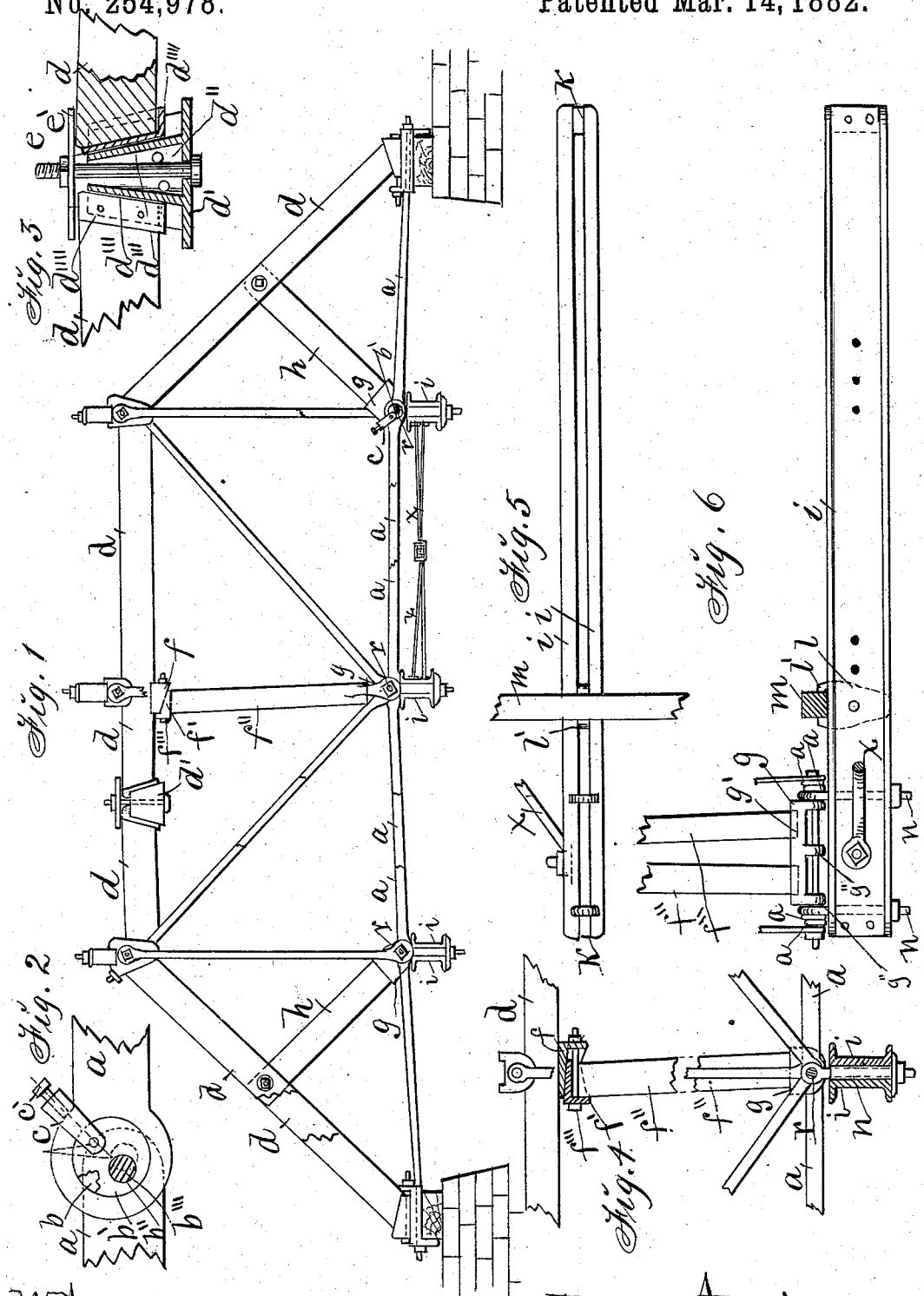
(No Model.)

W. IRELAN.

TRUSS BRIDGE.

No. 254,978. Patented Mar. 14, 1882.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM IRELAN, OF OAK SPRINGS, ASSIGNOR OF ONE-HALF TO C. W. BOWEN, OF CENTERVILLE, IOWA.

TRUSS-BRIDGE.

SPECIFICATION forming part of Letters Patent No. 254,978, dated March 14, 1882.

Application filed August 13, 1881. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM IRELAN, of Oak Springs, in the county of Davis and State of Iowa, have invented an Improved Bridge, of which the following is a specification.

My invention relates to the truss-bridge patented by me October 7, 1879, No. 220,382; and it consists, first, in a device for regulating and equalizing the tension of flexibly-connected chord-sections; second, in a keystone-coupling device for connecting timbers in the top chord or any part of the bridge where they are subject to compression; third, in wedge-shaped sliding shoes for regulating the longitudinal expansion of wooden stays; and, fourth, in the manner of constructing skeleton-girders of channel-iron and stay-blocks and combining track-rails or flooring-joists and chord-sections and stays therewith, all as hereinafter fully set forth.

Figure 1 of my accompanying drawings is a side view of one of my improved trusses. Fig. 2 is an enlarged detail view, showing two sections of a chord adjustably connected by means of my tension-regulator. Fig. 3 is a sectional view of my keystone-coupling for connecting and longitudinally adjusting timbers. Fig. 4 is a sectional view, showing my wedge-shaped sliding shoes and pivoted foot-plates carrying wooden stays, arranged and combined relative to each other, and sections of the upper and lower chords of the truss. Fig. 5 is a top view of one of my skeleton-girders. Fig. 6 is a side view of Fig. 5, showing flooring-joists, chord-sections, and stays attached. Jointly considered, these figures clearly illustrate the construction, application, and operation of all the various parts of my complete invention.

a a (shown in Figs. 1, 2, 4, and 6) represent contiguous and connected sections of the lower chords of the truss. They are preferably made of flat bar-iron or I-beams.

b (shown in Figs. 1 and 2) is a circular opening in the end of one of the chord-sections *a*, into which opening is fitted a revolving disk, *b'*, that is designed to carry a coupling-bolt.

b'' is a perforation in the disk located eccentrically. A coupling-bolt, *b'''*, is passed through the disk, and also through a corresponding perforation in the overlapping end of a contiguous section, *a*.

c is a bifurcated block placed astride of the end of the section *a*, so that its legs will extend over the revolving disk *b'* sufficiently to be pivoted to the disk by means of a bolt or rivet.

c' is a clamping-screw carried in the head of the block *c* and operated in a corresponding female screw extending vertically through the center of said head in such a manner as to allow the lower end of the screw *c'* to engage the edge of the section *a*, that is concentric to the revolving disk. By disengaging the clamping-screw from the edge of the section *a* the block can be readily adjusted relative to the section *a*, and by then operating the clamping-screw to again engage the same section *a* at a different point the disk will be partially revolved and carry the coupling-bolt along, and thereby cause the lapping of the two sections *a a* to be increased or diminished, as indicated by dotted lines in Fig. 2, and as required to lengthen or shorten a complete chord or stay.

d d (shown in Figs. 1, 3, and 4) represent pieces of timber and detachable sections of the upper chord of a truss.

d' (shown in Figs. 1 and 3) represents my keystone-coupling in the form of a metal casting and box that is closed at its bottom and open at its top. It has parallel side walls, *d''*, that extend longitudinally, and inclined connecting walls, *d'''*, that converge toward the top to form inclined planes, against which inclined socket-pieces *d''''*, fixed to the inclined ends of the timbers *d*, abut and upon which they slide. The bottom of the complete sliding coupling and its side walls, *d''*, extend longitudinally sufficiently beyond the inclined connecting-walls *d'''* to form open pockets, adapted to receive and retain the ends of the timbers inclosed and protected by the sockets or shoes *d''''*.

By means of a vertical rod extending upward through the center of the hollow keystone-coupling and a washer-plate, *e'*, placed on top of the ends of the timbers *d*, and a

screw and nut on the end of the rod, the contiguous ends of sections in the upper chord can be readily coupled together and the space between them increased or diminished as required to lengthen or shorten the complete chord.

I am aware that wedge-shaped castings have been combined with posts in a truss in such a manner that abutting sections of the complete truss could be adjusted relative to each other and the posts by raising and lowering the wedge; but my device, specially adapted for coupling pieces of timber rigidly together at any point intermediate between the posts of a truss and independently of any other parts in such a manner that the coupled pieces can be lengthened and shortened as a whole or united piece in a bridge, is novel and greatly advantageous.

f (shown in Figs. 1 and 4) are plates that have flat top surfaces to engage the under sides of the upper chord-timbers and wedge-shaped or tapering under sides to engage corresponding surfaces of sliding shoes. These plates *f* have flanges extending at right angles along their sides and rear ends to form bearings for the sliding shoes. They are cast complete in one piece and fastened to the timbers *d* by means of lugs and bolts, or in any suitable way.

f' is a sliding shoe, similiar to the sliding shoes shown and described in my former patent above referred to, but has an inclined or wedge-shaped surface adapted to engage the corresponding surface and inclined plane of the plate *f*. By placing the top end of a wooden brace, *f''*, in one of these wedge-shaped sliding shoes and its lower end in a pivoted foot-plate, as clearly illustrated in Fig. 4, the position of the brace can be inclined and then drawn into a perpendicular position by means a screw-bolt, *f'''*, that extends horizontally through the sliding shoe and the fixed plate *f*, as required to increase the expansive force of the brace.

g (shown in Figs. 1, 4, and 6) represents one of my pivoted foot-plates. It has one or more cavities or sockets, *g'*, in its top surface, adapted to receive the ends of detachable braces, and two or more perforated ears, *g''*, on its under side, adapted to receive a rod or bolt, by means of which they are flexibly connected with the lower chord.

h h (shown in Fig. 1) are diagonal braces adjustably connected with the lower chord by means of pivoted foot-plates *g*, and to the upper chord by means of screw-bolts, to serve as stay-blocks between the timbers *d d*, as well as diagonal stays in the complete truss, as shown in Fig. 1.

i i (shown in Figs. 1, 4, 5, and 6) are pieces of channel-iron that may vary in size and shape as desired.

k k (shown in Fig. 5) are stay-blocks between their ends, and retained in place by means of bolts or rivets that connect the ends of the skeleton-girders.

l l are stay-blocks detachably connected with the channel-irons *i* by means of bolts at points where flooring-joists or track-rails *m* are to be secured. These blocks *l* have lugs *l'* formed integral therewith at their corners, to adapt them to serve as a rail-seat as well as a stay-block.

n n (clearly shown in Figs. 4 and 6) are screw-bolts that have eyes at their top ends to receive transverse bolts. They are passed downward through the skeleton-girders and adjustably connected therewith by means of screws and nuts on their ends, for the purpose of forming flexible connections between the chord-sections and the stays by passing bolts *r* horizontally through the eyes of the bolts *n*, and also through the perforated ears *g''* of the foot-plates *g* and the perforated ends of the chord-sections *a* and metal diagonal stay-rods *s*.

x x (shown in Figs. 1, 5, and 6) represent diagonal tension-rods detachably fixed to the skeleton-girders by means of screw-bolts.

From the detailed description given of the construction, application, and function of each part of my invention the unitary operations and results thereof are obvious and a repetition of the practical operation of my complete invention and improved bridge is deemed unnecessary.

I claim as my invention—

1. The combination of two chord-sections, *d d*, the one having a simple perforation in its end and the other having a circular opening, *b*, adapted to receive a corresponding disk, the disk *b'*, having a perforation in an eccentric position, the bifurcated and pivoted block *c*, the clamping-screw *c'*, and a coupling or bolt, *b'''*, substantially as shown and described, for the purposes specified.

2. A keystone-coupling consisting of a metal casting, *d'*, that has a central vertical perforation for the admission of a screw-bolt, side walls, *d''*, vertical and converging connecting-walls *d'''*, and open pockets adapted to receive sockets of corresponding size and shape, to connect the ends of timbers in a bridge, substantially as and for the purposes set forth.

3. The combination of the sliding keystone-coupling *d' d'' d'''*, the sockets *d''''*, the stay-timbers *d d*, the bolt *e*, and washer-plate *e'*, substantially as shown and described, for the purposes specified.

4. The flanged plate *f*, having an outside surface adapted to engage a piece of timber and an inside wedge-shaped surface, and a sliding shoe, *f'*, having a wedge-shaped outside surface, in combination with a rigid stay-piece, *f''*, substantially as shown and described, for the purposes specified.

5. The combination of a pivoted foot-plate, *g g' g''*, a detachable stay, *f''*, having a wedge-shaped sliding shoe, *f'*, on its free end, and a fixed wedge-shaped plate, *f*, substantially as shown and described, for the purposes specified.

6. The flooring joist or rail *m*, in combination with the stay-block *l*, having lugs *l'*, and

the skeleton-girder *i i k k*, substantially as shown and described, for the purpose specified.

7. In a truss-bridge, the combination of a lower chord composed of sections flexibly connected, and having a tension and equalizing device, *b b′ b″ b‴ c c′*, an upper chord composed of detachable timbers *d*, and having a keystone-coupling and adjusting device *d′ d″ d e e′*, a series of skeleton-girders *i i k l*, coupling-bolts *n* and *r*, pivoted foot-plates *g g′ g″*, and detachable stays and tension-rods, substantially as shown and described, for the purposes specified.

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Witnesses:
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