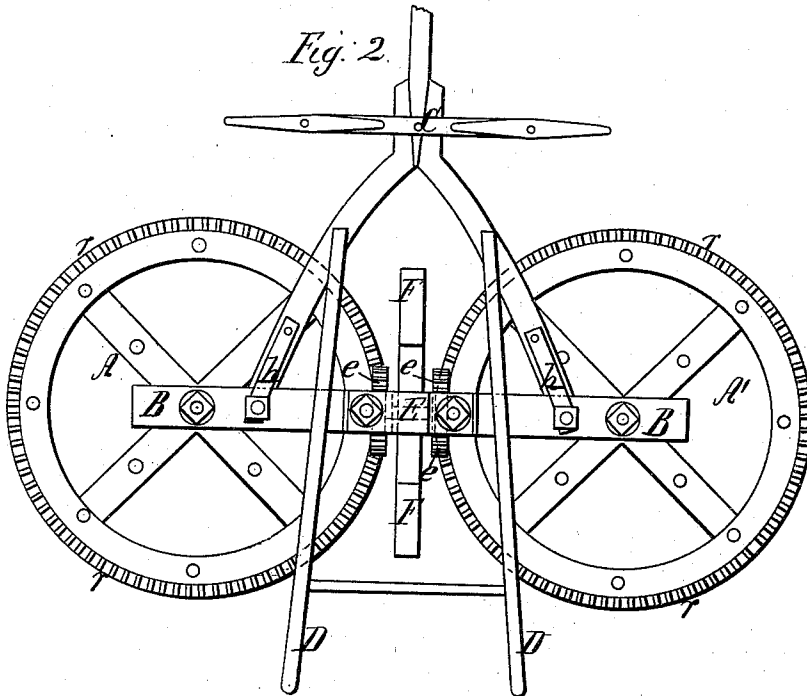
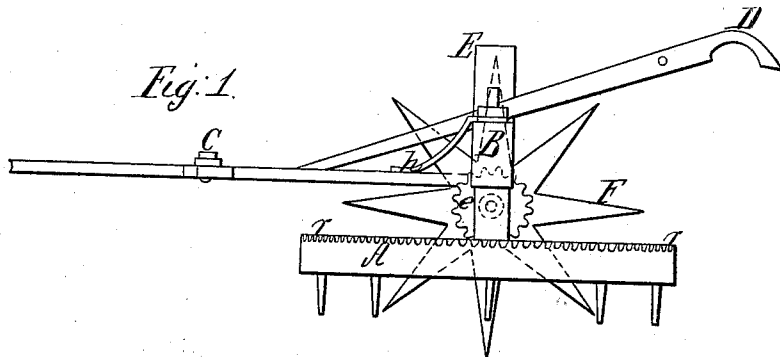


Lubolt & Trout,

Rotary Harrow.

No. 86,708.

Patented Feb. 9, 1869.



Witnesses;
C. A. Pettit
J. A. Green

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United States Patent Office.

SAMUEL LUBOLT AND JACOB TROUT, OF LYKENS, PENNSYLVANIA.

Letters Patent No. 86,768, dated February 9, 1869.

IMPROVEMENT IN ROTARY HARROWS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, SAMUEL LUBOLT and JACOB TROUT, of Lykens, in the county of Dauphin, and State of Pennsylvania, have invented a new and improved Rotary Harrow; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side elevation.

Figure 2 is a top view.

This invention relates to that class of double-rotary harrows in which two horizontal harrows are caused to rotate by means of a vertical wheel between them, and has for its object an improvement of the construction of such harrow, so as to render the whole instrument lighter, neater in appearance, and cheaper in construction than as it has heretofore been made, while operating in the field to better advantage.

To this end, the invention consists in rotating the two harrows by means of gear-wheels affixed to the sides of the vertical wheel, and operating against a cog-rim at the inner or adjacent edges of the harrows, whereby the long shaft heretofore employed is dispensed with, and a different and better motion is imparted to the two harrows, and whereby the form and construction of the frame of the instrument, and the various details of its several parts, can be greatly simplified, so as materially to reduce it in size and weight.

In the drawings, A A' represent the two revolving harrows, attached by vertical journals, or spindles, to a cross-bar, B, which is drawn along by means of a tongue, C, the harrow being guided and controlled by means of two handles, D D.

The cross-bar B is made in two parts, separated a few inches at the centre of the machine, directly behind the tongue, the two parts being connected by an arched metallic yoke, E.

This arrangement is for the purpose of accommodating a vertical spur-wheel, F, which rotates upon a short, stout shaft, having its bearings in lugs depending from the under surface of the cross-bar B, directly over the inner edge of the rims of the wheels A A'.

The rims of said wheels are, on their upper side and at their outer edge, provided with a row of cogs, *r r*, which gear with small pinions *e e*, attached to the shaft of wheel F, on each side of the latter, and close to it, or attached to the side of the wheel F itself.

Braces *h h* may be employed to strengthen the ap-

paratus, and more firmly connect the cross-beam and tongue.

The great advantage in this construction consists in dispensing with a long shaft, and employing the short one, which carries wheel F, for the purposes above described. This enables the frame to be so simplified as to consist merely of a single cross-beam, with a tongue to haul it, and handles to guide it, and, at the same time, it dispenses with the greater part of the weight of the old shaft.

There is another and very important advantage gained by arranging the gear-wheels *e e* at the inner edges of the cog-rim *r*, instead of at the outer edges, as heretofore, namely, that, in the old instrument, the wheel F, moving, at *z*, in a forward direction, caused the two harrows to move, at *z z*, in the opposite direction. The consequence was that, when the latter caught a stick, stone, &c., and moved it back, the obstruction was liable to meet the harrow-teeth moving forward, and to break either them or the teeth of the central wheel.

In our improved harrow, however, the teeth of wheel F, on its under side, move in the same direction as the teeth on the adjacent edges of the two harrows, and any obstruction caught by one set of the teeth is impelled to the rear by each of the other sets also, instead of having its progress resisted by the others.

Having thus described our invention,

What we claim as new, and desire to secure by Letters Patent, is—

1. The arrangement of the two horizontal rotary harrows A A', vertical wheel F, and two pinions *e e*, close at the sides of the wheel F, and gearing with cog-rims on the wheels A A' in such a manner that, as the instrument is drawn forward, the under side of wheel F and the inner edges of wheels A A' all move in one and the same direction.

2. The arrangement of the cross-beam B, united, at the centre, by the arch E, the handles D D, the tongue C, and the braces *h h*, substantially as and for the purpose above described.

To the above specification of our improvement, we have set our hands, this 12th day of October, 1868.

SAMUEL LUBOLT.
JACOB TROUT.

Witnesses:

C. A. HARPER,
H. B. GARDNER.