March 25, 1947. R. S. HOAR 2,417,822

WHEELED SCRAPER

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Fig. 1.

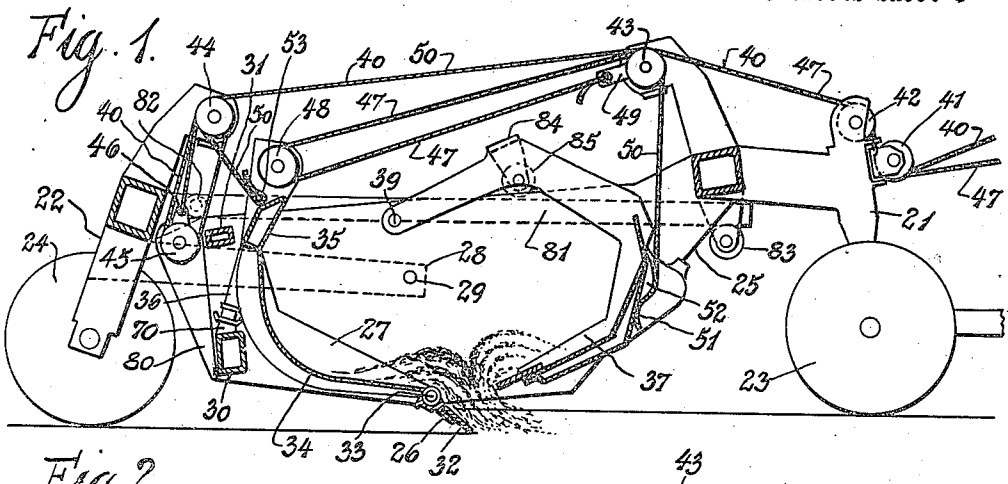


Fig. 2.

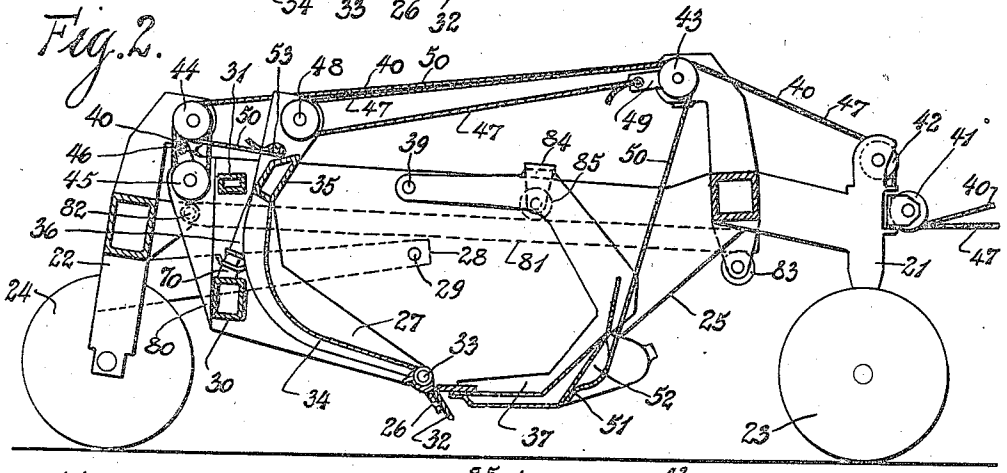
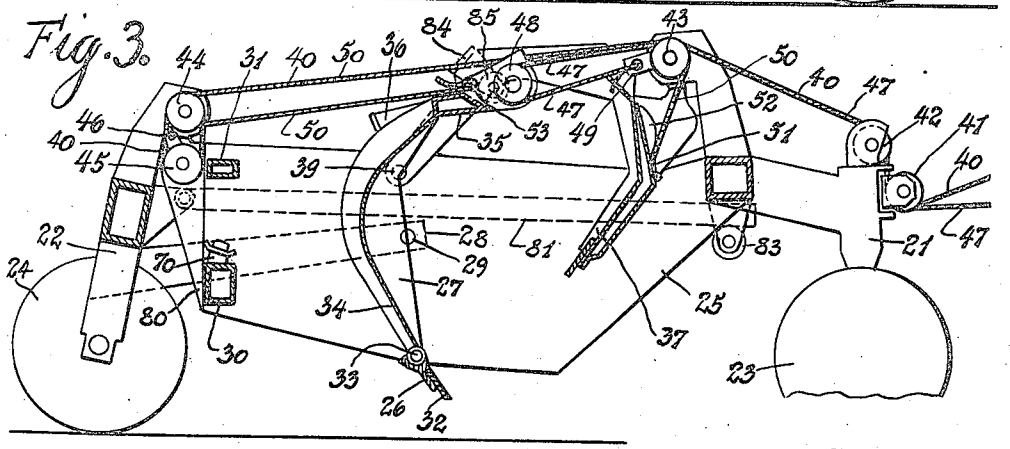


Fig. 3.



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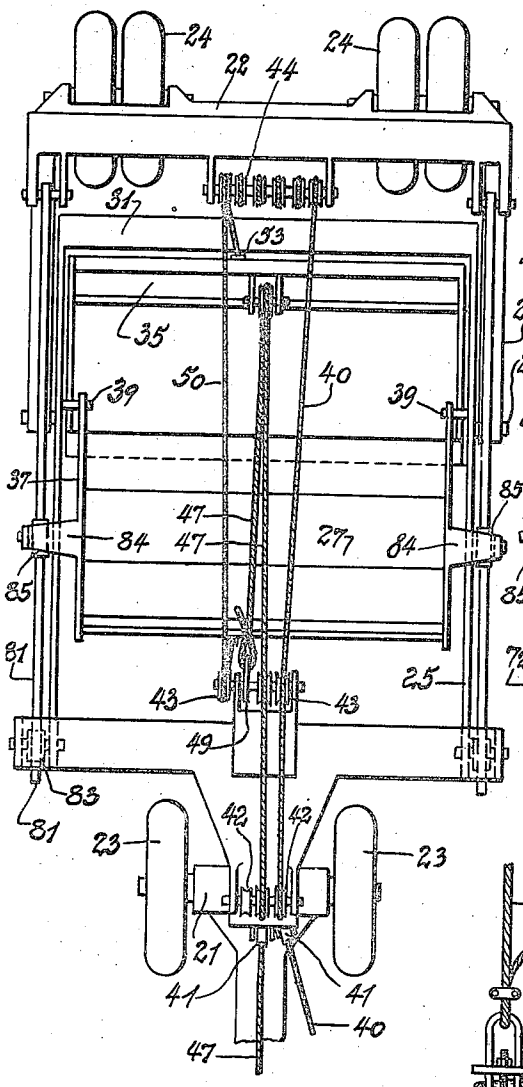


Fig. 4.

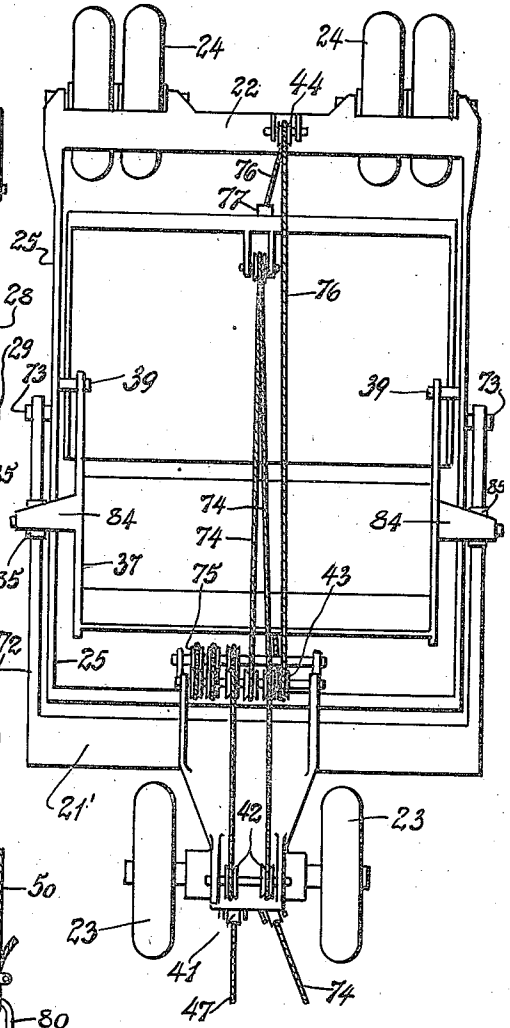


Fig. 8.

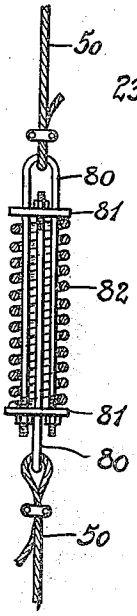


Fig. 9.

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Fig. 5.

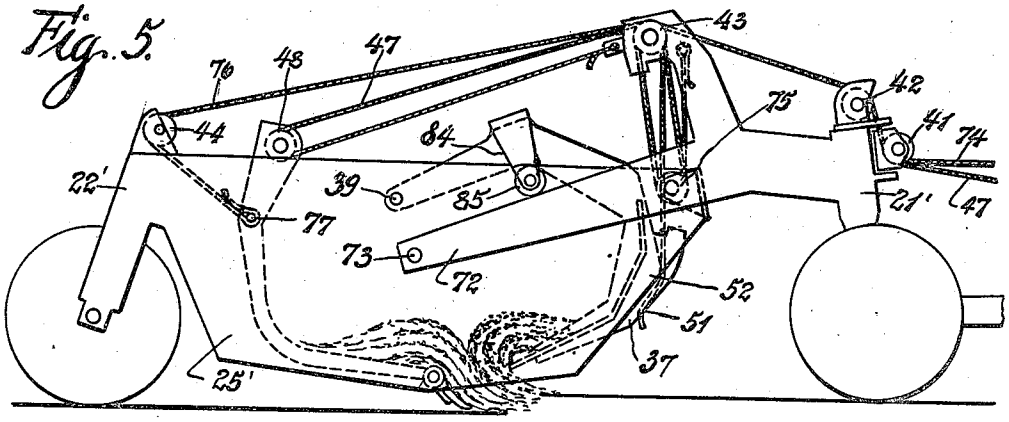


Fig. 6.

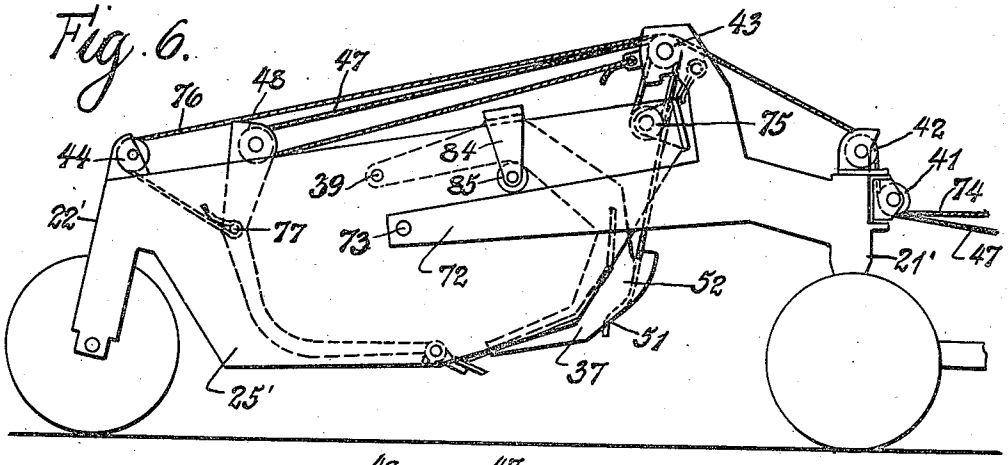
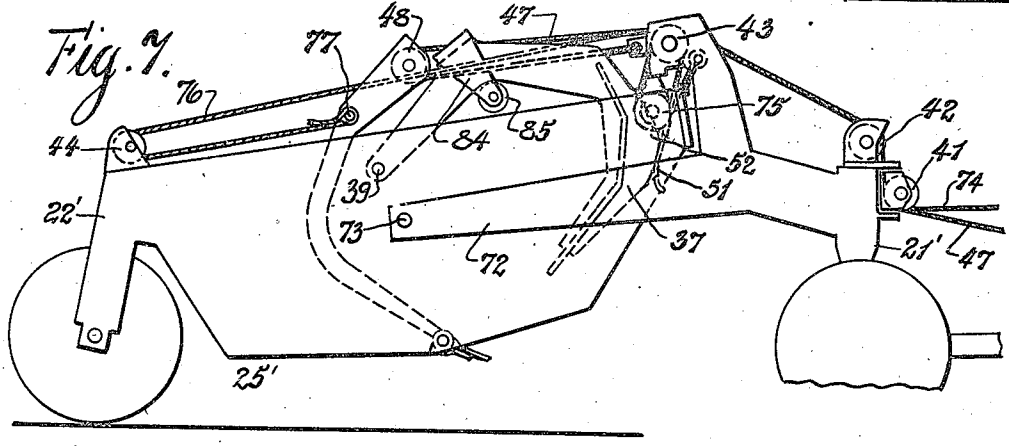


Fig. 7.



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Patented Mar. 25, 1947

2,417,822

UNITED STATES PATENT OFFICE

2,417,822

WHEELED SCRAPER

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Application January 17, 1944, Serial No. 518,503

8 Claims. (Cl. 37—126)

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My invention relates to new and useful improvements in wheeled scrapers of the general type shown and described in U. S. Patent No. 2,152,899, granted April 4, 1939, to Earl B. Maloon, to which patent reference is hereby made, inasmuch as this present invention represents an improvement thereon. Reference is also made to my copending U. S. Patent No. 2,387,263, granted October 23, 1945.

In scrapers of the general type covered by those two patents the bowl fills and dumps at its front end.

The main frame of such a scraper is pivoted at either its front end or rear end to a wheeled truck, and the digging and spreading depth is determined by raising or lowering the other end with respect to a second truck. This is the first operating function.

In Maloon and in one of the variants of this present invention, the pivoting is at the front end, and the raising and lowering takes place at the rear end; but this, although advantageous, is not essential—witness the variant of Figures 5, 6, 7 and 8 hereof.

The digging blade is carried rigid with the main frame, though this is not essential.

Adjacent the digging blade is pivoted a dirt-extruding curved member, variously termed. For conformity with the nomenclature of the Maloon patent, it will be called a "bowl" in my specification; although in my claims, to avoid any implication that this member is necessarily bowl-shaped, I shall call it a "dumping element." Swing this bowl upward to dump is the second function.

Returning it to load-carrying position is the third function.

There is also a front closure, known as the "apron." Opening this apron (when digging or dumping), and closing it again for carrying, is the fourth function.

Maloon has two controls (ropes), one of which performs the first function namely depth-control), and the other of which successively performs the fourth function (apron opening) and the second function (dumping). For the third function (bowl return), Maloon depends on gravity, although in another patent (No. 2,198,916, granted April 30, 1940), he performs this function by a kick-back cam, actuated by the fall of the apron.

It is the principal object of my present invention to employ two controls, one of which performs the first function (depth control), and the other of which performs the second function

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(dumping), and to provide actuating connections between bowl, main frame and apron, whereby either the forward motion of the bowl to dump, or the lowering of the digging edge, will perform the fourth function (apron opening).

A further object of my present invention is to utilize one of these actuating connections to perform the third function (bowl return), thus constituting an improvement over the apparently somewhat similar bowl return means of U. S. Patent No. 2,304,076, granted December 8, 1942, to Trevor O. Davidson and myself.

In addition to my principal objects, above stated, I have worked out a number of novel and useful details, which will be readily evident as the description progresses.

My invention consists in the novel parts and in the combination and arrangement thereof, which are defined in the appended claims, and of which two embodiments are exemplified in the accompanying drawings, which are hereinafter particularly described and explained.

Throughout the description, the same reference number is applied to the same member or to similar members.

Figures 1, 2 and 3 are vertical longitudinal sections of one form of my scraper, in digging, carrying, and dumping positions respectively.

Figure 4 is a plan view of this variant.

Figures 5, 6, 7 and 8 are corresponding views of a second variant.

Figure 9 is a slightly enlarged plan view of a slack-take-up device employed by me in certain of my control ropes.

Referring now to Figures 1 to 4, we see that the implement to which I have applied my invention, includes a forward truck 21, and a rear truck 22, supported respectively on two forward wheels 23, and four rear wheels 24. In my claims I shall refer to the forward wheels as the "forward ground support," and to the rear wheels as the "rear ground support," without intending thereby to be limited to wheels as a means of ground support. The forward truck 21 is rigidly secured to two side plates 25, preferably having substantially the outline indicated in Figures 1 to 4. Rigidly secured to the side plates 25, I provide a transverse lower beam 30, and an upper beam 31, which latter beam may if desired be made of lighter construction than the lower beam. Projecting rearwardly from beams 30 and 31 are sheave-supporting brackets 80.

These parts constitute parts of the frame of the implement, and in accordance with the invention they are connected together in such a way as

to enable the shoe 26, which is located forward of the bowl 27, to be raised or lowered at will with respect to the ground level. In order to accomplish this, the rear truck 22 is preferably provided with rigidly forwardly projecting side arms 28 that extend forwardly to a point about midway between the two trucks, at which point the arms 28 are connected by pivot pins 29 to the side plates 25. These plates and rigidly associated parts constitute my main dirt container, and will be so called in the claims, although it is evident that this container requires the cooperation of the bowl and apron (to be hereinafter described), in order to contain dirt.

The shoe 26 is preferably rigidly secured at its ends to the side plates 25, and preferably includes an inclined blade 32 that cuts into the earth when the bowl 27 is being filled. Adjacent the shoe and preferably at its rear edge, the bowl 27 is pivotally mounted on a transverse pivot bar 33.

The rear end of the bottom plate 34 of the bowl 27 is preferably bent upwardly to form an integral dished rear head 35 for the bowl.

When the bowl 27 is in the position of rest as indicated in Figures 1 and 2, the stop bracket 36, carried by the rear end of the bowl, rests against a bumper block 70 on the upper side of the lower beam 30, and this limits the downward movement of the rear end of the bowl.

To catch some of the dirt during digging, to hold the dirt in the bowl 27 and between the side plates 25 during carrying, and to assist in the discharge of the dirt during dumping, I employ an apron 37, pivotally supported on plates 25 by pivot pins 39.

In this particular variant of my invention, I employ two control ropes, the reeving of which will now be described, still with reference to Figures 1 to 4.

Rope 40 controls the first listed function, namely depth-control. It passes, from a winch (not shown, preferably mounted on the tractor which pulls my scraper), under one of fairlead sheaves 41, over one of fairlead sheaves 42, over one of sheaves 43, and several times around sheaves 44, on the rear truck 22, and sheaves 45 on the brackets 80. Thence it passes to an anchorage 46 adjacent either sheaves 44 or sheaves 45; as shown, it is adjacent the latter. Drawing-in on this rope 40 draws sheaves 44 and 45 together, as shown in Figures 2 and 3, thus raising the digging blade 32.

Rope 47 controls the second listed function, namely dumping. It passes, from the winch (not shown), under one of fairlead sheaves 41, over one of fairlead sheaves 42, over one of sheaves 43, around sheave 48 on the top of the bowl 27, and back to an anchorage 49 adjacent sheaves 43. Drawing-in on this rope 47 draws sheaves 43 and 48 together, thus tilting the bowl 27 from its carrying position as shown in Figures 1 and 2, to its dumping position as shown in Figure 3.

Rope 50 is one of the two actuating connections which control the fourth function, namely apron opening. It passes, from an anchorage 51 on the apron 37, over a grooved direction-changing cam 52 on said apron, thence over one of the sheaves 43, thence around one of sheaves 44, to an anchorage 53 on the rear top of the bowl 27. The result of this reeving is that whenever the bowl 27 is tilted forward to dump (thus widening the gap between sheaves 44 and anchorage 53), the tension thus imparted to rope 50 will raise the apron 37, as shown in Figure 3.

A by-product of this rope 50 is that the weight of apron 37, acting on that reach of rope 50 which is dead-ended to the apron at 51, will cause the tension in the reach which extends from sheaves 44 to anchorage 53, to tend to return the bowl to its dirt-receiving position after dumping. In this respect it acts somewhat similarly to the kick-back cam of the second Maloon patent already alluded to herein.

The second actuating connection is as follows. Along each side of my scraper extends a bar 81, pivoted to the rear truck 22 at 82, and sliding on roller 83, depending from front truck 21. In my claims, I shall generically refer to roller 83 as a "slide." Apron 37 has on each side a hooked bracket 84, overhanging side plate 25, and carrying a roller 85, which engages bar 81.

When the blade 32 is lowered into the digging position shown in Figure 1, by the slackening of rope 40, the engagement of rollers 85 with bars 81, opens the apron 37, slightly, as shown in Figure 1.

If desired to vary the extent of opening, to suit digging different classes of material, either rollers 83 or rollers 85 could be made adjustable in any obvious manner.

It should be noticed that neither interlock interferes with the other, nor do they cooperate under any given set of circumstances.

Let us now consider my second variant, namely that of Figures 5 to 8.

This present variant is similar to my first variant, namely that of Figures 1 to 4, except that in this present variant the main bowl pivots about the rear wheels rather than about the front wheels.

Side plates 25' are built integral with rear truck 22'. Arms 72 extend rearwardly from front truck 21', to pivots 73 on the side plates.

Rope 74 performs the functions of rope 40 of the first variant. It passes, from a winch (not shown, preferably mounted on the tractor which pulls my scraper), under one of the fairlead sheaves 41, over one of the fairlead sheaves 42, several times around sheaves 43 on the front truck 21' and sheaves 75 at the front end of side plates 25', to an anchorage.

Rope 76 performs the functions of rope 50 of the first variant. It passes from an anchorage 51 on the apron 37 over a grooved direction-changing cam 52 on said apron, thence over one of sheaves 43, thence over sheave 44 to an anchorage 77 on the rear of bowl 27.

Rope 47 and its associated sheaves and anchorages remain unchanged. But in this variant, roller 85 bears on arm 72.

We come now to my slack-take-up device of Figure 9.

Rope 50 of the variant of Figures 1 to 4, and rope 76 of the variant of Figures 5 to 8, are fixed-length ropes. Accordingly, were it not for the further feature which I am about to describe, considerable slack would be introduced into these respective ropes in Figures 1 and 5. While not fatal to operativeness, the presence of this slack would be undesirable for various reasons. Accordingly, optionally, I propose to insert in a gap of each of these two ropes some sort of slack-take-up device, such (for example, but not necessarily) as that shown in Figure 9, and which will now be described.

Each severed end of the rope 50 is shown attached to the loop of a U-bolt 80, the feet of each U-bolt being attached to a plate 81 which slides on the other U-bolt. Surrounding the two U-bolts 80, which serves as a core for it, and

constrained at its ends by the plates 81, is a spiral compression spring 82.

This spring is just merely strong enough to expand to take up slack in the rope 50 (or 76). When any real tension is put into rope 50, as in Figures 2 and 3, or into rope 76, as in Figures 6 and 7, the spring 82 contracts to its limit, and thereafter the rope in question acts as a tension unit, as though this take-up device were not in it.

Having now described and illustrated two forms of my invention, I wish it to be understood that my invention is not to be limited to the specific form or arrangement of parts herein described and shown, except insofar as required by limitations in my claims.

I claim:

1. In a scraper, having: front and rear ground supports; a main dirt container, pivotally supported at one end on a horizontal axis by one of these ground supports, and by the other ground support in such manner that its free end may be raised and lowered with respect to said other ground support; a transverse digging blade, carried by the main dirt container; a dumping element, carried by the main dirt container, and capable of being moved forwardly to extrude dirt from the main dirt container; a raisable apron, carried by the main dirt container, and adapted when lowered to prevent forward spillage of dirt from the main dirt container; means to raise the free end of the main dirt container, and thereby the blade; and means to move the dumping element forwardly, so as to cause it to extrude dirt; the combination therewith of: apron-opening means, operatively connecting the dumping element to the apron in such manner that thereby the forward moving of the dumping element to extrude dirt will raise the apron; and distinct apron-opening means, comprising an element carried by the apron and a cooperating element supported by the ground supports a substantially fixed distance above the ground, whereby the engagement of these two elements will raise the apron relative to the main dirt container whenever the free end of the main dirt container is lowered.

2. A scraper according to claim 1, further characterized by the fact that the element supported by the supports at a substantially fixed distance above the ground comprises a substantially horizontal bar, supported by both ground supports.

3. A scraper according to claim 1, further characterized by the fact that the element supported by the supports at a substantially fixed distance above the ground comprises a substantially horizontal bar, supported by both ground supports; and that the apron-carried element which engages it is a roller, carried by a hooked bracket on the apron, which bracket overhangs the side of the main dirt container.

4. A scraper according to claim 1, further characterized by the fact that the element supported by the supports at a substantially fixed distance above the ground comprises a substantially horizontal bar, pivotally supported by and adjacent to one ground support, and resting on a slide supported by and adjacent to the other ground support.

5. A scraper according to claim 1, further characterized by the fact that it is the rear ground support which pivotally supports one end of the main dirt container; that the front ground support carries, rigid therewith, two rearwardly extending arms pivoted to the sides of the main dirt container; and that the second apron-opening means comprises said arms plus elements carried by the apron and engaging said arms.

6. A scraper according to claim 1, further characterized by the fact that it is the rear ground support which pivotally supports one end of the main dirt container; that the front ground support carries, rigid therewith, two rearwardly extending arms pivoted to the sides of the main dirt container; and that the second apron-opening means comprises said arms plus rollers carried by hooked brackets on the apron, which brackets overhang the sides of the main dirt container.

7. A scraper according to claim 1, further characterized by the fact that the first actuating means comprises: a tension member, and means to take up slack in said member whenever the apron is raised by the second actuating means.

8. A scraper according to claim 1, further characterized by the fact that the first actuating means comprises: a rope attached to the dumping element; a rope attached to the apron; and a spring connecting the two ropes.

ROGER SHERMAN HOAR.

REFERENCES CITED

The following references are of record in the file of this patent:

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