Apr. 3, 1923. 1,450,461.

H. R. STRAIGHT.

GRAIN ELEVATOR.

FILED OCT. 8, 1920. 2 SHEETS—SHEET 1.

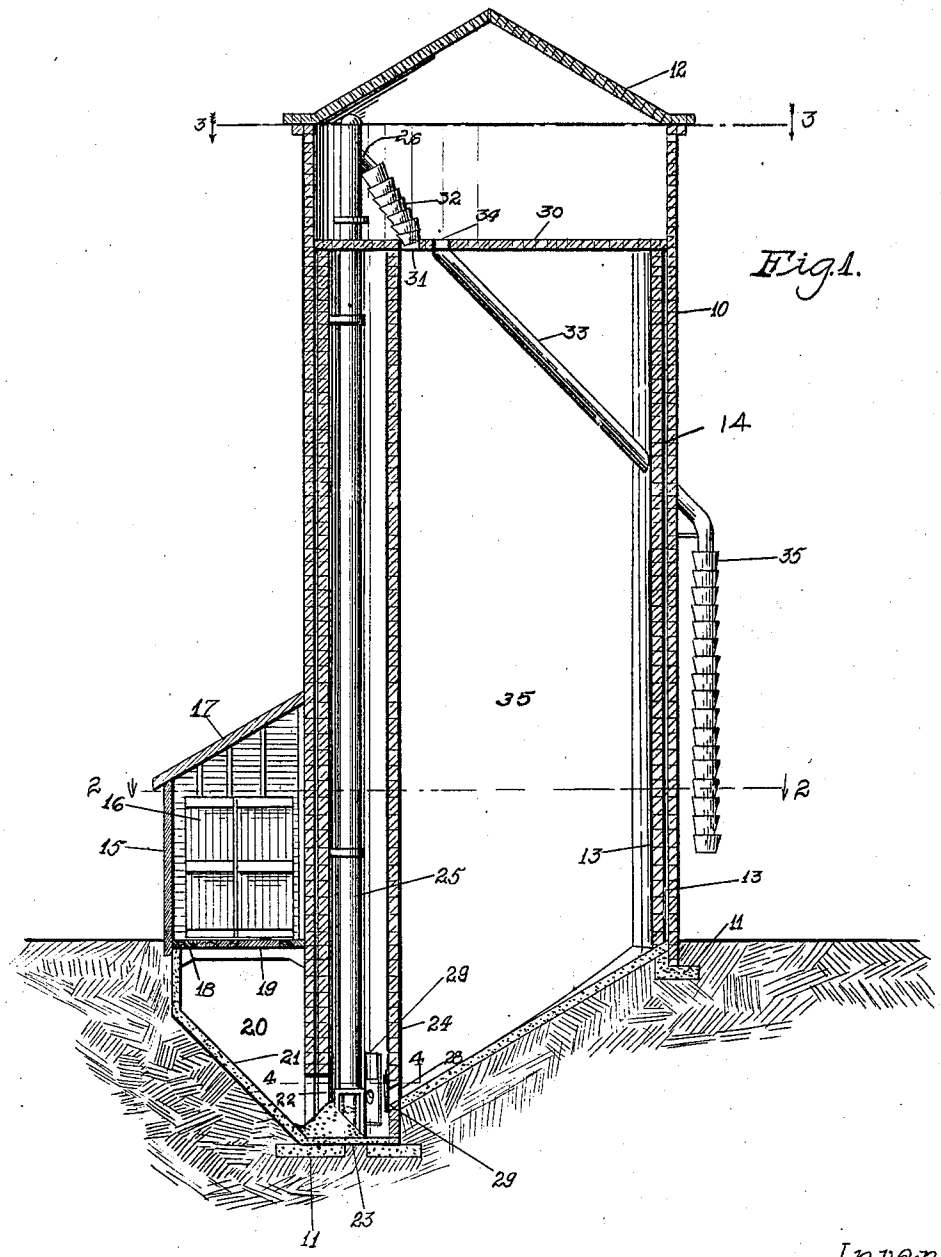



Fig. 1.

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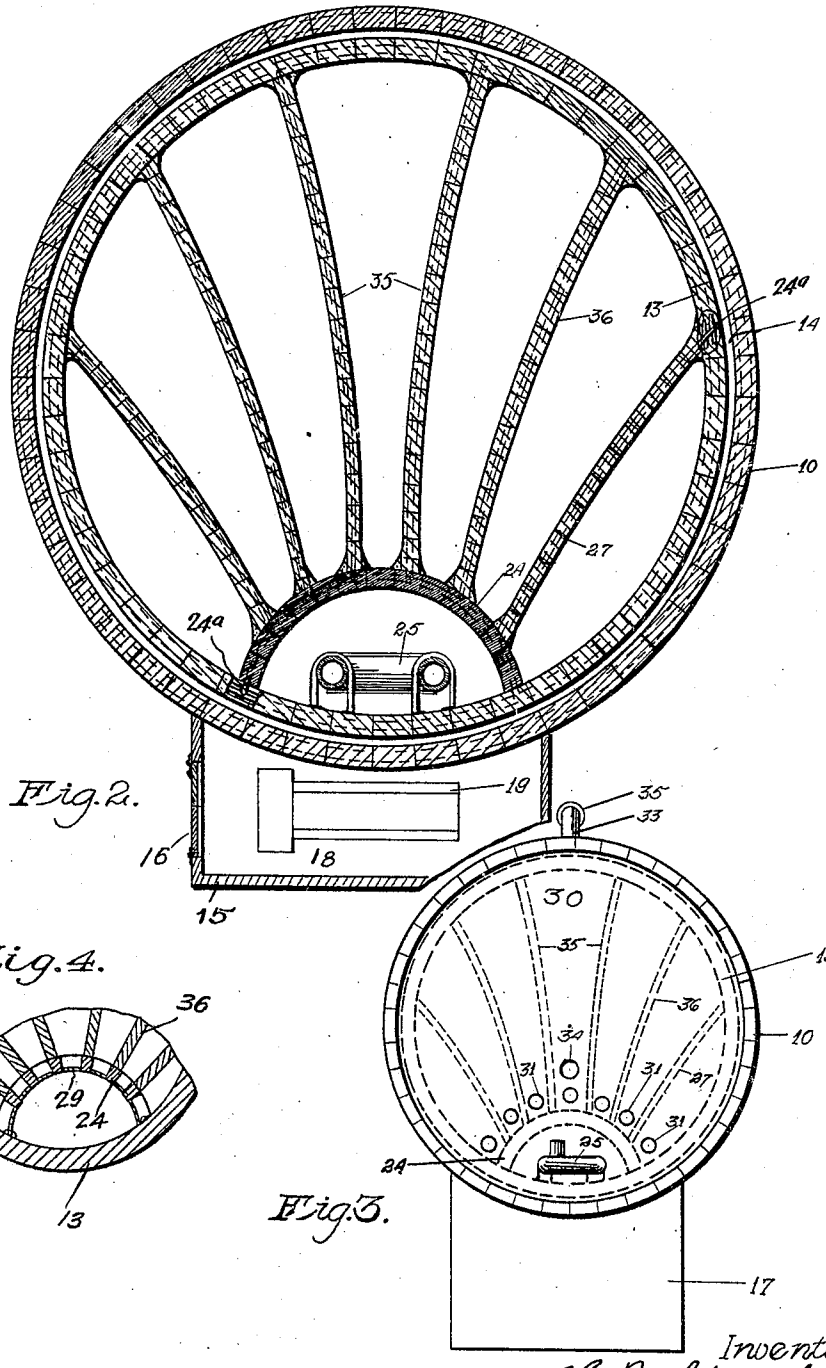



Fig. 2.

Fig. 4.




Fig. 3.

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# UNITED STATES PATENT OFFICE.

HALVER R. STRAIGHT, OF ADEL, IOWA.

## GRAIN ELEVATOR.

Application filed October 8, 1920. Serial No. 415,664.

*To all whom it may concern:*

Be it known that I, HALVER R. STRAIGHT, a citizen of the United States, and resident of Adel, in the county of Dallas and State of Iowa, have invented a certain new and useful Grain Elevator, of which the following is a specification.

This invention relates to improvements in the construction of grain elevators.

The object of my invention is to provide an improved grain elevator having a series of bins or compartments so arranged that a single elevating device may be employed for filling any one of the bins with grain from a wagon dump, and further so arranged that any of the bins may be emptied by the same elevator and the contents discharged to a point outside of the elevator, such as a box car or the like, the parts being so constructed and arranged that the above described bins, wagon dump and elevator may be formed with a minimum amount of material and at the same time have a maximum strength, the bins and wagon dump being so arranged that the elevator may be fed by gravity from any of the bins for emptying them, or may be fed by gravity from the grain elevator for filling the bins.

My invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 shows a vertical sectional view of my improved grain elevator with the elevating mechanism in position.

Figure 2 is a sectional view of the same, taken on the line 2—2 of Figure 1, showing the arrangement of the bins and the construction of the wall members; and

Figure 3 is a plan view with the roof removed, showing the top floor covering the bins and the arrangement of the communicating openings for filling the bins.

Figure 4 is a detail, sectional view taken on the line 4—4 of Figure 1.

My improved grain elevator is constructed preferably of a circular outer wall 10, resting on a foundation 11. This foundation is deeper at one side than at the other, as illustrated in Figure 1. The wall 10 is provided with reinforcing rods 10ª placed horizontally therein and also with a roof 12, this roof is of ordinary construction, preferably formed of tile.

I have provided an inner wall 13 of slightly smaller diameter than the inside of the outer wall 10, so that an air space 14 is provided between the two walls. This is for the purpose of preventing moisture that might pass through the motor joints of the outer wall, from entering the bins inside the inner wall. The inner wall 13 is slightly shorter than the outer wall, for the purpose of providing a room above the grain partition, as will hereinafter be made clear.

The inner wall 13 is mounted on the same foundation as the outer wall.

Mounted adjacent to one side of the outer wall 10 is a small compartment 15, having doors 16 at each end, and a roof 17. The compartment 15 is provided with a floor 18 provided with the usual dumping apparatus 19 used in connection with elevators of this kind. Beneath the floor 18 I have provided a pit 20, having an inclined bottom 21. The bottom 21 is in communication with the interior of the inner wall 13 by means of an opening 22. I have provided a bottom 23, substantially horizontal at this point. The bottom members 21 and 23 are formed of cement.

Mounted upon the bottom member 23 is a semi-circular wall 24, designed to extend the full height of the inner wall 13, and fastened to said wall by proper reinforcements 24ª. This wall forms a small vertical compartment which is designed to receive the elevator device 25. This elevator is of the usual construction, and need not be described in detail any more than to say that it is provided with means whereby it may be filled when grain is piled around the bottom in said elevator, and it is provided with a spout 26 for discharging the material. The bottom 26ª of the inner wall 13 is formed somewhat in the shape of an inverted half cone, the lower portion intersecting the wall 24 at a point slightly above the floor 23. The slant of this floor should be sufficient so that grain will slide by gravity to the lower point.

In elevators of this kind it is necessary to

provide a series of bins so that the different kinds of grain may be kept separated, and in this connection it should be explained that some of the bins may be full while the adjacent bins may be empty, and for that reason it is very essential that the partition walls be built very strong so as to resist the pressure offered by the grain in the filled bins.

Secured to the convex portion of the semicircular wall 24 is a series of substantially radial partitions 27, each of which is curved slightly, as clearly illustrated in Figure 2. These partitions are united with the inner wall member 13 at their opposite ends, and are constructed integral therewith, all of said walls and partitions being provided with proper reinforcing rods 24ª which are tied together in the usual manner.

By this arrangement it will be seen that I have provided a series of compartments or bins, each of which has one end adjacent to the circular wall 24 and close to the elevator device 25.

In the bottom of the wall 24, and in line with the floor member 26ª, I have provided a series of openings 28 so that an opening 26 will be provided for each of the bins or compartments. A door member 29 is provided for each of the openings 28, so that grain may be admitted from any one of the chambers within the wall 24 at the will of the operator.

A floor 30, formed of any suitable material, is provided over the bins and the inner wall 13. This floor 30 is provided with a series of openings 31, adjacent to the wall 24, and each opening is in communication with one of the bins below. By this arrangement it will be seen that if a load of grain is brought into the compartment 15, it may be dumped into the pit 20 by the dumping device 19. The grain will then slide into the opening 22 adjacent to the lower end of the elevator 25. The elevator may then be operated, and the grain will be elevated to the spout 26, which is provided with a flexible member 32 and is of such length that it may be operatively connected with any one of the openings 31. Thus it will be seen that when it is desired to fill any one of the bins, the member 32 is placed over the proper opening 31 and the grain will be emptied therein. When it is desired to fill another bin, the operator merely changes the member 32 to another opening.

For emptying the bins I have provided an inclined chute 33 having its upper end extending to the floor 30 and provided with an opening 34 near the bins 31, so that the member 32 may be placed in communication therewith. The lower end of the chute 33 is provided with a flexible member 35, which may be extended into the car or other device to be filled. When it is desired to fill a car from any one of the bins, the door 29 corresponding to that bin is opened, allowing the grain from the said bin to flow to the base of the elevator 25, after which the elevator is operated and the grain discharged through the member 32 to the chute 33 and into the car.

It will thus be seen that any one of the bins may be emptied by manipulating the proper door 29.

The grain may be moved from one bin to another bin in somewhat the same manner, by merely placing the member 32 to the proper opening 31, opening the proper door 29 and operating the elevator.

Thus it will be seen that by my construction I have provided a grain elevator having a series of compartments, any one of which may be filled from a grain dump or from other bins of the elevator, and which may discharge into a car by means of a single vertical elevator with no horizontal or cross conveyors.

By this construction it will also be seen that a minimum amount of head room may be provided above the floor 30, inasmuch as the openings 31 are very close to the elevator so that the said elevator need not be high above the floor in order to give the proper incline to the member 32.

It will also be noted that by my curved wall construction, both of the outer walls and the partition members, I have formed a very rigid construction with a minimum amount of material. If grain is placed in the middle bin, then the wall members 35ª act as an arch, which places the material of the wall under compression. If either of the compartments adjacent to the middle compartment be filled, then the wall 36 will act as an arch while the wall 35ª will be under tension. The reinforcing rods will take care of the tensile load, these rods having one end tied to the circular reinforcing members of the inner wall 13, while the others are tied to the reinforcing rods of the semicircular wall 24. The rods in the wall 24 will be under tensile strain, while the rods on the wall 13 will be connected in such a way that the said wall will be acted upon as an arch.

The partition walls of the bins may, however, be formed straight, if so desired, without departing from the advantages due to the arrangement of the elevator chamber, the dumping pit and the said bins, so that any of the bins may be filled as before described.

I claim as my invention:

1. In a structure of the class described, the combination of a reinforced circular wall, the said circular wall being provided with a floor having the shape of an inverted truncated cone, the center of the truncated portion of said cone being near the outside

of said wall, a semi-circular wall designed to rest on the outer edge of the truncated portion of said floor having its edges formed integral with the first said wall member, the interior of the first said wall being provided with a series of divergent partition walls having their ends radiating from the convex surface of said semi-circular wall and extending across the interior of said first wall, the ends of the partition walls being formed integral with the said walls, door openings near the bottom of said semi-circular wall one communicating with each of the bins formed by said partition walls, and means for opening and closing said door openings.

2. In a structure of the class described, the combination of a reinforced circular wall, the said circular wall being provided with a floor having the shape of an inverted truncated cone, the center of the truncated portion of said cone being near the outside of said wall, a semi-circular wall designed to rest on the outer edge of the truncated portion of said floor having its edges formed integral with the first said wall member, the interior of the first said wall being provided with a series of divergent partition walls having their ends radiating from the convex surface of said semi-circular wall and extending across the interior of said first wall, the ends of the partition walls being formed integral with the said walls, door openings near the bottom of said semi-circular wall one communicating with each of the bins formed by said partition walls, means for opening and closing said door openings, half of the said partition walls being slightly curved inwardly in one direction and the other half of said partition walls being curved inwardly in the opposite direction.

3. In a structure of the class described, the combination of a reinforced circular and outer wall, an inner circular wall, the said inner circular wall being provided with a floor having the shape of an inverted truncated cone, the center of the truncated portion of said cone being near the outside of said inner wall, a semi-circular wall designed to rest on the outer edge of the truncated portion of said floor having its edges formed integral with the said inner wall member, the interior of the said inner wall being provided with a series of divergent partition walls having their ends radiating from the convex surface of said semi-circular wall and extending across the interior of said inner wall, the ends of the partition walls being formed integral with the said inner walls, door openings near the bottom of said semi-circular wall one communicating with each of the bins formed by said partition walls, and means for opening and closing said door openings.

4. In a structure of the class described, the combination of a reinforced circular and outer wall, an inner circular wall, the said inner circular wall being provided with a floor having the shape of an inverted truncated cone, the center of the truncated portion of said cone being near the outside of said inner wall, a semi-circular wall designed to rest on the outer edge of the truncated portion of said floor having its edges formed integral with the said inner wall member, the interior of the said inner wall being provided with a series of divergent partition walls having their ends radiating from the convex surface of the said semi-circular wall and extending across the interior of said inner wall, the ends of the partition walls being formed integral with the said inner walls, a door opening near the bottom of said semi-circular wall communicating with each of the bins formed by said partition walls, means for opening and closing said door openings, half of the said partition walls being slightly curved inwardly in one direction and the other half of said partition walls being curved inwardly in the opposite direction.

5. In a structure of the class described, the combination of a reinforced circular and outer wall, an inner circular wall, the said inner circular wall being provided with a floor having the shape of an inverted truncated cone, the center of the truncated portion of said cone being near the outside of said inner wall, a semi-circular wall designed to rest on the outer edge of the truncated portion of said floor having its edges formed integral with the said inner wall member, the interior of said inner wall being provided with a series of divergent partition walls having their ends radiating from the convex surface of said semi-circular wall and extending across the interior of said inner wall, the ends of the partition walls being formed integral with the said inner walls, door openings near the bottom of said semi-circular wall one communicating with each of the bins formed by said partition walls, means for opening and closing said door openings, half of the said partition walls being slightly curved inwardly in one direction and the other half of said partition walls being curved inwardly in the opposite direction, the said inner circular wall and said partitions being shorter than the outer wall, a roof for said outer wall, a floor member on the top edge of said inner wall, said semi-circular wall and said partitions, the said floor being provided with an opening near said semi-circular wall for each of the bins formed by said partitions.

6. In a structure of the class described, the combination of a circular wall, a second wall adjacent to the inner face of said circular wall designed to form an elevator shaft, said second wall formed integral with the

first said wall, and provided with a series of diverging partitions having their outer edges integral with the first said wall, a floor for the chamber of said second wall, said second wall being provided near its bottom end with an opening for each of the bins formed by said partition walls, an inwardly and downwardly extending inclined floor for each of said bins to discharge material through said opening, and a door for each of said openings.

Des Moines, Iowa, September 7, 1920.

HALVER R. STRAIGHT.