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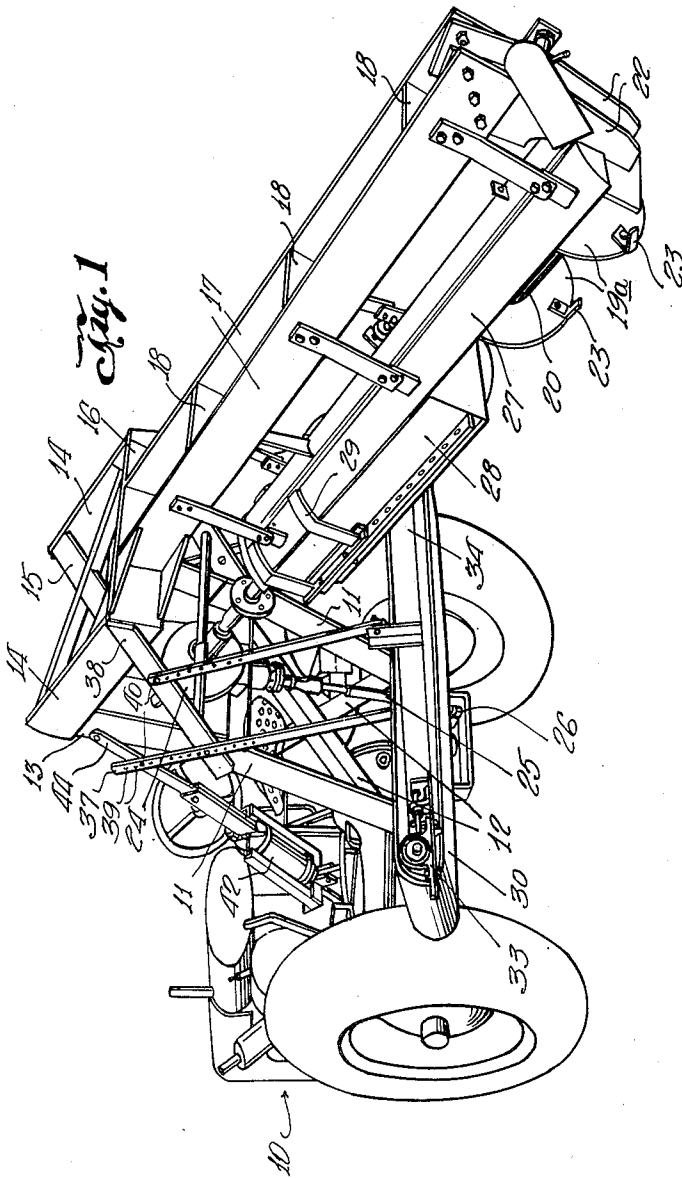
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SCREW CONVEYER DITCHING MACHINE

Filed July 14, 1947

2 Sheets-Sheet 1



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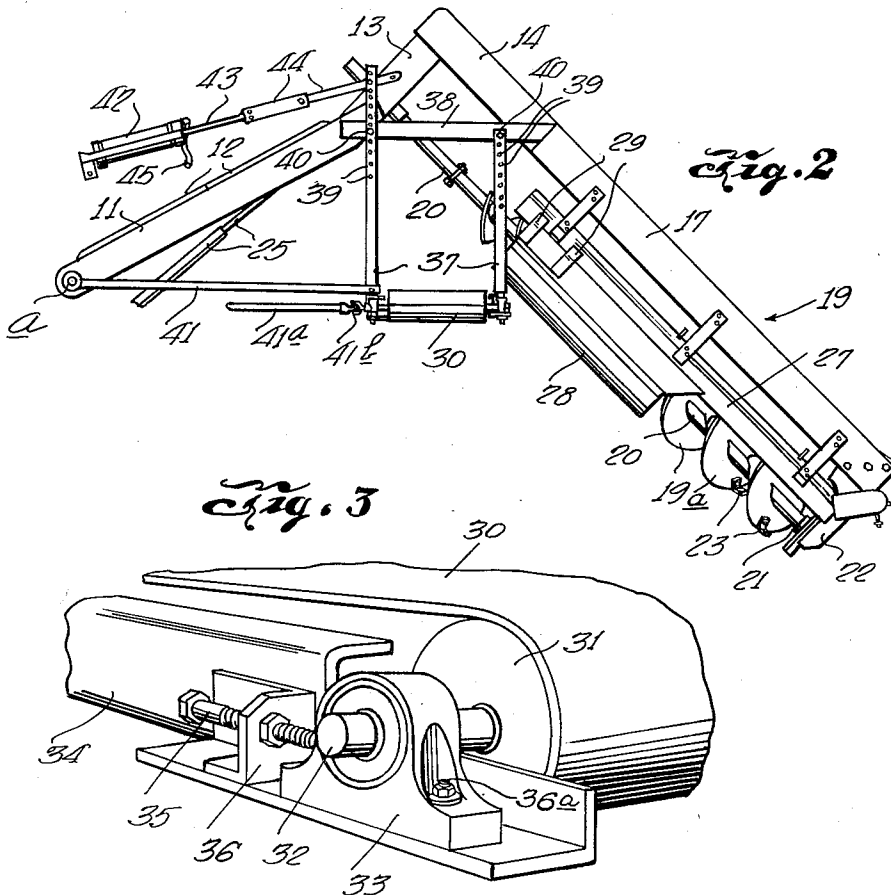
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UNITED STATES PATENT OFFICE

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SCREW CONVEYER DITCHING MACHINE

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1 Claim. (Cl. 37—82)

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This invention relates to ditching machines and it has particular reference to a ditch digging attachment for tractors.

The principal object of the invention is to provide an apparatus of the character set forth adapted for convenient attachment to a tractor which is at once a ditching machine and a combined soil excavating and conveying machine in the sense that the excavating means, consisting of an inclined auger or flight conveyor dislodges the soil to a predetermined depth and after conveying it upwardly to a point above the surface, deposits it onto an endless belt conveyor for discharge at the side of the ditch.

Another object of the invention is to provide a machine, either self powered or adapted for attachment to a suitable draft implement, having an inclined excavating auger whose degree of inclination determines the depth of the ditch being formed. Moreover, through and by virtue of the auxiliary conveyor, the operation is made continuous since the earth displaced by the excavator is deposited well out of the way of the latter at one side or the other of the ditch.

Still another object of the invention is to provide a ditching machine in which angular adjustments of the excavating means is effected hydraulically and is driven from the rear power take-off of a tractor on which the machine is mounted.

Yet another object of the invention is to provide means for maintaining the horizontal position of the belt conveyor irrespective of the angular position of the excavator.

With the foregoing objects in view, the invention has further reference to certain features of accomplishment which will become apparent as the description proceeds, taken in connection with the accompanying drawings wherein:

Figure 1 is a rear perspective view of a tractor and a ditching attachment, the latter constructed according to the present invention.

Figure 2 is a side elevational view of the attachment per se, and

Figure 3 is a fragmentary perspective view of the belt conveyor and tensioning means therefor.

Continuing with a more detailed description of the drawing, reference numeral 10 denotes generally a tractor, to the rear end of which is pivoted at *a* (Figure 2) the lower end of each of a pair of frame members 11 which are suitably braced by intercrossing members 12. Affixed to the upper ends of the members 11 are plates 13, which provide a support for the upper end of the excavator mounting. This mounting consists of

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parallel members 14, spaced apart and reinforced by intercrossed braces 15. A transverse header 16 is affixed at its ends to the forward ends of the parallel members 14 and to the midsection of the header 16 is affixed a pair of relatively parallel and elongated members 17, held in spaced relationship by transverse plates 18. The members 17 constitute the frame proper and mounting for the excavating means consisting of an auger or flight type conveyor 19a whose shaft 20 is journaled at its lower end in a bearing 21, mounted on depending plates 22 at the rear end of the members 17. Each of the flights of the evacuating auger 19a has affixed thereto one or more cleats 23 which are effective to cut into and dislodge the earth as the auger shaft 20 is rotated.

The excavator shaft 20 is rotated through the medium of a transmission 24 with which the upper end of the shaft 20 connects. The transmission is driven by an extensible shaft 25 which is connected at its lower end to the rear power take-off 26 of the tractor (Figure 1).

The excavator, which will be hereinafter designated generally by reference numeral 19, is provided with an arcuate hood 27 which confines the dirt elevated by the excavator preventing the same from falling back into the excavation. At a point above the midsection of the excavator 19, the latter is entirely enclosed, partly by the upper end of the hood 27 and partly by a concave pan 28 supported from the hood 27 by straps 29, on the underside of the excavator. Accordingly, the material excavated is constrained to move upwardly by the flights of the excavator, finding outlet only at the upper end of the housing formed jointly by the hood 27 and pan 28.

The material elevated by the excavator 19 is discharged onto an endless belt conveyor 30, operating below and in transverse relationship with the excavator 19 at the upper or discharge end of the pan 28. The endless conveyor belt 30 operates on rollers 31 whose shafts 32 are journaled in bearings 33 (Figure 3) slidably mounted adjustably at the ends of a frame composed of channel members 34. Adjustment of the bearings 33 is accomplished through screws 35 threaded through transverse plates 36 affixed to the ends of the channel members 34 and are effective to maintain proper tension on the belt 30 by pressure imposed thereby on the bearings 33, after loosening the retaining bolts 36a of the bearings.

The frame 34 of the belt conveyor 30 is suspended by parallel metal straps 37 from a cross-

member 38 extending from the inclined frame members 11 to the excavator frame 14 on each side thereof. The upper ends of the conveyor suspension straps 37 are provided with longitudinally aligned holes 39 cooperating with holes in the crossmembers 38 and in which the suspension bolts 40 are selectively placed to maintain horizontal position of the conveyor belt 30 irrespective of the angle at which the excavator 19 is disposed. This of course is necessary so that the material deposited onto the conveyor belt will remain in position until it reaches the end thereof and is discharged at one side of the excavation.

The conveyor frame 34 is braced by members 41 (Figure 2) which extend from the inner suspension straps 37 to the pivotal points *a* of the members or beams 11 which support the excavator.

Power for driving the belt conveyor 30 is supplied through shaft 41*a* (Figure 2) which is driven from the side power take-off (not shown) of the tractor and is connected at its opposite end to one of the conveyor shafts 32 through the medium of a universal joint 41*b*.

From the foregoing, it is obvious that initially, the lower end of the excavator is brought to rest on the surface and set in operation while the tractor remains motionless until the excavator has penetrated the earth to the desired depth, after which, the tractor is moved forward at a slow speed.

To raise and lower the excavator 19, a hydraulic cylinder 42 is mounted on the tractor, whose piston carries a rod 43 which is connected, through extension members 44 to the plate 13. By charging and exhausting the cylinder 42 under pressure by way of the flexible line 45 (Figure 2) the excavator frame is raised and lowered on the pivotal point *a*.

The excavator frame, once the excavator reaches the desired depth, is maintained at an angle suited to that depth. The diameter of the flights of the excavator being greater than the width of the hood 27 thereof, will cut the sides of the excavation cleanly and will elevate the loosened dirt to a point of discharge onto the belt conveyor 30. When the operation is completed or if for any reason it becomes necessary to withdraw the excavator from the ditch, it is necessary only to introduce fluid into the cylinder 42 under pressure to exert a pull on the upper end of the excavator frame.

Manifestly, the construction as shown and described is capable of some modification and such

modification as may be construed to fall within the scope and meaning of the appended claim is also considered to be within the spirit and intent of the invention.

What is claimed is:

A ditching machine attachment for a tractor including a pair of main frame members pivotally attached to and extending angularly upward from the rear end of said tractor, an excavator frame affixed at its upper end to the upper ends of said main frame members for adjustment to a variety of different angles in relation to the horizontal plane, an excavator mounted in said excavator frame, comprising a flight conveyor whose shaft is journaled in bearings at each end of said frame, a hood mounted on said excavator frame and disposed over the lower end of said conveyor, a substantially cylindrical housing embracing the upper end of said conveyor for confining material dislodged and elevated thereby to a point of discharge, an endless belt conveyor operating below said point of discharge for receiving and transporting material transversely with respect to the travel of said excavator, and for discharging said material on either side of said machine, a frame for said belt conveyor, a series of longitudinally apertured straps affixed at their lower ends at spaced points on said belt conveyor frame, bolts on the upper end of said excavator frame for selective engagement with the apertures of said straps, said straps being adjustable on said bolts to support said belt conveyor frame on a horizontal plane in relation to variations in the angular position of said excavator frame, hydraulic means for raising and lowering said excavator frame and means for driving said excavator and belt conveyor from the power take-off of said tractor.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
294,567	Bennett	Mar. 4, 1884
1,071,477	Stowe	Aug. 26, 1913
1,871,856	MacDonald	Aug. 16, 1932
2,202,882	Wylie	June 4, 1940
2,311,834	Hollmann et al.	Feb. 23, 1943
2,332,729	Klosterman	Oct. 26, 1943
2,360,334	Engel et al.	Oct. 17, 1944