(No Model.)

W. R. SMITH.

RAILWAY TRACK.

No. 528,309. Patented Oct. 30, 1894.

FIG. 1.

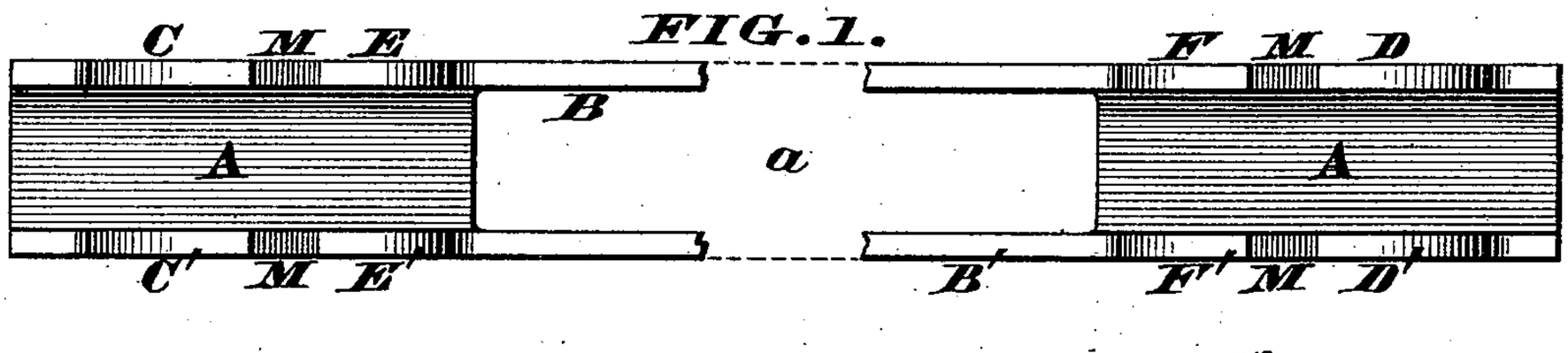


FIG. 2.

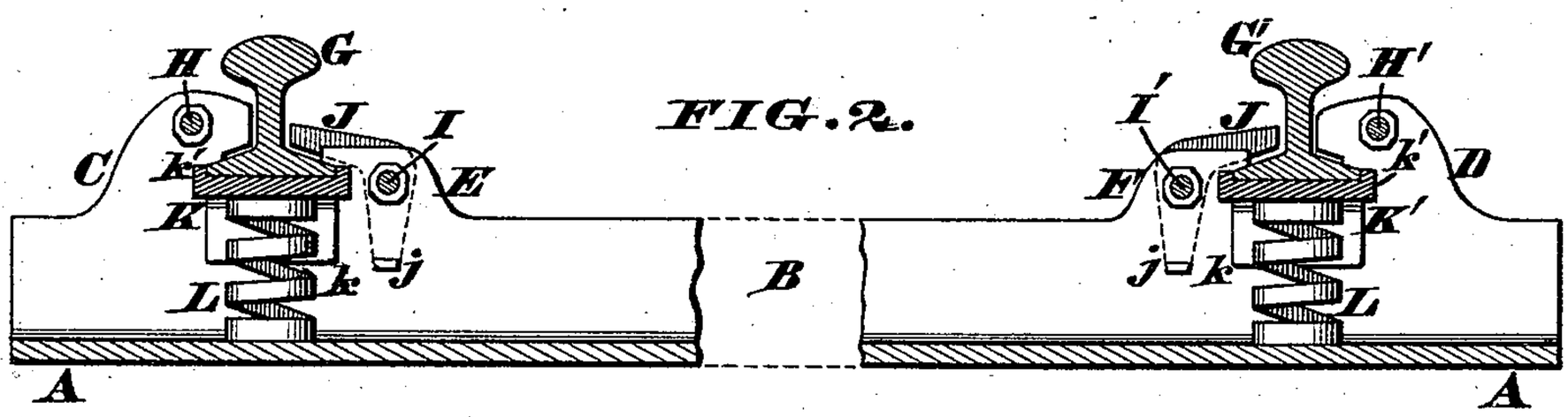


FIG. 3.

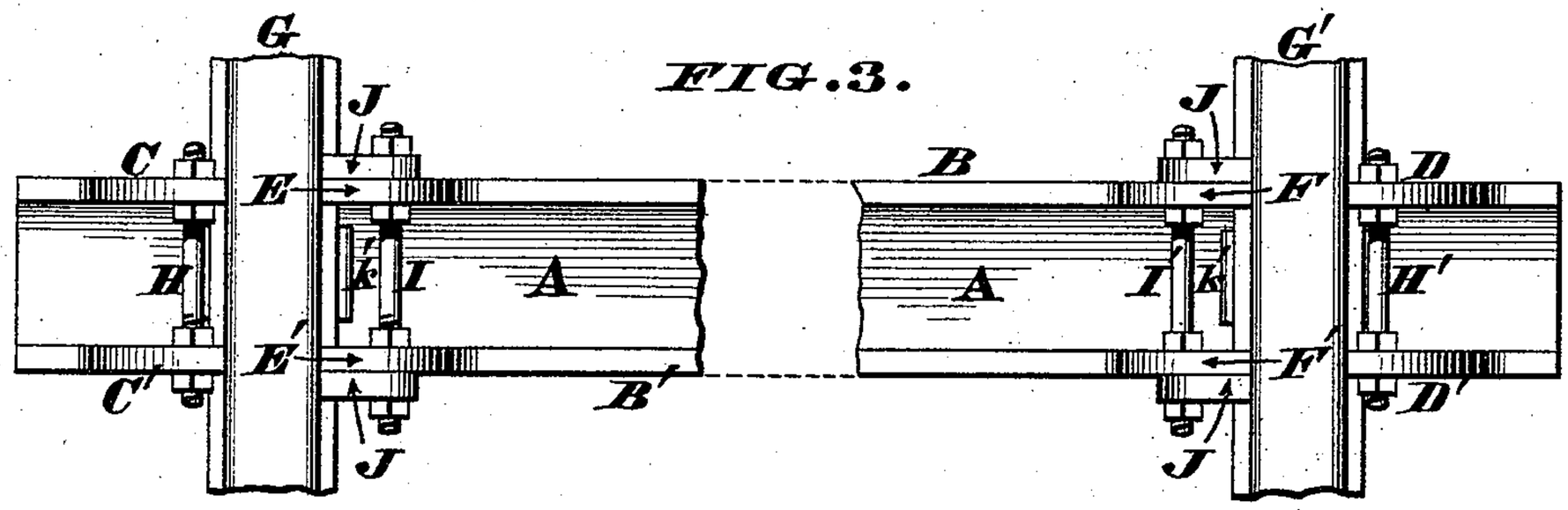


FIG. 4.

FIG. 5.

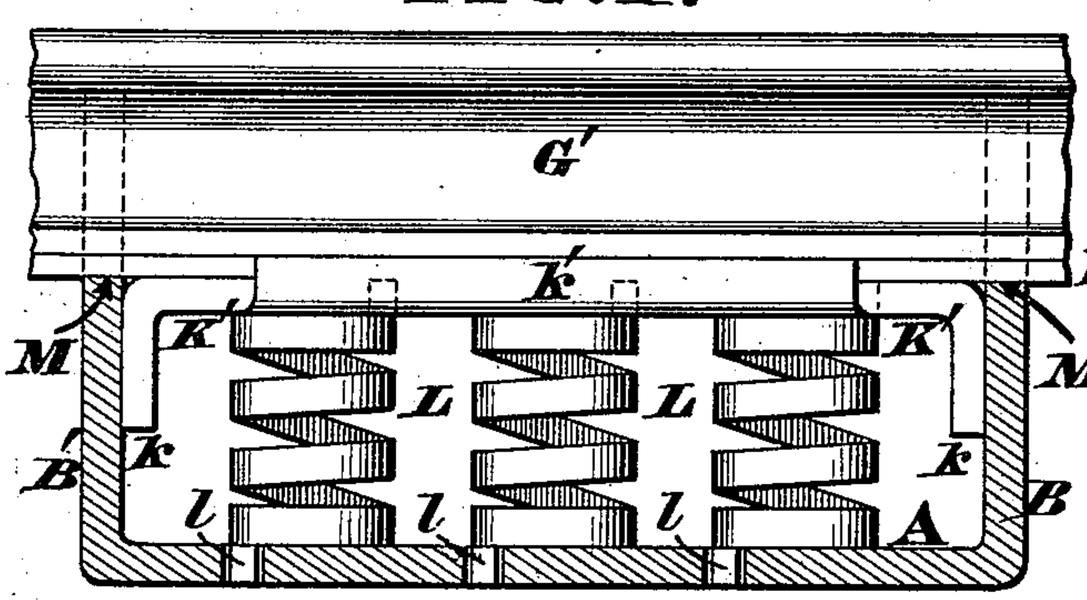


FIG. 7.

FIG. 8.

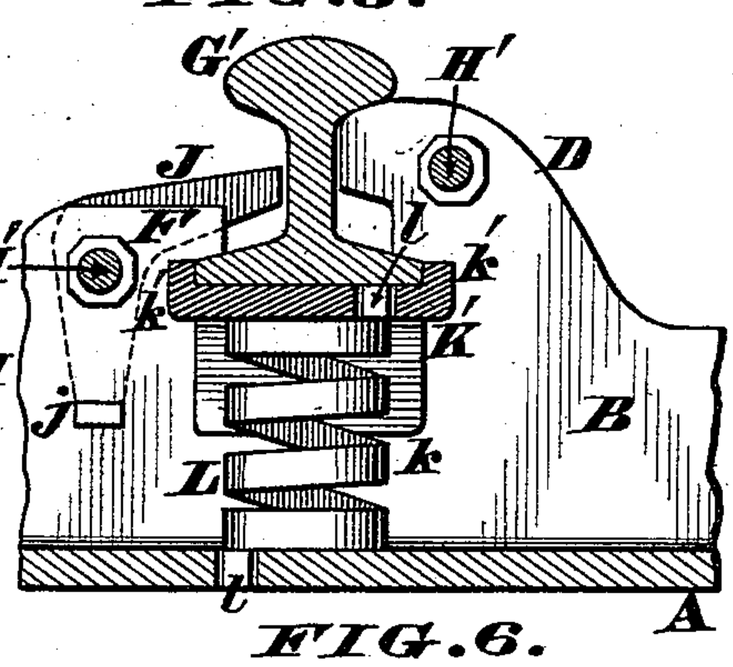
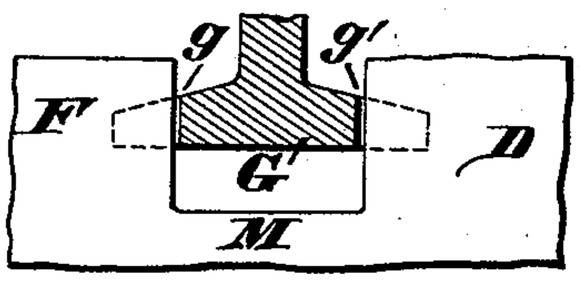
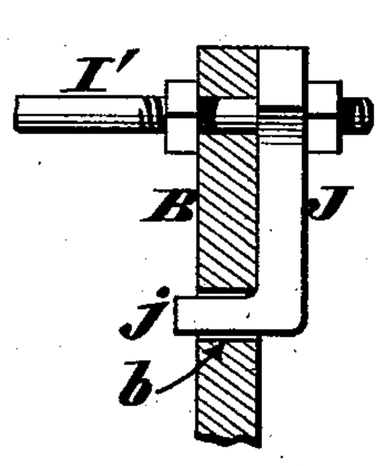
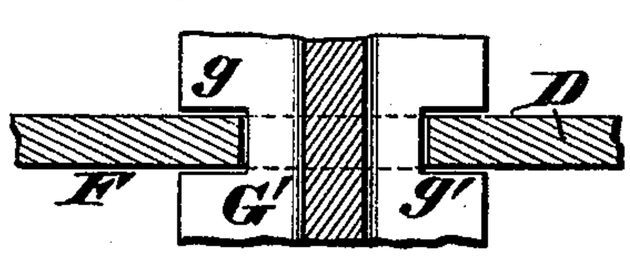


FIG. 6.







Attest.
Ida Steitz
Samuel McQuinn.

Inventor.
William R. Smith.
by James F. Layman.
Atty.

UNITED STATES PATENT OFFICE.

WILLIAM R. SMITH, OF RIVERSIDE, OHIO, ASSIGNOR OF TWO-THIRDS TO JOHN W. FISHER, OF SAME PLACE, AND THOMAS CLIFTON, OF CINCINNATI, OHIO.

RAILWAY-TRACK.

SPECIFICATION forming part of Letters Patent No. 528,309, dated October 30, 1894.

Application filed August 8, 1894. Serial No. 519,729. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. SMITH, a citizen of the United States, residing at Riverside, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Railway-Tracks; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the annexed drawings, which form part of this specification.

This invention relates to those railways whose tracks are supported upon springs housed within metallic cross-ties, and my improvements comprise certain details of construction that afford a very secure attachment of the rails to the ties, the peculiar features of said improvements being hereinafter more fully described, and then pointed out in the claims.

In the annexed drawings, Figure 1 is a plan of one form of cross-tie employed in constructing my yielding railway. Fig. 2 is a longitudinal section of another form of cross tie having a pair of rails applied thereto, the rails being seen in their normal or elevated positions. Fig. 3 is a plan of a portion of this track. Fig. 4 is an enlarged transverse section of a tie taken at one side of a rail, the latter being depressed. Fig. 5 is a transverse section through this rail and its supports. Fig. 6 is an enlarged horizontal section through part of a rail base, or foot. Fig. 7 is a vertical section through part of a base. Fig. 8 shows the method of attaching a keeper to a cross-tie.

In constructing my improved railway-track, I use a metallic cross-tie consisting of a horizontal plate or base A, provided with vertical flanges or side-webs B, B′, which are integral with said base. This tie can be a "drop forging," and should be about six or seven feet long, and from four to six inches wide, although these dimensions are not arbitrary, but may be varied to suit special circumstances. Furthermore, the metal must be sufficiently thick to preserve the proper shape of the tie when subjected to the heaviest kind of traffic. Again, the base-plate A may extend the entire length of the tie, as seen in Figs. 2 and 3, or the central portion of said plate may be omitted, as shown at *a*, in Fig. 1. Projecting vertically from the flange B, and near the ends of the tie, are abutments C, D, supplemented by similar abutments C′, D′, of the opposite web B′.

E, F, are lugs projecting from the flange B, and E′, F′, are other lugs of the web B′. These lugs are not so large as the abutments, and the distance between each lug and its associated abutment is somewhat less than the width of the base of the rails G, G′, to be applied to the ties, in order that the opposing edges of the lug and abutment may engage with notches *g*, *g′*, cut in said bases, as seen in Figs. 6 and 7.

H, H′, are bolts that unite the abutments, of each separate tie, and I, I′, are other bolts that fasten the lugs together, in the manner seen in Fig. 3, the bolts I, I′, being further used for attaching keepers J, to the outsides of the flanges B, B′. These keepers, of which four are applied to each tie, are shaped like bell-cranks and their upper, or horizontal arms project toward the rails, while their lower arms, after being carried down a sufficient distance terminate with short lateral-bends *j*, that pass through perforations *b′* in the tie-webs, as seen in Fig. 8; the object of these keepers being to prevent accidental detachment of the rails G, G′, from the ties, each of the latter being provided with a pair of vertically-reciprocating chairs K, K′, whose peculiar shape is shown in Figs. 4 and 5. Reference to these illustrations shows that the chair proper, K, is a flat plate, whose length about equals the distance between the tie-flanges B, B′, while the width of said plate is practically the same as the base or foot of a rail. The ends of each chair are bent down at *k*, *k*, to serve as guides that confine the chair to a vertical path between the webs B, B′. *k*, *k′*, are lips, on the sides of the chair, to prevent lateral shifting of the rails.

All the chairs of the track must be so arranged as to have a limited vertical play, which result is preferably accomplished by a system of helical springs L, arranged as seen in Figs. 2, 4 and 5. Three of these springs will be sufficient for each chair, and by providing the ends of their upper and lower

coils with short lateral-stumps *l*, adapted to enter sockets or holes in the chair and tie-base, said springs will be maintained in their proper positions.

To build a railroad embodying the above-described features, the ties are first laid at the desired distance from each other, and each of them is provided with a pair of spring-supported chairs, previous to the application of the rails. The heads of the rails are canted over toward the ends of the ties, so as to present the rail bases at such an angle as to cause their notches *g'*, to engage with the lower portions of the abutments C, C', and D, D'. The rails are then inclined toward the center of the ties, thereby causing the other base-notches *g* to engage with the lower portions of lugs E, E', and F, F'. Consequently, the rails now occupy the openings, between the abutments and lugs, this position of one of the rails being seen in Fig. 7, which illustration shows that the rail is elevated a slight distance above a bearing M, at the bottom of an opening. This lift is about one half of an inch, more or less, and is due to the chairs K, K', being elevated by the combined action of the various springs L. The abutments are now united by the rods or bolts H, H', and the lugs united by the other rods or bolts I, I', the nuts on these devices being so adjusted as to preserve the tie-flanges immovably in their proper vertical positions; but previous to screwing up the extreme outer nuts on the bolts I, I', the keepers J must be fastened to the ties, as seen in Figs. 5 and 8.

From the above description it is evident the rails are normally supported upon chairs carried by springs, and therefore, the entire track has a certain amount of elasticity, or vertical play, which yielding movement adds to the durability of the locomotives and cars, and increases the comfort of passengers. The rails, however, are gradually forced down as a train traverses them, and when its full weight is imposed on the rails, they are depressed until they rest directly upon the solid bearings M, of the ties, as seen in Fig. 4. Consequently, the rails now have a rigid or unyielding support, but the instant the train has passed, the springs L again come into action and automatically elevate the tracks to their normal positions.

As the abutments C, C', D, D', and lugs E, E', F, F', of each and every cross-tie enter notches *g*, *g'*, in the rail bases, it is evident the tracks can not shift longitudinally, and for this reason, fish-plates, with all their well-known objections, are dispensed with. Again, these very stout abutments prevent the rails of a curve losing their proper shape, and by carrying these integral projections up a sufficient distance to brace the rail heads, they will co-act with the tie-bearings M, in supporting the weight of passing trains. Finally, by detaching a sufficient number of keepers, an injured rail can be disengaged from the ties and a new one inserted in its place in a few minutes, and without disturbing the ties or affecting the road-bed.

I claim as my invention—

1. In a railway-track, the metallic cross-tie A, having vertical side-flanges B, B'; the rails G, G', applied to said tie; and the bell-crank keepers J *j*, secured to said flanges, in the manner described, to prevent accidental detachment of said rails, as set forth.

2. In a railway-track, the metallic cross-tie A B B', having integral abutments C, C', D, D', and lugs E, E', F, F'; the bolts H, H', I, I', traversing said abutments and lugs, in the manner described; the keepers J *j*, secured to the side flanges B, B', of said tie; the springs L, housed within the latter; the chairs K, K' carried by said springs; and the rails G, G', supported upon said chairs; all as herein set forth.

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

WILLIAM R. SMITH.

Witnesses:
JAMES H. LAYMAN,
ARTHUR MOORE.