

No. 721,543.

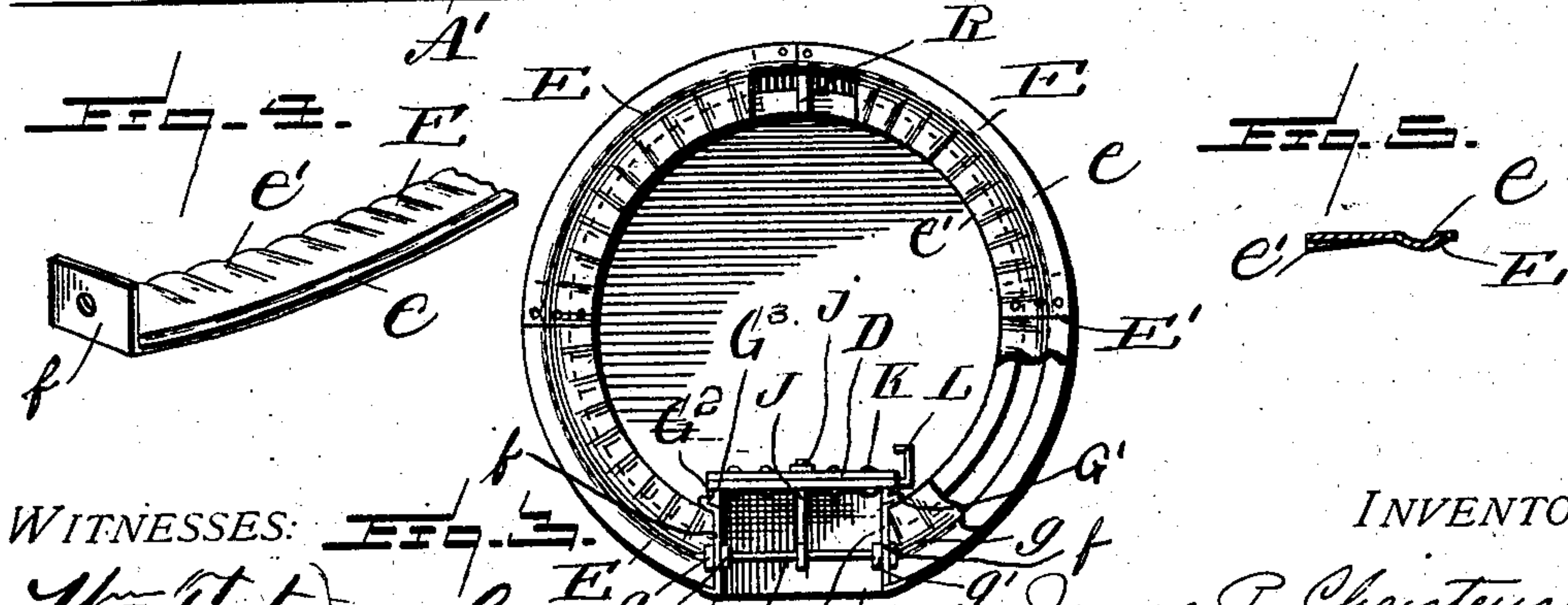
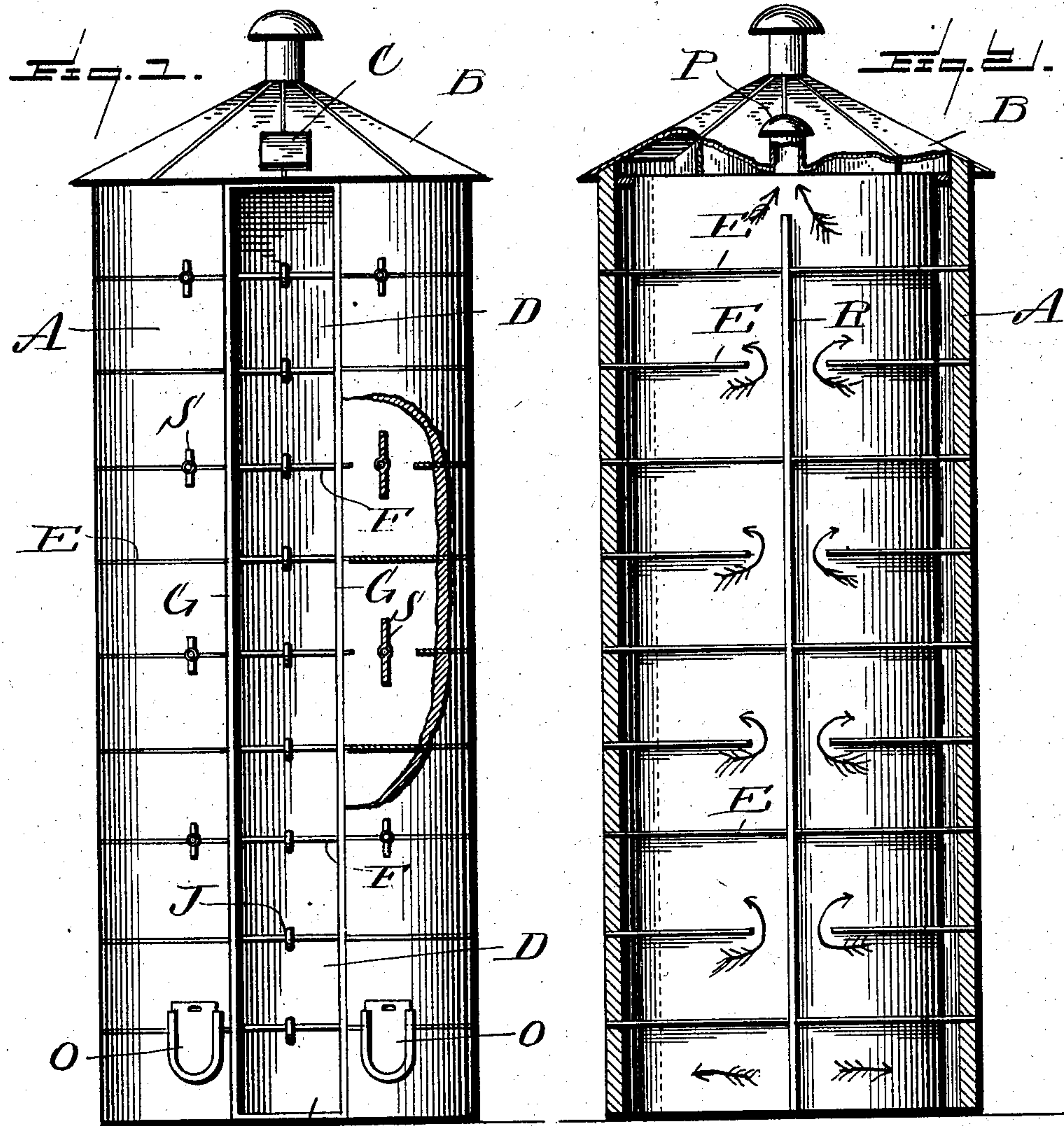
PATENTED FEB. 24, 1903.

J. P. CHRISTENSEN.

SILLO.

APPLICATION FILED AUG. 27, 1902.

NO MODEL.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JAMES P. CHRISTENSEN, OF VINLAND, WISCONSIN.

SILLO.

SPECIFICATION forming part of Letters Patent No. 721,543, dated February 24, 1903.

Application filed August 27, 1902. Serial No. 121,241. (No model.)

To all whom it may concern:

Be it known that I, JAMES P. CHRISTENSEN, a citizen of the United States, residing at the town of Vinland, in the county of Winnebago and State of Wisconsin, have invented new and useful Improvements in Silos, of which the following is a specification.

My invention relates to a silo or tank and to a new and novel method of construction, so that brick or any other indestructible material may be used for the wall.

The objects of my invention are, first, to provide an improved means of binding the wall; second, to provide a means of binding the doors tightly and to render them easily removable; third, to provide a means of ventilating the walls and to prevent freezing of the contents of the silo.

In the accompanying drawings, Figure 1 represents a view in side elevation of a silo embodying the features of the present invention. Fig. 2 represents a vertical section of the double wall. Fig. 3 represents a horizontal section on the plane of one series of tie-plates, parts being broken away to disclose the two walls of the structure. Fig. 4 represents an enlarged detail perspective view of one of the tie-plates, and Fig. 5 represents a vertical section of one of the tie-plates.

A represents a circular wall of the silo, provided at one side with a doorway or opening A', extending from top to bottom.

B is the roof, and C an opening through which the silo may be filled after all doors are closed.

D D D, &c., represent doors.

E represents a circular plate provided with one or more grooves *e e* and crimped upon the inner edge *e'*. The plate E is preferably constructed in sections and lapped at the ends E', as shown, Fig. 3. The sections may be first cut straight and then crimped by any mechanical means upon one edge, or they may be cast in the form shown. It is obvious that these tie-plates may be constructed of straight sheets of metal and simply crimped to secure the curve or cast without a groove; but I regard the addition and the use of one or more grooves *e e* as an improvement and more beneficial in insuring the stability and

rigidity of the plates and in binding the silo-wall. It will be understood that where the plates are both grooved and crimped and permitted to lap each other at the joints a maximum of rigidity and security is attained.

The plates E, &c., are laid horizontally between the coursings of brick constituting the wall at certain intervals in building the wall and are tied across the doorway A' by means of rods F F F, &c., passing through eyes in the upturned ends of the plates *f f* and the metallic door-jambs G G and being secured by nuts *g g* and *g' g'*. The plates and nuts *g g* are embedded in the masonry as the silo wall is built. The doors D D D, &c., are dropped down from above inside the jambs G G and attached to the respective rods F F F, &c., by one or more hooks J, which are tightened by means of nuts *j*. The doors are constructed of matched material, and one or more bolts K pass through each door, with nuts upon each end to tighten the joints in case of shrinkage, and a hook L is provided at one end by extension of the bolt to provide a means of hanging up the door after removal, either to the rod F or to some other support. I have found by experience that metallic door-jambs G G are preferable to wooden door-jambs with a metallic border or binding. I therefore construct the door-jambs G G with rectangular offsets G' G' and G² G², which are embedded around the ends of the tie-plates E E into the wall as it is laid up. These jambs may be constructed of thin material and the inner edges G³ G³ allowed to project sufficiently to engage the doors D D D, &c., and form a tight joint as the doors are clamped to the jamb by means of the hooks J.

In silos it is necessary that the construction be such as to prevent freezing. The walls are therefore preferably constructed double, with an air-space between the two sections, and tied across in the usual manner of double-wall construction. In my invention I provide a means of ventilation between the two walls. O O in Fig. 1 represent openings at the bottom through the outer wall leading into the central space between the two walls, and P represents a ventilating-chimney at the top. I also provide a vertical partition R

at the rear and horizontal partial divisions of the inner space leading thereto, as shown in Fig. 2. The object of this is to create a constant upward circulation of the air around the inner space from the bottom to the top of the silo, as indicated by the arrows. In cold weather when desiring to stop the circulation and create a dead-air space I provide dampers S S S, &c., closing openings between the horizontally-extending flues and capable of being operated from the outside of the silo. Then by closing the openings O O at the bottom I am enabled to provide an absolutely dead-air space to prevent freezing. I do not regard dampers S S S, &c., as a necessary feature of my invention; but they are of advantage in closing off portions of the silo-wall as the contents are used down from the top. The essential feature of my ventilating system is a sinuously-extending flue on each side leading from a lower opening at the side of the door upwardly to the chimney P at the rear.

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

1. A silo comprising a masonry-wall, tie-plates arranged at intervals therein, the said tie-plates having transverse corrugations along their inner edges, substantially as described.

2. A silo comprising a circular wall-closure of brick or other masonry, a series of tie-plates corrugated on their inner edges so as to give them a circular shape, the corrugations also serving to further strengthen and hold the masonry in position, substantially as described.

3. A silo comprising a masonry-wall, tie-plates arranged at intervals therein, the said tie-plates having longitudinal grooves or corrugations formed along one edge, and transverse corrugations along their other edges, substantially as described.

4. A silo comprising a wall-closure cylindrical in shape, a series of circular tie-plates incorporated therein and formed with upturned end flanges, the said wall being formed with a doorway on one side, tie-bolts extending across the doorway and connecting the upturned ends of the said plates for thor-

oughly bracing them at this point, substantially as described.

5. A silo formed of a cylindrical wall having an opening at one side, tie-plates incorporated in the wall, tie-rods connecting the ends of the tie-plates across said opening, and doors for closing the said opening together with means for fastening the said doors to the tie-rods, substantially as described.

6. A silo formed with a cylindrical wall provided with a doorway at one side, a door-jamb arranged therein, tie-plates in the wall having their ends adjacent to the door-jamb, rods connecting the ends of the tie-plates and extending through the jamb, doors applied to the inner edges of the door-jamb, and hooked bolts for connecting the doors with the tie-rods and tightly clamping the doors against the door-jamb, substantially as described.

7. A silo formed with a cylindrical wall, having a central air-space built therein, partitions in said air-space forming a series of baffle-plates for directing ventilation within the wall-space, and dampers for controlling the said ventilation, substantially as described.

8. A silo formed of a cylindrical wall provided with an air-space therein, the silo having a door extending from the top to bottom in one side, a partition in the air-space opposite the door, horizontal partitions arranged in the air-space but formed with openings leading from the space between one set of partitions to the next adjacent space, air-lets near the bottom of the silo, and an air-outlet at the top thereof, substantially as described.

9. A silo comprising a cylindrical wall, tie-plates mounted at intervals therein comprising a series of segmental corrugated plates having their ends lapped and riveted together the said plates strengthening the silo-wall, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JAMES P. CHRISTENSEN.

Witnesses:

ANNA R. WATERHOUSE,
MARIA MCCORMICK.