Aug. 19, 1969 R. SPRENKEL 3,461,971

VYBA MOUNT

Filed July 5, 1966 3 Sheets-Sheet 1

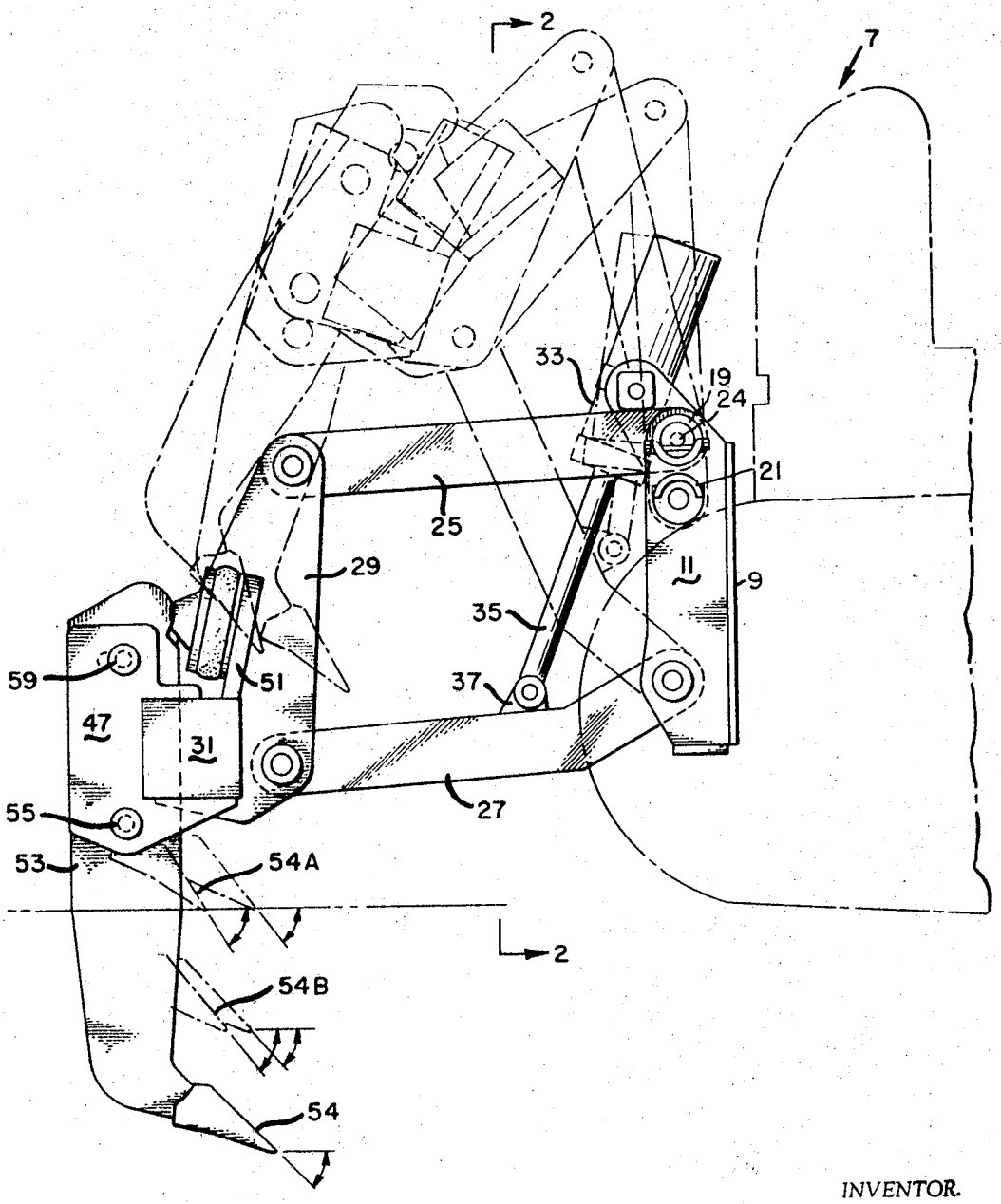


FIG. 1.

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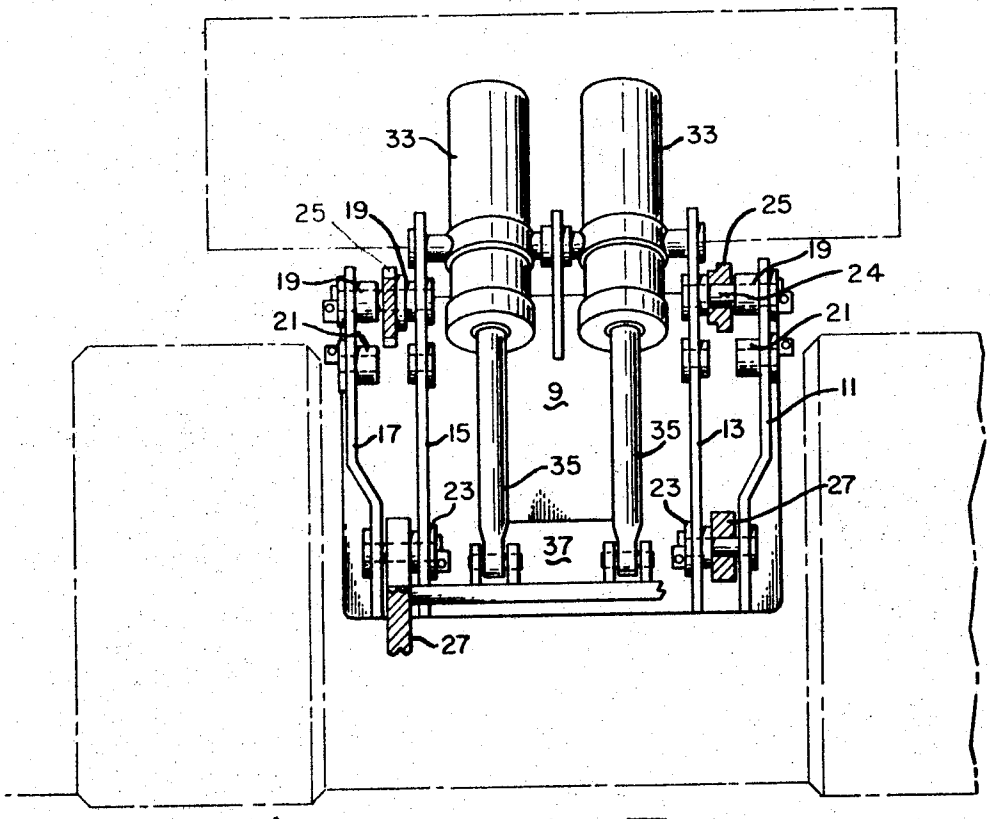


FIG. 2.

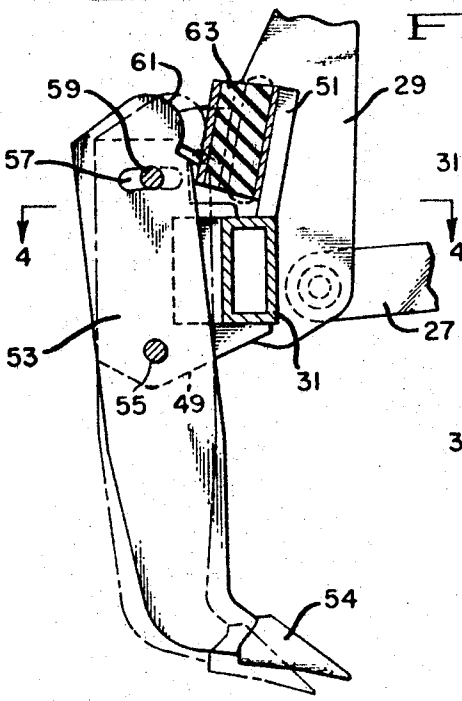


FIG. 3.

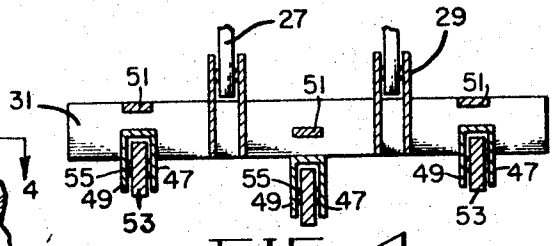


FIG. 4.

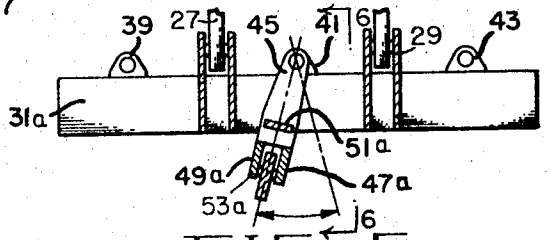


FIG. 5.

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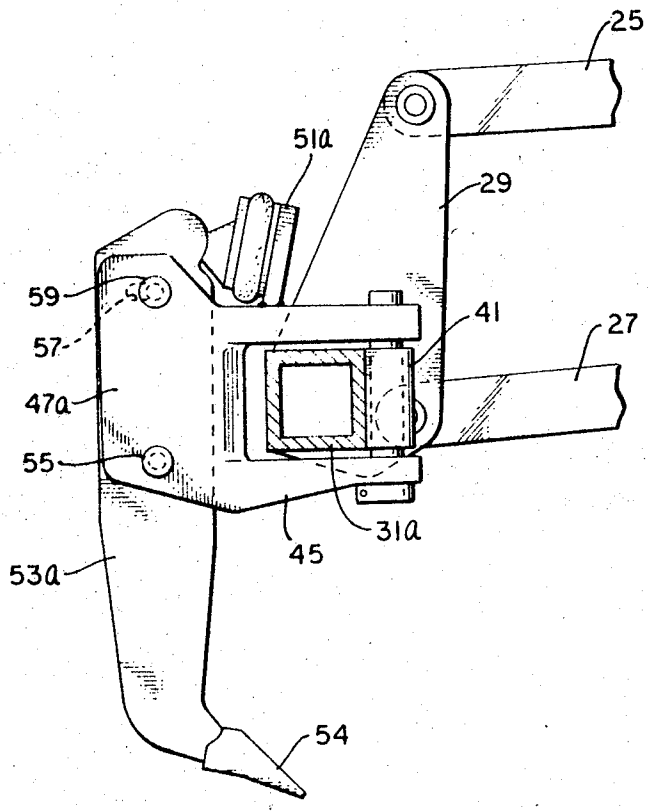


FIG. 6.

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3,461,971

VYBA MOUNT

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Filed July 5, 1966, Ser. No. 562,843
Int. Cl. A01b 15/12, 23/04
U.S. Cl. 172—710 1 Claim

ABSTRACT OF THE DISCLOSURE

This invention relates to a earth ripping tool in which a preloaded resilient member is provided between the upper end of the shank of the ripper tool and the shank support and wherein the effect of the resilient member is to keep the shank of the ripper tool moving in a fore and aft direction as the load on the shank varies due to the varying hardness of the soil or rock through which the ripping tool is moved, thus greatly increasing the capacity of the ripper.

It is therefore an object of the present invention to provide a vibratory ripper of improved mechanical construction.

Another object of this invention is to provide a vibratory ripper which employs a resilient mounting to impart the vibrating motion to ripper tool.

Still another object of this invention is to provide a ripper having a resilient mounting to impart the vibratory action wherein the resilient mounting is on top of the tool where it and the associated structure are out of the dirt and rock and therefore are protected from abrasive or other deleterious action.

Another object of this invention is to provide a vibratory ripper wherein the resilient mounting is easy to replace.

A further object of this invention is to provide a vibratory ripper wherein the shank is preloaded so that any desired portion of the compression curve of the resilient mounting can be utilized also so the device can be transported without rattling.

A still further object of this invention is to preferably provide a vibratory ripper wherein the tool is mounted in such a manner that when the point is at the ground line it is set for the best penetrating angle and automatically changes to the best ripping angle as it is lowered to various working depths. However the device works well on radial, parallel or modified parallel lift rippers.

Still another object of this invention is to provide a vibratory ripper wherein the ripper mechanism is mounted on a subframe so that the gear case and other working parts of the tractor are protected from strain.

Still another object of this invention is to provide a vibratory ripper on a swinging mount whereby the tool is given a limited swinging movement so that it will always face the line of direction, thereby pulling easier, increasing the track life and reducing the wear and tear on steering clutches and brakes.

Another object of this invention is to provide a ripper having a variable linkage so that is can be used as a radial lift device or as a parallelogram lift device.

Other objects will be apparent from the balance of the specification which follows.

In the drawings forming part of this application:

FIGURE 1 is a side view of a device embodying the present invention showing the device in ripping engagement with the ground in solid lines and in various raised positions in phantom.

FIGURE 2 is a section on the line 2—2 of FIGURE 1.

FIGURE 3 is a partial view, similar to FIGURE 1 showing some of the parts in section.

FIGURE 4 is a section on the line 4—4 of FIGURE 3.

FIGURE 5 is a partial plan view of the mounting bracket modified to allow a swinging movement of the ripper.

FIGURE 6 is a view along line 6—6 in FIGURE 5 and illustrating the modified form of ripper shown in FIGURE 5.

Referring now to the drawing by reference characters, there is shown in phantom a tractor, preferably of the crawler type, generally designated 7. Mounted on the tractor is a frame element 9 having a plurality of brackets 11, 13, and 15 and 17 welded thereto. Each of the brackets has upper bosses 19 and 21 and a lower boss 23. The pair of brackets 11 and 13 have mounted in the bosses 19 a pin 24 which supports an upper parallelogram arm 25 while the corresponding bosses 23 support a lower parallelogram arm 27. As can best be seen from FIGURE 2, the structure is symmetrical so that the brackets 15 and 17 carry corresponding parallelogram arms. The arms 25 and 27 are pivoted to the arms 29 to which is attached a box frame 31. Hydraulic cylinders 33 have piston rods 35 pivoted to a cross member 37 which extends from one of the arms 27 to the mating arm 27 at the opposite side of the structure. It can thus be seen, that the hydraulic cylinders 33 are adapted to raise and lower the parallelogram structure.

The vibratory ripper itself is mounted on the box frame member 31.

Mounting on the box spring 31 are a pair of side plates 47 and 49 and a back plate member 51. Mounted between the side plates 47 and 49 is shank 53 of the ripper propper, the shank having an opening near its center so that a pin 55 can pass through the opening and through mating holes in the side plates 47 and 49. Shank 53 is ordinarily provided with a replaceable ripping tooth 54. Near the top of the shank 53 is an elongated slot 57 and a pin 59 rests in this slot and passes between holes in the side plates 47 and 49. With the structures thus described, it is obvious that the shank 53 can pivot on the pin 55 but that its degree of movement is limited by the length of the elongated slot 57. Mounted between the back plate 51 and the rounded top portion 61 of the shank 53, is the resilient member 63. Normally the arrangement of the parts is such that when the device is assembled with the ripping point of shank 53 in its forward position, the resilient member 63 will be slightly compressed. By preloading the device in this manner, the desired portion of the compression curve is utilized and the shank will not rattle or shake while the device is being transported.

In FIGURE 1 the arrangement of the various parts is shown with the digging tooth 54 in various positions. It should be observed that the linkage has been described as a modified parallelogram linkage and that the distance between the pivot point on the arm 29 is greater than the distance point between the pivot point on the bracket 11. Therefore, as arm 27 is pulled upwardly by means of the hydraulic cylinder 33, the arm 29 does not maintain its original parallel relationship with the bracket 11 but tends to tilt forwardly somewhat as the arm is raised. The advantage of this structure is shown in the various positional views in FIGURE 1. It will be observed that when the digging tooth first enters the ground as at 54–A the angle made with the ground is relatively large, e.g. 50° which gives the point an ideal penetrating action. Now as the ripper is lowered, the angle decreased so that when the position shown at 54–B the angle is now about 46° while at the extreme lower limit, as is shown in solid lines in FIGURE 1, the angle which the point makes with the ground is about 24° which is an ideal ripping angle. Thus, the device of the present in-

vention automatically adjusts to an optimum penetrating angle when high and to an optimum ripping angle when lowered.

In the modified form of ripper, as shown in FIGURES 5 and 6, one of the vibratory rippers is pivotally mounted on each of pivot members **39**, **41** and **43** provided on the frame **31**. Although three such members have been shown, this is for illustrative purposes only and a larger number is ordinarily employed. Each of the pivot members is adapted to receive one of the vibrating ripper tools heretofore described in detail so that as many as three rippers can be used on one assembly. However in the embodiment of FIGURES 5 and 6, only a single ripper has been shown.

Mounted over at least one of the pivots is a saddle member **45** having attached thereto a pair of side plate members **47***a* and **49***a* and a back plate member **51***a*. Mounted between the side plate member **47***a* and **49***a* is a shank **53***a* of the ripper proper. Thus, the ripper cannot only vibrate back and forth as the result of the resilient member **63** but also can swing from side to side to a limited extent so as to always face into the load. This contributes greatly to the ease of steering the vehicle as well as reducing shock on steering clutches and brakes.

In some instances it will be desired to make an even greater change in the angle of the shank as the ripper assembly is raised. This is easily accomplished by changing the pivot points on arms **25** from the bosses **19** to the bosses **21**.

It is believed apparent from the foregoing that I have provided a vibratory ripper of generally improved design which has a number of highly advantageous features over vibratory rippers heretofore known.

I claim:

1. In a vibratory ripper:

(a) a frame comprising opposite spaced vertical side plates;

(b) a ripper member having an elongated shank with a tooth at its lower end;

(c) a first pin extending between said side plates and providing a pivot for the shank of the ripper adjacent the lower end of the side plates with the upper end of the shank extending above the side plates;

(d) a second pin extending between the side plates adjacent the upper end thereof and through an arcuate slot in an upper portion of the shank;

(e) a back plate fixed in relation to the upper ends of the side plates and of the shank and spaced in relation to the upper end of the shank;

(f) and a resilient member compressed between the upper end of the shank and the back plate when the tooth on the shank is in its forwardmost position.

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