No. 735,485. PATENTED AUG. 4, 1903.

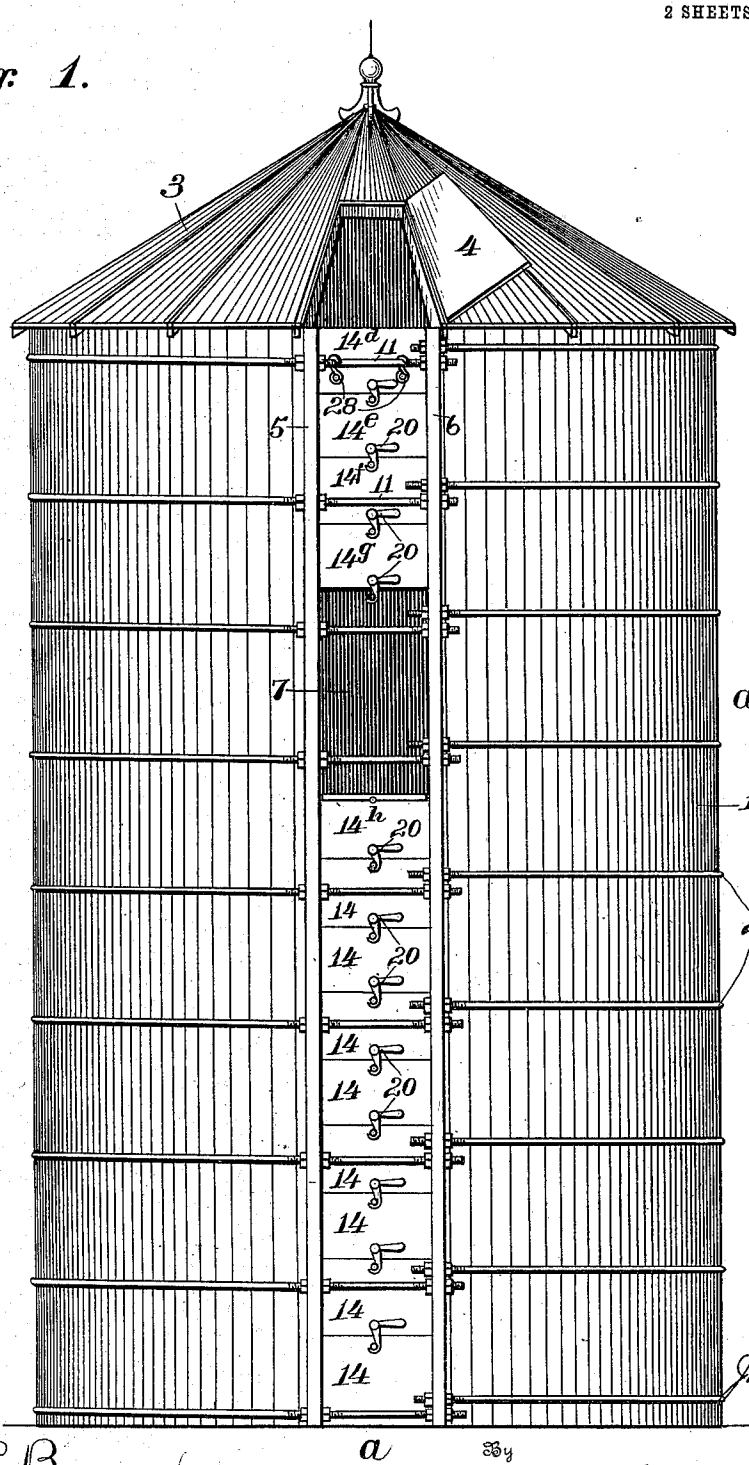
J. FARRELL.

SILO.

APPLICATION FILED MAY 6, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.



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No. 735,485. PATENTED AUG. 4, 1903.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.

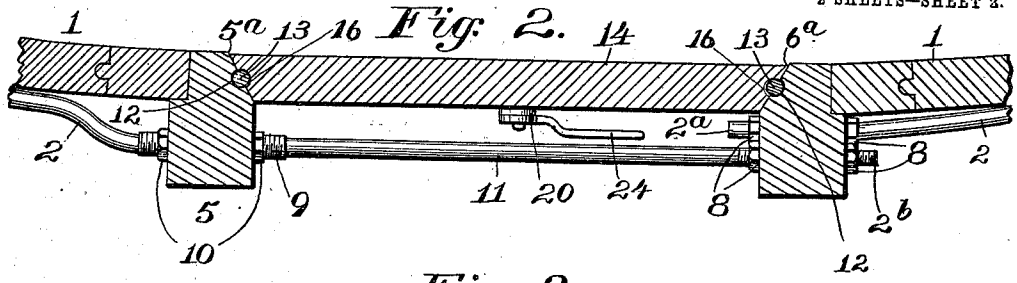


Fig. 3.

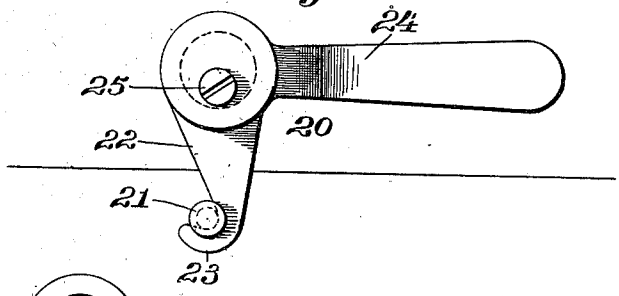


Fig. 4.

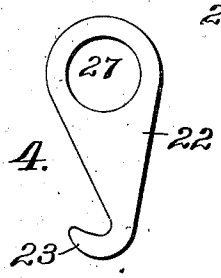


Fig. 5.

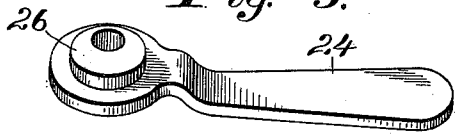


Fig. 6.

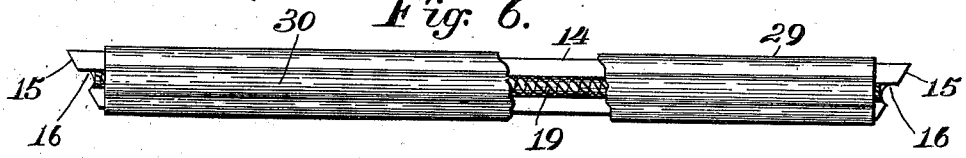
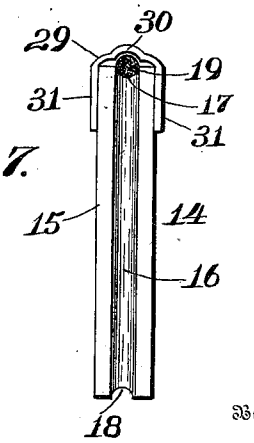


Fig. 7.



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No. 735,485. Patented August 4, 1903.

UNITED STATES PATENT OFFICE.

JOHN FARRELL, OF NEWTON, NEW JERSEY.

SILO.

SPECIFICATION forming part of Letters Patent No. 735,485, dated August 4, 1903.

Application filed May 6, 1902. Serial No. 106,195. (No model.)

To all whom it may concern:

Be it known that I, JOHN FARRELL, a citizen of the United States, residing at Newton, in the county of Sussex, State of New Jersey, have invented certain new and useful Improvements in Silos, of which the following is a specification.

This invention comprises improvements in silos, and it relates particularly to the construction of the door and adjacent parts by means of which the door may be conveniently operated and practically air-tight joints are maintained between the door-sections and door-jambs or guide-posts, as well as between adjacent door-sections.

In the accompanying drawings, Figure 1 is a front elevation of a silo embodying my improvements. Fig. 2 is a horizontal section taken through the doorway of the silo. Fig. 3 is a view showing the device for clamping adjacent door-sections together. Figs. 4 and 5 are detail views of said clamping devices. Fig. 6 is an end view of a door-section with a movable guard attached thereto, the latter being partly broken away; and Fig. 7 is a side view of the same.

Referring to the drawings, *a* indicates the silo, comprising a cylindrical wall 1, preferably made of suitably tongue-and-grooved staves or boards, retained in position against internal pressure by a suitable number of metal hoops or bands 2, and having a roof 3, provided with a hinged door 4. Guide-posts or jambs 5 and 6 are arranged parallel with one another at either side of a doorway 7, which extends from top to bottom of the cylindrical wall of the silo. The ends 2^a and 2^b of each band are threaded and extend through one of the guide-posts 6, said ends being adjustably secured to the post by nuts 8. Each hoop also extends through the guide-post 5 and has a thickened threaded portion 9 where it passes through the post. Nuts 10 are arranged upon the part 9 at either side of the post 5. The guide-posts are tied together by the parts 11 of the rods, and by adjusting the nuts on the rods the posts may be kept parallel with one another throughout their lengths, and the hoops or bands may be taken up or let out. The posts 5 and 6 are provided with beveled faces 5^a and 6^a, respectively, at the inner parts of their adjacent sides, and said beveled faces are provided with longitudinal grooves 12, substantially semicircular in cross-section, within which are arranged guide-ropes 13, said ropes being suitably held within the grooves. These ropes, which are preferably braided and rendered waterproof, serve as guides for the sliding door-sections 14 and also serve the purpose of packings between the door-sections and guide-posts.

The door consists of series of sections 14, each having its lateral edges 15 beveled to correspond with the beveled faces of the guide-posts or jambs and having semicircular groove 16 extending longitudinally of said beveled faces. The door-sections are placed in position by sliding them down from the top of the doorway, the grooves 16 fitting around the exposed surfaces of the ropes and forming tongue-and-groove joints therewith. The door-sections are thus locked against inward movement by the ropes, which form guides for the sections. Grooves 17 and 18 are also formed in the top and bottom, respectively, of each door-section, and a rope 19 is arranged in one of said grooves. As shown in Figs. 6 and 7, the rope 19 is secured within the groove 17 at the top of a door-section and forms a tongue which is adapted to fit within a groove 18 in the adjacent door-section. The pressure of the material within the silo forces the door-sections outward, compressing the ropes 13 within the grooves between the guide-posts and the door-sections, and thus preventing the circulation of air between the door-sections and posts. The adjacent door-sections are drawn firmly together by suitable clamping devices 20, thus compressing the rope packings 19 within the grooves at the ends of the sections. Each door-section is provided with a stud or projection 21 and a clamping device 20, the clamping device being arranged to engage the projection upon the adjacent door-section. As shown in the drawings, the clamping devices 20 are arranged near the lower edge of each door-section and engage projections arranged near the upper edge of the adjacent sections. Each clamping device consists of a latch 22, having a hooked or turned-over end 23, which engages the catch or stud 21, and a lever 24, secured by a pivot 25 to the

door-section and having an eccentric projection 26, which fits within a circular opening 27 in the latch, the arrangement being such that when the handle is raised from the horizontal position the latch will be lowered out of engagement with the catch and when the lever is turned into the horizontal position the latch will be brought into engagement with the catch or projection on the adjacent door-section, and the two sections will be drawn firmly together, compressing the rope packing 19 and making a practically air-tigbt joint.

In practice when a part of the ensilage has been removed from the silo one or more of the uppermost door-sections may be removed, and the next remaining section, such as the section 14^d, is then slid upwardly on the guide-ropes and secured to the part 11 of the uppermost band by suitable means, such as the hooks 28. As fast as the material is removed from the silo thereafter the succeeding door-sections 14^e 14^f, &c., may be moved upward and suspended from the section 14^d by connecting said sections together with the clamping devices 20. In the drawings the three topmost sections have been removed and the sections 14^d, 14^e, 14^f, and 14^g have been moved upwardly, leaving a space for ingress and removal of material equal in height to three door-sections between the section 14^g and the section 14^h. When the ensilage is removed to the bottom of the section 14^h, said section may then be moved upward and connected to the section 14^g. A doorway is thus provided at all times just above the top of the contents of the silo, and the door-sections, with the exception of the uppermost ones, will always remain in position ready to be replaced by simply unlocking and lowering them.

In order to prevent injury to the rope packings 16 while removing material from the silo or the grooves in case the packings are arranged at the bottoms of the door-sections, a sheet-metal guard 29 is provided, as shown in Figs. 6 and 7, said guard consisting of a plate having a central longitudinal rib 30, adapted to extend over the rope 19, and flanges 31, arranged to embrace the sides of the door-section. The guard is adapted to be placed upon each door-section in succession and to remain upon the section as long as it serves as a sill for the doorway of the silo. The packings may be made of ordinary rope, preferably braided and rendered waterproof, or of any other compressible material adapted to fit within the grooves for the purpose stated herein.

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

1. In a silo, the combination with a building having a vertical doorway, of posts at the sides of said doorway, said posts having beveled faces at their inner sides, compressible guides extending longitudinally of and projecting outwardly from said faces, and a series of door-sections having beveled lateral edges and grooves in said edges adapted to receive the projecting portions of the guides.

2. In a silo, the combination with a building having a vertical doorway, of posts at the sides of said doorway, said posts having beveled faces at their inner sides and grooves extending longitudinally of said faces, compressible guides within said grooves and projecting outwardly beyond said faces, and a series of door-sections having beveled lateral edges and grooves in said edges adapted to receive the projecting portions of the guides.

3. In a silo, the combination with a building having a vertical doorway, of posts at the sides of said doorway, said posts having beveled faces at their inner sides and grooves extending longitudinally of said faces, ropes within said grooves and projecting outwardly beyond said faces, and a series of door-sections having beveled lateral edges and grooves in said edges adapted to receive the projecting portions of the ropes.

4. In a silo, the combination with a building having a vertical doorway, of guide-posts at the sides of said doorway, said posts having beveled faces at their inner sides and grooves extending longitudinally of said faces, compressible guides within said grooves projecting outwardly beyond said faces, and a series of door-sections each having beveled lateral edges and grooves in said edges adapted to receive the projecting portions of the guides, each section also having a compressible packing extending along one end and forming a tongue, and a groove extending along its opposite end, and means for clamping said sections together.

5. In a silo, the combination with a building having a vertical doorway, of guide-posts at the sides of said doorway, said posts having beveled faces at their inner sides and grooves extending longitudinally of said faces, ropes within said grooves projecting outwardly beyond said faces, and a series of door-sections each having beveled lateral edges and grooves in said edges adapted to receive the projecting portions of the ropes, each section also having a rope extending along one end and forming a tongue, and a groove extending along its opposite end, and means for clamping said sections together.

6. In a silo, the combination with a building having a vertical doorway, of guides at the sides of said doorway and a door comprising a series of door-sections movable longitudinally of the guideways, each section having a groove extending along one end and a compressible packing extending along the other end and adapted to fit into the groove of an adjoining section.

7. In a silo, the combination with a building having a vertical doorway of guides at either side of said doorway, a series of door-sections movable vertically between the guides, means for holding an upper door-sec-

tion stationary between the guides, and devices upon each door-section for fastening it to the adjacent sections.

8. In a silo, the combination with a building having a vertical doorway, of a series of vertically-movable door-sections arranged across the doorway, means for holding an upper door-section stationary, and means for suspending one or more successive door-sections from said upper section.

9. In a silo, a door comprising a vertical series of sections, and a removable guard adapted to fit over the upper ends of said sections.

10. In a silo, the combination with a cylindrical building having a vertical doorway and guide-posts at either side of said doorway, of a series of metal hoops or bands each extending around said building and secured to the guide-posts, one portion of each band extending across the doorway and having adjusting-nuts thereon bearing against both guide-posts.

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

JOHN FARRELL.

Witnesses:
J. A. WATSON,
CHAPMAN W. FOWLER.