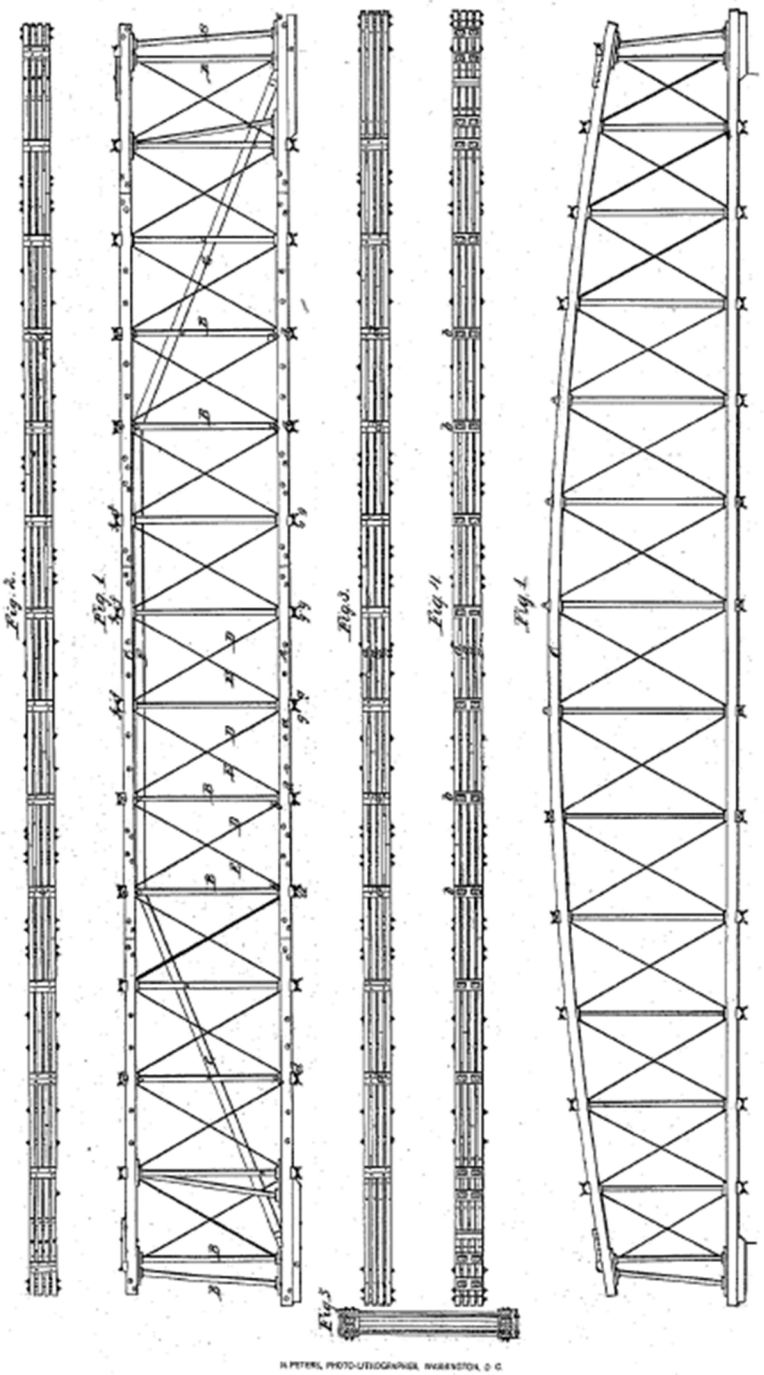
Patent Issued to Thomas and Caleb Pratt for the Pratt Through-Truss Bridge

C & T. W. Pratt.

Truss Bridge.

No. 3,523. Patented Apr. 4, 1844.



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UNITED STATES PATENT OFFICE.

THOS. W. PRATT, OF NORWICH, CONNECTICUT, AND CALEB PRATT, OF BOSTON, MASSACHUSETTS.

TRUSS-FRAME OF BRIDGES.

Specification of Letters Patent No. 3,523, dated April 4, 1844.

To all whom it may concern:

Be it known that we, THOMAS W. PRATT, of Norwich, in the State of Connecticut, and CALEB PRATT, of Boston, in the State of Massachusetts, have invented a new or improved mode of constructing truss-frames for bridges and such other architectural structures or purposes to which the same may be successfully applicable, and that the following specification thereof, taken in connection with accompanying drawings, constitutes a full and exact description of the same.

In said specification we have set forth the nature and principles of our improvement by which it may be distinguished from others of like character together with such parts of the same as we claim as our discovery and believe to be new.

Of the drawings above mentioned Figure 1, exhibits a side elevation of a truss constructed according to the principles to be hereinafter defined. Fig. 2, represents a top view thereof, or a view of the upper side of the upper string timbers of the same. Fig. 3, is a plan of the bottom of said truss or the lower side of the lower string timbers. Fig. 4, is a horizontal section exhibiting the upper face of the lower stringer. While Fig. 5 is a transverse vertical section of the whole truss, taken at or near the middle thereof.

Fig. 6 exhibits a modification of the truss, wherein the upper stringer is crowned or arched.

A, Figs. 1, 3, 4, 5, represents the inferior or lower stringer which may be composed of any number of planks or timbers *a*, *a*, *a*, arranged side by side, and spliced and bolted together in any convenient manner, or the same may be otherwise suitably constructed. Upon this stringer a series of vertical posts B, B, B, B, is elevated, the same resting upon shoes *b*, *b*, interposed between their feet and the upper surface of the stringer as seen in the drawings. These shoes may be formed of pieces of hard wood or planks or other proper material, extending laterally across the stringer and let or notched down a short distance into the same in order to secure them in their respective positions. The foot of each post may also be stepped a short distance into the shoe, if desirable, and upon each shoe two or more posts may be disposed as seen in Fig. 5. Other and similar shoes or cap pieces *c*, *c*, *c*, are placed on the top of the posts, and receive upon their upper surfaces the superior or upper stringer C, which is constructed in all respects like the lower stringer, before mentioned and extends parallel with the same or from post to post as exhibited in Fig. 1, or the said upper stringer may be curved longitudinally as seen in Fig. 6. A series of transverse bearing or straining blocks *d*, *d*, *d*, suitably formed from hard wood or metal, extends beneath the lower stringer and posts, the same being let into the lower face of the stringer and situated directly under the posts, as seen in Figs. 1, 3. Another series *e*, *e*, *e*, of such blocks is similarly arranged upon the upper face of the superior stringer C as seen in the drawings. Main braces D, D, D, &c., and counter braces E, E, E, crossing each other diagonally as seen in Fig. 1, extend from and through the lower blocks *d*, *d*, under the posts to and through the upper blocks *e*, *e*, of the upper stringer, each brace being a metallic rod or bar, which has a suitable head *f*, formed upon its upper end, and a screw and nut *g* arranged upon its lower end, so that when the nut is turned in the right direction upon the screw; it bears upon one of the beveled faces of the lower block, or a suitable washer placed on the face of the block and draws the head of the brace firmly against the opposite beveled face of the upper block. The tension braces may be placed on the sides of the truss if desirable, or they may be arranged so as to enter the spaces left between the timbers composing the stringers as seen in Fig. 5. Every panel of the bridge or rectangular space between any two consecutive posts, has its brace and counter brace, of each of which there may be any number passing from the lower to the upper blocks of the said panel according to the strength requisite in the truss.

Should it at any time be desirable to increase the strength of the truss—a beam F, of suitable length, may be arranged centrally and directly under and in contact with the upper stringer, as seen in Figs. 1, 5, and from each extremity of this beam, an inclined beam G may extend to the lower stringer, into or upon which it may be stepped in any convenient manner, the said central and side timbers forming what may be termed an arch beam; or instead of the

said method of constructing an arch-beam it may be arranged in connection with the upper and lower stringers or in connection with the upper stringer and the abutments of the bridge or truss in any of the methods usually known and practiced in carpentry.

In some situations where a truss may be employed which has its braces and counterbraces arranged as exhibited in Fig. 1, the lower stringer may not be requisite as the flooring or whatever is to be upheld by the truss may be depended directly from the lower straining blocks or other convenient parts, the former of which in such case will generally be arranged in direct contact with the feet of the posts.

The several iron braces are subjected to a tension strain and being arranged as hereinbefore described, they draw or confine the posts and stringers together. More or less camber may be easily given to the truss by means of the nuts upon the screws of the braces, which on being turned in the requisite direction, lengthen or shorten the distances between the heads and nuts of the braces to such degrees as may be requisite to produce the necessary camber. In the truss represented in Fig. 1, the braces of each panel, being coupled by means of the straining block, with the counter braces of the succeeding panel, and the counter braces also of the same, being in a similar manner coupled with the braces of the succeeding panel, a connected strain is thus kept on the tension braces, independent of the other parts of the frame, whereby the tie beam or lower stringer is more or less relieved of a portion of its strain, according to the disposition of the weights producing the said strain. The bracing by means of tension bars extending diagonally across each panel of a bridge truss has been long known and used; but the system of bracing and counterbracing, by means of tension bars crossing each other in each panel, is believed to be new, and not only affords the means of regulating the general camber of a bridge, but allows it to be drawn up, or depressed, in any particular segment, at pleasure, and thus furnishes a means of regulation not derivable from the single tension braces in each panel.

Having thus explained the nature of our invention we shall claim—

The above described method of constructing a truss, that is to say the combination of two diagonal tension braces and straining blocks, in each panel of the truss frame of a bridge; by means of which the camber may be regulated so as to increase or to diminish it, either in whole or in sectional part of the bridge, the whole being constructed and operating, substantially as herein before set forth.

In testimony that the foregoing is a true description of our said invention and improvements we have hereto set our signature this twenty second day of March in the year eighteen hundred and forty three.

THOMAS W. PRATT.
CALEB PRATT.

Witnesses:
R. H. EDDY,
EZRA LINCOLN, JR.

(source: Historic Bridges Encyclopedia: Historic Bridge Patents (http://historicbridges.org/info/patents/).