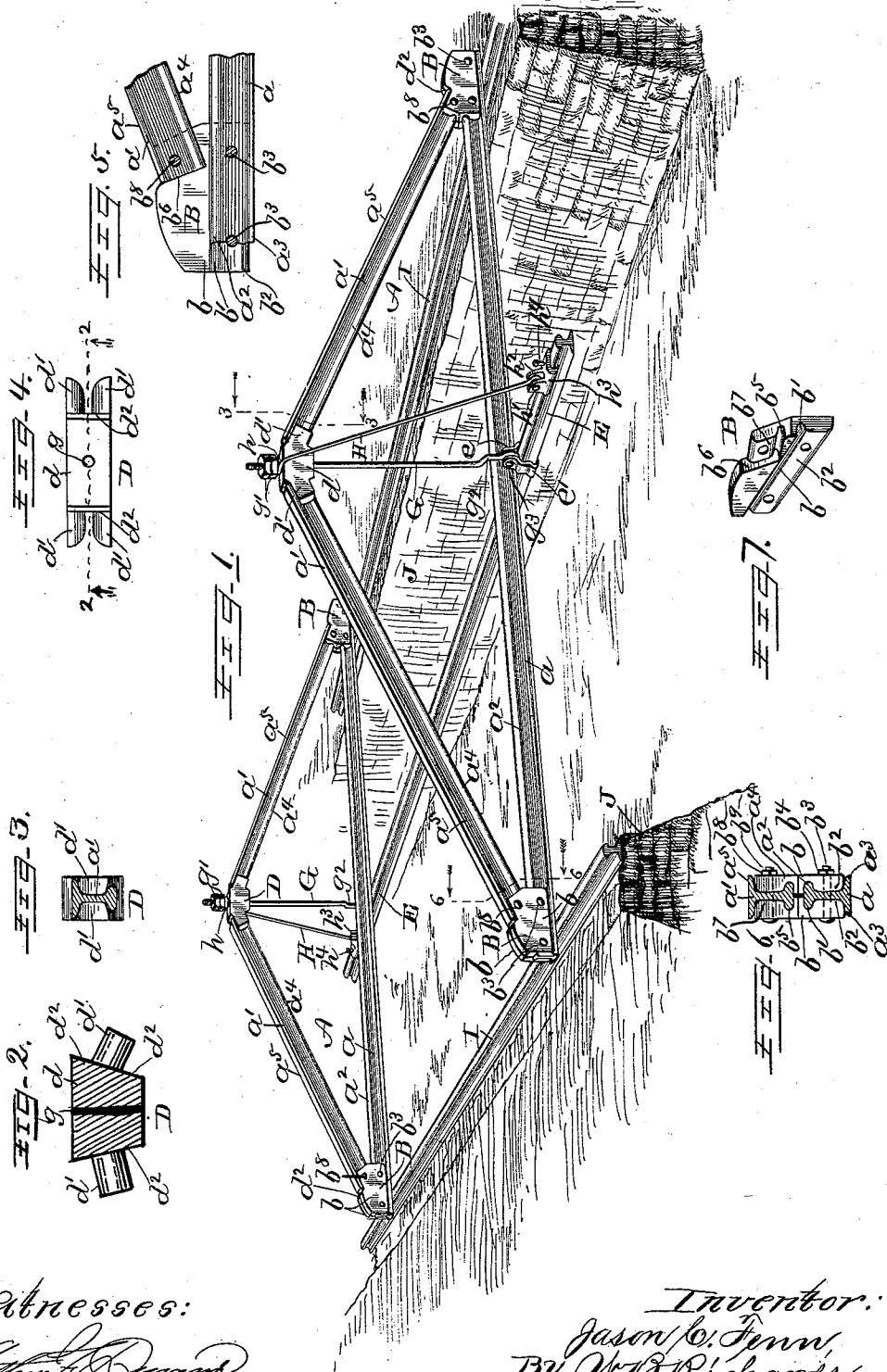


(No Model.)

J. C. FENN.
BRIDGE.

No. 530,265.

Patented Dec. 4, 1894.



Witnesses:
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UNITED STATES PATENT OFFICE.

JASON C. FENN, OF TERRYVILLE, CONNECTICUT, ASSIGNOR OF ONE-HALF
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BRIDGE.

SPECIFICATION forming part of Letters Patent No. 520,265, dated December 4, 1894.

Application filed January 29, 1894. Serial No. 498,310. (No model.)

To all whom it may concern:

Be it known that I, JASON C. FENN, a citizen of the United States, residing at Terryville, in the county of Litchfield and State of Connecticut, have invented certain new and useful Improvements in Bridges, of which the following is a specification.

The bridge to which the invention that is herein described pertains, is of that class which depend for their stability upon the application of the principle of the truss, known as truss bridges; and the object of my improvement is to provide a truss bridge of that type in which a triangular frame truss is used, the principal members of which shall preferably consist of railway rails, and which will be particularly useful for country road use in bridging small streams with single span bridges, which will be strong and durable, and also economic in cost of construction, as old railway T-rails not wanted for railway use and which can be purchased at nominal cost can be utilized in nearly the entire superstructure; and to this end and object the invention consists in its principal feature in triangular shaped truss frames, formed of a tie beam and brace beams of railway rails, the brace beams in which trusses are fixed at their lower or foot ends respectively to the tie beams by shoes having suitable seats for both the tie beam and the brace beam, and in which the brace beams are connected at their upper ends by a key block having seats for said ends of the brace beams, as hereinafter described and claimed; and the invention further consists in a suspension rod fixed to said key block at its upper end, and at its lower end to a transverse girder also formed of a railway rail, on which girder the central part of the tie beam is supported. In carrying out this main object of my invention subsidiary improvements are evolved, which consist in novel structural features, novel organization of parts and novel combinations of parts, the operation of which parts as constructed, as organized and as combined is hereinafter fully described, and expressed in the claims forming part of this specification.

The preferred structural peculiarities of the different parts, the assemblage and disposition of the different parts to act together in

the composite body, the bridge, and the combinations forming the subject matter of my improvements, are illustrated in the accompanying drawings, in which—

Figure 1 is a perspective, showing two of my improved truss frames as applied and used in constructing a single span truss bridge across a small stream; Fig. 2, an enlarged sectional elevation of the key block, in the line 2, 2, in Fig. 4; Fig. 3, an enlarged end elevation of the key block, and sectional elevation of a brace beam, in line 3, 3, in Fig. 1; Fig. 4, an enlarged top plan of the key block; Fig. 5, an enlarged side elevation of one of the shoes, one end of a brace beam, and a fragment of a tie beam, broken away at both of its ends; Fig. 6, a sectional elevation in line 6, 6, in Fig. 1; Fig. 7, a perspective, showing the inner side of one of the parts of one of the shoes.

The principal members in the construction of each truss A are the tie beam a and the two brace beams a' , each of which members, as shown, consists of an ordinary railway T-rail. The brace beam T-rails are preferably placed upside down, and the tie beam preferably right side up, or with its same side upward as is upward in railway use. The foot end of each brace beam a' is united to the adjacent end of the tie beam by a shoe B, which is formed of two similar parts b . The confronting faces of the parts b (see Fig. 6), have each, lengthwise of itself at its lower side, a groove b' which is adapted to closely engage the counterpart side of the head a^2 of the tie beam T-rail, and a ridge or ledge part b^2 which is adapted to closely engage the web of the same T-rail, the head thereof and its lower flange a^3 . Bolts b^3 pass through the parts b of the shoe B and through the web of the tie-beam, and with nuts b^4 serve to fix the two parts b of the shoe to each other and in place on the end of the tie-beam. The confronting faces of the parts b also have each, an inclined groove b^5 in its upper portion, which terminates against a shoulder b^6 , which groove b^5 is adapted to closely engage the counterpart side of the head a^4 of the T-rail brace beam a' , and has a ridge or ledge part b^7 paralleling the groove b^5 which is adapted to closely engage the web of the same T-rail,

the head thereof and its flange a^5 . The ridge or ledge b^7 also terminates at the shoulder b^6 . A bolt b^8 which passes through the parts b of the shoe and through the web of the brace beam T-rail, with a nut b^9 aids in fixing the foot of the brace beam to the shoe.

It will be evident that the bolts b^3 may be dispensed with, if preferred.

The confronting faces of each part b of the shoes B have as described a conformity of outline respectively with the sides of the T-rails forming the tie beam and the brace beam, and the foot of each brace beam abuts against a shoulder b^6 , so that the parts b when bolted together as described and by the same bolts clamped upon and fixed to the tie beam, form a shoe which can be clamped closely and firmly to old T-rails, that sometimes vary slightly in form from use and wear, and form an effective seat therefor, and in which the thrust of the brace beams is effectively provided for by the shoulders b^6 against which their foot ends abut.

The key block D has a central part d from each of the opposite ends of which project two arms or plates d' , the confronting faces of which fit closely to the groove in each side of the T-rails, formed by the rail head, web, and lower flange.

The upper ends of the brace beams are each seated in the recess between two of the plates d' by forcing the rails endwise into such seats until their ends reach and abut each against an inclined shoulder d^2 , which inclined shoulders are formed by the central part of the key block from which each pair of plates d' projects. By using key blocks D having plates d' and shoulders d^2 of different inclinations, the rise of the arch of the truss may be varied as desired, and shoes B with seats for the brace beams inclined to correspond therewith should be used.

If preferred, the key block D may be made in two parts, by dividing it centrally and vertically, lengthwise of itself, and the two parts be bolted to each other by through bolts, to clamp them closely upon old T-rails varying slightly in form, from use and wear.

At Fig. 1 I have shown two of my truss frames, as used in an ordinary single span bridge. Midlength of, transversely to, and beneath the two tie beams a is a girder E, formed also of a T-rail, the ends of which preferably project laterally past the tie beams, as shown, and for a purpose hereinafter described. The girder E is supported by suspension rods G. The upper end of each suspension rod G passes through a vertical hole g through the central part of a key block D, and is adjustably held at its upper end by suitable nuts g' . The lower end of each suspension rod G is bent at g^2 to pass the tie beam a , and is fixed at its lower end by a bolt g^3 , between the ends e of a strap or clasp e' which passes around the girder E. The tie beams a may be straight, as shown, or may be

slightly arched or bowed upwardly at their midlength parts if preferred, and in either case as may be, the suspension rods G can be adjusted to sustain the tie beams by bringing the girder E up to the lower sides of the tie beams. The girder E may be fixed to the tie beams if preferred, and the lower ends of the suspension rods G be fixed to the tie beams, by straps such as the straps e' .

The truss frames are braced laterally by brace rods H, the upper end of each of which brace rods has an eye h through which the upper end of the suspension rod G passes and which is secured between the nuts g' and the key block D, to fix the brace rod to said key block. The lower end of each brace rod H is by a through bolt h' secured between ears h^2 which project from a clip h^3 which grasps the head of the T-rail forming the girder. The clip h^3 is adjustable lengthwise of the girder as may be required, and is held after such adjustment by a set screw h^4 .

The mud-sills I, shown at Fig. 1, are also old T-rails, placed preferably right side up, and located, one on each abutment J, and preferably with their ends projecting as shown, beyond the shoes B which rest on the mud-sills. The trusses may be prevented from sliding on the mud-sills by clamps, stakes, or in any other ordinary way preferred.

A platform for the roadway, formed of suitable plank, not shown, may be supported on joists, not shown, paralleling the truss frames, and which joists are supported on the mud-sills and girders E.

What I claim as new, and desire to secure by Letters Patent, is—

1. An iron bridge truss, comprising in its structure and in combination, a tie beam, brace beams, and chairs each formed of two parts with confronting faces, each face conforming in contour to the tie beam and brace beam, and having a shoulder to receive the end of the brace beam, bolts securing said parts to each other and to the tie beam, and a key block having abutting shoulders and recessed ends for receiving the upper ends of the brace beams, substantially as described.

2. An iron bridge truss, comprising in its structure and in combination, a tie beam, brace beams, and chairs each formed of two parts with confronting faces, each face conforming in contour to the tie beam and brace beam, and having a shoulder to receive the end of the brace beam, bolts securing said parts to each other and to the tie beam, and a key block having abutting shoulders and recessed ends for receiving the upper ends of the brace beams, a girder, and a tie rod fixed to the key block and to the girder, substantially as described.

3. An iron bridge truss, comprising in its structure and in combination, a tie beam, brace beams, and chairs each formed of two parts with confronting faces, each face conforming in contour to the tie beam and brace

beam, and having a shoulder to receive the end of the brace beam, bolts securing said parts to each other and to the tie beam, and a key block having abutting shoulders and recessed ends for receiving the upper ends of the brace beams, a girder, and a tie rod fixed to the key block and to the girder, a clip adjustably fixed to the girder, and a side brace fixed at its upper end to the key block and at its lower end to said clip, substantially as described.

4. A bridge truss comprising in its composite structure, a tie beam *a* and brace beams *a'* of railway T-rails; shoes B, fixing the feet of the brace beams to the tie beam; and a key block having projections *d'* between which the upper ends of the brace beam T-rails are seated, and shoulders *d''* against which they abut, substantially as described.

5. A bridge truss comprising in its composite structure, a tie beam *a*, brace beam *a'* and girder E of railway T-rails; shoes B fixing the feet of the brace beams to the tie beam; a key block connecting the upper ends of the brace beams; and a suspension rod connecting the key block and the girder, substantially as described.

6. A bridge comprising in its composite structure, tie beams *a*, brace beams *a'*, and girder E of railway T-rails; shoes B fixing the feet of the brace beams to the tie beams; a key block connecting the upper ends of the brace beams; and a suspension rod adjust-

ably fixed to the key block and to the girder E, substantially as described.

7. A bridge comprising in its composite structure, tie beams *a*, brace beams *a'* and girder E of railway T-rails; shoes B, fixing the feet of the brace beams to the tie beams; a key block connecting the upper ends of the brace beams, a suspension rod connecting the key block and the girder; and a side brace, as H, fixed at its upper end to the key block, and at its lower end pivotally hinged to a clip which is adjustably fixed to the girder E, substantially as described.

8. A bridge comprising in its composite structure, tie beams *a*, brace beams *a'* and girder E, of railway T-rails; shoes B formed in two parts *b*, *b'*, with confronting faces having a conformity of surface with the adjacent faces of the tie beam and brace beams, and a shoulder *b''*; through bolts *b''*, *b'''*; a key block having plates *d'* and shoulders *d''*; a tie rod adjustably fixed to the key block and to the girder E; and a side brace fixed at its upper end to the key block, and at its lower end hinged to a clip which is adjustably fixed to the girder, substantially as described.

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

JASON C. FENN.

Witnesses:

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W. G. PLUMB.