Sept. 29, 1931. E. H. FUNDOM 1,824,989

EXCAVATING SCOOP

Filed Feb. 7, 1930

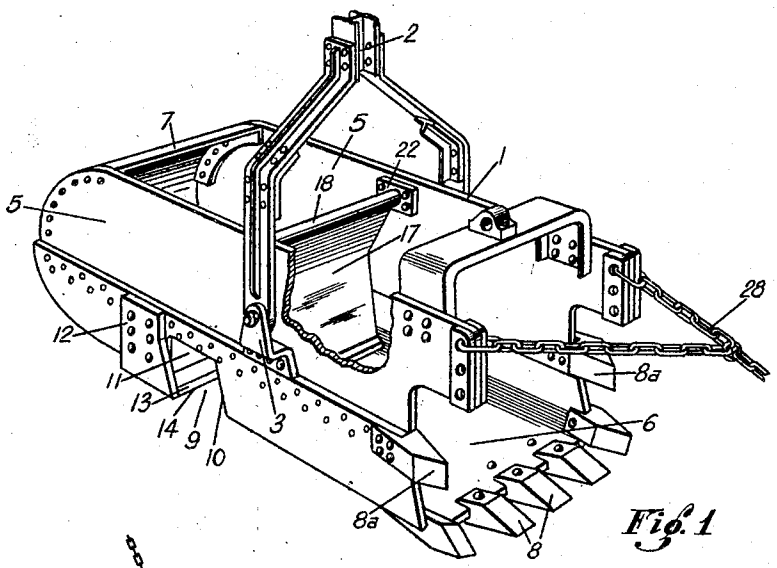



Fig. 1

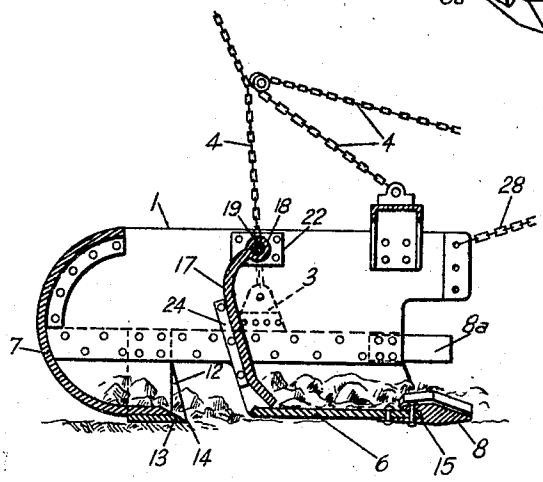



Fig. 2

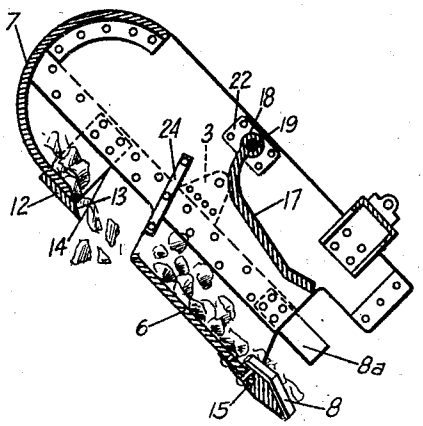



Fig. 3

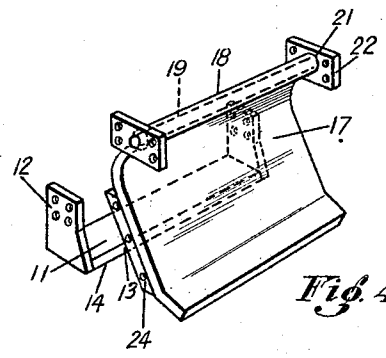



Fig. 4

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# UNITED STATES PATENT OFFICE

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## EXCAVATING SCOOP

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My invention relates to an excavating scoop. It relates more particularly to a scoop having two material-receiving compartments and means adjacent each compartment for penetrating and cutting the material to be excavated.

Most of the present day scoops comprise a body portion provided with teeth attached to the lower forward edge thereof. These teeth serve the function of breaking the material in advance of the scoop, thus facilitating the ready entry of the broken material into the interior of the scoop.

When operating in hard pan, or similar substance, especially in trench work where the trench is narrow-walled and the dipper is precluded from lateral movement, the teeth plow furrows in the hard pan, and with each succeeding stroke tend to reenter the already-formed furrow. It can be seen readily that the dipper teeth will follow the path of least resistance and will, under such circumstances, be rendered useless for digging.

One object of my invention lies in the provision of a scoop having means whereby the furrows plowed in the ground, or hard pan, by the digging teeth on the forward end of the scoop will be removed during each digging operation and a clean digging surface will be presented for each subsequent digging operation.

Another object of my invention lies in the provision of a scoop that may be filled rapidly with a minimum stroke.

Still another object of my invention lies in the provision of an excavator bucket that is provided with a plurality of entries and compartments for the reception of excavated material.

A novel feature of my invention lies in the provision of a cutter plate disposed in the rear of the mouth of said scoop and effective on the material to be excavated at a level below the bottom of the bucket, to cut out the furrows formed by the teeth adjacent the mouth of the scoop and to direct the material forming such furrows into the interior of the scoop.

Another novel feature of my invention lies in the provision of a scoop that is adapted to receive excavated material through the mouth thereof and through an opening disposed in rear of such mouth. The provision of this double entry will allow the scoop to be filled with rapidity, yet the material therein may be discharged freely through the forward open end of the dipper.

Still another novel feature of my invention lies in the fact that I provide, in reality, two compartments separated by a swinging door, each compartment having an entry or a mouth and a material-penetrating means in cooperation therewith, to break up or cut and to facilitate the entry of excavated material thereinto and, in addition, the swinging door forms the rear wall of the forward compartment and precludes the escape of excavated material into the rear compartment during the digging operation. During the emptying operation, the door swings out of position between the two compartments and allows the exit of all material in the second compartment through the forward mouth of the scoop.

Other objects and advantageous features of my invention will be shown and described in the accompanying drawings and the written description wherein similar characters of reference designate corresponding parts and wherein:

Figure 1 is a perspective view showing the preferred embodiment of my invention.

Figure 2 is a longitudinal sectional view showing the scoop during the digging operation.

Figure 3 is a longitudinal sectional view showing the scoop during the emptying operation.

Figure 4 is a perspective view of the cutter

plate, hinged door and door stops removed from the scoop.

With reference to the drawings, I have shown in Figure 1 a scoop 1 that may be pivotally mounted on a dipper stick 2 by means of the brackets 3 disposed on opposing sides of the scoop. The dipper stick 2, in this instance, is shown as having a bifurcated lower portion from which the scoop is hung. The scoop is not limited to a dipper stick mounting but it may be suspended. otherwise, as from the cables, or chains 4, Figure 2, for drag line work. A hauling line 28 may be attached to the forward end of the dipper.

This scoop is preferably formed with side walls 5, bottom 6 and curved rear wall 7, as shown. The top and forward end are preferably open. The lower forward end of the bottom 6 is provided with teeth 8. And the forward ends of the sides 5 are provided with side rake teeth 8*a*. These teeth may be of any type desired.

The bottom 6 of this scoop is provided, adjacent its rear end, with a transverse opening 9. The sides of the scoop adjacent this transverse opening are cut away vertically as at 10. A cutter plate 11, comprising the two vertical brackets 12 and an integrally formed inclined lip 13, terminating in the cutting edge 14, is disposed adjacent this opening 9. The cutter plate brackets 12 may be firmly riveted or bolted to the sides of the scoop.

In Figure 2, it will be noted that the bottom of the scoop is maintained at substantially the same plane throughout its length. The dipper teeth 8 depend somewhat below the bottom of the bucket, that is, the lower faces of the teeth, as at 15, are disposed in a lower plane than the bottom of the scoop. The cutter plate 11 is so disposed that the angling lip 13 thereof extends downwardly to such an extent that the cutting edge 14 will be on line with the lower faces 15 of the teeth 8. If desired, the plate 11 may extend below the level of the faces 15 of the teeth 8.

The interior of the bucket is provided with a swinging door member 17, located approximately at the forward edge of the opening 9. The upper end of this door has a hollow sleeve 18 formed integrally therewith, Figure 4, and a rod as at 19 (shown in dotted line) extends therethrough and is journaled in suitable bearings 21 disposed in the supporting blocks 22 that are mounted on the interior of the bucket walls.

This door forms the rear wall of the forward half of the scoop. It is adapted to swing forwardly only and the stop members 24, which comprise narrow strips of metal, or similar material, are disposed on the inner faces of the side walls 5 adjacent the opening 9, as shown, to preclude the door from swinging rearwardly to obstruct this opening 9. If desired, a strip may be disposed across the bottom of the scoop intermediate the two strips 24 to further aid in limiting movement of the door past this point. The door is preferably hung as near to the forward edges of the opening 9 as possible, it being obvious that the further back the door is positioned, the greater will be the capacity for holding material in the forward end of the scoop.

In operation, the scoop may be attached to an excavating machine in any one of several well known methods, such as by a drag line or a dipper stick, as illustrated. Figure 2 shows the teeth 8 entering the material to be excavated and the letter "A" shows a furrow that is being formed underneath the bottom of the bucket. The cutter plate 11 is penetrating this material in line with the faces 15 of the teeth 8 and is removing this furrow in the manner shown. The excavated material is directed into the rear half of the scoop. The forward half is being filled, as shown, the dirt therein packing against the door 17. It will be seen readily that the excavated material in the forward compartment will be precluded from entering the rear compartment.

When the bucket is dumped, the mouth of the scoop falls forward, as shown in Figure 3, and the excavated material in both compartments falls therethrough. The door 17, since it is pivotally mounted, always tends to hang vertically, and swings out of the way of the material. Thus, the material in both compartments, although taken in at two separate entries, is exuded through the mouth of the scoop. When the material is dumped, the door assumes the position shown in Figure 3 and does not interfere with, or preclude the discharge of material.

If, for any reason, the material should pack in the forward compartment, the mass of material in the rear compartment, falling against the door 17, will assist in forcing the material out of the forward compartment.

It is obvious that drop bottom scoops may be equipped with the cutter plate, it being only necessary to provide the proper opening in the bottom of the scoop. The door 17 could be easily mounted in a scoop of this type and, if desired, it could be provided with the proper means to prevent it from swinging. It would not be absolutely necessary to allow the door to swing, since the excavated material might be allowed to escape only when the bottom of the bucket is dropped.

It would also be possible to mount the cutter plate and swinging door on scoops that are provided with a rear dumping door. Of course, this would mean that the swinging door 17 should swing rearwardly and the rear dumping door could be connected thereto so that they could both be moved simultaneously, or, if desired, a separate means for moving the door could be utilized.

Having thus described my invention, what I claim is:

1. In an excavating scoop, a body portion, material-penetrating means adjacent the mouth of said body portion, a member mounted to swing within said scoop, an opening in the bottom of said body portion in rear of said swinging member and a cutter plate on one wall of said opening.

2. In an excavating scoop, a body portion, a hinged door within said body portion, an opening in the bottom of said body portion in rear of said door and a material-penetrating means extending below a wall of said opening.

3. In an excavating scoop, a plurality of compartments for the reception of excavated material, one of said compartments being disposed behind another and said compartments having openings thereinto and material-penetrating means adjacent said openings.

4. In an excavating scoop, a body portion, a bottom for said body portion, a plurality of compartments in said body portion, an opening into each of said compartments, a swinging door intermediate said compartments and said openings.

5. In an excavating scoop, a bottom having rake teeth, side walls having side rake teeth, and a cutter plate disposed on the bottom of said scoop in rear of said rake teeth.

6. An excavating scoop comprising a body portion having an opening at its forward end and an opening in its bottom intermediate its length, rake teeth on the forward end of said scoop, and a scraper blade carried by a lower wall of the opening which is intermediate the ends thereof.

7. An excavator scoop comprising a body portion having an opening at its forward end and an opening in its bottom intermediate its length, teeth on the forward end of said scoop for producing furrows in the ground, and a blade on a wall of the opening intermediate the length of the scoop for cutting away said furrows.

8. An excavator scoop comprising a body portion having an opening at its forward end, spaced teeth on said forward end, said scoop having an opening behind said forward opening, and a blade on a wall of said rear opening.

9. An excavator scoop comprising a body portion having an opening at its forward end and an opening in its bottom intermediate its length, said bottom being otherwise closed, and a pivoted door within said scoop immediately in advance of said bottom opening.

10. An excavating scoop comprising a body portion having an opening at its forward end, an opening intermediate its length, and a door immediately in advance of said intermediate opening, said door being mounted to swing forwardly so that material taken into said scoop through both of said openings may be discharged through one of said openings.

11. An excavating scoop comprising a body portion having a plurality of openings into which material will pass during the excavating operation, means for maintaining separate compartments in said scoop during such excavating operation, said means being of such structure that the compartments may be converted into one compartment during the dumping operation.

In testimony whereof I, hereby, affix my signature.

EARL H. FUNDOM.