

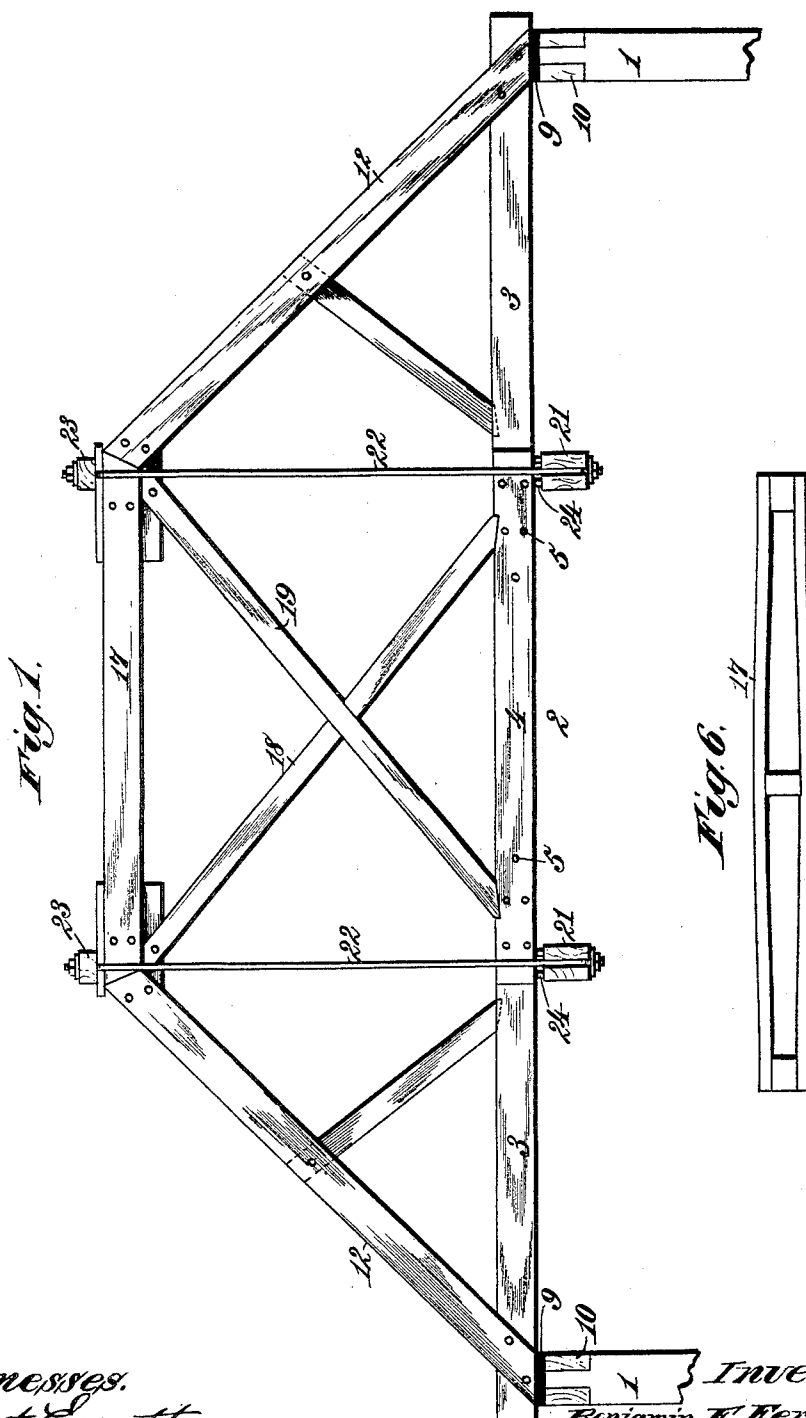
(No Model.)

2 Sheets—Sheet 1.

B. F. FERGUSON.
WOODEN BRIDGE.

No. 460,856.

Patented Oct. 6, 1891.



Witnesses.
Robert G. Smith.
J. A. Rutherford.

Inventor:
Benjamin F. Ferguson.
By *James L. Norris.*
Atty.

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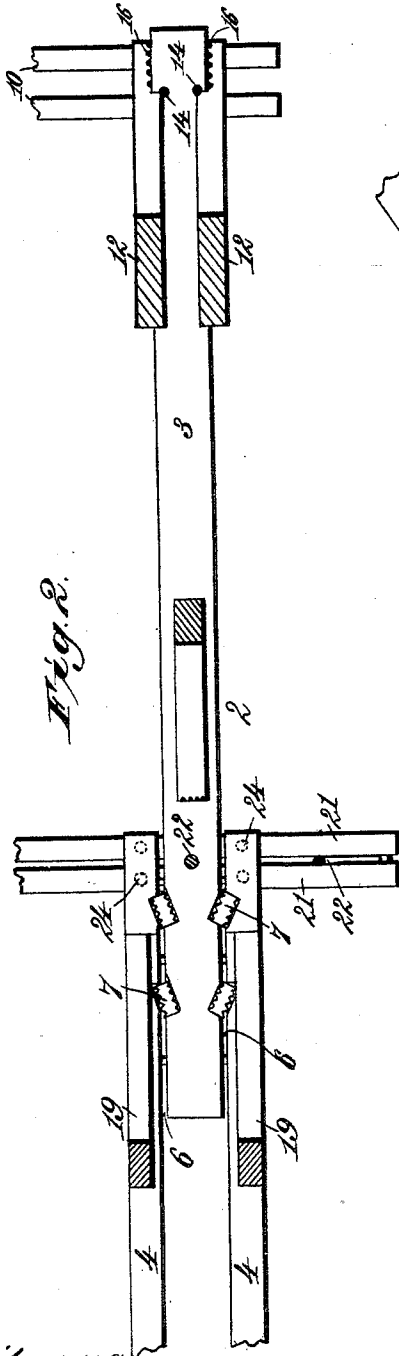


Fig. 2.

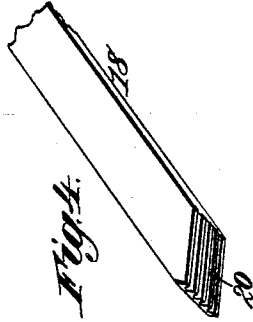


Fig. 4.

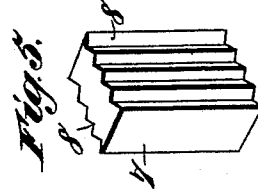


Fig. 5.

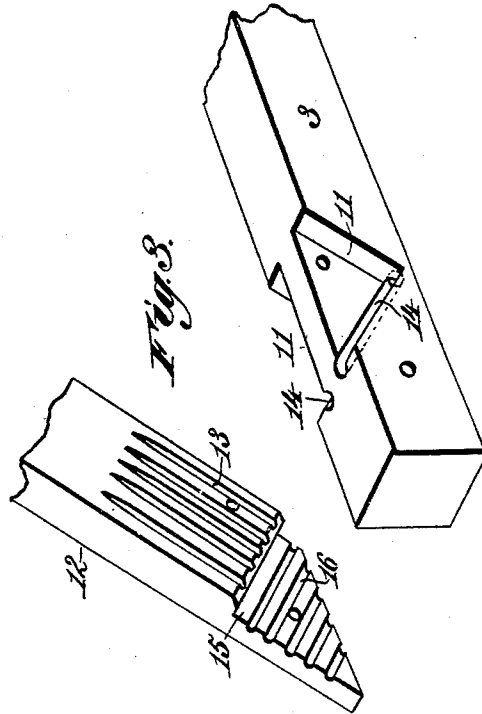


Fig. 3.

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UNITED STATES PATENT OFFICE.

BENJAMIN F. FERGUSON, OF MCKINNEY, TEXAS, ASSIGNOR OF ONE-HALF
TO GEORGE B. HUGHES, OF SAME PLACE.

WOODEN BRIDGE.

SPECIFICATION forming part of Letters Patent No. 460,856, dated October 6, 1891.

Application filed April 9, 1891. Serial No. 338,257. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN F. FERGUSON, a citizen of the United States, residing at McKinney, in the county of Collin and State of Texas, have invented new and useful Improvements in Wooden Bridges, of which the following is a specification.

My invention relates to the construction of wooden bridges or the trusses and spans therefor in such a manner as to provide effective means for the drainage of moisture from the timbers and for the free circulation of air between, around, or through the same, so as to greatly lessen the susceptibility to rot and thereby increase the durability of the structure.

To this end my invention consists in the peculiar features of construction and novel combinations of parts in a wooden bridge, as hereinafter particularly described and claimed.

In the annexed drawings, illustrating the invention, Figure 1 is a side elevation of a wooden-truss bridge constructed according to my improvements. Fig. 2 is a plan of the lower chord with corrugated rafters in section. Fig. 3 is a detail view of one end of the lower chord and corrugated rafters disconnected. Fig. 4 is a detail view of one of the corrugated braces. Fig. 5 is a detail view of one of the corrugated keys. Fig. 6 is a view showing how the upper chords and the rafters may be spread or bowed.

In carrying my invention into effect any suitable or well-known arrangement may be adopted for the general plan of the bridge.

As shown in Fig. 1, the numeral 1 designates any suitable posts or piers that may be employed to support the lower chords 2, which are each composed of the single members 3, alternating with double parallel-arranged connecting members 4. These members 3 and 4 are securely bolted together by transverse bolts 5, Fig. 1, in such a manner, however, as to provide narrow elongated passages 6, Fig. 2, between the lapped ends of said members for the drainage of moisture and the circulation of air. In these narrow passages 6, at suitable intervals, are placed vertically-corrugated keys 7, that are set at an angle in the chords, as shown in Fig. 2, so as to have a tendency to compress the timbers slightly

sidewise instead of exerting a straight pressure parallel with the grain of the wood. This arrangement of keys increases the strength and durability of the chord. By providing the keys 7 with vertical grooves or corrugations 8 on opposite sides, as shown in Fig. 5, drains are formed for carrying off any moisture from the joints between said keys and the members of the chord, and thus also free access of air is afforded to keep the parts dry.

Beneath the ends of the lower chords 2 are placed cushions 9, of rubber or other suitable water-proof material, that rest on the supporting posts, piers, or abutments, or on caps 10, to exclude water therefrom and prevent rotting from the absorption of moisture. The ends of the lower chords 2 are preferably provided with lateral diagonal recesses 11 to receive the lower ends of the diagonally-arranged rafters 12, each of which is provided on its inner side with a series of parallel longitudinally-arranged grooves or corrugations 13 for draining any water or moisture into two parallel diagonally arranged or inclined water-ways or channels 14, that are formed in the ends of the lower chords and extended through the same to conduct the drainage to the under side thereof and thus preserve the heel of the bridge. The lower ends of the rafters 12 may be recessed or rabbeted at 15, as shown in Fig. 3, and these recessed portions may be provided with diagonal grooves or corrugations 16, arranged to serve for drainage; but I do not confine myself to this construction; as it may be omitted.

The upper chord 17 of the bridge is supported by the diagonal rafters 12 and by suitable diagonal braces 18 and 19, arranged in any convenient and well-known manner. The lower ends of these braces may be provided with grooves or corrugations 20, Fig. 4, that may communicate with suitable channels in the lower chord to facilitate drainage of water and moisture and preserve the parts from rotting.

The floor-beams 21 are supported by truss-rods 22, suspended from the upper cross-beams 23, supported by the rafters and upper chords. Between the floor-beams 21 and the lower chords 2 are a number of vertical spacing-pins 24, that are arranged to maintain a suit-

able space between the said chords and beams for the drainage of moisture and access of air to prevent rot.

By grooving or corrugating the timbers of the bridge, as described, and thus providing channels or drains for carrying off water and permitting the free access and circulation of air through and around the joints, the life of the wooden bridge will be increased some
 10 forty per cent. or more, and by the arrangement of the corrugated keys 7, cushions 9, and spacing-pins 24 the strength and durability of the bridge are much enhanced and the liability to rot greatly lessened.

15 If desired, the rafters 12 and the upper chords 17 may be spread or bowed, as shown in Fig. 6, to increase their strength.

What I claim as my invention is—

20 1. In a wooden bridge, the combination, with a chord composed of double parallel members and alternating single members, arranged as shown, of keys that are vertically grooved or corrugated on opposite sides and set at an angle between the lapped ends of said mem-
 25 bers, substantially as described.

2. In a wooden bridge, the combination of

the lower chords having recessed ends provided with diagonal water-ways or channels and rafters having recessed or rabbeted lower ends provided with longitudinal grooves or
 30 corrugations draining into the said channels or water-ways of the lower chords and with diagonal grooves or corrugations draining to the under side of said rafters, substantially as described.

3. In a wooden bridge, the combination of the upper and lower chords, the rafters, and the diagonal braces provided with grooves or corrugations, substantially as and for the purpose described.

4. In a wooden bridge, the combination, with the lower chords and the suspended floor-beams, of vertical spacing-pins located between said chords and floor-beams, substantially as and for the purpose described.

In testimony whereof I have hereunto set my hand and affixed my seal in presence of two subscribing witnesses.

BENJAMIN F. FERGUSON. [L. S.]

Witnesses:

F. H. WELCH,

J. A. EVANS.