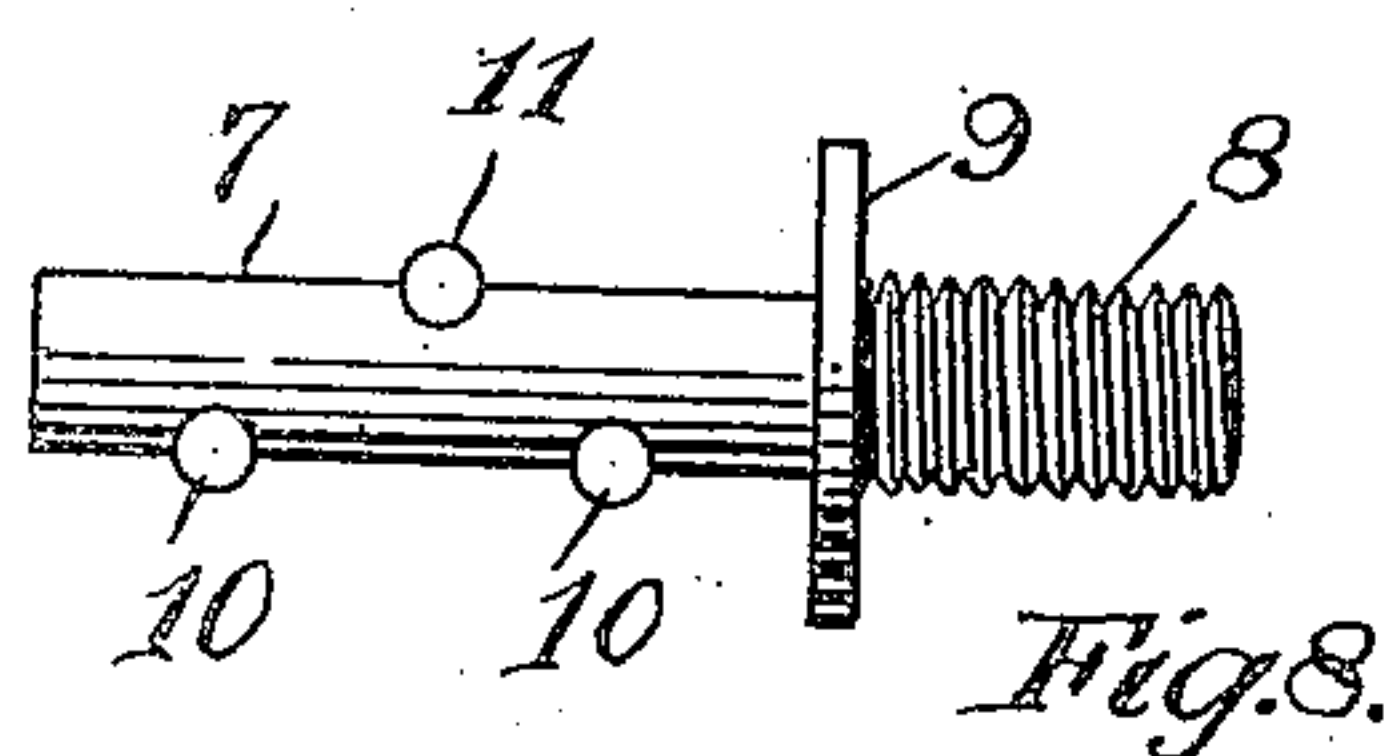
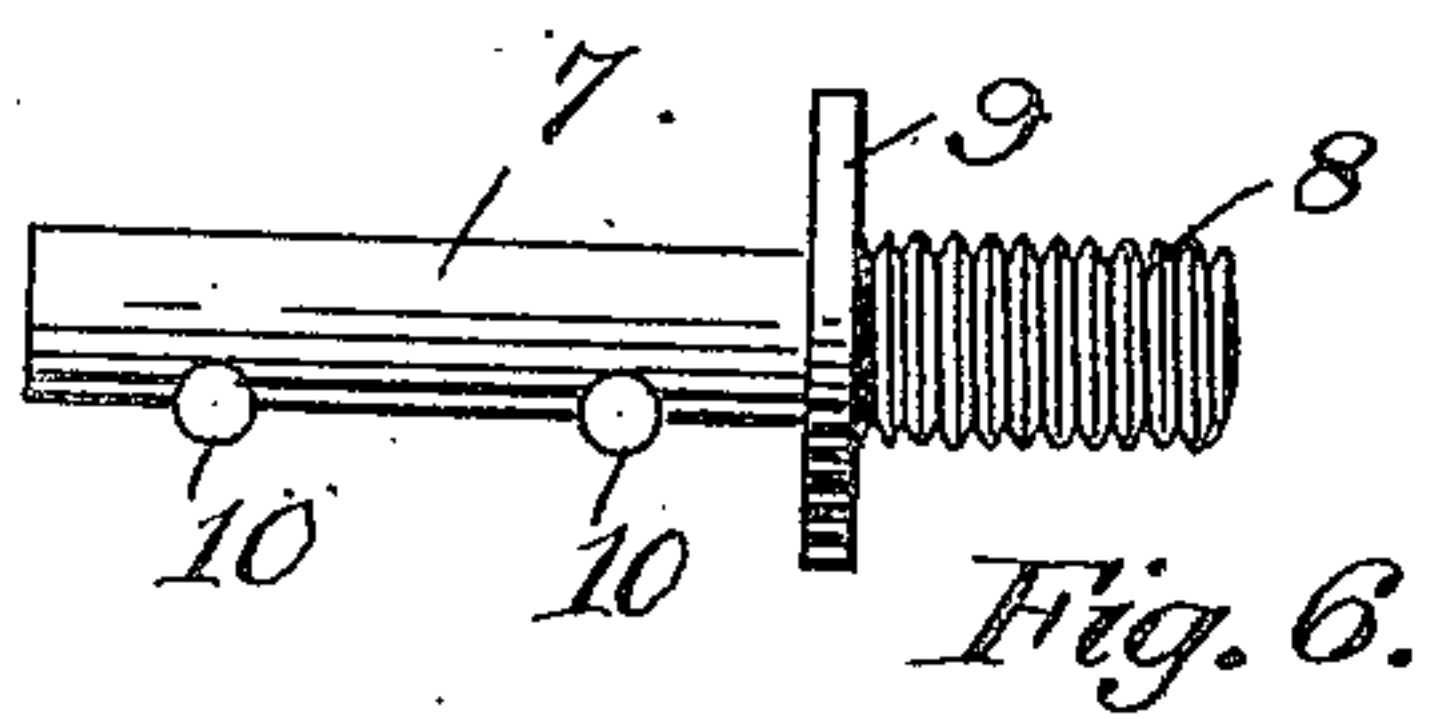
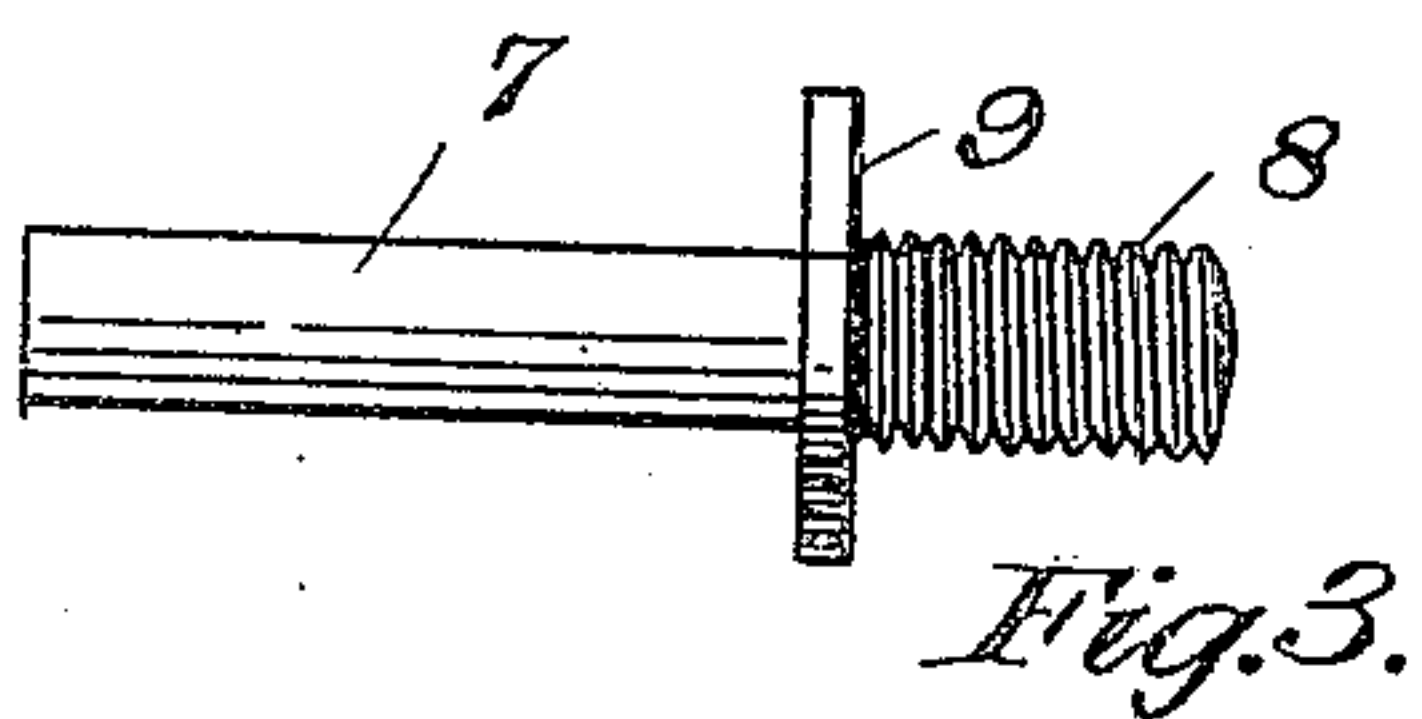
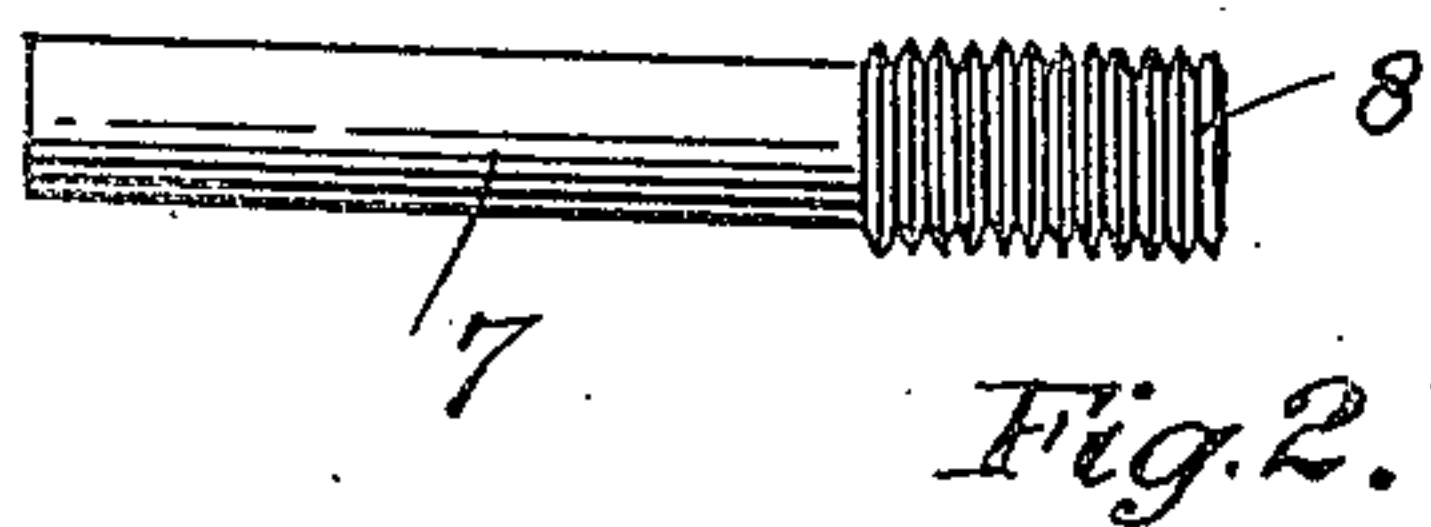
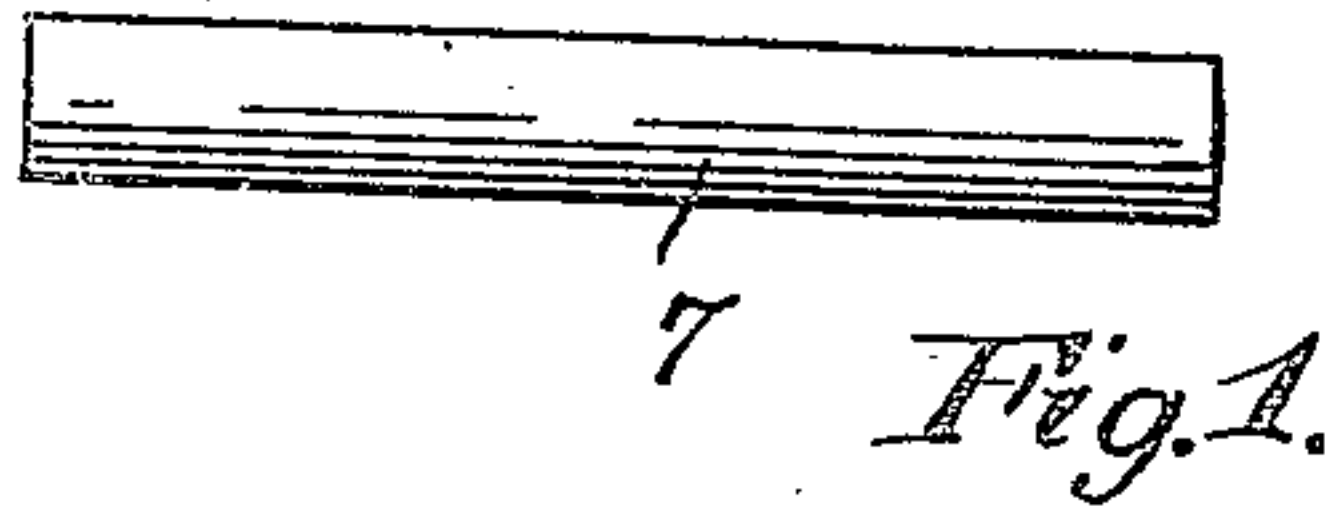


Jan. 2, 1923.

O. A. SMITH.  
METHOD OF MAKING BINDING POSTS.  
FILED DEC. 16, 1920.

1,440,802



INVENTOR  
Oscar A. Smith  
BY HIS ATTORNEYS  
Weed & Gray



## UNITED STATES PATENT OFFICE.

OSCAR AUGUST SMITH, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-HALF TO WILLIAM R. MITCHELL, OF CLEVELAND, OHIO.

## METHOD OF MAKING BINDING POSTS.

Original application filed August 2, 1919, Serial No. 314,884. Divided and this application filed December 16, 1920. Serial No. 431,244.

*To all whom it may concern:*

Be it known that I, OSCAR A. SMITH, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Methods of Making Binding Posts, of which the following is a specification.

This application is a division of my co-pending application for binding posts, Serial No. 314,884, filed Aug. 2, 1919, and relates to the method of making binding posts by means of which an electrical conductor or wire may be attached to one of the elements of a battery cell.

The object of the invention is the provision of an improved method of making binding posts, which can be readily and quickly attached to the carbon of a battery by forcing the same into a hole drilled in the carbon without the breaking or splitting of the carbon, and which when in place will be efficiently and rigidly held against improper separation.

A further object of the invention is the provision of a simple method for quickly, efficiently, and inexpensively producing this improved binding post.

In the drawings accompanying and forming a part of this specification, Fig. 1 illustrates the stock cut to the proper length; Fig. 2 illustrates one end thereof threaded; Fig. 3 shows the post with a flange, in the present instance in the form of a washer slipped over the smooth portion of the post and up against the threads which act as a shoulder; Figs. 4, 5, and 7 illustrate the several steps in the making of the post shown in Figs. 6 and 8 which latter figures illustrate the complete post with the projections in position to hold the binding post in the carbon against rotation; and Fig. 9 is a detail view of the washer which may be used.

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

In the binding post shown in the patent to E. C. Henn No. 813,093, Feb. 20, 1903 the post is provided with a series of longitudinally extending ribs disposed parallel with the axis of the shank and located in juxtaposition around the post, and as I had con-

siderable to do with the making of devices in accordance with this patent, great difficulty was experienced in fitting these binding posts into the carbon without splitting it as they were driven thereinto. Owing to the number of ribs in this Henn binding post considerable pressure was required to force the post into the carbon which frequently split it, and if a hole was drilled sufficiently large to prevent the splitting of the carbon it prevented the binding post from being rigidly held in place and consequently it would turn with the terminal nut when rotated or tightened.

By the present method a binding post can be made much less expensively, but a great saving results as concerns the amount of brass required in the manufacture of the post, for in the present improvement the stock can be cut off to the required length and size as illustrated in Fig. 1 by a cutting off machine for the rolling of the thread. The rolling of this thread leaves a shoulder back of the thread, against which a punched washer can be located. The post is then placed in a punch press provided with suitable dies by means of which one or more, usually two or three half circular fins or projections, are formed on the cylindrical portions of the post.

The dies shown in Fig. 4 comprise a pair of members 2 and 3, each having a semi-circular recess therein, as 4, forming when the two members are brought together a cylindrical opening corresponding throughout the major part of the length of the plain or smooth part of the stock to the diameter of the stock of the binding post. At the zones where the fins or projections are to be formed about 180° of this cylindrical opening corresponds to the diameter of the stock, while about 90° of each member is built out or that is inwardly so as to be of smaller radius as partly shown by dotted lines *a* in Figs. 4, 5, and 7, which dotted lines illustrate what would be the larger radii if the built up portion were not present. Thus by reason of this difference in radii the metal of the post will be subjected to greater pressure at the points having the smaller radii, thus causing more metal to be projected into the path of the projections 5. The built up



portions *a*, it will be understood act to force out more metal for the projections 5 to act upon. The die members are provided, one with a projection 5 and the other 5 with a semi-circular recess 6 at one side thereof, there being a projection and a co-operating recess for each fin to be formed. In the form of die for the binding post shown in Fig. 6 there are two projections 10 and two mating recesses located side by side but spaced apart. In the form of binding post shown in Fig. 8 the die is provided with three of these projections and likewise three mating recesses, two at one side of the die members and one at the opposite side 15 in alternation whereby two fins would be formed at one side of the stock and one at the other.

In carrying out this improved method of 20 making these improved binding posts, the stock 7 after being first suitably cut to the desired length is then rolled to have its thread 8 placed therein after which a suitable punched washer 9 is placed on the post 25 and then the plain or smooth portion of the post is placed between the die members, which are then brought together by a press to form the fins 10 or 10 and 11 according to the desired number of the fins that are 30 to be provided.

As the die members 2 and 3 are brought together each built out portion *a* and projection 5 will force a portion of the metal of the stock (see Figs. 5 and 6) into the recess 35 6 and thus form a semi-circular fin or projection as 10 or 11.

Owing to the shape of the recess 6 and projection 5 which of course may be of various shapes the fins 10 and 11 are shown 40 semi-circular in form and it will be observed that they are obtained by utilizing a portion of the metal of the stock which under pressure is caused to gradually flow, as it were into the recess 6.

In the form shown in Fig. 6 as hereinbefore stated two of the fins are located on one tangent of the stock, while in the form shown in Fig. 8 two of the fins are located on one tangent while an alternating fin is 50 located on the opposite tangent of the stock.

Either form has been found successful in practice and found to be sufficient to hold the post in the carbon and to prevent the turning of the binding post when placed in 55 the carbon.

Furthermore, the formation of the binding post in the manner described prevents the splitting of the carbon when the post is forced into the drilled hole thereof, especially since the fins are so located away from 60 the end of the post which permits the latter to project quite a distance into the carbon before the fins are brought into engagement with such carbon, and especially because the 65 location of the fins relatively far apart does

not in forcing the post into the carbon cause pressure on all parts of the carbon at the same time.

Furthermore, the carbon is prevented from splitting due to the fact that the fins 70 or projections 10 are so formed or shaped as to have substantially a cutting edge. In the present instance mechanism is shown by way of example, for carrying out my improved method, and a part of the stock is 75 thereby subjected to transverse pressure in such manner as to form a thin or cutting fin. Due to the brittle or fragile character of carbon, the fins must be sufficiently thin or 80 be formed with a sufficiently thin edge to permit the post to be forced into the carbon without any danger of the fins splitting or pulverizing it. Thus, each fin is formed with substantially a semicircular or curved cutting edge or edge of such thin formation 85 as to permit it to cut into the carbon. The forward portion of this curved edge is thus shaped to such cutting thinness as to cut a path in advance of the body of the fin, and since this forward edge curves or tapers 90 rearwardly the cutting action thereof on the carbon is gradual.

The projections 5 may be formed by suitable steel hardened circular pins rigidly secured in openings of the die whereby the 95 pins are renewable and replaceable.

The various details may be more or less changed without departing from the spirit or scope of the present improvement.

I claim as my invention:

1. The method of making a binding post, 100 which consists in forcing a portion of the metal outwardly, and simultaneously exerting pressure on said metal to form a rearwardly curving edge of cutting thinness. 105

2. The method of making binding posts, which consists in projecting a portion of the metal outwardly, and forming such metal into a curved cutting edge.

3. The method of making a binding post, 110 which consists in forcing a portion of the metal outwardly, and forming a rearwardly tapering cutting edge thereon.

4. The method of making a binding post, which consists in forcing a portion of the 115 metal outwardly, and shaping the same by pressure into a curved fin of cutting thinness.

5. The method of making a binding post, which consists in forcing a portion of the 120 metal outwardly, and shaping the forward portion of such metal into an edge of cutting thinness.

6. The method of making a binding post, which consists in exerting pressure on the 125 post to project alternate portions of the metal outwardly at the sides thereof, and shaping such projecting metal portions into edges of substantially cutting thinness.

7. The method of making a binding post, 130



which consists in simultaneously exerting pressure on a plurality of sides of the post to project portions of metal outwardly, and shaping such portions into projections of substantially cutting thinness. 10  
5 substantially cutting thinness.

8. The method of making a binding post, which consists in exerting pressure at spaced

intervals at a side of the post to form alined projections, and shaping such projections into edges of substantially cutting thinness. 10

Signed at Cleveland, county of Cuyahoga and State of Ohio, this 13th day of December, 1920.

OSCAR AUGUST SMITH.