

*F. H. Smith,
Truss Bridge.*

No. 89,442.

Patented Apr. 27, 1869.

Fig. 1.

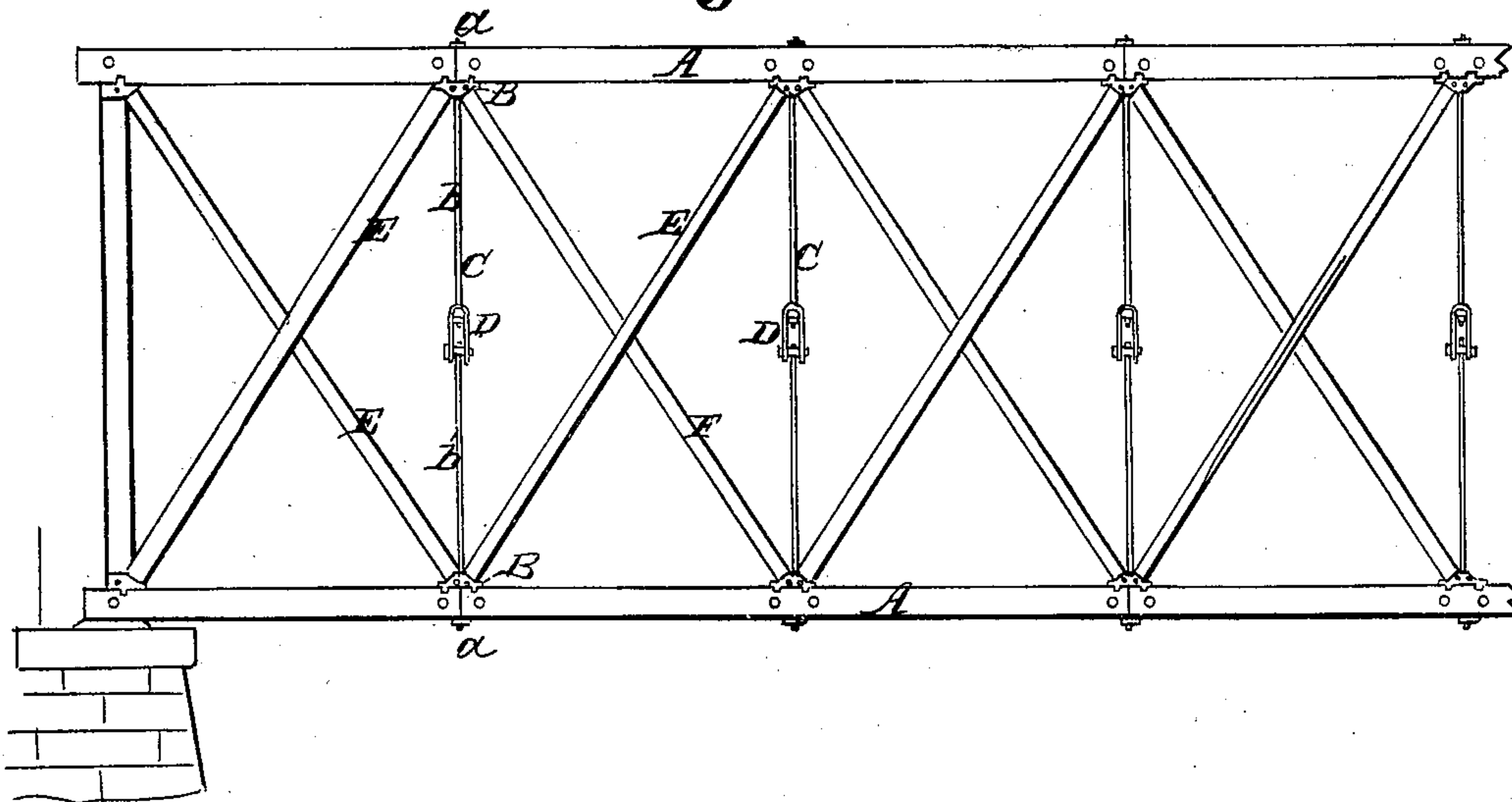


Fig. 2.

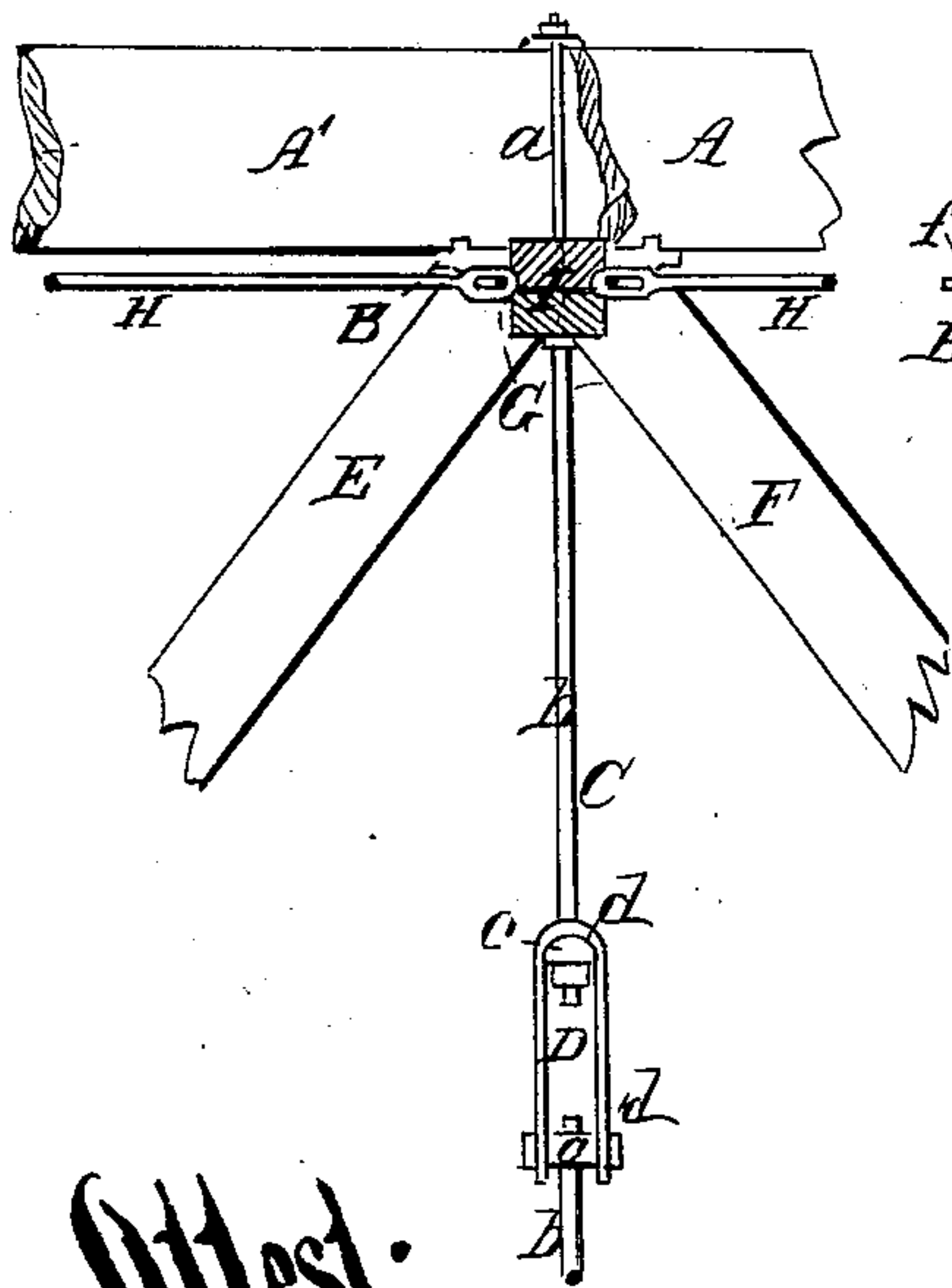


Fig. 3.

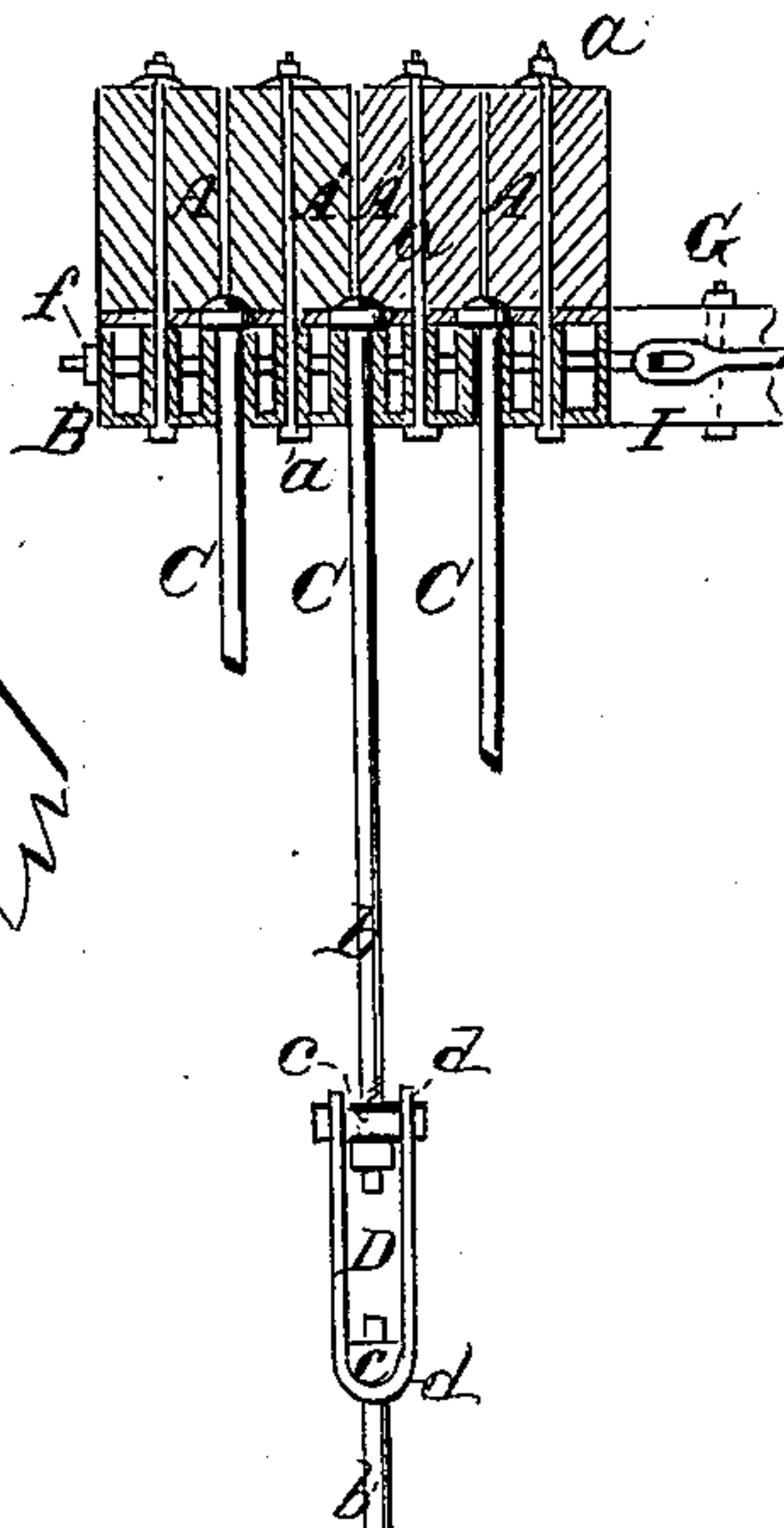
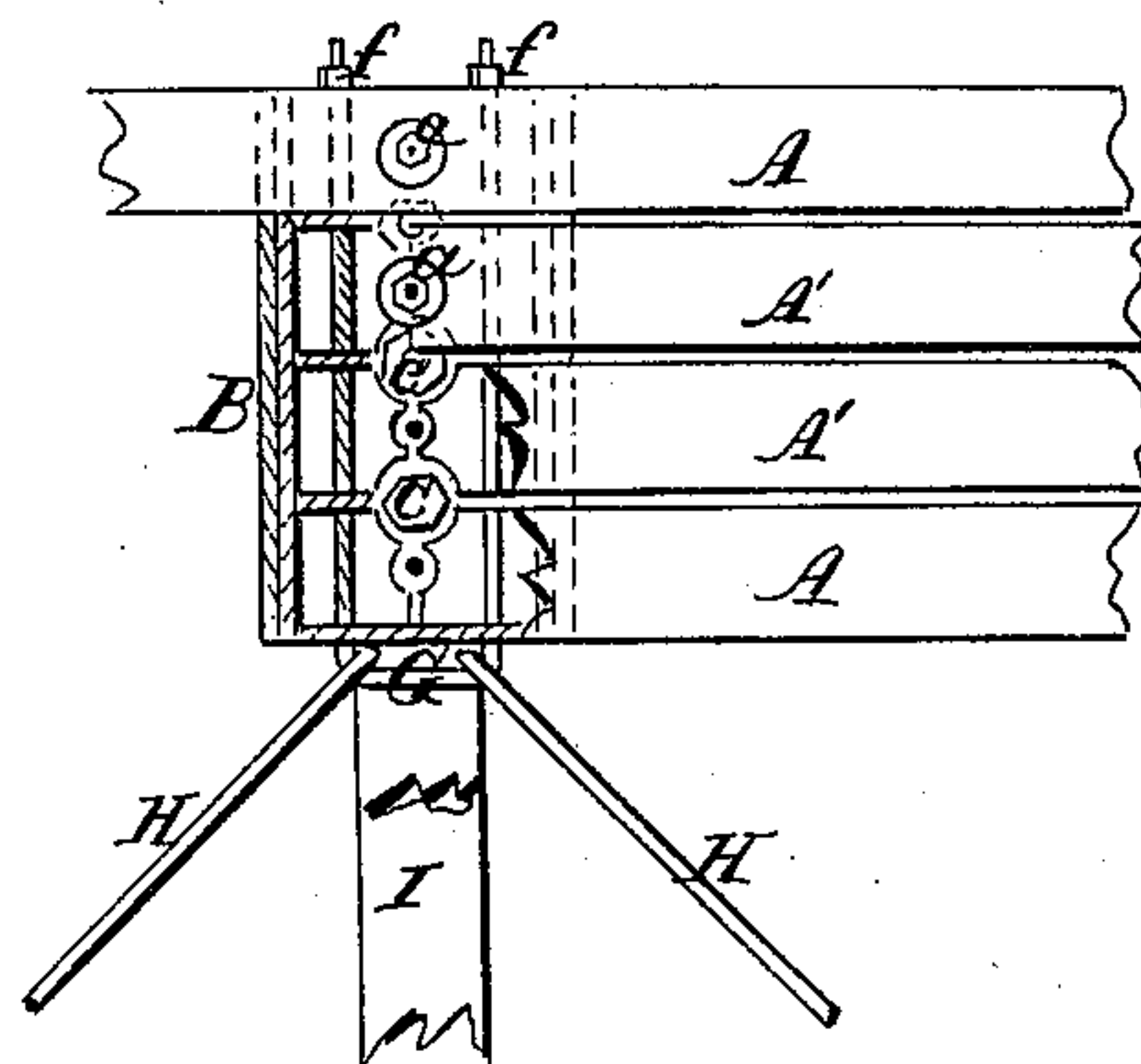


Fig. 4.



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FREDERICK H. SMITH, OF BALTIMORE, MARYLAND.

Letters Patent No. 89,442, dated April 27, 1869.

IMPROVED BRIDGE.

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, FREDERICK H. SMITH, of Baltimore, in the county of Baltimore, and the State of Maryland, have invented a new and useful Improvement in Bridges, of which the following is a full and clear description, reference being had to the accompanying drawings, making part of this specification.

The nature of my improvement in bridges consists in the construction and arrangement of the various parts comprising it, whereby the lateral or side braces, and also the top and bottom chords may be separately removed, tightened or loosened, as the exigency of the case calls for, without the employment of "false work," or injury to its integral system.

Figure 1 is an elevation of the bridge.

Figure 2 is a detail view of part of the same.

Figure 3 is a cross-section of the top chord and angle-block.

Figure 4 is a plan of the top chord and angle-block.

A A' are respectively the outer and inner chord-timbers. They break joint with each other, the timbers A crossing the angle-block on which the timbers A' abut.

B B' are angle-blocks, to which are bolted, by through-bolts *a*, the chord-timbers A and A', a bolt being used for each timber at all the angle-blocks.

C are truss-rods, that connect the upper and lower angle-blocks B B'.

They are in two parts, *b b'*. Each part has a head or nut at one end, to prevent its passing through the perforation in the angle-block. The other end is threaded.

D is a swivel, constructed of a single bar of iron. The ends are united, the opposite sides made parallel at a suitable distance apart. The connections of the parallel sides are semicircles.

The parallelogram so formed is then bent one hundred and eighty degrees, in the direction perpendicular to the plane of the sides.

Blocks, *c*, extend across the loops *d*, at the upper and lower end of the swivel. Their bearings are semicircular.

The lower section, *b'*, of the rod C, screws into the lower block *c*, and the upper section, *b*, extends through the corresponding block, C, and is provided with the nut, or head *e*.

E and F are braces and counter-braces, having their ends abutting upon the angle-blocks.

The free ends of the screw-loop G are passed outwardly through the angle-block, and secured in place by the nuts *f*.

The bracing-rods H, having looped ends, connect together the opposite principals of the bridge.

A parting-timber, I, in two sections, one upon the other, and firmly bolted together, extend between opposite angle-blocks, with which its ends are kept in contact by the bracing-rods H, or the diagonals can be of timber, and the straight member be a rod, as desired.

As usually constructed, wooden bridges have lateral bracing-rods passed through the timbers of the chords, and secured up against them, allowing the strain to act across the grain of the wood, which insures the

loosening of the system when the wood shrinks in seasoning.

The vertical rods also pass through to the top of the chord-timbers, resting their ends upon large plates or washers, which, in turn, rest upon the side-section of the timber, until it seasons sufficiently to allow them to rest upon cast-iron tubes extending down to the angle-block at the bottom of the chord, thus necessitating frequent screwing up as the timber shrinks, and rendering it necessary to support the bridge with false work while the vertical rods are loosened, and the washers and plates taken off, and the lateral rods and bracing removed, before any of the chord-sticks can be taken out and replaced when decayed.

These defects are remedied by attaching the lateral-bracing system directly to the solid iron angle-block, instead of to the constantly-shrinking chord-timbers, and also resting the heads of the vertical rods upon the angle-blocks, instead of carrying the strains entirely through the chords, and back again to the angle-blocks.

In this manner of construction, the timber is submitted to strains only in the direction of the fibre of the wood, and a large amount of surplus metal avoided, and the lateral, as well as the supporting-systems, are preserved complete, while the chord-timbers are being unbolted, one at a time, and replaced where decayed.

In order to adjust the truss when first erected, as well as to again bring it into line in case of accident, the lateral systems are placed entirely under the control of the screw-loops, which pass through the angle-blocks, and swivels are introduced about the middle of the vertical rods, to tighten them when slackened.

The swivel herein described gives a universal joint. The opposite ends of the rod may vibrate in planes perpendicular to each other. It is, at the same time, the most economical of all swivels, less liable to defective workmanship, by reason of the single weld, instead of three or four welds in those ordinarily constructed, and being more reliable, with its four small bars rolled by the mill, than the old swivel, with its two bars, drawn and welded.

What I claim as new, and desire to secure by Letters Patent, is—

1. The screw-loop G, bracing-rods H, and parting-timbers I, or their equivalents, when attached directly to the angle-blocks B, instead of to their chord-timbers, all constructed substantially as shown, and for the purpose specified.

2. Connecting the angle-blocks B B' by the truss-rods, in such a manner that the truss-strains are rested directly upon the angle-blocks, instead of carrying them through the chords and block again.

3. The combination of the angle-blocks B B', chord-timbers A A', screw-loops G, rods H, braces I, rods C, and swivels D, or their equivalents, when arranged substantially as herein shown, and for the purpose specified.

FREDERICK H. SMITH.

Witnesses:

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