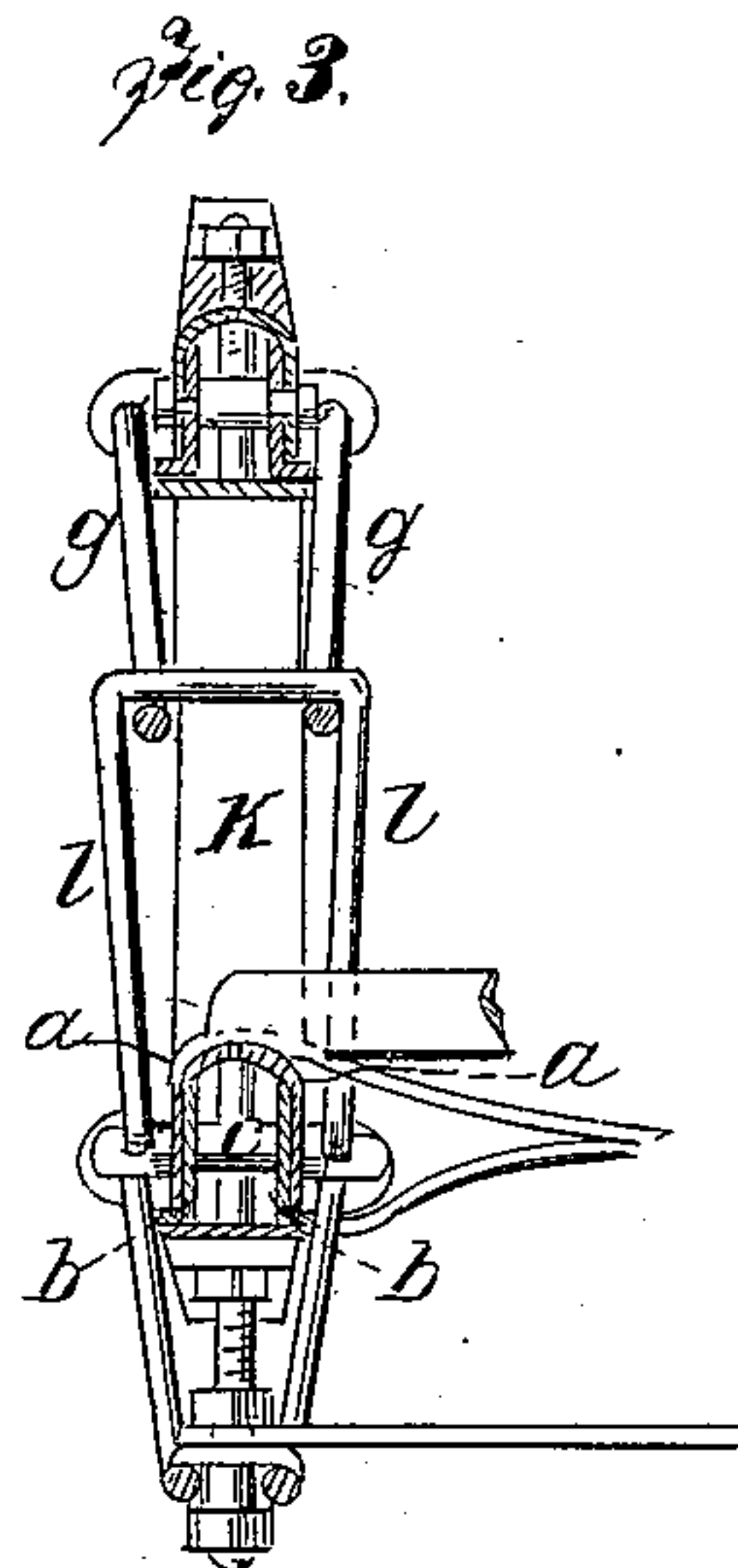
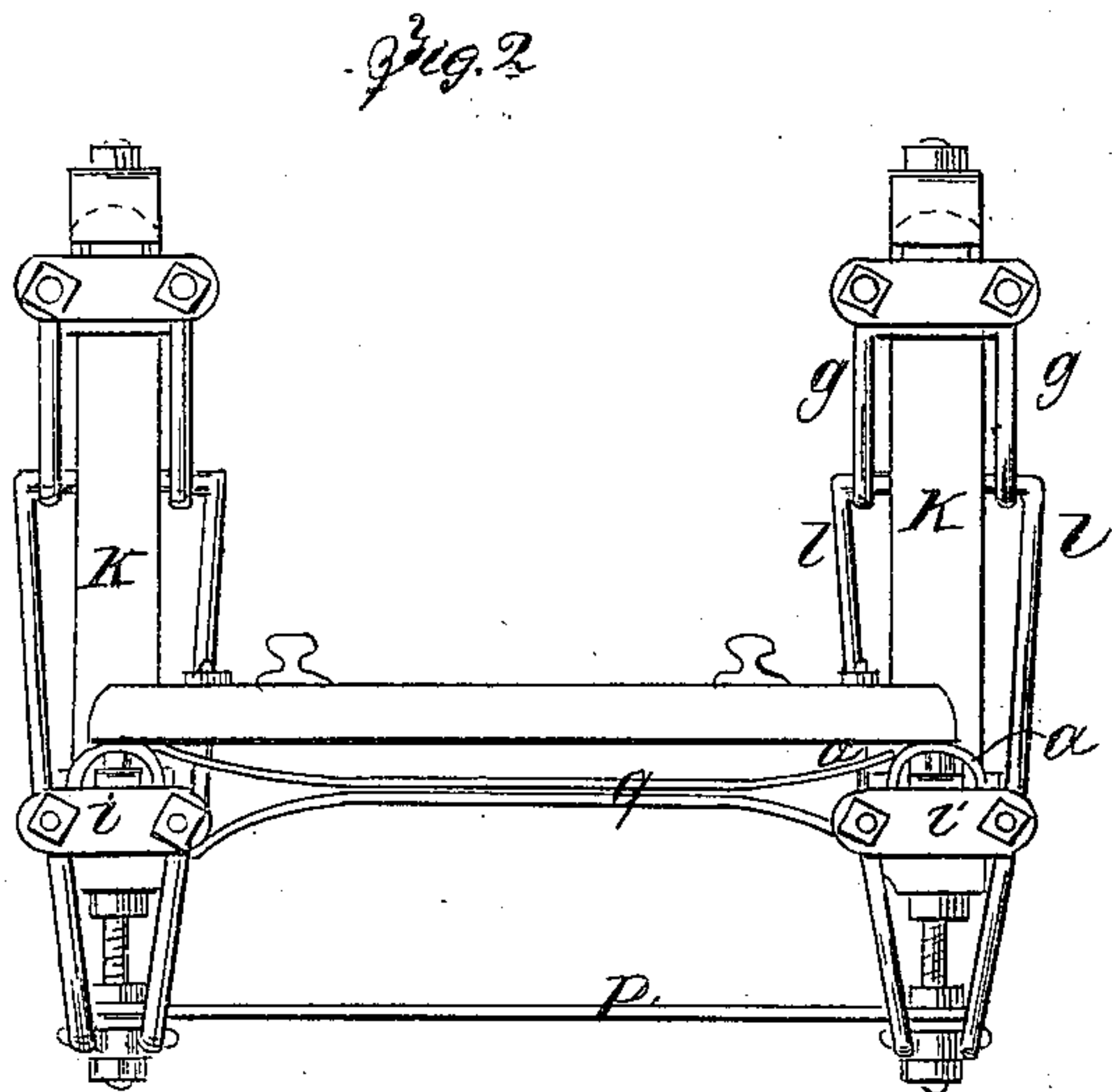
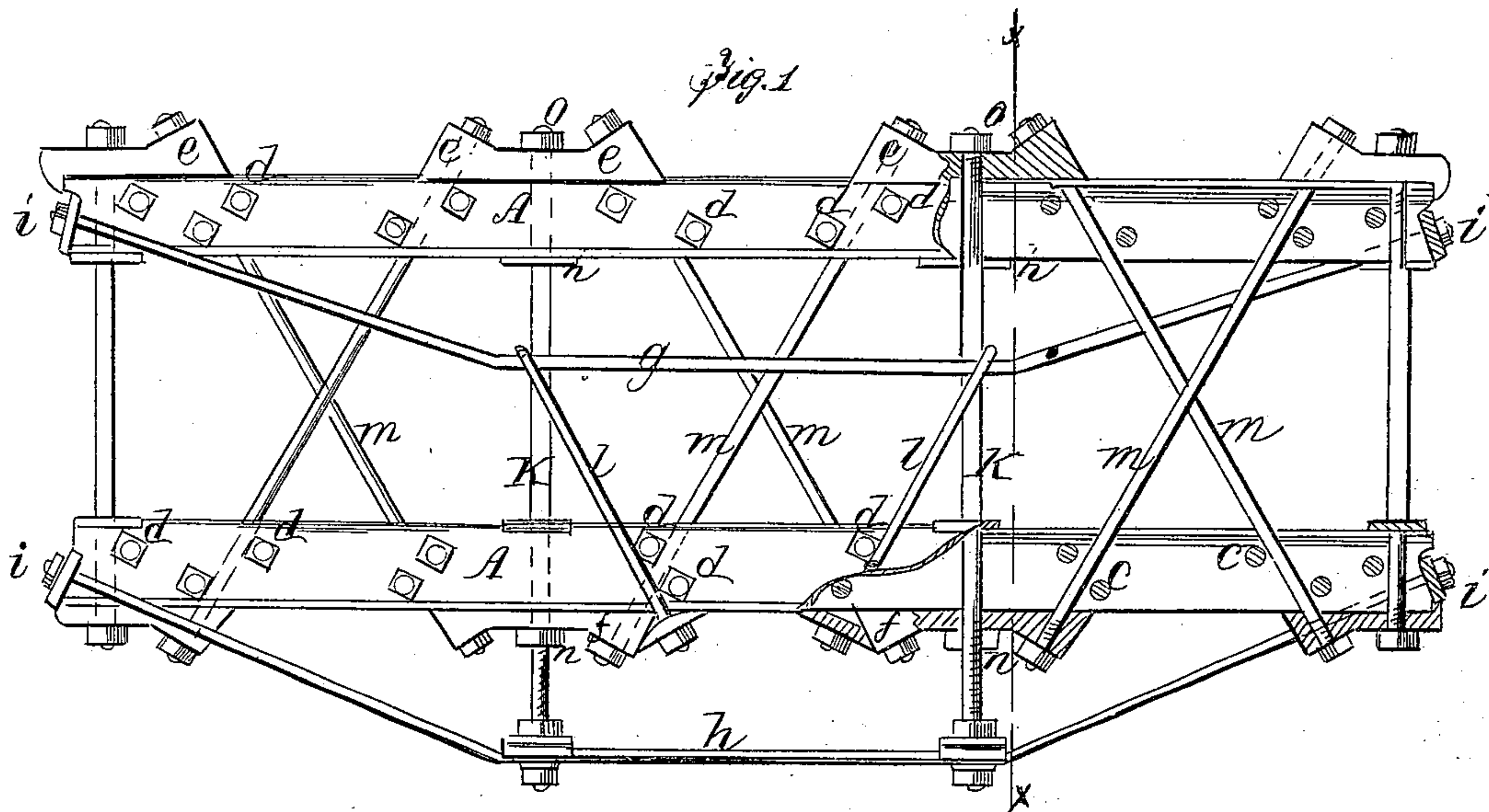


S. Ensign, Truss Bridge.

No. 96,569.

Patented Nov. 2, 1869.



WITNESSES.

Finchman
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United States Patent Office.

SAMUEL ENSIGN, OF NEW FRANKLIN, OHIO.

Letters Patent No. 96,569, dated November 9, 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, SAMUEL ENSIGN, of New Franklin, in the county of Stark, and State of Ohio, have invented a new and useful Improvement in Bridges; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

The object of this invention is to provide certain improvements in the construction of iron bridges, calculated to work an economy of construction, both as to cost and in the disposition of the metal for supporting the greatest possible weight with a given quantity.

The essential feature of the invention consists in the construction and arrangement of the chords, which are made up of bars or slabs of either rolled or cast-metal, bolted together and so shaped as to permit them to be cheaply formed and joined together. Another part of the invention consists in the arrangement of the braces, suspension-rods, and posts, and the supporting-blocks for the same, all as hereinafter more fully specified.

Figure 1 represents a side view, partly in elevation, and partly in section, of my improved bridge;

Figure 2 represents an end elevation; and

Figure 3 represents a section of one side, taken on the line *x x* of fig. 1.

Similar letters of reference indicate corresponding parts.

I form the chords *A* of two bars, or it may be one exterior bar, of either rolled or cast-metal *a a*, and two interior bars *b*, joined together, as shown in cross-section in fig. 3, and secured by bolts *C*, having shoulders, against which the inner sides of the bars are screwed up tight by the exterior nuts *d*.

The said plates *a* are so formed as to constitute the exterior vertical wall of the chords and the curved tops thereof, the edges of the said plates, when made of two parts, meeting at the centre of the tops of the chords.

The plates *b* form parallel inner walls, extending from below the lower walls of the plates *a*, as high as the vertical parts of the latter, and they are turned outward at the base, to form substantial bearing-surfaces for the support of the chords.

This method of construction, as will be seen, is very simple and cheap, and provides the most available arrangement as to the strength of the material, all the plates may be readily rolled to the form required, and punched to provide the holes, or in the case of cast-metal, they may be moulded in the simplest manner.

The supporting-blocks *e*, for the top of the chords, may have curved bases to fit the curvature of the tops of the chords, and the lower supporting-blocks *f* may be otherwise fitted to the configuration of the bases of the chords.

To these chords I propose to add upper and lower suspension-rods *g h*, fitted at the ends to the transverse blocks or plates *i*, supported in angular recesses in the ends of the chords.

The lower suspension rods are strained over the projecting ends of the posts *k*, provided with adjusting nuts, and the upper suspension rods are provided with diagonal tension braces *l*, looping over them and around the posts in a manner to prevent them from sliding toward the vertical plane of their connection with the chords.

The diagonal braces, in extending from one chord to another, and crossing each other, are arranged in the ordinary way, and supported at the ends by the blocks *e* and *f*.

The posts are provided with supporting-blocks *n*, below each chord, the lower ones being adjustable by means of screw-threads, and the upper ends of the posts screwed into nuts *o*, which firmly clamp the chords between the said upper blocks *n* and the blocks *e*.

The transverse bars may consist of flat plates *p* and *q*, the latter doubled, and the parts separated near each end, to embrace the chords at top and bottom, and both fitted to permit the bolts to pass through them.

The floor-beams may be placed either on the upper or lower chords, as preferred.

I propose to make the posts of flat bars, in the parts between the chords, with rounded projections for passing through the chords and other parts. These flat parts afford shoulders, against which the chords are firmly clamped by the braces *m*.

Having thus described my invention,

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

1. The combination, with two exterior and two interior bars *a a* and *b b*, shaped as described, of the shouldered bolts *C*, secured by the nuts *d*, all as set forth.

2. The improved bridge above described, each of its parts being shaped, fitted, and arranged in the structure with respect to the others, as shown and described.

SAMUEL ENSIGN.

Witnesses:

J. R. BEATTY,
H. O. MARCH.