April 12, 1932. J. H. KERBER 1,853,212

SCARIFIER

Filed Oct. 5, 1929 4 Sheets-Sheet 1

Fig. 1.

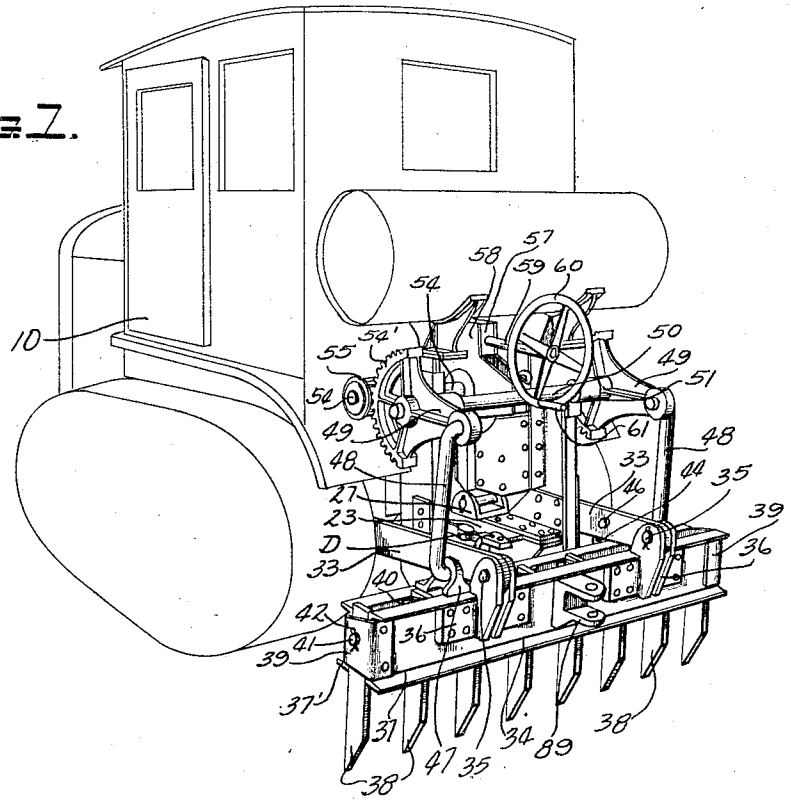
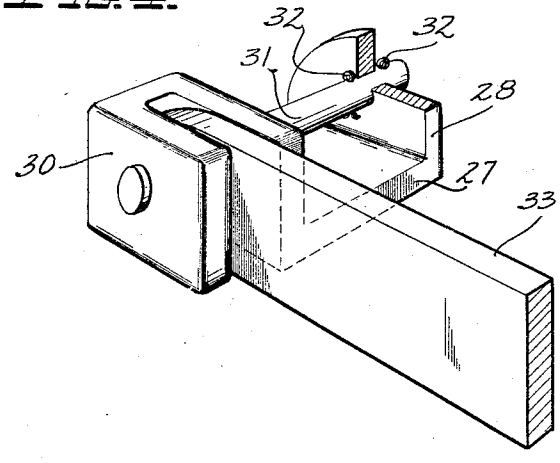


Fig. 4.



Inventor
Joseph H. Kerber

By Louis O. French
Attorney

April 12, 1932. J. H. KERBER 1,853,212

SCARIFIER

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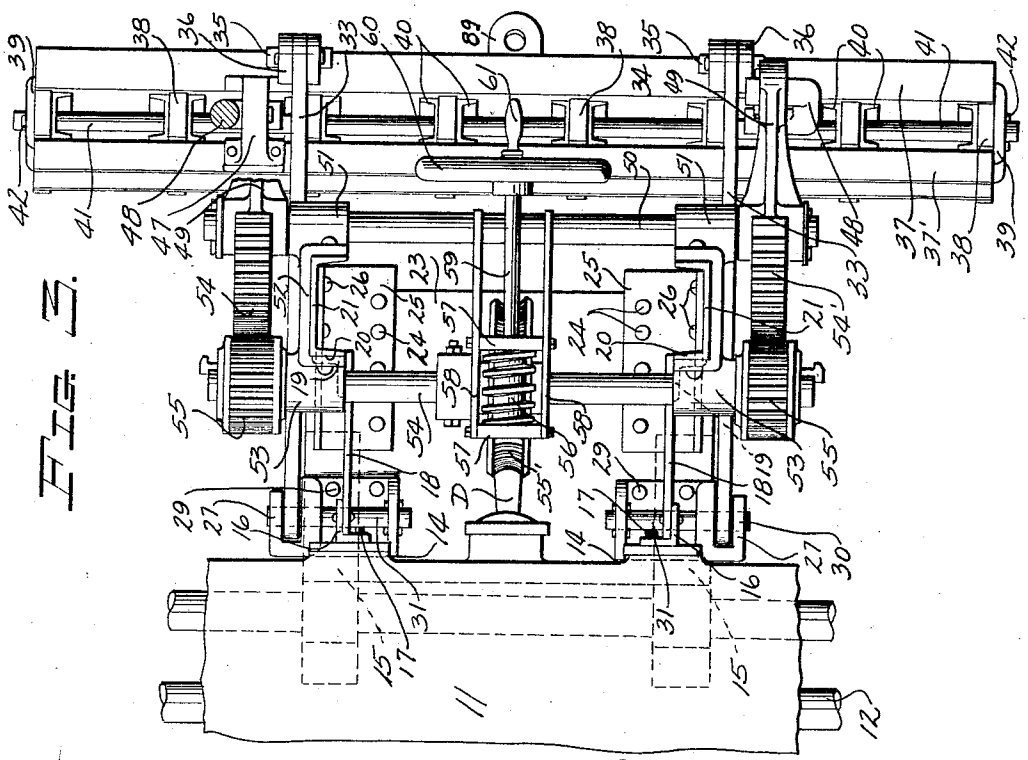
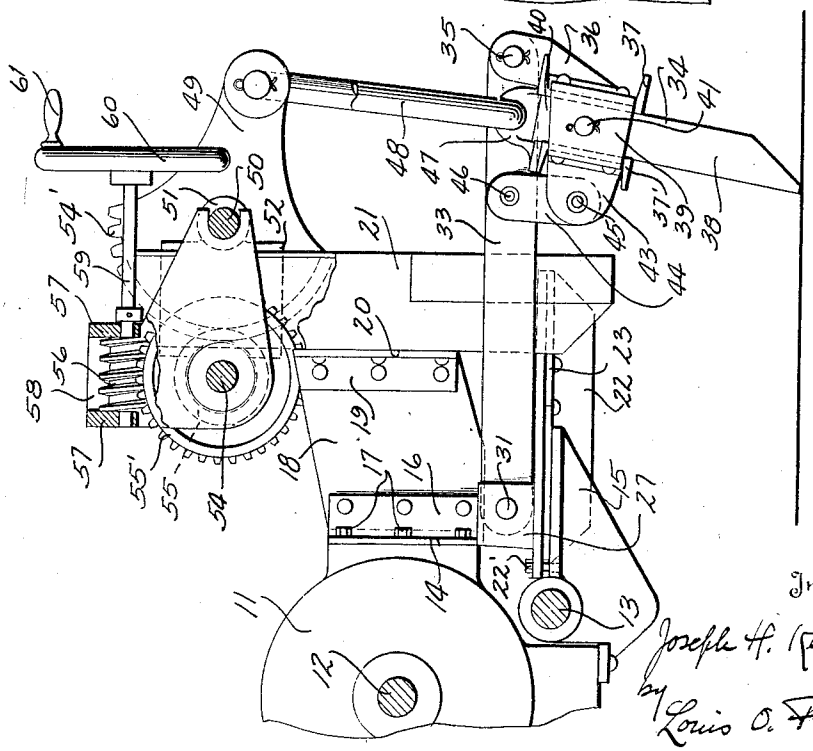


Fig. 2.



Inventor
Joseph H. Kerber
by Louis O. French
Attorney

April 12, 1932. J. H. KERBER 1,853,212

SCARIFIER

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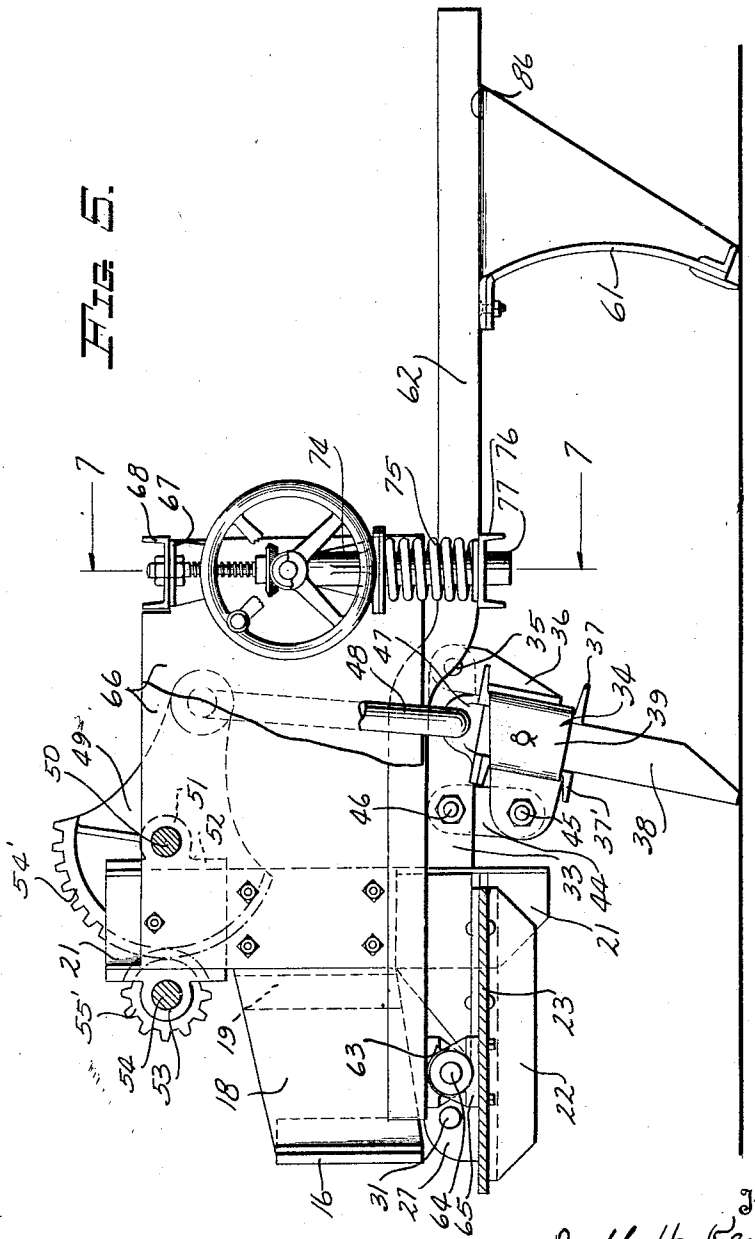
Fig. 5.



Inventor

Joseph H. Kerber

By Louis B. French

Attorney

April 12, 1932. J. H. KERBER 1,853,212

SCARIFIER

Filed Oct. 5, 1929 4 Sheets-Sheet 4

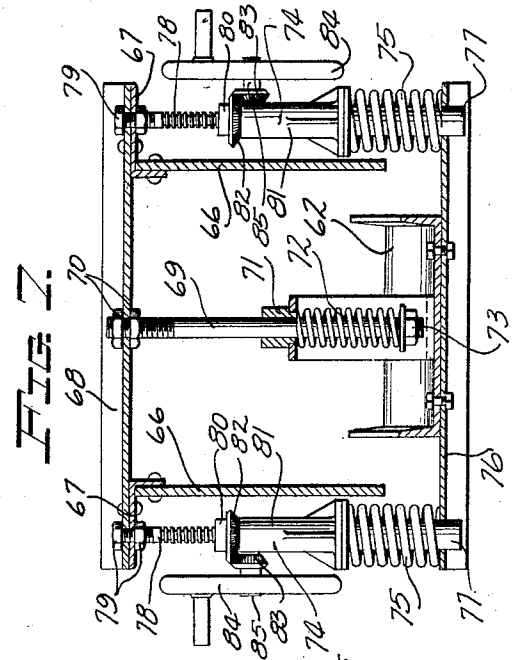


Fig. 2.

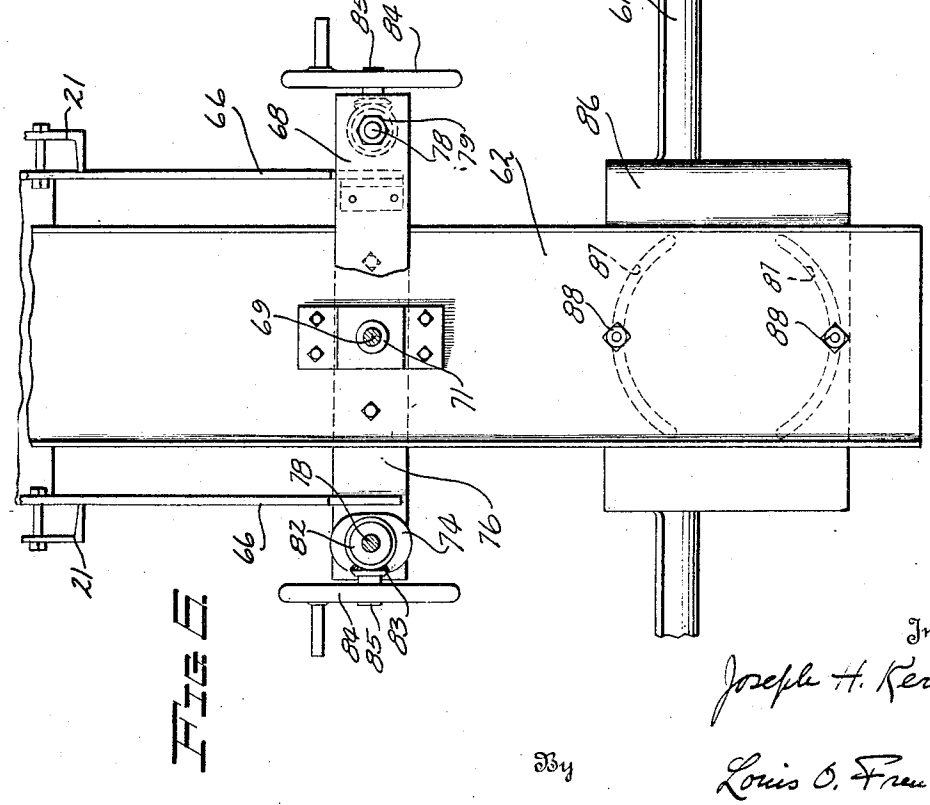


Fig. 3.

Inventor
Joseph H. Kerber

By Louis O. French
Attorney

Patented Apr. 12, 1932 1,853,212

UNITED STATES PATENT OFFICE

JOSEPH H. KERBER, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO HI-WAY SERVICE CORPORATION, OF MILWAUKEE, WISCONSIN, A CORPORATION OF WISCONSIN

SCARIFIER

Application filed October 5, 1929. Serial No. 397,539.

The invention relates to scarifiers.

One of the objects of the invention is to provide a scarifier that may be readily attached to a tractor of the endless tread propelled type so as to form a unit therewith, said scarifier including a pivotally mounted bar equipped with digging teeth that may be readily raised or lowered to suit working conditions.

A further object of the invention is to provide a scarifier with simple and effective means for raising and lowering the digging member and holding it in any desired position of adjustment.

A further object of the invention is to provide a scarifier in which a scraper member is associated with the digging member and preferably yieldingly mounted on the frame and adapted to be pressed against the road bed under adjustable spring tension.

The invention further consists in the several features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawings Fig. 1 is a perspective view of a scarifier embodying the invention showing it applied to a tractor of the endless tread propelled type;

Fig. 2 is a side elevational view of the scarifier, with parts broken away and parts shown in section, shown in connection with the back end of the tractor;

Fig. 3 is a plan view of the scarifier;

Fig. 4 is a detail view partly in section of one of the hinge connections;

Fig. 5 is a detail side elevational view of the scarifier showing the scraper associated therewith, parts being broken away and parts being shown in section;

Fig. 6 is a detail plan view of the scarifier-carrying frame, parts being broken away;

Fig. 7 is a detail sectional view taken on the line 7—7 of Fig. 5.

Referring to Figs. 1 to 3 of the drawings, the numeral 10 designates generally a tractor of the endless tread or track-laying type and 11 the transmission housing thereof in which the drive shaft 12 is mounted. The tractor herein shown is of known construction in which the shaft 12 drives gears associated with sprockets connected with the propelling tread, which sprockets are mounted on a casing 13 that is supported by the framework of the tractor.

The transmission housing of the tractor has vertically disposed spaced pads or bosses 14 and horizontally disposed spaced pads or bosses 15.

The supporting frame of the scarifier is of fabricated steel construction, consisting of vertically disposed angle iron bars 16 secured to the pads 14 by bolts 17 and riveted to one end of plates 18 which are riveted at their other end to one of the sides of angle iron bars 19, the other side of said angle iron bars 19 being riveted to one of the flanges 20 of channel-shaped frame members 21. Angle iron frame members 22 rest on the bosses 15 and project beyond the same and are detachably secured thereto by bolts 22′ passing through a flat steel plate 23 that extends across the space between these members 22 and is riveted thereto to form a connector therebetween by rivets 24 which also secure the bottom leg of angle iron plates 25 to the members 22, the other leg of said plates 25 being secured by rivets 26 to the webs of the channel irons 21, thus forming a rigid frame detachably secured to the pads 14 and 15. This frame is secured to the tractor, independent of the draw-bar D thereof shown in Fig. 1.

Referring to Figs. 2, 3 and 4, there is riveted to the plate 23, adjacent the angle frame members 16, pivot fittings or brackets 27. Each fitting, as shown in Fig. 4, includes a channel portion 28 whose web is secured to the plate 23 by rivets 29, and an integral hook portion 30. A pivot pin 31 extends through both legs of the channel and the bill of the hook 30 and is locked against longitudinal movement by cotter pins 32 mounted in transverse openings in the pin 31 on opposite sides of the innermost leg or flange of the channel.

Digger-frame-carrying members 33, respectively have their inner ends pivotally mounted on the pins 31 within the sides of the hooks 30 and projecting outwardly beyond the rear of the machine and are con-

nected to a fabricated digger bar 34 by pins 35 carried in bracket members 36 of the brackets 27 riveted or otherwise suitably secured to one of the channel members 37 forming a part of the digger bar 34.

Digging teeth are secured to the digger bar 34 between the channel 37 and the channel 37′ on the other side thereof. These channels 37 and 37′ are secured together in spaced relation by end plates 39 which are riveted thereto and channel spacer members 40 also riveted to the webs of the channel members 37 and 37′, these channel spacing members 40 being arranged in pairs, spaced apart to receive the shanks of the teeth 38 between them, the teeth being held in position by a shaft 41 passing through openings in the teeth members 39 and 40 and locked against removal by cotter pins 42.

The digger bar 34 with the teeth 38 is pivotally connected with the tractor through the members 33. In addition to the brackets 36 connecting the digger bar 34 with the members 33, the channel member 37′ of the digger bar 34 has brackets 43 riveted thereto and operatively connected by links 44 and pins 45 and 46 to the members 33. Thus the digging teeth are substantially rigidly connected with the members 33 and the digging angularity of the teeth will be varied with the angular setting of the members 33 as well as the depth to which the teeth are permitted to penetrate into the road bed.

For varying the depth of working of the teeth 38 means are provided for raising and lowering the same by raising and lowering the digger bar 34. For this purpose eyed brackets 47 are secured to the bar 34 and pivotally receive one of the ends of a link bar 48 whose other end is pivotally mounted in a lever 49. Each of the levers 49 is pivotally mounted on a transversely disposed shaft 50 journalled in suitable bearings 51 forming a part of a casting 52 that is secured to the upright channel frame members 21, said castings 52 also having journal portions 53 in which a transverse shaft 54 is mounted. The lever 49 at the end opposite from the link connection is formed with a segmental gear portion 54, the teeth of which mesh with a pinion 55 connected to the shaft 54 whereby turning of shaft 54 will oscillate the lever 49 through the gearing connection above described and thus through the links 48 raise or lower the bar 34 and swing the members 33 about their pivots 31. For turning the shaft 54 a worm-wheel 55 is mounted on the medial portion thereof and meshes with a manually operable worm 56 journalled in bearing blocks 57 secured to side plates 58 that are mounted in part on the shaft 54 and in part on the shaft 50. An operating shaft 59 connects the worm 56 with a hand-wheel 60 provided with a hand crank 61 for the purpose of turning the worm 56 and hence the worm-wheel 55 and shaft 54 to raise and lower the digger bar as previously described. Inasmuch as the operating mechanism for the shaft 54 is a worm and worm-wheel the parts are automatically locked in any adjusted position to which they have been moved by the operator. With this construction, as the structure proceeds along the road bed the teeth, in the desired position, dig into the road bed and break it.

In order to remove the broken material a scraper 61 is preferably associated with the digging member. This scraper 61 is in the general form of a plow blade that is mounted for suitably angular adjustment upon a supporting channel member 62 whose inner end projects through into the space between the frame members 18 and has an eyed pivot portion 63 secured to the bottom portion of its web at its inner end through which a pivot pin 64 passes, said pin being carried by spaced pivot supports 65 secured to the plate 23, these connections not being shown in Fig. 3, for the sake of clearness, but being shown in Fig. 5. In addition, where the scraper blade is used side plates 66 are bolted to the channel frame members 21 and have angle iron bars 67 bolted thereto to which a cross channel frame member 68 is bolted or otherwise suitably secured. These plates and frame members 66, 67 and 68 form a frame for supporting the means that suspend the scraper-carrying member 62 and scraper 61 in operative position. For this purpose a threaded rod 69 extends through the frame member 68 and is clamped thereto by nuts 70 and is slidably mounted in a yoke 71 secured to the frame member 62, with a spring 72 interposed between the transverse portion of the yoke and the nut 73 on the lower end of the rod, whereby the spring 72 yieldingly supports the scraper and its carrying member and counteracts its weight but permits the frame 62 to swing upwardly.

In order to impose a yielding pressure on the scraper to hold it against the work, a pair of manually operable jacks 74 act on springs 75 which are interposed between the bosses of said jacks and a transverse frame member 76 bolted to the channel frame member 62, the springs 75 being properly centered by shafts 77 projected from the base of the jacks through openings in the member 76. Each of the jacks 74 comprises a jackscrew 78 secured by nuts 79 to the frame member 68 and associated with a nut 80 carried by the casing 81 whereby turning the nut 80 will cause the jack casing 81 to move up or down relative to the screw 78 and thus either release or increase the tension of the spring 75 on the frame member 76 and the scraper frame associated therewith. For turning the nut 80, in each instance said nut has a beveled gear 82 associated therewith and meshing with a bevel gear 83 adapted to

be turned by a hand-wheel 84, said hand-wheel and gear being suitably journaled on a shaft extension 85 projecting from or secured to the casing 81.

For the angular connection between the scraper 61 and the frame member 62, the scraper has a top plate portion 86 with arcuate slots 87 formed therein and clamping bolts 88 project through said slots and through suitable openings in the frame member 62 and when tightened up hold the scraper member in the desired angular position with reference to the center line of the frame member 62 and hence to the digger bar 34. Thus, as the scraper 61 is disposed behind the digging teeth 38, the material broken by the digging teeth is caught by the scraper 61 as the structure advances and is deflected to one side or the other of the path of the digging teeth and assists in keeping material from piling up between the teeth.

As shown in Figs. 1 and 3, the digger bar has a draw-bar 89 affixed thereto so that any road equipment that may be used in connection with the tractor may be applied thereto without taking off the scarifier.

I desire it to be understood that this invention is not to be limited to any particular form or arrangement of parts except insofar as such limitations are included in the claims.

What I claim as my invention is:

1. In a scarifier, the combination of a supporting frame adapted for connection to a tractor and including spaced digger-frame-carrying members, a digger member mounted on the outer ends of said members, brackets, each of said brackets having hooked portions receiving the inner end of one of said digger-frame-carrying members and a flange spaced therefrom, a pivot pin passing through said hooked portion, the inner end of said digger-frame-carrying member and said flange, means cooperating with said flange to hold said pin against longitudinal movement, and means on said frame for raising and lowering said digger member.

2. In a scarifier, the combination of a frame adapted for connection to a tractor and including spaced digger-frame-carrying members, a digger member mounted on the outer ends of said members including spaced, lengthwise extending frame members and sets of spaced, transverse frame members providing teeth sockets, digging teeth having their shanks mounted in said sockets, and a removable member passing through openings in said sockets and the shanks of said teeth for holding said teeth in position.

3. A scarifier having a frame adapted for connection to a tractor and including a pivotally mounted digger bar comprising a pair of spaced channel irons and sets of spaced transverse frame members therebetween providing teeth sockets, digging teeth having their shanks mounted in said sockets, and a locking bar passing through openings in said digger bar and said shanks for holding said teeth in position.

In testimony whereof, I affix my signature.

JOSEPH H. KERBER.