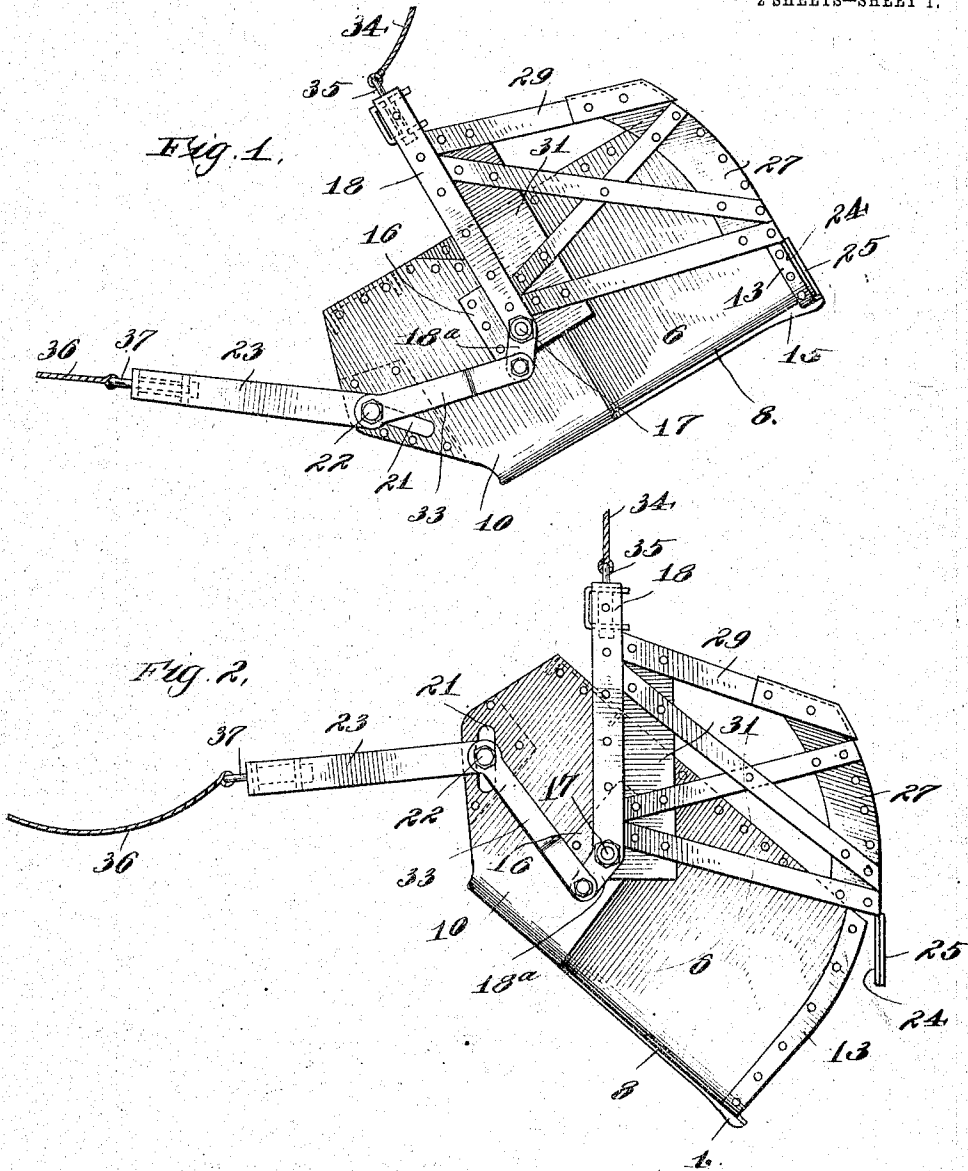


E. R. SHNABLE.
EXCAVATOR BUCKET.
APPLICATION FILED APR. 29, 1909.

1,018,275.

Patented Feb. 20, 1912.

2 SHEETS—SHEET 1.



Witnesses:

G. A. Paulschmidt
S. N. Pond

Inventor:
Emile R. Shnable,

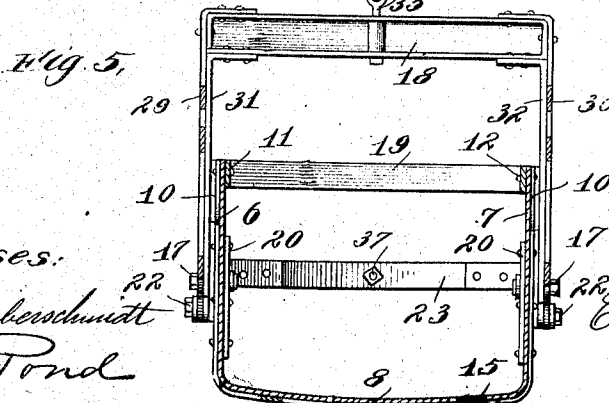
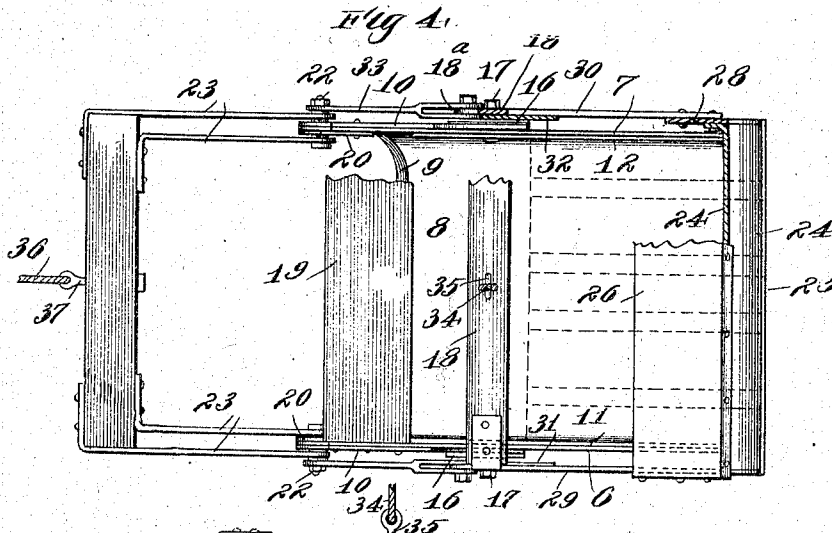
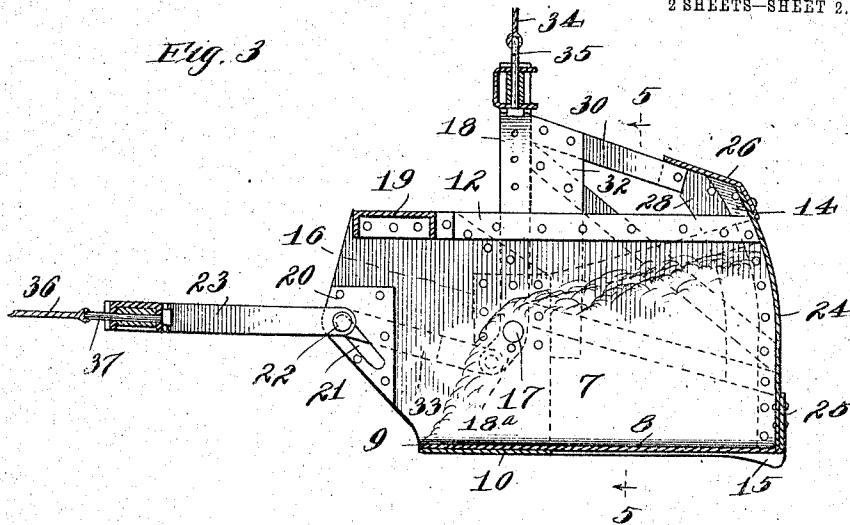
By Offield, Towle & Lutherman
Attys.

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2 SHEETS—SHEET 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

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EXCAVATOR-BUCKET.

1,018,275.

Specification of Letters Patent.

Patented Feb. 20, 1912.

Application filed April 29, 1909. Serial No. 492,876.

To all whom it may concern:

Be it known that I, EMILE R. SHNABLE, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Excavator-Buckets, of which the following is a specification.

This invention relates to excavating buckets of that type which have an open front with a forward cutting edge, and are manipulated through the agency of pulling and hoisting cables.

The chief object had in view in the development of my invention has been to produce a bucket requiring a minimum number of bucket-operating accessories, since it is manifest that the fewer and simpler these accessories, the less the liability to derangement of the parts in operation and the greater the speed with which the bucket can be operated, especially when employing the usual derrick or boom.

In carrying out my invention I employ two main structural parts, one comprising a body or scoop, which is formed with solid side and bottom walls, open at both ends, and with the forward edge of the bottom wall beveled or tapered to a cutting edge, and the other comprising a closure for the rear end of the body member and being formed rigid with the hinged bail by which the bucket is elevated. The closure referred to does not depend upon any lock or catch to maintain it closed during the filling operation, but is maintained closed by the draft or pull which is made effective through the agency of suitable link and lever connections between the draft yoke and the hoisting bail; and the opening of the rear end of the bucket when elevated to permit the discharge of the load is automatically effected by the gravity of the load upon releasing the tension on the draft cable and permitting the loaded bucket to hang wholly from the hoisting cable; so that but two cables (the draft cable and a hoisting cable) are required to effect not only the filling of the bucket, but also the release of the closure and the discharge of the load.

In order that the principle of my invention may be made entirely clear, I have illustrated, in the accompanying drawings one practical form in which the same may find expression, and referring thereto,—

Figure 1 is a side elevational view of the bucket, showing the same in loading position. Fig. 2 is a similar view, showing the bucket in dumping or discharging position. Fig. 3 is a central vertical longitudinal section of the bucket as it appears when loaded and ready to be transferred to its point of delivery. Fig. 4 is a top plan view, partly broken away and in horizontal section. Fig. 5 is a vertical transverse section on the line 5—5 of Fig. 3.

Describing first the body member or scoop, this comprises essentially a metal structure having parallel side walls 6 and 7 and a slightly curved transverse bottom wall 8, which latter is formed with a front beveled cutting edge 9. This structure is preferably variously stiffened and reinforced, the forward portion thereof, which is subjected to the greatest strain, being embraced by a reinforcing plate 10 strongly riveted to the side and bottom walls thereof and having the forward edge thereof merged into the cutting edge of the body. The side walls 6 and 7 are stiffened longitudinally by reinforcing strips 11 and 12 riveted to the inner sides of the upper margins thereof; while the rear vertical edges of the side walls are reinforced by marginal strips 13 and 14. The bottom wall of the bucket body is provided preferably with a series of longitudinal wear strips or runners 15 of increased thickness at their rear ends; and it will be observed by reference to Figs. 2 and 3 that the bottom wall 8 of the bucket extends rearwardly slightly beyond the rear edges of the side walls 6 and 7. Also riveted to the outer sides of the side walls, preferably to the sides of the reinforcing plate 10, are a pair of reinforcing and spacing plates 16, which latter, with the walls to which they are secured, are apertured to form bearings for pivot-pins 17 by which the body is suspended in the vertical arms of a rectangular hoisting bail 18. The side walls are strongly connected between the upper portions of their forward ends by a horizontal channel bar 19 riveted at its ends to the upper edges of said side walls. Reinforcing plates 20, best shown in Fig. 3, are riveted to the inner faces of the side walls 6 and 7 at the forward ends of the latter; and these reinforcing plates, together with the side walls of the bucket-body and external reinforcing plate 10, are formed with

oblique slots 21 engaged by pivot-pins 22, on which are pivoted the inner ends of the longitudinal arms of the draft-yoke 23, thereby giving such yoke a lost motion connection with the bucket.

24 designates the main member or door of the closure which coöperates with the rear open end of the bucket-body. This member is a metal plate of sufficient area to cover the rear open end of the bucket-body and so shaped in vertical cross-section as to conform to and substantially fit the rear upright margins of the side walls of the body. The door 24 is reinforced and strengthened by longitudinal and transverse binding-strips, the lower longitudinal binding-strip 25 being riveted externally to the lower edge portion of the door and, with the latter, being trimmed to a substantial fit upon the rearwardly projecting portion of the bottom wall 8 of the bucket-body. The chief purpose in having the lower edge of the door rest upon the rear edge of the bottom wall of the body is to prevent injury to the lower edge of the door through contact with stones and like obstructions. The upper longitudinal binding-strip 26 (which virtually constitutes an inward extension of the upper edge of the door-plate proper) and the transverse binding strips 27 and 28 are riveted to a pair of suitably trussed or braced side-frames designated as an entirety by 29 and 30, which latter, at their forward ends, are connected to the vertical arms of the hoisting bail through the agency of connecting plates or cleats 31 and 32. The vertical arms of the hoisting bail 18 below the pivots 17 are bent in a forward direction, forming short lever arms 18^a, the lower ends of which are connected by links 33 with the pivot-pins 22 of the draft-yoke 23; and the relation of the parts is such that, when the door is in closed position and the draft-yoke 23 is under tension, the pivot-pins 22 lie just at the advance ends of the slots 21. Hence, the pull of the draft-yoke is exerted directly upon the forward end of the bucket-body at a point causing the forward edge or mouth thereof to tip downwardly, as shown in Fig. 1, and assume a position favorable to the scooping up of the load, while at the same time, through the connection of the links 33 to the lever arms 18^a, which are rigid with the bail arms 18, the door is held securely in its closed position, since it cannot open without at the same time drawing the links 33 rearwardly, as illustrated by Fig. 2.

34 designates the hoisting cable connected through a suitable eye-bolt 35 with the lifting bail 18 centrally thereof, and 36 designates the draft-cable connected through a similar eye-bolt 37 with and centrally of the draft-yoke 23. The lifting bail 18 is preferably pivoted in the sides of the bucket-body at points slightly in advance of the

center of gravity of the latter, although said pivotal points are preferably slightly in rear of the center of gravity of the combined bucket-body and draft-yoke 23. In operation, the bucket having been lowered to its work, the hoisting cable 34 is slackened, and a pull is applied to the draft-cable 36; the cutting edge of the bucket taking hold of the soil, and the forward pull on the bucket causing the same to automatically fill, the load assuming substantially the form and position shown in Fig. 3, in which it piles up against the door 24, during which filling operation the door 24 is held in place against the thrust of the load through the links 33 connected to the draft-yoke 23, as above explained. The bucket is then raised by the hoisting cable 34 and swung to a position above the point of discharge, during which operation sufficient tension is maintained on the draft-cable 36 to prevent premature dumping of the load. As soon as the bucket has been swung directly over the point of delivery, the draft-cable 36 is slackened, and, the center of gravity of the loaded bucket being considerably in rear of the pivot 17, the body of the bucket instantly swings to the dumping or discharging position shown in Fig. 2, thus uncovering its rear end and permitting the load to fall therethrough. The empty bucket is then swung back and lowered to excavating position, whereupon, by slackening the hoisting cable 34 and pulling on the draft-cable 36, the above-described operations of loading, transferring and delivery are repeated.

Preferably the parts are so constructed that as soon as the bucket has discharged its load the bucket-body swings back automatically to closed position because the center of gravity of the combined bucket-body and draft appliance is desirably in advance of the pivotal support of the body. Under these circumstances the operator need pay no attention to the closing of the bucket. In other words, no pull on the draft appliance other than that of its own weight is required to swing the bucket-body closed. When the body is loaded, however, a substantial pull on the cable is necessary to prevent it from opening and discharging its load.

It will be observed that the entire manipulation and control of the bucket is effected solely through the hoisting and draft cables, and without requiring the use of any locks and lock-tripping or releasing devices for maintaining the bucket closed during loading and effecting its dumping or discharge.

Whereas I have herein indicated one particular and preferred embodiment of this invention, I wish to have it understood that the invention is susceptible of a variety of embodiments, and the mechanical elements and features of the bucket herein set forth

may be modified within wide limits without departure from the heart and essence of this invention and without the sacrifice of any substantial benefits and advantages.

I claim:

1. In an excavator bucket, the combination with a bucket-body having a forward cutting edge and an open rear end, of a closure for said rear end mounted on said bucket-body, a draft-member connected to the forward portion of said bucket-body above the center of gravity of the latter, and means connecting said draft-member and closure to hold the latter in closed position under pull on said draft member, substantially as described.

2. In an excavator bucket, the combination of a bucket-body having a forward cutting edge and an open rear end, a bucket-supporting member to which said bucket-body is pivoted, a closure on said supporting member for the rear end of said bucket-body, a draft member connected with said supporting-member and said bucket-body above the center of gravity of the latter and adapted under pull on said draft member to hold the loaded bucket-body in closed relation to said closure and permitting the bucket-body to turn on its pivots to dump its contents upon releasing the pull on the draft member, substantially as described.

3. In an excavator bucket, the combination of a bucket-body having a forward cutting edge and an open rear end, a bucket-supporting member to which the sides of said bucket-body are pivoted, a closure for the rear end of said bucket-body rigidly affixed on said supporting member, and a draft member connected with said supporting member and said bucket-body above the center of gravity of the latter, said draft member under pull thereon acting to hold the loaded bucket-body in closed relation to said closure and permitting the bucket-body to turn on its pivots to dump its contents upon releasing the pull on the draft member, substantially as described.

4. In an excavating bucket, the combination with a bucket-body having a forward cutting edge and an open rear end, of a hoisting bail pivoted to the sides of said bucket-body, a door for closing the rear end of said bucket-body rigid with said hoisting bail, a draft-yoke having a lost-motion connection to the forward end of said bucket-body, and connections between the arms of said draft-yoke and the arms of said hoisting bail below the pivots of the latter, substantially as described.

5. In an excavating bucket, the combination with a bucket-body having a forward cutting edge and an open rear end, of a hoisting bail pivoted to the sides of said bucket-body and having rigid depending extensions below said pivots, a door for closing

the rear end of said bucket-body rigid with said hoisting bail, a draft-yoke having a lost-motion connection to the forward end of said bucket-body, and links pivoted to and connecting the arms of said draft-yoke and the depending extensions of said hoisting bail, substantially as described.

6. In an excavating bucket, the combination with a bucket-body having a forward cutting edge, an open rear end, and side walls slotted at their forward ends, of a hoisting bail pivoted to the sides of said bucket-body forwardly of the center of gravity of the latter and having rigid depending extensions below said pivots, a door for closing the rear end of said bucket-body rigid with said hoisting bail, a draft-yoke pivotally mounted in the slots of said bucket-body, and links connecting the arms of said draft-yoke and the depending extensions of said hoisting bail, substantially as described.

7. In an excavating bucket, the combination with a bucket-body having side walls, and a bottom wall formed with a forward cutting edge and at its rear end extended beyond the rear ends of said side walls, of a closure comprising a door mounted to swing between open and closed positions relatively to the rear end of said bucket, and when in closed position overlying the rear ends of said side walls and at its lower edge resting upon the rear extension of said bottom wall of the bucket-body, a draft member connected to the forward end of the bucket-body above the center of gravity of the latter, and operative connections between said draft member and closure, substantially as described.

8. In an excavator bucket, the combination with a bucket body having a forward cutting edge, an open rear end, and side walls slotted at their forward ends, of a hoisting bail pivoted to the sides of said bucket body forwardly of the center of gravity of the latter and having rigid depending extensions below said pivots, a door for closing the rear end of said bucket body rigid with said hoisting bail, a draft yoke, and links pivotally connected to the depending ends of said hoisting bail and to the inner ends of said draft yoke, the pivot pins connecting such links with said draft yoke being extended through said slots and being disposed above the center of gravity of the bucket when the rear door is in closed position, substantially as described.

9. In an excavating bucket, the combination of a bucket-body having a forward cutting edge and an open rear end and provided on the under surface of its bottom wall with longitudinally-disposed runners extending beyond the rear end of the bucket-bottom, a closure for said rear end mounted on said bucket-body, the projecting ends of said runners acting as a stop for said closure, a draft member connected to the forward portion of

5 said bucket-body above the center of gravity of the latter, and connecting means between said draft member and closure to hold the latter in closed position under pull on said draft member, substantially as described.

10 10. In an excavating bucket, the combination of a bucket-body having a forward cutting edge and an open rear end and provided on the under surface of its bottom wall with a series of longitudinally-disposed runners of increasing thickness from their forward to their rear ends, such runners extending beyond the rear end of the bucket, a closure for

said rear end mounted on said bucket-body, the extending ends of said runners acting as a stop for said rear closure, a draft member connected to the forward portion of said bucket-body above the center of gravity of the latter, and means connecting said draft member and closure operating to hold the latter in closed position under pull on said draft member, substantially as described.

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Witnesses:

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MATTIE B. BLISS.