

No. 639,060.

Patented Dec. 12, 1899.

S. S. KING.

RAIL JOINT.

(Application filed Apr. 26, 1898.)

(No Model.)

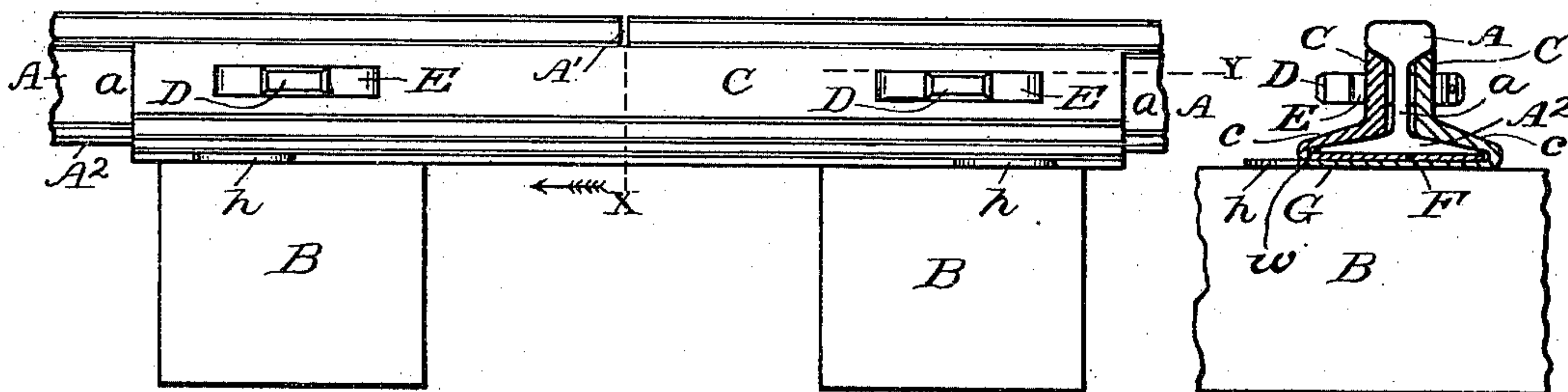


Fig. 1.

Fig. 2.

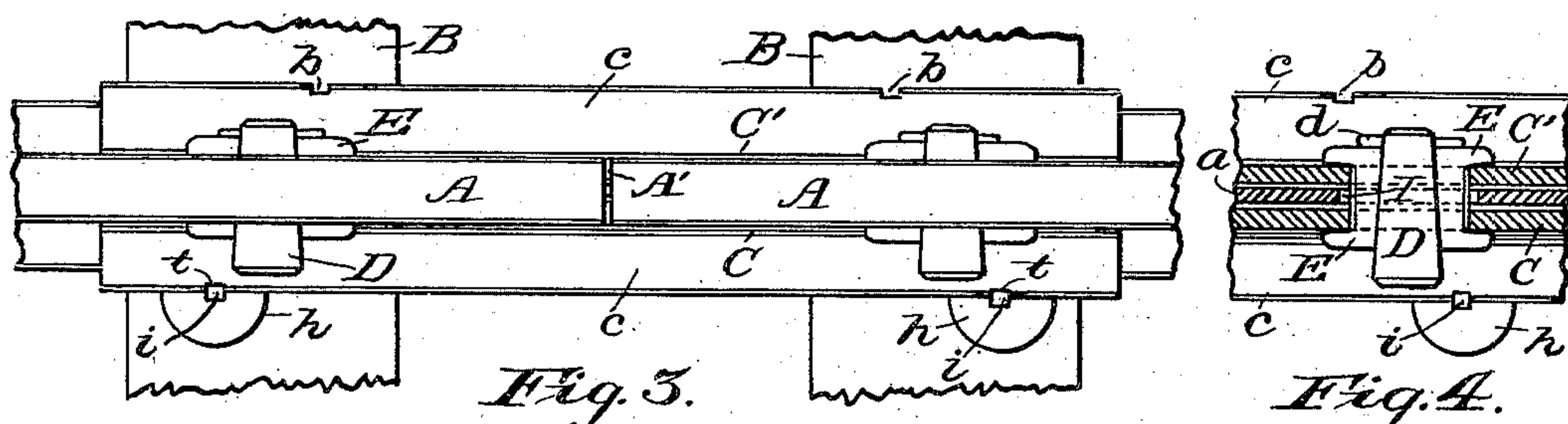


Fig. 3.

Fig. 4.

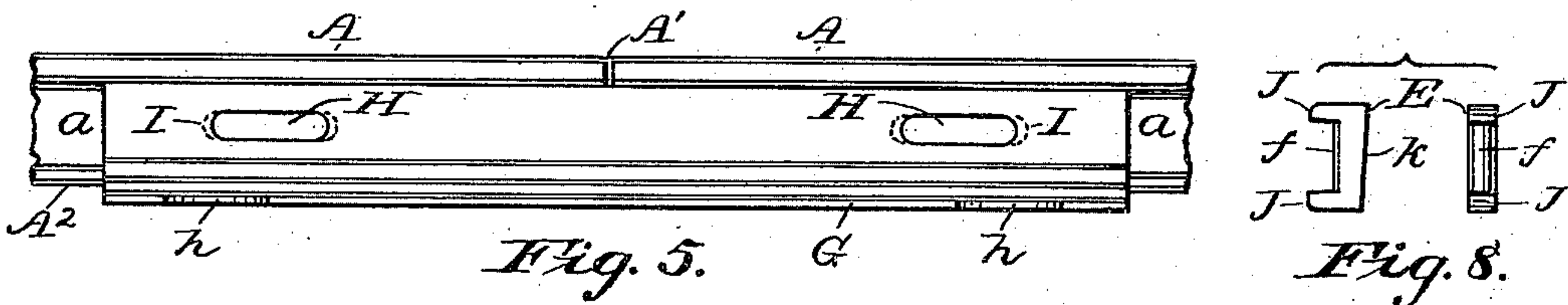


Fig. 5.

Fig. 8.

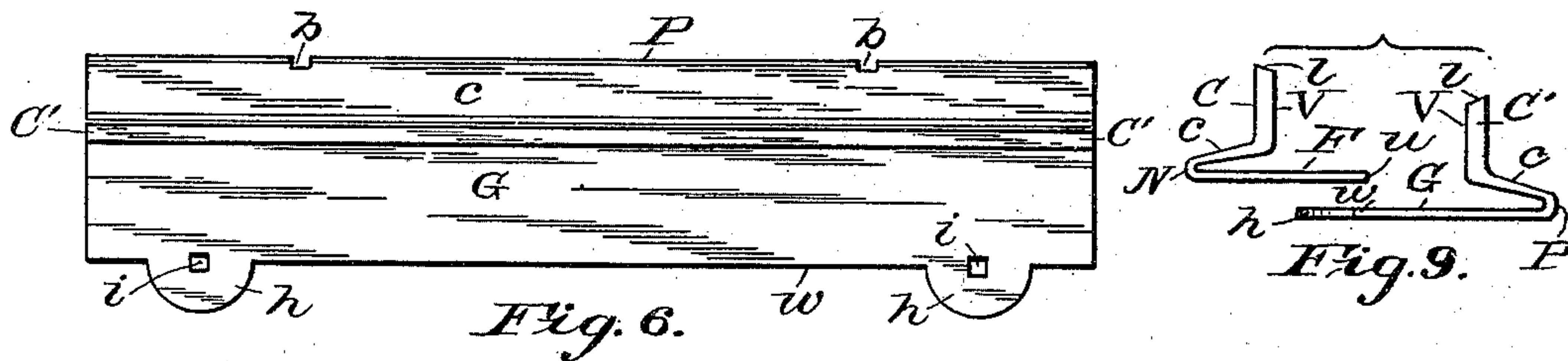


Fig. 6.

Fig. 9.

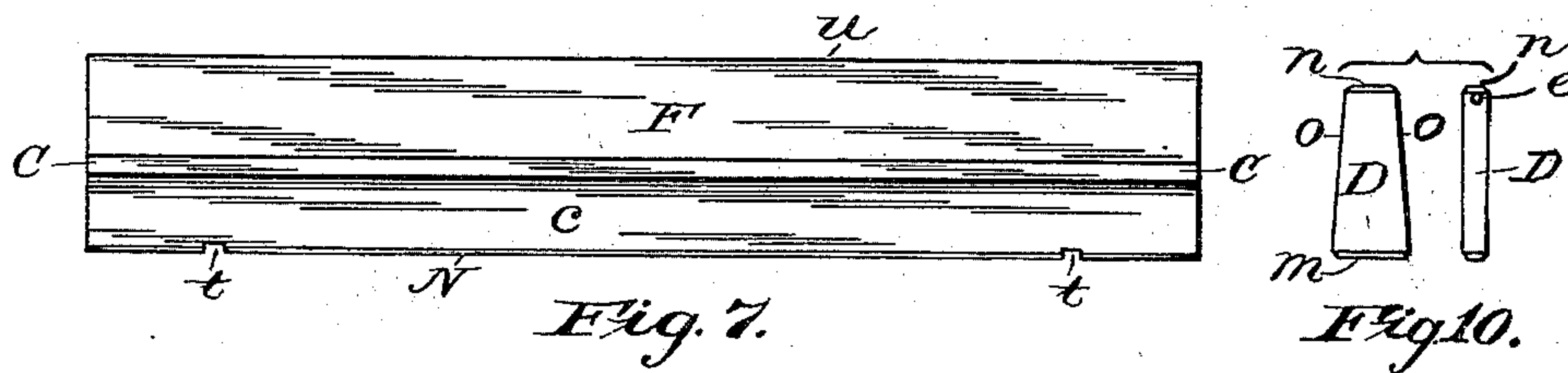


Fig. 7.

Fig. 10.

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UNITED STATES PATENT OFFICE.

SAMUEL S. KING, OF SUNBURY, PENNSYLVANIA.

RAIL-JOINT.

SPECIFICATION forming part of Letters Patent No. 639,060, dated December 12, 1899.

Application filed April 26, 1898. Serial No. 678,830. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL S. KING, a citizen of the United States, residing at Sunbury, in the county of Northumberland and State of Pennsylvania, have invented certain new and useful Improvements in Rail-Joints; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to devices for connecting the rails forming a railway-track and which, together with the abutting rail ends, are commonly known as "rail-joints;" and it consists in certain new and novel forms of splice-bars therefor, a novel means by which the bars bind the rails and support the joint, a novel means by which the bars are secured to the rails, and in the parts and combination and arrangement of parts, as will be more fully hereinafter described and claimed.

My objects are to provide a rail-joint which is adapted for either the T-rail or for the street-railway type of rail and which shall be as strong as the unbroken portion of a rail and yet as elastic, and also capable of maintaining the joint in exact alinement both vertically and laterally and prevent deflection of the rail ends as the wheels pass over the joint, which in other joints occur to such an extent as to flatten the top edges of the extreme ends.

A further object is to provide a joint which may be cheaply constructed and maintained and in which the troublesome bolts and nutlocks are eliminated, so that the fewest parts are necessary and those of such simple form that they may be operated without the use of special tools.

A still further object is to provide against "crawling" of the joint on account of the expansion and contraction of the rails. These are fully attained in my invention, which also possesses other advantages, in that it is adapted to be either supported directly over a tie or suspended between two, as may be most convenient or desired.

Referring to the drawings, in which similar letters of reference in the several views des-

ignate corresponding parts, Figure 1 represents a side elevation of a rail-joint made in accordance with my invention; Fig. 2, a transverse vertical sectional view on the line X in Fig. 1 looking in the direction indicated by the arrow; Fig. 3, a top plan view; Fig. 4, a fragmentary horizontal longitudinal sectional view taken on the line Y in Fig. 1; Fig. 5, a side elevation of the joint incomplete; Figs. 6 and 7, top plan views of the splice-bars; Fig. 8, details of the clamping-gibs; Fig. 9, end views of the splice-bars, and Fig. 10, details of the gib-securing key.

In the drawings, A A designate the ordinary type of T-rails abutting at A'; B B, cross-ties; C C', the splice-bars; D D, the gib-securing keys, and E E the clamping-gibs.

The splice-bars C C' have each the usual vertical portion and an angled flange *c*, and thus far are alike, resembling the common type of angle-bar almost universally employed, and to the same extent my bars perform similar functions, but with the improvements added accomplish the desired results in a perfect manner. The bar is of sufficient height, so that the top *l* shall support the rail-head in the usual way; but in my invention this applies to lateral support more particularly, as it has been found that the small surface afforded is not sufficient for vertical support at the extreme rail end. Hence undue wear follows and sometimes fracture of the bar. Enlarged or swelled portions or longitudinal ribs may be formed at the outer side of the splice-bars to provide for sufficient strength to prevent buckling of the bar, this being a mere mechanical expedient. Also, the inner face V of the bar may be either a plane surface to bear against the web *a* of the rail or it may be grooved longitudinally so as to not touch the web, as may be preferred.

The bar C in its whole length has a horizontal plate F, formed integrally and being a continuation of the flange *c* bent under at N and extending back under the flange *c* and beyond so as to reach practically across the bottom of the base or foot A² of the rail against which it bears, the edge *u*, however, being preferably slightly short to compensate for inaccuracy in rolling. In the bent edge N are a number of suitably-situated notches *t*, corresponding to a rail-spike to prevent longi-

tudinal movement of the bar. The bar C' has also in its whole length a horizontal plate G, formed integrally and being a continuation of the flange *c* bent under at P, but in a curve having a greater radius than that of the bend N and extending back under the flange *c* and beyond so as to reach across the bottom of the base A² of the rail; but by reason of the larger bend P the plate G is permitted to pass under the plate F when connected to the rails. The bent side or edge P has a number of suitably-disposed notches *b*, corresponding to a rail-spike for preventing longitudinal movement of the bar. The edge *w* of the plate G has a suitable number of projections *h*, extending beyond the bent edge or side N of the bar C when connected, and each projection has a perforation *i*, adapted to receive a spike closely fitting and situated so as to register with a notch *l* in the bar C. With no other appliance than the spike driven into the tie a strong clamp is thus provided to draw the lower portions of the two splice-bars together and more tightly against the flanges of the base of the rail to make a more perfect bond. When the projections *h* are placed at the inner side of the rail, as designed, they also afford greater security against the rail being forced outward by the wheel-flanges, as the spikes therein reinforce those at the outside of the rail, while at the same time adding an additional safeguard against crawling of the rails, particularly upon inclines. In bars designed to reach across three or more ties additional projections are preferable. The value of these separate projections will be apparent when it is remembered that the head of a spike may be broken off in either driving or drawing, so that the perforation *i* becomes plugged, in which case a spike may be driven at either or both sides of the projection close to the base thereof, so as to effectually prevent crawling of the splice-bars upon inclined grades, which has become such an important factor in railway operation.

Each splice-bar is provided with a suitable number of oblong horizontally-disposed transverse perforations or slots H, preferably two for short bars and three for the longer bars and having semicircular ends, and the rail ends have through the web corresponding and registering slots I, but of slightly greater length to permit expansion and contraction of the rails.

The clamping-gibs E are adapted to pass through the slots H and I and at each end have at one side a projection J, having a tapering inner face, so that the distance from one projection to the other at their bases is less than at their outer ends. The side *f* between the projections is adapted to fit into the ends of the slots H and the opposite side *k* is tapering from one end to the other as in a wedge. Two gibs are designed to be applied in each slot, so that when forced apart the projections J J draw against the outer surfaces

of the splice-bars and bind the bars tightly against the rails, as indicated in Fig. 4.

The gib-securing keys D are made in the usual form of a wedge having a broad end *m* and a narrower end *n* and sides O O tapering in relation to a center line, so that when inserted between two gibs the sides *f* of the latter shall be parallel. The smaller end *n* has a cotter-hole *e*, situate either horizontally or vertically, and may be adapted to receive a cotter *d*, either of the straight or tapering type, to prevent accidental dislodgment of the key.

As specified above, the notches *l* register when assembled with the perforation *i* in the projection. This is highly advantageous in order to guard against the creeping of the joint-plates, which in other forms causes much trouble and expense on account of there being a too limited number of spikes available for this purpose. I remedy this defect by making use of the spikes that are employed for drawing the plates together by setting them not only in the perforations, but in the notches in the other plate registering therewith, so that there is an equal force exerted upon both plates, and in case of an accident should a car-wheel run alongside the rail and shear off the bolts or keys the spikes may prevent the joint-plates from being displaced, so as to cause greater damage through the breaking of the joint.

From the foregoing the manner of assembling will be clear to the mechanic and the advantages obvious, as a maul is the only tool required, and it may be observed that after a joint is made by the use of my devices it must remain compact permanently, as there are no screw-nuts to work loose and no tendency to cause the keys to become loose, as the principal support is provided by the bottom plates F and G, bearing upon the ties and presenting a bearing-surface for the rail of large area. A single plate, as F or G, could be employed; but it would fall far short of furnishing the maximum degree of safety, as a defect in the material or crystallization thereof would render it useless, while it is well known that the same weight of metal distributed in two separate plates affords greater security against rupture. In the use of very long splice-bars instead of using a third set of gibs and key at the point of abutment of the rails I may employ a simple bolt of the ordinary type inserted through a suitable bolt-hole to more firmly bind the bars and rails together to prevent side deflection of the rail-head at this the point of greatest weakness laterally. The plates F G may also have a straight taper decreasing in thickness from the bend to the edge.

I am aware that rail-joints have been made in which securing-keys have been used and that others have employed angular plates under the rail, but I am not aware that a joint has been produced having in combination all the advantages embodied in my invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a railway-joint, the combination with the abutting rail ends having the slots therein; of the splice-bars supporting the rail-head laterally and vertically, and having the horizontal plates extending under the bases of the rail ends each to the edge of the opposite side thereof and one of which is provided at the extreme edge thereof with the projections extending from the edge of the plate so as to afford an abutment against which spikes may be driven at the sides thereof, and having the perforation therein; the slots in the vertical portions of the bars; and the gibs and keys in said slots, substantially as and for the purposes shown and described.

2. In a railroad-joint the combination with the abutting rail ends, of the counterpart splice-bars extending under the bases of the rail ends each to the edge of the opposite side thereof; the projections attached to the free edge of one of said splice-bars and extending laterally therefrom so as to provide abutments against which supplemental spikes may be driven at the outer sides thereof as a reinforcement, and having the perforation there-through; a lateral brace bearing against the under side of the rail-heads and attached to the said splice-bars; and the means whereby said splice-bars are secured to said rail ends, substantially as and for the purposes shown and described.

3. In a rail-joint, the combination with the abutting rails and the splice-bars having the integral angular and horizontal portions; of the projections having the perforations therein and extending laterally from the free edge of the bottom one of such horizontal portions whereby abutments adjacent to the perfora-

tions are provided against which supplemental spikes may be driven into the cross-tie under said perforations; the notches in the opposite side of said horizontal portion at the junction thereof with the angular portion of said splice-bar; the notches in the free edge of the upper one of such horizontal portions and registering with the perforations in said projections; and the securing devices for said splice-bars, substantially as and for the purposes shown and described.

4. In a rail-joint, the combination with the abutting rails, and a pair of splice-bars, each comprising a vertical and an angular and a horizontal portion, the latter portions of which extend under the rail-bases to the opposite sides thereof, one below the other, said vertical portions bearing against the under sides of the rail-heads; of the slots in the rail-webs; the slots in the vertical portions of the said splice-bars; the gibs and keys in said slots; the projections having the perforations therein and extending laterally from the free edge of the bottom one of said horizontal portions whereby supplemental abutments are provided against which reinforcing-spikes may be driven into a cross-tie under said perforations; the notches in the opposite side of the lower one of said horizontal portions; and the notches in the free edge of the upper one of said horizontal portions and registering with said perforations in said projections, substantially as and for the purposes shown and described.

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

SAMUEL S. KING.

Witnesses:

GEO. E. DEPPEN,
G. G. SHATSBERGER.