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DITCHING MACHINE

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Fig. 1.

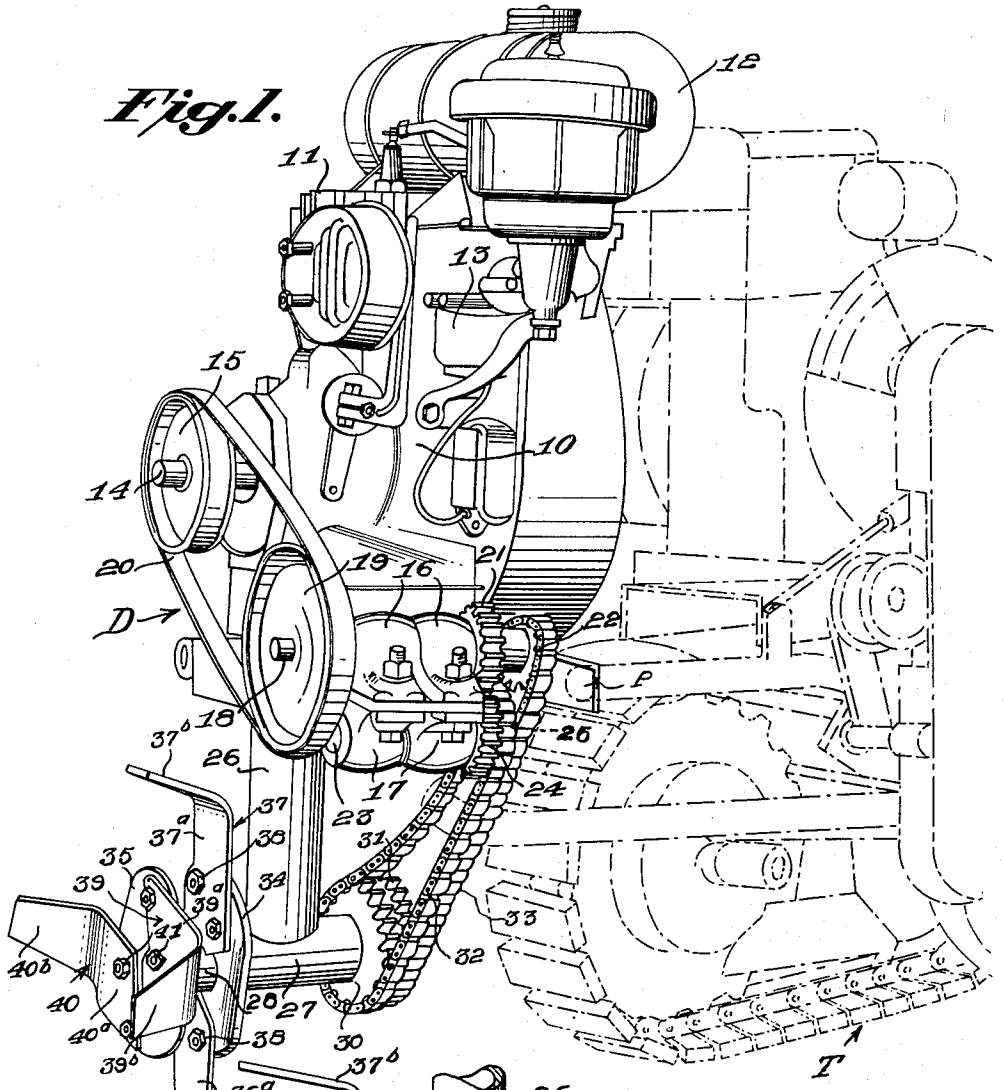



Fig. 2.

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# DITCHING MACHINE

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2 Claims. (Cl. 37—92)

This invention relates to a ditching machine.

The invention is more particularly concerned with a ditching machine for forming relatively shallow ditches in conditioned soil in irrigating and draining operations.

A primary object of the invention is the provision of a ditching machine which is self-contained and powered for self-motivation.

A further object of the invention is the provision of a ditching machine which is self-motivated and adapted for propulsion by a tractor and which machine is capable of forming ditches in the absence of side draft and with complete removal of the soil from the ditches being formed.

A still further object of the invention is the provision of a self-motivated ditching machine which in operation removes the soil from ditches being formed in opposite lateral directions thereby avoiding any side draft on the machine in its forward movement in ditch digging operations.

A still further object of the invention is the provision of a ditching machine which is relatively simple in construction, highly efficient in operation and durable in use.

Other objects and advantages of the invention will become apparent in the course of the following detailed description, taken in connection with the accompanying drawing, wherein —

Fig. 1 is a perspective view showing the improved ditching machine in solid lines and a propelling tractor in dot-and-dash lines;

Fig. 2 is a vertical axial sectional view of the digging unit with a portion of the support for the unit shown in elevation.

Referring now in detail to the drawing, the ditching machine is shown in solid lines and designated in its entirety as D, while a propelling tractor is shown in dot-and-dash lines and designated in its entirety as T.

The improved self-contained and self-motivated ditching machine D comprises a frame 10 which suitably supports a gasoline motor 11, a gasoline supply tank 12, a carburetor 13 and other cooperating elements for imparting rotation to a shaft 14 on whose protruding end is secured a belt pulley 15.

Supported on the frame 10 are upper and lower bearings 16 and 17 in the former of which is rotatably journalled a shaft 18 on whose outer end is secured a second belt pulley 19 and a belt 20 is operatively engaged with the belt pulleys 15 and 19 for imparting rotation to the shaft 18.

The shaft 18 adjacent its inner end is provided with a gear wheel 21 and in axial spaced relation thereto a sprocket wheel 22.

Rotatably journalled in the lower bearings 17 is a shaft 23 which is disposed below and in parallel relation to shaft 18 and which is provided with a gear wheel 24 in driving engagement with the gear wheel 21 and a sprocket wheel 25.

It is apparent that upon rotation of shaft 18 in one direction, shaft 23 will be rotated in an opposite direction



and accordingly the sprocket wheels 22 and 25 will be rotated in opposite directions.

Depending from the frame 10 is a vertical ditch digger support 26 whose lower end is rigidly connected to a bearing sleeve 27. A second bearing sleeve 28 is rotatably supported in the bearing sleeve 27 and a shaft 29 is rotatably supported in the bearing sleeve 28.

A sprocket wheel 30 is secured to the bearing sleeve 28 adjacent one end thereof and a sprocket wheel 31 is secured to shaft 29 adjacent a corresponding end thereof.

The sprocket wheels 25 and 30 are engaged by a sprocket chain 32, while the sprocket wheels 22 and 31 are engaged by a sprocket chain 33 whereby the bearing sleeve 28 and the shaft 29 will be rotated in opposite directions.

Fixed to the bearing sleeve 28 adjacent its opposite end is a mounting plate 34 and fixed to shaft 29 adjacent its opposite end is a mounting plate 35. With the sprocket wheels 30 and 31 and the mounting plates 34 and 35 being disposed as above described and as is clearly shown in Fig. 2, the bearing sleeve 28 and shaft 29 will be restrained against axial movement.

A pair of digging blades 36 and 37 which include parallel mounting portions $36^a$ and $37^a$ and angularly disposed digging portions $36^b$ and $37^b$ have the portions $36^a$ and $37^a$ secured to the mounting plate 34 as by means of bolts 38.

As shown in Fig. 1, the blades 36 and 37 are diametrically disposed relative to the axis of shaft 29.

A second pair of digging blades 39 and 40 which include parallel mounting portions $39^a$ and $40^a$ and angularly disposed digging portions $39^b$ and $40^b$ have the portions $39^a$ and $40^a$ secured to the mounting plate 35, by means of bolts 41.

It is to be particularly observed that the latter blades are axially spaced from the former blades and are disposed in right angular relation thereto.

As is shown in Fig. 1, the digging portions $36^b$ and $37^b$ are disposed at a different pitch than the digging portions $39^b$ and $40^b$ and the digging blades 36 and 37 are of greater diametrical extent than the digging blades 39 and 40.

In operation of the improved ditching machine, same is propelled by any small garden tractor T of the caterpillar or wheeled type, which may readily be connected by bolts as at laterally opposite points designated P in Fig. 1.

The ditching machine D provides its own digging power from motor 11, while being propelled by the tractor, thereby avoiding the use of belts from the tractor to the ditch digging machine.

The digging blades 36 and 37 will rotate about the axis of shaft 29 in one direction while the digging blades 39 and 40 will rotate about said axis in an opposite direction. The angular portions $36^b$, $37^b$, $39^b$ and $40^b$ of the blades will remove the soil from the ditch and dispose same on opposite sides thereof and due to the opposite rotation of the two sets of digging blades, side draft will be overcome in a ditch digging operation.

The digging unit is compact, light in weight and is capable of being readily operably connected to a propelling tractor.

Having set forth the invention in accordance with a preferred structural embodiment thereof, what is claimed and desired to be secured by U.S. Letters Patent is—

1. A ditching machine comprising a frame, a motor driven shaft rotatably supported by said frame, a second shaft rotatably supported by said frame in parallel relation to said first shaft, a drive connection between said motor driven shaft and said second shaft, a third shaft rotatably supported by said frame adjacent said second shaft and parallel therewith, gear drive connections be-

tween said second and said third shafts for opposite rotation thereof, a support depending from said frame, a bearing sleeve rigidly secured to the lower end of said support, a second sleeve rotatably supported within said bearing sleeve and being disposed in parallel relation with said first, second and third shafts, a shaft rotatably supported within said rotatable sleeve, drive connections between said second and said third shafts and said rotatable sleeve and said last shaft for opposite rotation thereof, a pair of ditching blades secured to said rotatable sleeve and disposed diametrically thereof, and a pair of ditching blades secured to said last shaft and disposed diametrically thereof, and said first and second pair of ditching blades being in spaced relation axially of said rotatable sleeve and said last shaft.

2. A ditching machine according to claim 1, wherein said blades each include a plane inner mounting portion and an outer ditching portion in angular relation thereto,



the ditching portions of the blades of one pair thereof being of a pitch greater than the ditching portions of the blades of the other pair thereof, and the ditching portions of the blades secured to said rotatable sleeve overhanging the ditching portions of the blades secured to said last shaft.

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