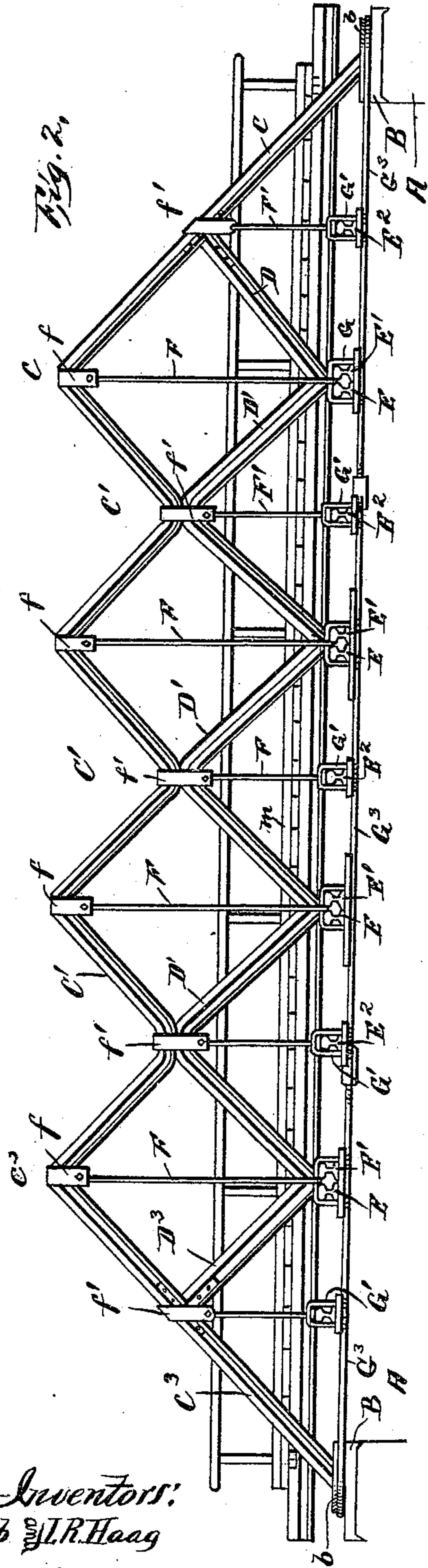
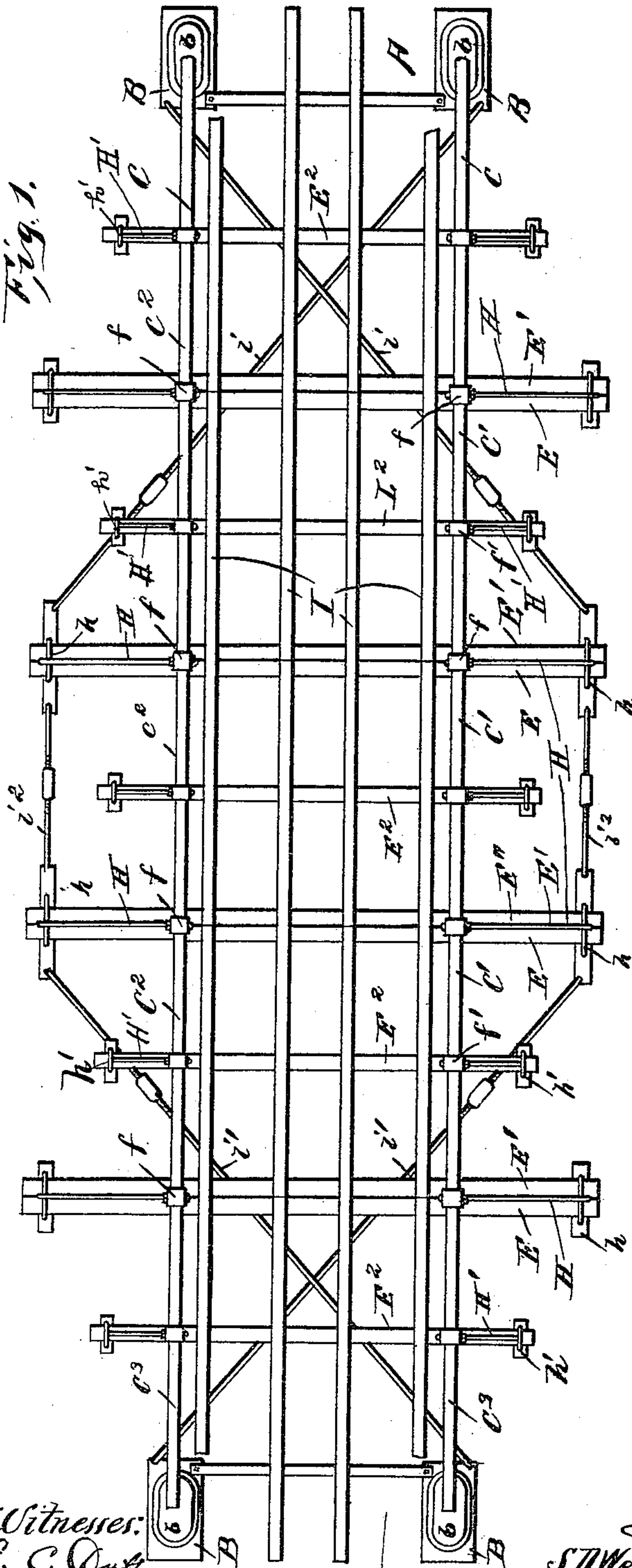


S. D. WEBB & L. R. HAAG.
IRON BRIDGE.

No. 438,511.

Patented Oct. 14, 1890.



Witnesses:

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Inventors:

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By their Attorneys

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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

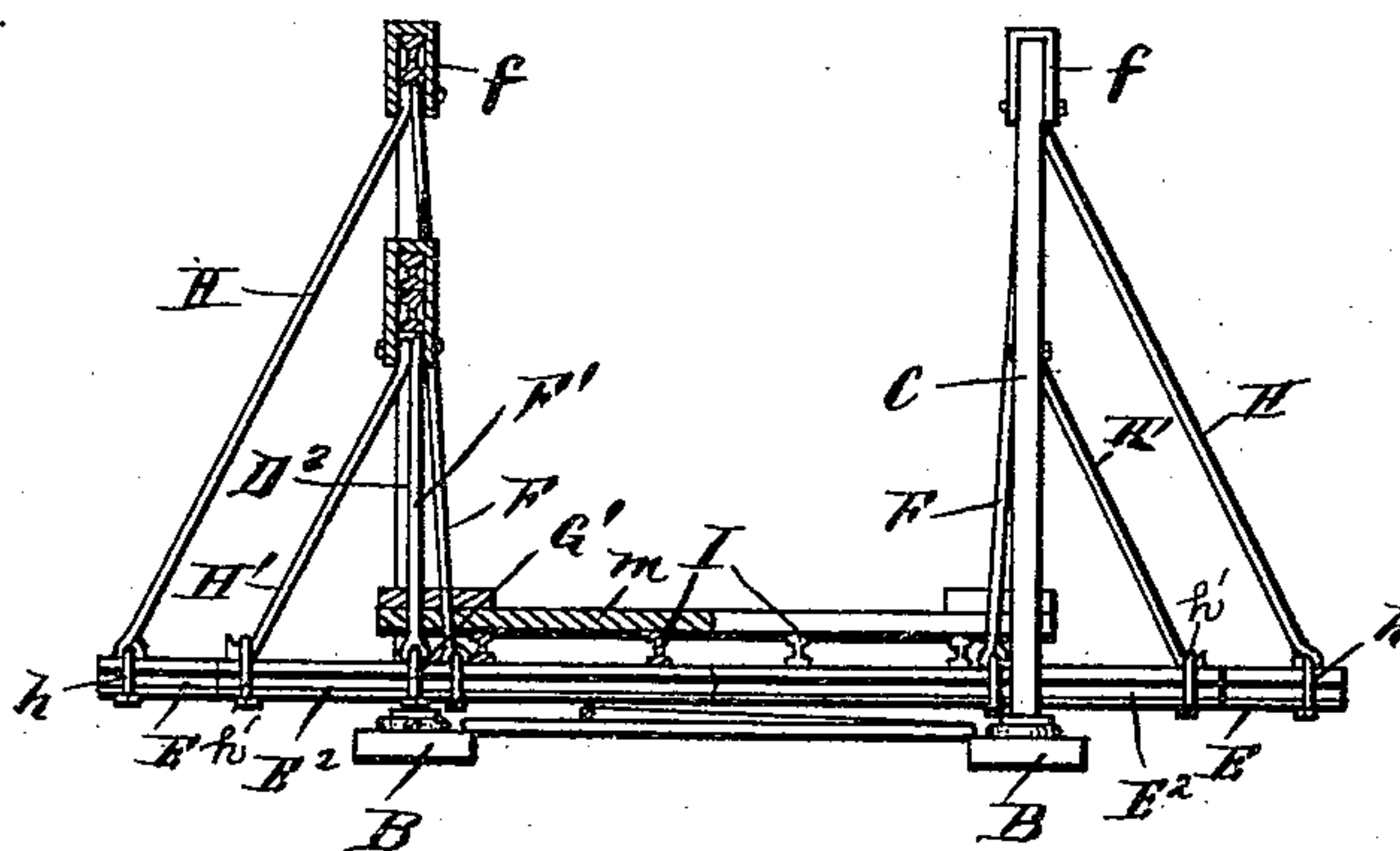


Fig. 4.

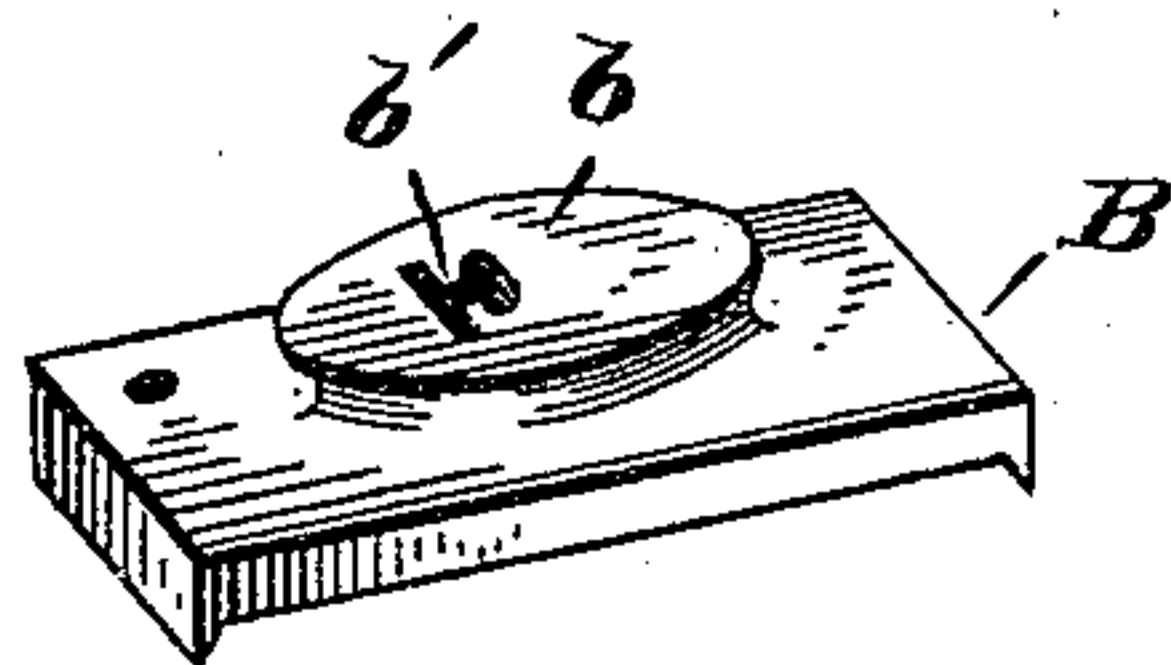
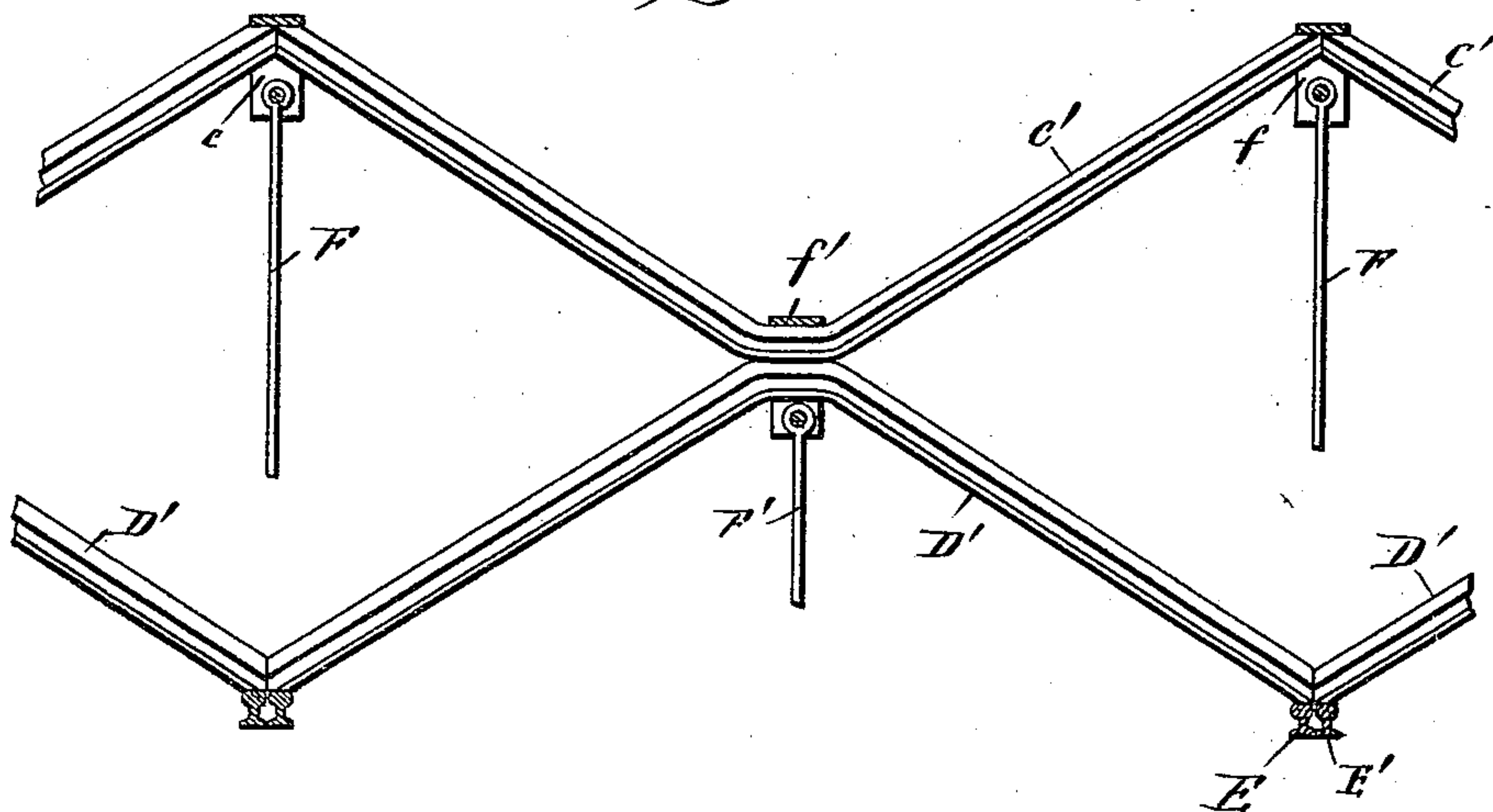


Fig. 5.



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UNITED STATES PATENT OFFICE.

STEPHEN D. WEBB AND LEWIS R. HAAG, OF MIDDLEPORT, OHIO, ASSIGNORS
TO J. S. BOGGESE, AGENT THE OHIO MACHINE COMPANY, OF SAME PLACE.

IRON BRIDGE.

SPECIFICATION forming part of Letters Patent No. 438,511, dated October 14, 1890.

Application filed May 1, 1890. Serial No. 350,168. (No model.)

To all whom it may concern:

Be it known that we, STEPHEN D. WEBB and LEWIS R. HAAG, citizens of the United States, residing at Middleport, in the county of Meigs and State of Ohio, have invented certain new and useful Improvements in Iron Bridges; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to that variety of bridges known as "truss-bridges," and has for its objects to provide a cheap, simple, and durable structure in which may be utilized old and worn-out railroad-rails and such as are no longer serviceable for their original purpose.

The invention consists in certain novel features of construction and in combinations of parts more fully described hereinafter, and particularly pointed out in the claims.

In the accompanying drawings, which illustrate our invention and form a part of this specification, Figure 1 is a plan view. Fig. 2 is a side elevation of a bridge constructed according to our invention. Fig. 3 is an end elevation of the bridge, partially in section. Fig. 4 is a detail perspective of one of the cap-plates for the abutments, which plates support the end rails. Fig. 5 is a detail section showing the joint formed by the meeting ends of the truss-rails.

Similar letters of reference designate the same parts throughout the several views.

A designates one of the abutments upon which the ends of the bridge are supported. Upon each abutment are two metal cap-plates B, one at each side. These cap-plates have raised portions *b*, in which are formed sockets or recesses *b'* to receive and hold the ends of the outer or end rails *C C*³. The opposite cap-plates at the ends of the bridge are tied together by cables or tie-rods *G*³, which pass and are looped around the raised portions *b*.

*C C*³ are the end rails, the outer ends of which are stepped in the sockets *b'*. The end truss-rails *C C*³ are straight rails and extend from their steps on the cap-plates B to points *c c*³ at the full height of the truss-frame. Between the end rails *C C*³ the truss-frame is

composed of upper and lower rails *C' C*² and *D' D*², with short rails or braces *D D*³ between the rails *C C*³ and the ends of the lower rails *D' D*². The upper rails *C' C*² abut against each other at their inner ends, while their outer ends abut against the ends of the outer rails *C C*³. They are bent downward at their mid-lengths, where they rest upon and are supported by the lower rails *D' D*², which are bent upward to form similar angles, so that the joint between the upper and lower rails is at the mid-height of the entire truss-frame, as shown in Fig. 2. By thus forming the truss-frame of upper and lower series or sets of rails we produce a double truss without crossing the rails and one which has only the thickness of a single rail.

E E' are cross-ties or beams arranged in pairs under the joints between the lower truss-rails and supporting the latter. Their ends rest in yokes *G*, which are supported from the joints formed by the meeting ends of the upper truss-rails by rods *F*, which are bolted to clips *f*, placed over and around said joints.

At intermediate points between the double beams *E E'* and immediately below the joints between the upper and lower truss-rails are single beams *E*², which are similarly supported by yokes *G'*, rods *F'*, and clips *f'*, the latter being placed over and around both the upper and the lower truss-rails at the points where the former rest upon the latter.

H designates braces, which are also secured at their upper ends to the clips *f* and at their lower ends to yokes *h*, which are placed around and clamped upon the projecting ends of the double beams *E E'*, as best shown in Figs. 1 and 3. Similar short braces *H'* extend from the clips *f'* and are connected by yokes *h'* with the projecting or extended ends of the single beams *E*², which are correspondingly shorter than the double beams.

To render the structure more rigid and to prevent it from swaying laterally, a system of horizontal brace-rods is employed, connecting the cap-plates at opposite ends of the bridge and secured to certain of the transverse beams. In the present instance the two center double beams *E E'* have their op-

posite corresponding ends connected by the longitudinal rods i^2 , and the opposite ends of one of said center double beams are connected by the diagonal crossing braces ii with the diagonally-opposite cap-plates at the same end of the bridge, and the other central double beam is similarly secured to the cap plates at its ends of the bridge by the two diagonal brace-rods $i' i'$. These brace-rods are suitably and strongly secured to the cap-plates, and are shown also secured to the collars h , although they can be secured to any desirable portions of the beams.

This system of stay-rods or braces, if made of sufficient weight and strength of material, will be found sufficient to render the structure perfectly rigid and secure; but, if desired, additional stays may be applied.

I designates the stringers, upon which the floor m is laid. These stringers are also railroad-rails, as represented in the drawings. They lie upon the cross ties or beams $E E'$ E^2 , and for the sake of security from longitudinal shifting or displacement they should be so laid as to break joints at the double beams.

While we show and describe a bridge of certain length—that is, having a certain number of cross ties or beams and truss-frames composed of a certain number of lengths of rails—we desire to have it understood that its length may be extended to any extent found desirable or deemed feasible.

It is evident that various changes might be made in the form and arrangement of the parts described without departing from the spirit and scope of our invention. Hence we do not wish to limit ourselves to the precise construction herein set forth.

What we claim is—

1. The combination, with the abutments and their cap-plates, of the straight end truss-rails stepped in said cap-plates and intermediate upper and lower truss-rails, the said upper rails resting on and supported by the lower ones, substantially as shown and described.

2. The combination, with the abutments and their cap-plates, of the end truss-rails stepped in said cap-plates, the intermediate upper and lower truss-rails, the said upper rails resting on and supported by the lower ones, and the tie-rods or cables by which the cap-plates are tied together, substantially as shown and described.

3. In a bridge, the combination of the end truss-rails, with their lower ends resting on the abutments, the short inclined rails or braces having their upper ends bearing against the center of said truss-rails, the upper series of rails and the lower series of rails forming the truss-frames, and the transverse beams suspended from the truss-rails, substantially as described.

4. In a bridge, the herein-described truss-frame, comprising end rails, the series of lower rails, each rail of which is bent up within its length, with its ends resting on the cross-beams, and the upper truss-rails having their ends resting together, each rail being bent down within its length, the downwardly-bent portions of the upper rails resting on the upper bent portions of the lower rails, substantially as described.

5. In a bridge, the combination of the truss-frames, the double horizontal cross-beams, each embraced by yokes, the yokes embracing the rails of the truss-frames, and the tie-rods connecting said yokes and suspending the cross-beams.

6. In combination, the truss-frames composed of bent railroad-rails, the double cross-beams suspended from the joints between the upper rails of the frames, and the single cross-beams suspended from the joints between the upper and lower rails of the frames.

7. In a bridge, a truss-frame formed of a series of lower rails bent up within their lengths and a corresponding series of upper rails correspondingly bent downward, the bent-up portions of the upper rails resting on the bent-up portions of the lower rails, and means for securing and supporting said upper and lower rails, substantially as described.

8. The combination of the cap-plates resting on the abutments, each having a grooved raised portion integral therewith, the truss-frames having end rails at their lower ends directly stepped in said cap-plates, and the two tie-rods or cables extending the length of and beneath the bridge and provided with loops on their ends directly embracing said raised portions of the cap-plates.

9. In a bridge, the combination of the truss-frame and cross-beams composed of railroad-rails, yokes or straps uniting the rails of the truss-frame, yokes or straps embracing the cross-beams, and tie-rods or connections connecting the truss-frame and cross-beam yokes.

10. The combination of the truss-frames composed of upper and lower series of rails, yokes or straps uniting said rails of the upper and lower series, the cross-beams, and tie-rods or connections suspending said cross-beams from said yokes.

11. The combination of the truss-frames, yokes or straps embracing and uniting the sections of the truss-frames, the cross-beams, tie-rods suspending said cross-beams from said yokes, and diagonal brace-rods from the yokes to the outer ends of the cross-beams.

In testimony whereof we affix our signatures in presence of two witnesses.

STEPHEN D. WEBB.

LEWIS R. HAAG.

Witnesses:

JOHN B. DOWNING,
MILLER R. DOWNING.