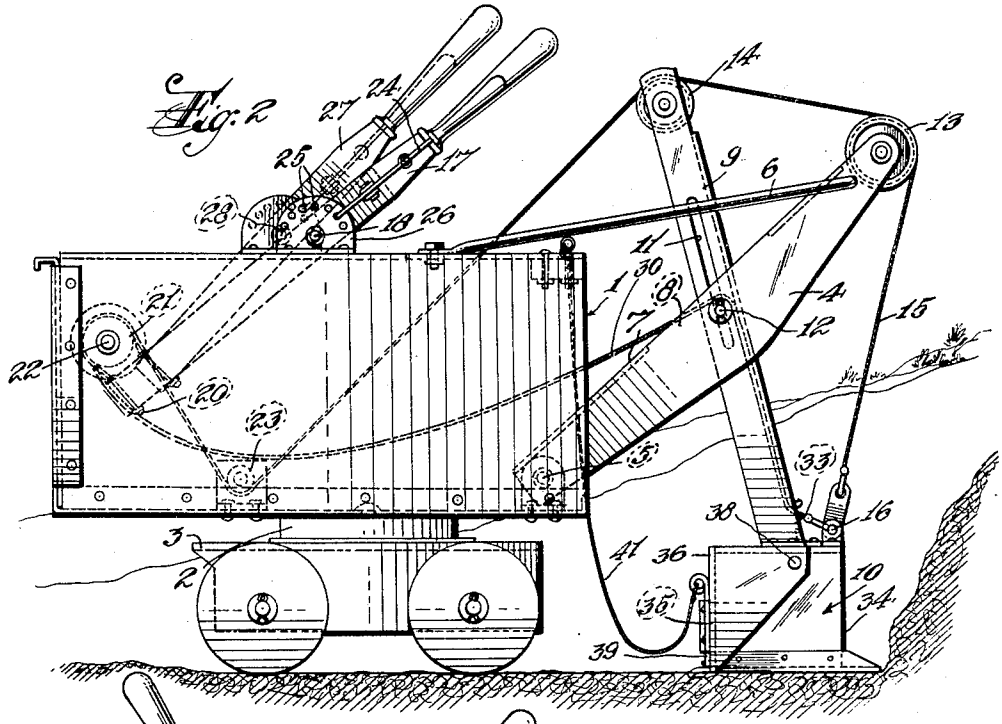
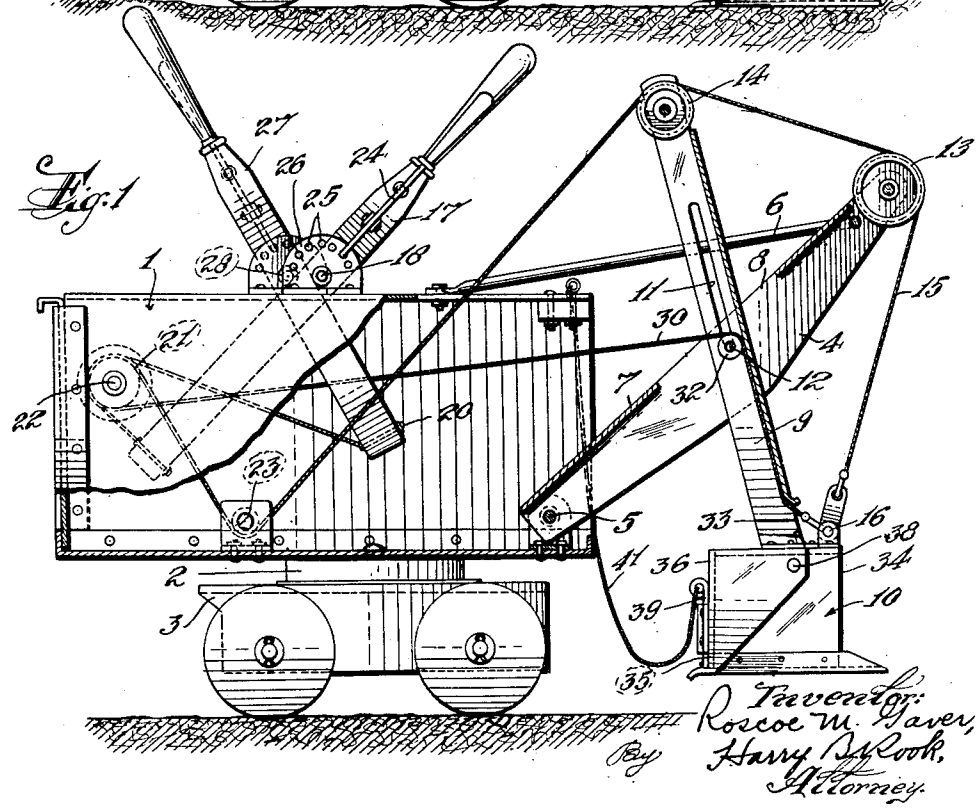
Dec. 12, 1933. R. M. GAVER 1,939,442

TOY POWER SHOVEL

Filed Sept. 16, 1932 3 Sheets-Sheet 1





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TOY POWER SHOVEL

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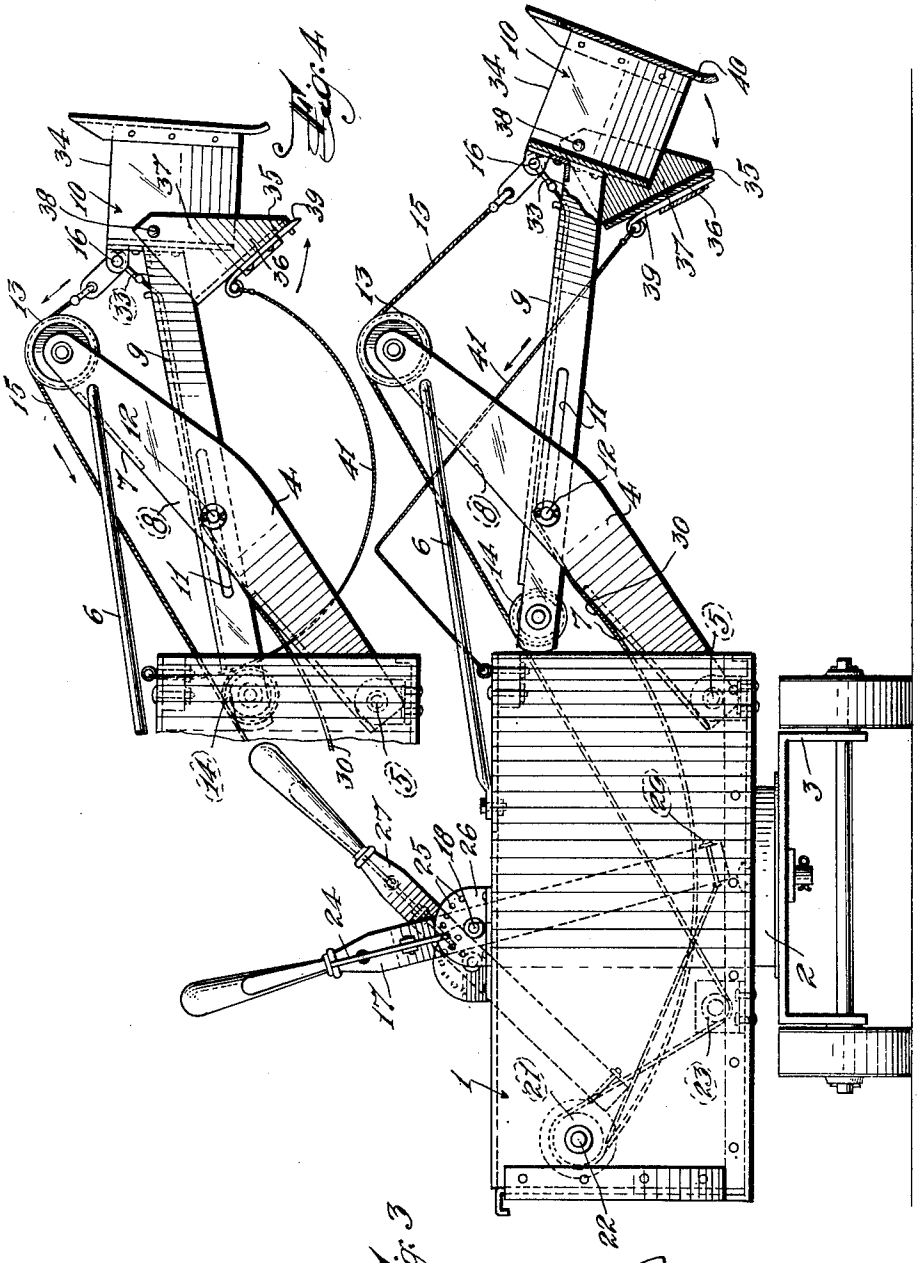


Fig. 3

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TOY POWER SHOVEL

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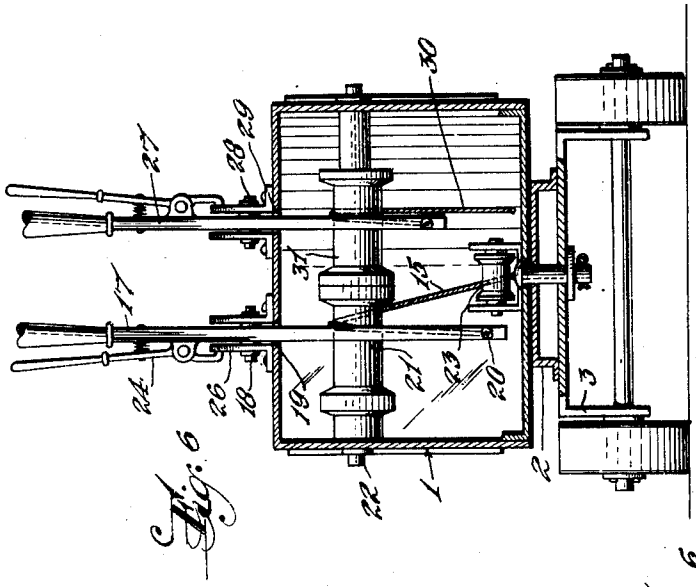


Fig. 6

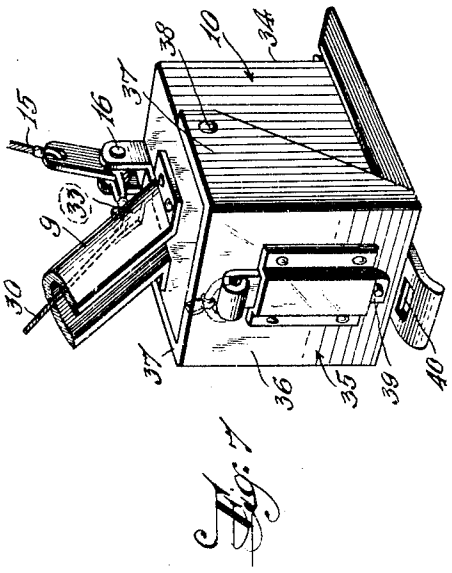


Fig. 4

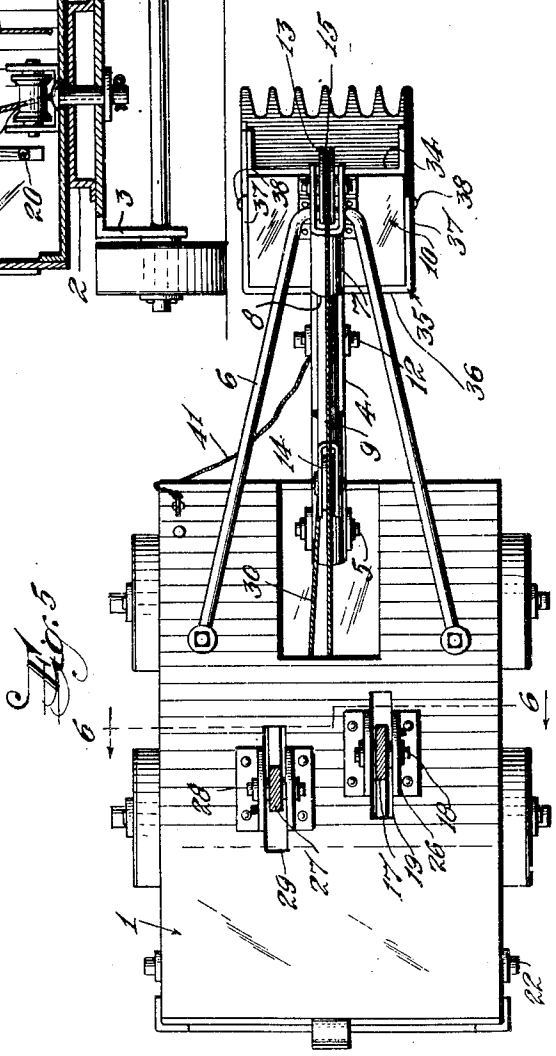


Fig. 5

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UNITED STATES PATENT OFFICE

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TOY POWER SHOVEL

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Application September 16, 1932
Serial No. 633,403

10 Claims. (Cl. 46—37)

This invention relates to a mechanical toy in the form of a simulation of a power or steam shovel.

One object of the invention is to provide a novel and improved toy power shovel which shall so closely simulate all of the action of a power or steam shovel in the picking up of a load, elevating it and dumping it, that the toy shall be amusing, entertaining and instructive, and a child manipulating the toy shall have the sensation of an engineer operating a full size steam shovel which will provide satisfaction for the child's innate desire to imitate adult activities.

Power shovels are usually controlled by levers which are manipulated by the engineer to control the engine, and another object of my invention is to provide a novel and improved toy power shovel wherein all of the action in picking up, elevating and dumping a load shall be effected by the simple oscillation of two levers, one to be actuated by each hand of the child, whereby the operation of the toy shall be so simple and easy that even a very young child may operate the toy without difficulty and yet operation of the toy shall require the undivided attention of the child in coordinating the operation of the two levers and thereby exercise the power of concentration and orderly thought and action.

Many power shovels also include a boom on which is longitudinally slidably mounted what is called a bucket-stick or digger stick which has a bucket or scoop connected to one end, and this digger stick is actuated by cables or gearing connected to drums or shafts driven by an engine which is controlled by levers. A further object of my invention is to provide a simple construction wherein the digger stick shall be operated by two levers directly connected by two cables to the digger stick and scoop, to avoid complicated mechanism.

Other objects are to provide such a toy which shall be simple, inexpensive, strong and durable in construction so as to be capable of withstanding hard usage without the necessity for frequent adjustment or repair; to thus provide a toy power shovel which shall include a cab or body having a boom, and a digger stick slidably and pivotally mounted on the boom in a novel and improved manner; to provide in such a toy shovel novel and improved means for sliding and oscillating said digger stick including two levers and cables, whereby one lever and cable shall serve primarily to slide or crowd said digger stick outwardly and swing it pivotally, while the other lever and cable shall serve to slide said digger stick inwardly and hold the scoop clear of the ground while lowering the scoop to digging position with the other lever and cable; to provide a novel and improved trap door for the bucket or scoop; and to obtain other advantages and results as will be brought out by the following description.

Referring to the accompanying drawings in which corresponding and like parts are designated by the same reference characters throughout the several views,

Figure 1 is a vertical longitudinal sectional view partially in side elevation of a toy power shovel embodying my invention, showing the scoop and digger stick in the position assumed preparatory to starting digging operations.

Figure 2 is a side elevation of the toy showing the beginning of the digging operation.

Figure 3 is a similar view showing the cab of the toy swung into a position at 90 degrees to that illustrated in Figure 2, with the scoop partially elevated.

Figure 4 is a fragmentary side elevation of the forward portion of the toy, showing the scoop elevated to its highest position.

Figure 5 is a top plan view of the toy with the handle ends of the levers shown in cross section.

Figure 6 is a transverse vertical sectional view on the line 6—6 of Figure 5, and

Figure 7 is an enlarged perspective view of the scoop.

Specifically describing the illustrated embodiment of the invention, the toy includes a body having a hollow cab-like portion 1 mounted to rotate on a turn-table 2 upon a wheeled base 3. This body may be made of light sheet metal shaped up and secured together in any suitable manner.

A boom 4 is connected at one end as at 5 to one end of the cab 1 and projects upwardly and outwardly from the cab. The upper end of the boom is supported on the cab by a brace 6. This boom is preferably formed of a single piece of sheet metal bent into a substantially channel shape, and the base portion 7 of the channel has a slot or opening 8 through which slides a digger stick 9 at one end of which is rigidly connected a bucket or scoop 10.

The digger stick 9 is also preferably formed of sheet metal and channel shaped in cross section, and has aligned longitudinal slots 11 in the arms of the channel through which pass a pin 12 which is mounted on the boom 4 transversely thereof and intermediate the ends of the boom. With this construction, the digger stick is arranged between the arms of the channel shaped boom and is both

longitudinally slidable and pivotally movable relative to the boom. Also, preferably the channel of the digger stick faces toward the cab, as clearly shown in Figure 1.

At the outer end of the boom 4 is journaled a pulley 13 and another pulley 14 is journaled on the end of the digger stick opposite the scoop, the pulley 13 being disposed above the scoop and the pulley 14 being disposed above the boom.

A cable or other suitable flexible connector 15 has one end connected to the end of the digger stick adjacent the scoop as at 16 and passes around the pulleys 13 and 14. This cable is operated by a lever 17 which is pivotally mounted intermediate its ends at 18 on the top of the cab 1 and extends through a slot 19 in the top of the cab with one end disposed within the cab and the other end projecting upwardly above the top of the cab. The end of the lever 17 within the cab is connected at 20 to the end of the cable 15 opposite that attached to the digger stick, and the cable passes from the lever 17 around a pulley 21 which is journaled on a shaft 22 which is mounted within the cab. The cable also passes around an idler pulley 23 which is secured to the bottom of the cab. Preferably the axis of the pivot 18 of the lever is at right angles to the plane of the digger stick, and the pulley 21 is mounted at the side of said axis of the lever opposite the digger stick.

With this construction it will be observed that the digger stick will be longitudinally and pivotally actuated on the boom 4 by oscillation of the lever 17. Assuming that the scoop is resting upon the ground as shown in Figure 2 of the drawings, a pull on the upper end of the lever 17 will cause the digger stick to be pushed longitudinally outwardly from the boom and simultaneously will elevate the scoop, so that the scoop may be crowded into a pile of dirt or bank and simultaneously elevated as shown in Figures 2, 3 and 4. The crowding action is caused by the cable 15 passing over the pulley on the digger stick, the cable tending to straighten between the idler pulley 23 and the pulley 13 on the boom as the lever 17 is swung. By swinging of the upper end of the lever 17 in the opposite direction or toward the boom, the scoop will be lowered. For holding the scoop in any desired position I may provide a spring detent lever 24 on the handle 17 to cooperate with a series of openings 25 in a segmental portion of the pivot bracket 26 upon which the lever 17 is pivotally mounted.

As the scoop 10 is lowered the digger stick slides outwardly on the boom, and means is necessary to hold the scoop from contact with the ground so that the scoop may swing into digging position close to the body portion of the toy, as shown in Figures 1 and 2. This means is shown as comprising a second lever 27 which is pivotally mounted at 28 on the top of the cab on an axis parallel with the axis of the lever 17, said lever 27 passing through a slot 29 in the top of the cab with one end extending into the cab and the other end projecting upwardly above the cab. The end of the lever 27 within the cab is connected to one end of a cable 30 which passes around a pulley 31 journaled on the cab 1 on the same shaft 22 upon which the pulley 21 is journaled. The cable 30 also passes around a pulley 32 mounted on the pin 12 which connects the digger stick to the pulley, and the other end of the cable is connected to the digger stick, preferably at the same point 16 at which the cable 15 is connected to the digger stick. The cable 30 passes into the channel of the digger stick and through an opening 33 in the base portion of said channel.

With this construction, the digger stick 9 may be slid longitudinally independently of the movement of the digger stick by the lever 17 and the cable 15. Assuming the scoop 10 to be resting on the ground as shown in Figure 2, a pull on the lever 27 away from the boom will lift the scoop from the ground as shown in Figure 1.

In operation of the toy and assuming that the scoop 10 is resting on the ground as shown in Figure 2, the operator will first pull the upper end of the lever 17 toward himself or away from the boom 4, which will cause the scoop to dig into the pile of dirt or a bank and at the same time elevate the scoop. Before the lever 17 is released to lower the scoop, the operator will pull upon the upper end of the lever 27 so as to slide the digger stick inwardly or upwardly into the position shown in Figure 1. Thereupon the lever 17 will be swung in the opposite direction so as to permit the scoop to swing downwardly about the pivot pin 12, the lever 27 being held in the position above described while this action takes place. The scoop will therefore be lowered but will be held out of contact with the ground. To begin the next digging operation, the lever 27 will be released and the lever 17 will be operated as already described to elevate the scoop.

As usual, the scoop 10 is approximately box-shaped and has one open end 34 into which the dirt is pushed during the digging operation. The opposite or bottom end of the scoop is normally closed by a trap door 35. The open end 34 of the scoop is the filling opening, while the opposite end of the scoop is the discharging opening, and these two openings face horizontally when the scoop is in its lowermost position as shown in Figures 1 and 2, while the discharging opening is lowermost when the scoop is elevated as shown in Figure 3. The trap door 35 comprises a body 36 to cover the discharging end of the scoop and having approximately right tri-angular side flanges 37, one side of each of which is coincident with the corresponding edge of said body. These flanges are pivotally connected at 38 adjacent their apexes which are remote from the body 36 to the scoop adjacent the filling opening 34 and the side of the scoop which is uppermost when the scoop is in its lowermost position. The door is held in closed position by a sliding bolt 39 which cooperates with the opening 40 in a keeper plate. This construction is particularly desirable in that the center of gravity of the trap door is located with respect to the scoop so as to ensure closing and opening of the trap door by gravitational action when the scoop is in its lower and upper position respectively, and this in turn admits of the trap door being made of light sheet metal.

In operation of the scoop, when the scoop is lowered to digging position, the door swings closed by action of gravity and the bolt 39 slips into the keeper opening 40. When the scoop has been raised after the digging operation, the bolt 39 is pulled from the keeper opening 40 whereupon the door opens by action of gravity and the force of the dirt falling from the scoop, as clearly shown in Figures 3 and 4 of the drawings. Any suitable means such as a flexible connector 41 may be provided for pulling the bolt 39 from the keeper opening 40.

The construction and operation of the toy are extremely simple, but the undivided attention of the operator is necessary during the operation

due to the necessity for the use of both hands and proper coordination of the operation of the two levers. The toy is inexpensive and will withstand hard usage; the action of the toy closely simulates the operation of a steam shovel which is usually controlled by two or more levers, and yet no complicated mechanism is involved.

While I have shown and described the invention embodied in certain details of construction it will be understood that this is primarily to illustrate the principles of the invention and that many modifications and changes may be made in the details of construction without departing from the spirit of the invention.

Having thus described my invention what I claim is:

1. A toy power shovel comprising a body portion a boom projecting upwardly therefrom, a digger stick mounted intermediate its ends on said boom intermediate the ends of the latter for longitudinal and pivotal movement, a scoop on one end of said digger stick, a cable connected at one end to the end of said digger stick carrying said scoop and passing over and in contact with said digger stick above said boom and over said boom above said digger stick, and a lever pivotally mounted intermediate its ends on said body portion on an axis at right angles to the plane of movement of said digger stick and connected at one end to the other end of said cable, and a pulley on said body portion at the side of the axis of said lever opposite said digger stick over which said cable passes, whereby oscillation of said lever causes longitudinal and pivotal movement of said digger stick to elevate and lower said scoop.

2. A toy power shovel comprising a body portion, a boom projecting upwardly therefrom, a digger stick pivotally mounted on said boom intermediate the ends of the latter, a scoop connected to one end of said digger stick, a cable passing over said boom above said digger stick and connected at one end to the end of the latter carrying said scoop, and a lever pivotally mounted intermediate its end on said body portion on an axis at right angles to the plane of movement of said digger stick and connected at one end to the other end of said cable.

3. A toy power shovel comprising a body portion, a boom projecting upwardly therefrom, a digger stick pivotally mounted on said boom intermediate the ends of the latter, a scoop connected to one end of said digger stick, a cable passing over said boom above said digger stick and connected at one end to said scoop, and a lever pivotally mounted intermediate its end on said body portion on an axis at right angles to the plane of movement of said digger stick and connected at one end to the other end of said cable, and a pulley on said body portion at the side of the axis of said lever opposite said digger stick over which said cable passes, whereby oscillation of said lever causes longitudinal and pivotal movement of said digger stick to elevate and lower said scoop.

4. The toy set forth in claim 1 with the addition of a second cable connected at one end to said digger stick, and a second lever pivotally mounted on said body portion on an axis parallel to the axis of the first lever and connected at one end to the other end of said second cable, and a second pulley over which said second cable passes mounted on said body portion coaxially with the first pulley for longitudinally sliding said digger stick independently of the first cable and the first lever.

5. A toy power shovel comprising a cab-like body portion having a slot in the top thereof, a boom projecting upwardly from one end of said body portion, a digger stick pivotally mounted on said boom, a scoop on one end of said digger stick, a lever pivotally mounted between its ends on said body portion and extending through said slot with one end in said body-portion and the other end projecting above the top of said body portion, and a flexible connection between said stick and the end of said lever within said cab for elevating and lowering said scoop.

6. A toy power shovel comprising a body portion, a boom formed of a single piece of sheet metal and projecting upwardly from said body portion, said boom being channel-shaped in cross section and having an opening in its base portion, a digger stick formed of a single piece of sheet metal extending through said opening in the boom and having a longitudinal slot, a pin passing through said boom and said slot to mount said digger stick for longitudinal and pivotal movement, a scoop carried by said digger stick, and means for operating said digger stick to elevate and lower said scoop.

7. A toy power shovel comprising a body portion, a boom formed of a single piece of sheet metal and projecting upwardly from said body portion, said boom being channel-shaped in cross section and having an opening in its base portion, a digger stick formed of a single piece of sheet metal extending through said opening in the boom and having a longitudinal slot, a pin passing through said boom and said slot to mount said digger stick for longitudinal and pivotal movement, a scoop carried by said digger stick, a cable connected at one end to said stick and passing over said digger stick above said boom and over said boom above said digger stick, means for operating said cable to longitudinally move and swing said digger stick to raise and lower said scoop, a second cable connected at one end to said stick and passing over said pin and through said opening in the base portion of said boom, and means for operating said second cable to longitudinally slide said digger stick independently of the first cable and said means for operating it.

8. The toy set forth in claim 6 wherein said digger stick is also channel-shaped in cross section with the channel facing toward said body portion, and with the addition of a cable connected at one end to said digger stick and passing through the channel of said digger stick over said pin and through said opening in the base portion of said boom, and means for operating said cable to longitudinally slide said digger stick independently of the first means for operating said digger stick.

9. A toy power shovel comprising a hollow cab-like body portion having a slot in the top thereof, a scoop, means mounting said scoop on said body portion so that the scoop may be elevated and lowered, a lever pivotally mounted between its ends on said body portion and extending through said slot with one end within said body portion and the other end projecting above the top of the body portion, and a cable connecting the end of said lever within said body portion to said means so that said scoop can be elevated and lowered upon oscillation of said lever.

10. A toy power shovel comprising a cab-like body portion having two slots in the top thereof, a boom projecting upwardly from one end of said

body portion, a digger stick pivotally and longitudinally slidably mounted on said boom, a scoop on one end of said digger stick, a pair of levers each pivotally mounted between its ends on said body portion and extending through one of said slots with one end in said body-portion and the other end projecting above the top of said body portion, a flexible connection between said stick and the end of one of said levers within said cab for elevating and lowering said scoop about said pivotal mounting of said stick on the boom, and a second flexible connection between said stick and the end of the other lever in said cabs for longitudinally sliding said stick independently of the first lever.

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