Feb. 15, 1955 C. W. JENNINGS 2,701,994

AUTOMATICALLY-OSCILLATED MOUNTING FOR EARTHWORKING ELEMENTS

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FIG. 1.

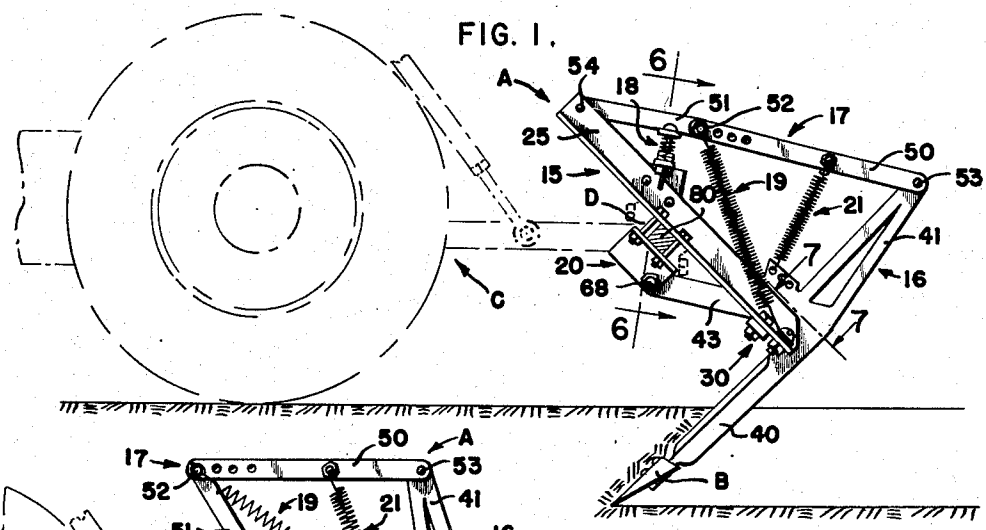


FIG. 2.

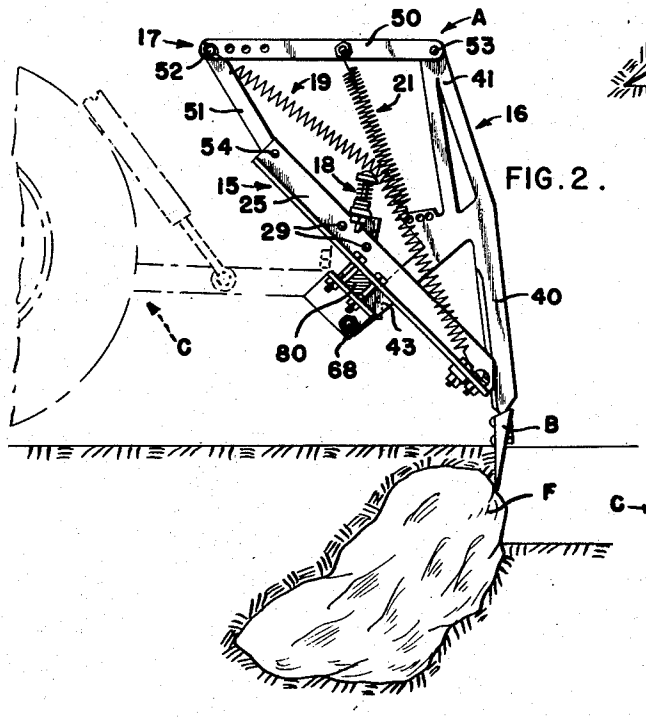


FIG. 6.

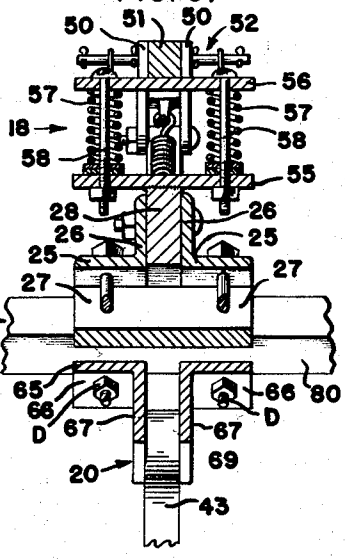
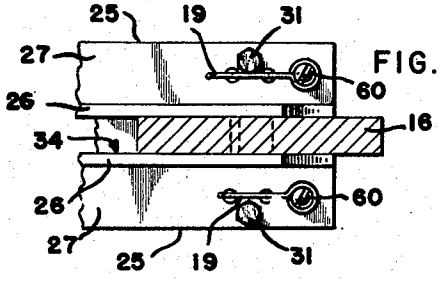


FIG. 7.



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AUTOMATICALLY-OSCILLATED MOUNTING FOR EARTHWORKING ELEMENTS

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FIG. 3.

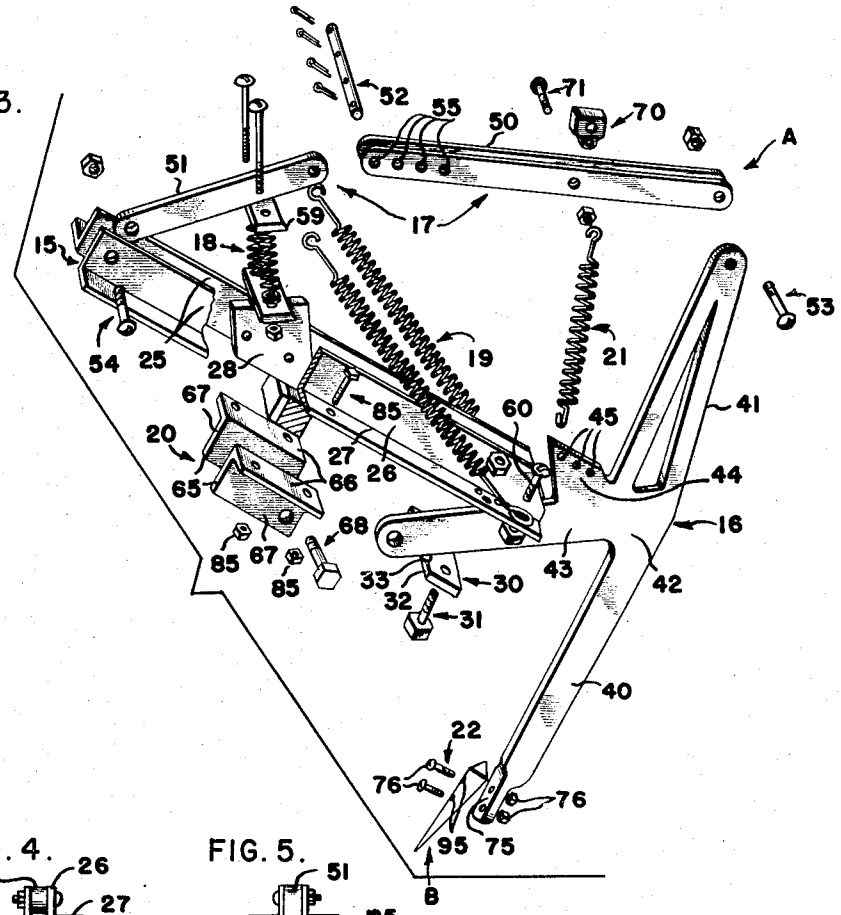


FIG. 4.

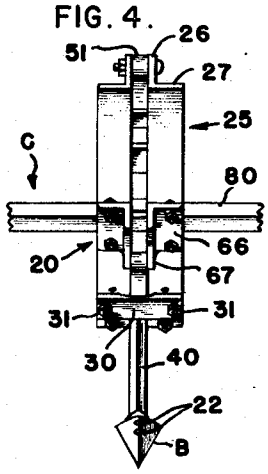
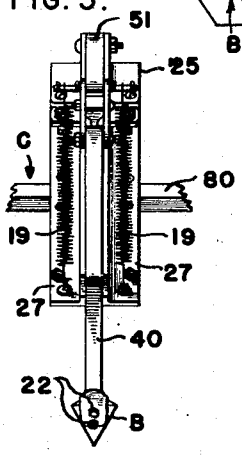


FIG. 5.



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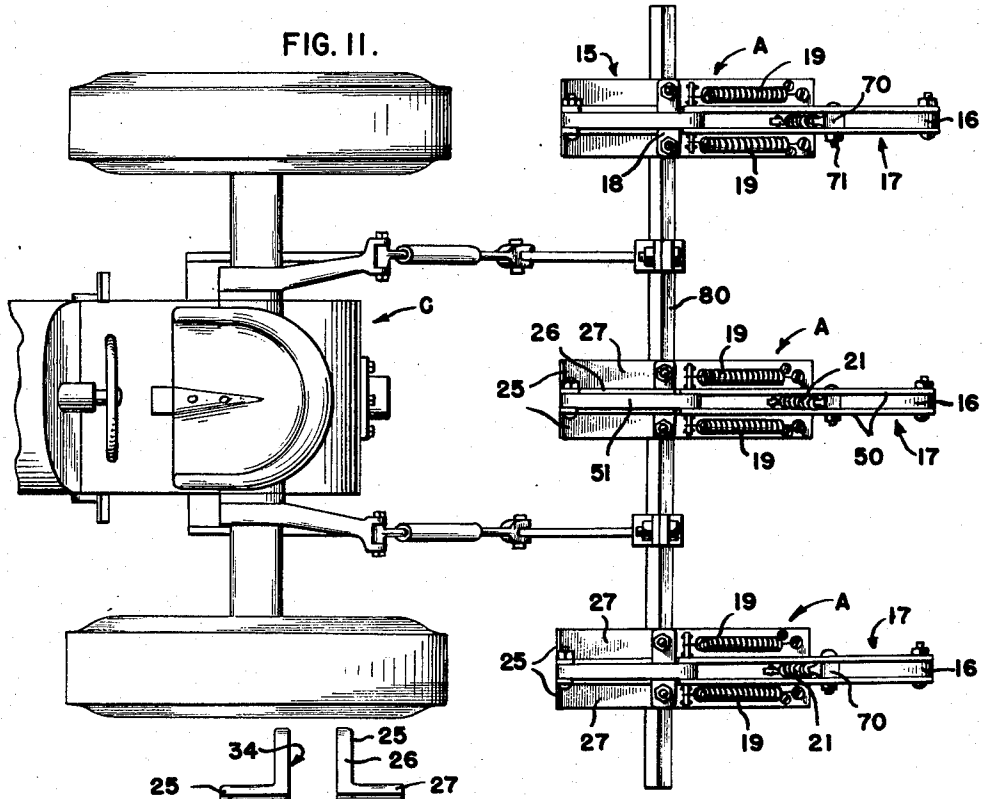
Attorney

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AUTOMATICALLY-OSCILLATED MOUNTING FOR EARTHWORKING ELEMENTS

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FIG. 11.



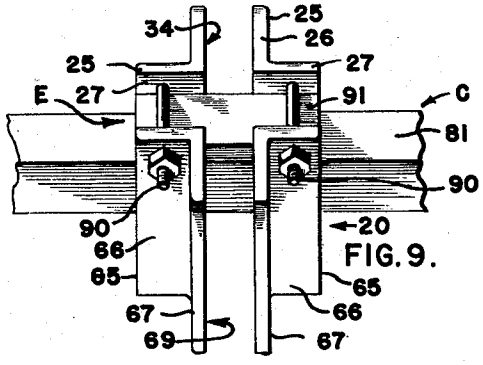


FIG. 9.

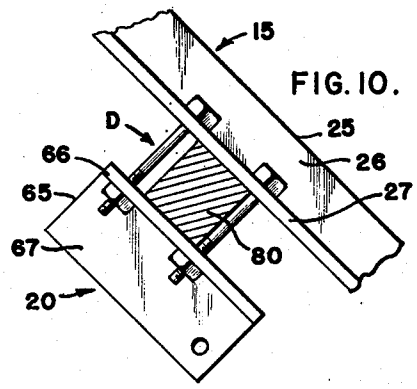


FIG. 10.

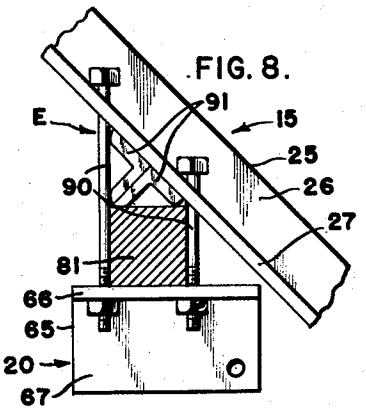


FIG. 8.

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AUTOMATICALLY OSCILLATED MOUNTING FOR EARTHWORKING ELEMENTS

Charles Wendell Jennings, Ballinger, Tex.

Application April 2, 1951, Serial No. 218,836

5 Claims. (Cl. 97—47.83)

This invention relates to earthworking machinery and more particularly to such machinery which includes earthworking elements, such as shares or points, which are automatically movable in order to overcome certain conditions encountered in earthworking operations.

An important object of the invention is to provide earthworking machinery as described wherein automatically-oscillated mounting means is provided to enable the earthworking elements, such as shares or points, to ride over obstructions in or on the earth or ground and reset themselves in normal positions for work after the obstruction has been passed.

Another important object is to provide the means just referred to, wherein the operation is rapid and positive, so that damage to the earthworking elements themselves, their connections with the rest of the earthworking machine or a tractor, for example, as well as the machine itself will not be apt to occur.

A further important object is to provide such means which may be readily mounted upon a support as the conventional tool bars of tractors, so that one or a plurality of earthworking elements may be employed. Such mounting generally entails no alterations in the conventional tool bar. On the other hand, the mounting may be made, employing a suitable substantially horizontally-extending support of a suitable frame structure.

Furthermore, a very important object is to provide such means which is so constructed and arranged that the earthworking element or elements will be found very easy to pull, for the reasons subsequently explained.

Additionally, an important object is to provide a beam, as a part of the means, which is adapted to support or mount various types of earthworking elements, such as shares, points, sweeps and so-called middle busters.

Other objects and advantages of the invention will be apparent during the course of the following detailed description of the invention, taken in connection with the accompanying drawings forming parts of this disclosure, and in which drawings:

Figure 1 is a side elevation of the new mounting means for an earthworking element in its normal position and shown as a point, and with the means carried by a tractor beam shown in vertical transverse section.

Figure 2 is a view somewhat similar to that of Figure 1 but with the earthworking element, having encountered an obstruction, being moved away from it.

Figure 3 is an exploded perspective view of the portions of the new mounting means and an example of an earthworking element associated therewith.

Figure 4 is a front elevation of the new mounting means.

Figure 5 is a rear elevation of the same.

Figure 6 is a vertical section substantially on the line 6—6 of Figure 1.

Figure 7 is a section substantially on the line 7—7 of Figure 1.

Figure 8 is an enlarged fragmentary side elevation of the new mounting means, showing a modification of a bracket for securely attaching the means to a suitable horizontally-disposed support, shown in transverse cross section.

Figure 9 is a plan view of the bracket and associated structure of Figure 8.

Figure 10 is an enlarged fragmentary side elevation of the new mounting means, supported as in Figure 1.

Figure 11 is a top plan view of three of the new means, carried by the tractor bar of a tractor shown in fragmentary top plan.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of the invention and wherein similar reference characters designate corresponding parts throughout the several views, the letter A designates the new automatically-oscillated mounting means for an earthworking element, designated as B, and mounted upon a portion of a vehicle designated as C by the mounting means D of Figure 9, or in the event a different shaped portion of the vehicle is employed, by the mounting means E of Figure 8. The letter F designates an obstruction.

The new automatically-oscillated mounting means A includes a main or first frame **15**, fixed with respect to the vehicle C and connected to one end portion of a beam **16**, by link means **17**, with the frame **15** also providing a guide and abutment for the beam **16**, a support for bumper means **18** and for one end of a reset means **19** for the beam and earthworking element, while the beam **16** is also pivotally connected with a sub-frame **20** fixed with respect to the vehicle C and carries a set means **21** for the beam **16** and element B, as well as means **22** to mount an earthworking element B thereon.

The main frame **15**, best shown in Figure 3, includes a pair of spaced-apart, elongated and substantially parallel members **25**, preferably L-shaped in transverse section and may be angle irons, with one portion **26** thereof being upwardly-extending and the other portion **27** thereof extending outwardly from the lower end of the portion **26**. The two members **25** are rigidly secured, intermediate their lengths, by a spacer member **28** which also functions as a support for a bearing **55** forming part of the bumper means **18** and this bearing may be welded to and extend crosswise of the upper face of the member **28**. Conventional securing means **29** may be employed to rigidly secure the members **25** and **28** together by providing suitable aligning bolt shank-receiving openings in the members **25** and **28** to receive the shanks of bolts, with their heads bearing against the outer face of one portion **26** and the nuts threaded to the shanks and bearing against the outer face of the other portion **26**. In addition, the frame **15** includes a combined cross member and abutment member **30** which bridges the members **25** at the lowermost parts of the portions **27**. The member **30** may be secured to the portions **27** by suitable securing means **31**, such as bolts and nuts with the shanks of the bolts extending through suitable aligning bolt shank-receiving openings in the member **30** and portions **27** with the heads of the bolts and suitable nuts drawing the parts together in a rigid manner. It will be noted that at least a portion of the edge **32** of the member **30** is beveled as at **33** to provide an area, rather than a line, contact of an arm **43** of the beam **16**, next to be described, with the member **30**. From the foregoing and Figures 3, 4 and 5, it will be apparent that between the members **28** and **30** there is a slot **34** defined by parts of the portions **26**, to receive the aforesaid arm **43**.

Figure 3 also illustrates the preferred beam **16** which is, preferably, a single casting or the like comprising an earthworking element-carrying and forwardly-extending lowermost arm **40**, a link-connected rearwardly-extending uppermost arm **41**, both being elongated and merging into each other at the portion **42** of the beam **16** and from this portion **42** extends a third arm **43**, being an elongated pivoted arm. The arm **43** forms an acute angle with the arm **40** and an obtuse angle with the arm **41** and from the arm **43**, preferably just above its juncture with the portion **42**, there is a projection **44** provided with a plurality of spaced-apart openings **45** to receive portions of means to selectively secure the seat means **21** to the beam **16**, utilizing any selected opening **45**.

In the example shown, the link means **17** comprises a pair of spaced-apart, but facing, elongated links **50**, a single shorter link **51**, pivot means **52** connecting the inner end portions of the links **50** and **51**, pivot means **53** connecting the outer end portions of the links **50** to the outer end portion of the arm **41** and pivot means **54** connecting the outer end portion of the link **51** to the upper end parts of the members **25** at their portions **26**. The pivot means **52** may be a pin provided with a plurality

of spaced-apart transverse openings to receive cotter pins or the like, with the pin extending through any pair of aligning spaced-apart openings **55** in the inner end portions of the links **50** and through an opening in the inner end of the link **51**. This pin also supports the like ends of a pair of springs which preferably provide the reset means **19**. The pivot means **53** and **54** may be suitable bolts and nuts, the shank of one bolt extending through suitable openings in the outer end portions of the arm **41** and links **50** and the shank of the other bolt extending through suitable openings in the outer end portion of the link **51** and upper end parts of the members **25** at their portions **26**. The respective nuts and bolt heads bear against the outer faces of their associated links **50** and portions **26**, as the case may be. Thus, the links **50** and **51** bridge the space between the outer end portion of the arm **41** and upper end parts of the members **25**, with the longitudinal axes of the links converging slightly upwardly, as in Figure 1, so that the links will be slightly off dead center, but the links are capable of forming angles of various degrees, such as the acute angle of Figure 2.

The bumper means **18** is best shown in Figure 6, and illustrated in action in Figure 1. It includes a bearing **55** which may be a plate welded or otherwise rigidly secured across the upper end of the spacer member **28** of the frame **15**, a second bearing **56** which may be substantially like the bearing **55** and extends crosswise the travel of the under edge of the link **51** intermediate the ends of the latter, with a face of this bearing **56** and a face of the bearing **55** confronting. The bumper means **18** also includes a pair of expansion spiral springs **57** with their ends bearing against the confronting faces of the bearings **55** and **56** and through the springs extend the bolt shanks (one for each spring) of bolts **58** with the shanks also slidably extending through aligning openings in the bearing **56** and the protruding free end portions of the shanks receiving nuts on each side of the bearing **55** to retain the bolt shanks rigid therewith. It is preferred to provide a bevel **59** at the rearward side edge of the bearing **56** for a purpose detailed in the next paragraph.

Reset means **19** for the beam **16** and earthworking element B after it has been moved away from an obstruction, as the obstruction F, preferably comprises an expansible and contractable means such as a pair of contraction helical springs with their lower end portions carried by suitable means such as bolts **60**, with their shanks extending through suitable openings in the portions **27** of the members **25** adjacent their lower ends. Suitable nuts are provided for the bolts **60**. The springs are under some tension at all times but the greatest is when the parts are in positions such as in Figure 2 and to prevent damage to the springs by an otherwise sharp edge of the bearing **56**. the bevel **59** is provided, and functions as is clear in Figure 2.

The sub-frame or second frame **20** preferably comprises a pair of short spaced-apart members **65** which may be short lengths of angle iron (but each longer than the transverse length of a tool bar for example), each including a portion **66** facing a portion **27** of the main frame **15** and a portion **67** facing the opposite portion **67**. Preferably adjacent the lower rear corners of the portions **67** are axially aligned perforations to receive a pivot means **68** as a bolt shank which also extends through a suitable opening in the free end portion of the arm **43** and is provided with a suitable nut. Because the portions **67** are spaced apart, a slot **69** is provided. The frame **15** and sub-frame **20** provide a frame structure.

The set means **21** for the beam **16** and earthworking element B preferably includes a contraction helical spring with its upper end secured, as by the hook at the upper end portion of the spring, to a rockable member **70** pivotally carried, as by a pivot **71** (as a bolt shank) extending through it and suitable axially aligned openings in the two links **50** intermediate their ends. The other end portion of the spring of the means **21** is secured to the projection **44** from the arm **43** as by hooking the end portion of the spring into any selected opening **45** in the projection **44**, and, because the distance of each opening **45** from the links **50** varies, as is clear in Figure 3, the tension upon the spring may be increased or decreased.

The means **22** to mount an earthworking element B on the beam **16** may vary, depending in part upon the shape of the element, but preferably comprises an element support face **75** at the free end portion of the arm **40** and nut and bolt assemblies **76** with the shanks adapted to extend through suitable openings from the face **75** through the arm **40** and suitable aligning openings **95** in the element B. Generally, the element B projects forwardly from the surface **75**.

In the example shown the vehicle C, shown as a conventional tractor, has a support in the nature of a tool bar **80**, horizontally disposed and of polygonal (as square) transverse section, with adjacent faces of the bar **80** inclined from the horizontal and vertical as, for example, in Figures 1 and 10, and, in order to detachably secure the new automatically-actuated element-mounting means A to the tool bar **80**, mounting means D may be provided comprising suitable nut and bolt assemblies **85** with the shanks of the bolts extending through suitable openings in the frame **15** at the intermediate parts of the portions **27** of the members **25** and in the sub-frame **20** at the portions **66** and the nuts tightened so that the parts are in positions as in Figure 10.

In the event a tool bar **81**, as in Figure 8 is encountered, the mounting means E may be employed. Here the bolt and nut assemblies **90** differ as to length of shank and spacer **91**, a pair of short angle irons may be provided to compensate for the differences in the space between the portions **27** of the members **25** and upper face of the tool bar **81** of Figure 8 are concerned.

In either case, the normal earthworking position of the element B will be substantially as in Figure 1, with a vertical line from the pivot means **68** intersecting the element and this line forming an acute angle with the longitudinal axes of the arms **40** and **41** of the beam **16**, which axes, in turn, normally form acute angles with the surface of the soil being worked. The position of this pivot means **68** with respect to the element B and the position of the beam **16** with respect to the soil surface provide means which enables the element B to be easily pulled through the soil. Moreover, because the element B is normally directly under the pivot means **68** of the beam, the element B tends to lift up the soil and much of the weight is transferred to the tool bar and thence to the ground wheels supporting the latter.

When an obstruction F is encountered the reaction thereto of the means A is quick and positive. The point of the element B will not hang on the obstruction F but sweeps rearwardly in an arc, then rides over the top of the obstruction and the subsequent operations of the set means **21** will cause the element to be forced into the soil again to the desired depth. This is due partly to the spring and partly to the abutment of the arm **43** (at its juncture with the portion **42** of the beam **16**) with the abutment member **30** of the frame **15**.

The arm **43** rides along the slots **34** and **69**, from its position in Figure 1 to and from its position in Figure 2, and the walls of the slots tend to prevent side sway of the beam **16**.

In Figure 11 is shown three of the new means A mounted upon the tool bar **80** of a vehicle C. Obviously a greater or less number than three of the new means A may be employed and, of course, various earthworking elements B capable of earthworking desired may be used.

Various changes may be made to the form of the invention herein shown and described without departing from the spirit of the invention or the scope of the claims.

What is claimed is:

1. An automatically-oscillated mounting for an earthworking element, said mounting including an upwardly-extending frame structure provided with spaced-apart substantially parallel elongated members of L-shaped transverse section with one like wall of each defining a slot, a spacer between a part of each of said one like walls defining said slot and secured to said one like walls, said spacer extending outwardly of each of said one like walls, and an abutment and frame members connecting-member bridging a pair of the other like walls of said members adjacent the lower ends thereof; a beam including a downwardly-and-forwardly-extending element-carrying arm, a link-carrying arm rigid with and extending away from said first arm and an elongated pivoted arm forming an acute angle with said first arm and rigid therewith, an edge of said pivoted arm forming a contact edge for said abutment member; mounting means

for said element carried by said first mentioned arm at the free end portion thereof; linkage between the free end portion of said second-mentioned arm and the upper end portion of said frame structure; bumper means for said linkage rigidly mounted upon said spacer and disposed in the downward path of travel of said linkage; means pivotally mounting said elongated arm, at the free end portion thereof, upon said frame structure intermediate said abutment and the pivotal connection of said linkage and frame structure; means carried by said frame structure and said linkage to yieldably urge said edge into contact with said abutment; and means mounting said frame structure upon a support.

2. A mounting according to claim 1, characterized in that said support is a substantially horizontally disposed one, and said last-named means mounts said frame structure with the longitudinal axis of said pivot intersecting a vertical line which intersects said element.

3. A mounting according to claim 1, characterized in that said spacer and bumper means are directly above and closely adjacent the last-named means of claim 1.

4. An automatically-oscillated mounting for an earthworking element, said mounting including an upwardly-extending elongated frame structure having an elongated slot at the lower portion thereof and a combined cross member and abutment adjacent the lower end of said slot; an elongated beam comprising a lowermost arm, an uppermost arm and an elongated arm integral with the uppermost and lowermost arms and with its longitudinal axis forming an acute angle with the longitudinal axis of the lowermost arm, said elongated arm being in longitudinal and transverse sliding contact with the walls of

said slot and normally in contact with said abutment and having an outer end; pivot means at the outer end of said elongated arm remote from said combined cross member and abutment and below said slot and carried by said frame structure, whereby said combined cross member and abutment functions as a stop for said elongated arm in pivotal movement in one direction of said elongated arm; means for mounting an earthworking element upon said lowermost arm; link means between said uppermost arm and frame structure; means carried by said link means and frame structure to yieldably move said elongated arm into contact with said abutment; and means for mounting said frame structure upon a substantially horizontally-disposed support.

5. An automatically-oscillated mounting for an earthworking element according to claim 4 characterized in that the longitudinal axis of said elongated arm forms an obtuse angle with the longitudinal axis of the uppermost arm.

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