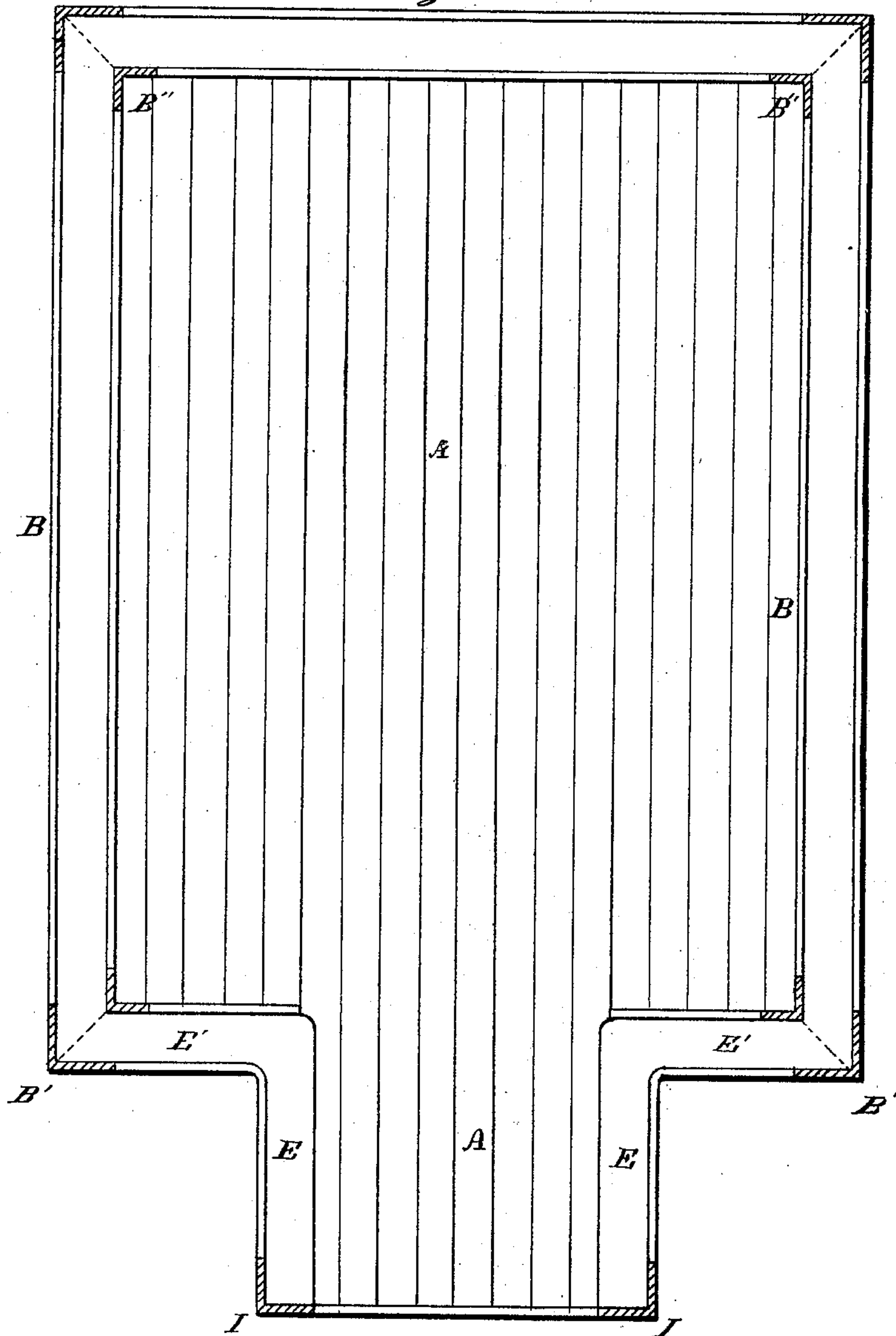


C. O. YALE.  
BURGLAR-PROOF VAULT.

No. 169,938.

Patented Nov. 16, 1875.

*Fig. 1.*



*Witnesses.*

*John Birch*

*W. Munch*

*Chas. O. Yale*

*by Charles H. Smith*

*Atty.*

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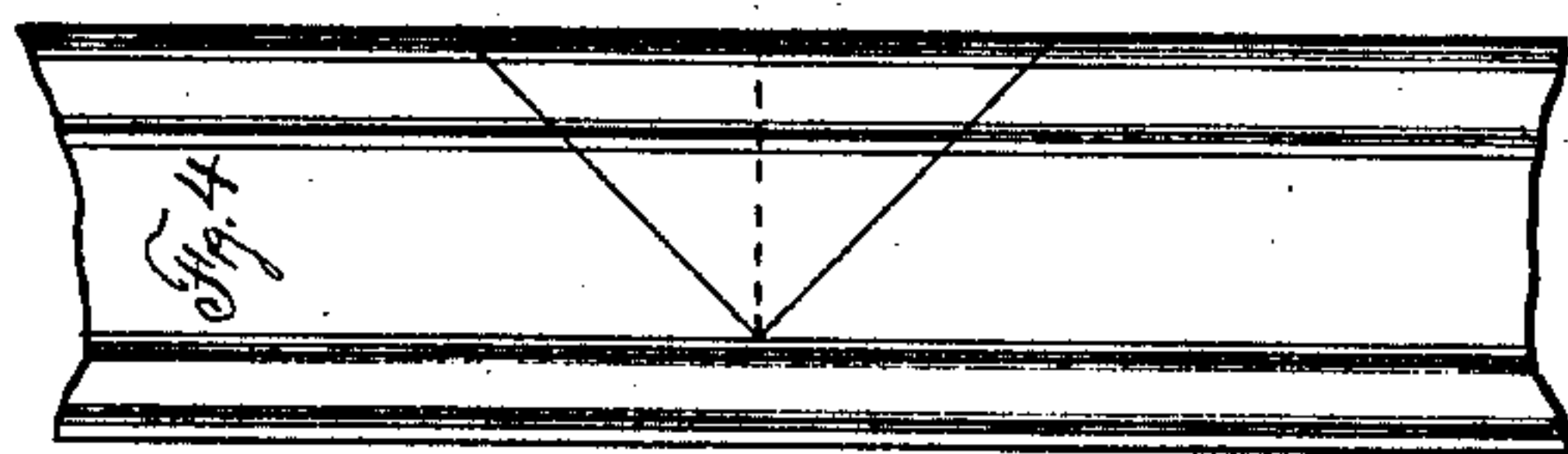
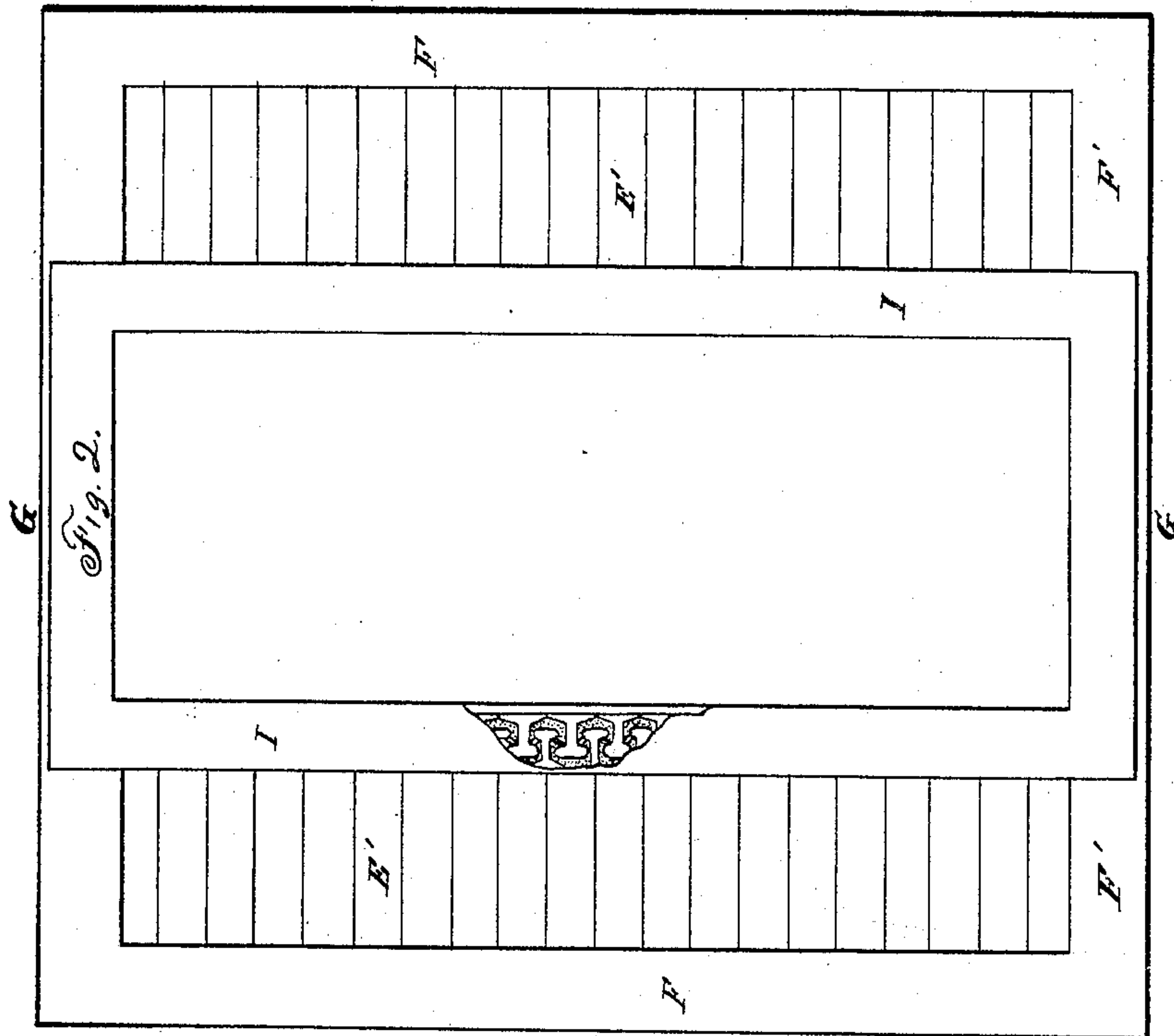
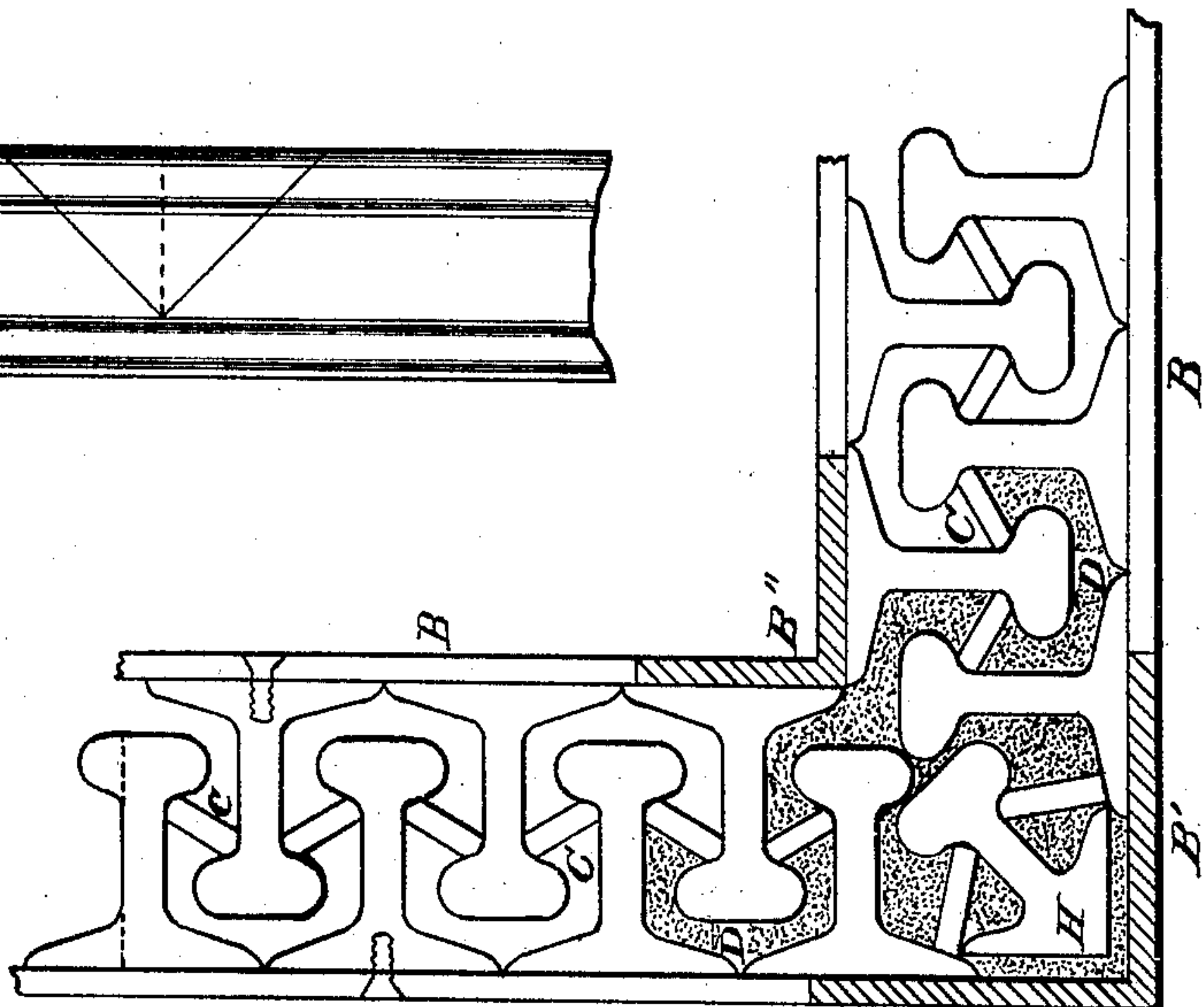


Fig. 3.



Witnesses  
John Birch  
W. Munchie.

Chas. O. Yale  
by Carle H. Smith  
att'y



# UNITED STATES PATENT OFFICE

CHARLES O. YALE, OF NEW YORK, N. Y.

## IMPROVEMENT IN BURGLAR-PROOF VAULTS.

Specification forming part of Letters Patent No. **169,938**, dated November 16, 1875; application filed July 21, 1875.

### CASE D.

*To all whom it may concern:*

Be it known that I, CHARLES O. YALE, of the city, county, and State of New York, have invented, made, and applied to use certain Improvements in Burglar-Proof Vaults, whereof the following is a specification:

The improvements relate to such vaults wherein railroad T-rails are used for the walls, floor, and roof, or as a lining within a surrounding structure of masonry.

Referring to the annexed drawing of a vault embodying my invention, Figure 1 is a plan, showing the floor or ceiling and boundaries of the walls. Fig. 2 is a front elevation, showing the front walls of the vault and the entrance to the vestibule. Fig. 3 is a section of the wall and floor enlarged. Fig. 4 shows the mode of preparing the rails for bending.

A suitable foundation of masonry is first prepared, and on this is laid, preferably in cement or mortar, the floor A of railroad or I rails, and upon that the first course of rails for the walls. The rails are placed with the feet or base outward, and the heads or tread inward, and interlocked or dovetailed with each other within the walls, floor, or ceiling, and the outer or exposed portions present plane surfaces. As the rails are placed in position they are secured by suitable sustaining-irons, which are screwed fast to the flat bases of the rails. At the corners of the structure the meeting ends of the rails are joined by mitering, and the sustaining-irons applied at those and other corners are of angle iron or steel, embracing and protecting the goings of the rails both at the horizontal and vertical corners. Where the angle-iron frame is turned around a corner, one side or edge is cut out V-shaped at the turning-point, and, after being bent at that point, the lapping portions of the adjacent sides of the V are welded together. Solid angle-iron frames are thus formed, extending entirely around the structure at different parts thereof, strengthening the corners, and protecting the seams thereat, and imparting stability to the whole. Other supports of flat bars may also be applied midway between the corners.

The inner and outer sustaining-frames are usually prepared with perforations for receiving fastening-screws, and set up in pairs before beginning to place the rails, which are then inserted between the inner and outer frames B' and B'', and secured thereto by screws or otherwise.

The walls, floor, and ceiling or roof composed of railroad-rails thus combined with angle-iron frames are very strong. The force of blows delivered with a sledge-hammer by manual power make no impression upon it, and the irregular surfaces, due to the shape of the rails as they are dovetailed together, are unfavorable to any operation of drilling.

For the purpose of mutually bracing the I-rails, and strengthening the walls, &c., hard iron or steel bracing-strips C (shown in cross-section in Fig. 3) are introduced between the rails as they are placed side to side; and for the best effect said strips are arranged obliquely from head to head of the rails in the opposite courses thereof, and a drill, if penetrating the wall, would, on reaching them, be deflected. The inner spaces or interstices between the rails not otherwise occupied are filled with a grouting, D, such as cement and sand, or granulated emery or flint. The effect of this is to solidify the wall, and more thoroughly interlock or dovetail the rails together therein. It also adapts the wall the better to resist any drilling operation. The rails of the outer course cannot be extricated from the inner course, because the heads exceed in width the spaces between them when the rails are laid with their bases contiguous.

A very strong and durable wall may be made with the I-rails and sustaining-frames with the grouting, without the bracing-strips, or with the bracing-strips, omitting the grouting.

The walls E of the vestibule are formed by the rails E' of the front walls of the vault being inserted and firmly secured in the sustaining-irons at the front corners of the vault, and the junction of the vault with the vestibule is bent at right angles, forming rectangular walls, with corners at the point of continuous



rails dovetailed or interlocked with each other. The rails for said junction are prepared for bending by cutting out the head and entire web at the point of bending, as shown in full lines in Fig. 4, for the inner rails, and by forming a slit in the same place, as shown by dotted lines in that figure, in the case of the outer rails, the base remaining whole in both instances. The floor and ceiling of the vestibule are formed by extending the rails of the ceiling and floor of the vault, and the central portion of the vertical web or leaf of the outer leaf-angle  $F'$  at the front horizontal corners of the vault is removed to make room therefor; but the horizontal portion or leaf of such angle-iron is left whole, and runs from one outer corner to the other. An angle-iron frame,  $I$ , is also secured upon the front face of the vestibule-wall, covering the ends of the rails.

The depth of the vestibule may be taken as representing the thickness of the masonry with which the vaults would usually be surrounded.

Where it is necessary to use part only of the width of the rail, as in finishing off, one side of the base and head is removed, leaving the other side and the full web, as shown by dotted lines in Fig. 3, and where required in forming a horizontal corner, the two feet of the base are bent over at acute angles to the web, as shown at  $H$  in Fig. 3.

A fire-proof filling may sometimes be used

in place of, or in combination with, the grouting I have described.

I claim as my invention—

1. A burglar-proof vault having the walls, ceiling, and floor of railroad or **T** rails, interlocked with each other, as described, combined with a frame-work of angle-iron.

2. The combination, with such wall, ceiling, or floor of interlocked railroad or **T** rails, of inner bracing-strips, inserted between the rails.

3. In a combination of the **T**-rails and bracing-strips, the arrangement of such braces obliquely from rail to rail.

4. A wall for burglar-proof vaults, composed of interlocked railroad-rails, having the interstices between the rails filled with grouting, such as cement, sand, emery, &c., for the purposes specified.

5. In combination, the interlocked rails, the inside bracing-strips between them, and the angle-iron frame-work.

6. In a vault having walls composed wholly or in part of railway **T**-rails, the vestibule having the walls, ceiling or roof, and the floor, one or either, formed in one with the rails of the vault, substantially as described.

CHAS. O. YALE.

Witnesses:

EARLE H. SMITH,  
WILLIAM MUNCH.