W. FETZER.

PULVERIZER AND ROLLER.

APPLICATION FILED OCT. 29, 1914.

1,302,146.

Patented Apr. 29, 1919.

3 SHEETS—SHEET 1.

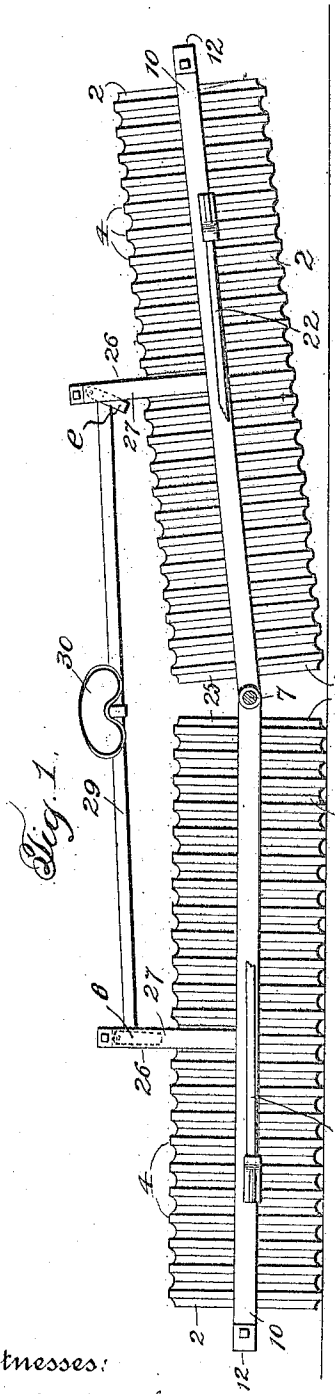


Fig. 1.

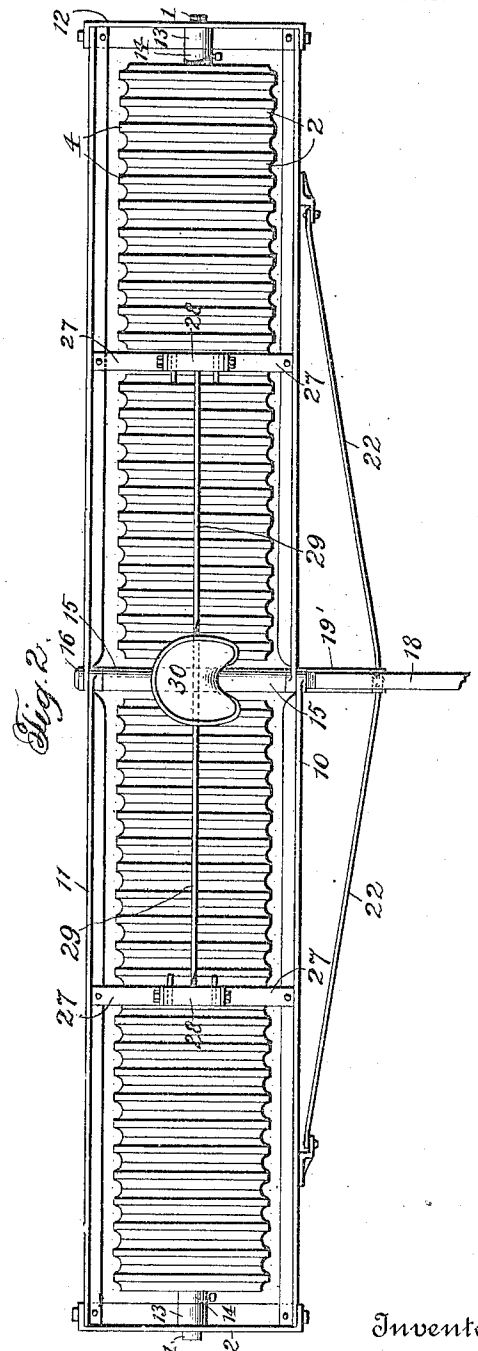


Fig. 2.

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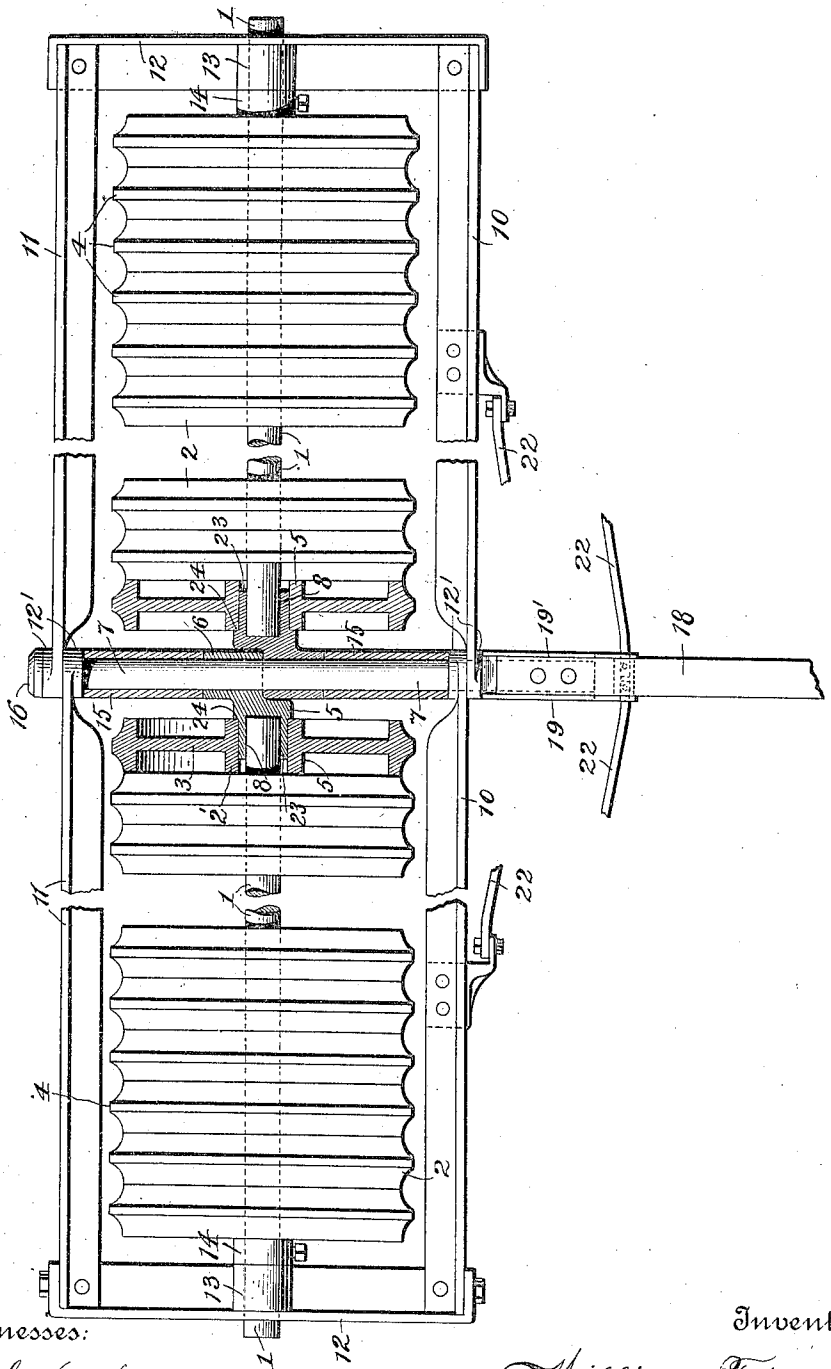
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3 SHEETS—SHEET 2.

Fig. 3.




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3 SHEETS—SHEET 3.

Fig. 4.

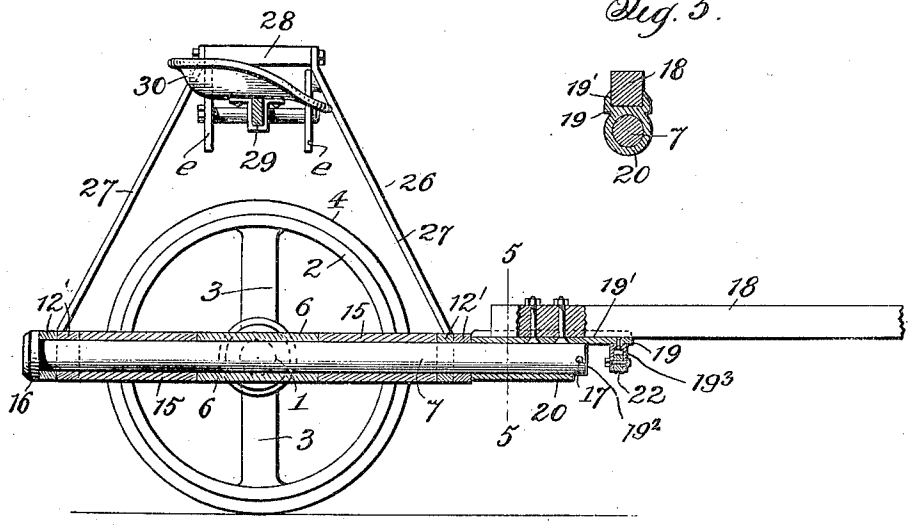



Fig. 5.




Fig. 6.

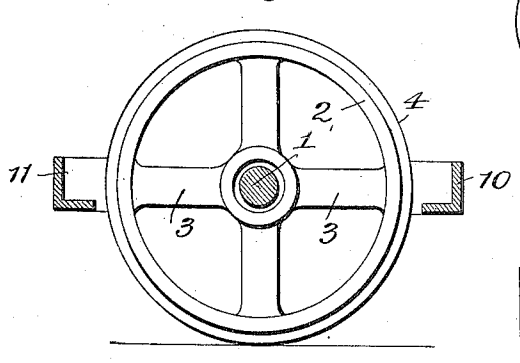



Fig. 7.

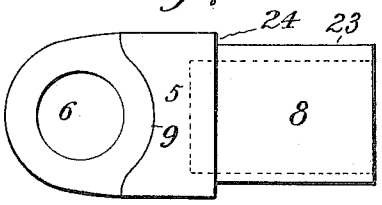
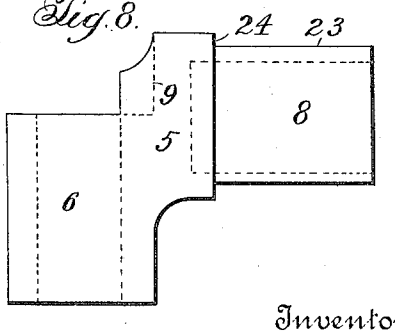



Fig. 8.




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# UNITED STATES PATENT OFFICE.

WILLIAM FETZER, OF SPRINGFIELD, ILLINOIS.

## PULVERIZER AND ROLLER.

1,302,146. Specification of Letters Patent. Patented Apr. 29, 1919.

Application filed October 29, 1914. Serial No. 869,188.

*To all whom it may concern:*

Be it known that I, WILLIAM FETZER, a citizen of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented certain new and useful Improvements in Pulverizers and Rollers, of which the following is a specification, reference being had therein to the accompanying drawing.

The invention relates to improvements in flexible pulverizers and rollers of that type having sections or parts adapted to swing or oscillate in a vertical plane relative to each other to adjust themselves to inequalities or unevenness in the surface of the ground operated upon.

The invention aims to provide an improved device of this nature which will be simple in construction, and strong, durable and efficient in use.

An object of the invention is to provide an improved device of this character in which the working portions of adjacent relatively movable pulverizer sections are brought well up to each other at the hinge connection thereof whereby there is very little space left between the sections at this point.

Another object of the invention is to provide improved means for flexibly connecting the sections together whereby a more simple and stronger construction is produced and one in which the pulverizing means or elements and other parts can be conveniently assembled.

A further object of the invention is to provide an improved device of this nature having a seat arranged and supported so that the driver's weight is distributed equally upon the flexible sections.

A still further object of the invention is to provide an improved device of this nature in which the main draft or pull is substantially direct from the axles.

The invention, with its advantages and other objects thereof will be clearly understood from the following detailed description when considered in connection with the accompanying drawings forming part hereof and illustrating one embodiment of the invention.

In the drawings:

Figure 1 is a front elevation partly in section of my improvements, one of the gang of disks being slightly elevated;

Fig. 2 is a top plan view;

Fig. 3 is an enlarged fragmentary top plan view with certain parts shown in section;

Fig. 4 is a cross sectional view through the center of the machine;

Fig. 5 is a sectional view on line 5—5 of Fig. 4; and,

Figs. 6, 7 and 8 are detail views.

In the accompanying drawings, in which like reference characters designate corresponding parts throughout the several views, I have illustrated a preferred embodiment of the invention, and the particular construction shown comprises two pulverizer and roller sections arranged end to end and flexibly connected together, to swing or oscillate in a vertical plane relative to each other whereby said sections are adapted to adjust themselves to inequalities or unevenness in the surface of the ground operated upon so that each section throughout its length will always be in contact with the ground. Each of said pulverizer and roller sections include an axle 1 carrying the pulverizing and roller means, which preferably takes the form illustrated in the drawings, namely a gang of disks or rollers 2 mounted for rotation upon the axle. Each roller or disk 2 has a hub 2′ to fit over the axle, spokes 3 and an outer substantially broad rim provided with a central rib 4. It will be understood, however, that the present invention is not limited to the specific form of disks or rollers shown as obviously pulverizing and rolling means of various forms can be employed.

The axles 1 are flexibly connected together at their adjacent inner ends to swing vertically relatively to each other by members 5 having bearing sleeves or eyes 6 engaging a central longitudinally and horizontally extending pintle rod or shaft 7, and laterally extending bearings 8 for supporting the inner ends of the axles of the respective sections, the bearings 8 preferably taking the form of sockets to receive the inner ends of the axles. The bearing sleeves or eyes 6 and the axle sockets 8 of the respective members 5 are constructed and relatively arranged so that when the bearing sleeves or eyes are arranged adjacent each other on the pintle shaft the axle sockets will be disposed opposite to each other. With this idea in view and also that of providing a strong compact hinge connection, each axle socket is offset to one side of the inner end of the bear-

ing sleeve or eye. Preferably the socket of each member extends at right angles to the bearing sleeve thereof and the inner end of the bearing sleeve or eye of the member extends to the medial line of the socket, as shown, the members being of the same construction, so that when the sections are fitted together on the pintle shaft the axle sockets extend in lateral alinement, the sockets of one member overlapping the bearing sleeve of the other member. The bearing sleeves are cylindrical and the inner faces 9 of the offset portions of the sockets 8 are concave or extend in an inward curve, as shown, to conform thereto.

Each pulverizer and roller section also includes a substantially oblong frame consisting of front and rear sides 10 and 11 and an outer end 12. In the drawings, the frame is shown as made up of bars of angle iron suitably connected together. The frames at their inner open ends are pivotally connected together, the inner ends of the sides 10 and 11 of the respective frames overlapping each other and being provided with eyes 12′ engaging the central longitudinal pintle rod or shaft 7. The inner ends of the axles are fitted in the sockets 8 and the axles are supported at their outer ends in bearings 13 at the outer ends of the said frames, which latter extend in the same horizontal plane as the axles, the sides of the frames extending along opposite sides of the axles. The inner ends of the axles are retained in place in the sockets by collars 14 adjustably secured on the outer portions of the axles and fitting against the inner face of the ends 12 of the frames.

The members 5 and the frames are retained in position on the pivot shaft by any suitable means. Conveniently the pivot shaft has a head 16 at its rear end and an aperture at its front end with which is engaged a cotter pin 17.

18 designates a draft tongue which is connected with the pivot shaft at the front end thereof. A plate or bracket 19 is fitted against the bottom face of the tongue at the inner end thereof and bolted thereto, said plate or bracket being preferably provided with a seat or groove 19′ to receive the tongue as shown. The bracket 19 projects beyond the inner end of the tongue and is provided at its under side with a socket or sleeve 20. The longitudinal pivot shaft 7 extends forwardly of the front sides of the frame sections and is engaged with the said sleeve, said shaft projecting beyond the inner end of the sleeve, and the opening $19^2$ through the shaft being located so that the cotter pin when engaged with the shaft will bear against the inner end of the said sleeve. Spools or sleeves 15 are fitted on the longitudinal pivot shaft between the members 5 and the front and rear sides of the frames, said spools or sleeves serving to space and maintain the members 5 in proper position intermediate the sides of the frames.

22 designates pull rods pivotally connected at their front ends with the draft tongue 18 and extending rearwardly and diagonally and being pivotally connected at their outer ends with the front sides of the frames of the respective sections, the pull rods, draft tongue, axles, and frames normally extending in the same horizontal plane. The bracket or plate 19 is provided with a pair of depending spaced lugs $19^3$ to and between which the inner ends of the pull rods are connected.

The connection of the adjacent ends of the axles to each other is an important feature of the invention. This serves to materially increase the strength and durability of the device and the connection of the sides of the frames of the respective sections with the pivot shaft of the axles is also important, this construction serving to further brace and steady the device in operation. This arrangement also permits the inner ends of the axles of the sections with the pulverizer means thereon to be brought well up to each other so that there is very little space left between the inner adjacent ends of the pulverizer sections at the hinge connection thereof. This advantageous close association of the inner working portions of the pulverizer sections is also furthered by the special socket and hinge connection for the axles, and the mounting of the innermost disk or rollers 25 of the sections on the sockets 8 of the members 5. For this purpose the sockets 8 have a reduced outer portion 23 and a shoulder 24 at the inner end thereof, the innermost disks or rollers 25 being mounted on the said reduced portions and fitted against the said shoulders. It will also be observed that the special arrangement and connection of the axles, pulverizing means, and frames permit of the convenient assembling of the parts or the removal thereof for repair, interchanging of other parts, or other purposes.

The special axle and frame construction is also advantageous as combined with the special draft connections, hereinbefore described, as by this combination of parts the main pull or draft is substantially direct from the axles.

An important novel feature of the invention also resides in the provision of improved seat supporting means whereby the driver's weight is distributed upon the different sections. With this idea in view, each section is provided with a support 26 arranged substantially intermediate its ends and rigidly secured thereto. Said supports take the form of inverted substantially U-shaped frames comprising front and rear inclined bars 27 rigidly connected at their

lower end and extending upwardly from the front and rear sides of the respective frames, and connected at their upper ends by a top cross bar 28. A rigid bar 29 extends transversely above the pulverizer frame sections and is suspended from the supports a substantial distance below the tops thereof, by parallel link members *e* opposite ends of the bar being pivoted to and between the sets of parallel links, which are pivotally connected at their upper and lower ends with the supports and bar respectively. The sets of links connected with each support normally extend at a slight inward inclination from the supports.

I desire it to be understood that obvious variations and minor changes in the particular construction illustrated in the drawing may be made without departing from the broad principles of the invention, the scope of which is defined in the appended claims.

What I claim is:

1. A device of the class described, having sections flexibly connected together to swing in a vertical plane relative to each other, said sections including axles, means connecting the adjacent ends of the axles together comprising a longitudinal pivot shaft, hinge members engaging the shaft and each having a socket to receive the inner end of one of the axles, said socket being provided with an outer reduced portion and a shoulder at the inner end thereof, and pulverizing disks or rollers mounted on the axles, and inner disks mounted on the reduced portions of the said sockets and fitting against the shoulders of the sockets.

2. In a device of the class described, the combination of a pair of sections arranged end to end and flexibly connected together to swing in a vertical plane relative to each other, each of said sections including an axle, pulverizing means on the axle, and a frame comprising front and rear sides extending along opposite sides of the axle, and an outer end, the outer end of the frame being connected with the outer end of the axle, means pivotally connecting the adjacent end of the axles, and the adjacent free inner ends of the frames of said sections, said means comprising a longitudinal pivot shaft, hinged members having a sleeve bearing pivotally engaging said longitudinal pivot shaft, and a socket receiving the inner end of one of the axles, the inner ends of the sides of the frames overlapping each other and being provided with eyes pivotally engaging said longitudinal pivot shaft, and sleeves on the longitudinal pivot shaft interposed between the said hinged members and the overlapping ends of the frame sections serving to maintain these parts in proper relation relative to each other.

3. In a device of the class described, the combination of a pair of sections arranged end to end and flexibly connected together to swing in a vertical plane relative to each other, each of said sections including an axle, pulverizing means on the axle, and a frame comprising front and rear sides extending along opposite sides of the axle, and an outer end, the outer end of the frame being connected with the outer end of the axle, means pivotally connecting the adjacent ends of the axles, and the adjacent free inner ends of the frames of said sections, said means comprising a longitudinal pivot shaft, hinged members having a sleeve bearing pivotally engaging said longitudinal pivot shaft, and a socket receiving the inner end of one of the axles, the inner ends of the sides of the frames overlapping each other and being provided with eyes pivotally engaging said longitudinal pivot shaft, and a draft tongue connected with the forward end of the said longitudinal pivot shaft.

4. A device of the class described, comprising a pair of sections arranged end to end and flexibly connected together to swing in a vertical plane relative to each other, each of said sections including an axle, pulverizing means on the axle, and a frame comprising front and rear sides extending along opposite sides of the axle, and an outer end, means connecting the adjacent ends of the axles together comprising a longitudinal pivot shaft, hinged members engaging the pivot shaft and each having a socket receiving the inner end of one of the axles, the inner ends of the sides of the frames also pivotally engaging the said pivot shaft, each of said frames having a bearing at its outer end for the outer end of one of the axles, through which the axle is adapted to be passed, collars mounted on the axles and fitting against the outer ends of the frames, and means for detachably securing the collar in position on the axle.

5. A device of the class described having sections flexibly connected together for relative swinging movement in a vertical plane, each of said sections comprising an axle, means for connecting the adjacent ends of the axles together including a longitudinal pivot shaft, hinge members engaging the shaft and each having a part provided with a socket receiving the end of one of the axles and rigidly connected thereto, and pulverizing means rotatably mounted on the said axles and on the said socket members.

6. A device of the class described having sections flexibly connected together to swing in a vertical plane relative to each other, each section including an axle, means connecting the adjacent ends of the axles together comprising a longitudinal pivot shaft, and hinge members, each hinge mem-

ber having a bearing to engage the pivot shaft, and a part to be rigidly connected with the inner end of one of the axles, said part extending at an angle to the hinge bearing and being offset to extend to one side of the inner end thereof, said members being adapted to fit together in overlapping relation with the said parts disposed opposite to each other, and pulverizing rollers rotatably mounted on the axles and on the said parts.

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

WILLIAM FETZER.

Witnesses:
Z. J. CUTLER,
I. C. RYAN.

**Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."**