No. 683,442. Patented Oct. 1, 1901.

F. W. COOLEY.

FIREPROOF GRAIN ELEVATOR.

(Application filed Mar. 11, 1901.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1.

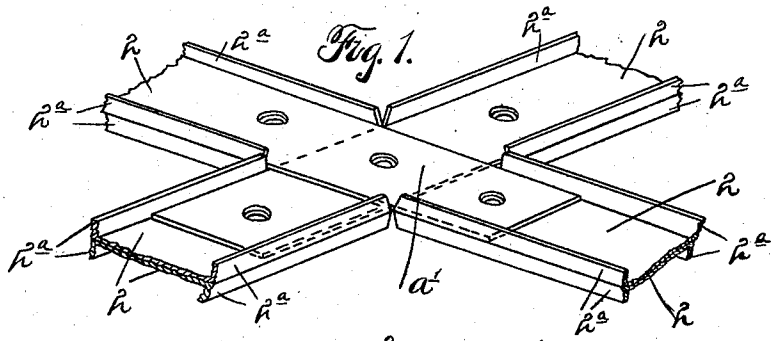


Fig. 2.

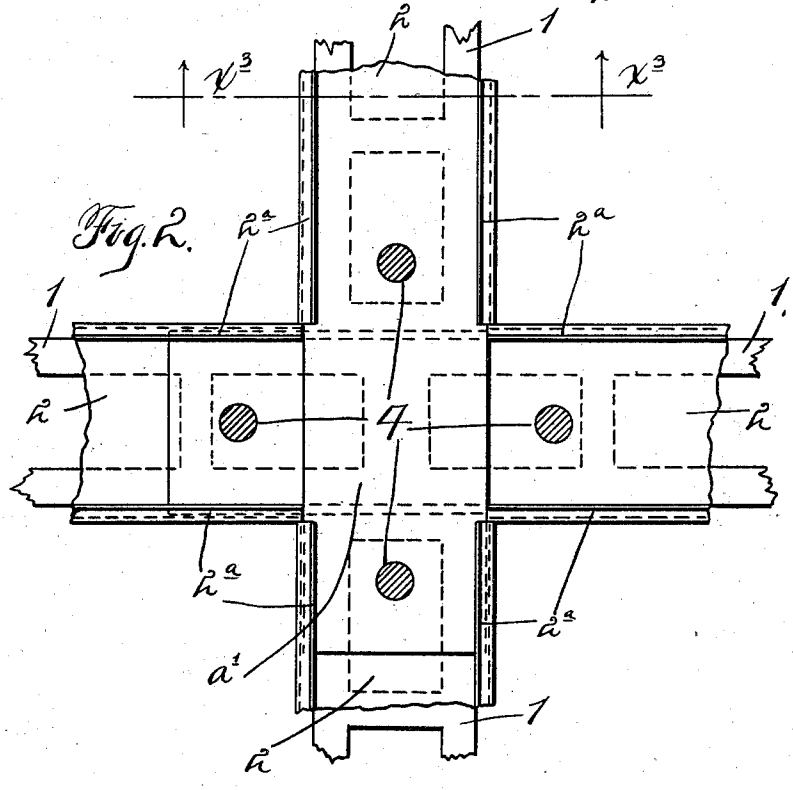
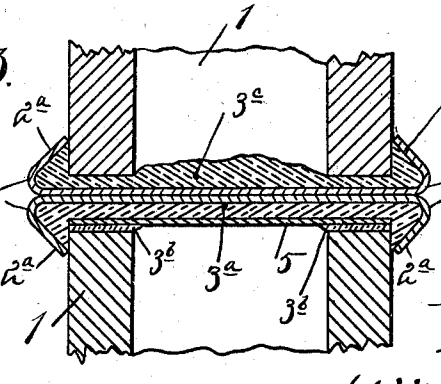


Fig. 3.



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Fig. 4

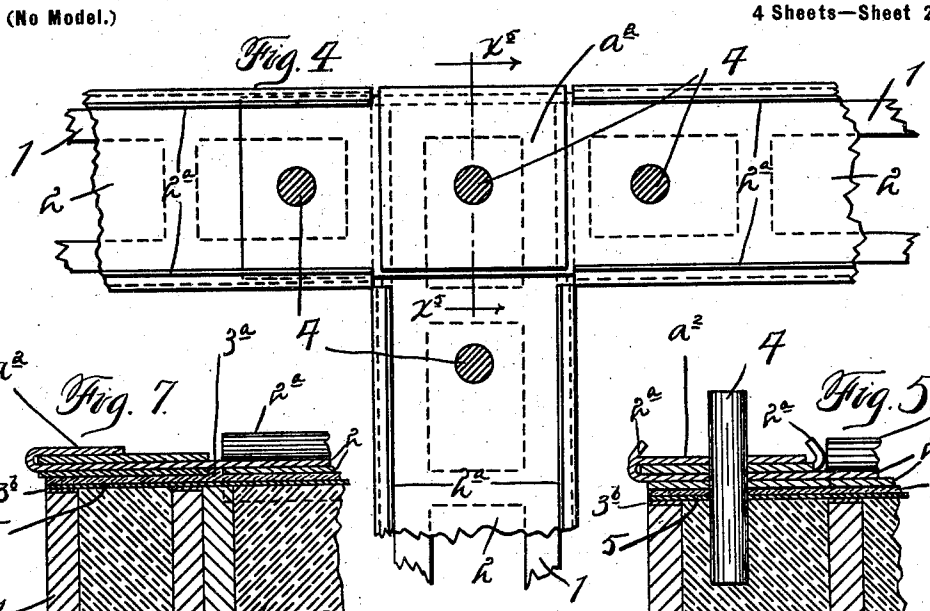


Fig. 7

Fig. 5

Fig. 6

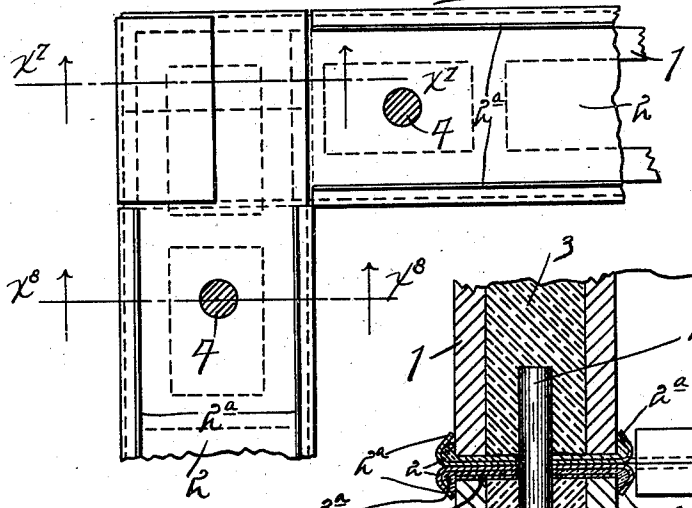
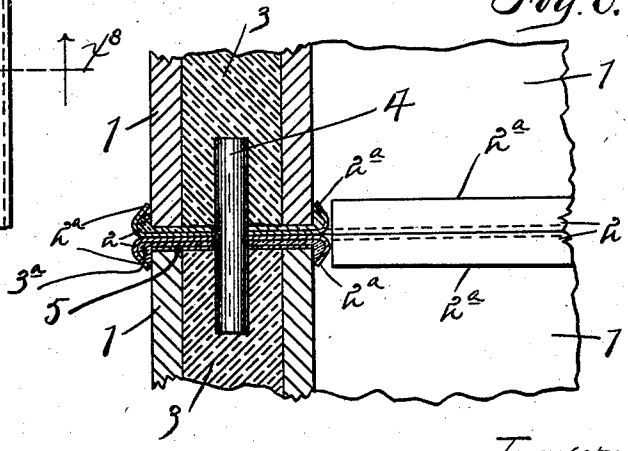


Fig. 8



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Fig. 9.

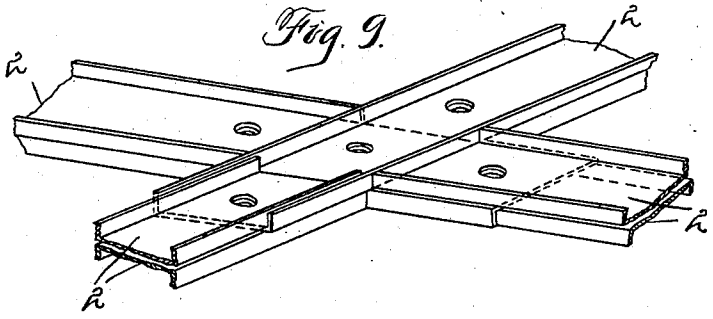


Fig. 10.

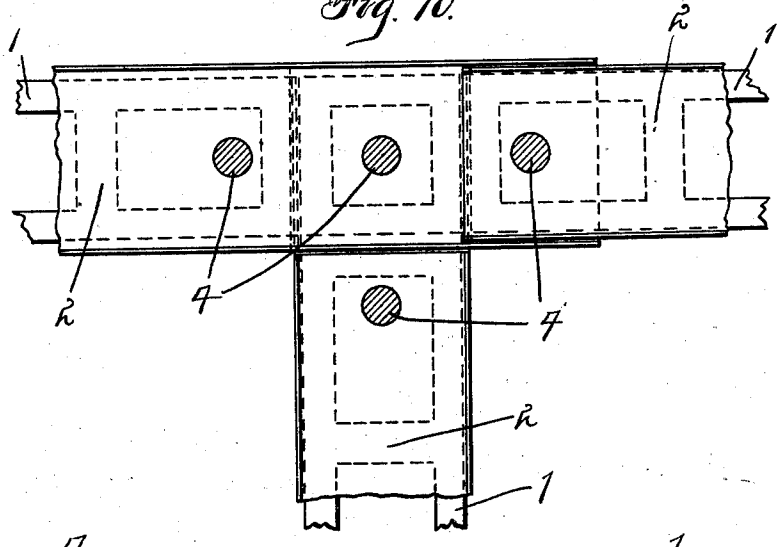
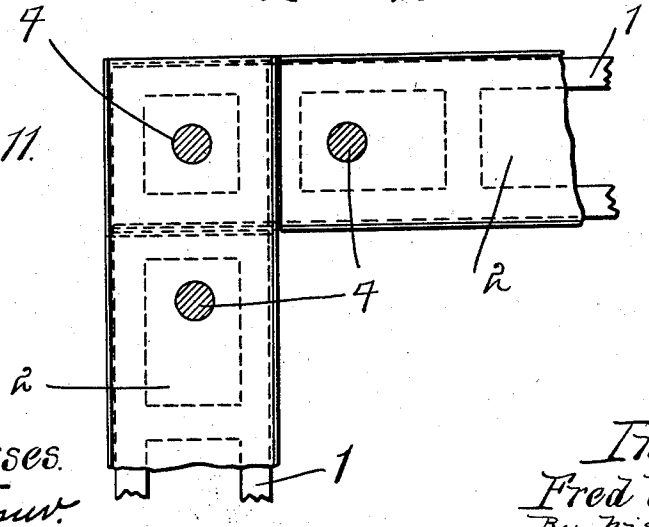


Fig. 11.



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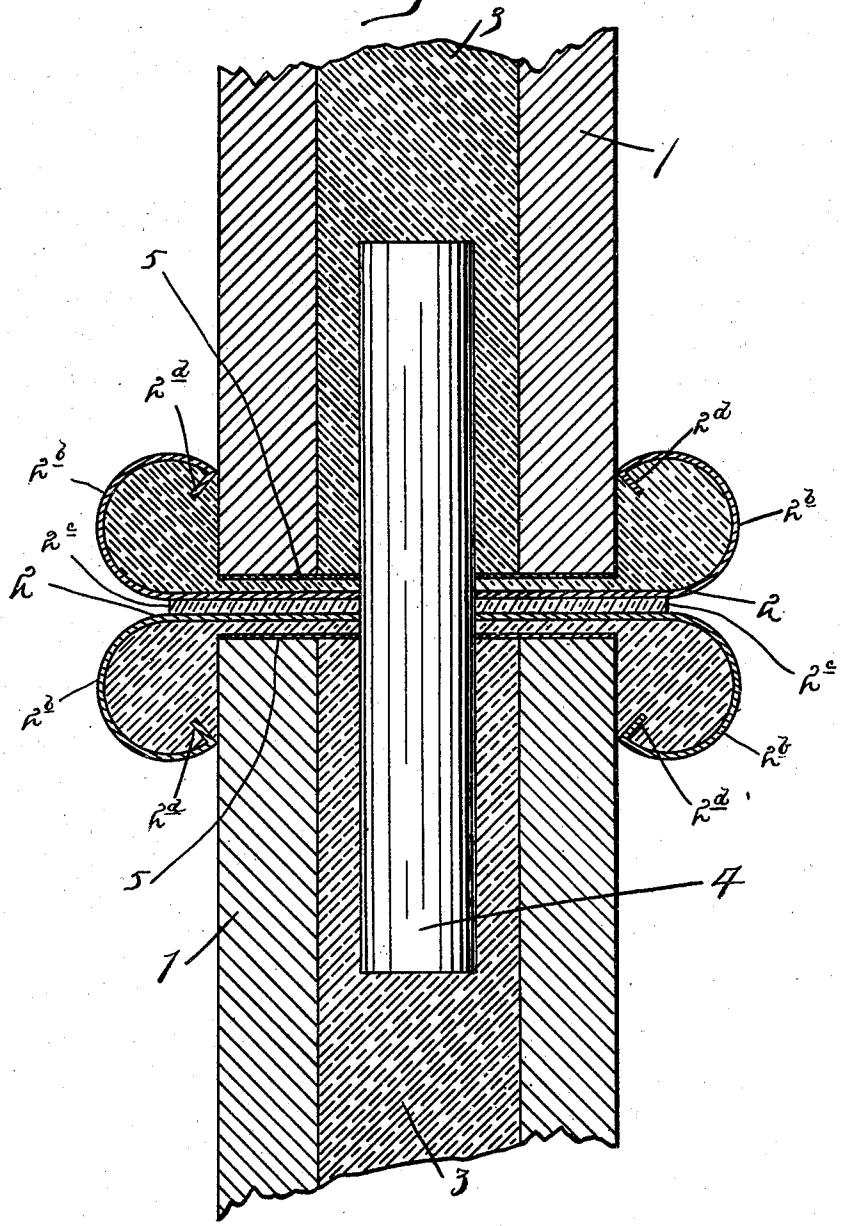
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Fig. 12.



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UNITED STATES PATENT OFFICE.

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

FIREPROOF GRAIN-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 683,442, dated October 1, 1901.

Application filed March 11, 1901. Serial No. 50,557. (No model.)

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 Grain-Elevators; 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 the construction of elevators or grain-storage buildings and bins, and is in the nature of an improvement on certain of the features of construction set forth in my prior application, Serial No. 47,541, filed February 16, 1901, entitled "Fireproof grain-elevators."

The invention is illustrated in the accompanying drawings; and it consists of the novel devices and combination of devices hereinafter described, and defined in the claims.

This invention has for its principal objects, first, to provide a firmer connection between the so-called "I-beams" and the tile-blocks, and, second, to improve the construction of the joints or connections between the abutting or overlapping beams.

In the drawings like characters indicate like parts throughout the several views.

Figure 1 is a perspective view with parts broken away, showing the manner in which the I-beams are connected at the corner formed by four connected bins. Fig. 2 is a plan view of the same construction as that shown in Fig. 1, but showing tile-blocks in working position. Fig. 3 is a transverse vertical section on the line x^3 x^3 of Fig. 2. Fig. 4 is a plan view illustrating the manner in which the I-beams are connected at the junction of two abutting bins. Fig. 5 is a vertical section on the line x^5 x^5 of Fig. 4. Fig. 6 is a plan view illustrating the manner in which the I-beams are connected at the exposed corner of a bin. Fig. 7 is a vertical section on the line x^7 x^7 of Fig. 6. Fig. 8 is a vertical section on the line x^8 x^8 of Fig. 6. Fig. 9 is a view corresponding to Fig. 1, but illustrating a slightly-modified construction. Fig. 10 is a plan view corresponding to Fig. 4, but illustrating a slightly-modified construction. Fig. 11 is a view corresponding to Fig. 6, but illustrating a somewhat-modified construction; and Fig. 12 is a view corresponding to Fig. 8, but illustrating a slightly-modified construction.

In my present invention, as in my identified prior application, the bins are of rectangular form and are made up of layers of tiling, between which horizontally-extended I-beams are placed to hold the said blocks in position and to strengthen the structure. Also these so-called "I-beams" are perferably formed by channel-beams placed back to back and secured in any of a great many different ways.

In my present construction as an improvement over the construction of said earlier application the flanges of the I-beams are bent or turned inward, so as to afford a dovetailed channel or groove. The edges of the tile-blocks being placed in these dovetailed grooves and the said grooves being filled with cement there is formed when the cement hardens a dovetailed connection or joint between the I-beams and the said tile-blocks. In this way the component parts of the bins are more securely bound together.

In the drawings the tile-blocks are indicated by the numeral 1, while the I-beams, which are made up of channel-beams 2, placed back to back, are provided with inturned flanges 2^a. (See Figs. 1 to 8, inclusive.) At the corners of the bins the adjacent cavities of the tile-blocks 1 are filled with cement, as indicated at 3, and in line with these filled compartments heavy anchor-pins 4 are passed through the I-beams 2 2, as best shown in Figs. 5 and 8, but also in the other views. To form a support for the cement 3^a, which is contained between the downturned flanges of the I-beams, (see particularly Fig. 3,) thin strips of metal or other suitable material 5 are placed on the tops of the tile-blocks 1, and preferably a thin layer of cement 3^b is spread between the said tiles and plates 5.

3^c indicates the cement, which is placed in the dovetailed channels formed on the upper surfaces of the I-beams.

In the construction illustrated in Fig. 12 the so-called "I-beams" are provided with curved flanges 2^b, and the bodies of the channel-beams 2, which form the said I-beams, are shown as slightly separated at 2^c by cement. Furthermore, the extreme edges of the flanges 2^b are turned radially inward, as

shown at 2^d, and these edges are embedded in the cement contained within the curved flanges 2^b. It may be here stated that the expressions "I-beams" and "dovetailed joints" are used in a very broad sense.

In my present invention the I-beams are overlapped at the corners of the bins, so that independent joint-plates are not necessary. In the construction illustrated in Fig. 1 the under members of the channel-beams 2, which make up the I-beams, are shown as cut off at their meeting edges. The flanges of the upper channel-beams 2 are cut off on vertical lines with the underlying ends of the lower channel-beams 2; but the bodies or flat portions of the said upper channel-beams are extended and overlapped, as shown at a'. If desired, the under channel members 2 might be overlapped in the same manner as are the upper members.

In Fig. 4 the two I-beams which stand in line are connected the same as in the construction illustrated in Figs. 1 and 2; but the third and transversely-extended I-beam—that is, the upper channel member thereof—is provided with a long flat body extension a^2, which is passed first between the overlapped ends of the other two I-beams and is then bent inward and over the top of the same.

In the joint illustrated in Figs. 6 and 7, which joint is supposed to be located at the outer corner of the corner-bin, the lower channel members 2 are cut off, as before, and so, also, are the flanges of the upper channel members; but the flat body portions of the said upper channel members are overlapped and crossed and are then folded backward, the one upward and the other downward, over the sections which they embrace. In this way the I-beams are rigidly interlocked at their corners.

In the construction illustrated in Figs. 9 to 11, inclusive, channel or I beams of different widths are employed, and these are overlapped telescopically without requiring the flanges of the said beams to be cut off.

In Fig. 9, which corresponds to Figs. 1 and 2, two of the alined upper channel members 2 are overlapped, the one extending within the other, while the upper channel members 2, which extend at a right angle thereto, are cut off and simply abut against the flanges of the wider of the two overlapped channel members. The arrangement of the under channel members is substantially the same as that of the upper, except that the overlapped under members extend at a right angle to the overlapped upper members. This, as is obvious, gives a very rigid joint.

The construction illustrated in Fig. 10, which corresponds in location to Fig. 4, is very much the same as that illustrated in Fig. 9, but in this case one of the four radiating I-beams is dispensed with. Again, in the construction illustrated in Fig. 11 the construction is the same as that illustrated in Fig. 10, with the omission of those portions which in Fig. 10 project toward the right.

From the foregoing description it is evident that my invention above described is capable of quite a large range of modification.

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

1. A bin or similar structure, made up of layers of tile-blocks and flanged metal beams connected by interlocking dovetailed joints, substantially as described.

2. A bin or similar structure, made up of layers of tile-blocks and interposed horizontally-extended metal beams, having inturned flanges, said blocks and beams being interlocked by cement applied in the channels of said beams, substantially as described.

3. A bin or similar structure made up of tile-blocks and horizontally-extended interposed I-beams, the flanges of which I-beams are turned inward to form dovetailed channels for receiving the edges of the tile-blocks, and cement placed within the dovetailed channels of said I-beams and interlocking the same with said tile-blocks, substantially as described.

4. A bin or similar structure, made up of alternate layers of tile-blocks and interposed I-beams, which I-beams are afforded by channel-beams laid back to back and provided with inturned flanges, anchor-bolts passed through the said channel-beams, and cement placed within the channels of the said beams and interlocking the same with said tile-blocks, substantially as described.

5. A bin or similar structure comprising the tile-blocks 1, the channel-beams 2 placed back to back to form I-beams and provided with the inturned flanges, the cement-supporting plates 5 on the upper edges of the tile-blocks, and cement placed in the channels of said I-beams and interlocking the same with said tile-blocks, substantially as described.

6. In a bin structure of the character described, the combination with successive layers of tile-blocks or similar material, of interposed flanged metal beams, which beams at the corners of the bins are overlapped and folded back one over the other, substantially as described.

7. In a bin structure of the character described, the combination with successive layers of tile-blocks or similar material, of interposed I-beams, connected at the corners of the bin, by overlapped and overturned body portions, the flanges of which beams are cut away at their overlapped portions, substantially as described.

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

FRED W. COOLEY.

Witnesses:
MABEL M. MCGRORY,
F. D. MERCHANT.