

W. GRANGE.
Rotary-Harrow.

No. 36,345.

Patented Sept. 2, 1862.

Fig. 1.

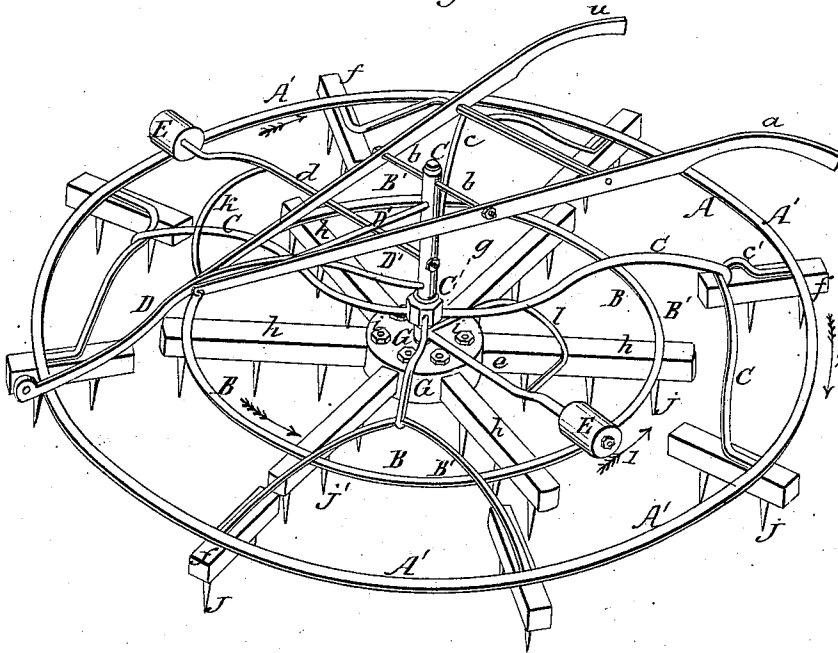
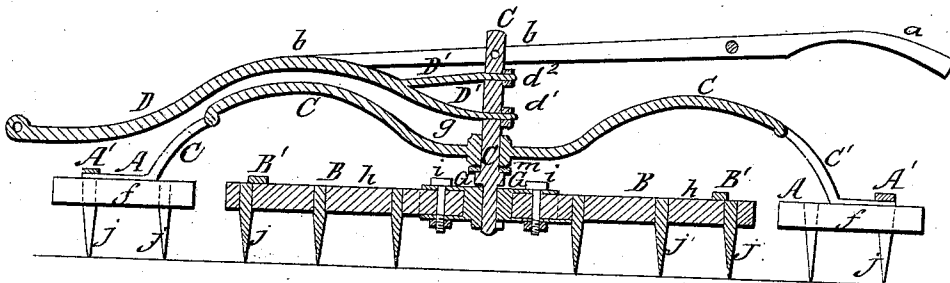


Fig. 2.



Witnesses:

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WILLIAM GRANGE, OF AUGUSTA, KENTUCKY.

IMPROVEMENT IN HARROWS.

Specification forming part of Letters Patent No. **36,345**, dated September 2, 1862.

To all whom it may concern:

Be it known that I, WM. GRANGE, of Augusta, Bracken county, and State of Kentucky, have invented certain new and useful Improvements in Rotary Harrows; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

My invention relates to harrows which have a rotary motion in combination with the forward or direct motion; and it consists in the arrangement of devices hereinafter described.

Figure 1 is a perspective view of my improved harrow. Fig. 2 is a sectional view lengthwise through the draft-beam and central stem.

The outer part of the harrow, A, consists of a metal ring, A', to which is secured a suitable number of short blocks, f, which are set radially, and which carry each a pair of harrow-teeth, j'. This part is connected with a central rotating hub, g, by the curved arms c, each of which branches at a convenient distance from the center into two arms, c', which are attached at their outer extremities to the blocks f, respectively, one arm attaching to each block.

The inner part, B, consists of the metal ring B', the radial arms h, to which the former is secured centrally, and the hub G. The arms h enter the hub G and receive the through-bolts i. The hubs G and g, which are the centers, respectively, of the parts A and B of the harrow, are forced to rotate on the central stem, C.

D is the draft-bar. It is bifurcated from a point near the central stem, C, and the two parts D' enter the central stem, C, and are secured thereto by the nuts d', as shown in Fig. 2.

a a are handles, which extend forward from the after side of the harrow, and, receiving a round, b, which passes through the upper end of central stem, C, unite at upper and opposite sides of draft-bar D, where they receive a through-bolt, b', by which they are firmly secured to central stem, C, and, projecting therefrom laterally or at right angles with the draft-line, carry a cylindrical roller, which rests as a weight on the circular ring A', and rotates thereon as the part of the harrow to which the ring A belongs is caused to rotate.

k is a stay, by which the arm d and its roller E are retained in a lateral position with reference to the line of draft.

e is an arm secured to C, and projecting therefrom in an opposite direction from the arm d. It carries a weight, F, similar to E, which rests and rotates upon the ring B' of the inner part of the harrow. The arm e is rendered more inflexible by the bow-stay l.

The form and arrangement of the arms c and the other parts which have been described are such that the outer part, A, of the harrow and the inner part, B, are both free to rotate around the central stem, C, without. A washer, m, is interposed between the central hub, g, and a collar upon the central stem, C. This may be renewed with another of a greater thickness, to compensate for wear producing inequalities in the level of the two parts of the harrow.

As the harrow is drawn over the ground by the draft-bar D the weight E, resting upon the ring A at one side thereof, as has been stated, causes the teeth upon that side to enter the earth deeper, and thus offer a greater resistance to the forward draft of the implement than is produced by the teeth upon the opposite side of the outer part of the harrow when no extra weight is applied; hence the forward motion of the weighted side is somewhat retarded, while the motion of the opposite to compensate for the same is accelerated, and thus the entire part A is caused to have a slow rotary in the direction indicated by the arrows; but the tendency of this unequal resistance would be to cause the harrow to deviate from its central draft-line to a line of central resistance. The draft would thus become indirect, and the draft-chain would interfere with the limbs of the animals, besides occasioning other obvious inconveniences. To compensate for this tendency to side draft the weight F, applied to the opposite side of the inner part of the harrow, produces precisely the same effect upon that part which has been described with reference to the weight E upon the outer part; but the weight F being upon the side opposite E, the tendency to side draft which it creates is in an opposite direction; hence the side draft promoted by the unequal resistance upon one part of the rotating parts of the harrow is counteracted by a corresponding tendency existing in the other rotating parts of the harrow exerted in an opposite direction. The implement is thus caused to follow the team in a comparatively true draft-line.

I am aware that rotary harrows consisting of two or more rotating parts or horizontal wheels rotating upon different centers have been used. I do not therefore claim the use of a harrow of two or more rotating parts, except when constructed as herein described; but

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

The peculiar arrangement of the arms *c* and *c'*, outer rotating frame, *A'*, and roller *E*, in con-

nection with the inner rotating frame, *B'*, and roller *F*, the two rotating frames being carried by and rotating concentrically in opposite directions upon the same central stem, *C*, as set forth.

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Witnesses:

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