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ELEVATOR CLEANING DEVICE

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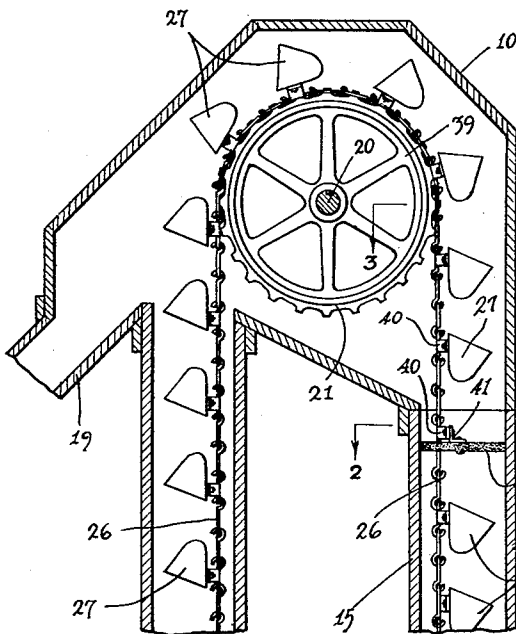
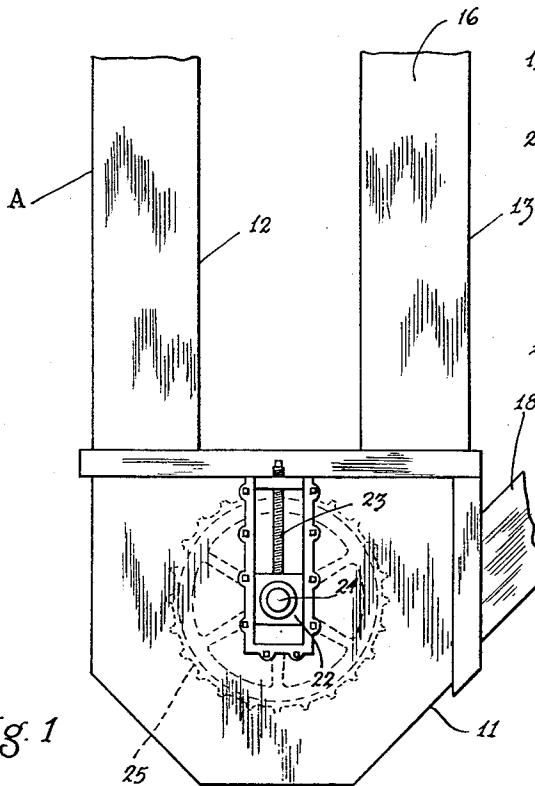


Fig. 1

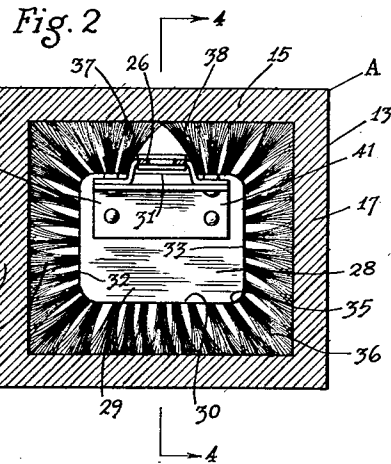
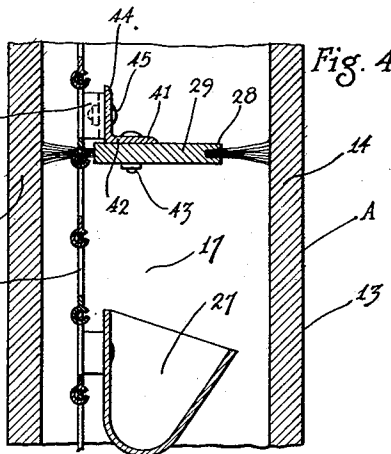


Fig. 4

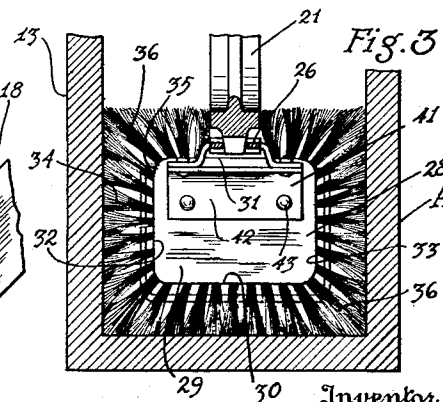


Fig. 3

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UNITED STATES PATENT OFFICE

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ELEVATOR CLEANING DEVICE

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8 Claims. (Cl. 198—231)

My invention relates to cleaning devices for bucket elevators and has for its object to provide a device whereby the interior surface of the legs of a bucket elevator may be readily and thoroughly cleaned without shutting down the elevator.

Another object of the invention resides in providing a cleaning device particularly adaptable for use in conjunction with an elevator formed with rectangular shaped legs and having a chain passing through said legs in spaced relation thereto and carried by sprockets.

A still further object of the invention resides in providing a brush for attachment to the chain of the elevator and having bristles thereon adapted to substantially engage the entire inner surfaces of the legs of the elevator as the same travel therethrough.

Another object of the invention resides in providing the body of the brush with an edge or surface extending in the same direction as the elevator leg and from which said bristles issue.

An object of the invention resides in providing said brush body with edges or surfaces conforming to the front, back and sides of the elevator leg and spaced therefrom and in providing bristles upon all of said surfaces or edges for engagement with substantially the entire inner surface of the elevator legs.

A feature of the invention resides in cutting away or rounding the body of the brush at the intersections of the edges thereof and in attaching to such portions of said body of the brush, bristles adapted to enter the corners of the elevator legs to completely and effectively clean the same.

An object of the invention resides in spacing the bristles at the rear edge of the brush body to cause said bristles to straddle the chain and in further causing said bristles to approach one another in back of the chain to completely cover the surface of the back of the elevator leg.

A feature of the invention resides in employing bristles of resilient material adapted to be spread apart by engagement with the rim of the sprocket whereby the bristles at the back of the brush may receive the sprocket as the portion of the chain carrying the brush passes about the sprocket.

Other objects of the invention reside in the novel combination and arrangement of parts and in the details of construction hereinafter illustrated and/or described.

In the drawing:

Fig. 1 is a fragmentary side elevational view

of a bucket elevator with a portion thereof shown in section and illustrating an embodiment of my invention applied thereto.

Fig. 2 is a sectional view of one of the elevator legs having the brush therein taken on line 2—2 of Fig. 1 and drawn to a larger scale.

Fig. 3 is a view similar to Fig. 2 taken on line 3—3 of Fig. 1.

Fig. 4 is a fragmentary vertical sectional view taken on line 4—4 of Fig. 2.

In flour mills, elevators, bakeries and other plants where flour and similar materials are handled through bucket elevators, flour adheres to the surfaces of the legs, head and boot of the elevator and accumulates in the corners and crevices thereof. Where such conditions occur, weevil and other animal or plant life thrive, and in time the entire plant becomes infested with the same. The best remedy for such conditions is to prevent the accumulation of flour in any particular locality. This can readily be prevented in the boot and head of the elevator, the sides of which are usually removable for inspection and repair, but a different problem arises in conjunction with the elevator legs which are frequently of considerable length and are often quite inaccessible. The present invention provides a device which operates continuously and maintains the elevator legs at all times free from flour deposit, thereby eliminating weevil and other undesirable animal or plant life.

For the purpose of illustrating the application of my invention, I have shown in Fig. 1, an ordinary bucket elevator which is indicated in its entirety at A. This elevator consists of an elevator head 10 and a boot 11 connected together through two elevator legs 12 and 13, and is illustrated as constructed of wood though the invention is equally as applicable to elevators built of metal or with elevators of any form or design. The head 10 and the boot 11 are constructed in the ordinary manner and have detachable sides through which access to the interior of the head may be had, and the legs 12 and 13 are each formed with a front 14, a back 15 and sides 16 and 17 connected together in the usual manner as through screws or nails. The legs 12 and 13 are detachably secured to the head 10 and boot 11, which latter are provided with spouts 18 and 19 by means of which the flour or other commodity to be handled by the elevator is led into the same and discharged therefrom.

In suitable bearings in the elevator head 10, not shown, is journaled a transversely disposed

shaft 20 which carries a sprocket wheel 21. In other bearings 22, forming part of a takeup device 23 which is carried by the boot 11, is jour-
 5 nalled a transversely disposed shaft 24 which carries another sprocket wheel 25. A link belt chain 26, which has attached to it a series of
 10 buckets 27, passes over the two sprockets 21 and 25 and as either of the shafts 20 or 24 is rotated, the flour or other material discharged into the
 15 boot 11 through spout 18, is picked up and elevated and finally discharged from the head 10 through the discharge spout 19 thereof.

My invention proper consists of a brush indicated in its entirety at 28 which is attached to
 15 the chain 26 and which travels with said chain through the two legs 12 and 13 and about the sprockets 21 and 25. This brush includes a body 29 constructed of wood or some other suitable
 20 material of uniform thickness. The body 29 is rectangular in form being provided with a front edge 30, a rear edge 31 and side edges 32 and 33, the surfaces of which extend parallel with the
 25 inner surfaces of the front, back and sides 14, 15, 16 and 17 of the elevator legs proper, and which when the brush is attached to the chain are equally spaced from said surfaces.

For the purpose of attaching the brush to the elevator chain 26, one of the buckets 27 thereof
 30 is removed and the special link 40 of said chain to which the bucket was previously attached utilized for this purpose. The body 29 has attached to it a clip angle 41, one leg 42 of which
 35 is bolted to the said body through bolts 43 and the other leg 44 of which extends outwardly from the brush body 29 and is adapted to be bolted to the special link 40 through bolts 45
 40 in exactly the same manner as the previously attached elevator bucket. The angle 41 is so attached to the body 29 of the brush that the edges of said body lie in proper spaced relation
 45 to the inner surfaces of the walls of the elevator leg when the brush travels through the legs.

The brush 28 is further provided with bristles 34 which issue outwardly from the edges 30, 31,
 45 32 and 33 and which are adapted to engage the inner surfaces of the front, back and sides of the elevator legs. For the purpose of cleaning the corners of the elevator legs, the body 29 at the
 50 intersections of the various edges of the same are cut away or rounded as indicated at 35. At these localities, longer bristles 36 are employed which are adapted to extend into the corners of the legs so as to positively clean the same as the
 55 brush travels through the elevator.

The bristles 37 and 38 on the rear edge 31 of the brush body 29 straddle the chain 26 and are
 60 disposed in such a manner that the same extend toward one another, meeting at the inner surface of the back 15 of the elevator leg. When the brush travels along the leg, the bristles thereof completely engage the entire surface of the leg
 65 so that the same is thoroughly cleaned throughout its extent. The bristles 37 and 38 are preferably constructed of some suitable resilient material so that the same may be spread apart when engaged by the rim 39 of sprocket wheels 21 and
 70 25. When the chain reaches these sprockets, the said bristles are engaged by the rim 39 and spread apart to receive the same, thereby permitting the brush to travel about the sprockets without interference. As the brush passes away
 75 from the sprockets, the bristles 37 and 38 spring together again and the bristles are again in position to completely engage the entire inner surface of the elevator legs.

In the use of the invention it is merely necessary to substitute my improved brush for one
 80 of the elevator buckets. The elevator is then run in the ordinary manner, the brush traveling with the chain and successively passing through the two legs of the elevator proper. During its
 85 travel, the bristles of the brush engage all of the walls of the legs of the elevator and completely remove any loose material which may have been deposited against the inner surfaces thereof. After the brush has once been applied, the elevator legs need no further attention and the in-
 90 vention continues to function until the bristles of the brush are worn out.

My invention is highly advantageous in that
 95 it provides a device whereby the cleaning of the elevator legs is effectively and automatically performed. With my invention, the elevator legs are cleaned along the entire inner surfaces thereof so that no places are left within the elevator legs
 100 in which flour may accumulate. By constructing the brush body with rounded or cut away portions at the intersections of the edges of the same, bristles may be employed which engage into the corners of the elevator legs and com-
 105 pletely clean the same. By the arrangement of the bristles adjacent the chain, the bristles extend back of the chain and completely cover the surface of the rear of the elevator leg. The bristles, being of resilient material, readily yield and
 110 spread apart as the portion of the chain carrying the brush passes about the sprocket thereby automatically adjusting themselves to compensate for the sprocket as the elevator is operated. The invention is extremely simple and can be
 115 constructed at a nominal cost and may readily be applied to or removed from the elevator as the occasion demands.

Changes in the specific form of my invention as herein disclosed may be made within the
 120 scope of what is claimed, without departing from the spirit of my invention.

Having described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A cleaning device for cleaning the interior
 125 of an elevator leg, rectangular in form and having a chain passing therethrough in spaced relation to the inner surface thereof, said device comprising a rectangular brush body having four edges substantially conforming in lateral
 130 configuration to the shape of said leg and of smaller lateral dimensions than said leg, means for attaching said brush body to the elevator chain to maintain the inner part of the chain unobstructed throughout its extent and bristles
 135 issuing outwardly from the four edges of said brush body and engaging the front, back and sides of said leg, for cleaning the same, the bristles at the back of the leg and adjacent the chain straddling the same.

2. A cleaning device for cleaning the interior
 140 of an elevator leg having a chain passing therethrough and in spaced relation to the inner surface thereof, said device comprising a brush including a body formed with a surface extending substantially in the same direction as the inner
 145 surface of the leg and spaced therefrom, means for attaching said brush body to the chain to maintain the inner part of the chain unobstructed throughout its extent and bristles issuing out-
 150 wardly from said surface of the brush body and engaging the inner surface of said leg, said bristles straddling the chain and extending toward one another in back of the chain to make

substantially continuous contact with the inner surface of the leg in back of the chain.

3. A cleaning device for cleaning the interior of an elevator leg, having a chain passing there-through in spaced relation to the inner surface thereof, and carried by sprockets, said device comprising a brush, including a body formed with a surface extending substantially in the same direction as the inner surface of the leg and spaced therefrom, means for attaching said brush body to the chain to maintain the inner part of the chain unobstructed throughout its extent, and bristles issuing outwardly from said surface of the brush body and engaging the inner surface of said leg, said bristles straddling the chain and extending toward one another in back of the chain to make substantially continuous contact with the inner surface of the leg in back of the chain, said bristles being laterally movable in the locality of the chain to form a space therebetween for the reception of the sprockets, in the passage of the portion of the chain having the brush attached thereto about said sprockets.

4. A cleaning device for cleaning the interior of an elevator leg, having a chain passing there-through in spaced relation to the inner surface thereof, and carried by sprockets, said device comprising a brush, including a body formed with a surface extending substantially in the same direction as the inner surface of the leg and spaced therefrom, means for attaching said brush body to the chain, and bristles issuing outwardly from said surface of the brush body and engaging the inner surface of said leg, said bristles straddling the chain and extending toward one another in back of the chain to make substantially continuous contact with the inner surface of the leg in back of the chain, said bristles being laterally movable in the locality of the chain and engageable by the sprockets to form a space therebetween for the reception of the sprockets in the passage of the portion of the chain having the brush attached thereto about said sprockets.

5. A cleaning device for cleaning the interior of an elevator leg rectangular in form and having a chain passing therethrough in spaced relation to the inner surfaces thereof, said device comprising a rectangular brush body having back, front and lateral edges substantially conforming in lateral configuration to the shape of the leg and of smaller lateral dimensions than said leg, means for attaching said brush body to the elevator chain, bristles extending outwardly from the four edges of said brush body and disposed at right angles thereto and engag-

ing the front, back and sides of the leg for cleaning the same, and bristles extending from the brush body adjacent the chain, said bristles being set in converging relation to the back edge of the brush to cause the said bristles to meet in back of the chain.

6. In combination with an elevator comprising a head sprocket, a boot sprocket, a chain passing over said sprockets and having two runs, spaced cups thereon, said elevator further comprising a separate elevator leg for each run of said chain, said legs being rectangular in form, a cleaning device disposed between two of said cups comprising a rectangular brush body having four edges substantially conforming in lateral configuration to the shape of said legs and of smaller lateral dimensions than said legs, means for attaching said brush body to the chain at the locality of one of the edges thereof to leave the chain unobstructed at the rear thereof and bristles issuing outwardly from the four edges of said brush body and engaging the front, back and sides of said legs for cleaning the same, the bristles at the back of the brush adjacent the chain straddling the chain.

7. In combination with an elevator comprising a head sprocket, a boot sprocket, a chain passing over said sprockets and having two runs, spaced cups thereon, said elevator further comprising a separate elevator leg for each run of said chain, each having an inner surface back of the run of the chain passing therethrough, a cleaning device disposed between two of said cups comprising a brush body formed with an edge adapted to extend in spaced parallel relation to said surfaces of the legs and bristles extending outwardly from said edge of the brush and engaging said surfaces of the legs, said bristles adjacent the chain straddling the chain and extending toward one another in back of the chain to make substantially continuous contact with the inner surfaces of the legs.

8. A cleaning device for cleaning the interior of an elevator leg, having a chain passing there-through in spaced relation to the inner surface thereof, and carried by sprockets, said device comprising a brush, including a body, means for attaching the brush body to the chain so as to leave the inner part of the chain unobstructed throughout its extent and separable means attached to the brush body for engagement with the inner surface of the elevator leg, said means normally extending in back of the chain and being adapted to become separated upon the brush reaching the sprocket to clear the sprocket in the passage of the brush around the sprocket.

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