(No Model.) 2 Sheets—Sheet 1.

J. M. PATTERSON.

SCREW PULVERIZER OR HARROW.

No. 563,057. Patented June 30, 1896.

Fig. 1.

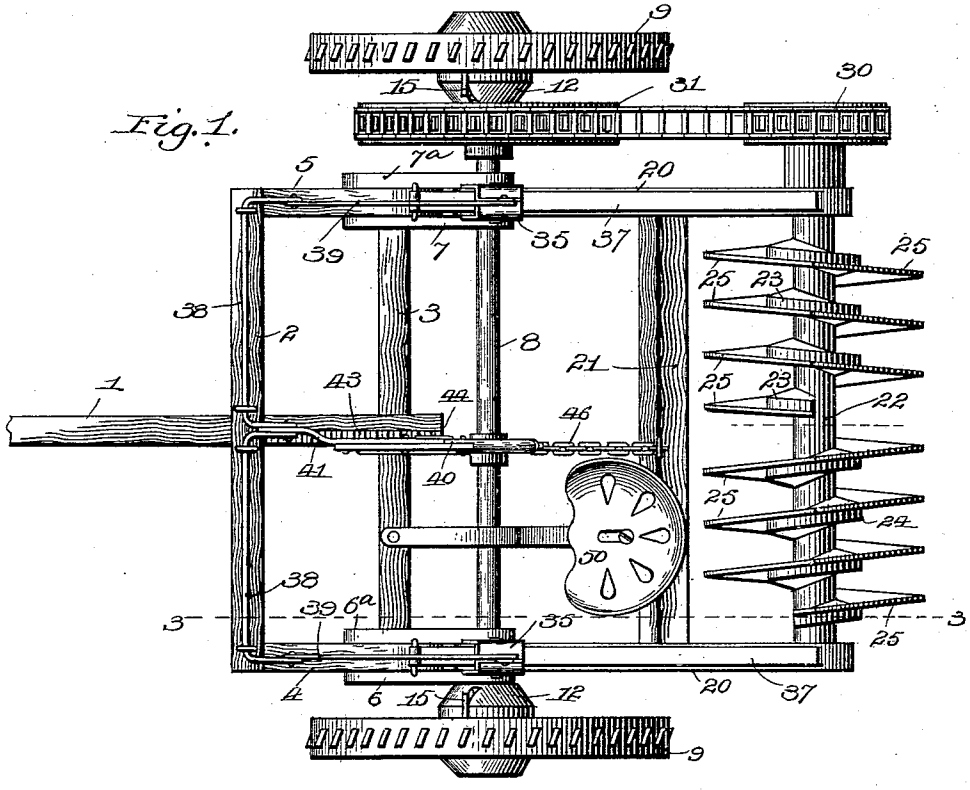
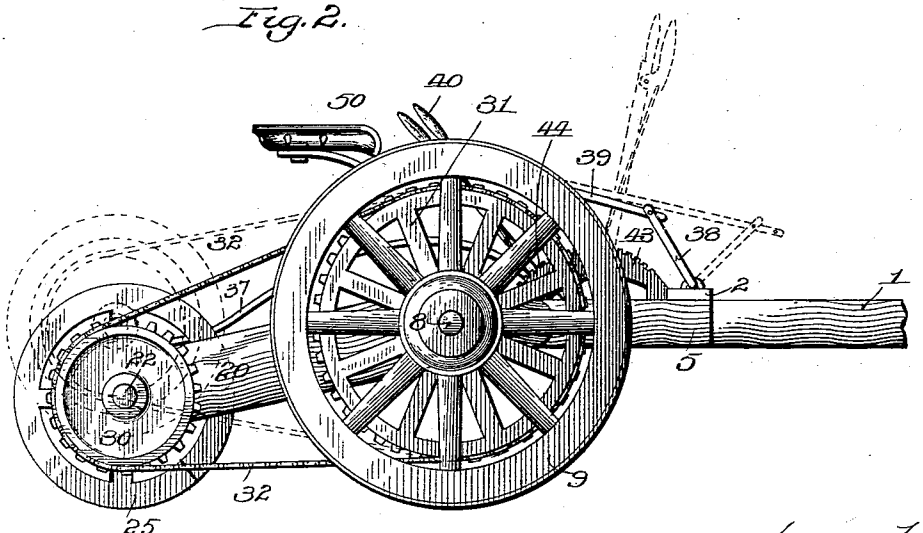


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

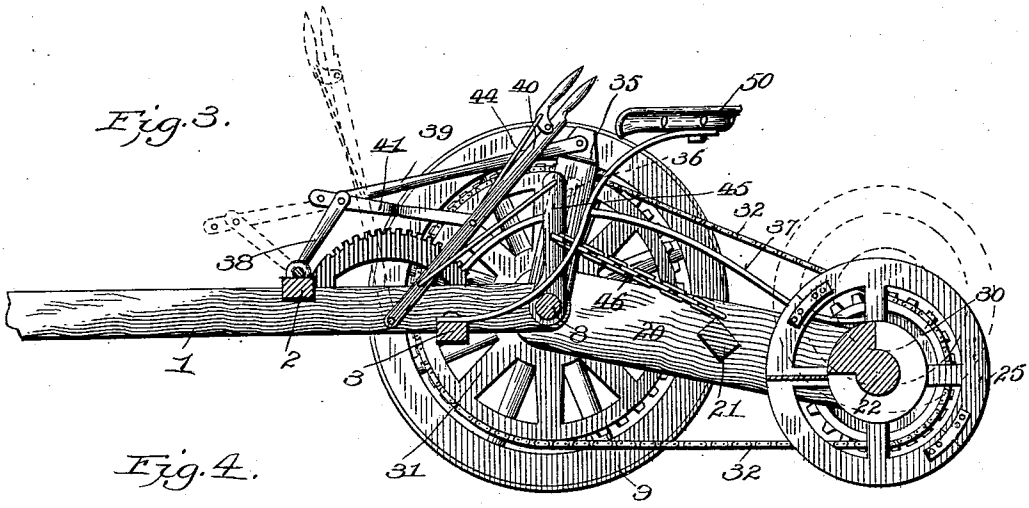


Fig. 4.

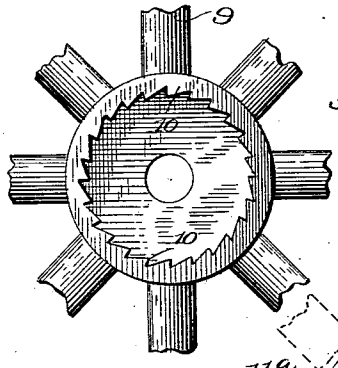


Fig. 10.

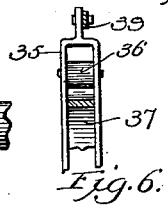
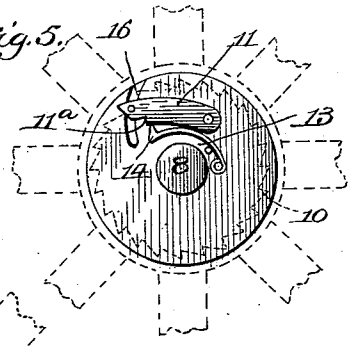


Fig. 6.

Fig. 5.



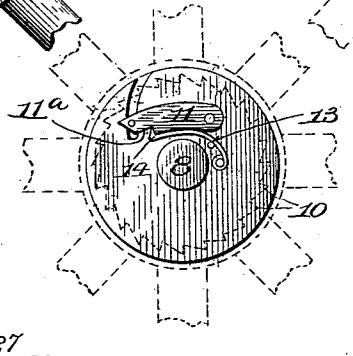


Fig. 8.

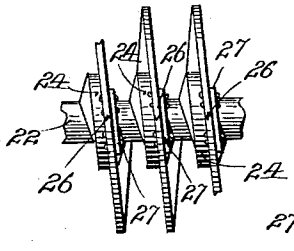


Fig. 9.

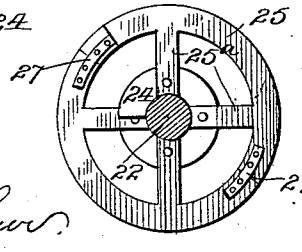
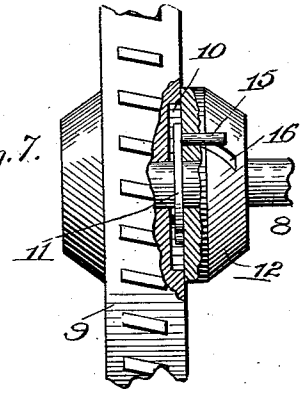


Fig. 7.



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UNITED STATES PATENT OFFICE.

JOHN M. PATTERSON, OF LA FAYETTE, GEORGIA.

SCREW PULVERIZER OR HARROW.

SPECIFICATION forming part of Letters Patent No. 563,057, dated June 30, 1896.

Application filed September 20, 1895. Serial No. 563,122. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. PATTERSON, a citizen of the United States, residing at La Fayette, in the county of Walker and State of Georgia, have invented certain new and useful Improvements in Screw Pulverizers or Harrows; and I do hereby declare that the following specification, taken in connection with the accompanying drawings, is a full, clear, and exact description of my invention, such as will enable those skilled in the art to make and use the same.

My invention relates to improvements in the form of pulverizers or harrows comprising, essentially, one or more spiral or screw cutters adapted to be rotated in contact with the ground to be broken up.

My invention consists, essentially, of a suitable sulky-frame from which is supported the spiral or screw cutters, suitable mechanism being provided for rotating the cutters while in contact with the ground, and suitable mechanism being provided for holding the cutters to their work and for raising them out of contact with the ground and holding them in elevated position when not in operation.

In order that my invention may be fully understood, I will first describe the same with reference to the accompanying drawings, and afterward particularly point out the novelty in the annexed claims.

In said drawings, Figure 1 is a top plan view of my improved pulverizer. Fig. 2 is a side elevation of the same. Fig. 3 is an inside sectional elevation of the same, taken on the line 3 3 of Fig. 1. Figs. 4, 5, 6, and 7 are detail views showing the structure of the clutch mechanism located in the hubs of the supporting-wheels for throwing the spiral cutters in and out of operation. Figs. 8 and 9 are detail views illustrating the construction of the spiral cutters. Fig. 10 is a detail view showing one of the pivoted standards in which the roller-bearing on the spring is carried.

The sulky-frame comprises a tongue 1, the cross-bars 2 3, to which the tongue is secured, the side bars 4 5, extending between the cross-bars 2 and 3, and the pairs of auxiliary side bars 6 6^a and 7 7^a, which are rigidly secured to the side bars 4 and 5 and cross-bar 3 at their forward ends, and which are formed with journal-openings in their rear ends.

8 is the main supporting-axle, which passes through the journal-openings in the rear ends of the auxiliary side bars 6 6^a and 7 7^a.

9 are the supporting-wheels loosely journaled on the outer ends of the axle 8. Each of the wheels 9 is formed with internal ratchet-teeth 10 in its hub, with which engages a pivoted spring-pawl 11. The pawl 11 is pivotally mounted upon the outer face of the hub-section 12, which is keyed to the axle 8 close up against the hub of the wheel 9.

13 is a small spring having a hook end 14, which is adapted to engage the shoulder 11^a of the pivoted pawl 11 and hold the same out of engagement with the internal ratchet-teeth 10. The spring 13 normally forces the pawl 11 outwardly into engagement with the ratchet-teeth 10, but when the pawl is forced back by means of the pin 15, which projects through the curved slot 16 of the hub-section 12, the hook end 14 of the spring 13 will engage the shoulder 11^a and hold the pawl out of engagement with the ratchet, so that the wheels 9 will be allowed to revolve in either direction without rotating the axle 8. When the pawl 11 is in engagement with the ratchet-teeth 10, it will be observed that the forward movement of the wheels 9 will rotate the axle 8, whereas the backward movement of the wheels 9 will merely cause the ratchet-teeth to slip past the pawl and will not rotate the axle 8.

Pivotally mounted upon the axle 8 between the frame-pieces 6 6^a and 7 7^a are the rearwardly-extending side bars 20, which are centrally connected by the cross-bar 21 and have journaled in their outer ends the cutter-shaft 22. Extending around the cutter-shaft 22 are two spiral ribs 23 and 24, which extend in opposite directions, and upon these ribs the screw-blades or spiral cutters are mounted. The spiral cutter-blades are formed of sections or flights 25, having radial arms 25^a, which are secured to the spiral ribs 23 and 24, and tongue-and-groove joints 26 at their contiguous edges. Plates 27 overlap the joining edges of the sections or flights and are secured in place by rivets.

Keyed to the outer end of the shaft 22 is a sprocket-wheel 30, and keyed to the axle 8 in line with the sprocket-wheel 30 is a large sprocket-wheel 31. A sprocket-chain 32 ex-

tends around the sprocket-wheels 30 and 31 for communicating motion from the latter to the former.

35 are bifurcated standards journaled upon the axle 8 and carrying near their upper ends the rollers 36.

37 are long curved leaf-springs pivoted at their forward ends to the frame-sections 4 and 5 and extending over and having their rear ends resting upon the side bars 20 and exerting pressure thereon for holding the spiral cutters to their work. The springs 37 pass through standards 35 under the rollers 36, which bear on the springs for holding them in position. 38 are U-shaped crank-arms journaled upon the upper face of the cross-bar 2 and connected to the upper ends of the standards 35 by means of the links 39, and to an operating hand-lever 40 through the link 41.

43 is a rack in which the hand-operated spring-pawl 44 engages for holding the hand-lever in any desired position. By this means the position of the standards can be changed and the amount of pressure of the rollers 36 upon the springs 37 regulated.

45 is an arm pivoted upon the axle 8 and connected through chain 46 to the bar 21 of the rear frame, and through link 48 with the hand-lever. By means of this connection the frame carrying the spiral cutters can be raised or lowered out of or into operative position, and when the cutters are lowered the rollers 36 will press upon the springs 37, whereas when the cutters are raised the pressure will be removed.

50 is the driver's seat.

Having thus fully described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In a harrow or pulverizer, the combination of a sulky-frame, a rotatable pulverizer-screw suitably supported from the sulky-frame, suitable means for rotating the screw from the axle of the sulky-frame, the supporting-wheels loosely journaled upon the axle and formed with ratchet-teeth in the hub, separate hub-sections keyed to the axle close up against the supporting-wheels, spring-pawls carried by said separate hub-sections and adapted to engage the ratchet-teeth of the supporting-wheels, and suitable catches for holding the pawls out of operative position, substantially as set forth.

2. In a harrow or pulverizer, the combination of the sulky-frame having a rotatable axle and loosely-journaled supporting-wheels, a rotatable pulverizer-screw suitably supported from the sulky-frame, suitable means for rotating the screw from the rotatable axle; and ratchet-clutches between the supporting-wheels and axle, each comprising ratchet-teeth on the supporting-wheel, a separate hub-section keyed to the axle, a pivoted pawl carried by the separate hub-section and adapted to engage the ratchet-teeth, a spring adapted to hold the pawl to its work, a hook on the spring adapted to hold the pawl out of operation, and an arm extending from the pawl through a slot in the separate hub-section by means of which the pawl can be pushed back into engagement with the hook, substantially as set forth.

3. The combination of a suitable frame or carriage having a rotatable supporting-axle and loosely-journaled supporting-wheels, with a clutch between the axle and wheels comprising suitable ratchet-teeth, a pivoted pawl adapted to engage the ratchet-teeth, a shoulder formed on the pawl, a spring engaging the pawl and formed with a hook end and adapted to engage the shoulder of the pawl, and an arm by which the pawl can be moved, substantially as set forth.

4. In a harrow or pulverizer, the combination of a suitable supporting-frame, with a rotatable spiral cutter or screw constructed of a rotatable shaft having a spiral rib extending around it, and a series of spirally-set sections or flights formed with radial arms which are secured to the spiral rib and having their meeting ends secured together by tongue-and-groove and overlapping securing-plates riveted to the sections, substantially as set forth.

5. The combination of the sulky-frame, the pulverizer mounted in a suitable frame pivoted to the sulky-frame upwardly-curved leaf-springs connected at one end to the sulky-frame and bearing at the other end upon the pulverizer-frame, and a pressure device adapted to bear on the curve of the spring for regulating the pressure of the springs, substantially as and for the purpose set forth.

6. The combination of the sulky-frame, the pulverizer-frame pivoted thereto and carrying the pulverizer leaf-springs secured to the sulky-frame and extending over and engaging the pulverizer-frame, pivoted standards embracing the springs and carrying rollers which engage the springs, and means for moving the standards for imparting more or less pressure through the spring to the pulverizer, as set forth.

7. The combination of the sulky-frame, the pulverizer-frame pivoted thereto and carrying the pulverizer leaf-springs secured at their ends to the sulky-frame and extending over and engaging the pulverizer-frame, pivoted standards embracing the springs and carrying rollers which bear upon the springs and hold them to their work, a hand-lever having a pawl and rack, and suitable lever connections between the standards and hand-lever, substantially as set forth.

8. The combination of the sulky-frame, the pulverizer-frame pivoted thereto and carrying the pulverizer, leaf-springs secured at their ends to the sulky-frame and extending over into engagement with the pulverizer-frame, bifurcated standards pivoted to the supporting-axle and embracing the leaf-springs and carrying rollers which bear upon the springs and hold them to their work, crank-levers journaled upon the cross-bar of the sulky-frame and having suitable link connection

with the standards, a hand-lever, and suitable connections between the hand-lever and the crank-lever, substantially as set forth.

9. The combination of the sulky-frame, the pulverizer-frame pivoted on an axis and carrying the pulverizer, an arm pivoted upon the said axle, a chain connecting the pulverizer-frame to said arm, a hand-lever, pawl and rack, and a link connecting the pivoted arm to the hand-levers, substantially as set forth.

10. The combination of the sulky-frame, the pulverizer-frame pivotally connected thereto and carrying the pulverizer, leaf-springs secured to the sulky-frame and extending over into engagement with the pulverizer-frame, means controlled by a hand-lever for applying pressure to and removing pressure from said springs, and independent connection between the pulverizer-frame and hand-lever, whereby the pulverizer-frame can be lifted when the pressure is removed from the springs, and vice versa, substantially as set forth.

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