Nov. 19, 1929. R. B. MUFFETT 1,736,661

EXCAVATING MACHINE

Filed March 14, 1927 3 Sheets-Sheet 1

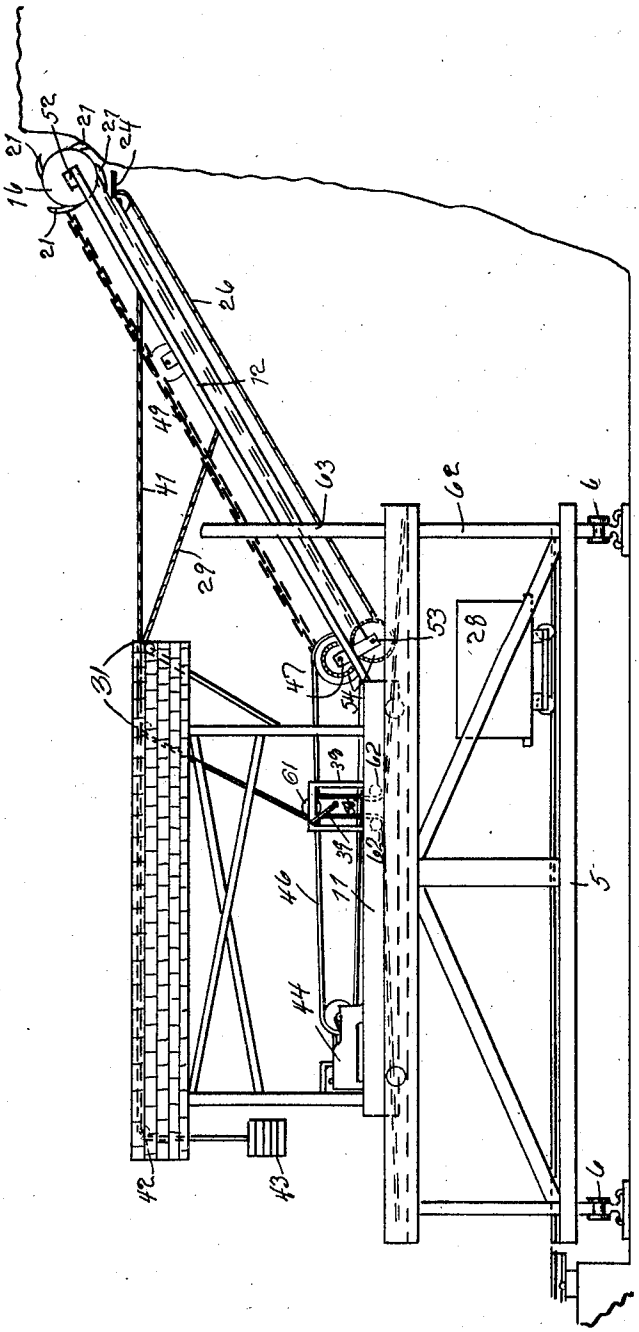


Fig. 1.

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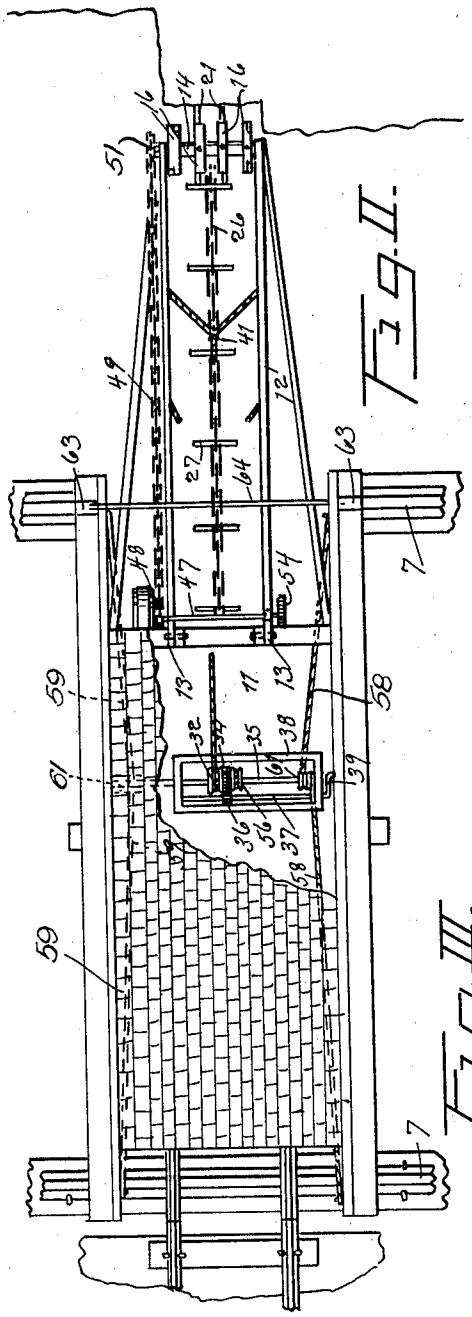


Fig. II.

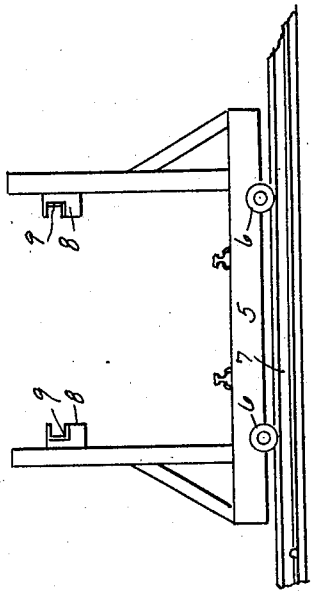


Fig. IV.

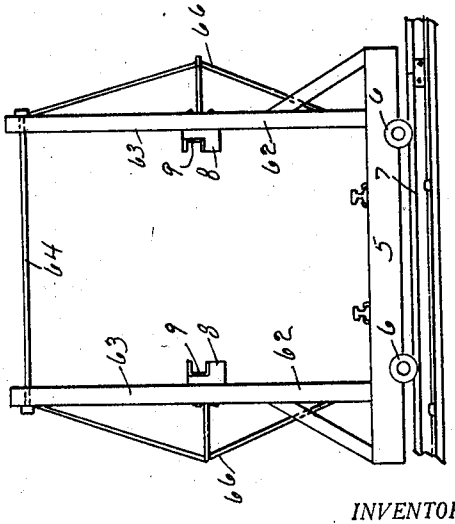


Fig. III.

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EXCAVATING MACHINE

Filed March 14, 1927 3 Sheets-Sheet 3

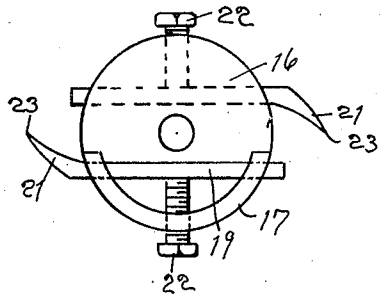


Fig. V.

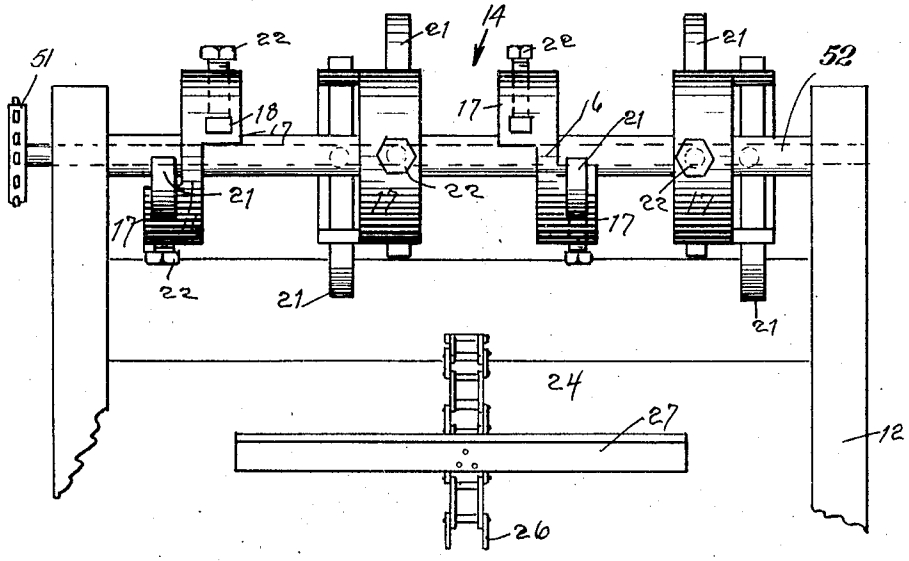


Fig. VI.

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Patented Nov. 19, 1929 1,736,661

UNITED STATES PATENT OFFICE

ROBERT B. MUFFETT, OF RIDGEFIELD, WASHINGTON

EXCAVATING MACHINE

Application filed March 14, 1927. Serial No. 175,196.

This invention relates to excavating machines and an object of the invention is to provide a machine by means of which soil may be cut from a bank and leave an almost perpendicular wall to the bank.

Another object of the invention is to provide an excavating machine as specified, which will cut the soil from the bank and deliver it to a suitable car from which the soil may be emptied into a wagon or any suitable conveyor and further to provide in an excavating structure, a movable upper carriage which carries a pivoted excavating arm and which is movable longitudinally over a supporting structure to permit rearward movement of the car as the excavator proper travels downwardly over the face of the bank being cut.

Another object of the invention is to provide an excavating machine as specified, in which the soil receiving car is connected directly with the excavator carrying movable car for movement in unison therewith so as to ensure the proper delivery of the soil to the car.

Other objects of the invention will appear in the following detail description, and in the accompanying drawings wherein:

Figure I—is a side elevation of the improved excavating machine.

Figure II—is a top plan of the improved excavating machine, partly broken away to show the mechanism thereof.

Figure III—is a front end view of the excavating machine supporting frame.

Figure IV—is a rear end view similar to Figure III.

Figure V—is a detail section through the excavating rotor, and

Figure VI—is an enlarged detail view of the excavator head.

Referring more particularly to the drawings, the improved excavating machine comprises a carrier structure 5 which has flange supporting wheels 6 carried thereby, one at each corner, and the said wheels ride upon rails 7 to permit lateral movement of the excavating machine along a bank of soil being excavated.

The carrier 5 has L-shaped rail supports 8 along its upper end which support rails 9 over which the movable excavating car 11 is movable. The car 11 is movable along the rails 9 longitudinally of the carrier 5 and it has a beam 12 pivotally connected thereto, as shown at 13. The rotary excavating head 14 is rotatably carried by the outer end of the beam 12 and comprises a plurality of spaced discs 16 which have extending arcuate flanges 17 formed thereon. The flanges 17 are provided with bit receiving openings 18 through which the shanks 19 of the picks or bits 21 extend. Suitable set-screws 22 are threaded through the flanges 17 and clamp the bits 2 tightly in position. It is to be understood that the bits 21 are disposed in opposed relation and that the various discs 16 are arranged to position the cutting edges 23 of the bits 21 at circumferentially spaced points so as to provide a continuous cutting action on the soil.

The soil cut from the bank by the rotary excavating head 14 is delivered to a suitable platform 24 which is supported beneath the beam structure 12 in any suitable manner. An endless chain conveyor 26 travels over the platform or trough 24 and consists of a single length of chain having a plurality of transverse flights 27 thereon which engage the soil and carry it downwardly and deposit it in a suitable receiving car 28.

A cable 29 is connected to the beam 12 adjacent the upper end which passes over suitable guide pulleys 31 on the superstructure of the car 11, and is connected to a drum 32. The drum 32 is rotatable upon a shaft 35 that has a gear 34 secured thereto and the gear 34 is capable of being secured to the drum 32 for rotating the latter by any suitable clutch mechanism. The gear 34 is adapted to mesh with a pinion 36 which is keyed upon a shaft 37 slidably carried by suitable supports 38 and the shaft 37 is movable longitudinally to shift the pinion 36 either into or out of meshing engagement with the gear 34 and a gear 56 for a purpose which will be later apparent. A hand lever 39 is mounted on the shaft 37 to permit manual rotation of the shaft for varying the elevation of the excavating head 14 and of the

beam 12 and for the purpose of moving the car 11 in a manner which will be presently described. A second cable 41 is connected to the beam 12 and passes over suitable guide pulleys 42 and has a counter-balancing weight 43 thereon to facilitate the adjustment of the elevation of the beam 12, by counter-balancing the weight.

A prime mover 44, preferably an internal combustion engine, is carried by the car 11 and is connected by a suitable power transmitting belt 46 to a shaft 47 on which a sprocket 48 is mounted. A sprocket chain 49 travels over the sprocket 48 and over a sprocket 51 connected to the shaft 52 upon which the rotary excavating head 14 is mounted so as to permit rotation of the excavating head. A second shaft 53 is connected by means of gears 54 to the shaft 47, and the shaft 53 is in turn connected to the chain 26 for moving the conveyor flights in the proper direction to carry the excavated soil downwardly.

The shaft 35 has drums 61 mounted on the ends thereof, and it will be understood that the drums 32 and 61 are held against longitudinal movement on the shaft 35 by suitable collars. The drums 61 are keyed to the shaft 35 which also has a gear 56 secured thereto and adapted to mesh with the pinion 36 to rotate the drums 61, the shaft 37 being shifted for this purpose from its position as shown in Figure 2. One of the gears 34 and 56 may be provided with suitable ratchet mechanism to prevent rotation of the shaft 35 when necessary in the operation of the machine. The cables 58 and 59 are wrapped about the winding drums 61 and have their ends connected at the opposite ends of the frame of the carrier 5, and also pass about suitable guiding pulleys 62 as clearly shown in Figure 1 of the drawings, so that by rotation of the drums 61, the carriage or car 11 may be moved longitudinally over the rails 9 as may be desired, and preferably for moving the excavating head 14 into engagement with a bank to be cut, and to hold the car accordingly, as the pressure of the excavating head against the bank will have a tendency to move the car 11 rearwardly or away from the bank. Car 28 is connected in any suitable manner to the car 11, so that it will move longitudinally of the carrier 5 in unison with movement of the car 11, whereby the car 28 will be positioned at all times, to receive the soil excavated. The standard 62, at the front ends of the carrier 5 project above the rail supports 8, and form abutments for limiting the forward movement of the car 11. The upwardly projecting ends 63 of the standard 62 are braced by transverse braces 64 and by downwardly extending angled braces 66, so as to provide a rigid and secure construction. The provision of the two independently rotatable drums 32 and 56 permits movement of the car 11 without raising or lowering the excavating head or digger 14, or vice versa.

From the foregoing description taken in connection with the accompanying drawings, it will be apparent that an excavating machine has been provided by means of which a bank may be cut down in an almost perpendicular manner, and that the soil may be at all times, properly delivered to the receiving car 28 from which it may be unloaded or dumped into any suitable conveyor, and furthermore, that a practical, easily operated and controlled excavator or digger has been provided.

It is, of course, to be understood, that the invention may be constructed in various other manners and the parts associated in different relations, and therefore, we do not desire to be limited in any manner, except as set forth in the claim hereunto appended.

Having thus described my invention, I claim:—

In an excavating machine, a movable carrier, a car movable along said carrier transversely to the direction of movement of the carrier, a beam pivotally carried by said car, an excavator head rotatably carried by said beam, a conveyor adapted to receive material from said rotary head, a soil receiving car movable upon said carrier and adapted to receive material from said conveyor, means for moving said first mentioned car on said carrier, said means comprising a pair of cables having their opposite ends secured to said carrier and their center portion wrapped about winding drums, said cables serving to move said car and further serving to hold said car against endwise movement in the manner described.

In testimony whereof I affix my signature.

ROBERT B. MUFFETT.