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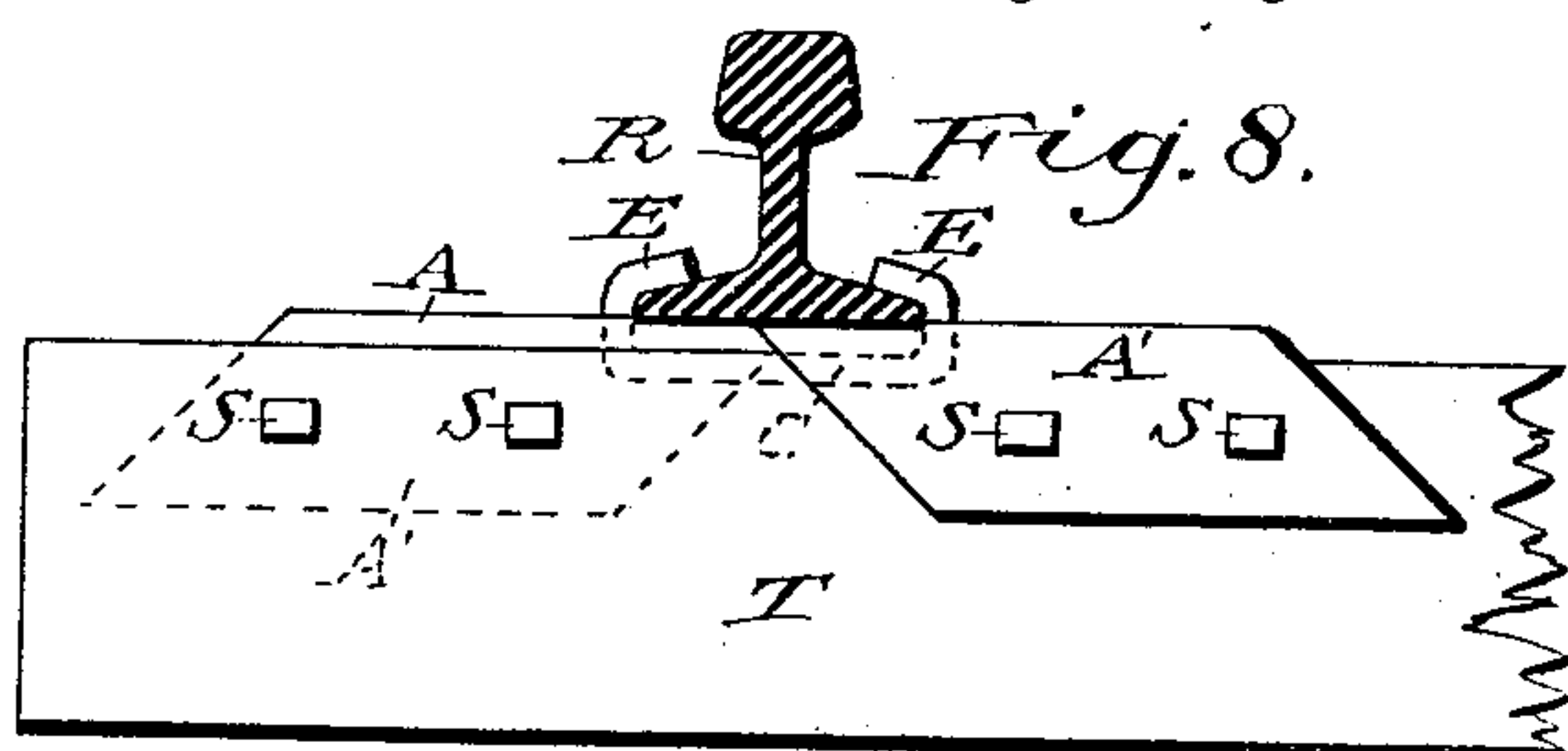
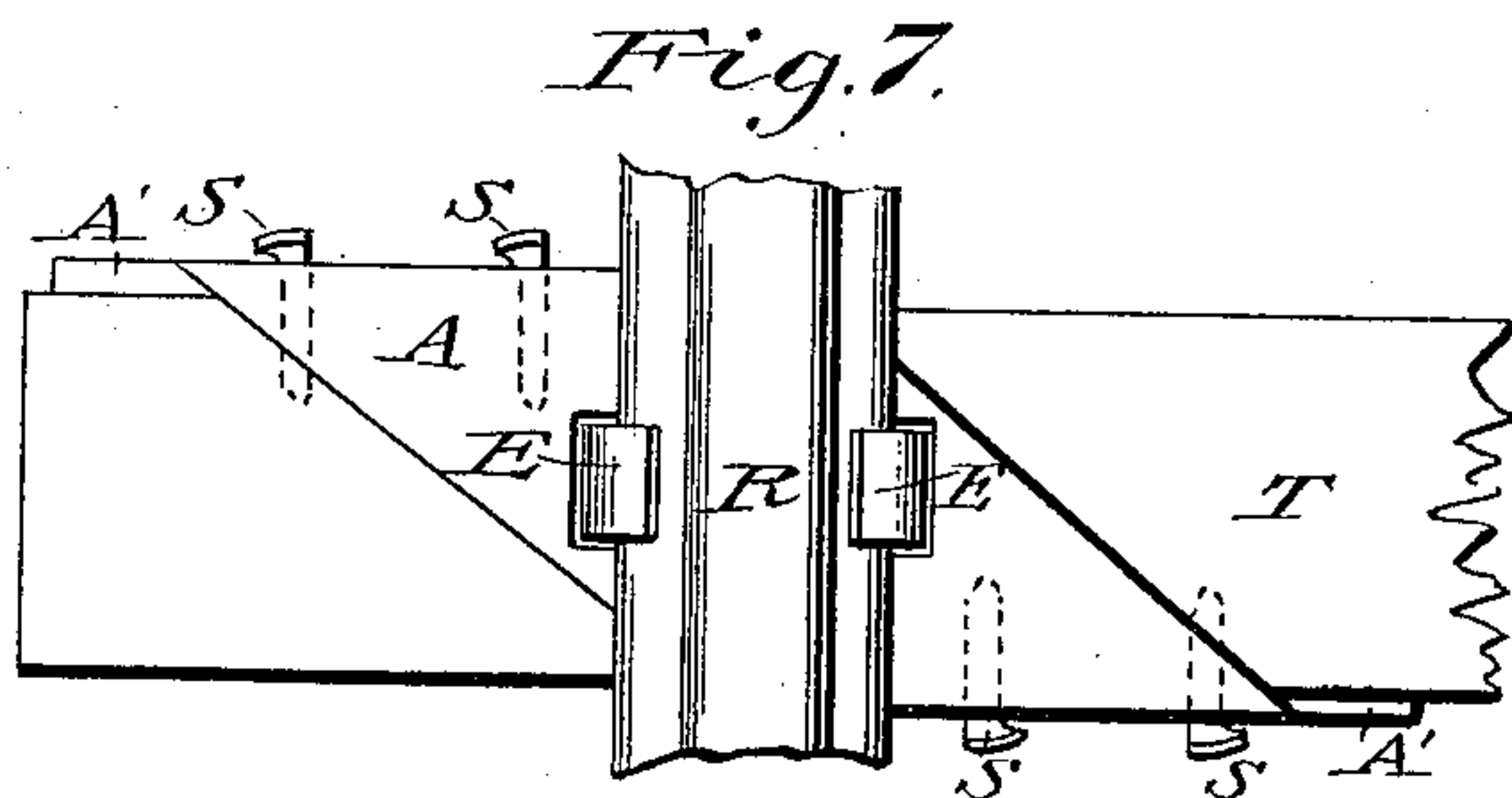
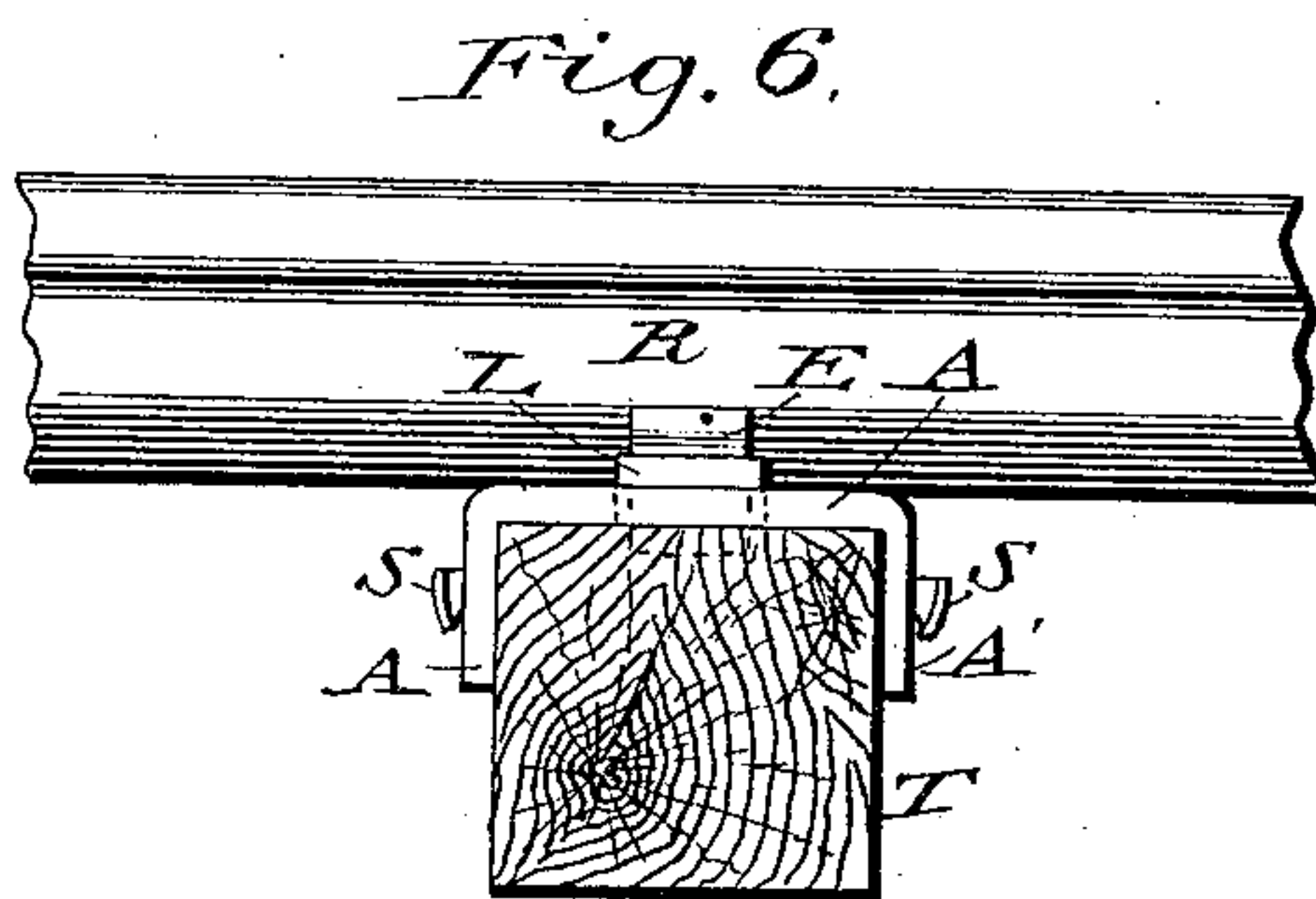
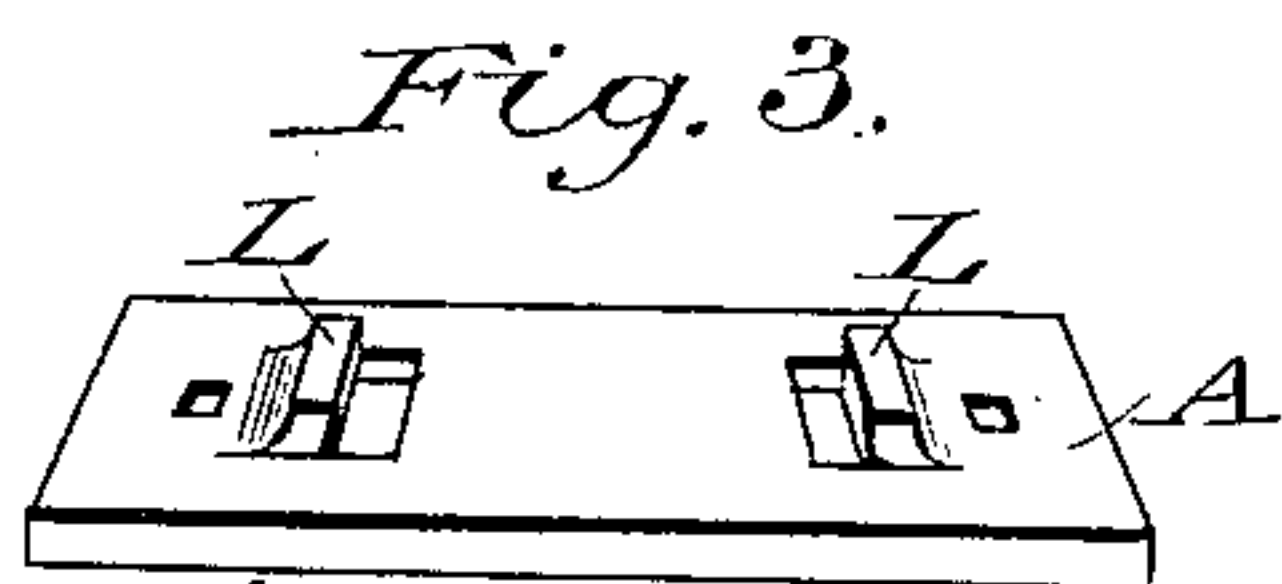
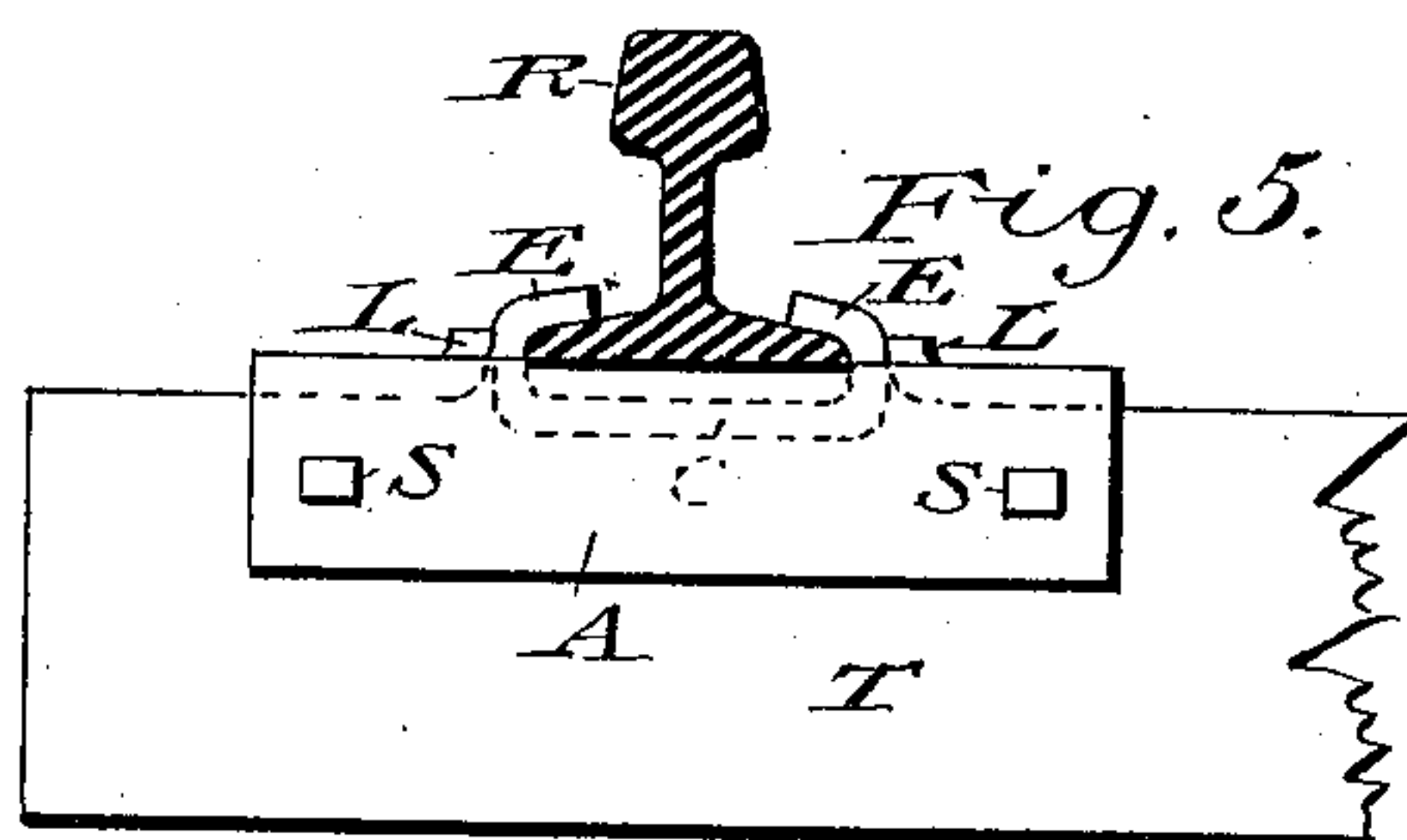
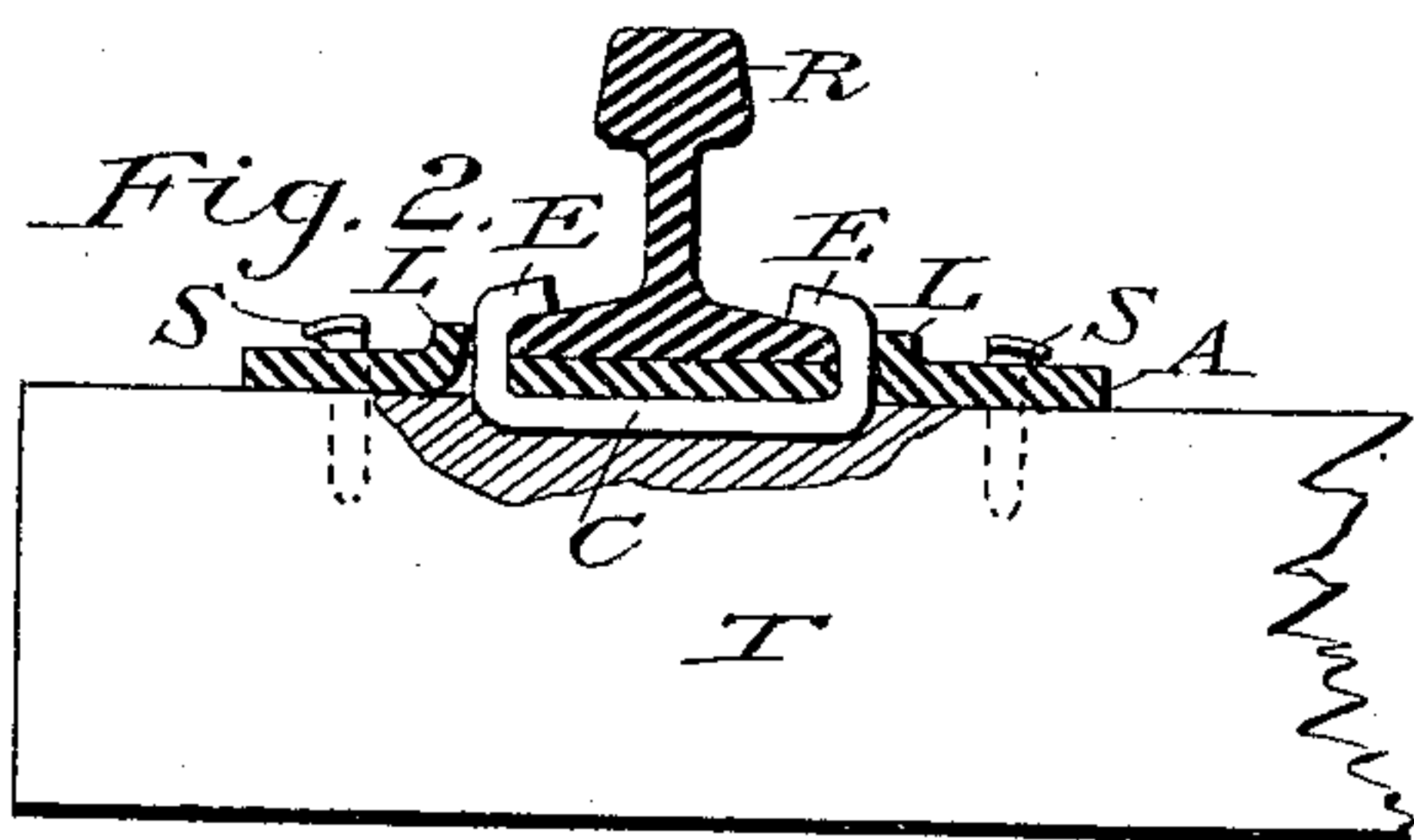
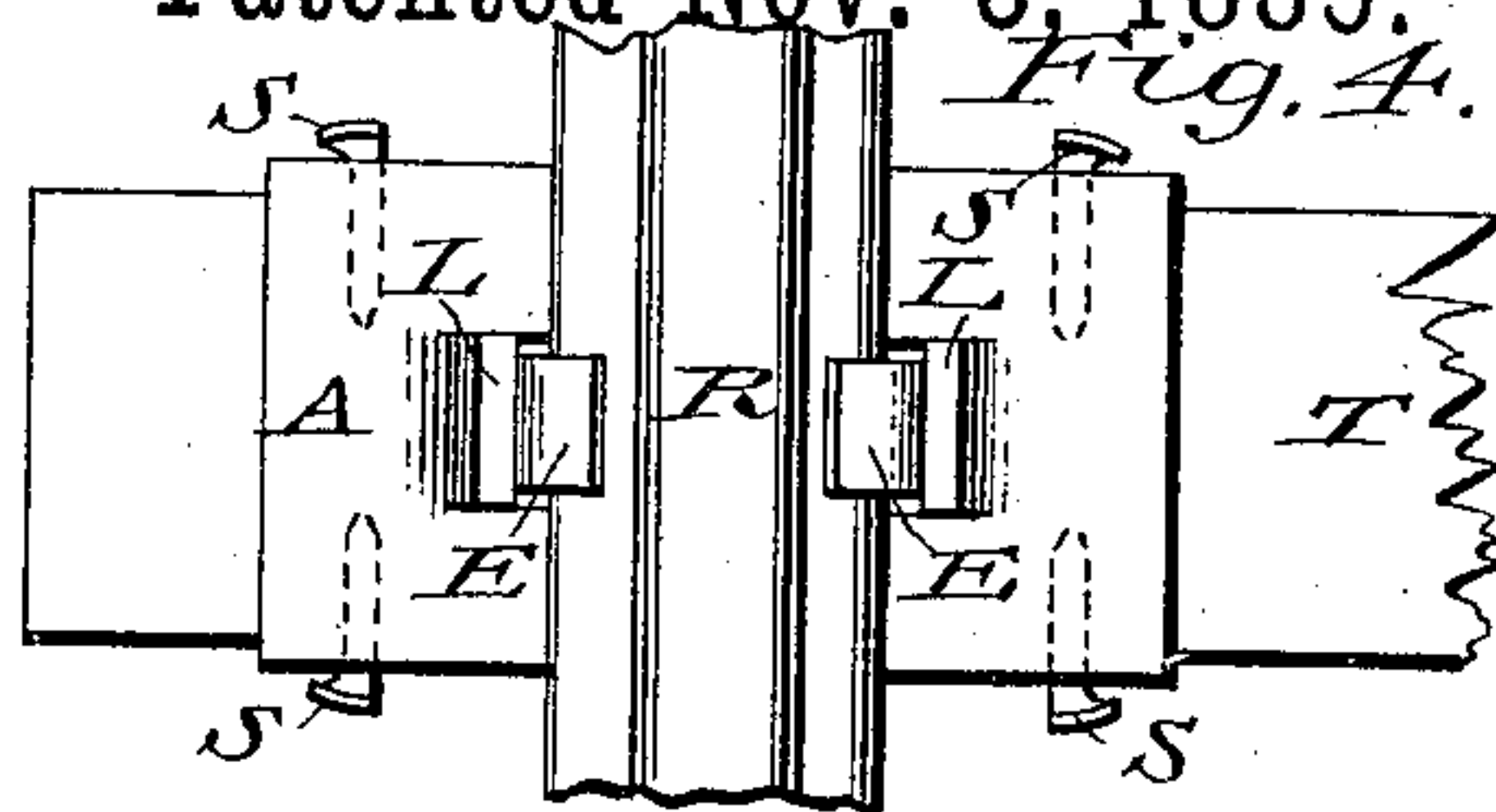
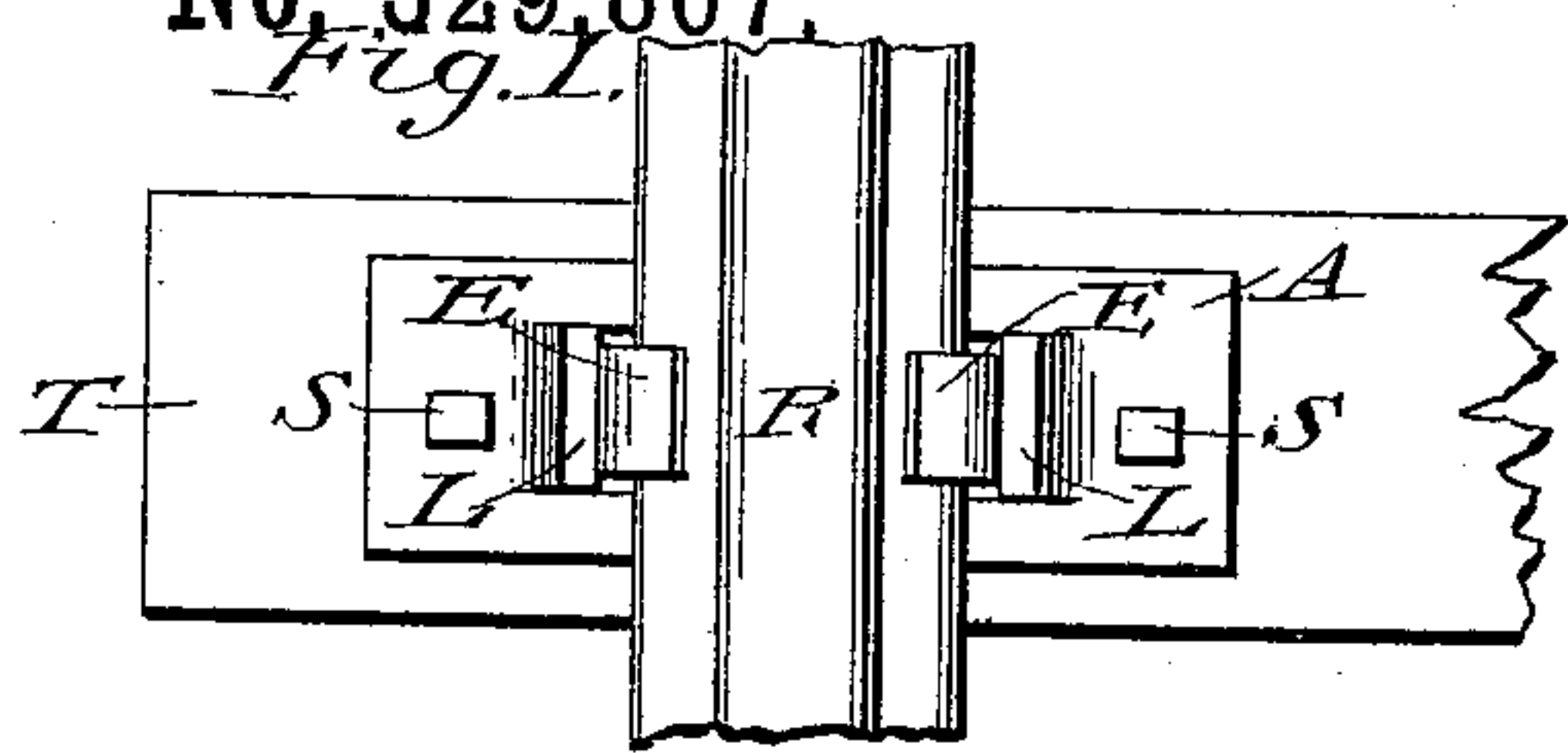
2 Sheets—Sheet 1.

A. M. TRUDE.

RAILROAD TRACK FASTENING.

No. 329,867.

Patented Nov. 3, 1885.



Witnesses:

C. O. Palmer  
O. Tyberg

Inventor:

A. M. Trude,  
By F. H. Richards,  
Atty.

(No Model.)

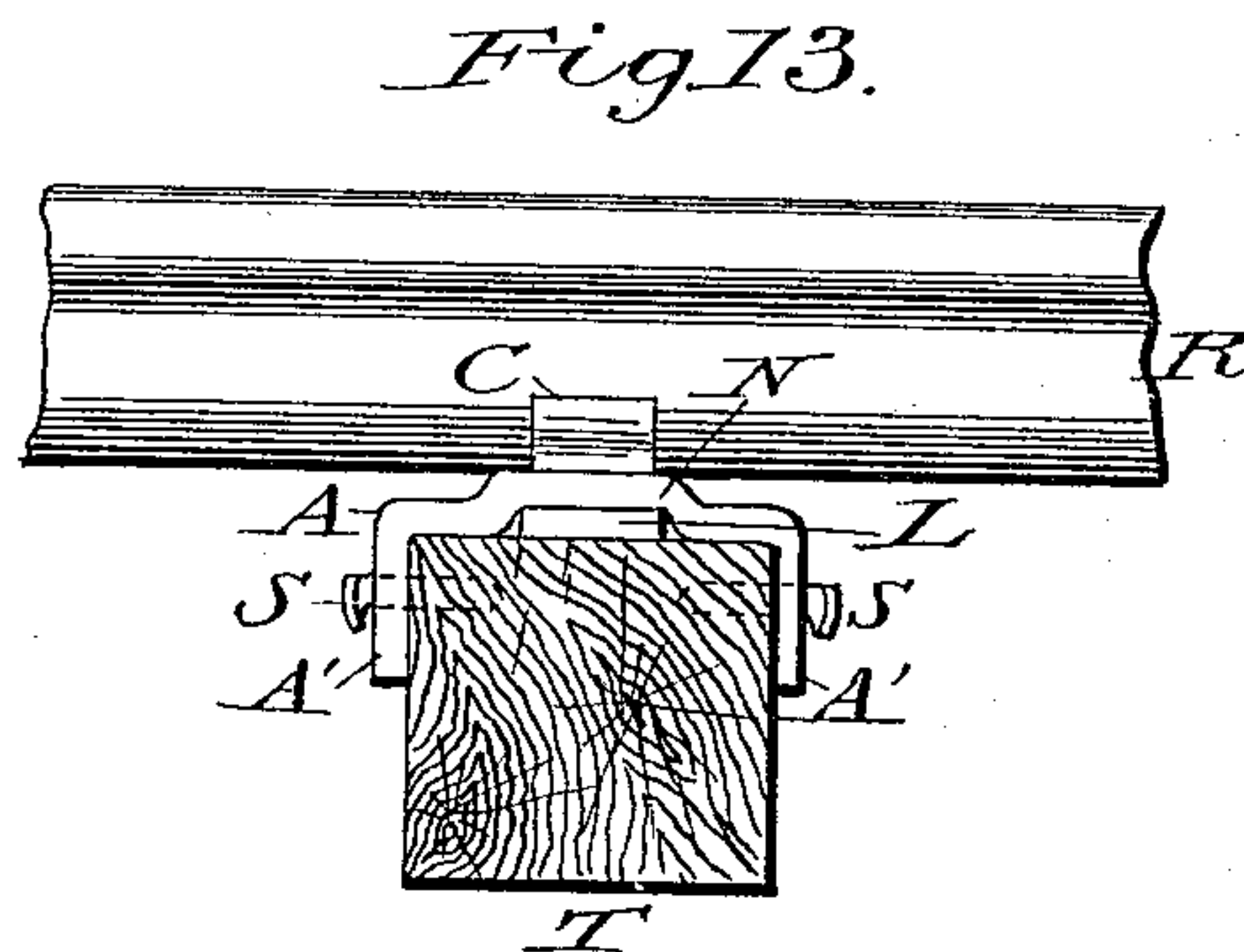
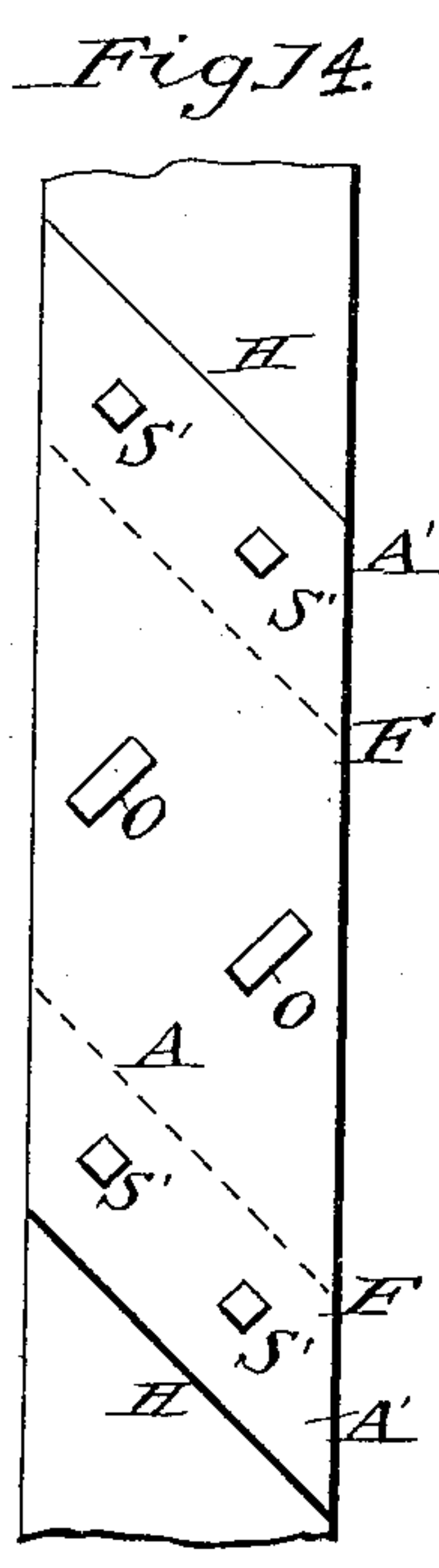
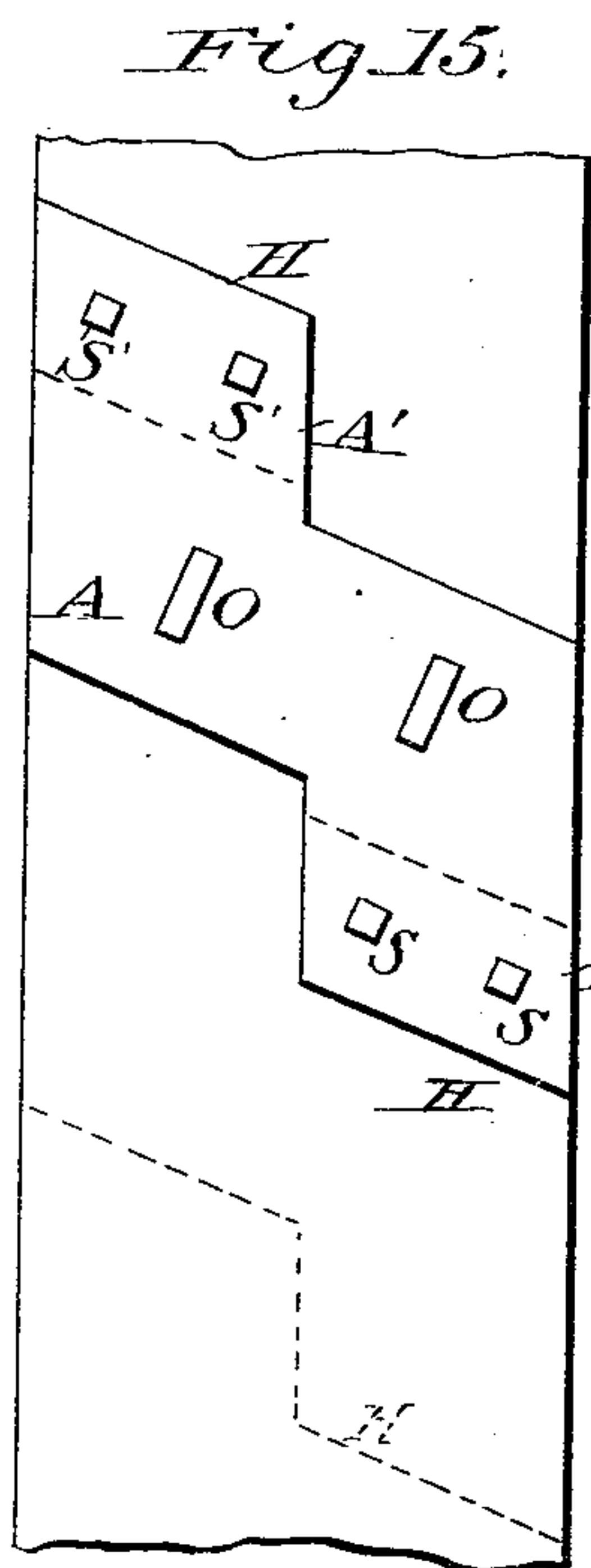
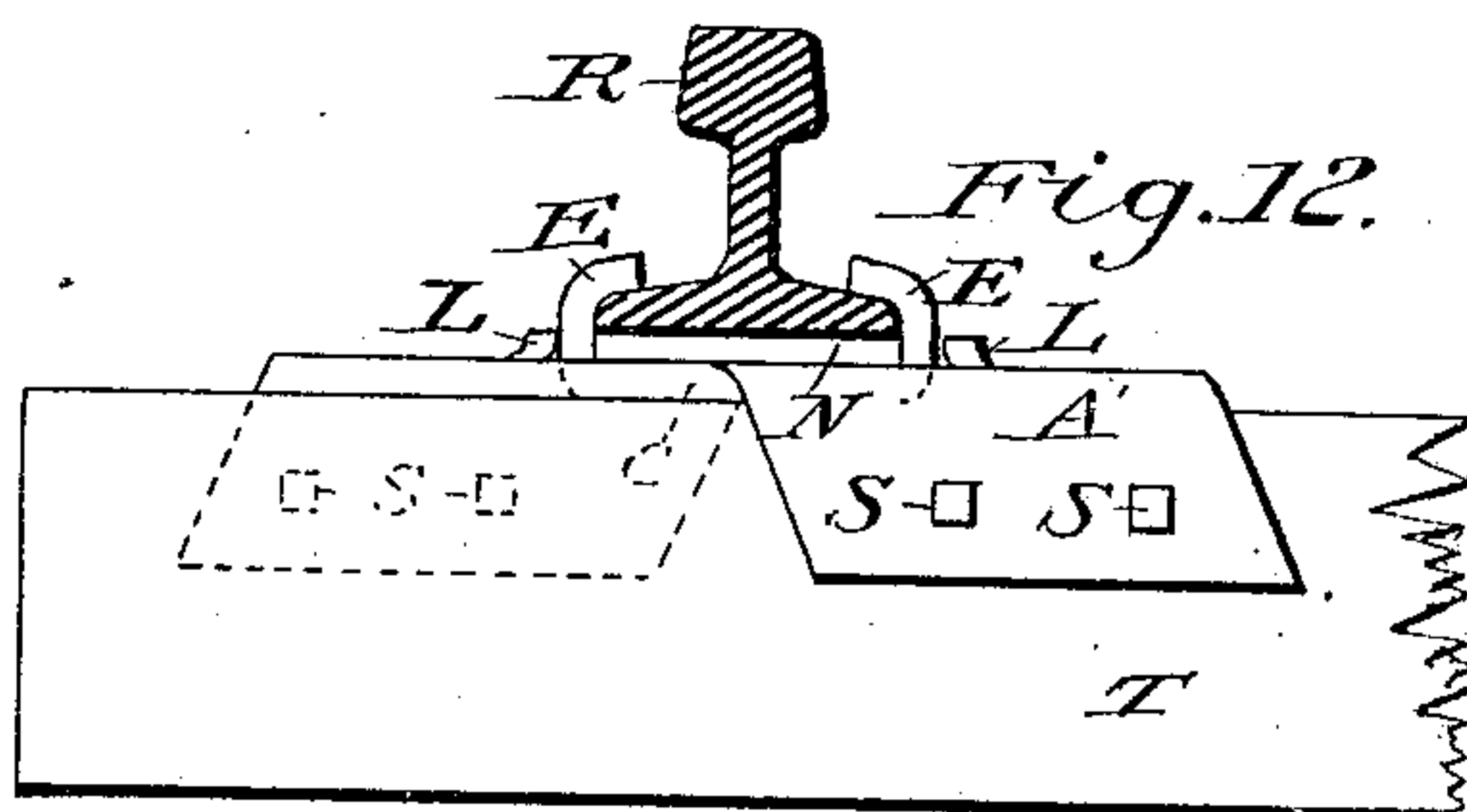
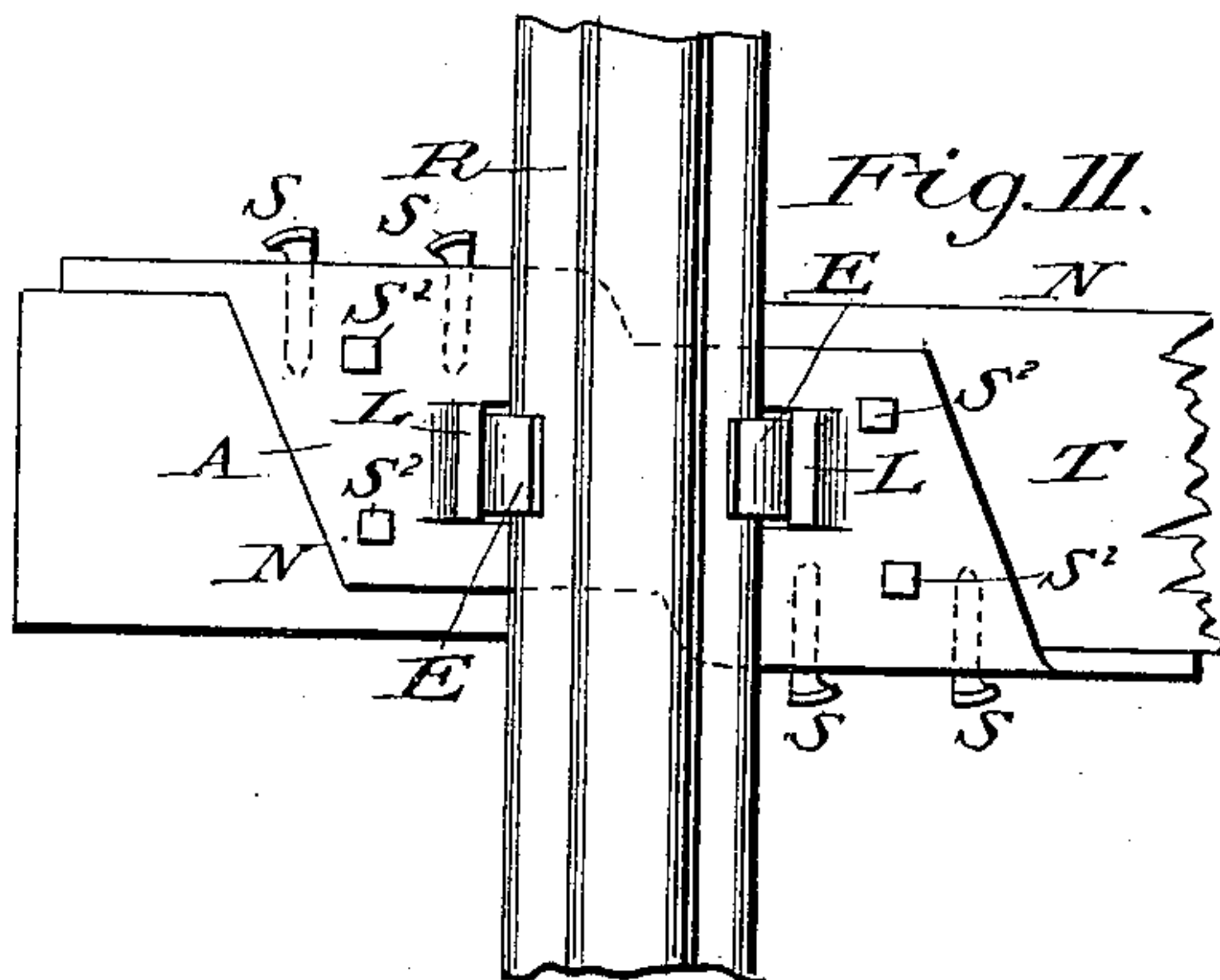
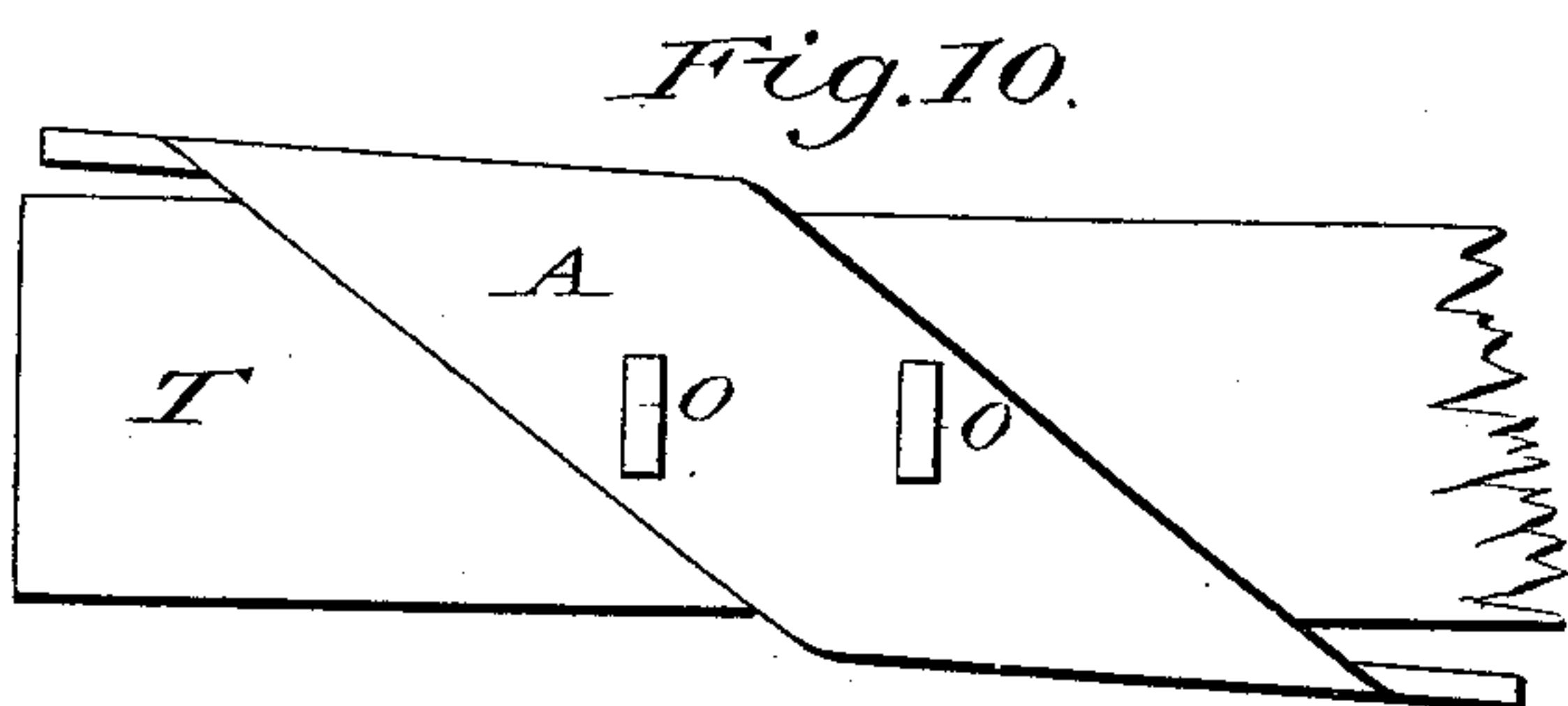
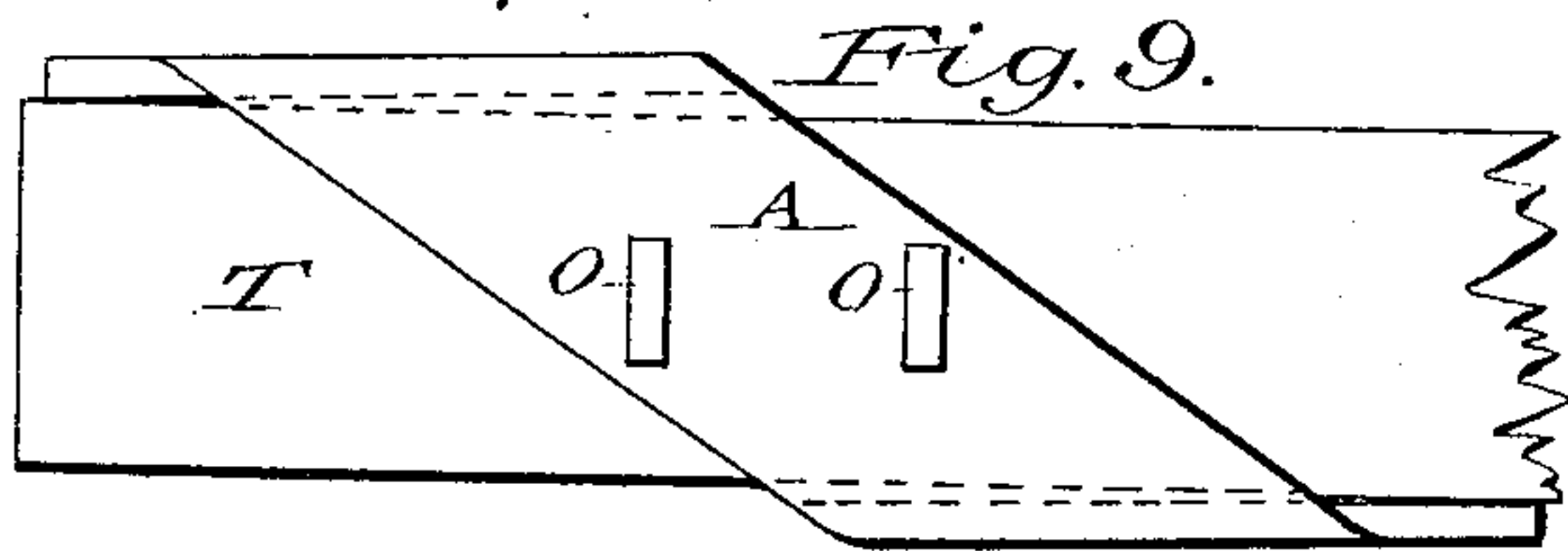
2 Sheets—Sheet 2.

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Witnesses:

C. O. Palmer  
O. Tyberg

Inventor:

A. M. Trude,  
By F. H. Richards, Atty.



# UNITED STATES PATENT OFFICE.

ARTHUR M. TRUDE, OF HARTFORD, CONNECTICUT.

## RAILROAD-TRACK FASTENING.

SPECIFICATION forming part of Letters Patent No. 329,867, dated November 3, 1885.

Application filed October 30, 1884. Serial No. 146,854. (No model.)

*To all whom it may concern:*

Be it known that I, ARTHUR M. TRUDE, of the city and county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Railroad-Track Fastenings, of which the following is a specification, reference being had to the accompanying drawings, and to the reference-characters marked thereon, forming a part thereof, in which—

Figure 1 is a plan view of a portion of a railroad-track having fastenings embodying a portion of my improvements, being the most simple form thereof. Fig. 2 is an end elevation of the same, (being viewed from the end of the rail,) partially in section, drawn in projection to Fig. 1. Fig. 3 is a perspective view of the form of plate shown in Figs. 1 and 2. Fig. 4 is a plan view similar to Fig. 1, showing the plate extending over the sides of the tie. Fig. 5 is an end elevation of the same drawn in projection to Fig. 4. Fig. 6 is a side elevation of the same, partially in section, drawn in projection to Fig. 5. Fig. 7 is a plan view of a modification of the form of fastening shown in Figs. 4, 5, and 6. Fig. 8 is an end elevation of the form shown in Fig. 7. Figs. 9 and 10 are plan views illustrative of the object of the improvement shown in Figs. 7 and 8. Fig. 11 is a plan view showing a further modification in the form of the plate. Fig. 12 is an end elevation of this improved form, and Fig. 13 is a side elevation of the same. Fig. 14 shows the manner of cutting from a strip of metal the form of plate shown in Figs. 7 and 8; and Fig. 15 shows the manner of cutting from a wider strip the form shown in Figs. 11, 12, and 13.

Similar characters refer to similar parts throughout the several views.

This invention relates to improvements in devices for fastening together the rails and cross-ties of railroads in a superior manner, the object being to provide means for making such fastenings more secure, and to prevent the ties from being so rapidly destroyed by the driving of spikes, abrasion, and decay.

The invention consists in certain devices and combinations, which will be first described in connection with the drawings, and afterward pointed out in the claims.

When railroad-rails are laid directly on the

cross-ties, this being the ordinary manner of laying them, the passage of trains produces a violent grinding action between the rail and the tie, which rapidly wears away the rail-seat, allowing the rail to sink down into the channel thus formed in the tie, and away from the heads of the spikes, which must then be driven deeper into the wood.

My invention overcomes the aforesaid difficulty by furnishing an inexpensive re-enforcing plate adapted to be placed between the rail and cross-tie for withstanding that grinding action. This plate, in its simplest form, is shown at A in Figs. 1 and 2, being a plain rectangular plate perforated for spikes S, whereby said plate is secured to tie T, and for a rail-holding clasp, C, for holding down the rail R, and having abutments for supporting the said clasp. These perforations or openings (see O, Figs. 14 and 15) are situated on either side of the rail-seat, and the clasp lies with its middle portion underneath the plate, its ends E extending up through said openings and closing down onto the flanges of said rail.

The clasp-openings are best made by cutting the plate on three sides of the required opening and turning up the metal to be removed, so as to form lips or abutments L. The object of these abutments is to assist the clasp in resisting the forces tending to produce a lateral displacement of the rail.

When the spikes for holding down the plate (or the rails when plates are not used) are driven into the top of the ties, as heretofore practiced, water readily finds its way down beside them. This, together with the action of the sun, induces decay, thereby reducing the firmness of the wood around the spikes and destroying the security of the rail-fastening. This necessitates a frequent changing of the spikes to new positions, which soon destroys the tie in that part where the plate or rail is secured to such an extent that the whole tie is rendered useless, although it may still be sound enough elsewhere. To prevent the so rapid destruction of cross-ties from this cause, I make the aforesaid plate wider than the tie and bend the edges thereof downward upon one or both of the sides of said tie, and then secure the plate to the tie by spikes driven through holes in these downwardly-



projecting flanges into the sides of said tie. This additional improvement is shown in Figs. 4, 5, and 6, A' being the flanges referred to. The spikes being now horizontal, or nearly so, the water obviously has less tendency to follow into the tie beside the spike than it has to run out, and thus cannot settle, as before, in the spike-holes.

As ordinarily laid railroad-rails are held down merely by the friction of the spike in the wood, so that if the spike becomes loosened by the decay of the tie around, as aforesaid, or otherwise, there is nothing to prevent said rail from being lifted vertically from the tie. By driving the spikes into the sides of the tie horizontally through the plate-flanges, as provided for by my invention, as aforesaid, any force tending to lift the rail—said rail being secured to the plate as described or by other equivalent means—is resisted by the flanges drawing against the under side of the spikes after the manner of what is called a “shearing-strain.” In this case the spikes may be loosely held into the tie and yet act with full effect to hold down the plate and rail.

For fastening the rail to the plate, I prefer to employ a stout L-shaped clasp, as before briefly described, the ends of which project up through the openings in said plate on each side of the rail-seat, and which are adapted to be bent down onto the flanges of the rail by blows from the track-layer's hammer. By this construction of fastening, using a clasp separate from the plate, the most suitable material may be used for each part. Another advantage is that when one part is broken or otherwise destroyed it may be replaced without renewing the entire fastening.

My improved track-fastening is designed more especially to be used on cross-ties having a rectangular cross-sectional form, usually prepared by sawing them to an approximately-uniform size. It is well known, however, that such cross-ties will, owing to imperfect workmanship and shrinkage, vary slightly in size, so that a plain flanged plate, as shown in Figs. 4, 5, and 6, will not exactly fit all of them. This imperfection of fitting is usually slight, and if the plate is not too thick the flanges are readily closed onto the wood by means of the spikes; but I prefer to secure the proper fit of the flanges to the tie by an additional improvement. (See Figs. 7 and 8.)

This improvement consists in such a construction of the plate that the flanges thereof shall be situated from each other in a direction diagonally to the tie, and preferably so that one flange shall be on the inside while the other is on the outside of the rail. When so constructed, if the tie is either too wide or too narrow the plate may be slightly turned or swung on the top of said tie and the flanges drawn close to the sides thereof by driving home the spikes. This is shown in Figs. 9 and 10, showing, respectively, a tie too narrow and one too wide. In its simplest form this style of plate is a plain strip with the ends cut

off parallel to the folding-line. This is illustrated by Fig. 14, in which F F are the folding-lines and H H the end of a plate. The plates having been severed from the strip by diagonal cuts, the clasp-openings O and the spike-holes S, Figs. 14 and 15, are made, and the plate finished by properly bending the flanges at the said folding-lines.

It will be understood that the form of plate may be modified in various ways to a considerable extent without effecting the novel features of my improved track-fastening; but there is one modification which I consider an improvement over the form last above described. This modification is shown in Figs. 11, 12, and 13, the manner of cutting the same from a strip of metal being shown in Fig. 15, which corresponds (except in the shape of the plate) to Fig. 14. The diagonal cuts are here made to have a zigzag course across the strip, so that, without using a greater amount of metal for the plate, there is more width of metal outside of the clasp-holes O than is shown in Fig. 14. Another advantage is that the flanges may be more nearly vertical to the top of the tie and the extreme length of plate be less.

As hereinbefore described, that part of the plate A lying on the top of the tie is flat in one plane, and the middle portion of the clasp underneath said plate lies in a cavity formed in the tie. This, especially if the ties are made of hard wood, is not always convenient, and I therefore in such cases construct the plate with another additional improvement, which improvement consists in constructing the plate with its middle portion, N, elevated above the marginal parts thereof, so as to form a recess therein for receiving the middle part of the clasp. This is plainly shown in Figs. 11, 12, and 13, the top of said elevated portion forming the rail-seat.

It will be understood that bolts or any other suitable form of rail-holding device can be substituted and are equivalents for clasp C (the openings O being suitably modified) in some of those combinations claimed in which the plate A has flanges; but I prefer the clasp because of its simplicity and cheapness and of its less liability of being loosened accidentally. In practice, for greater security, I prefer to use two spikes in each flange, in which case it is sufficient to make them each about one-half the weight of spikes now generally used. This I consider favorable, as small spikes are of course much less destructive to the tie than larger ones. In exceptional instances it may be necessary, as when laying track around sharp curves, to use more spikes than are in the flanges to prevent lateral displacement of the rails. In this case they may be driven through holes in the top of the plate, as shown at S<sup>2</sup>, Fig. 11; but this is usually unnecessary.

It is obvious that screws or bolts may be used in place of spikes whenever desired, these being well-known equivalents for each other.



Having now described my improved railroad-track fastening, what I claim to be new, and therefore desire to secure by Letters Patent of the United States, is—

5 1. An improved article of manufacture consisting of the cross-tie re-enforcing plate herein described, (see Figs. 1, 2, and 3,) the same being a plate having clasp-openings O, and having abutments L formed of the metal removed  
10 in making said openings, substantially as set forth.

2. The combination, in a railroad-track, of a flanged rail, a wooden tie underneath and supporting said rail, a metal plate between  
15 said rail and said tie having two openings, one on each side of said rail, substantially as described, and having perforated flanges extending down over the sides of said tie, a metallic clasp having its middle portion inclosed in a  
20 cavity or recess formed between said tie and said plate, and having its ends extending up through the openings in said plate and closed down on said rail, and spikes passing horizontally through the perforations of said flanges  
25 into said tie, all substantially as and for the purpose described.

3. The combination, in a railroad-track, of a railroad-rail, a wooden tie underneath and supporting said rail, a metal plate between  
30 said rail and said tie, provided with a rail-holding device, substantially as described, said plate extending diagonally across said tie and having perforated flanges extending down over the sides thereof, and a series of spikes passing  
35 horizontally through the perforations of said flanges into said tie, substantially as and for the purpose specified.

4. A railroad-cross-tie re-enforcing plate, as A, Figs. 4, 5, and 6, having flanges adapted

to extend down onto the sides of the tie, said 40 plate perforated for spikes situated horizontally, and having openings for a rail-holding device, substantially as described.

5. A railroad-cross-tie re-enforcing plate, as A, Figs. 4, 5, and 6, having flanges adapted 45 to extend down onto the sides of a tie, and perforated for spikes situated horizontally, said plate having openings for a rail-holding clasp, and abutments for supporting said clasp, all constructed and arranged substantially as 50 described.

6. A railroad-cross-tie re-enforcing plate constructed to lie diagonally across said tie, and having flanges one on either side of said rail, said plate being formed by severing it 55 from a strip by a zigzag cut, substantially as shown and described.

7. The combination of the wooden cross-tie F, the plate A, having openings O and abutments L, as shown and described, the holding 60 devices, substantially as described, for holding the plate to the tie, and clasp C, bent over the rail-flanges and supported by said abutments, substantially as set forth.

8. A railroad-cross-tie re-enforcing plate, as 65 A, Figs. 7 and 8, having flanges adapted to extend down onto the side of a tie, and perforated for spikes situated horizontally, said plate being fitted to the tie obliquely, so that said flanges rest on said tie at different points 70 in its length, all substantially as set forth.

In testimony whereof I have hereunto subscribed my name, at Hartford aforesaid, this 30th day of September, A. D. 1884.

ARTHUR M. TRUDE.

Witnesses:

A. P. MOORE,  
C. H. COOLEY.