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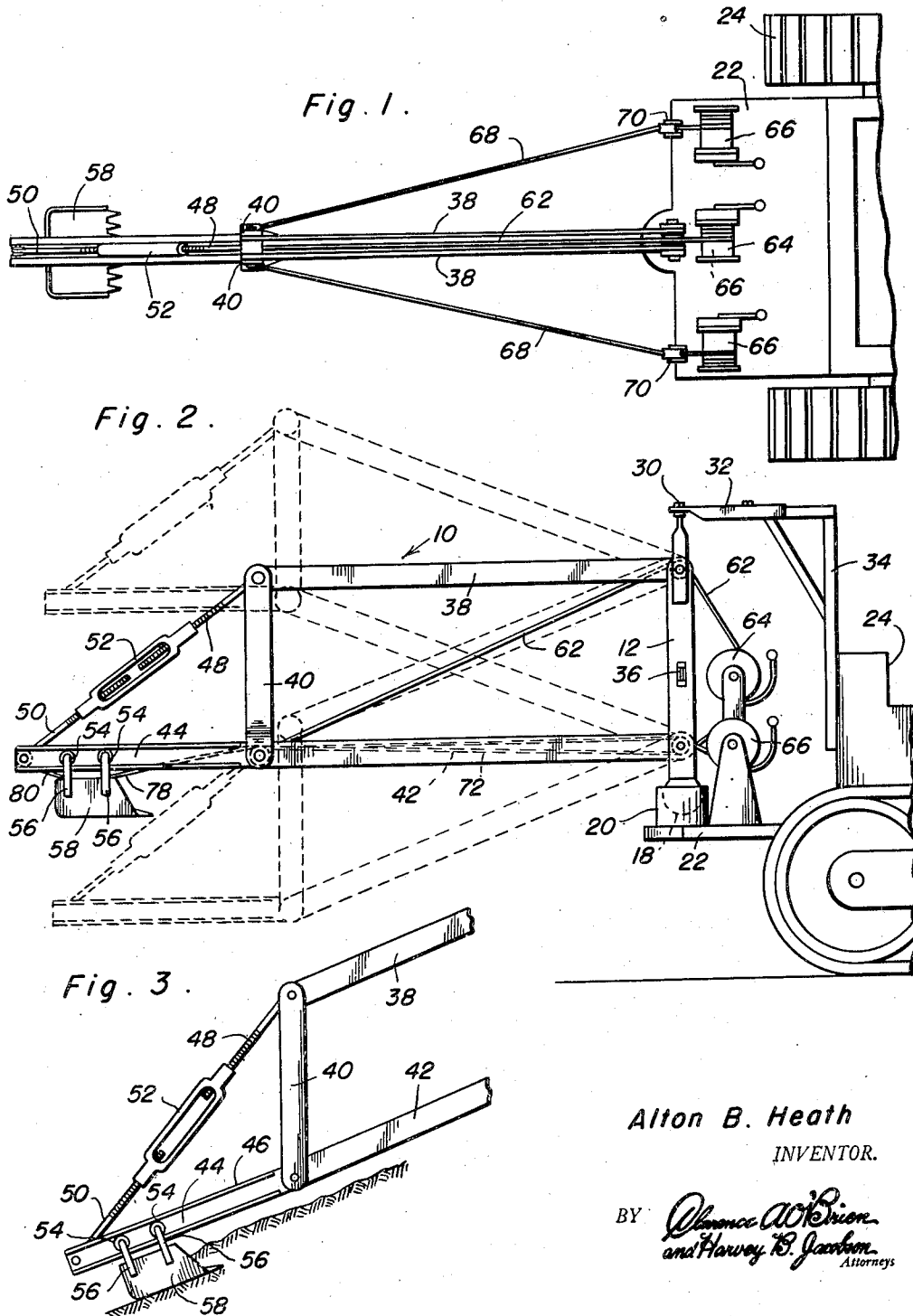
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2,484,709

APPARATUS FOR TRENCHING

Filed July 7, 1948

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2 Sheets-Sheet 2

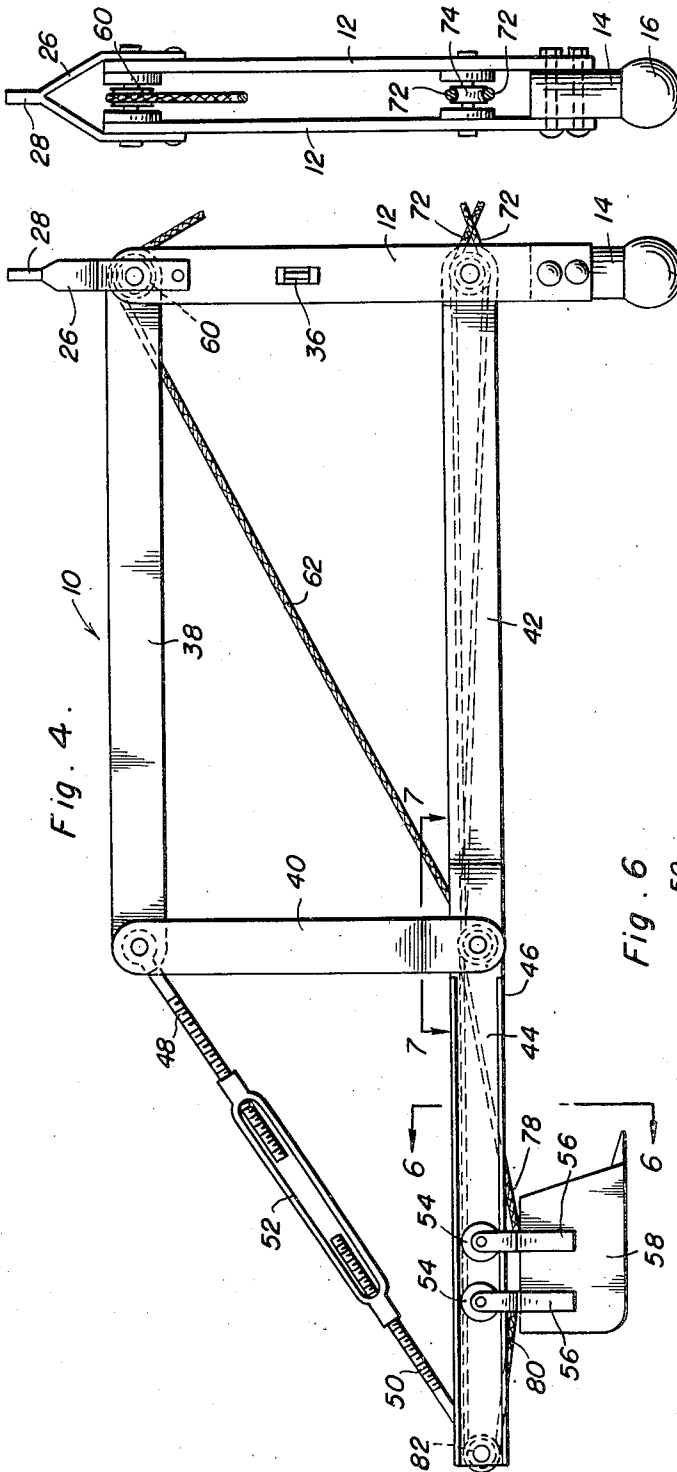
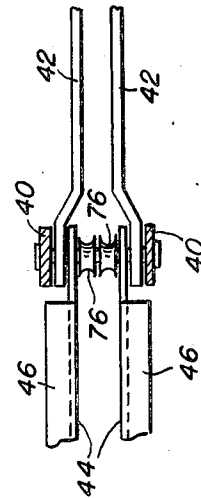
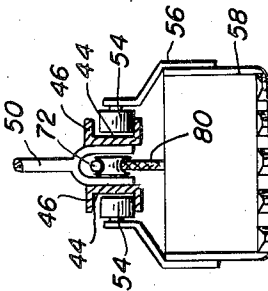


Fig. 4.

Fig. 5.

Fig. 7.

Fig. 6.



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APPARATUS FOR TRENCHING

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3 Claims. (Cl. 214-102)

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This invention relates to new and useful improvements in trenching equipment and a primary object of the present invention is to provide a pivotally adjustable frame having a portion which will remain vertical at all times during the pivotal movement thereof, and a ground engaging member slidably actuated and applied to a guide adjustably carried by the vertical portion of said frame, whereby the said ground engaging member will be disposed at a selected slope or angle at all times once the guide has been adjusted relative to the fixed portion of said frame, thus permitting trenches and the like to be dug without the necessity of having to provide slope lines, stakes or the like.

Another important object of the present invention is to provide an apparatus for trenching including a novel and improved frame construction of pivotal links forming a parallelogram and having one link fixed in a vertical position, a ground surface member engaging guide, and embodying novel and improved means for adjustably retaining said guide disposed at a selected, predetermined angle relative to said fixed link whereby the frame may be raised or lowered without changing the predetermined angle at which the guide has been set.

A further object of the present invention is to provide an apparatus for trenching which may be pivotally lowered, raised or swung from side to side to effectively and efficiently dig and remove material dug to a convenient discharge point, such as a truck, vehicle or the like.

A still further aim of the present invention is to provide an apparatus for trenching that is simple and practical in construction, strong and reliable in use, small and compact in structure, neat and attractive in appearance, relatively inexpensive to manufacture, and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a fragmentary top plan view of a tractor, and showing the present invention applied thereon;

Figure 2 is a side elevational view of the present invention, showing the same applied to a tractor, and with dotted lines showing various alternate positions for the ground engaging member;

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Figure 3 is a fragmentary side elevational view of the present invention, illustrating the ground engaging member in use for digging a trench at a selected slope;

Figure 4 is an enlarged side elevational view of the present invention, and showing the same removed from a vehicle;

Figure 5 is an end view of Figure 4;

Figure 6 is a transverse vertical sectional view taken substantially on the plane of section line 6-6 of Figure 4; and

Figure 7 is a fragmentary longitudinal vertical sectional view taken substantially on the plane of the section line 7-7 of Figure 4.

Referring now to the drawings in detail, wherein for the purpose of illustration, there is disclosed a preferred embodiment of the present invention, the numeral 10 represents a parallelogram linkage or frame generally, that includes a pair of main sides or posts between the lower ends of which there is fixed a support 14 having an integral, spherical element 16 that engages a concave recess 18 provided in the upper face of an anchor block or plate 20.

The block 20 is preferably fixed to the rear platform 22 of a tractor or suitable vehicle 24 and the upper terminals of the member 12 are braced by a U-shaped bracket 26 having an integral upstanding arm 28 that rotatably engages a socket 30 mounted on a holding member 32 that is adjustably secured to a suitable framework 34 carried by the vehicle 24, so that the members 12 may be rotated or adjusted in all directions relative to the platform 22.

In order to indicate when the members 12 are disposed in a vertical plane, there is provided a suitable level 36 which is secured to one or both of the members 12. Obviously, this level may be so arranged with an indicating bubble that will be disposed centrally with respect to the level when the members 12 are disposed in a vertical plane, or the level may be disposed horizontally so that the level bubble will be centrally disposed relative to the level when the members 12 are disposed in a vertical plane.

Pivoted to the upper terminals of the members 12, is an upper pair of spaced parallel links or members 38 the outer free ends of which pivotally support a pair spaced parallel depending cross members or outer links 40.

A pair of spaced parallel lower members 42 are pivoted at their respective terminals to the members 12 and the outer links 40 and will remain spaced parallel to the upper members 38 at all times when the frame 10 is raised or lowered or swung from side to side.

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The outer links 40 will remain at all times spaced parallel to the members and in a vertical plane when the present invention is in operation.

The forward terminals of a pair of back to back channel shaped guides 44 are pivoted between the members 42 and the forward end of the legs 46 of the guides 44 are notched to permit the said guides to pivot upwardly and downwardly relative to the members 40.

An upper bolt 48 is pivoted between the members 40 and is adjustably connected to a lower bolt 50 pivoted between the rear ends of the guides 44 through the medium of a turnbuckle 52, to permit the guides 44 to be retained at a selected angle relative to the members 40 and hence the members 12.

Slidably carried by the guides 44 are rollers 54 to which there are pivoted depending straps or hangers 56 that support a ground engaging member or scoop 58. Obviously, the scoop 58 may or may not be provided with a hinged bottom wall so that the dirt, gravel or the like engaged by the same may be conveniently dumped.

In order to pivotally raise or lower the frame 10 there is provided an upper pulley 60 that is rotatably supported between the members 12 and which engages a flexible line or cable 62 that is suitably secured at one end to the rear terminals of the members 42. The remaining end of this cable 62 engages an upper cable drum 64 which is mounted on the platform 22 and which is operatively connected to the power take-off shaft of the tractor 24 in any suitable manner.

Three additional power rotated cable drums 66 are provided on the platform 22 and a pair of the same engage flexible elements or side cables 68 which are trained over pulleys 70 carried by the platform 22. The cables 68 are connected in any suitable manner to the rear terminals of the members 42, thus permitting the frame 10 to be swung back and forth to empty the scoop adjacent a trench, ditch or the like that is being dug.

The remaining of the group of drums 66 engages a further cable 72 the flights of which also engage a pulley 74 rotatably disposed between the members 12, a pair of pulleys 76 rotatably supported between the members 42, and the ends 78 and 80 of the cables 72 are then fixed to a forward portion of the scoop 58 in a rear portion thereof, with the rear end 80 trained over a pulley 82, so that as the drum on which the cable 72 is mounted, rotates in one direction, the scoop will move forwardly, and as the same is rotated in an opposite direction the scoop will move rearwardly.

In practical use of the present invention, the vehicle 24 is stopped at a desired location and the members 12 are adjusted so that the same will be in a vertical position, that is indicated by the level 36. The guides 46 are then adjusted at a selected angle relative to the members 40 by the turnbuckle 52.

The frame 10 is then lowered and the scoop 58 actuated so that the same will dig into the ground. After the said scoop has received a sufficient quantity of that surface or ground being dug, the frame 10 is raised to the dotted line position shown in Figure 2 of the drawings, and swung to one side. The hinged bottom wall of the scoop 58 is then opened to discharge the dirt from the same.

The frame 10 is then lowered into the ditch

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being dug and the scoop 58 will be disposed at the initially set slope to further dig the ditch.

Obviously, when the vehicle 24 is moved it will be necessary to adjust the members 12 so that the same will remain vertical at all times. By so retaining the members 12 in a vertically disposed position, it is evident that the guides 44 and scoop 58 will be disposed in a selected predetermined adjusted angle relative to the members 40 and the same will continue to dig a ditch without the necessity of having to disturb the original setting for the guides. By such a construction, it is obvious that a continued length of ditch may be dug at a predetermined slope with the necessity of only having to retain the members 12 in a vertically disposed position.

Although shown in the drawings there is a slidable type of scoop 58, it is obvious that any suitable type of scoop could be employed in conjunction with the present frame and guides without deviating from the scope of the present invention.

The groups of cable drums, namely, 64 and 66 referred to, are operatively connected to the power take-off shaft of tractor 24 in any suitable manner and it is noted that such pulley drum constructions are frequently applied to platforms at the rear portions of the tractor 24. The cable drums 64 and 66 could be rotated manually if desired, however it is necessary to employ some power means for actuating the scoop 58.

In view of the foregoing description taken in conjunction with the accompanying drawings it is believed that a clear understanding of the device will be quite apparent to those skilled in this art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. An apparatus for trenching ditches at a predetermined slope comprising a post, means for swivelling said post to a tractor, means for indicating a vertical position for said post, a pair of upper members pivoted to said post, a pair of lower members pivoted to said post, pitmans connecting said upper members to said lower members, said pitmans being parallel to said post at all times during the raising and lowering of said upper and lower members, means for selectively raising and lowering said upper and lower members and said pitmans, means for adjustably swinging said upper and lower members and said pitmans, a guide carried by said lower members, a ground engaging member slidably carried by said guide, and means adjustably bracing and retaining said guide at a predetermined angle relative to said pitmans during raising and lowering of said upper and lower members.

2. The combination of claim 1 wherein said means adjustably bracing and retaining said guide at a predetermined angle relative to said pitmans includes a pair of pivotal bolts carried by said guide and said pitmans and a coupling member adjustably connecting said bolts.

3. An apparatus for trenching comprising a plurality of link bars pivoted to each other to form a parallelogram having a fixed side, means securing the fixed side of said parallelogram to a vehicle, means for raising and lowering the re-

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maining sides of said parallelogram, means for adjustably swinging said parallelogram about said fixed side as an axis, a guide pivotally carried by said parallelogram, means for retaining said guide fixed in a predetermined angle relative to said fixed side of said parallelogram, a ground-engaging member slidably carried by said guide, and means for actuating said ground-engaging member, said means securing one side of said parallelogram to a vehicle including a spherical element, and a base plate fixed on a vehicle and having a concaved recess receiving said spherical element.

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