May 31, 1955 E. J. SEIFERT 2,709,312

SIDE COLLECTOR FOR MOBILE LOADER

Filed July 26, 1951

Fig-1

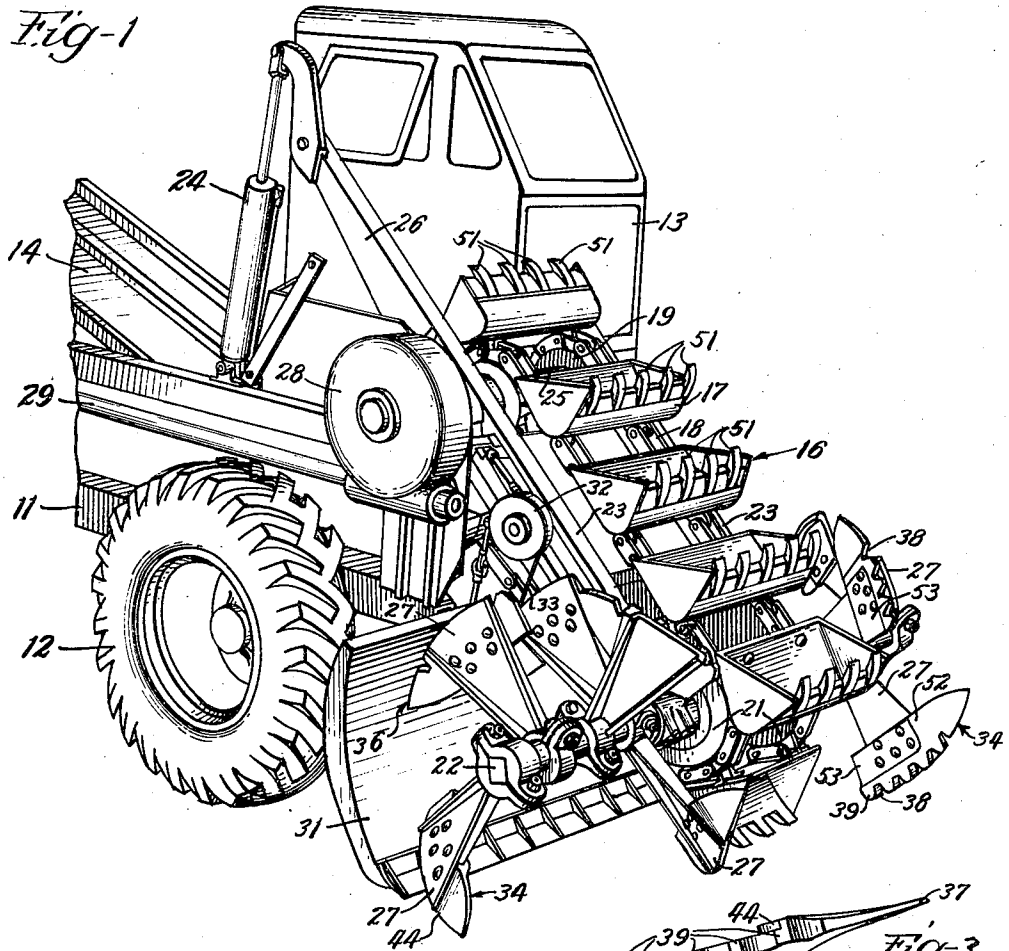


Fig-3

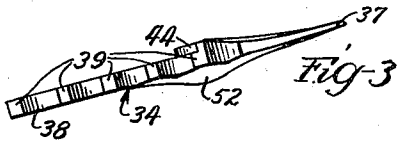


Fig-4

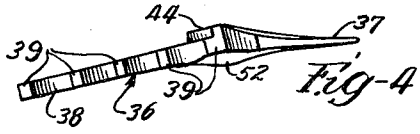
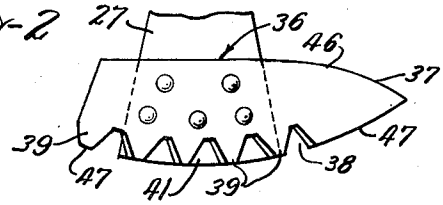


Fig-2



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2,709,312

SIDE COLLECTOR FOR MOBILE LOADER

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1 Claim. (Cl. 37—190)

A very popular type of mobile loader has comprised a vehicle having a short bucket-type conveyor at its front end which digs up the material to be loaded and dumps it onto a belt-type conveyor of considerably greater length, the belt-type conveyor extending over a truck or other receiver to be loaded. For reasons of economy and to confine the material ultimately dumped to a desirably small area, both conveyors are of only moderate width. It is desirable, nevertheless, that this vehicular loader be capable of picking up everything within its path as a vehicle. Heretofore this has been accomplished by a large cross-blade in the nature of a scraper and by providing propeller blades on a cross shaft, the blades being disposed to push the material toward the centrally located bucket-type conveyor. Conveniently, the cross shaft may be the same shaft on which the bottom sprockets of the bucket-type conveyor are carried. The scraper blade is preferably arcuately shaped to correspond to the path of the propeller blades.

According to the present invention, this loader which has heretofore been highly satisfactory for loose material has been made highly satisfactory also for compacted and fairly hard material. This is accomplished by a general increase in the digging power of the front end equipment. The main increase has been accomplished by applying arcuate picks to the bottoms of the propeller blades. As each such blade rotates, its pointed pick chops or prys or both chops and prys the compacted or hardened material, breaking off chunks of it so that it can be pushed sideways by the remainder of the blades or picks. In addition the arcuate outside edges of the picks are provided with teeth, successive teeth preferably being axially spaced from one another so that they may chew gradually at the remaining hardened material. Furthermore, the buckets themselves are provided with increased digging ability by virtue of providing teeth on each bucket which are staggered with respect to the position of the teeth on the preceding bucket.

Additional objects and advantages of the invention will be apparent from the following description and from the drawings.

Designation of figures

Figure 1 is a fragmentary perspective view of the loader chosen for illustration of this invention.

Figure 2 is an approximate face view of one of the picks shown in Figure 1.

Figures 3 and 4 are views looking at the bottom edges of the two forms of pick shown in Fig. 1.

Although the law requires a full and exact description of at least one form of the invention, such as that which follows, it is, of course, the purpose of a patent to cover each new inventive concept therein no matter how it may later be disguised by variations in form or additions of further improvements; and the appended claim is intended to accomplish this purpose by particularly pointing out the parts, improvements, or combinations in which the inventive concepts are found.

General description

In the illustrated form of the invention, the loader is in the form of a vehicle which may include a main frame or chassis **11** carried by wheels **12** or other mobility means. Preferably there are four wheels, at least two of which are driven. The vehicle may be steered and operated from a cab **13**. A belt conveyor **14** carries the material upwardly and dumps it in a truck or other receiver. In many instances, the truck and loader will move along together slowly while the truck is loaded.

In the use of the illustrated form of the invention, the material is dug up and dumped on belt conveyor **14** by a bucket-type of conveyor **16**. This conveyor may include buckets **17** carried by a pair of endless chains **18** which may be carried by upper sprockets **19** and lower sprockets **21**. The lower sprockets **21** are carried by a shaft **22** which is carried by a conveyor frame **23**. Preferably sprockets **21** may be raised or lowered by a hydraulic cylinder **24** operating through arm **26** forming an extension of the conveyor frame **23**. Arm **26** rocks the conveyor frame **23** about a shaft **25** on which sprockets **19** are mounted.

The shaft **22** is preferably provided with a plurality of propeller blades **27** which rotate with the shaft **22**. It may be noted that the shaft **22** is driven through the sprockets **21** by the chains **18** which in turn are driven by the upper sprockets **19** through a gear box **28** and drive shaft **29**.

The outer portions of the blades **27** are disposed angularly so that as they rotate they will propel loose material toward the conveyor buckets **17**, thus forming a cross collector. Their action in this regard is improved by a large cross blade **31** which is preferably in the nature of a scraper blade and which is shaped arcuately in vertical cross section to conform to the paths of the propeller blades **27**, although being slightly spaced from them. The cross blade **31** may be carried by a separate pivoted frame, not shown, and its elevation may be controlled independently or by means of the frame **23** acting through pulleys **32** carried by the frame **23**. For example, its lower limit or operating level may be independently set and it may be raised from this level by cables **33** raised by pulleys **32** when frame **23** is raised for high-speed travel.

According to the present invention, each of the propeller blades **27** is provided with a pick **34** or **36**. Preferably these blades are shaped as seen best in Figs. 2, 3 and 4. Thus they may all have a pointed toe portion **37** at their front ends. In each instance the remainder or body portion of the pick assumes the angularity of the body portion of the blade to which it is secured. In most cases the pointed toe portions **37** of the picks are angularly disposed to the bodies of the picks **36** so that they can slice through or tear up hard material with the least possible resistance.

The two picks **34** which are at opposite ends of the shaft **32** preferably have their toe portions **37** in alignment with the body of the picks so that they will reach out and gather in material from a maximum width, at the same time clearing a path for the passage of the vehicle.

Each of the picks **34** and **36** preferably is provided with notches **38** which form teeth **39**. The provision of these teeth along the portions of the picks which exert an inward thrust has been found to greatly increase their ability to loosen and scrape inwardly hard material occasionally encountered. At the same time, the end portions **41** of the blades **27** may advantageously be unnotched with the result that they tend to scrape more clean the residue of material which might otherwise be left by teeth **39**.

Each of the buckets **19** is provided with a plurality of teeth **51**. As seen in Fig. 1, however, the teeth are staggered with respect to one another when adjacent buckets are compared. Thus the uppermost bucket shown has four teeth **51**, while the next bucket has five teeth. The teeth greatly increase the ability of the bucket to dig through hard material and the staggering of the teeth further increases this ability and decreases the amount of material which may be left. The teeth **51** together with points **37** and teeth **39** of the picks **34** and **36** extend substantially the full width of the vehicle. Necessarily there are some gaps, but they are narrow.

The picks **34** and **36** are preferably manganese steel castings bolted to the blades **27**. The bolts are relieved from shearing force, however, by ribs **44** which engage the forward edges of the blades **27**. The side faces of each toe portion preferably converge upwardly so that most of the upper edge **46** of each toe portion is fairly sharp to facilitate cutting through hard material. The picks should of course be readily replaceable when they become excessively worn.

The front or leading faces of teeth **39** all preferably slope outwardly and rearwardly so as to present a sharp leading edge to the material they strike.

Each pick is preferably considerably thickened at **52**, a zone opposite the leading edge of arm **27**, where the greatest strain occurs. Rearwardly of this, they may have panels **53** of reduced thickness, shown only in Fig. 1.

The picks have also been found to be very satisfactory when turned about and operated in the reverse direction. Thus, with a machine in which the bucket conveyor illustrated is replaced by scoops which slide the material rearwardly along the ground and upwardly on an inclined trough dumping it on a conveyor such as conveyor **14**, the bottom shaft **22** would rotate in the opposite direction. Here the arms **27** would be interchanged, those shown on the left being on the right, and

vice versa. The picks **33** and **36** would be turned about to point in the direction of rotation (rearwardly at the bottom of the cycle) and to lie on the inside of the arms **27**.

Both arrangements provide a very desirable chewing-up action on the material being loaded, greatly improving its quality as a fill or as top soil.

From the foregoing it is seen that a loader is provided which is very satisfactory in cleaning off a wide layer of compacted material, as on the shoulder of a road, as well as loading loose material into a truck moving with the loader.

I claim:

A mobile loader including a mobile chassis, a conveyor carried by the chassis and including spaced pairs of upper and lower sprockets, chains extending around the sprocket pairs, material movers carried by the chains, a shaft for the lower sprockets extending axially therefrom, and cross-collector means carried and rotated by the shaft and including arm means each having at its end as a separate member a pick having a point near the outer orbit of the arm means pointing approximately in the direction of rotation and a trailing portion extending at least to the rear side of the arm, having tooth-forming notches and otherwise extending approximately to the same distance from the axis as said point, but sloping axially whereby the notches provide successive staggered teeth.

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