C. & H. M. WOOLCOTT.

DEVICE FOR HANDLING NON-FLOWING MATERIALS.

APPLICATION FILED JAN. 10, 1916.

1,269,668.

Patented June 18, 1918.

2 SHEETS—SHEET 1.

Fig. 1.

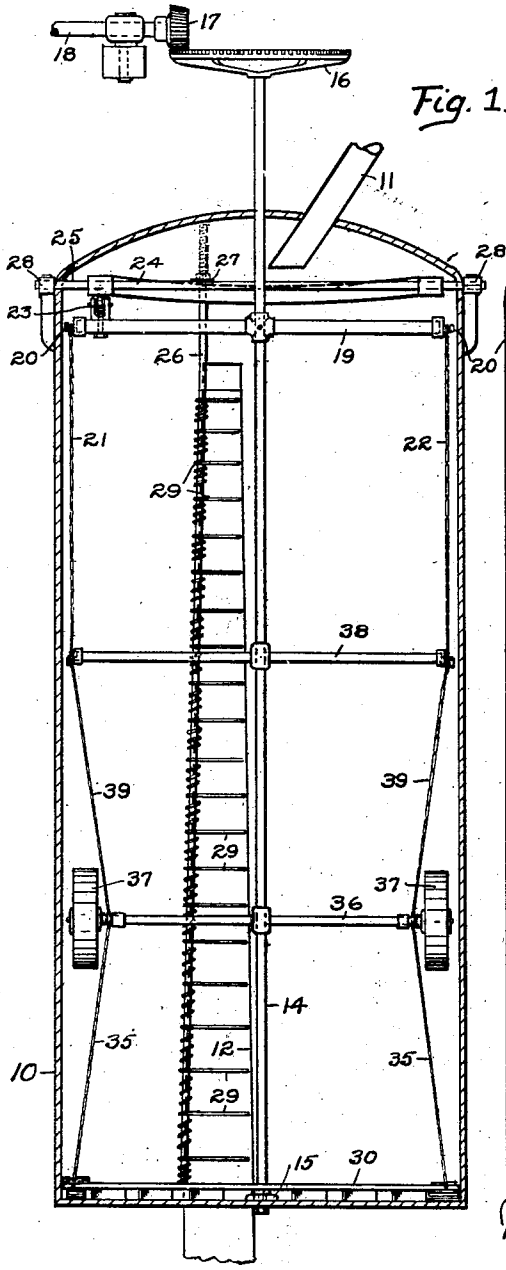
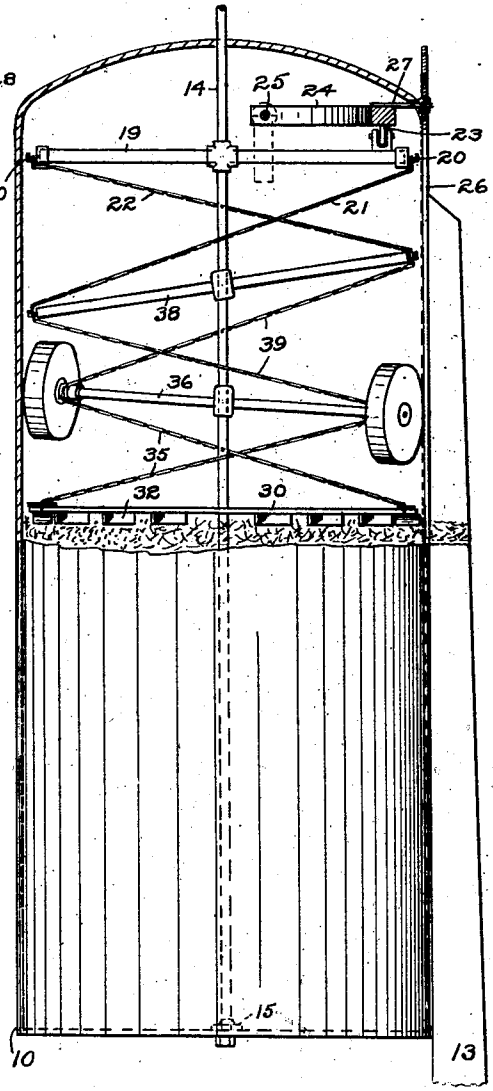


Fig. 2.



Carl Woolcott and Harry M. Woolcott INVENTOR.

BY Taylor & Hulse

ATTORNEYS.

C. & H. M. WOOLCOTT.

DEVICE FOR HANDLING NON-FLOWING MATERIALS.

APPLICATION FILED JAN. 10, 1916.

1,269,668.

Patented June 18, 1918.

2 SHEETS—SHEET 2.

Fig. 3.

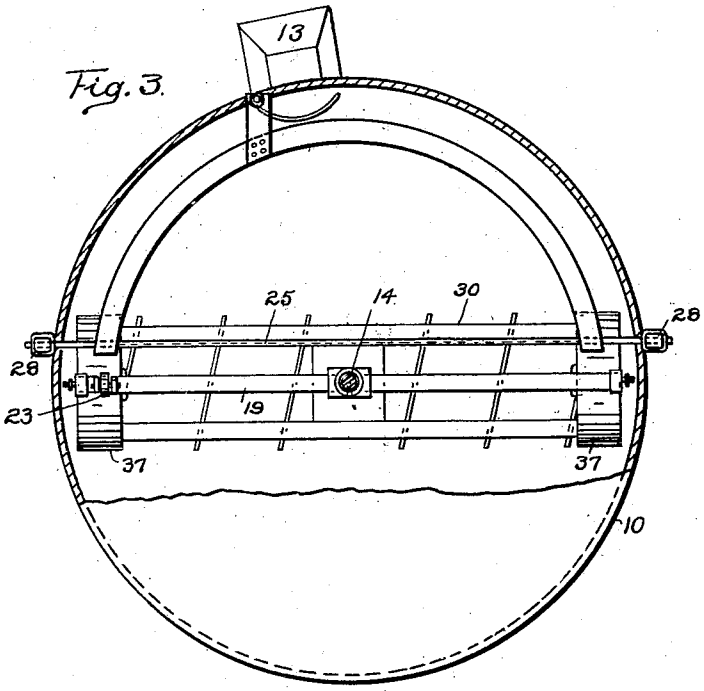


Fig. 4

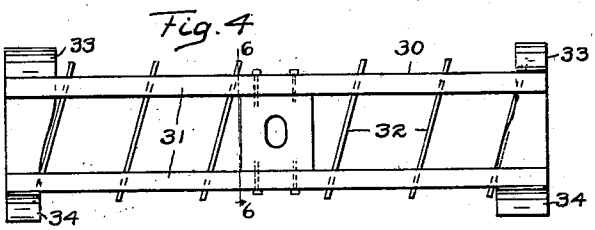


Fig. 6.

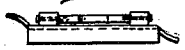


Fig. 5.

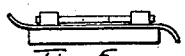


Fig. 7

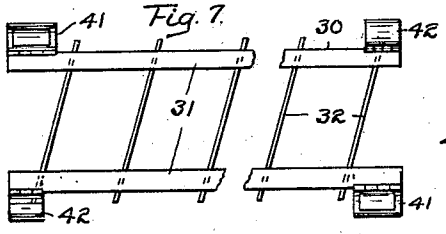
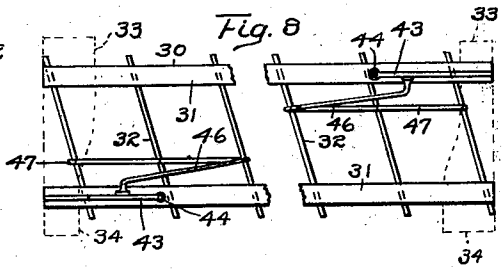


Fig. 8



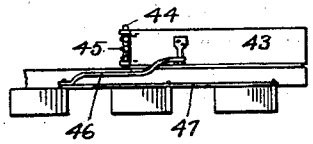


Fig. 9.

INVENTORS.
Carl Woolcott, and
Harry M. Woolcott,
BY Taylor & Hulse
ATTORNEY

UNITED STATES PATENT OFFICE.

CARL WOOLCOTT AND HARRY M. WOOLCOTT, OF HARRISBURG, ILLINOIS.

DEVICE FOR HANDLING NON-FLOWING MATERIALS.

1,269,668. Specification of Letters Patent. Patented June 18, 1918.

Application filed January 10, 1916. Serial No. 71,239.

To all whom it may concern:

Be it known that we, CARL WOOLCOTT and HARRY M. WOOLCOTT, citizens of the United States, residing at Harrisburg, in the county of Saline and State of Illinois, have invented new and useful Improvements in Devices for Handling Non-Flowing Materials, of which the following is a specification.

The invention relates to devices for handling any non-flowing materials. There are many materials, such as various foods, which do not flow but which it is desirable to store and to remove from the storage place as wanted. The non-flowing quality of the materials makes their economical storage and removal from storage practically impossible where they are handled by hand. The object of our invention is to provide an automatic sectional storage and feeding device by which such materials are readily and economically handled in the act of storing and in their removal from the storage receptacle. Further objects will appear in the description of the accompanying drawings which illustrate how the invention may be carried out in practice, and in which drawings—

Figure 1 is a vertical cross-sectional view of the empty device.

Fig. 2 is a vertical cross-sectional view of the device partly filled with material, the view being taken at right angles to that of Fig. 1.

Fig. 3 is a plan view of the device.

Fig. 4 is a plan view of the conveyer.

Fig. 5 is an end view of the conveyer.

Fig. 6 is a cross-sectional view on line 6—6 of Fig. 4.

Figs. 7 and 8 are plan views of modified forms of the conveyer.

Fig. 9 a fractional elevational view of the conveyer illustrated in Fig. 8.

Referring to the drawings, 10 is a suitable bin or tank having a spout 11 through which the materials are delivered into it, and also having an opening or slot 12 extending up its side wall from the bottom to a suitable point in the upper portion of said wall. Opening 12 is the discharge for the tank or bin and is covered by a spout 13 which extends downwardly below the bottom of the tank a suitable distance.

A revolubly mounted shaft 14 has a suitable foot bearing 15 on the bottom of the tank and it is extended up through the top of the tank, its outer end being provided with suitable means to drive it, as gear 16 which is secured to the shaft. Pinion 17 secured to shaft 18 is in mesh with gear 16, shaft 18 being driven by some suitable power. A cross-arm 19 is fixed to shaft 14 a suitable distance below the top of the tank and is provided at its opposite ends with suitable attachments 20 to which chains 21 and 22 may be connected. The cross-arm also carries a roller 23 which is suitably positioned on the cross-arm to make contact with the lower face of track 24 as the arm is revolved by shaft 14. Track 24 is suitably connected at its ends to rod 25 and to vertically disposed rod 26 by bracket 27. Rod 25 is supported in bearings 28 which are secured to the outside of the tank, the rod passing through the upper part of the tank. Rod 26 is extended down through the tank adjacent opening 12 and is provided with a suitable number of springs or fingers 29 which project out into the tank and over opening 12, the purpose of the fingers being to break loose the material near the opening when the material requires it, as hereafter described. The rod 26 is connected with the packing floor below the bin and thereby accessible to manual operation as well as mechanical. When roller 23 meets track 24, the track having been inclined or rocked downwardly by lowering rod 26, the track is raised thereby raising rod 26 and fingers 29 to cause the fingers to loosen up the material in front of the discharge opening. The discharge opening and the spout increase in size toward the bottom of the tank as shown in Figs. 1 and 2, and the fingers 29 also increase in length progressively from the upper to the lower ones. When the roller leaves the track after elevating it the weight of the same and of the rod 26 causes both the track and rod to drop again.

At the lower end of shaft 14 is loosely mounted a conveyer 30 which consists of a suitable number of bars 31 to which are secured a suitable number of diagonally arranged flights 32. At the ends of the bars are provided flights 33 and 34. Flights 32 tend to cause the material to be carried or conveyed toward the wall of the tank and to the discharge opening 12 and flights 33 and 34, which are curved as shown and project beyond the sides of bars 31, enable the con-

veyer to raise on top of the material. The opposite ends of the conveyer are connected to chains 35, which chains are connected to cross-arm 36 which is also loosely mounted on shaft 14 and is provided with a drum 37 at each end. Between cross-arm 36 and fixed cross-arm 19 is provided any suitable number of loose cross-arms 38 (one only being shown) which is connected by chains 39 to cross arm 36 and by chains 21 and 22 to fixed arm 19. It will be necessary to use more than one auxiliary cross-arm 38 only when the tank is too tall for the one arm 38 to perform its function alone—that is, the number of auxiliary cross-arms required depends entirely upon the height of the tank. Cross-arm 36 having the drums 37 thereon serves as a carrier for such auxiliary cross-arms as may be above it. The drums are revolubly mounted on arm 36 and tend to prevent the engagement of the conveyer with that arm and also the engagement of arm 38 with arm 36. They also tend to climb up on any material above the conveyer thereby causing the arm 36 to rise and to assist the conveyer in rising to perform its function.

When shaft 14 is rotated, cross-arm 19, being fixed, pulls all the arms below it by means of the chain connections and thereby imparts the revolution of the shaft to the conveyer. The diagonal flights of the conveyer drives the material toward the side of the tank and the material is thereby forced out through the discharge opening 12 into the spout 13 from which it is delivered to the desired point. As the tank is filled the conveyer, by means of its flights 33 and 34, remains on top of the material and is therefore in position at all times to perform its conveying function.

Different materials require different forms of supporting or elevating flights for the conveyer. In Fig. 7 the flights 41 and 42 are hinged to bars 31, flights 41 being provided with weights 43. When the load on the conveyer is too great flights 41 raise and flights 42 lower, thereby increasing the carrying power of the conveyer. In the conveyer shown in Figs. 1 and 2 the flights 33 and 34 may be hinged to the bars just as they are in Fig. 7. In Fig. 8, instead of the fixed or hinged flights for raising the conveyer, two gates 43 are provided at two opposite corners of the device. Each gate is mounted upon a post 44 which is secured to bar 31 its movement being opposed by spring 45. A rod 46 is connected at one end to the gate and at its other end it is pivoted to a fixed bar 47 which is secured to some suitable part of the conveyer, as the diagonal flights.

Flights 32 are set to convey the materials to the wall of the bin and discharge opening. If no discharge of the material is taking place the material will collect at the wall of the bin and finally accumulate to such extent that the conveyer will travel through it, some of the material going over the conveyer. The material passing over the conveyer will engage hinged flights 43, and when there is sufficient resistance offered by the material to overcome springs 45 those flights move back and the conveying action of flights 32 is neutralized thereby. The conveyer then raises or climbs up on the material and, as soon as no material passes over the conveyer, flights 43 return to their normal position and flights 32 resume their conveying action.

For some materials the conveyer having the gates or vertical flights 43 has considerable advantage over the other forms of conveyers previously described, and the flights 43 may be used with either of the other two forms of conveyers previously described.

It will be noted that the conveyer mechanism is sectional so that it may be increased in height by the addition of more auxiliary cross-arms, or it may be shortened by removing the same. This flexible feature enables the mechanism to be applied to any height of bin or tank.

It will also be noted that the number of discharge openings in the side of the tank may be increased if it is desirable to do so.

What we claim is:

1. The combination with a bin having a discharge opening therein, of a shart revolubly mounted in the bin, means to rotate the shaft, a support fixed to the shaft, a conveyer slidably and revolubly mounted on the shaft for conveying materials toward the discharge opening, a plurality of loosely connected cross-arms loosely mounted on the shaft between the conveyer and support, the conveyer being loosely connected to one of the cross-arms and the fixed support being loosely connected to another of said cross-arms.

2. The combination with a bin having a discharge opening therein, of a shaft revolubly mounted in the bin, means to rotate the shaft, a support within the bin and fixed on the shaft, a cross-arm slidably and revolubly mounted on the shaft below the support and having a loose connection to the support, a revolubly mounted drum at each end of the cross-arm, a revoluble conveyer suspended from the cross-arm and having a series of flights thereon adapted, as the conveyer is revolved, to convey materials in the tank toward the discharge opening.

3. The combination with a bin having an elongated discharge opening at its side, of a conveyer revolubly suspended within the bin, means to rotate the conveyer at a plurality of positions in the bin, means on the conveyer to engage materials in the bin for conveying the same toward the discharge

opening, and means adjacent the discharge opening for loosening the materials at said opening.

4. The combination with a bin for the storage of non-flowing materials and having an elongated discharge opening at its side, of a revoluble support within the bin, means to rotate the support, a conveyer mechanism suspended from the support, means adjacent the feed opening for loosening the materials at said opening and means connected to the loosening means and operatively connected to the support for actuating the loosening means.

5. The combination with a bin for the storage of non-flowing materials and having a discharge opening in one side thereof, a vertically movable conveyer revolubly mounted within the bin, means to rotate the conveyer, the conveyer having a series of hinged flights at opposite corners thereof for neutralizing the conveying action of the conveyer when overloaded with the materials, and means on the conveyer for conveying the materials toward the discharge opening as it is revolved.

6. In combination a bin for the storage of non-flowing materials and having a discharge opening therein, a revoluble conveyer suspended within the bin having a series of flights for conveying materials toward the discharge opening, and a plurality of hinged flights on the conveyer adapted to maintain it on top of the materials at any level thereof in the bin.

In witness whereof we hereunto subscribe our names this 5th day of January, 1916.

CARL WOOLCOTT.
HARRY M. WOOLCOTT.

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