

Aug. 14, 1945.

E. C. STREATER

2,382,346

TOY EXCAVATOR

Filed Nov. 20, 1943

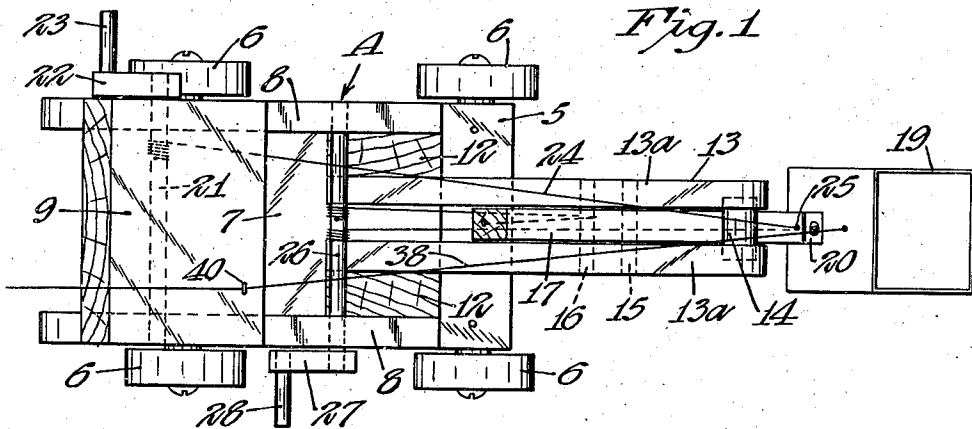


Fig. 1

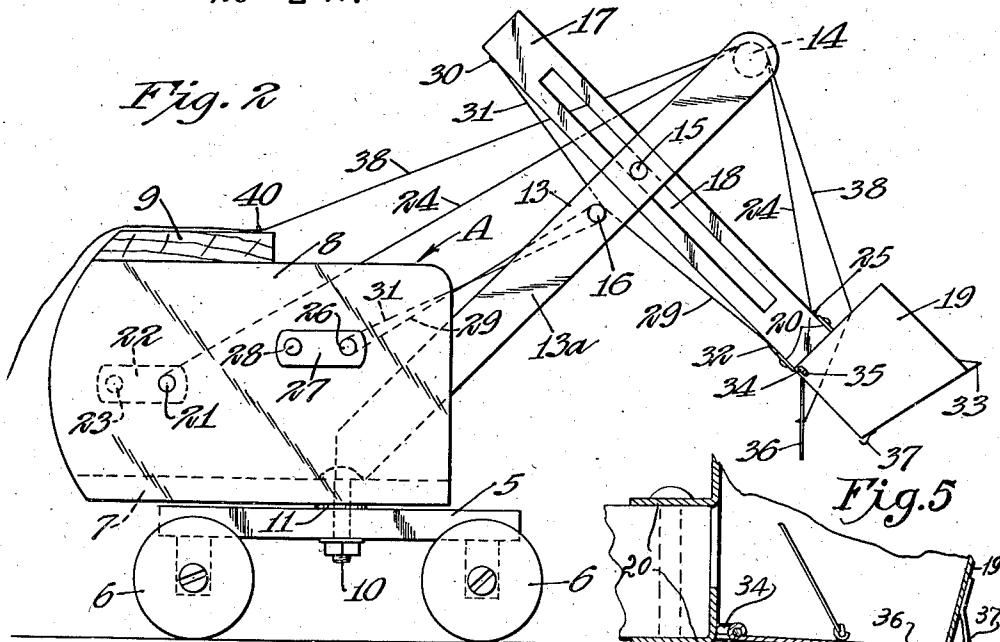


Fig. 2

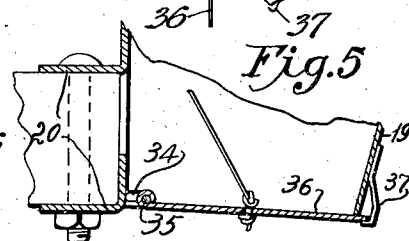


Fig. 5

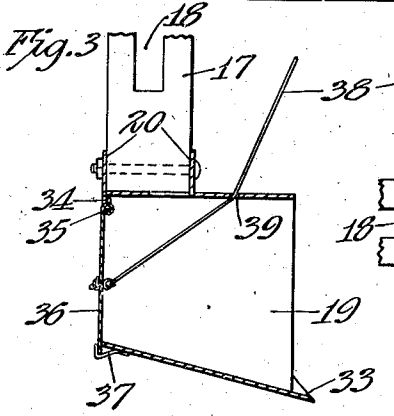


Fig. 3

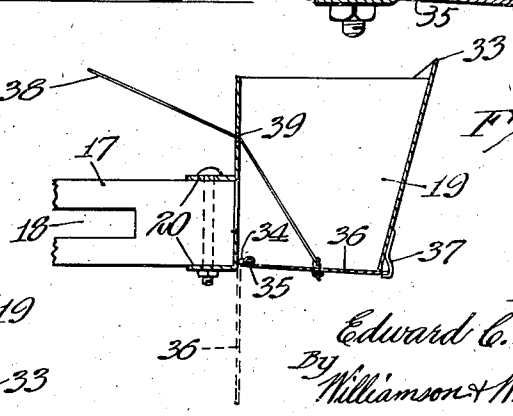


Fig. 4

Inventor
Edward C. Streater
By
Williamson & Williamson
Attorneys

UNITED STATES PATENT OFFICE

2,382,346

TOY EXCAVATOR

Edward C. Streater, Spring Park, Minn., assignor
to John Brayley, Minneapolis, Minn., as
trustee

Application November 20, 1943, Serial No. 511,176

2 Claims. (Cl. 214-146)

This invention relates to toy excavators adapted to simulate the general appearance and action of industrial excavators having movable dipper buckets.

It is a general object of the invention to provide a toy device simulating an industrial power scoop or shovel which includes a boom, a dipper stick mounted upon the boom for movement relative thereto and a dipper bucket having a discharge gate wherein movement of the dipper stick and dipper is similar to that of a full sized industrial machine, and wherein such movement is accomplished by means of simply constructed and easily actuated manual controls.

More specifically it is an object of the invention to provide a toy excavator with an undercarriage having a cab pivotally mounted thereon; a boom extending from the cab; a dipper stick pivotally and slidably mounted on the boom; a manual winding drum on the cab and flexible connections between the drum and the dipper stick to provide for pivotal and/or sliding movement of the dipper stick relative to its supporting boom.

Another object of the invention is to provide a toy excavator with a movable dipper stick having a dipper thereon wherein the dipper is provided with a gate which can be swung to open and closed positions and wherein the opening and closing of the dipper gate can be controlled from the cab.

These and other objects and advantages of the invention will more fully appear from the following description made in connection with the accompanying drawing, wherein like reference characters refer to the same parts throughout the views, and, in which:

Fig. 1 is a plan view of the device;

Fig. 2 is a side elevation thereof;

Fig. 3 is an enlarged fragmentary view of the outer end of the dipper stick and the dipper, the latter being in section and in gate closed position;

Fig. 4 is an enlarged fragmentary view with the dipper in section and in gate closed position with the gate shown open in dotted lines; and

Fig. 5 is an enlarged fragmentary sectional view of the dipper gate construction.

In the drawing there is shown a main frame member 5 supported by wheels 6. Mounted upon the frame is a cab A having a bottom 7, sides 8, and a top portion 9. As best shown in Fig. 2, a pivot bolt 10 connects the frame member 5 with the cab bottom 7 and said members 5 and 7 are separated by a washer 11 so that the cab A will swing freely on the pivot bolt 10 in simulation

of the pivotal movement of the control cab of an industrial excavating shovel.

A pair of blocks 12 are secured in spaced relation at the forward side portions of the cab sides 8, and between the blocks 12 is positioned a boom 13 made up of a pair of spaced members 13a, each of said members 13a being secured to one of the blocks 12. At the outer end of the boom which extends forwardly and upwardly from the cab A there is a bearing or roller 14 which connects the members 13a at their outer ends. Intermediate the ends of the boom member 13a are wooden pins 15 and 16 which, as best shown in Fig. 2, are spaced from each other longitudinally of said boom members 13a.

Supported by the pin 15 is a dipper stick 17 having an elongated slot 18 formed therein, the pin 15 being received in said slot 18. The lower end of the dipper stick 17 as viewed in Fig. 2 carries a dipper bucket 19 which is secured to the dipper stick by any suitable means such as brackets 20 which may be bolted or screwed to the end of said dipper stick 17. The details of the dipper construction are described below.

Extending between the side walls 8 which form part of the cab A is a shaft 21 in the form of a dowel pin which extends through the far side wall 8 as viewed in the drawing, and the outwardly extending portion of said shaft 21 is provided with a crank arm 22 having a crank handle 23 which permits the shaft 21 to be turned by hand. A cord 24 extends from the shaft 21 forwardly and upwardly, over the bearing pin 14 at the upper end of the boom 13, and thence downwardly to connect with the forward end of the dipper stick at 25. Extending between the cab side walls 8 adjacent the forward ends thereof is a shaft 26 which has an end extending through the near side wall 8, as viewed in the drawing, to receive a crank arm 27 having a crank handle 28 thereon. A cord 29 extends from the shaft 26 upwardly and forwardly beneath the pin 16 between the boom members 13a and thence upwardly to connect with the upper end of the dipper stick 17 at 30. A second cord 31 also extends from the shaft 26 forwardly and upwardly and over the pin 16 mounted between the boom members 13a and thence downwardly to connect with the lower end of the dipper stick at 32. In Fig. 2 it will be noticed that the cords 29 and 31 lead from the under and upper portions of the shaft 26 to indicate that said cords 29 and 31 are wound oppositely on the shaft 26.

The dipper bucket 19 is provided with sides as in the case of an ordinary industrial excavator or

dipper bucket, and the forward side at its upper edge is provided with a cutting or digging portion 33. The lower rear side wall portions of the dipper bucket 19 are provided with elongated openings 34 which are adapted to receive a pivot pin 35. To the pivot pin 35 is connected a dipper gate 36 which, as shown in the drawing, can swing with the pivot pin 35 to provide a pivoted closure for the bottom of the bucket 19. The lower forward portion of the bucket 19 is provided with a stationary catch member 37, and the catch 37 is so related to the dipper gate 36 and the elongated openings 34 in the sides of the dipper bucket that the door 36 can be shifted rearwardly or toward the end of the dipper stick 17 so that the free edge of the gate 36 will swing past the catch 37. A cord 38 is connected to the dipper gate 36 and extends through an opening 39 in the back of the dipper bucket and thence upwardly over the roller pin 14 at the upper end of the boom 13 and rearwardly through an eyelet 40 which may be secured to the cab top 9.

The device can be manipulated to swing the dipper stick 17 forwardly or rearwardly away from and toward the cab A and about the pivot pin 15, and also the dipper stick 17 can be slid along the pivot pin 15 to move the dipper bucket 19 toward and away from the boom 13. By winding the cord 24 on the shaft 21 the lower forward end of the dipper stick 17 will be pulled upwardly. This will produce generally a pivotal movement of the dipper stick 17 about the pivot pin 15 although there is some slight sliding movement which takes place. In order to produce a decided sliding movement of the dipper stick relative to the boom 13 the shaft 26 is rotated by means of the crank members 27, 28. In order to produce a pivotal action without sliding or a sliding movement without pivoting it is necessary to coordinate the movements of the shafts 21 and 26. The movements of the two shafts are such that the dipper stick 17 will follow through the action of a full sized industrial machine. The boom can be extended forwardly and upwardly from the position shown in Fig. 2, and when so extended the dipper gate control cord 38 can be pulled with the dipper bucket to the position shown in Fig. 4. This will pull the gate rearwardly and out of engagement with the catch 37 so that the gate will drop open to the dotted line position of Fig. 4. The dipper stick can then be manipulated through proper rotation of the shafts 21 and 26 until the dipper stick hangs vertically in the position shown in Fig. 3 with the dipper bucket 19 in contact with or closely adjacent to the ground surface. In such position the dipper gate control

cord 38 can be pulled to slightly raise the dipper gate 36 so that it will be lifted up over the catch 37 and permit it to drop therebehind in gate locking position.

From the foregoing description it will be seen that I have provided a toy excavating machine which is capable of simulating the movements of a full sized industrial power shovel or excavator. As stated above the various movements and positions of the dipper stick 17 can be produced entirely by proper coordinative movement of the shafts 21 and 26 which carry the crank arms 22 and 27 respectively, and the dipper gate can be opened and closed by pulling on the gate control cord 38 when the dipper bucket 19 is in one of the positions shown in Figs. 3 and 4. The pin 16 on the boom 13 serves not only as a bearing pin for the cords 29 and 31 which connect to opposite ends of the dipper stick 17 but it also provides for free but limited movement of the dipper stick.

The device is of extremely simple construction and can be cheaply constructed from wood or any other suitable material.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the various parts without departing from the scope of my invention.

What I claim is:

1. In a dipper construction for toy excavators, a bucket having a discharge opening, a gate pivotally supported by said bucket adjacent said discharge opening and having a free edge portion swingable toward and away from said discharge opening, a catch member on said bucket adjacent said opening and adapted to engage said free edge of said gate, and said gate being shiftable partially across said opening and toward and away from said catch member.

2. In a toy excavator, a unit including a supporting frame and a cab rotatably mounted on said frame, a pair of spaced parallel members extending upwardly and forwardly from said cab to provide a boom, said members being connected intermediate their ends and more closely adjacent the upper ends thereof by a pin, said pin being stationary relative to said boom members, a dipper stick having an elongated longitudinal slot formed therein and slidably receiving said pin, an element mounted between the upper ends of said boom members and rotatable relative to said boom members, and a boom swinging strand of flexible material extending from said cab over said rotatable element and connected to the lower end of said boom.

EDWARD C. STREATER.