S. HARTMAN.
Rotary-Harrow.

No. 200,656. Patented Feb. 26, 1878.

fig 1

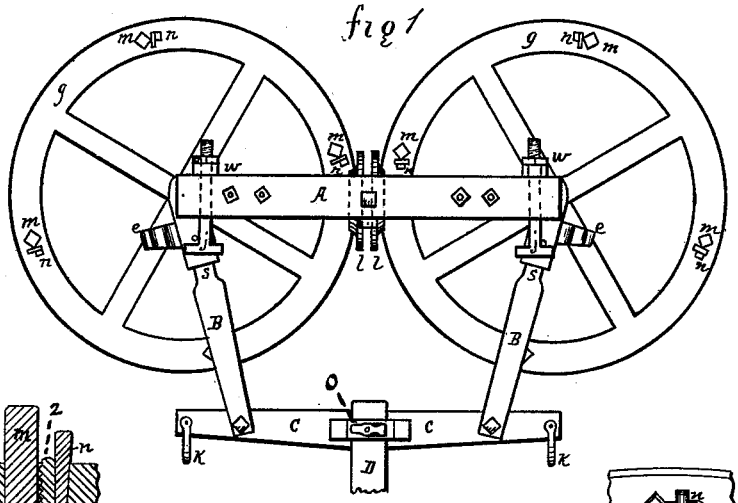


fig 4

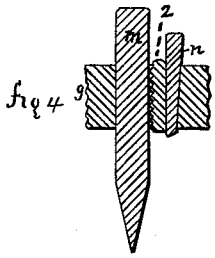


fig 5

fig 2

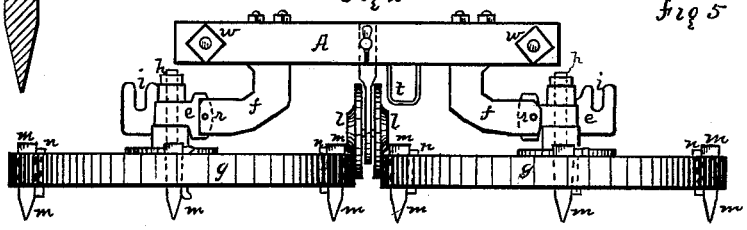
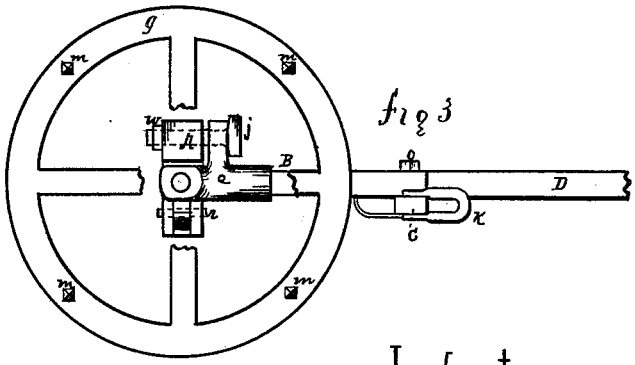


fig 3



Witnesses
A. P. Davis
B. L. Johnston

Inventor
Samuel Hartman
By A. L. Johnston
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UNITED STATES PATENT OFFICE.

SAMUEL HARTMAN, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN ROTARY HARROWS.

Specification forming part of Letters Patent No. **200,656**, dated February 26, 1878; application filed January 10, 1878.

To all whom it may concern:

Be it known that I, SAMUEL HARTMAN, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Rotary Harrows; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to that class of harrows in which the wheels are adapted to be changed from a horizontal to a vertical plane, whereby the harrow is converted into a vehicle.

My improvement relates to the construction and combination of mechanism for accomplishing the desired changes in such harrows, and also to an improvement in the mode of securing the teeth in the wheel.

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

In the accompanying drawings, which form part of my specification, Figure 1 is a top view of my improvement in harrows. Fig. 2 is a rear elevation of the same. Fig. 3 is a side view of the same converted into a two-wheeled vehicle, with a portion of the spokes of one of the wheels broken away. Fig. 4 represents a transverse section of the rim *g* of the harrow-wheel (enlarged) at line *y*, when the wheel is in a horizontal position. Fig. 5 is a detailed section of the same, representing a top view of the wheel in a horizontal position.

The frame consists of the bars A B C, pendants *f*, secured to the bar A and projecting below the same, and bearings *e*, which are hinged to the pendants *f* at *r*, and swiveled upon the axles of the harrow-wheels. The bars B are secured in sockets of castings or arms *s s*, the said arms being formed with eyes, whereby they are swiveled upon the axles of the wheels in the same way as the hinged bearings *e*.

According to my improvement the arms *s* are formed with side projections *i*, which have recesses formed therein, as shown in Fig. 2, and cross-bar A is provided with bolts *j*, which are adapted to engage with the said recesses of projections *i*, and thereby maintain the wheels in a vertical plane when such is desired.

The wheels *g* are armed with harrow-teeth *m*, which are secured and regulated in the rim *g* by a gib, (marked 2,) having a series of teeth in its face, which are forced against the corner or angle of the teeth by means of the key *n*, so as to make slight indentations in the tooth, and sufficient to hold the teeth in the rim *g*. The inner sides of the harrow-wheels are held down to their work through the medium of friction-wheels *l*.

To the cross-timber A, to which are attached the pendants *f*, is also attached a yoke, *t*, for the support of the tongue D, attached to the front bar C by loop and hammer *o*. To each end of the bar C is attached a clevis, *k*.

When the process of harrowing is over, in storing away the harrow, the hammer *o* is removed and the tongue D pushed back into the yoke *t*, which is an advantage in storing away the harrow.

Through the cross-piece A pass two key-head bolts, *j*. The projecting ears or portions *i* of the arm *s* are provided with a recess for the reception of the bolts *j*.

In changing the harrow into a wheeled vehicle, the wheels *g* are changed from the horizontal position represented in Figs. 1 and 2 into a vertical position, as represented in Fig. 3. When this is done the bolts *j* are placed in the recess of the ears *i* upon arm *s*, as indicated in Fig. 3, and are braced with relation to the cross-bar A by screwing up the screw-nuts *w*.

From the foregoing description, and by reference to the accompanying drawings, the skilled mechanic will readily understand the construction and arrangement of the several parts of my improvement, and the relation that they bear to each other.

A harrow constructed as hereinbefore described will be of light draft, efficient in its operation of harrowing the ground, and convenient for transferring it from place to place.

Having thus described the nature, construction, and operation of my improvement, what I claim is—

In a rotary harrow which is convertible from a harrow into a vehicle, the arms *s*, with

sockets for bars B, and formed with the side projecting ears *i*, having recesses therein, in combination with the bar A, provided with bolts *j* and bracket *f*, with hinged bearing *e*, substantially as herein shown and described, and arranged to operate as set forth.

In testimony that I claim the foregoing I hereunto set my hand in presence of two witnesses.

SAMUEL HARTMAN.

Witnesses:
A. C. JOHNSTON,
WESLEY JOHNSTON.