(No Model.) 2 Sheets—Sheet 1.

A. J. SHAW.

HOISTING MACHINERY.

No. 528,621. Patented Nov. 6, 1894.

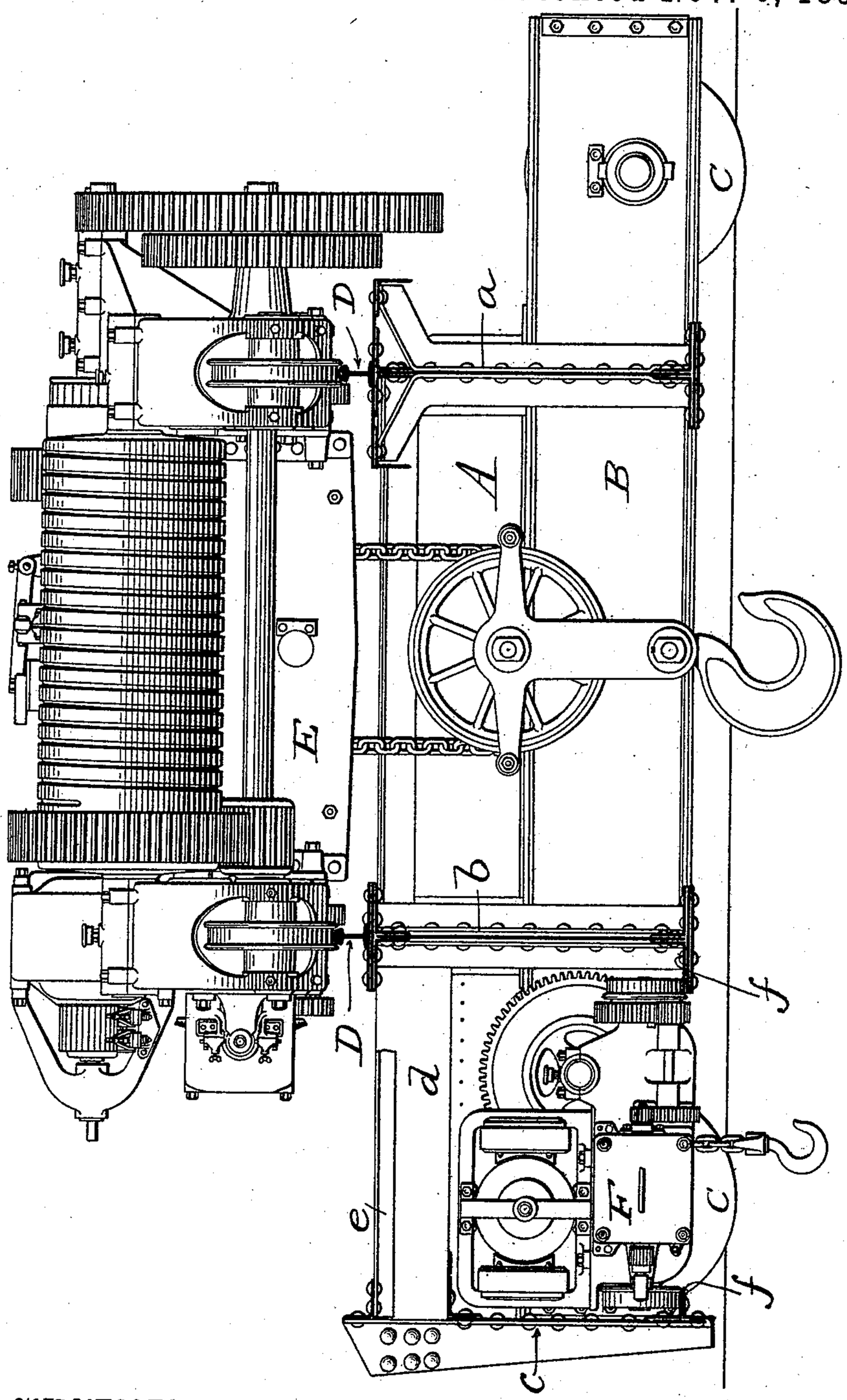

Fig. 1.

WITNESSES

W. C. Burdine

G. M. Copenhaver.

INVENTOR

Alton J. Shaw,

by Dodger Sons, Attorneys.

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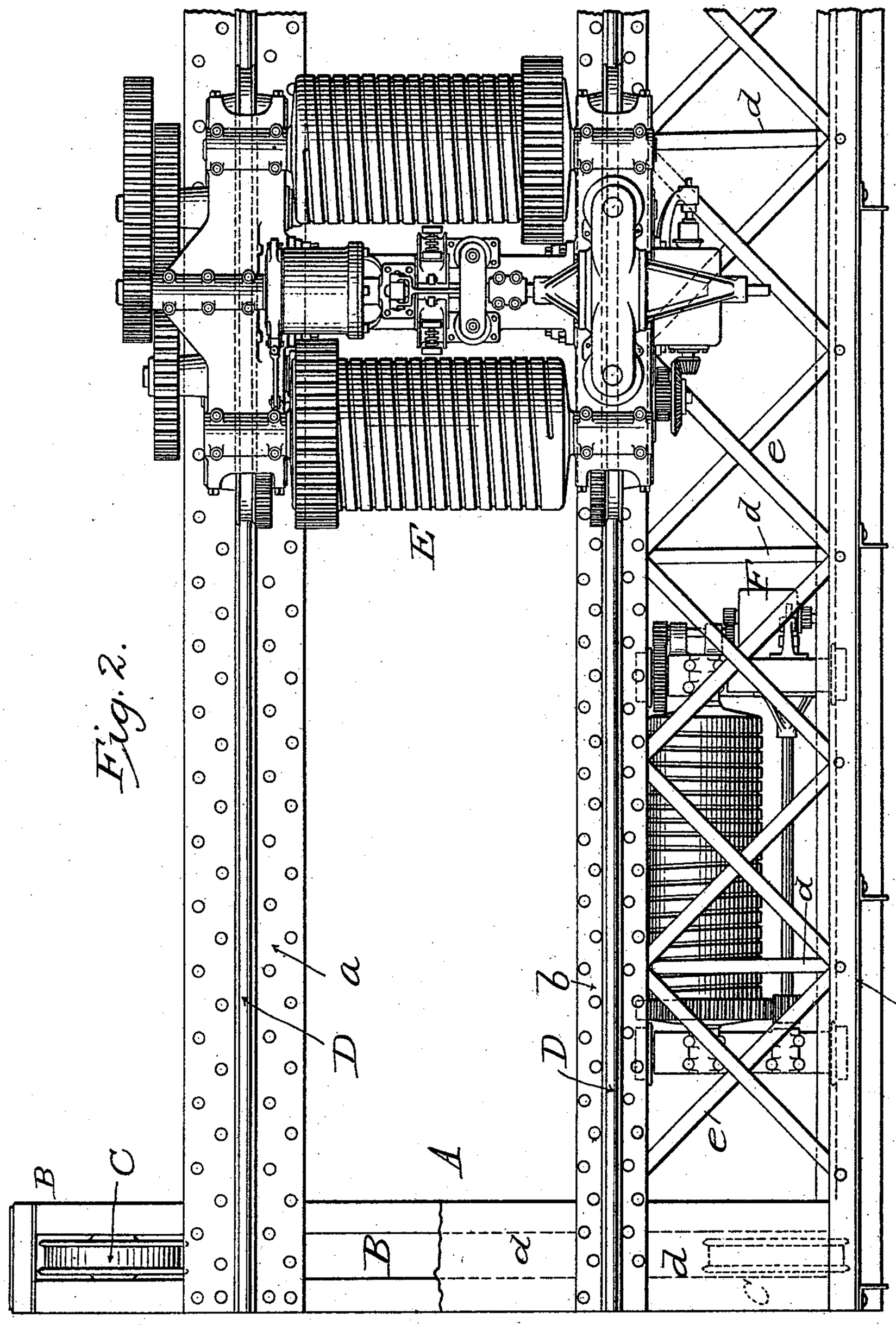

Fig. 2.

WITNESSES,
C. C. Burdine
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INVENTOR,
Alton J. Shaw,
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UNITED STATES PATENT OFFICE.

ALTON J. SHAW, OF MUSKEGON, MICHIGAN, ASSIGNOR TO THE SHAW ELECTRIC CRANE COMPANY, OF SAME PLACE.

HOISTING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 528,621, dated November 6, 1894.

Application filed August 6, 1894. Serial No. 519,584. (No model.)

To all whom it may concern:

Be it known that I, ALTON J. SHAW, a citizen of the United States, residing at Muskegon, in the county of Muskegon and State of Michigan, have invented certain new and useful Improvements in Hoisting Machinery, of which the following is a specification.

My invention relates to bridge cranes, and consists in constructing the same with three longitudinal bridge girders and mounting two independent trolleys upon ways or tracks upon such bridge in the manner hereinafter explained; whereby the trolleys are enabled to pass each other and to act independently or conjointly, as required. Other and material advantages resulting from the three girder construction will be pointed out in the following description.

In the drawings Figure 1 is a transverse sectional view of my improved crane, showing one of the bridge ends and both the trolleys in elevation; and Fig. 2 is a plan view of one end of the bridge, showing the trolleys in place.

The present invention is applicable to bridge cranes generally, regardless of the power employed for their actuation, but I have illustrated an electric crane because that is the type now generally adopted, and the one in which I have embodied my invention in practice.

It has hitherto been a common practice to construct cranes of this class with a bridge composed of two parallel main beams or girders, and to mount thereon one or two trolleys, as required. As the bridges have been ordinarily constructed, however, the trolleys have been unable to pass each other, because mounted in the same plane and upon the same track. My object is primarily to overcome this difficulty, and this I do by the following construction:

A indicates the bridge of a traveling-bridge crane, which bridge is composed of three parallel beams or girders *a*, *b*, and *c*, connected at their ends to supporting and carrying trucks B, provided with track wheels C as usual. The girders or beams *a*, *b*, and *c* are advisably made of varying dimensions and strength, since they receive varying proportions of the load, but I do not restrict myself to this or to any particular relative proportions or strengths. Under the embodiment here illustrated, the beam or girder *a* is made quite heavy, being both broad and deep, because it is without lateral or other support from end to end. The beam or girder *b* is represented as somewhat lighter, and the beam or girder *c* is shown as still lighter, but this relation is rendered permissible by the fact that beams or girders *b* and *c* are tied together by cross beams or struts *d* and diagonal braces *e*, thus combining the two into a horizontal truss, and also causing the beam *c* to contribute to the carrying capacity of beam *b*.

The beams or girders *a* and *b* are provided with rails D on their upper plates or faces, upon which runs a trolley E, provided with suitable hoisting mechanism, this being the main hoisting trolley. A lower flange of girder or beam *b*, and a flange of girder *c*, formed by angle plates *f*, constitute or are furnished with rails, to support and guide a second trolley F, which is smaller and lighter than trolley E, and is designed for quick lifting of light loads, for tipping ladles, tripping tongs and buckets, and performing other operations requiring relatively little power.

The beams or girders *b* and *c* being tied together and braced by the struts and diagonal braces above noted, it is necessary that the trolley F be arranged beneath said connecting members. On the other hand, by thus placing the second trolley on a different horizontal plane from the first, I am enabled to give each an independent track and runway while employing only three beams or girders.

Owing to the length which it is often necessary to give the bridge, there is considerable tendency to buckle or deflect the girders laterally, since it is impracticable to cross-brace or truss the girders when the trolley is placed on top of the bridge, which is the position offering greatest load-capacity. It is therefore essential that a girder which is without lateral trussing shall have wide flanges, to withstand the lateral strains, which are particularly great in starting and stopping the loaded bridge. The beam or girder *a* is shown as having very wide flange plates;

but the beam *b*, being laterally braced and stiffened, and also augmented as to its capacity to withstand vertical strains, by the cross connections and trussing with girder *c*, does not require such wide plates. Girder or beam *c* in turn may be made still lighter, since it carries only one side of the light-load trolley F. I do not, however, restrict myself to any stated or specific proportions.

It will be seen from the foregoing description and explanation that without materially or greatly increasing the weight of the bridge I give it great stiffness and carrying capacity, and at the same time provide independent tracks or runways for the two trolleys, whereby they are enabled to pass and repass each other at will and without interference.

I do not in this application make broad claim to a bridge having two trolleys in different planes and arranged to pass each other, but,

Having described my invention, what I claim is—

1. In a traveling-bridge crane, the combination with a bridge composed of three parallel beams or girders, of two trolleys, and rails or girders therefor, two of said rails being carried by the intermediate beam or girder and the others being carried by the outer beams or girders.

2. In combination with beams *a*, *b* and *c* constituting a bridge, two trolleys E and F, the former carried upon the beams *a* and *b*, and the latter carried between the beams *b* and *c*, substantially as set forth.

3. In a traveling bridge crane, the combination with a bridge comprising three parallel beams *a*, *b* and *c*, and bracing connecting the beams *b* and *c*, two trolleys, E and F, the former mounted above the beams *a*, *b*, and the latter arranged to travel between the beams *b*, *c*, and beneath the bracing connecting said beams.

In witness whereof I hereunto set my hand in the presence of two witnesses.

ALTON J. SHAW.

Witnesses:
J. G. EMERY,
THOMAS C. AKIN.