

(No Model.)

2 Sheets—Sheet 1.

B. S. SEXSON.
LAND PULVERIZER.

No. 503,006.

Patented Aug. 8, 1893.

Fig: 1.

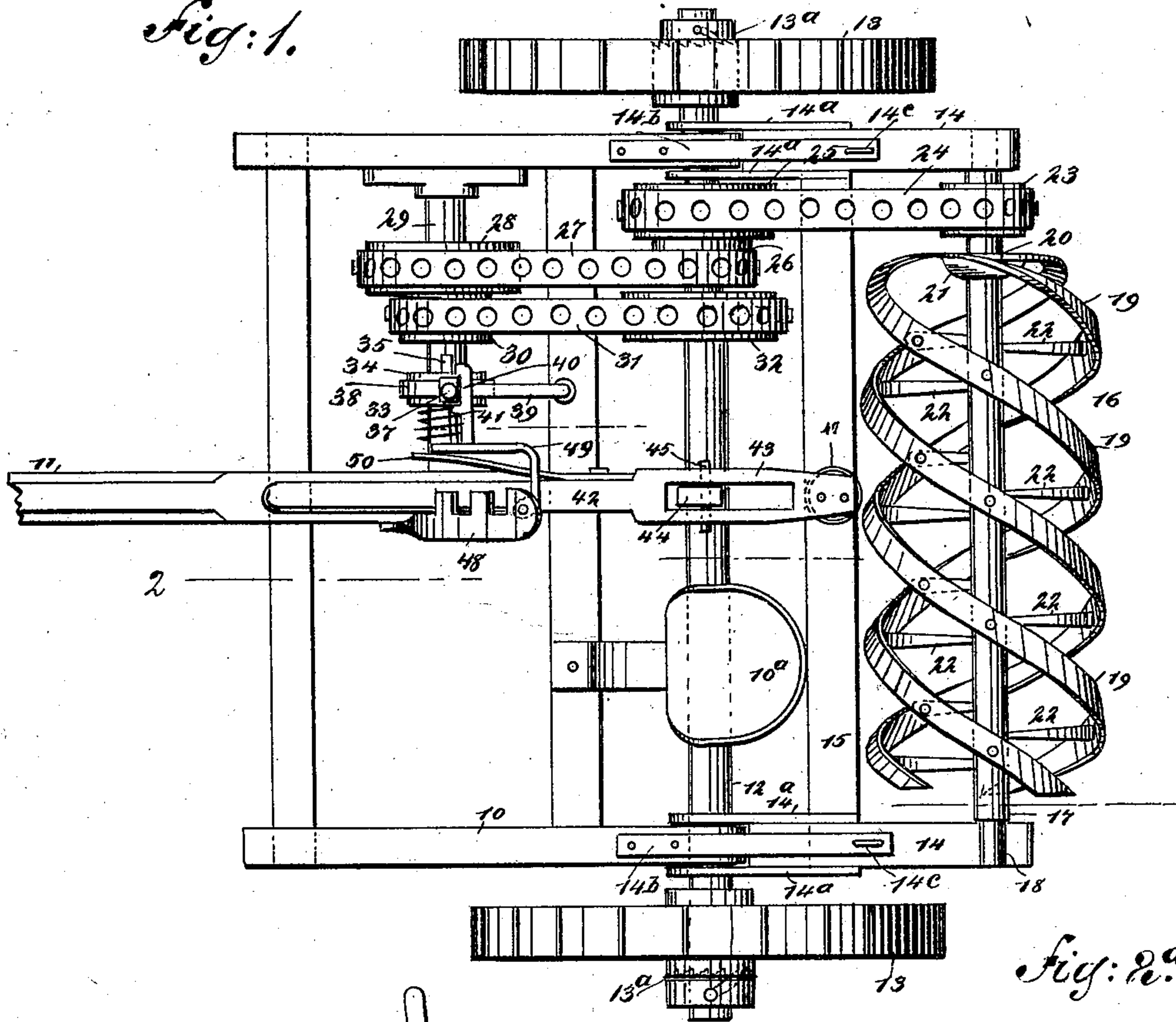
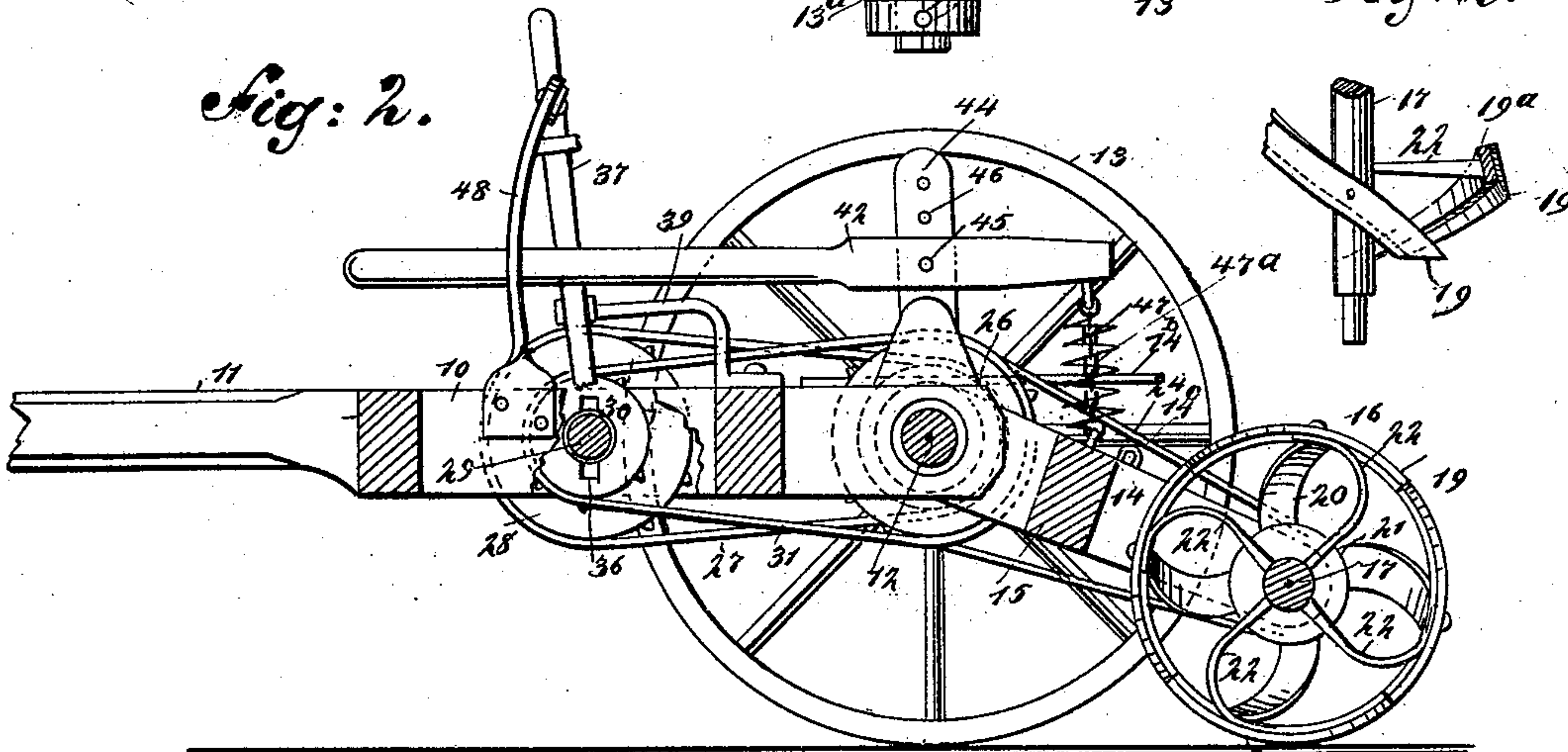


Fig: 2a.



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(No Model.)

2 Sheets—Sheet 2.

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Fig: 3.

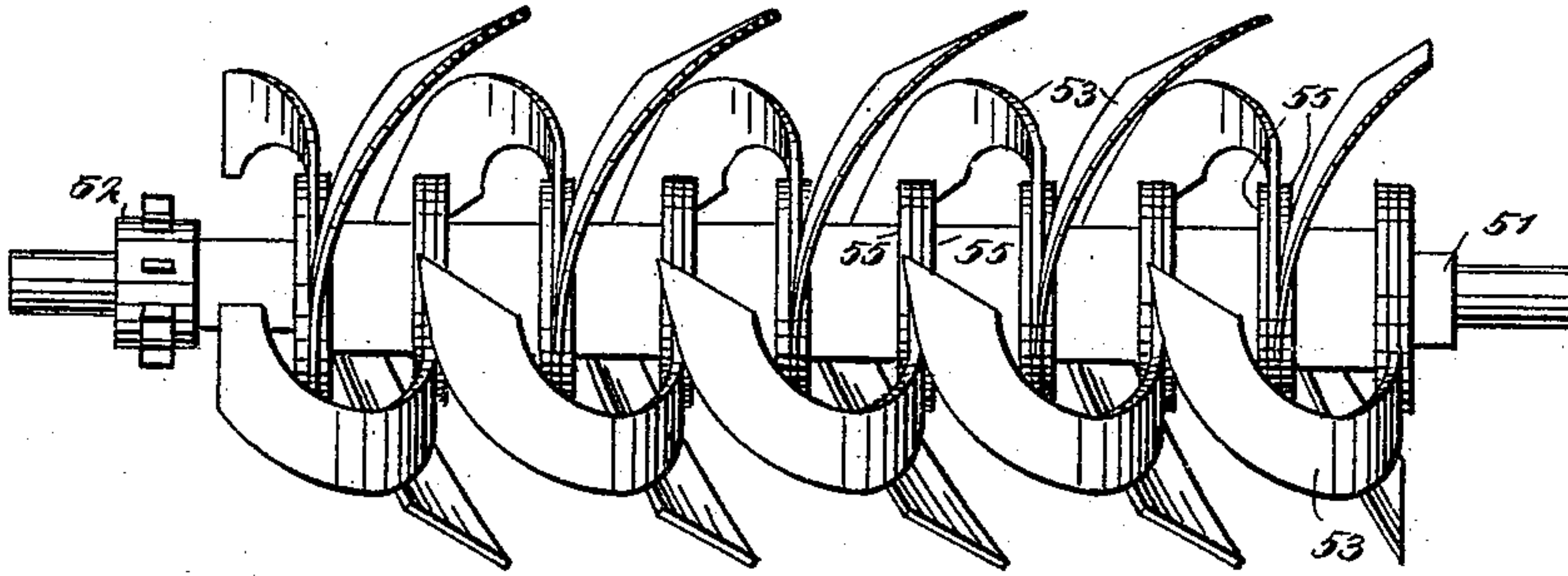


Fig: 4.

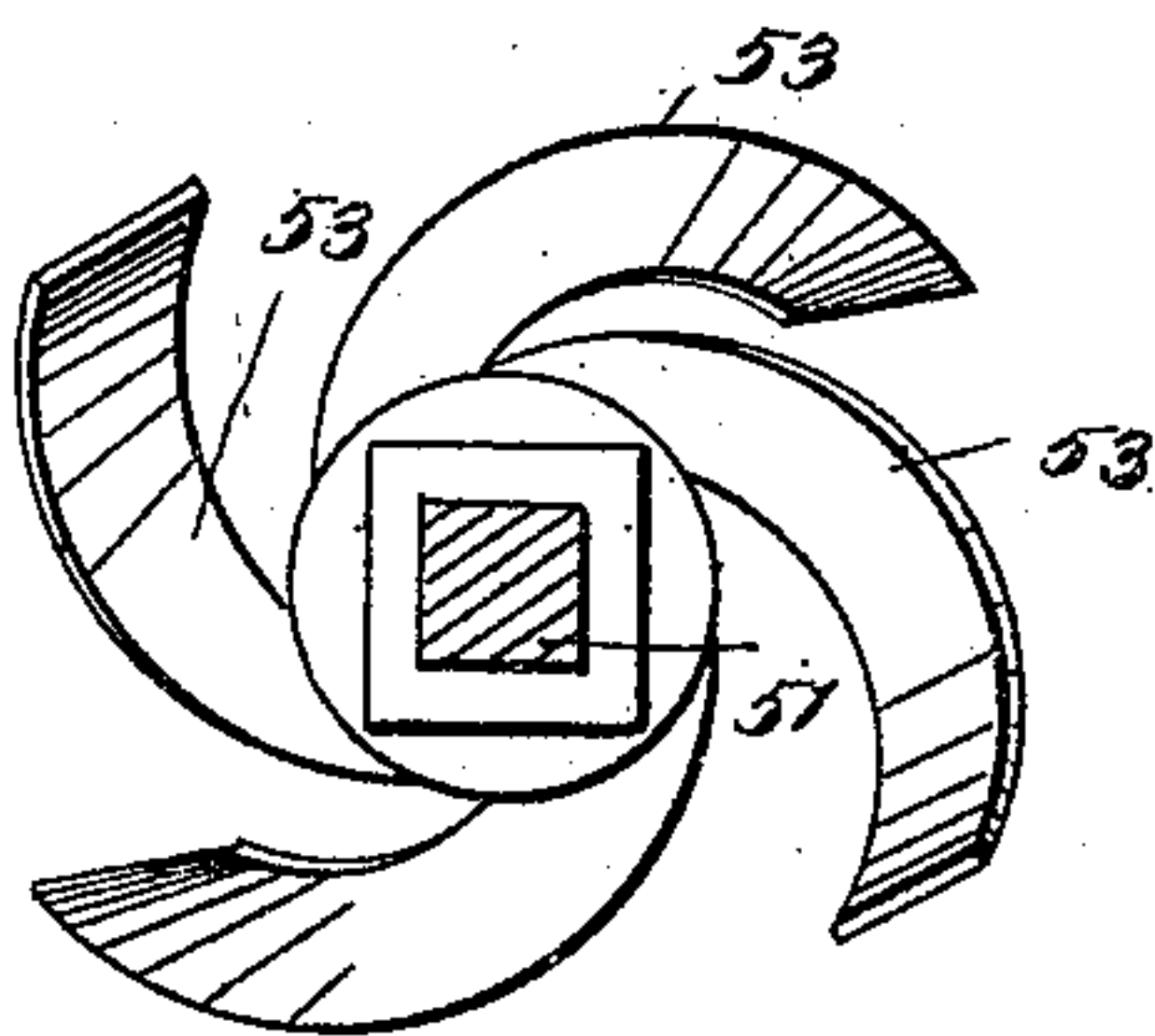


Fig: 5.

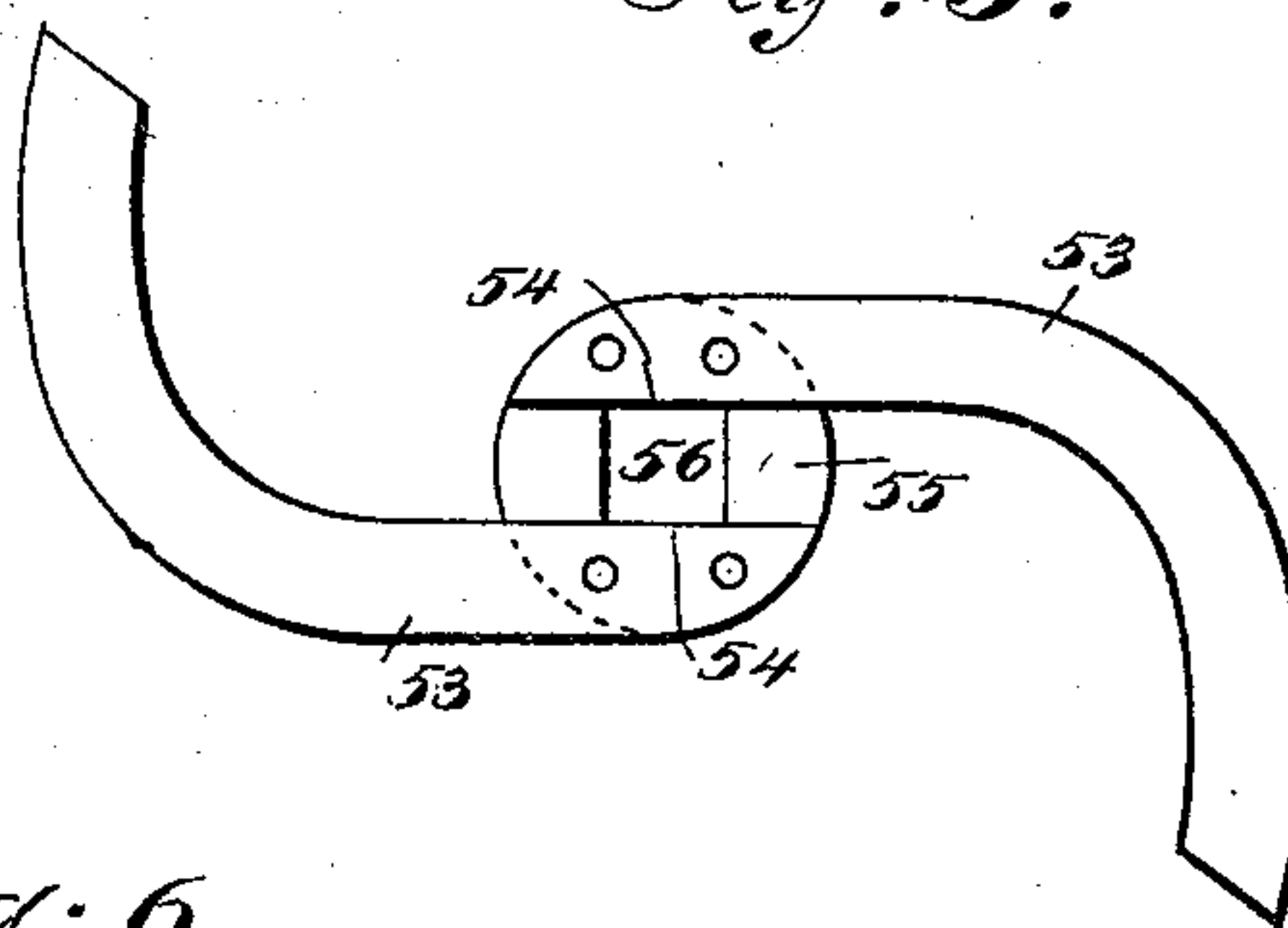


Fig: 6.

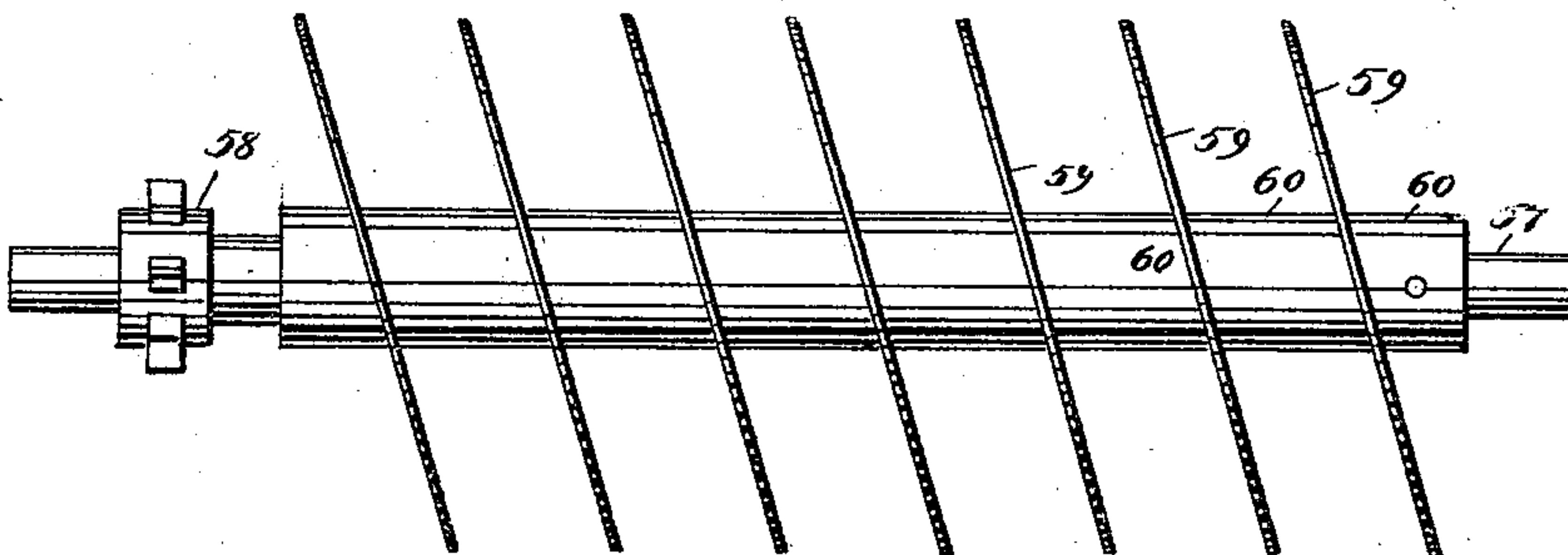
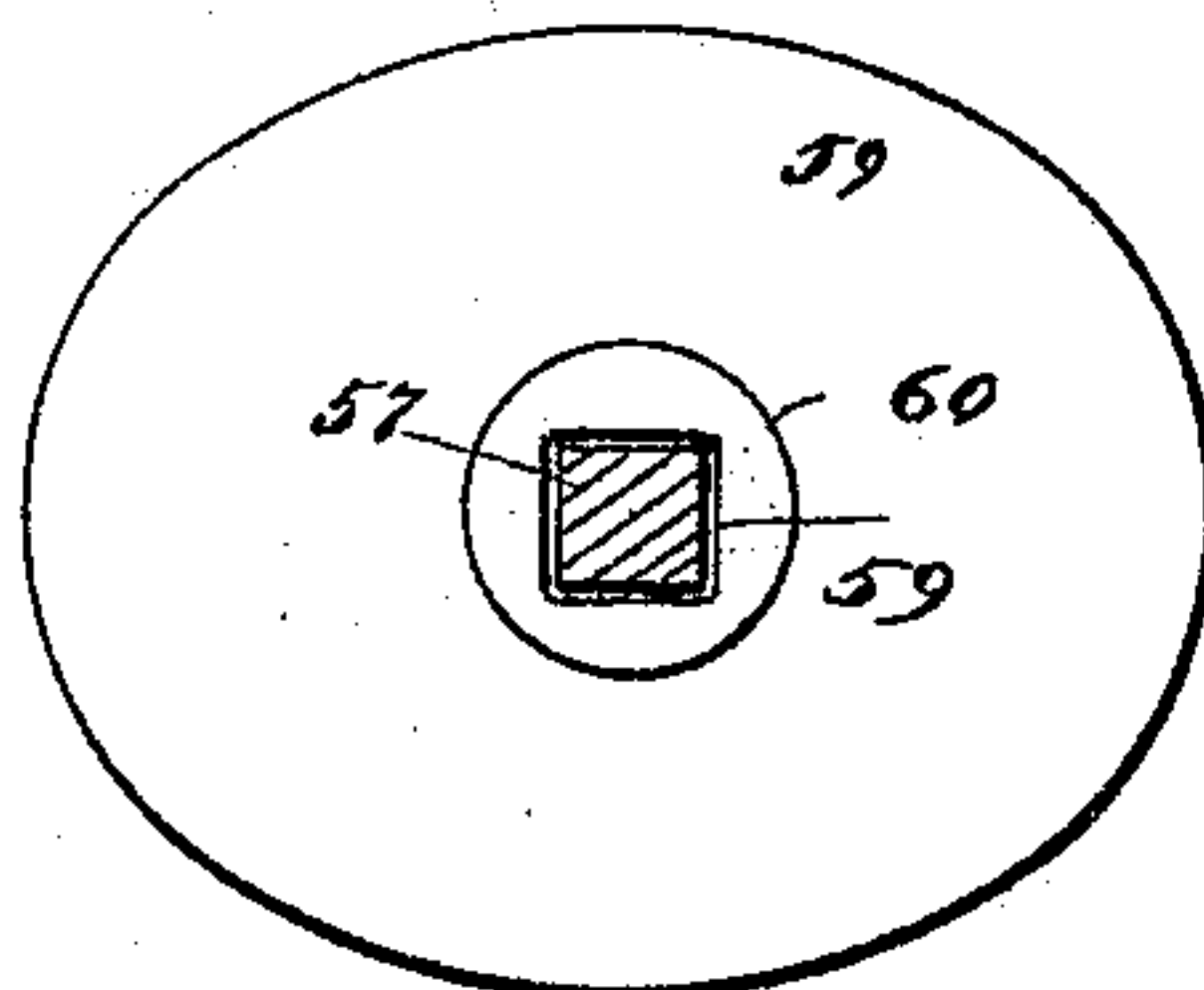


Fig: 7.



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UNITED STATES PATENT OFFICE.

BENJAMIN S. SEXSON, OF CINCINNATI, INDIANA.

LAND-PULVERIZER.

SPECIFICATION forming part of Letters Patent No. 503,006, dated August 8, 1893.

Application filed April 1, 1893. Serial No. 468,669. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN S. SEXSON, of Cincinnati, in the county of Greene and State of Indiana, have invented a new and Improved Land-Pulverizer, of which the following is a full, clear, and exact description.

My invention relates to improvements in land pulverizers; and the object of my invention is to produce a simple machine which may be easily hauled, which has rotary cutters or pulverizers adapted to be held at any necessary height and to turn easily through the soil and finely pulverize the same, which is provided with several of these pulverizers or cutters so that it may be adapted to different varieties of soil, and which is intended to pulverize any soil which has been once plowed so as to obviate replowing.

A further object of my invention is to construct and arrange the pulverizers so that they may be cheaply made, easily repaired, and rapidly rotated.

To these ends my invention consists of certain features of construction and combinations of the same, as will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a broken plan view of the machine embodying my invention. Fig. 2 is a longitudinal section on the line 2—2 in Fig. 1. Fig. 2^a is a broken detail section of the cutter or pulverizer. Fig. 3 is a detail plan view of a modified form of cutter or pulverizer. Fig. 4 is a central cross section of the same. Fig. 5 is a detail view showing how the cutter blades shown in Figs. 3 and 4 are fastened in place. Fig. 6 is a detail plan of another modified form of cutter or pulverizer; and Fig. 7 is a cross section of the same.

The machine is provided with a suitable frame 10 which is provided with a common pole 11 or its equivalent, by means of which it may be hauled, and the frame is journaled at its rear end on the axle 12 of the wheels 13. The wheels are loose on the axle and connect with it by means of the usual ratchet mechanism 13^a which causes the axle to turn only while the machine is being drawn forward. The pawls may be thrown out when the ma-

chine is not to be operated thus permitting the wheels 13 to turn on the axle.

Behind the main frame is a vertically swinging frame, carrying the detachable cutter or pulverizer forming the main feature of my invention, and this frame consists of the parallel side pieces 14 and a connecting cross bar 15. The side pieces are hinged to the axle 12 by means of straps 14^a which are journaled on the axle and rigidly attached to the side pieces 14.

The cutter or pulverizer 16 shown in Figs. 1 and 2 is especially adapted for use on relatively hard soil, as it is very strong and is adapted to force its way easily through such soil. It is provided with a center shaft 17, one end of which is journaled in one of the side pieces 14 and the other end of which rests in a socket 18 in the opposite side piece, this arrangement enabling the cutter or pulverizer to be easily removed when another is to be substituted.

The cutter is provided with curved spiral blades 19 which are arranged parallel with each other and which encircle the center shaft, these blades being bent inward at one end, as shown at 20, and secured to a collar 21 on one end of the shaft 17. The blades are also supported at intervals by curved spokes 22 and by the curved bars 19^a, see Fig. 2^a, which are secured to the spokes and are curved to the shape of the blades. The blades are fastened to the bars and may be detached when necessary so that they may be easily renewed. The blades may be each made of a single piece or may be made up in sections, if desired, and each blade has a cutting edge bent outward slightly so that when the cutter or pulverizer is rotated, the blades will readily enter the ground and as they turn they cause the ground, with which they come in contact, to be thoroughly pulverized.

The shaft 17 has a sprocket wheel 23 thereon which connects by means of chain 24 with a sprocket wheel 25 which turns loosely on the shaft. The sprocket wheel 25 is fixed to a smaller sprocket wheel 26 which also turns loosely on the shaft, and this connects by a chain 27 with a larger sprocket wheel 28 which is fixed on a countershaft 29 journaled in the front portion of the frame 10; journaled on the shaft 29 is a smaller sprocket wheel 30

which is driven by a chain 31 connecting with a relatively large sprocket wheel 32 which is fixed to the shaft 12.

On the shaft 29 is a common form of clutch 5 33 which is adapted to connect the sprocket wheel 30 with the shaft, and the clutch comprises the usual sleeve 34 which has teeth 35 to enter recesses 36, see Fig. 2, in the sprocket wheel 30, and a lever 37 for actuating the 10 sleeve. The sleeve is keyed to the shaft in the usual way, and the lever 37 for operating it is fulcrumed on an arm 39 which is secured to a cross bar of the main frame 10. The sleeve 34 is normally pressed against the 15 sprocket wheel 31 by a spring 41 on the countershaft, and when thrown away from the sprocket wheel it may be held in position by a catch 40, see Fig. 1; when the catch engages the sprocket wheel, it will be seen that the 20 motion of the axle will be transmitted to the pulverizer through the sprocket wheels 32, 30, 28, 26, 25 and 23, and their connecting chains, so that the speed of the pulverizer will be increased and the pulverizer will turn with 25 sufficient rapidity through the soil. It will be understood that other suitable gearing may be substituted for the sprocket wheels and chains and that the pulverizer may be rotated with any necessary speed.

30 The lever 37 for operating the catch should extend to within easy reach of the seat 10^a on the main frame, and a lever 42 for regulating the height of the pulverizer is also arranged within reach of the seat and extends longitudinally across the top of the machine. 35 This lever 42 is split, as shown at 43, and fulcrumed on a post 44 by means of a pin 45 which extends through the lever and post, and the post is provided with a series of holes 40 46 to receive the pin so that the lever may be arranged at any necessary height. The rear end of the lever connects with the swinging frame carrying the pulverizers by means of a spring 47 and chain 47^a which are secured to 45 the rear end of the lever and to the cross bar 15 of the swinging frame. This enables the frame to be adjusted by moving the lever and it also causes the pulverizer to have the necessary freedom of movement to enable it to pass 50 without injury over obstructions in the soil.

The lever 42 swings opposite a notched quadrant 48 of the common form which is secured to the pole 11 and extends upward therefrom, the lever moving between this 55 quadrant and guard rail 49, while a spring 50, which is secured to the lever and arranged between it and the guard rail, presses the lever into engagement with the notches of the quadrant. This arrangement enables the lever 60 to be held at any necessary height. The swinging frame and pulverizer may be held raised when the machine is to be moved from field to field, by the bars 14^b, staples 14^c and suitable keys for the staples. The bars 14^b 65 are secured to the frame 10 and project above the side pieces 14 of the swinging frame and have slots to receive the staples, which pro-

ject through the bars when the frame is raised, and by inserting keys in the staples the frame is held up. 70

The pulverizer is used by simply drawing it across the ground to be mellowed, and the movement of the machine causes the pulverizer to be turned by the gear mechanism described, and the blades 19, rotating rapidly 75 through the ground as they do, completely pulverize the same.

When the machine is to be used on soil which is covered with or contains any considerable quantity of trash, roots, sprouts, or other 80 similar substances, the form of cutter or pulverizer shown in Fig. 3 is preferably employed, and this may be readily substituted for the pulverizer 16. The pulverizer shown in Fig. 3, comprises a shaft 51 which is adapted to be 85 hung in the swinging frame of the machine, and it has a sprocket wheel 52 to connect with the chain 24. The shaft 51 is provided with a plurality of outwardly extending curved blades 53 which are not continuous like the 90 blades 19 but which are of a very similar shape, being of much such shape as the blades 19 would be if sections were cut out of their peripheries. These blades 53 are preferably 95 fastened to the shaft in the manner shown in Fig. 6; that is to say, the ends of the blades are bolted between collars 55 on the shaft which is square in cross section, as shown in Fig. 4, and the edges 54 of the blades, which come 100 in contact with the shaft and which lie between the washers, are straight so as to have a firm bearing on the shaft; this makes a strong support for the blades, although they may be attached in other ways without departing from the principle of my invention. 105 The washers or collars 55 have a square opening 56 in the center, which also fits the shaft.

For soils which are very full of trash, the form of cutter or pulverizer shown in Fig. 6 is preferably employed, and this is provided 110 with a shaft 57 having a sprocket wheel 58 to connect with the chain 24. The shaft 57 is provided with a series of cutters 59 which are in the form of oblong disks, and these are held between sleeves 60 on the shaft and in an inclined position, as shown in Fig. 6, so that as 115 they turn they will wobble through the earth, turning themselves to one side and then to the other, thus serving to pulverize the soil and also free themselves from trash. The 120 shaft 51 may, however, be round in cross-section, in which case the base of the blades 53 and the openings in the washers or collars 55 will be of corresponding shape to fit the shaft.

Having thus described my invention, I 125 claim as new and desire to secure by Letters Patent—

1. The combination with the main frame and its drive wheels and axle, of the vertically swinging frame hung on the axle and 130 carrying the rotary pulverizer operated from said drive wheels, the longitudinally extending lever connected at its rear end with the swinging frame, staples on the side bars of

the swinging frame and the bars extending rearwardly from the sides of the main frame and provided with apertures to receive said staples when the swinging frame is swung up and permit of locking the same by passing keys or pins through the staples, substantially as set forth.

2. The combination with the main frame and its drive wheels and axle, of the vertically swinging frame carrying a rotary pulverizer operated from the drive wheels, a longitudinally extending adjustable lever, a spiral spring connecting the rear end of the lever with the swinging frame and a chain extending through the spring and also connected to the lever and swinging frame, substantially as set forth.

3. The combination with the main frame, its drive wheels and axle, of the vertically swinging frame hung on the axle and carrying the rotary pulverizer, an adjusting lever for raising and lowering said swinging frame, the sprocket wheel 23 on the pulverizer shaft, connected sprockets 25, 26 loose on the main

shaft, a fixed sprocket 32 also on the main shaft, a chain connecting the sprockets 23, 25, a counter shaft 29 journaled on the main frame in front of the axle and provided with a fixed sprocket 28 chained to the sprocket 26 and a loose sprocket 30 chained to the sprocket 32, and a clutch mechanism for connecting the sprocket 30 with its shaft, substantially as set forth.

4. A rotary pulverizer consisting in the shaft 51 provided with series of short spring blades or cutters 53 curved longitudinally and laterally, substantially as shown.

5. A rotary pulverizer consisting in the squared shaft 51, pairs of collars 55 having squared openings receiving the shaft and the longitudinally and laterally curved blades the straight inner edges of which are held between said collars and rest transversely on the shaft, substantially as shown.

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Witnesses:

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