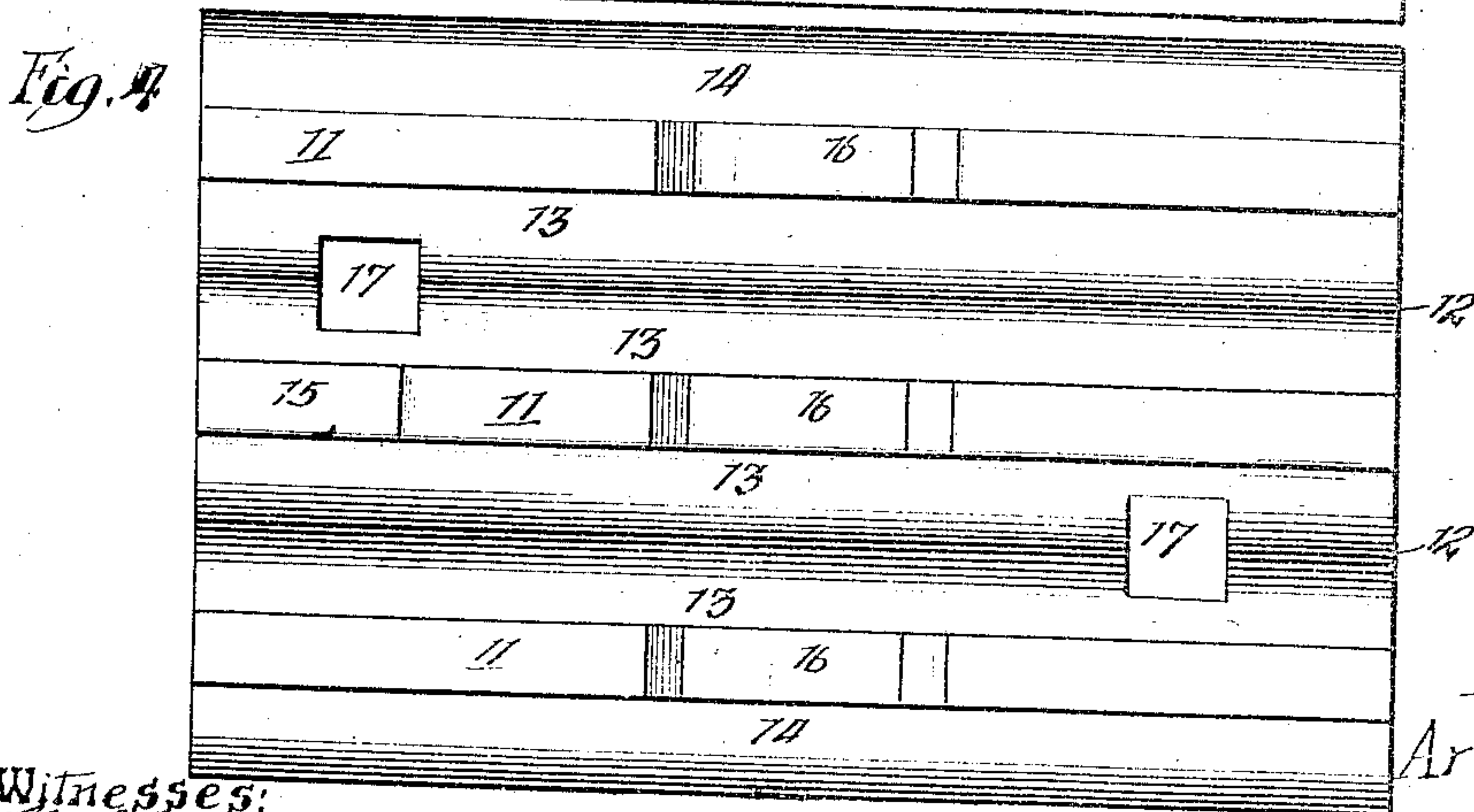
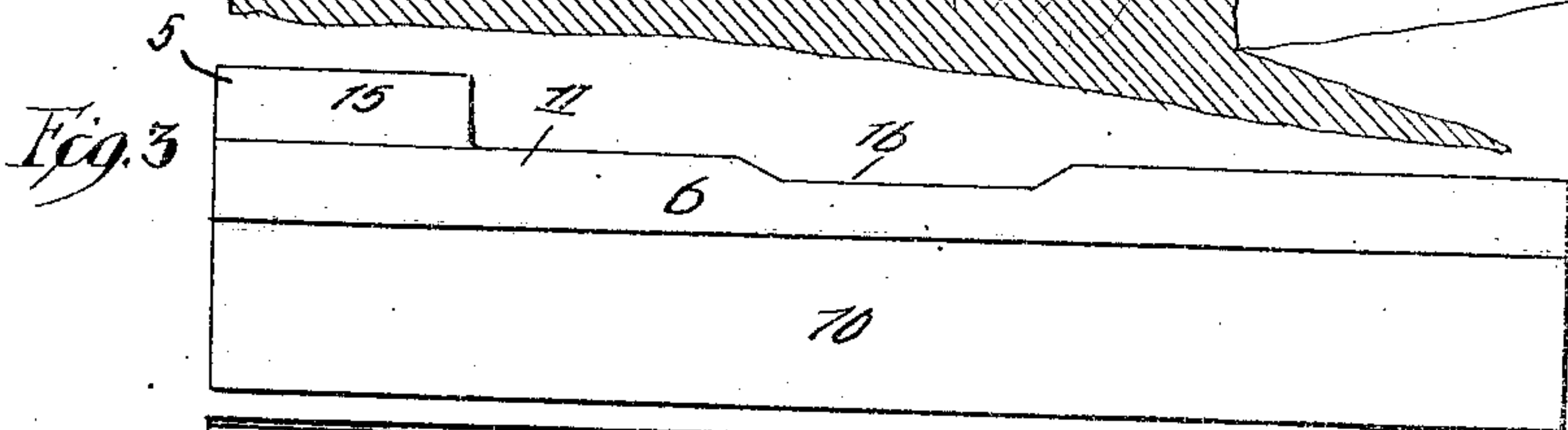
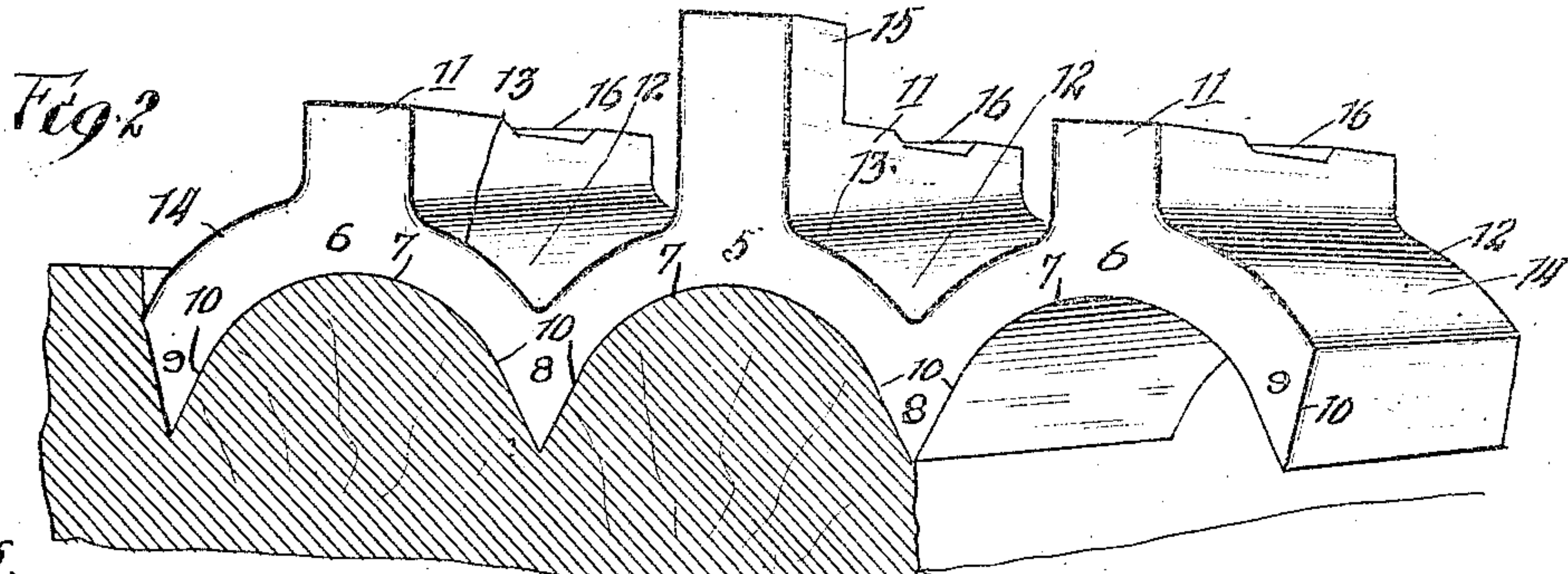
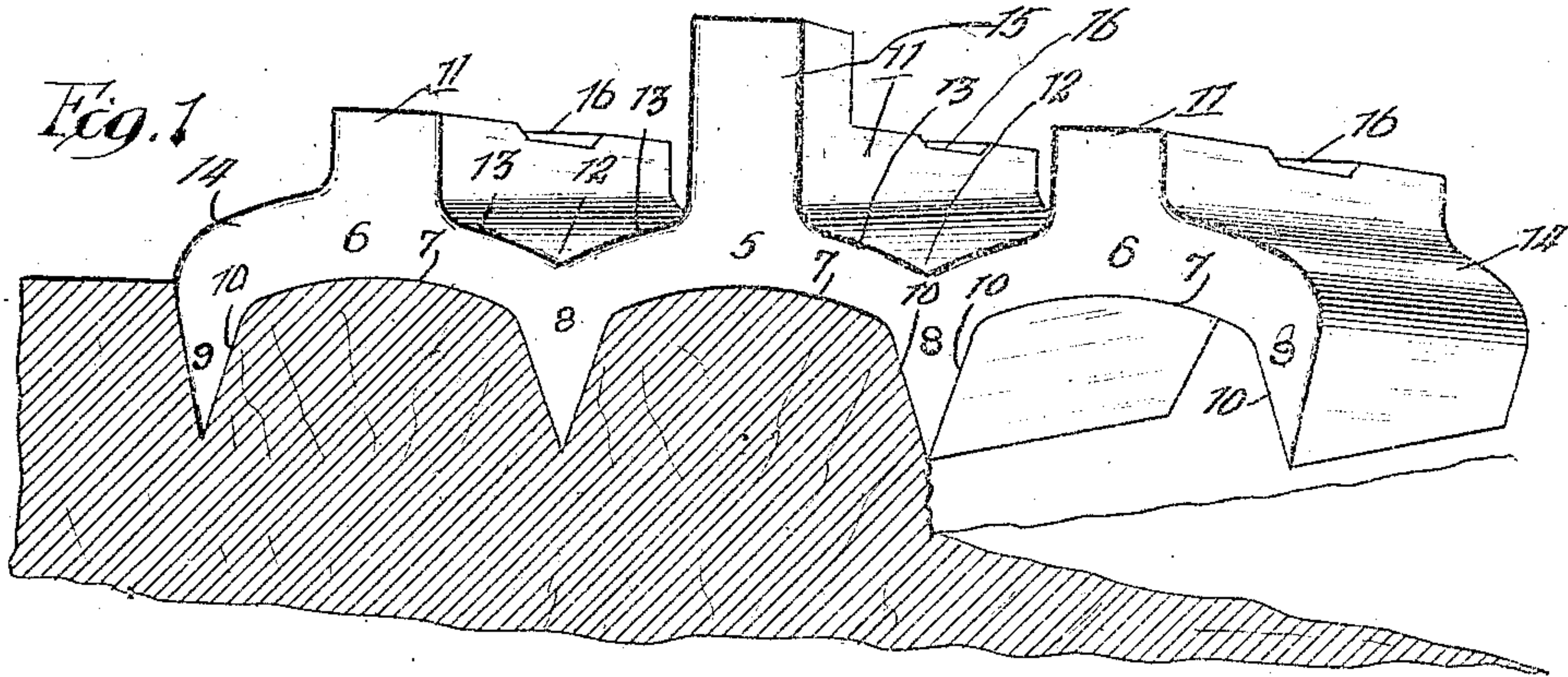


A. L. STANFORD.
TIE PLATE.
APPLICATION FILED JAN. 28, 1909.

931,517.

Patented Aug. 17, 1909.



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UNITED STATES PATENT OFFICE.

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TIE-PLATE.

No. 931,517.

Specification of Letters Patent.

Patented Aug. 17, 1909.

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To all whom it may concern:

Be it known that I, ARTHUR L. STANFORD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Tie-Plates, of which the following is a specification.

Tie plates are frequently used in the laying of railroad rails, for the purpose of protecting the wooden ties from the wear that in a greater or less degree always accompanies the vibration and pounding of the rails, due to the passage of trains. This is especially true in cases where soft wood ties are employed, which are being increasingly used by reason of the scarcity and expense of hard wood ties in many sections of the country. Tie plates, furthermore, are of value in maintaining the level and grade of the track, in reinforcing the spikes against shearing action, in maintaining the rail in its vertical position, and in reducing the cost of track labor and supervision, by reason of the increased stability and longevity of the track as a whole.

The object of the present invention is to provide a tie plate, so constructed that its pointed flanges, when driven into the wood of the tie, will compress the wood displaced by the flanges toward a central point, thereby securing uniformity of compression with a resultant rigidity in the mounting for the tie plate, and a close compactness of the wood between the flanges.

Another object of the invention is to reinforce the tie plate on its upper side, intermediate the lower pointed flanges, in such manner as to provide the greatest amount of strength and rigidity consistent with the use of a given amount of metal; and to provide grooves or channels which will facilitate the discharge of water, sand, or drippings from the cars.

Another object is to so arrange the flanges and ribs that the tie plate can be easily rolled by ordinary rolling mill methods, which is of vital importance in devices of this kind, which are used in great numbers and must be capable of manufacture at a minimum cost.

Another object is to so construct the bearing surfaces for the rail that the latter will be unsupported in its center, immediately

beneath the web, thereby providing a desirable resiliency and lessening the pounding of the rail.

Another object is to so arrange and locate the spiking holes that the head of the spike will occupy the position as near as possible to the surface of the wooden tie.

Another object is to provide means for preventing the spreading of the rails, and for relieving the spikes from a shearing action.

Further objects will appear from a detailed description of the invention, which consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a perspective view of the end of a tie plate, of the style intended for use on hard wood ties, showing a portion of the tie in section and a portion broken away; Fig. 2 a similar view, showing the formation of the tie plate intended for use on soft wood ties; Fig. 3 a side elevation of the tie plate of Fig. 1; and Fig. 4 a top or plan view of the tie plate of either formation.

Referring to Fig. 1, the tie plate is in the form of one or more intermediate arch sections 5, and edge sections 6. Each of the sections, on its under surface 7, is given a curvature struck on the true arc of a circle, so that, when the tie plate is in use, the wood beneath the arches will be compressed toward a common center. The curving under surfaces 7 merge into depending longitudinally extending wedge-shaped flanges 8 and 9, which are provided with flat side faces 10; and, in the formation of the plate for use with hard wood ties, it is desirable that the flanges be relatively sharp and narrow in order to more easily enter into the hard wood of the tie.

Each of the arch sections is provided, on the center of its top surface, with a longitudinally extending flat faced rib 11, which ribs are arranged in staggered relation with respect to the under flanges, and serve to reinforce each of the arch sections in its center and to sustain the weight of the rail. The formation is one which provides a plurality of channels 12 intermediate the ribs, which channels are afforded by the juncture of the curving upper faces 13 of the arch sections.

The marginal walls 14 of the edge arch sections are of greater thickness than the intermediate walls, by reason of the fact that these portions of the tie plate as a whole are connected and supported on their inner sides only, and are therefore thickened to compensate for the lack of support on the other side. The center rib 11 is provided at its outer end with a shouldered lug 15, against which the outer edge of the rail flange is adapted to abut, and this lug is of sufficient length to afford the necessary reinforcement for preventing the rail from spreading when subjected to the weight of a heavy moving train. Obviously, additional ribs could be provided with such lugs, although a single lug affords ample protection under ordinary conditions. Each of the ribs, near its center and immediately beneath the rail web, is cut away to provide a recess 16 adapted to be bridged by the base of the rail, which recess serves to relieve the rail from support at its center, and thereby affords the necessary resiliency to prevent objectionable pounding of the rail. The plate, in the embodiment shown, is provided with two spiking holes 17, which are cut through the channels 12 and the dependent intermediate flanges 8.

The tie plate shown in Fig. 2 differs from that previously described only in details of its shape, the same principles being involved in its construction. The arch sections are curved on a smaller radius, and the curve is struck from a point on a level with and intermediate the edges of the wedge shaped flanges. The description of the parts previously given applies equally to the construction shown in Fig. 2, so that it is not deemed necessary to describe said construction in detail.

In use, the tie plate will be applied to the tie by driving or forcing the wedged flanges into the surface of the wood to some extent, although it is customary to rely upon the weight of passing trains to force the plates to their extreme limit of depression within the wood of the tie. As the plate is depressed, the wood, intermediate the wedged flanges and underlying the curved under surface of the arch sections, will be compressed toward a common center, which results in a highly desirable uniformity of compression, and serves to impart to the wood a high degree of rigidity and compactness, which tends to prevent undue sinking of the tie plate into the surface of the wood. The formation is one which strongly reinforces the plate, both above and below, against any buckling strain which is most severely felt at a point closely adjacent to and outside of the edges of the rail flanges, which marks the limit of the direct compressing action of the rail when subjected to the weight of the train.

In certain prior constructions there has been a tendency for the plate to bend or buckle at these points, by reason of the fact that the resistance of the wood underlying the ends of the tie plate tended to bend the plate along the lines indicated. The formation of the present tie plate is such that this difficulty is overcome, and the plate will be uniformly depressed from end to end without buckling or distortion. The arch formation is one which affords the greatest amount of rigidity in proportion to the weight of metal employed, and at the same time affords an upper surface contour which provides for the escape of water, sand or drippings, and an under surface contour which adapts the device to engage the wood of the tie in a most satisfactory manner. Furthermore, the staggered relation of the upper ribs and lower flanges is one which is highly desirable in rolling the plates, in that the metal displaced to form the arches will be forced into the ribs, and the metal displaced to form the channels will be forced into the flanges, thereby facilitating the rolling operation to a very marked degree.

By cutting the spiking holes through the flanges, the spikes, when driven, will be supported and reinforced for a considerable distance below the surface of the tie, so that the spikes will be supported against displacement from their normal vertical position under the pressure of the load carried by the rail.

What I claim as new and desire to secure by Letters Patent is:

1. A tie plate, comprising a plurality of arch sections merging one into another, the under contour of each of the sections having a curvature struck on the arc of a circle, substantially as described.

2. A tie plate comprising a plurality of arch sections, the under contour of each of the sections having a continuous curvature, and each of the arch sections being provided on its upper side with a longitudinally extending rib adapted to support a rail, substantially as described.

3. A tie plate comprising a plurality of arch sections, the under contour of each of the sections having a continuous curvature, and each of the arch sections being provided on its upper side with a longitudinally extending rib adapted to support a rail, said tie plate being provided on its under side at the points of intergence of the sections with a plurality of longitudinally extending flanges adapted to be embedded within the wood of the tie, substantially as described.

4. A tie plate, comprising a plurality of arch sections merging one into another, the under contour of each of the sections having a curvature struck on the arc of a circle, the tie plate being provided, on its under side,

with a plurality of longitudinally extending flanges adapted to be embedded within the wood of the tie, each of the arch sections being provided, on its upper side, with a longitudinally extending rib, adapted to support a rail, each of the ribs being cut away, at its center, to relieve the rail from

support beneath the rail web, substantially as described.

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