J. L. GRISWOLD.

SHIFTABLE SILO DOOR.

APPLICATION FILED DEC. 26, 1916.

1,322,690.

Patented Nov. 25, 1919.

2 SHEETS—SHEET 1.

Fig. 1

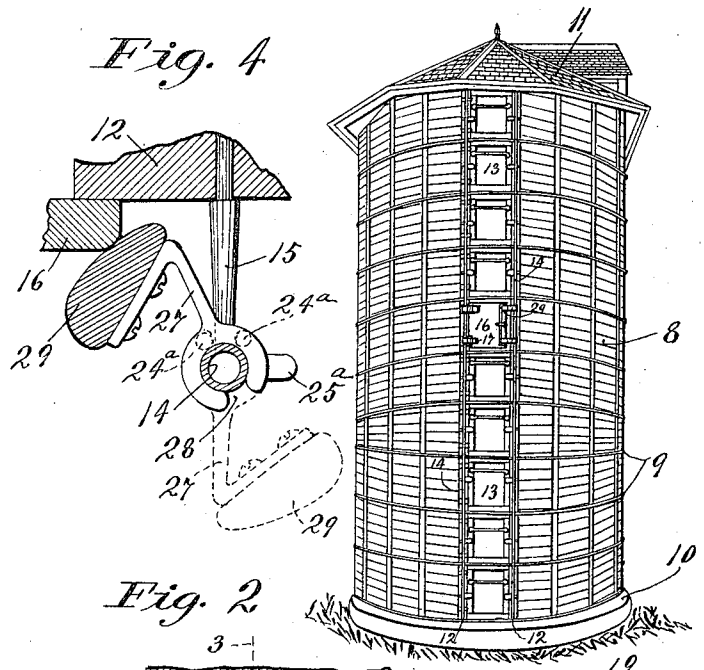


Fig. 4

Fig. 5

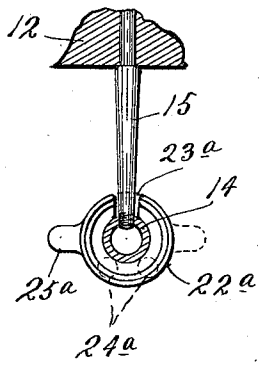


Fig. 2

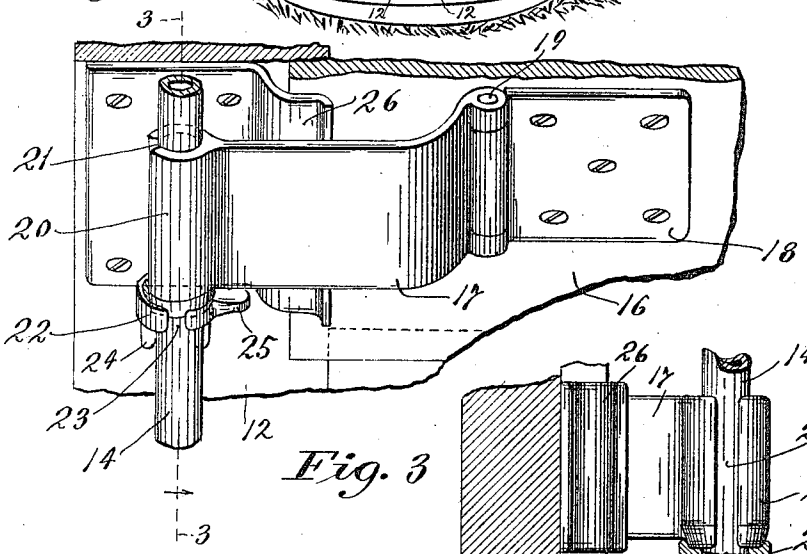


Fig. 3

Witnesses.

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2 SHEETS—SHEET 2.

Fig. 6

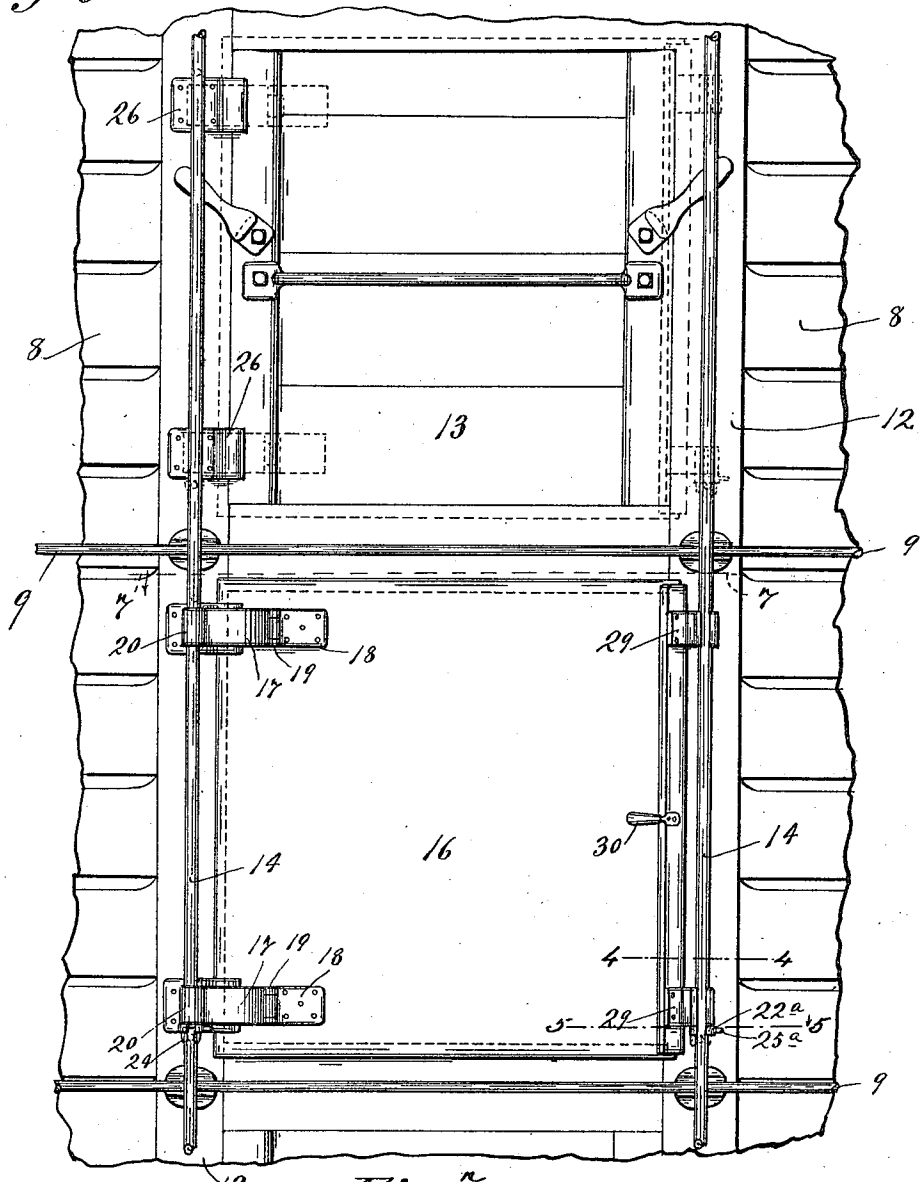
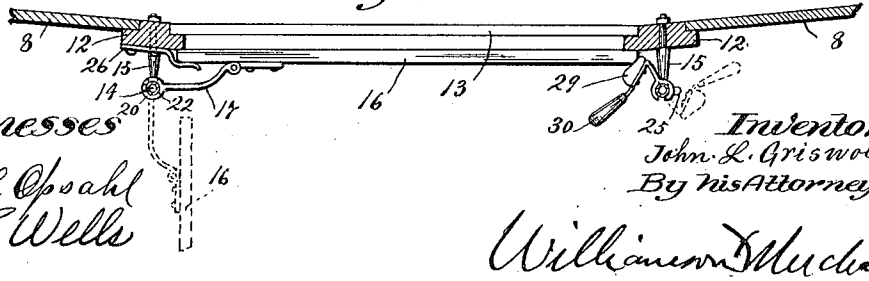


Fig. 7



Witnesses

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SHIFTABLE SILO-DOOR.

1,322,690. Specification of Letters Patent. Patented Nov. 25, 1919.

Application filed December 26, 1916. Serial No. 138,750.

To all whom it may concern:

Be it known that I, JOHN L. GRISWOLD, a citizen of the United States, residing at Dodge Center, in the county of Dodge and State of Minnesota, have invented certain new and useful Improvements in Shiftable Silo-Doors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to silos and has for its object to provide a simple and efficient shiftable or so-called follow-up door therefor.

As is well known, it is customary to provide silos with a vertical series of inside doors, which are removed in succession, or progressively, from top to bottom as the ensilage is removed, and then progressively re-applied at points above the ensilage, leaving one inside door always removed.

My improved so-called follow-up door is an outside door, which is shiftable vertically along a vertical guide, and is arranged to be automatically supported in position to close the door openings progressively from top toward the bottom of the silo so that it may always be used to close that door opening from which the inside door has been removed, or moved into an open position.

In the accompanying drawings, which illustrate the preferred form of the invention, like characters indicate like parts throughout the several views.

Referring to the drawings:

Figure 1 is a perspective view, showing a silo with my improved door applied thereto;

Fig. 2 is a detail and perspective, showing particularly the hinge structure for the follow-up door;

Fig. 3 is a vertical section on the line 3—3 of Fig. 2;

Fig. 4 is a horizontal section taken approximately on the line 4—4 of Fig. 6;

Fig. 5 is a section taken approximately on the line 5—5 of Fig. 6; and

Fig. 6 is an enlarged front elevation of the door and frame structure.

Fig. 7 is a section taken on a line 7—7 of Fig. 6.

The improved door is applicable to a silo of any type having a vertical series of inside doors. The silo illustrated is an ordinary cylindrical silo having walls 8, hoops 9, base 10, and roof structure 11. Between the usually vertically extended door posts 12 the silo is provided with a vertical series of door openings adapted to be closed by a corresponding number of inside doors 13, of the usual or any suitable construction.

To both door posts 12 guide rods 14 (preferably in the form of metal tubes or pipes) are rigidly secured by outstanding stud-like brackets 15, which, at points where they join said guide rods, are of much less diameter than the said rods, this being an important feature as will presently appear. These guide rods extend from the top to the bottom or from roof to base of the silo.

The outside follow-up door, which may be of metal, wood or any suitable construction, is indicated as an entirety by the numeral 16.

In the arrangement illustrated this "follow-up door" is hinged to the left hand guide rod 14, by upper and lower two-section hinges 17—18, connected by a hinge joint 19. The hinge sections 18 are rigidly connected by screws or otherwise to door 16 and are located considerably inward of the left hand vertical edge of the said door. The hinge sections 17 at their free ends have sleeves 20 pivoted on the left hand guide rod 14, and these sleeves are provided with vertical slots 21 of such width that the said sleeves will clear and vertically pass the outer ends of brackets 15, when the hinge sections 17 are turned outward and directly away from the said brackets.

To temporarily support one or the other, to-wit, as shown, the lower hinge section 17, in any one of the several proper positions for alining the door 16 to close any one of the door openings, I provide a so-called follow-up hub 22. This follow-up hub 22 has a slot or gap 23 of such width that it also will pass vertically by the brackets 15 when said gap is alined therewith as shown by full lines in Fig. 5. The said hub 22 is further provided with two depending lugs 24 and a projecting finger piece 25. When this hub is turned into the position shown in Figs. 2, 3, 4 and 6 and rested on the adjacent bracket 15, with its lugs straddling same, it will be locked against lowering movement and against rotation and will then serve as a base support for the lower hinge section 17 so that the door 16 will be properly alined to close one or the other of the door openings.

By noting Figs. 2 and 3 it will be seen that the lower end of the sleeve 20 of the lower hinge 17 is tapered and fits a corresponding seat on the hub 22. Rigidly secured to the left hand post 12 at each door opening are upper and lower joint plates 26 the projecting edges of which stand out from said post so that the left hand edge of the door 16 when closed will be wedged or jammed between the same and the adjacent door post and hence tightly closed against the latter. The free edge of the door 16 is arranged to be locked against the right hand door post, by one or more lock levers pivotally mounted on the right hand guide rod 14. As shown there are two of these lock levers 27 and each lock lever is provided with a hub that is pivoted on the said right hand guide rod and is provided with a slot or gap 28 which, when the lock lever is turned outward, will clear the alined brackets 15 and move vertically past the same. At their free ends the levers 27 are shown as secured to the vertically extended cam bar or head 29 that directly engages the free edge of door 16 and frictionally locks against the same with a wedging action, when said levers are moved to the position shown by full lines in Figs. 4, 6 and 7. Preferably the cam or wedge bar 29 has a hand piece 30.

For temporarily supporting the above door locking device in any one of its several positions I provide a so-called follow-up hub 22^a which is of substantially the same construction as the hitherto described follow-up hub 22, and like the latter has a gap 23^a and depending pins 24^a, that performs the same functions respectively, as the elements 23 and 24. Said hub 22, also hub 22^a, is preferably provided with a finger piece 25^a.

From the above description it is evident that both the follow-up door and its locking device may be adjusted vertically on the supporting rods and pivotally set for action at any one of the door openings. Where desired, two or more of these so-called follow-up doors may be provided on the same silo and mounted on the same supporting rods, but for most purposes the single follow-up door will be found sufficient.

The inside silo doors are usually made of wood, and hence, subject to expansion and contraction under varying moisture conditions. The ensilage will contain a large amount of moisture, and when confined in a silo, a slow decomposition thereof produces very considerable heat, and the vapor arising therefrom will permeate all of the wooden parts of the silo including the doors and cause the same to expand.

When the inside door is first opened from immediately above the ensilage, it will be very damp and in the winter time will be covered with frost and expand to such an extent that it cannot be conveniently immediately applied to close the door opening. For this reason, the outside so-called follow-up door is required.

After the door has been opened for a short time, it will contract sufficiently to permit its re-use in closing of its corresponding door opening, but there will always be at least one door opening that cannot be closed by a coöperating inside door.

What I claim is:

1. The combination with a silo or like structure having a plurality of vertically alined door openings and coöperating inside doors, of a follow-up door adjustable vertically along one side of said door openings, for alinement with any one of the said inside doors, and mounted for swinging movements to close the alined door opening.

2. The combination with a silo or like structure having a plurality of vertically alined door openings and coöperating inside doors, of a follow-up door adjustable vertically along one side of said door openings for alinement with any one of the said inside doors, and mounted for swinging movements to close the alined door opening, and a locking device for said follow-up door, mounted for swinging movements to and from operating position, and for vertical adjustments along the opposite side of the said door openings.

3. The combination with a silo or like structure having vertically alined door openings and inside doors therefor, of guide rods extended along the opposite sides of said door openings and provided with anchor brackets rigidly securing the same to the body of the silo, of an outside follow-up door having a hinge, one member of which at its free end is in the form of a sleeve mounted to pivot and slide on one of said guide rods, said sleeve having a slot permitting it to pass one or more of said anchor brackets, and a door locking device having a hub mounted to pivotally slide on the other guide rod, the said hub thereof having a gap permitting it to pass one or more of said anchor brackets, and follow-up hubs mounted to pivot and slide on said guide rods and having gaps permitting them to pass one or more of said brackets, one of said follow-up hubs serving to temporarily support the said follow-up door and the other thereof to temporarily support said door locking device.

4. The combination with a silo or like structure having vertically alined door openings and inside doors therefor, of guide rods extended along the opposite sides of said door openings and provided with anchor brackets rigidly securing the same to the body of the silo, of an outside follow-up door having a hinge, one member of which at its free end is in the form of a sleeve mounted to pivot and slide on one of said guide rods,

said sleeve having a slot permitting it to pass one or more of said anchor brackets, and a door locking device having a hub mounted to pivot and slide on the other guide rod, said hub having a gap permitting it to pass one or more of said anchor brackets, and follow-up hubs mounted to pivot and slide on said guide rods and having gaps permitting them to pass certain of said anchor brackets, one of said follow-up hubs serving to temporarily support the said follow-up door and the other thereof to temporarily support said door locking device, and the said follow-up hubs having shoulders engageable with said anchor brackets to lock the same against rotation, with their gaps out of alinement with said brackets.

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

JOHN L. GRISWOLD.

Witnesses:
CLARA DEMAREST,
F. D. MERCHANT.