July 7, 1925. 1,544,564

A. I. EDWARDS

SOIL PULVERIZER

Filed Nov. 10, 1924 2 Sheets-Sheet 1

Fig. 1.

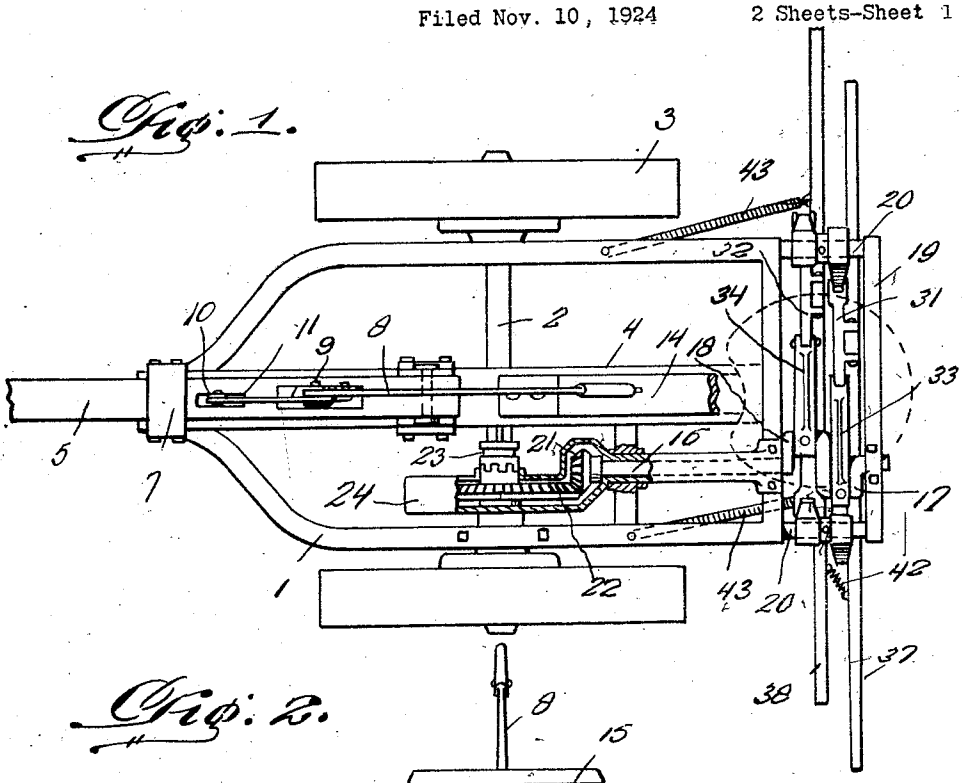


Fig. 2.

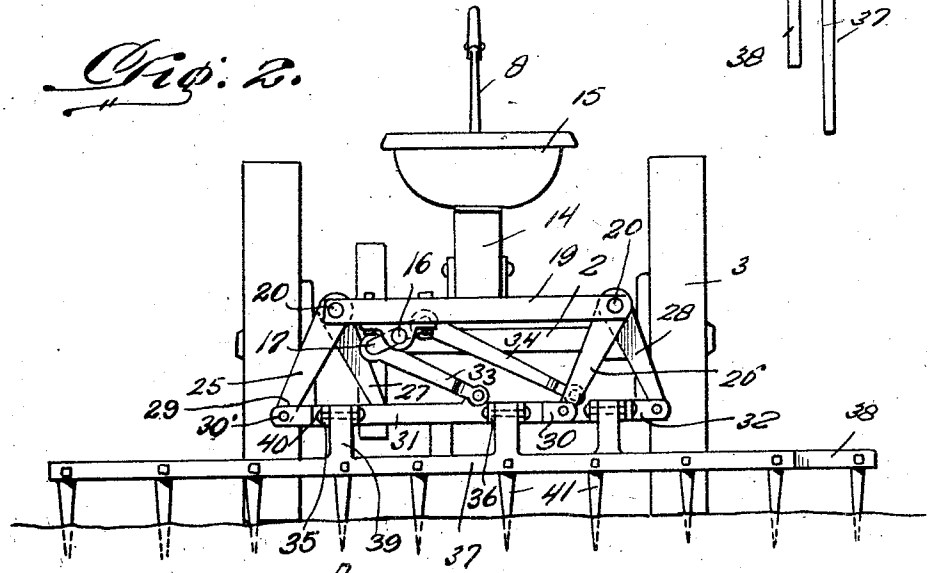
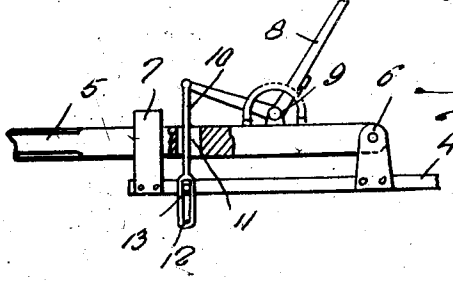


Fig. 3.



A. I Edwards,
Inventor

By Clarence A. O'Brien.
Attorney

July 7, 1925. 1,544,564

A. I. EDWARDS

SOIL PULVERIZER

Filed Nov. 10, 1924 2 Sheets-Sheet 2

Fig. 4.

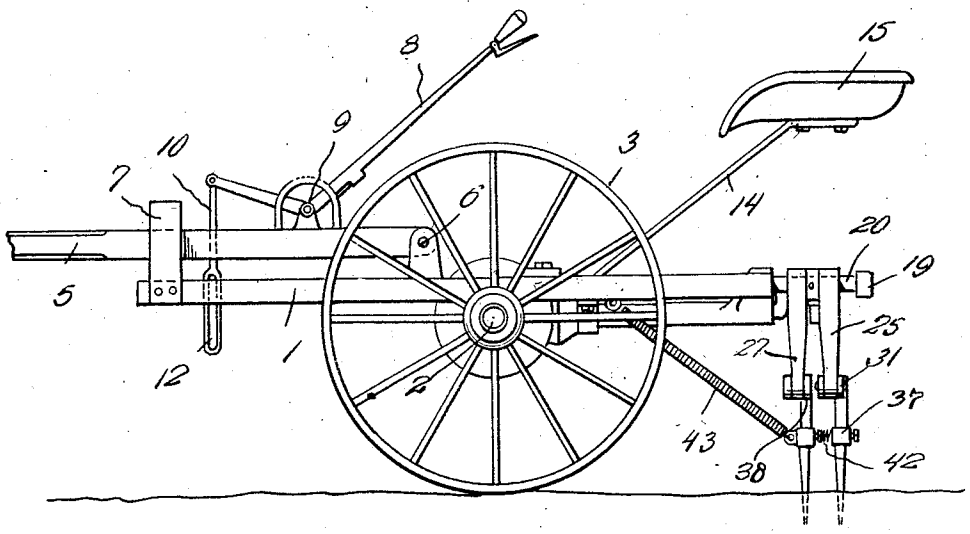
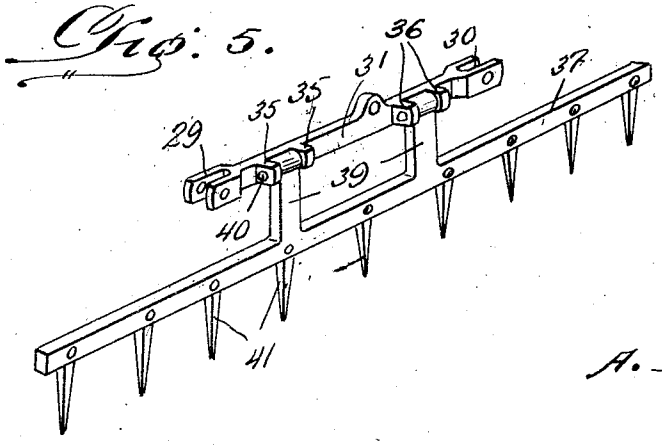


Fig. 5.



A. I. Edwards,
Inventor

By Clarence A. O'Brien.
Attorney

Patented July 7, 1925. 1,544,564

UNITED STATES PATENT OFFICE.

ALCANZAR I. EDWARDS, OF RICHMOND, KANSAS.

SOIL PULVERIZER.

Application filed November 10, 1924. Serial No. 748,927.

To all whom it may concern:

Be it known that I, ALCANZAR I. EDWARDS, a citizen of the United States, residing at Richmond, in the county of Franklin and State of Kansas, have invented certain new and useful Improvements in Soil Pulverizers, of which the following is a specification.

This invention relates to improvements in agricultural implements, and has reference more particularly to a soil pulverizer.

One of the important objects of the present invention is to provide a soil pulverizer wherein toothed bars are adapted for reciprocatory movement in opposite directions with respect to each other transversely of the plane of movement of the pulverizer for breaking up the clods of soil and levelling the surface of the ground efficiently.

A further object of the invention is to provide a soil pulverizer of the above mentioned character, wherein the toothed bars are mounted in such a manner as to permit the same to be automatically moved into an inoperative position, upon encountering an obstruction, whereby injury to the toothed bar will be prevented, the toothed bars being adapted to assume their normal operative positions, after the same have passed over the obstruction.

A further object of the invention is to provide a soil pulverizer of the above mentioned character, to provide a means for balancing the frame on the axle so that the harrow teeth will at all times extend into the ground, at a uniform depth regardless of the condition of the ground over which the traction wheels of the pulverizer pass.

A further object of the invention is to provide a soil pulverizer of the above mentioned character, which is simple in construction, inexpensive, strong and durable and further well adapted for the purposes for which it is designated.

Other objects and advantages of this invention will become apparent during the course of the following description.

In the accompanying drawings, forming a part of this specification, and in which like numerals designate like parts throughout the same:

Figure 1 is a top plan view of the soil pulverizer embodying my invention.

Figure 2 is a rear elevation thereof.

Figure 3 is a fragmentary detail of the supporting means for the draft pole or tongue.

Figure 4 is a side elevation, and

Figure 5 is a detail perspective view of one of the cross bars, showing the manner in which the toothed bar is associated therewith.

In the drawings, wherein for the purpose of illustration is shown the preferred embodiment of my invention, the numeral 1 designates the frame, the same being supported intermediate its ends on the axle 2. Traction wheels 3 are mounted on the respective ends of the axle. The frame 1 further includes the longitudinally extending beam 4, which is disposed between the sides of the frame, as more clearly illustrated in Figure 1. The draft tongue or pole 5 is pivotally supported, at its rear ends on the central beam 4 of the frame 1, as illustrated at 6. A yoke 7 is associated with the converging forward ends of the sides of the frame, for limiting the upward movement of the tongue 5.

An angular lever 8 is pivotally supported, at 9, on the tongue 5, adjacent the rear end thereof. The link 10 is secured at its upper end to the outer end of the shorter arm of the angular lever 8, and the same is adapted for vertical movement through the slot 11, provided in the tongue 5. The lower portion of the link 10 is slotted, as illustrated at 12, and cooperates with a transverse pin 13 associated with the central beam 4 of the frame, as clearly illustrated at Figure 3. A suitable pawl and ratchet means is associated with the angular lever, for holding the same in the desired adjusted position, and normally the frame is disposed on the axle 2, in such a manner as to have the pin 13 carried by the forward end of the frame disposed on the upper portion of the block 12 of the link 10.

A spring seat support 14 is secured on the rear portion of the central longitudinally extending beam 4 and a suitable seat 15 is secured on the support. In normal position, when the soil pulverizer is in operation, the frame will be balanced on the axle by the weight of the operator occupying the seat 15. Should the traction wheels 3 travel in furrows the front end of the frame will tip downwardly, thereby compensating for the difference in the surface level, and thereby prevent the weight of

the machine being thrown on the harrow teeth, the construction of which will be presently described, and causing a strain to be placed on the draft forces.

A crank shaft 16 extends longitudinally on the rear portion of the frame 1. The outer end of the crank shaft extends beyond the rear end of the frame and has formed thereon the cranks 17 and 18 respectively. The outer end of the crank shaft is journaled in a suitable bearing supported by a cross member 19, which is spaced from the rear end of the frame, by means of the rods 20, as is clearly illustrated in Figure 1. The forward end of the crank shaft 16 carries thereon a pinion 21, which is adapted to mesh with a gear 22, carried by the axle 2, and adapted to be driven simultaneously therewith, by means of the slidable clutch 23, which is keyed on the axle. A suitable housing 24 is provided for the gearing, and the crank shaft, in a manner as also illustrated in Figure 1.

A pair of arms 25 and 26 respectively, are hingedly supported at their upper ends on the rods 20, adjacent the cross member 19. A similar pair of arms 27 and 28 respectively, are also hingedly supported, at their upper ends on the rods 20, adjacent the rear end of the frame. The lower ends of the arms 25 and 26 are pivotally secured in the forked ends 29 and 30 respectively of the cross bar 31, by means of the transverse pins 32. The lower ends of the arms 27 and 28 are in a similar manner pivotally secured in the forked ends of the bar 32 which is identical in construction with the cross bar 31.

The cross bar 31 is operatively associated with the crank 17 formed in the crank shaft 16, adjacent the outer end thereof, through the medium of a pitman 33. A similar pitman 34, forms a connection between the crank 18 of the crank shaft 16, and the other cross bar 32, which is spaced with respect to the cross bar 31, in the manner as more clearly illustrated in Figure 4.

Carried by each of the cross bars 31 and 32 and extending laterally from the rear face thereof are the pairs of spaced lugs 35 and 36 respectively. The purpose thereof is to provide a means for hingedly supporting on the cross bars 31 and 32 the toothed bars 37 and 38 respectively. Upwardly extending arms 39 are associated with the intermediate portions of each of the toothed bars and the upper ends of the arms 39 are hingedly supported in the respective spaced lugs 35 and 36 as at 40, with reference more particularly to Figure 5. This construction permits a swinging movement of the toothed bars with respect to the cross bar for the purposes hereinafter to be more fully described.

Each of the bars 37 and 38 respectively, carries the downwardly extending harrow teeth 41, any number of which may be associated with the respective bars 37 and 38, as may be desired. For the purpose of normally holding the toothed bar in an operative position, the pair of bars are connected together by suitable coil springs 42. Additional coil springs 43 connect the toothed bar 38 to the frame 1, in the manner as clearly shown in Figure 1.

The operation of my improved soil pulverizer may be briefly stated as follows: As the machine moves along the surface of the ground, the crank shaft 16 will be rotated simultaneously with the rotation of the axle 2, when the clutch 23 is thrown into engagement with the clutch associated with the gear 22, and a reciprocatory movement will be imparted to the cross bars 31 and 32 respectively, to which are connected the toothed bars 37 and 38 respectively. The toothed bars will be caused to reciprocate transversely of the plane of movement of the soil pulverizer, in opposite directions, with respect to each other, so that the clods of soil will be completely broken up and the teeth 41 carried by the bars 37 and 38 will move in a substantially zig-zag manner in the earth. Should an obstruction be encountered by the teeth of the toothed bar, the latter will automatically be swung upwardly into inoperative position by the obstruction, so that injury to the teeth will be prevented.

After the obstruction has been passed, the coil springs will return the toothed bars to their normal position whereupon the teeth 41 will again be disposed in engagement with the soil.

It will thus be seen from the foregoing description that a soil pulverizer has been provided, which is very simple in construction, further efficient in its operation, and being of such construction as to save considerable time and labor in cultivating the soil.

While I have shown the preferred embodiment of my invention, it is to be understood that various changes in the size, shape, and arrangement of parts may be resorted to, without departing from the spirit of the invention and the scope of the appended claims.

Having thus described my invention, what I claim is:

1. A soil pulverizer comprising in combination, a wheeled frame, a crank shaft supported on the frame, a pair of spaced cross bars hingedly connected at their respective ends to the frame, pitman connections between the crank portions of the crank shaft and the respective cross bars, toothed bars carried by the cross bars, and means for actuating the crank shaft, whereby reciprocatory movement is imparted to

the cross bars and the respective toothed bars carried thereby, the latter being adapted to operate simultaneously, in opposite directions.

2. A soil pulverizer comprising in combination, a wheeled frame, a crank shaft supported on the frame, a pair of spaced cross bars hingedly connected at their respective ends to the frame, pitman connections between the crank portions of the crank shaft and the respective cross bars, toothed bars carried by the cross bars, means for actuating the crank shaft whereby reciprocatory movement is imparted to the cross bars and the respective toothed bars carried thereby, the latter being adapted to operate simultaneously, in opposite directions, and means for permitting outward swinging movement of the toothed bars with respect to the cross bars when an obstruction is encountered.

3. A soil pulverizer comprising in combination, a wheeled frame, a crank shaft supported on the frame, a pair of spaced cross bars hingedly connected at their respective ends to the frame, pitman connections between the crank portions of the crank shaft and the respective cross bars, toothed bars carried by the cross bars, means for actuating the crank shaft whereby reciprocatory movement is imparted to the cross bars and the respective toothed bars carried thereby, the latter being adapted to operate simultaneously, in opposite directions, means for permitting outward swinging movement of the toothed bars with respect to the cross bar when an obstruction is encountered, and means for normally holding the toothed bars in an operative position.

In testimony whereof I affix my signature.

ALCANZAR I. EDWARDS.