No. 720,948. PATENTED FEB. 17, 1903.

J. P. MULRONY.

ATTACHMENT FOR DISK PLOWS.

APPLICATION FILED JUNE 7, 1902.

NO MODEL.

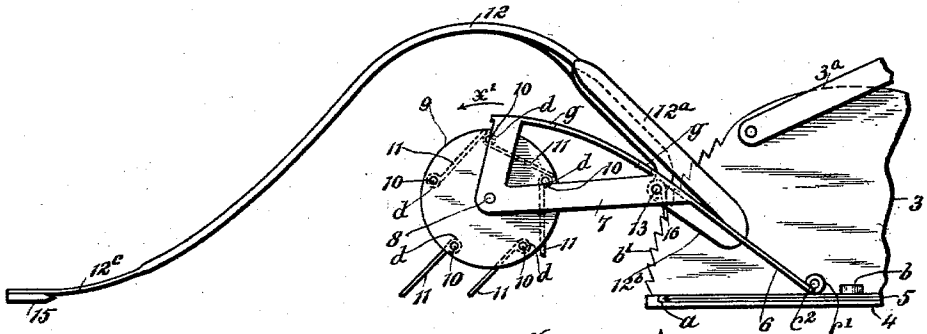

Fig. 1.

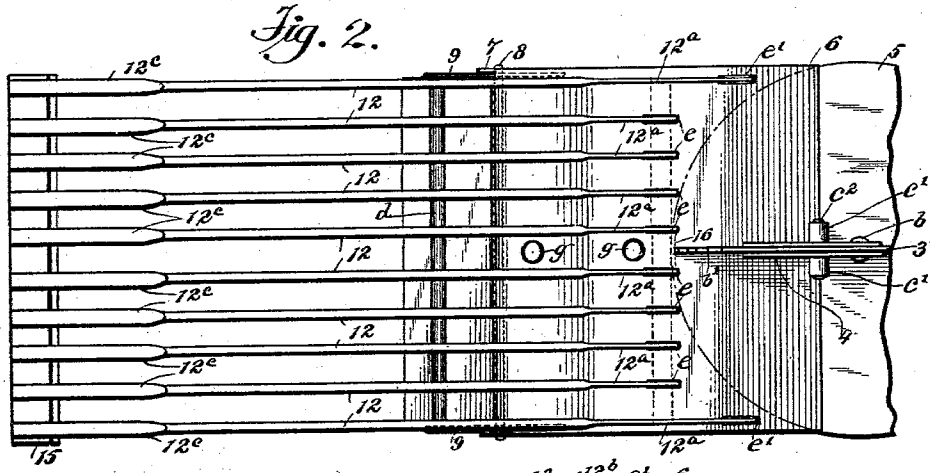

Fig. 2.

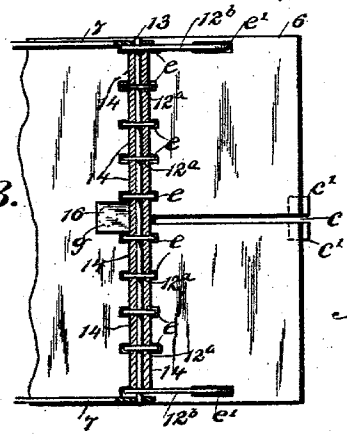

Fig. 3.

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# UNITED STATES PATENT OFFICE.

JOHN PHILIP MULRONY, OF PLAZA, WASHINGTON.

## ATTACHMENT FOR DISK PLOWS.

SPECIFICATION forming part of Letters Patent No. 720,948, dated February 17, 1903.

Application filed June 7, 1902. Serial No. 110,624. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN PHILIP MULRONY, a citizen of the United States, and a resident of Plaza, in the county of Spokane and State of Washington, have invented a new and Improved Attachment for Disk Plows, of which the following is a full, clear, and exact description.

The object of this invention is to provide a novel simple attachment for a disk plow of a type wherein a horizontal cutter-blade is employed which will effectually pulverize the soil as it is plowed, will separate surface soil from the subsoil and spread the latter on top of the plowed ground, and also that will thoroughly separate weeds, roots, or tubers from the soil as it undergoes the plowing operation and dispose such material at the rear of the plow attachment upon the surface of the plowed ground.

The invention consists in the novel construction and combination of parts, as is hereinafter described, and defined in the appended claims.

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

Figure 1 is a side view of the improved plow attachment mounted upon the rear portion of a disk plow. Fig. 2 is a plan view of the same, and Fig. 3 is a partly-sectional reverse plan view of novel details seen in direction of the arrow $x$ in Fig. 1.

In the drawings, 3 indicates a plate-metal plow-standard, 4 a shoe-plate secured horizontally on the straight lower edge of the standard 3, and 5 is a sharp-edged flat plow-disk pivoted at $b$ in a slot $a$ in the shoe, these parts being elements of a novel plow forming the subject-matter of another application filed by me on the 23d day of January, 1902, Serial No. 90,889, and do not, therefore, need further description in this specification.

The standard 3 is convex on the edge above the shoe 4, and at the rear portion of said edge teeth $b'$ are formed, the use of which will be hereinafter explained.

A plate-metal moldboard 6 has a longitudinal slot $c$ formed in it at its transverse center to loosely receive the plate-metal standard 3, and at each side of the standard a hinge-scroll $c'$ is formed on the lower edge of the moldboard, these scrolls, that are alined, receiving a transverse pintle $c^2$, that projects at each side of the standard near to the shoe 4, and it will be seen that the hinge-joint thus provided holds the moldboard rockably connected with the standard 3.

The portion of the moldboard 6 which extends rearward of the standard 3 is bent into arch form, and at each side edge of said arched portion of the moldboard a bracket-arm 7 is formed or secured. The oppositely-positioned bracket-arms 7 are oppositely perforated at the lower rear portions thereof for the reception of the journal ends of a transverse shaft 8, that extends between the bracket-arms, as indicated by dotted lines in Fig. 2.

Two head-disks 9 are secured upon the shaft 8, respectively near to one of the bracket-arms 7, and between said disks a plurality of carrier-rods 10 extend, having their ends secured to the disks, and preferably the carrier-rods are evenly spaced apart and positioned near the peripheral edges of the disks.

Upon the carrier-rods 10 a like number of bucket-plates 11 are loosely hung, each plate upon a respective carrier-rod, this connection being preferably effected by forming a tubulation $d$ along one side edge of a bucket-plate and inserting one of the rods 10 therethrough. The bucket-plates 11 are of rectangular form and fit loosely between the head-disks 9, their width permitting such as are disposed above the shaft 8 to have contact at their free side edges upon the tubulations $d$ on adjacent bucket-plates 11.

It will be seen that the support afforded to the uppermost bucket-plates 11 will incline them somewhat from a horizontal plane and that the one which is at the rear of the free upper edge of the moldboard 6 is inclined from its free transverse edge, that rests upon a tubulation $d$, rearward and downward, so that in service said bucket-plate will receive earth passed over the rear edge of the moldboard, as will be further explained.

A plurality of pulverizer-bars 12 are provided, which may be mainly cylindrical in their bodies, and all of these bars are arched between their ends, as shown in Fig. 1, the arched portions being positioned over the

bucket-wheel when the pulverizer-bars are in position for service. The bars 12, with the exception of the two that are the outermost ones of the series, have their bodies at and near their forward ends flattened, so as to afford a cutting-blade $12^a$, which is curved downward.

A series of spaced slots *e* is formed in the moldboard 6 rearward of and near the rear end of the longitudinal slot *c* therein, and the end portions of the cutter-blades $12^a$, that curve downward and forward, when in place extend loosely down through the slots *e*, said ends of the blades being laterally perforated.

A pivot-shaft 13 is held at its ends in opposite perforations in the bracket-arms 7 near the moldboard 6, so that the pivot-shaft is located below and adjacent to the moldboard. The perforated ends of the cutter-blades $12^a$ are mounted upon the pivot-shaft 13, and alternating with these blade ends a series of similar spacing-sleeves 14 is mounted upon the pivot-shaft, the sleeves by their loose contact with the sides of the cutter-blades $12^a$ serving to prevent said blades from having frictional contact with the side walls of the slots *e*.

The two outermost pulverizer-bars 12 have their cutter-blades $12^a$ extended forwardly and then bent rearwardly, passing loosely through the slots *e'* in the moldboard near its side edges, the portions $12^b$ of the cutter-blades $12^a$ that project rearward below the moldboard having their ends laterally perforated and loosely mounted upon the pivot-shaft 13, and there is sufficient angular divergence between adjacent edges on the bent portions $12^a$ $12^b$ of the cutter-blades of the outer bars 12 to permit a limited rocking movement of said bars on the pivot-shaft 13 along with the intermediate bars of the series.

The pulverizer-bars 12 from their arched portions curve downward and rearward and are flattened, as at $12^c$, these rear end portions being substantially level, and upon said flattened ends a presser-bar 15 is secured, that is designed to have contact with the soil when the device is in use.

Upon the pivot-shaft 13 a pawl 16 is rockably held, preferably by its attachment upon one of the sleeves 14, this pawl being adapted to engage with a suitable ratchet-tooth *b'*, that is one of a series of such teeth formed on the rear curved edge of the standard 3, as before mentioned.

It will be seen that the pawl 16 enables the adjustment of the moldboard and rockable pulverizer-bars 12 toward or from the ground at their rear ends, and thus graduate pressure of the cross-bar 15 upon the soil.

In the moldboard 6 a suitable number of openings *g* are formed rearward of the standard of the plow, which are to accommodate the seed-dropping spouts of a seed-planter of any preferred style, (not shown,) but which may be mounted upon the standard 3 and seat upon the bar $3^a$ thereon.

In use it will be seen that the forward progressive movement of the plow having the standard 3 and the horizontal cutting-disk 5 as elements will cut a slice of soil that is subdivided by the plate-metal standard and passes up rearwardly upon the moldboard 6. When the soil in its upward passage impinges upon the blades $12^a$ of the pulverizer-bars 12, it will be finely sliced and in further passage between the bars become granulated or coarsely pulverized. The pulverized soil as it passes from the transverse edge of the moldboard 6 falls upon the inclined upper bucket-plate 11, that is in position to receive it, as before explained, and it will be understood that the subsoil will be beneath the surface-soil when it is thus deposited upon the bucket-plate. The deposit of soil upon the bucket-plate as described will cause the shaft 8 to rotate in the direction of the arrow *x'* in Fig. 1, which will dump the soil rearwardly and invert as well as mix the soil, so that the subsoil will become partially or wholly deposited on top of the soil that was at the surface before the action of the plow disturbed it. As the plow moves forward the cutting of the soil and its subsequent disintegration will be continuous, so that the bucket-plates 11 will be successively brought into position for the reception of soil passing off of the rear edge of the moldboard and dump the soil, as before explained.

In case a seeding attachment is used the seed dropped through the perforation *g* nearest to the standard 3 will fall upon the bottom of the furrow forward of the buckets 11 as the plow is drawn forward, and such seed as passes down through the rearward perforation *g* will be deposited upon the bucket 11 immediately below said perforation. Now as the bucket-plate 11 that has received the seed is turned in direction of the arrow *x'* and receives soil from the rear end of the moldboard 6 it will be seen that the seed will be mixed with the loosened soil as it drops from the bucket-plate, and thus be covered as the plow progresses.

It will be evident that all roots, clump-grass, weeds, or the like will be separated from the plowed ground by the bars 12 and be deposited on the surface of the soil rearward of the same as the plow and its attachment moves forward. Furthermore, a crop of tubers, such as beets or potatoes, may be excavated by the plow and separated from the plowed soil by the pulverizer-bars 12, upon which bars they will be conveyed upward by the action of the soil until they pass over the arched portions of the bars and will then roll by gravity down the rearwardly-descending portions of the pulverizer-bars upon the plowed and pulverized soil.

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

1. An attachment for a disk plow, comprising a plate-moldboard inclined upward and

rearward from the plow-standard, a series of pulverizer-bars held to rock on the moldboard and extended rearward therefrom, and a soil-receiver carried by the moldboard, comprising adjustable bucket-plates carried on a central shaft by head-disks, and adapted to successively receive and dump the plowed soil discharged from the rear end of the moldboard.

2. An attachment for a disk plow, comprising a plate-metal moldboard slotted to straddle the plow-standard, and pivoted on the standard at the lower edge of said moldboard, a series of arched pulverizer-bars having cutter-blade formations on their forward edges, a transverse shaft carried by arms projected rearward from the moldboard, means for supporting the moldboard and bars inclined at a suitable angle, and a bucket-wheel adapted to rotate by the action of soil as it is plowed and mix the soil as it is discharged.

3. An attachment for a disk plow, comprising a plate-metal moldboard slotted longitudinally at its transverse center to straddle the plow-standard, a ratchet-and-pawl device between the plow-standard and moldboard, adapted to support the moldboard at a suitable angle, a series of similarly-arched pulverizer-bars having cutter-blades on their forward ends that pass down through slots in the moldboard, two bracket-arms extended rearwardly from the side edges of the moldboard, a pivot-shaft journaled in the bracket-arms and passing through perforations in the ends of the cutter-blades on the pulverizer-bars, and a soil receiving and dumping device comprising a transverse shaft pivoted in the bracket-arms, head-disks secured on said shaft, and a series of bucket-plates held to rock on the head-disks below the rear edge of the moldboard.

4. An attachment for a disk plow, comprising a plate-moldboard inclined upward and rearward from the plow-standard, a series of pulverizer-bars held to rock upon and over the moldboard, and a soil-receiving device comprising a plurality of bucket-plates held radially projected on a rotatable supporting-shaft below the rear edge of the moldboard.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN PHILIP MULRONY.

Witnesses:
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M. F. LEWIS.