May 22, 1956 W. A. FICKEN 2,746,180

THROWER TYPE WHEEL EXCAVATOR

Filed April 23, 1952 2 Sheets-Sheet 1

Fig. 1.

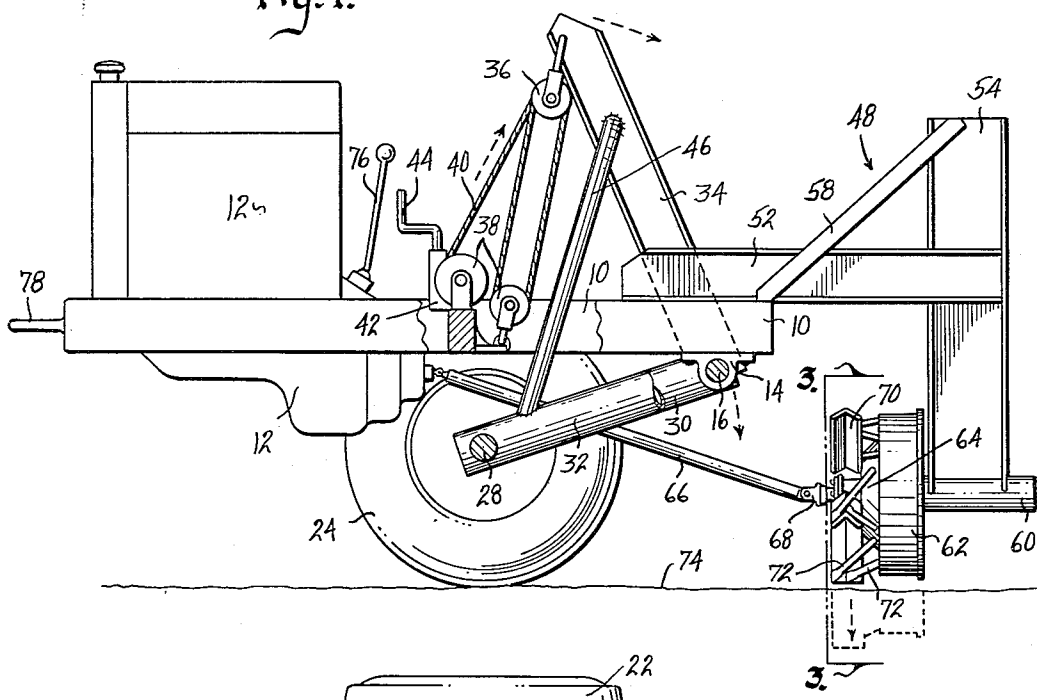
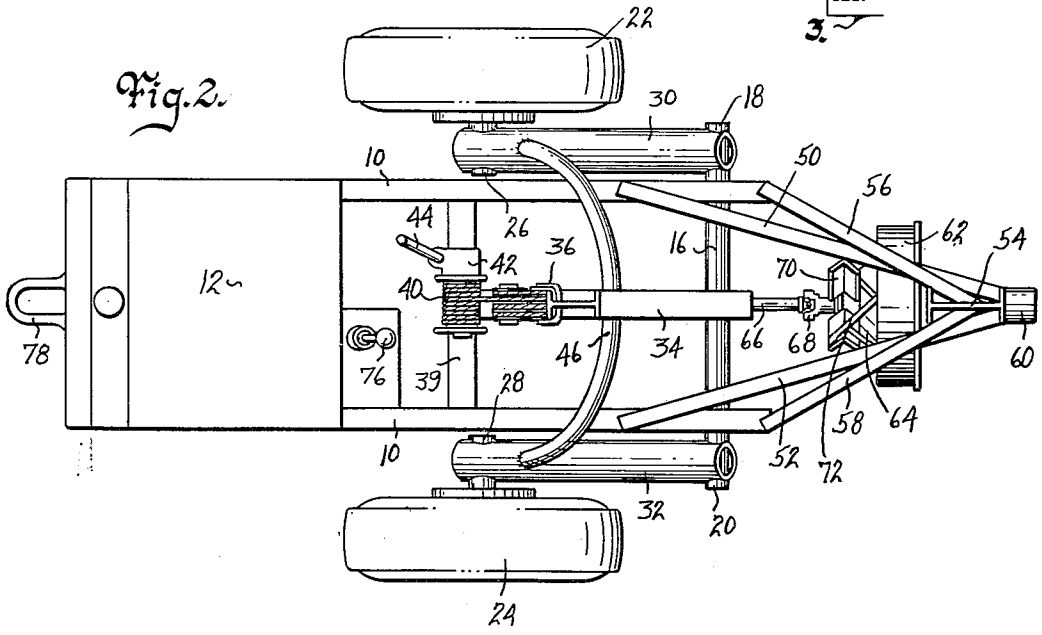


Fig. 2.



Inventor
Wilbert A. Ficken
by Talbert Dick & Adler
Attorneys

Witness
Edward P. Feeley

May 22, 1956 W. A. FICKEN 2,746,180

THROWER TYPE WHEEL EXCAVATOR

Filed April 23, 1952 2 Sheets-Sheet 2

Fig. 3.

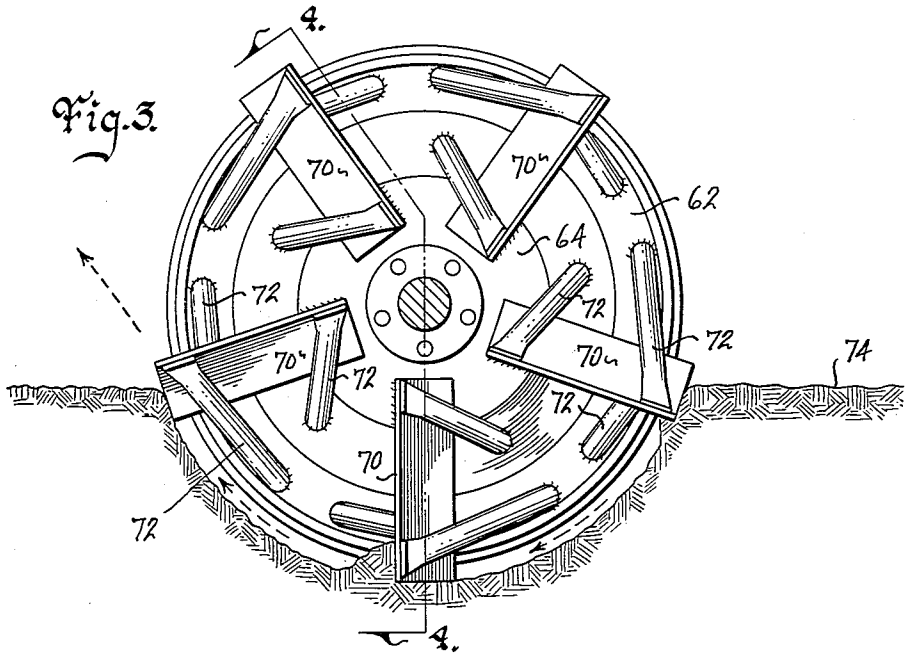
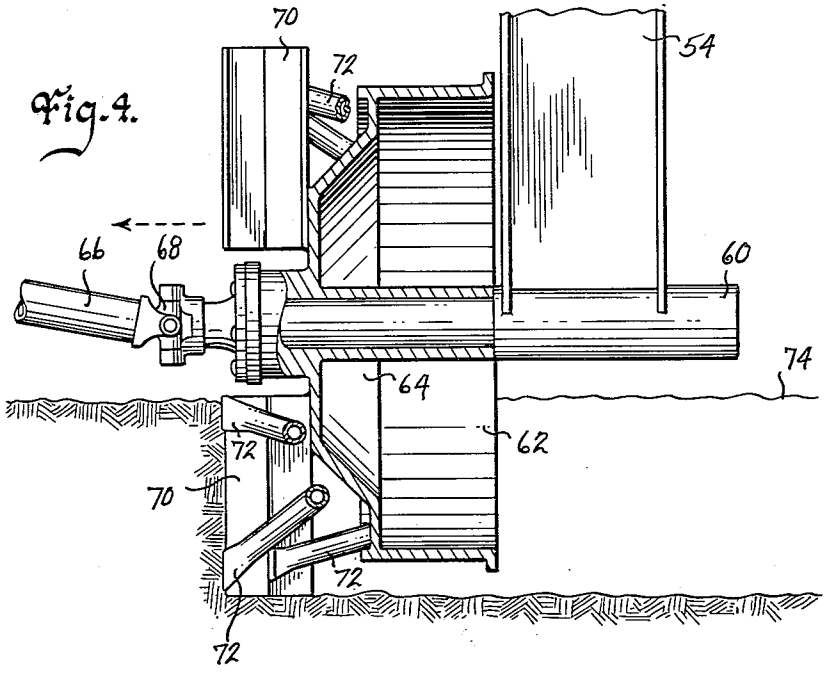


Fig. 4.



Inventor
Wilbert A. Ficken
by Talbert Dick & Adler
Attorneys

Witness
Edward P. Seeley

United States Patent Office 2,746,180 Patented May 22, 1956

2,746,180

THROWER TYPE WHEEL EXCAVATOR

Wilbert A. Ficken, Gayville, S. Dak.

Application April 23, 1952, Serial No. 283,845

2 Claims. (Cl. 37—92)

My invention relates to improvements in ditch digging equipment and has particular utility in regard to digging drainage ditches although it is not intended to be limited thereto.

A low area in farm land, for example, will frequently be found to contain one or more isolated low points into which water collects and from which it is not always easy to drain the water. Ordinary ditch digging equipment would require means for hauling away the dirt removed since if it were allowed to be deposited along the side of the ditch it would create a parapet or dike that would prevent water in this low area from flowing into the drainage ditch. In addition, such low areas are very soft when wet so that the use of ordinary ditching machines and trucks, for example, to carry away the dirt it not feasible due to the likelihood of these machines getting mired.

The use of a plow blade or the like to create a drainage ditch or furrow creates a parapet on a small scale that is nevertheless sufficient to adversely affect the drainage from the surrounding area as above pointed out.

With this problem in mind it is the general aim of my invention to provide a ditching machine that will leave the ground surface adjacent the ditch free of any dike or parapet forming accumulation from the earth removed in creating the ditch without the necessity of separate means for removing the earth so removed.

More specifically my invention provides a machine of the above class which embodies the use of rotating scoops that propel and disperse the removed earth away from the ditch into the adjacent area in such a manner that at no point does it cause any accumulation sufficient to interfere with the natural drainage of water from this area to the ditch.

A still further object of my invention is to provide a ditching machine as above described that is trailer mounted so that it can be easily and quickly attached to or detached from a tractor or the like.

Still other objects of this invention are to provide a machine having the above characteristics that is economical in manufacture, durable in construction and efficient in use.

These and other objects will be apparent to those skilled in the art.

My invention consists in the construction, arrangement, and combination of the various parts of the device, whereby the objects contemplated are attained as hereinafter more fully set forth, and specifically pointed out in my claims, and illustrated in the accompanying drawings, in which:

Fig. 1 is a side elevational view of my digger mounted on a trailer, with a portion broken away to more fully illustrate its construction.

Fig. 2 is a top view of this device,

Fig. 3 is an enlarged front view of the rotating scoop assembly of this invention taken from the line 3—3 of Fig. 1, and,

Fig. 4 is a cross-sectional view taken on the line 4—4 of Fig. 3.

Referring to the drawings I have used the numeral 10 to designate a trailer frame or chassis preferably having a self-contained power unit such as an internal combustion engine 12 suitably mounted on the forward end thereof. On the underside of each frame side at the rear is secured a bearing member 14, and a rod 16 positioned transversely of the longitudinal axis of the frame is arranged in these bearing members 14 so that the respective end portions 18 and 20 of the rod protrude from the respective frame sides as shown in Fig. 2. Wheels 22 and 24 respectively are oppositely disposed at the side of the frame intermediate the frame ends and each wheel is secured respectively to the stub axle members 26 and 28 that each extend toward but not to the frame as illustrated in Fig. 2. A rigid link means such as a rod, bar or tubular member 30 (Fig. 2) is pivotally connected at one end to the stub axle 26 and at its other end similarly connected to the end portion 18 of rod 16. Likewise, the rigid link member 32 is similarly arranged relative to the stub axle 28 and rod end 20. An upstanding arm 34 is secured to the transverse rod 16 intermediate its ends and extends forwardly therefrom so that its forward end is vertically spaced above the frame 10 as shown in Fig. 1. A block and tackle 36 depends from the forward end of arm 34 and one or more sheaves 38, depending on the mechanical advantage desired, are arranged on a cross bar 39 on the frame 10 on which the cable 40 is reeved in a well known manner. A means 42 carrying a handle 44 is used for operating the block and tackle in a well known manner. A bail like member 46 has its respective ends secured to the members 30 and 32 near the axles 26 and 28 and this member 46 extends through and is secured to the forward portion of arm 34 as illustrated in Figs. 1 and 2.

A frame supporting means 48 used for supporting my digging assembly, to be later described, is mounted on and extends rearwardly of the chassis 10. For this purpose a pair of horizontal I beams or the like 50 and 52 are secured respectively at the end to the frame 10 sides near the rear thereof and converge rearwardly so that their rearward ends are oppositely disposed on and secured to a vertical supporting arm 54 at a point intermediate its upper and lower extremities. A pair of bar braces 56 and 58 are respectively secured to the rear end portion of the frame 10 side and converge therefrom toward and are secured to the upper portion of arm 54 as shown in Figs. 1 and 2. To the bottom of the member 54 and extending forwardly thereof there is secured the horizontal axle member 60 and on the cross sectionally reduced forward portion 60*a* thereof is rotatably mounted the hub portion 62*a* of a drum member 62 that preferably has a forwardly protruding body portion 64 that is concentrically reduced in diameter relative to the main drum portion. It is pointed out, however, that a disc plate or the like may be used in place of my preferred use of a drum as described. This drum is operatively connected to the motor 12 for rotation and preferably I illustrate this by means of a drive shaft 66 having a universal joint means 68 on each respective end.

A plurality of angle iron segments 70 each have a portion of one end secured, as by brazing or the like, to the drum portion 64 and extend radially therefrom slightly beyond the perimeter of the drum portion 62 as shown in Figs. 3 and 4. Each segment 70 is similarly positioned to present an elongated V-shaped scoop-like blade in one direction of rotation. The back side of each segment 70 is suitably braced at one or more points by rigid brace members 72 secured at one end to the segments 70 and at their other ends to suitable places on the drum portions 62 and 64 as shown in Fig. 3. Thus arranged it will be observed that the major length of each segment is

spaced from the main drum portion 62 to minimize any clogging or binding from the removed earth.

Thus constructed and arranged, my ditcher will operate in the following manner. For transporting to and from a site for digging operations the drum 62 can be elevated above ground level 74 by taking up the cable 40. When this is done the arm 34 will move forwardly to raise the frames 10 and 48 and the wheels 22 and 23 will bear the weight due to the pivoting of members 30 and 32 on the axles 26 and 28. To lower the drum 62 the cables 40 are let out whereby the arm 34 moves as indicated by arrows in Fig. 1 to lower both frames 10 and 48. Since the axles 26 and 28 are stubs and not secured to the frame 10 the action above described is possible. When the drum has been lowered to the desired level, it is rotated by using the gear lever 76 to engage the motor 12 with drive shaft 66. The drum 62 is pulled forwardly on a horizontal plane and the rotating blades 70 will eat into the earth as illustrated in Fig. 4. It will be appreciated that the motor 12 is capable of different speeds and the rotation of the drum 62 should be at a speed where in the digging action of the blades 70 the earth removed will be propelled by centrifugal force away from the digging site so that it is dispersed over a relatively wide area and will not form an accumulation in any one place sufficient to impede the normal drainage toward the ditch. It will be appreciated that preferably the chassis 10 is attached to a tracked vehicle or the like (not shown) by the hitch means 78 so that in ditching a number of low spots in any given area, this device can be pulled from one to the other and thus provide a single ditch connecting all low spots to a single point of disposal. It will also be understood that this device can be used in places other than those which are marshy and swampy and in such locations where traction is no problem a wheeled prime mover can be used efficiently to pull this digger.

Some changes may be made in the construction and arrangement of my ditch digger without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim:

1. A ditch digging machine comprising in combination, a frame, vertically adjustable frame-carried ground-supported means for supporting the frame as the latter is propelled over the ground to be ditched, a forwardly extending axle carried by said frame, an excavating drum having a hub portion rotatably mounted on said axle, the forward end of said drum comprising a forwardly and inwardly extending concentrically tapered area, the forward end of said area terminating in a concentrically positioned flat face area around said hub portion, frame-carried drive means for said drum and operatively connected thereto, a blade member secured adjacent one end portion to the flat face area of said drum, said blade extending substantially radially from said flat face area beyond the outer margin of the latter and in spaced opposition to said concentrically tapered area, and frame-carried control means operatively connected to said ground-supported means whereby, through raising and lowering of said ground-supported means, the frame and the excavating drum carried thereby are raised and lowered to vary the depth of the ditch to be excavated.

2. A ditch digging machine comprising in combination, a frame, vertically adjustable frame-carried ground-supported means for supporting the frame as the latter is propelled over the ground to be ditched, a forwardly extending axle carried by said frame, an excavating drum having a hub portion rotatably mounted on said axle, the axis of said excavating member extending in the direction of travel of said frame, said excavating drum having a forwardly and axially extending reduced portion, said reduced portion providing a blade seat extending in a plane substantially normal to its axis and spaced forwardly of the major portion of said drum, an excavating blade member secured to said seat and extending substantially radially outward from said reduced portion in spaced opposition to the major drum portion, and frame-carried control means operatively connected to said ground supported means whereby through raising and lowering of said ground supported means, the frame and the excavating drum carried thereby is raised and lowered to vary the depth of the ditch to be excavated.

References Cited in the file of this patent

UNITED STATES PATENTS

738,597	Berglund	Sept. 8, 1903
1,095,097	Fournet	Apr. 28, 1914
1,491,686	Fitch	Apr. 22, 1924
2,101,400	Lawler	Dec. 7, 1937
2,310,526	Horrigan	Feb. 9, 1943
2,310,735	Greer	Feb. 9, 1943
2,408,459	Tuttle	Oct. 1, 1946
2,518,622	Ingersoll	Aug. 15, 1950
2,542,474	Burchett	Feb. 20, 1951

FOREIGN PATENTS

108,038	Australia	July 19, 1939