T. V. BARNARD.

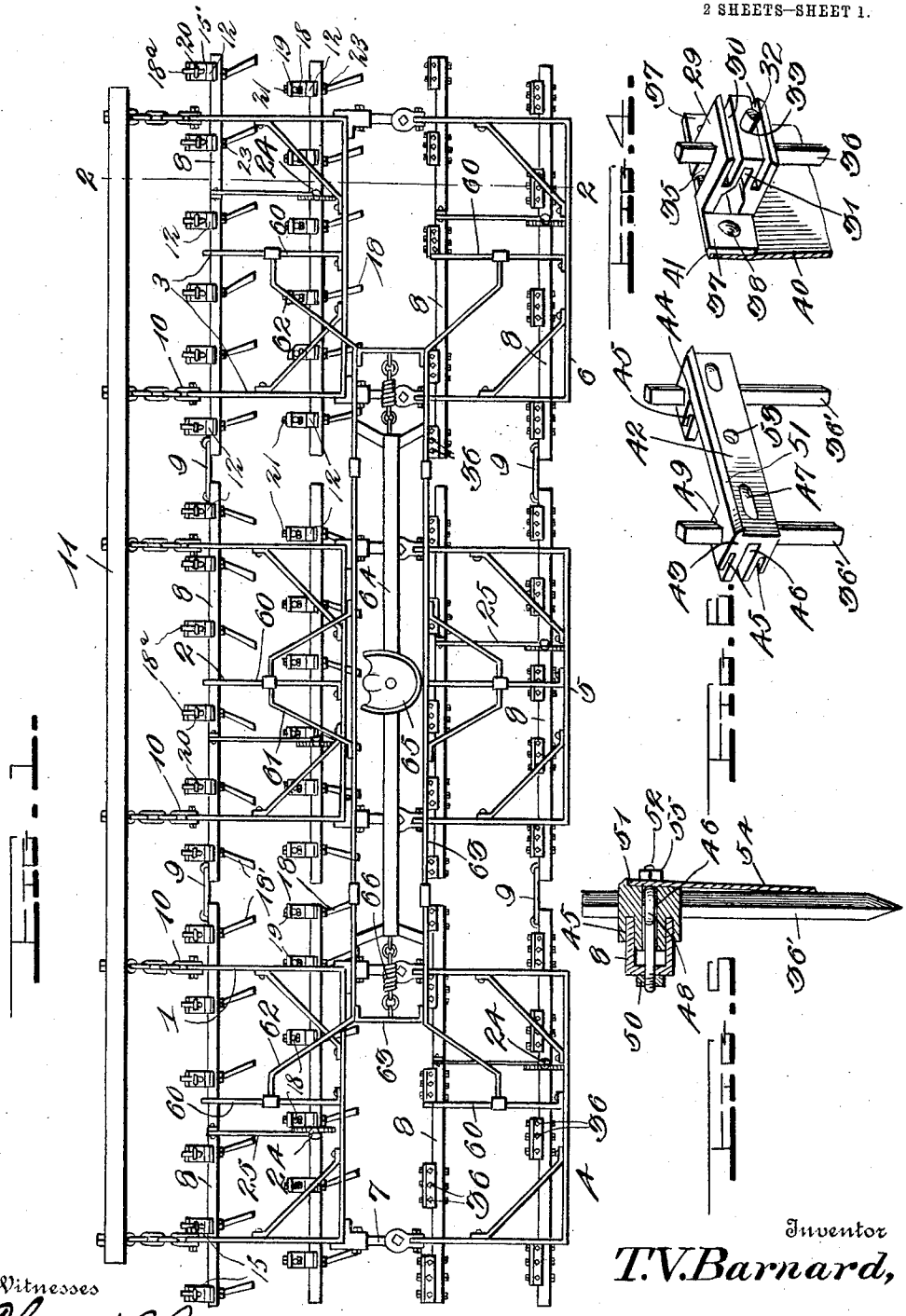
COMBINED PULVERIZER AND LEVELER.

APPLICATION FILED NOV. 11, 1911.

1,050,774.

Patented Jan. 14, 1913.

2 SHEETS—SHEET 1.



Witnesses

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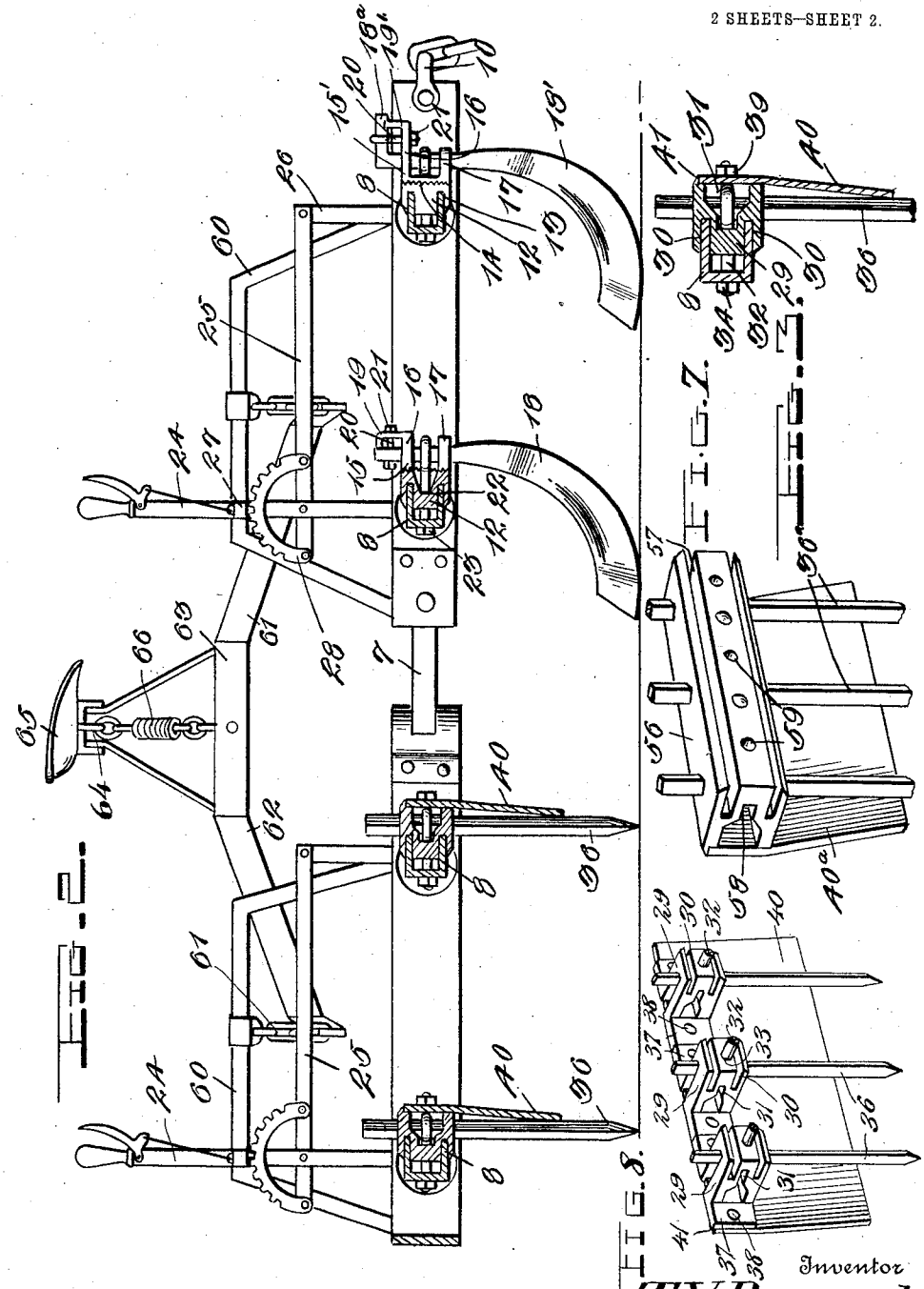

FIG. 2.

FIG. 7.

FIG. 8.

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UNITED STATES PATENT OFFICE.

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COMBINED PULVERIZER AND LEVELER.

1,050,774. Specification of Letters Patent. Patented Jan. 14, 1913.

Application filed November 11, 1911. Serial No. 659,866.

To all whom it may concern:

Be it known that I, THERIDES V. BARNARD, a citizen of the United States, residing at Schaller, in the county of Sac and State of Iowa, have invented certain new and useful Improvements in Combined Pulverizers and Levelers, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to new and useful improvements in the art of harrows and diggers and more particularly to the class of devices known as combined pulverizers and levelers, and the primary object of the invention is to provide a device of this character with improved forms of leveling devices thereon.

A further object of the invention resides in providing a plurality of spaced groups of leveling devices which may be arranged in units or any multiple of units, and a still further object resides in the arranging of these groups in staggered relation with respect to one another.

Another object of the invention resides in providing a leveling plate in connection with each group of teeth, and still another object is to provide means for the securing of the plates and groups of teeth to the bars of the frame.

A still further object of the invention resides in providing a plurality of frame sections linked one to the other, certain of which are provided with leveling devices and certain others of which are provided with pulverizing devices.

With these and other objects in view, my invention consists in the novel features of construction, combination and arrangement of parts as will be hereinafter referred to and more particularly pointed out in the specification and claims.

In the accompanying drawings forming a part of this application, Figure 1 is a top plan view of the device complete. Fig. 2 is a section therethrough as seen on line 2—2, Fig. 1. Fig. 3 is an enlarged section through one of the leveling devices. Fig. 4 is a fragmentary detail perspective of one of the leveling devices. Fig. 5 is an enlarged section of a modified form of leveling device. Fig. 6 is a detail perspective view of the last referred to form, and, Fig. 7 is a similar view of a further modified form of leveling device. Fig. 8 is a perspective detail view showing a group of earth engaging implements assembled by means of a leveling plate.

In carrying out my invention, I shall refer to the drawings in which similar reference characters designate corresponding parts throughout the several views and in which 1, 2, 3, 4, 5 and 6 indicate, respectively, frame sections which are looped together in pairs to form units, and each pair or unit in turn linked together, and in this instance, the sections 1 and 4, 2 and 5, and 3 and 6 are, respectively, linked together by means of the eye couplers 7. Rotatably mounted in each of the frame sections mentioned, is a pair of channel or U-shaped in cross section, rocking bars 8, and the forward of said rocking bars in each of the sections 1, 2 and 3 and the rearward of said rocking bars in each of the sections 4, 5 and 6, are linked together by means of the links or the like 9, thereby connecting the respective units or the like and permitting flexibility in the joints therebetween, and to the side bars of the frame sections 1, 2 and 3, are secured the clevises or the like 10, to which is connected the draw bar 11, whereby a draft animal may be attached to the device.

It might be here stated that while I have shown three pairs of frame sections, that is, three units or the like, the same may be in unitary form or any desired multiple of units hinged together, and it will be understood that where reference in the specification is had to certain elements, the same may refer to one section only, but similar elements are to be used in a like manner upon the other sections.

Mounted in the channel-shaped rocking bars of the frame sections 1, 2 and 3 and spaced throughout the length thereof, are the sockets 12, which sockets are provided with transverse slots or the like 13 spaced one above the other to receive therein the arms of the channel-shaped bars, and the outer faces of said sockets are corrugated, as shown at 14. Engaged with the corrugated faces of the sockets mounted on the rear bars of said frames 1, 2 and 3, are the corrugated faces of the bearings 15, said bearings having the opposite faces thereof provided with upper and lower flanges 16 and 17, respectively, through which extend the shanks of the scimitar-shaped blades 18, and the upper flanges 16 of said bearings are each provided with the upwardly and inwardly curved flanges 19 which are adapt-

ed to contact with the shanks of said blades 18. Bolts 20 extending through the shanks of said blades and the flanges 19 have the free ends thereof provided with the nuts 21, thereby securing the blades to bearings and permitting the same to be adjusted on their vertical axes and extending through central openings in said sockets and bearings are the eye bolts 22, the eyes of which are disposed between the flanges 16 and 17 of the bearings to receive therethrough the shanks of the blades 18. The free ends of said bolts 22 are also extended through the channel bars 8 and engaged with nuts 23, whereby the bearings, blades and sockets may be securely retained to said channel bars and simultaneously permit of a torsional movement of the bearings to oscillate said blades on their horizontal axes, when desired.

As stated, the form of bearing just described is used in connection with the sockets mounted on the rear bars of the sections 1, 2 and 3, that is to say, such is so shown in the drawings, and with the sockets of the forward bars of said sections are engaged the slighest modified form of bearings 15′ similar to the other form of bearings, in being provided with the upper and lower flanges 16 and 17, respectively, and extending through these flanges are the scimitar-shaped blades 18′, but in this instance, the shanks thereof having their free ends provided with the angular lugs 18^a. The free ends of the upper flanges 16 are bent upwardly, as shown at 19′, to receive in engagement therewith the lugs 18^a of the shanks of said blades, and engaged with the lugs 18^a are the eye bolts 20, the free ends of which extend through the flanges 16 and are engaged by the nuts 21. Thus, it will be seen that the blades may be securely held to the bearings, and said bearings and sockets are, in this instance, secured to the channel bar 8 in a similar manner as that described in the other form.

From the foregoing description of the manner of mounting the blades on the channel bars, it will be seen that said blades are capable of adjustment with respect to the bearings on their vertical axes and are also capable of adjustment on their horizontal axes through the torsional adjustment of any bearing on its respective socket, which may be effected by the loosening of the nut on the eye bolt sufficiently to disengage the corrugated faces of said bearings and sockets. When such adjustment has been completed, however, a rigid relation between the parts may be established and maintained through the tightening of the nuts on the eye bolts, thereby reëngaging the corrugated faces of the bearings and sockets, and it will be appreciated that while I have described two forms of bearings in connection with the securing of the blades to the bars, either or both forms may be used, as desired. These scimitar-shaped blades heretofore described are, as shown in the drawings and described in the specification, provided on the forward frame sections of the units of the device, thereby cutting and pulverizing, to a certain extent, all clods of soil encountered in the operation of the machine, and it will be appreciated that in view of the functions performed by these blades, it is particularly essential that the same be capable of various adjustments with respect to the frames themselves. While it has been described just how said blades may be adjusted, both on their horizontal and vertical axes, it will be appreciated that this adjustment is with respect to the channel-shaped rocking bars 8, but I have also provided means whereby said bars themselves may be oscillated, thereby giving the blades an additional adjustment with respect to the frames, and to this extent I provide the levers 24 which have their lower ends secured to the rear bars 8 of the sections 1, 2 and 3 and have pivoted, intermediate of their ends, the bars 25, which bars have their forward ends in turn pivoted to arms or the like 26 carried on the forward channel bars 8 of said sections. From this construction, it will be seen that as said levers are moved forwardly or rearwardly, the channel bars 8 will be partially rotated in the frame sections, and in order to retain the same in any adjusted position, I provide the detents 27 on said levers which are adapted to engage the teeth of segmental racks 28 carried on the bars 25.

As this machine is described as a combined pulverizer and leveler, it will be appreciated the various form of teeth or blades are adapted for use thereon which may be secured in various different ways, and it must be stated, therefore, that in addition to the pulverizing or hummock blades carried on the front frame sections of the units of the device, I have provided leveling devices in the rear frame sections which may be termed sectional levelers. To this extent, I provide a plurality of combined sockets and bearings 29 which are mounted on the channel bars of the rear frame sections 4, 5 and 6 and arranged in spaced groups throughout the length of said bars. These combined sockets and bearings comprise substantial blocks or the like, each of which is provided with a pair of transverse slots 30 spaced one above the other on one of the faces thereof to receive therein the arms of the channel-shaped bars 8, and the opposite face of each of said members 29 is provided with an additional transverse slot or channel 31 which extends about centrally thereof and into the block between the slots 30. This channel or slot 31 is provided to receive the head of an eye bolt 32 which ex-

tends through an opening 33 in the member 29 and also extends through the channel bar 8 and is engaged with a nut 34, whereby it will be seen that by merely tightening said nut 34 on said bolt and against the rear face of the bar 8, said bearing may be securely held to the bar. Each of the members 29 has the face thereof having the slot 31 therein provided with a vertical slot 35 which extends the full height of the member, thereby bisecting the slot 31, and entered in the slot 35 is a harrow tooth 36 which is also adapted to be received by the head of the eye bolt 32, and thus it will be seen that as said eye bolt is secured on the bar 8 to secure the member 29 thereto, said harrow tooth will also be securely held to the member 29. These members 29 are arranged on the bars 8 in series or groups, in any multiple of units desired, to correspondingly arrange the harrow teeth 36 in such groups, and each of said members 29 is provided, on the face thereof having the slot 35 therein, with a laterally extending flange 37, and secured to the flanges of each group of teeth by means of the bolts 38 and nuts 39 is a leveling plate 40. These plates 40, which, in addition to serving as leveling plates, serve to assemble the ground engaging implements in groups of any predetermined number of units have the upper edges thereof resting in engagement with shoulders 41 formed on the upper edges of the members 29, and the lower portions of said plates 40 are bent somewhat inwardly to permit the lower edges thereof to contact with the teeth 36, and it will be seen that as the device is propelled forwardly and the hummock or scimitar blades and harrow teeth crush the clods of soil, said blades will tend to level the same, the lower edges of the same being disposed to points above the lower or effective edges of the teeth 36.

When either of the modified constructions illustrated in Figs. 6 and 7 is adopted, it will be seen that the holding block, designated, respectively, 42 and 56, serves to support a group or plurality of teeth, which group may be composed of any desired number of units, from two upward.

It must here also be stated that the groups of teeth are arranged in staggered relation with respect to one another, and as the plates 40 are of a width substantially equal to the width of the space covered by a group of earth engaging teeth, it will be seen that the soil covered by the complete width of the machine will be thoroughly pulverized and leveled as the device is propelled thereover.

In Figs. 5 and 6, I have shown a slightly modified form of means for securing the harrow teeth to the channel bars of the device. In this instance, I have provided means for arranging the teeth in pairs which consists of a plate or the like 42, one face of which has provided at its ends the heads 43 and 44, respectively, said heads being each provided with a pair of slots 45 spaced one above the other to receive therein the arms of the channel-shaped bars 8, and each of said heads is also provided, in the space between said slots 45, with a transverse channel or slot 46 which extends completely through the plate 42, as shown at 47. The channels or slots 46 and the heads 43 and 44 are adapted to receive the eye bolts 48, the heads or eyes of which are adapted to register with vertical slots 49 in said heads, whereby the harrow teeth 36′ extending through said channels 49 may also pass through the eyes or heads of said bolts 48. These bolts 48 are also adapted to extend through the channel bars 8 and have the free ends thereof engaged with the nuts 50, whereby it will be seen that, when said nuts are turned home against the rear faces of said channel bars, the plates 42 may be securely held to the bars and the harrow teeth securely held to the respective plates. The face of the plate 42 opposite that having the heads formed thereon is flat, with the exception of a shoulder 51 formed at the upper edge thereof, and secured to the flat face of each plate by means of a bolt 52 extending through an opening 53 therein is a leveling plate 54 similar to the plate 40 described in the other form. The bolts 52 have the free ends thereof engaged with the nuts 55, thereby securing said plates 54 to the flat face of the plate 42, and the upper edge of the plate is adapted to engage the shoulder 51 of the plate 42, while the lower edge of said plate 54 is adapted to contact with the tooth 36′.

As stated previously, the groups of members may contain a single leveling device or any multiple thereof, but in the drawings I have shown preferably three such devices on each member, and in order to simplify the construction somewhat, I have provided a means whereby all three teeth may be secured simultaneously to the channel bars and also secure leveling plates thereto, which modified form is particularly shown in Fig. 7 of the drawings. In this form, I have shown an elongated block 56 which has one face thereof provided with a pair of horizontal slots or channels 57 which are spaced one above the other and extending the full length thereof to receive therein the arms of the channel bars, and the opposite face of said block is provided with a similar channel or slot 58 which extends horizontally through the central portion of the block. This latter channel is adapted to receive the eyes or heads of eye bolts (not shown), the shanks of which are adapted to extend through the openings 59 in the block, and a trio of harrow teeth 36^a which extends vertically through the block, is

adapted to also extend through the eyes or heads of said eye bolts. These eye bolts, when secured to the channel bars in a manner similar to the manner shown in the other forms, are adapted to also secure the teeth in position on the block 56. A leveling plate 40ª is also provided in connection with this form of device and adapted to be secured to the block 56 in a manner the same as shown in the other forms, and which it is not deemed necessary to describe in detail. In this connection it might be stated that while the leveling plates have been particularly shown and described in connection with this device, it will be understood that the same may be entirely eliminated, if desired, in view of the particular manner in which the same are connected to the device and the device used as a harrow and pulverizer without performing the functions of a leveler, whatsoever. Furthermore, it will be appreciated that any desired form of teeth or blades may be substituted for the ones herein described and shown.

While it will be appreciated that the weight of the frames and parts carried thereby may be sufficient to permit the teeth to effectively engage the soil as the device is propelled, it is a well known fact if a seat be applied to the device so that the driver thereof may place his weight upon the device, the same will be more effective, and in this connection it is extremely important to have the seat so arranged as to distribute the weight of the driver equally throughout the sections of the device. To this extent, each frame section is provided with a seat support 60, to which are suspended, by means of the links 61, the ends of the inclined arms 62 which extend from a rectangular frame 63. This frame 63 extends transversely of the sections of the device substantially over the linking means between the front frame sections and the rear frame sections, and supported above the frame 63 is a rod or bar 64 carrying a seat 65, said bar being connected with the ends of the frame 63 by means of the springs 66. From this construction it will be seen that the weight of any person within the seat will be perfectly distributed throughout the sections of the device, whereby absolutely none of the ground-treating implements and no portion of the device will more effectively engage the soil than the ground-treating implements on any other portion of the device.

From the foregoing description it will be seen that I have provided simple, durable and efficient means for accomplishing the numerous objects of the invention, but while the elements herein shown and described are well adapted to serve the functions set forth, it is obvious that various changes in form, proportion and in the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the principles of the invention.

What I claim is:—

1. In a machine of the class described, a frame having cross bars, ground engaging implements, means for assembling said implements in groups, each comprising a plurality of ground engaging implements, and means for mounting such groups on the cross bars of the frame.

2. In a machine of the class described, a frame having cross bars, ground engaging implements, means for assembling said implements in groups, each comprising a plurality of ground engaging implements, and means for mounting such groups in staggered relation on the several cross bars of the frame.

3. In a machine of the class described, a frame having cross bars, ground engaging implements, means for assembling said implements in groups, each comprising a plurality of ground engaging implements, and means including clamping means for mounting such groups on the cross bars of the frame.

4. In a machine of the class described, a frame having cross bars, ground engaging implements, means for assembling said implements in groups, each comprising a plurality of ground engaging implements, and means including clamping means for the individual ground engaging implements for mounting such groups on the cross bars of the frame.

5. The combination with a frame, and channel bars mounted therein; of a plurality of ground-treating implements, a plurality of members designed to receive said implements therein, means to simultaneously secure said implements and members to the channel bars, and means on said members for securing leveling plates thereto.

6. The combination with a frame, and channel bars mounted therein; of a plurality of ground-treating implements, a plurality of members designed to receive said implements therein, said members being provided with slots to receive portions of said channel bars therein, means to simultaneously secure said implements and members to the bars, and means to secure leveling plates to the outer faces of said members.

7. The combination with a frame, and channel bars mounted therein; of a plurality of ground-treating implements, a plurality of members having one of the faces thereof provided with spaced horizontal slots to receive the portions of the channel bars therein, the opposite faces of said members being each provided with a vertical slot to receive an implement therein and also provided with a horizontal slot intersecting the vertical slot, eye bolts extending through said members and the channel bars, the

heads of which bolts are disposed in the last referred to horizontal slots of said members to receive therethrough said implements, and means engaging the free ends of said bolts to simultaneously secure said members and implements to said bars.

8. The combination with a frame, and channel bars mounted therein; of a plurality of ground-treating implements, a plurality of members designed to receive said implements therethrough, means to simultaneously secure said implements and members to the channel bars, leveling plates, and means to secure said plates to said members.

9. The combination with a frame, and channel bars mounted therein; of a plurality of ground-treating implements, a plurality of members designed to receive said implements therethrough, means to simultaneously secure said implements and members to the channel bars, said members being each provided with a laterally extending flange, leveling plates, and means to secure said plates to the flanges of said members.

10. The combination with a frame, and channel bars mounted therein; of a plurality of ground-treating implements, a plurality of members designed to receive said implements therethrough, means to simultaneously secure said implements and members to the bars, a plurality of leveling plates, and means to secure said leveling plates to a predetermined number of members, whereby said implements will be arranged in groups throughout the length of said bars.

11. The combination with a frame, and channel bars mounted therein; of a plurality of ground-treating implements a plurality of members designed to receive said implements therethrough, and also designed to receive portions of said channel bars therein, means to simultaneously secure said implements to the bars, a plurality of leveling plates, and means to secure said leveling plates to the outer faces of said members, said members being each provided with a shoulder on their outer faces against which the upper edges of said plates contact.

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

THERIDES V. BARNARD.

Witnesses:
A. J. MARTIN,
C. W. BRUNHALL.