M. L. POULTER.

DITCH DIGGER.

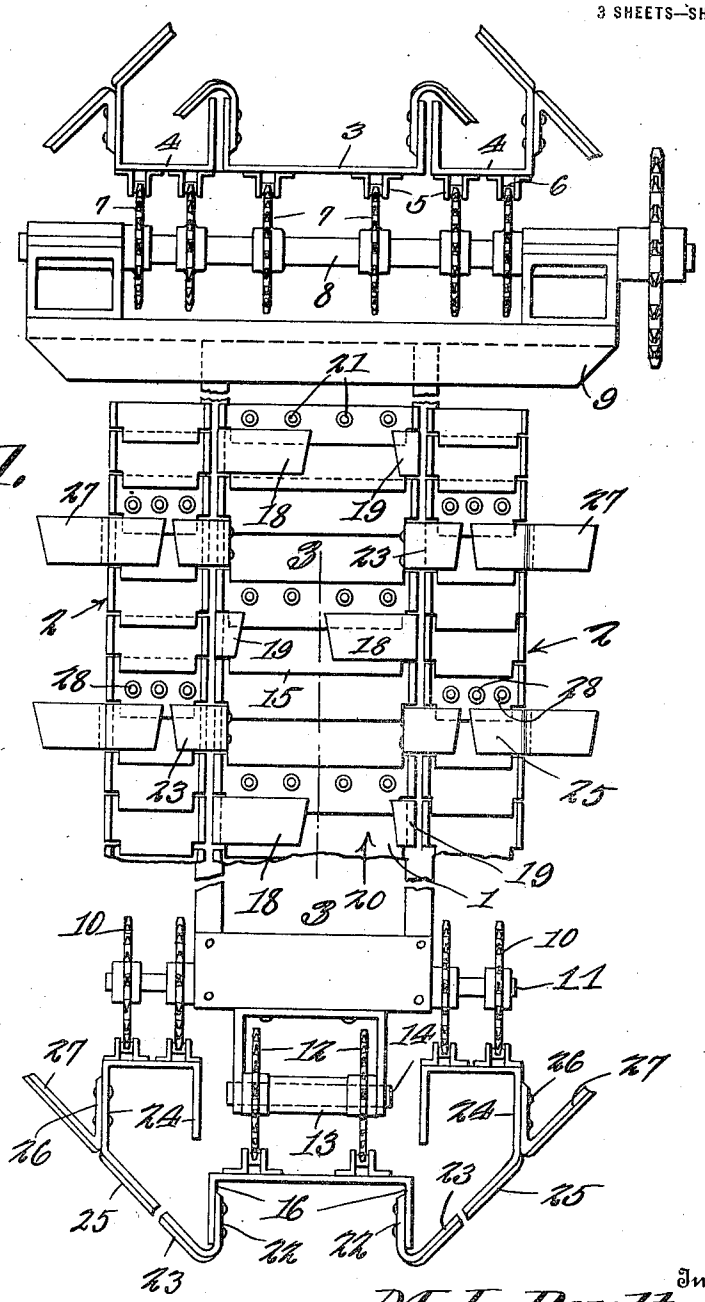
APPLICATION FILED DEC. 4, 1917.

1,284,447.

Patented Nov. 12, 1918.

3 SHEETS—SHEET 1.

Fig. 1.



Witness

J. P. Somers

A. A. Mitchell

Inventor

M. L. Poulter

By C. A. Snow & Co.

Attorneys.

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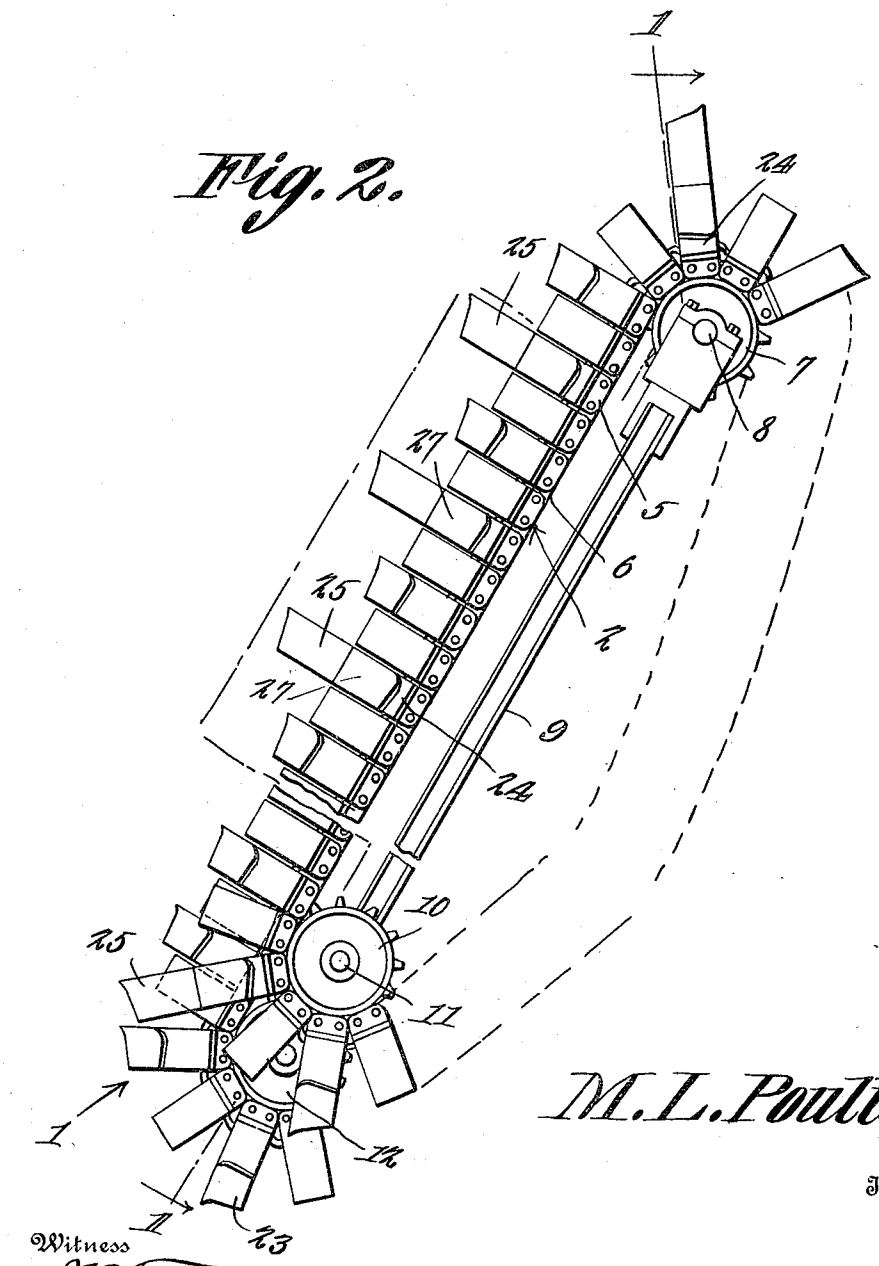
3 SHEETS—SHEET 2.

Fig. 2.



Witness

J. R. Conners

H. A. Mettlett

M. L. Poulter

Inventor,

By Cachow & Co.

Attorneys.

M. L. POULTER.

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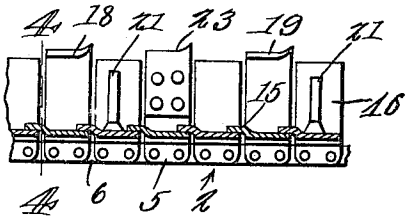
3 SHEETS—SHEET 3.

Fig. 3.



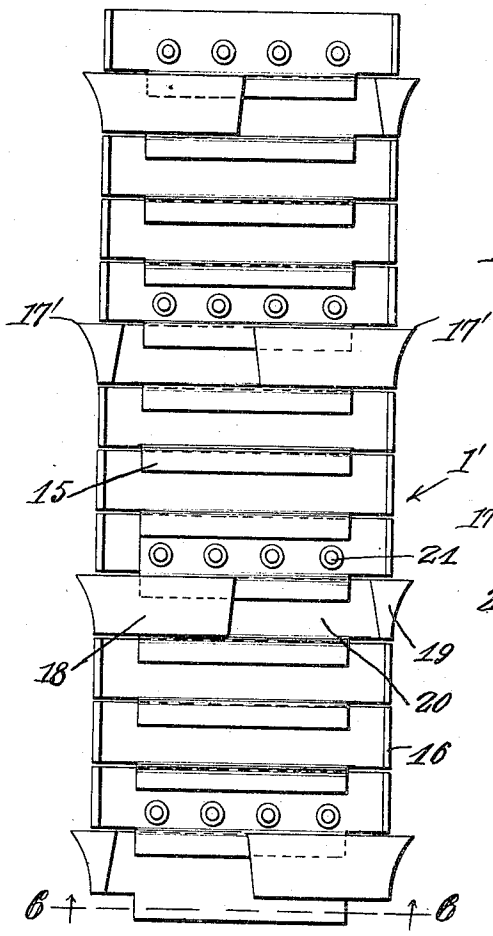


Fig. 4.

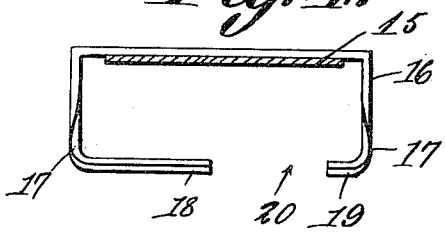


Fig. 6.

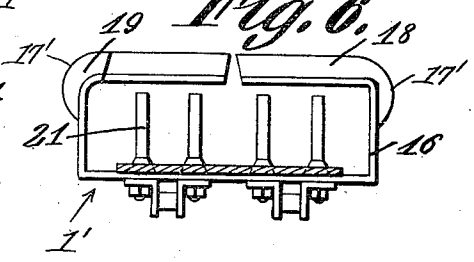


Fig. 5.

M. L. Poulter

Inventor,

Witness

J. R. Bowen

H. A. Mitchell

By C. A. Snow & Co.

Attorneys.

UNITED STATES PATENT OFFICE.

MICAJAH L. POULTER, OF MOUNT PLEASANT, IOWA.

DITCH-DIGGER.

1,284,447. Specification of Letters Patent. Patented Nov. 12, 1918.

Application filed December 4, 1917. Serial No. 205,376.

To all whom it may concern:

Be it known that I, MICAJAH L. POULTER, a citizen of the United States, residing at Mount Pleasant, in the county of Henry and State of Iowa, have invented a new and useful Ditch-Digger, of which the following is a specification.

The present invention relates to ditch digger or excavator, and aims to provide a novel and improved device of that character.

It is the object of the invention to provide the ditch digger embodying a dirt elevator of novel construction, the lower portion of which works in the ground to cut the dirt loose and carry it upwardly.

Another object of the invention is the provision of a mechanism of the nature indicated embodying novel means for cutting the dirt loose, and for catching and elevating the loosened dirt.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed, without departing from the spirit of the invention.

The invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a view of the improved digger, partly in elevation and partly in section, this view being taken on the line 1—1 of Fig. 2.

Fig. 2 is the side elevation thereof.

Fig. 3 is a sectional detail taken on the line 3—3 of Fig. 1.

Fig. 4 is a cross section on the line 4—4 of Fig. 3.

Fig. 5 is a fragmental plan view of a simplified form of digger, for cutting a ditch having vertical sides, and instead of slanting sides as provided with the digger shown in Figs. 1 and 2.

Fig. 6 is a cross section on the line 6—6 of Fig. 5.

The digger, as shown in Figs. 1 to 4 inclusive, is for cutting ditches with slanting or inclined sides, and embodies three endless sections or elevators, including the intermediate elevator 1, and the side elevators 2 at the opposite sides of the intermediate elevator 1. The elevators 1 and 2 embody the transverse sheet metal slats 3 and 4, respectively, disposed edge to edge, and links 5 are riveted or otherwise secured to the inner sides of the slats and are connected by links 6, thereby providing endless sprocket chains, two for each set of slats. These pairs of sprocket chains carry the slats, and all of the sprocket chains are trained around sprocket wheels 7 secured upon an upper transverse shaft 8 carried by the digger frame 9, which is disposed in an inclined position, as seen in Fig. 2. The frame 9 is carried by a suitable vehicle which forms no part of the present invention, so that it has not been shown, and the shaft 8 is driven in any suitable manner for actuating the digger, whereby the forward inclined run thereof is moved upwardly and rearwardly. Although the three elevators are driven simultaneously from the shaft 8, they are independent of one another. The lower portions of the sprocket chains of the side elevators are trained around sprocket wheels 10 secured upon a lower transverse shaft 11 journaled within the lower portion of the frame 9, while the lower portion of the sprocket chains of the intermediate elevator 1 are trained around a pair of sprocket wheels 12 carried by a sleeve 13 rotatable upon a stationary shaft 14 carried by the frame 9 and offset downwardly from the shaft 11. Thus, the lower portion of the intermediate elevator projects farther downward than the lower portions of the elevators 2, as seen in Fig. 1. The slats 3 will therefore be moved farther downward at the lower portion of the digger than the slats 4, whereas the slats 3 and 4, when they pass over the sprocket wheels 7, are flush, as well as being flush in the forward runs of the elevators. The rear edges of the slats 3 and 4 are provided with outwardly offset rearwardly projecting lips 15 overlapping the outer sides of the companion slats, as seen in Fig. 3, whereby to close the slots between the slats, to prevent the elevators from buckling, and to prevent the slats being forced rearwardly as they move upwardly from the sprocket wheels 10 and 12.

The slats 3 are provided with outturned end portions 16 extending at substantially right angles whereby the slats are of U-shape, and provide an endless trough or channel. Some of the slats 3 are provided

with cutters for cutting the dirt loose, and as shown, every fourth slat 3 is equipped with the cutters, the forward edges of the end portions or wings 16 of said slats being sharpened as at 17, and said end portions 16 are provided with relatively long and short cutters 18 and 19, respectively, having their forward edges sharpened and curved outwardly. The cutters 18 and 19 overhang the slats 3 and have openings 20 therebetween allowing the dirt to drop out. The cutters 18 and 19 are in staggered arrangement, as seen in Fig. 1. The cutters 18 and 19 of each pair are disposed transversely opposite to one another, and the cutters 18 and 19 alternate at each side of the elevator 1, so that the long cutters 18 are disposed in rear of the openings 20 of the cutters immediately in advance thereof.

Some of the slats 3 are provided with series of outstanding pins 21 disposed transversely of the elevator 1, and said pins are preferably carried by the slats 3 immediately in advance of the cutter slats or those slats having the cutters 18—19. The pins 21 serve to catch the dirt and carry the same upwardly, without the dirt clinging to said pins, as might prevent the discharge of the dirt at the upper portion of the elevator.

The elevator 1 is provided in addition to the cutters 18—19, which project toward one another from the sides of the elevator, with cutters 23 having shanks 22 riveted or otherwise secured to the end portions 16 of those slats 3 intermediate the slats having the cutters 18—19. The cutters 23 project toward opposite sides from the elevator 1, and project inwardly, *i. e.*, toward the plane between the runs of the elevator. The cutters 18—19 will be horizontal at the lower portion of the elevator, while the cutters 23 will extend upwardly at an angle beyond the sides of the elevator 1.

The slats 4 of the elevators 2 are also provided with outturned end portions or wings 24, and those end portions 24 at the remote sides of the elevator are provided at intervals with inclined cutters 25, and other inclined cutters 27 have shanks 26 riveted or otherwise secured to said portions 24. The cutters 25 and 27 of each pair are in alinement and are inclined or arranged obliquely, the cutters 25 overhanging the slats 4 while the cutters 27 project from the sides of the elevators 2. The forward edges of the cutters 25 and 27 are sharpened and curved outwardly as are also the forward edges of the cutters 23, whereby to effectively engage and cut the dirt, roots, and the like. The cutters 23 overhang the slats 4, and due to the downward offsetting of the slats 3 at the lower end of the elevator 1, as seen in Fig. 1, the cutters 23 will be brought into alinement with the cutters 25—27, to be disposed in upwardly diverging inclined planes, to provide the slanting sides of the ditch, while the cutters 18—19 provide the flat bottom.

The slats 4 immediately in advance of the slats having the cutters 25—27 are provided with outstanding sets of dirt catching and holding pins 28 arranged transversely of the elevators 2.

In operation, the cutters will be carried forwardly at the lower portion of the digger, where they pass under the lower sprocket wheels, and will move upwardly in front of said sprocket wheels with the forward runs of the diggers. The cutters 23—25—27 will cut the inclined or slanting sides of the ditch, while the cutters 18—19 in working between the lines of movement of the cutters 23 will cut the flat bottom of the ditch. The dirt which is loosened by the cutters will fall into the troughs formed by the slats, and will be caught and taken up by the pins 21 and 28. The outwardly curved forward edges of the cutters in loosening the dirt will deflect the dirt into the trough-shaped elevators, whereby the dirt will be carried upwardly with the forward runs of the elevators, to be discharged at the upper portions thereof where they pass over the sprocket wheels 7, any suitable means (not shown) being employed for catching the discharged material and directing it to one side or other point of discharge. It will be noted that although the lower portion of the elevator 1 projects downwardly beyond the elevators 2, the forward runs of the elevators work in the same inclined plane, and the upper portions of the elevators are flush for the convenient discharge of dirt from the upper portion of the digger, the dirt readily falling from the pins 21—28 and cutters. It is also to be noted that the elevator 1 in being longer than the elevators 2, will have a greater number of slats and the intermediate and side elevators will, therefore, continually change their relations, the side elevators completing their circuit of movement before the intermediate elevator, although all of the elevators have the same speed of movement.

In Figs. 5 and 6, a simplified form is illustrated, embodying an elevator 1′ somewhat similar to the elevator 1 above described, without using the side elevators. The cutting edges 17′ of the respective end portions or wings 16 are curved outwardly to form the sides of the ditch, which, with this form of elevator, will be vertical. The remainder of elevator 1′ is practically the same as the elevator 1, but the cutters 23 are eliminated since there is no need for them in cutting the vertical sides of the ditch.

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

1. A digger embodying an endless trough-shaped elevator, cutters carried by the sides thereof for loosening the dirt and directing

it into the elevator, and members carried by the elevator within the same for carrying the loosened dirt.

2. A digger embodying an endless trough-shaped elevator, and overhanging cutters carried by the sides thereof.

3. A digger embodying an endless trough-shaped elevator, cutters carried by the sides thereof, and overhanging the elevator, and pins carried by the elevator between the sides thereof.

4. A digger embodying an endless trough-shaped elevator, and staggered overhanging cutters carried by the sides thereof.

5. A digger embodying an endless trough-shaped elevator, and relatively long and short overhanging cutters carried by the sides of the elevator and projecting toward one another, the cutters being in staggered arrangement and having openings therebetween.

6. A digger embodying an endless trough-shaped elevator, staggered overhanging cutters carried by the sides thereof, and sets of pins carried by the elevator between its sides and immediately in advance of said cutters.

7. A digger embodying an endless elevator comprising transverse slats having outturned end portions, and cutters carried by said end portions for loosening the dirt.

8. A digger embodying an endless elevator comprising transverse slats having outturned end portions, overhanging cutters carried by the end portions of some of the slats, and dirt catching and carrying means carried by other slats.

9. A digger embodying an endless elevator comprising transverse slats having outturned end portions, and staggered overhanging cutters carried by the end portions of some of the slats.

10. A digger embodying an endless elevator comprising transverse slats having outturned end portions, staggered overhanging cutters carried by the end portions of some of the slats, and outstanding pins carried by other slats in advance of said cutters.

11. A digger embodying intermediate and side elevators having means for cutting the bottom and inclined sides of a ditch, respectively.

12. A digger embodying intermediate and side elevators, the intermediate elevators projecting downwardly farther than the side elevators, means carried by the intermediate elevator for cutting the dirt and forming the bottom of a ditch, and means carried by the side elevators for cutting the dirt and forming inclined sides for the ditch.

13. A digger embodying endless trough-shaped intermediate and side elevators, and overhanging cutters carried thereby for forming the bottom and inclined sides of a ditch, respectively.

14. A digger embodying endless trough-shaped intermediate and side elevators, the intermediate elevator projecting downwardly beyond the side elevators, overhanging cutters carried by the sides of the intermediate elevator for forming the bottom of a ditch, and cutters carried by the elevators inclined at the lower portion thereof for forming inclined sides for the ditch.

15. A digger embodying endless trough-shaped intermediate and side elevators, the intermediate elevator projecting downwardly beyond the side elevators, overhanginging cutters carried by the sides of the intermediate elevator for forming the bottom of the ditch, other cutters carried by the sides of the intermediate elevator and overhanging the side elevators, the last mentioned cutters being inclined at the lower portion of the intermediate elevator, and cutters carried by the remote sides of the side elevators and inclined at the lower portion of said elevators to coöperate with the second mentioned cutters for forming the inclined sides of the ditch.

16. A digger embodying intermediate and side endless elevators, each comprising transverse slats having outturned end portions, cutters carried by the end portion of the intermediate elevator for forming the bottom of a ditch, and other cutters carried by the end portions of the slats of the elevators and inclined at the lower portions of the elevators for forming the inclined sides of the ditch.

17. A digger embodying endless intermediate and side elevators, each comprising transverse slats having outturned end portions forming troughs, the intermediate elevator projecting downwardly beyond the side elevators, overhanging cutters carried by the end portions of the slats of the intermediate elevator for forming the bottom of a ditch, and cutters carried by the end portions of the slats of the intermediate elevator and the remote end portions of the slats of the side elevators and inclined at the lower portions of the elevators for forming the inclined sides of the ditch.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

MICAJAH L. POULTER.

Witnesses:
FRED C. WOODSON,
CARL E. STERNER.