Jan. 5, 1932. F. EWING 1,839,749

AUTOMATIC DISTRIBUTOR

Filed Aug. 15, 1930 2 Sheets-Sheet 1

Fig. 1.

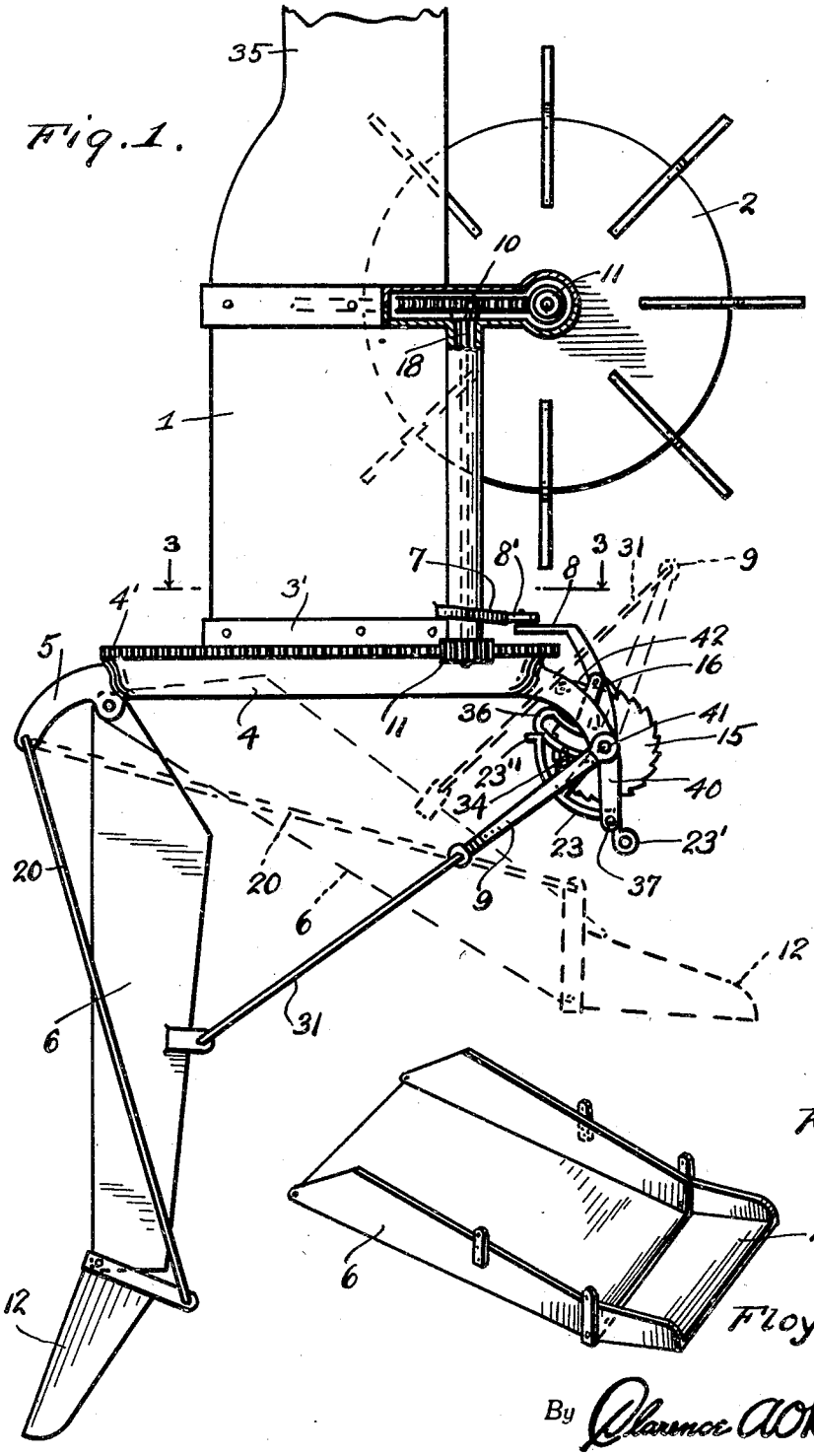


Fig. 4.

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Fig. 2.

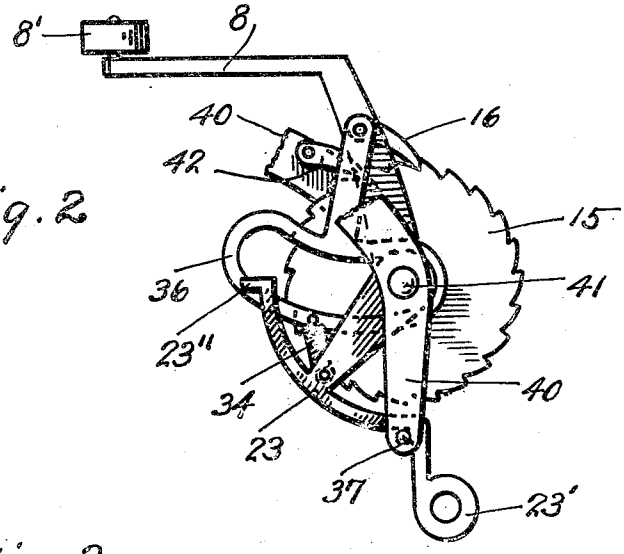
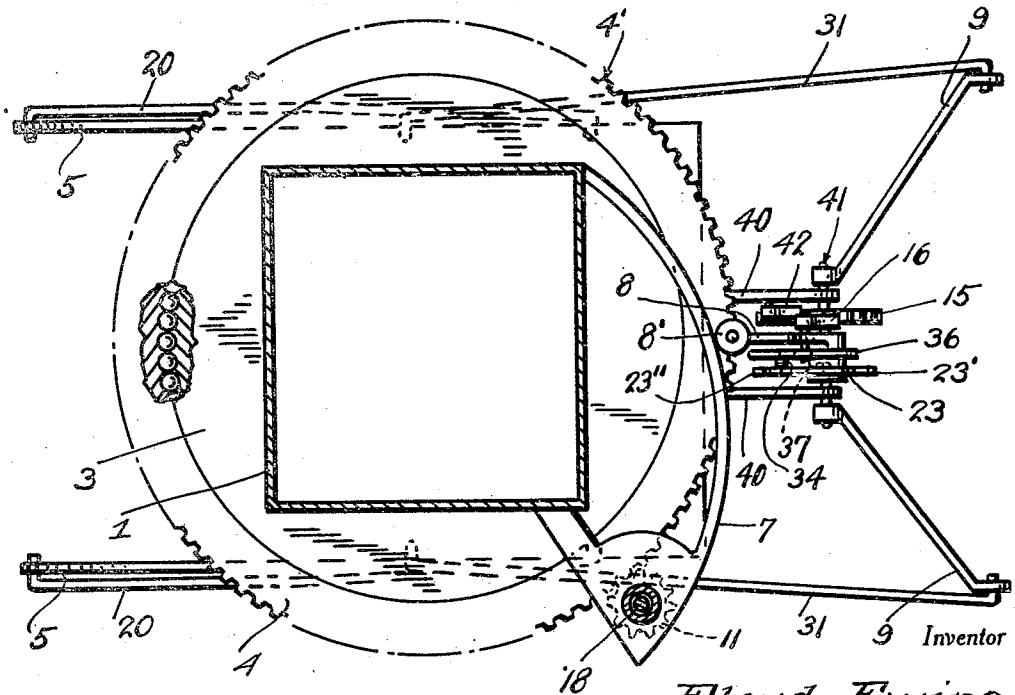


Fig. 3.



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Patented Jan. 5, 1932 1,839,749

UNITED STATES PATENT OFFICE

FLOYD EWING, OF ELKHORN, WISCONSIN

AUTOMATIC DISTRIBUTOR

Application filed August 15, 1930. Serial No. 475,529.

The present invention relates to an automatic distributor and is designed for the even distribution of material in bins or storage places where the material is delivered under pneumatic pressure, and is especially useful in the distribution of silage in a silo.

The object of the invention resides in the provision of an apparatus of this nature which is automatic in its action, compact and convenient in its arrangement of parts, strong and durable, thoroughly efficient and reliable in use and operation, and otherwise well adapted to the purpose for which it is designed.

With the above and numerous other objects in view as will appear as the description proceeds, the invention resides in certain novel features of construction, and in the combination and arrangement of parts as will be hereinafter more fully described and claimed.

In the drawings:

Figure 1 is a side elevation of an apparatus embodying the features of my invention,

Figure 2 is an enlarged detail elevation of the lever and ratchet mechanism,

Figure 3 is a horizontal section taken substantially on the line 3—3 of Figure 1,

Figure 4 is a perspective view of the deflector and scoop.

Referring to the drawings in detail it will be seen that numeral 1 denotes a chute into which the material is delivered under air pressure in the usual well known manner. The pressure of air and particles of silage cause the impeller 2 to rotate. The chute is preferably of square metal construction having an opening in one side thereof through which the bladed impeller or fan 2 projects so that the tips of the blades move within close proximity to the wall of the chute. The rotary action of the impeller is transmitted through worm gearing 10, shaft 18 and worm 11 to a collar 4 which rotates slowly around the axis of the chute 1. The numeral 3 denotes a circular plate having on its outer edge a ball race and formed with a square opening of the same dimensions as chute 1 and has a flange 3′ to receive the bottom end of the chute. The ring 4 has on its outer edge an annular series of teeth 4′ which engage the pinion 11 and on its inner edge a ball race corresponding to the race on the plate 3 and this ring is fitted with ears 5 to pivotally support a scoop or deflector 6 which is formed with a hinged tip 12.

A cam 7 is attached to the plate 3 and a pair of arms 40 are carried by the ring 4, a shaft 41 being journalled in these arms. A ratchet wheel 15 is fastened to the shaft as are also the cranks 9 which are connected by the links 31 to the scoop 6. A lever 8 has one end rotatably mounted on the shaft 41 and its free end carries a roller 8′ which engages the cam 7 during a portion of the rotary movement of the ring 4 to which the lever 8 is connected by the shaft and arms 40. A dog 16 on the lever engaging a tooth of the ratchet wheel 15 will rotate the wheel and the shaft 41 one step at a time as the lever is moved outwardly by the engagement of its roller 8′ with the cam.

As the crank arms 9 are connected with the shaft, this step-by-step movement of the shaft will cause the arms 9 and the links 31 to gradually lift the scoop during the rotation of the ring 4 until the parts reach the position shown in dotted lines in Figure 1 when gravity will cause the parts to drop to the original position shown in full lines in Figure 1 due to the parts passing dead center. The step-by-step upward movement of the scoop then starts over again.

A holding dog 42 pivotally connected with one of the arms 40 engages the ratchet wheel to hold the same from retrograde movement.

In a practical embodiment of this invention the ring 4 revolves around the plate 3 in about one and one quarter minutes according to the velocity of the material, there being twenty teeth in the ratchet wheel 15. In ten revolutions of the ring 4 about the plate 3, the scoop 6 would move from its vertical position to the outward position as indicated in dotted lines in Figure 1 thereby spreading the silage from the center of the silo to the wall. Should it, however, be necessary to fill any portion of the silo either center or near the wall, the action of lever and ratchet can be stopped by moving a sector 23 pivoted to the shaft 41 to a position,

where a spring 34 connected with the sector 23 and a link member 36 will cause said link member 36 to swing the lever 8 to a position where its roller 8′ will be out of contact with the cam when the parts are moved to a position opposite the cam. This link member 36 has a stem which is pivoted to the lever so that when the sector 23 is moved from a position where its handle 23′ engages a stop pin 37 on one of the arms 40 to a position where a stop 23″ at the opposite end of the sector engages the pin 37 the spring 34 will pull the loop member 36 to the right and thus swing the lever 8 to a position where its roller will not engage the cam 7. When this is done the scoop will remain stationary as far as the swinging movement is concerned. I have experimented with this type of distributor and find that any type of deflecting scoop that is of rigid construction does not work so well and for this reason I provide the hinged tip 12. This tip is so actuated by link 20 pivoted to ears 5 that it does not come into action on the stream of silage until the scoop has been raised to a certain position.

Some of the important advantages of this invention reside in the fact that the device for the distribution of the material is actuated by a blast of air and material which revolves the fan or impeller and the action of this fan or impeller revolves the deflector around the axis of the delivery chute. This deflector also has a simultaneous crosswise swinging action.

Attention is directed to the offset 35 in the chute 1. The object of this offset is that the blast of air in the material may strike directly on the blades of the fan or impeller in order that there may be ample clearance on all sides of the blade and that the stream will pass through the center of opening in plate 3 thereby giving the deflector the same effect at all angles of its revolution about the axis of the chute 1.

It is thought that the construction, operation, utility and advantages of this invention will now be quite apparent to those skilled in this art without a more detailed description thereof.

The present embodiment of the invention has been described in considerable detail merely for the purposes of exemplification since in actual practice it attains the features of advantage enumerated as desirable in the statement of the invention and the above description.

It will be apparent that changes in the detail of construction, and in the combination and arrangement of parts may be resorted to without departing from the spirit or scope of the invention as hereinafter claimed or sacrificing any of its advantages.

Having thus described my invention, what I claim as new is:

1. In an apparatus of the class described, a chute, a plate on the outlet end of the chute, a ring revolvable about the plate, a deflector hingedly engaged on the ring, an impeller on the chute actuatable by the passage of air and material therethrough, and gearing operatively connecting the impeller with the ring to cause the rotation of said ring, a shaft rotatably supported by the ring, a ratchet wheel on the shaft, cranks on the shaft, links connecting the cranks with the deflector, a cam on the chute, a lever pivoted to the shaft and having a pawl engaged with the ratchet wheel, and a wheel on the lever to engage the cam.

2. In an apparatus of the class described, a chute, a plate on the outlet end of the chute, a ring revolvable about the plate, a deflector hingedly engaged on the ring, an impeller on the chute actuatable by the passage of air and material therethrough, and gearing operatively connecting the impeller with the ring to cause the rotation of said ring, a shaft rotatably supported by the ring, a ratchet wheel on the shaft, cranks on the shaft, links connecting the cranks with the deflector, a cam on the chute, a lever pivoted to the shaft and having a pawl engaged with the ratchet wheel, and a wheel on the lever to engage the cam, a tip portion hingedly mounted on the deflector, and a link arrangement for controlling the swinging of the tip in relation to the deflector.

3. In an apparatus of the class described, a chute, a plate on the outlet end of the chute, a ring revolvable about the plate, a deflector hingedly engaged on the ring, an impeller on the chute actuatable by the passage of air and material therethrough, and gearing operatively connecting the impeller with the ring to cause the rotation of said ring, a shaft rotatably supported by the ring, a ratchet wheel on the shaft, cranks on the shaft, links connecting the cranks with the deflector, a cam on the chute, a lever pivoted to the shaft and having a pawl engaged with the ratchet wheel, a wheel on the lever to engage the cam, and means for moving the lever to a position where its wheel will not engage the cam to stop the upward swinging movement of the deflector.

In testimony whereof I affix my signature.

FLOYD EWING.