

G. H. JOHNSON.

Grain Bin.

No. 37,134.

Patented Dec. 9, 1862.

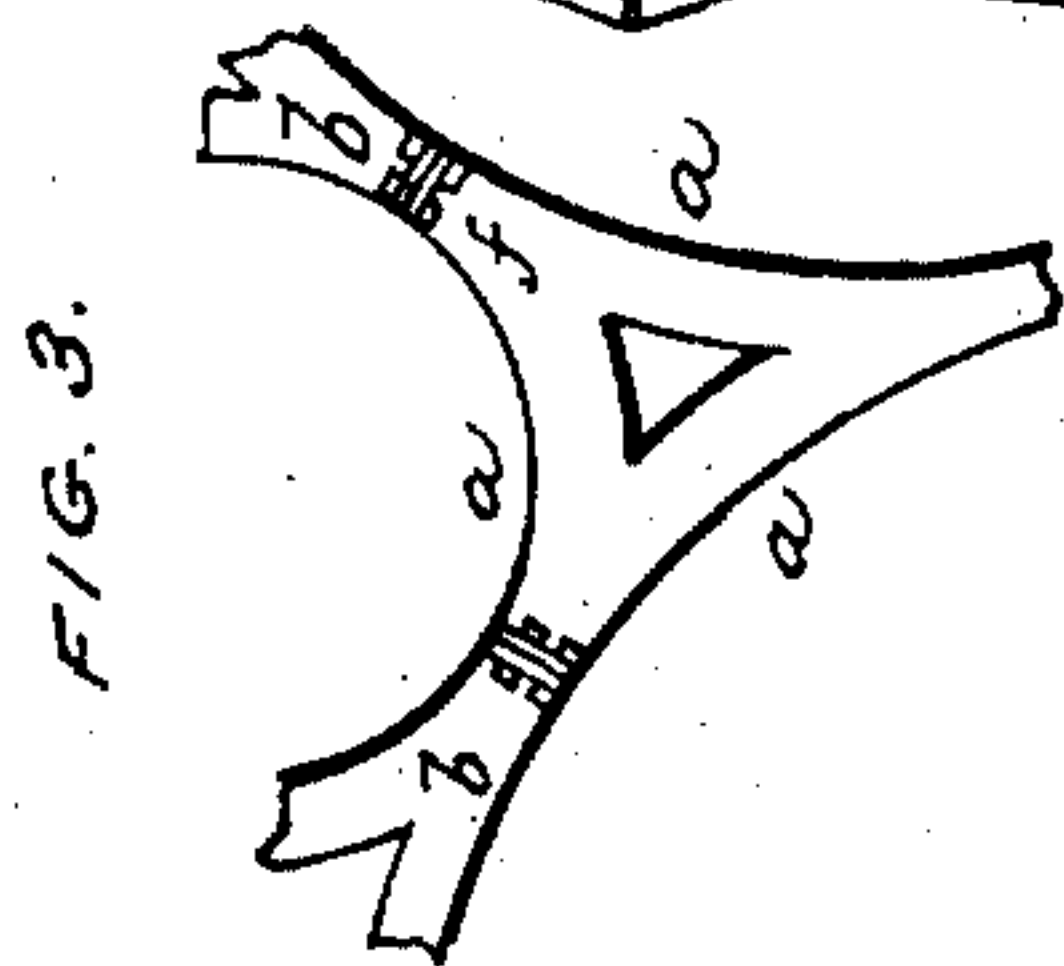
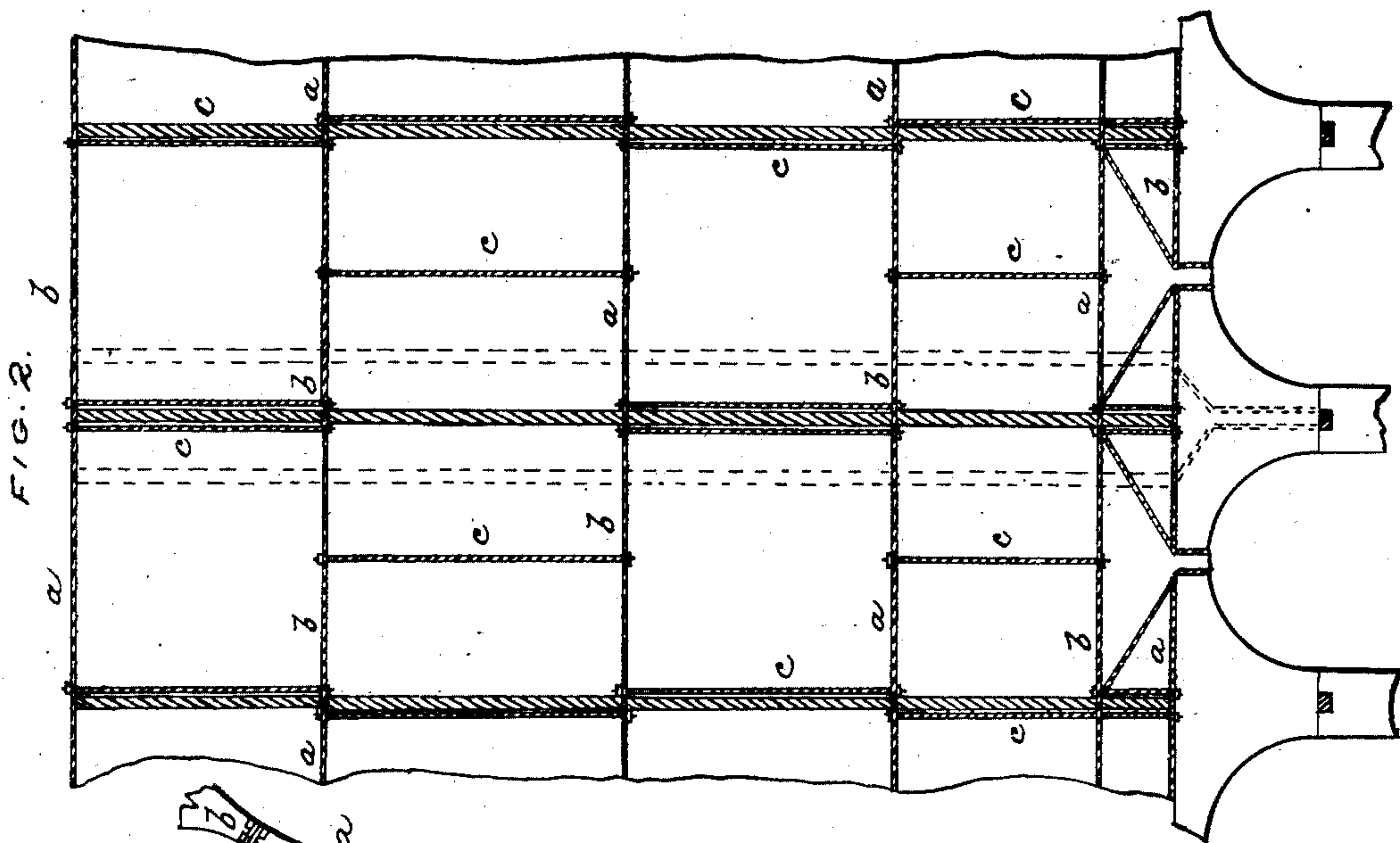
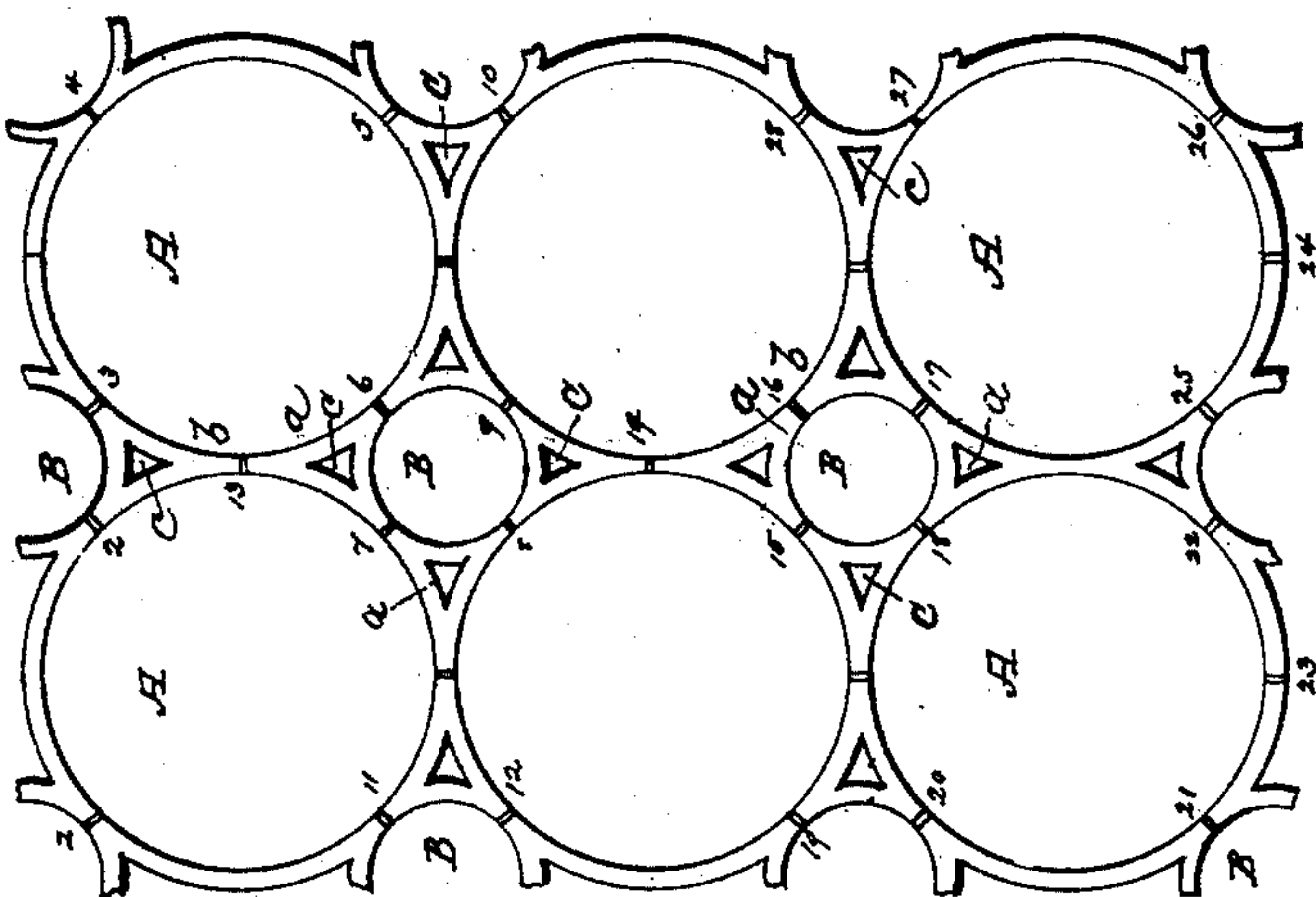


FIG. 1.



WITNESSES:

*Charles D. Lee,
Attest.*

INVENTOR.

*G. H. Johnson, By
J. H. Johnson.*

UNITED STATES PATENT OFFICE.

GEORGE H. JOHNSON, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND
W. S. SAMPSON, OF SAME PLACE.

IMPROVEMENT IN GRAIN-BINS.

Specification forming part of Letters Patent No. 37,134, dated December 9, 1862.

To all whom it may concern:

Be it known that I, G. H. JOHNSON, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in the Construction of Grain-Bins; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this application.

My invention relates to certain new improvements in the mode of combining and arranging together cylindrical bins, and has for its objects to render the spaces between the cylinders capable of sustaining greater pressure by introducing minor or auxiliary cylinders; also, to induce a circulation around and in contact with the external surfaces of the cylinders of atmospheric air, and also to completely lock together several bins, so as to effect great strength in the whole structure; and to these ends my invention consists, first, in the employment of auxiliary cylindrical bins, in combination with the principal bins, when the latter are arranged so as to have their sides come about in contact, and the former are arranged so as to occupy the spaces between the larger bins, all substantially as hereinafter more fully explained; secondly, in forming ventilating flues or columns of the several spaces left between and formed by the arrangement together of the series of cylinders, as hereinafter set forth; thirdly, in the employment, in combination with a series of bins, of metallic bond-plates, so constructed and arranged as to unite or lock together the several bins or cylinders, as will be presently fully described.

To enable those skilled in the art to make and use my several improvements, I will proceed to describe their construction and operation, referring by letters to the accompanying drawings, forming part of this application, and in which—

Figure 1 is a top view of a portion of a grain-house, showing a series of the cylindrical bins with my improvements embraced therein. Fig. 2 is a vertical section of same at *x x*, Fig. 1, and Fig. 3 is a detail view showing construction of bond-plates.

Before describing particularly the construction of the several parts of the apparatus it will not be improper for me to state that previous to my invention very extensive store-houses for

grain have been constructed of a series of cylindrical iron bins arranged vertically and in contact with each other, and that in such arrangements it has been attempted to employ the spaces left between the several cylinders (these cylinders are made about fifteen feet in diameter) as bins also; but it has been found that when the grain is drawn off from any of the cylinders the sides of the cylinders (calculated to be sufficiently strong to sustain the pressure of their contents) will be collapsed or forced in by the pressure exerted on their external side by the grain in the contiguous space-bin. I have overcome this difficulty by the employment of a small cylindrical bin in the place of the space-bin, and although this auxiliary cylinder does not of course occupy the whole space between the four larger bins surrounding it, the four small spaces left, I have discovered, if used as ventilating-columns, are of vastly more utility than when employed as grain-depositories. Although this feature of the arrangement of smaller cylinders with the larger ones and forming ventilating-shafts is equally applicable to the iron bins or cylinders, I have shown it, together with the other features of my invention, as applied to a new construction of bin or cylinder formed of brick-work tied together by plates and rods of iron.

In the several figures of the drawings the same letter indicates the same parts.

A are the main bins, and B are the smaller or auxiliary bins, and C are the ventilating shafts or flues. The cylinders or bins are all constructed of peculiarly-shaped brick, in combination with horizontal metallic bond-plates and vertical tie-rods, according to the invention of W. S. Sampson, a description of which will be found in his application for a patent, which I need not give here.

a b are the bond-plates, and *c* are the vertical tie-rods.

The bins A and B are all constructed with suitable funnel-shaped bottoms with the proper discharge-orifices for drawing off the grain, and suitable distributors and elevating machinery for filling the bins will be employed, as usual previous to my invention. All the bins or cylinders are sustained on a suitable floor by arches D and columns E of masonry, brick-work, or iron, as deemed expedient. The cylinders A and B are built up together so

that the wall at the points where said cylinders join or come together is the same thickness as at other places, (see Fig. 1,) and the cast-iron bond plates, in lieu of being cylindrical or circular in a cross-section, as shown and described in the application of W. S. Sampson, are formed of triangular sections *a* and *b*, (see Figs. 1 and 3,) with suitable flanges or lugs, *e f*, by which they are firmly bolted together. Now, it will be observed that with this mode of construction when a course or layer of bond-plate sections, *a b*, is laid on and bolted together at the points 1 2, &c., (see Fig. 1,) just described, a complete net-work of iron will extend in a horizontal plane through the whole series of cylinders or bins, and, this net-work or framing being tied by vertical rods *c* to another similar net-work above it, and the latter similarly tied to another, and so on, that the whole series of cylinders is locked together in every direction, and the greatest possible amount of strength is afforded to the entire structure with the least weight of material.

Another great desideratum in having these several cylinders so intimately connected is that when any particular cylinders are full and the remainder empty (in a whole series) the weight will nevertheless be nearly equally distributed on all the supports of the whole series of cylinders.

It is obvious that by my improved method of constructing and locking together the several cylinders the entire structure is thrown into an exceedingly strong and desirable condition for the purposes for which it is intended to be used. By the employment of the small cylinders B not only the space before useless for storage where the bins A were empty is utilized, (without extra strength in bins A,) but also the larger and small cylinders (present-

ing in horizontal section arches in all directions) afford so much mutual strength or support to each other that I am enabled to make all the cylinders much lighter or weaker, and yet have each and all capable of sustaining the same amount of pressure as when the larger cylinders were employed without the smaller ones.

It has been discovered that the most beneficial effect is the result of a thorough ventilation around the bins, and it will be seen that by my peculiar arrangement of cylinders and flues C the latter expose about one-half of all the external surface of each cylinder to the column of air in the said tube C.

I wish it to be understood that I do not here lay any claim to the mode of forming a bin of bricks locked together in courses and sections vertically by tie-rods and bond-plates; but,

Having fully described my several improvements, what I claim as new, and desire to secure by Letters Patent, is—

1. The combined arrangement of the smaller cylinders, B, with the larger ones, A, for the purpose of utilizing the space between the larger ones for storage purposes, and rendering the whole structure more capable of sustaining the pressure of the contents of the cylinders, substantially as described.

2. The method of interlocking the layers of horizontal bond-plates *a b*, in the manner and for the purposes described.

3. The employment of ventilating-flues C, in combination with the grain-bins, substantially as described.

In testimony whereof I have hereunto set my hand and seal.

GEO. H. JOHNSON. [L. s.]

In presence of—

J. N. McINTIRE,

ANDREW J. TODD.