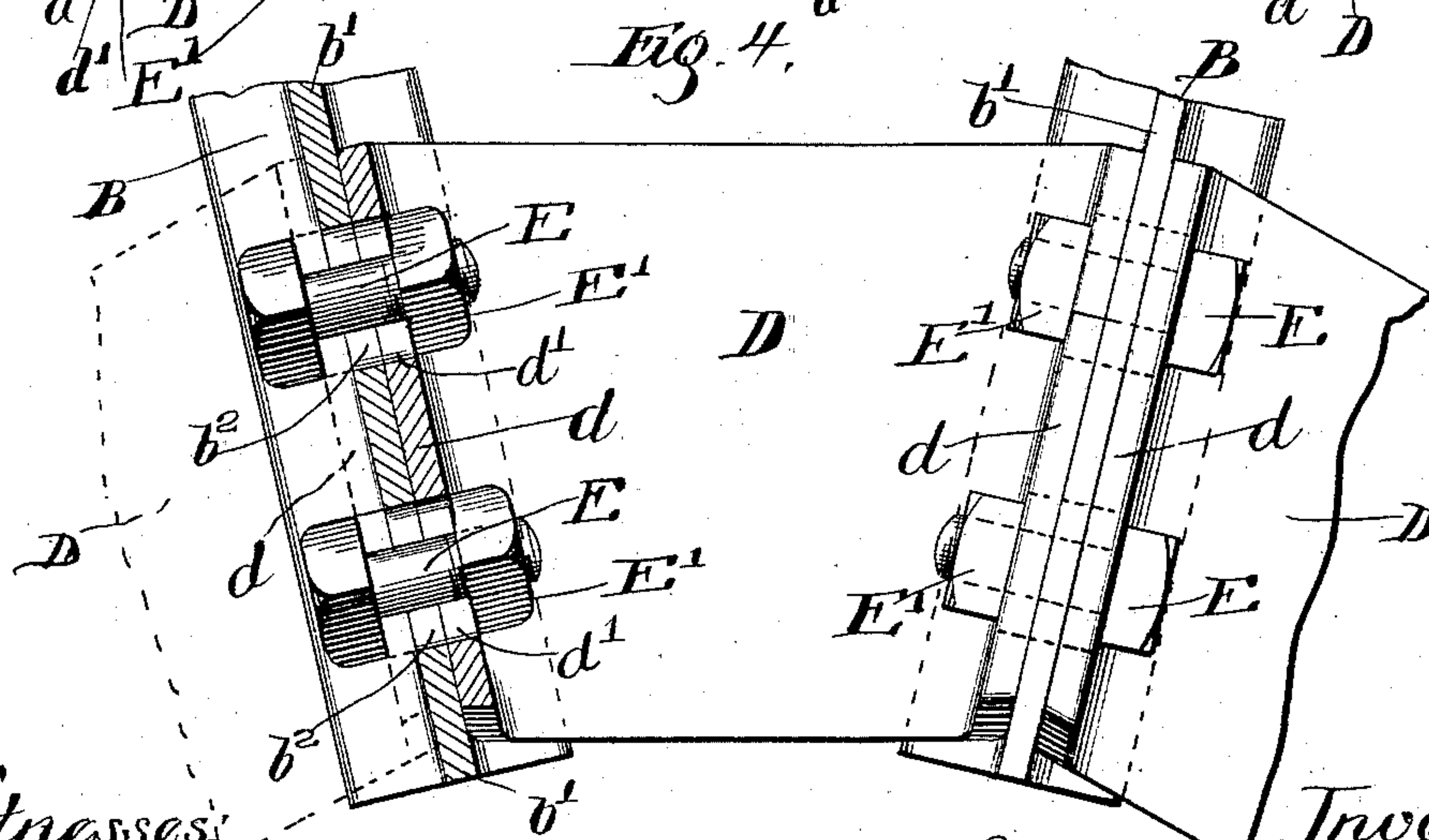
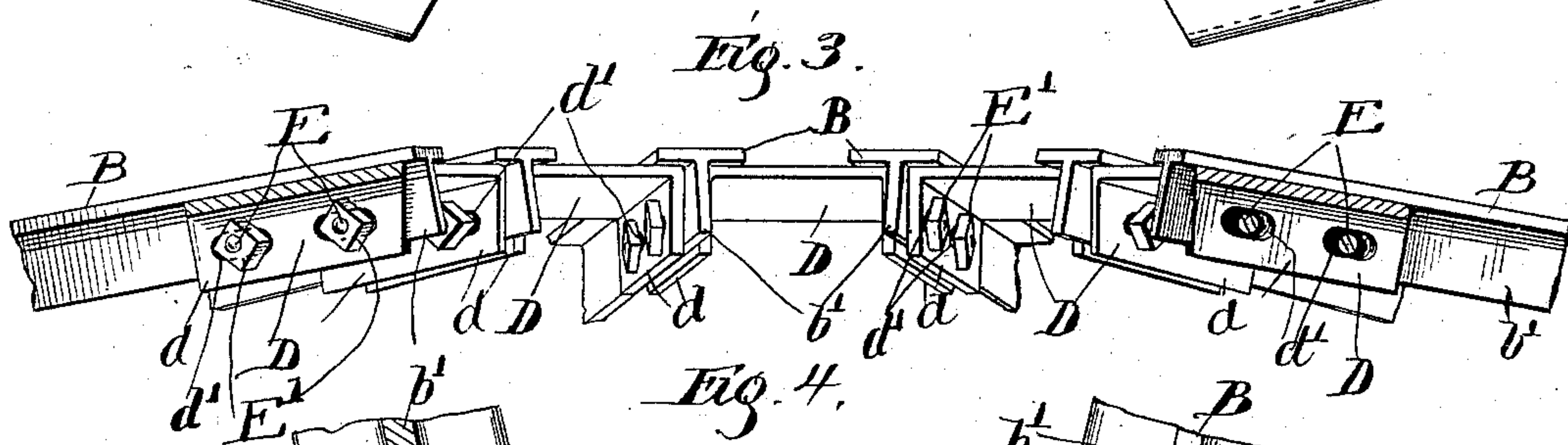
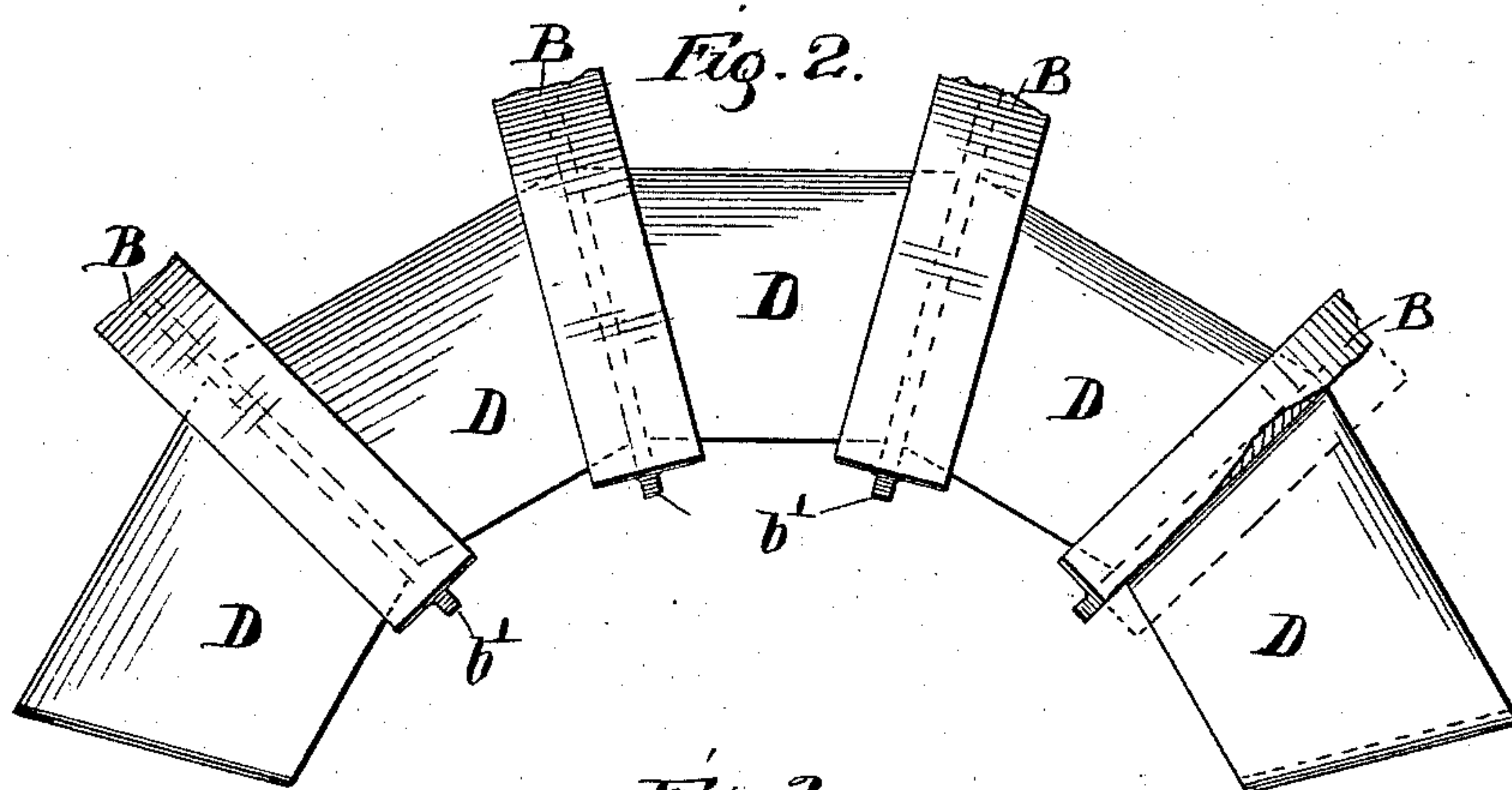
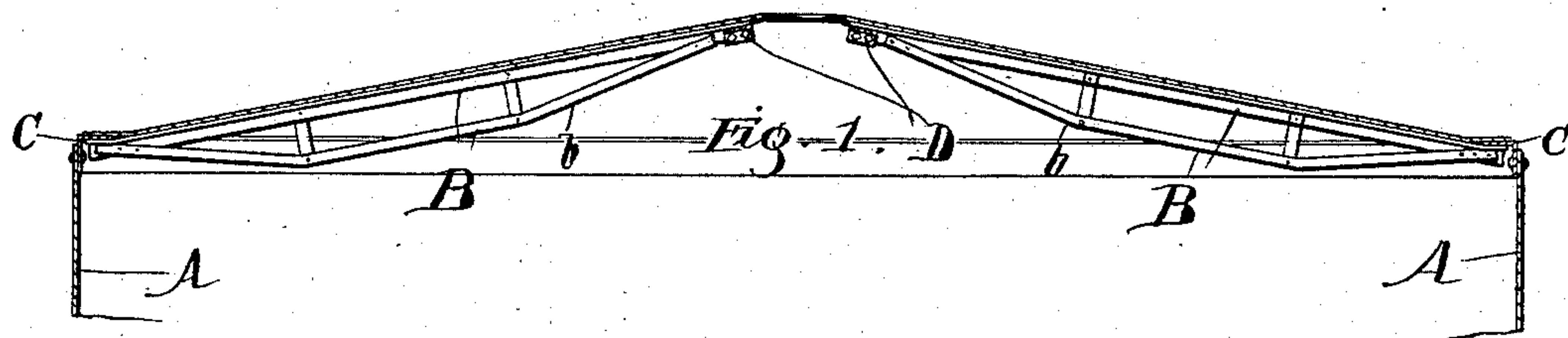


(No Model.)

W. GRAVER.
ROOF CONSTRUCTION.

No. 580,666.

Patented Apr. 13, 1897.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM GRAVER, OF CHICAGO, ILLINOIS.

ROOF CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 580,666, dated April 13, 1897.

Application filed January 27, 1897. Serial No. 620,984. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM GRAVER, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Roof Constructions, of which the following is a specification.

My invention relates to certain improvements in roof constructions designed especially for use in roofs which are conical or pyramidal, the purpose of the invention being to accomplish two main objects—first, to provide for a certain amount of adjustment in the height of the inner ends of the rafters, so as to make an absolute fit between the same and the roof thereon, and, second, to leave the extreme peak or center of the roof free for the location of a manhole. Incidental to these main objects it is of course desirable that the strength of materials be utilized most advantageously and the parts be made as light and cheap as possible.

My invention is illustrated in its preferred form by means of four figures in the accompanying drawings, of which—

Figure 1 is a central vertical section of a roof containing my invention. Fig. 2 is an enlarged top plan of a part of the central portion of the same. Fig. 3 is a diametrical vertical section through said central portion, and Fig. 4 is an under plan upon a still larger scale of a portion of Fig. 2.

In the drawings the sides of the structure upon which the roof is shown are lettered A, and said structure is a hollow cylinder, rafters B being supported at their outer ends upon the sides of the structure and extending upward and inward to the center of the same, where they are joined together. The rafters are suitably trussed, as seen at *b*, to stiffen them vertically, and the lateral thrust of the ends of the same is sustained by means of a circular angle-iron C. The rafters are preferably made of T-iron set with the flat side uppermost. They stop a trifle short of the extreme peak of the roof and are connected together by means of a series of plates D, each shaped like the frustum of a wedge or keystone and fitting between the upper and inner ends of the rafters. The edges of the plates are turned downward to form flanges

d, which rest against the depending flange *b'* of the T-iron rafters, and which contain a series of elongated holes *d'*. The rafters are themselves provided with corresponding holes *b*², and bolts E and nuts E' are used to clamp the flanges of the plates tightly upon the opposite sides of the rafter-flanges, the flat portions of the rafters preferably resting upon the top of the plates.

The plates and rafters when assembled and clamped together form a perfectly rigid arch about the peak of the roof and leave the center entirely free to be utilized as a manhole through which the interior of the structure may be reached for filling or other purposes.

The invention is made with particular reference to its use upon iron or steel storage-tanks, and in such structures it is of considerable importance that there be means for adjusting the rafters to a certain extent. Both the rafters and the steel roof are completed in the shop and not put together until upon the ground where the tank is to stand. The slightest error or inaccuracy in cutting the roof or the rafters becomes a serious difficulty when the same are put together if no means of adjustment are provided. When the rafters are united at the center by means of the plates D, they may be either raised or lowered by loosening the bolts and allowing them to slip in the slots in both rafters and plates, so that with my construction the sheet-metal roof may be placed upon the rafters and then the latter raised or lowered to fit the roof, after which the whole structure may be made absolutely rigid by tightening up the bolts E.

There are numerous other advantages in the way of strength, cheapness, and lightness which it is thought not necessary to explain at length.

It is possible to vary the form of the invention to a considerable extent, and I desire, therefore, not to limit myself to the specific construction illustrated and described.

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

1. The combination in a roof of the class described and with a series of rafters radiating outward and downward from the center, of a series of keystone-shaped plates arranged

between the rafters in a circle about the center and secured to said rafters; substantially as described.

2. The combination with a series of rafters radiating downward, of a series of keystone-shaped plates arranged between the rafters in a circle about the center and secured to said rafters by devices adjustable longitudinally thereof; substantially as described.

3. The combination with a series of rafters radiating downwardly from a center, of a series of keystone-shaped plates slotted longitudinally of the rafters and bolts securing the plates and the rafters together and adjustable longitudinally in the slots; substantially as described.

4. The combination of a series of rafters radiating downwardly from a center and having vertical flanges provided with slots near their upper ends, a series of keystone-shaped plates provided with corresponding slots and bolts extending through said slots and clamping the plates and rafters together; substantially as described.

5. The combination with a series of rafters radiating from a center and inclined downward and away from said center, of a series of keystone-shaped plates having vertical slotted flanges and bolts extending through the slots in said flanges and clamping the latter to the rafters; substantially as described.

6. The combination with a series of rafters extending upward and toward a common center and having vertical flanges slotted near the top, of a series of keystone-shaped plates arranged between the rafters and in a circle about their common center, said plates having vertical flanges along their edges slotted to correspond with the slots in the rafters and bolts extending through said slots and clamping the plates and rafters together; substantially as described.

7. The combination with a series of T iron or steel rafters extending upward and inward toward a common center and having slots in the upper portions of their vertical flanges, of a series of keystone-shaped plates about the center and between the rafters, said plates having vertical flanges along their edges slotted to correspond with the slots in the rafters and bolts extending through the slots and clamping the plates and rafters together; substantially as described.

In witness whereof I have hereunto set my hand, at Chicago, in the county of Cook and State of Illinois, this 21st day of January, A. D. 1897.

WILLIAM GRAVER.

Witnesses:

JAMES P. GRAVER,

CHARLES O. SHERVEY.