

No. 720,419.

PATENTED FEB. 10, 1903.

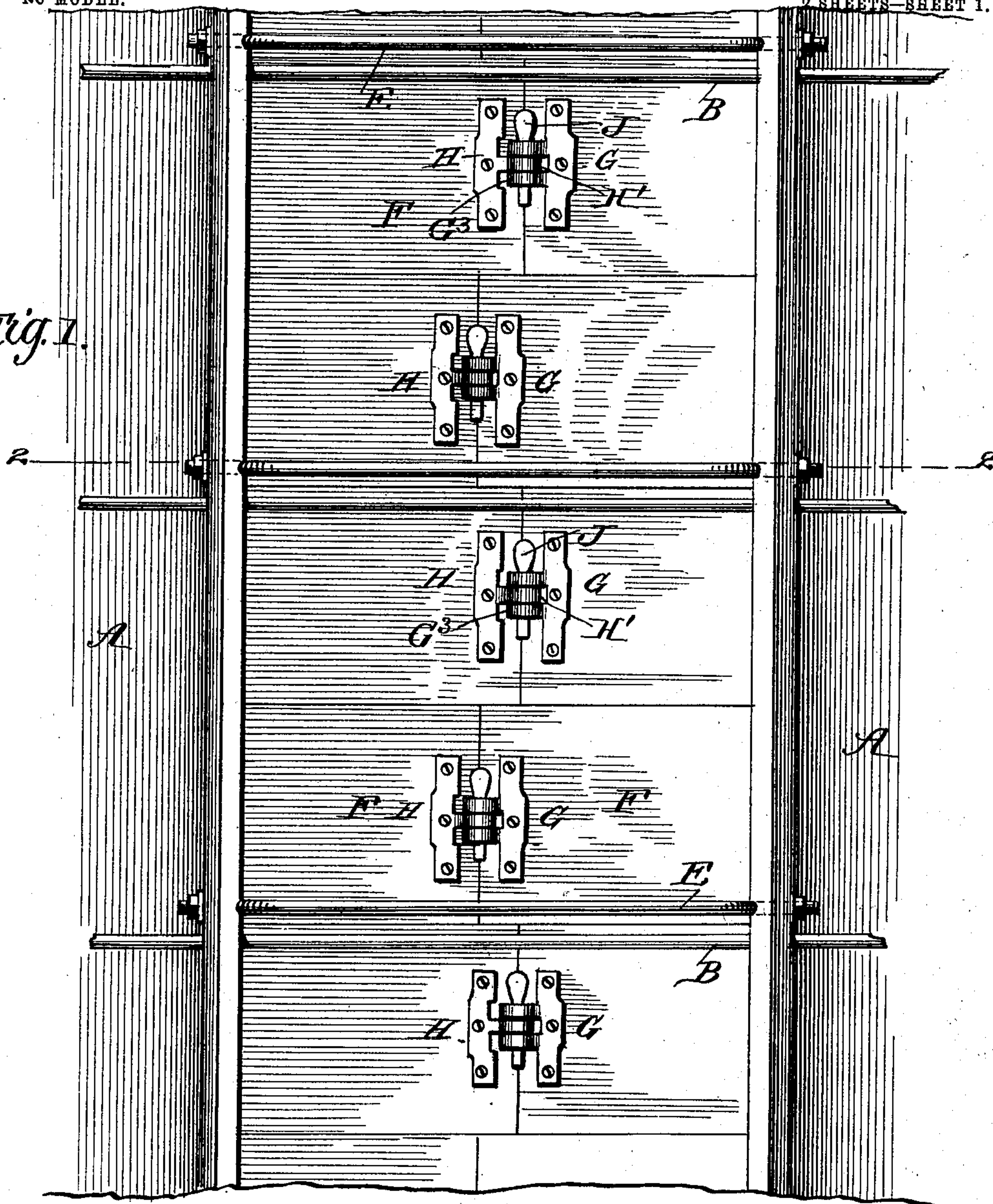
E. W. GILBERT.  
SILO.

APPLICATION FILED SEPT. 13, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:  
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NO MODEL.

2 SHEETS—SHEET 2.

Fig. 2.

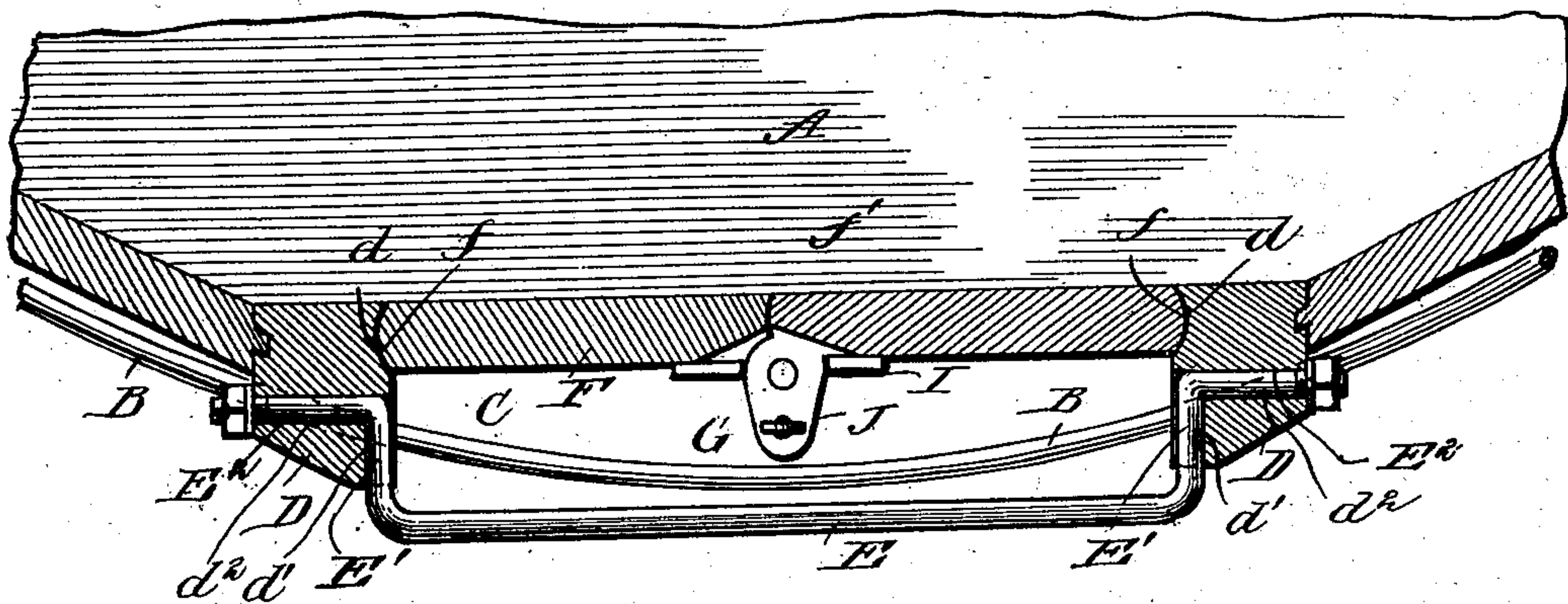


Fig. 3.

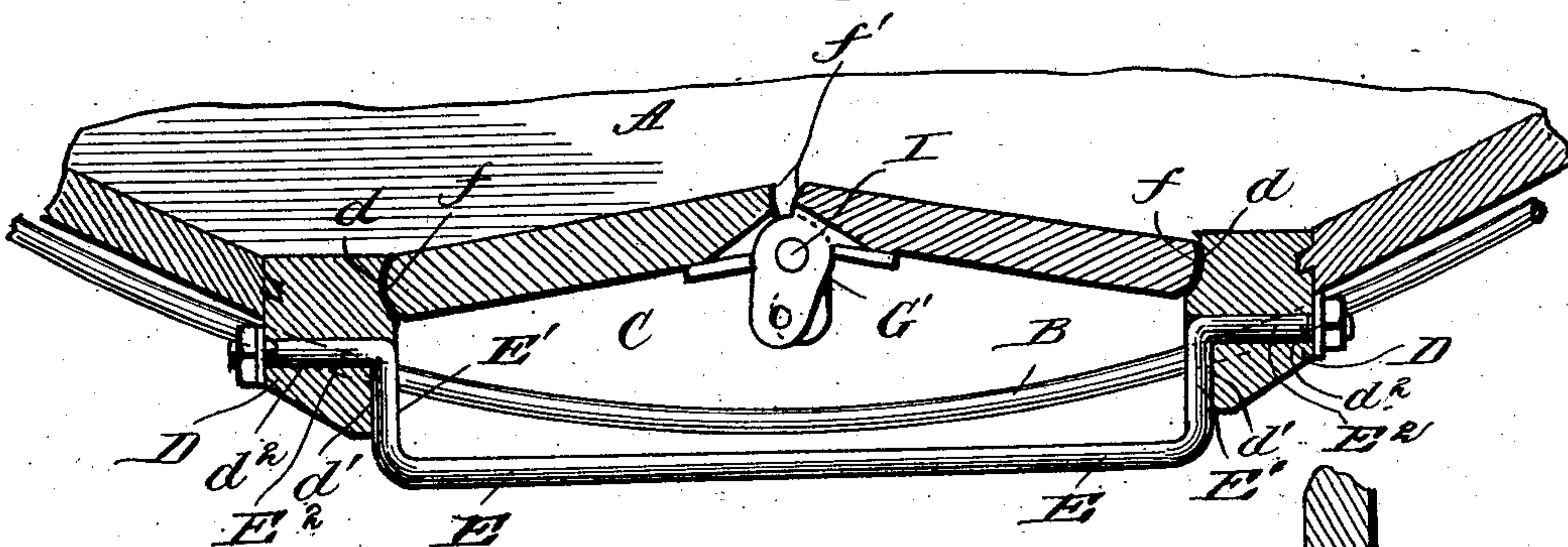


Fig. 4.

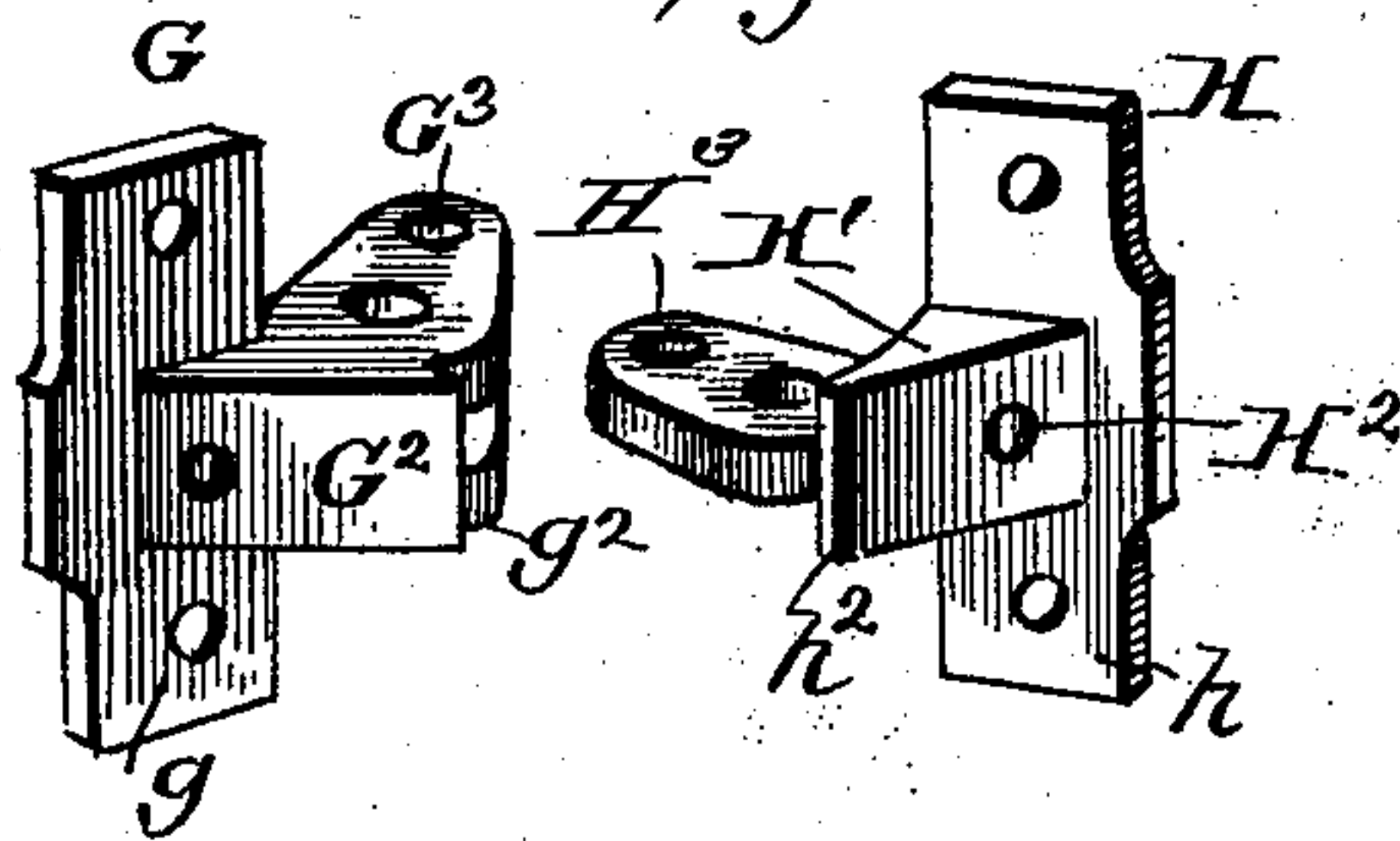
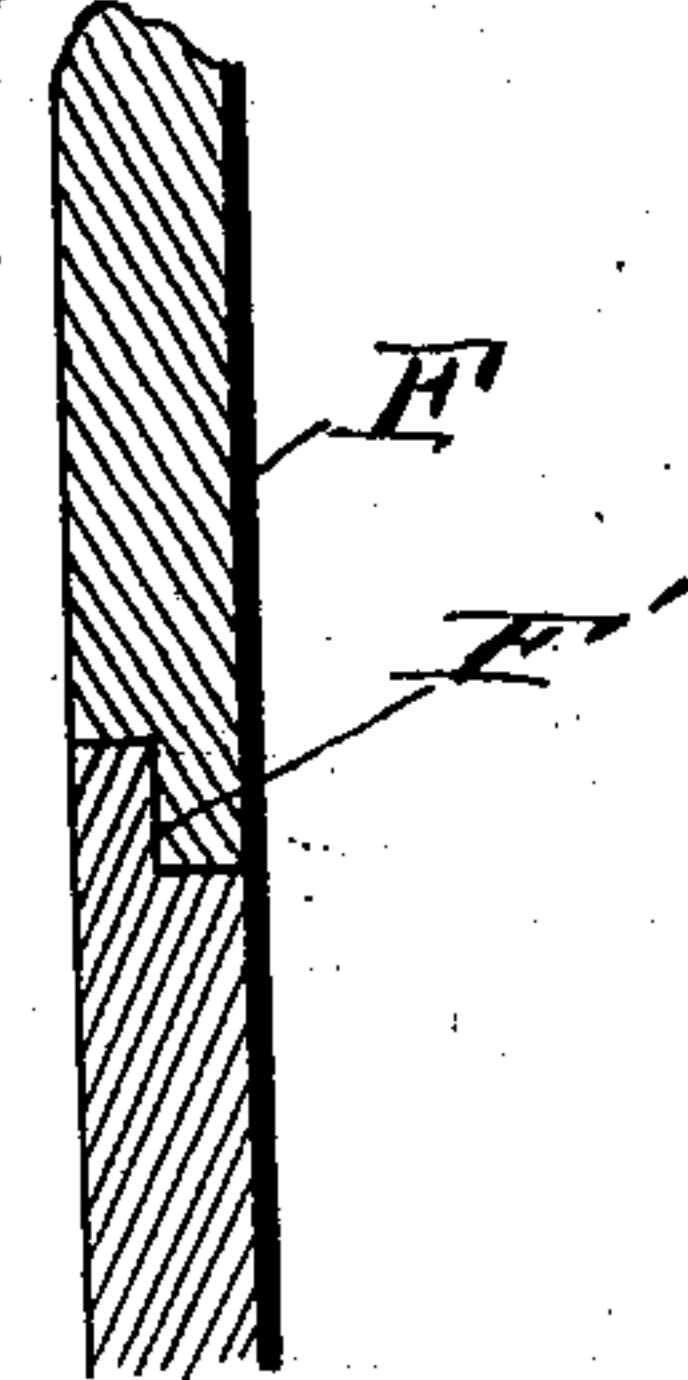


Fig. 5.



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# UNITED STATES PATENT OFFICE.

EDWARD WINSLOW GILBERT, OF PHILADELPHIA, PENNSYLVANIA.

## SILO.

SPECIFICATION forming part of Letters Patent No. 720,419, dated February 10, 1903.

Application filed September 13, 1902. Serial No. 123,333. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD WINSLOW GILBERT, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Silos, of which the following is a specification.

My invention is an improvement in silos, and relates particularly to the construction of the doors and doorways; and the invention consists in certain novel constructions and combinations of parts, as will be hereinafter described and claimed.

In the drawings, Figure 1 is a front elevation of a portion of a silo embodying my invention. Fig. 2 is a cross-section on about line 2 2 of Fig. 1, showing the door closed. Fig. 3 is a similar section showing the door sprung slightly inward to open position. Fig. 4 is a detail perspective view illustrating the two hinge-sections, and Fig. 5 is a detail vertical section showing the overlapping joint between the edges of the adjacent doors.

The silo A may be in general respects of ordinary construction and is provided with the encircling hoops B, which may be tightened to draw the silo together, as is usual. The silo is provided with a vertical doorway C, on opposite sides of which are the upright posts D, through which the hoops pass and between which extend the braces E and fit the doors F, as shown in Figs. 2 and 3.

A special feature of my invention consists in the construction of the doors and the seating of same in the door-posts, while the construction of the cross-braces E form another feature of my invention, as will be more fully described in detail.

The doors F are arranged in vertical series one above the other, as shown in Fig. 1, and each of the doors is composed of sections jointed together between their ends, preferably at one side of and adjacent to the center of the door, and fitting at their outer edges against the inner sides of the posts D and arranged to break at their joint in such manner as to permit them to be forced to closed position by a lever action which will press their outer edges tightly against the inner edges of the posts D when the door is closed, as shown in Fig. 2. I thus provide a silo-door which extends transversely across the doorway and is jointed between its ends, so

it may press by leverage to its seat in the doorway, thus insuring a close joint between the outer edges of the door and the door-posts. The doors thus arranged between the posts are on a direct line with the staves in the silo, releasing any and all strain on door-posts which takes place when the encircling hoops are drawn up, also releases the strain from the swelling of the wood which occurs when the silo is filled with ensilage and that which results from the contraction of the iron hoops in cold weather. These doors are removed after the ensilage has been taken out of the silo to the depth of the door, (usually there are from one to two inches of depth of ensilage taken from the silo per day,) thus giving the wood in the silo time to dry and shrink, releasing the strain on the door-posts before the door-section is removed. I also prefer to curve the outer edges of the door at *f*, bringing them to a convex form, and to provide at *d* in the posts D correspondingly curved grooves to receive the rounded edges *f* of the door, the curves of the door and of the grooves being circular in order to fit and make an air-tight joint without the use of packing, although packing may be employed, if desired or necessary. By rounding the contacting surfaces of the door and posts I increase the surface of the joint, and thus improve the air-tight joint secured. Also when the door breaks at the center in inserting or removing the same the circular joint between the door and posts permits the door to be readily pushed in or out to open or close the same, avoiding sharp corners and other angles. As will be understood from Figs. 2 and 3, the door breaks at its joint between its ends to permit its ready insertion or removal, and it is preferred to arrange the door to break inwardly, so it will be stopped in the closed position, as shown in Fig. 2, by the pressure of the ensilage within the silo. I also prefer to provide a locking device for holding the door closed, as shown in Fig. 2, and which may be released to permit the door to break, as shown in Fig. 3. This is preferably used in connection with the hinge shown in detail in Fig. 4 and which I employ in uniting the sections of the door at *f'*, as shown in Fig. 2. The hinge comprises the two sections G and H, having leaf-plates *g* and *h*, which are secured to the sections of the door and are pro-



vided with outwardly-projecting knuckles  $G'$  and  $H'$  and with inwardly-projecting knuckle-blocks  $G^2$  and  $H^2$ , having stop-shoulders  $g^2$  and  $h^2$ , which stop the hinge in position to stop the door closed, as shown in Fig. 2. These knuckle-blocks  $G^2$  and  $H^2$  are in practice seated in mortises in the outer faces of the door-sections, and the knuckles  $G'$  and  $H'$  project outwardly and receive the pintle  $I$ , so the door-sections are connected by a hinge-joint, which permits a limited movement of the sections, as will be understood from Fig. 3. The knuckles are also provided with outwardly-projecting locking-eyes  $G^3$  and  $H^3$ , which register in the closed position of the door, as shown in Fig. 2, and receive in such position the locking-pin  $J$ , by which the doors are secured when closed. (See Figs. 1 and 2.) These locking-eyes also by engaging with the leaf-plates  $g$  and  $h$  limit the extent to which the doors may be broken, as will be understood from Fig. 3 of the drawings. As before suggested, the door-sections are joined together slightly to one side of the center, and in arranging the several doors they are alternately turned end for end to stagger the joints in the adjacent doors, as shown in Fig. 1. As these doors are pressed in position by a leverage action which in itself holds the door in position to a certain extent and by staggering the points, each door, with its overlapping edges, supports the others, so the staggered joint serves two purposes: first, securing absolutely an air-tight joint in the doors from top to bottom of the silo, which would not practically be the case if the joint in the doors were on a line; second, should the user of the silo neglect to place the pin  $J$  in the locking-eyes the doors would stay in position provided too much pressure were not exerted against the outside of the door. This result would not be accomplished if the joints in the door were on a line.

By my invention I employ a special construction of brace for holding the door-posts apart and construct such braces so they will not interfere with free access to the ensilage through the doorway, will efficiently hold the door-posts apart, and will constitute a ladder leading to the top of the silo. To this end I provide grooves  $d'$  in the inner faces of the posts  $D$  and communicating with openings  $d^2$ , which lead through the posts from the inner to the outer sides thereof. The braces  $E$  are made somewhat in U shape, having the main cross-bar, which extends across the doorway  $C$ , the wings  $E'$  at a right angle to said cross-bar and fitting in the grooves  $d'$ , and the arms  $E^2$ , which extend from the inner ends of the wings  $E'$  through the openings  $d^2$  and receive the nuts by which the braces are securely held to the door-posts. By the special construction of the braces they are spaced away from the doors so they will serve as ladders and by being embedded in the door-posts will be braced strongly in position, as desired.

As will be understood from Figs. 2 and 3, the door can be broken at its joint and adjusted to the position shown in Fig. 3 in applying and removing the door, and when spread to the position shown in Fig. 2 will fit snugly between the opposite door-posts and may be locked by the pin  $J$ , as shown in Fig. 2. When it is desired to remove the door, the pin  $J$  may be removed and the door broken inward, as shown in Fig. 3, and removed.

At their meeting edges the doors  $F$  are provided with overlapping portions, as shown at  $F'$  in Fig. 5.

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

1. The improvement in silos herein described comprising the opposite upright door-posts provided near their inner edges with the curved grooves and having in their said inner faces the transverse grooves leading to their outer edges and the openings extending from said grooves to the outer faces of the posts, the braces extending between the side posts, the wings fitting in the grooves thereof, and the arms extending from said wings outwardly through the posts and secured, and the doors composed of sections hinged together between their ends at one side of and adjacent to their centers and seating at their outer edges in the grooves of the upright door-posts, said doors being arranged to break on their intermediate joints, and lock devices for holding the doors in closed position substantially as set forth.

2. A silo-door composed of sections, a hinge connecting the adjacent ends of said sections and having hinge-knuckles and projecting locking-eyes, and the locking-pin fitted to said eyes, substantially as set forth.

3. The combination in a silo-door with the two sections, of the hinge connecting said sections and having the cooperating knuckles and the projecting locking-eyes, substantially as set forth.

4. In a silo the combination with the opposite door-posts provided in their inner faces with the grooves leading to their outer edges and with the openings extending from said grooves through the posts to the outer sides thereof, of the braces comprising the cross-rods, the wings at the ends thereof and fitting in the grooves of the posts and the arms extending from said wings through the openings in the posts and secured substantially as set forth.

5. A silo provided with doors arranged in series one above the other and lapping each other at their meeting edges, the doors being composed of sections jointed together at their inner or meeting ends with the joints between the several doors staggered or out of alignment substantially as set forth.

EDWARD WINSLOW GILBERT.

Witnesses:

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HARRY BOSWELL.