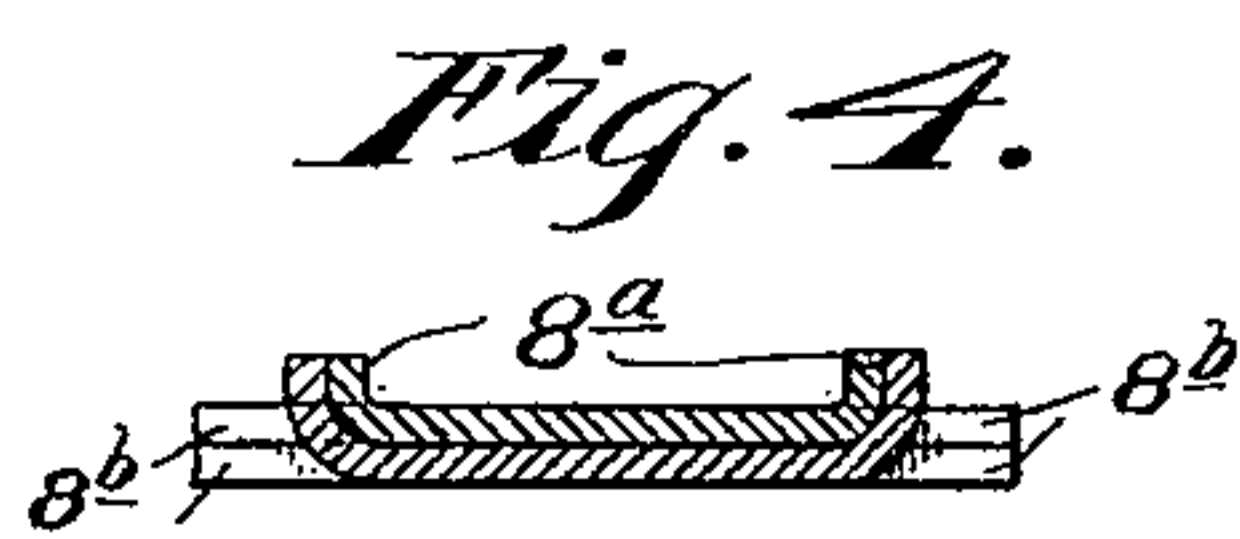
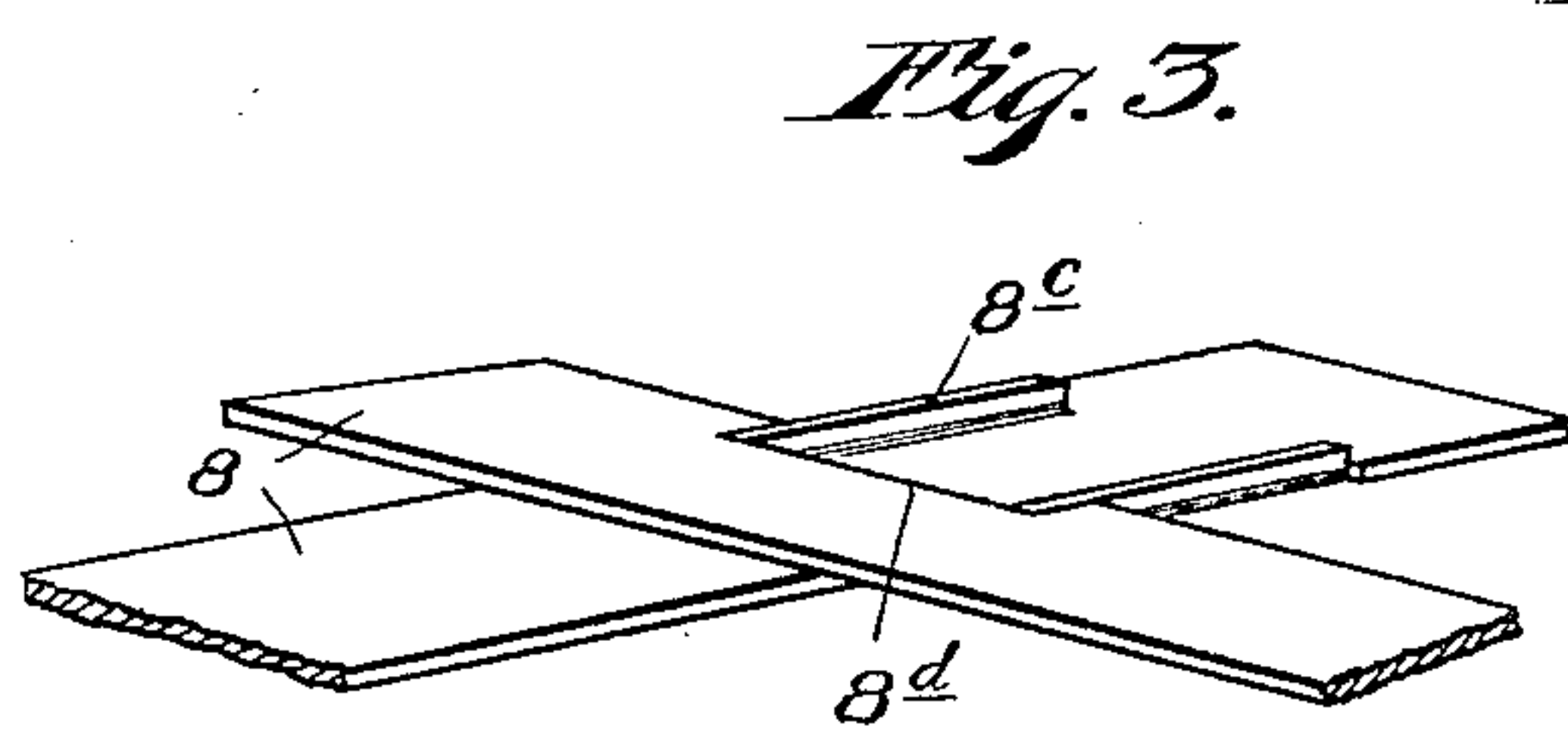
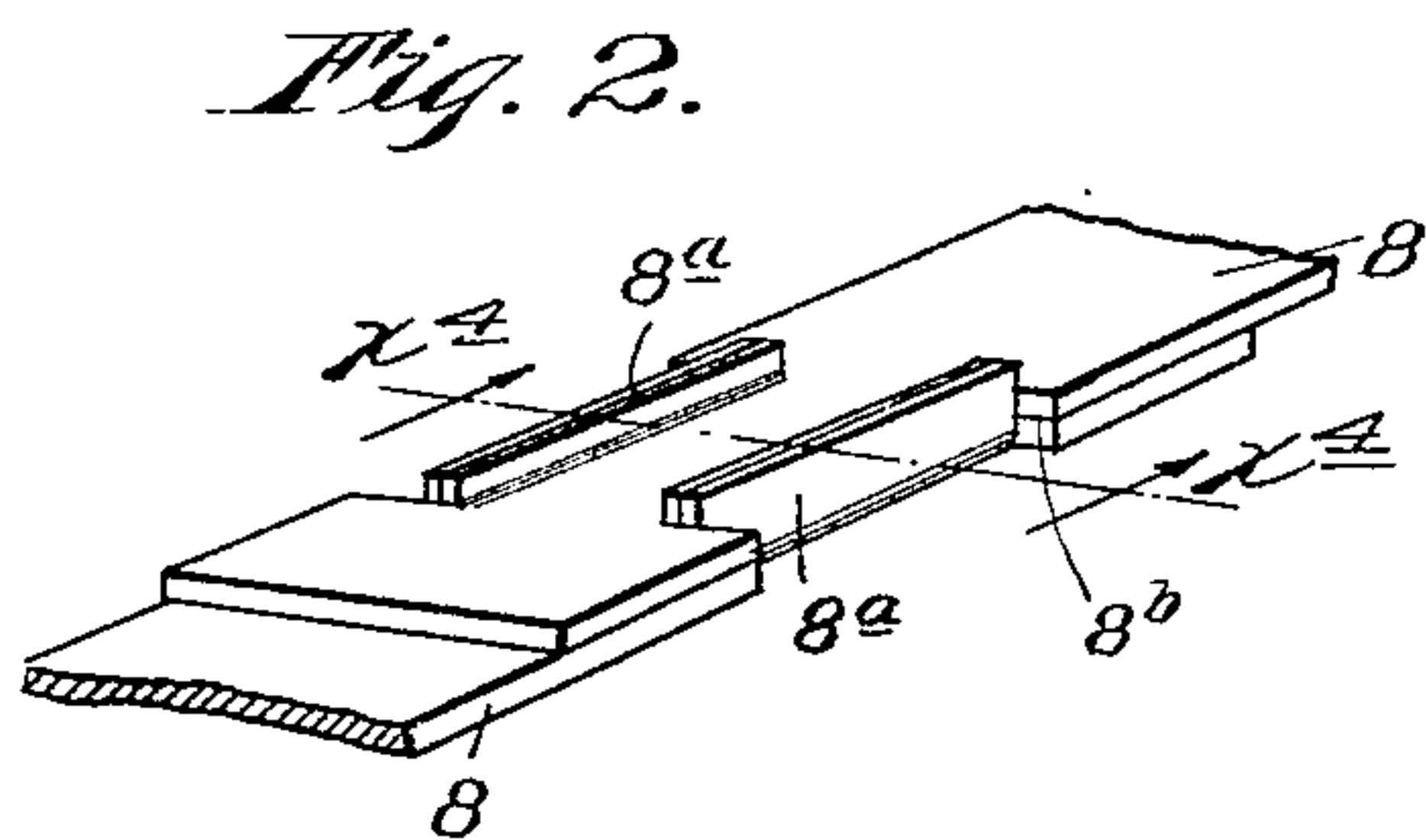
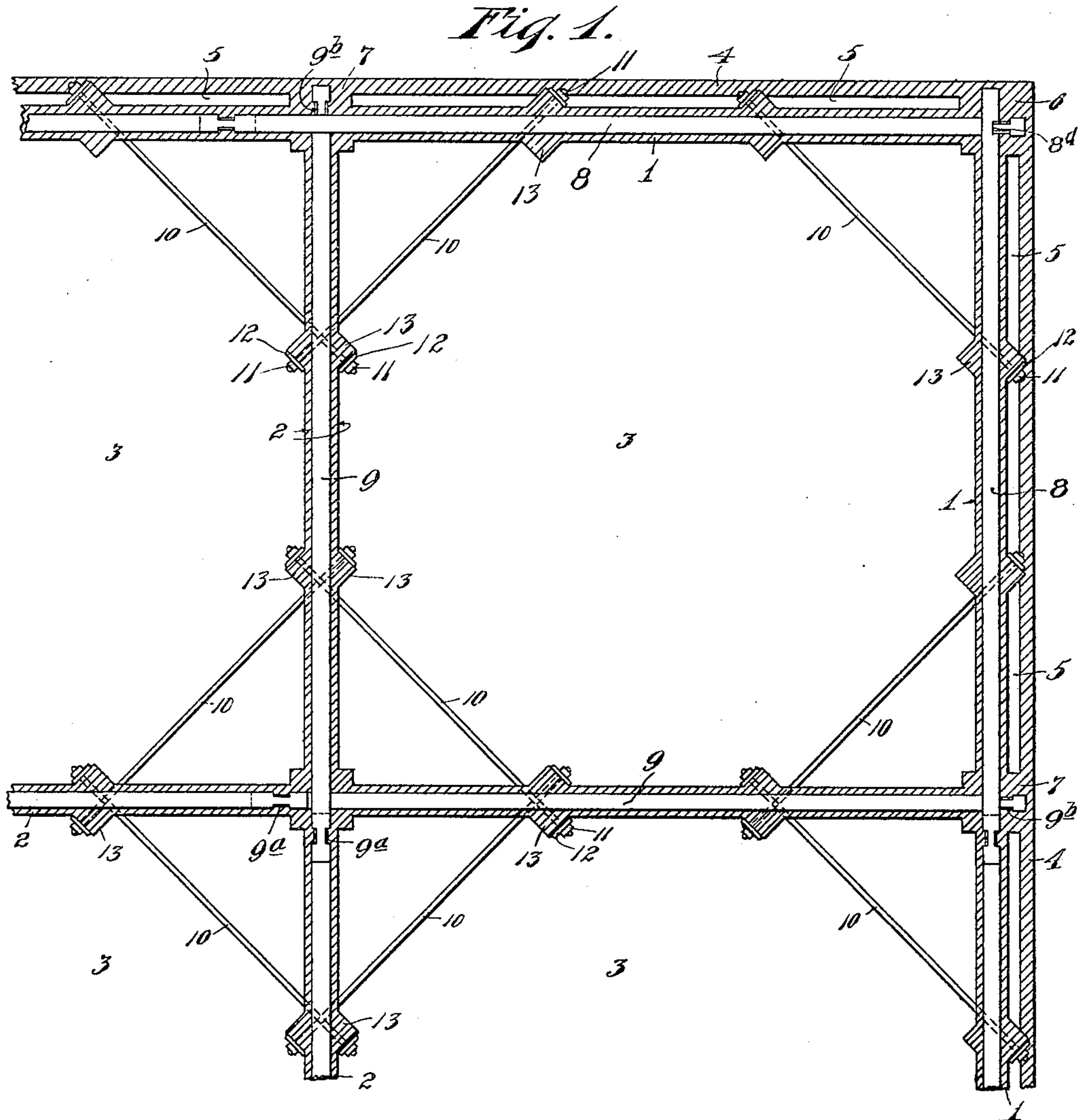


No. 795,344.

PATENTED JULY 25, 1905.

F. W. COOLEY.  
FIREPROOF STRUCTURE.  
APPLICATION FILED DEC. 13, 1904.



Witnesses:  
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Inventor:  
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By his Attorneys.

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# UNITED STATES PATENT OFFICE.

FRED W. COOLEY, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR OF TWO-THIRDS TO GEORGE T. HONSTAIN, OF MINNEAPOLIS, MINNESOTA.

## FIREPROOF STRUCTURE.

No. 795,344.

Specification of Letters Patent.

Patented July 25, 1905.

Application filed December 13, 1904. Serial No. 236,659.

*To all whom it may concern:*

Be it known that I, FRED W. COOLEY, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Fireproof Structures; and I 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.

My present invention relates to fireproof buildings, and more especially to grain-storage elevators having rectangular or square bins, and has for its object to improve the same in the several particulars hereinafter noted.

The invention consists in the novel devices and combinations of devices hereinafter described, and defined in the claims.

In the accompanying drawings, which illustrate my invention, like characters indicate like parts throughout the several views.

Figure 1 is a horizontal section taken through a portion of a grain-storage structure made up of a plurality of rectangular or square bins. Figs. 2 and 3 are detail views in perspective illustrating the manner of connecting the metallic tension-bars of the structure, and Fig. 4 is a section on the line  $x-x$  of Fig. 2.

The numeral 1 indicates the outer walls, and the numeral 2 the inner walls, of the structure, which walls are disposed so as to form a plurality of rectangular or square bins 3. The walls 1 and 2 are, as shown, constructed of concrete, but in some instances they will be constructed of brick or tile. The outer walls 1 are preferably formed with outer portions 4, that are spaced laterally outward therefrom, so as to leave air gaps or spaces 5. The walls 1 and their supplemental sections 4 are at the corners of the structure integrally or rigidly united at 6 and at their intermediate portions in line with the abutting walls 2 they are rigidly or integrally united at 7.

The walls 1 are reinforced by horizontally-extended metallic tension-bars 8, and the walls 2 in a similar manner are reinforced by horizontally-extended metallic tension-bars 9. These reinforcing-bars 8 and 9 are overlapped in rectangular arrangement and are embedded in the walls at intervals of its height, depending on the lateral strain which the bins are con-

structed to withstand. The said series of tension-bars would be placed closer together in a vertical direction at the lower portion of the bin than at the top thereof. The aligned bars 8 overlap at their adjacent ends and are interlocked by upturned inwardly-bent lock-flanges 8<sup>a</sup> of the under bar which engage with notches 8<sup>b</sup> of the upper bar, as best shown in Fig. 2. The lock-flanges 8<sup>a</sup> are formed by slitting the edges of the bar 8 and turning up the intervening portions, while the lock-notches 8<sup>b</sup> are formed in a similar manner, but by cutting deeper into the edges of the said bar. The adjacent ends of the tension-bars 9 are overlapped and are interlocked in the same way as the said bars 8 by means of lock-flanges 9<sup>a</sup> on the lower bars, which engage the lock-notches of the upper bars. The end members of the tension-bars 9 transversely overlap the tension-bars 8 and are provided with upturned locking-flanges 9<sup>b</sup>, that engage the outer edges of said bars 8. At the corners of the building the tension-bars 8 are overlapped and are interlocked by the engagement of upturned flanges 8<sup>c</sup>, that engage with notches 8<sup>d</sup>, the said flanges 8<sup>c</sup>, as shown, being formed by slitting upturning portions of the under bar 8 and the notches 8<sup>d</sup> being formed in the overlying bar 8, as best shown in Fig. 3.

Trussed rods 10 are passed diagonally through the corners of the several bins at approximately forty-five degrees to the sides thereof and at their outer ends they are provided with nuts 11 and preferably, also, with washers 12. The walls 1 and 2 are formed with angular abutments 13, through which the bolts or rods are passed and against which the washers 12 are clamped. The outwardly-projecting portions of the abutments 13 of the walls 1 project into the air-spaces 5, but are covered by the supplemental outer walls 4. The truss-rods 10 are arranged in horizontal planes, and preferably there is one set of the rods (illustrated in Fig. 1) for each horizontal set or series of reinforcing-bars 8 9. The ends of the rods 10 are passed through the respective walls of the bins as closely as possible or practicable to the said reinforcing-bars, so that the strain of the former will be transmitted to the latter and the said tension-bars be caused to serve as reinforcements to their abutments.

By the construction described the walls of the rectangular bin are made very rigid against



bulging strains, and at the same time all of the advantages of rectangular bins are maintained. By reference to Fig. 1 it will be noted that each wall of a particular bin is divided into three spans of substantially equal length and that each span is provided with independent supports, which very greatly reinforce the continuous wall.

From what has been said it will be understood that the structure described is capable of modification within the scope of my invention as herein set forth and claimed.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In a fireproof building having angular compartments, reinforcing-bars embedded in the walls thereof and interlocked with each other, and truss-rods extended diagonally through the walls of the compartments and anchored thereto in the vicinity of said tension-bars, substantially as described.

2. In a fireproof building having angular bins, horizontally-extended transversely-intersecting tension-bars 8 and 9, interlocked with each other by upturned lock-flanges, substantially as described.

3. The combination with a fireproof wall,

of tension-bars embedded therein, and formed in sections that are overlapped at their ends, and formed with cooperating upset lock-flanges 8<sup>a</sup> and lock-notches 8<sup>b</sup>, substantially as described.

4. The combination with walls 1 and 2, of the tension-bars 8 and 9, respectively, embedded therein, said bars 8 having the cooperating lock-flanges 8<sup>a</sup> and lock-notches 8<sup>b</sup> at their overlapped ends, and said bars 9 having their overlapped ends united by lock-flanges 9<sup>a</sup> and cooperating lock-notches, the end members of said bars 9 lapping certain of said bars 8, and having lock-flanges engageable therewith, and the end members of said bars 8 being overlapped and interlocked by lock flanges and notches, and truss-rods 10 passed diagonally through said walls 1 and 2, and anchored thereto in the vicinity of said tension-bars, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

FRED W. COOLEY.

Witnesses:

STEPHEN MAHONY,  
F. D. MERCHANT.