(No Model.)

C. LA DOW.

PULVERIZER.

No. 375,365. Patented Dec. 27, 1887.

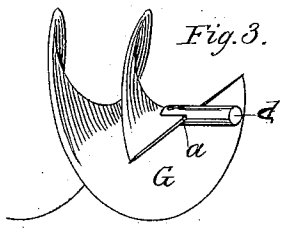


Fig. 3.

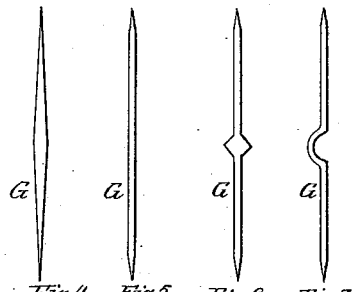


Fig. 4 Fig. 5 Fig. 6. Fig. 7.

Fig. 1.

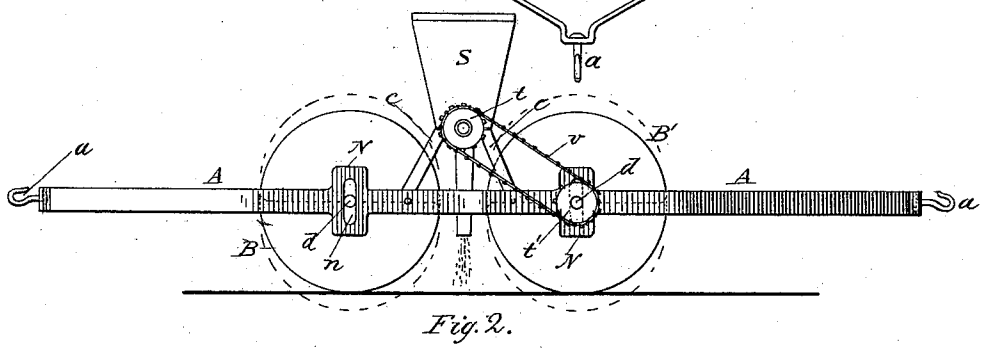


Fig. 2.

Witnesses.
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UNITED STATES PATENT OFFICE.

CHARLES LA DOW, OF ALBANY, NEW YORK.

PULVERIZER.

SPECIFICATION forming part of Letters Patent No. 375,365, dated December 27, 1887.

Application filed December 31, 1886. Serial No. 223,202. (No model.)

To all whom it may concern:

Be it known that I, CHARLES LA DOW, of the city of Albany, county of Albany, and State of New York, have invented a new and useful Improvement in Pulverizers, of which the following is a specification.

My invention relates to that class of pulverizers which employs spiral or screw cutters twisted in cross-section in the shape of right and left hand auger-blades, and arranged in two gangs, which are adapted to counteract the end-thrusts of each other.

In the drawings, Figure 1 represents a top view of my invention, showing by dotted lines a seeder-box supported over and between the gangs. Fig. 2 is an end view of my invention, showing by dotted lines that the ends of the spiral-cutter gangs may vibrate up and down independently of each other; also showing the method of mounting the seeder-box relatively to the gang. Fig. 3 represents a perspective view of an end of one of the blades after being twisted into auger shape; also showing the attached journal-bearing. Figs. 4, 5, 6, and 7 represent end views of the sheets of metal from which the auger-blades are twisted, in which views (in cross-sections) it will be observed that sharp edges are rolled into the sheets of metal on each side thereof, so that when the said sheets are twisted they are also left sharpened their entire length. Fig. 4, in cross-section, represents a sheet of metal rolled thickest at its middle and tapering in each direction therefrom to its edges. Fig. 5 represents a sheet of metal in cross-section of uniform thickness, with its edges beveled. Fig. 6 represents an end view of a sheet of metal having ribs rolled thereon lengthwise of the same to form a solid axle the entire length of the gang, so that when twisted the gang will be very rigid in cross-section. The ribs may also be extended beyond the ends of the blades and adapted to form journal-bearings therefor. Fig. 7 represents an end view of a sheet of metal having a depression rolled into one side thereof to stiffen the blade in cross section.

In the drawings, A represents the draft-frame of the machine, and *a a* draft-hooks, to either of which the draft animals may be attached, so as to draw the machine in either direction.

B and B′ are the gangs of spiral cutters, which are twisted in the shape of augers in such manner that one gang shall thrust the earth to the right and the other gang to the left as the machine is drawn forward, and thus adapt the machine to travel in a direct line.

Journal-bearings *b b* may be fastened to the ends of the spiral blades, as shown at *a* in Fig. 3. These journal-bearings are attached to the draft-frame in slots *n* in such manner that either end of either gang may vibrate up and down independently of its fellow gang. Any other preferred form of attaching the gang to the draft-frame may be used, if desired.

It will be observed that one gang is shorter than the other, and that the machine can be drawn equally well from either of the draft-hooks *a a*. This construction adapts the machine to work equally well on all kinds of soil, as if the ground be very hard the short gang should be drawn in front of the other, and this position reversed if the ground be soft at the first time going over it.

S represents a box for receiving grain or phosphate, and may be of any well-known construction and operated by a chain belt, as shown in the drawings, or by other means, and may be mounted on the frame, either between the gangs or above them, as may be desired.

It will be observed that the gangs, being arranged directly across the line of draft, leave no ridge or furrow the entire width of the machine, so that all the ground is thoroughly broken and stirred at one transit of the machine. It will also be observed that in the arrangement shown of a seeder depositing the grain or phosphate between the gangs affords a great advantage to the methods heretofore used for depositing the seed in the ground, inasmuch as the preceding gang prepares the ground for the proper reception of seed and the following gang buries it completely, so that the ground is broken, the seed deposited and covered at one operation and during one passage of the machine across the field.

By reference to the drawings, in Figs. 4, 5, 6, and 7 it will be seen that in whichever style the sheet metal for the spiral gangs is

rolled that both edges of said sheets are sharpened when the metal is rolled, and that when the gangs are twisted the edges are also twisted at the same time. This gives a continuous double edge, which entwines one around the other the entire length of the gangs and is very easily and cheaply produced.

The draft-frame A may be made in other forms, and, if desired, the spiral gangs may be mounted therein in other ways, and may be made angularly adjustable relatively to each other.

A draft-pole may be attached to the draft-frame A at either side thereof; but I prefer the construction here shown.

By reference to the drawings it will be observed that G in Figs. 4, 5, 6, and 7 represents end views or cross-sections of various styles in which the sheets may be rolled for the gangs, while G in Fig. 3 represents a perspective view of Fig. 5 after being twisted, while B B′ in Fig. 1 represents the complete gangs after being twisted from the metal rolled, as shown in Fig. 5.

In another application, filed by me January 6, 1887, No. 223,616, is shown a machine somewhat similar to that herein illustrated, and I disclaim in this case any subject-matter claimed in said application.

Having thus described my invention, I claim—

1. In a pulverizer, two spiral gangs of oppositely-twisted solid blades of metal adapted to counteract the side thrusts of each other on their draft-frame.

2. In a pulverizer, a twisted spiral cutter formed of a blade of sheet metal rolled with both edges sharpened and adapted to be twisted spirally in such form as shall present parts of both said edges simultaneously to the soil, in combination with a draft-frame for supporting the blade in position.

3. In a pulverizer, two gangs of revolving cutters twisted from sheet metal, arranged one in front of the other and adapted to throw the earth in opposite directions, in combination with a draft-frame attached directly to the ends of the gang-blades.

4. In a pulverizer, two gangs of oppositely-acting screw-cutters adapted to vibrate independently of each other in a vertical direction, in combination with a draft-frame which supports the cutters in substantially parallel planes relatively to each other while operating to turn the soil in opposite directions to each other.

5. As a new article of manufacture, a pulverizer-blade formed in cross-section of sheet metal rolled substantially as shown in Figs. 4, 5, 6, or 7, and having an auger-shaped twist, substantially as shown in Fig. 3, adapted to give said blade a spiral shear cut when revolving either directly or obliquely across the line of draft.

6. In a pulverizer, two gangs of oppositely-acting screw-cutters, in combination with a draft-frame adapted to support one gang in rear of the other while turning furrows across the path of the machine.

7. In a pulverizer, two gangs of opposing spiral cutters, each gang being made of sheet metal and twisted, as shown, the screw of each cutter being adapted to rotate in an opposite direction to its fellow by tractional contact with the ground.

8. In a pulverizer, two gangs of oppositely acting and revolving cutters, which move the soil laterally in opposite directions, and are arranged to leave no furrow or ridge between their ends, and a seeding device adapted to discharge the grain so as to be covered by the soil turned by the cutters, in combination with a frame adapted to support a seeder and cutters.

9. In a pulverizer, a sheet of metal rolled with a bevel on opposite edges thereof and twisted spirally, as shown, in combination with a draft-frame, in which it is mounted at two points to permit its revolution.

10. In a pulverizer, a metal cutter having a strengthening-rib, enlargement, or groove on one side thereof, in combination with the spiral cutting-edges surrounding said rib or enlargement.

11. In a pulverizer, a sheet of metal rolled thinnest at its edges, in combination with spiral curves, substantially as shown, which adapt the inner thicker portions of the blade to strengthen the edges of the cutter transversely.

12. In a pulverizer, two independently-revolving gangs of spiral cutters having a continuous cutting-edge the entire length of the gang, one gang adapted to follow the other and turn the soil in a direction opposite to that in which it was turned by the preceding gang, in combination with a draft-frame.

13. In a pulverizer, a gang of spiral cutters formed of a blade of sharpened twisted metal, in combination with the journal-bearing *d*, attached to the gang, substantially as shown.

14. In a pulverizer, two gangs of spiral cutters adapted to turn the earth in opposite directions, one gang following the other, a draft-frame in which they are mounted, and connections between the frame and gangs which permit an end of the front gang to raise without raising the corresponding end of its fellow gang.

15. In a pulverizer, two independently moving or vibrating gangs of spiral cutters adapted to turn the earth in opposite directions, and each gang arranged at substantially a right angle to the line of draft, in combination with a draft-frame.

16. In a pulverizer, two independent gangs of spiral cutters adapted to turn the earth in opposite directions, and each gang arranged at substantially a right angle to the line of draft, in combination with a draft-frame adapted to be drawn from either end.

17. In a pulverizer, two independent gangs of spiral cutters, one gang being longer than the other, said gangs being adapted to turn

the earth in opposite directions, in combination with a draft-frame.

18. In a pulverizer, the combination of the frame A, spiral gang B, and oppositely-twisted spiral gang B′, arranged one in advance of the other.

19. In a pulverizer, a draft-frame, two gangs of revolving cutters adapted to turn the earth laterally in opposite directions, arranged one in advance of the other, in combination with seeding devices adapted to discharge the grain between said gangs.

20. In a pulverizer, a reversible draft-frame, a seed-distributing box mounted thereon, in combination with two gangs of cutters, one arranged in advance of the other, said gangs being adapted to maintain the seed-box in an upright position while the draft is being applied to the opposite end of the machine.

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Witnesses:
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