No. 614,549. Patented Nov. 22, 1898.

O. HOFF.

GRAIN BIN.

(Application filed Oct. 26, 1897.)

(No Model.)

Fig. 1.

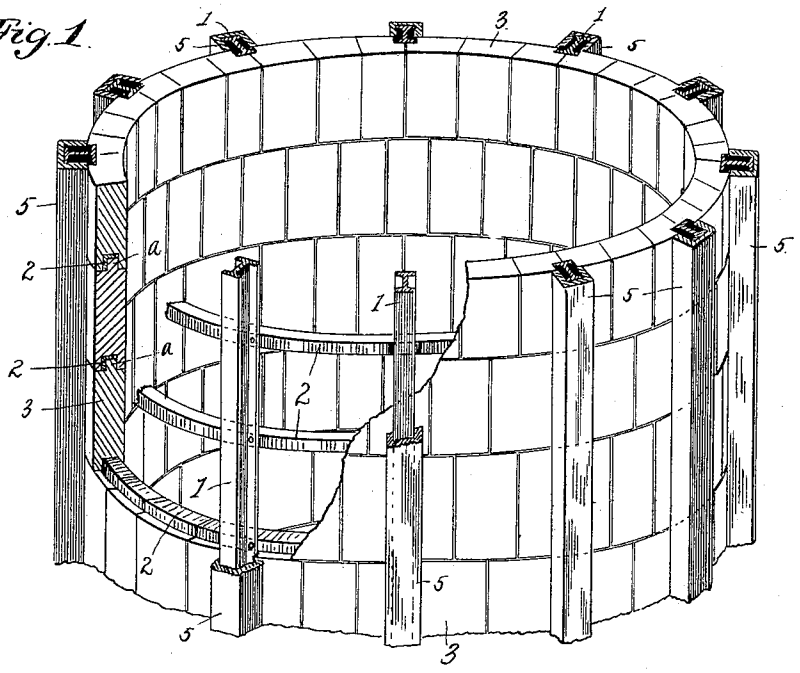


Fig. 2.

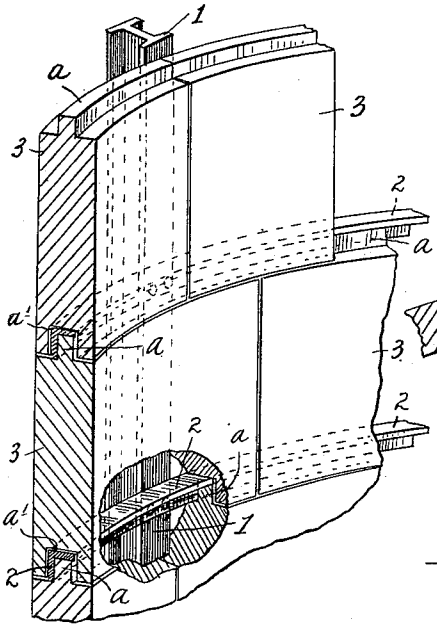


Fig. 3.

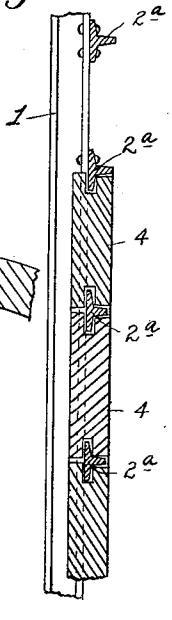


Fig. 4.

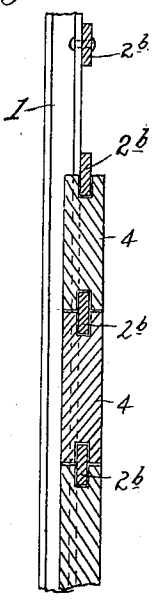


Fig. 6.

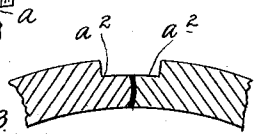
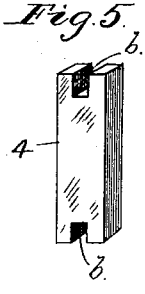


Fig. 5.



Witnesses.
C. F. Kilgore
Frank D. Merchant.

Inventor
Olaf Hoff
By his Attorney
Jas. F. Williamson

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

OLAF HOFF, OF MINNEAPOLIS, MINNESOTA.

GRAIN-BIN.

SPECIFICATION forming part of Letters Patent No. 614,549, dated November 22, 1898.

Application filed October 26, 1897. Serial No. 656,386. (No model.)

To all whom it may concern:

Be it known that I, OLAF HOFF, 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 Grain-Bins; 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 invention has for its object to provide an improved storage-bin for grain or other materials which shall be strong, durable, and entirely fireproof.

To these ends my invention consists of the novel devices and combinations of devices, which are hereinafter described, and defined in the claims.

The bin herein disclosed is in the nature of a further improvement over the bin disclosed in my pending application, Serial No. 644,380, filed July 13, 1897.

The invention is illustrated in the accompanying drawings, wherein like notations refer to like parts throughout the several views.

Figure 1 is a perspective view of a part of my improved bin, with some portions broken away. Fig. 2 is a detail in perspective, showing some of the parts illustrated in Fig. 1, but on a larger scale. Figs. 3 and 4 are views in sectional elevation, illustrating modifications. Fig. 5 is a perspective showing one of the bricks illustrated in Figs. 3 and 4 detached from the framework, and Fig. 6 is a detail in horizontal section through two of the adjacent lining-sections which come directly opposite the uprights.

As in my pending application, I employ a stationary self-sustaining metallic framework to form the outline of the bin. This framework, as shown, is made up of standards or uprights 1, preferably formed of I-bars, and of horizontal tie-frames 2, which are preferably formed of angle-bars, as shown in Figs. 1 and 2, but may take other forms, such as the T-bars 2^a, as shown in Fig. 3, or the flat bars 2^b, as shown in Fig. 4. I preferably construct the bin in cylindrical form, and hence the standards 1 are properly disposed, and the tie-bars 2 are of the proper form to form a skeleton framework affording the outline of a cylinder. To this metallic framework I apply a lining or filling of fireproof material properly constructed and applied thereto to complete the walls of the bin and to cover or embed in the fireproof material the metallic parts or framework. This fireproof lining or filling is preferably composed of fire-clay and may take either the form shown at 3 in Figs. 1 and 2 or the form of a brick with mortised edges, as shown at 4 in the other views, so far as the general outline of the same is concerned. Otherwise stated, the lining is constructed in detachable sections, and in whatever form it may be made it is provided with suitable recesses for embedding or covering the metallic parts of the framework. I prefer the construction shown in Figs. 1 and 2, wherein the sections 3, of fireproof material, are provided at one end with tenons a and at the other with mortises a', which construction adapts the sections 3 to interlock with each other and with the horizontal tie-frames 2 at their ends. The tenons a are so placed on the sections 3 as to abut against the vertical and horizontal parts of the angle-iron tie-frames 2, and the mortises a' are of sufficient size in cross-section to embrace both the tie-frames and the tenon of the adjacent lining-section. The lining-sections are thus interlocked with each other and to the metallic framework in a manner to afford a strong and tight joint. The particular adjacent sections of the lining which come directly opposite the uprights 1 are rabbeted, as shown at a^2, lengthwise of the sections on opposing or adjacent edges, so as to form a seat for the base or back of the I-bar when the parts are in working position, as shown in Fig. 1. Trough-shaped coverings 5, of fire-clay or other suitable fireproofing material, are then applied to cover the outwardly-projecting parts of the standards 1, and thereby complete the casing for the metallic framework. The sections 3 are of course set in mortar or cement, and the coverings 5 are cemented or otherwise secured to the uprights 1 and the linings 3. Hence when all the parts are thus put together the metallic framework is entirely covered and protected from fire. The coverings 5 for the I-beam form of the standards 1, applied as described, afford air-spaces surrounding the web of the I-bar, which is an additional advantage in protection against fire.

In the modifications shown in Figs. 3 and 4 the tie-frames are shown as made up in forms differing in shape from those shown in Figs. 1 and 2, and the linings are shown as made up of the bricks 4, which are provided at their opposite ends with mortises *b*, adapting the same to engage with the tie-bars 2^a or 2^b. In these modifications the brick would be tilted endwise into working position, so as to engage the tie-bars, and be set in mortar or cement, as in the other case. When thus in working position, it is obvious that the brick 4 are locked to the tie-bars, and by the tie-bars acting as tenons are locked to each other. The particular brick which come opposite the uprights 1 would be rabbeted in the same way as the sections 3 for receiving the backs of the I-bar columns.

From the foregoing statements it is obvious that a strong and durable bin is afforded which is entirely fireproof and in which the interior walls will be comparatively smooth and dry, thus affording a bin best adapted for grain or other similar material. The special necessity for the fireproof coverings for the metallic parts or framework is to prevent the warping and twisting to pieces of the bin from the expansion and contraction of the metal of the framework in case of fire. By securing this covering to the metallic parts by the linings themselves I am able to secure the completely fireproof bin with a minimum of cost.

The cross-section of the vertical joint, formed by two adjacent members of the lining sections or slabs 3, may either be straight, as shown in Figs. 1 and 2, or be formed as shown in Fig. 6, wherein the cross-section of one joint-surface is slightly concave and that of the other slightly convex. The latter is the preferred construction.

It should be further noted that a fireproofing of clay in the form of slabs or sections 3, having the tenons *a* and mortises *a'* for interlocking with each other, is generally serviceable wherever fireproofing material may be required. For example, it would make excellent partitions.

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

1. In a storage-bin, the combination with metallic standards or uprights, and horizontal tie-frames rigidly secured to said standards at their ends and intermediate portions, to form a rigid self-sustaining skeleton framework, of filling or lining sections having interlocking engagement with and held by the adjacent tie-frames, substantially as described.

2. In a storage-bin, the combination with metallic standards or uprights and horizontal tie-frames rigidly secured to said standards at their ends and intermediate portions, to form a rigid self-sustaining skeleton framework, of filling or lining sections having interlocking engagement with each other and with the adjacent tie-frames at their upper and lower edges, substantially as described.

3. In a storage-bin, the combination with the skeleton framework composed of the metallic standards 1 and metallic tie-frames 2, of the linings 3 composed of fireproof material constructed in sections and provided with the tenons *a* and the mortises *a'* for interlocking with each other and with the tie-frames and embedding the same therein, substantially as described.

4. In a storage-bin, the combination with the I-bar standards 1 of the angle-bar tie-frame 2, the lining-sections 3 having the tenons *a* and the mortises *a'*, and the trough-like coverings 5, all arranged and coöperating substantially as described.

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

OLAF HOFF.

Witnesses:
JAS. F. WILLIAMSON,
BESSIE B. NELSON.