July 16, 1929. E. HEUMANN 1,721,392

DITCH DIGGING AND CLEANING MACHINE

Filed Feb. 24, 1928

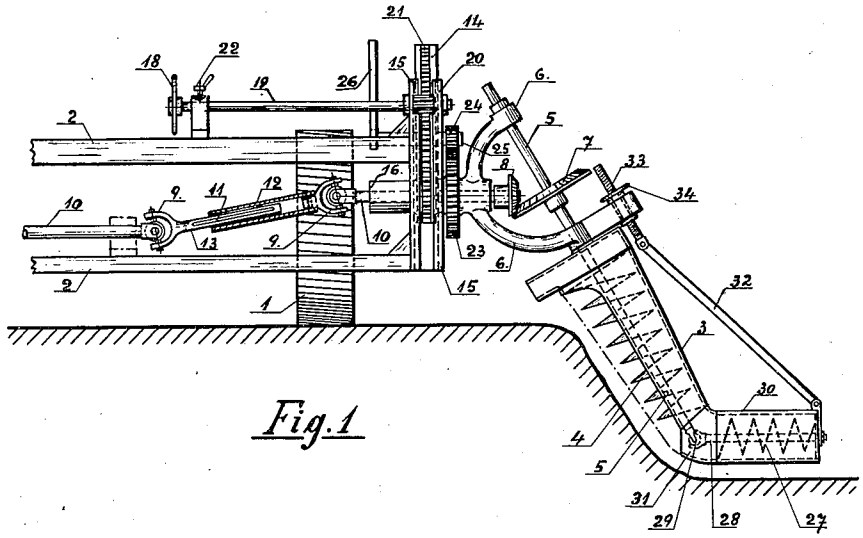


Fig. 1

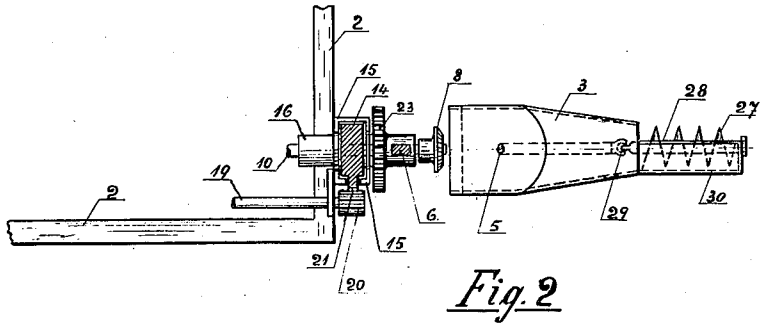


Fig. 2

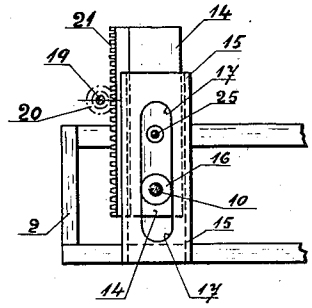


Fig. 3

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UNITED STATES PATENT OFFICE.

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DITCH DIGGING AND CLEANING MACHINE.

Application filed February 24, 1928, Serial No. 256,777, and in Germany July 6, 1927.

The ditch digging and cleaning machine according to the invention comprises a worm-like cutter extending from the side of the transportable frame and arranged by means of a holding fork so that it can oscillate around the horizontal driving shaft and be brought into any desired angular position.

The adjustability obtained by this arrangement permits of adjusting the cutter at any desired angular position in the direction of travel of the machine, whereby adjusting of the cutter for light work and further, in a limited degree adjusting of the cutter as regards depth is possible, this latter adjusting being however not possible to any desired depth and specially not, when at the lower edge of the worm-like cutter for the side-walls of the ditch a horizontal cutter for the bottom of the ditch is arranged, the semi-circular guiding envelope of which must constantly preserve a certain angular position to ensure a perfect working. In order that also the bottom of the ditch can be cut at any desired depth by means of the ditch digging and cleaning machine the holding fork of the worm-like cutter for the side-walls of the ditch is arranged, according to the invention, on a slidable body guided in a separate side-frame of the transportable frame and comprising a hub in which the driving shaft is mounted which has universal joints so that the cutter for the side-walls can be raised and lowered at any desired degree. To the lower end of the side-wall-cutter a horizonal bottom-cutter is hingedly connected which has a semicircular guiding envelope similar to that of the side-wall-cutter and which can be adjusted to any depth owing to the improved adjusting mechanism of the side-wall-cutter.

A ditch digging and cleaning machine according to the invention is diagrammatically illustrated, by way of example, in the accompanying drawing, in which:

Fig. 1 is a rear-elevation showing the cutter-device.

Fig. 2 is a top-plan-view of Fig. 1.

Fig. 3 shows in side-elevation the arrangement of the slidable body designed to hold the side-wall cutter.

The transportable frame 2 carried by running wheels 1 and the side-wall-cutter 4 enclosed by a semi-cylindrical guide-envelope 3 and arranged at the side of the transportable frame are described and shown in my co-pending application Serial Number 204,623, dated July 9th, 1927. The shaft 5 of the worm-like side-wall-cutter is suspended in a fork 6 and driven by means of bevel-wheels 7, 8 from a shaft 10 having universal joints 9. Between the universal-joints 9, 9 an intermediate piece is inserted consisting of a tubular element 12 and of a rod 13 shiftable the one on the other and connected by groove and feather 11, so that the fork 6 with the whole cutter-mechanism can be adjusted in vertical direction. The holding fork 6 is fixed in a slidable body 14 guided in a side frame 15 of the transportable frame 2 so that it can be adjusted in vertical direction. This slidable body 14 has on its inner side a hub-shaped extension 16 for the driving shaft 10. Vertical slots 17 in the side-walls of frame 15 permit of raising and lowering the hub 16 with the slidable body 14. The adjusting is effected by a spindle 19 on the inner end of which a hand-wheel 18 is fixed. A pinion 20 keyed on the outer end of said spindle meshes with a rack 21 of the slidable body 14, suitable locking devices, for instance a locking screw, being provided. The side-wall-cutter can be oscillated in the direction of travel of the machine by means of a spur-wheel 23 fixed on the fork 6 and meshing with a pinion 24 the spindle 25 of which, carries a hand-lever 26 adapted to be locked, being also mounted in the slidable body 14.

The worm-like cutter 27 for the bottom of the ditch is constructed similar to the side-wall-cutter 4 and its shaft 28 is hingedly connected by a universal-joint 29 to the shaft 5 of the side-wall-cutter. The bottom-wall-cutter has an envelope 30 of semicircular cross-section connected by an elbow-piece 31 to the envelope 3 of the side wall cutter. The material cut off the bottom of the ditch is conveyed through the guide-wall 30 to the guide-wall of the side-wall-cutter. The bottom-cutter is reinforced by a hingedly connected stay 32 designed to adjust said bottom-cutter to the horizontal position by means of a screw-spindle 33 and nut-like hand-wheel 34.

The bottom-cutter can be lifted if desired so that the side-wall-cutter 4 works alone.

I claim:

1. A ditch digging and cleaning machine comprising in combination with a transportable frame mounted on wheels and a worm-like side-wall-cutter, a worm-like bottom-cutter oscillatably connected to the lower end

of said side-wall-cutter, a guide-envelope of semicircular cross-section enclosing said worm-like bottom-cutter, a holding fork on which said side-wall-cutter is suspended, a separate side-frame of said transportable frame, a hub-like extension on the inner side of said holding fork, a supporting body mounted in said separate side-frame so that it can be shifted in vertical direction, said slidable body carrying said hub-like extension of said holding fork, a driving shaft journaled in said hub-like extension, an intermediate piece hingedly mounted in said driving shaft, and universal-joints connecting the ends of said intermediate piece with the ends of the corresponding parts of said driving shaft.

2. A ditch digging and cleaning machine as specified in claim 1, comprising in combination with a side wall-cutter a fork-shaped holder to which said side wall cutter is suspended and a slidable body in which said holder is mounted, a spur wheel fixed on said fork-shaped holder, a horizontal spindle, a pinion on the outer end of said spindle meshing with said spur wheel, and a hand lever on said spindle for oscillating said side wall cutter in the direction of travel.

In testimony whereof I affix my signature.

EMIL HEUMANN.