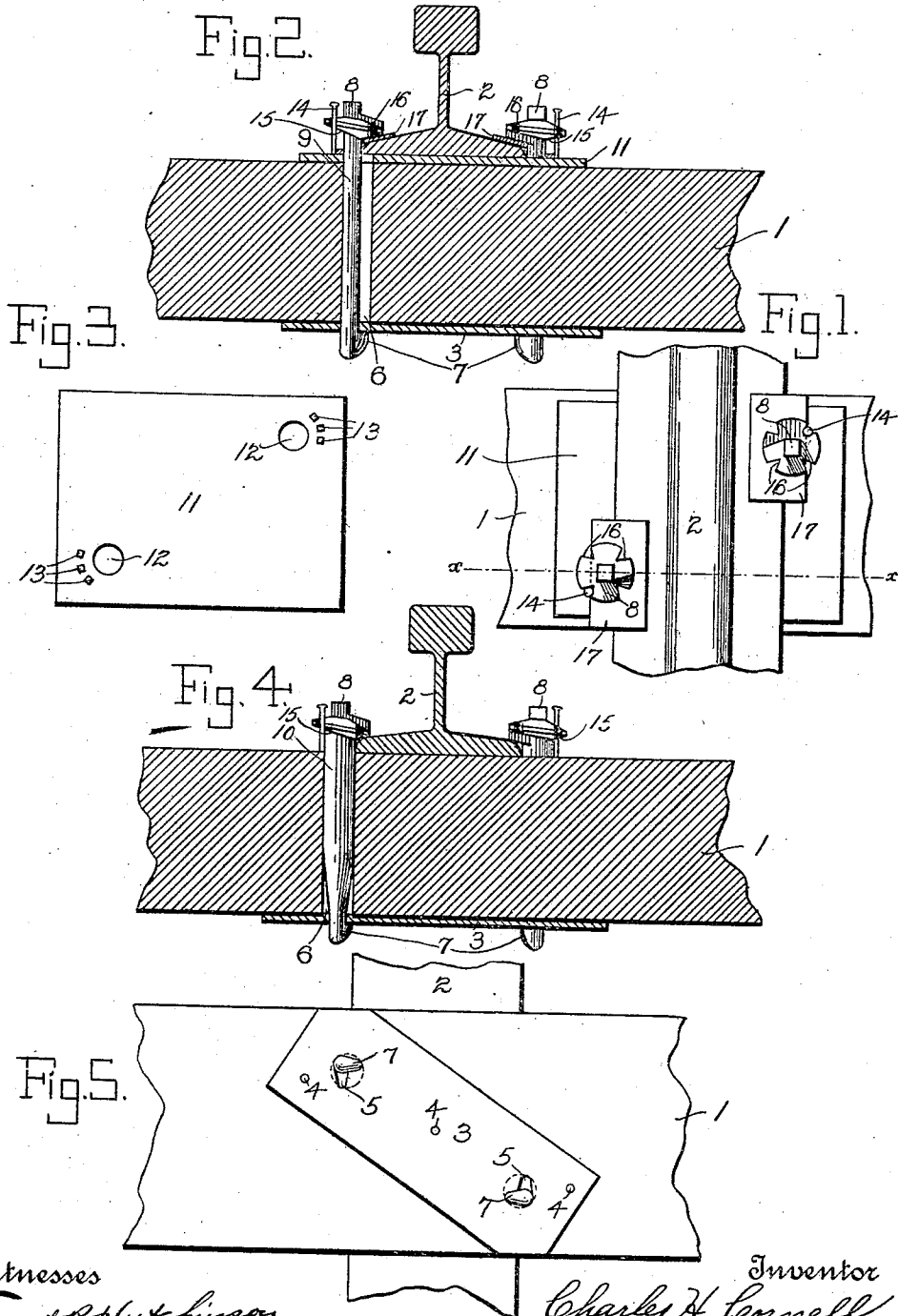


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RAILWAY FASTENER.
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UNITED STATES PATENT OFFICE.

CHARLES H. CORNELL, OF VALENTINE, NEBRASKA.

RAILWAY-FASTENER.

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To all whom it may concern:

Be it known that I, CHARLES H. CORNELL, a citizen of the United States, residing at Valentine, in the county of Cherry and State of Nebraska, have invented certain new and useful Improvements in Railway-Fasteners; and I do hereby 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.

My invention relates to railway fasteners and is designed as an improvement upon the devices shown and described in my pending applications, Serial No. 433,243, filed May 16, 1908, Serial No. 461,403, filed Nov. 6, 1908, and Serial No. 474,225, filed January 26, 1909. When a bolt or fastener of the kind described in these applications is used on a wooden tie especially, its shank being small and the extension of the key slot in which it is fitted being arranged in line with the force exerted on the bolt by its tendency to slip off of the beveled surface of the foot of the rail, said shank is apt to work back into the key slot extension and loosen the grip of the head of the bolt on the rail.

It is the object of the present invention to relieve or rather remove this tendency on the part of the bolt to pull away and to become loose.

Other objects are to provide against the necessity of making key slots in the tie and to simplify the means of locking the bolts against reverse turning.

To these ends the invention contemplates a tie having round openings or slots therein for the passage of the bolts instead of the key slots. These round openings are made large enough in diameter to permit the lateral lugs on the lower ends of the bolts to pass through them. The shanks of the bolts may be made of uniform diameter or they may be enlarged above the lugs to fit the openings in the tie. A plate provided with key slots to receive the lower ends and lugs of the fasteners is used on the bottom of the tie. A plate may also be placed on top of the tie below the rail to protect the former and provide a seat for the latter but this top plate is not necessary and may be dispensed with, if desired. Where a top plate is used, it may be provided with key slots to go with the smaller-shanked bolts or with larger round openings for the enlarged shanks of the other form of bolts.

The invention also contemplates the use of spikes driven into the top of the tie and engaging serrations in the heads of the bolts and further consists in the features of construction and combinations of parts hereinafter described and specified in the claims.

In the accompanying drawing illustrating the preferred embodiments of my invention: Figure 1 is a plan view of a part of a tie and rail secured together by my improved fasteners, a top plate also being shown. Fig. 2 is a sectional view on the line $x-x$ of Fig. 1. Fig. 3 is a detailed plan view of the top plate. Fig. 4 is a sectional view similar to Fig. 2 but showing bolts with enlarged shanks, and no top plate, and Fig. 5 is an under plan view of the structure shown in Figs. 1 and 2.

The drawing shows my invention applied to a wooden tie 1, for securing a rail 2 thereto. It will be understood, of course, that ties of other material may be substituted and used with my fastening bolts without departing from my invention.

The metal plate 3 extends across below the tie so as to be engaged by the bolts arranged at the opposite sides thereof. Said plate may be secured to the tie in any suitable manner, for instance, by nails 4 shown in Fig. 5. The metal plate has key slots 5 formed therein of suitable shape and size to permit the lower ends of the shanks of the bolts and the projecting lugs thereon to pass through them.

The round openings or passages 6 in the tie are larger than the key slots in the bottom plate so that the lateral lugs 7 on the bolts 8 may pass through them. If the shanks of the bolts are of uniform diameter, as illustrated at 9 in Fig. 2, the openings in the tie are arranged so as to extend under the rail, as shown. When the other form of bolt, illustrated in Fig. 4 and having the enlarged shanks 10, is used, the passages in the tie must be placed just at the edges of the rail because said enlarged portions of the shanks fit said passages. In this last mentioned form, the lower end of the shank is reduced in diameter where the lug 7 is arranged and said lug terminates in alignment with the outer surface or periphery of the enlarged portion of the shank.

As heretofore stated, a top plate 11 may or may not be used, as desired. I have illustrated the top plate in Figs. 1, 2 and 3 but have omitted it in Fig. 4. Said top plate is

provided with openings 12 for the passage of the shanks of the bolts and also with a plurality of perforations 13 near each of said openings to permit a spike or nail 14 to be driven into the tie for holding the bolt against reverse turning. These perforations are arranged in arcs described from the openings 12 as centers. Three are shown adjacent to each opening but more or less may be employed if found desirable. It will be noted that if the top plate were dispensed with in Fig. 2, the outer walls of the openings in the tie would prevent the shanks of the bolts from slipping away from the rail, because of the arrangement of said openings extending below the rail.

The heads of the bolts have cam-shaped under surfaces 15 as shown and described in my former applications. The peripheries of said heads are notched or serrated, as at 16, said notches being preferably V-shaped. The spikes or nails 14, when driven into the tie, engage these notches and thereby lock the bolts against reverse turning and becoming loose. Washers 17 may be used between the rail and heads of the bolts for the purpose of adjustment or to take up wear. I have shown them in Figs. 1 and 2 but not in Fig. 4.

It will be noted that the bolts in all the constructions shown and described herein are arranged in pairs, one on each side of the rail and one near each edge of the tie. The latter arrangement is desirable in order that two holes will not be cut through the same grain of wood of the tie. It will also be observed that the extensions of the key slots are arranged in line with the rail instead of longitudinally of the tie. This has been found by actual experiment to be the very much preferable way. Metal may be saved in the bottom plate 3 by making it narrower than the tie and placing it diagonally on the same, as shown in Fig. 5. Attention is also directed to the peculiar advantage which my improved rail fasteners have when applied to the elevated railways in our cities. These fasteners, by drawing the rail and tie closely together, tend to deaden and decrease noise in that they prevent the joints from becoming loose and causing the rumbling sound so often heard where ordinary spikes are used. This clamping action of the heads of the bolts which draws the rail tightly down upon the tie also prevents the rail from "creeping" or moving laterally on the tie.

I claim:—

1. The combination, with a rail and a tie, of a plate arranged at the bottom of the tie and having a key slot therein, said tie being provided with a passage therethrough larger than the key slot in the plate, and a rotatable bolt having a head engaging the foot of the rail, a shank extending through the passage

in the tie and the key slot in the bottom plate, and a lateral lug engaging the under surface of said plate.

2. The combination, with a rail and a tie, of a plate arranged at the bottom of the tie and having a key slot therein, said tie being provided with a passage therethrough larger than the key slot in the plate, and a rotatable bolt having a head provided with a cam-shaped under surface engaging the foot of the rail, a shank extending through the passage in the tie and the key slot in the bottom plate, and a lateral lug engaging the under surface of said plate.

3. The combination, with a rail and a tie, of a plate arranged at the bottom of the tie and having a key slot therein, said tie being provided with a passage therethrough larger than the key slot in the plate, a rotatable bolt having a head provided with a cam-shaped under surface engaging the foot of the rail, a shank extending through the passage in the tie and the key slot in the bottom plate, and a lateral lug engaging the under surface of said plate, and means to lock said bolt against reverse turning.

4. The combination, with a rail and a tie, of a plate arranged at the bottom of the tie and having a key slot therein, said tie being provided with a passage therethrough larger than the key slot in the plate, and a rotatable bolt having a head provided with a cam-shaped under surface engaging the foot of the rail, a shank extending through the passage in the tie and the key slot in the bottom plate, and a lateral lug engaging the under surface of said plate, the periphery of the head of said bolt being notched, and a spike driven into the top of the tie and engaging one of said notches for the purpose specified.

5. The combination, with a rail and a tie, of a plate arranged on the bottom of said tie and having a key slot therein, said tie being provided with a passage larger than the key slot in said tie, a plate arranged between the tie and rail and having a slot registering with the passage in the tie, a rotatable bolt having a head provided with a notched periphery and a cam-shaped under surface engaging the foot of the rail, a shank extending through the slot in the upper plate, the passage in the tie and the key slot in the bottom plate, and a lateral lug engaging the under surface of said bottom plate, said upper plate having an opening therein adjacent to its slot and a spike extending through said opening into the tie and engaging one of the notches in the head of the bolt for the purpose specified.

6. The combination, with a rail and a tie, of a plate arranged on the bottom of said tie and having a key slot therein, said tie being provided with a passage larger than the key slot in said tie, a plate arranged between the tie and rail and having a slot registering

with the passage in the tie, a rotatable bolt having a head provided with a notched periphery and a cam-shaped under surface engaging the foot of the rail, a shank extending through the slot in the upper plate, the passage in the tie and the key slot in the bottom plate, and a lateral lug engaging the under surface of said bottom plate, said upper plate having a plurality of openings adjacent to its slot and arranged on an arc described from said slot as a center, and a spike extending through one of said openings into the tie and engaging one of the notches in the head of the bolt for the purpose specified.

7. The combination, with a rail, a tie having a round opening therethrough, and a plate arranged at the bottom of said tie and provided with a key slot therein, of a bolt having a head adapted to engage the foot of the rail, and a shank enlarged at its upper end to fit the opening in the tie but restricted in diameter at its lower end, and a lug projecting from said restricted portion of the shank and terminating within the plane of the peripheral surface of the enlarged portion of said shank, said restricted portion of the shank and the lug being adapted to fit the key slot in said plate.

8. The combination, with a rail, a tie having a round opening therethrough, and a plate arranged at the bottom of said tie and provided with a key slot therein, of a rotatable bolt having a head provided with a cam-shaped under surface adapted to engage the foot of the rail, and a shank enlarged at its upper end to fit the opening in the tie but restricted in diameter at its lower end, and a lug projecting from said restricted portion of the shank and terminating within the plane of the peripheral surface of the enlarged portion of said shank, said restricted portion of the shank and the lug being adapted to fit the key slot in said plate.

9. The combination, with a rail, a tie having a round opening therethrough, and a plate arranged at the bottom of said tie and provided with a key slot therein, of a rotatable bolt having a head provided with a cam-shaped under surface adapted to engage the foot of the rail, the periphery of said head being serrated, and a shank enlarged at its upper end to fit the opening in the tie but restricted in diameter at its lower end, a lug projecting from said restricted portion of the shank and terminating within the plane of the peripheral surface of the enlarged portion of said shank, said restricted portion of the shank and the lug being adapted to fit the key slot in said plate, and means adapted to engage said serrations to lock the bolt against reverse turning.

10. The combination, with a rail, a tie having a round opening therethrough, and a plate arranged at the bottom of said tie and provided with a key slot therein, of a rotatable bolt having a head provided with a cam-shaped under surface adapted to engage the foot of the rail, the periphery of said head being serrated, and a shank enlarged at its upper end to fit the opening in the tie but restricted in diameter at its lower end, a lug projecting from said restricted portion of the shank and terminating within the plane of the peripheral surface of the enlarged portion of said shank, said restricted portion of the shank and the lug being adapted to fit the key slot in said plate, and a spike driven into the tie and engaging one of said serrations for the purpose specified.

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

CHARLES H. CORNELL.

Witnesses:

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