Oct. 10, 1933. A. G. REDMOND 1,929,516

TOY SHOVEL

Filed July 28, 1932 2 Sheets-Sheet 1

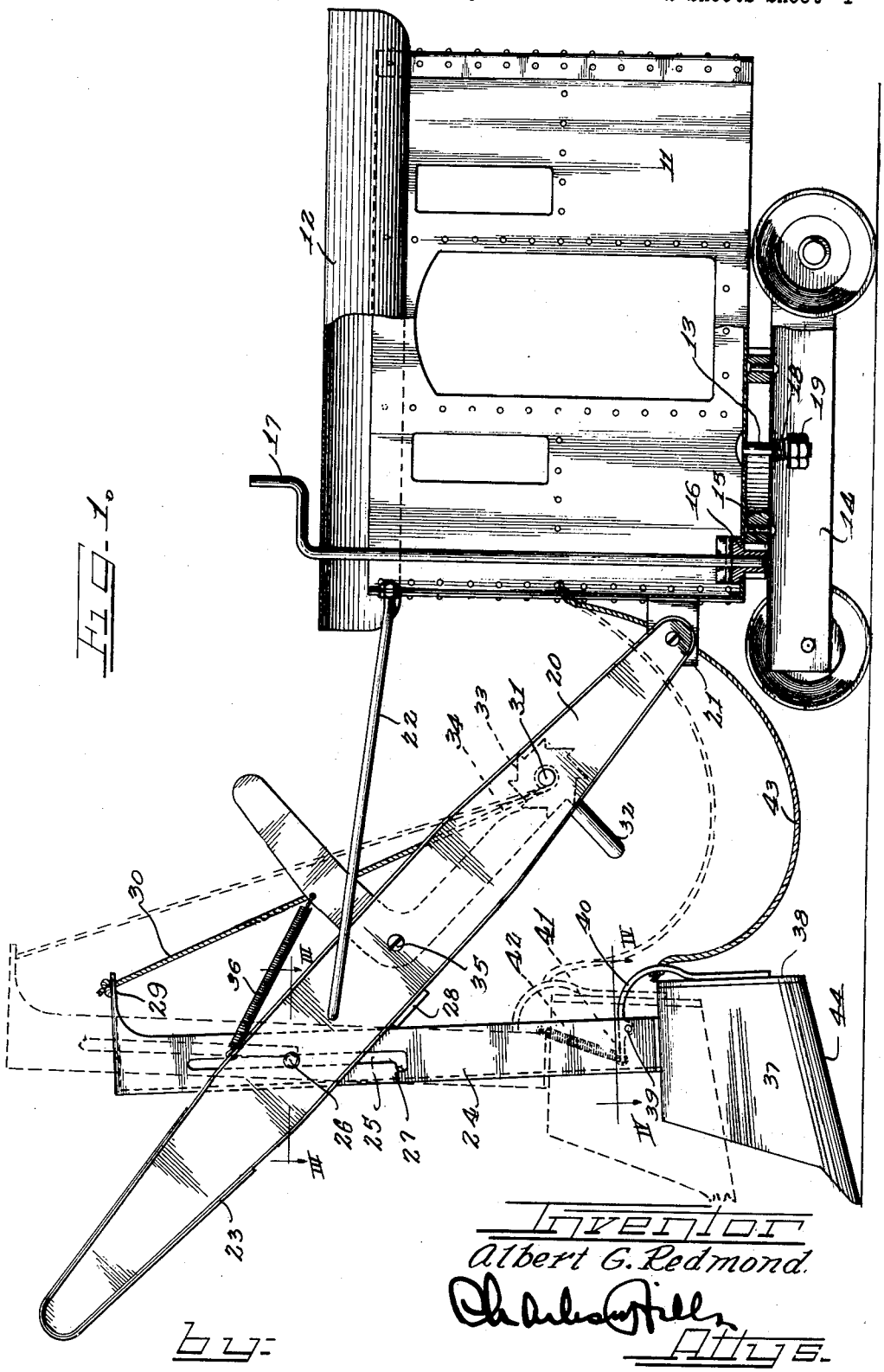



FIG. 1.

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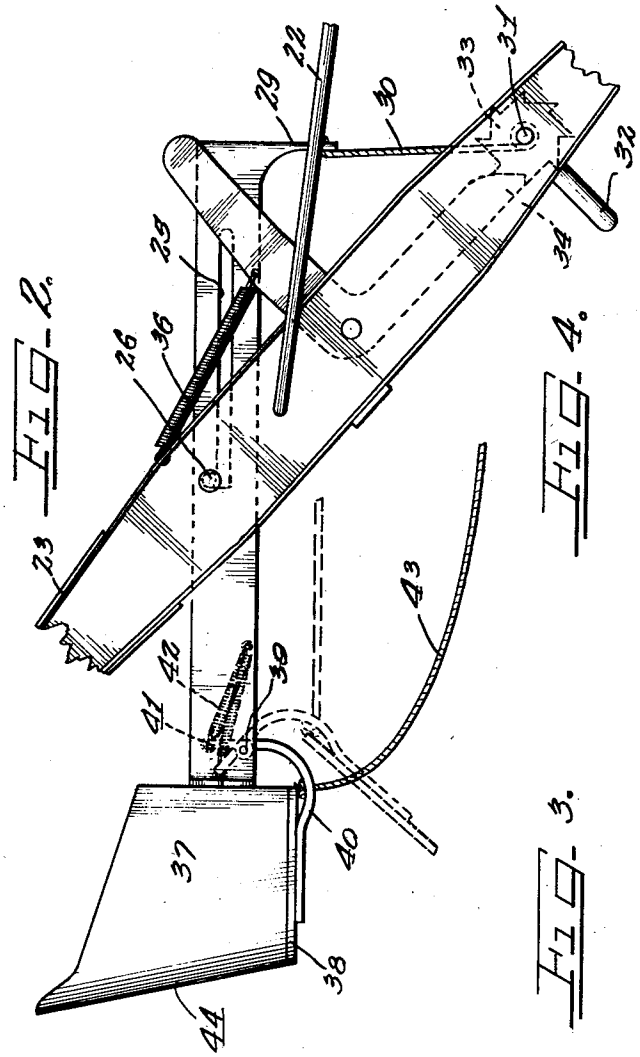



Fig. 2.

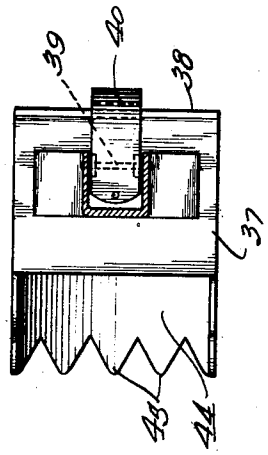



Fig. 4.

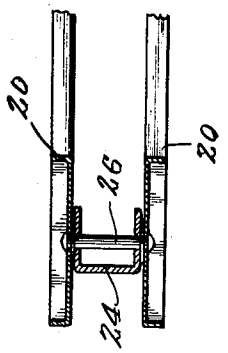



Fig. 3.

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Patented Oct. 10, 1933 1,929,516

# UNITED STATES PATENT OFFICE

1,929,516

## TOY SHOVEL

Albert G. Redmond, Flint, Mich.

Application July 28, 1932. Serial No. 625,261

7 Claims. (Cl. 46—37)

This invention relates to toy shovels simulating the action of steam shovels and has special reference to such a toy steam shovel that can be operated to closely approximate the digging action of commercial excavating shovels.

An object of this invention is to provide an improved toy steam shovel resembling commercial shovels and having a simplified and improved shovel operating mechanism capable of digging below the normal ground level on which the shovel is supported.

Another object of this invention is to provide an improved toy of the class described that can be easily manipulated by a juvenile operator to produce a variety of results over and beyond a mere digging and dumping routine, thus rendering the toy a perennial source of amusement and educational development.

It is also an object of this invention to provide a shovel trap door mechanism not dependent on a gravity operated latch since the use of the toy in damp sand renders such latches unreliable.

It is a further object of this invention to provide an improved and simplified self contained toy of the class described that will be economical to manufacture and easily operated without the liability of derangement of the operating parts.

Other and further important objects of this invention will be apparent from the disclosures in the specification and the accompanying drawings.

This invention (in a preferred form) is illustrated in the drawings and hereinafter more fully described.

On the drawings:

Figure 1 is a side elevation of a toy steam shovel embodying the features of this invention, part of the cab being broken away to show the turntable mechanism.

Figure 2 is a fragmentary view of the boom with the shovel and its arm shown in the elevated or dumping position.

Figure 3 is a section on the line III—III of Figure 1, showing the pivot for the shovel arm.

Figure 4 is a section on the line IV—IV of Figure 1, showing the shovel trap door operating mechanism.

As shown on the drawings:

The embodiment chosen to illustrate my invention includes a cab comprising walls 11 built up of sheet metal with simulated riveted joints and suitable door and window openings and a crowned roof 12, the floor of the cab having a pivot bolt 13 therethrough which engages the cab to a wheeled truck 14 therebeneath, the truck carrying a gear 15 concentric to the bolt, which gear is engaged by a pinion 16 journaled in the cab floor and rotated by a shaft, the crank handle 17 of which projects above the cab roof. This arrangement provides a turntable for the cab, which bears on the top surface of the gear 15 and is yieldingly held thereagainst by a spring 18 between the nuts 19, engaged on the pivot bolt 13, and the bottom of the truck. This arrangement permits the operator to dig at one point and then mechanically swing the cab and shovel mechanism around relative to the truck to dump at some other point, as over a wagon.

The front end of the cab supports a boom 20 pivoted at its lower end to a bracket 21 on the cab, and held in operating position by tie bars 22. The boom is made of two spaced members formed as stampings with peripheral flanges, the outer end of the boom having a tie plate 23 applied over the end thereof as a spacer and stiffener.

A shovel arm 24 of channel section has slots 25 in the sides through which projects a hinge pin 26 on the boom, the arm having a considerable longitudinal movement on the pivot pin. The ends of the slots next the shovel are notched as at 27 to allow the arm to drop slightly when the hinge pin 26 is aligned therewith. With the hinge pin 26 in the notches 27, the arm tends to pivot thereabout until bumped out of the notch by striking a plate 28 provided on the boom.

The upper end of the shovel arm 24 carries an offset extension 29 to which is secured one end of a hoisting rope 30, the other end thereof being wound on a shaft 31 operated by a hand crank 32 and functioning as a hoisting drum. The shaft 31 is journaled in the boom side members and carries a ratchet wheel 33 engageable by a pawl 34 pivoted at 35 to the boom and urged into engagement by the a spring 36.

The shovel proper comprises a scoop 37 applied to the lower end of the shovel arm and having a trap door 38 pivoted to the arm 24 at 39, the door arm 40 having an extension 41 engaged by a spring 42 sufficiently strong to hold the door closed against normal loads when the shovel is in the position of Fig. 2. The trap door is releasable at will by a pull cord 43 extending to a convenient point on the cab. The bottom of the scoop is inclined relative to the ground line when the arm 24 is nearly vertical in order that the scoop may dig into the ground as the hoisting drum pulls down and back on the upper end of the arm 24. The front or cutting edge of the

bottom may conveniently be serrated as at 45 to facilitate taking on a load of sand or earth.

The operation of the shovel can be conveniently described as starting from the postion of Fig. 1 when the shovel arm has dropped, with the pin 26 sliding in the arm slots, until the point of the shovel bottom strikes the ground. Upon operating the crank on the shaft 31, with the arm nearly vertical, the direction of pull of the rope 30 is sufficiently close to being parallel with the arm to force the shovel downwardly, as well as rotate the arm clockwise about the pin so that the shovel tends to dig in below ground level until the swing of the shovel brings the shovel bottom parallel to the ground surface, whereupon the shovel breaks out from the ground and swings up about the pin 26 until the arm reaches a horizontal position. At the same time, the backward pull of the cord tends to slide the arm back on the pin until the notch 27 is reached when the arm drops slightly as the pin enters the notch, as shown in Fig. 2.

Thereafter the shovel and cab can be rotated on the truck by use of the pinion crank handle 17. A pull on the dumping cord 43 then releases the trap door as shown by the dotted lines in Fig. 2.

After rotating the shovel back to the digging location, the shovel arm can be dropped back to the starting point by releasing the pawl lever 34 from the ratchet. The arm then pivots about the pin 26 which remains in the notch 27 until the arm reaches the dotted lines position of Fig. 1 where the arm strikes the stop plate 28 on the boom which bumps the arm ahead, releasing the pin from the notch and allowing the arm to slide down until the shovel strikes the ground. Thus the shovel drops back and down on a shorter arc that allows the shovel to clear the ground on the return movement. The cycle is then repeated with no action on the part of the operator other than the cranking, rotation of cab, release of the shovel bottom, and releasing the pawl lever. Since each of these actions closely simulate the operation of an industrial shovel, the operator has available a wide range of results that prevents the operation of the toy from becoming monotonous.

It will thus be seen that I have invented an improved and simplified toy shovel closely simulating the operation of an industrial shovel and one which can operate below the ground level.

I am aware that many changes may be made and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I, therefore, do not purpose limiting the patent granted hereon otherwise than necessitated by the prior art.

I claim as my invention:

1. In a toy of the class described, a truck, a body pivotally mounted on the truck, a boom fixed to said body to swing therewith, a hinge pin fixed to said boom at a distance from the body and a shovel arm having an elongated slot embracing said hinge pin, the slot having an offset notch on the end adjacent the shovel, said notch forming a pivot for the return swing of the shovel arm.

2. In a toy of the class described, a truck, a body pivotally mounted on the truck, a boom fixed to said body to swing therewith, a hinge pin fixed to said boom at a distance from the body, a shovel arm having an elongated slot embracing said hinge pin, the slot having an offset notch on the end adjacent the shovel, said notch forming a pivot for the return swing of the shovel arm and means for dislodging the pin from said notch to permit radial extension of said shovel arm relative to the hinge pin.

3. In a toy of the class described, a truck, a body pivotally mounted on the truck, a boom fixed to said body to swing therewith, a hinge pin fixed to said boom at a distance from the body, a shovel arm having an elongated slot embracing said hinge pin, the slot having an offset notch on the end adjacent the shovel, said notch forming a pivot for the return swing of the shovel arm and means to rotate said shovel arm about said hinge pin to perform a digging operation.

4. In a toy of the class described, a truck, a body pivotally mounted on the truck, a boom fixed to said body to swing therewith, a hinge pin fixed to said boom at a distance from the body, a shovel arm having an elongated slot embracing said hinge pin, the slot having an offset notch on the end adjacent the shovel, said notch forming a pivot for the return swing of the shovel arm, means for dislodging the pin from said notch to permit radial extension of said shovel arm relative to the hinge pin and means adapted to rotate said shovel arm about said hinge pin to perform a digging operation.

5. A toy shovel of the class described, including a boom formed of a pair of spaced members, a shovel arm pivoted between said members, said arm having an elongated slot therein, a hinge pin passing through said slot and secured to said boom members and hoisting means secured to the boom and pulling on the shovel arm and so positioned relative to the arm as to cause both pivotal and longitudinal movement of the arm relative to the hinge pin and boom.

6. A toy shovel of the class described, including a boom formed of a pair of spaced members, a shovel arm pivoted between said members, a scoop type of shovel attached to one end of the shovel arm, a pivoted trap door closing the rear end of the shovel, spring means acting on the pivot of said door to yieldingly maintain said trap door in the closed position, said arm having an elongated slot therein, a hinge pin passing through said slot and secured to said boom members and hoisting means secured to the boom and pulling on the shovel arm and so positioned relative to the arm as to cause both pivotal and longitudinal movement of the arm relative to the hinge pin and boom.

7. A toy shovel of the class described, including a boom formed of a pair of spaced members, a shovel arm pivoted between said members, means mounting said shovel arm between the boom members for both pivotal and longitudinal movement, and a single operating means for said shovel arm to swing the arm upwardly on an arc of increasing radius and to return said shovel to the starting point on an arc of fixed minimum radius.

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