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 [21] Appl. No. **805,670**
 [22] Filed **March 10, 1969**
 [45] Patented **Nov. 10, 1970**
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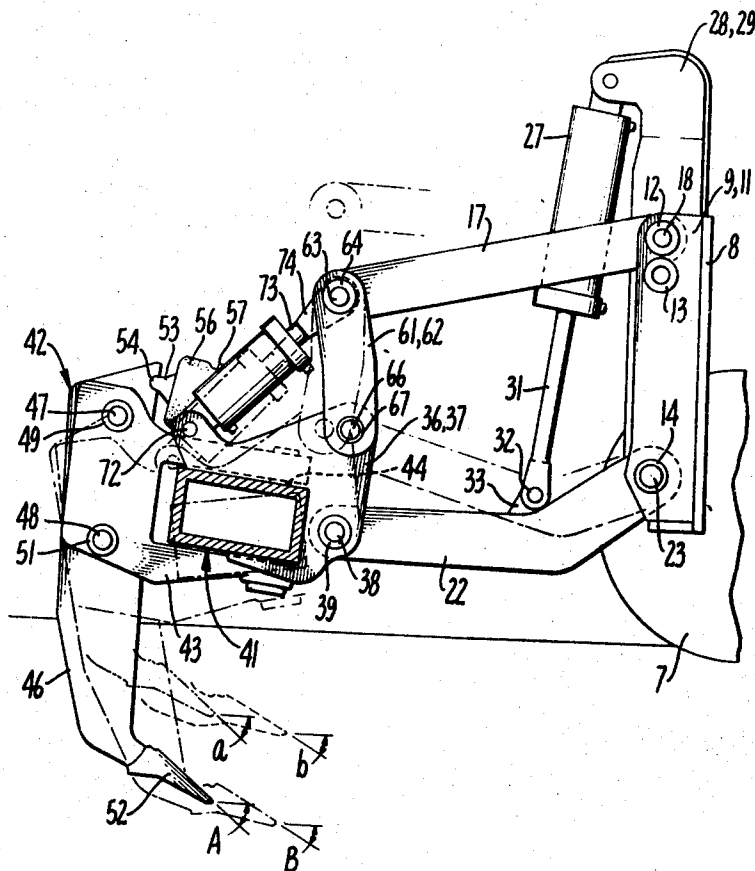
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[54] **RIPPER**
4 Claims, 3 Drawing Figs.

[52] U.S. Cl..... 172/484,
 172/491
 [51] Int. Cl..... A01b 63/32
 [50] Field of Search..... 172/484,
 307, 744, 657, 491

ABSTRACT: This invention relates to an earth-ripping tool in which the position of the ripper tooth can be selectively altered while the ripper is being utilized to the end that the ripping tooth is placed in that position in which its angle of attack is most favorable for ripping earth.



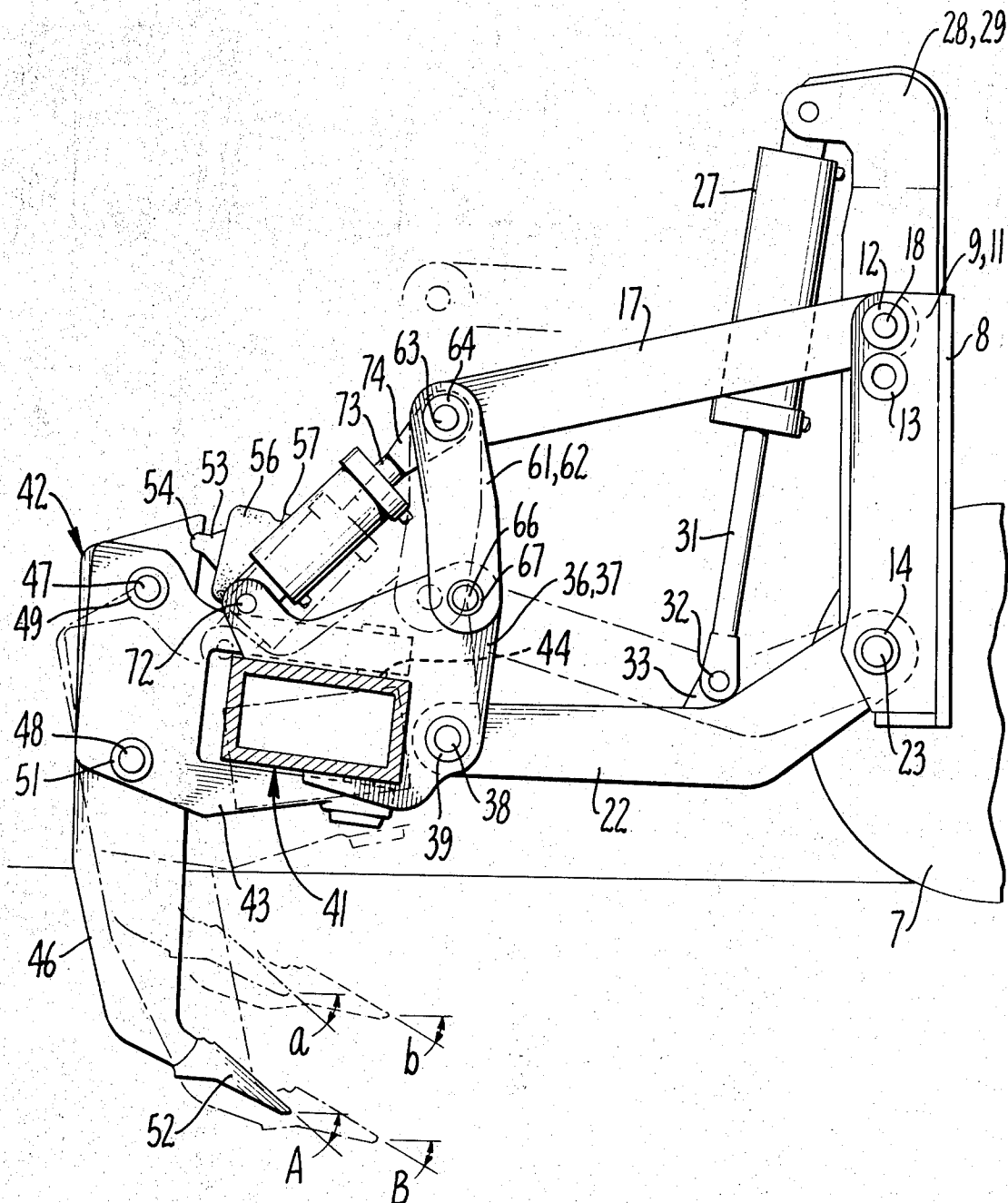


FIG. 1.

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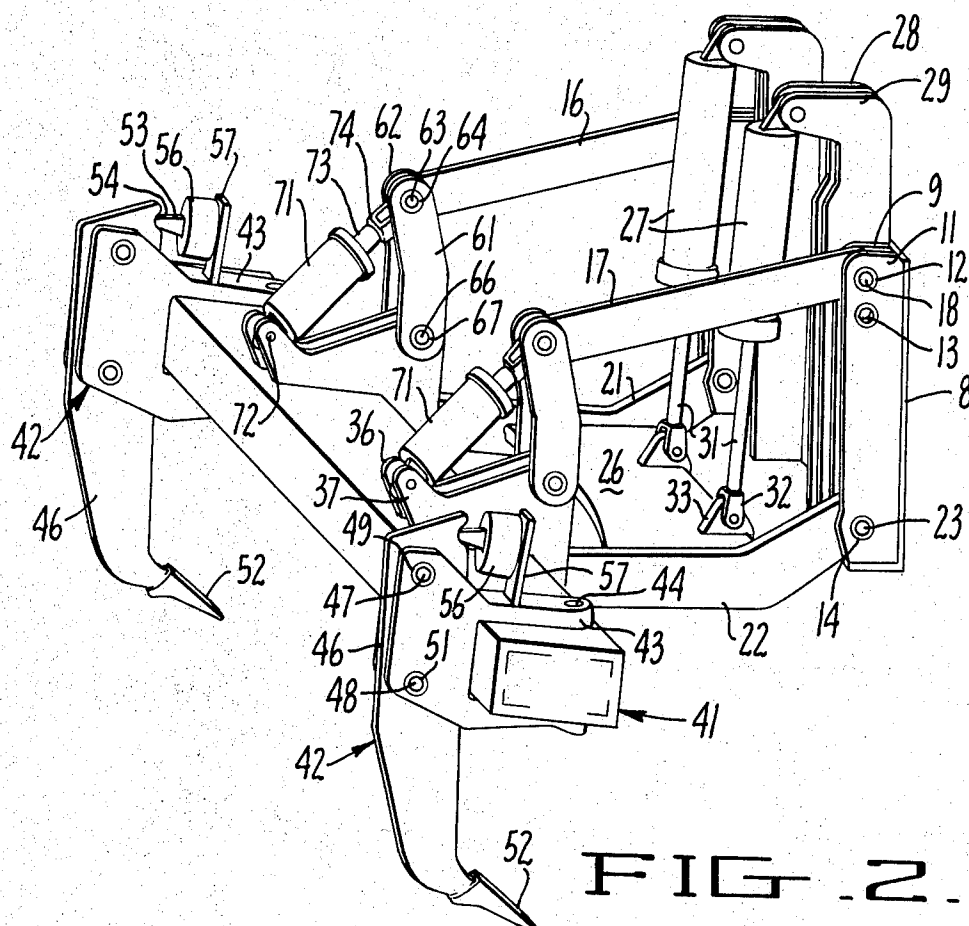


FIG. 2.

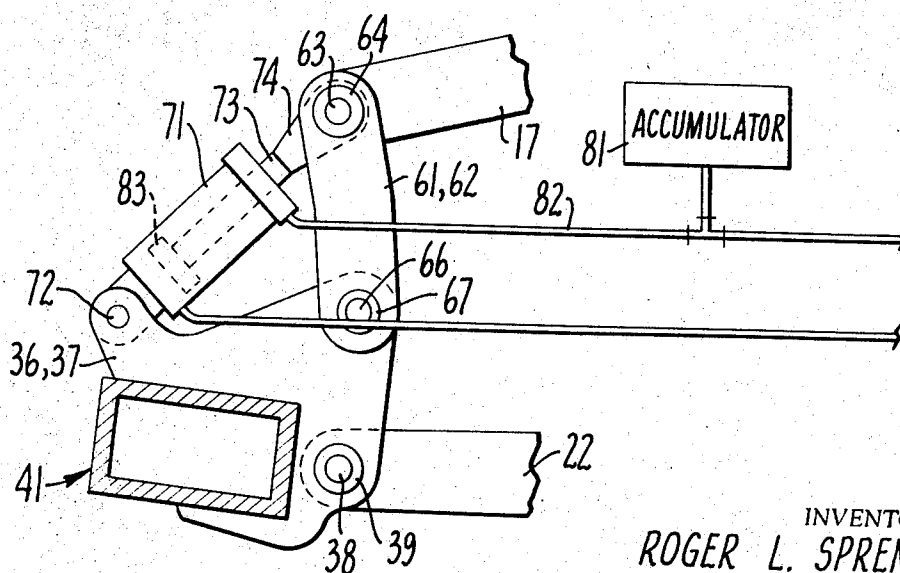


FIG. 3.

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RIPPER

OBJECTS OF THE INVENTION

It is a general object of the invention to provide a ripper construction in which one operating the ripper can so adjust the ripping tool that the angle of attack of the ripping tooth is most favorable under the conditions encountered.

The invention includes other objects and features of advantage which will become apparent from the following drawings forming a part hereof.

BRIEF DESCRIPTION OF THE FIGURES

FIG. 1 is a side elevation partly in section showing a construction embodying the present invention;

FIG. 2 is a perspective view of the ripper tool construction; and

FIG. 3 is a side elevation partly in section showing the modified form of the device.

SUMMARY OF THE INVENTION

In brief outline, the device includes a beam support for one or more rippers. The beam is supported on a linkage including generally parallel horizontally disposed upper and lower links and a substantially vertically disposed end link and the elevation of the beam in relation to earth can be altered by raising and lowering the generally horizontal links of such linkage. In accordance with this invention, the relation of the ripper on its beam support can be altered selectively to change the attack angle of the ripper tooth without substantially altering the relationship of the linkage support.

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings, there is shown in phantom a vehicle, generally designated as 7, and which is usually a tractor of the crawler type. A plate 8 is mounted across the rear of the tractor and mounted on opposite ends of the plate 8 are pairs of spaced plates 9 and 11. At the top of plates 9 and 11, spaced bosses 12 and 13 are provided while at the lower end of each of the spaced plates bosses 14 are present. A pair of upper links 16 and 17 are mounted respectively between the plates 9 and 11 on either side of plate 8, the forward end of each of these links being supported selectively by pin 18 positioned in either one of the bosses 12 and 13. A pair of lower links 21 and 22 generally parallel to the upper links is mounted by pin 23 in the bosses 14. Plate 26 extends between the links 21 and 22. Cylinder and piston structures, generally indicated at 27, are extended between plate 26 and the upper end of spaced plates 28 and 29 which are also mounted on the plate 8. The piston rods 31 from each of the cylinder and piston structures 27 are connected by clevises 32 to upstanding lugs 33 provided on the plate 26. The rear ends of links 21 and 22 are mounted between spaced plates or brackets 36 and 37, the connection being by means of a pin 38 passed through a boss 39 in each of the plates 36 and 37. Each of the pair of plates 36 and 37 is secured to a box beam, generally indicated at 41.

Mounted on opposite sides of the box beam are ripper structures, generally indicated at 42. These include U-shaped brackets 43 each mounted by pin 44 on the forward side of the box beam 41 so that each ripper 42 can swing from side to side. The rear end of the U-member is bifurcated and shank 46 of the ripper tool is mounted by pins 47 and 48 in bosses 49 and 51. At the forward end of the ripper shank, a hard metal ripper tooth 52 is provided. Preferably the upper end of the shank of the ripper tool is engaged by a projection 53 received in a recess 54 in the shank, the projection 53 being carried on a block of resilient material 56 which is mounted upon a bracket 57 carried on the upper leg of the U-shaped member 43. Normally the block of resilient material is under compression so that as the ripper tooth 52 is moved through the ground, the fluctuating pressure causes the ripper tool to vibrate rapidly.

The rearward end of each of links 16 and 17 is mounted between spaced generally vertically extending links 61 and 62 by pins 63 in bosses 64. The lower ends of links 61 and 62 are mounted by pins 66 in boxes 67 in each of the links 61 and 62.

The structure so far described provides a generally parallel linkage support for the beam, this linkage comprising the generally horizontal upper and lower link pairs 16 and 17 and 21 and 22, respectively, the forward link provided by spaced plates 9 and 11 and the rearward link provided in part by plates or brackets 36 and 37 and generally vertically extending links 61 and 62.

In accordance with this invention, means are provided for adjusting the position of the box beam 41 and thereby the attack angle of the tooth 52 without substantially disturbing the linkage support. This means comprises a cylinder and piston structure 71 with one end of the cylinder mounted between the extending ends of plates 36 and 37 by pin 72 while the end of each piston rod 73 is connected by a clevis 74 engaged with a pin 63.

The change in attack angle can be seen by comparing the two full-line and solid-line positions in FIG. 1. Note in each lowermost position the attack angle A is approximately 40° while when the tooth is in the dotted line lowermost position, the value of angle B is approximately 30°. A similar change is achieved when the tool is raised and is moved by admitting fluid to the cylinders 71 whereby the tooth is moved forwardly as in the upper position. By altering the position of the piston in the cylinder structure 71, the box beam can be rotated selectively about pins 38. This movement of the box beam is effective to alter the attack angle of the ripper tooth without substantially affecting the linkage support and the basic elevational position of the ripper.

It follows that the structure undergoes substantial shock as it is pulled through the earth and to this end I provide an accumulator 81 and connect this to the fluid line 82 from the upper side of piston 83 in the cylinder and piston structure 71.

I claim:

1. Linkage means for supporting a ripper tool in operative position on a vehicle, comprising:

- a. generally parallel top and bottom link means connected at one end thereof to said vehicle;
- b. generally vertically extending link means pivotally connected at one end thereof to the other end of said top link means;
- c. bracket means pivotally interconnected between the other end of said vertically extending link means and the other end of said bottom link means;
- d. a beam transversely secured to said bracket means;
- e. ripper tool means secured to said beam;
- f. first actuator means connected between said bracket means and the point of interconnection of said generally vertically extending link means and said top link means for pivoting said beam and said ripper tool means; and
- g. second actuator means connected between said bottom link means and said vehicle for raising and lowering said linkage means and said ripper tool means.

2. In a ripper as in claim 1 wherein said first actuator means comprises a cylinder and piston.

3. In a ripper as in claim 1 wherein:

- a. the bracket means mounting the beam pivotally on said other end of the bottom link includes spaced plate means secured to the beam and hinged on said other end of the bottom link; and
- b. said first actuator means comprises a cylinder and piston structure extended between said other end of the top link and the plate means for moving the beam relative to said other end of the top link.

4. Linkage means as in claim 1 wherein:

- a. a pair of generally parallel top and bottom links are connected at one end thereof to said vehicle; and
- b. said bracket means are connected to said beam at longitudinally spaced positions thereon.