June 10, 1930. H. S. ATKINSON 1,762,946

BUCKET OR GRAPPLE

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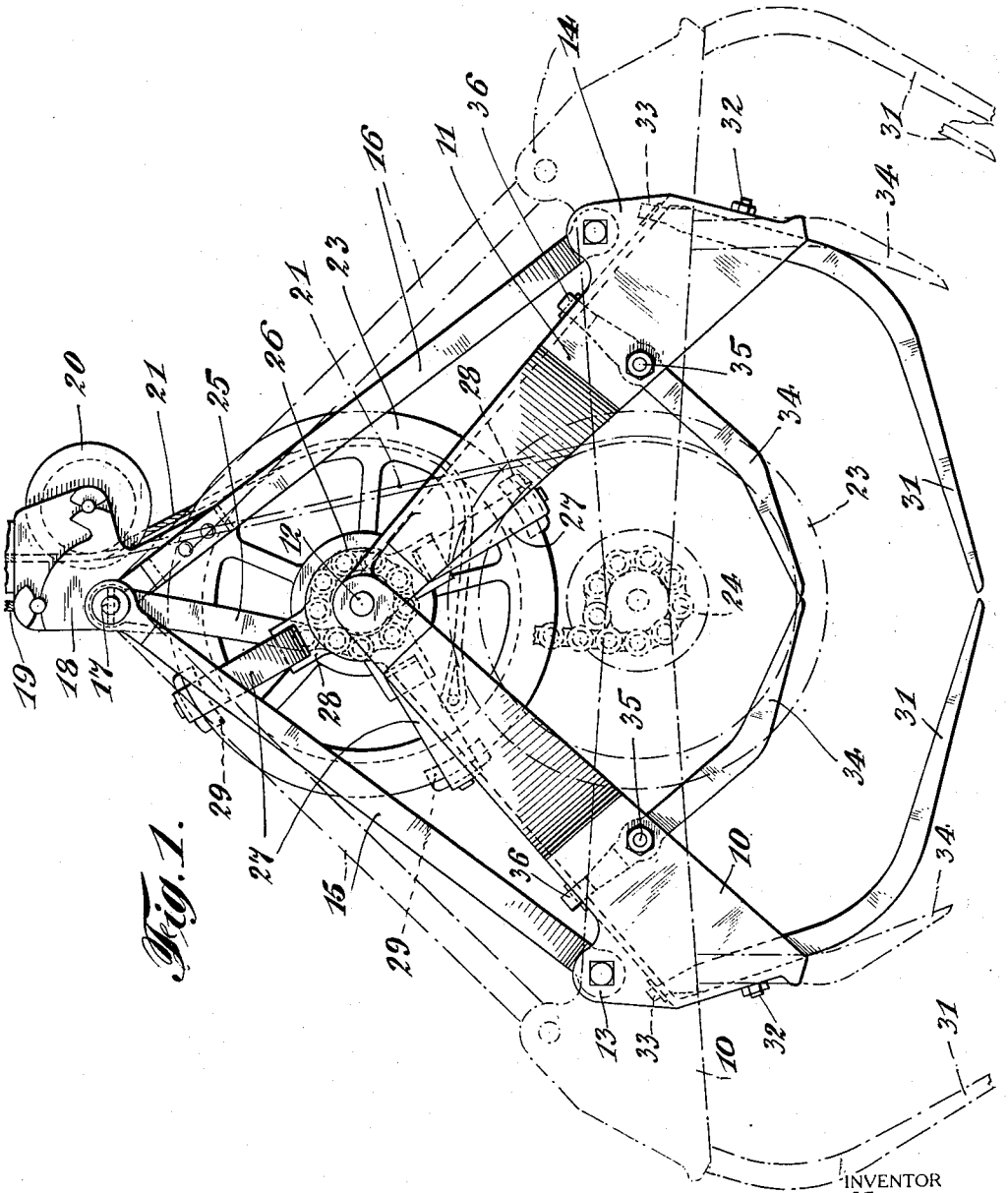


Fig. 1.

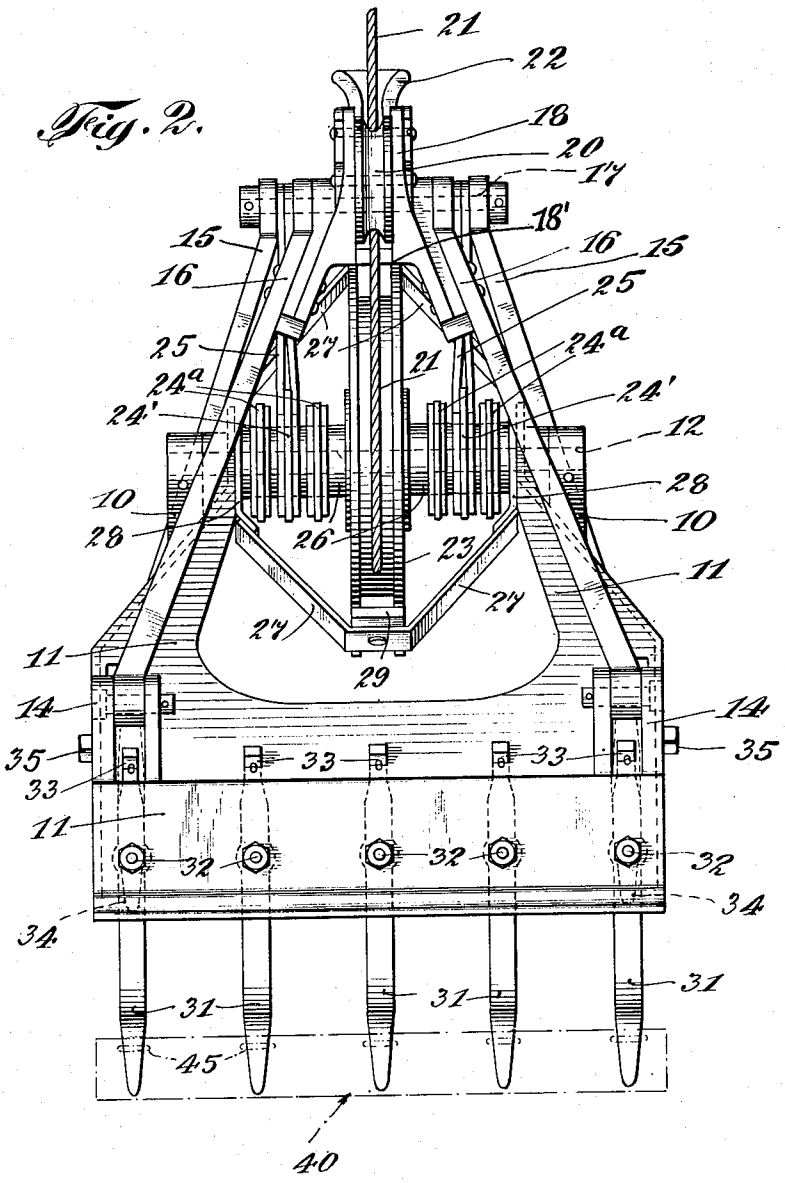
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Fig. 2.



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Fig. 6.

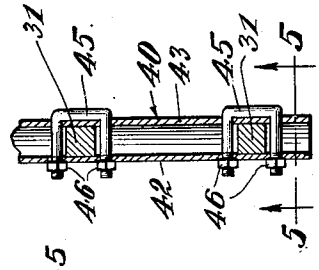


Fig. 5.

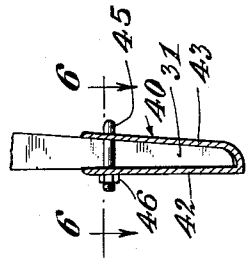


Fig. 3.

Fig. 4.

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Fig. 7.

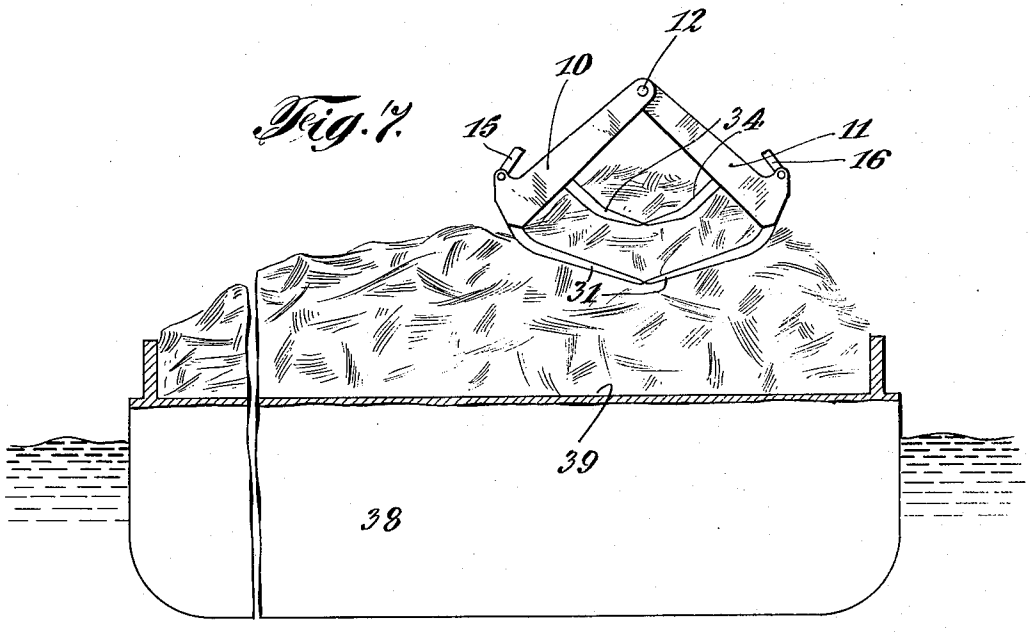
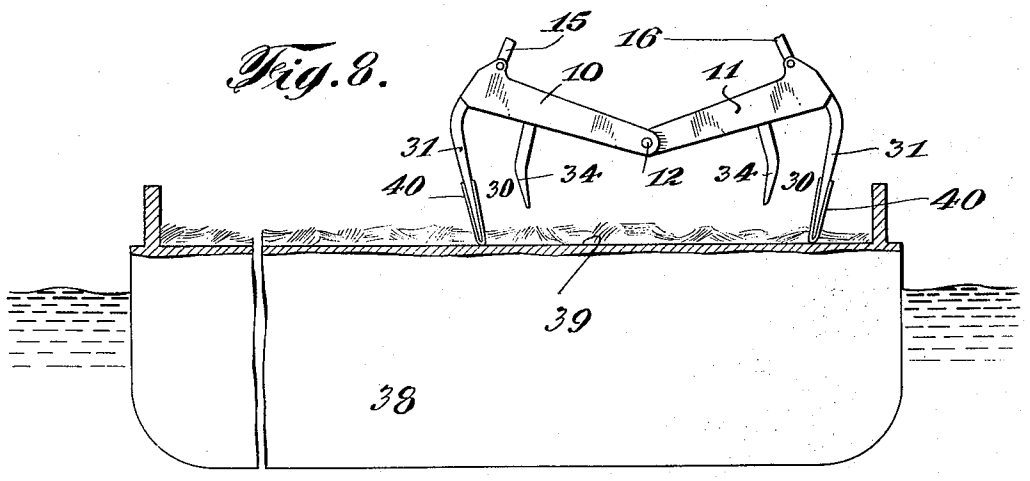


Fig. 8.



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UNITED STATES PATENT OFFICE

HERBERT S. ATKINSON, OF EAST ORANGE, NEW JERSEY, ASSIGNOR TO THE HAYWARD COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

BUCKET OR GRAPPLE

Application filed June 4, 1926. Serial No. 113,683.

This invention relates in general to handling devices and in particular to buckets or grapples adapted for handling manure or like material.

The invention comprehends the provision of a device of the above character embodying means for opening and closing certain co-acting sections, said sections being operatively connected to material-handling means in the form of tines.

Another feature of the invention resides in the provision of a plurality of tines connected to said coacting sections in a manner to permit their placement, adjustment, and removal with the least possible loss of time.

A further object is to provide means in the form of shoes which may be attached to the points of said tines and thus permit the functioning of the device in a manner similar to the clean-up bucket.

The invention is further featured by an improved construction wherein the work of loosening the material is facilitated and made more rapid in the transferring of said material according to the attendant circumstances.

Further objects and advantages of my invention will become apparent as the description proceeds, and in order that the same may be better understood, reference is had to the accompanying drawings forming a part of this specification.

In said drawings:

Figure 1 is a side elevation of the device embodying my invention, an open position thereof being indicated in dot-and-dash lines.

Figure 2 is an end view of the same to clearly illustrate the connection between certain co-acting sections and tines, the shoe-member hereinbefore referred to being shown secured to the tines.

Figure 3 is a view like unto Figure 1, but depicting the sections in substantially full open position.

Figure 4 is a perspective detail of the shoe-member

Figure 5 is a sectional detail taken substantially on the line 5—5 of Figure 6, to show the connection between one of the tines and said shoe-member.

Figure 6 is another sectional detail taken on the line 6—6 of Figure 5, further illustrating the connection shown in said Figure 5.

Figure 7 somewhat diagrammatically illustrates an operation of the device, the co-acting sections in this figure having approached one another to a point to cause certain tines to be firmly embedded in the material handled and ready for transfer to another point.

Figure 8 illustrates the device equipped with shoe-members and performing the operation of cleaning the deck of a scow or the like, of the material remaining thereon after the operation of the tines.

The essential parts of my device comprise the sections 10 and 11 pivotally connected together by the shaft 12, and on inspection of Figure 2 it will be observed that said sections are each provided with a pair of spaced lugs 13 and 14 at their outer ends, for pivotally receiving the ends of the connecting bars 15 and 16, there being two bars for each section, the upper ends of said bars being inclined and connected to a common pivot 17.

Disposed between the upper ends of said bars 16 is a filler block 18, to which is connected the supporting line 19 (see Fig. 3), said block having a side extension which is bifurcated to pivotally receive an idler 20 which engages the operating rope 21, entering through the guide thimble 22. From this point said operating rope 21 continues downwardly, where it is connected to the circumferentially grooved power wheel 23, mounted on said power shaft 12.

In this particular instance I prefer to operatively connect said pivot 17 and said power wheel 23 through the medium of a pair of flexible members 24, in the form of a chain, the upper ends thereof being secured to a suspending rod 25, connected to said pivot 17, its other extremity being connected to the hub 26 of said power wheel. Each of said chains consists of a duplex section 24^a and a single section 24′, so constructed that when the power wheel has made one complete rotation, as in the closing of the device, the said sections will each wrap completely around the hub without such sections overlapping, as will be well understood by those

skilled in the art, and as fully shown and described in my Patent No. 906,184, of December 8, 1908.

As clearly shown in Figure 2, I have provided a rope guard having spider-like arms 27, their inner ends being secured to a web portion 28 mounted on said power shaft 12. Each of the arm portions is provided with a shoe 29, which extends part of the way into the circumferential groove arranged in said wheel 23 for a purpose well understood, and which is also fully shown and described in my said patent already referred to.

The essential features of the main operative portion of my device having now been described in detail, I direct particular attention to certain features of my invention associated with said sections 10 and 11. I now refer to the tine-members, denoted generally by the numeral 30, and point out that due to the structure of said sections, which consist of solid or single-piece members, arranged as shallow scoops with side portions, tops, and rears especially adapted to receive my tine-members, I am enabled to secure a two-point connection between said sections and tine-members and thus am assured of a rigid and secure connection. For instance, let us consider the outer tines 31 and observe that they are arcuately disposed, having their upper ends arranged within the rear portion of the sections and bolted thereto, as shown at 32, while their extreme tips are reduced and pass through apertures in the top of said sections and are there pinned as indicated at 33. The lower portion of said tines have their outer edges tapered gently to facilitate their insertion into a mass of material. The inner tines 34 are similarly secured to the sections, being bolted to the sides of the sections as at 35 and their upper ends also piercing the tops of the sections and pinned as shown at 36. While the inner tines naturally function as such, they really serve as stays in that they are only placed on both sides of the sections (see Fig. 2); and when the device is in closed position, as shown in Fig. 1, they materially assist in the retention of the material which might otherwise break away from the mass.

It will also be noted that, as shown in Fig. 2, the lower portion of the filler-block 18 constitutes a stop, as at 18′, to limit the upward movement of the power wheel 23, and that this, in turn, limits the closing movement of the tines and prevents their striking when the sets come together.

The illustration in Figure 7 diagrammatically shows a scow 38 carrying a quantity of material to be handled, and it will be noted that my device is now in what may be termed "closed position," the tines have pierced a mass of material about to be transported to some convenient point. The value of the inner tines 34 will at once become apparent, in spite of the inherent cohesion of this type of material.

Obviously the removal of the material as shown in Figure 7 may be continued to a point extremely close to the deck 39 of said scow, but in view of the somewhat sharpened points of the tines, it is quite apparent that some means of protection should be provided in order to prevent damage to said deck by the digging-in action of said tines.

To obviate this danger, I provide a shoe-member 40, formed preferably from a single sheet of material and bent upon itself to form the structure illustrated in Figure 4. The inner face 42 is made substantially straight, while the rear face 43 is inclined upwardly from the bight portion, said portion being gently curved and blending with said inner face 42 to conform to the general configuration of the lower portion of said tines 31. The upper portion of the shoe-member is provided with a plurality of apertures 44, arranged in pairs, for the reception of U-bolts 45, the leg portions thereof straddling each of the outer tines 31 and firmly locking the shoe-member over said tines through the medium of nuts 46, as clearly shown in Figures 5 and 6.

When these shoe-members are disposed over the points of said tines 31, a relatively wide scraping area may be covered and due to the ability of the device to assume an extremely large open position, it becomes quite apparent that a deck may be quickly and neatly scraped of its surface material.

What I claim is:

1. The combination with a grapple having pivoted scoop sections each comprising one-piece members including side, rear and top portions, of a plurality of tine-members depending from the rear portions of said sections and having their upper ends secured to said rear portions and their tips attached to said top portions, and a second set of tine-members arranged inwardly of the first-mentioned tine-members and having their upper ends secured to said side portions and their tips attached to said top portions.

2. In a device of the character described, a pair of opposed pivoted one-piece scoop sections each embodying side, top and rear portions, operating mechanism for opening and closing said sections and a plurality of tine-members depending from the said rear portions and having their upper ends secured thereto and their tips passing through apertures formed in said top portions.

3. In a device of the character described, a pair of opposed pivoted sections, a series of arcuately disposed tine-members depending from said sections and a shoe-member conforming to the configuration of the said tine-members and adapted to envelop the depending portions thereof.

4. In a device of the character described,

a pair of opposed pivoted sections, a series of tine-members depending from said sections and a shoe-member conforming to the configuration of said tine-members and adapted to envelop the depending portions thereof to convert the same into structurally unitary scraper-members.

5. In a device of the character described, a pair of opposed pivoted sections, a series of tine-members depending from said sections, a shoe-member conforming to the configuration of said tine-members and adapted to envelop the depending portions thereof and means for locking said shoe-member over said tines to convert the same into structurally unitary scraper-members.

HERBERT S. ATKINSON.