E. D. STORY.

EXCAVATOR.

APPLICATION FILED SEPT. 1, 1916.

1,209,353.

Patented Dec. 19, 1916.

3 SHEETS—SHEET 1.

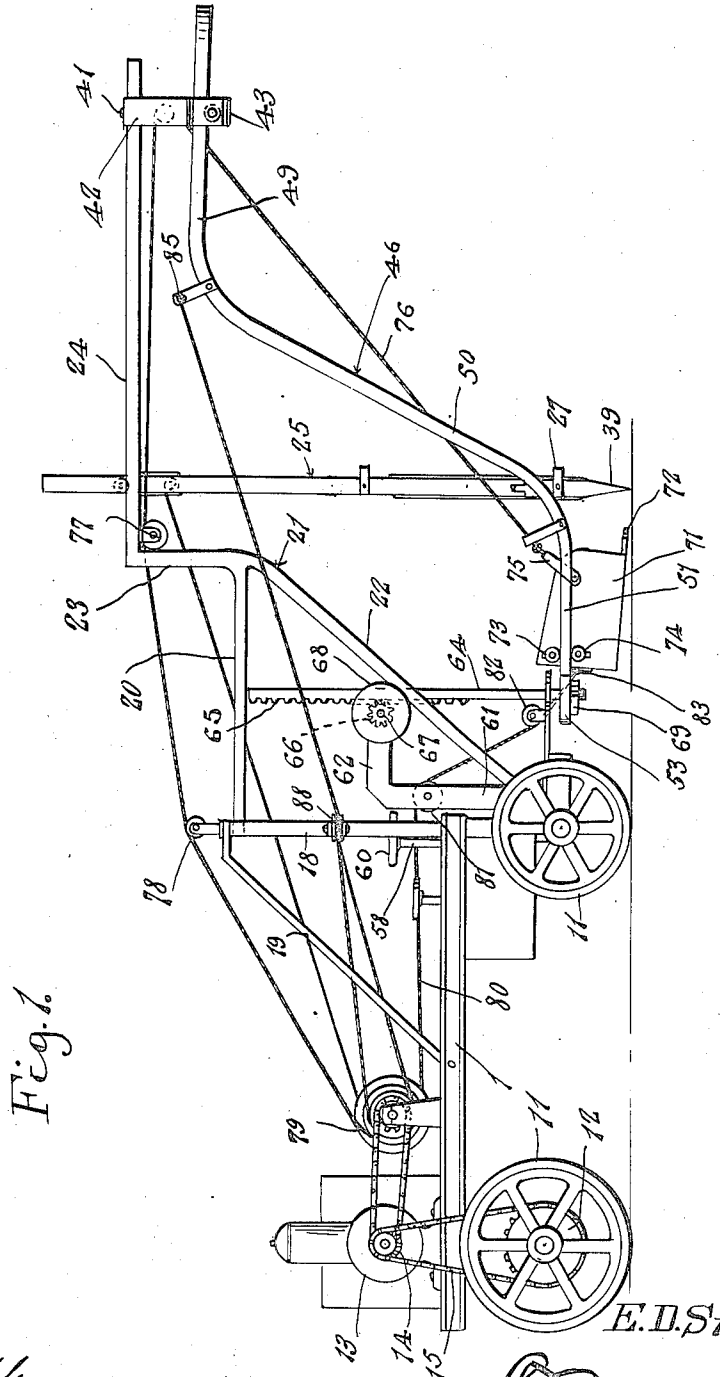


Fig. 1.

Witnesses.

J. P. Wables.

Inventor

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3 SHEETS—SHEET 2.

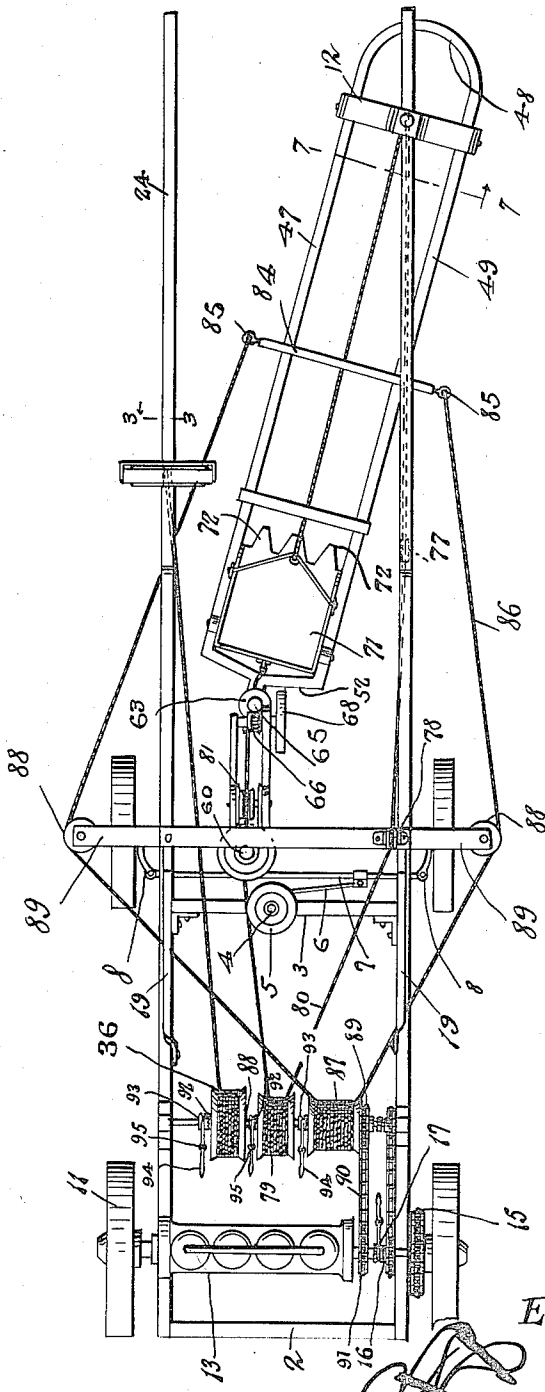


Fig. 2.

Witnesses

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3 SHEETS—SHEET 3.

Fig. 3.

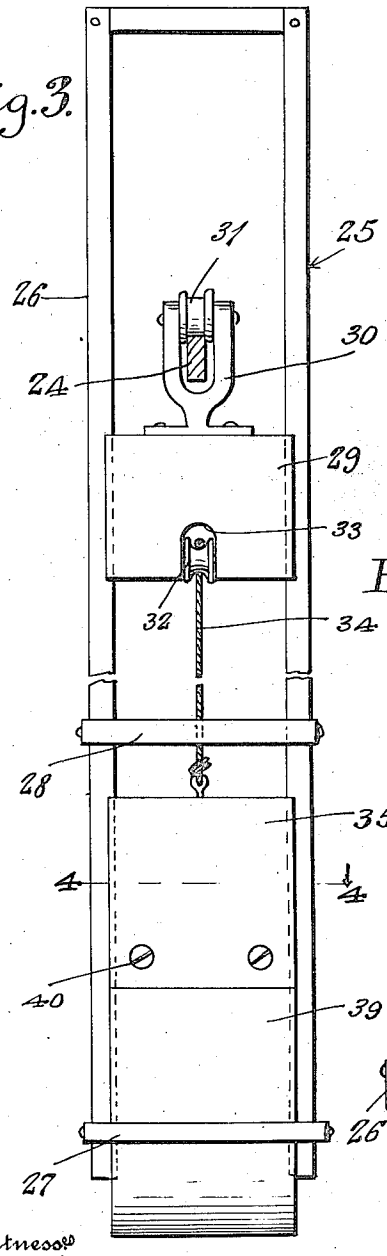


Fig. 6.

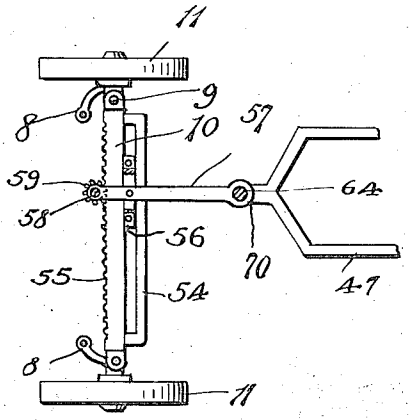


Fig. 5.

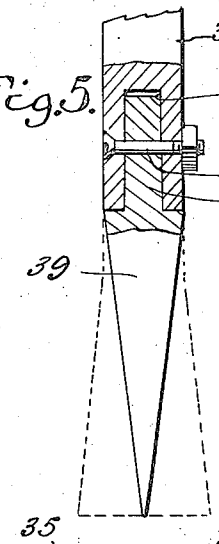
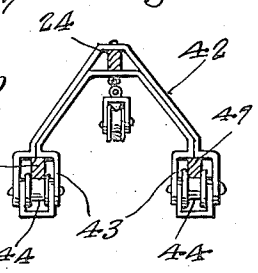


Fig. 7.



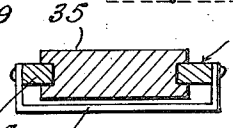


Fig. 4.

Witnesses

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UNITED STATES PATENT OFFICE.

ELA D. STORY, OF TYLER, TEXAS.

EXCAVATOR.

1,209,353. Specification of Letters Patent. Patented Dec. 19, 1916.

Application filed September 1, 1916. Serial No. 118,088.

To all whom it may concern:

Be it known that I, ELA D. STORY, a citizen of the United States, residing at Tyler, in the county of Smith and State of Texas, have invented certain new and useful Improvements in Excavators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to new and useful improvements in excavators and the principal object of the invention is to provide an excavator which is relatively light in construction and yet strong and substantial.

Another object of the invention is to provide an excavator having a movable bucket supporting frame which is arranged to be swung laterally at its rear end so as to give the bucket the greatest possible efficiency in order that an excavation of greater width than the width of the device may be made.

A still further object of the invention is to provide a bucket having an endless controlling cable which is wound upon a suitable drum and which is arranged in such a manner that upon the moving of the drum to raise the bucket the run of the cable for returning the bucket to original position will be paying out from the drum and when the bucket is being returned the operating run of the cable will be paying out, while the returning run will be wound upon the drum. It will thus be seen that steel cable may be used without danger of the same becoming kinked.

Another object of the invention is to provide a cable for moving the bucket supporting frame laterally which cable like that previously described is also kept tight in order to avoid kinking.

A still further object of the invention is to provide a grubbing tool and rock crusher which is mounted in close proximity to the bucket so that roots and weeds may be cut and rocks which are in the path of the traveling bucket may be broken into small particles in order that they may be removed.

A still further object of the invention is to provide a device which is so arranged that the bucket, frame and supports therefor together with the grubbing tool may be dismantled and placed on the device for transportation.

With these and other objects in view the invention consists in the novel combination and arrangement of parts which will be fully set forth in the following specification and accompanying drawings, in which:—

Figure 1 is a side view in elevation of an excavator constructed in accordance with this invention. Fig. 2 is a top plan view of Fig. 1. Fig. 3 is an enlarged sectional view on line 3—3 of Fig. 2 illustrating the grubber in detail. Fig. 4 is a horizontal sectional view on line 4—4 of Fig. 3. Fig. 5 is an enlarged fragmentary detail view partly in section of the lower end of the grubber illustrating the stone crusher in dotted lines. Fig. 6 is a fragmentary top plan view of the forward end of the chassis of the device illustrating the method of supporting and adjusting the rear end of the bucket frame, and Fig. 7 is a sectional view on line 7—7 of Fig. 2.

Referring to the drawing the numeral 1 designates the main frame or chassis of the device consisting of a pair of channel bars arranged in spaced parallel relation and connected at their rear ends with a transversely extending bar designated by the numeral 2. The forward ends of the side bars of the frame are connected by a suitable transverse bar 3 to which the steering shaft 4 is rotatably mounted. This steering shaft is provided at its upper end with a steering wheel 5 while the lower end is provided with a crank to which the link 6 is connected the opposite end of which is connected to the connecting bar 7 of the arms 8 which are formed on the steering knuckles 9 of the front axle designated by the numeral 10. The rear axle is mounted in any suitable bearing and is provided with the wheels 11, one of which is provided with a sprocket 12 over which the drive chain of the device passes. A motor 13 is mounted on the rear end of the frame and loosely mounted on the motor shaft is the drive sprocket 14 which is connected to the sprocket 12 by means of the endless chain 15. This sprocket 14 is provided with a clutch half designated by the numeral 16 which is adapted to cooperate with the clutch half 17 which is splined on the motor shaft in such a manner that when the clutch half 17 is moved into engagement with the clutch half 16 the drive sprocket 14 will be rotated.

Extending upwardly from the forward ends of the side bars of the frame 1 are suitable standards 18 which are held against

movement by the braces 19. The upper ends of these standards have attached thereto the horizontal bars 20 of the brackets designated generally by the numeral 21 each of which comprises the horizontal bar 20 and an inclined bar 22, the upper end of which is connected to the horizontal bar while the lower end is connected to the axle 10.

At the point where the inclined bar 22 joins the horizontal bar 20 of the bracket 21 is provided an upstanding member 23 provided at its upper terminal with the horizontal guide bar 24 on which the supporting yokes for the grubbers and bucket guide frames are mounted.

As shown in the drawings there are two of the brackets and supporting arms and mounted on the supporting arm to the left is the grubber designated generally by the numeral 25 which comprises a frame 26 consisting of vertical guide bars connected at their upper ends by a suitable horizontal bar and at their lower ends by a yoke 27 and a similar yoke 28 is connected between the upper and lower ends of the side bars of the frame 26. Secured between the side bars and the frame intermediate its ends is the block 29 carrying at its upper end the yoke 30 in which the roller 31 is journaled. This roller is adapted to run on the upper side of the guide bar 24 in order to support the device in place. A suitable pulley 32 is journaled in a recess 33 in the inner edge of the block 29 and forms a guide for the rope 34, one end of which is connected to the weight 35, while the opposite end is connected to a winding drum 36 which will be more fully hereinafter described. The lower end of the weight 35 is provided with a longitudinal groove 37 for the reception of the tongue 38 on either the grubber or rock crusher designated by the numeral 39. A suitable bolt 40 may be passed through the flanges formed by the groove 37 and the tongue 38 in order to support the tool 39 in place.

Swivelly mounted near the outer end of the bracket 21 on the right side of the frame as indicated at 41 is a yoke 42 which is best illustrated in Fig. 7. This yoke comprises an inverted V-shaped body carrying at the lower ends of its arms suitable inverted U-shaped yokes 43 in which are journaled the rollers 44. These rollers form guide rollers on which the bucket frame, which will be more fully hereinafter described, rocks. A suitable pulley 45 is attached to the under side of the yoke 42 and forms a guide for the cable or rope by means of which the movements of the bucket are controlled.

The bucket frame hereinbefore referred to is designated generally by the numeral 46 and comprises a pair of parallel guide bars 47 connected at their forward ends by the curved portion 48. As shown in Fig. 1 each of these guide bars is provided with the horizontal portion 49 arranged adjacent the curved portion 48 and at the rear ends of the horizontal portion is the downwardly and rearwardly extending inclined portion 50 which terminates at its lower end in the horizontally extending portion 51. The extreme rear ends of the horizontal portions are bent inwardly as at 52 and provided with an eye 53 for surrounding the vertically adjustable hanger post which will be more fully hereinafter described and upon which the rear end of the bucket frame 46 is supported.

The supporting structure for the rear end of the bucket frame is best illustrated in Figs. 1 and 6 and comprises a frame 54 which is attached to the forward side of the axle 10. The rear side of said axle is provided with a rack bar 55, the use of which will appear as the description proceeds. Slidably mounted between the forward bar of the frame 54 and the axle is a block 56 having attached to its upper side a supporting bar 57, the rear end of which is formed with a journal bearing for the reception of the shaft 58 which extends upwardly therefrom and carries the pinion 59 for meshing with the rack bar 55. It will thus be seen that upon rotation of the shaft 58 the carriage or block 56 will be moved laterally of the machine. In order to provide a means for controlling the movements of the shaft a suitable hand wheel 60 is attached to the upper end thereof as clearly illustrated in Figs. 1 and 2. Extending upwardly from the block 56 are a pair of spaced standards 61 which converge toward their upper ends which are provided with the forwardly extending arms 62. The forward ends of these arms are connected by a suitable bearing 63 in which the supporting post 64 is slidably mounted. This post is provided on its inner face with a plurality of gear teeth 65 for meshing engagement with a pinion 66 mounted on the shaft 67 which is journaled in the arms 62 and is provided with the hand wheel 68 by means of which the same is rotated. The lower end of the post 64 has threaded thereon a nut 69 for supporting the rear end of the bucket frame 46 and a suitable eye 70 is formed at the forward end of the bar 57 through which the rod 64 is slidable. The bucket used in connection with the device is designated by the numeral 71 and consists of a bottom having side walls formed integrally therewith which are connected at their rear edges by a rear end wall. The forward end of the bucket is open and the bottom is formed with a plurality of teeth 72 which act as diggers when the device is in use. Attached to the side walls of the bucket adjacent the rear edges thereof are a pair of

guide rollers 73 which are adapted to engage the upper sides of the guide rails 47 while similar rollers 74 are attached to the sides of the bucket a spaced distance from the rollers 73 and the rollers 74 coöperate with the rollers 73 in holding the bucket on the track. A suitable bail 75 connects the forward ends of the sides of the bucket and attached thereto is a cable 76 which passes over the pulley 45 and bends rearwardly over a suitable pulley 77 and thence over a guide pulley 78 to the drum 79 which will be more fully hereinafter described. The under run of the cable 76 winds around the drum for several turns and then it is extended forwardly as at 80 over a suitable guide pulley 81 and the idler 82 and is attached to an eye 83 which is secured to the rear wall of the bucket. It will thus be seen that when the drum is rotated to move the bucket forwardly on the bucket frame, the run 80 of the cable will pay off from the drum and when the bucket returns the under run will be wound upon the drum while the upper run will pay off. It will thus be seen that the cable will at all times be held taut and be prevented from kinking.

In order to steady the frame 46 a suitable transversely extending bar 84 is provided and projects beyond the sides of the frame as shown in Fig. 2. Suitable eyes 85 are attached to the outer ends of the bar 84 and connected to the eyes is a cable 86 which is wound upon the drum 87 and is continued and has its opposite end attached to the eye 85 on the side opposite that to which the first end is connected. Suitable guide pulleys 88 are secured to the outer end of suitable brackets 89 which in turn are connected to the standards 18 and it will thus be seen that when the drum 87 is rotated the frame may be shifted according to the direction of rotation of the drum and when the device is properly adjusted and the drum is held against rotation further movement of the frame will be prevented.

The drums 36, 79 and 87 hereinbefore referred to are loosely mounted on a counter-shaft 88 carrying at one end a sprocket 89 over which the drive chain 90 runs. This drive chain also runs over a drive sprocket 91 on the motor shaft and it will thus be seen that when the motor 13 is in operation the counter-shaft will be driven. In order that the drums may be rotated simultaneously or separately each of said drums is provided with a clutch half 92 and splined on the counter-shaft is a clutch half 93 arranged for coöperation with each of the clutch halves 92. The clutch halves 93 are controlled by levers 94 which are pivoted as at 95 to the chassis of the device and it will thus be seen that when the levers are moved so as to move the clutch halves into cooperative positions the drums will be rotated.

While in the foregoing there has been shown and described the preferred embodiment of this invention, it is to be understood that such changes may be made in the combination and arrangement of parts as will fall within the spirit and scope of the invention as claimed.

What is claimed is:—

1. A device of the class described comprising a chassis, a motor mounted on said chassis, arms extending upwardly from the forward end of the chassis, said arms projecting forwardly therefrom, a grubber mounted on one of said arms, a bucket frame mounted on the other of said arms, a bucket slidable on the bucket frame and means to move the rear end of the bucket frame transversely of the device to enable the bucket to cut a distance beyond each side of the machine.

2. An excavator of the class described comprising a frame, a bracket mounted at the forward end of the frame, an arm extending forwardly from the bracket, a bucket frame pivotally and slidably mounted on one of the arms, an excavating bucket operable on said frame and means to move the rear end of the frame transversely of the machine to enable the bucket to cut on each side of the machine.

3. In an excavator of the class described, a frame, a bracket extending forwardly from the frame, a bucket supporting frame pivotally and slidably mounted near the forward end of the bracket, a carriage movable transversely of the main frame adjacent its forward end, the rear end of the bucket frame being attached to the carriage and means to move said carriage.

4. In an excavator, a main frame, a bracket at the forward end of the main frame, an arm extending forwardly from the bracket, a bucket frame pivotally and slidably mounted at the forward end of the arm, a carriage movable transversely of the forward end of the main frame, the rear end of the bucket frame being attached to the carriage, a vertical adjustable post operable through the carriage for adjusting the rear end of the bucket frame vertically and means to move the carriage transversely of the main frame.

In testimony whereof I affix my signature in presence of two witnesses.

ELA D. STORY.

Witnesses:
A. B. EDWARDS,
KARL K. WHITE.