

O. CHRISTIANSON.

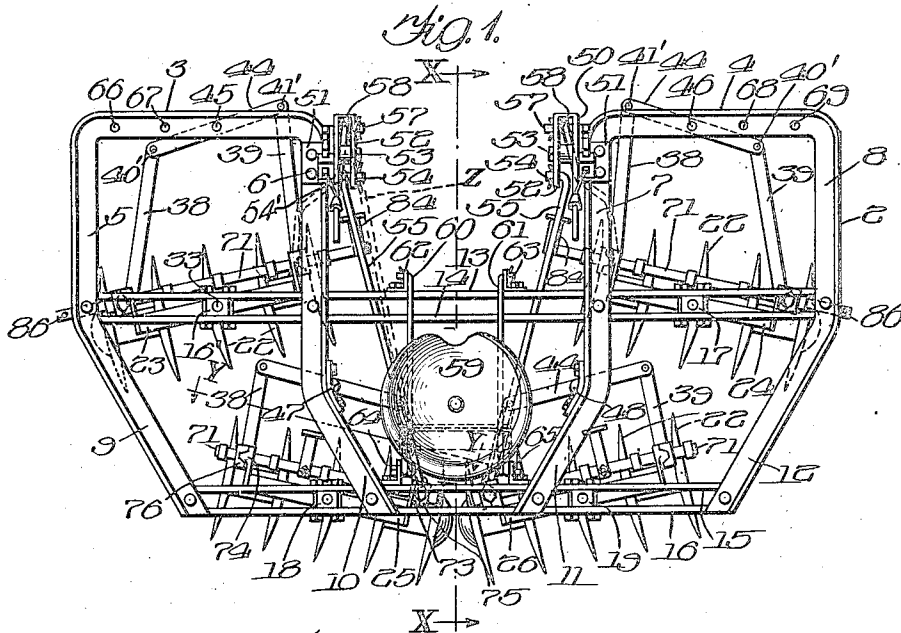
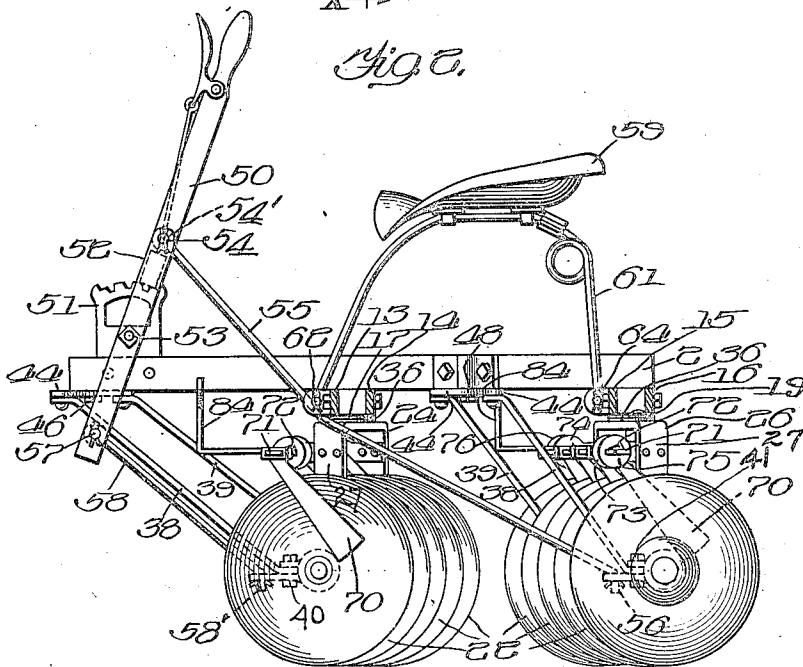
PULVERIZER.

APPLICATION FILED JAN. 29, 1912.

1,070,014.

Patented Aug. 12, 1913.

2 SHEETS—SHEET 1.



Witnesses:
Jno. H. Nelson Jr.
Edwin Nelson.

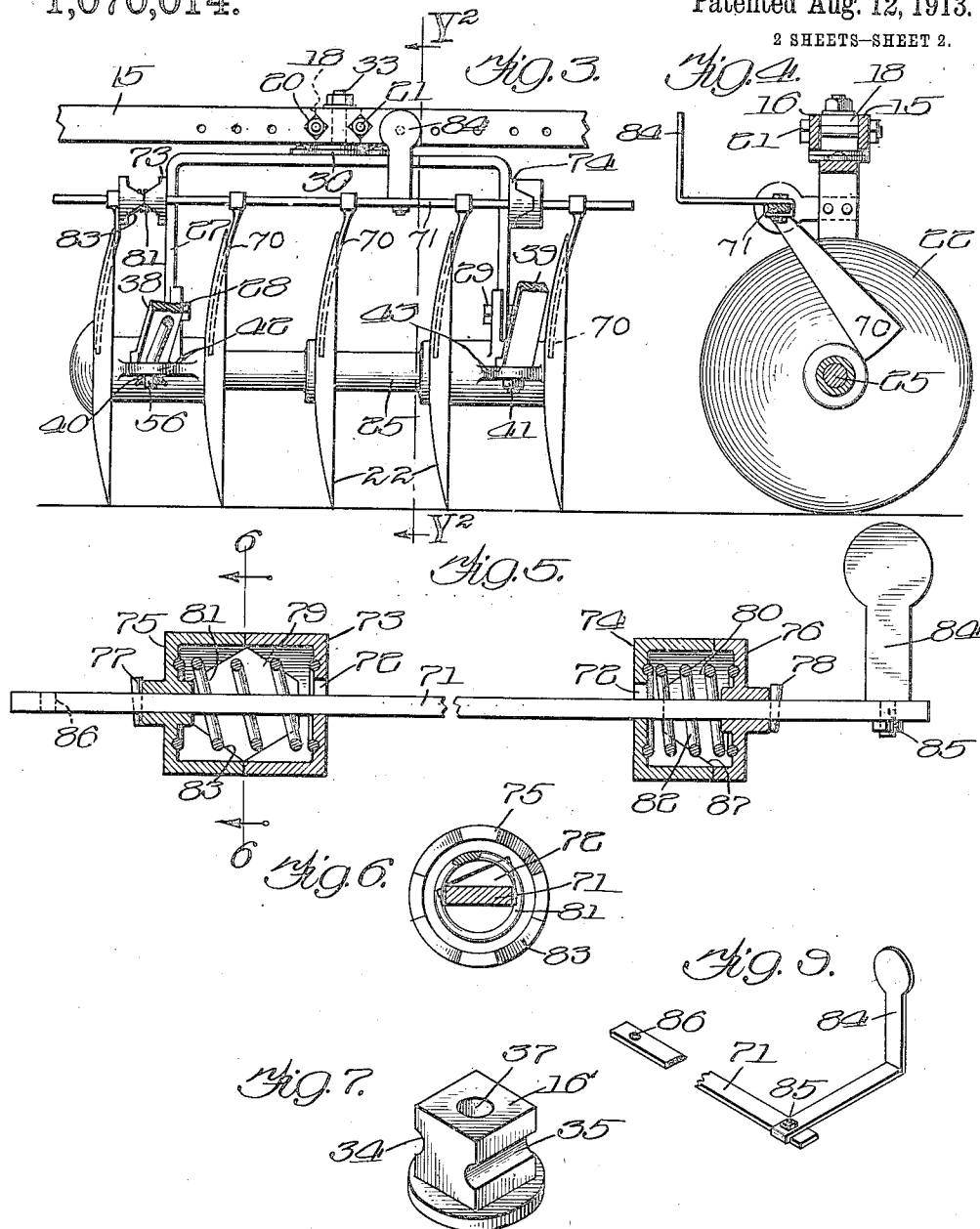
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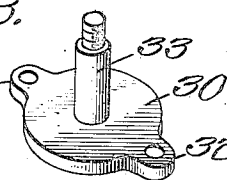
2 SHEETS—SHEET 2.



Witnesses: *Fig. 8.*

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UNITED STATES PATENT OFFICE.

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PULVERIZER.

1,070,014.

Specification of Letters Patent.

Patented Aug. 12, 1913.

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To all whom it may concern:

Be it known that I, OSCAR CHRISTIANSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Pulverizers, of which the following is a specification.

My invention relates to pulverizers of the type employing gangs of disks, and the objects of the invention are to provide a construction wherein the front gangs of the machine may be adjusted toward or from each other to adapt the pulverizer for such different kinds of work as ordinary pulverizing and filling in corn-rows; to vary the width of the machine as a whole; to make it possible to adjust the outer disks of a gang to work outside of the frame so that the soil may be pulverized where an ordinary pulverizer-frame would have no room to turn; to make it possible to reverse the throw of the disks, or their concavity, without disturbing the mountings of the individual disks; and to provide efficient disk-scraping means for this removable and reversible type of disk-gang.

Another object of the invention is to lighten the labor of turning the gangs by means of the hand-levers, by swinging each gang on a pivot placed between the ends instead of at the one end of the gang, and to provide such a construction and combination of parts as will simplify the machine as a whole adapted for the several kinds of operations to be performed by the present invention.

The invention therefore consists in the novel construction, combination and arrangement of parts, hereinafter described in detail, illustrated in the accompanying drawings and incorporated in the appended claims.

In the drawings Figure 1 is a plan view of a pulverizer embodying my invention. Fig. 2 is a section taken substantially on line X—X of Fig. 1. Fig. 3 is an enlarged view of one of the gangs, parts being broken away, seen substantially from the section line Y—Y on Fig. 1. Fig. 4 is a section taken substantially on line Y²—Y² on Fig. 3. Fig. 5 is an enlarged detail view, partly broken away and in section, of the rod on which the scrapers are mounted and the mechanism for actuating said rod. Fig. 6 is a section taken on line 6—6 of Fig. 5. Fig. 7 is a perspective view of one of the four

bearing-members. Fig. 8 is a perspective view of the king-bolt plate and king-bolt on which each gang of disks turns. Fig. 9 is a perspective view of the elbow-lever attached to one of the scraper-rods partly broken away.

In the several views 2 represents the frame of the machine. This frame consists of a pair of angle-irons each of which is bent twice at right angles to form front portions 3 and 4 and rearwardly extending parallel portions 5, 6, 7, and 8. The latter are extended by inwardly inclined portions 9, 10, 11, and 12 which form the rear portion of the frame. The angle irons are bound together by two pairs of flat bars 13 and 14 and 15 and 16 which are secured to the angle-irons in any suitable manner. Between each of these two pairs of flat bars, at any desired places along their lengths, forward bearings 16' and 17 and rear bearings 18 and 19 are clamped by bolts 20 and 21, as shown in Figs. 2, 3, and 4. The machine is equipped with four gangs of "dished" disks 22 of ordinary form, which are mounted upon shafts and equipped with bearings which form no part of the present invention. The shafts and the gangs of disks are designated by the numbers 23, 24, 25, and 26.

In Fig. 3 one of the gangs is shown on an enlarged scale. Each gang is connected, as shown in Fig. 3, with the frame of the machine by an arch 27 formed from a bar of iron or steel bent twice at right angles to form a pair of vertical legs and a horizontal leg upon which the frame rests. The vertical legs are bolted at 28 and 29 to suitable bearing portions on the shaft and on the horizontal part of the arch is bolted a plate 30, a perspective view of which is shown in Fig. 8. This plate has apertured ears 31 and 32 for the bolts which secure it to the arch. From the plate 30 rises a king-bolt 33 which engages a hole therefor in the bearing-member, one of the latter, 16', being shown in Fig. 7. In opposite sides of the bearing-member 16', as well as in the other three identical members 17, 18 and 19, are horizontal grooves 34 and 35 which are engaged by the bolts 20 and 21. These bearing-members may be clamped at different places between the pair of bars 13 and 14 and the pair 15 and 16.

In Fig. 1 the disks of the forward gangs have their concave sides facing inwardly,

while the rear gang disks face the opposite way. These facings may be reversed by disengaging the gangs from the frame and shifting each gang, or a portion thereof, such as only the forward gangs, to the opposite side. This may be effected by simply removing the nut from the king-bolt 33 and one other bolt to be referred to, and lifting the frame off the gang. In Fig. 1 the gangs are set to level out corn ridges, the rear gangs straddling one ridge and throwing the earth into the ditch or depression on each side of this ridge, while the forward gangs are set to throw in one-half of each of the adjacent ridges into the same depressions. The adjustability of the bearing blocks or members 16', 17, 18 and 19 between the flat bars permits the adjustment of the machine to variously spaced apart rows or ridges, and when the forward gangs are set in their innermost positions the outer ends of the rear gangs will work over again the ground pulverized by the inner ends of the forward gangs. The angles at which the gangs are placed relative to their path of movement will determine the character of work done in the way of leveling the ridges or filling up depressions.

When the machine is to be used as an ordinary pulverizer, the capacity of the machine as to the amount of ground it covers, will be greatly increased over its spread shown in Fig. 1, as then the forward gangs may be separated to place the innermost disk of each outside of the path of the outermost disk of each rear gang. The adjustment of the forward bearings for the front gangs also permits double-disking ground, or pulverizing the same ground with the forward disks first and then with the rear disks.

The method of fastening the bearings between the pairs of flat bars may be varied in numerous ways, the essential feature being the lateral adjustability. When the forward gangs are placed their maximum distance apart the outer disks thereon will operate beyond the sides of the frame, which removes the frame as an obstruction over these disks, enables the operator to work every inch of ground up to a hedge, fence or building. Cutting away the usual rear corners of the frame by slanting its sides inwardly facilitates the operation of the machine in places where there is but small room for turning, the room required by this construction being substantially all that would be required for the front gangs alone. Each frame 27 and its gang of disks is given support in addition to that provided by the king-bolt, through pull and push rods 38 and 39, the rear ends of which are pivoted at 40 and 41 to suitable lugs on the shaft-bearings, such as at 42 and 43. The forward ends of these rods are pivoted at 40' and 41' to a bar 44. This bar is pivoted at

its middle at 45 and 46, respectively, for the front gangs and at 47 and 48 for the rear gangs. The gangs of disks are swung on their pivots 33 by means of a pair of levers 49 and 50, the former operating the front and rear gang at the left and the latter the gangs at the right. Each lever is fulcrumed upon a quadrant casting 51 secured to the parts 6 and 7, respectively. The lower end of each of these levers is bent upon itself to form a short lever 52' as shown clearly in Fig. 1. The latter and the body portion of the lever are fulcrumed on a bolt 53 which passes through the quadrant casting. In the upper end of the lever portion 52 is a hole which is engaged by a bolt 54 which also engages an eye 54' of a connecting rod 55 the rear end of which is attached at 56 to a suitable lug on the rear shaft-bearing. At the lower end, or bend, of the lever is a bolt or pin 57 to which the forward end of a rod 58 is attached, this rod connecting the lever with the inner end of the forward gang. Like the rod 55 the rear end of the rod 58 is attached at 58' to the inner end of the front disk shaft bearing. When the inner end of the forward gang and the outer end of the rear gang are to be moved in the same direction by each movement of the lever the forward end of the rod 55 is removed from the bolt 54 and attached also to the bolt or pin 57, as indicated by dotted line Z in Fig. 1. When arranged as in Fig. 2, however, the adjacent ends of the gangs at each side are swung in opposite directions at each movement of the lever. In each instance the pull or push of one of the connecting rods upon one end of a gang is transmitted to the opposite end of the gang through the equalizing rod 38, 39 and 44, the rearward push on the rod 58, for instance, being transmitted to the opposite end of the gang by a pulling force through the rod 39.

A driver's seat 59 is mounted over the rear portion of the frame on a pair of spring-supports 60 and 61 secured at 62 and 63 to the bar 13 and at 64 and 65 to the bar 15.

66, 67, 68 and 69 represent several of a series of holes into which the pivots 45 and 46 may be inserted to accommodate the equalizing rods to the adjustments of the king-bolt bearings immediately over the disk-shafts. The draft-rigging may be attached in any suitable manner to the forward portions 3 and 4 of the frame, and for this purpose unoccupied holes 66 to 69 may be used to attach clevises to.

Referring, now, to the cleaning devices for the disks, these are designed to form a part of each gang of disks and to follow said gangs when they are exchanged or shifted. Each gang is therefore provided with a set of scrapers and a foot-pedal for operating same. The entire set of scrapers or shovels

are rigidly secured to a bar and this bar is yieldingly mounted, to obviate the disadvantage of the looseness and inoperativeness of individual scrapers yieldingly mounted separately. The scrapers are of the type working end-wise like shovels and are swung by a foot-lever from the hubs of the disks toward the peripheries. A scraper 70 is provided for each disk, this scraper being mounted on the concave side of the disk. These scrapers are rigidly secured to a rod 71 or flat bar which is mounted for a partial turning movement as well as for end-wise movement. The flat bar is mounted in a triangular opening 72 in each of two castings 73 and 74 secured to, or forming a part of, the upright legs of the frame 27 as shown in Fig. 3. The castings 73 and 74 have cam surfaces on which castings of cams 75 and 76 operate. The former are fixed on the frame and the latter are rotated by the rod carrying the scrapers. The operation of the cams moves the rod carrying the scrapers endwise whereby the scrapers in swinging from their normal positions at the hubs of the disks are also mounted laterally to adapt themselves to the curvature of the disk radially from center to circumference. The cams 75 and 76 are held against movement away from each other on the rod 71 by means of stop-pins 77 and 78 which pass through the rod or flat bar 71. The castings 73, 74, 75, and 76 are hollow which provides interior spaces 79 and 80 in which are placed coiled springs 81 and 82 which normally hold the cam-portions together and return them and the rod to normal position when the foot-lever is released by the operator after each operation of scraping the disks clean of earth or clay. One end of the coiled spring 81 is secured to the casting 75 and the other end is secured to the casting 73. The spring 82 is similarly fastened at its respective ends to the cam-portions 74 and 76. A side view of the cams showing their exterior and the cam surfaces is shown in Fig. 3, and an enlarged section showing the interior of the cams is shown in Fig. 5.

In Fig. 5 83 represents one of the meeting lines between the stationary and the revolu-

ble halves of the cam sections 75 and 73. 84 is an elbow-shaped foot-lever by means of which the operator turns the rod 71. This lever is in each instance fastened by a bolt 85 to the rod 71 and the opposite end of the rod or bar 71 is provided with a hole 86 with which the foot-lever bolt may be engaged when the lever is shifted as when the gangs are caused to exchange positions to change the facings of the disks without disturbing the latter in the shafts on which they are mounted.

The pivoting of each gang intermediate of its ends will very materially reduce the strain upon the operating-levers, as only about half of the disks are forced through the earth in the direction of travel, and the disks which swing toward the rear of the pivot of the gang while the machine is operating in the earth will very largely offset the lever-resistance offered by the disks that must be swung forwardly.

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

1. The combination in a pulverizer, of a pair of forward gangs of disks, a pair of rear gangs, said rear gangs extending across a narrower path than said forward gangs, and a frame for said gangs which has a contracted rear portion.

2. The combination with a frame, of a pair of forward gangs of disks, a pair of rear gangs, swinging supports connecting said gangs with said frame, a pivoted connecting rod for each end of each gang, a pivoted bar for each gang to which the connecting rods for the gang are pivoted, means for swinging a forward and a rear gang simultaneously either in the same or in opposite directions, and means for varying the pulverizing width of the machine as a whole.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

OSCAR CHRISTIANSON.

Witnesses:

JULIA M. BRISTOL,
J. W. BECKSTROM.