

June 18, 1946.

V. L. SCHIELD

2,402,299

SHOVEL

Filed Aug. 24, 1944

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Fig. 1

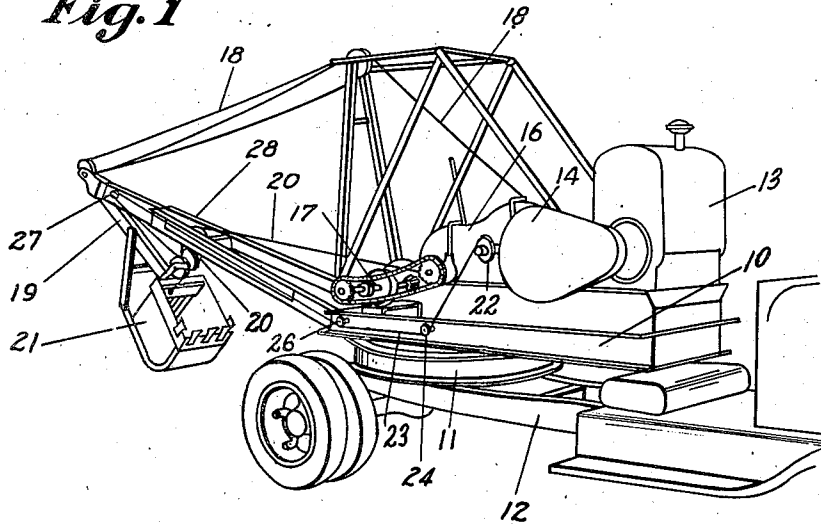
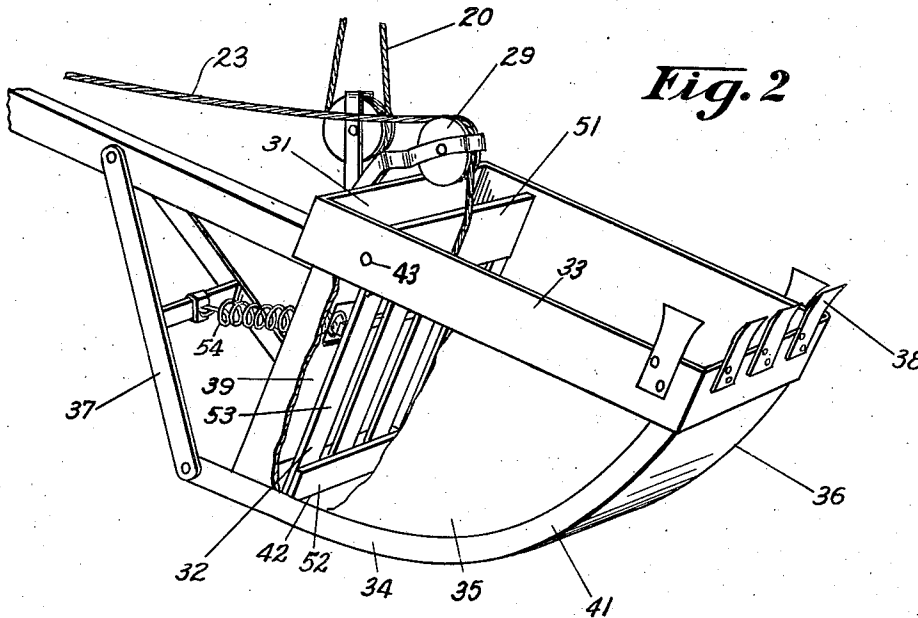


Fig. 2



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Fig. 3

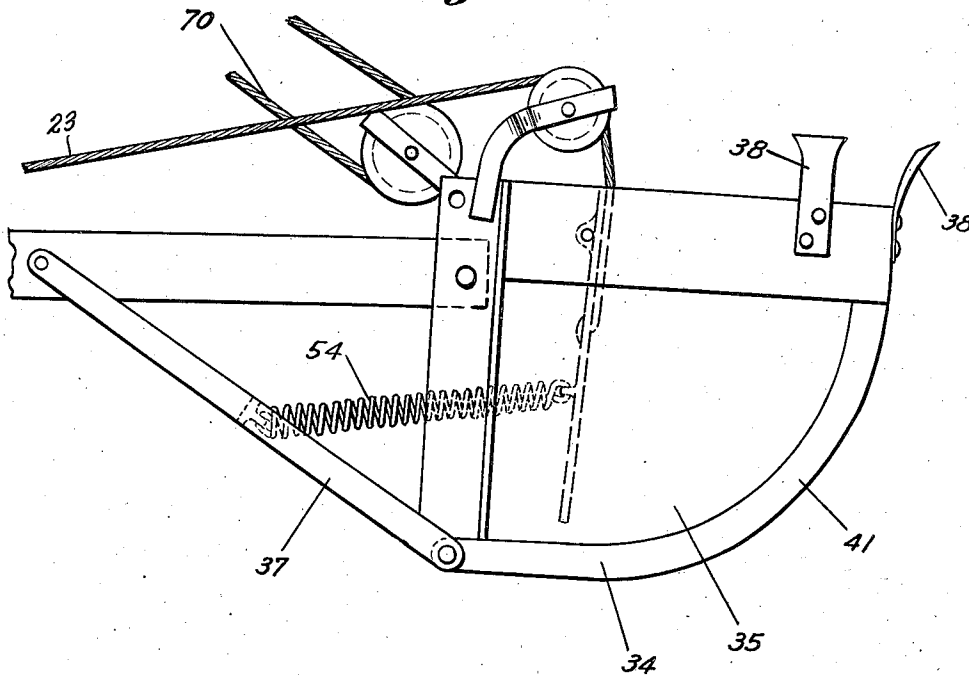
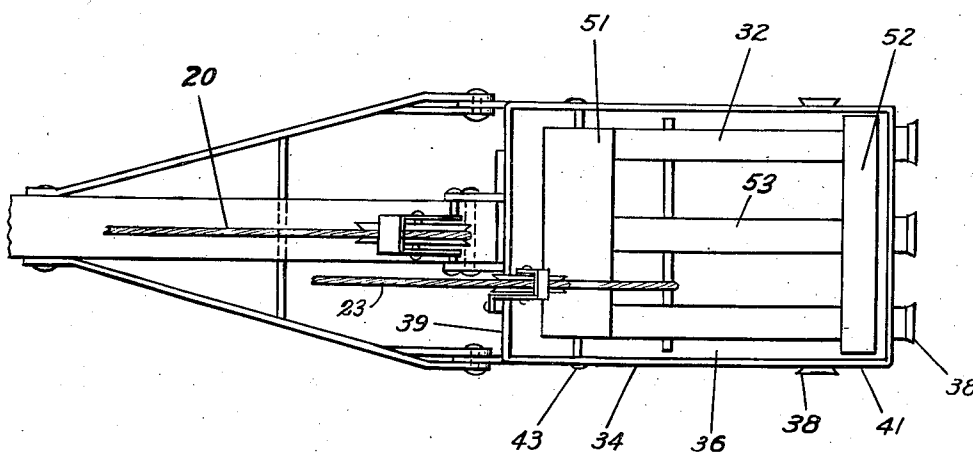


Fig. 4



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Application August 24, 1944, Serial No. 550,938

6 Claims. (Cl. 214-146)

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This invention relates to earth moving and excavating means and has particular relation to a shovel particularly suitable for ditch digging and the like.

In digging ditches and other narrow excavations, it is most economical and most common practice to utilize a shovel of relatively narrow dimensions so that only a minimum of material is removed. These shovels have the disadvantage, however, that if digging is carried on in mud and clay, the shovels clog and it is extremely difficult to dislodge the mud and clay from the shovel after it has been loaded.

A primary object of my invention is to provide means for mechanically ejecting wet and sticky materials from an excavating shovel, and particularly from the narrow shovels used in ditching and tiling.

Another object of my invention is to provide a new and improved ejecting means for such shovels.

Still another object of my invention is to provide new and improved means for power actuation of shovels of the above character.

Other and further features and objects of the invention will be more apparent to those skilled in the art upon a consideration of the accompanying drawings and following specifications, wherein is disclosed a single exemplary embodiment of the invention, with the understanding, however, that such changes may be made therein as fall within the scope of the appended claims, without departing from the spirit of the invention.

In said drawings:

Figure 1 is a view in perspective illustrating an excavating machine and including a shovel constructed according to one embodiment of my invention. A portion of the truck on which the excavator is mounted has been broken away to illustrate the main parts in greater detail.

Figure 2 is a view in perspective illustrating a shovel constructed according to one embodiment of my invention as it appears with the ejecting means in the retracted position. A portion of the side wall of the shovel has been broken away to illustrate the ejecting means.

Figure 3 is a side elevational view of the shovel illustrated in Figures 1 and 2, and

Figure 4 is a plan view of the shovel illustrated in Figures 1, 2 and 3.

Referring then to the drawings:

A shovel constructed according to my invention can of course be mounted on any of the conventional forms of excavating machines, but in this embodiment of the invention I have illustrated

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the shovel mounted on an excavating machine constructed in accordance with my co-pending application Serial Number 523,998, filed February 26, 1944.

In this device the rotating portion or turntable 10 is mounted upon rollers which roll upon a stationary ring or bull ring 11 which is in turn mounted on the truck chassis 12. The turntable includes a power unit 13, a transmission 14 and suitable sheaves or drums which are mounted in a frame 16. The turntable is rotated by means of the cross swing shaft 17 driven from a sprocket on the frame 16.

The frame 16 is provided with a suitable sheave for drawing in and paying out a cable 18 which raises and lowers the A frame 28. Another cable 20 swings the dipper stick 19 and the shovel 21. The hoist mechanism at 16 is provided with a power driven sprocket 22 which may be engaged or disengaged to draw in or pay out the ejector cable 23. This cable passes along over pulleys 24 and 26 on the side of the swinging frame and up over a sheave 27 on the end of the A frame 28. The cable then passes down over a sheave 29 mounted on the stationary rear wall 31 of the shovel and from thence down to the intermediate portion of ejector plate 32.

The shovel is constructed of a rectangular main frame 33 and curved members at 34 and 36 which form the main frame members for the lower wall and end of the shovel. The shovel is braced by means of the A frame members 37.

The shovel is provided with shovel teeth 38 in the usual fashion. The rectangular frame 33 and the corner members 34 and 36 have side plates illustrated at 35, and a rear wall at 39 so as to enclose five sides of the shovel. It is to be noted that the lower end wall of the shovel is curved, as illustrated more particularly at 41, and the radius of curvature is substantially the same as the distance from the lower end 42 of the ejector plate to the pivot 43 on which the ejector plate swings.

In operation, after the shovel has been loaded in the digging operation, the shovel may be swung to a position such that the open front of the shovel is down and if the material does not fall from the shovel, the cable 23 is reeved in, causing the ejector plate to swing downwardly and outwardly within the shovel to eject the material from the shovel.

The ejector plate 32 may be constructed in any suitable manner, but I preferably employ an open-work frame including a heavy end member 51 which engages the pivot shaft 43 and a some-

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what lighter outer end member 52. These are connected by means of slats 53 at their rear walls and thus if any material drops in behind the ejector it will fall through the openings between the slats. The ejector plate is returned to retracted position by the spring 54.

In operation, if sticky material is encountered, it is only necessary to actuate the clutch controlling the sprocket 22 to reeve in the draw cable 23 and cause the ejector plate to swing within the bucket to eject material from the buckets.

Although I have described a specific embodiment of my invention, it is apparent that modifications thereof may be made by those skilled in the art. Such modifications may be made without departing from the spirit and scope of my invention as set forth in the appended claims.

I claim as my invention:

1. In a device of the class described, a dipper comprising a dipper stick, a rectangular frame fixed at its upper end to the lower end of the dipper stick and comprising a pair of side members and upper and lower end members, a pair of rear curved frame members connected at their lower ends to the lower end member of said rectangular frame, a curved bottom wall carried by said rear curved frame members, a pair of side plates connecting said curved members with said side members, a gate pivotally connected with the upper portions of said side members and having a lower edge swingable along said curved bottom wall toward the lower end member of said rectangular frame, a bracket fixed to the central part of said upper end member and overhanging the pivoted portion of said gate, a sheave mounted on the outer end of said bracket, and a cable connected at one end to said gate, and trained upwardly over said sheave.

2. In a device of the class described, a dipper comprising a dipper stick, a rectangular frame fixed at its upper end to the lower end of the dipper stick and comprising a pair of side members and upper and lower end members, a pair of rear curved frame members connected at their lower ends to the lower end member of said rectangular frame, a curved bottom wall carried by said rear curved frame members, a pair of side plates connecting said curved members with said side members, a gate pivotally connected with the upper portions of said side members and having a lower edge swingable along said curved bottom wall toward the lower end member of said rectangular frame, means serving as an A-frame connecting the upper ends of said curved frame members with said dipper stick above said rectangular frame, a gate retractor spring connected between the A-frame means and said gate, and means for swinging said gate outwardly.

3. In a device of the class described, a dipper comprising a dipper stick, a rectangular frame fixed at its upper end to the lower end of the dipper stick and having a pair of side members and upper and lower end members, a pair of rear

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curved frame members connected at their lower ends to the lower end member of said rectangular frame, a curved bottom wall carried by said rear curved members, a pair of side plates connecting said curved members with said side members, a rear wall extending between the ends of said curved frame members and the upper part of said rectangular frame, said rear wall having an opening therethrough, a gate pivotally connected with the upper portions of said side members and disposed in front of said rear wall, bracing means connecting the upper ends of said curved frame members to said dipper stick above the rectangular frame, a gate retractor spring connected between said bracing means and said gate, and means for swinging said gate outwardly.

4. A shovel comprising a rectangular frame carrying side walls, a rear curved wall and a back wall, an ejector plate pivoted at one end to said frame, an operating cable connected at one end directly to the forward side of said ejector plate, said back wall having an opening therethrough, and a gate retractor spring connected to the rear side of said ejector plate and extending outwardly through said opening.

5. A shovel as defined in claim 4, further characterized by a bracket carried by said frame and extending over said pivoted end of the ejector plate, and a sheave carried by said bracket adjacent the pivoted end of said ejector plate and receiving said operating cable.

6. In an excavating device, a dipper comprising a dipper stick, a rectangular frame fixed at its upper end to the lower end of the dipper stick and having a pair of side members and upper and lower end members, a pair of rear curved frame members connected at their lower ends to the lower end member of said rectangular frame, a curved bottom wall carried by said rear curved members, a pair of side plates connecting said curved members with said side members, a rear wall extending between the ends of said curved frame members and the upper part of said rectangular frame, said rear wall having an opening therethrough, an ejector plate pivotally connected with the upper portions of said side members and disposed in front of said rear wall, bracing members connecting the upper ends of said curved frame members to said dipper stick at a distance spaced from the rectangular frame, a retractor spring extending through the opening in the rear wall and secured at one end to the said bracing means, and at the other end to the rear side of the ejector plate at a distance spaced from its point of pivotal connection, a sheave, a bracket carried by the rectangular frame and adapted to mount the said sheave in a position overhanging the pivoted end of the ejector plate, and a cable carried by the said sheave and secured to the forward side of the said ejector plate at a distance spaced from the point of pivotal connection.

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