I. E. HANSON.

DITCHING MACHINE.

APPLICATION FILED FEB. 21, 1919.

1,329,523.

Patented Feb. 3, 1920.

2 SHEETS—SHEET 1.

Fig. 7.

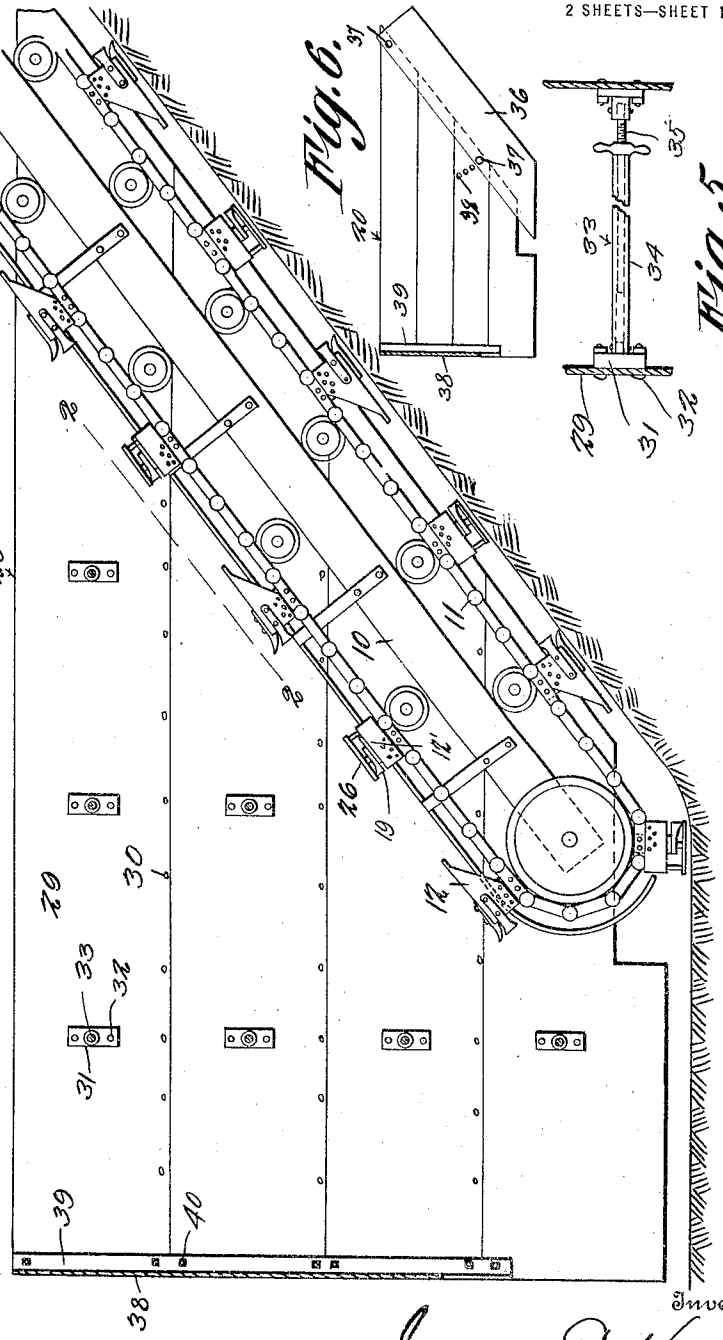


Fig. 6.

Fig. 5.

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2 SHEETS—SHEET 2.

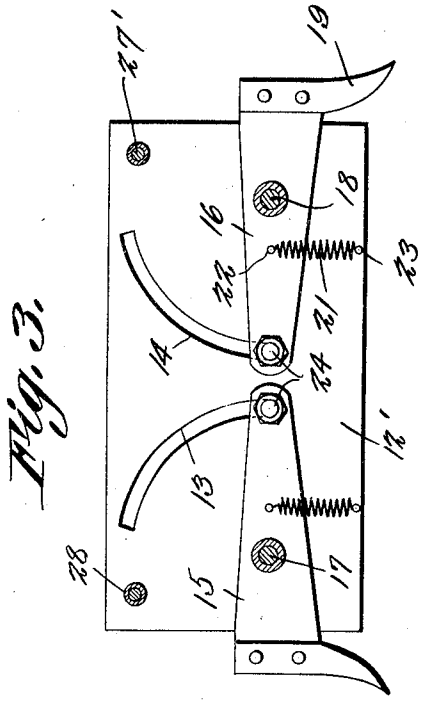


Fig. 3.

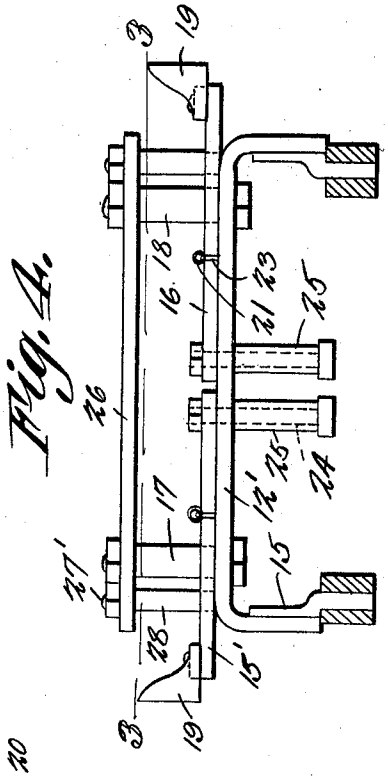


Fig. 4.

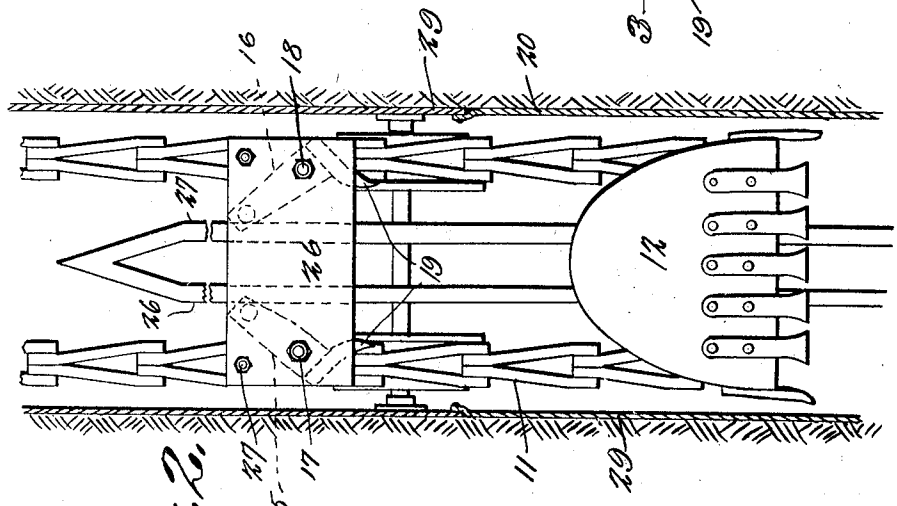


Fig. 2.

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UNITED STATES PATENT OFFICE.

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DITCHING-MACHINE.

1,329,523. Specification of Letters Patent. Patented Feb. 3, 1920.

Application filed February 21, 1919. Serial No. 278,455.

To all whom it may concern:

Be it known that I, ISAAC E. HANSON, a citizen of the United States of America, and resident of Marcus, in the county of Cherokee and State of Iowa, have invented certain new and useful Improvements in Ditching-Machines, of which the following is a specification.

This invention relates to excavating machinery and particularly to ditching machines.

An object of this invention is to produce novel means for holding the sides of ditches against disintegration or caving while the earth removing mechanism is being operated, and furthermore, to provide novel means whereby the sides of a ditch may be operated on and dislodged for the purpose of widening the cut or ditch as the scooping at the bottom of the ditch progresses.

A further object of this invention is to produce earth displacing mechanism operating laterally of the ditch during a predetermined interval of its travel longitudinally of the ditch, novel means being also supplied for rendering the said displacing mechanism inactive or inoperative during another interval of its travel, and particularly to move the displacing mechanism laterally when traveling along that part of the ditch containing the shield.

A still further object of the invention is to provide novel means whereby the shield and excavating mechanism are assembled to move in unison along a ditch, novel means being present for bracing the shields at the sides and holding them firmly against the walls of the excavation.

With the foregoing and other objects in view, the invention consists in the details of construction, and in the arrangement and combination of parts to be hereinafter more fully set forth and claimed.

In describing the invention in detail, reference will be had to the accompanying drawings forming part of this specification, wherein like characters denote corresponding parts in the several views, and in which—

Figure 1 illustrates a side elevation of a fragment of the device, the rear wall of the shield being in section;

Fig. 2 illustrates a top plan view of a fragment of the excavating apparatus on an enlarged scale;

Fig. 3 illustrates a sectional view on the line 3—3 of Fig. 4;

Fig. 4 illustrates a transverse sectional view of the trench side scraper;

Fig. 5 illustrates a sectional view of a fragment of the sheathing showing a brace in elevation; and

Fig. 6 illustrates a sectional view of the casing on a reduced scale.

In these drawings 10 denotes a frame of an excavator of any appropriate type for digging ditches, the same including ordinary sprocket chains, excavating and conveying buckets 12, and any appropriate power transmitting means (not shown).

There is of course a plurality of excavating and conveying buckets and preferably alternating therewith, there are side scraping or cutting devices, attached to the chains and carried thereby. In the present embodiment of the side scrapers or cutters, each comprises an inner plate or yoke 12′, having curved slots 13 and 14; the said yoke being connected to the links of the chains 11 by posts 15 attached to the yoke by welding or fasteners (not shown), which fastenings may comprise rivets, bolts or the like.

Arms 15 and 16 are oscillatably mounted on posts 17 and 18 respectively and the outer end of each arm has a shovel or blade 19 adapted to cut the sides of a ditch to create a clearance for the side supporting shields 20. Each arm is under the influence of a spring 21, one end of which is connected to a pin 22 on an arm and the other end of which is connected to a pin 23 on the plate or yoke 12. Near the inner end of each arm, there is a post 24 on which a collar 25 is rotatable and the collars are intended to engage a guide or camming surface 26 or 27 for the purpose of swinging the arms on their pivots, against the action of the springs to move the said arms from the positions shown in Fig. 3 to the positions shown in Fig. 2, in order that the shovels or blade will be drawn inwardly, out of operative positions so that they will move by or clear the shield 20 when that portion of the excavating apparatus is reached. The outer ends of the posts 17 pass through a plate 12 and are further connected by the posts 27, the said posts 17 and 18 and 27 having spacing collars, such as 28, by which the plates 26 and 12 are held separated.

The shield 20 on each side comprises a series of plates 29 having their edges secured together by rivets 30 or the like and the said plates have a series of bases 31 secured to them by fastenings such as shown at 32, the said bases constituting abutments for the braces 33 which hold the sides of the shield in spaced relation and force the said sides of the shield against the side of the excavation so as to prevent dislodgment of the earth. The braces 33 are of a type which comprise two telescopic sections 34 and 35 screw threaded so that the sections may be extended or retracted to increase or diminish the pressure on the sides of the shield.

By reason of the employment of the invention described, the ditching machines now in common use can be employed in any kind of soil while at the same time the sides of the ditch will be held against caving so that the idea of the attachment is to convert a regular ditching machine and provide it with a shield bolted to the ditcher on each side, the said shield following in a path made for it by the clearance afforded, due to the operation of the laterally extending arms and the blades carried by them.

The present invention, that is to say, the attachment which is applied to ordinary ditching machines is not intended to operate to increase the depth of a ditch, but is simply intended to widen the ditch by removing some of the sides to create a clearance, as stated, for the shield. The regular bucket ditching machines now in common use cut the depth of the ditch and carry out the soil so that the main idea included in this invention is that of the side cutting elements and the shield which may be used in connection with any ditching machine. The braces for holding the sides and shield in spaced relation are also important features of the invention.

On the front end of the shield there is a diagonally disposed plate 36 on each side, made separate from the main parts of the sides of the shield, so that they may be attached to the sides of the shield by bolts 37 to adjust the end plate in different positions on the ditching boom to allow for the removal of rocks from in front of the boom, and the holes 38 permit the bolt to be adjusted for the purpose stated.

The rear end of the steel boom may be used opened or closed and when closed, the ditch may be filled directly behind it, it being seen that the rear wall 38 has a flange 39, one of which will, of course, be supplied on each end of the wall, so that it may be attached by bolts 40 or the like to the sides of the shield.

I claim:

1. In a ditching machine, a chain having excavating and conveying buckets thereon adapted to excavate and remove earth, members carried by the chain and extending laterally thereof, means on said members for removing earth from the sides of a ditch, and means for retracting the last mentioned members.

2. In an excavating machine, excavating buckets, means for moving the said buckets whereby they operate to remove earth, members interposed between the said first mentioned members and operative to remove earth from the sides of the cut created by the first mentioned members, means for holding the second mentioned members in operative position, and means for retracting the said members.

3. In an excavating machine, a frame, excavating and conveying members, means for carrying the excavating and conveying members with relation to the frame and shield, a shield carried by the frame, means for holding the parts of the shield in operative positions, means for removing the sides of the excavation, means movable with the first mentioned members for removing the sides of the excavation and means for retracting said members when they pass the shield.

ISAAC E. HANSON.