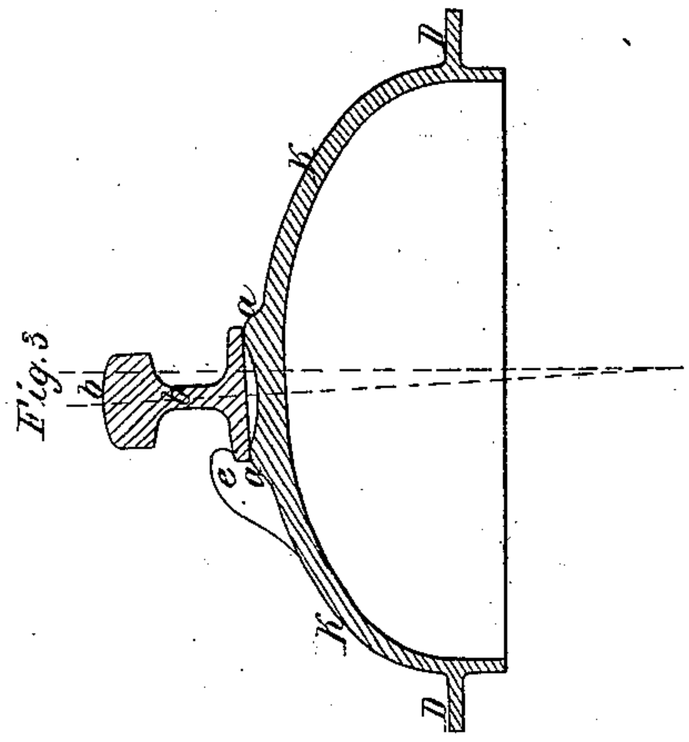
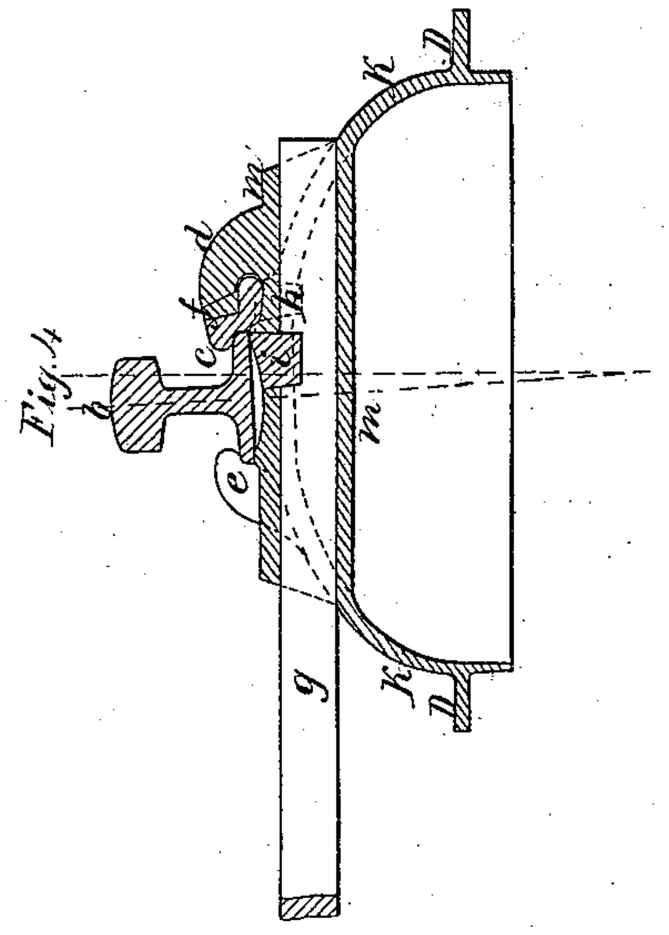
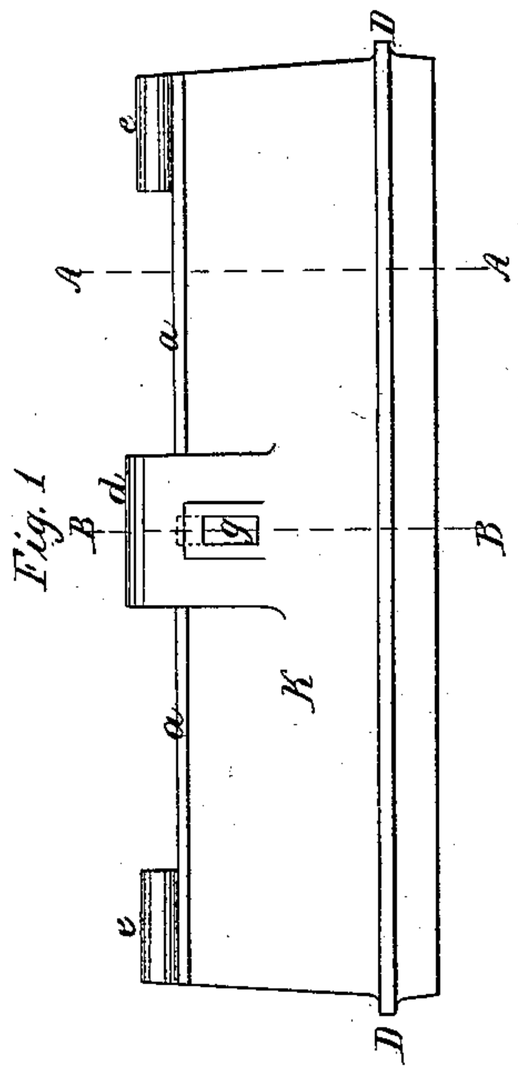
W. J. C. Muir,

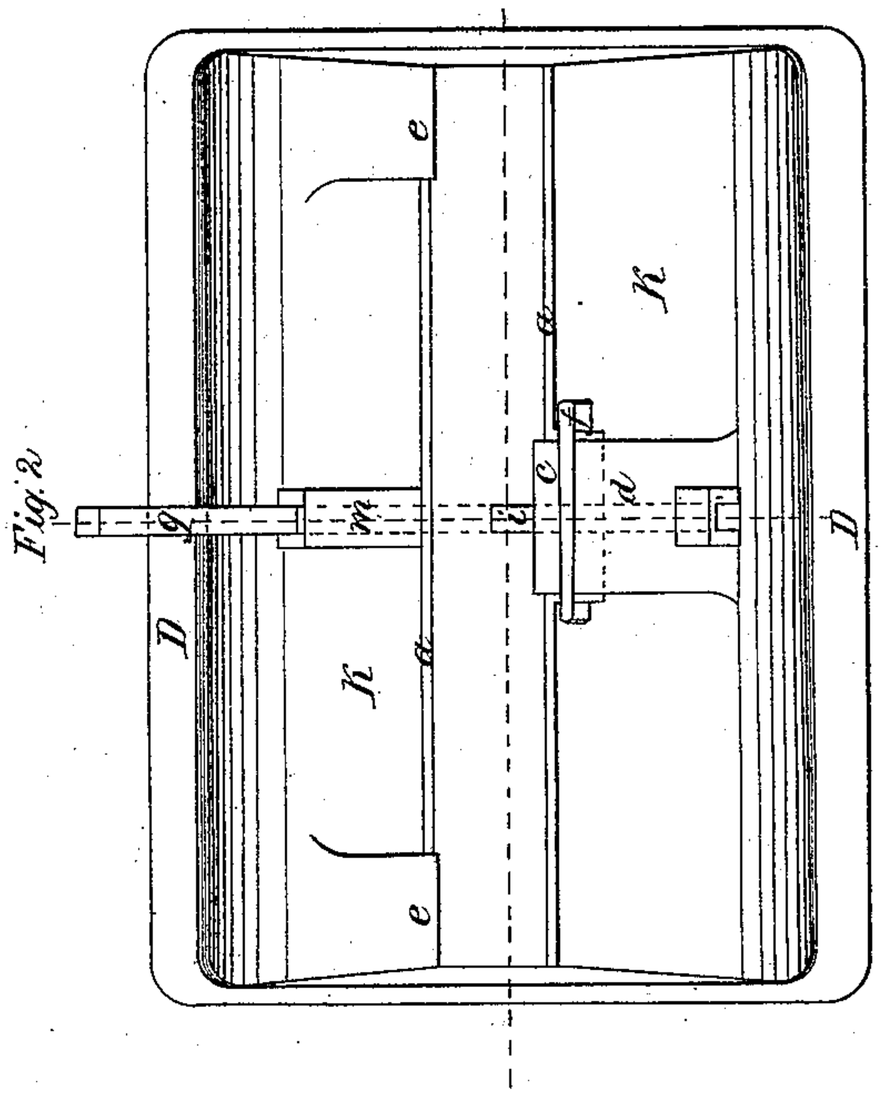
R. R. Track.

No. 92,874. Patented July. 20. 1869.









Witnesses

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W. J. COCKBURN MUIR, OF WESTMINSTER, ENGLAND.

Letters Patent No. 92,874, *dated July* 20, 1869.

IMPROVEMENT IN RAILWAYS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, W. J. COCKBURN MUIR, of Westminster, Middlesex county, England, have invented certain Improvements in Railways; and I do hereby declare the following to be a full, clear, and exact description of the same.

This invention, which relates to improvements in the construction of certain parts or members of the permanent way of railways, whereby greater efficiency and economy are combined, consists, in the first place, of a sleeper, made of cast, wrought, or malleable iron or steel, with a horizontal flanch carried wholly or partly round its outward perimeter, and so much above the base of the sleeper as to leave a vertical edge or rim round the base under the flanch, for securing a perfect gripe on or in the ballast, the normal transverse section of the body of the sleeper, exclusive of projections, being a semi-ellipse, or the half of any other curve resulting from a conic section.

In the second place, it consists in the application of this sleeper to a flat-bottomed rail, at the same time securing elasticity in the bedding of the rail without the interposition of wood or other packing, this being effected by casting on the sleepers two narrow shoulders or fillets, running along its upper side or crown, their distance apart being such that the edges of the foot or flanch of the said rail shall rest on the fillets, leaving a hollow space under the middle of the rail, into which it may deflect under pressure or concussion.

In the third place, it consists in a method of holding the rail to the sleeper by the employment of a griping-piece, or clip of iron or steel, so formed as to fix also the tie-bar, which connects a pair of sleepers, the tie-bar having a projecting head, hole, slot, notch, or groove, at or near each end, and the griping-piece being held firmly in place by a key or wedge.

Another method of fixing the rails is by a griping-piece and key or wedge, which is free of the tie-bar, or by a wedge-clip with serrated edge or edges. In these cases the bar is held by a separate wedge, key, or cotter.

In addition to the foregoing, any ordinary fastening for the rail and tie-bar, such as a gib and cotter, wedge or key, serrated or not, or bolts and nuts, in combination with the form of sleeper hereinbefore described, may be used.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

Figure 1 is an elevation of one side of a sleeper, as constructed according to this invention, being the side exterior to the rails when fixed in the line of railway;

Figure 2 is a plan of the same;

Figure 3 is a section on the line A A, fig. 1; and

Figure 4 is a section on the line B B, fig. 1.

On all the figures, similar parts are indicated by corresponding letters of reference.

The sleeper, K, may be made of cast, wrought, or malleable iron or steel. To insure stability of the sleeper, its base is of the form of a parallelogram with the angles rounded off, as shown in fig. 2.

The transverse form of the sleeper K, as shown in the transverse sections, figs. 3 and 4, is a semi-ellipse, but may also follow the halves of other curves of a conic section, the axes of such curves lying horizontally.

The vertices of the curve or curves are produced in tangents downward, so as to give a vertical rim along each side of the sleeper.

To give increased stability to the sleeper, and prevent its rocking, a horizontal flanch, D, is carried wholly or partly round the outer perimeter of the sleeper, as shown in figs. 1, 2, 3, and 4, at the level where the vertical rim is tangential to the vertices of the curve or curves; the depth of the vertical rim from this flanch to the base of the sleeper, as shown in figs. 3 and 4, being made sufficient, according to the nature of the ballast, to secure a better gripe in or on the ballast.

The sleeper shown on the annexed sheet of drawings is designed for the reception of a flat-bottomed rail, which may be of the form known as the bridge-rail, or of that known as the flanch or "Vignoles"-rail. The part of the sleeper which carries the rail is formed in such a way as to secure elasticity in the bedding of the rail without the interposition of wood or other packing.

This is effected by casting on the sleeper two narrow shoulders or fillets, *a a*, figs. 1, 2, 3, and 4, running along its crown or upper side, their distance apart being such that the edges of the bottom or flanch of the rail *b*, figs. 3 and 4, shall rest upon them, and a hollow space be left between them under the middle of the rail *b*, into which space it may deflect under pressure or concussion.

For a road on which rolling stock with conical tires is to be run, the rail *b* is fixed at right angles with a plane which has an inclination of about one in twenty with the horizon, and at or near that part of the sleeper where the plane would be tangential to the curve described by the body of the sleeper, so as to bring the rail to the inner side of the longitudinal axis of the sleeper, as shown in figs. 3 and 4, in contradistinction to the ordinary method of fixing the rail over the axis of the sleeper.

The objects to be effected by placing the rail in this position, are, to obtain a larger portion of the mass of the sleeper and its contained ballast, on the outside

than on the inside of the rail, thus giving it greater abutment to resist the diagonal thrust arising from the use of wheels with conical tires, and at the same time to give the required tilt or cant to the rail.

Where cylindrical tires are used for the rolling stock, the rail *b* may be fixed over the centre line of the sleeper, with or without cant or tilt.

The rail *b* is held by a griping-piece or clip of iron or steel, as shown at *c*, figs. 2 and 4, so that the necessity for punching the web or flanch of the rail is avoided.

The griping piece or clip *c*, is L-shaped, and is so formed that one edge takes a bearing in a hollowed space under the jaw *d*, figs. 1, 2, and 4, cast at the middle of the outer side of the sleeper, while the other edge bears upon the edge of the flanch of the rail *b*, being curved over for that purpose, as seen at fig. 4 more particularly.

The clip *c* is brought to bear and tighten upon the edge of the flanch of the rail, and at the same time the other edge of the flanch of the rail is forced under the lips *e e*, figs. 1, 2, 3, and 4, cast on each end of the inner side of the sleeper, by a metal wedge or taper key, *f*, figs. 2 and 4, which, when driven home, fills up the space between the angle of the clip *c* and the face of the jaw *d*.

The taper key *f* may be formed with or without a serrated side or sides, to prevent its working loose, and the angles of the sides are such as to present the greatest resistance to upward motion of the rail-flanch, with the least strain on the jaw *d*.

The clip or griping-piece *c* may be used only for holding the rail *b*, and be free of the tie-bar *g*, figs. 1, 2, and 4, which holds together a pair of sleepers; or a projecting piece *h*, shown in dotted lines at fig. 4, may be cast, stamped, or forged, on the under side of the clip *c*, to pass through the top of the sleeper and fit into a notch or groove in the tie-bar *g*, as shown in fig. 4, thereby holding the tie-bar in position.

When the tie-bar *g* is not held by the griping-piece *c*, which clamps the rail *b*, a small metal block or cotter, of the form shown at *i*, figs. 2 and 4, may be dropped through an opening in the top of the sleeper, under the edge of the rail *b*, into a notch or groove formed as before mentioned in the tie-bar *g*, to prevent its travelling in the socket *m*, figs. 2 and 4.

The edge of the rail resting upon the head of the block or cotter *l*, holds it firmly in place and prevents its working.

In addition to, or instead of the fastenings here described, any ordinary fastening for the rail and tie-bar respectively, such as a gib and cotter, wedge or key, serrated or not, or bolts and nuts may be used, in combination with the form of sleeper hereinbefore described, and shown in the accompanying sheet of drawings.

The same form of sleeper may also be applied to a double-headed or any other form of rail, by modifying the form of the jaws to suit the section of the rail, the rail being held by a wedge or key, or by bolts passing through the web or through the flanch, as in common use.

I claim as my invention, and desire to secure by Letters Patent—

1. The within-described sleeper, curved at the upper portion, having vertical sides and a horizontal flange, D, above the vertical portions, as set forth.

2. The two ledges *a a*, arranged on the upper portion of the sleeper, beneath and parallel to the edges of the lower flanges of a rail, as set forth.

3. The piece C, in combination with the jaw *d*, the rail and the wedge *f*, when the said piece is constructed as described.

4. The clip *c*, with its projection *h*, in combination with the sleeper, recessed to allow the passage of the projection *h*, and with the bar *g* notched to receive the said projection.

5. The sleeper, with its recess for the reception of the detachable block *i*, in combination with the tie-rod *g*, notched and adapted for the reception of the block, as described.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

W. J. COCKBURN MUIR.

Witnesses:
EDWD. N. HOBBS,
ROBT. LINKSON.