

Sheet 1, 2 Sheets.

L. E. Truesdell.

Truss Bridge.

No. 21,388.

Patented Aug. 31, 1858.

Fig. 1.

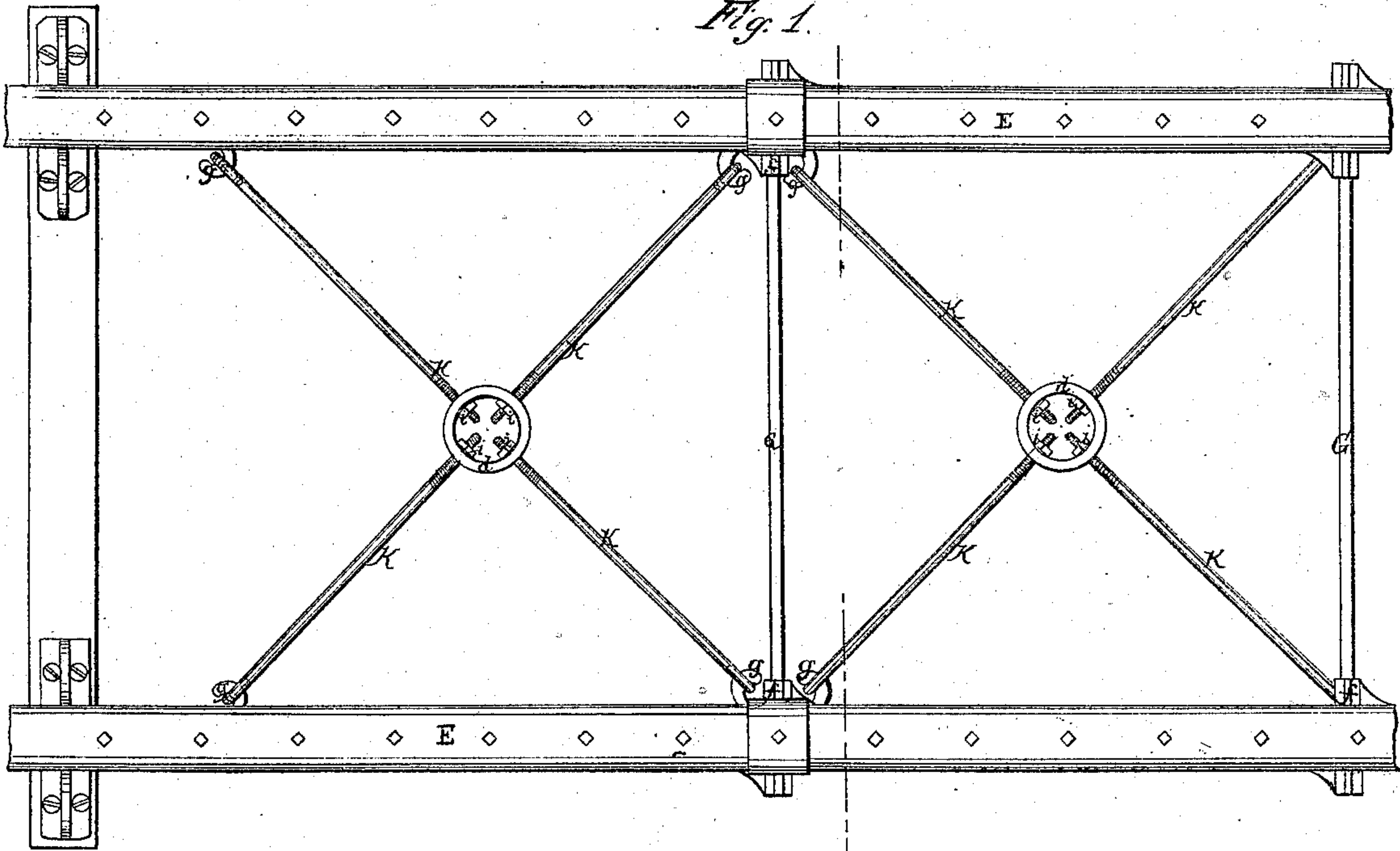
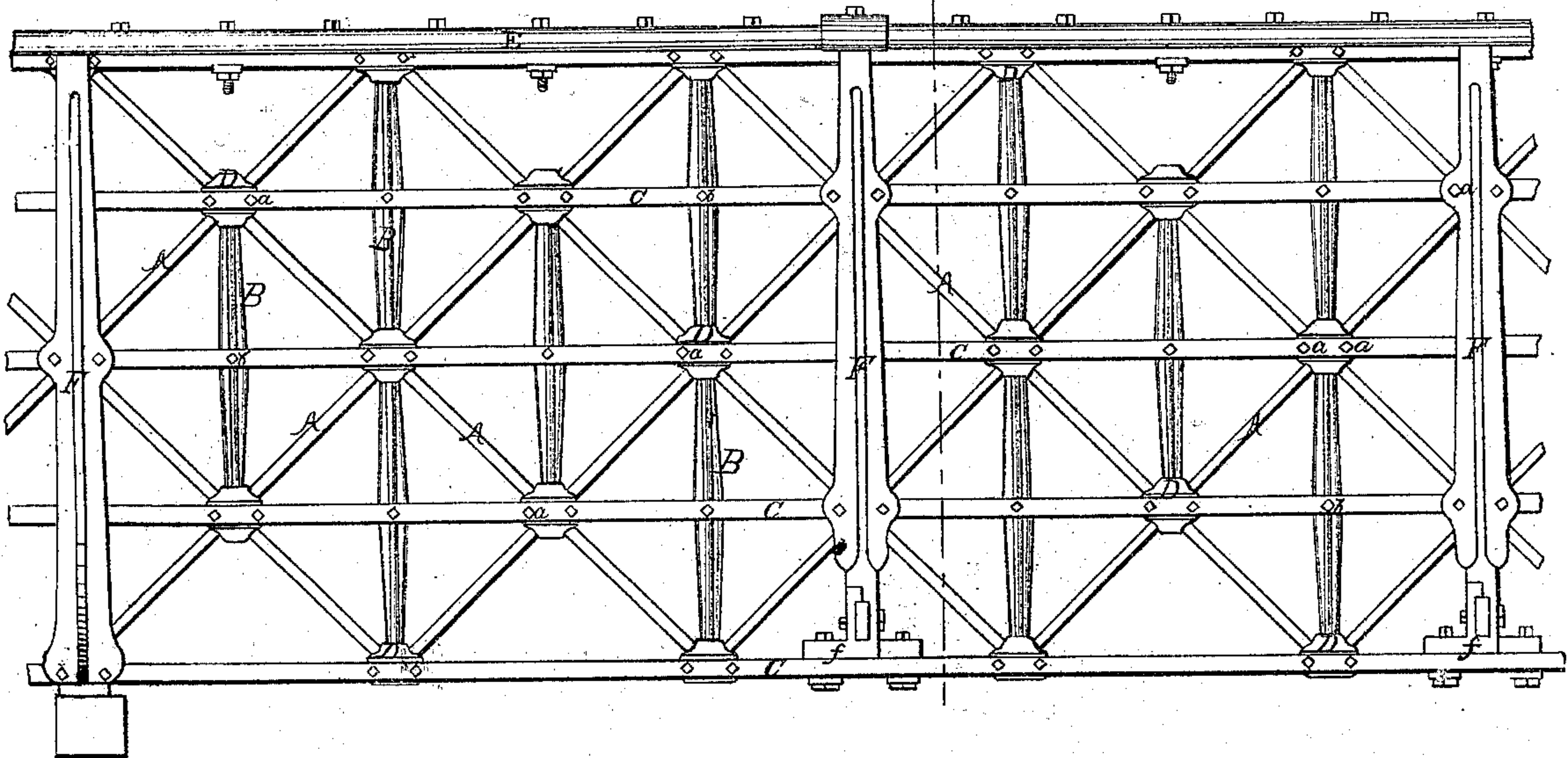


Fig. 2.

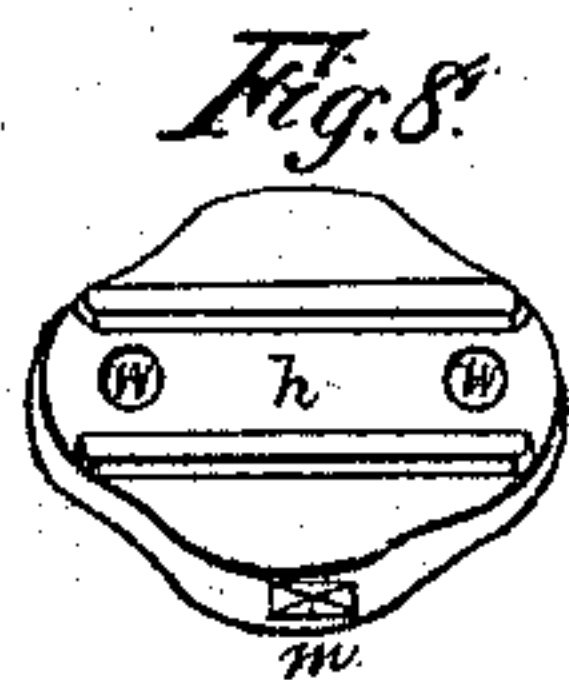
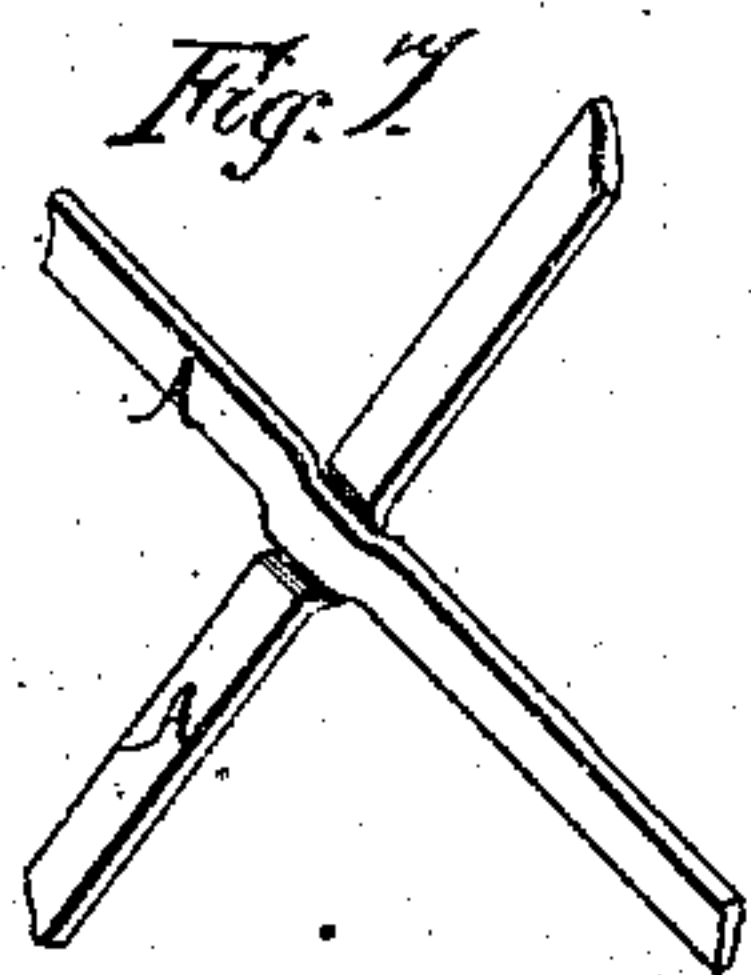
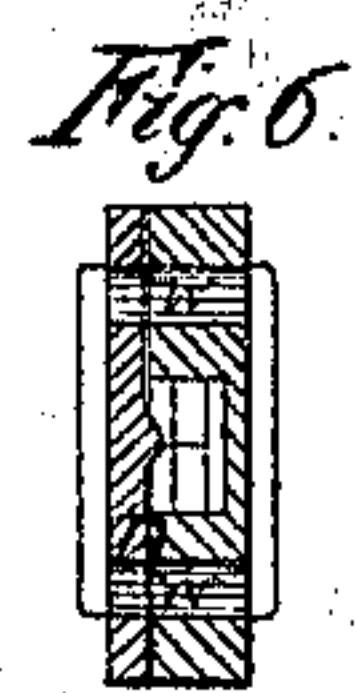
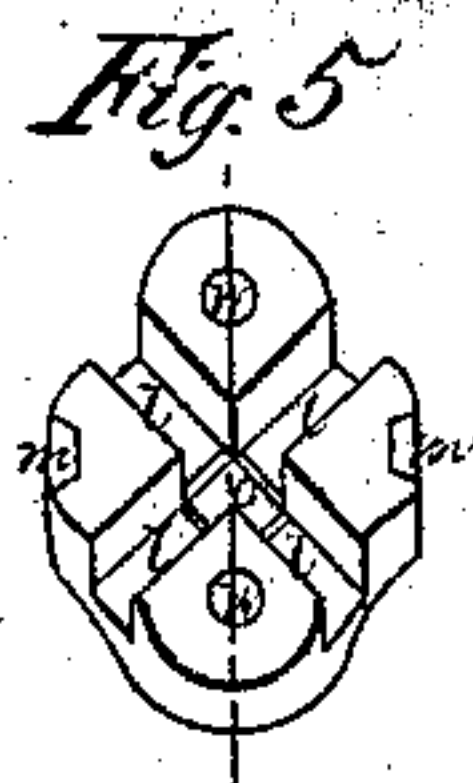
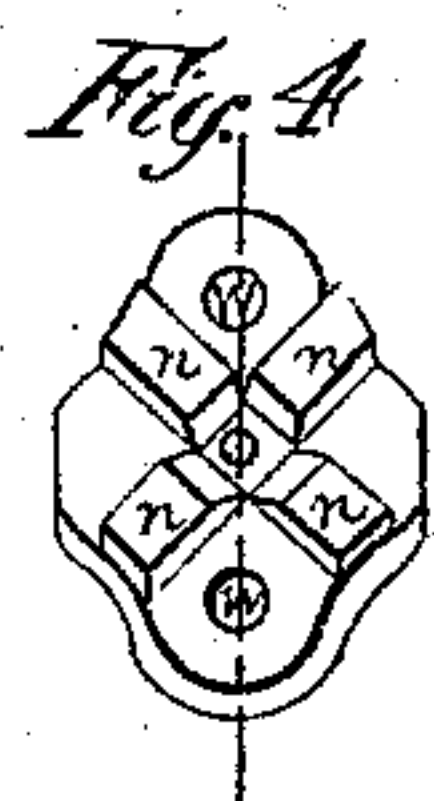
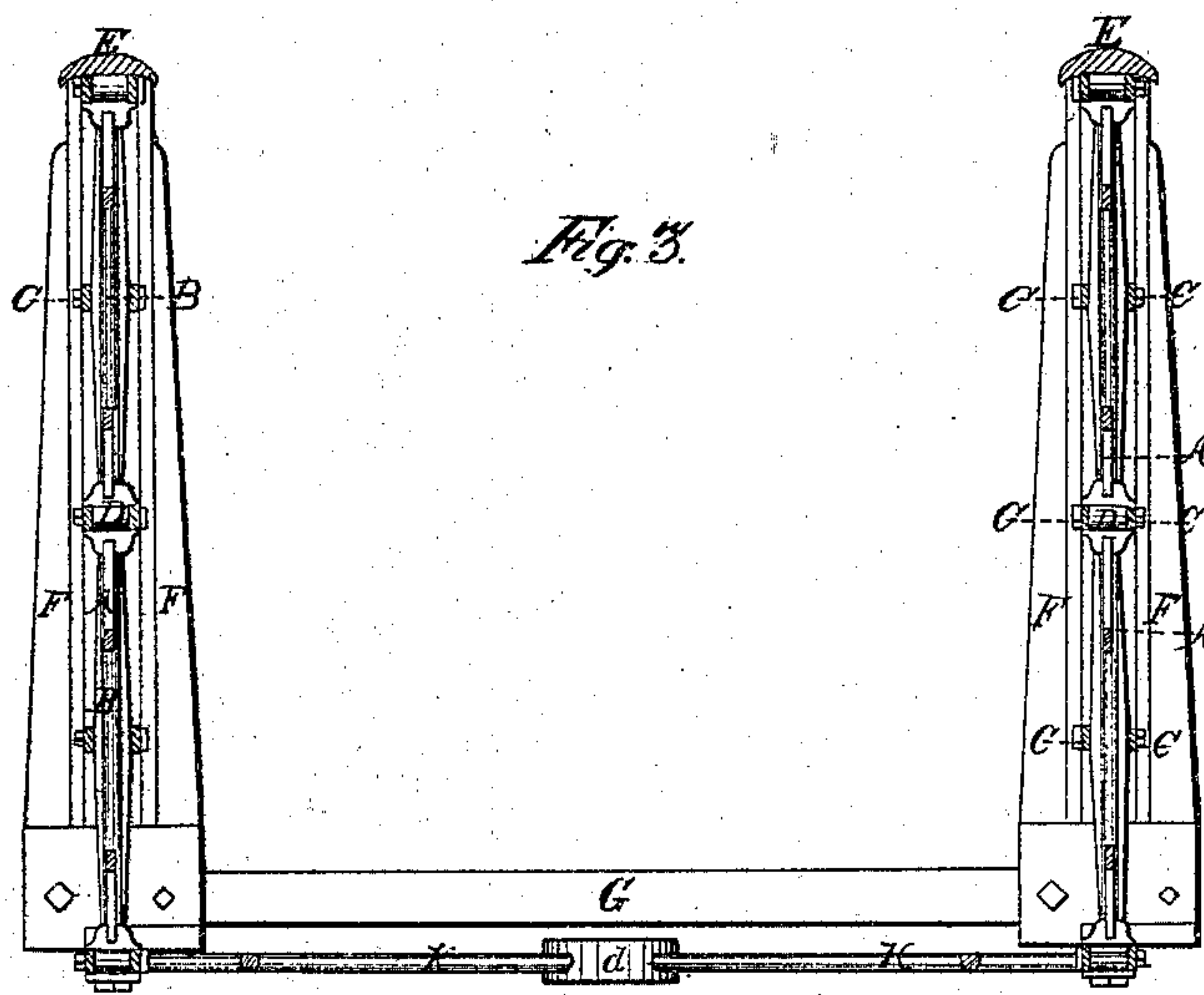


Sheet 2, 2 Sheets.

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Patented Aug. 31, 1858.



UNITED STATES PATENT OFFICE.

LUCIUS E. TRUESDELL, OF WARREN, MASSACHUSETTS.

BRIDGE.

Specification of Letters Patent No. 21,388, dated August 31, 1858.

To all whom it may concern:

Be it known that I, LUCIUS E. TRUESDELL, of Warren, in the county of Worcester and State of Massachusetts, have invented a certain new and useful Improvement in the Construction of Iron Bridges, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

Figure 1 represents a plan of a bridge constructed on my improved plan; Fig. 2, a side elevation of the same; Fig. 3, a transverse vertical section. Fig. 4 represents a perspective view of the inner side of one of the castings of the clamp; Fig. 5, a similar view of the other half of the clamp; Fig. 6, a section through the clamp. Fig. 7 represents the mode of connecting the diagonal braces at their points of intersection; Fig. 8, a view of the upper side of the castings of the clamp.

The nature of my invention relates to bridges constructed of iron, and it consists in the use and combination of a double series of horizontal ribs or chords with a series of diagonal and vertical braces or their equivalents, by means of which the strain and tension of the various parts under a rolling weight is in a measure neutralized by the tendency of these parts to distribute them more evenly throughout the whole structure, thereby giving greater strength, rigidity and firmness to the bridge with less weight of material than is obtained by any other known modes of constructing them.

Secondly, it consists in a new mode of forming the connections of the different parts, and of securing them together by a clamp of peculiar construction, by means of which while great strength and rigidity are obtained, they can be put together with great ease and expedition.

To enable others skilled in the art to make construct and use my invention I will now proceed to describe it in detail.

In the accompanying drawing each of the two sides or vertical framings of the bridge is represented as consisting of two series of diagonal braces (A) running in opposite directions so as to intersect with each other, in this instance at right angles or thereabout, and of a double series of horizontal chords or ribs (C,) so arranged as to run on either side of the diagonal braces and to which they are firmly secured at their point of intersection by means of a clamp, thereby

forming as it were a double net work. In order to render this framing more rigid, a vertical standard (B) is interposed between the angles of each of the spaces formed by the intersection of the diagonal braces, for which purpose sockets are formed in the upper and under sides of the clamps for the reception of the ends of the vertical braces. At the point of intersection of the diagonals they are each bent or curved in opposite directions for a distance equal to the width of the other, so that they shall fit into and embrace each other as it were and thus form a lock or tie as shown in Fig. 7. Being thus constructed, the lock is formed in two parts or halves (Figs. 4 and 5), of cast iron or other material, so as to embrace them; in one (Fig. 5) of which two diagonal grooves (l) are formed of a sufficient size, to embrace and receive the two diagonal braces as locked together, for which purpose the square (o) formed by the intersection of the two grooves is more depressed than the other parts, so as to serve as a receptacle for the curved or raised portion of the braces where they embrace each other. The other half (Fig. 4) of the clamp has tenons (n) formed on its inner side corresponding to the grooves (l) in the other, with this exception that the tenons are not raised as high as the grooves are deep, so that when the two are fitted together sufficient space will be left between them to receive the diagonal braces at their point of intersection.

On the outer side of both castings a groove (h) is formed for the reception of the horizontal chords (C), in which and the clamp two holes (w) are pierced, one at either end of the clamp, through which screwbolts (a) are passed by means of which the whole are clamped firmly together. On the upper and under sides of this clamp (D) are formed the sockets (m) for the reception and support of the ends of the vertical standards. In this instance there are five series or rows of locks; to the two outer ones of which are fitted and secured the upper and lower ends of the diagonal braces (A) next to the horizontal chords which form the top and bottom chords of the bridge. Between the first and third series of locks are inserted the first row of cast iron vertical standards (B); the ends of which are fitted into the bearings or sockets (m) formed in the clamps, they being properly shaped for this purpose. These stand-

ards may be made of an enlarged width in the middle and are provided with a hole for the reception of a bolt (*b*) by means of which they are secured to the horizontal chords (*C*); similar brace standards are fitted between the second and fourth and the third and fifth row of locks. To each row of locks are also secured two of the horizontal chords (*C*) one on each side of the lock, they being made to fit in the grooves (*h*) formed for their reception in the outer sides of the clamp. These horizontal chords, which are made of wrought or malleable iron and run through the entire length of the bridge, serve the purpose of distributing the tension or strain which may be exerted on any particular portion of the bridge equally throughout the whole, for as the action of a heavy pressure on any part of the structure is to depress it in a vertical plane, and as such a depression can only be effected by an elongation of the base lines of the bridge, thus creating a longitudinal tension and strain, it follows that in a bridge constructed on this plan, as the base line can not be sensibly elongated without a similar elongation of all the horizontal chords, that any longitudinal tension will be transmitted or distributed through all the horizontal chords; thus relieving that part which lies in the plane of pressure from undue strain.

For the support of the roadway strong transverse beams (*G*) are arranged, on which the longitudinal beams and planks are to be supported. Each of these beams is firmly mounted between two heavy iron standards (*F*) which in this instance are represented as consisting of two vertical castings, running on each side of the framing and provided at their lower extremity with a shoe or platform (*f*) which rests on and is firmly secured to the lower horizontal

chords or base line of the bridge. These standards (*F*) are also firmly secured to the lock or clamps (*D*), they being for this purpose provided with holes corresponding to the holes in the clamps, so that the same screwbolts which hold together the clamp and horizontal chords, can be passed through them. The upper ends of these standards are in this instance fitted under a cast iron frame (*E*) of suitable shape, which forms the top of the vertical framings of the bridge. To prevent any independent lateral play of the two vertical framings or sides of the bridge, solid double hooks (*g*) are secured to the base line of the framings, arranged at suitable distances apart and opposite to each other, to which are hooked at each end iron rods or bars (*k*) having a screw thread cut on their other end, and connected together in fours, by means of a ring (*d*) provided with four holes for the reception of the four bars (*k*), each of which can be properly adjusted and tightened by means of a screw nut (*i*).

Having thus described my invention what I claim as new and desire to secure by Letters Patent is—

1. An iron bridge constructed with a series of horizontal chords (*C*) in combination with vertical standards (*B*) and diagonal braces (*A*) or their equivalents, when the whole is arranged and connected together in the manner substantially as and for the purposes set forth.

2. I claim constructing the clamp (*D*) in the manner and for the purposes substantially as set forth.

In testimony whereof, I hereunto set my hand to this specification.

L. E. TRUESDALL.

Witnesses:

THOMAS C. DONN,
W. LESKI.