March 26, 1957 F. NEUMEISTER 2,786,591

BUCKET CLEANING ATTACHMENT

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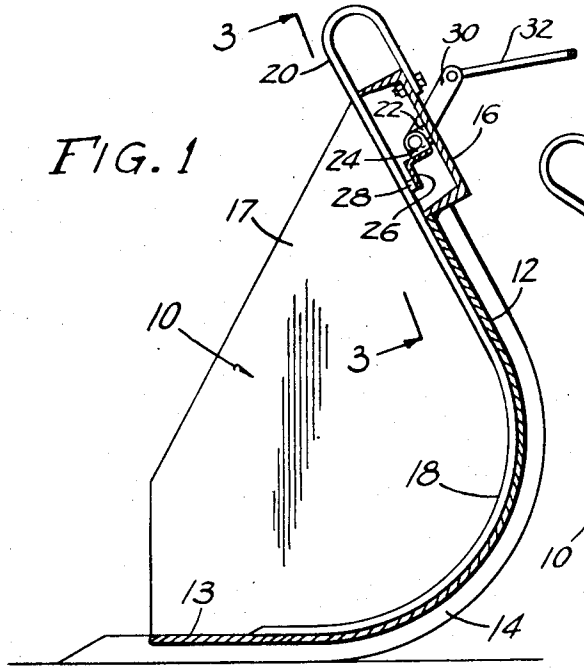



FIG. 1

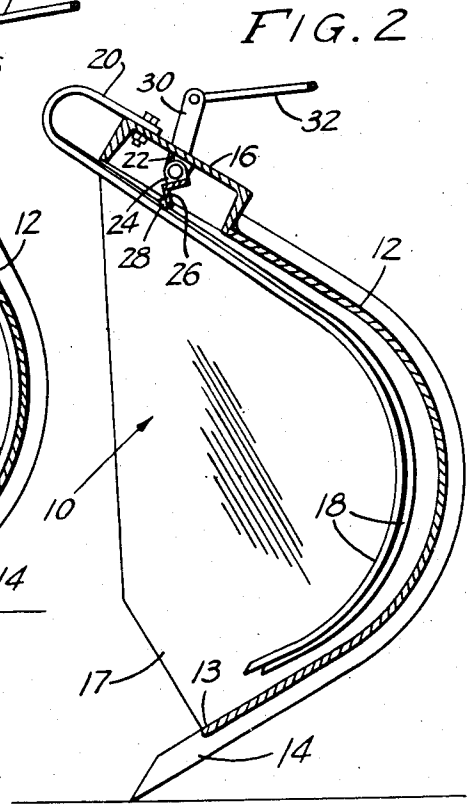



FIG. 2

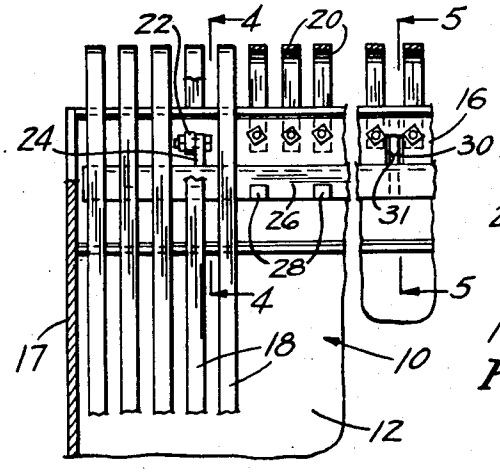



FIG. 3

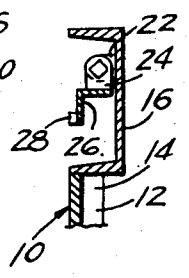



FIG. 4

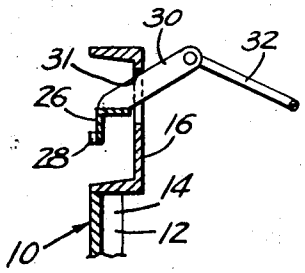



FIG. 5

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FIG. 6.

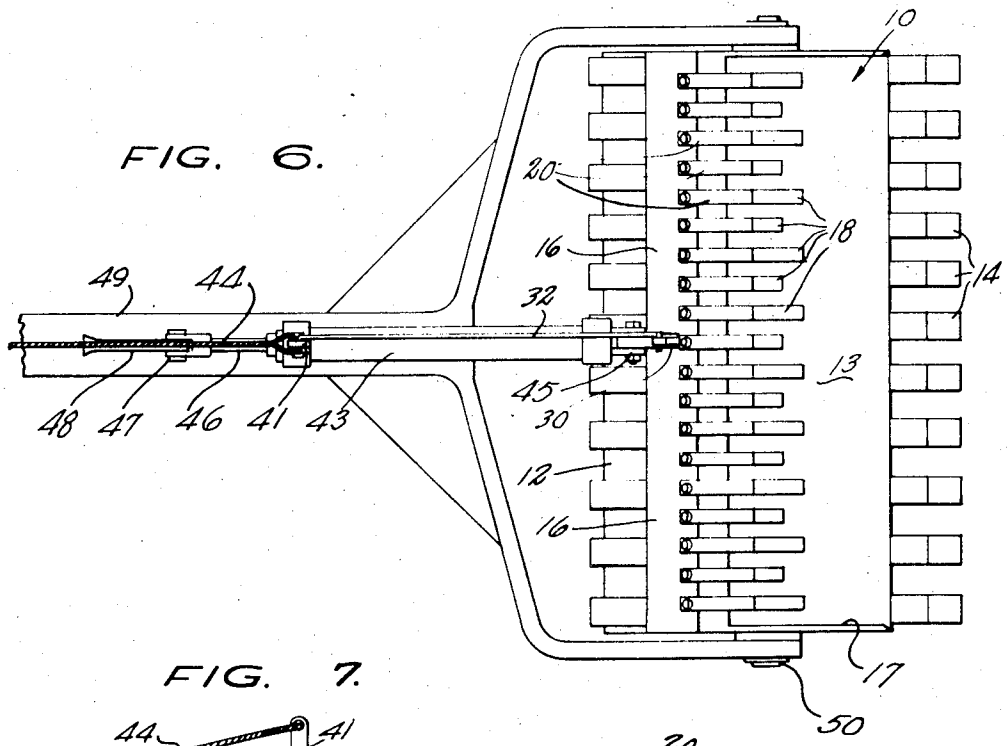
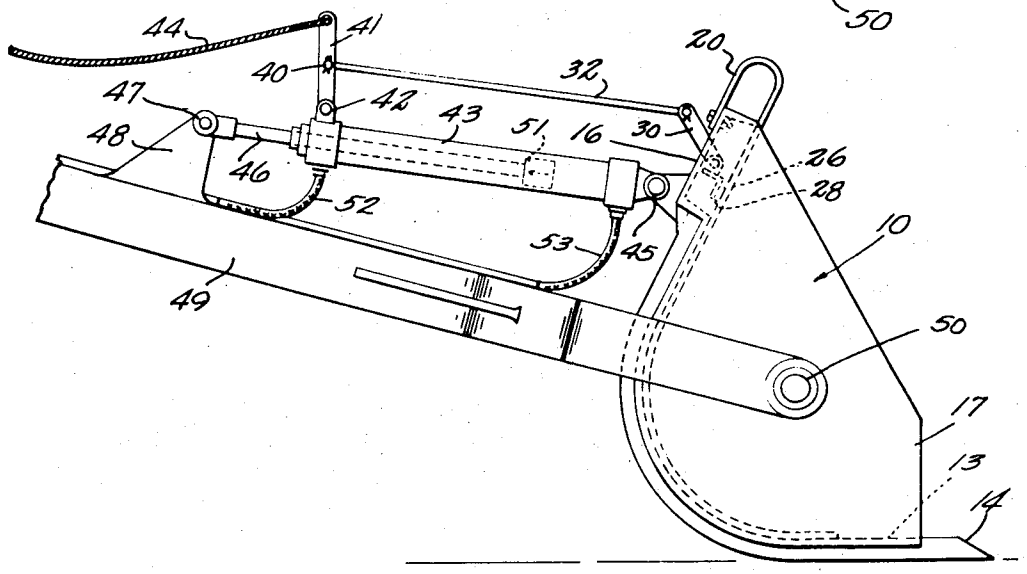



FIG. 7.




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# BUCKET CLEANING ATTACHMENT

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Application December 16, 1955, Serial No. 553,513

3 Claims. (Cl. 214—510)

This invention relates to a device mountable in the bucket of a power shovel or similar device, and more particularly has reference to a bucket attachment the function of which is to clean the bucket of encrustations of mud, dirt, etc.

A bucket loader, when used in the excavation or moving of clay or other wet, sticky types of material, tends to become clogged or encrusted with said material. As a result, the capacity of the bucket is seriously reduced, thus correspondingly reducing the general efficiency of the apparatus.

While it is not broadly new to provide cleaning devices for a bucket of the character described, in many instances said devices tend to be excessively complicated, as a result of which not only are the cleaning devices too expensive to make the same commercially feasible, but also, inefficient operation of the cleaning devices may result.

Further, in the prior art devices of which I have knowledge, the cleaning means has often required modification and re-design of the bucket, or of the mechanism on which the bucket is supported. Still further, cleaning devices of this type may themselves occupy excessive space within the bucket, which space should be left clear to move the material that is being handled by the shovel or loader.

The broad purpose of the present invention, in view of the above, is to provide a bucket cleaning attachment that will have none of the deficiencies noted above. Other objects, also of considerable importance, are as follows:

First, to permit the invention to be readily adapted for mounting in any of various sizes and shapes of buckets;

Second, to effect automatic operation of the cleaning means responsive to each tilting movement of the bucket, thus to effect cleaning of the bucket prior to each movement thereof into the material being handled;

Third, to so form the device that at different stages during the tiltable movement of the bucket alternate series of cleaning teeth will be actuated, to improve the cleanin action; and

Fourth, to provide a bucket cleaning device as stated that will not affect full visibility of the material being handled, or the conventional movement of the bucket into and out of said material.

Other objects will appear from the following description, the claims appended thereto, and from the annexed drawing, in which like reference characters designate like parts throughout the several views, and wherein:

Figure 1 is a vertical sectional view through a bucket equipped with a cleaning device formed according to the present invention;

Figure 2 is a view similar to Figure 1 in which the bucket has been tilted to shift the cleaning teeth outwardly;



Figure 3 is a fragmentary sectional view on line 3—3 of Figure 1;

Figure 4 is a detail, vertical sectional view on line 4—4 of Figure 3;

Figure 5 is a detail sectional view on line 5—5 of Figure 3;

Figure 6 is a plan view of the assembly of the tiltable bucket with the cleaning attachment of the present invention associated therewith; and

Figure 7 is a longitudinal elevational view of the assembly of Figure 6.

Referring to the drawings in detail, the reference numeral **10** generally designates a conventional bucket on an earth moving machine. The bucket includes a back wall **12** merging along a curved path at its lower end into a bottom wall **13**. Reinforcing the back and bottom walls are elongated, curved ribs **14**, the forward ends of which project beyond the front end edge of bottom wall **13** and are pointed to effect efficient penetration of the material being handled.

On the upper end of the bucket, there is mounted a forwardly opening, transversely extending channel member **16**, extending between and fixedly secured at its opposite ends to the side walls **17** of the bucket. A plurality of spring teeth **18** is secured to the channel member, said teeth being designated by the reference numeral **18** and being formed at their upper end portions of inverted U shape designate at **20**, said portions being bolted or otherwise fixedly secured to the channel member.

Projecting forwardly from the web of the channel member intermediate the top and bottom walls of said member are ears or brackets **22**, and pivotally attached to said brackets are upwardly projecting ears **24** carried by an elongated angle member **26** extending longitudinally of the channel member, substantially from one to the other of the side walls **17** of the bucket. The angle member **26**, at uniformly spaced locations along the length thereof, has cleats **28** fixedly secured thereto. The cleats provide cam projections on the angle member, said projections swinging in an arcuate path with member **26** about the axis of the pivotal connection of said member to support brackets **22** of channel member **16**.

The cleats are so spaced longitudinally of member **26** as to engage in back of alternate teeth **18**, so that on swinging of member **26** from its Figure 1 to its Figure 2 position, the teeth engaged by the cam projections will be shifted outwardly from the back and bottom walls of the bucket a distance greater than those teeth **18** extending in the spaces between projections **28**. This is shown to particular advantage in Figure 2, and the construction and operational characteristics have the desirable result of breaking up formations of clay or other sticky material adhering to the walls of the bucket, more efficiently than would be true if all the teeth **18** were shifted forwardly equal distances from the bucket wall.

To effect rocking movement of angle member **26** relative to the channel member **16** of the bucket, an arm **30** is welded or otherwise fixedly secured to the angle member **26** medially between the ends thereof, said arm extending through a slot **31** formed in the web of channel member **16**. At its rear or outer end arm **30** is pivotally connected to one end of a trip rod **32**, the other end of the rod **32** being pivotally connected as at **40** to an upstanding lever **41**. The lever **41** has the lower end pivotally connected as at **42** to a hydraulic cylinder **43**, the upper end of the lever **41** having one end of a trip rope **44** attached thereto, and having the other end secured to a rigid part of the material handling machine, not shown. So, a pull on the rope **44** will exert a pull on the arm **30** through the medium of the rod **32** each time the bucket is tilted as in Figure 2 preliminary to move-

ment of the same into the material being handled. It is to be noted that the cylinder **43** is pivotally connected to the back of the channel member **16** as at **45**, and projecting out of the end of the cylinder adjacent the connection **42** is a portion of a piston rod **46** which is pivotally connected as at **47** to an ear **48** carried by a boom **49**. The boom **49** is pivotally connected as at **50** to the side wall **17** of the bucket **10**. The piston rod **46** is attached to a piston **51** movable back and forth within the cylinder **43**. The cylinder **43** is provided with the flexible hoses **52** and **53** adjacent the ends thereof for actuating the piston **51**. Actuation of the piston **51** so as to move same away from the bucket **10** causes the tilting of the bucket about its pivot **50** to a dumping position or the position as shown in Figure 2, and actuation of the piston **51** so as to move same toward the bucket **10** causes the tilting of the bucket about its pivot **50** to the position in which the cleaning teeth are shifted inwardly or the position of Figure 1.

By reason of the construction illustrated and described, ordinarily the spring teeth will be disposed in full contact over their entire lengths with the back and bottom walls of the bucket, and accordingly will not interfere in any way with the handling of the material put into the bucket, said teeth occupying only a very small amount of space within the bucket so as to decrease the capacity of the bucket only to a minute and inconsequential extent.

Each time the bucket is tilted to release the load, angle member **26** will swing forwardly and will initially move outwardly those teeth **18** engaged by projections **28**. Then, as the member **26** moves forwardly to a further extent, the remaining teeth **18** will be engaged and shifted outwardly from the bucket wall, to effect breaking up of the crust of material so that said material may be loosened and will fall out of the bucket.

It is believed clear that the invention is not necessarily confined to the specific use or uses thereof described above, since it may be utilized for any purpose to which it may be suited. Nor is the invention to be necessarily limited to the specific construction illustrated and described, since such construction is only intended to be illustrative of the principles of operation and the means presently devised to carry out said principles, it being considered that the invention comprehends any minor changes in construction that may be permitted within the scope of the appended claims.

What is claimed is:

1. The combination, with a tiltable bucket of a materials-handling machine, of a plurality of closely spaced spring teeth anchored at one end to the bucket and extending for at least a substantial part of their lengths in contact with a wall of the bucket; an elongated member pivotally connected to the bucket and extending in back of said teeth; projections spaced longitudinally of said member and disposed rearwardly of some of said teeth, whereby on swinging movement of the member in the direction of the teeth said projection will engage the teeth in front of the same to bias the same outwardly from said wall of the bucket and, on further movement of the member in said direction, the remaining teeth will be engaged by the member for movement outwardly from the bucket following movement of the projection-engaged teeth; and means connected to the member for swinging the same in said direction responsive to tilting of the bucket in one direction.



2. The combination, with a tiltable bucket of a materials-handling machine, of a device for cleaning the bucket responsive to tilting of the same, comprising: a plurality of like spring teeth anchored at one end to the bucket and extending in contact for the major portion of their lengths with one wall of the bucket, said teeth being disposed in closely spaced parallel relation over the full width of the bucket; an elongated member extending in back of all of said teeth and connected to the bucket for swinging movement about an axis extending transversely of the teeth; a series of projections carried by said member, said projections being disposed in back of some of said teeth, the remaining teeth alternating with those in front of the projections whereby on swinging movement of said member in one direction about said pivot axis, said projection will engage the teeth in front of the same to bias the same outwardly of the bucket, the remaining teeth being engaged by said member following outward movement of the projection-engaged teeth and movement of said remaining teeth outwardly of the bucket following outward movement of the first named teeth; and means connected to said member for swinging the same in said direction responsive to tilting of the bucket.

3. The combination, with a tiltable bucket of a materials-handling machine, of a device for cleaning the bucket responsive to tilting of the same, comprising: a plurality of like spring teeth anchored at one end to the bucket and extending in contact for the major portion of their lengths with one wall of the bucket, said teeth being disposed in closely spaced parallel relation over the full width of the bucket; an elongated member extending in back of all of said teeth and connected to the bucket for swinging movement about an axis extending transversely of the teeth; a series of projections carried by said member, said projections being disposed in back of some of said teeth, the remaining teeth alternating with those in front of the projections whereby on swinging movement of said member in one direction about said pivot axis, said projections will engage the teeth in front of the same to bias the same outwardly of the bucket, the remaining teeth being engaged by said member following outward movement of the projection-engaged teeth and movement of said remaining teeth outwardly of the bucket following outward movement of the first named teeth; and means connected to said member for swinging the same in said direction responsive to tilting of the bucket, comprising an arm rigid with said member and extending radially of the pivot axis thereof, and a trip rod pivotally connected at one end to said arm and extending rearwardly from the bucket for connection to said machine, thus to swing said member responsive to tilting of the bucket.

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