

May 19, 1931.

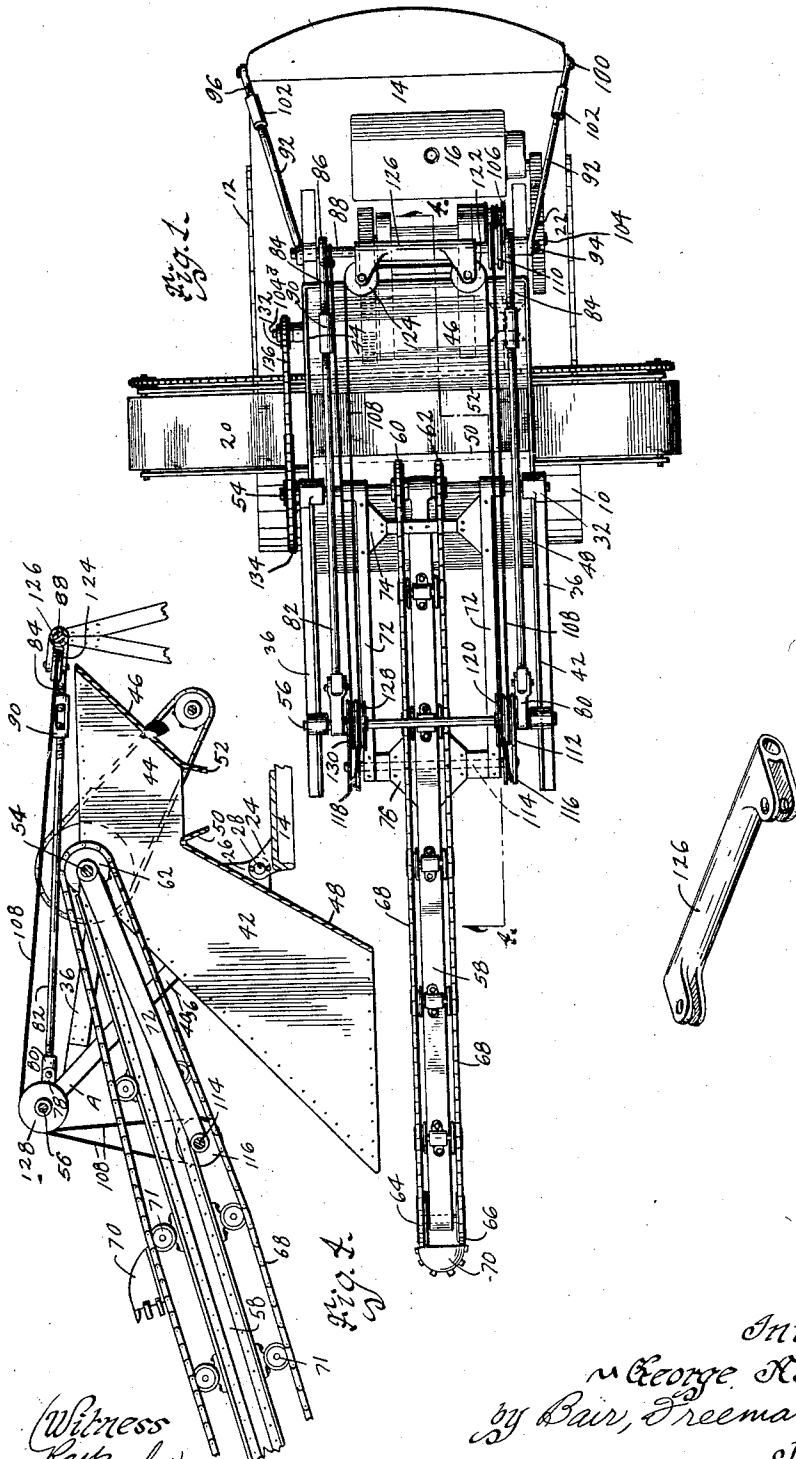
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1,806,511

CONVERTIBLE EXCAVATING ATTACHMENT

Filed Oct. 19, 1929

2 Sheets-Sheet 1



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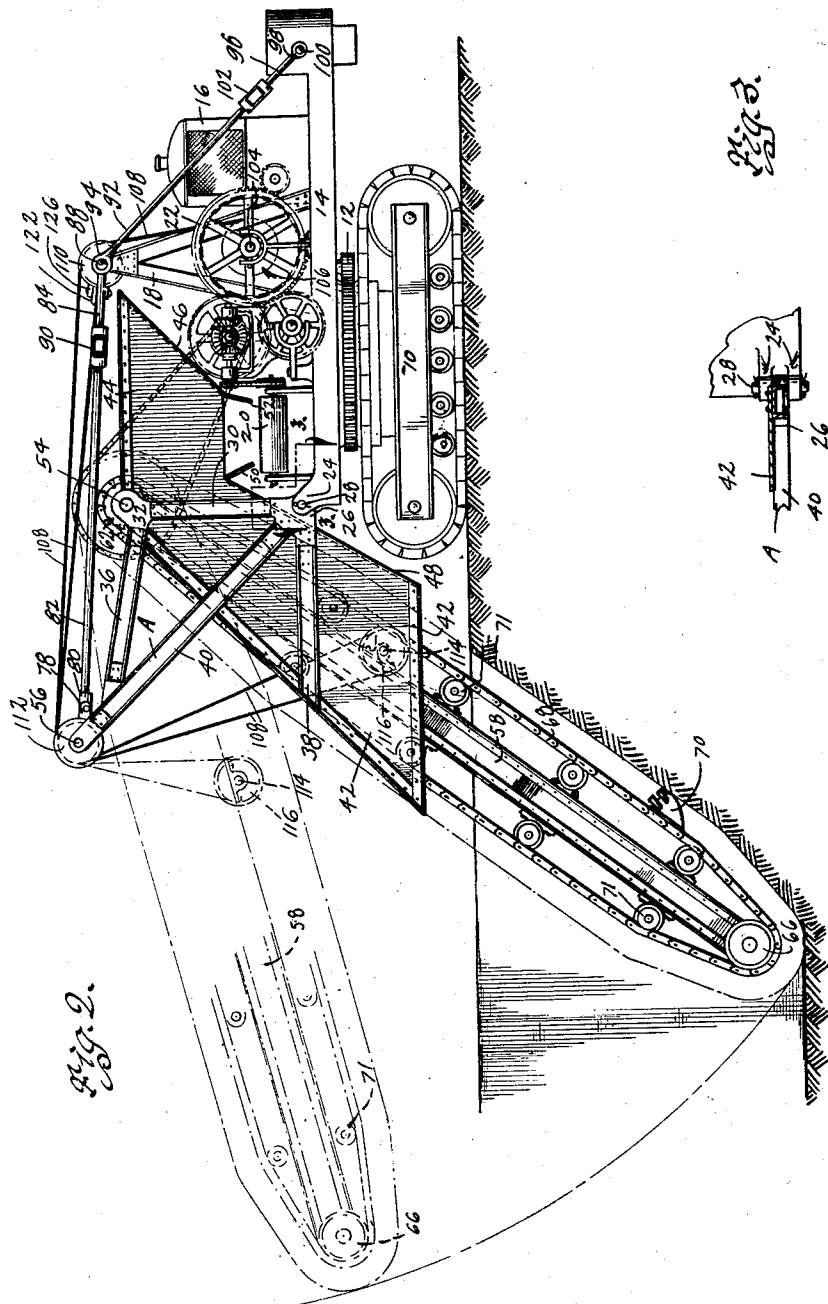


Fig. 2.

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CONVERTIBLE EXCAVATING ATTACHMENT

Application filed October 19, 1929. Serial No. 400,825.

The object of my invention is to provide a convertible excavating attachment adapted to be mounted upon a traction device and power plant, preferably of the type having a crawling tread traction, and a full revolving turn table, so that the crawlers may be turned to a 90° angle with relation to the excavator boom, which will permit cutting across the surface of the ground for greater widths than is possible with the ordinary cutting attachment for large open drainage ditches or basements.

More particularly, it is my purpose to provide such an attachment having parts so constructed and arranged as to facilitate easy and convenient installation on a traction device and power plant built to have various devices, such as a crane, drag line, excavator and the like mounted thereon.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my convertible excavating attachment, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a top or plan view of one of my attachments mounted on a traction device and power plant.

Figure 2 is a side elevation of the same.

Figure 3 is a detail, sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a detail, sectional view taken on the line 4—4 of Figure 1; and

Figure 5 is a perspective view of a portion of the attachment.

In the drawings herewith, I have used the reference numeral 10 to indicate generally a creeping tread traction device of well known construction. Supported on the traction device 10 by means of a turn table 12 is a frame 14 on which is a power plant 16 having an engine 16.

Supported on the frame 14 are spaced A frames 18, a lateral endless conveyor 20 and suitable gearing mechanism 22.

The frame 14 has at its rear end laterally spaced pairs of ears 24.

Excavator attachment

I shall now describe my excavator attachment.

I provide a pair of laterally spaced frames adapted to be secured to the respective pairs of ears 24 on opposite sides of the machine. These frames are indicated generally at A. (Figure 2.) Each comprises what may be for convenience called a corner fitting 26, shown in Figure 2, pivotally supported between the adjacent ears of a pair of ears 24 by means of a pin 28.

Extending upwardly from the corner fitting 26 is an upright channel bar frame member 30 connected at its upper end to a bearing 32. Extending rearwardly and slightly upwardly from the bearing 32 is a channel frame member 36.

Extending rearwardly from the corner fitting 26 is a channel frame member 38.

Extending diagonally upwardly and rearwardly from the corner fitting 26 is another similar frame member 40, to which the rear end of the member 36 is secured.

Rigidly fixed to the inner face of each frame A is an apron 42 having at its upper end a forward extension 44. The forward edges of the members 44 are connected by a cross member 46 forming the forward portion of what may be termed a hopper (see Figures 2 and 4).

The rear edges of the members 42 are connected by a cross member 48, as shown for instance in Figure 4. The upper edge of the member 48 is turned downwardly slightly as at 50 and the rear edge of the member 46 extends downwardly below the members 44, as at 52, to form a discharge spout above the endless conveyor 20.

A shaft 54 is journaled in bearings 32 (see Figure 1). A shaft 56 is journaled in the rearward ends of the frame members 40 (Figures 2 and 4). Pivotally supported on the shaft 54, shown in Figure 1, is an excavator boom 58, forming part of an endless chain and bucket excavator mechanism.

Fixed on the shaft 54 at the central portion thereof are spaced sprockets 60 and 62. Aligned guide pulleys 64 and 66 are mounted

on the lower end of the excavator boom 58. Laterally spaced chains 68 travel on the respective sprockets 60 and 62 and the respective pulleys 64 and 66. These pulleys are idlers. Additional idler wheels or pulleys 71 are suitably mounted on the boom.

The chains 68 carry excavating buckets 70. Pivoted to the shaft 54, as also shown in Figure 1, are laterally spaced frame members 72, which extend along the side and are spaced from the boom 58 and are rigidly secured thereto by means of frame devices 74 and 76.

Thus the frames A are hung on the main frame and carry the shaft 54 and the excavator boom is pivotally supported on the shaft 54.

I shall now describe further means for supporting the frames A and the apron members and hopper above mentioned. As so far described, it will be noted that the frame members A are simply pivotally supported between the pair of ears 24.

The frame members A are connected in the manner already described by the shafts 54 and 56 and also by the members 42 and 44 and the connecting members 48 and 46. Thus the side frames A and the members 42, 44, 46 and 48 form a fixed frame.

Means are provided for aligning this frame and rigidly holding it in place, which means will now be described.

Pivoted to the shaft 56 near the ends thereof are fittings 78 to which are pivoted sockets 80 into which are screwed rods 82 (Figures 1 and 2).

Rods 84 have eyes 86 mounted on a shaft 88 mounted in the upper ends of the A frames 18. Each shaft 84 is aligned with one of the shafts 82.

Turn-buckles 90 are mounted on the threaded adjacent ends of the respective shafts 82 and 84 as shown for instance in Figures 1 and 2. By adjusting the turn-buckles 90 the frame of the attachment device can be rigidly aligned and fixed.

For further bracing the parts, rods 92 are provided with eyes 94, which receive the shaft 88. Rods 96 have eyes 98 receiving pins 100 on the forward portion of the frame 14. Each rod 96 is aligned with a rod 92 connected therewith by a turn-buckle 102, which may be tightened for taking up slack, if the parts should wear.

Provision is thus made for suitably mounting the attachment on the main frame and adjusting it originally and also adjusting it in case of any wear on the parts.

For raising and lowering the excavating mechanism, I have provided the following means:

Supported on the main frame is a shaft 104 rotatably operated from the engine 16. On the shaft 104 is a drum 106, on which is wound a cable 108. On the shaft 88 near

one end thereof is a pulley or sheave 110, over which the cable 108 is extended. From the pulley 110, the cable 108 is extended rearwardly in the machine over a pulley 112 on the shaft 56, as shown in Figure 1.

A shaft 114 is supported below the boom 58 and has on its ends pulleys 116 and 118.

From the pulley 112, the cable 108 is extended around the pulley 116 and thence upwardly and over a pulley 120 on the shaft 56, and thence forwardly in the machine around pulleys 122 and 124. These pulleys 122 and 124 are mounted in the ends of a pulley carrying sleeve 126, which is supported on the shaft 88.

From the pulley 124, the cable 108 is extended rearwardly in the machine over a pulley 128 on the shaft 56, thence downwardly and around the pulley 118, and thence upwardly and over a pulley 130 on the shaft 56, and thence forwardly to the shaft 88 to which the cable is secured.

By winding the cable 108 on the drum 106, the boom and excavating mechanism may be raised, and by unwinding the cable from the drum, the boom may be lowered. The boom is shown in its raised position by dotted lines in Figure 2.

The excavating mechanism is operated from the engine 16 in the following manner:

The gearing mechanism 104 already mentioned includes a shaft 104a, shown in Figure 1, for example, on which is a sprocket 132. On the shaft 54 is a sprocket 134 aligned with the sprocket 132. A chain 136 travels on the sprockets 132 and 134.

The sprockets 60 and 62 are fixed on the shaft, so that when it is rotated, the chains 68 are operated.

An attachment of this kind has a number of advantages.

The traction device, the main frame and the power plant may be built in standard forms and sizes for the attachment of a series of excavating devices, such for instance as a shovel, crane, drag line and so on, and for the mounting of the attachment herein under consideration.

There is thus provided a machine convertible to a great variety of uses by installing thereon at different times different kinds of excavating mechanism.

My attachment which is the subject of this application is a unit which can readily and conveniently be mounted on the main frame by securing the members 26 to the ears 24 by means of the pins 28 and installing and adjusting the rods 82 and connected parts.

In the practical use of my improved attachment, it is used as an excavator in the same manner as any other excavator of this general chain and bucket type.

Changes may be made, of course, in the details of the construction and arrangement of the parts of my improved attachment with-

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out departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents, which may be reasonably included within their scope.

I claim as my invention:

1. In a structure of the class described, the combination of a traction element having a frame and a power plant on the frame, with an excavating attachment having side frame elements detachably pivoted to said first frame at its rear part, longitudinally adjustable rigid braces connecting the upper parts of the side frame elements with the first frame and an excavating mechanism pivotally carried on said attachment.

2. In a structure of the class described, an excavator attachment comprising rigid sides, means for connecting the sides including a hopper element and a shaft at the upper forward portions of the sides, arms pivoted to the shaft, an excavator boom pivoted on the shaft, rigidly secured between said arms, having an endless chain and bucket excavating mechanism, means for detachably mounting the lower forward parts of the sides on a main frame, longitudinally adjustable rods for connecting the upper rearward parts of the sides to such a main frame, pulleys carried by the boom on its opposite sides between its ends, a second shaft connecting the upper rear parts of the sides, and pulleys on said second shaft.

3. In a structure of the class described, an excavator attachment comprising rigid sides, means for connecting the sides including a shaft at the upper forward portions of the side, an excavator boom pivoted on the shaft, means for detachably mounting the lower forward parts of the sides on a main frame, longitudinally adjustable rods for connecting the upper rearward parts of the sides to such a main frame.

4. In an attachment of the class described, a pair of spaced rigid side frames, side aprons carried thereby having forward extension at their upper ends, apron and hopper elements connecting the forward edges of the aprons and extensions respectively, first and second transverse shafts supported respectively at the upper forward and upper rearward parts of the side frames, a pair of spaced arms pivoted to the first shaft, an excavator boom pivoted to the first shaft and rigidly secured between said arms, pulleys supported at the lower rear ends of said arms, and pulleys supported on said second shaft.

5. In an attachment of the class described, a pair of spaced rigid side frames, side aprons carried thereby having forward extensions at their upper ends, apron and hopper elements connecting the forward edges of the aprons and extensions respectively, first

and second transverse shafts supported respectively at the upper forward and upper rearward parts of the side frames, a pair of spaced arms pivoted to the first shaft, an excavator boom pivoted to the first shaft and rigidly secured between said arms, pulleys supported at the lower rear ends of said arms, pulleys supported on said second shaft, means for mounting the lower forward portions of the rigid side frames of said attachment on a main frame, and means for mounting the upper rearward portions of the side frames on such a main frame, comprising sockets pivoted to the second shaft, rods threaded into said sockets, rods having means for pivoting them on the main frame, and turn-buckles for connecting the respective first rods to the respective second rods.

Des Moines, Iowa, September 11, 1929.

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