R. H. QUICK.

SILO.

APPLICATION FILED NOV. 12, 1915.

1,232,604.

Patented July 10, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

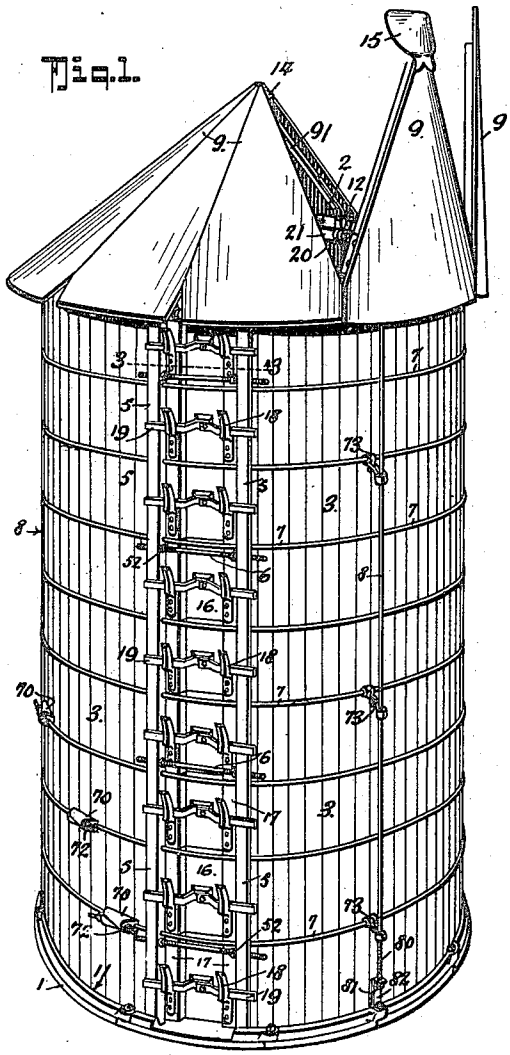


Fig. 2.

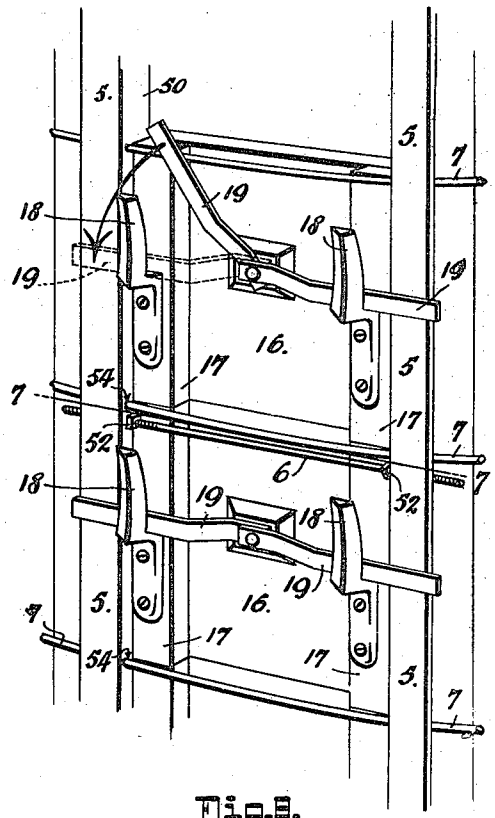


Fig. 3.

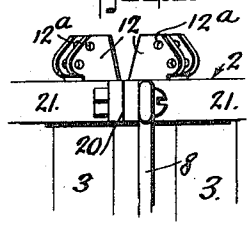
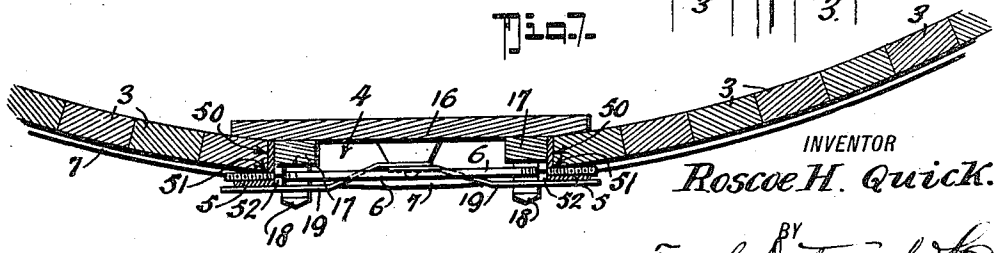


Fig. 7.



INVENTOR

Roscoe H. Quick.

BY

Fred G. Dieterich & Co

ATTORNEYS

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2 SHEETS—SHEET 2.

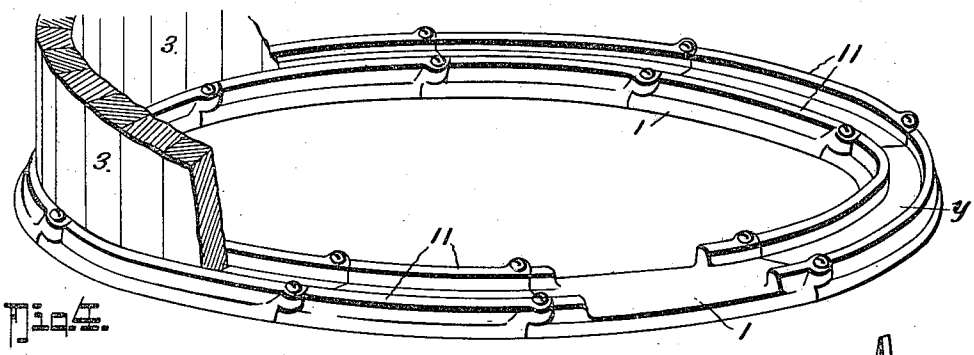


Fig. 4.

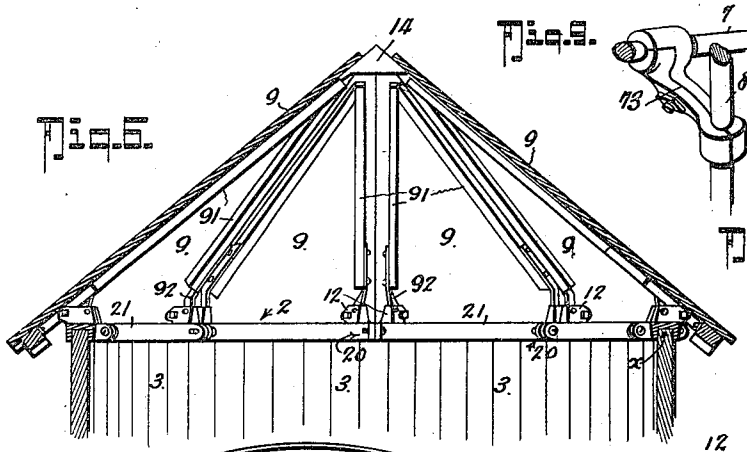


Fig. 6.

Fig. 9.

Fig. 5.

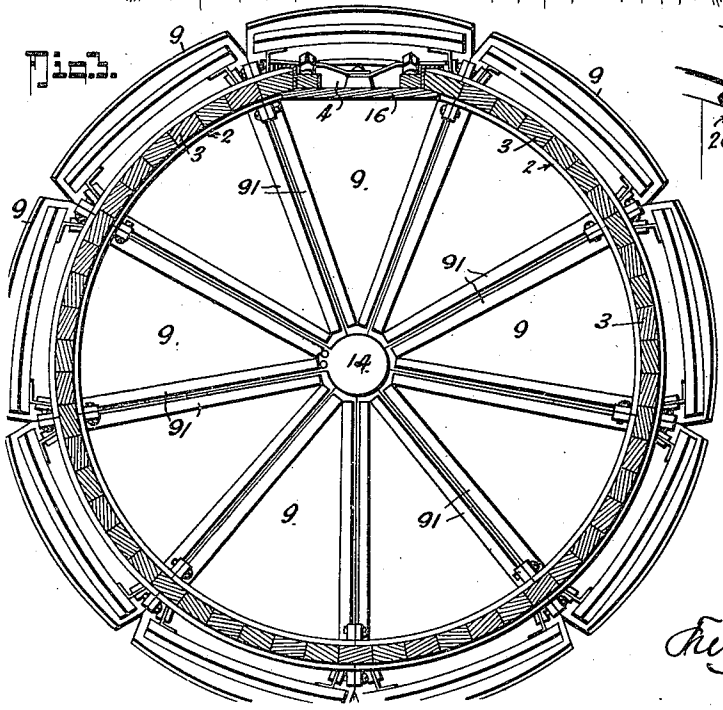


Fig. 3.

INVENTOR

Roscoe H. Quick.

BY

Fred G. Peterich & Co

ATTORNEYS

UNITED STATES PATENT OFFICE.

ROSCOE H. QUICK, OF FIATT, ILLINOIS.

SILO.

1,232,604. Specification of Letters Patent. Patented July 10, 1917.

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To all whom it may concern:

Be it known that I, ROSCOE H. QUICK, residing at Fiatt, in the county of Fulton and State of Illinois, have invented certain new and useful Improvements in Silos, of which the following is a specification.

This invention primarily has for its object to provide an improved construction of silo, whose parts are coöperatively so arranged whereby the same may be quickly and conveniently set up for use and maintained in a strong, durable and air-tight condition.

With other objects in view that will hereinafter appear, my invention consists in the peculiar construction and novel arrangement of parts, all of which will be hereinafter fully described, specifically pointed out in the appended claims and illustrated in the accompanying drawings, in which:—

Figure 1 is a perspective view of my invention, several of the top or cap sections being shown at the open position for ventilating the silo.

Fig. 2 is a detail perspective view of a portion of the front of the silo and illustrating the manner in which the door sections are put into their locked position.

Fig. 3 is a horizontal section of the silo taken substantially on the line 3—3 on Fig. 1.

Fig. 4 is a detail perspective view of the lower sectional clamp rim, several of the staves being shown as held thereon.

Fig. 5 is a detail perspective view of a portion of the upper sectional bearing ring, the hinge brackets to which the top sections are hinged being shown as formed integral with the sections of the said ring, one of the top sections also being shown.

Fig. 6 is a cross section of the upper end of the silo, the sectional top members being shown at their down or closed position.

Fig. 7 is a horizontal section on the line 7—7 of Fig. 2.

Fig. 8 is a detail view on an enlarged scale showing the connections of the stay rods to the top ring.

Fig. 9 is a detail view showing one means for clamping the stay rods to the cross bands.

In constructing my improved silo, a lower clamping rim 1 is provided which may be of solid concrete or wood, but preferably of metal formed of a series of segments having hinged lapped ends secured together as at 11 to form a continuous ring rim where the sections are joined together, as shown.

2 designates an upper clamping rim which may be of wood, but is preferably of metal and the said rim is also formed of segments that are joined, as at 20, to form a continuous ring rim and the said upper rim has vertical flanges 21 that form the guideway *x* for the upper ends of a series of staves 3 that form the silo body and whose lower ends engage the guideway Y formed by the vertical flanges 11—11 on the lower rim 1, as shown.

The opposite ends of the row of staves that form the silo body are separated to form a doorway 4 that extends continuously from the top to the bottom of the silo body.

5—5 designate angle iron uprights that extend the full height of the silo body, the opposing inner edges 50—50 of which engage the edges of the oppositely disposed separated staves and in connection therewith form the door frame.

6—6 designate spreader rods which at suitable intervals engage the opposite uprights 5—5, their outer threaded ends passing through apertures 51—51 in the upright edges 50—50, and the said threaded ends carry clamp nuts 52—52 that engage the inner side of the members 50 of the uprights 5, it being understood the said rods act as spreaders to force the staves tightly together, making an air-tight silo body and keeping the same tight, without the necessity of drawing up the stay hoops or bands 7.

The hoops or bands 7—7 are spaced apart according to the dimensions of the silo and when properly applied are of the same diameter as the outer edge of the guide grooves *x*—*y* in the upper and lower rim members to thus form a perfectly round silo that can not be drawn or twisted out of shape.

Hoops or bands 7—7 pass through apertures 54 in the inner edges 50—50 of the door uprights 5—5, their ends being joined by clamp plates 70 and nuts 72, and the said hoops are also secured by suitable clamp 73 to one or more of a series of vertical stay rods 8, whose upper ends are connected to the upper clamp rim in the manner best shown in Fig. 8 and whose lower ends are threaded as at 80 to receive the draw nuts 81 that engage bracket members 82 attached to the lower clamp rim as shown.

The roof or top of my silo is composed of

a series of triangular shaped sections 9, each of which is hingedly connected to the clamping rim, with its base end projected over the outside of the silo body, as is clearly shown in Fig. 1, by reference to which it will be also noticed each section 9 has a pendent rib or flange 91 at the opposite edges that extend from the point to near the base of the section and to the inner end of each flange 91 is secured a metal stub shank or plate 92—92. Shanks 92—92 are pivotally mounted on the oppositely disposed sets of metal brackets 12—12 which are preferably cast integral with their respective section portions of the upper rim, as shown, or they may be separate members bolted onto the said upper rim.

Each bracket 12 has one or more cross apertures 12^a in advance of their pivot aperture, to receive a bolt or pin 13, for locking the triangular sections to their open or upright position, see Fig. 5.

The uniform roof sections, which may be of wood or metal, when closed form a cone-shaped top and for holding the sections in the proper close relation one of such sections is provided with a metal cone shaped seat 14 on which the upper ends of the other sections rest when the roof is closed, and the said upper ends are held firmly seated by a metal conical cap piece 15 on one of the other sections.

In my construction of silo one or more of the top sections are swung up to the open position and held to such position for ventilating the silo when filled, or for allowing the ensilage to be put in, by a pneumatic chute or other elevating means, it being also clear that by making the roof or top of the shape shown, the capacity of the silo is correspondingly increased.

Furthermore in my construction of silo, the several door sections are required to be successively removed from the top to the bottom when unloading the silo and to provide for a quick and convenient applying and removal of the said door sections each section consists of a body portion 16 of a width sufficient to extend across the doorway and bear against the inner face of the edges of the door.

Cleats 17 are attached to the body 16 that fit against the edges 50 of the uprights 5 and the said cleats each have a stepped vertically disposed bracket 18 that form locking members that coact with a pair of spring steel bars 19—19 pivotally secured at the inner ends to the front of the door section and to swing into the stepped brackets 18 and over the outer face of the uprights 5 and thereby hold the said door sections locked practically air-tight over the door opening, it being apparent that to remove the said sections one from the top of the next lower section, it is only necessary to swing up the metal locking bars 19, as indicated in Fig. 2.

By reason of providing the doorway with the spreader rods and the locking bars as shown, the said rods and bars may also serve as ladder rungs.

From the foregoing description taken in connection with the drawings, the complete construction, the manner in which my silo is used and the advantages of its construction will be readily apparent.

Slight changes or modifications in the construction shown and described may be made without departing from my invention as set forth in the appended claims.

What I claim is:

1. In a silo, a base flange member composed of segments, said segments having lapping portions at their ends, means securing said segments together through said lapping portions, said segments having annular flanges to form a continuous groove, a sectional top ring having flanges to form a continuous groove, a body portion formed of staves having their ends seated in the grooves of the bottom and top flanges, vertical stay rods connecting the base and top flanges together, horizontal tie rods embracing said staves, said top flange having bracket portions, roof forming segments hinged to said bracket portions, said body having a continuous doorway from the top to the bottom, a plurality of superimposed door sections removably secured in said doorway, and means for reinforcing said staves along said doorway, the latter means including spreader elements in said doorway.

2. In a silo, a base flange member composed of segments, said segments having lapping portions at their ends, means securing said segments together through said lapping portions, said segments having annular flanges to form a continuous groove, a sectional top ring having flanges to form a continuous groove, a body portion formed of staves having their ends seated in the grooves of the bottom and top flanges, vertical stay rods connecting the base and top flanges together, horizontal tie rods embracing said staves, said top flange having bracket portions, roof forming segments hinged to said bracket portions, said body having a continuous doorway from the top to the bottom, a plurality of superimposed door sections removably secured in said doorway, means for reinforcing said staves along said doorway, the latter means including angle uprights at the sides of said doorway, said angle uprights being apertured to permit passage of said tie rods and spreader elements extending between said angle uprights and secured to the same.

3. In a silo, a base member and a top member, said members having opposing annular grooves, a body composed of staves whose

upper and lower ends are edgewise slidable in the said opposing annular grooves, the said body having a doorway that extends from the top to the bottom thereof, angle iron uprights on the adjacent opposite edges of the doorway, spreader devices coöperating with the said angled iron uprights for forcing the staves edgewise into an air-tight relation, vertical stay rods that join the opposing base and top members, a plurality of bands that embrace the staves that form the body, and means for clamping the bands to, at least one of the upright stay rods, door sections in superimposed relation mounted in the doorway, each section being individually removable, and adjustable means mounted upon each door section for locking the said sections in place.

4. The combination with the upper edge of a silo body, the said edge including a top ring formed of segmental members, and means for securing the said members end to end; of a series of top sections, one of said sections for and hingedly connected to the respective segmental members of the ring, and other means coöperating with the segmental members and the hinged ends of the top sections for holding the said sections to their open or ventilating position.

ROSCOE H. QUICK.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."