June 16, 1931. W. H. BOSWORTH 1,810,069

WAGON LOADER

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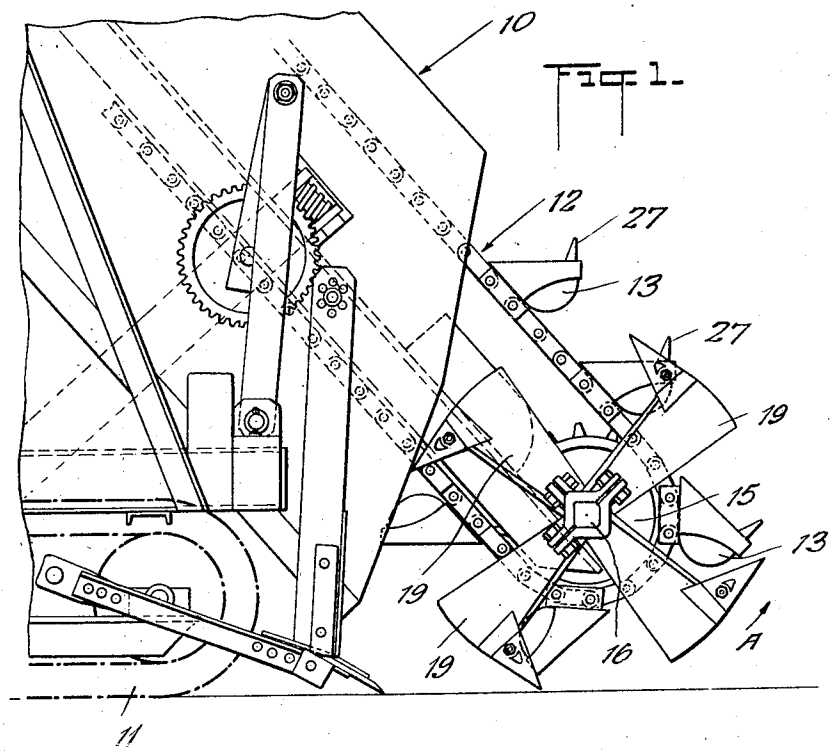
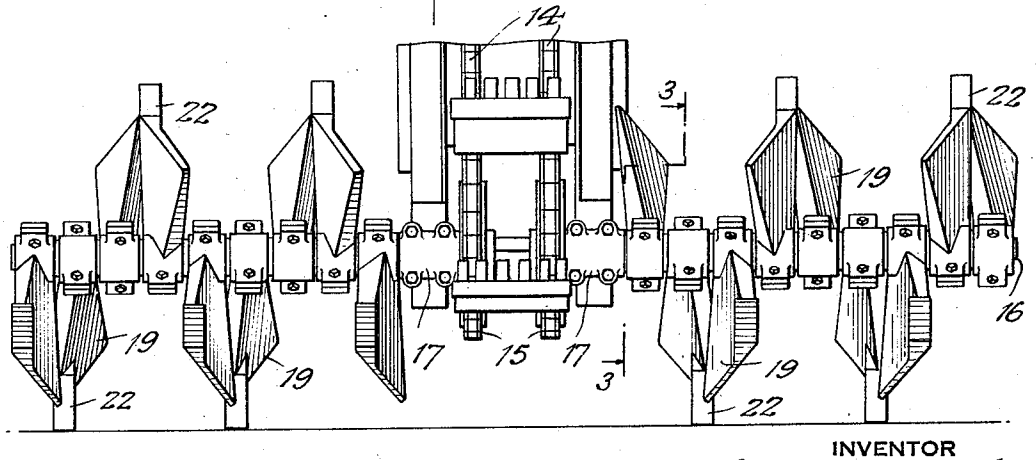


Fig. 1.

Fig. 2.



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Fig. 3.

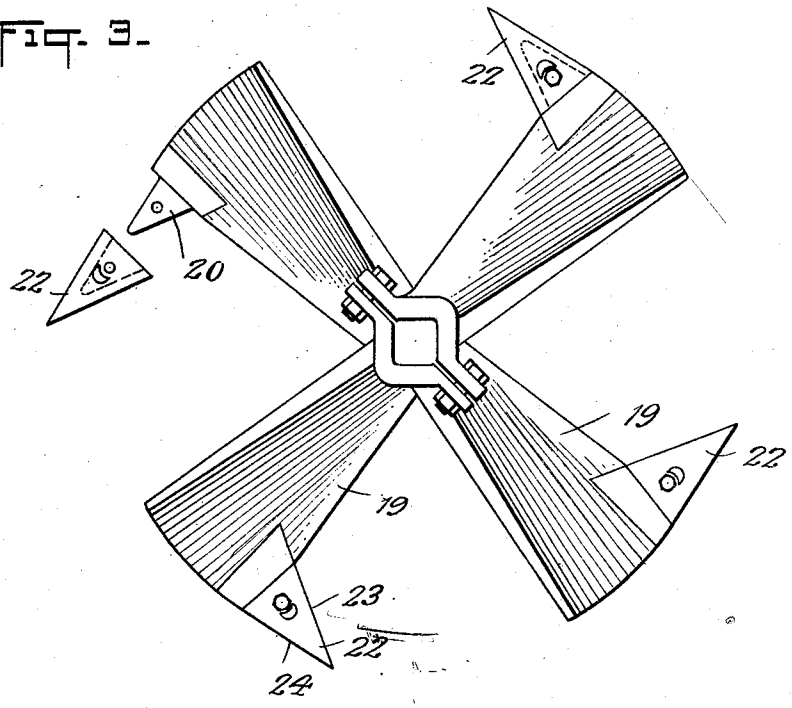
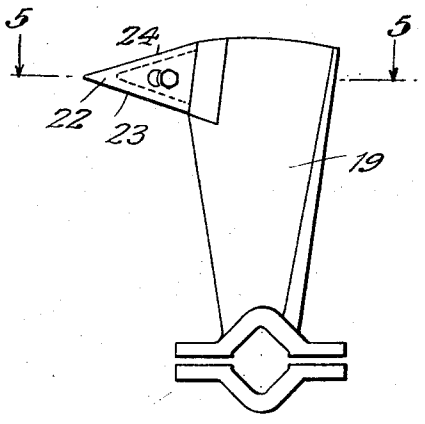


Fig. 4.



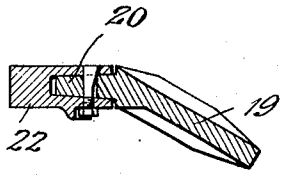


Fig. 5.

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UNITED STATES PATENT OFFICE

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WAGON LOADER

Application filed October 24, 1929. Serial No. 402,166.

This invention relates to wagon loaders and excavators, and is directed particularly to the digging and feeding mechanism of such machines.

The primary object of this invention is to provide a novel digging and feeding mechanism by which the operation of such a machine as that to which the present invention relates may be satisfactorily carried out under adverse conditions, as when, for example, the material to be handled is of such a nature as to require loosening or breaking up thereof before it can be effectively acted upon by the material-propelling means.

To the above end the present invention contemplates the use of a plurality of digging elements or picks for loosening or breaking up firmly packed and frozen material, such as soil, earth, sand, gravel and the like, in combination with rotatable material-propelling means, and more specifically suitably supported propeller blades for moving the loosened or broken up material into the path of the conveyor by which such material is picked up, elevated and discharged into a truck or other vehicle adapted to receive the same, the digging elements or picks being carried by the outer ends of the propeller blades and tapered to a relatively sharp entering edge at their respective forward ends.

Other objects and advantages of the invention will become apparent from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of the pick-up end of a wagon loader and excavator embodying this invention; Figure 2 is an end view of the machine as viewed from the right in Figure 1; Figure 3 is a sectional view taken on line 3—3 of Figure 2, one of the picks or digging elements being shown detached from its propeller blade; Figure 4 is a view in elevation of one of the propeller blades shown at the left in Figure 2, the faces of which propeller blades are oppositely inclined to the faces of the propeller blades at the right in Figure 2; and Figure 5 is a sectional view taken on line 5—5 of Figure 4.

Loaders of the type above mentioned include a frame 10 adjustably mounted on a traction device 11 by which the machine may be propelled from place to place and crowded at slow speed toward and into the material to be excavated, there being a power unit such as an internal combustion engine (not shown) employed as a driving means for the traction device as well as for the bucket conveyor 12. This conveyor includes a plurality of buckets 13 carried by a pair of chains 14, passing over the sprockets, of which the lower sprockets 15 only are shown, these sprockets being secured to the intermediate portion of a shaft 16, which is journalled at 17 in the lower end of the frame 10 and extends transversely of the machine. It will be understood that the driving connection between the power unit and the conveyor chains 14, which drives the shaft 16, is such that the shaft is rotated in the direction of the arrow A in Figure 1.

Secured to portions of the shaft 16, which extend from each side of the journal boxes 17, are a plurality of radially projecting and laterally disposed propeller blades 19 which are adapted to impart forwardly and upwardly directed impacts to the material to be loaded to loosen such material and to move it toward and into the path of the conveyor buckets, such movement of the material being effected by reason of the fact that the angular inner faces of the propeller blades at one side of the conveyor are oppositely disposed to the similar faces of the propeller blades at the opposite side of the conveyor.

Carried by the outer margin or ends of the propeller blades 19 at the entering edges thereof are a plurality of lugs or tongues 20 to which are detachably secured a plurality of picks or digging elements 22. Each of these digging elements is tapered to a relatively sharp entering edge at its forward end, the taper being such that its inner and outer faces 23 and 24 are at an angle of preferably 30–35° to each other. It will be noted that the entering edge of each pick is located at a greater distance from the center of the shaft 16 than the outer edge of its corresponding propeller blade 19, the difference being, for example, 1″, and that the greater portion of the outer face 24 lies within the circle de-

scribed by the entering edge of the pick as the material-feeding mechanism is rotated. By reason of the disposition of the entering edge of the pick, the material to be loaded is subjected to the action of the digging element radially beyond the respective propeller blades, thus providing for ease in rotation of the material-feeding mechanism at a considerable saving in power. Moreover, by reason of the fact that the outer face of each digging element is slightly inclined from the entering point of the pick towards the center of rotation of the material-feeding mechanism, the outer faces of these teeth are not required to slide over the tightly packed material at the rear of the entering edges of the teeth as they pass through the material, with the result that a further saving in power is effected. As a result of the inclination of the inner faces 23 of the digging elements, the material being acted upon by them is permitted to pass easily up over such faces as the teeth pass through the material and impart to it a combined skimming and plowing action which, together with the upwardly and forwardly directed impacts delivered by the series of teeth and the plurality of propeller blades to the material to be loaded, effectively break up such material so that the propeller blades may easily move the material acted upon toward and into the path of the buckets 13 of the conveyor.

Regardless of whether the machine is employed in the handling of loose or compact material, the path of travel of the conveyor buckets is cleared by the buckets themselves, which, due to the provision of digging teeth 27 on the forward edge thereof, can be forced forwardly and upwardly through the material with comparative ease. The path which is cleared by the buckets provides room to receive material which is moved inwardly from opposite sides of the conveyor by the material-propelling means as the machine advances toward and into the material to be loaded or excavated.

Although only one form of the invention is herein shown and particularly described, it will be understood that certain modifications may be employed without departing from the spirit of the invention or the scope of the following claim, as, for example, the number of propeller blades and teeth or digging elements may be varied as desired.

What is claimed is:

A machine of the character described comprising a conveyor having buckets adapted to receive material at the pick-up end of the conveyor and elevate it to the discharge end of the same, a rotatable shaft located at the pick-up end of said conveyor and projecting outwardly beyond opposite sides thereof, a plurality of propeller blades carried by said shaft at opposite ends of said shaft and adapted to impart forwardly and upwardly directed impacts to the material, and having oppositely inclined faces adapted to act upon and move the material to be loaded toward and into the path of the conveyor buckets, a plurality of tongues carried by the outer ends of said propeller blades and projecting forwardly therefrom at the forward edges thereof, and a plurality of digging elements associated with said tongues and projecting forwardly from said propeller blades, said digging elements being tapered forwardly and terminating in entering edges located in advance of the respective propeller blades.

In testimony whereof, I have affixed my signature to this specification.

WILLIAM H. BOSWORTH.