

J. S. SCHAEFFER.

CROSS TIE.

APPLICATION FILED OCT. 6, 1908.

944,637.

Patented Dec. 28, 1909.

2 SHEETS—SHEET 1.

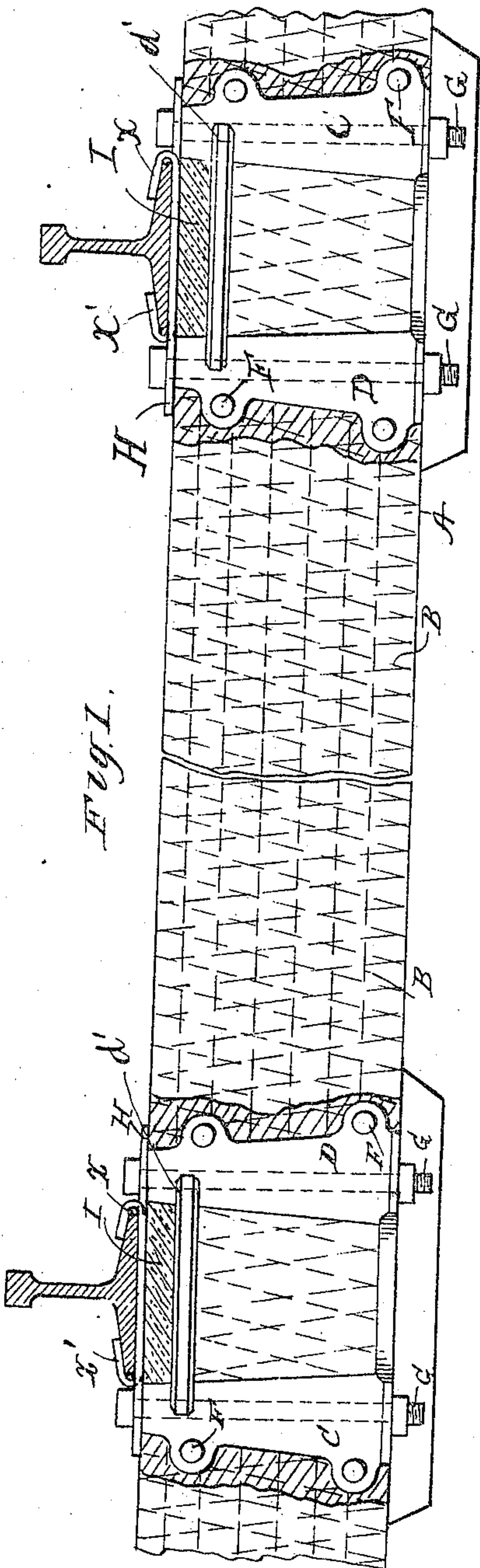


Fig. 1.

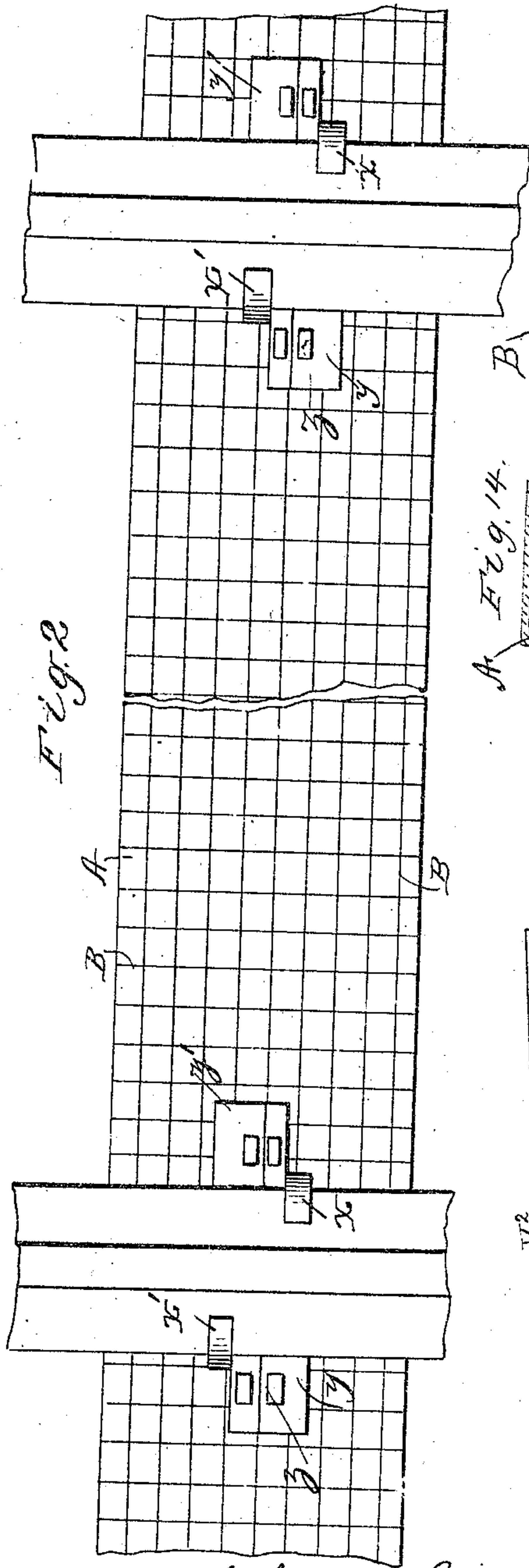
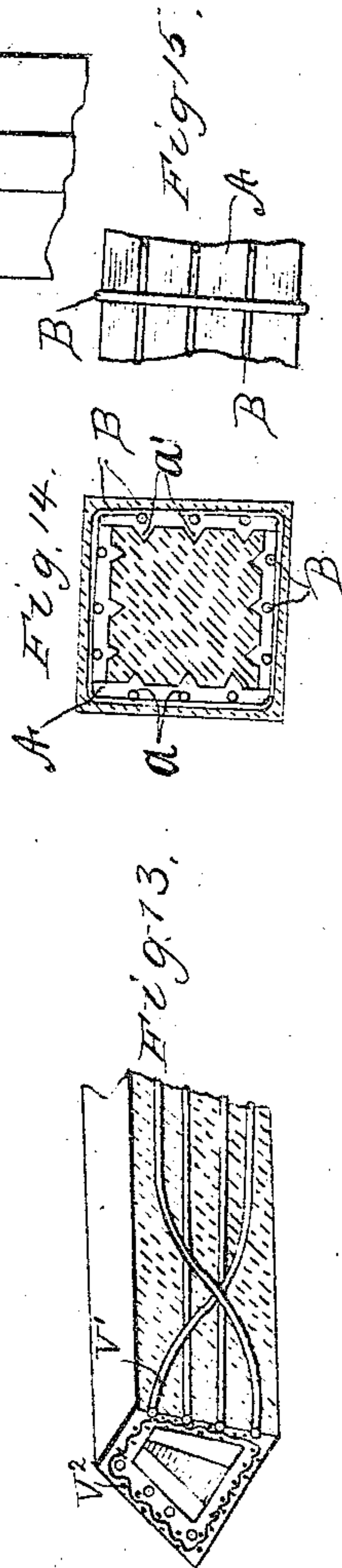


Fig. 2.



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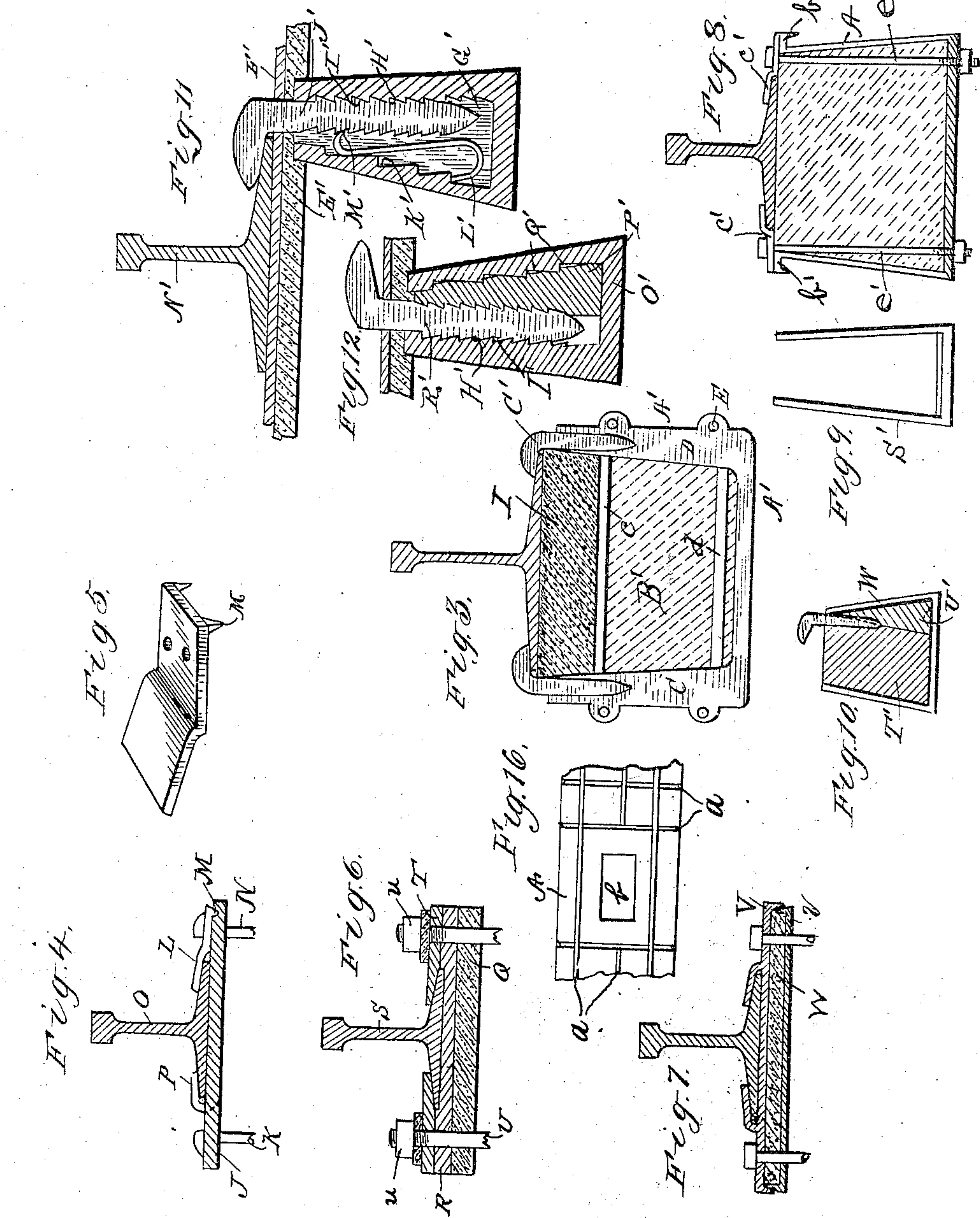
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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

JOHN S. SCHAEFFER, OF PHOENIX, NEW YORK.

## CROSS-TIE.

944,637.

Specification of Letters Patent.

Patented Dec. 28, 1909.

Application filed October 6, 1908. Serial No. 456,412.

*To all whom it may concern:*

Be it known that I, JOHN S. SCHAEFFER, a citizen of the United States of America, residing at Phoenix, in the county of Oswego and State of New York, have invented certain new and useful Improvements in Cross-Ties, of which the following is a specification.

This invention relates to railway tracks and particularly to cross ties and rail fasteners therefor.

An object of this invention is to provide a composition tie and rail fastener, said tie comprising preferably metal and a composition in which the metal is embedded and the metal is preferably hollow and filled with concrete so that the concrete acts as a filler and an envelop for a metal shell.

A further object of the invention is to provide a hollow metal core for a railway tie, the said core being formed of a series of plates secured together, the said plates being wrapped with wire or the like for the purpose of retaining them in assembled relation to increase the strength of the tie, the said metal shell thus formed being embedded in concrete and preferably having a concrete filler.

A further object of the invention is to provide a tie having a body as indicated above, the shell heretofore referred to having openings therein to receive the rail anchoring devices, and the rail anchoring device comprising clamping members suitably anchored with respect to the cross tie.

A still further object of the invention is to provide a cross tie having a rail securing device in which bolts are used for holding the rails in place or in which substitutes for bolts may be utilized in the shape of the ordinary spike, and the invention further contemplates the provision of a serrated spike and a wooden anchorage for the spikes suitably held in the prismoidal holder.

A still further object of this invention is the provision of a novel cushion so positioned with relation to rail securing devices that the said cushion is held in place against movement by the said rail securing devices, and the invention further consists in the novel clamps acting in conjunction with the tie plates and the means for holding the cushion, tie plates and clamps in assembled relation.

With the foregoing and other objects in view, the invention consists in the details of

construction and in the arrangement and combination of parts to be hereinafter more fully set forth and claimed.

In describing the invention in detail, reference will be had to the accompanying drawings forming part of this specification wherein like characters denote corresponding parts in the several views in which—

Figure 1 is a view in elevation, partly in section illustrating a cross tie embodying the invention; Fig. 2 illustrates a top plan view thereof; Fig. 3, illustrates a sectional view showing one form of rail securing device; Fig. 4, is a sectional view illustrating a rail clamping device; Fig. 5, illustrates a perspective view of one of the clamps of the device shown in Fig. 4; Fig. 6, illustrates a sectional view of a rail clamping device shown in Fig. 4, with a cushion added beneath the tie plate; Fig. 7, is a sectional view similar to the view shown in Fig. 6, except that the rail clamping means is slightly modified; Fig. 8, is a transverse sectional view similar to Fig. 3, except for the changed construction of the means for holding the rail; Fig. 9, is a detail view of a modified element to be used in connection with a rail securing device; Fig. 10, illustrates a sectional view of a spike anchoring means, a further modified form of securing the rail in place; Fig. 11, is a detail view of a further modified form for holding the rail in place; Fig. 12, is a still further modification thereof; Fig. 13, illustrates a further means of reinforcing the tie; Fig. 14, is a transverse sectional view of the tie; and Fig. 15 illustrates a view in elevation of a fragment of the shell of a tie with the reinforcing wires applied thereto; Fig. 16, is a detail plan view of a fragment of the shell showing the longitudinal and transversely extending grooves and the aperture in the shell.

The cross tie is preferably formed by utilizing metal and concrete and the metal portion of the tie is preferably in the form of a shell A, comprising two or more sections, the outer surfaces of the sections of the shell being grooved transversely and longitudinally at  $a$ , in order that the said grooves may form seats for the binding wire B, which is wrapped around the shell transversely and longitudinally or diagonally. By reason of the binding wire, the sections of the shell are held together against displacement and the strength of the structure is increased.



The upper and lower walls of the shell are provided with apertures *b*, adapted to receive a yoke (hereinafter referred to) for fastening the rails to the cross ties and these yokes are preferably applied to the apertures of the shell prior to the application of the concrete to the shell. In constructing or forming the tie the sections of the shell are first assembled and wrapped after which the said shell is placed in a molding box which is filled with concrete so that the concrete find its way to the interior of the shell and the molding box is of such size as to permit the shell to be coated on its whole external surface and I have found in practice that the external coating need not be very thick. The rail fastening device is applied to the tie in position to receive the rails and said yokes comprise prisms, formed in two halves, one half being shown as comprising the sections C, D, connected by a base plate, and being connected near their tops by a bar *d'*, and the two sections of each half of a prism have ears to receive the rods or bolts E, F, by which the two halves of the prism are joined. The tops of the prisms are open, except for the covering afforded by the clamping plates H, which clamping plates are apertured to receive the bolts G. In the use of the tie plates and bolts, the said clamping plates are held against movement owing to the fact that the hollow prisms are embedded in the crosstie. When the shell heretofore described has been applied to the mold box and the hollow prisms are placed in the openings of the shell, the concrete which is applied to the shell fills the spaces between the hollow prisms and by this means, the hollow prisms are anchored in the shell. The prisms are connected by horizontally disposed bars *d'* and the space between the bars and the tops of the prisms is filled by a cushion I, and it is preferable that such cushion extend slightly beyond the tops of the prisms in order that the tie plate may be raised on the cushion, so that said cushion may absorb the shock and vibration incident to the use of the rails which are supported by the tie plates.

The means for securing the bases of the rail and the tie plates may be variously modified and for the purpose of illustrating some of the forms that may be advantageously formed, I show in Fig. 4, a tie plate J, with rods K, for connecting the tie plates and the prisms and in this form of the invention, I employ a clamping plate L, having spurs M, adapted to be embedded in the tie plate and I also employ bolts N, which extend through the apertures in the tie plate and as shown in this figure, the clamp overlies a portion of the base of the rail O, and hence said rail is secured in place. In this form, the tie plate is provided with an integral curved lug P, which extends over the base flange on the

side of the rail opposite to that engaged by the clamp L. The tie plates are, as stated, two in number one of which is made a right hand, and the other a left hand in order to remove them without displacing the track or disturbing the tie, this being true as to the renewing of the bolts.

In the form shown in Fig. 6, the cushion Q, is provided, on which the tie plate R, rests and the said tie plate supports the rail S, the flanges of the rail being secured by clamps T, quite similar in construction to the clamps L, heretofore described, although they have a slightly different contour. In this form, the threaded ends of the bolts U, extend through the cushion, tie plate, and clamps and the nuts *u*, are applied thereto, for the purpose of binding the parts in position. In utilizing the bolts as here shown, it will be understood that the heads of said bolts will lie against the bottoms of the said prisms and the shanks of said bolts will extend through the apertures in said bottoms and through the hollow prisms.

In the form shown in Fig. 7, the tie plate has an upper and a lower section V, *v*, respectively and the sides of said sections have overlapping flanges adapted to confine the cushion W. In this last form the means for engaging the base flanges of the rails are integral with the upper section V, of the tie plate and are bent to overlie and retain the base flange in position.

In the form shown in Fig. 8, of the drawings, which is a transverse sectional view similar to the view shown in Fig. 3, the shell A, for the filler is provided with out-turned portions *b'*, adapted to partially support the rail securing plates *e'*, the rail in this instance resting directly on the filler and being clamped firmly by means of bolts *e'*, as is clearly shown therein.

The tie plates which I show in Fig. 2, will be found very desirable in practice as they provide for securing the rails in place and bracing them from opposite sides. In this construction, there are two tie plates on each end of the cross tie, and said tie plates having curved lugs X, X', extending in opposite directions so that one tie plate Y, will project on one side of the rail and be secured by a bolt Z, with the lug X, of said plate Y, overlying the flange on one side of the rail, whereas the plate Y', will project on the opposite side of the rail and its curved lug X', will overlie the base flange of the rail on the side of the rail opposite to that engaged by the curved lug X.

Fig. 1, shows a cross tie and it also shows a prism in place having the cushion I, above the bars of the prism and it also shows the tie plates with curved lugs X, X', applied to the rail.

In connection with the hollow prisms heretofore described, I may employ other fasten-



ing means, such as ordinary spikes or I may employ serrated spikes. When the ordinary spikes are used, the hollow prisms A', are provided with a wood core or filler B' and a spike C', is driven into the filler and anchored therein, the same as it would be anchored in an ordinary wood tie. In this form, the cushion I, is employed in the same relation and for the same purposes as heretofore described.

In the form shown in Fig. 11, a cushion E', is employed with a tie plate F', and a hollow prism G', is also employed having its internal wall provided with shoulders H', and the said shoulders are designed to be engaged by teeth I' on the shank of a spike J'. The wall of the prism opposite the shoulders H', is provided with a series of shoulders K', designed to be engaged by a spring L', which spring has a curved end engaging the serrations M', on the shank of the spike and as the said spike is applied to the hollow prism with its head engaging the base of a rail N', the spring will act to force the shank of the spike into engagement with the shoulders of the wall of the prism and by this means the spike will be held against upward movement.

The form shown in Fig. 12, is somewhat analogous to that shown in Fig. 11, except that in this form, the hollow prism O', is provided with a wood or composition filler P', which is held in the prism by the roughened surface Q', of the prism and the serrated spike R', is driven into the filler and anchored therein as fully illustrated in said Fig. 12.

Figs. 9, and 10, show another means for anchoring spikes and it consists in a housing S', adapted to receive two prismoidal core blocks T' and U', respectively and the said blocks are connected by the spike when it is driven into the said blocks. By reason of the fact that the sections of the core are prismoidal, they can be assembled in the housing in sections and then when they are connected by the spikes, they can not be withdrawn from the housing until the spike is removed. This anchoring means may be substituted for the prisms and clamps heretofore described, as the housing may be applied to the shell of the cross tie before or at the time the shell is placed in the mold to receive the concrete.

As shown in Fig. 13, the tie may be strengthened to prevent bending of the same

by the use of reinforcing members V', to be placed at each end of the cross tie inside of the shell or wire netting and in applying the reinforcing rods they are preferably applied so that the concrete will cover them and it is desirable to have the rods curved to cross one another, as shown in the drawings. Two such rods are placed on each side of the tie and the space inclosed by them is elliptical and as shown in this figure, the tie is preferably wider at the base than at the top to carry out the prismoidal construction that corresponds to the spike anchoring device.

In Figs. 14 and 15, I have shown a transverse sectional view and an elevation of a fragment of the tie, respectively. In this instance the shell A, with wires B, wound therearound, in grooves a, is provided with spurs a', to more effectually hold the same embedded.

I claim:

1. In a railway tie, a shell having grooves on its external surface and lugs on its internal surface, a binder wrapped around the shell and lying in the grooves, a composition filler, an external coating for the shell, prismoidal holders embedded in the composition within the shell, and means for securing rails to the cross tie.

2. In a railway tie, a shell, a composition filler and cover for the shell, said shell having an opening in its upper surface, hollow prisms in the opening of the shell, tie plates above the shell, a cushion interposed between the tie plate and shell, and a rail securing device on the tie plate, means for securing the rail securing devices in place, said means extending into the hollow prisms, and means for anchoring them.

3. In a railway tie, a shell having openings, spike anchoring means comprising hollow prisms having shoulders on their internal walls, a spike for each prism having a serrated shank adapted to engage the shoulders of a prism, and a spring engaging one of a series of serrations on the spike and one of a series of shoulders on the prism, whereby the said spike is held in engagement with the shoulders of the prism.

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

JOHN S. SCHAEFFER.

Witnesses:

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