

No. 740,340.

PATENTED SEPT. 29, 1903.

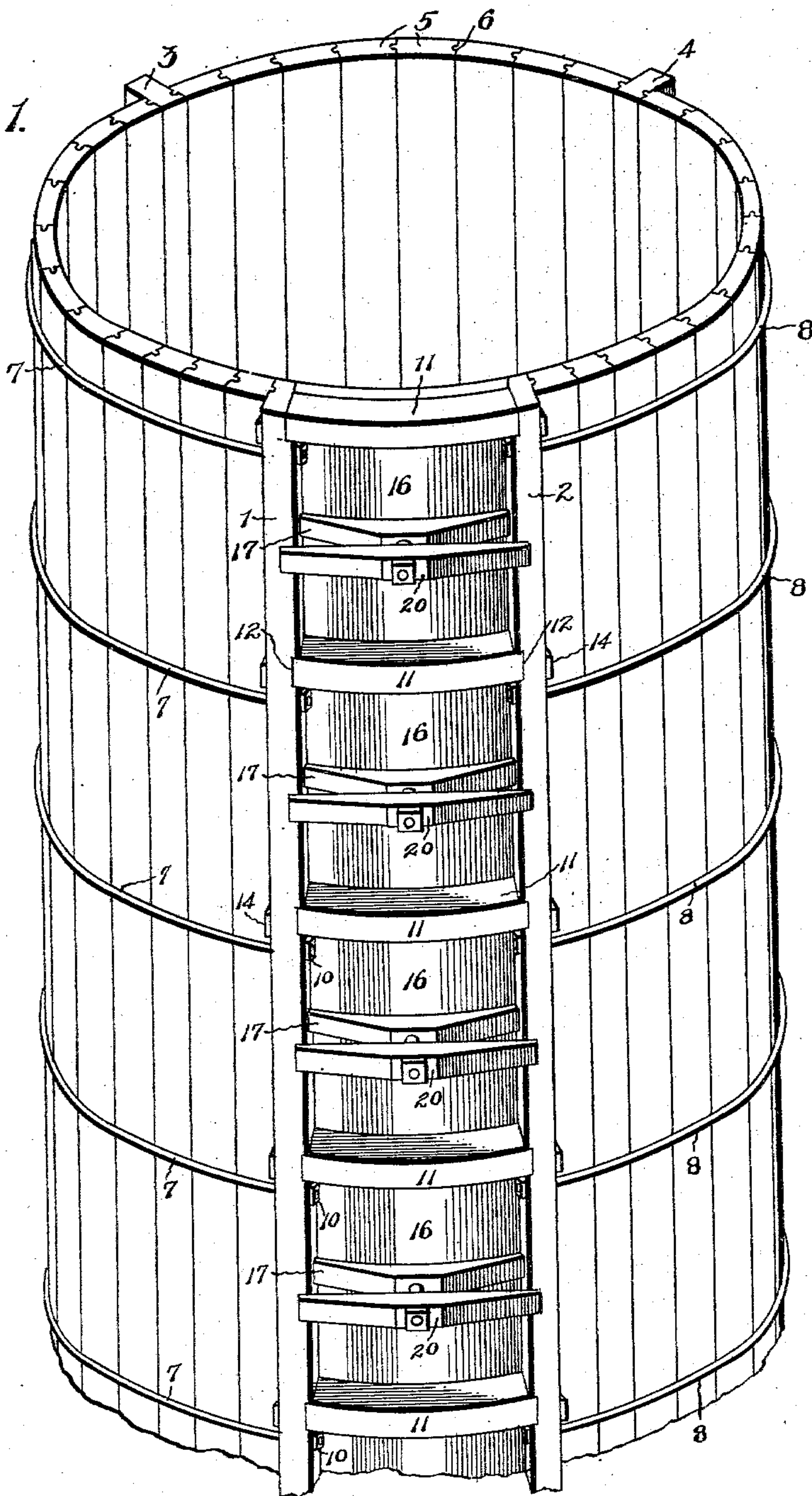
R. F. VAN WINKLE.
SILO.

APPLICATION FILED MAR. 26, 1903.

2 SHEETS—SHEET 1.

NO MODEL.

Fig. 1.



Witnesses
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2 SHEETS—SHEET 2.

NO MODEL.

Fig. 3.

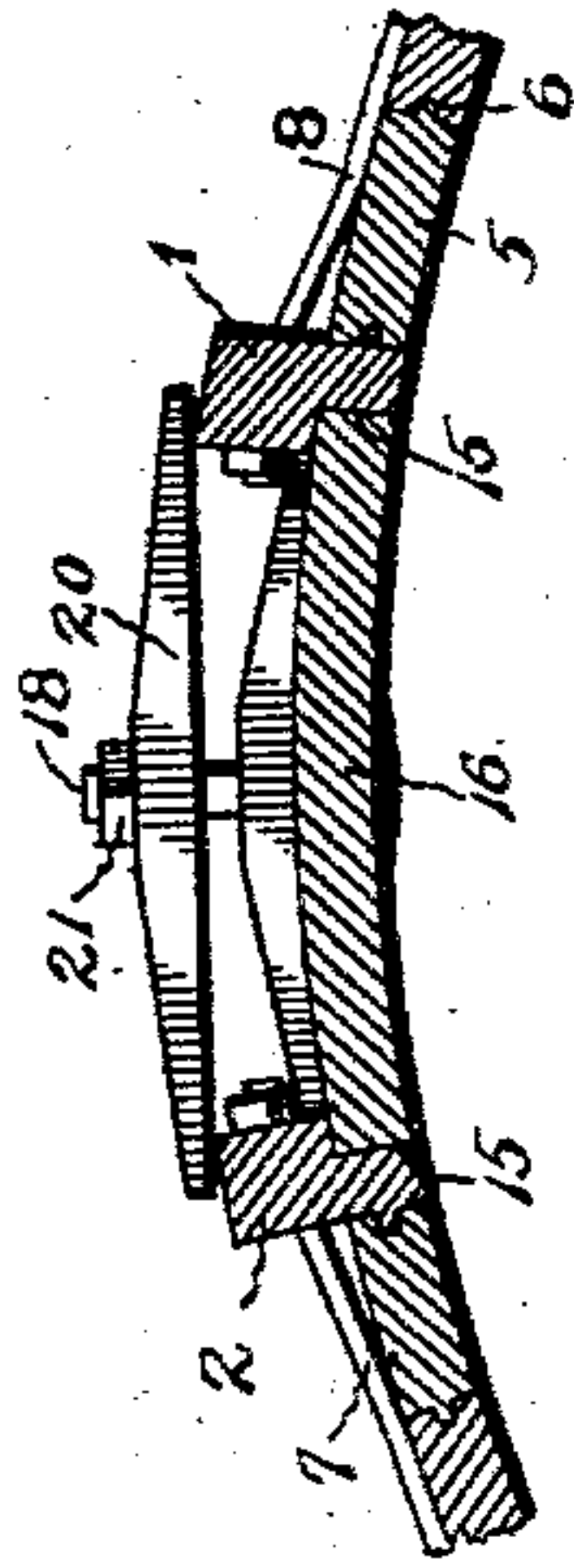


Fig. 5.

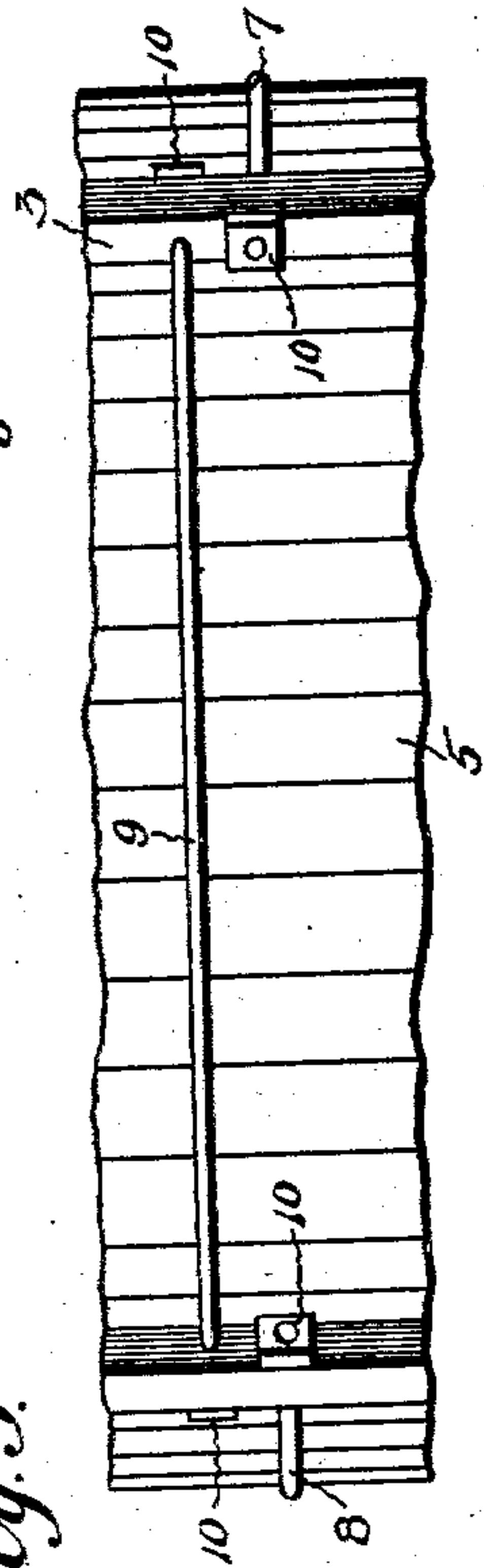


Fig. 4.

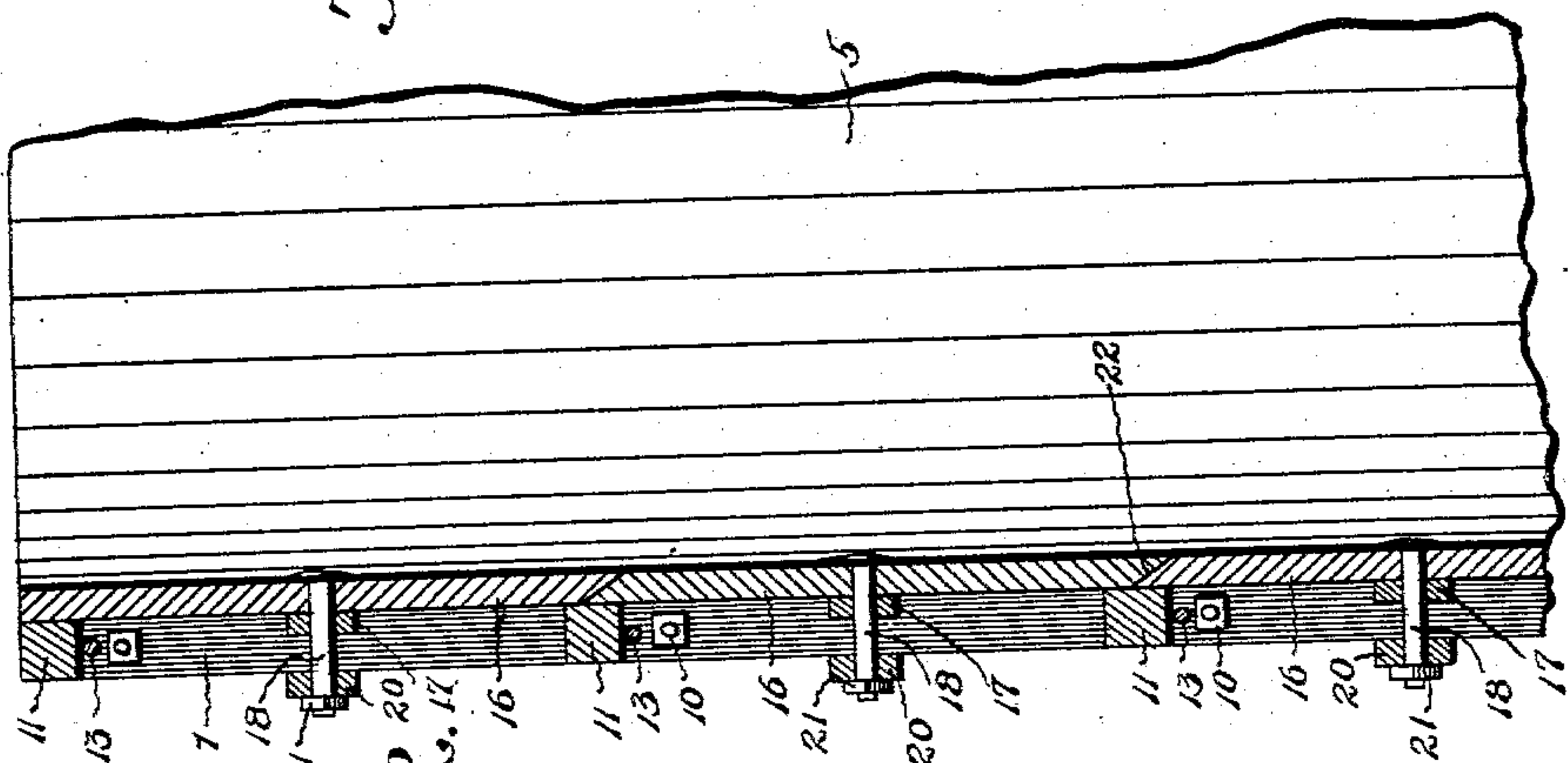
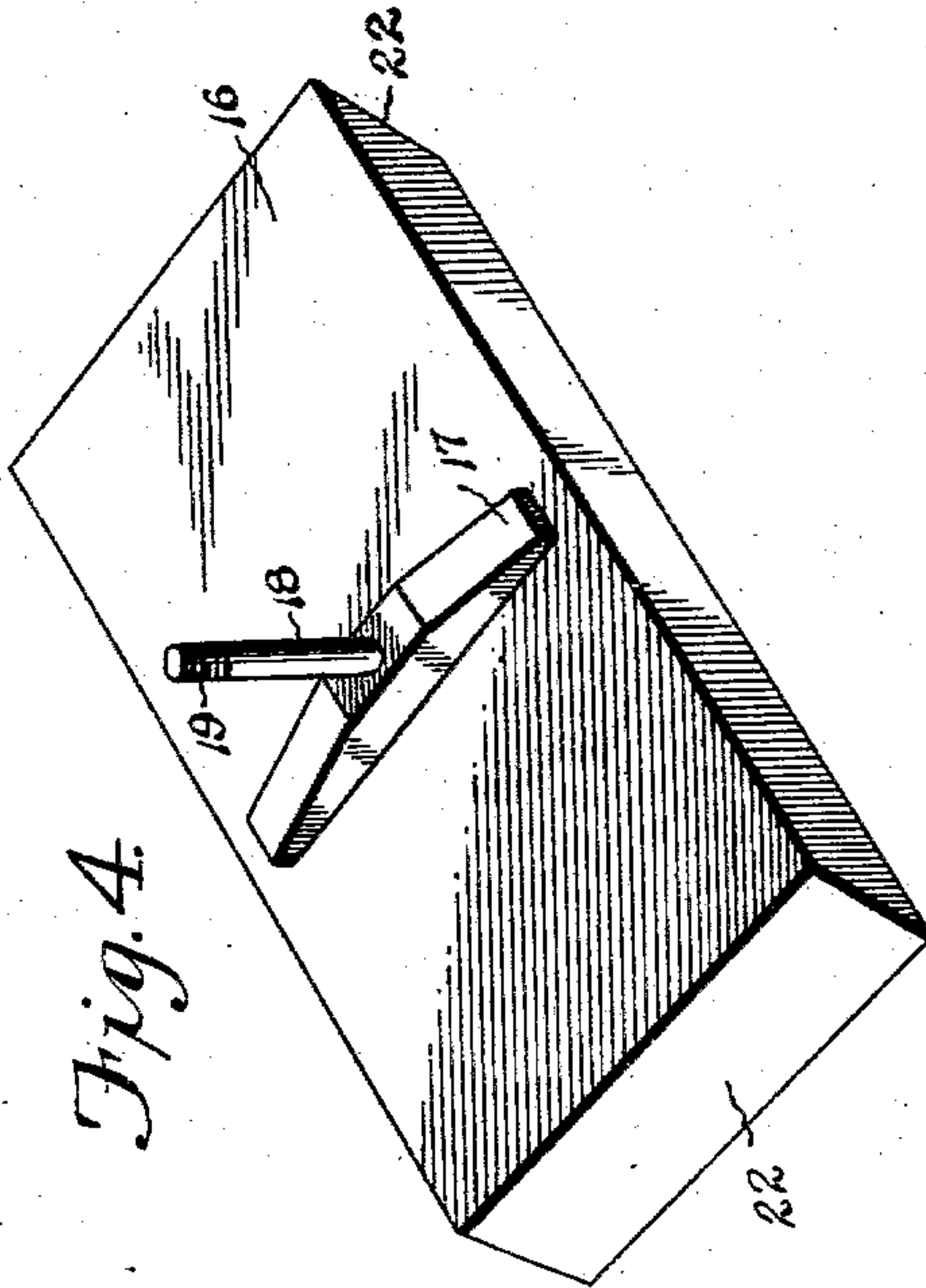


Fig. 2.

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UNITED STATES PATENT OFFICE.

RALPH F. VAN WINKLE, OF LINESVILLE, PENNSYLVANIA.

SILO.

SPECIFICATION forming part of Letters Patent No. 740,340, dated September 29, 1903.

Application filed March 26, 1903. Serial No. 149,649. (No model.)

To all whom it may concern:

Be it known that I, RALPH F. VAN WINKLE, a citizen of the United States, residing at Linesville, in the county of Crawford and State of Pennsylvania, have invented certain new and useful Improvements in Silos, of which the following is a specification.

This invention relates to silos, and is designed to provide improvements in the structure thereof whereby the silo may be conveniently set up and maintained in a strong, durable, and air-tight condition.

Another object of the invention is to provide a continuous doorway from the top to the bottom of the silo, so as to give access thereto at any height and to obviate obstructions in the doorway, which would interfere with the throwing out of the silage through said doorway.

It is furthermore designed to provide for convenience in applying and removing individual door-sections without sliding the entire door and without interfering with the other door-sections and also to insure air-tight joints between adjacent door-sections.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims.

In the drawings, Figure 1 is a perspective view of the upper portion of a silo embodying the features of the present invention. Fig. 2 is a detail longitudinal sectional view taken through the upper portion of the door of the device. Fig. 3 is a detail cross-section taken through one of the door-sections. Fig. 4 is a detail perspective view of a door-section. Fig. 5 is a detail rear elevation of a portion of the silo to show the manner of arranging the sectional bands for confining the staves which make up the body of the silo.

Like characters of reference designate corresponding parts in each and every figure of the drawings.

In constructing the present silo two substantially parallel upright standards 1 and 2 are employed at the front of the device, said standards being separated by a suitable space to constitute a doorway. Other intermediate

standards are also provided—as, for instance, two such standards, designated by the reference characters 3 and 4—between which and the respective front standards are staves 5, which have tongue-and-groove joints 6, there also being tongue-and-groove joints between the standards and the adjacent staves. It will be noted that the standards are thicker than the staves and are projected at the outer sides thereof, while they are flush with the inner peripheral wall of the body. At suitable intervals the silo-body is embraced by bands formed in sections, there being three such sections in the form of silo shown in the accompanying drawings and designated by the reference characters 7, 8, and 9, each of which is in the form of a metallic rod having its opposite ends screw-threaded and piercing the adjacent standards, with suitable nuts 10 fitted to the projected screw-threaded ends and bearing against the standards, the intermediate portions of the bands snugly embracing the staves, so that by manipulation of the nuts the sections may be drawn to snugly embrace the silo, and thereby hold the staves in rigid relation. Whatever shrinkage may occur can be readily taken up by tightening the nuts 10. When two intermediate standards are employed, each band or hoop is made up of three sections, and in silos of greater diameter a greater number of intermediate standards are of course employed, and the hoops or bands are divided into sections accordingly.

To space the front or door standards 1 and 2, suitable cross-bars 11 are interposed between the standards and fitted in corresponding seats or notches 12, formed in the inner faces of the standards. Beneath each cross-bar and in contact therewith is a rod 13, the opposite ends of which pierce the standards and have their projected terminals screw-threaded for the reception of nuts 14, whereby the standards may be drawn into snug engagement with the cross-bars and a tight and durable structure insured thereby. It will here be noted that the cross-bars 11 are disposed adjacent to and slightly above the respective bands or hoops, with the tie-rods 13 located between the cross-bars and the bands. Any individual cross-bar may be removed

outwardly through the seats or notches 12 without interfering with any of the other cross-bars.

As best indicated in Fig. 3 of the drawings, 5 it will be seen that the inner faces of the front standards 1 and 2 are longitudinally notched or rabbeted at their backs, as indicated at 15, to form longitudinal seats or guideways, and in these seats are fitted a vertical series of in- 10 dependent door-sections 16, one of which has been shown in detail in Fig. 4. Each door-section of course corresponds in cross-section to the general curvature of the body of the silo, and while shown as formed in a single 15 piece may of course be built up of staves whenever such construction may be deemed desirable. Extending transversely across the middle portion of each door-section and at the outer side thereof is a stationary cleat 17, 20 which strengthens the door-section and prevents warping thereof, and a bolt or stem 18 centrally pierces the door-section and the cleat and projects at a predetermined degree beyond the door, the outer extremity being 25 screw-threaded, as at 19. A locking cross-bar 20 has an intermediate opening to receive the stem and permit rotation of the bar thereon, the normal disposition of the bar being transverse of the door, with its opposite ends 30 lying across and in frictional engagement with the front faces of the standards 1 and 2, there being a suitable nut 21 fitted to a screw-threaded portion of the stem and bearing against the locking-bar to prevent accidental 35 rotation thereof. By manipulation of the nut 21 the door-section may be drawn into snug engagement with the seats or rabbets of the door-standards, and by loosening the nut the 40 locking-bar may be rotated so as to clear the standards, and thereby prevent removal of the door-section.

A very important feature of this invention is best disclosed in Fig. 2 of the drawings, wherein it will be seen that the abutted ends 45 of adjacent door-sections have an overlapping or beveled joint and each section has its opposite ends correspondingly beveled, as at 22, the inclination of the bevel being downwardly and inwardly. Furthermore, the cross-bars 50 11 are disposed to lie across and close the joints between the door-sections, thereby to effectually seal the beveled joints between the door-sections and provide an air-tight structure.

55 By the present arrangement of abutted door-sections it is apparent that a continuous doorway is formed from top to bottom of the silo—that is to say, there are no permanent or stationary body-sections between adjacent 60 door-sections—so that when a pair or more

of adjacent door-sections are removed a continuous unobstructed opening is afforded, the cross-bars 11 not affording much of an obstruction and can be removed, together with the tie-rods 13, should it become necessary. 65

A very important feature resides in beveling the upper and lower ends of each door-section in the same direction, as this permits 70 of any section being removed independently of any other section.

In addition to the functions hereinbefore described for the cross-bars 11 and the locking-bars 20 these members also constitute the 75 rungs of a ladder to permit convenient access to the top of the silo, the latter varying in height from fifteen to forty feet. Furthermore, the cross-bars 11 serve to limit the drawing together of the front standards 1 and 2 by the nuts 14 of the tie-rods 13 and are so 80 proportioned as to prevent the standards from being drawn into such snug engagement with the door-sections as to interfere with the convenient removal thereof.

Having thus described the invention, what I claim is— 85

1. A silo having a doorway, and a continuous series of individually-removable integral door-sections closing the doorway, the opposite ends of the door-sections being beveled, said bevels lying in parallel planes to permit 90 of individual removal of the sections.

2. A silo having a doorway, a continuous series of individually-removable abutted door-sections closing the doorway and having 95 their upper and lower ends beveled, said bevels lying in parallel planes.

3. A silo having a doorway, a continuous series of individually-removable abutted door-sections closing the doorway and having 100 their upper and lower ends beveled, said bevels lying in parallel planes, and cross-bars lying externally across the joints between the door-sections to close said joints.

4. A silo having a doorway, a continuous series of individually-removable integral 105 abutted door-sections closing the doorway, said individual sections having their top and bottom ends beveled, said bevels lying in parallel planes, and locking-bars intermediately pivoted to the individual door-sections 110 and normally overlapping the opposite sides of the door to removably hold the door-sections in place.

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

RALPH F. VAN WINKLE.

Witnesses:

CHARLES N. CROSBY,
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