(No Model.)

E. M. BOYNTON.

RAILWAY SYSTEM.

No. 394,055. Patented Dec. 4, 1888.

Fig. 1.

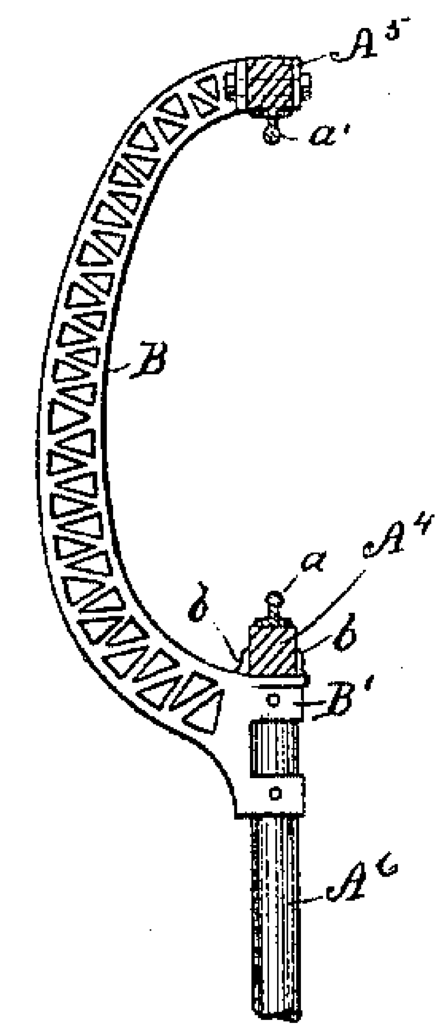


Fig. 2.

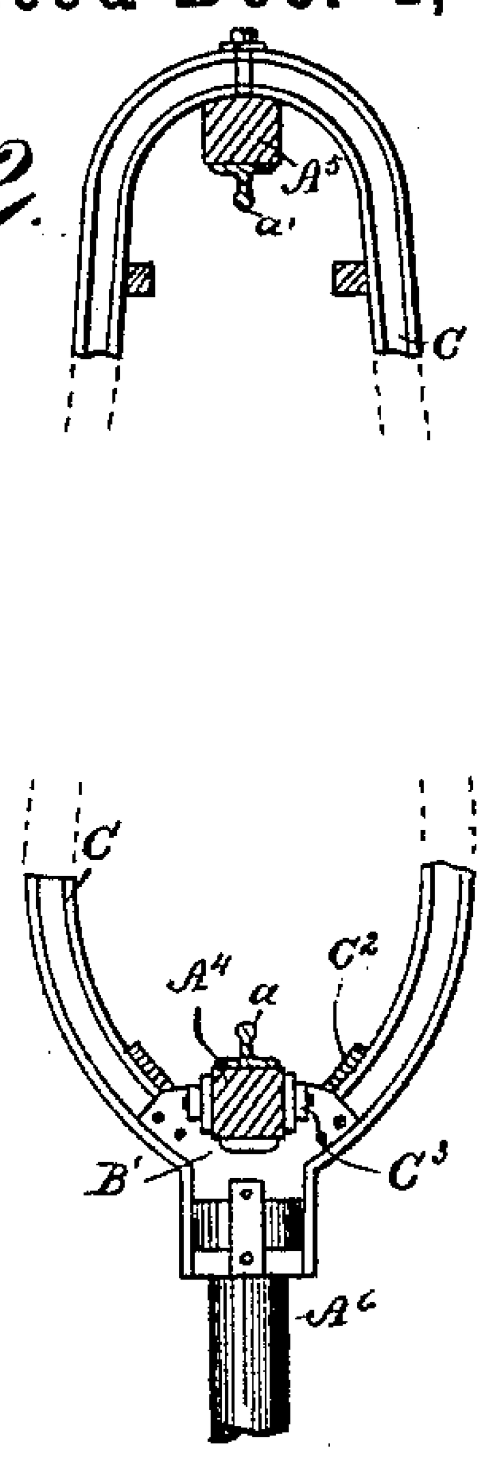


Fig. 3.

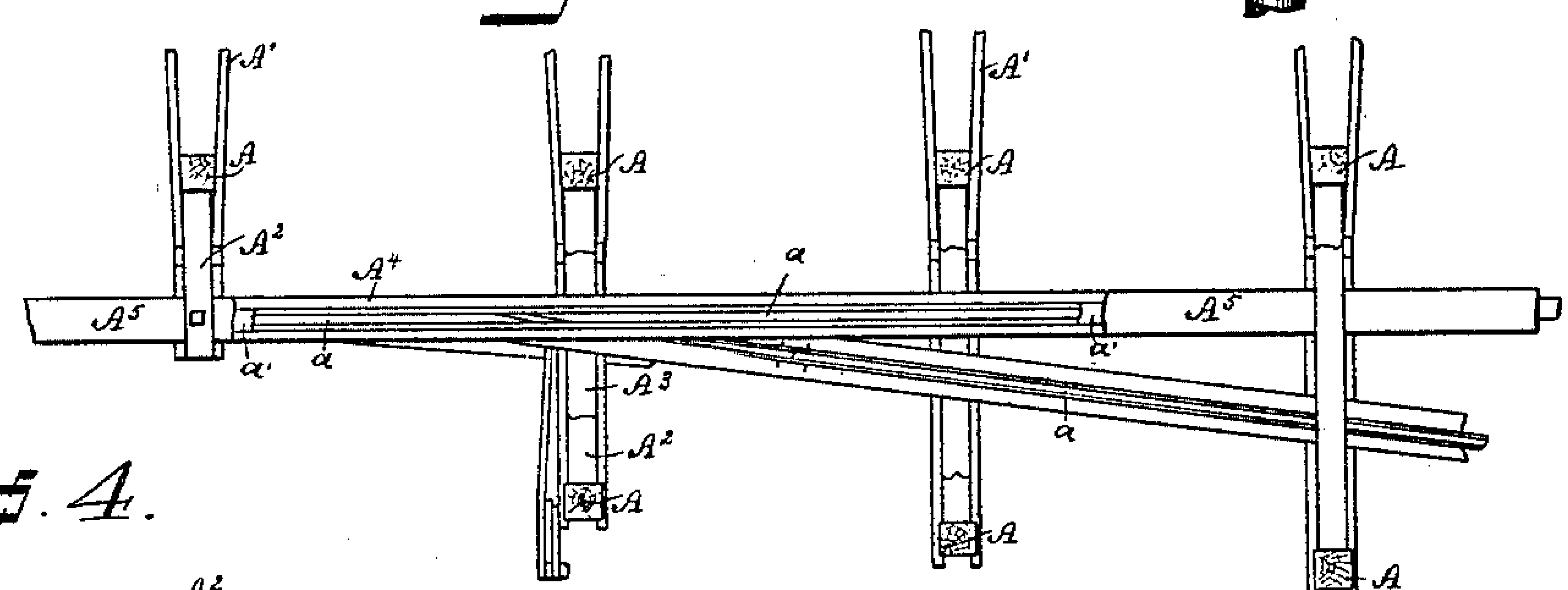


Fig. 4.

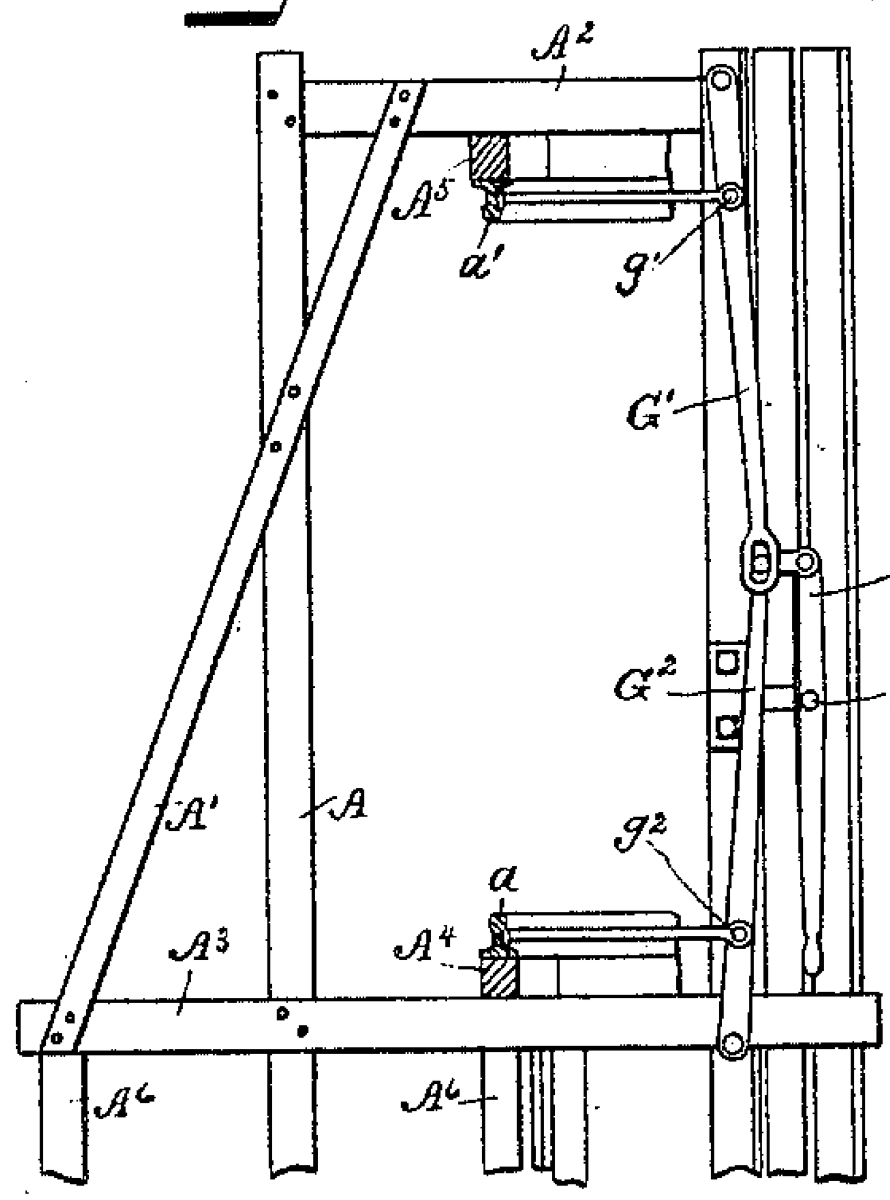
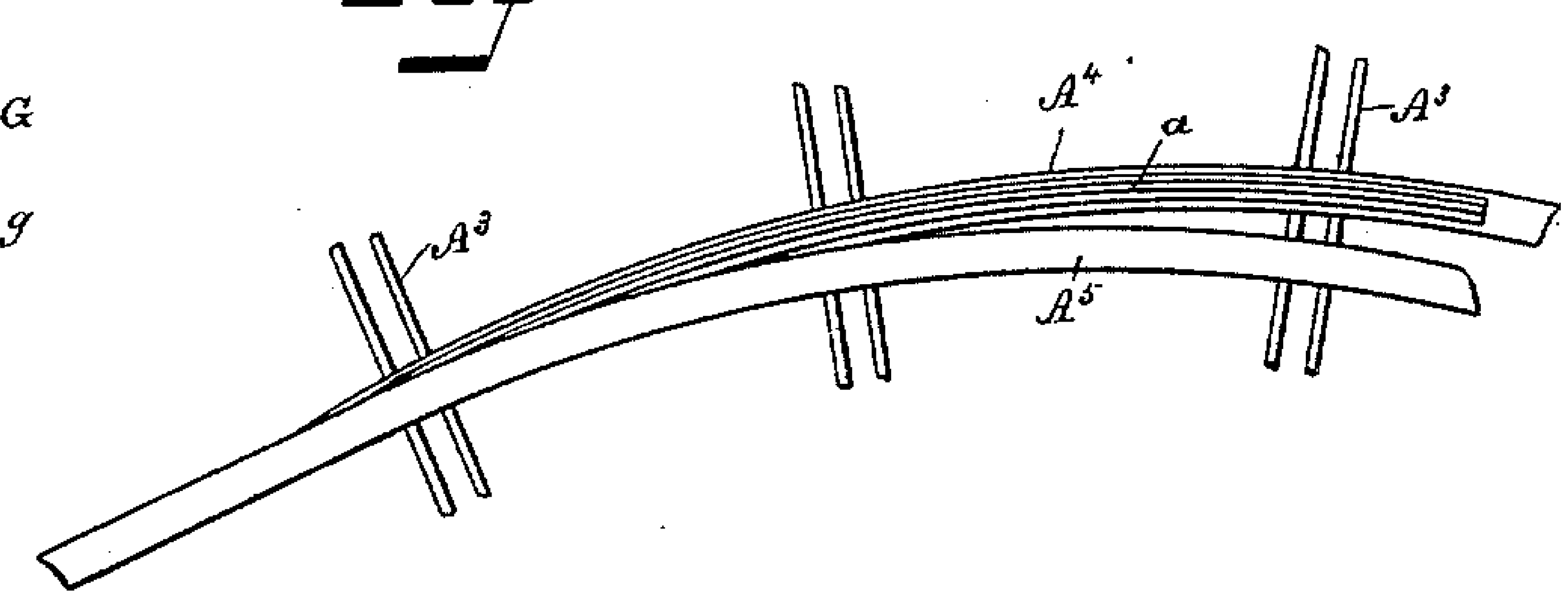


Fig. 5.



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RAILWAY SYSTEM.

SPECIFICATION forming part of Letters Patent No. 394,055, dated December 4, 1888.

Application filed November 14, 1887. Serial No. 255,053. (No model.) Patented in England March 8, 1887; in Spain June 2, 1887; in Belgium June 30, 1887; in France August 30, 1887; in Brazil October 13, 1887; in Austria-Hungary October 30, 1887; in Norway December 22, 1887; in New South Wales March 7, 1888; in Victoria March 7, 1888; in New Zealand March 7, 1888, and in India April 2, 1888.

To all whom it may concern:

Be it known that I, EBEN MOODY BOYNTON, a citizen of the United States, residing at West Newbury, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Railway Systems, (patented in England March 8, 1887; Belgium June 30, 1887; Brazil October 13, 1887; Norway December 22, 1887; Victoria March 7, 1888; India April 2, 1888; Spain June 2, 1887; France August 30, 1887; Austria-Hungary October 30, 1887; New South Wales March 7, 1888, and New Zealand March 7, 1888;) 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.

The said invention relates to railways, the leading principle of which is a single line of supporting-rails below and a single line of guiding-rails overhead, the rolling-stock being adapted to run on said upper and lower rails, the overhead guide-rail being employed to retain the train upon the supporting-rail. The rolling-stock is preferably constructed of such a width as to allow the trains to pass each other in the same or opposite directions, when running on the two parallel rails of an ordinary railway, without change of gage, thus converting what is now termed a "single-line" to a "double-line" railway. This construction enables me to utilize the existing railways for my rolling-stock while the road is still being used with the present system, and old-style cars may be gradually replaced to avoid loss. The overhead guide-rail is placed out of reach of the existing locomotives and cars. The construction of the road-bed may be of any suitable description. A firm support should be placed directly under the rails, and in adapting an ordinary railway to my system a girder properly supported may be placed under the sleepers. The present style of rails may be employed; but the shape may be varied to suit existing conditions, and when rails are made especially for my system they may be lighter, and I consider that a round-headed rail is preferable. The overhead guide-rail may be placed in a V-shaped girder, if preferred, to insure the safety of the train in case the supporting-rail should settle sufficiently at any point to allow the guiding-wheels to leave the guide-rail. This guide-rail on the straight line or tangent is placed, preferably, immediately over the supporting-rail; but around curves it is placed in such a position as to preserve the equilibrium of the train, thereby preventing in a great measure the friction that would be generated if the guide-rail was immediately over the supporting-rail. To secure the perpendicular position of the train with suitable deflection at the curves and to prevent its leaving the track are the objects sought wherever the guiding-rail is placed. The driving and supporting wheels of the locomotive and the wheels of the cars are double flanged to embrace the track. The form of the groove may be varied somewhat to adapt the wheels to existing conditions, the object being to avoid any danger of the wheel leaving the track and to secure the requisite adhesion to enable the locomotive to draw the train. The overhead guide-wheels are also preferably provided with deep flanges, springs, and side safety-wheels, in order that any sinking of the bed-track may not cause the wheels to leave the track. Spiral springs are used to keep the guiding-wheels in contact with the overhead rail, and springs are provided to cushion the supporting-wheels.

The construction of my novel system will now be more particularly described in connection with the accompanying drawings.

Figure 1 is a transverse section of a single line of bicycle-railway. Fig. 2 is a similar view, on a larger scale, showing another form of supporting-frame; Fig. 3, a plan view showing a portion of the switching-rail; Fig. 4, a transverse section showing the switching device; and Fig. 5 is a plan view of a portion of a line at the curves or switches.

The structures shown in Figs. 1 and 2 are designed for light trains, and are made, preferably, of iron or steel.

The structure shown in Fig. 1 consists of arms or frames B, secured to a row of spiles,

A^6. These arms or frames B are preferably constructed with sockets B′ to fit over the spiles, and are secured thereto by bolts, and upon the spiles themselves there is laid a continuous line of stringers, A^4, to which the lower supporting-rails are secured. These stringers are embraced by sockets B′, as shown, and are firmly secured to supporting-flanges *b*. The upper stringer, A^5, is secured to the frame B in a similar manner.

The structure shown in Fig. 2 consists of a steel rail, C, bent in such a form as to completely encircle the train. For this purpose old and discarded rails can be used to great advantage, ther. by securing a cheap and light structure of great strength. The ends of this rail are bolted to the spiles and are secured to the socket B′ by means of curved fish-plates C^2, the socket being securely fastened to the spiles. The sockets are formed of semicircular metal plates cast to fit the grooves of a T-rail, and when bolted together clasp the posts between them and fit into the grooves of the T-rail on each side, and are held together by bolts passing through the plates and rail, as shown. The sockets have flanges C^3, which embrace the supporting-stringer A^4, on which the lower rails are laid. The top stringer, A^5, to which the guiding-rail is secured by bolts or in any other suitable manner, is the same as in the other forms.

In Figs. 3 and 4 is shown a siding or switch-track connecting with the main line for the purpose of switching trains. The switch device moves the supporting and guiding rails simultaneously and equally, and without a device of this character switching on my system would be difficult, if not impracticable. The switch consists of compound levers G G′ G^2, pivoted at their extremities. These levers are hinged, as shown, at their fulcrums g g' g^2, and the lever G is drawn outward and upward by the switchman when it is desired to connect the side track or tracks with the main track to switch a train, and by reversing this movement the switch-rails are placed in position for the passage of trains on the main line, the compound levers G G′ G^2 operating over their fulcrums g g' g^2 to open or close the switch.

Fig. 3 shows the relative position of the main and side tracks when the switch is disconnected from the main line. This arrangement not being materially different in principle from those now in use, no detail description is necessary.

Fig. 5 shows the position relative to each other of the upper and lower rails of the track in turning curves. While on a straight line the upper stringer, A^5, is by preference in a vertical plane with the lower stringer, A^4. Upon curves the top rail must be more or less deflected to secure smooth running of the train, as shown in the drawings. This deflection must be sufficient to overcome centrifugal force of the train acting outward, and by tilting the train inward the equilibrium or balance is maintained.

The relative position of the rails most desirable for the curves depends upon the radius of the curve and the desired speed of the train. This relative position of the rails prevents pressure of the inner flange of the wheels, thus rendering the highest rate of speed on a bicycle-railway not only possible, but practical and safe.

Having thus described my invention, I claim—

1. A railway structure consisting of curved arms or frames having sockets B′, adapted to fit over spiles and bolted thereto, and stringers A^4 and A^5, secured to the bottom and top of said frames, to which the rails are attached.

2. A railway structure consisting of rails C, curved so as to encircle the train, the ends of said rails being secured to sockets placed upon spiles, a stringer, and a line of track being provided at the top and bottom of said structure within the curve.

3. In a railway structure, sockets B′, having flanges C^3, in combination with bent rails C, and curved fish-plates C^2.

4. In a railway structure, the combination, with spiles A^6, and sockets B′, having flanges C^3, of curved rails C, fish-plates C^2, and the top and bottom stringers, A^4 and A^5.

5. In a railway structure, supporting and guiding rails a and a', in combination with a system of compound levers G, G′, and G^2, pivoted to said rails and to each other, so that both upper and lower rails may be moved simultaneously.

6. The combination, with the supporting-rail and the guide-rail, of compound levers G G′ G^2, fulcrumed at g g' g^2, substantially as and for the purpose set forth.

7. In a railway system, the combination, with a single supporting-rail, of a single guide-rail deflected from the vertical plane at curves, whereby the centrifugal force of trains is overcome by tilting the trains inward.

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

EBEN MOODY BOYNTON.

Witnesses:
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