George P. Herthel Jr.

Improvement in Truss Bridges.

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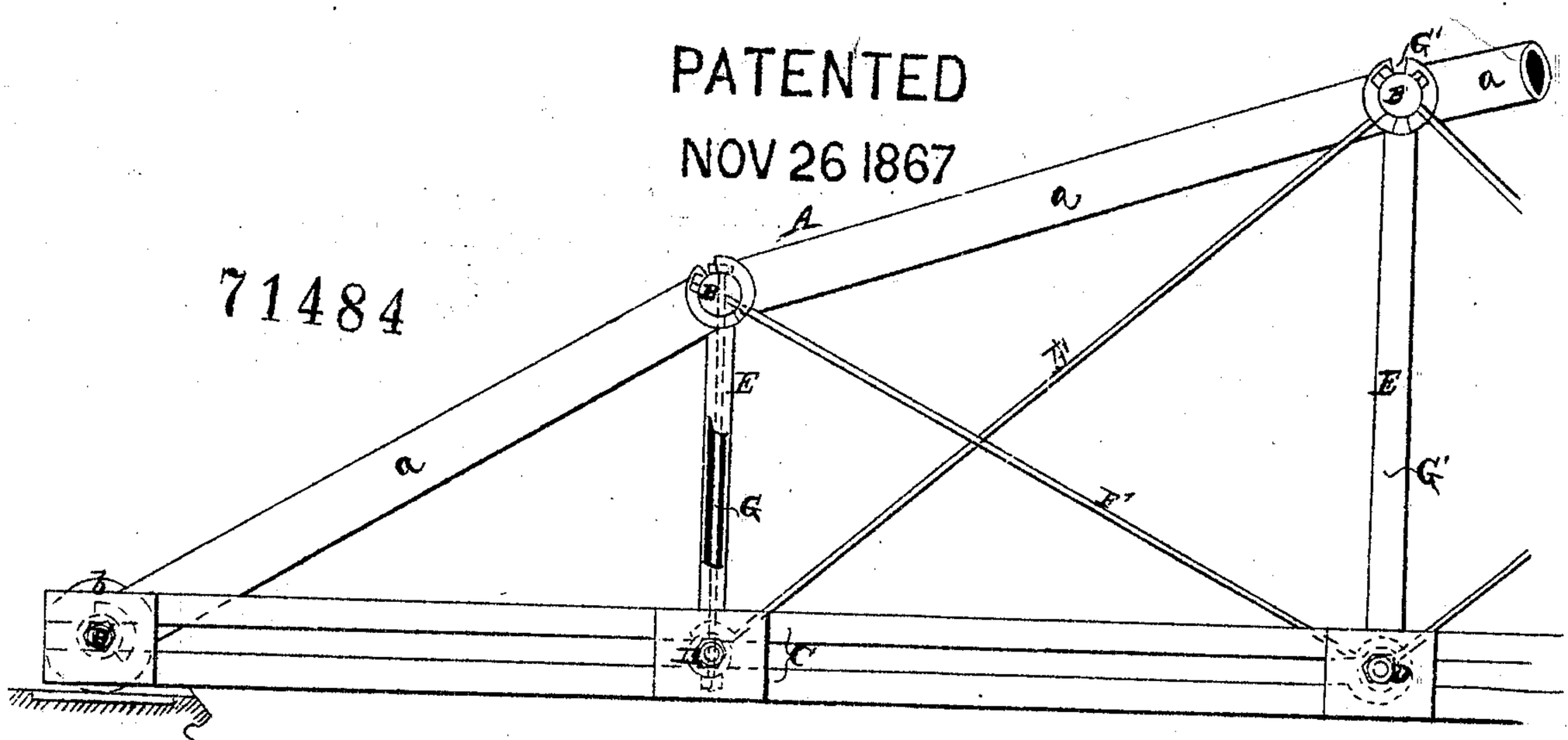

Figure. 1.

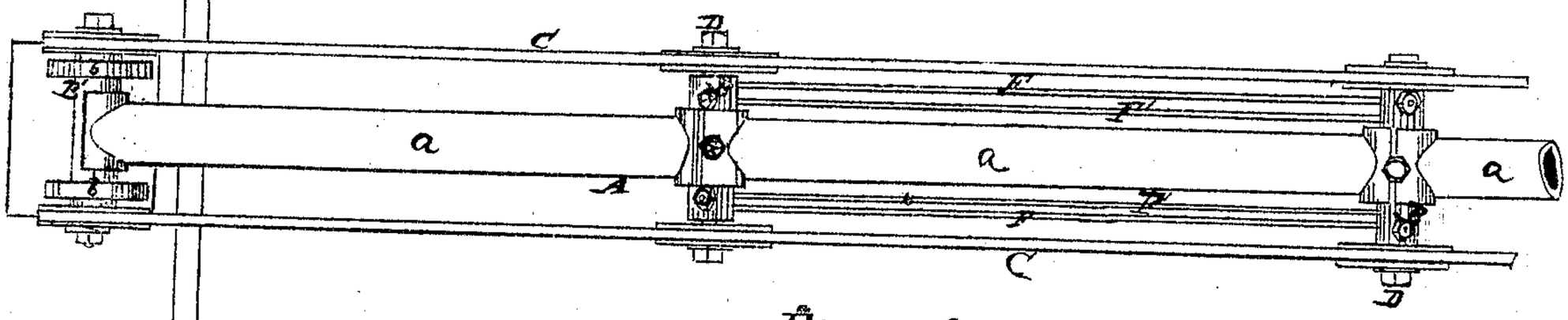

Figure. 2.

Witnesses:

Wm Randolph

Chas. H. Boyle

Inventor:

Geo. P. Herthel Jr.

United States Patent Office.

GEORGE P. HERTHEL, JR., OF ST. LOUIS, MISSOURI.

Letters Patent No. 71,484, *dated November* 26, 1867.

IMPROVEMENT IN TRUSS-BRIDGES.

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, GEORGE P. HERTHEL, Jr., of the city of St. Louis, county of St. Louis, and State of Missouri, have invented certain new and useful Improvements in Truss-Bridges; and I do hereby declare the following to be a full and true account thereof.

This invention relates, firstly, to the connection of the upper and lower chords of a truss-bridge in a flexible manner, and, secondly, to the combination of a tension tie-rod with the compression-post of said bridge. The general nature of this invention is as fully detailed in the Letters Patent, No. 59,769, dated November 20, 1866, being for improved truss-bridge, and issued to me, and the parts here more especially described and claimed as additional improvements, which are of useful application in certain forms of truss-bridges.

To enable those skilled in these arts to make and use my said improved form of bridge, I will proceed to describe its detail construction, having reference to the accompanying drawings and to the letters of reference thereon. Of said drawings—

Figure 1 is a partial elevation, showing the general arrangement of such parts of the improved truss as are here particularly referred to, and

Figure 2 is a partial plan.

Similar letters of reference are used to indicate similar parts.

The general form of my said truss is as fully shown in said Letters Patent No. 59,769, and it will be seen that in said drawings hereto attached, I have shown simply two panels, the same being moreover the end panels of a truss-bridge, the general construction of other panels necessary to form a complete structure being similar to that of the parts here shown and now to be described.

I construct the upper chord, A, of cast iron or steel, or of similar material, and in such form as to resist efficiently the strain of compression thrown thereon, said chord being formed principally of the pieces *a*, which simply butt against the king-bolts B, the ends of *a* being rounded or fitted to conform to the cylindrical bearing on B. I construct the lower chord C, usually of wrought iron, in such form as to resist the tension caused therein by the weight of the structure and the added load. Said chord C connects indirectly with the upper chord A, by the end bolts B′; the joint between C and B′ being either by lap-plates on both sides of C, or in any equivalent manner, to permit a perfect transmission of strain. The chord-piece *a* rests against B′, being, however, in nowise rigidly connected therewith. On said end bolt B′ may be arranged the rollers *b*, resting on an abutment-plate, and thus permitting a longitudinal motion of either or both ends of the truss, when caused by the expansion or contraction thereof. Instead of said rollers *b*, a bearing may be arranged, in which the bolt B′ may lie, as does a shaft or journal, and this bearing may move on rollers or rest directly on the abutment or pier masonry.

At the end of a panel I arrange the queen-bolts D, passing through the lower chord C, and resting theron, without being rigidly joined thereto. Between the king-bolt B and the corresponding queen-bolt D, I arrange the post E, the same fitting the convexity of said bolts, the said parts being again in nowise rigidly joined. The diagonal brace-rods F pass through the king-bolts and queen-bolts, as shown, the heads and nuts on said rods bearing upon the king and queen-bolts respectively, either directly or through washers, and thus the parts of my said truss are tied together.

Now, as in the end panels there are, owing to its triangular form, no diagonal braces, and as, owing to rolling loads, there may arise a tendency to raise the chord A and separate the same from its relative position to the post E and lower chord C, I have arranged either within the last posts E, or to each side hereof, one or more post-rods G. This, by passing through the king and queen-bolts, and by its head and nut, retains the king and queen-bolt of the end panel in their relative places, and thus prevents a deformation of the truss by unequally distributed loads. In case the post E is hollow, I arrange the post-rod G within the same, but if E be solid, I use two post-rods, one each side of the post E. This arrangement is not specially shown in the drawings, it being a substantial equivalent of the form as drawn.

If the rolling load is very great, so that great strain comes on a single panel of the truss, it will be advantageous to use a post-rod, G′, or two of said post-rods G′, if the post E is solid, in other panels besides the end ones. The post-rods G′ will then act in conjunction with the braces F to transmit the load to the upper chord.

Moreover, the post-rods G′ may then act in connection with a single set of diagonal braces to stiffen the structure, thus avoiding the necessity of counter-braces F′. By the application of said post-rods G and G′, I have, therefore, secured a simpler form of truss, the same being composed of the parts, to wit, the upper chord A, the lower chord C, the posts E, the post-rods G G′, the braces F, which is fully capable of resisting rolling weights in an efficient manner.

Having thus fully described my invention, what I claim, is—

1. The combination of the last piece *a* of the upper chord A, with the end bolt B′, the lower chord C, the queen-bolt D, the compression-post E, and tension-post rod G, and king-bolt B, substantially as and for the purposes set forth.

2. The end bolt B′ in combination with the rollers *b* and the chords A and C, substantially as set forth.

3. The general combination of the upper chord A, the lower chord C, post-rods G′, posts E, and braces F, substantially as set forth.

In witness whereof I have hereunto set my hand in the presence of—

GEO. P. HERTHEL, JR.

Witnesses:

M. RANDOLPH,

CHAS. H. BOYLE.