Aug. 26, 1952 W. S. TYLER 2,608,290

ELEVATOR BUCKET CLEANER

Filed April 1, 1950

Fig. 1.

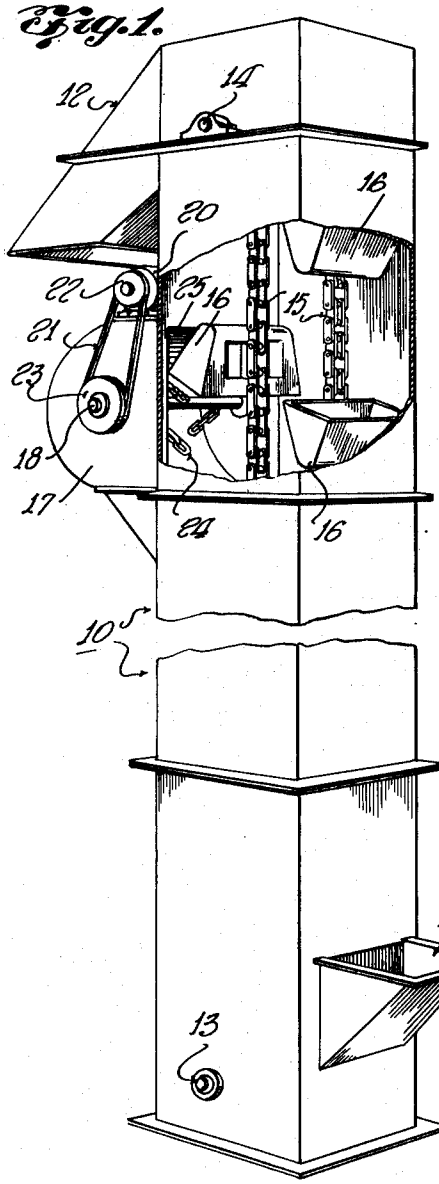


Fig. 2.

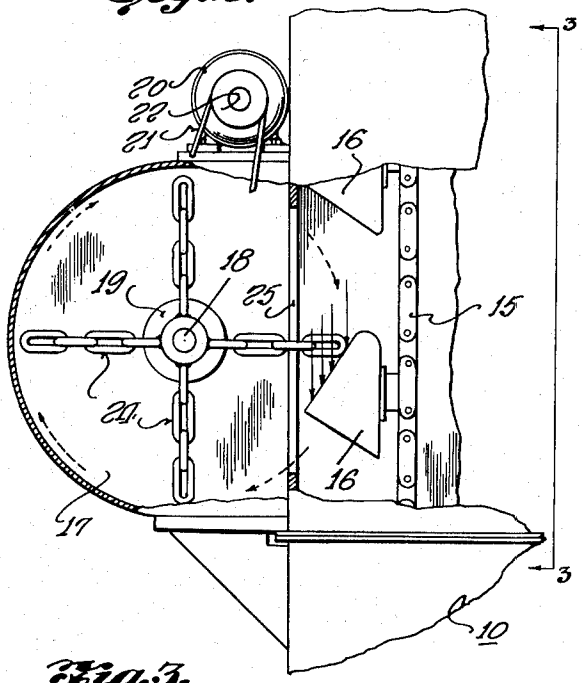


Fig. 3.

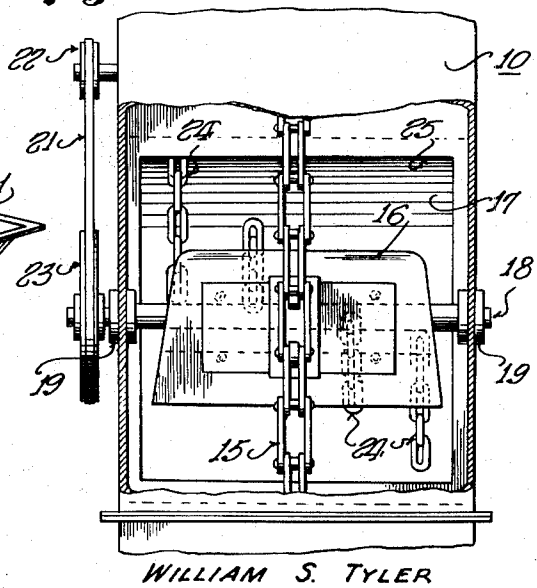
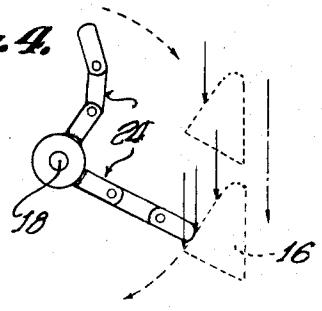


Fig. 4.



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Patented Aug. 26, 1952

2,608,290

UNITED STATES PATENT OFFICE

2,608,290

ELEVATOR BUCKET CLEANER

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Application April 1, 1950, Serial No. 153,316

1 Claim. (Cl. 198—229)

1

This invention relates to bucket elevators and more particularly, to a bucket cleaning device for such elevators.

The principal object of the invention is to provide a simple device which is useful in keeping elevator buckets clean under conditions in which the buckets are required to lift loose materials and especially such materials as fertilizer, crushed grain and the like which may be deliquescent in character and hence have a tendency to adhere to the walls of the bucket. The described conditions are sometimes the cause of frequent shut-downs necessary for the manual cleaning of individual buckets of the elevator, which not only entails cessation of plant operation but requires the intervention of labor to clean the buckets by hand.

Another object of the invention is to provide an elevator bucket cleaner consisting of a rotatable shaft adapted to be situated adjacent the discharge or head of the elevator housing and in juxtaposition to the inverted buckets on the downgoing side thereof. By virtue of a plurality of chain hammers, flails or equivalent means staggeredly attached to the shaft from end to end, the buckets will each be subjected to a series of shocks or impacts as they pass within the orbit of the flails or hammers which latter revolve at a speed proportionately greater than the travel of the buckets, thus to insure that the entire area of the bucket exposed to the hammers will be encountered thereby to loosen adhering material and release the same from the bucket.

Other objects will appear as the description proceeds, taken in connection with the accompanying drawing, wherein:

Figure 1 is a perspective view of a conventional bucket elevator housing with a portion broken away to reveal the relationship of the invention with the buckets of the elevator.

Figure 2 is a fragmentary side elevational view of the elevator on a slightly larger scale and broken away to show a chain hammer of the invention in collision with a bucket.

Figure 3 is a fragmentary sectional view taken on line 3—3 of Figure 2, and

Figure 4 is a fragmentary view per se of a modified form of hammer.

Continuing with a more detailed description of the drawing, reference numeral 10 denotes generally the vertical housing of a conventional bucket elevator, having at its base or "boot" a feed box 11 and at its upper end, a discharge or head 12. A boot shaft 13 is suitably arranged on the housing 10 near the bottom thereof and a

2

head shaft 14 is similarly arranged in the head of the housing. Each shaft carries a sprocket wheel (not shown) and over these sprockets operates a chain 15, to which is attached in the usual manner a plurality of relatively spaced buckets 16. When the elevator is operated, the buckets 16 are filled with material in the bottom of housing 10 and convey the same to the top thereof where the material is released through the discharge chute 12 upon inversion of the buckets on the downgoing side of the elevator.

As previously stated, many finely divided or loose materials such as mashed or crushed grain as feedstuffs; corn, flour and even fertilizers usually have a tendency to stick to the interior wall surfaces of the buckets 16, due either to the moisture content of the materials or perhaps to the natural mucilaginous nature thereof. In any case, however, the adhering materials will soon build up within the buckets and reduce their capacity to such an extent that the efficiency of the elevators is seriously affected.

To obviate the foregoing conditions, the invention provides a housing 17 of any suitable design or form, which is secured to the wall of the elevator housing 10 next adjacent to the downgoing side of the elevator. A shaft 18, disposed transverse to the travel of the elevator chain 15, has its ends journaled in bearings 19 in opposite walls of the housing 17 and is driven by means of an electric motor 20 supported on the housing 17 or by other suitable propelling means. As shown, a belt 21 connects a pulley 22 on the motor shaft and a pulley 23, mounted on an end of shaft 18 exteriorly of the housing 17.

Attached at one end to the shaft 18 and staggered spirally about the same is a series of short lengths of chain 24.

When the shaft 18 is set in motion by energizing motor 20, the short lengths of chain 24 will, by centrifugal force, be maintained in radial relationship with their shaft and their free ends will move in a circular path through an opening 25 provided therefor in the wall of the elevator housing 10. As the elevator buckets 16 are moved downwardly through the paths of the chains 24, the bottoms of the buckets will be successively struck by the outer ends of the chains from the lip of the bucket to the bottom thereof, at points suggested by the arrows in Figure 2, as the bucket moves downwardly. Repeated rapping of the buckets by the chains causes impacted material to be dislodged from the walls of the buckets.

Actual operation of the cleaning device herein

described, on a bucket elevator has revealed no damage to the buckets nor to the cleaning mechanism. The flails on chain hammers being highly flexible, they will not hang up or break, which may not be true of rigid devices, nor do they interfere in any manner with normal operation of the elevator.

The chain hammers **24** may be replaced by the modified form of chain or centrifugal hammer shown in Figure 4, whose elements, because of their similarity to the chains **24**, bear the same reference numeral.

Manifestly, the construction as shown and described is capable of some modification and such modification as may be construed to fall within the scope and meaning of the appended claims is also considered to be within the spirit and intent of the invention.

What is claimed is:

In a bucket elevator, the combination of a vertical housing having transverse shafts in its upper and lower ends, each carrying a sprocket, a chain surrounding and driven by said sprockets, a plurality of buckets having inclined walls mounted in longitudinally spaced relationship on said chain, a second housing mounted on said

vertical housing adjacent the path of the buckets of said elevator in their inverted positions on the down-going side of said chain, a shaft rotatable in said second housing, a plurality of flexible hammers attached to said shaft in spiral arrangement and adapted to be brought centrifugally into operative position by rotation of said shaft to collide with the inclined walls of each bucket progressively from the top to the bottom thereof as said buckets traverse the operative range of said flexible hammers, and means for rotating the shaft in said second housing to operate said chain.

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