J. E. FUNK.

DITCHING MACHINE.

APPLICATION FILED APR. 1, 1912.

1,073,227.

Patented Sept. 16, 1913.

2 SHEETS—SHEET 1.

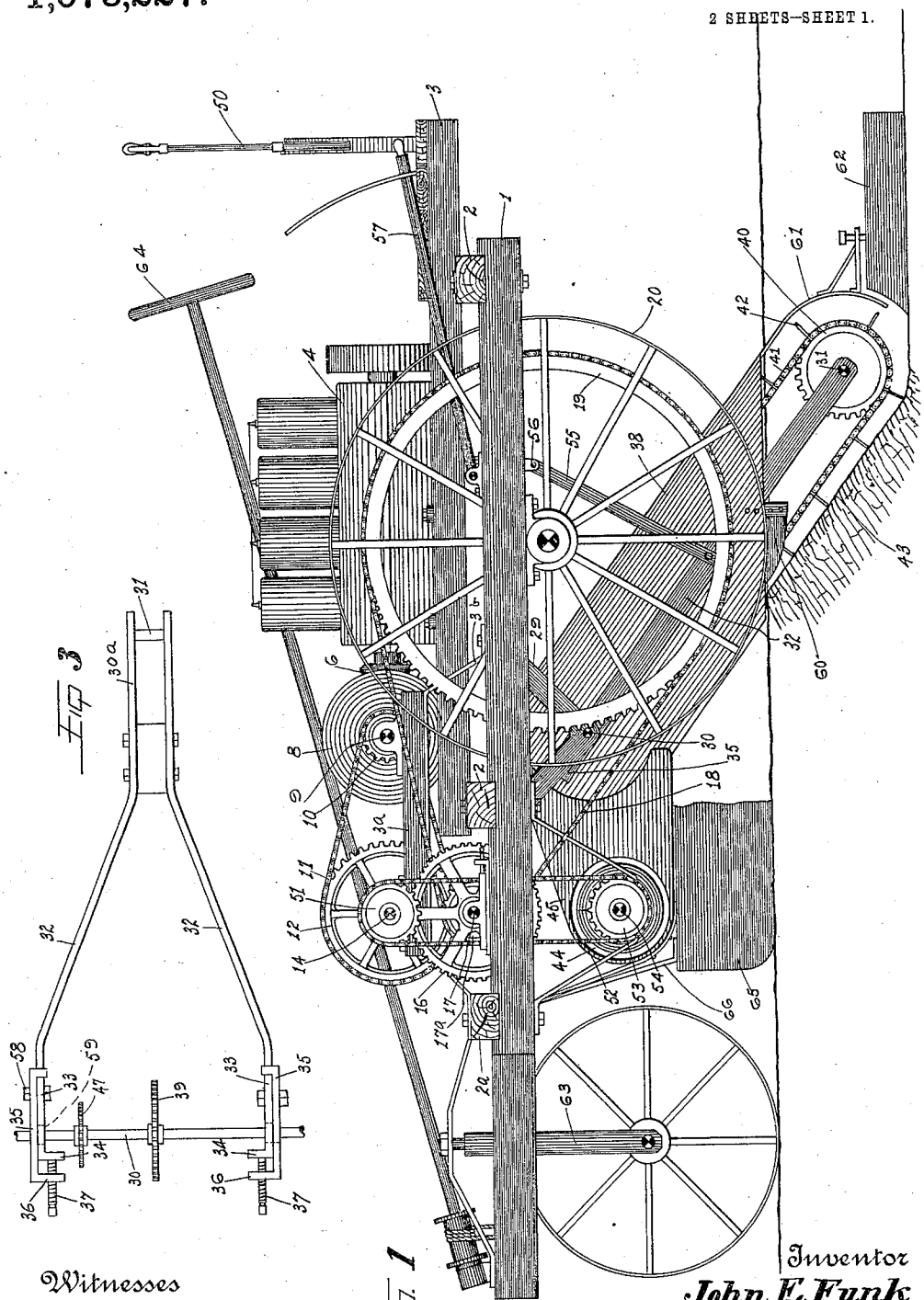


Fig. 1

Fig. 3

Witnesses

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J. B. Webster

Inventor

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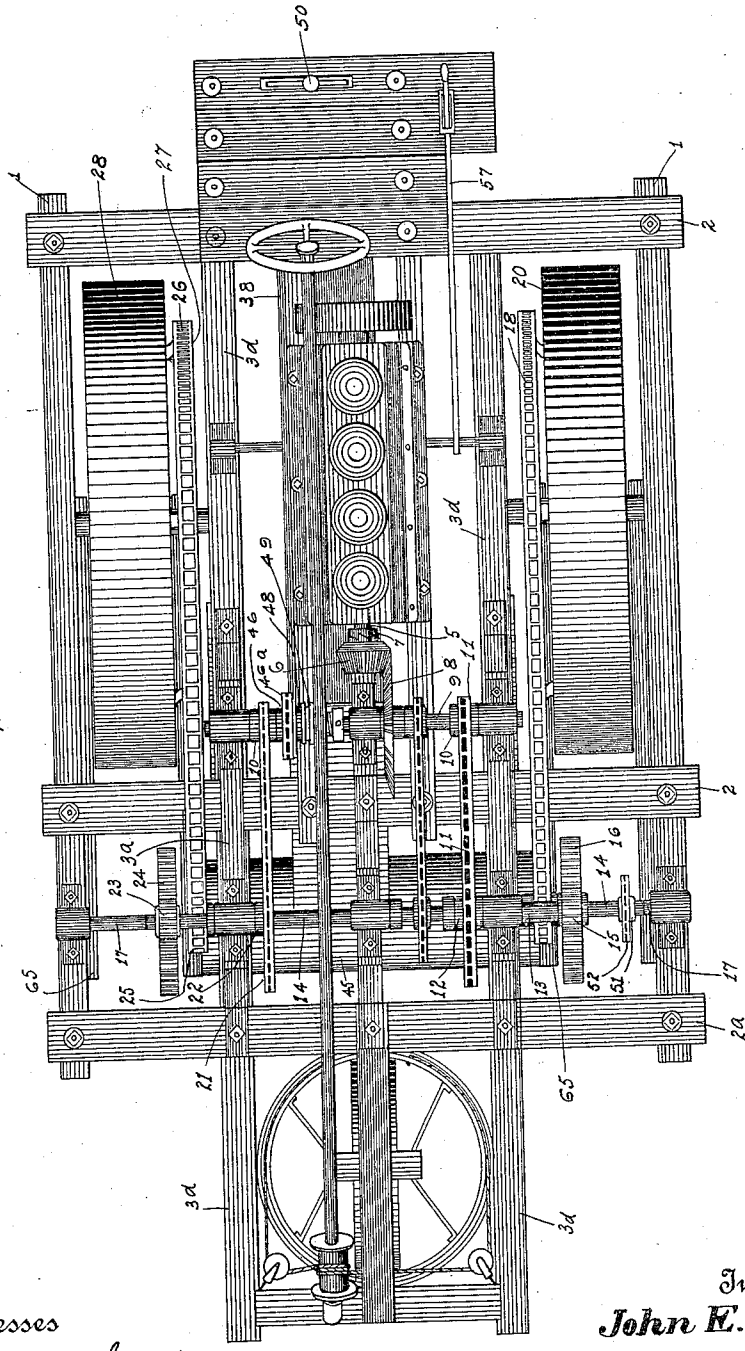


Fig 2

Witnesses

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UNITED STATES PATENT OFFICE.

JOHN E. FUNK, OF MOORLAND, CALIFORNIA, ASSIGNOR TO PROGRESSIVE MANUFACTURING COMPANY, OF STOCKTON, CALIFORNIA, A CORPORATION.

DITCHING-MACHINE.

1,073,227. Specification of Letters Patent. Patented Sept. 16, 1913.

Application filed April 1, 1912. Serial No. 687,907.

To all whom it may concern:

Be it known that I, JOHN E. FUNK, a citizen of the United States, residing at Moorland, in the county of San Joaquin, State of California, have invented certain new and useful Improvements in Ditching-Machines; and I do declare the following to be a clear, full, and exact description of the same, such as will enable others skilled in the art to which it appertains to make and use 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 ditching machines of all kinds but more particularly to a ditching machine adapted for use in any light and soft soils such as delta lands which contain peat or similar sediment deposits, the object of the invention being to produce such a ditcher as will handle such light soils in a rapid and effective manner. The great difficulty heretofore encountered in producing a ditching machine to handle such light soils has been that it is impossible to handle the same by means now commonly employed, namely that of conveying the dirt upwardly by ordinary conveyers calculated to discharge such dirt from the machines by gravity. This difficulty is occasioned by the fact that the soil is so light that it will not remain in the conveyer but will float away in the air or with the breeze and it is so light that it will not dump itself by gravity from the ordinary conveyers.

My device is particularly designed to cut the dirt in a rapid and effective action in a manner similar to a saw cutting through wood, this operation being effected by means of an endless chain having teeth which will cut through the ground rapidly carrying the dirt on its under side and throw the same into a conveyer which will discharge at the sides of the ditch.

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 for which it is designed.

These objects, I accomplish by means of such structure and relative arrangement of the 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 the complete device. Fig. 2 is a top plan view of the same. Fig. 3 is a top plan view of a cutting conveyer frame supporting means.

Referring now more particularly to the characters of reference on the drawings, the numeral 1 designates a main supporting frame mounted on which are auxiliary cross beams 2 supported on which are further beams 3 to which is secured an engine or other motive power 4, which engine drives a main shaft 5 having on its outer end a beveled gear 6, there being a suitable clutch 7 interposed between the engine 4 and said gear 6 whereby such engine may be connected and disconnected from the operating mechanism of the ditcher. The beveled gear 6 intermeshes with another beveled gear 8 secured on a shaft 9 journaled on the beams 3^a, supported upwardly from the beams 3^d which are secured to the under side of the beams 2 by means of brackets 3^b there being two sprocket gears 10 disposed on said shaft 9 at each end. One of said gears 10 is connected by a chain 11 with another sprocket gear 12 on a sleeve 13 mounted on a shaft 14 journaled on the beams 3^a, which sleeve 13 is provided with a pinion 15 on its outer end intermeshing with another pinion 16 mounted on a shaft 17 journaled on the frame 1 and driving a sprocket gear 17^a connected by a chain 18 with a sprocket gear 19 secured on a wheel 20 on which wheel 20 is mounted the frame 1. The other wheel 10 is connected by a chain 21 with a sprocket wheel 22 secured on the shaft 14. There is another pinion 23 similar to the pinion 15, which pinion intermeshes with another pinion 24 on the shaft 17, there being a sprocket gear 25 on said shaft 17 on the outer end connected by a chain 26 with a sprocket gear 27 secured on a wheel 28 similar to the wheel 20 which supports the other side of the frame 1.

The numeral 3^a designates two beams

spaced apart and secured to the under side of beams 2 as described and to another cross beam 2^a.

Secured on the outer edges of each of the members 3^a is a hanger 29 pivotally mounted on the lower end of which, as at 30, is a Y-shaped supporting frame consisting of a lower portion 30^a having a pin 31 and upper projecting branches 32, each of said branches 32 having a horizontally disposed arm 33 provided with an inwardly projecting flange 34. Slidably mounted over each of the members 33 is a bar 35 having an inwardly projecting flange 36, there being a set screw 37 disposed through each flange 36 and against each flange 34. Projecting through the hangers 29 and the members 33 and 35 is the shaft 30 which supports an inclosed box 38, there being a gear 39 secured centrally on said shaft 30 within the box 38. The members 32 project through the sides of the box 38 as shown in Fig. 1 and on the pin 31 is a gear 40.

The numeral 41 designates a chain projecting over the gears 39 and 40 and provided with outwardly projecting metal flanges or teeth 42 which, as the chain 41 revolves, as will be hereinafter described, work against the earth surface 43 of the ditch in a rapid and effective manner and throw the dirt up into the box 38 where it is then carried and thrown into an auger conveyer 44 in a box 45 communicating with the box 38 as shown in Fig. 1. The shaft 30 is driven by means of a chain 46^a connected with a gear 47 on the shaft 30, and with a gear 46 on the shaft 9, such gear 47 being mounted on a sleeve 48 having a clutch 49 whereby by means of a lever 50 the same may be connected or disconnected with the driving shaft 9 when it is desired to operate the chain 40.

The auger conveyer 44 is driven by means of a gear 51 mounted on the shaft 14 and connected by a chain 52 with a gear 53 on the shaft 54 of said auger conveyer 44. At this point it might be well to state that the conveyer 44 may or may not be an auger conveyer, a draper conveyer or any other kind or character desired.

In order to raise or lower the box 38 and its accompanying parts, I provide a link 55 connected with another link 56 which in turn is connected to a lever 57 by the operation of which lever 57 the box 38 and its accompanying parts may be raised or lowered according to the depth of the ditch desired or this structure may be used to entirely raise the box 38 and connected parts. In practice the box 38 is adapted to end at the top of the ground while the members 30 and their connected parts project into the ditch as shown in Fig. 1.

To tighten the chain 40 the set screws 37 are operated which drives the members 33 through the members 35 to any fixed position and then this fixed position is set by means of bolts 58. (See Fig. 3.) For this purpose the members 35 are fixed stationary on the shaft 30 while the members 33 have slots 59 to enable them to move over said shaft 30 for the purpose, as described.

In the under edges of the box 38 are shoes 60 adapted to cut in the edges of the ditch as the machine proceeds in order to prevent them from caving in.

Projecting down over the lower edge of the chain 4 and its teeth 42 is a hood 61 to keep the dirt inclosed within the operating space of the saw like construction while the numeral 62 designates a block secured to the hood 61 and adapted to drag along the bottom of the ditch in order to keep all the loose dirt directly in the path of the teeth 42. In conjunction with and to aid this operation, I provide on each side of each wheel a sled or runner 65 suitably connected to the main frame of the device by means of brackets 66. These sleds form a tray into which the dirt is emptied by the conveyers and the wheels then roll directly over it as described and pack the same into the soil on the sides of the ditch. The particular object gained by this is that the soil of delta lands is so very light that if left in piles or levees on either side of the ditch it would have a tendency to fly back and into the ditch, but by means of this packing action just described this difficulty is overcome since as the dirt is passed out on the sides of the ditch by the conveyer 44 it is discharged directly in front of the wheels 20 and 28 which roll the same down and prevent any sides piling up on the sides of the ditch as set forth.

The front end of the machine is supported by a steering means 63 having a steering wheel 64, the construction of each of said last mentioned parts being of an ordinary type, hence no specific claim to the same is made at this time.

Whenever desired the saw-like cutting structure and conveyers hereinafter described may be removed and the balance of the structure used as a farm tractor as will already appear.

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 structure may be resorted to as do not form a departure from the spirit of the invention.

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

1. A device of the character described

comprising a wheel mounted frame, a motive power on said frame, a box suspended from said frame, a shaft projecting through the upper end of said box, means for driving said shaft with said motive power, a sprocket wheel disposed on said shaft within said box, a frame adjustable along the side of said box and projecting below the lower end of said box, a sprocket wheel mounted in the lower end of said frame, a chain connecting said sprocket wheels, a cutting means mounted on said chain, and a conveyer upon which said cutting means discharges, as described.

2. A device of the character described comprising the combination of a wheel mounted frame, a motive means carried by said frame, a box flexibly mounted on said frame and carrying a conveyer, means for driving said conveyer with said motive means and a shoe disposed on each side of said box, such box being adapted to ride along the surface of the ground and said shoes being adapted to cut into the earth's surface below the line of said box, as described.

3. A device of the character described comprising a wheel mounted frame, a cutting means mounted on said frame, a conveyer upon which said cutting means discharges, such conveyer discharging directly in front of the wheels of said frame and runners disposed on each side of each wheel to form a trough into which said conveyer discharges, as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN E. FUNK.

Witnesses:
JOSHUA R. WEBSTER,
PERCY S. WEBSTER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents Washington, D. C."