June 30, 1931.

A. W. HAISS

1,812,292

WAGON LOADER AND EXCAVATOR

Filed July 3, 1930

Fig. 1.

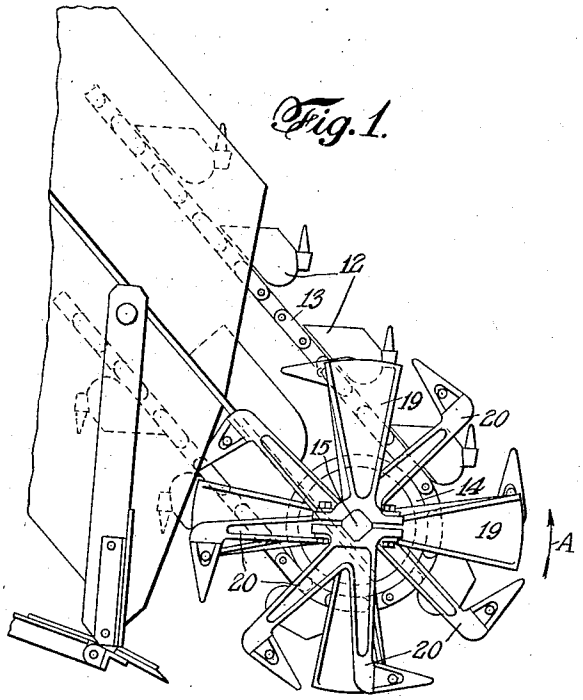


Fig. 3.

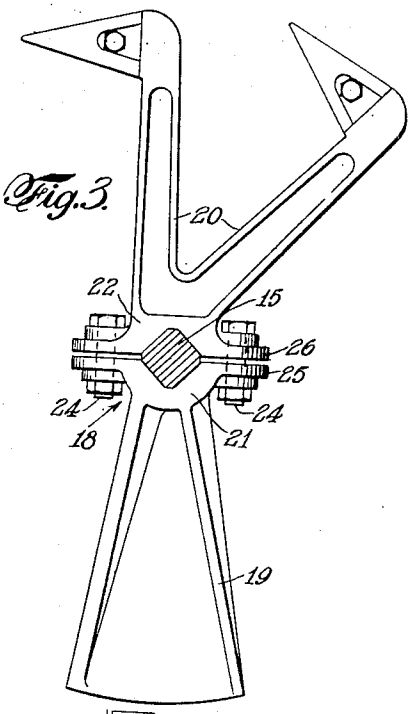


Fig. 2.

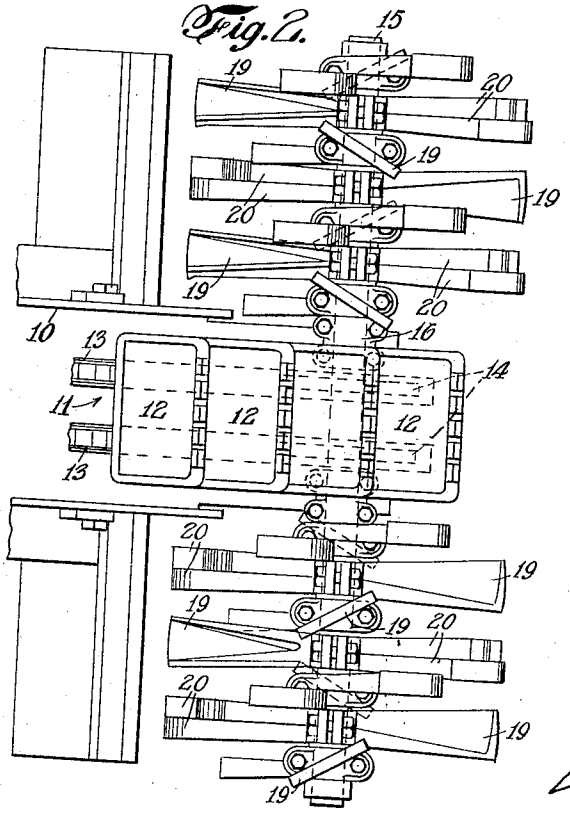
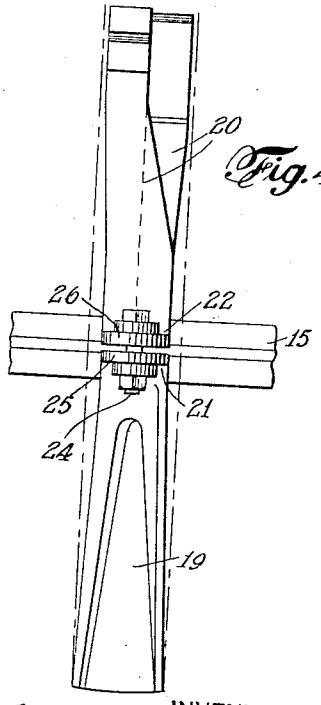


Fig. 4.



INVENTOR

Alfred W. Haiss

BY

Williams, Rich & Evans,

ATTORNEYS

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UNITED STATES PATENT OFFICE

ALFRED W. HAISS, OF NEW YORK, N. Y., ASSIGNOR TO GEORGE HAISS MANUFACTURING CO. INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

WAGON LOADER AND EXCAVATOR

Application filed July 3, 1930. Serial No. 465,499.

This invention relates to machines of the general type shown and described in the application of Raymond C. Haiss, Serial No. 352,196, filed April 3, 1929, wagon loaders and excavators, and is directed particularly to a modified form of digging and feeding mechanism.

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

To the above end, the present invention contemplates the use of a rotatable shaft located at the pick-up end of the machine and provided at opposite sides of the usual conveyor with a plurality of radially-disposed and laterally-spaced overlapping propeller blades constituting material-propelling means, in combination with a plurality of digging elements common to each blade and disposed in advance thereof, the digging elements common to the respective blades being one in advance of another and having a combined width substantially equal to the effective width of their associated blade.

Among the advantages to be derived from the above generally described material-digging and propelling means, the following are of particular importance; first, effective loosening of the material in advance of the propeller blades throughout the combined effective width of each group of blades due to the lateral disposition of the digging elements and their dimensional relation to each other; and, second, economical operation of the machine from a power-consumption standpoint, due to the advanced relation to each other of the digging elements common to the respective propeller blades.

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 a plan view of the parts shown in Figure 1; Figure 3 is an enlarged detail view of a pick and propeller blade unit; Figure 4 is a view of the pick and propeller blade unit as seen from the right in Figure 3.

Loaders of the type above mentioned include a frame 10, adjustably mounted upon a traction device (not shown) by which the machine may be propelled from place to place and moved at slow speed toward and into the material to be loaded, 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 11. This conveyor includes a plurality of buckets 12 carried by a pair of chains 13, passing over sprockets of which the lower sprockets 14 only are shown, these lower sprockets being secured to the intermediate portion of a shaft 15 journaled at 16 in the lower end of the frame 10 and extending transversely of the machine. It will be understood that the driving connection between the above mentioned power unit and the conveyor chains 13, which drive the shaft 15, is such that this shaft is rotated in the direction of the arrow A in Figure 1.

Secured to the portions of the shaft 15 which extend beyond each side of the conveyor 11, are a plurality of pick and propeller blade units 18. Each of these units includes a propeller blade 19 and a pair of picks 20, the propeller blade and the pair of picks being connected respectively to cooperating head portions 21 and 22. The respective propeller blades and associated pairs of picks are secured to the shaft 15 by bolts 24, which pass through holes in flanges 25 and 26 ex-

tending respectively from the hub portions 21 and 22. It will be noted that the blades 19 on opposite sides of the conveyor are oppositely inclined or pitched so that as the shaft 15 rotates, the blades will exert impacts upon the material and will feed it laterally toward the conveyor as do the blades described in the aforesaid application Serial No. 352,196. Further, it will be noted that the propeller blades 19 are so positioned that there are four blade-positions of impact to each rotation of the propeller shaft 15, and that since there are two picks, one in advance of the other, for each propeller blade, there are eight pick-positions of impact to each rotation of the propeller shaft.

As shown most clearly in Figure 2, the propeller blades are arranged in an overlapping relation at the opposite sides of the conveyor, and, as shown most clearly in Figure 4, the picks associated with each propeller blade are of a combined width substantially equal to the effective width of each such blade, each individual pick being equal in width to only substantially half the effective width of its associated propeller blade. By reason of the combined width of the picks common to each propeller blade, it is obvious that they will effect a digging action in advance of each blade substantially throughout the effective width thereof; and that the combined effective width of all of the picks at each side of the conveyor is substantially equal to the combined effective width of all of the propeller blades at the respective sides of the conveyor. The action of the picks is, therefore, such that they will dig a path at each side of the conveyor, which is equal in width to the path at each side of the conveyor which is traversed by the overlapping propeller blades which function to progressively move the loosened material forwardly and at the same time laterally toward and into the path of the conveyor at the pick-up end thereof. Moreover, it will be appreciated that by arranging the picks of each propeller blade, one in front of the other, the pick-impacts are delivered more frequently per revolution of the shaft 15, than if a single pick were employed for each such blade, the width of each of which single picks would have to be twice that of the respective picks herein employed to effect the same thorough digging action as is attained by the present invention. It follows that, with the arrangement of picks herein shown, the advantage of thorough digging, as above explained, throughout the width of the respective paths at opposite sides of the conveyor is attained; and at the same time the load incident to the digging effort is made substantially uniform, with the result that smoothness of operation is insured and an economical consumption of power is attained.

Although only one form of the invention is herein shown, it will be understood that various changes may be made without departing from the spirit of the invention or the scope of the following claims.

What is claimed is:

1. In a machine of the character described, a combined digging and feeding mechanism comprising a rotatable shaft, a plurality of laterally spaced propeller blades carried by said shaft at opposite ends thereof, and a plurality of picks associated with each of such blades and arranged in advance thereof.

2. In a machine of the character described, a combined digging and feeding mechanism comprising a rotatable shaft, a plurality of laterally spaced propeller blades carried by said shaft at opposite ends thereof, and a plurality of picks associated with each of such blades and arranged in different advanced positions thereof.

3. In a machine of the character described, a combined digging and feeding mechanism comprising a rotatable shaft, a plurality of propeller blades carried by said shaft, and a plurality of picks associated with each of such blades and arranged in advance thereof, each of said blades having an effective width greater than the width of each of its associated picks and substantially equal to the combined width of all of its associated picks.

4. In a machine of the character described, a combined digging and feeding mechanism comprising a rotatable shaft, a plurality of propeller blades carried by said shaft, and a plurality of picks associated with each of such blades and arranged in different advanced positions, each of said blades having an effective width greater than the width of each of its associated picks and substantially equal to the combined width of all of its associated picks.

5. In a machine of the character described, a combined digging and feeding mechanism comprising a rotatable shaft, a plurality of propeller blades carried by said shaft, each having a hub portion, a plurality of picks associated with each of said blades and arranged in advance thereof, the picks common to each blade having a common hub portion, and means for securing the respective hub portions together and for clamping such respective hub portions on said shaft.

6. In a machine of the character described, a combined digging and feeding mechanism comprising a rotatable shaft, a plurality of propeller blades carried by said shaft, each having a hub portion, a plurality of picks associated with each of said blades and arranged in different advanced positions thereof, the picks common to each blade having a common hub portion, and means for securing the respective hub portions together and for clamping such respective hub portions on said shaft.

7. In a machine of the character described,

a combined digging and feeding mechanism comprising a rotatable shaft, a plurality of propeller blades carried by said shaft, each having a hub portion, a plurality of picks associated with each of said blades and arranged in different advanced positions thereof, each of said blades having an effective width greater than the width of each of its associated picks and substantially equal to the combined width of all of its associated picks.

In testimony whereof, I have signed this specification.

ALFRED W. HAISS.