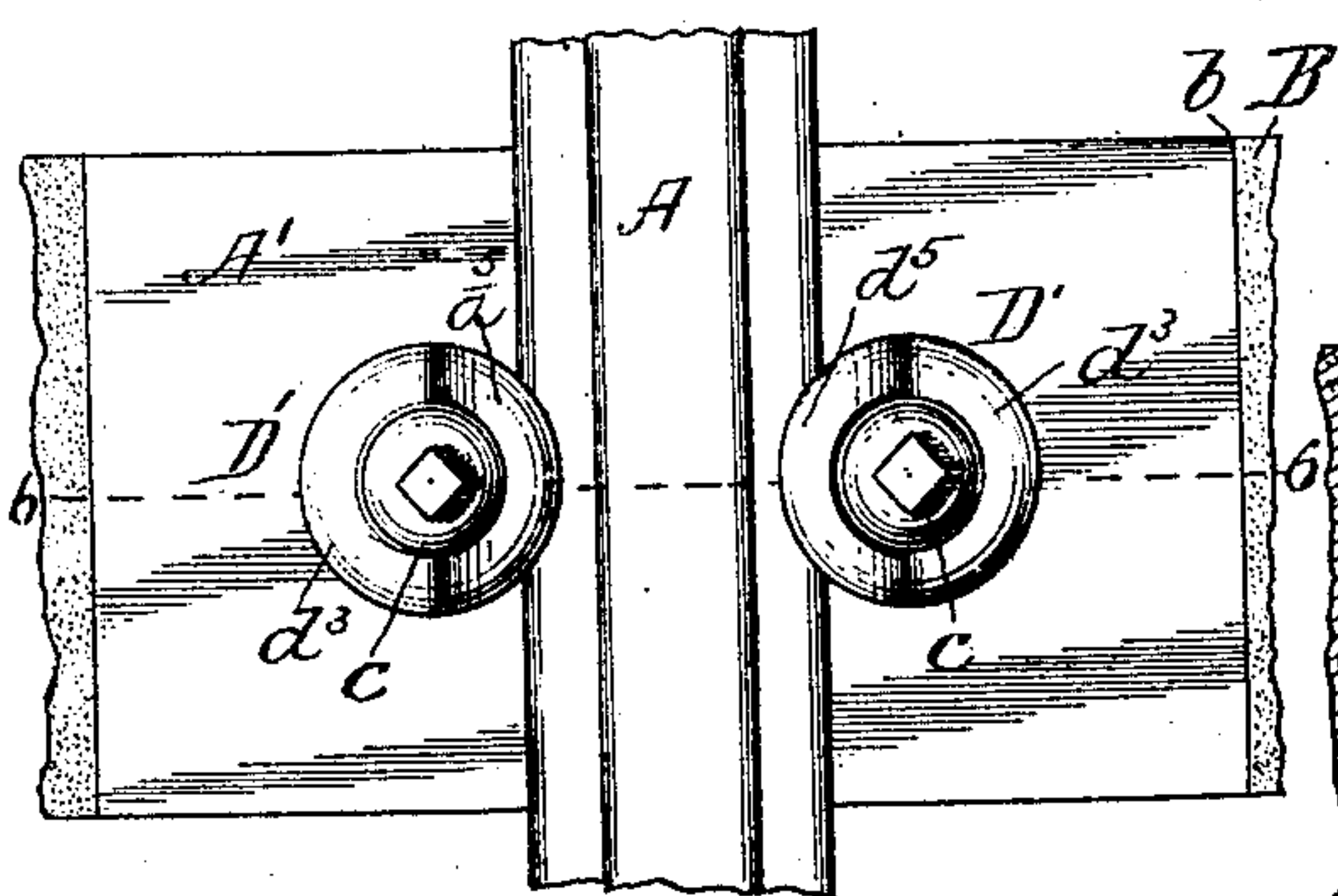


924,688.

Fig. 1. A perspective view of a double-throw switch mechanism. It shows two contact fingers, A and A', pivoted on a central support. The fingers are connected to a common terminal B. The mechanism is shown in a closed position, with the contact fingers touching the terminal B. Labels include A, A', B, C, D, and D'.

A technical drawing of a mechanical assembly, likely a valve or a similar component. The drawing shows a cross-section of a block with two vertical channels. Each channel contains a piston or valve stem with a rounded top. The top of the block is labeled 'A'. The top of the piston stems are labeled 'A' and 'A'' respectively. The top of the block is also labeled 'a'. The top of the piston stems are labeled 'C' and 'c' respectively. The top of the block is also labeled 'd' and 'd'' respectively. The top of the piston stems are labeled 'd''' and 'd''' respectively. The top of the block is also labeled 'd''' and 'd''' respectively.

β β' Fig. 4.



A technical drawing showing a cross-section of a mechanical assembly. Two screws are shown, each with a hexagonal head and a threaded shaft. The screws are positioned symmetrically, passing through a horizontal plate and into a larger, textured block below. The horizontal plate has a central raised section. Above the plate, there are two vertical components, possibly part of a larger structure, labeled with 'A' and 'A'' at the top. Various letters and numbers are used as labels: 'a' and 'a'' are at the bottom left and right; 'd', 'd'', 'd^3', 'd^5', 'c', 'c'', 'c^3', 'c^5' are along the top and sides of the screws and the central plate; 'D' and 'D'' are near the screw heads; 'A' and 'A'' are at the top of the vertical components. The drawing uses hatching to indicate different materials or cross-sections.

B *b'* Fig. 6

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UNITED STATES PATENT OFFICE.

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RAIL-FASTENING.

No. 924,688.

Specification of Letters Patent.

Patented June 15, 1909.

Application filed December 14, 1906. Serial No. 347,841.

To all whom it may concern:

Be it known that I, HERBERT E. PERCIVAL, of Houston, in the county of Harris and State of Texas, a citizen of the United States, have invented a new and useful Improvement in Rail-Fastenings, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

My invention relates to an improvement in rail fastenings especially designed for use in connection with cement or concrete ties. The usual method of securing a rail to a cement or concrete tie consists in the use of a spike, bolt or the like having a head which engages with the flange of the rail and a shank which extends down into a socket formed in the tie, and which shank acts to keep the rail from spreading. By reason of the preformation of the socket in the tie and the non-adjustability of other means employed for holding the spike or bolt in place, it is usually found that no provision has been made by which the spike or bolt may be moved laterally so as to accommodate rails of different widths. Now in railroad construction frequent changes are made in the size of the rails used and it is very important that provision be made whereby rails of different sizes or widths may be used. By reason, also, of the inherent rigidity of the mode of fastening the repeated shocks of trains passing over the rails are very hard upon the retaining bolts or spikes and with the common modes of fastening the spikes or bolts are likely to become loosened.

It is accordingly the object of my invention to provide means by which rails of different widths may be retained by the same bolts or spikes which act to hold or retain rails of maximum width and without changing the location of the sockets in which said spikes or bolts are contained; and by which means, also, the rails are better retained and the spikes or bolts primarily employed for holding the rails relieved in part of the strain upon them.

My invention can best be seen and understood by reference to the drawings, in which—

Figure 1 shows in plan the improved means or device used in connection with a rail of maximum width. Fig. 2 shows a cross section on the line 2—2 of Fig. 1. Fig.

3 shows in plan the improved means or device used in connection with a rail of lesser width than that shown in Fig. 1. Fig. 4 shows a cross section on the line 4—4 of Fig. 3. Fig. 5 illustrates in plan the improved means or device used in connection with a rail of lesser width than that shown in Fig. 3, and Fig. 6 shows a cross section on the line 6—6 of Fig. 5.

In the drawings:—A represents a portion of a rail and B a portion of a cement or concrete tie. Inasmuch as a cushion is usually employed with a cement tie, on which the rail rests in order to take up the vibratory shock which would otherwise come upon the rigid tie, I have shown interposed between the rail and the tie the cushion A¹ on which the rail rests. This cushion fits snugly within a recess *b* in the top of the tie and consists preferably of a block of wood. For the purpose of illustrating my invention, I have shown the rail held in place by a screw bolt C having a head *c* and a shank *c*¹ which extends down through the cushion and is contained within the socket *b*¹ formed in the tie and which socket is formed substantially as described in my United States Patent No. 808,401, dated December 26, 1905.

In order to provide for the retention of rails of different widths, it is first to be observed that the sockets in the tie are set so far apart that rails of a maximum width may lie between them or rather between the spikes or bolts contained in said sockets.

D represents the members or devices which, as will hereinafter be explained, by reason of their construction and the manner in which they are maintained furnish means both for holding rails of different widths by the same spikes or bolts C and for assisting or supplementing the spikes or bolts in the retention of the rails. Each of these rail-holding members D is preferably made annular in shape; through it the shank of the bolt or spike is adapted to extend and the member is held in place by the head of the spike or bolt in the manner of a washer. Each member is also located within a socket *a* formed within the base of support on which the rail rests. Inasmuch as the rail usually rests upon a cushion A¹ as before described, the socket is accordingly formed in the cushion and is so shown in the drawings.

Before referring to the construction and

adaptability of the rail-holding members or devices, it should first be understood that a rail should be held in place as against both a vertical and lateral movement. With sockets in the tie located as before described to receive between them rails of a maximum width, the screws or spikes contained in said sockets would act in themselves to retain the rails, the head of the spike holding the same as against vertical movement and the shank of the spike preventing displacement in a lateral direction. Now when rails of maximum width are used their retention by the spikes or bolts is supplemented by the use of one form of rail-holding member D, which form of the member I have shown in Figs. 1 and 2 of the drawings. As may be seen from these figures the said retaining member or device D fits snugly within its socket *a* and with the shank of the spike or bolt C passing through it. That portion *d* of the member or device which lies back of the forward edge of the shank of the bolt, or that edge adjacent to the edge of the rail, extends up from the socket in which it is contained to a point about equal with the top of the flange of the rail in order that that portion of the device which lies back of the shank of the bolt may act as a supporting shoulder for sustaining the head of the bolt at the same time that it is engaging with the flange of the rail. The device D acts accordingly to directly help sustain the spike or bolt. The device also is cut away in part to form a face or edge *d*¹. Now for use with rails of maximum width this face is formed to extend on a line with the face of the inner edge of the shank of the spike, or the edge thereof which lies adjacent to the edge of the rail. It accordingly acts as a retaining shoulder or edge supplementing the shank of the spike or bolt against which the edge of the rail may bear laterally. Inasmuch as the device itself—contained in its socket—is held against lateral displacement, it accordingly by means of the face *d*¹ acts to keep the rail from spreading and it also prevents the rail from loosening the spike or bolt C as it might otherwise do. As was before described, I prefer that the device D shall be annular in shape. Accordingly the socket *a* in which the device is contained would extend in part beneath the rail, and that portion *d*² of the device which is contained within the portion of the socket underneath the rail forward of the edge *d*¹, is beveled flush with the top edge of the cushion or support upon which the rail is resting. Now when a rail of narrower width is employed, as I have shown in Figs. 3 and 4, the head of the same spike or bolt C might still act by engaging with the flange of the rail, to prevent its moving vertically, but some auxiliary provision must be made for preventing the spreading of the rail.

Such provision is made by the use of the rail-holding member or device as shown in Figs. 3 and 4. In these figures the device is shown as formed in the manner substantially as before described and it acts also in the same manner to support the head of the spike and prevent the rail from spreading. It is to be noted, however, that the face or edge *d*¹ of the device, as shown in these figures, against which the edge of the rail is adapted to bear to prevent a lateral displacement thereof is not on a line or flush with the inner edge of the spike, or the edge thereof adjacent to that of the rail, but is located inwardly removed from said inner edge of the spike so as to fit snugly against the edge of a rail of narrow width. Accordingly by changing the location of this face or edge *d*¹ of the device, rails of a variety of widths—provided they can be retained against vertical movement by the head of the bolt or spike—can be retained against lateral movement. The interchange of the members can, of course, be very easily accomplished by removing the screw or bolt which holds them, the members being all made to fit in the one size of socket.

In Figs. 5 and 6 I have shown a modified form of the rail-holding member or device D¹ by which it may act for the retention of rails narrower than those shown in Figs. 2 and 3, or in other words, rails so narrow that they cannot be retained against vertical movement by the heads of the spikes or bolts C, the flanges of the rails being too far removed therefrom. The device D¹, as may be noted, fits in the common socket *a* in the cushion or other support upon which the rail rests, and it is held in place by the bolt or spike C. That portion *d*³ of the member which lies in the rear of the front edge of the spike or bolt, or that edge which is adjacent to the edge of the rail, extends up so far within its socket that it acts as a support for the head of the bolt or spike in the same manner as the device D before described. The member D¹ has also a face or edge *d*⁴ which lies in front of the inner edge of the bolt so as to present a shoulder against which the edge of the rail may bear, preventing the same from spreading. So far the device D¹ is substantially the same as the form of device D and performs the same functions. Instead, however, of the rail being held against vertical movement by the head of the bolt or spike, it is to be noted that the device D¹ is provided with a flange *d*⁵ which extends up over the flange of the rail, by which the rail is held against vertical movement. By varying the location of the face *d*⁴ narrow rails of varying widths may be securely retained, or in other words, rails so narrow in width that they cannot be retained by the heads of the common bolts or spikes C.

Having thus fully described my invention,

I claim and desire to secure by Letters Patent of the United States:—

1. The combination with a rail and a tie having a shoulder formed therein of a cushion support bearing endwise against said shoulder and upon which cushion the rail rests, said cushion having separate sockets formed therein adjacent to the flanges of the rail when in place resting on said cushion, rail-retaining members contained in said sockets of substantially the same size as said sockets whereby they may be embedded to fit therein, and fastenings connecting with the tie for holding said rail-retaining members in place.

2. The combination with a rail and a tie having a shoulder formed therein of a cushion support bearing endwise against said shoulder and upon which cushion the rail rests, said cushion having separate sockets formed therein adjacent to the flanges of the rail when in place resting on said cushion, rail-retaining members for laterally retaining said rail, said sockets being of substantially the same size as the bodies of said rail-retaining members whereby said members may be embedded to fit within said sockets, and fastenings connecting with the tie for holding said rail-retaining members in place and being supported in part by said members.

3. The combination with a rail of a cushion support upon which the rail rests, said support having a socket formed in it, a rail-retaining member contained in said socket and extending in part beneath the rail, and

a fastening for holding said rail-retaining member in place.

4. The combination with a rail of a cushion support on which the rail rests, said support having a socket formed in it, a rail-retaining member contained in said socket and extending in part beneath the flange of said rail, and a fastening extending through said rail-retaining member with the head of said fastening when in place bearing against the flange of the rail.

5. The combination with a rail of a cushion support on which the rail rests, said support having a socket formed in it, a rail-retaining member contained in said socket and extending in part beneath the flange of said rail, said member having also a shoulder against which said flange of the rail may bear laterally, and a fastening extending through said rail-retaining member the head of which fastening is adapted to draw in part against the flange of the rail and in part against said rail-retaining member.

6. The combination with a rail of a cushion support upon which the rail rests, said support having separate round sockets formed in it, rail-retaining members of substantially the same size and form as said sockets whereby they may be embedded to fit therein, and fastenings extending through said members for holding the same in place.

HERBERT E. PERCIVAL.

Witnesses:

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M. RAPHAEL.