No. 781,819. PATENTED FEB. 7, 1905.

H. W. FRACKMANN.

RAIL.

APPLICATION FILED SEPT. 19, 1904.

2 SHEETS—SHEET 1.

Fig: 1.

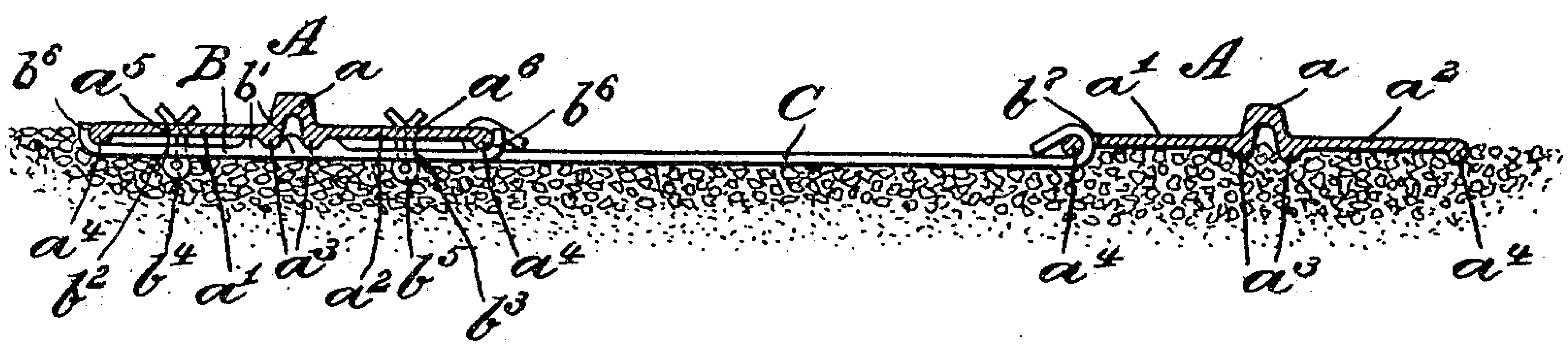

Fig: 2.

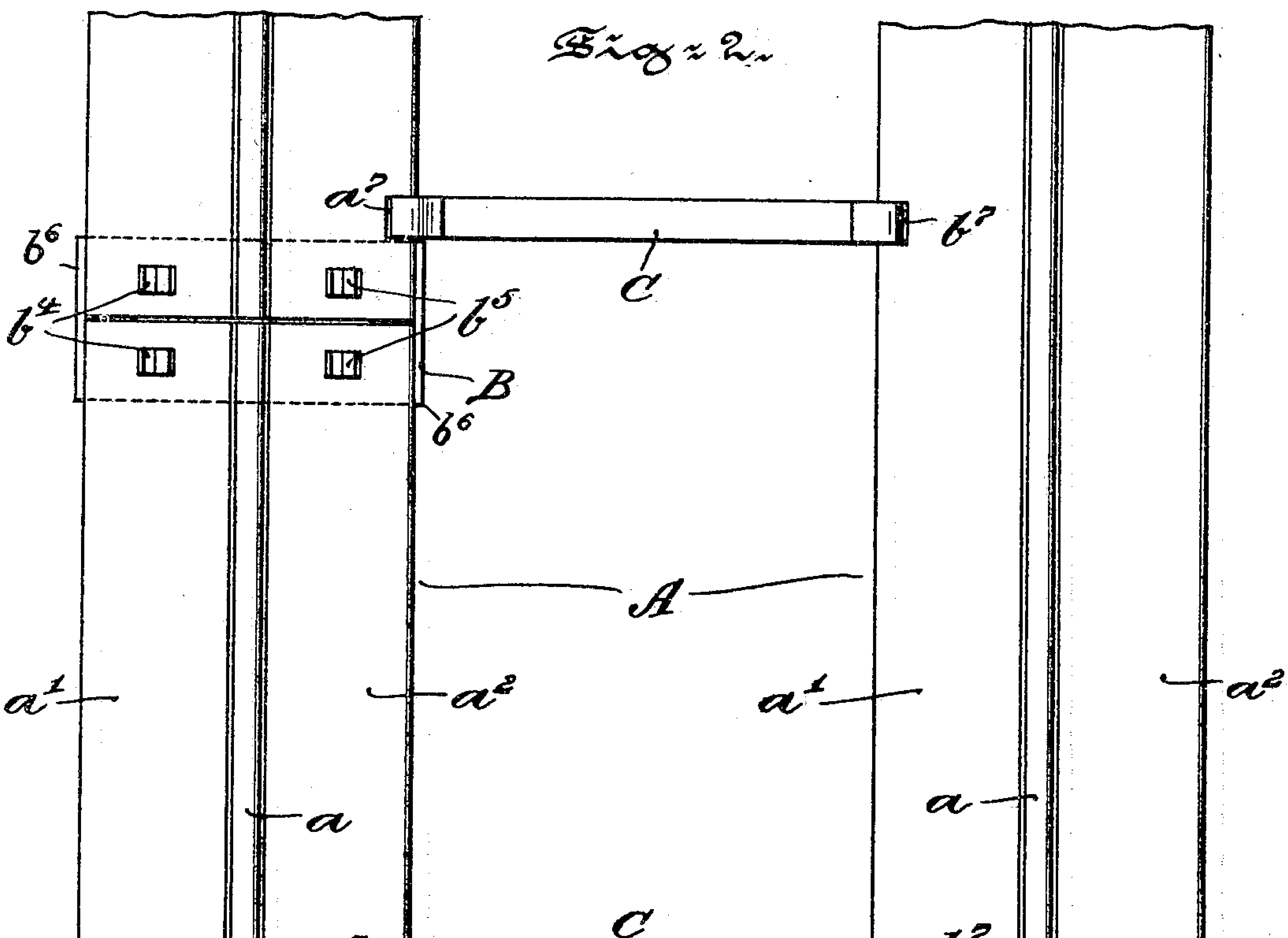

Fig: 3.

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2 SHEETS—SHEET 2.

Fig. 4.

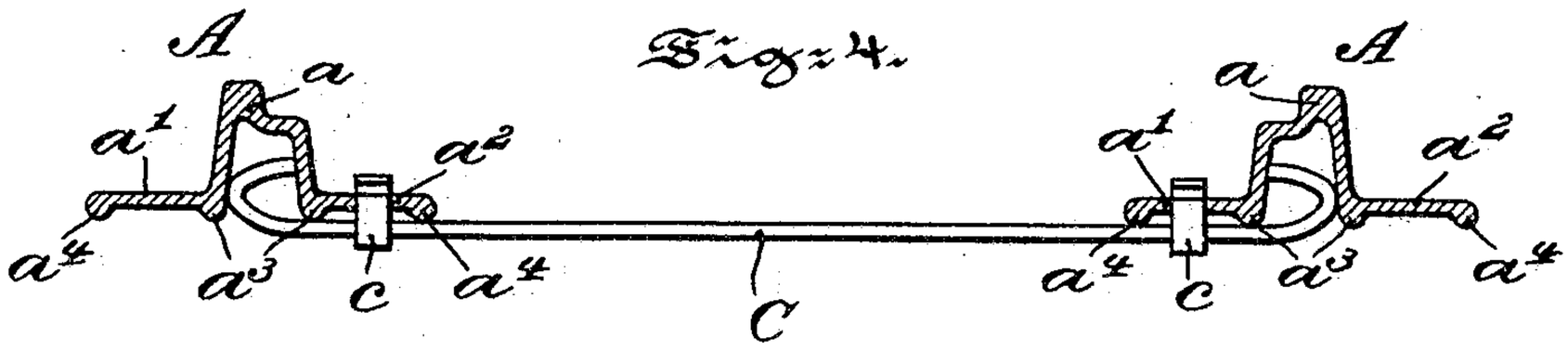


Fig. 6.

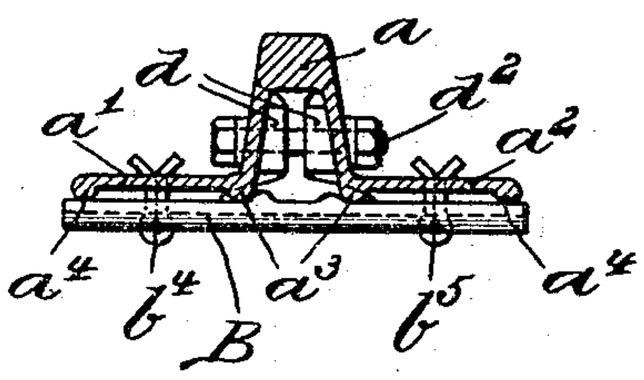


Fig. 5.

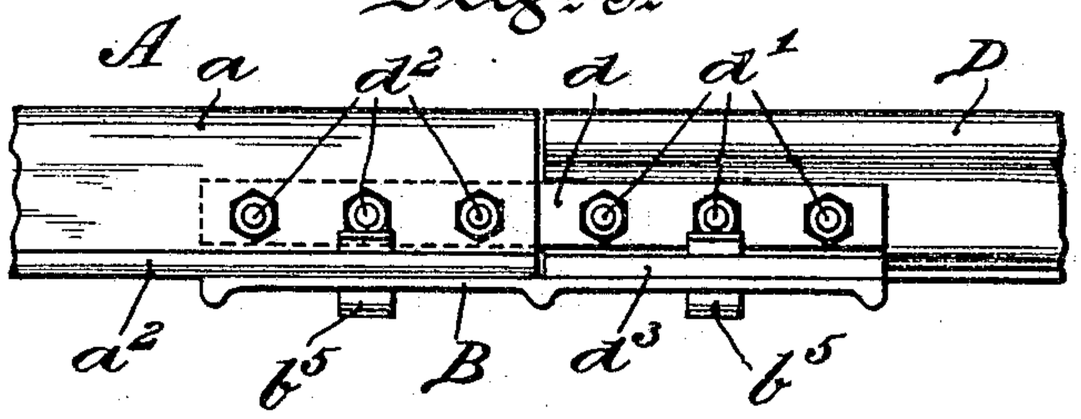


Fig. 7.

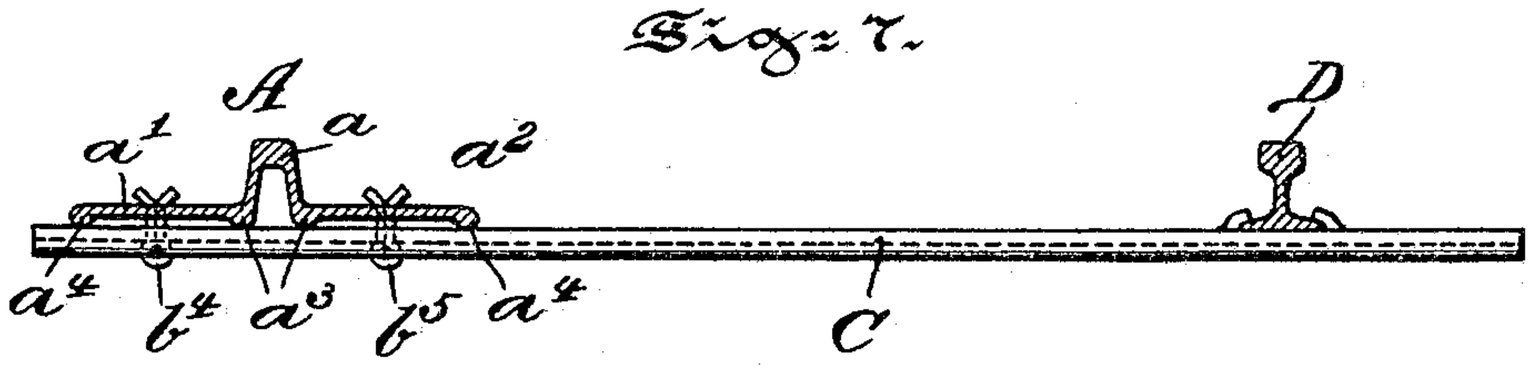


Fig. 8.

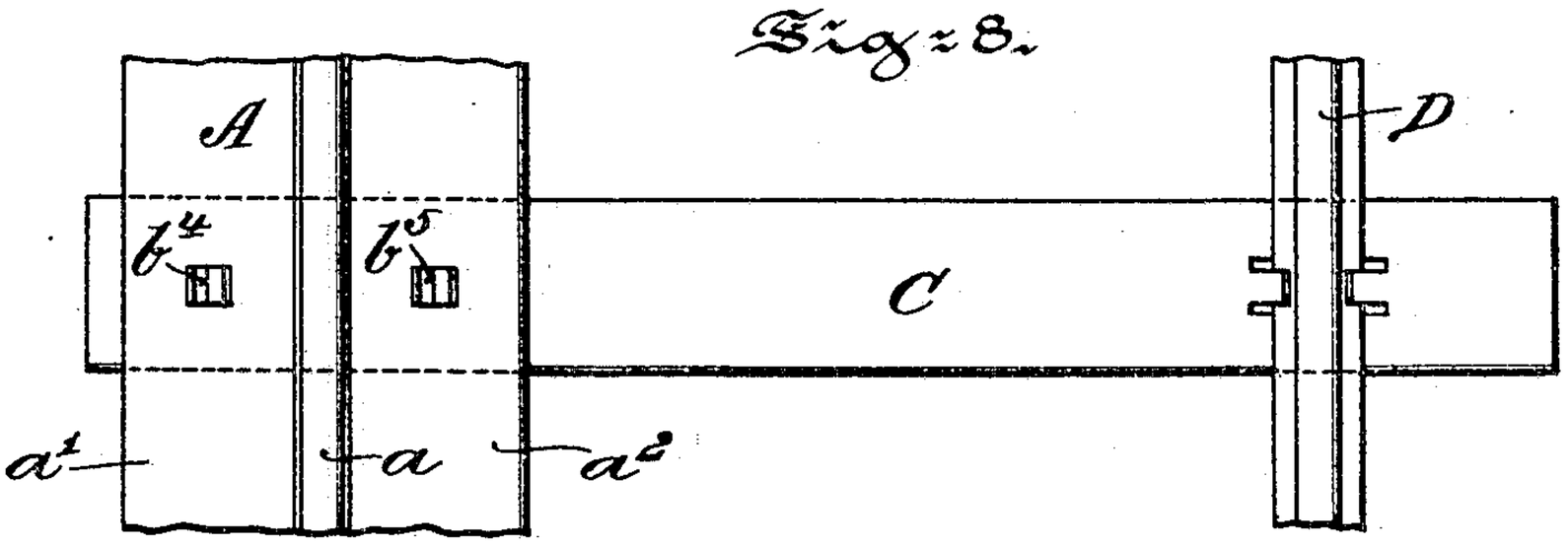
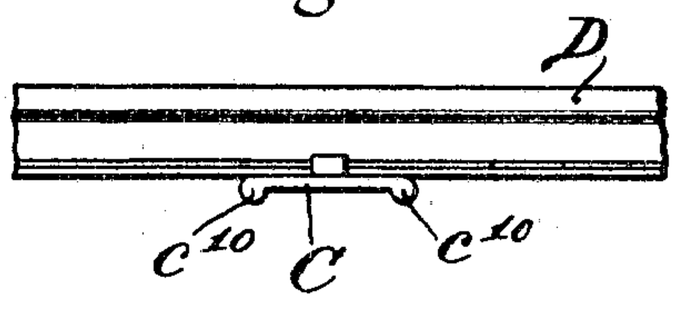


Fig. 9.



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No. 781,819. Patented February 7, 1905.

UNITED STATES PATENT OFFICE.

HENRY W. FRACKMANN, OF PHILADELPHIA, PENNSYLVANIA.

RAIL.

SPECIFICATION forming part of Letters Patent No. 781,819, dated February 7, 1905.

Application filed September 19, 1904. Serial No. 224,952.

To all whom it may concern:

Be it known that I, HENRY W. FRACKMANN, a citizen of the United States, residing in the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Rails, of which the following is a specification.

My invention has relation to the provision of a rail with a supporting base plate or flange adapted for use on steam, trolley, and other roads; and in such connection my invention relates to a rail having formed integral therewith a supporting base plate or flange, whereby such rails may be employed without using the ordinary sleepers and ties, but may be located directly in a bed of rock, gravel, or other material and held firmly apart of proper gage by means of suitable intermediate tie-bars connected with and locked to the flanges or supporting base-plates of the rails, as well as of being used in conjunction with the ordinary rails now employed on steam and other roads.

My invention, stated in general terms, consists of a rail structure having a base consisting of right and left flanges or plates and a projection adapted to form the tread or head of the rail proper constructed substantially in the manner hereinafter described and claimed.

There are various modifications of the principle of my invention which may be resorted to and availed of and still be within the spirit of my invention.

In the drawings are illustrated several exemplifications of the practical application of main features of the invention, in which—

Figure 1 is a cross-sectional view of one form of the rail with its supporting base plate or flange, showing the particular shape of rail and its supporting base flange or plate, the manner of employing the rail, and of tying one rail to another at a proper gage apart embodying main features of the said invention. Fig. 2 is a top or plan view of the same. Fig. 3 is a cross-sectional view of another manner of employing the rail with its supporting base-flange and of securing or holding the same in a practically efficient position in the ground with cobble about the rail. Fig. 4 is a transverse sectional view of two rails and of another manner of tying at proper gage apart said two rails by tie-rods engaging the interior thereof and upon which said rails bear. Fig. 5 is a side elevational view showing a rail of my invention bound to an ordinary rail by fish-plates placed so as to extend internally into the body of the rail and along the exterior of the ordinary rail and also underneath both types of rails. Fig. 6 is a rear elevational view from the left-hand end of Fig. 5. Fig. 7 is an elevational view of a cross tie-rod and cross-sectional views of a rail of my invention to the left in said view keyed to said tie-rod and to the right an ordinary T-rail clamped or clipped to the cross tie-rod. Fig. 8 is a top or plan view of Fig. 7; and Fig. 9 is an end view from the right of Fig. 8, showing the form of the cross tie-rod with the clip struck up therefrom for holding the T-rail in position thereon.

Referring to the drawings with reference to Figs. 1 to 3, inclusive, the rail A of the invention comprises a centrally-disposed projection forming a head or tread a for a wheel to travel over and with a base extending on both sides of the projection, forming supporting-flanges or base-plates a' and a^2 of the rail on the road-bed. The base of the rail A is formed, preferably, with enlargements or ribs a^3 and a^4, so that the supporting-flanges may be reinforced at the point of junction with said tread and at the free edges thereof and also that the same may be firmly embedded in the ground to guard against lateral movement or displacement of the rail on the same. B represents a plate provided with complemental projections or ribs b', engaging and surrounding the ribs a^3, and with upwardly-bent ends b^6, partially surrounding the ribs a^4 and engaging the flanges a' and a^2 at their free edges and at the point of meeting of two abutting sections of the rail. The rib b' and upwardly-bent ends b^6 of the plate B, which serves as a fish-plate, prevent the spreading of the tread a at

the ends of the rail A by engaging the ribs a^3 and a^4 thereof in the manner hereinbefore described. The supporting-bases a' and a^2 of the rail a at certain distances apart are provided with openings a^5 and a^6 and also the plates B at b^2 and b^3 for inserting keys or split pins b^4 and b^5 therethrough and which are then slightly bent over onto the bases of the rails for locking the same to position on the road-bed. The proper gage of one rail with respect to the other is secured by a tie-rod C, fitting through openings a^7 and b^7 in the supporting-flanges or base-plates a' and a^2 of the rail a and adapted to be bent over to tie the respective rails a proper distance apart, as shown in Figs. 1 and 2. In Fig. 3 the rail, with its supporting base flanges or plates, is mounted in the ground directly, with cobble disposed or packed about the top surface, so as to abut against the side walls of the hollow rail A proper, and having the projections or enlargements at the base of the rail and its supporting flanges or plates entering the ground to prevent sidewise or other movement of the same by the weight of the rolling action of the load passing over the rail proper, and thus to avoid displacement of the rails in use.

In Fig. 4 the hollow rails a are arranged so as to be adapted to be mounted directly into the ground and held a proper distance apart by transverse tie-rods C, fitting up against the internal body of the rails a by the bending of the tie-rods so as to rest against the respective internal side walls of each rail, as shown, and inserted through openings in the supporting-bases a' and a^2 of the rails are keys c for locking the tie-rods C to the rails, so as not to be affected by the rolling action of a car or other conveyance over the rails in position.

In Figs. 5 and 6 is shown an application of the rail of the invention joined to the ordinary **I** or **T** rail now employed on trolley and steam roads, whereof the hollow rail a is tied to the **I** or **T** rail D through a fish-plate d by means of bolts d' passing through the web of the **I** or **T** rail D and with the fish-plate d extending into the interior and bearing against the hollow rail a. The fixed position of one type of rail with respect to the other is secured by bolts d^2 passed through the hollow rail a from one side to the other, as shown in Fig. 5. The two different types of rails a and D at their abutting ends may be supported directly in the ground or by a plate B, in which latter event the supporting-flanges or base-plates a' and a^2 of the rail a will have split keys b^5 extending upward through the plate B and supporting-flanges or base-plates a' and a^2 of the rail a to secure the same firmly to position against lateral thrust or displacement, and the rail D will likewise be held firmly in position by keys b^5 extending through the plate B and base of the rail D, as illustrated in Fig. 5 of the drawings.

In Figs. 7, 8, and 9 is shown a further exemplification of the invention adapted to be employed in conjunction with the ordinary **I** or **T** rails D, such as hereinbefore described, but in this instance placed on opposite sides of the rail structure—that is, with a hollow rail a on one side and the **I** or **T** rail on the opposite side and the two rails held at the proper gage apart and firmly in position by cross tie-rods C, the rails a being keyed to the tie-rods and the rail D clamped or clipped thereto. The form of tie-rods C in this instance may be of the type illustrated in Fig. 9, with enlargements c^{10} at the ends to snugly engage the ground against sidewise movement or thrust and to thereby avoid possible displacement of the respective types of rails in position constituting the rail structure for the travel of steam, trolley, or other cars thereover.

It is manifestly obvious that from the foregoing description of my invention and of its applications other modifications and applications of the same may be resorted to than those explained and illustrated and still be within the spirit of the invention, and hence I do not wish to be understood as limiting myself to all the details of arrangement illustrated and described; but,

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

1. A rail having an inverted substantially **U**-shaped tread or projection with wide flanges extending laterally from each side of said tread and having ribs arranged at the edges, the ribs adapted to reinforce said flanges at the point of junction with said tread and at the free edges.

2. A rail having an inverted substantially **U**-shaped tread or projection with wide flanges extending laterally from each side of said tread and having ribs arranged at the edges, the ribs adapted to reinforce said flanges at the point of junction with said tread and at the free edges, in combination with a plate having ribs and upwardly-bent ends, the ribs adapted to engage and surround the ribs of the flanges opposite the tread and the bent ends adapted to engage the flanges at the ends thereof and to partially surround the ribs of the same.

3. A rail having an inverted substantially **U**-shaped tread or projection with wide flanges extending laterally from each side and having ribs at the edges of the flanges at the point of junction with the tread and at the free edges,

in combination with a fish-plate adapted to support the abutting ends of two rails having ribs and upwardly-bent ends, the ribs of said plate adapted to engage and surround the ribs of the flanges opposite the tread and the bent ends adapted to engage the flanges at the free edges and the ribs connected therewith.

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

HENRY W. FRACKMANN.

Witnesses:

J. WALTER DOUGLASS,

THOMAS M. SMITH.