

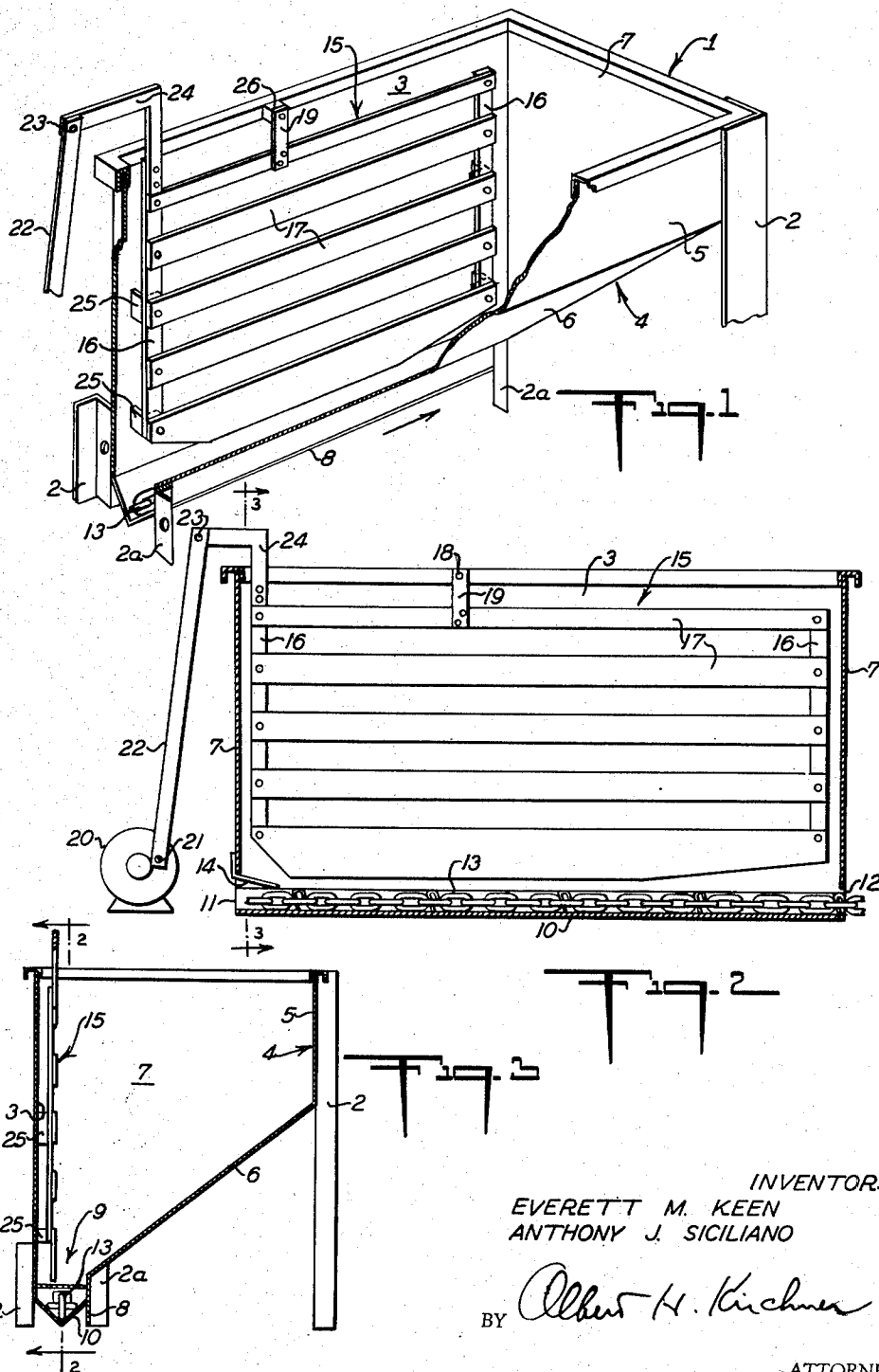
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AGITATOR FOR BINS AND THE LIKE

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AGITATOR FOR BINS AND THE LIKE

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The present invention relates to agitators for bins and the like, particularly for such bins as are used to supply poultry feed to conveyor systems for delivering the feed to poultry.

Such conveyor systems include open troughs, frequently arranged in endless form, and generally containing some sort of propelling means, such as the chain device which is the subject of our copending U. S. patent application, Serial No. 267,756, filed January 23, 1952, now Patent No. 2,699,250, dated January 11, 1955. These systems also include bins or hoppers to which the trough is connected and through the lower area of which the chain or other propelling means passes to pick up feed from the bin for movement through the trough to the poultry or other stock to be fed.

The feed is generally a mixture of grain and other materials, usually containing a considerable proportion of moisture, and sometimes some glutenous or other sticky or coherent ingredients, as the result of which the feed composition tends to pack in the bin and become arched between the walls thereof so that steps must be taken periodically to break down the arching and permit the feed to descend in the bin so as to be caught by the propelling device and be moved out into the trough.

A principal object of the present invention is to provide a mechanical agitator for such a bin that will keep the material loose, prevent packing and arching, and insure free flow down into the bin bottom to the flights or other elements of the conveyor chain or other propelling mechanism.

Related objects are to provide such an agitating means as will occupy negligible space in the bin and require very little power to operate it.

Other objects and advantages will be apparent to those skilled in the art from the following description of a preferred embodiment of the invention which is illustrated in the accompanying drawing, in which

Figure 1 is a perspective view, partly broken away, showing a bin provided with the new agitator;

Figure 2 is a longitudinal sectional view taken on the line 2—2 of Figure 3; and

Figure 3 is a cross sectional view taken on the line 3—3 of Figure 2.

Generally speaking, the invention comprises a bin having one full vertical wall and an opposite wall which at least in part slopes toward the vertical wall to form therewith a hopper outlet bottom, in combination with a rack or frame almost as long as the bin and substantially as high, but comparatively thin, pivoted adjacent to the top of the inner surface of the full vertical wall, and provided with means for rocking it in a plane parallel to said wall, with the result that material tending to flow down the sloping wall toward the vertical wall is kept from adhering to the vertical wall and is caused to drop by gravity to the hopper bottom of the bin.

Such a structure is shown in the drawing. The reference numeral 1 designates generally a suitable type of bin conveniently made of sheet metal and mounted on six legs

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which, as shown, may be made of angle iron stock. Four of these legs, designated 2, may be welded, bolted or otherwise secured to the four corners of the bin and two legs, each designated 2a, may be similarly secured to the lower portion of the front wall, between the legs at each end, as best appears in Figures 1 and 3.

The bin is rectangular in plan and is comprised of four walls, including a rear wall 3 which is vertical and flat throughout its entire height, a front wall 4 which includes an upper vertical portion 5 and a lower portion 6 which slopes steeply toward the rear wall 3, and a pair of end walls 7, 7, which connect and close off the front and rear walls and are of the shape best shown in Figure 3.

The lower edge of the sloping portion 6 of the front wall 4 terminates short of the bottom edge of the rear wall 3, and has joined to its lower edge a short depending vertical skirt 8 which cooperates with the lower area of the rear wall 3 to provide a hopper bottom outlet 9. This outlet which extends the full length of the bin is closed at its bottom by a channel or V-shaped trough 10 which is open through apertures in the end walls 7, as shown at 11, 12 in Figure 2, to provide connections with outside trough sections (not shown) which can be formed with brackets connected to each pair of legs 2, 2a (see Figure 1). The continuous trough formed by these outside sections and the bin bottom trough 10 is adapted to contain a chain or the like 13, which may be like the chain shown in our copending application, but which may be any other type of moving and preferably flexible means adapted to enter the bin through the inlet opening 11, receive material from the upper zones of the bin and move it along the trough 10 out through the outlet opening 12 and thence through the outside trough sections to the poultry or other stock to be fed.

The chain or analogous conveyor enters the trough section 10 through the opening 11, and to prevent loss of material out through this opening a baffle or shield plate 14 may be arranged in covering and protecting position over the opening, chain and trough, as shown in Figure 2.

In order to insure at all times a full supply of feed to the trough section 10, i. e., a constant load of feed bearing down on the section and the contained conveyor 13, the agitator generally designated 15 is provided. In the preferred embodiment of the invention this agitator comprises a flat framework made up of two end uprights 16 connected by a plurality of transverse blades 17 which are arranged in spaced parallelism and are bolted or welded at their ends to the uprights. This framework, which is only slightly shorter than the bin length and only slightly less in height than the height of the rear wall 3, is pivoted at 18 to the upper edge of the rear wall by means of a short hanger 19 which is welded or bolted to the top blade of the frame. For a purpose to be hereinafter indicated, the pivot point is located considerably closer to the end wall 7 containing the inlet opening 11 than to the opposite end wall 7 which contains the outlet 12.

The frame is thus mounted for swinging or rocking movement about the pivot 18, and this movement is conveniently applied by an electric motor 20 incorporating a speed reduction device having an eccentric or crank pin 21 driving a connecting rod 22 pivoted at 23 to an arm 24 which is rigidly secured to that one of the uprights 16 which is adjacent the inlet opening 11. The arm 24 may be made straight and extended in alignment with the top blade 17, through a slot in the adjacent end wall 7 of the bin, but it is preferable to make the arm L-shaped and extend it up above the top of the bin and over the wall 7, as shown in Figures 1 and 2, because this eliminates the otherwise necessary slot in the wall 7 and the

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resulting possibility of loss of feed material through the slot when the bin is loaded to capacity.

It will be evident that when the connecting rod 22 is reciprocated, it will repeatedly raise and lower the arm 24, thus rocking the frame 15 about its pivot 18.

This constant rocking movement of the frame keeps the material in the bin from packing against the wall 3. The material tends to slide toward that wall by the slope of the front wall portion 6. To keep the thrust of the material from pressing the frame against the wall 3, with resulting heavy friction that might stall the motor or wear out the wall, it is convenient to provide small slide elements or anti-friction rollers 25 which serve to space the frame slightly from the wall 3 and which cooperate with a thin spacer block 26 behind the hanger 19 in positioning the frame in a substantially accurately vertical plane paralleling the wall 3.

Movement of the chain or other conveyor element 13 from the opening 11 toward the outlet 12 tends to introduce a somewhat greater compaction of material in the region of the outlet. This tendency is overcome by the off-center mounting of the hanger 19 and pivot 18, hereinabove described, by which the pivot point is closer to the inlet 11 than to the outlet 12, because such mounting causes the frame portions which are adjacent the outlet 12 to swing through a longer arc than do the opposite end portions of the frame. Thus the contents are agitated to a greater degree near the outlet than near the inlet.

It is believed that the foregoing description, taken in conjunction with the accompanying drawing, both of which are concerned with a preferred form of embodiment of the invention, will be sufficient to acquaint those skilled in the art with the principles of the invention. These principles are capable of being embodied in other and further modified forms within the spirit of the invention and the scope and purview of the broader of the appended claims.

We claim:

1. In combination with a bin having opposite end walls and back and front wall members connected to the end walls, said back wall member having a substantially vertical inner surface and said front wall member sloping downwardly toward said back wall member to define therewith an elongated slot constituting a vertical outlet opening for gravity discharge through the bottom of the bin, an agitator for the bin contents comprising a relatively thin member substantially as long and as high as said back wall member disposed vertically in the bin adjacent to said back wall member and directly over said slot, means mounting the agitator member in the bin comprising a single pivot connecting the upper portion of the agitator member to the upper portion of said back wall member, and means for rocking said agitator member in an arcuate path in a vertical plane about said pivot as a center, said means comprising a rigid arm upstanding from the agitator member and extending above the top of the bin for connection to a reciprocating drive element.

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2. In combination with a bin having opposite end walls and back and front wall members connected to the end walls, said back wall member having a substantially vertical inner surface and said front wall member sloping downwardly toward said back wall member to define therewith an elongated slot constituting a vertical outlet opening for gravity discharge through the bottom of the bin extending substantially the entire distance between said end walls, an agitator for the bin contents comprising a relatively thin member substantially as long and as high as said back wall member disposed vertically in the bin adjacent to said back wall member and directly over said slot, means mounting the agitator member in the bin comprising a single pivot connecting the upper portion of the agitator member to the upper portion of said back wall member, and means for rocking said agitator member in an arcuate path in a vertical plane about said pivot as a center, said means comprising a rigid arm upstanding from the agitator member and extending above the top of the bin for connection to a reciprocating drive element.

3. In combination with a bin having opposite end walls and back and front wall members cooperating in their lower zones to define an elongated slot constituting a discharge opening, an agitator for the bin contents comprising a relatively thin and open framework substantially as long and as high as one of said wall members disposed vertically in the bin between said wall members and parallel to at least one of them, means mounting the framework in the bin comprising a single pivot connecting the upper portion of the framework to the upper portion of said last named wall member, and means for rocking said framework in an arcuate path in a vertical plane about said pivot as a center, a trough extending beneath the discharge opening, and material-propelling means in said trough movable lengthwise thereof from an inlet opening in one of said end walls to an outlet opening in the other end wall, said pivot being located closer to said inlet opening than to said outlet opening.

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