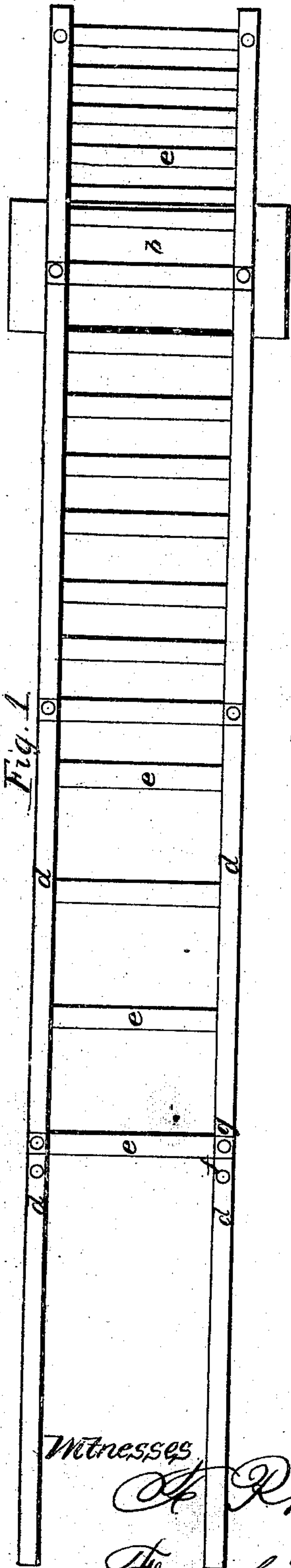


A. Cottrell. Truss Bridge.

No 43,099.

Patented Jun. 14, 1864.



Witnesses

W. P. Hale Jr

Frederick Curtis.

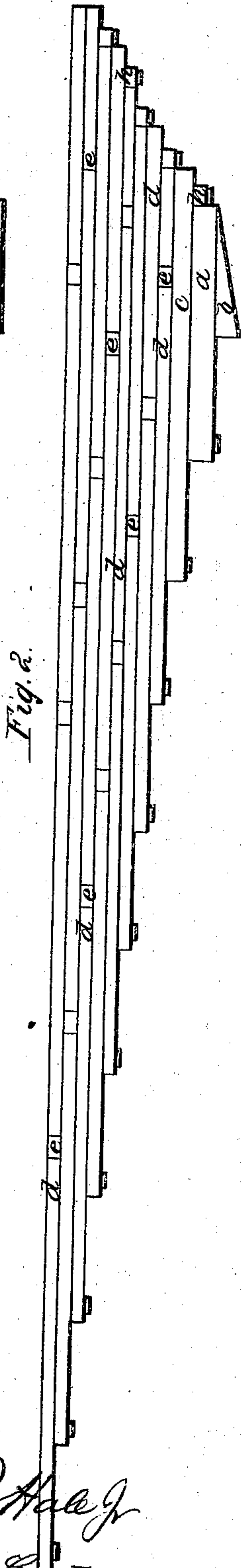


Fig. 3.

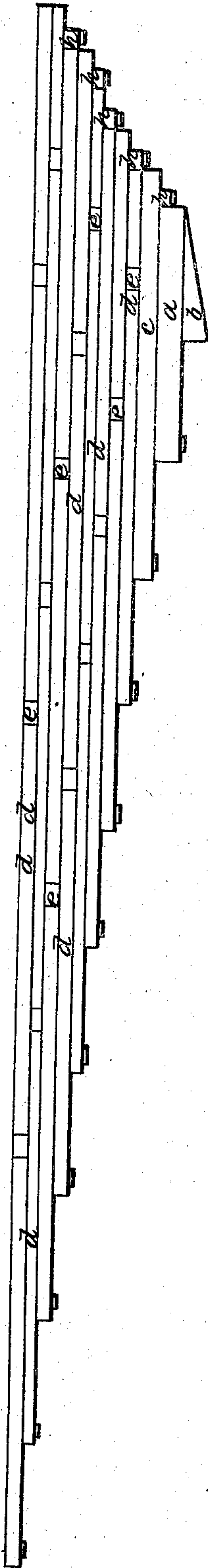


Fig. 4.

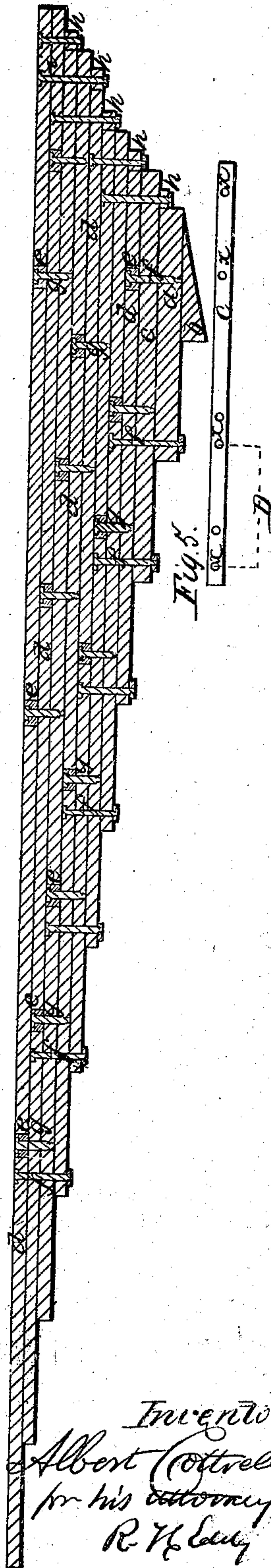


Fig. 5.



Inventor
Albert Cottrell
for his attorney
R. H. Seely

UNITED STATES PATENT OFFICE.

ALBERT COTTRELL, OF NEWPORT, RHODE ISLAND.

IMPROVEMENT IN BRIDGES.

Specification forming part of Letters Patent No. 43,099, dated June 14, 1864.

To all whom it may concern:

Be it known that I, ALBERT COTTRELL, of Newport, in the county of Newport and State of Rhode Island, have invented a new and useful Improvement in Forming or Constructing Wooden Viaducts or Bridges; and I do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a top view of one-half of a bridge-frame constructed in accordance with my invention. Fig. 2 is a side view thereof. Fig. 3 is a central and longitudinal section of it. Fig. 4 is a section taken longitudinally through one of the side beams or levers. Fig. 5 is a top view of one of the stretch or longitudinal timbers employed in making the side levers.

My invention is a peculiar combination and arrangement of bond timbers, counterbalance-weight supporters, screws, bolts, and stretchers of two side beams or levers, the whole constituting the half of a bridge-frame of the nature termed a "counterbalanced bridge." In constructing a bridge of this kind it is commenced on each abutment and built out and projected therefrom over the stream or river without the employment of any piers, or centering the portion projected over the river and beyond the abutment, being balanced or sustained by means of stones or heavy weights laid on a timber or part caused to project in rear of the abutment. As the two halves of the bridge approach each other they will curve more or less, and when completed may be connected over the middle of the stream and will present an arched form. By means of my invention viaducts or bridges of this nature and of very long spans can be constructed with great ease and safety, and with little cost, and when completed they possess much rigidity and strength.

I am aware that in its details of construction, when separately considered, my improved bridge does not possess novelty, but when considered collectively and in their arrangement and application its particular parts constitute a novel bridge-framing.

In my arrangement of the stretchers of my said bridge-frame I first determine the distance the inner lowermost stretcher of each range is to lap by that on which it rests. If we suppose, for instance, this overlap to be five feet, I usually make the length of each

stretcher equal to three and one-half (or about one-half) times such distance. In Fig. 5, D represents such distance, it being that at which each hole is to be bored through the stretcher is from the hole next to it. Four of such holes are next bored down through the stretcher, as shown at *x x x x*, each hole which is nearest to the end of the stretcher being situated at one-fourth, or about one-fourth of D from such end. Every one of the longitudinal timbers in each side lever should be made and bored alike.

In building the bridge-frame I usually commence by laying two supporting sills, *a a*, on the abutment *b*, (see Figs. 2, 3, and 4,) each of such sills being properly inclined to the horizon, and made to project beyond the abutment, as shown in such drawings. I next lay longitudinally upon each of such sills *a a* a stretcher, *c*, and lap it by the front end of the sill the distance D. Next I bolt each of such timbers or stretchers *c* down to its sill and cause it to lap over the rear end of the sill, as shown in the drawings. Next I lay on each timber *c* another stretcher, *d*, and lap it a distance, D, beyond the front end of the stretcher *c*. Against the rear ends of the stretchers *d d*, I lay transversely a bond timber, *e*. Afterward I continue to arrange the stretchers and bond timbers in manner as shown in the drawings, being careful to secure the inner end of each stretcher to three other stretchers immediately over it by means of an iron screw, *f*, or a screw-bolt. I also not only bolt each of the stretchers to one or more of those immediately beneath it, but I bolt each bond timber to one or more of the stretchers, the several screws and bolts being arranged as represented at *f f f f*, &c. *g g g g*, &c., in Fig. 4. The rear end of each course of stretchers extends beyond the rear end of that course on which it rests, and abuts against one of a series of cross-timbers, *h h h*, which I term "counterbalance-weight supporters," each of the latter being secured to four of the stretchers by two screw-bolts, one of which is shown at *i* in Fig. 4. It is on the series of timbers *h h* that the counterbalance stones or weights are to be laid as the building of the bridge may progress, the structure under such circumstances being erected both in front and rear of the abutment, as shown in the drawings.

The two halves of the bridge, being commenced on their respective abutments and afterward constructed so as to approach one another, may, when completed, be so lapped on and suitably connected to one another as to form a single structure, on which the floor-timbers and flooring for the bridge may be laid. More stretchers, if necessary, may afterward be laid on each side beam, and be connected together so as to constitute parapets for the bridge, and also add to the strength of the whole.

By building backward, or laying each course of stretchers and bond timbers backward toward the abutment, we are enabled to adjust the timbers together to better advantage than would be the case were we to pursue an opposite course. The heads of the screws and

the bolts of the front stretcher of each course of stretchers are covered by the stretchers which rest directly on them, each of such screws going through three stretchers, and not being put in place until the three stretchers are laid.

I claim—

The above-described combination and arrangement of the bond timbers, the balance-weight supporters, the screws, bolts, and stretchers of the two side beams or levers, the whole constituting the half of a bridge-frame of the character specified.

ALBERT COTTRELL.

Witnesses:

R. H. EDDY,
F. P. HALE, Jr.