

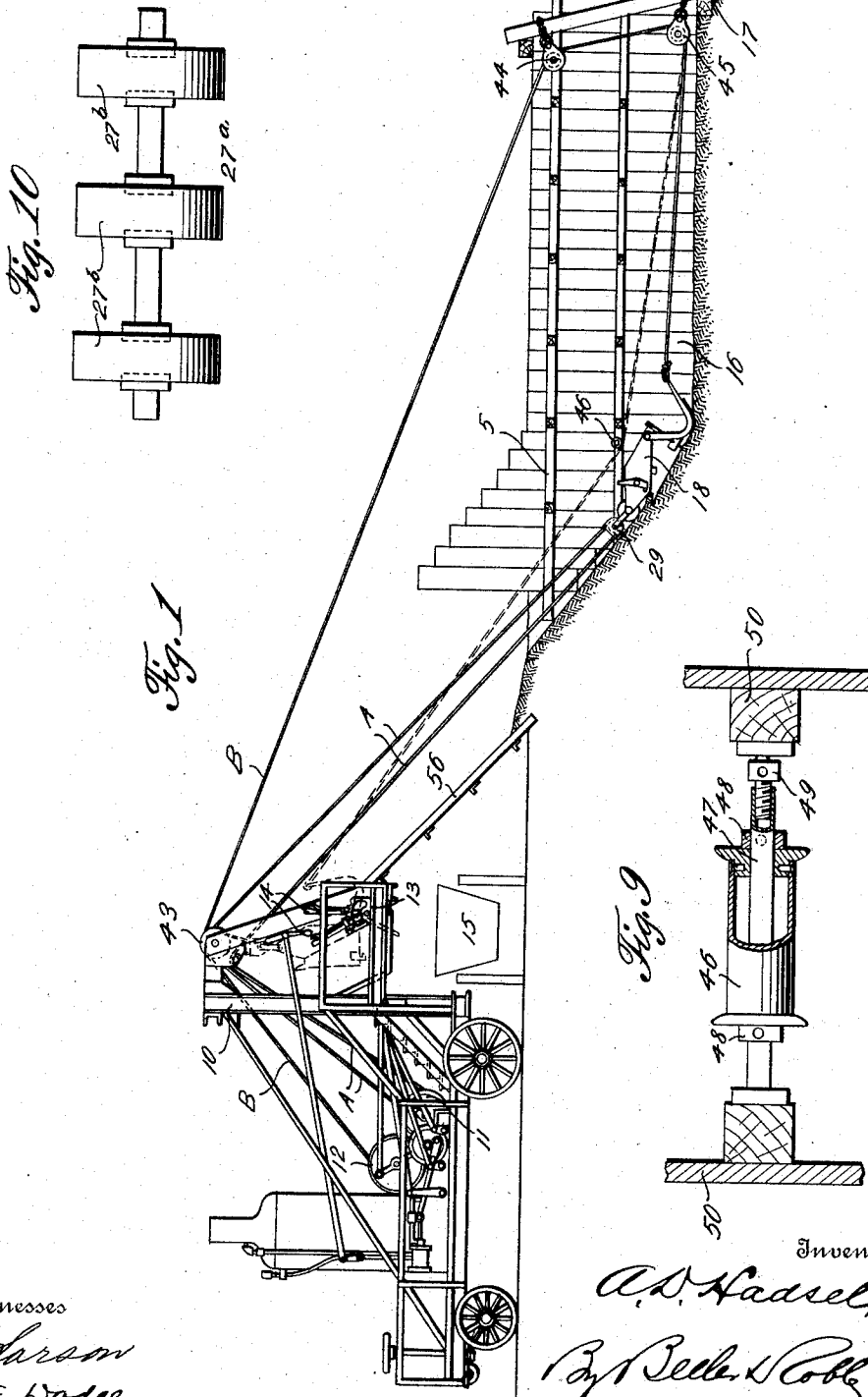
A. D. HADSEL.
EXCAVATOR.

APPLICATION FILED SEPT. 15, 1909. RENEWED JULY 12, 1911.

1,015,489.

Patented Jan. 23, 1912.

3 SHEETS-SHEET 1.



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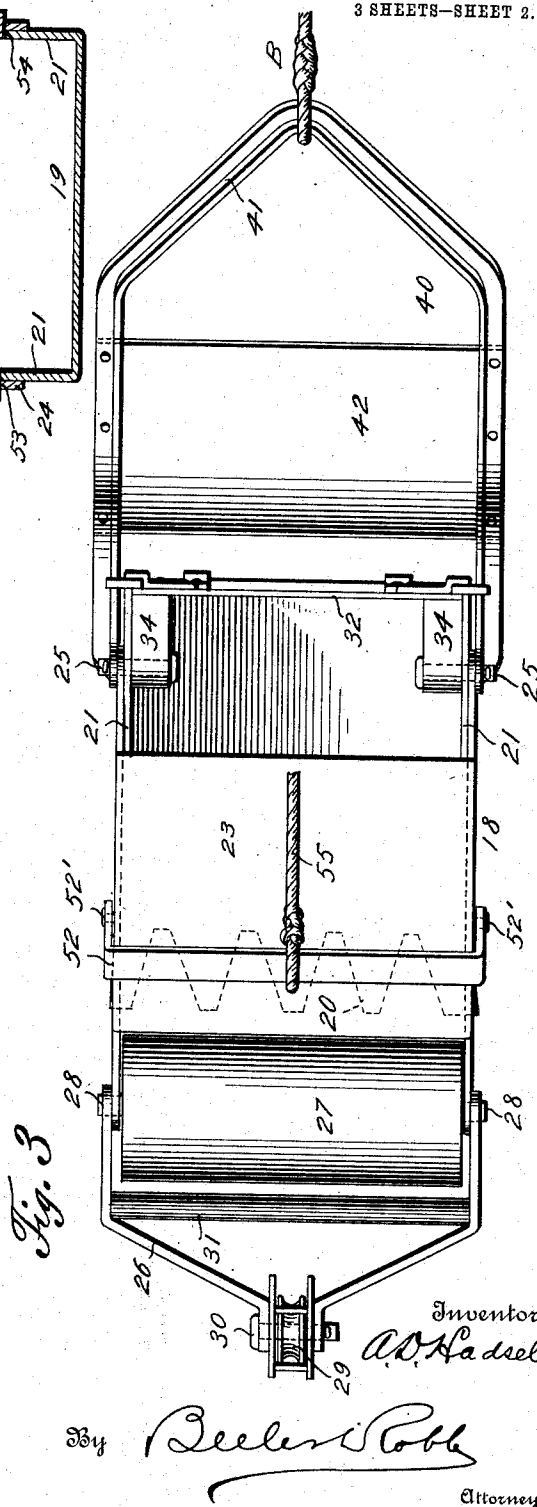
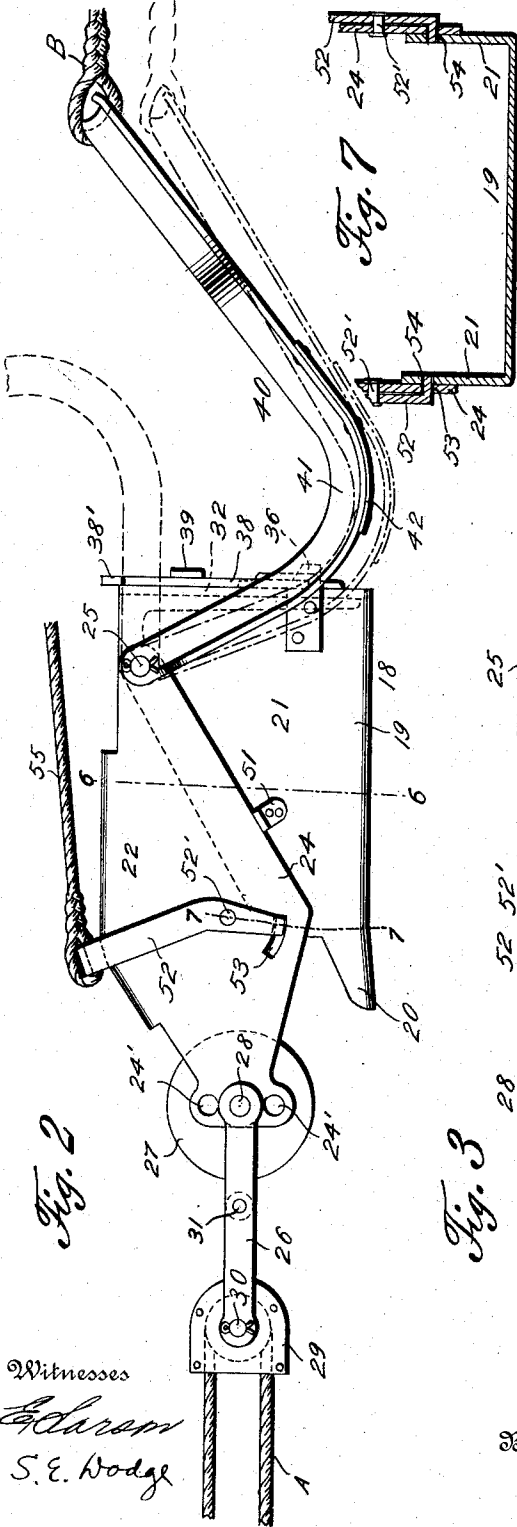
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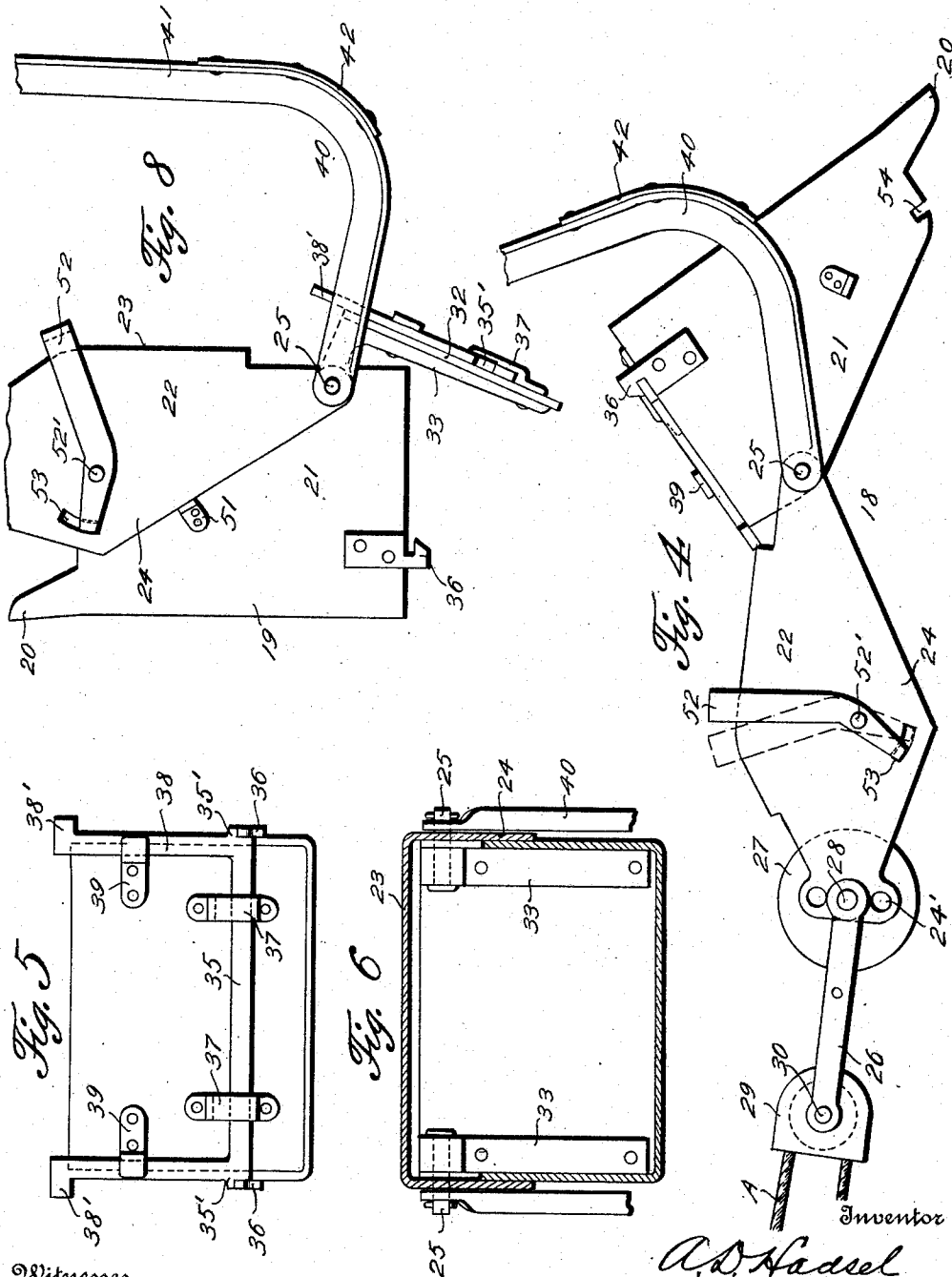
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UNITED STATES PATENT OFFICE.

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EXCAVATOR.

1,015,489.

Specification of Letters Patent.

Patented Jan. 23, 1912.

Application filed September 15, 1909, Serial No. 517,849. Renewed July 12, 1911. Serial No. 638,212.

To all whom it may concern:

Be it known that I, ALVAH D. HADSEL, a citizen of the United States, residing at Wilkes-Barre, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Excavators, of which the following is a specification.

This invention relates to excavating machinery, and has special reference to devices of this character wherein there is a scoop operated from a distant power, and the invention consists of certain specific novel features of construction of the scoop especially, adapting it for more satisfactory operation than has heretofore been possible.

The invention will be understood as this description progresses and with reference to the accompanying drawings, in which—
Figure 1 is a diagrammatic side elevation of an apparatus embodying the invention and showing one of its adaptations in practice; Fig. 2 is a view in side elevation of the scoop, full lines indicating the position of the parts when in position for digging, and dotted lines indicating other positions of certain of the parts; Fig. 3 is a plan view of the device shown in Fig. 2; Fig. 4 is a side elevation of the scoop in one of the dumping positions; Fig. 5 is a rear elevation of the scoop with the rear door closed; Fig. 6 is a transverse section of the scoop on the line 6—6 of Fig. 2 looking toward the rear; Fig. 7 is a transverse sectional detail on the line 7—7 of Fig. 2; Fig. 8 is a fragmentary side elevation of the scoop indicating another of its dumping positions; Fig. 9 is a detail view of the guide roller hereinafter described, and Fig. 10 is a detached view of a modified form of roller.

Throughout the following detail description, and on the several figures of the drawings similar parts are referred to by like reference characters.

The apparatus constituting the subject-matter of this invention is adapted especially for excavation of trenches or ditches, and the scoop is operable longitudinally of the ditch. It is to be understood, however, that it is also adapted for the excavation of canals or other forms of ditches wherein the apparatus will be operable transversely of the ditch. It is my purpose not to be limited to any particular use or specific details of construction of the device, except as may be necessitated by the state of the art.

Referring particularly to Fig. 1 wherein is shown one of the applications of the invention, at 10 is indicated any convenient form of a support, preferably elevated, and which may or may not be mounted upon wheels or runners for transportation along the line of the excavation. The support is shown as supporting hoisting machinery including a pair of independently operable drums 11 and 12. A platform 13 is provided for the engineer or operator upon which he stands while conducting the excavating operations and preferably in an elevated position. Adjacent to the operator on the platform 13 are a set of levers 14 whereby the operations of the hoisting drums are controlled in any well known manner, such devices, *per se*, constituting no part of the present invention. The platform 13 is arranged over the point at which the scoop is to be dumped and beneath which a cart 15 may be driven to receive the material excavated.

At 16 is indicated a trench or ditch under process of excavation and at any suitable distant point is provided an anchor 17. The anchor is usually of a temporary construction and movable along the line of the excavation.

The scoop 18 consists of four principal parts, all pivoted together on a common axis. Said parts comprise a body 19 having a forward cutting edge 20 and substantially parallel upwardly extending sides 21.

Another part of the scoop is a hood 22 including a top member 23 and downwardly extending sides 24, which embrace or inclose the upper edges of the sides 21. The hood is pivoted to the body portion upon a pair of strong coaxial pivots 25, said pivots being positioned substantially at the top of the scoop and at some distance forward of the rear end thereof. At the front end of the hood is a bail 26 and within said bail and between the forward ends of the sides of the hood is journaled a roller 27. The roller is mounted upon a shaft 28, which extends through the same and through rear ends of the bail and also through any one of a series of holes 24' in said hood walls 24.

The description of the means for connecting the roller and bail to the scoop is to be understood as being merely suggestive and that any other suitable means may be employed.

Instead of providing a series of holes 24'

a single pair may be employed and the same effect of adjustment be provided by substituting rollers of different diameters. At the forward end of the bail is provided a shackle including a pulley 29 mounted upon a pin 30. The arms of the bail are preferably spaced by means of a brace 31.

The rear end of the bucket or scoop is closed by means of a door 32 to which are secured a pair of hinges 33, each including an angularly disposed hub 34 extending forwardly and through which the pivots 25 are passed. This form of mounting of the rear door insures the automatic gravitation of the door to closed position when the scoop is in normal horizontal position ready to receive a fresh charge. Said door 32 is adapted to be locked closed by any suitable locking means, the same being indicated herein as a latch 35 extending across and beyond said door and having shoulders 35' which interlock with a pair of catches 36 connected to the sides of the scoop body. The latch 35 is slidable bodily upward with respect to the rear door and is maintained in a proper position with respect thereto by means of a pair of keepers 37 near the bottom of the door. A pair of extensions 38 extend upward along the lateral edges of the door and terminate in shoulders 38' at their upper ends. Said extensions are maintained in proper position by means of a pair of keepers 39. The purpose of said extensions will presently appear.

The fourth principal part of the scoop consists of a slide or tail-piece 40, of substantially U-form as viewed from the side, and the curved portion of which engages with the ground. The forward and upper ends of the frame 41 of the tail-piece are pivoted as before mentioned upon the pivots 25, and preferably on the outside of the previously mentioned parts. The tail-piece is provided on its bottom with a shoe 42, which slides upon the ground and prevents the rearward draft upon the scoop from being obstructed. The extreme rear end of the tail-piece is directed upwardly as well as rearwardly.

A pair of ropes or cables are connected respectively to the aforesaid power drums and the front and rear ends of the scoop. The cable A is connected to the drum 11 and passes thence rearwardly over an idler pulley 43, thence to the shackle or pulley 29 where it may be secured or for the purpose of increasing the power said rope A may be continued around the pulley 29 and returned to the hoisting apparatus support and there anchored in any suitable manner. The tail-rope B is connected to the power drum 12 and extends thence rearwardly over an idler pulley at the top of the support, thence to and around one or more direction pulleys 44 and 45 connected to the anchor 17, and thence said tail-rope extends forwardly and

is connected to the extreme rear end of the tail-piece 40. When the scoop is drawn toward the power support the tail-rope B passes beneath the idler drum or pulley 46, shown particularly in Fig. 9. The pulley is loosely mounted upon a shaft 47 and is maintained in position thereon by means of collars 48. The shaft 47 serves as a ditching jack or brace, and to this end either or both ends thereof may be fitted with a screw 49 for adjustment purposes and in coöperation with the temporary scaffolding of the ditch, indicated at 50.

The pulley 46 may be located at any desired point along the path of the excavation, and serves to be engaged alternately by both of the power cables for the purpose of insuring that the scoop will be properly maintained in operative relation with the earth being operated upon or excavated. If the ditch is deep in comparison with the distance between the power station and the anchor, without the pulley 46 it would be difficult or inexpedient for the scoop to be held down to cutting position at any or all points along the bottom of the ditch unless some expedient such as above described were employed.

The hood 22 is limited in its downward movement with respect to the body 19 by means of brackets 51, and is adapted to be locked in such position by a trigger 52. The trigger may be of any suitable construction, but as indicated comprises a U-shaped bail extending across the upper wall of the hood and downwardly on opposite sides thereof and is pivoted at 52' to said hood. The extreme lower ends of the trigger bail 52 extend inwardly through slots 53 at right angles to the main portions thereof and co-operate with a pair of notches 54 formed in the front edges of the side walls 21. The trigger bail 52 is swung forwardly as indicated in the side view so as to bring its center of gravity in front of the pivots 52', whereby it will automatically cause the interlocking of the said points in the notches 54 when the scoop is in normal loading position. A trip-rope 55 is connected to the bail for the purpose of releasing the same and permitting the hood and body portion to separate when it is desired to dump as indicated in Fig. 4.

The operation of the device is substantially as follows: Referring to Fig. 1 the scoop is indicated in full lines in the position in which it is being filled by engagement with the earth, draft at this time being upon the cable A and the tail-rope B being free. The cutting edge 20 of the scoop body is preferably deflected downwardly somewhat so as to insure quick engagement thereof for excavating and such engagement continues until the scoop is full of dirt and the dirt at the forward end

thereof causes by engagement with the roller 27 a sort of wedge lifting the cutting edge 20 of the scoop out of the earth. It will be seen, therefore, that the loading of the scoop is automatic as well as the disengagement thereof from the earth. The adjustment of the roller up or down with respect to the bottom of the scoop is for the purpose of accommodating the devices to different circumstances or conditions of soil to be operated upon. After being filled the scoop is drawn toward the power up any suitable incline 56 and is drawn thence over the opening above the dump or cart 15 at which time the tail-piece 40 strikes at its lower portion upon the upper edge of the incline or the frame adjacent to the opening whereby said tail-piece is retarded in its movement or elevated with respect to the other portions of the scoop and the side rails 41 of said tail-piece engage the shoulders 38', lifting the latch 35 out of the catches 36. Continued movement of the loaded scoop and the weight of the load cooperating with the tail-piece complete the opening of the rear door 32, permitting the contents of the scoop to fall into the cart. The body of the scoop and the hood during this operation are retained in their closed position as indicated in Fig. 8. After the load has been dumped the tail-rope B is operated and backward draft thereupon causes the scoop to drag backwardly upon a shoe 42 as the main point of contact, as indicated in dotted lines in Fig. 2, the point of connection of the rope B being such as to insure such rearward draft causing the necessary lifting of the rear end of the scoop body. By the time the scoop is returned to the point where it is again desired to be filled the rear door will be closed and locked by the automatic operation of the door and its latch 35. During this operation it is only necessary for the operator on the platform 13 to start and stop the independent drums 11 and 12.

When it is desired to dump the load on the ground or on a flat place, the same will be effected in the manner indicated in Fig. 4, wherein the trip rope 55 is drawn upon to unlock the hood, permitting the hood and rear and upper portion of the body to tip forwardly over the cutting edge 20 of said body. A rearward draft upon the tail-rope 13 will right the device as before, returning it to its loading position.

The roller 27^a shown in Fig. 10, wherein a plurality of spaced members or rollers 27^b are employed, is especially adapted for use in connection with operations upon rocky soil and it is desired to provide a space or spaces to admit large stones or lumps to more freely enter the scoop than would be permitted by the roller 27. The automatic function of both forms of rollers is substantially the same.

The device may be constructed of any suitable size or materials, and it has been found in practice that as designed it is especially adapted for the rough usage to which machinery of its type is customarily subjected, and that it is reliable in its automatic operations in the manner above set forth.

I claim:

1. In an excavator, a scoop comprising a body portion having a forward cutting edge and upwardly extending sides, a hood above the body portion and including sides cooperating with the sides of the body, and a rearwardly extending tail-piece, said body, hood, and tail-piece being pivoted together on a common axis at the top of the scoop and between the front and rear ends thereof.

2. An excavator scoop comprising a body portion having a forward cutting edge and upwardly extending sides, a hood above the body portion including side members extending downwardly and embracing the body side members, a rear door, locking means for the door, a rearwardly extending tail-piece including a shoe, and pivot means pivotally connecting the body, hood, rear door, and tail-piece together on a common axis.

3. An excavator scoop comprising a body, a rear door to close the rear end thereof, means to lock the door closed, draft means to fill the scoop, a rearwardly extending tail-piece, said tail-piece being pivoted to said body on a transverse axis, means to swing the tail-piece on said axis, and means operable by said tail-piece when so swung to unlock said door.

4. An excavator comprising a body, a rear door to close the rear end thereof, locking means for said door comprising a latch slidable bodily vertically of the door and extending entirely across the same, a pair of catches connected to said body to receive the ends of said latch, a rearwardly extending tail-piece pivoted to said body, and means whereby the relative pivotal movement between said body and tail-piece will cause the lifting of said latch to unlock the door.

5. An excavator scoop comprising a body, a door pivoted thereto on a horizontal axis, means to lock the door closed including a latch on the outside of the door and extending transversely entirely across the same, a pair of catches connected to the door to receive the ends of the latch, a pair of extensions extending upward from the latch, and a rearwardly extending tail-piece pivoted to the body, the frame work of the tail-piece being adapted to cooperate with said latch extensions to release the latch when the body and tail-piece are moved relatively upon said pivot.

6. The hereindescribed excavator scoop

comprising a body portion having a forwardly extending cutting edge and upwardly extending sides, stop means connected to said side members, a hood pivoted
5 at its rear end to the upper part of the body and having a pair of sides embracing the body sides and impinging against said stop means to limit the movement thereof in one direction, locking means to lock the hood
10 in the position just described, power means connected to the hood to cause the scoop to automatically fill, and means carried by the hood to cause the scoop to automatically become detached from the earth when filled.
15 7. In an excavator, the combination of a support, power means mounted thereon and including a pair of independently operable drums, a distant anchor, a scoop comprising

a body portion and a rearwardly extending tail-piece, a pair of cables connected respectively to the power drums, one of said cables being connected to the front end of the scoop and the other being connected to said tail-piece by way of said anchor, and an idler roller 46 mounted transversely of the path
20 of the scoop between the power support and the anchor and adapted to be engaged alternately by said cables in order to maintain the scoop in operative relation with the
25 earth, substantially as set forth. 30

In testimony whereof I affix my signature in presence of two witnesses.

ALVAH D. HADSEL.

Witnesses:

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FLORENCE M. THOMA.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."