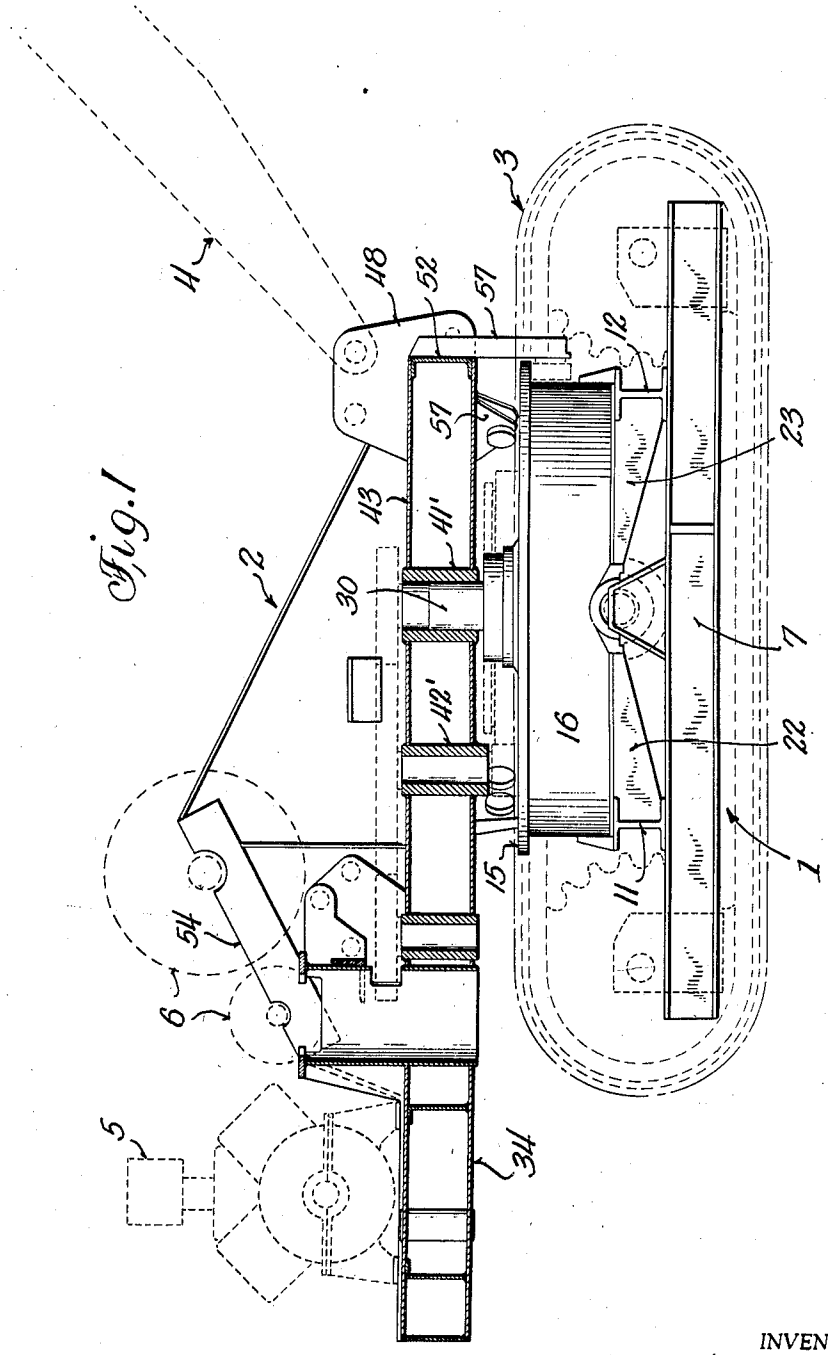
Jan. 24, 1939. W. HARNISCHFEGER 2,144,760

EXCAVATOR BASE AND FRAME

Filed Jan. 11, 1937 4 Sheets-Sheet 1

Fig. 1




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EXCAVATOR BASE AND FRAME

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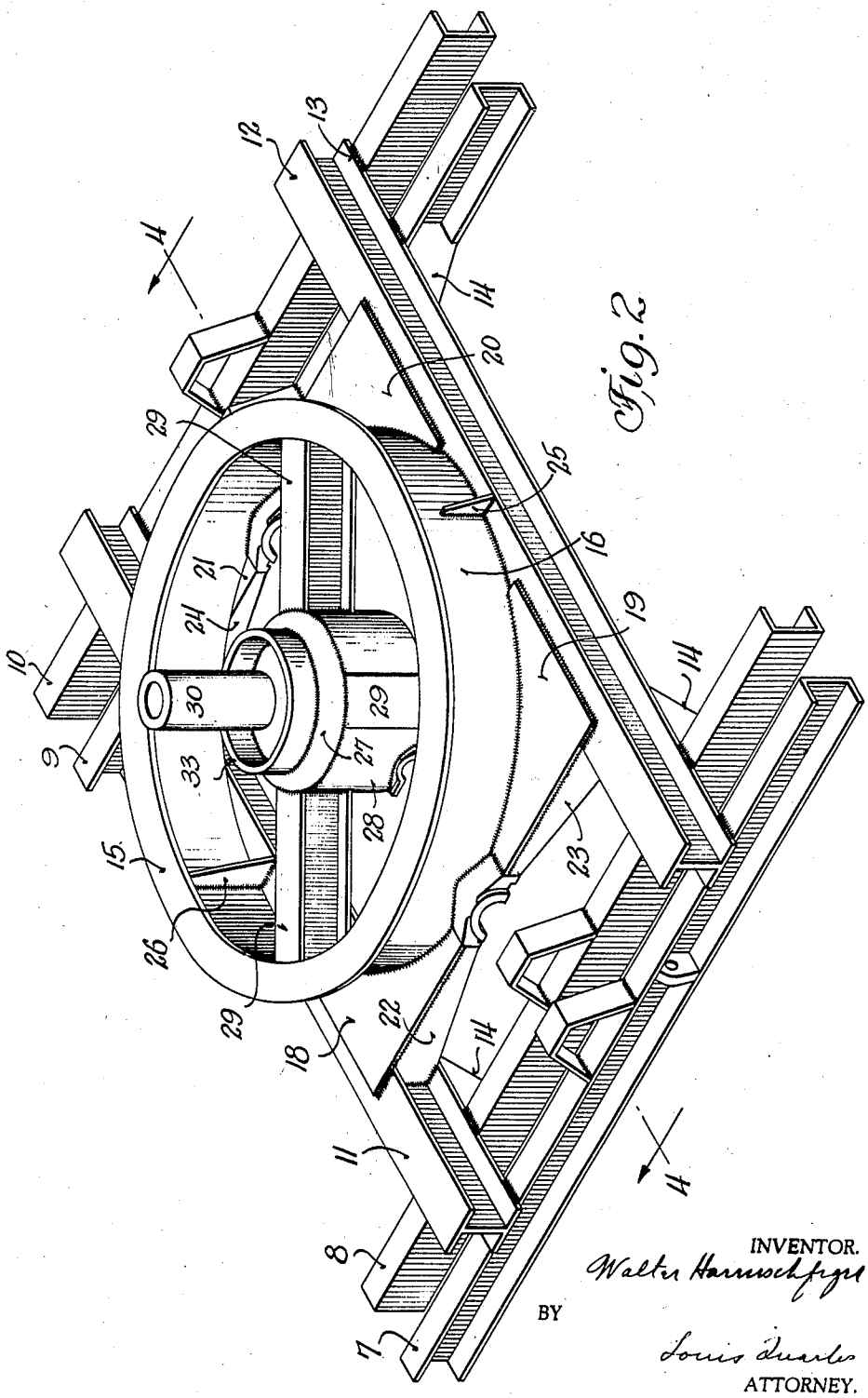



Fig. 2

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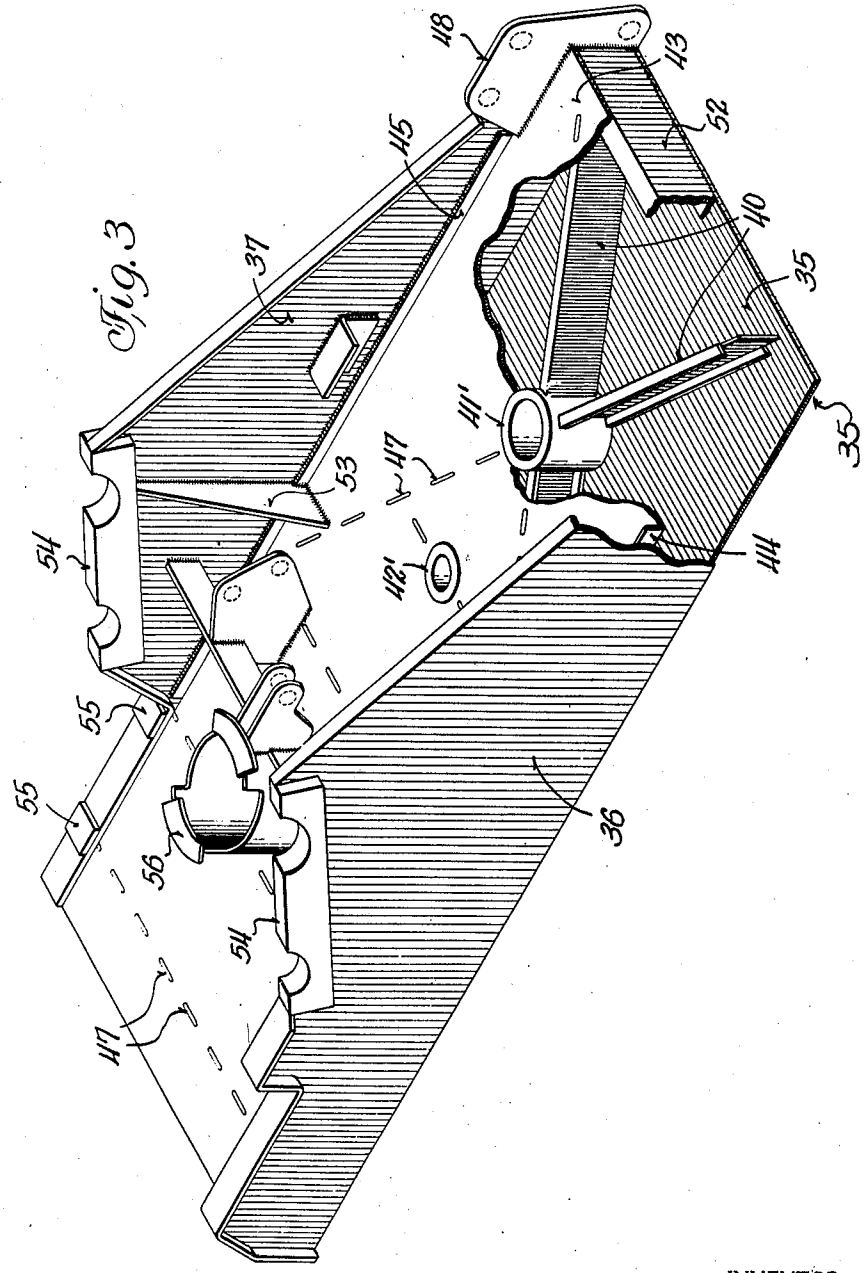
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Fig. 3




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EXCAVATOR BASE AND FRAME

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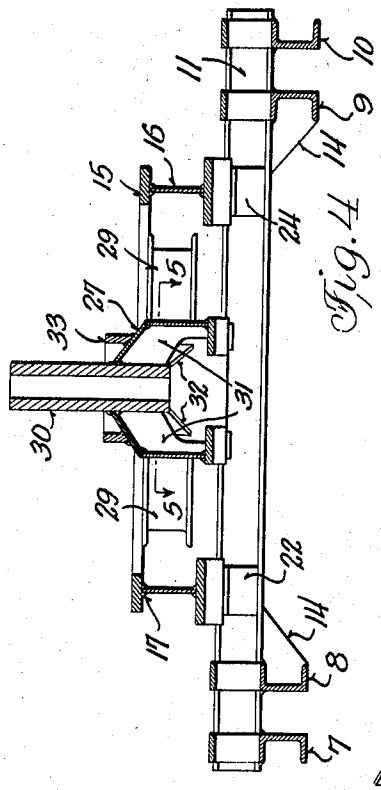


Fig. 4

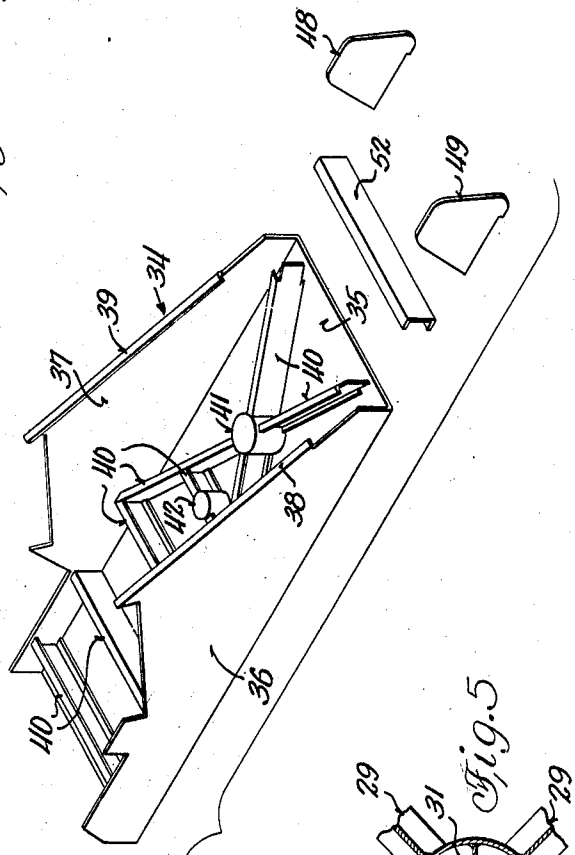
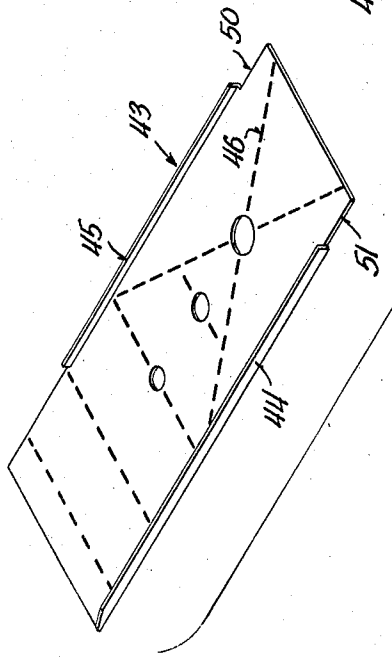


Fig. 6



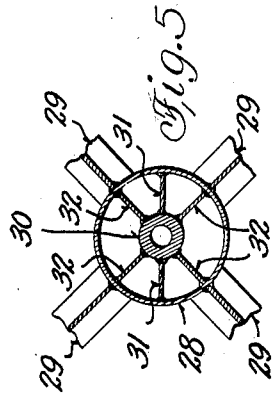


Fig. 5

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Patented Jan. 24, 1939 2,144,760

# UNITED STATES PATENT OFFICE

2,144,760

## EXCAVATOR BASE AND FRAME

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Application January 11, 1937, Serial No. 119,947

6 Claims. (Cl. 212—69)

This invention relates to supporting structures for tractor-propelled rotating-cab material-handling equipment and resides in a novel form of tractor base and rotating-cab frame composed entirely of rolled or forged or high strength elements united by welding.

In the fabrication of the supporting structures used for rotating-cab material handling equipment it has been the custom to employ as the main element of the structure castings made from iron or steel. The requirement of high strength which the particular service imposes has been met largely through the use of massive designs. The structures so fabricated although possessed of the requisite strength have been characteristically heavy. Some attempts have been made to employ other methods of fabricating such structures, as by the use of rolled structural members united by bolting, riveting, or other methods of fastening. In every case where such variation from the customary design has been resorted to, the object, apparently, has been to make the substitution as inobvious as possible and to as nearly approximate conventional massive designs as circumstances would permit. Consequently, material reduction in weight or material gain in strength has not resulted from such departure.

The supporting structure of this invention, however, is composed entirely of rolled or forged standard sheets or shapes of consequently high strength, the structure being united by welding. Strength through sheer massiveness of design is avoided and strength is obtained by proper disposition of high tensile strength material. As a result, the supporting structure of this invention is rugged and of appreciably reduced weight. In addition, by reason of the simplicity of the structure of this invention, it may be fabricated with facility and at a cost not exceeding that of the older and more inferior designs.

The structure of this invention is best described by reference to the accompanying drawings, wherein

Fig. 1 is a side elevation, partly in section, showing the supporting structure of this invention;

Fig. 2 is a perspective view from above of the tractor base portion of the supporting structure of this invention;

Fig. 3 is a perspective view from above, with parts being shown broken away, of the rotating cab frame portion of the structure of this invention;

Fig. 4 is a sectional view taken on the plane 4—4 of Fig. 2;

Fig. 5 is a sectional view of a detail taken on the plane 5—5 of Fig. 4; and

Fig. 6 is a perspective view showing the method of assembling the rotating cab frame portion of the structure of this invention.

In the following description of the figures the further objects and advantages of the structure of this invention will appear more in detail.

In Fig. 1 the appurtenances and structure of a typical rotating cab, material-handling machine are shown in light, broken lines, together with the structure of this invention in heavier lines so that the relation of this invention thereto may be clearly understood. As shown in Fig. 1, the structure of this invention is composed of two major portions, the tractor base 1 and the rotating cab frame 2, these parts both being shown in heavy lines. Indicated in dotted lines are a conventional tractor tread 3, mounted in conventional manner upon the tractor base 1, and a boom 4 mounted on the forward end of the rotating cab frame 2 and a motor 5 and gearing 6 mounted on the rearward end of the frame 2. The portion of the structure shown in heavy lines, being the portion with which this invention is concerned, constitutes the main structural supporting member of the entire machine.

The tractor base, as shown in Fig. 1, and as illustrated more in detail in Fig. 2, rests upon the longitudinals 7, 8, 9, and 10 formed of channel bars or bent plates arranged in pairs, as shown clearly in Fig. 2. Mounted upon the longitudinals are the cross bearers 11 and 12, the longitudinals above described being held in place thereby through the medium of the margin welds indicated in the drawings, one of which is designated, for example, by the numeral 13. The inner longitudinals 8 and 9 are additionally secured to the cross bearers 11 and 12 by the corner boxes formed from bent sheet material 14, which are welded in place, as shown in Fig. 2. Mounted upon this frame, as shown by dotted lines in Fig. 1, is any suitable type of track-type tractor tread 3.

The cross bearers 11 and 12 support in turn a circular turntable track 15. The track is in the form of an annulus shaped from rolled steel, as shown clearly in Fig. 2, and is secured by welding to the top of the cylindrical collar 16 as shown by the numeral 17 in Fig. 4. The collar 16 rests directly upon the cross bearers 11 and 12 and is welded thereto. The collar 16 is, however, as shown in Fig. 2, additionally secured to the cross bearers 11 and 12 by means of the corner plates 18, 19, 20, and 21. Box ribs 22, 23, 24, and

a corresponding rib in the remaining corner, not shown, further serve to stiffen and support the corner plates 18, 19, 20, and 21. Further stiffening may be added, as by means of the gussets 25 and 26. Centered within the collar 16 is a fixed hub composed of a conical sheet top 27 secured by welding, as shown, and to the cylindrical drum 28. The drum 28 is held in position by four spoke members 29, which are formed of short lengths of I section, as shown, fastening being made by welding, as shown. Mounted upon the central webs 31 and 32, as shown in Fig. 4, and projecting vertically therefrom, is the pintle 30, which is welded to the conical top 27 and securely braced within the drum 28 by the webs 31 and 32. These webs are firmly welded to the drum 27 and to the pintle 30, as clearly shown in Fig. 5. A cylindrical crown 33 is welded into place on the top of the cone 27.

Mounted to turn about the pintle 30 is the frame 2 of the rotating cab, as shown clearly in Fig. 1. The frame 2 is formed as shown more clearly in Figs. 3 and 6 from a principal troughlike member 34 fashioned from a single plate and bent to the shape shown in Fig. 6. The member 34 is composed of a bottom portion 35, the sides of which are bent upwardly to form respectively the side plates 36 and 37. The edges of the side plates 36 and 37 are rolled over, as indicated at 38 and 39 (Fig. 6), to add additional stiffness. The member 34 having been thus formed, bracing 40, composed of bent or rolled channels, is laid upon the bottom 35 and securely welded in place by means of margin weld, as shown in Fig. 6. In addition, steel plugs, such as 41 and 42, are welded in place, to be subsequently bored out to form bushings.

A floor plate 43 is next formed, having rolled edges 44 and 45, as shown in the left hand end of Fig. 6. The floor plate 43 is perforated, as indicated by the numeral 46, and is provided with openings of proper size and position to correspond with steel plugs, such as 41 and 42. The floor plate 43 is brought into position by sliding it forwardly from the position shown in the left hand end of Fig. 6 to the position shown in Fig. 3. Having been thus brought into position, the rolled margins 44 and 45 are welded to the side plates 36 and 37, respectively, as shown in Fig. 3. In addition, the plate 43 is securely welded to the bracing 40 by plug welds 47 formed in the perforations 46, which are provided therefor. Ears 48 and 49 are then inserted in the slots provided by the notches 50 and 51 and welded in place, and finally the cap member 52, formed of a channel, is fastened in place by welding. The side plate 37 is additionally stiffened by the gusset 53, a similar gusset, not shown, serving to strengthen the side plate 36. After assembly the plugs 41 and 42 are bored out, as shown in Fig. 3, to form the bushings 41' and 42' shown in Fig. 3. Various accessories, such as pillow blocks 54, engine mountings 55, and drive housings 56, may be secured in place, as desired, to accommodate any particular handling equipment employed.

Secured to the bottom of the frame 2 are roller supports 57, which bear upon the circular track 15 forming the turntable upon which the rotating crane body swings. As shown in Fig. 1, the boom 4 may be attached to the ears 48 and 49 in the usual manner.

It will be seen that the rotating cab frame 2 as well as the tractor base 1 are composed entirely of rolled, forged, or other high strength shapes welded into integral members. Further, the members are assembled by welding in forms having great strength and rigidity. All of the welds above described and illustrated in the drawings are preferably made by means of conventional arc welding. However, arc, torch, or spot welding, or other suitable welding, may be employed to effect assembly without departing from the broad principals of the structure of this invention.

That which I claim as my invention is:

1. In a supporting structure for track-type tractor-propelled, rotating-cab material-handling equipment, the combination comprising a tractor base formed of spaced longitudinals, cross bearers welded to said longitudinals to maintain the same in spaced relation, a cylindrical collar welded upon said cross bearers, an annular turntable track welded upon said collar, spokes welded within said collar, a hub held in centered relation with respect to said collar by welded connections to said spokes, an upwardly projecting pintle securely welded to said hub, a rotating cab frame mounted to swing about said pintle formed from a principal troughlike member having a bottom portion the sides of which are bent upwardly to form side portions, bracing members welded upon said bottom portion, a bushing cooperating with said pintle welded to said bottom portion, a floor plate between said side portions and welded thereto and resting upon said bracing members and united by welding thereto, and means for the support of suitable material-handling appliances upon said rotating cab frame.

2. A rotating cab frame suitable for use with equipment of the type described, comprising a principal troughlike member having a bottom portion with sides bent upwardly to form side portions including vertical projections forming bearing supports, bracing members welded upon said bottom portion, a bushing forming a center about which said frame rotates welded to said bottom portion, and a floor plate between said side portions and welded thereto and resting upon said bracing members and united by welding thereto.

3. A tractor base suitable for use with equipment of the type described, comprising longitudinals, cross bearers welded to said longitudinals to maintain the same in spaced relation, a cylindrical collar welded upon said cross bearers, an annular turntable track welded upon said collar, spokes welded within said collar, a hub held in centered relation with said collar by welded connection to said spokes, and an upwardly projecting pintle securely welded to said hub.

4. In a supporting structure for track-type tractor-propelled, rotating-cab material-handling equipment, the combination comprising a tractor base formed from spaced longitudinals, cross bearers welded to said longitudinals to maintain the same in spaced relation, corner braces welded to said longitudinals and said cross bearers at the junction thereof, a cylindrical collar welded upon said cross bearers, bracing members beneath said cylindrical collar and welded thereto and to said cross bearers, an annular turntable track welded upon said collar, spokes welded within said collar, a hub formed from a drum-shaped exterior and a webbed interior held in centered relation with respect to said collar by welded connection to said spokes, an upwardly projecting pintle securely welded to said hub and to the webs therein, a rotating cab frame mounted to swing about said pintle formed from

a principal troughlike member having a bottom portion and sides which are bent upwardly to form side portions, bracing members welded upon said bottom portion, a bushing cooperating with said pintle welded to said bottom portion, a floor plate between said side portions and welded thereto and resting upon said bracing members and united by welding thereto, and means for the support of suitable material-handling appliances upon said frame.

5. A rotating cab frame suitable for use with equipment of the type described, the combination comprising a principal troughlike member having a bottom portion and sides which are bent upwardly to form side portions including vertical projections forming bearing supports, bracing members secured to said bottom portions, a bushing about which said frame rotates secured to said bottom portion, and a floor plate secured between said side portions and resting upon said bracing members and united thereto.

6. In a tractor base suitable for use with equipment of the type described, the combination comprising spaced longitudinals, cross bearers superimposed thereon and secured thereto for maintaining said longitudinals in spaced relation, a collar superimposed upon said cross bearers and secured thereto so that said collar is rigidly held in place, an annular turntable track on said collar, a hub centrally disposed within said collar and having an upwardly projecting pintle, and spokes within said collar for holding said hub in position and for providing stiffness to said collar so that the same may serve for cross-bracing of said cross bearers and spaced longitudinals.

WALTER HARNISCHFEGER.