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APRON MOVEMENT FOR CARRY TYPE SCRAPERS

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2 Sheets-Sheet 2

Fig 4

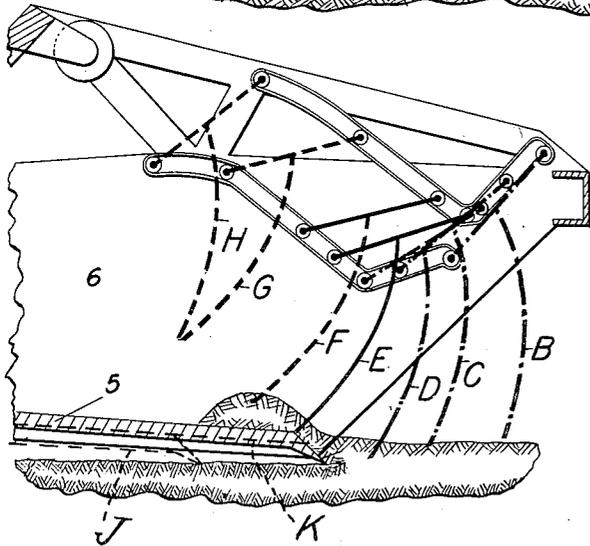
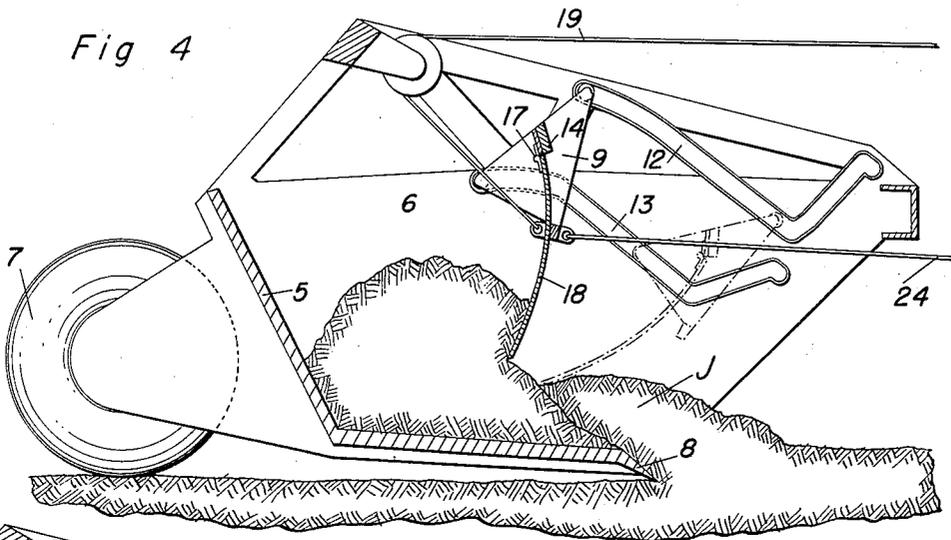


Fig 5

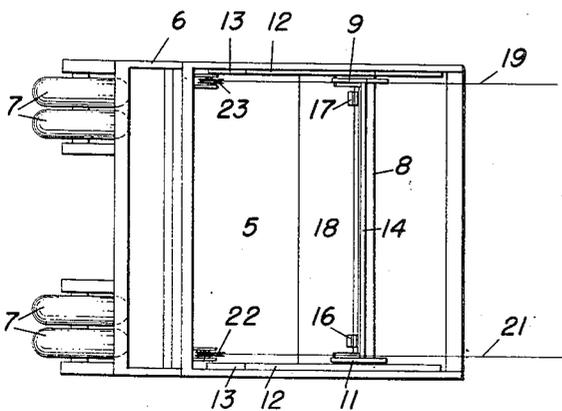


Fig 6

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APRON MOVEMENT FOR CARRY TYPE SCRAPERS

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2 Claims. (Cl. 37-126)

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This invention relates to improvements in apron movement for earth movers.

The principal object of this invention is to provide means for moving earth onto the carrier of an earth mover in such a manner that the piling up of the earth on the carrier is materially assisted, thus eliminating a large amount of the power required to move the earth mover as a whole over the ground.

A further object is to produce a device of this character which may be attached to and used with the ordinary earth mover without materially altering its construction.

A still further object is to provide means whereby the apron blade may be actuated forwardly and rearwardly while the earth mover is progressing over the ground.

Another object is to produce a device of this character which is economical to manufacture, simple to use and in which the parts will not become easily deranged.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same,

Fig. 1 is a side elevation of an earth mover partly in cross section and showing my device applied thereto, the blade being in retracted position.

Fig. 2 is a similar view showing the blade in carrying position.

Fig. 3 is a cross sectional view taken on the line 3-3 of Fig. 2 and on a reduced scale.

Fig. 4 is a view similar to Fig. 1 showing the blade in advanced position.

Fig. 5 is a diagrammatic view showing the various positions the blade assumes from its retracted position to its forward position, and

Fig. 6 is a top plan view taken on a reduced scale.

In the moving of earth on a large scale it has been the generally accepted practice to employ heavy duty scrapers which consist of a wheeled structure having a carrier which is provided with a digging plate so that when the carrier is lowered to scraping position this plate bites into the earth, and as the carrier moves forwardly the earth is scooped up into the carrier, the earth tumbling as it is shoved rearwardly into the carrier.

As the earth commences to accumulate in the carrier the power required to move the carrier materially increases until the carrier frequently becomes stalled before it has received a full load.

It, therefore, becomes necessary to use a bulldozer or other traction means to assist in pushing or pulling the carrier to further fill the blade.

Applicant has, therefore, devised a blade (which at the present time is merely used to hold

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the load in the carrier during transportation), which blade assists in moving the earth into the rear of the carrier so that the digging point can load more earth thereinto without the resistance of the previous earth which has piled up within the carrier, and by actuating the blade back and forth during the forward movement of the carrier the earth elevated by the digging action of the carrier will be continuously pushed rearwardly out of the way of the incoming earth, thus reducing the resistance and consequently the power required to move the carrier as a whole over the ground.

After the carrier has been fully loaded, the blade can then be placed at a position to hold the dirt within the carrier while the same is being transported to a distant point.

In the accompanying drawing wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 5 represents the carrier of an earth mover designated as a whole by the numeral 6.

The customary ground engaging wheels are shown at 7.

The carrier has a forward cutting edge 8 which when lowered bites into the ground and scoops up earth into the carrier as shown at "A" in Fig. 1.

The device as a whole is moved over the ground under its own power, or by being pushed or pulled by an independent tractor.

It is customary to provide a blade which may be dropped down against the forward edge 8 for the purpose of carrying earth to a remote point and to prevent the earth from spilling out of the carrier.

The arrangement thus far described is common to all earth movers and my improvement consists in providing a blade which will also act as a drag for the purpose of assisting in moving the carrier toward the blade and thereby causing the top layer of earth to be banked up against the blade and to be received on the carrier.

Referring to Figs. 1 and 3, it will be noted that I have provided a pair of plates 9 and 11 which are supported in opposed tracks 12 and 13 through the medium of rollers mounted on the plates 9 and 11.

Extending between these plates is a spreader bar 14 to which is hingedly secured as at 16 and 17 a blade 18.

Drag lines 19 and 21 are reeved over pulleys 22 and 23 respectively and have one end connected to an eye secured to the forward edge of the plates 9 and 11 respectively, and their other ends are in turn connected to the winch of the power unit.

Retrieving lines 24 are connected to eyes formed on the rear of the plates.

The operation of my device is, as follows:

Assuming that a digging operation is about to commence, the initial digging of the forward

edge 8 will lift earth into the carrier, which earth will pile up, as shown at "A" in Fig. 1, tending to resist the further movement of earth into the carrier and thus adding to the tractive effort of moving the carrier over the ground.

As previously stated the lines 19 and 21 extend to the power unit, that is to the winding drum of a tractor. By actuating this drum tension is exerted on these lines to the effect, assuming that the carrier is about to be moved through a forward step, that the blade 18 which is then in the position shown at B in Fig. 5 is first drawn downwardly through the positions shown at C and D in that Figure and thus penetrates the upper layer of earth and anchors the blade 18 in the earth. At this time the forward edge 8 of the carrier is spaced, as shown well rearwardly of the bottom earth engaged edge of the blade 18. Since the blade is engaged in undisturbed earth any further pull on the lines 19 and 21 will cause movement of the carrier forwardly towards the blade 18 and in this forward movement the portion 8 will pare off a layer of earth which will mound up on the front of the carrier. When the carrier reaches the position shown in full lines in Fig. 5 the earth between the carrier and the blade at D will have so loosened that the blade will no longer be anchored but the carrier will lessen its forward movement and the blade will move through the positions E, F, G and H thus pushing earth into the carrier.

By an inspection of Figure 5 it will be seen that there is a downward movement through the positions B, C and D. During this time the forward end of the member 9 travels downwardly as does the rear and lower end of that member. On arriving at the position D the forward end still continues to move downward while the lower rear end moves slightly upward. This upward movement wherein the member 18 passes from the position D to the position E, is not however sufficient to clear the lower end of the member 18 from its engagement in the undisturbed portion of the ground in which such lower end is embedded. It is during this time that the member 5 moves forwardly. In other words, the member 18 remains practically anchored from the position D nearly to the position E, at which time only material scooped up by the member 5, such material being fully loosened, remains in between the members 18 and 5 and in such a loose condition as no longer to afford sufficient resistance to the member 18 to effect further forward movement of the member 5. This will leave the member 18 to continue movement through the positions F, G and H, the latter being the position shown in Figure 4.

By actuating the retrieving lines 24, the blade will return to its Fig. 1 position and in so doing the plate will hinge whenever an obstruction is encountered, as for example, the oncoming earth "J." (See Fig. 4). The blade will, therefore, pass over this newly accumulated pile and when it reaches the position of Fig. 1 it will then be ready to be actuated to again push the earth "J" to the rear of the carrier.

Thus, as the carrier moves over the ground in a continuous operation, the blade is reciprocated back and forth so as to move the earth into the carrier and then after the same has been loaded the blade is moved to the position shown in Fig. 2, which is a holding position, so that the earth will not fall out of the carrier during transportation.

The carrier as a whole will now be raised so as to move the forward edge 8 out of digging position while the load is being transported to a distant point.

It will thus be seen that by continuously moving the earth being excavated into the back of the carrier a large amount of resistance is removed and a consequent reduction is effected in the amount of power required to move the carrier over the ground to complete a digging operation.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same and that various changes relative to the material, size, shape and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. In an earth mover, a pair of transversely connected side frames, a carrier fixed between said side frames and having a forward earth-cutting edge, a pair of guide members fixed to the inner surface of each side frame, each of said guides extending downwardly and rearwardly along the frame sides, and then extending rearwardly and upwardly along said sides, one guide of each pair being located below the other guide of the pair, a plate member for each pair of guides, having spaced rollers engaging the respective guides, a shovel-like blade carried by said plate members and depending therefrom, pulleys on said side frames and cables fixed to eyes carried by said plate members and extending around said pulleys and forwardly for connection to a winding means of a propelling vehicle, said guides being arranged to cause said blade to move downwardly and rearwardly to said cutting edge, and then rearwardly and upwardly over the carrier.

2. In an earth mover a pair of transversely connected side frames, a carrier fixed between said side frames and having a forward earth cutting edge, a pair of guide members fixed on the inner face of each side frame, each of said guides extending downwardly and rearwardly along the frame sides and then extending rearwardly and upwardly along said sides, one guide of each pair being located below the other guide of the pair, a plate member for each pair of guides, having spaced rollers engaging respective guides, a shovel-like blade carried by said plate members and depending therefrom, pulleys on said side frames, cables fixed to eyes carried by said plate members and extending around said pulleys and forwardly for connection to a winding means of a propelling vehicle, said guides being arranged to cause said blade to move downwardly and rearwardly to said cutting edge and then to move rearwardly and upwardly over the carrier, and a further cable connected to said plate member and extending forward therefrom.

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