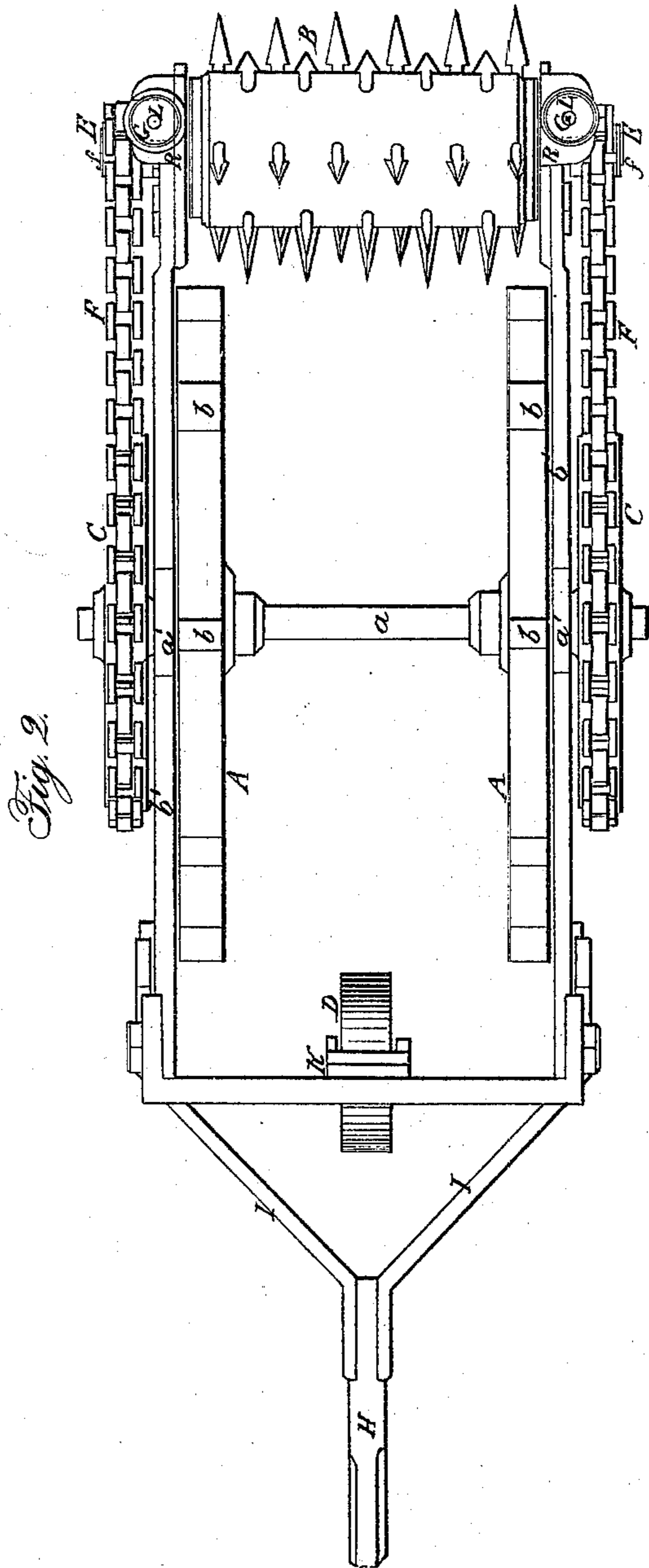
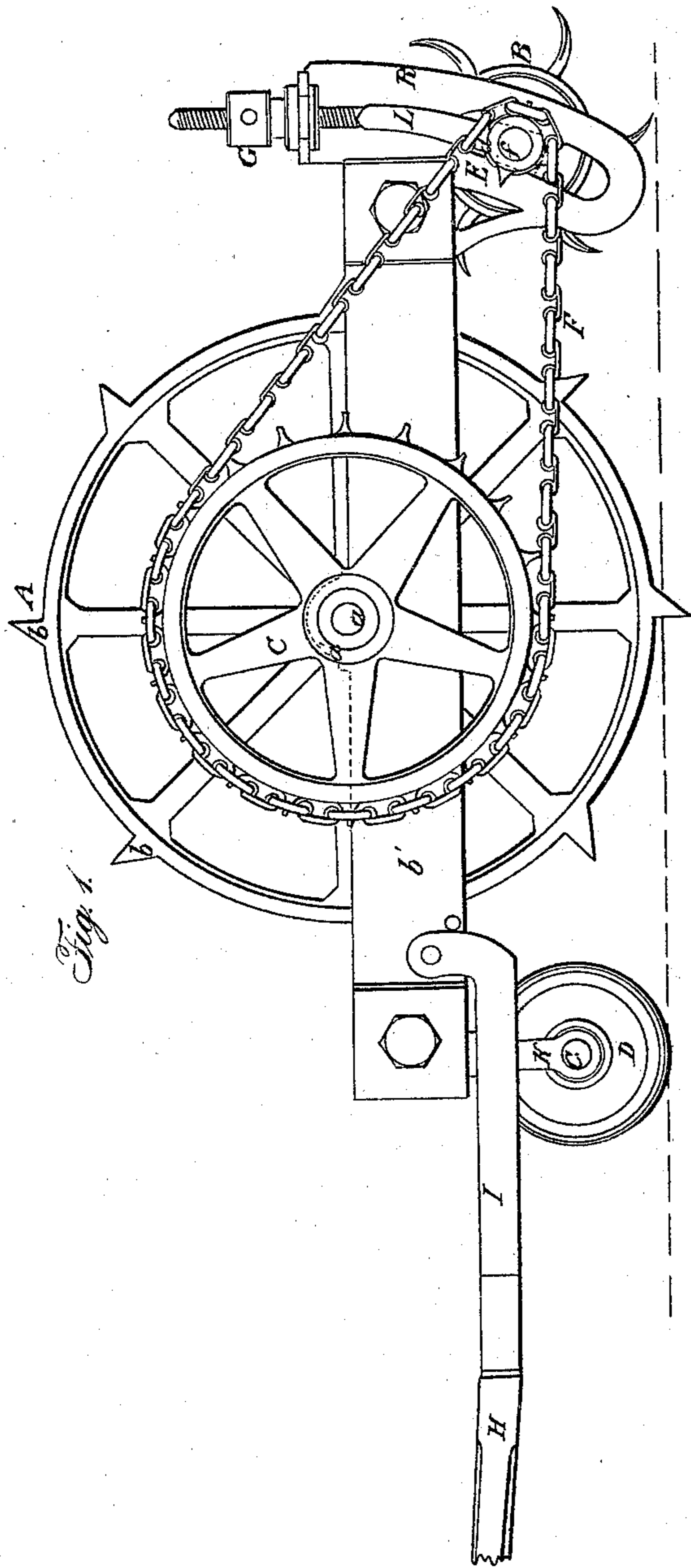


P. E. ROYSE.

Steam Plow.

No. 8,747.

Patented Feb. 17, 1852.



UNITED STATES PATENT OFFICE.

PLEASANT E. ROYSE, OF NEW ALBANY, INDIANA.

IMPROVEMENT IN ROTARY CULTIVATORS.

Specification forming part of Letters Patent No. 8,747, dated February 17, 1852.

To all whom it may concern:

Be it known that I, PLEASANT E. ROYSE, of the city of New Albany, in the county of Floyd and State of Indiana, have invented a new and useful Improvement in Rotary Cultivators for Plowing, Stirring, and Harrowing Ground; and I hereby declare the following to be a clear, full, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification.

The chief point of my invention consists in the peculiar construction of the chisel-beveled cogson the driving-wheels for taking and maintaining a firm hold of the ground, the character of which will be apparent from the following description, in which—

Figure 1 is a side view, and Fig. 2 a top view or plan.

The same letters of reference in both views point out like parts.

To enable others skilled in the art to make and use the machine, I will proceed to describe its construction and operation.

A A are the carrying and rotary plow-driving wheels fitted on the ends of the shaft *a*, which turn in boxes *a' a'*, secured to the carriage-frame *b' b'*. The wheels A A, of any suitable diameter, should be made of sufficient breadth or width on their peripheries to prevent sinking deeply into the soil upon which which they may rest and in which they bite or hold, and obviate slipping by means of spurs *b b* projecting from their peripheries. These spurs are of any appropriate depth and width, according to the nature of the land they are designed to traverse. They all, however, should be of uniform size, equal distance apart, and of sufficient number, so that on the wheels rotating the spurs, digging into the ground, have always one (on either wheel) entered or in contact—that is, when the one spur is about leaving the ground or relinquishing its bite the next in succession is entering, this being the same on either wheel, the spurs on the two wheels being arranged opposite one another, or, in other words, in the same transverse line of the machine. The spurs *b b* are of the following form or shape. Their one side or face, extending transversely of the machine and (when in the ground) nearest the draft-pole or tongue, is, as it were, (each spur,)

a portion or extension of the radius of the wheel, as shown by dotted lines in red, Fig. 1, while their opposite side or face, meeting (each spur) at its outer extremity, branches off at an angle to the front face, uniting with the periphery of the wheel at a suitable point for the proper referred to inclination of the back face and thickness of root to the spur. This shape has a peculiar and important effect in the operation of the plow, and will be presently further adverted to.

H is the draft-pole or tongue, connected by hounds I I with the carriage-frame.

D is a central running-wheel for supporting the tongue, holding up the fore end of the frame, and preventing the latter at that end from being depressed by the cultivator at the back and burdening the team. The wheel D has its axle C hung in bearings made through arms, one on either side, forming a hanger, K.

On either side of the machine, at the back end, is attached a cheek or stand, R, which has a curved slot in it struck from the center of the shaft *a*. A box, *d*, (represented by dotted lines in Fig. 1,) is made to slide up and down in either of the said slots, one box on either side, the which are adjusted in their slots by means of screws L L and nuts G G, the lower end of the screws L L surrounding the shaft *f* of the cultivator-cylinder B, which shaft has its bearings in the said boxes.

O O are two wheels on the shaft *a*, fitted with studs or projections on their peripheries for meshing into chains F F, driving the cylinder B through smaller studded wheels E E on the shaft *f*.

The cultivator-cylinder B is provided with projecting curved V or other shaped shares, of any number in a series and of any number of series, the shares in each series being in a line parallel with the shaft *f*, and each alternate series being in the same transverse line of the cylinder B and centrally intermediate to the succeeding series, as seen more particularly in Fig. 2.

The rotary cultivator thus constructed is set in motion by the travel of the team yoked to the tongue H. The wheels A A rotate the cylinder B through the means already specified, which cylinder is adjusted higher or lower by the screws L L and other pertaining appliances referred to, as more or less cut is required, ac-

according to the nature of the work and soil being operated on; or when not plowing and simply moving the machine about, say, from field to field or farm to farm, the cylinder B may be altogether raised from the ground; and these actions of the cylinder are not attendant with any alteration in the stretch of the propelling-chains FF, as will be evident from the described contrivances carrying and connected with the cylinder, the curved slots in the cheeks or stands producing this effect and allowing of many facilities in the working of the machine.

The shares of the cultivator-cylinder B, thoroughly plowing, breaking, and harrowing the ground to any extent required, have the efficiency of their cut largely produced by the adoption, form, and arrangement of the spurs *b b*, which, by their radial and angular faces, as described, serve, as the machine travels forward, to establish fulcrum for the action of the shares or points of resistance against the earth, which will prevent the cultivator-cylinder and several wheels driving it from slipping back, the which they have a tendency to do through the resistance of the cut, and this particularly so in stiff or hard earths. The action of these spurs is more clearly seen in Fig. 1, wherein by red lines is represented one of the spurs leaving, while the adjoining one is entering, the ground. When the spurs arrive at a vertical position of their radial sides in the earth the resistance they exert against the ground, as produced by the shares, lies directly in a horizontal line, and in loose soil, where they sink deep, the adjoining spurs, by their radial and angular faces, divide the resistance in the best possible direction, assisting one another by the angular face of the one entering pressing the earth against the radial face of the next one, and the spur leaving the earth having a similar advantageous effect upon the one following it. Spurs of this shape I have found by actual experiment work better than spurs made straight or beveled on both sides, which latter shape produces a tendency to raise the machine, that in consequence requires a heavy dead weight to keep it down, the which I propose to obviate, building the machine light so as to economize labor by reducing strain upon the draft, and employing loose weights to weigh down the framing when cutting deep and working in particular soils. This may be done by having a box on the machine in which to put stones or any other heavy convenient material. I propose also to put the wheel D on a swivel to facilitate turning.

The distribution specified of the plowshares and mode of driving them through the resistance thrown against the spurs *b b*, shaped and arranged as described, keep up a continuous and powerful cut sufficient to plow and break the ground to any required extent, which has never hitherto been done by revolving shares,

they having only been found able to harrow, and for this purpose have been arranged round shafts, one in rear of the other, thereby giving inconvenient length to the machine, and, where the surface of the ground is undulating, cutting deeper at one part than another, so as in some places to break only the upper surface, whereas by my arrangement and mode of operating the plowshares an equal cut of any required depth is procured and the ground thoroughly plowed and broken, the lower as well as the under soil being pulverized. Thus may fresh or unbroken earth be plowed by the rotary shares where formerly plowed ground, by the same devices, only could be harrowed, the effective power of the team operating (through the wheels A A, fitted with spurs of the shape described) the rotary shares, thereby communicating sufficient force to produce the effect specified, which, except by complication of devices and heavy outlay for labor, could not be accomplished by manual exertion. The machine, too, as described, is simple in its construction, therefore cheap, and not liable to get out of repair.

I am aware that most of the parts contained in this description of my improved machine are not in themselves, separately considered, novel, but that they have singly, or more or less connectively, in similar machines, or others for a different purpose, been employed, patented, or used, such as the front running-wheel, D, in plows and cultivators, driving-wheels A A having spurs in various locomotive machines, chain-belts, and wheels for communicating motion, revolving shares in harrowing-machines; also, in harvesting and other machines, the curved slots and specified appliances for raising and lowering the shaft without affecting the stretch of the belt or belts. I therefore do not claim as new any of these parts separately considered, or irrespective of the manner or form in which I propose, in combination, to apply them, for the purposes and to produce the advantages specified; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

The construction of the teeth on the main or driving wheels of a chisel-formed bevel—that is to say, one face being a continuation of the line or plane of the radius of said wheel, while the other face is beveled to meet it at an angle somewhat less than forty-five degrees, for the purpose of striking into and taking a firm hold of the ground, in the manner and for the purpose set forth.

In testimony whereof I have hereunto signed my name before two subscribing witnesses.

PLEASANT E. ROYSE.

Witnesses:

OLIVER LESLEY,
EDWARD DOULIN.