

1,047,861.

Patented Dec. 17, 1912

Fig. 1.

Fig. 2.

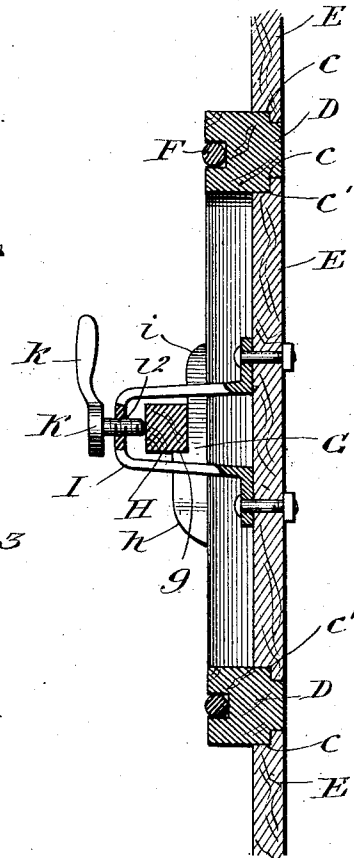
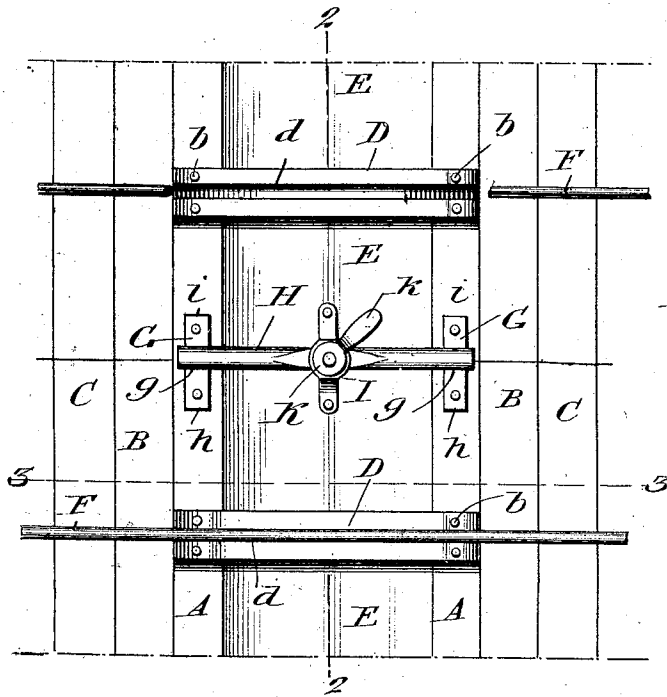


Fig. 3.

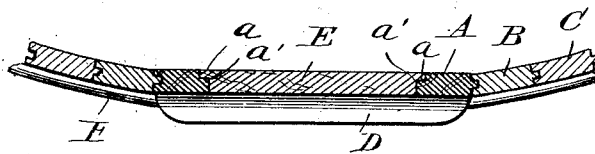
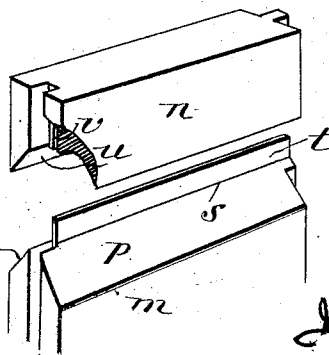


Fig. 4.



WITNESSES

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SILO.

1,047,861.

Specification of Letters Patent.

Patented Dec. 17, 1912.

Application filed October 19, 1911. Serial No. 655,563.

To all whom it may concern:

Be it known that we, WALTER C. ULINE and BURTON A. ULINE, citizens of the United States, residing at Nappanee, in the county of Elkhart and State of Indiana, have invented new and useful Improvements in Silos, of which the following is a specification.

This invention consists of an improved construction of silo, and also consists of certain novel and advantageous details of construction, as hereinafter described and definitely claimed.

In the accompanying drawings which are hereby made a part hereof: Figure 1 is an elevation of so much of a silo as is necessary to illustrate the present invention. Fig. 2 is a vertical section of the same taken in the plane indicated by the line 2—2 of Fig. 1. Fig. 3 is a horizontal section taken in the plane indicated by the line 3—3 of Fig. 1. Fig. 4 is a detail perspective illustrating the novel splice that is employed when a silo is of such height that it is necessary for each stave to be in two sections.

Similar letters designate corresponding parts in all of the views of the drawings, referring to which:

A A are spaced posts which are embodied in a silo of circular form in horizontal section and are preferably joined by tongue and groove connections to the staves B next to the said posts. The edges of the staves B that are opposed to the outer edges of the posts A are of course adapted for the tongue and groove connections, as are also the other staves C comprised in and extending entirely around the silo which, as stated, is preferably, though not necessarily, of circular form in horizontal section.

The posts A are provided in their inner sides with rabbets *a*, Fig. 3, and the said posts are connected at intervals of their height and are braced and retained in spaced relation by horizontal cross-bars D. These cross-bars D have portions opposed to the inner edges of the posts and portions that lap the faces of the posts, and they are connected in fixed manner to the posts by the bolts *b* which extend through the said lapping portions and the posts. Each cross-bar D has its interior side flush with the interior sides of the posts A, and each cross-bar D is, moreover, provided in its interior side with rabbets *c*, which communicate with the rabbets *a* of the posts.

Each pair of cross-bars D serves in combination with the posts A to form a frame for the reception of a door E. Any number of the said doors E may be employed according to the height of the silo, and each door is rabbeted, as indicated by *a'* and *c'*, to correspond and meet the rabbets *a* and *c*, respectively, of the door frame, with the result that when fastened in position the inner side of the door is flush with the inner sides of the posts A and cross-bars D, with the result that the fastening of the doors in position does not entail diminishing the capacity of the silo in any measure. In other words when fastened in position the doors do not extend to any extent whatever into the silo beyond the inner sides of the posts A and cross-bars D. It will also be observed by reference to Figs. 1 and 2, that the cross-bars D are provided with horizontal grooves *d* for the reception of the silo hoops *F*; and it will further be observed by comparison of Figs. 1 and 2 that each post A is provided at a point intermediate and about midway between each pair of cross-bars D with a lug G. These lugs G are respectively provided at *g* with a horizontal shelf, and from the said shelf each lug is curved or beveled, as indicated by *h* and *i*, for a purpose hereinafter set forth. Each pair of lugs G is designed to cooperate with a fastener bar H, of which there is one for each door E. The said bars H rest on the shelves *g* of their complementary lugs G, and extend through vertical yokes I on their complementary doors E, and it will also be understood that each yoke I is provided with a threaded aperture *i'* in which bears a screw K, which screw is provided at its outer end with a suitable handle *k* and has its inner end arranged to bear against the outer side of its complementary fastener bar H.

The manner of fastening the doors E is similar, and therefore a detailed description of the manner of putting in and taking out one door will suffice to impart a definite understanding of all. In putting in the door shown in Fig. 3, it is introduced endwise through its respective frame from without inward, and is then manipulated to oppose its rabbeted edges to the rabbeted edges of its frame. After the said placing of the door, its respective fastener bar H is manipulated to position on the shelves *g* of the adjacent lugs G, and then the screw K is turned inward. Such turning of the screw

K will bind the fastener bar H against the faces of the lugs G, and will draw the door E outwardly against its frame with the result that a very tight joint is produced between door and frame as is desirable.

To remove the door, the operation described is reversed—i. e., the screw K is loosened, and the fastener bar is swung in the yoke I until its ends are within the outline of the door opening, whereupon the door with the fastener bar H still in the yoke may be moved inward with respect to the frame, and removed therefrom.

The yoke I can be used as a convenient handle during the placing and removal of the door, and is also advantageous because it affords a durable bearing for the screw K. The said screw K, equipped with the handle *k* is advantageous because it renders unnecessary the employment of a wrench in the tightening of the door; and it is also advantageous inasmuch as when it is employed in combination with the door frame, the outwardly bearing door, the yoke, the lugs, and the fastener bar, relatively arranged as shown, the door can be quickly closed in a strong and tight manner, and so that the door is supported partly by the direct bearing of the door on the lower portion of the door frame and partly by the bearing of the clamped bar H on the lugs G.

As will be readily understood both the cross-bars D and the fastener bars H are adapted to serve the additional function of ladder steps or rungs to enable a person to climb to the top of the silo when necessity demands.

As will be observed by comparison of Figs. 1 and 4, we also show herein a splice that is used when it is necessary because of the height of the silo to have each stave B and C comprise a lower section and an upper section. In Fig. 4, the lower section of the stave is lettered *m*, while the upper section is lettered *n*. The upper end of the lower section is beveled at *p* and *r* to an apex *s*, and in the said upper end is embedded a splice bar *t*, preferably of galvanized steel; the said splice bar protruding about one-half of its height above the upper end of the section *m*. The upper section *n* is provided in its underside with a recess *u*, conforming in shape to and adapted to receive the beveled upper end of the section *m*, and said section *n* is also provided with a socket *v* which extends upward from the uppermost portion of the recess *u* and is adapted to snugly receive the protruding portion of the bar *t*. By virtue of this construction it will be manifest that in addition to being strong, the splice is both air-tight and self-draining; the splice bar being so relatively arranged that it is impossible for the same to be affected by acids given off by the ensilage in the silo. From this it follows that there is no liability of the splice bar *t* rusting and becoming broken because of such cause.

We would have it understood in the above connection that both the staves B and the staves C may, when necessity demands, be constructed in the manner shown in Fig. 4.

Having described our invention, what we claim and desire to secure by Letters-Patent, is:

The combination of a door frame, a door opposed to and bearing outward against the said frame and having on its outer side a fixed vertical yoke provided with an outer upright portion and a horizontally disposed threaded aperture therein, a screw bearing in said aperture and having a handle at its outer end, upright lugs fixed on the outer side of the frame, and an imperforate fastener bar removably arranged in the yoke and against the inner end of the screw and on the lugs.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

WALTER C. ULINE.
BURTON A. ULINE.

Witnesses:

EDWARD C. WEBSTER,
THOMAS J. PRICKETT.