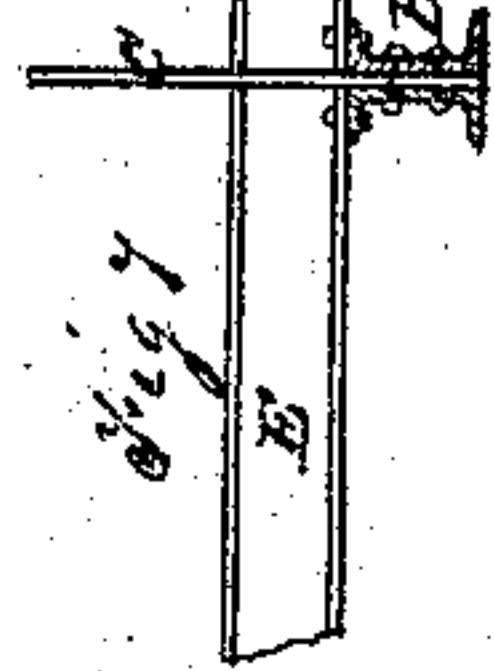
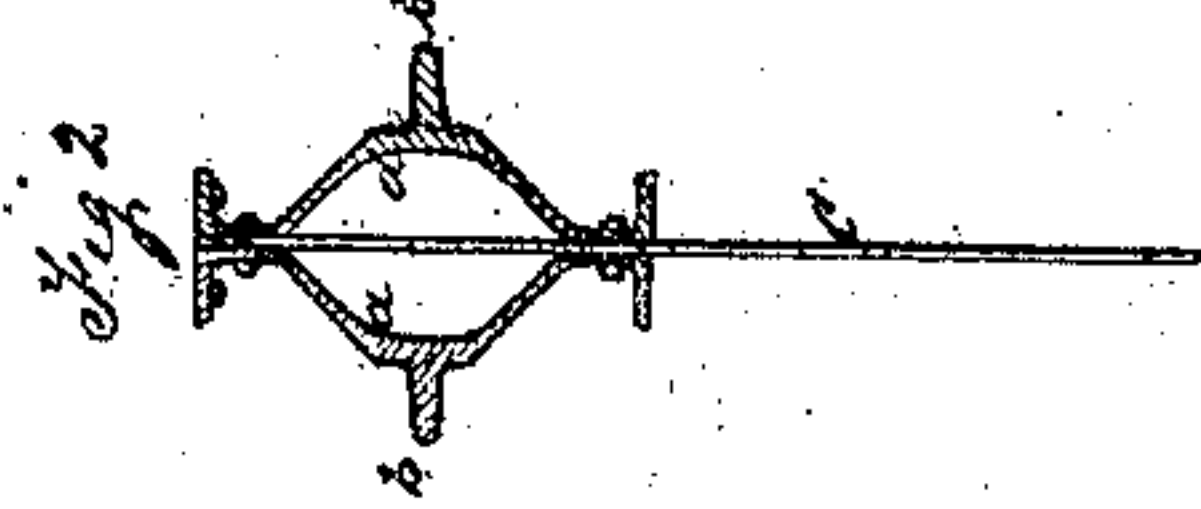
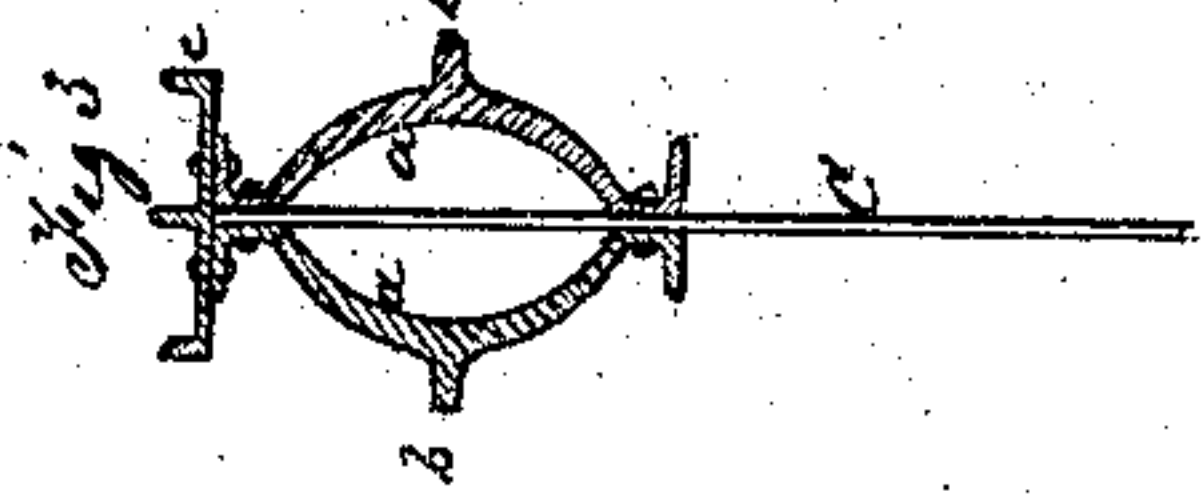
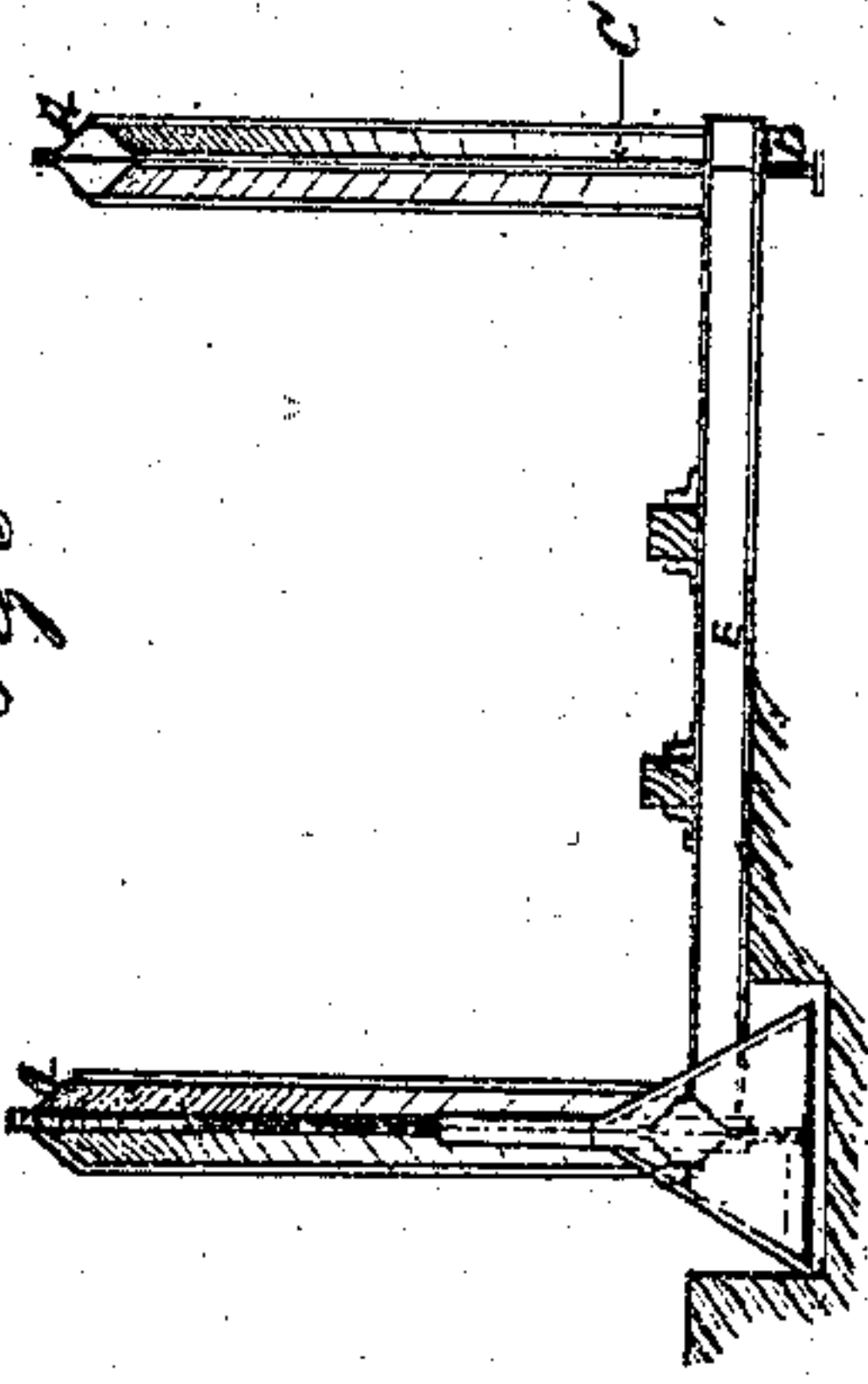
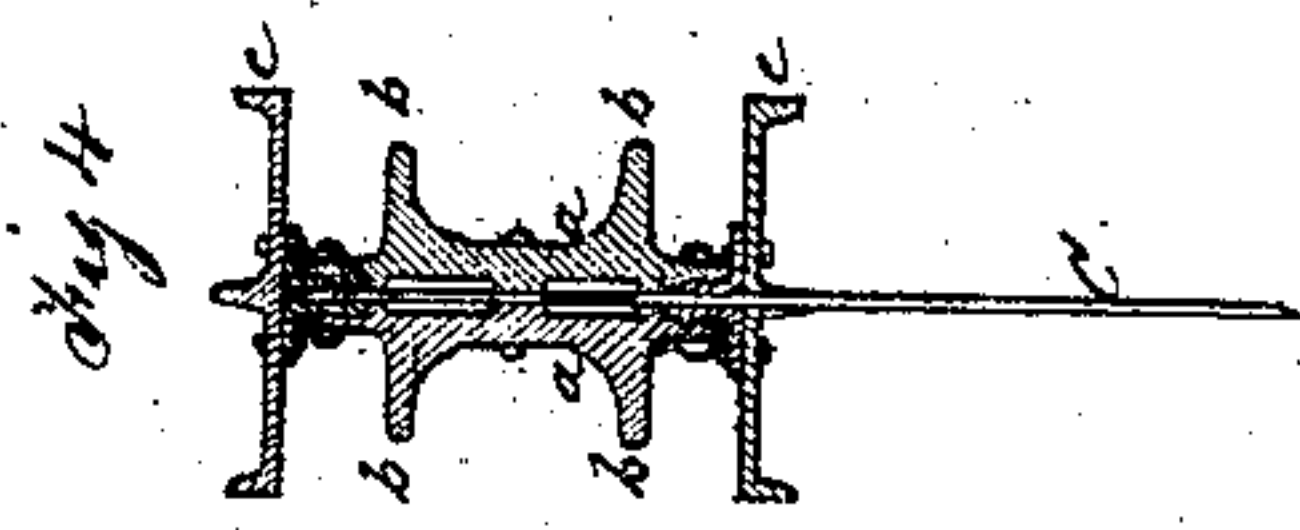
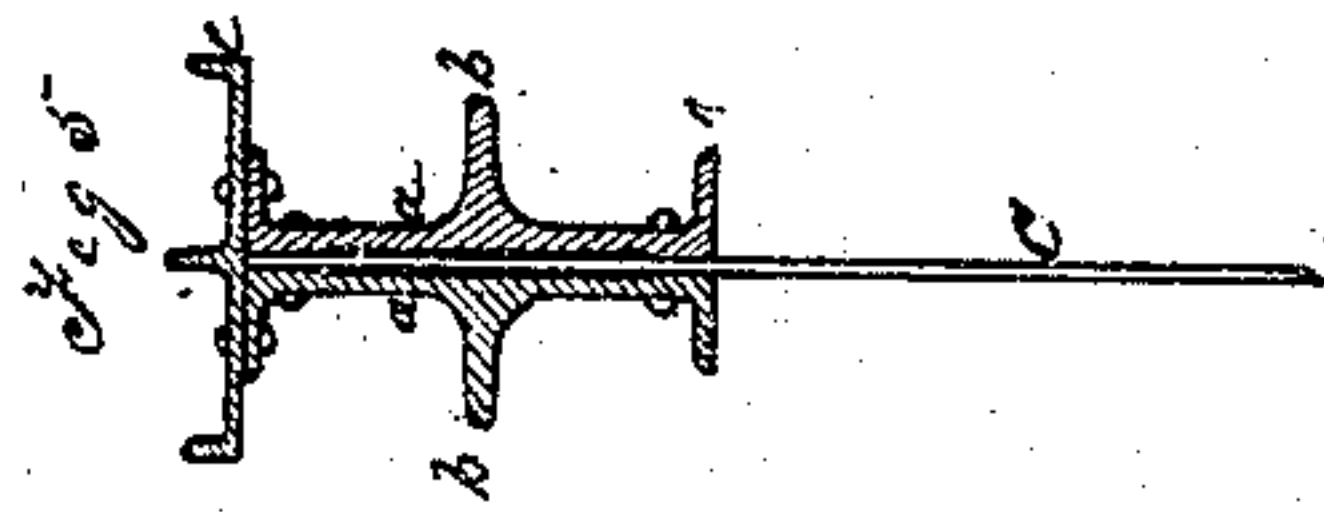
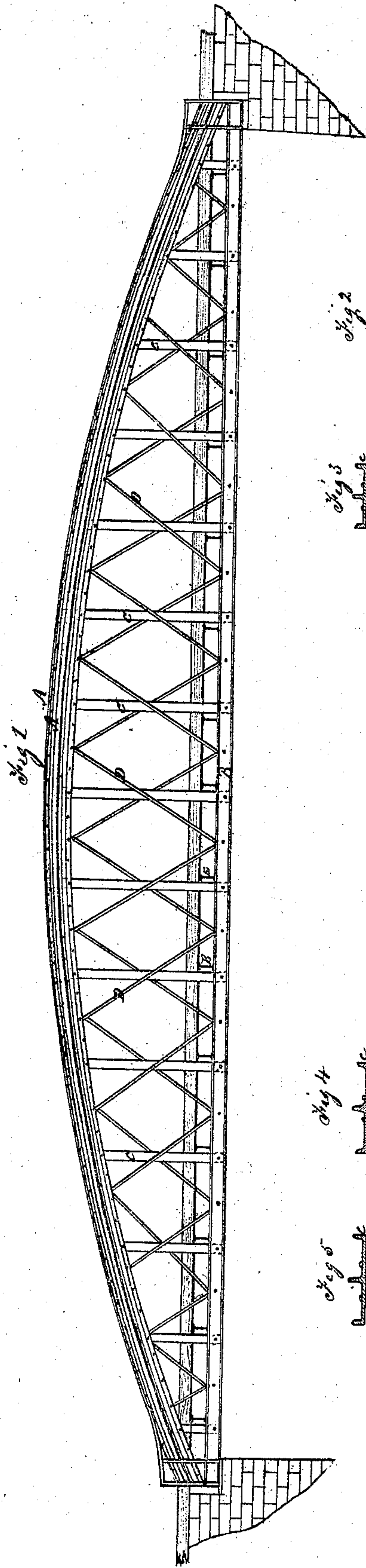


S. Kirkups, Improved Bridge.

No. 120,282.

Patented Oct. 24, 1871.



Wm. Kirkups
John W. Plattner

Samuel Kirkups by his atty
Abner Y. Brown

UNITED STATES PATENT OFFICE.

LANCELOT KIRKUP, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN BRIDGES.

Specification forming part of Letters Patent No. 120,282, dated October 24, 1871.

To all whom it may concern:

Be it known that I, LANCELOT KIRKUP, of Brooklyn, Kings county, New York, have invented certain new and useful Improvements in the Construction of Bridges for Railways and Highways; and that the following is a full, clear, and correct description of the same, reference being had to the accompanying drawing making part of this specification, and to the letters of reference marked thereon, in which—

Figure 1 is a side elevation of a bridge made in accordance with my invention. Figs. 2 and 3 are transverse sectional views of the top chord of the same. Figs. 4 and 5 are sectional views of the top chords as sometimes constructed by me. Fig. 6 is an end view of a bridge constructed in accordance with my invention. Fig. 7 is a sectional view of the bottom chord employed by me.

In the drawing like parts of the invention are designated by the same letters of reference.

The nature of the present invention consists in certain improvements, as more fully hereinafter set forth, in the construction of bridges for railways and highways, and will be found to have reference more particularly to the construction of the top and bottom chords of the bridge; the object of the invention being to reduce the cost of construction of bridges, while the strength and durability of the same are greatly increased.

To enable those skilled in the arts to make and use my invention, I will describe the same.

A shows the top chord or arch of the bridge, made either straight or arched, and composed of wrought-iron and formed of two plates, *a*, bolted together. These plates *a* may be made of any of the forms shown in Figs. 2, 3, 4, and 5 of the drawing. When made as shown in Figs. 2 and 3, they are provided with the ribs *b*, rolled onto the plates *a*. When made as shown in Figs. 4 and 5, they are ribbed as shown in those figures, and are provided with the longitudinal plates *c* at top and bottom. This form of plate shown in Figs. 4 and 5 is employed when extra sectional area is required, according to the length of the span. These plates *a* are made of any suitable length, and are made thicker at the center than at the top or bottom, that the chord or arch may the more readily withstand the liability of compression and the effect of tensile strain. B

shows the bottom chord of the bridge, composed of two double-flanged plates riveted together, as shown, for the purpose of giving it additional strength and to enable it to withstand any lateral movement. C shows a series of vertical suspension-bars employed to connect the upper and lower chords of the bridge together. These bars are made of wrought-iron, sufficiently long for the purpose intended, and have their ends passed between the plates forming the upper and lower chords of the bridge, and then riveted in position. D shows a series of diagonal braces, having their ends secured between the plates forming the top and bottom chords. These braces are employed to sustain the weight of the track or roadway placed upon the floor-beams E secured upon the bottom chord B. The plates *a*, constituting the upper chord, may be secured together in any suitable manner; and the bridge, when constructed, rests on stone or wood piers, with a metal plate on the top for the ends of the bridge to rest on.

The particular advantages resulting from the construction of the upper chord or arch as just set forth are that by making it of two plates, with flanges rolled solid on the top and bottom, and the center of the plate being made thicker than the sides and placed in a vertical position, the inside of the two plates, when united, being formed in a hexagonal shape, or any of the forms shown in Figs. 2, 3, 4, and 5 of the drawing, is the strongest position the plates can be placed in to withstand tensile strain and compression; and by riveting the top and bottom of the chord A together the cost of labor and material is reduced.

By making the bottom chord B of the two double-flanged plates as shown, each plate being made in one piece up to one hundred and ten feet, all joints, welding, and cover-plates generally employed in bridges made in spans from fifty to one hundred feet are dispensed with, the bridge is rendered more solid, and any tremulous motion of the structure is avoided, which frequently occurs in bridges where the bottom chord is formed of links or separate sections connected together.

Having thus set forth my present invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The upper chord or arch formed by combining the plates *a*, constructed as shown in Figs. 2, 3, 4, and 5 of the drawing, for the purpose specified.

2. The combination, with the upper and lower chords A and B, of the vertical suspension-rods C and diagonal braces D, when the same shall

be constructed and operate substantially as and for the purposes set forth.

L. KIRKUP.

Witnesses:

A. SIDNEY DOANE,
WM. HASTINGS.

(21)