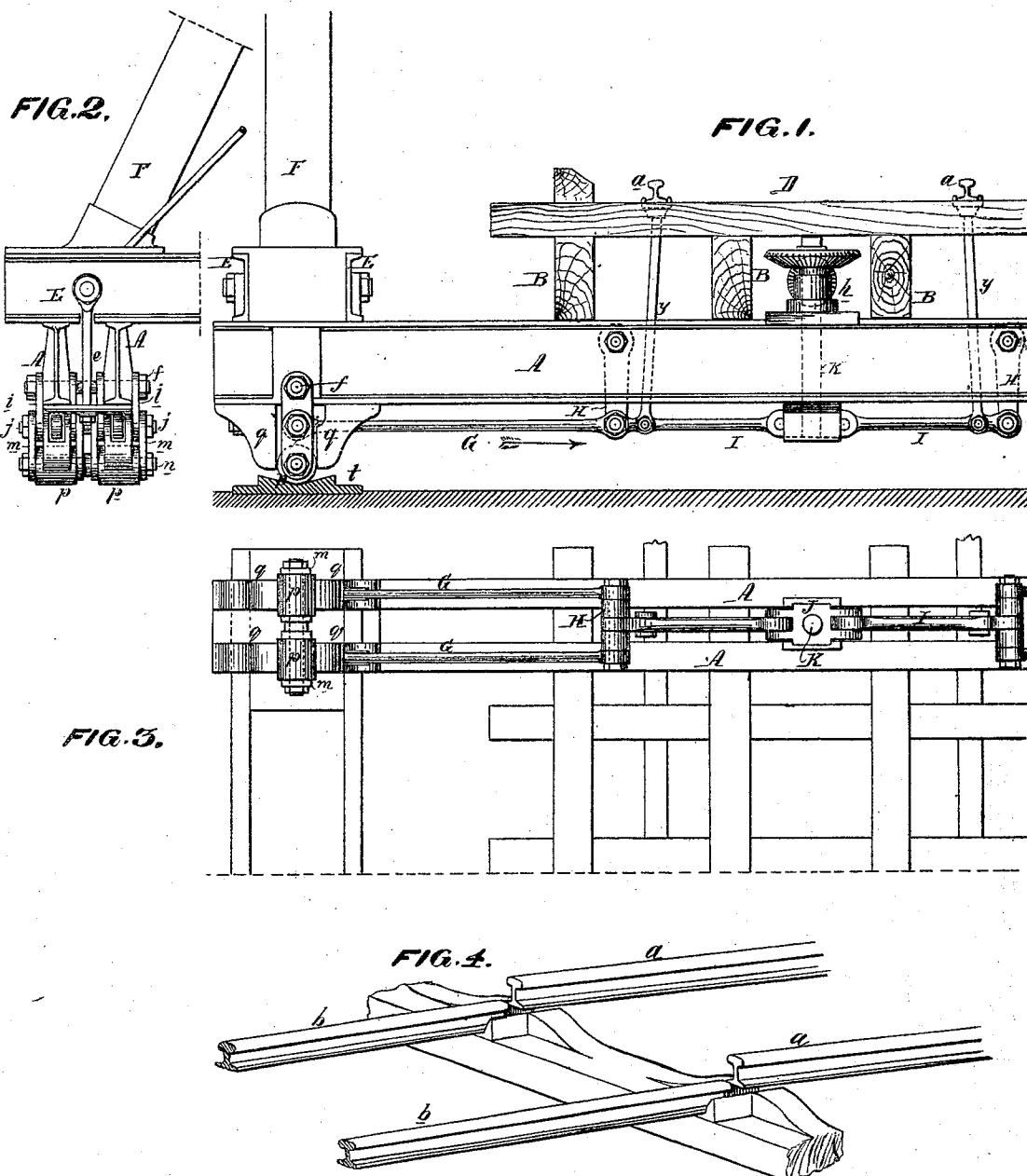


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Improvement in Pivot-Bridges.

No. 128,115.

Patented June 18, 1872.



WITNESSES

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IMPROVEMENT IN PIVOT-BRIDGES.

Specification forming part of Letters Patent No. 128,115, dated June 18, 1872.

Specification describing certain Improvements in Pivot-Bridges, invented by THOMAS C. CLARKE, of Philadelphia, and ADOLPHUS BONZANO and JOHN GRIFFEN, of Phoenixville, Pennsylvania.

Improvements in Pivot-Bridges.

Our invention relates to certain improvements in pivot-bridges, too fully explained hereafter to need preliminary description; the said improvements having for their object, first, the ready withdrawal of the corner-supports of the bridge when the latter has to be turned on its pivot, and the ready restoration of these supports when the position of the bridge demands them; and second, the self-centering of the bridge, so that the nice and tedious manipulative adjustment demanded in order that the rails of the bridge may coincide with those of the permanent track, is rendered unnecessary.

In the accompanying drawing, Figure 1 is a view of a portion of the end of a pivot-bridge; Fig. 2, a side view of a portion of one end of the bridge; Fig. 3, a plan view of Fig. 1; and Fig. 4, a perspective view illustrating a part of our invention.

A and A' are two transverse beams at one end of the bridge, these, together with other transverse beams of like character, supporting the longitudinal beams B, across which extend the ties D for receiving the rails *a a*. The transverse beams A are secured to the lower chord-beams by suspension-bolts *e*, this lower chord forming part of a truss-frame of which the pivot-bridge is composed, and of which F represents a portion of one of the diagonal end posts. To the transverse beam A are hung, by means of a pin, *f*, a series of links, *i i i i*, and to the latter are hung, by means of a pin, *j*, a series of similar links, *m*, and to a pin passing through the lower ends of the latter series of links are hung two rollers, *p p*, which are guided vertically by brackets *q q* secured to the under side of the beams A. The two sets of links, as will be seen hereafter, form a knee-joint, to the central pin *j* of which two rods, G G, are joined, the opposite ends of these rods being connected to the lower ends of arms H, which are hung to the trans-

verse beams A A, and these arms are connected, by a rod, I, to lugs on a nut, J, which is adapted to vertical guides arranged between the two beams A A, the said nut being also connected by similar appliances to knee-joint links arranged at the opposite corner of the bridge, which is not shown in the drawing. The nut J is controlled by a vertical screw so confined to suitable bearings *h*, secured to the beams A A, that while it can be turned easily it is incapable of vertical movement. This screw may be operated by any suitable mechanism; but we prefer to operate it from a central point on the pivot-bridge and to connect the operating mechanism by means of a horizontal shaft extending along the bridge beneath the ties, one end of the shaft being geared by bevel-wheels to the screw K at one end of the bridge, and the opposite end to a similar screw at the opposite end of the bridge, so that the knee-joint links at all four corners of the bridge may be operated simultaneously from one point. The outer ends of the rails *a a* at each end of the bridge admit of being raised and lowered by the same mechanism which operates the knee-joints. Thus the rails *a a* in Fig. 1 are connected by rods *y y* to the rods I I, and these rails are adapted to chairs *d d*, which are secured to the permanent roadway or permanent part of a bridge, and which receive the ends of the permanent rails *b b* of the track, the chair thus insuring the coincidence of the rails of the pivot-bridge with those of the permanent track.

As seen in the drawing, the bridge is supposed to be closed and free for the passage of trains, the rollers *p* at the lower end of the knee-jointed links at each corner of the bridge bearing in a cavity in the top of a plate, *t*, secured to the foundation or pier; and, the pins of the knee-joint links being in the same vertical line, the links afford a steady support for the bridge at each of its four corners. When it is necessary to swing the bridge round the screw K at each end of the bridge is turned so as to elevate the nuts J. This consequently draws the rods G and I in the direction of the arrows, and therefore so acts on the knee-joint links as to elevate the rollers *p p* in their guides; and this is continued until the bridge

is in the first instance lowered and supported on its center pivot only, and afterward until the rollers are clear of their bearings. Simultaneously with this movement of the knee-joint links the outer ends of the rails, owing to their connections with the rods *II*, were elevated clear of the chairs *dd*, as seen in Fig. 4, and consequently the bridge is free to be turned on its pivot. In restoring the bridge to its original position it is turned round until the rollers *pp* of the knee-joint links are above the cavity of the foundation-plate *t*. It is very rarely, however, that the bridge can be arrested in its movement at a point where the said rollers are directly above the center of the said cavity; but as soon as the screws *K* are operated to straighten the knee-joint links and the rollers *q* begin to bear upon the plates *t* the weight on the rollers will induce them to descend into the cavities of the plates; and hence as the straightening of the knee-joints is continued the bridge will be slightly turned until the rollers have arrived at the most depressed portion of the cavities in the plates, and there remain while the straightening of the knee-jointed links is continued until their pins are in the same vertical line, as shown in Fig. 1. After the bridge had adjusted itself in the manner described during the preliminary straightening of the links, and this straightening was continued, the rails *aa* on the bridge descended until they rested in and were confined laterally by the shoes *dd* of the permanent track. It will be seen, therefore, that by connecting these rails *aa* to the mechanism which operates the knee-joints the said rails are elevated out of the chair simultaneously with the releasing of the bridge from its corner-bearings, and when the knee-joints become the corner-bearings the rails are lowered into the chairs, and their coincidence with the rails of the permanent track is thereby insured. The accidents which have frequently occurred through the non-coinciding of the

rails of a pivot-bridge with those of the permanent track are thus prevented.

The knee-joint bearings at the corner of the bridge possess this important advantage, that they can be operated with comparatively little exertion, either through the medium of the mechanism described or any equivalent operating devices.

Although we have shown and described a pivot-bridge constructed in a manner which we deem most appropriate, it should be understood that our improvements are applicable to any pivot-bridge. A change in the operating mechanism may be demanded in a bridge constructed in a manner differing from that described, but the principal features may remain; these features being the knee-joint links, forming corner-supports, which can be easily withdrawn, and the plates *t*, which render the bridge self-centering.

We claim as our invention—

1. The combination, with a pivot-bridge substantially as described, of knee-joint supports and the mechanism described, or any equivalent to the same, for operating the said joints.

2. In combination with a pivot-bridge having movable links as supports, we claim plates *t*, constructed, substantially as described, so as to render the bridge self-centering.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

THOMAS C. CLARKE.
ADOLPHUS BONZANO.
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Witnesses to the signature of THOMAS C. CLARKE:

WM. A. STEEL,
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Witnesses to the signatures of ADOLPHUS BONZANO and JOHN GRIFFEN:

P. G. CAREY,
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