

No. 638,279.

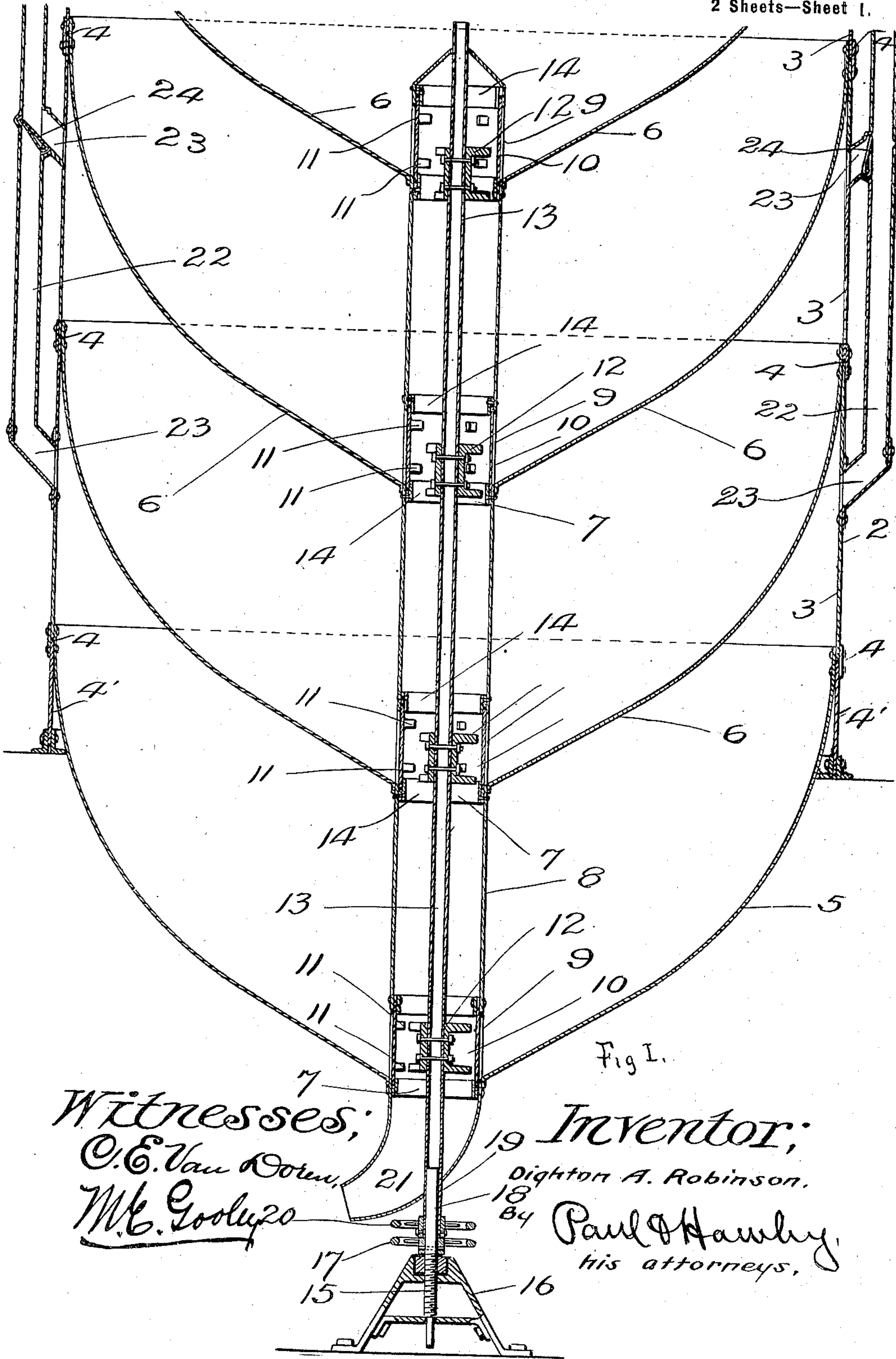
Patented Dec. 5, 1899.

D. A. ROBINSON.
SUBDIVISION OF GRAIN BINS.

(Application filed July 24, 1897.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses;

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No. 638,279.

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2 Sheets—Sheet 2.

Fig. 6

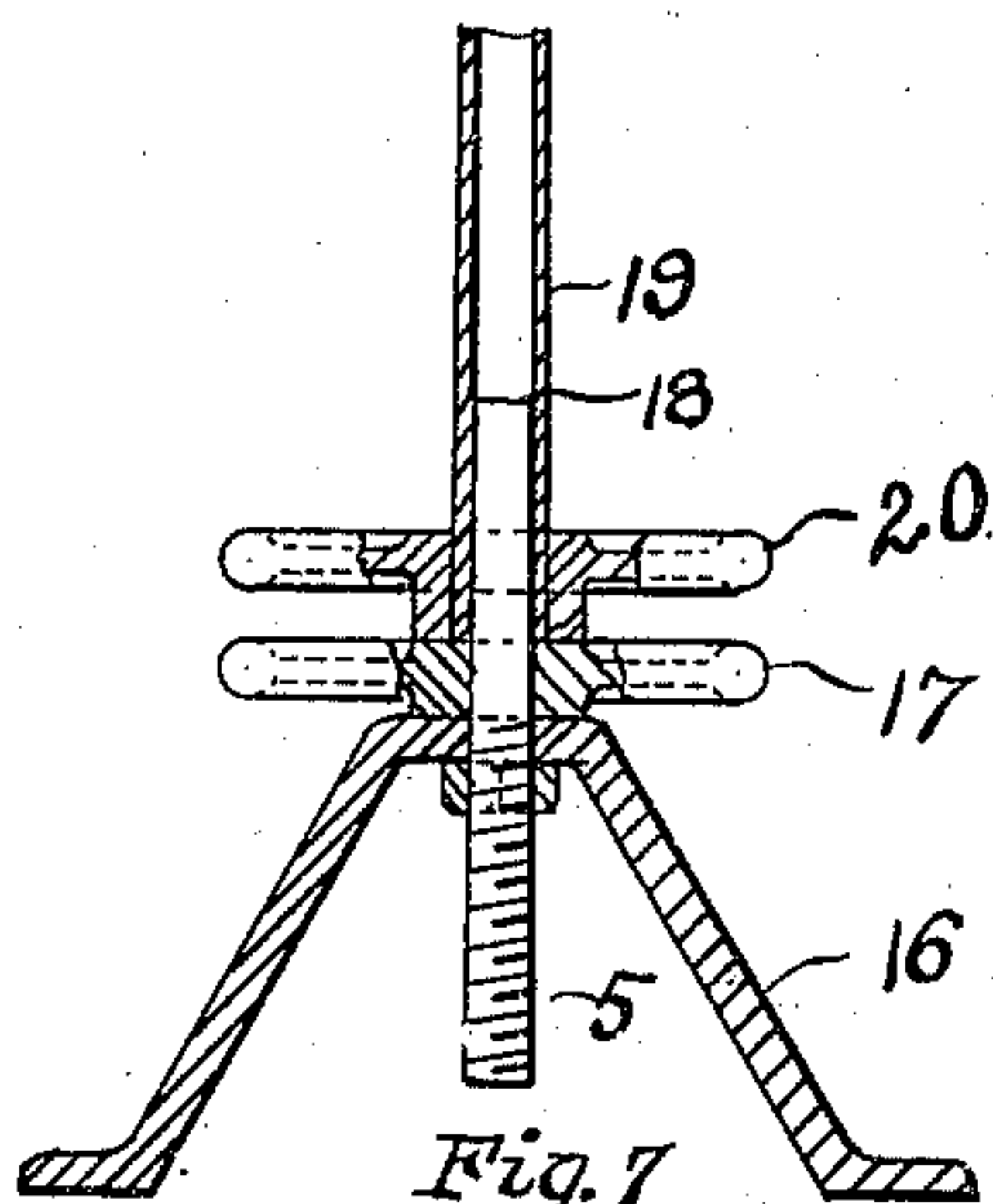


Fig. 7

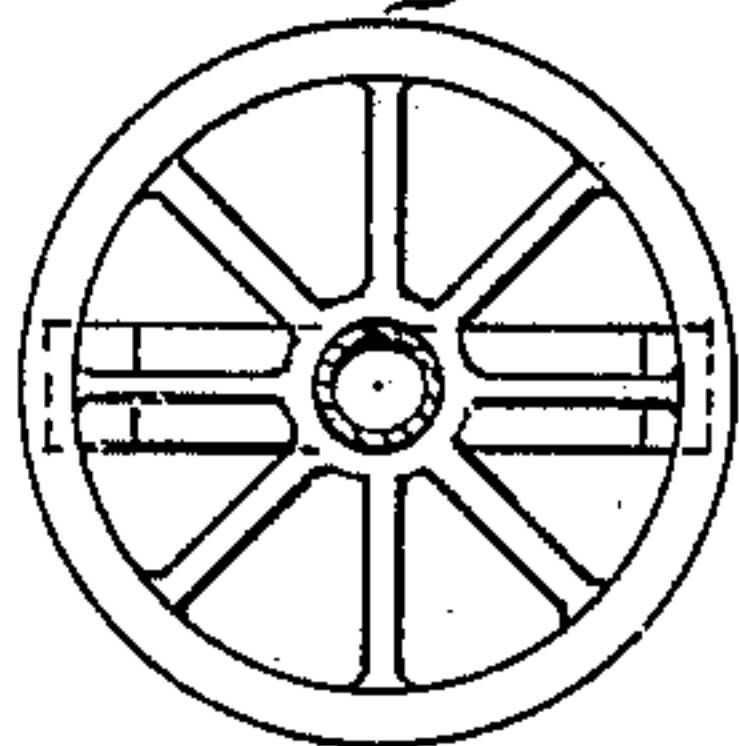


Fig. 2.

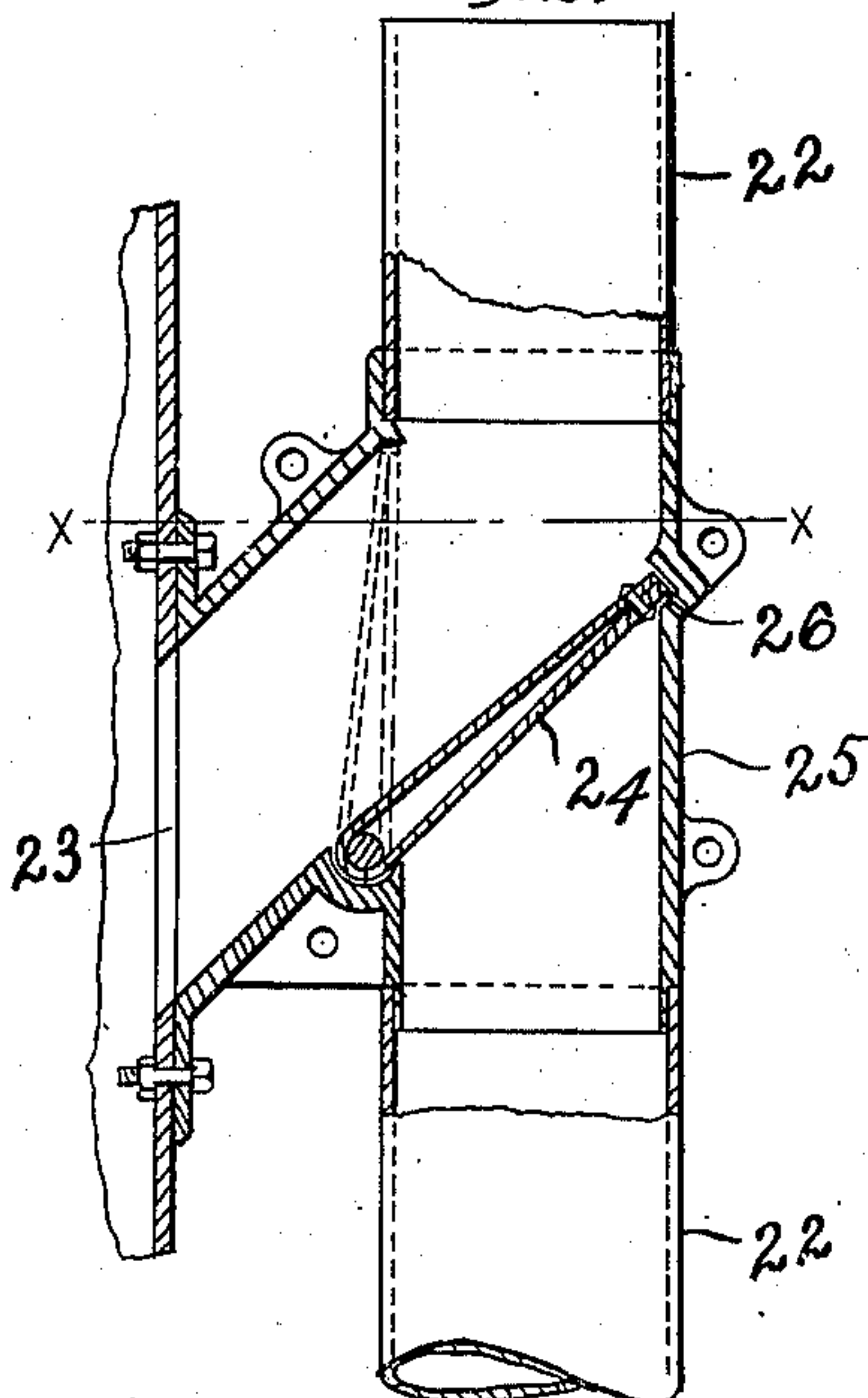


Fig. 3.

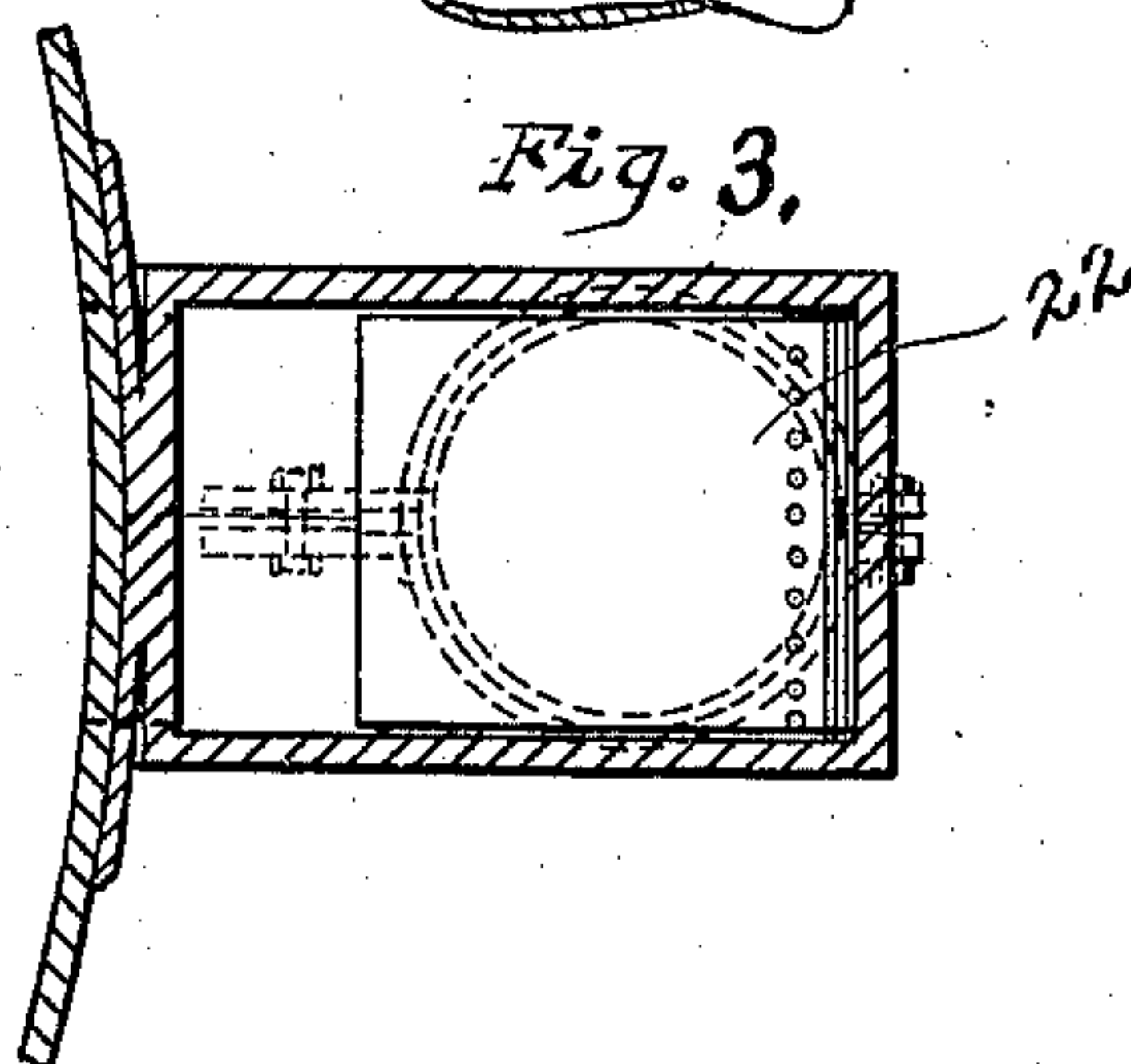


Fig. 4.

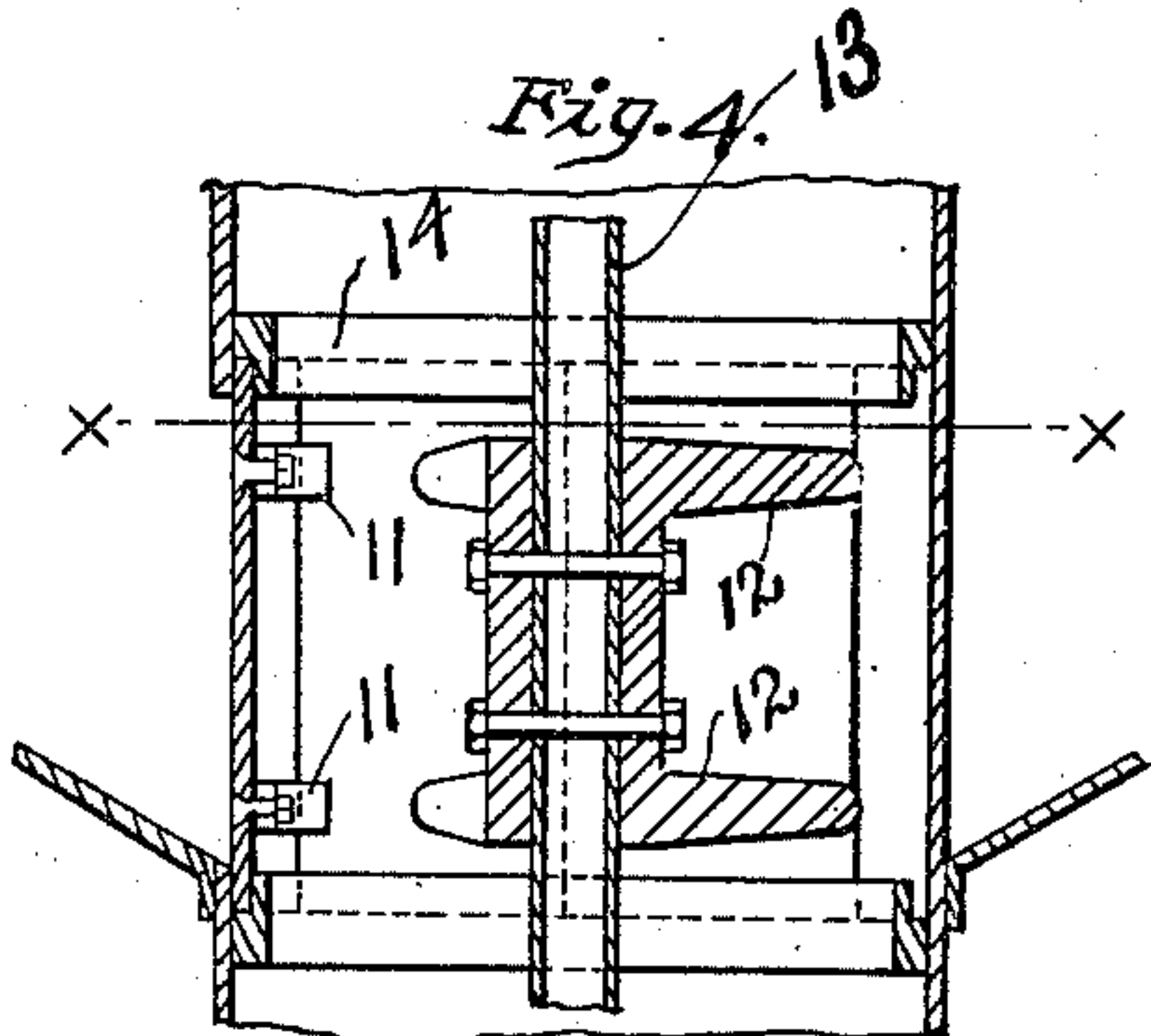
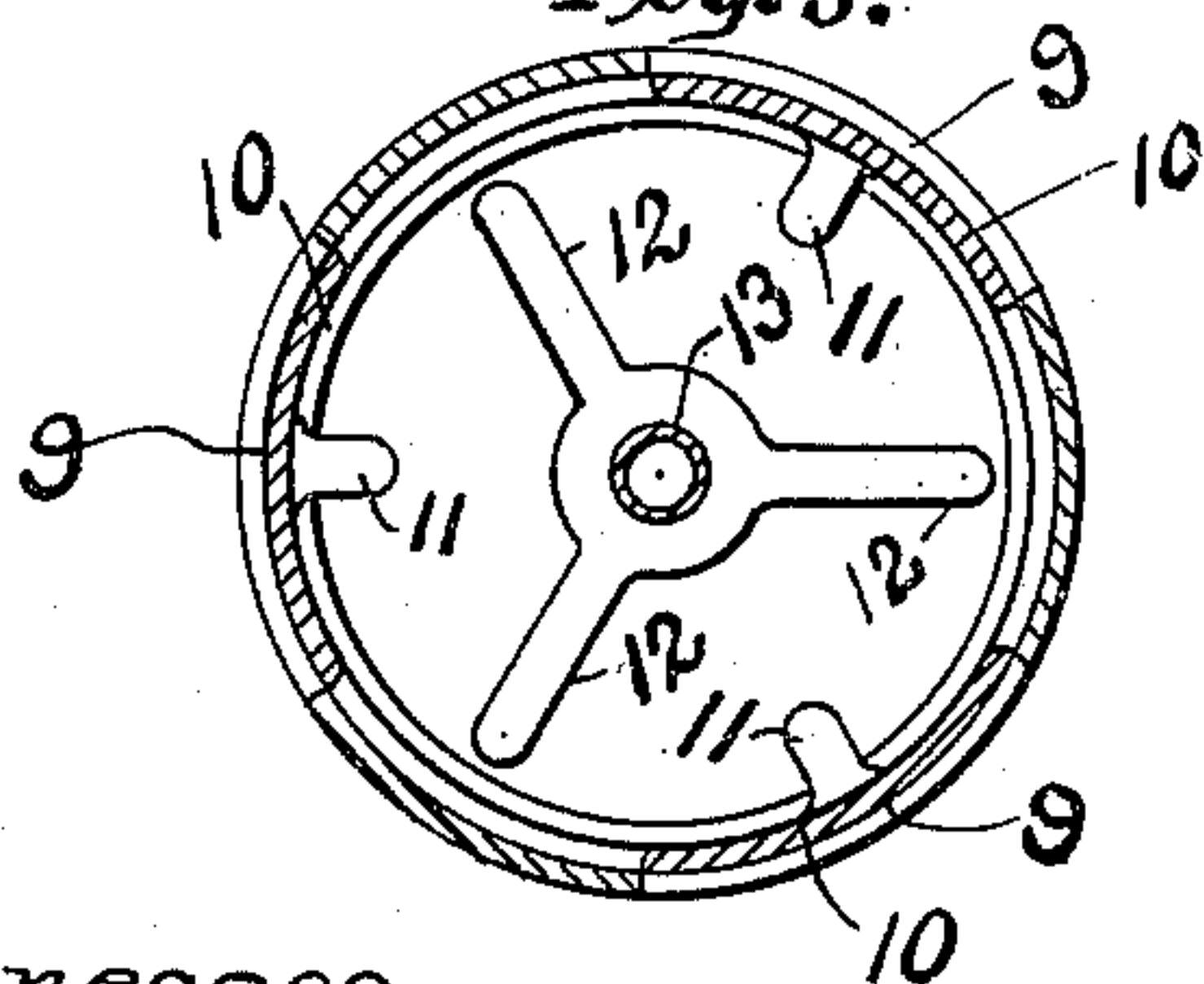


Fig. 5.



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UNITED STATES PATENT OFFICE.

DIGHTON A. ROBINSON, OF MINNEAPOLIS, MINNESOTA.

SUBDIVISION OF GRAIN-BINS.

SPECIFICATION forming part of Letters Patent No. 638,279, dated December 5, 1899.

Application filed July 24, 1897. Serial No. 645,768. (No model.)

To all whom it may concern:

Be it known that I, DIGHTON A. ROBINSON, of the city of Minneapolis, county of Hennepin, State of Minnesota, have invented certain new and useful Improvements in Grain-Bins, of which the following is a specification.

My invention relates to bins or receptacles for grain, and particularly to metallic grain-bins; and the objects of the invention are to provide a subdivided grain-bin any compartment of which may be filled or emptied without regard to the other compartments and also to provide means for easily and cheaply subdividing cylindrical metallic grain bins or tanks.

My invention consists generally in a grain bin or tank comprising a cylindrical wall extending from top to bottom of the bin, an elevated circular support for said wall, a substantially hemispherical bottom suspended from said circular support, and one or more substantially hemispherical partitions or divisions suspended from said cylindrical wall above said bottom.

The invention further consists in means for filling any of the compartments into which the bin is divided.

The invention further consists in means for emptying any compartment independently of the others; and the invention further consists in the constructions and combinations hereinafter described, and particularly pointed out in the claims.

The invention will be more readily understood by reference to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is a vertical section of a grain-bin embodying my invention. Fig. 2 is an enlarged vertical section of one of the inlet ducts and valves. Fig. 3 is a plan section thereof substantially on line $x x$ of Fig. 2. Fig. 4 is an enlarged vertical section showing one of the outlet valves or gates. Fig. 5 is a horizontal section on line $x x$ of Fig. 4.

As shown in the drawings, the main metallic cylindrical wall 2 extends from top to bottom of the bin and is preferably made up of a number of cylindrical sections 3, arranged one above the other, with their edges bolted or riveted together with bands or rings 4. This wall is supported upon an elevated

circular girder 4'. The bin has a suitable bottom 5, which I prefer to make as shown and described in my pending application, entitled "Grain-bins," filed June 12, 1897, Serial No. 640,581. This bottom is substantially hemispherical in form, with the exception of the lower part, which is a thirty-degree hopper, so that the grain will slide freely from any point of contact with the bottom and discharge through a central opening therein. The bottom is preferably made up of riveted sections, and it is suspended by its upper edge from the circular girder 4'. It might be suspended from the wall 2 without materially changing the construction. The divisions which I employ to divide the cylindrical tank into two or more compartments are preferably duplicates of the bottom of the tank. These divisions 6 have their upper edges joined to the walls of the cylindrical tank, preferably at the joints between the tank-sections 3, and even after a large tank has been erected and completed I may divide the same by dropping a division 6 into the tank, removing the short bolts or rivets which tie the opposite section 3 and ring, and securing the ring, tank-section, and edge of the division by longer bolts or rivets.

But little material is required in the construction of one of the divisions, and the cost thereof is much less than the cost of any vertical partition which could be used. Each division 6 is provided in the bottom with a central hole 7 for the discharge of the grain, and a central tube 8 extends from the bottom of the tank upward through all of the divisions therein. This tube 8 is provided at points above each division with an opening 9, and the bottom 5 is provided with one or more of such gate-openings 9, through which the grain will flow from the compartment into the discharge tube or spout 8. At each gate-opening 9, and preferably within the tube 8, I provide a rotating or sliding gate or valve 10, which valve is provided with one or more lugs 11 to be engaged by an arm or arms 12 upon the central rod 13, which extends up within the discharge tube or spout 8. The gates are secured in suitable guides 14 and move easily. The detail construction thereof is well shown in Figs. 4 and 5, and the construction of the arms 12 and their arrangement upon the shaft

or rod 13 are made clear. A partial turn or revolution of the gate 10 will uncover the discharge-opening 9. In order that any one of the gates belonging to the different compartments may be opened without disturbing the other gates, I provide for both a rotary and a longitudinal movement of the rod or shaft 13. This is accomplished by means of the standard or jack-screw 15, arranged beneath the tank and supported by a suitable base 16. The hand-wheel 17 forms a part of the jack-screw, and the upper end 18 of the jack-screw is swiveled in the lower end 19 of the rod or shaft 13, which rod or shaft is carried upon the top of the hand-wheel 17. The rod may be moved longitudinally, therefore, by turning the hand-wheel 17, and after it has been adjusted at the right height the rod or shaft 13 is rotated by means of the second hand-wheel 20, secured to the foot or lower end of the rod 13. The arms 12 for respective gates are arranged at varying distances upon the rod, the distance between the arms or pairs of arms being less than the distances between the gates belonging to the successive compartments. Hence it is necessary to raise the rod different distances in order to carry the arms of a particular gate into a plane where they will engage the lugs 11 upon the gate, after which the rotation of the rod or shaft 13 will cause the gate to open or close. A suitable indicator may be provided at the lower end of the rod to measure the distance that the same must be lifted to operate the gates of different compartments. At the lower end of the discharge tube or spout 8 I preferably provide a rotatable spout or nozzle 21, through which the grain is discharged. For filling the compartments I employ one or more of the spouts or trunks 22. The upper compartment may be filled direct from the top, but the compartments beneath the same must be filled through the spout or trunk 22, which therefore is provided with byways 23, entering the several compartments. These byways are preferably inclined, and the grain is directed into the same by pivoted valves 24, arranged in connection therewith, and whereby the spout may be cut off at any point. No valve need be used at the byway for the lower compartment. I preferably arrange the byways or chutes and the movable valves in parts 25, which are independent from the main portions of the trunk 22, making the byways in two-part castings, which are provided with an inclined seat 26 for the upper or free end of the pivoted valve or deflector 24. When said deflector is raised, it closes the opening into the opposite compartment and allows the grain to pass down to the lower byway 23. Any suitable means may be provided for operating the valves or deflectors 24 from either the upper or lower parts of the building in which the tank or bin is located. The grain-bin which I have herein described possesses great utility and advantage over bins as ordinarily constructed. I provide, as

will be seen, a grain-bin comprising a unitary structure capable of being made of any size and divided into any desired number of compartments and all mounted upon a common support. This common support is the elevated circular girder or support, which in itself is a novel and valuable feature of my construction. From this circular girder the hemispherical bottom of the bin is suspended, and upon it is simultaneously supported the walls of the bin and the subdivisions that are suspended upon the walls. The combination, with the bin, of the described means for filling and emptying independently any compartment of the bin adds greatly to the utility of the bin. Grain-storage bins are at present in use built by me in accordance with the construction herein shown and described and having a capacity of as high as three hundred thousand bushels. The bin combines great capacity, cheapness of construction, and facility of operation.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A metallic grain-storage bin, comprising a cylindrical wall extending from top to bottom of the bin, an elevated circular support for said wall, a substantially hemispherical bottom suspended from said circular support, and one or more substantially hemispherical divisions suspended from said cylindrical wall above said bottom, substantially as described.

2. A metallic grain-bin, comprising a cylindrical wall extending from top to bottom of the bin and having a suspended hemispherical bottom, one or more hemispherical divisions provided in the tank or bin above the bottom thereof and suspended from its wall, whereby the tank or bin is divided into compartments, one above the other, and means for filling or emptying any compartment, substantially as described.

3. A metallic grain-bin, comprising a cylindrical wall extending from top to bottom of the bin, two or more concave depending divisions suspended therein, one above the other, dividing the bin into separate compartments, central means for emptying any compartment, and means for filling any compartment, substantially as described.

4. The combination, in a grain-bin, with a cylindrical wall extending from top to bottom of the bin, of two or more concave hemispherical divisions provided therein, one above the other and suspended from the wall of the bin and dividing the bin into separate compartments, and means for filling and emptying any compartment, substantially as described.

5. The combination, in a grain-bin, with a cylindrical wall extending from top to bottom of the bin, of two or more concave hemispherical divisions suspended therein, one above the other, and dividing the bin into separate compartments, and a central discharge-spout having openings from each compartment,

whereby any one thereof may be emptied, substantially as described.

5 6. The combination, in a grain-bin, with a cylindrical wall extending from top to bottom of the bin, of two or more concave hemispherical divisions suspended therein, one above the other, and dividing the bin into separate compartments, a central discharge-spout having openings from each compartment, where-
10 by any one thereof may be emptied, and a spout or spouts arranged at the side of the bin, whereby any compartment below the top compartment may be filled, substantially as described.

15 7. The combination, in a grain-bin, with a cylindrical wall extending from top to bottom of the bin, of one or more divisions, one above the other, suspended from the wall of the bin and dividing the bin into separate compartments, a discharge-spout extending through
20 these separate compartments and provided with openings in each, gates or valves for closing said openings, and means for opening either one of the gates without moving the others,
25 substantially as described.

8. The combination, in a grain-bin, with a cylindrical wall extending from top to bottom of the bin, and divisions suspended from said walls transversely to the axis of the cylindrical body of the bin, of means for emptying
30 the compartments of said bin, a vertical spout

having byways into said compartments, and valves or deflectors arranged in said byways, as and for the purpose specified.

9. The combination, in a grain-bin, with a 35 cylindrical wall extending from top to bottom of the bin and divided into separate compartments by one or more suspended divisions arranged transversely to the axis of the cylindrical body of the bin, of a discharge spout or
40 tube 8, with an opening or openings 9 in each compartment of the bin, a movable gate or valve 10 for each opening, and a rotatable and longitudinally-movable rod for operating any
45 one of said valves without moving the others, substantially as described.

10. The combination, in a grain-bin, with a cylindrical wall extending from top to bottom of the bin, and suspended divisions, dividing
50 the bin into separate compartments, of the tube or spout 8 having openings in each compartment, a slide, valve or gate 10 for each opening, the rod 13 provided with arms to engage said gates or valves, and means to rotate
55 said rod and means to move the same longitudinally, as and for the purpose specified.

In testimony whereof I have hereunto set my hand this 29th day of June, A. D. 1897.

DIGHTON A. ROBINSON.

In presence of—

C. G. HAWLEY,
M. E. GOOLEY.