Dec. 9, 1930. W. H. GUY ET AL 1,784,284

SCRAPER CONTROL MECHANISM

Filed July 16, 1929

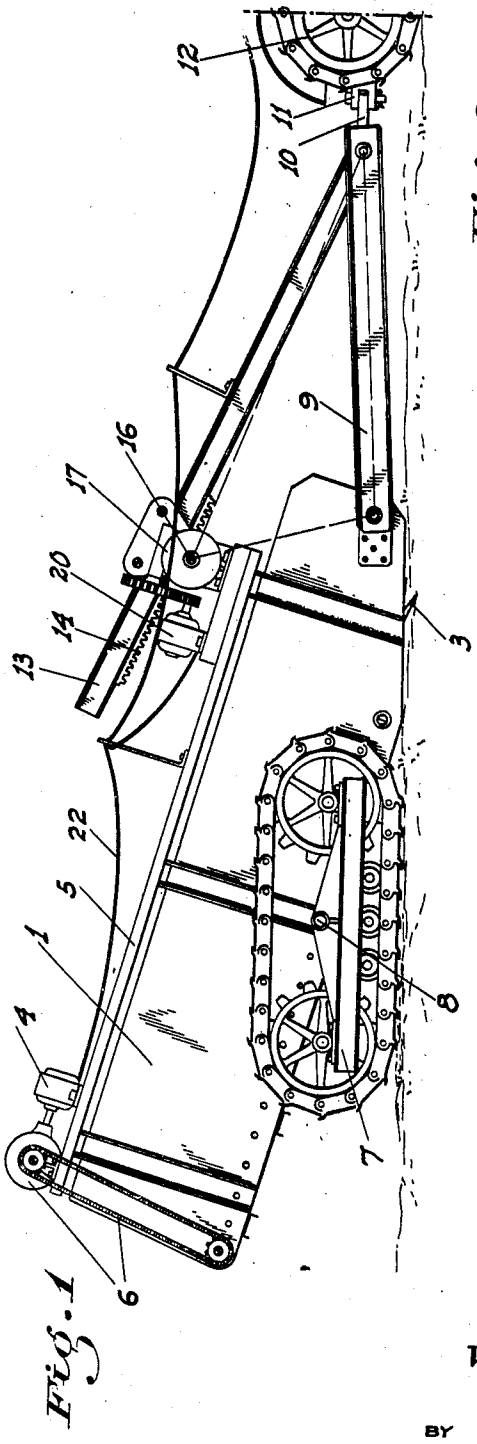


Fig. 1

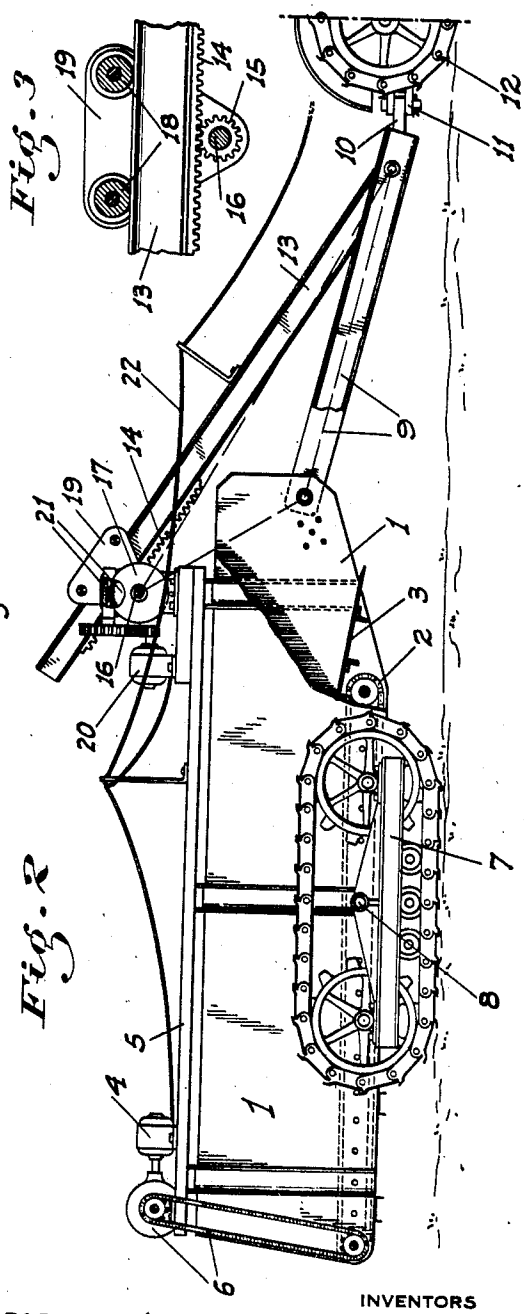


Fig. 2



Fig. 3

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Patented Dec. 9, 1930 1,784,284

# UNITED STATES PATENT OFFICE

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## SCRAPER-CONTROL MECHANISM

Application filed July 16, 1929. Serial No. 378,662.

This invention relates to large capacity scrapers and especially to the type of scraper shown in our Patent No. 1,497,505, dated June 10th, 1924; and particularly deals with the means for raising the front end of the scraper.

In the type of scraper referred to the dirt supporting surface consists of an endless conveyor, the upper run of which is adapted to be moved rearwardly as the load is received on its front end, so that the entire length of the supporting surface may be loaded without the dirt having to push back of itself; and such dirt may then be discharged when desired from the rear end of the conveyor. It is therefore unnecessary to raise and lower the scraper to any great extent but only sufficient to clear the blade from the ground when it is desired to transport the scraper without engaging and scraping up any dirt.

In the previous device the weight was carried at the rear on a pair of wheels and at the front by similar wheels which were arranged in connection with an adjustable screw structure which caused the front end of the scraper to be raised about the rear wheel axle as an axis. With this arrangement not only was a considerable percentage of the weight of the scraper constantly supported by the screw but the position of the screw was such that it was in the path of the dirt entering the scraper and rapid abrasion and wear of the screw and its bearings was unavoidably had.

The principal object of the present invention is to avoid the objectionable features of the previous device by rockably supporting the scraper centrally of its length on a pair of endless track trucks and providing a relatively simple means for rocking the scraper on the trucks, so as to raise and lower the front end whenever desired.

A further object of the invention is to arrange this means so that its control mechanism may be mounted at such a height on the scraper so as to be out of the way of any dirt entering the scraper and no part of the raising means is directly in the path of the dirt at any time.

This arrangement also allows the blade and apron unit, which digs the dirt and conveys the same onto the conveyor, to be placed at a shallower angle to the conveyor than was previously the case since the angle of tilting of the scraper relative to the ground is greater than before on account of the central location of the pivotal mounting of the scraper on its supporting trucks. This facilitates the movement of the dirt from the ground onto the conveyor and the consequent loading of the scraper.

These objects we accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claim.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a side elevation of the scraper and its control mechanism, the scraper being shown in its digging position.

Fig. 2 is a similar view partly broken out showing the scraper in a fully raised or horizontal position.

Fig. 3 is a fragmentary sectional view showing the guide and operating means for the control bar of the raising mechanism.

Referring now more particularly to the characters of reference on the drawings, the scraper comprises a main body which includes substantially rectangular and parallel side frames 1, disposed between which along the bottom and extending from the rear end thereof to a point short of the front end is an endless conveyor indicated generally at 2 and which is preferably of the same form as shown in said previous patent. The digger blade and apron member 3 extends forwardly and downwardly from and at a slight angle to the forward end of the conveyor and projects a short distance below the adjacent bottom edge of the side plates.

These plates, from the front end of the conveyor forwardly, are preferably cut on an angle to the remainder so as to extend substantially parallel to and adjacent the ground when the scraper body has a downward and forward tilt. The rear end of the conveyor is preferably operated by an electric motor 4

mounted on an auxiliary framework 5 extending across the plates 1 at the top; suitable drive means such as a differential gearing and a chain drive indicated conventionally at 6 being employed between said motor and the rear end sprocket of the conveyor.

Endless track trucks 7 of standard form are disposed alongside the scraper, being rockably connected thereto by a transverse shaft 8 disposed substantially centrally of the length of both the trucks and scraper. By reason of this mounting the weight of the scraper is substantially centered on the shaft and trucks, so that the load when the scraper is both empty and full is evenly distributed both ahead of and to the rear of the supporting shaft. This feature makes it very easy to raise and lower the front end of the scraper at all times, as will be evident.

Drawbars 9 are pivotally connected to the scraper sides at their forward end and adjacent the bottom and extend forwardly in converging relation to each other to a common pivotal connection with a link 10 which in turn is connected to the clevis 11 of a tractor, indicated conventionally at 12. Pivotally connected to the drawbars toward their forward ends and extending thence upwardly and rearwardly to a point above and rearwardly of the front end of the scraper body is a control bar 13, the under face of which along the portion above said body being provided with rack teeth 14. These teeth mesh with a pinion 15 fixed on a transverse shaft 16 journaled in connection with a housing 17 mounted on the framework 5.

The teeth of the bar are held in engagement with said pinion at all times by longitudinally spaced rollers 18 riding on the upper face of said bar and which are supported in side plates 19 turnably mounted in the shaft 16.

The pinion is driven from a reversible electric motor 20 mounted on the frame 5 through the medium of any suitable speed reduction connections, which include worm gearing 21; said gearing being mounted inside the housing 17 and the worm wheel being on the shaft 16 so as to prevent said shaft from rotation unless driven by the worm. The current wires 22 from the motors 4 and 20 extend to the tractor on which the current penetrating means and the necessary control switches are mounted, as is now frequently done.

The shaft 8 being on a fixed horizontal level, as is the connection of the front end of the drawbar with the tractor; and both forming pivotal connections, the drawbar and scraper can tilt or knuckle relative to each other about these constant-level points, so that the blade 3 may be either engaged with or disengaged from the ground, depending on the direction and extent of tilting of the body. The rigid bar 13 however arranged as it is provides the necessary means for controlling such tilting and in effect it forms the extensible side of a triangle, one leg of which is the drawbar and the other leg may be considered as being the scraper body from the pivotal connection of the drawbar therewith to the shaft 16, as indicated in dash lines on the drawings.

Now if the shaft 16 is rotated in a direction such that the pinion tends to move forwardly along the rack bar, the result is that the operative length of said bar, or the distance from said shaft to the front end of the bar (which is at a fixed point) is shortened. Since however the other sides or legs of the triangle are definitely fixed lengths, the apex of the triangle (which is at the connection of the drawbar with the scraper) is moved further away from the bar on a line perpendicular to the same. As a consequence the scraper is given a downward and forward tilt causing the blade to dig into the ground, the amount of tilt and the depth of engagement of the blade depending of course on the amount of rotation of the shaft 16 and the accompanying shortening of the operative length of the bar.

Conversely if the shaft is rotated in the opposite direction, or so as to increase the operative length of the bar the apex of the triangle is automatically moved closer to the bar, which results in the tilt of the scraper being decreased or reversed, depending on the extent to which the operative length of the bar is altered.

From the above description it will be seen that the worm gearing connection between the rack bar and the shaft 16, or some equivalent means, must be provided to hold the bar at any position to which it is moved, so as to prevent pressure exerted on the bar by the scraper action from allowing the bar to rotate the shaft of itself and thus alter its operative length when it is not desired to do so.

From the foregoing description it will be readily seen that we have produced such a device as substantially fulfills 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 detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claim.

Having thus described our invention what we claim as new and useful and desire to secure by Letters Patent is:

A scraper including a body, ground supported elements on which the body is rockably mounted, a drawbar pivoted on the body and extending forwardly for connection to a draft means, a bar pivoted on the drawbar toward the forward end of and above

the same and extending thence rearwardly and upwardly to the body, and terminating rearwardly of the point of connection of the drawbar with the body and means on the body engaging the bar adjacent such rear termination for enabling a downward or upward pressure to be exerted on the forward portion of the body.

In testimony whereof we affix our signatures.

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