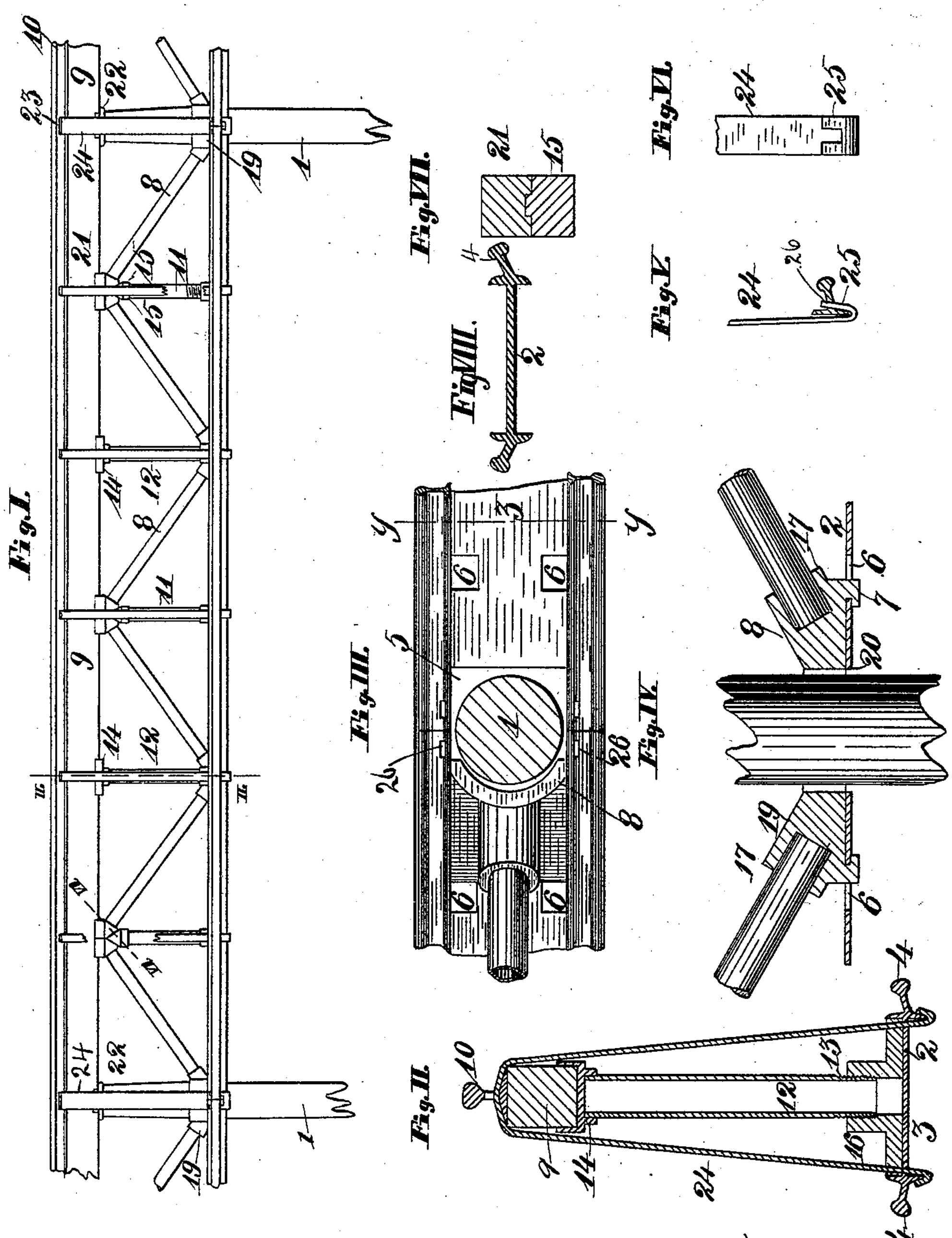
(No Model.)

E. M. TURNER, G. L. VAN BEEK & L. A. BROWN.

TRUSS FOR ELEVATED STRUCTURES.

No. 456,101. Patented July 14, 1891.



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TRUSS FOR ELEVATED STRUCTURES.

SPECIFICATION forming part of Letters Patent No. 456,101, dated July 14, 1891.

Application filed October 2, 1890. Serial No. 366,872. (No model.)

To all whom it may concern:

Be it known that we, EPHRAIM M. TURNER, GEORGE L. VAN BEEK, and LEWIS A. BROWN, of St. Louis, Missouri, have invented certain new and useful Improvements in Trusses for Elevated Structures, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

Our invention relates to an improved truss for elevated structures; and it consists in the devices and combination and arrangement of devices hereinafter set forth and claimed.

Our object is to construct a truss of this nature without the usual bolts, nuts, and rivets heretofore employed, and, further, to improve upon the construction indicated in the United States Patent No. 424,693, granted to Ephraim M. Turner and James P. Taylor April 1, 1890.

In the drawings, Figure I is a side elevation of the improved truss with parts broken away. Fig. II is a transverse section through the same on the vertical line II II. Fig. III is a detail plan view, partly in section, of a rail-plate, showing the manner of jointing two sections at a supporting-column. Fig. IV is a section through the latter-named parts in a longitudinal direction. Fig. V is a detail view showing the hooked end of a strap-hanger in engagement with the rail-plate. Fig. VI is a detail view of the hooked and bifurcated end of a strap-hanger. Fig. VII is detail section on line VI VI, Fig. I, illustrating the tongue-and-groove connection between the several wedge-caps at that point in the structure; and Fig. VIII is a detail section through the rail-plate on the line *y y* of Fig. III.

1 represents the supporting posts, columns, or pillars upon which the different sections of the truss are mounted, as will now be described.

2 represents the rail-plates, any number of which may be used, which are formed of such width that they form a gage for the two guide-rails of the track, and they have the said rails 4 formed integral with their web 3 on opposite edges thereof, and said plates are of such length as to reach entirely from center to center of the posts or supports, a portion of the web at each end being cut out, as at 5, to form a recess for said supports, Fig. III.

Holes 6 are punched or otherwise formed in the web adjacent to the ends of the plates for receiving hooked lugs of the foot-blocks 8, as will be stated more fully further on.

Upon the upper ends of the supports 1 the usual stringer 9 is mounted, and an ordinary T-rail 10 is mounted on this stringer. Between each two supports we propose to locate a span of the truss, and each span is made up of a series of sections, and at the center of each section we locate a vertical extension-post 11, and intermediate to these extension-posts we locate a screw-post, the construction of both posts being on the order of a "jack-screw."

The construction of both styles of post is clearly indicated in Fig. II, in which the main body of the post is made up of a suitable length of tubular or solid metallic post having a screw-thread 13 at one end and its other end squared and adapted to be located and revolved within a socketed cap 14, indicating the cap for the screw-posts, and 15 the cap for the extension-posts. The lower ends of the extension-posts are threaded into foot-blocks 16, which are placed upon the web 3 of the rail-plates 2, and the screw-posts 12 are also threaded into foot-blocks very similar to those in which the extension-posts are located, with the exception that the foot-blocks for the screw-posts are provided with additional opposite sockets, which are not threaded, and the sockets just mentioned are located relatively in each block at an angle to receive the lower ends of the inclined braces 18, which are located in the sockets of the blocks. The foot-blocks 19, which are located at opposite sides of the supports, are also provided with these inclined sockets 17, for the reception of the inclined braces, which terminate near to such supports; but these foot-blocks 19 are made in two halves, or are divided, and are provided with hooked lugs 7 upon their under surface, which are adapted to be located in the holes 6 made in the rail-plates, (previously mentioned,) said lugs engaging the under surface of said rail-plates after being passed into said holes, and thereby preventing said blocks, also said rail-plates, from coming in contact with said supports, this being made possible by reason of the recesses 5, cut in the ends of the webs of

said rail-plates and throwing the entire tensional strain upon the said rail-plates and permitting none whatever to be imposed upon said supports. The advantage of this last-named construction is that we permit said rail-plates to freely expand in a longitudinal direction, which we do by leaving a clear space 20 between each span and its supports, except of course at the upper ends of said supports, at which place the entire weight of the structure is supported. The caps 15 of the extension-posts 11 have (in addition to a socket in their lower ends) a tapering, conical, or wedge-shaped upper end, which is connected with the brace-caps 21 upon its oppositely-inclined faces by means of a tongue and groove, as shown in Fig. VII. These brace-caps having oppositely-inclined lower faces, one of the said faces of each of the brace-caps resting upon one of the corresponding inclined faces of the cap 15, while the remaining face of each of the brace-caps has an inclined socket thereon, such as that shown upon the foot-block 19 in Fig. IV.

The caps 14 for the screw-posts are provided with a groove in their upper sides or ends of sufficient size to receive the stringers 9 therein, and, we may say, so also do the brace-caps have such grooves in their upper ends for reception of the stringer, and similar grooves may be formed in the caps 22, located on the upper terminals of the supports or posts.

The main rail 10 is provided with a series of slots 23 in its web, which are preferably located directly above the posts 11 and 12, and strap-hangers 24, formed of an integral piece of wrought-iron or steel, is passed through this series of slots and have their ends passed downward through the web 3 of the rail-plates and the hooks or heads thereof 25 connected to said web or to the rails thereof.

In Figs. I, III, V, and VI we show the hooked end of a strap-hanger forked, whereby the forks or prongs may be passed up into holes 26, formed in the meeting ends of the rail-plates, between the heads of their rails and the bases thereof, which construction obviates any necessity for the use of fish-plates or the like, other than as here shown. It will be observed that the heads and webs of the rails 4 are bent or turned upward slightly with relation to the web 2, which places said heads at the correct angle in such cases.

In operation, in tightening the parts we usually employ an ordinary pipe-tongs or wrench to turn the extension and screw-posts out of their foot-blocks, which turning operation, as will be readily understood, forces upward all of the caps, tightening or straining the strap-hangers 24, forcing apart the brace-caps on each extension-post and throwing pressure downward through the inclined braces 8, and thereby binding securely together the entire structure. In some cases, such as in preparing a truss for a long span across a stream or a large building, we may arch either the devices forming the chord of the upper portion of the structure or we may arch the devices forming the lower chord, or both. It will be observed that we use no bolts, rivets, or spikes, thus doing away with these costly devices.

What we claim is—

1. In elevated structures, a single main rail having a series of apertures formed in its web at intervals of its length, in combination with suitable supports, and strap-hangers passing through said apertures and supporting portions of the structure located beneath said rail.

2. In elevated structures, a rail-plate having headed rails upon its opposite edges and having recesses in its web, in combination with supports passing through the said web contiguous to the said recesses, and bearing-blocks having hooks thereon engaging the said recesses whereby the contact of the several parts with the support is prevented, as described.

3. In elevated structures, the combination of supports, such as 1, and a rail-plate cut shorter than the distance between the nearest sides of said supports, substantially as specified.

4. The combination of upper and lower chords, inclined braces, and extension-posts, such as 11, socketed at one end and threaded at the opposite end and adapted to be elongated by revolution, substantially as described.

5. In a truss, upper and lower chords and inclined braces, in combination with extension-posts adapted to be elongated and shortened by revolution, and wedges adapted to be spread apart by elongation of said extension-posts, substantially as specified.

6. In a three-rail elevated structure, the combination of the upper main rail 10, lower guide-rails, such as 4, having abutting ends, and holes 26 formed therein, and a strap-hanger 24, having bifurcated or pronged ends, the forks or prongs whereof pass into respectively a hole in each of said abutting rails, substantially as specified.

7. In a truss, the rail-plate having a tures 6 near its terminals and foot-blocks provided with depending hooks or lugs 7, adapted to engage said apertures in the plate, in combination with the upper and lower chords, extension-posts, and inclined braces, substantially as specified.

In testimony whereof we affix our signatures in presence of two witnesses.

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Witnesses:
C. C. LOGAN,
GEO. F. BERGFELD.