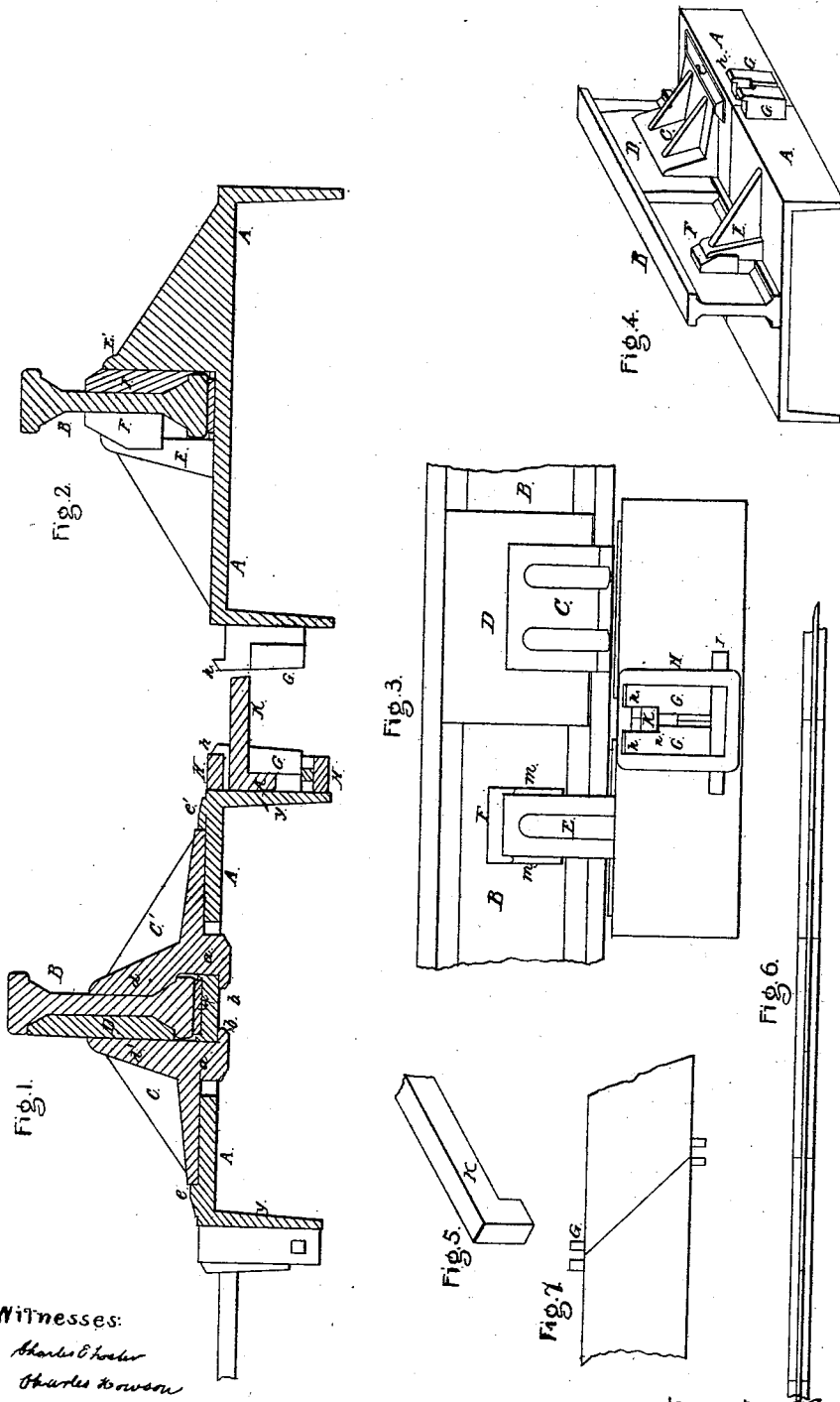


B. C. SMITH.
RAILWAY.

No. 36,579.

Patented Sept. 30, 1862.



Witnesses:

Charles E. Foster
Charles H. Brown

Inventor *Henry H. Brown*
Atty for B. C. Smith

UNITED STATES PATENT OFFICE,

BARZILLAI C. SMITH, OF BURLINGTON, NEW JERSEY.

IMPROVEMENT IN RAILWAYS.

Specification forming part of Letters Patent No. 36,579, dated September 30, 1862.

To all whom it may concern:

Be it known that I, BARZILLAI C. SMITH, of Burlington, Burlington county, New Jersey, have invented certain Improvements in Railways; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to improvements in the patent granted to me on the 9th day of July, 1861; and my improvements consist, first, in combining a series of longitudinal cast-iron girders secured to each other and bedded into the ground with a series of rails rendered detachable, so as to be reversed or replaced with new rails, thereby overcoming the defects of my above-mentioned patent of July 9, 1861, in which the rail was cast to and formed a part of the girder; secondly, in a device for connecting the rails to the girders at points where both the lateral and vertical security of the rails are required; thirdly, in a device for connecting the rails to the girders at points where lateral security only of the rails is required; fourthly, in a peculiar device for securing two adjacent beams or girders to each other, and, fifthly, in a mode of connecting the tie rods to the beams or girders.

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.

On reference to the accompanying drawings, which form a part of this specification, Figure 1 is a transverse section of a portion of my improved railway, showing the foundation beam or girder and the manner of securing the rail to the same. Fig. 2 is also a transverse section of part of the railway, showing the manner of securing the rails to the girders laterally only. Fig. 3 is a side view of Figs. 1 and 2; Fig. 4, a perspective view; Fig. 5, a perspective view of the end of one of the cross-ties; Fig. 6, a plan view (drawn to a reduced scale) of the rails and girders, &c.; Fig. 7, a diagram illustrating a modification of my improvement.

A is a cast-iron beam or girder, having vertical flanges *y y* extending throughout its whole length. This girder is simply bedded

into the ground, as described in my patent of July 9, 1861, and forms the foundation for the rail B, which is secured both vertically and laterally to the girder in the following manner:

C and C' are two cast-iron brackets, one being situated on one side and the other on the opposite side of the rail B, and both resting on the upper surface of the girder A. Each bracket has on the under side a projection, *a*, which passes through an opening in the girder, and a lip, *b*, which bears against the under side of the girder. (See Fig. 1.)

The portion *d* of the bracket C' is made to conform to the side of the rail against which it bears; but between the portion *d* of the bracket C and the rail B intervenes a wedge, D, which is arranged to fit snugly between the upper and lower flanges of the rail.

It will be observed that the outer end of the bracket C bears against a projection, *e*, on the girder A, and that the outer end of the bracket C' bears against a similar projection, *e'*, these projections being so formed as to confine the brackets in their proper position longitudinally.

It will be observed that when the wedge D is driven tight into its place the effect will be to depress the outer ends of the two brackets and force them against the projections *e* and *e'*, while the lips *b* are forced upward against the under side of the girder, to which the rail is thus effectually confined both vertically and laterally. When the rail has to be detached from the girder, the wedge D is in the first instance withdrawn, after which both brackets can be readily removed by first raising them at the outer ends clear of the retaining projections *e* and *e'*, then moving them laterally until the lips *b* are released from the girder, when the projections *a* can be withdrawn through the openings in the girders.

Although I prefer the use of two detachable brackets, in some instances the bracket C' may be cast directly to the girder, while the bracket C and its key are made detachable, in the manner described above.

A recess is formed in the upper surface of the girder at or near the point where the brackets are situated, for the reception of a strip, *x*, of gutta-percha, hard wood, or metal of a

character which will tend to absorb the shocks to which the girder would be otherwise subjected when heavy loads pass over the rails. At certain intervals, where there is no necessity of securing the rail vertically to the girder, but where lateral security is required, I adopt the device illustrated in Fig. 2.

E and E' are two permanent brackets cast to the girder, and situated so far apart from each other that the flange of the rail B can pass freely between them.

Between the rail and each bracket intervenes a block, F, which is slightly wedge-formed, this block being furnished with flanges *m m*, which retain it in its proper position in respect to the brackets, the inside of the block being made to conform to the shape of the rail. Their own weight is sufficient to maintain these blocks in their proper position, and they can be readily removed by raising them vertically.

In order to secure two adjacent beams A to each other, I cast on each beam at or near the point where the two meet each other, and on each side of said beams, a projection, G, that of one beam being exactly opposite to that of the adjacent beam.

A strap, H, is arranged to fit over the said projections and to bear against the sides of the same, the upper portion of the strap fitting over the lips *h*, while a key, I, driven through the strap, serves to confine it effectually to the projections, the strap thus maintaining the ends of two adjacent girders in proper contact with each other. When the adjacent girders have to be disconnected from each other, the keys I are withdrawn from the straps, the latter elevated so as to be clear of the lips *h*, and then removed from the projections G.

It is necessary, in order that the two rails of the track may be maintained at a uniform distance apart, to connect the girders A supporting one rail to the girders supporting the other rails of the track to each other. This I accomplish by means of the rods K, Fig. 3; the heads *k* of each rod being arranged to fit snugly in a recess or chamber formed between the projections G G of two adjacent beams, while the rod itself is maintained in its proper vertical position by shoulders *n n*, formed on the said projections, and by the straps H. The head at the opposite end of the rod is confined to the girders which form the foundations of the opposite rails precisely in the same manner.

The ends of the girders, instead of being at

right angles to the sides, may be inclined, as seen in Fig. 2, the lugs G G and straps H being in this case also used to connect two adjacent girders together.

Care should be taken in arranging the rails and girders that the point of junction of two adjacent rails are midway, or thereabout, between the opposite ends of one of the girders. as seen in Fig. 7.

In my former patent of July 9, 1861, the rail was cast to and formed a part of the girder, so that when the rail is worn the entire girder becomes useless; hence the importance of making the rail separate from the girder, so that the former, when worn, can be reversed, or when totally useless can be replaced with a new one without disturbing the foundation girder.

It will be evident that the method described of connecting two adjacent beams or girders to each other is at once cheap, simple, and effective, and that by adopting the simple plan described of connecting the tie rods K to the girder the usual screw and nut arrangements and expensive fitting are avoided.

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

1. Combining a series of longitudinal cast-iron girders, A, secured to each other and bedded into the ground, with a series of detachable rails, B, substantially as set forth, for the purpose specified.

2. The brackets C and C', the latter being either fixed or loose, and the wedge D, the whole being combined with and applied to the girder and rails, substantially as set forth.

3. The projections E and E' on the girder A, in combination with the rail B and detachable wedge-formed blocks F, the whole being arranged substantially as and for the purpose set forth.

4. Securing the adjacent beams to each other by means of the straps H, applied to the projections G G and secured thereto by lips *h* and key I, substantially as specified.

5. Connecting the tie-rod K to the beams by confining the head in a recess formed between projections G G, as specified.

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

B. C. SMITH.

Witnesses:

HENRY HOWSON,
CHARLES HOWSON.