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DIGGER CHAIN FOR DITCH DIGGING MACHINES.

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1,397,679. **Patented Nov. 22, 1921.**

Fig. 1

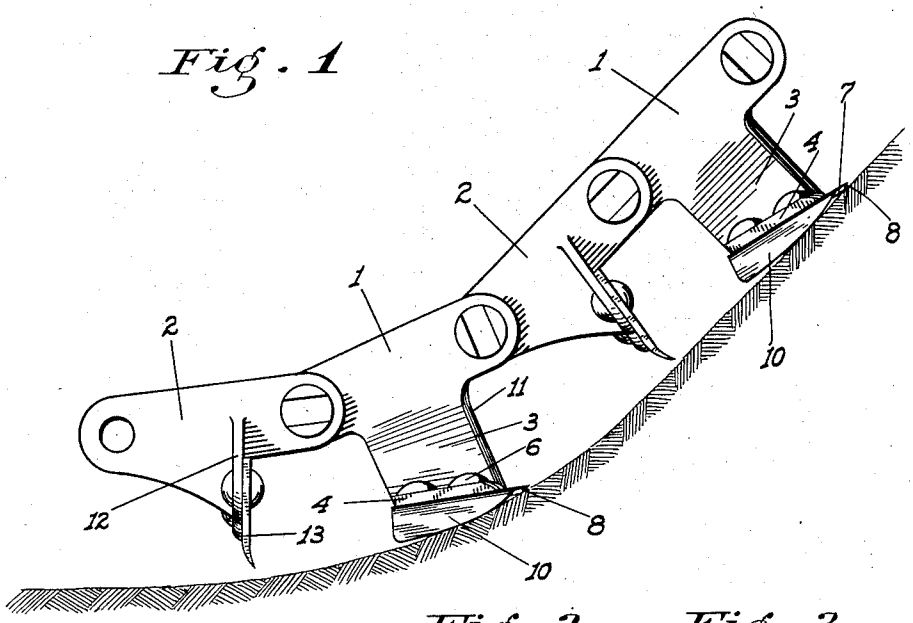


Fig. 2

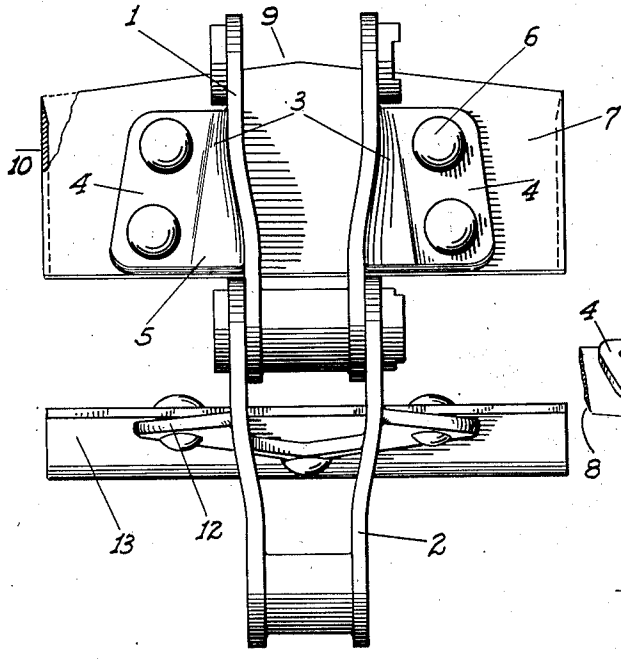
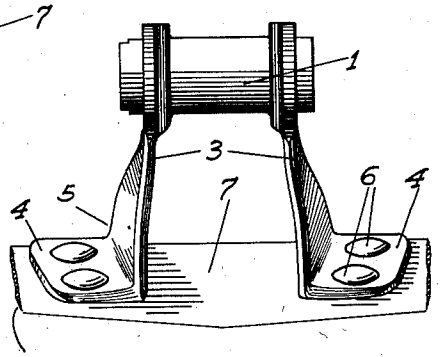


Fig. 3



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DIGGER-CHAIN FOR DITCH-DIGGING MACHINES.

1,397,679. Specification of Letters Patent. Patented Nov. 22, 1921.

Application filed August 9, 1920. Serial No. 402,391.

To all whom it may concern:

Be it known that I, LESTER G. DUNLAP, a citizen of the United States, residing at Stockton, in the county of San Joaquin, State of California, have invented certain new and useful Improvements in Digger-Chains for Ditch-Digging Machines; and I do declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this application.

This invention relates to improvements in the cutting or digging means for ditch diggers or excavators of the type employing a digger boom carrying an endless driving chain on which the digging members are mounted.

As far as I am aware, all such digger chains as now constructed, are provided with only one form of so called digging plates, which are positioned so that in reality they do not dig the dirt, but only scrape it, and must not only so scrape or dig the dirt, but must also convey the dug dirt to the discharge chute or conveyer carried by the machine above ground.

Such a construction necessitates very heavy and rigid parts, and is unsatisfactory under certain conditions, especially when operating in hard ground, since these plates having no actual cutting or digging power, cannot effectively bite into the hard ground, and as a result merely pass thereover, causing a great clattering of the digger boom as a whole and a consequent and injurious vibration of the entire structure.

The principal object of my invention therefore is to eliminate the defects inherent in the above form of construction by providing the chain with blades at spaced intervals which are so positioned that they will positively function as cutters with a chisel-like action, and by interposing on the chain between the said cutting blades, other blades positioned to function as scrapers or conveyers only, having no contact with the uncut dirt.

In this manner the strain of working is distributed more evenly over the entire chain structure, and as a result the same may be made lighter than the present form of chain, and may at the same time run at a higher speed with less liability of choking, and so dig a greater length of ditch in a given time than with the aforementioned type.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purposes which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views.

Figure 1 is a side elevation of a section of chain showing the arrangement of the alternate cutters and scrapers.

Fig. 2 is an enlarged top plan view of a pair of adjacent links with the co-operating parts, attached thereto.

Fig. 3 is an end elevation of a link carrying a digging blade.

Referring now more particularly to the characters of reference on the drawings, the numerals 1 and 2 denote a pair of chain links, arranged in constantly recurring order throughout the length of the chain.

The side plates of the links 1 are provided with integral arms or extensions 3 projecting therefrom for a certain distance, and at their outer ends have opposed flanges 4 disposed in a plane parallel to the axes of the links but at an acute forward angle relative to the longitudinal plane thereof and to the direction of movement of the chain.

The arms 3 spread apart somewhat from the link-plates outwardly, the amount of such spread being greater at the rear end of the arms than at the forward end, as shown at 5.

Fixed to the flanges 4 by means of rivets 6 are transverse cutting plates 7, the width thereof being the width of a ditch to be dug thereby.

The forward edge of the plate 7, which is at that end of the flanges farthest from the longitudinal plane of the link, is beveled similar to a chisel, as shown at 8, and this edge, instead of being straight, is preferably formed as a very flat V, as indicated at 9, the point or apex projecting outwardly.

The side edges of the blades are turned down at right angles as shown at 10, these flanges being substantially wedge-shaped from back to front, and also sharp edged, so that they not only serve as cutters for the

sides of the ditch, but stiffen the blades as well.

The edges of the arms 3 and flanges 4 adjacent the cutting edge of the blade 7 are also beveled or sharpened as at 11, so that the resistance to the dirt is lessened.

The alternate links 2 are provided with integral and transverse brackets 12 depending therefrom at a slight rearward angle.

Fixed to these brackets and substantially the same width as the plates 7 are scraper plates 13, the distance from the lower edge of these plates to the center line of the links being somewhat less than that of the cutting edge of the blades 7 therefrom.

It will be noted that due to the relative positions of the flanges 4 and brackets 12, the plates 7 and 13 are substantially at right angles to each other.

In operation, the blades 7 of course cut the dirt, which passes between and on both sides of the arms 3 and is caught and conveyed upwardly by the blades 13. In this manner, the cutter blades are relieved of the strain of not only having to cut the dirt but to push it ahead of them at the same time. By reason of the spreading or flaring apart of the arms, the dirt will not have the tendency to wedge between the same that it would otherwise have.

It will also be noted that on account of the setting of the cutter blades, when they first come around the boom idler sprocket wheel and contact with the dirt, they will be in a position to exert a positive cutting and digging effect therein.

The side blade-flanges 10 are not only valuable to cut the sides of the ditch, but in the event that an obstruction, such as a tough root, should be encountered, the shape of the flanges is such that they ride over the obstruction and raise the blade at this point, preventing the same from becoming bent, or stalling the machine.

Also should it be found desirable, one or more plain links may be interposed in the chain between the corresponding links 1 and 2, so as to widen the space between the cutter blades and their coöperating scraper blades.

By reason of the fact that the outer edges of the scraper blades are above the plane of the cutting edges of the cutter blades, the former do not come in contact with the uncut ground, but merely convey the loose dirt already dug. Also their angled setting relative to their links tends to prevent any dirt from being pocketed therein when rounding the upper sprocket wheel of the boom of the machine.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfils the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to and do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention, what I claim as new and useful and desire to secure by Letters Patent is:—

1. A digger chain for ditch digging machines comprising rigid arms projecting from the side plates of the links of the chain and flaring apart from front to rear, rigid and opposed flanges formed with said arms at the outer termination thereof, said flanges being positioned in a plane angularly disposed to the longitudinal plane of the links, and transverse digging members fixed to each pair of flanges on a plate, the digging edges of the plates being farthest from the plane of the links.

2. A digger chain comprising rigid arms formed with and projecting from the side plates of the links of the chain, rigid and opposed flanges on the arms at the outer ends thereof, and transverse cutting plates fixed to the flanges and having a beveled cutting edge, the edges of the arms and flanges nearest said cutting edge being also beveled whereby the resistance to the dirt encountered will be lessened.

3. A digger chain for ditch digging machines comprising transverse cutting members attached to spaced links of the chain and spaced therefrom, and outwardly projecting flanges on the side edges of the plates at right angles thereto, said flanges being substantially wedge-shaped from back to front.

In testimony whereof I affix my signature.

LESTER G. DUNLAP.