July 4, 1933. H. H. BARBER 1,916,247

LATERALLY SHIFTABLE DIGGING BOOM

Filed Aug. 7, 1931 5 Sheets-Sheet 1

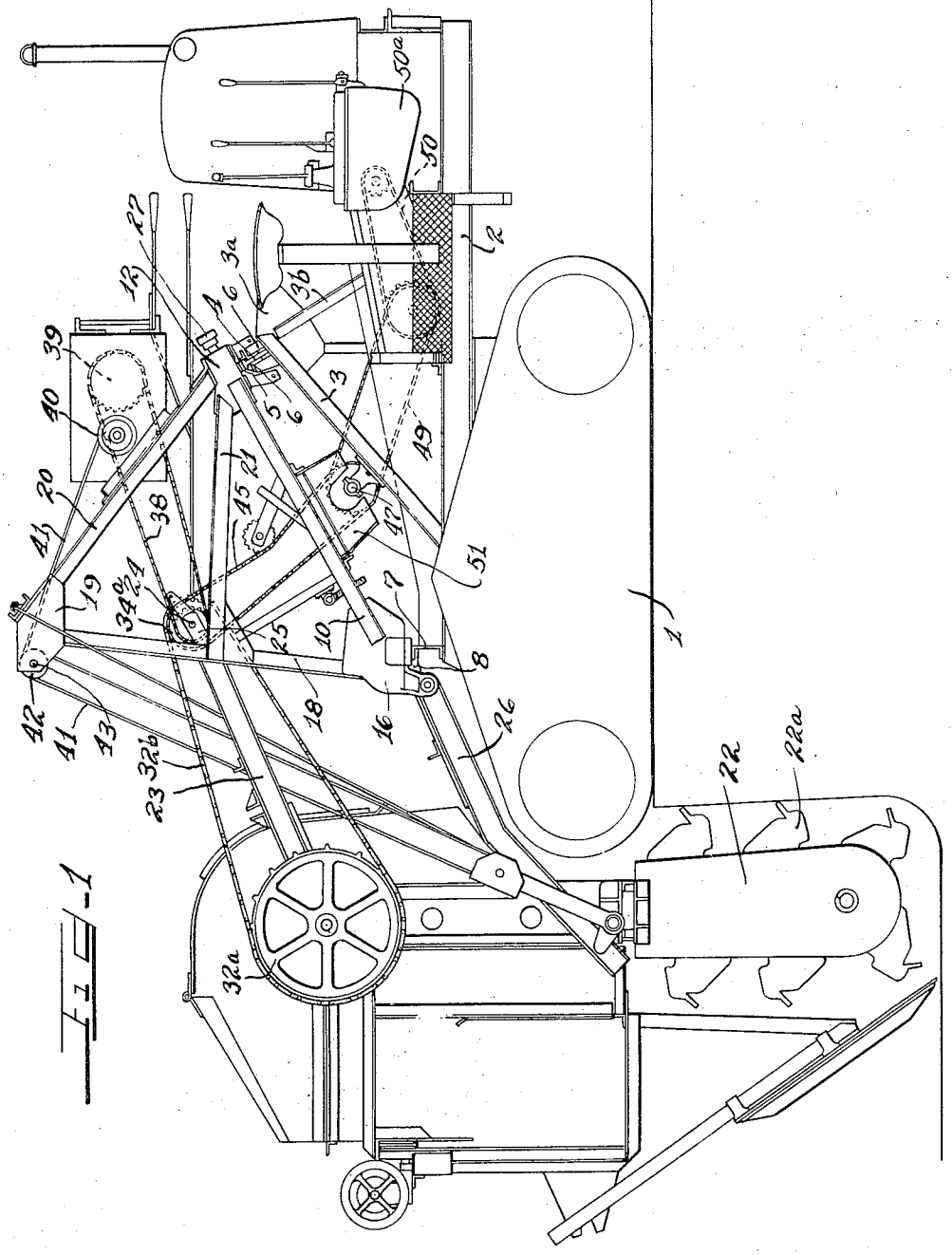


FIG. 1

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LATERALLY SHIFTABLE DIGGING BOOM

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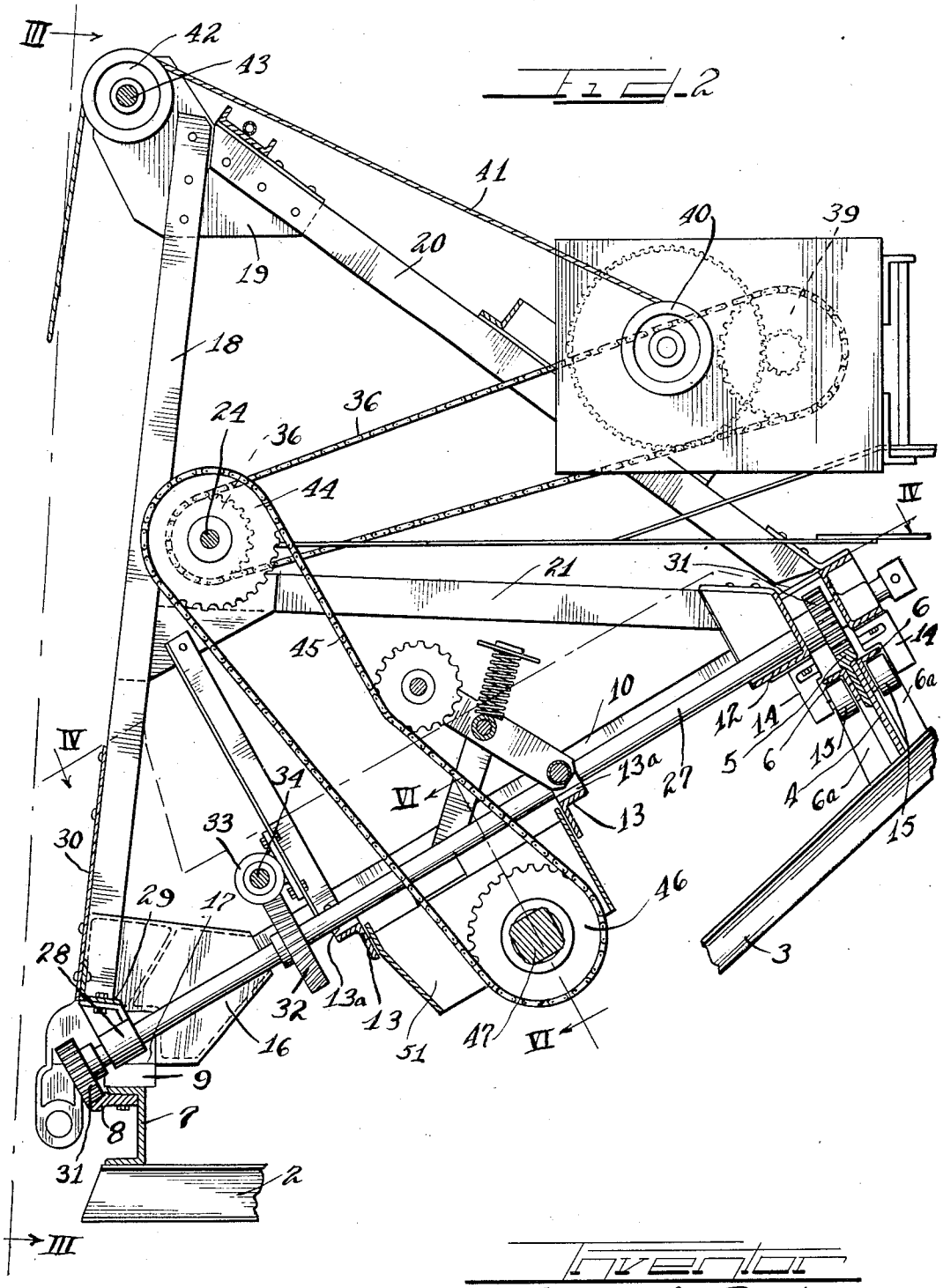


Fig. 2

Inventor

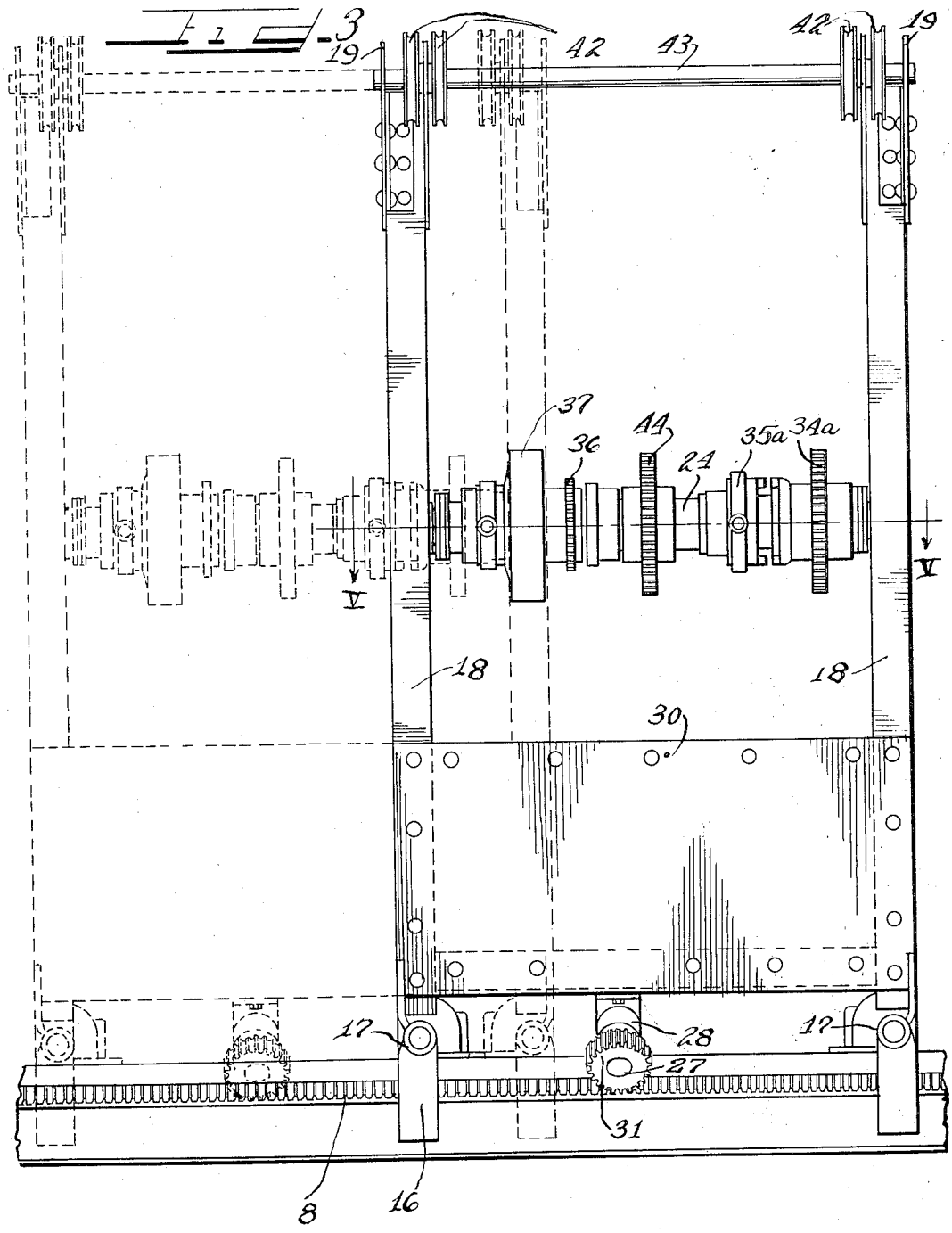
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July 4, 1933. H. H. BARBER 1,916,247

LATERALLY SHIFTABLE DIGGING BOOM

Filed Aug. 7, 1931 5 Sheets-Sheet 3



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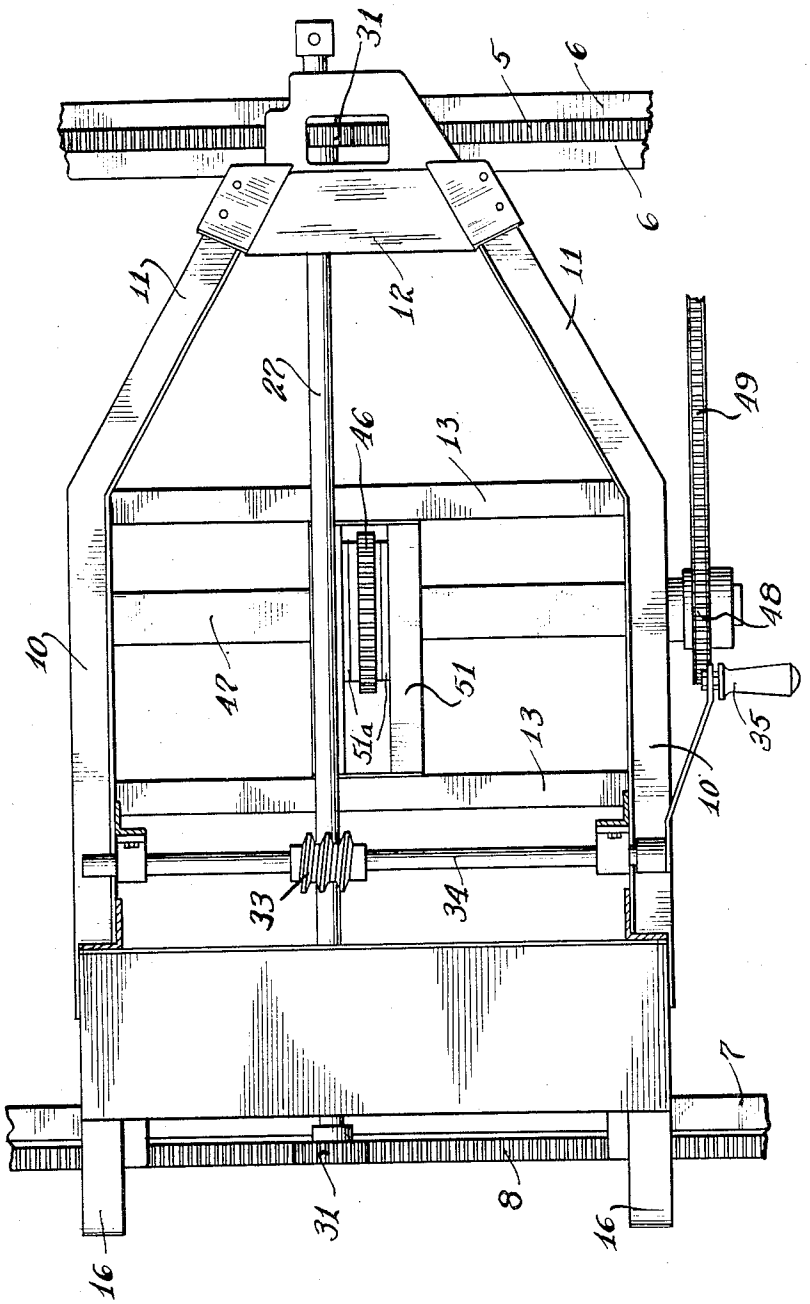
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July 4, 1933. H. H. BARBER 1,916,247

LATERALLY SHIFTABLE DIGGING BOOM

Filed Aug. 7, 1931 5 Sheets-Sheet 4

FIG. 4



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LATERALLY SHIFTABLE DIGGING BOOM

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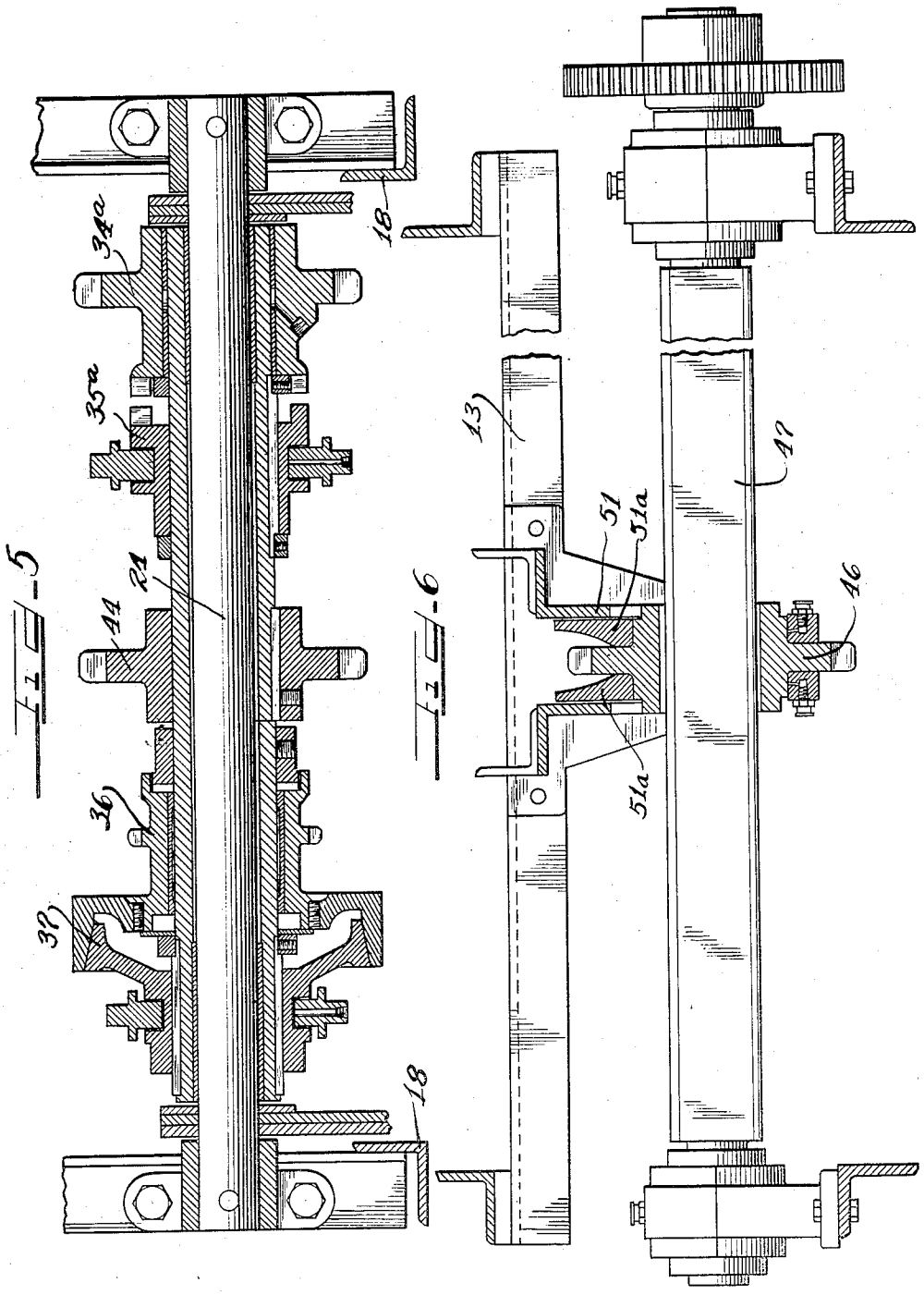


FIG-5

FIG-6

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UNITED STATES PATENT OFFICE

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LATERALLY SHIFTABLE DIGGING BOOM

Application filed August 7, 1931. Serial No. 555,764.

This invention relates to a laterally shiftable digging boom for ditching machines and concerns itself with the mechanism for supporting and shifting the boom so that the same can be shifted to dig a trench at different lateral locations with respect to the vehicle or truck upon which it is supported.

The invention comprises the novel structure and combination of parts hereinafter described and more particularly pointed out and defined in the appended claims.

In the accompanying drawings which illustrate a preferred embodiment of this invention and in which similar reference numerals refer to similar features in the different views:

Figure 1 is a side elevational view of a ditching machine embodying a laterally shiftable boom involving this invention.

Figure 2 is an enlarged fragmentary sectional view taken in a longitudinal direction through the laterally shiftable carriage and parts adjacent thereto with parts shown in elevation.

Figure 3 is an elevational view taken substantially upon the line III—III of Figure 2 looking into the machine.

Figure 4 is an enlarged sectional view taken upon the line IV—IV of Figure 2 looking in the direction of the arrow and showing part in elevation.

Figure 5 is an enlarged sectional view taken upon the line V—V of Figure 3 looking in the direction of the arrow.

Figure 6 is a sectional view taken upon the line VI—VI of Figure 2 showing part in elevation.

In the drawings there is shown the usual crawler 1 embodying a crawler frame 2. A plurality of upwardly inclined angle bars 3 are attached at their lower ends to the frame 2. A gusset plate 3*a* is attached to the upper end of each inclined angle bar 3 and struts 3*b* are connected to the plate 3*a* and frame 2 as shown in Figure 1. In referring to Figure 2, it will be seen that a plate member 4 extends across the upper portions of the inclined angle bars 3. A rack 5 is attached to the plate 4 and a pair of angle members 6 are attached upon opposite sides of the rack 5. These angle members 6 have their outstanding flanges braced by suitable upstanding struts 6*a* which rise from the angle bars 3. A channel member 7 extends transversely of the rear ends of the frame 2. A bearing plate 9 is attached to the top of the channel member 7 and a rack bar 8 is attached to the upper flange of the channel member 7. A carriage is supported on the parts just described for transverse shifting movement as will presently appear.

The carriage comprises a shiftable frame as shown in Figure 4. This shiftable frame consists of a pair of spaced angle bars 10 which converge forwardly as indicated at 11. The forward portions of the angle bars 10 are connected by a casting 12. Intermediate portions are connected by angle bars 13 having filler blocks 13*a* to space the same slightly beneath the angle bars, as shown in Figure 2. In referring to Figure 2, it will be observed that the casting 12 has a pair of hangers 14 upon which rollers 15 are mounted just beneath the outstanding flanges of the angle bars 6. As many sets of rollers 15 may be used as is necessary to anchor the carriage to the crawler frame for transverse shifting movement. Upon the rear margin of the carriage, there are a pair of spaced castings 16 in which rollers 17 are mounted and travel upon the bearing block 9 which rest upon the transverse channel bar 7. The superstructure of the transversely shiftable carriage consists of a pair of upright struts 18 extending from the casting 16. These uprights 18 are connected by means of gusset plates 19 to diagonal members 20 which are attached to the casting 12. Brace members 21 also extend from the castings 12 to the vertical struts 18.

The digging boom which is represented by the reference character 22 is attached by means of radius rods 23 (only one of which is shown) to a shaft 24 which is journaled in suitable brackets 25 attached to the uprights 18. Spacing arms 26 (only one of which is shown) are connected to the castings 16 and connected with the boom. A shaft 27 is suitably journaled upon the carriage, preferably in the casting 12, and the bearing 28

which is attached to an angle member 29 which in turn is secured to a shield plate 30 attached to the upright struts 18. Spur gears 31 are secured upon the shaft 27 for traveling upon the rack bars 5 and 8 as clearly shown in Figure 4. Intermediate the ends of the shaft 27, there is secured a worm gear 32, Figure 2, which is in mesh with a worm 33 secured upon a transverse shaft 34 which is suitably journaled in the carriage and which is provided with an operating crank 35 at one end whereby the said shaft 34 may be rotated for rotating the shaft 27 and causing the gears 31 to travel upon the racks 5 and 8 for shifting the carriage transversely. The head sprocket 32*a* on the boom is connected by a sprocket chain 32*b* to a sprocket 34*a* mounted upon shaft 24 and controlled by a clutch 35*a* as shown more clearly in Figure 5. A second wheel 36 upon the shaft 24 and which is controlled by a clutch 37 is connected by a sprocket chain 38 to a sprocket 39 which operates the winding drum 40 for winding up the hoisting cables 41 which are trained over pulleys 42 mounted upon a shaft 43 which is journaled in the gussets 19 on the uprights 18. The head sprocket 32*a* drives the bucket chain 22*a* as is well known in the art.

A third sprocket wheel 44 which is secured upon the shaft 24 is connected by a sprocket chain 45 with a gear 46 which is slidably mounted upon a shaft 47. It will be noted that the shaft 47 is substantially rectangular in cross section and carries a sprocket gear 48 at one end which is connected by suitable sprocket gearing 49 and 50 to a motor 50*a*.

In referring to Figures 4 and 6, it will be observed that a yoke 51 is connected to the transverse members 13 upon each side of the gear 46 and suitable filler members 51*a* are loosely mounted upon the hub of the gear 46 for absorbing the impact of the yokes, with the result that when the carriage is shifted, one yoke 51 will shift the gear 46 therewith so that the sprocket gears 44 and 46 will always be in proper alignment for driving shaft 24.

The operation of the digging boom is well known and requires no description. It may however, be mentioned that the carriage that supports the digging boom may be transversely shifted upon the main frame of the crawler by merely rotating the crank 35 for rotating shaft 34 which in turn rotates shaft 27 and causes the gears 31 thereon to travel over the rack bars 5 and 8 for laterally shifting the carriage and boom. During such shifting movement of the carriage, the driving gear 46 for the boom will shift therewith so as not to disturb the driving relation between the stationary motor and the shiftable boom.

I am aware that many changes may be made and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I, therefore, do not purpose limiting the patent granted hereon otherwise than necessitated by the prior art.

I claim as my invention:

1. In a ditching machine comprising a crawler having a frame, transverse racks mounted upon said frame, a carriage mounted upon said frame, a pair of angle members secured adjacent one of said rack bars, hangers upon said carriage adjacent said angles, rollers journaled in said hangers and engaging beneath said angle members, a shaft carried by said carriage, gears upon said shaft engaging said rack bars, means for rotating said shaft for transversely shifting said carriage, a boom supporting a digging chain supported by said carriage, and driving mechanism for said chain including a polygonal shaft, a gear upon said shaft, and a yoke connecting said gear to the carriage for the purpose set forth.

2. In a ditching machine including a frame, a carriage mounted upon said frame, means for shifting the carriage transversely upon said frame, a digging boom including a bucket chain pivotally supported upon said carriage for elevating and lowering movements, driving mechanism on said carriage and frame for driving said bucket chain including a slidable element on said frame and a connection between said carriage and element.

3. In a ditching machine embodying a crawler frame, a carriage mounted upon said frame, means for transversely shifting said carriage, a boom supported upon said carriage and having a digging chain thereon, driving mechanism for said chain partly mounted upon said frame and partly mounted upon said carriage and including an element slidably mounted upon said frame and means on said carriage for engaging and shifting said element when said carriage is transversely shifted.

4. In a ditching machine including a main frame, a transversely extending rear rack bar mounted upon the main frame, a forward rack mounted upon said main frame at a higher elevation than said rear rack bar, a carriage having gears mounted upon said rack bars and extending in an upwardly and forwardly inclined plane, a boom having a digging chain pivotally mounted upon said carriage, a power generating device upon the main frame, a shaft upon the main frame, gearing connecting said device and shaft, a slidable gear upon said shaft, a connection between said gear and carriage whereby said gear is transversely shiftable with said carriage, and driving mechanism between said gear and digging chain.

5. In a ditching machine, including a main

frame, spaced supporting members mounted transversely upon said main frame, the rear supporting member being at a lower elevation than the forward member, a carriage mounted upon said supporting members for transversely shifting movements, a boom including a digging chain pivotally mounted upon said carriage, power generating means mounted upon said main frame, a shaft on the main frame and geared to said means, a gear slidably mounted upon said shaft, and driving means between said gear and digging chain.

6. In a ditching machine including a main frame, a carriage mounted upon said main frame in an upwardly and forwardly inclined plane, means for shifting said carriage transversely of said main frame, a boom including a digging chain pivotally mounted upon said carriage for elevating and lowering movements, an engine mounted upon said main frame, a shaft mounted upon said main frame and geared to said engine, a gear slidably mounted upon said shaft and driving means between said gear and digging chain.

In testimony whereof I have hereunto subscribed my name at Aurora, Kane County, Illinois.

HARRY H. BARBER.