No. 802,708. PATENTED OCT. 24, 1905.

B. F. POWERS & G. L. HOXIE.

ROTARY HARROW.

APPLICATION FILED MAY 18, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

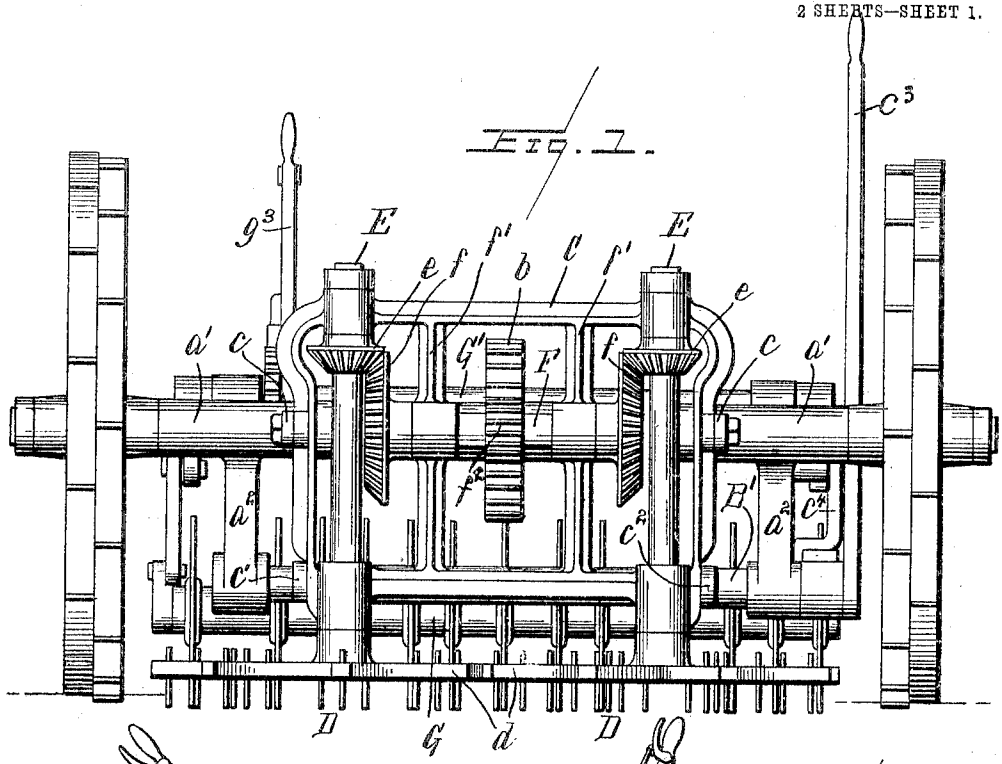
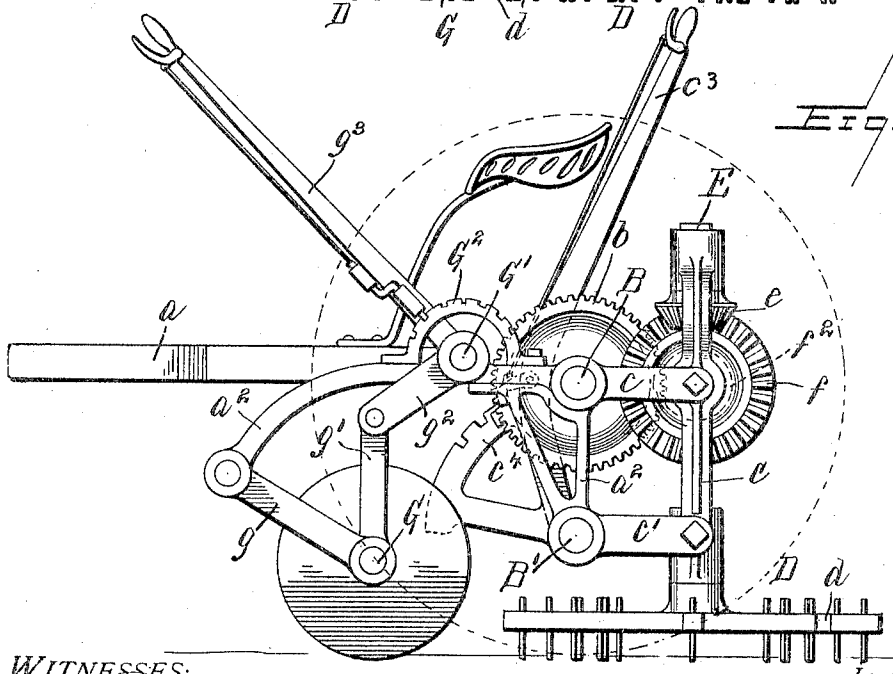


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 1.

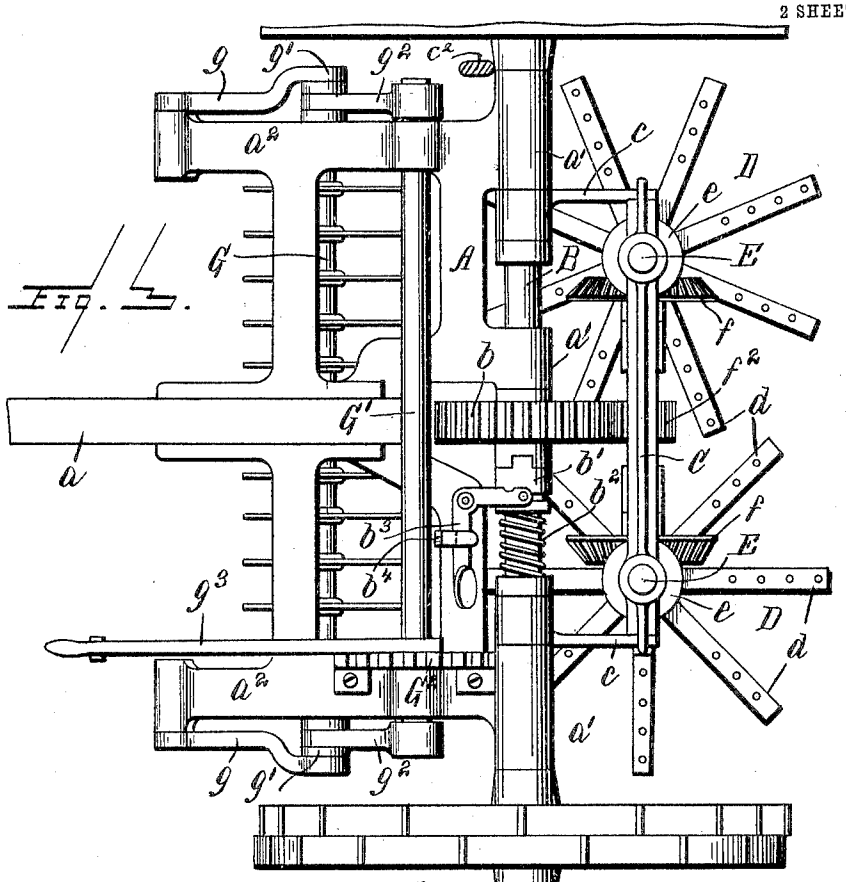
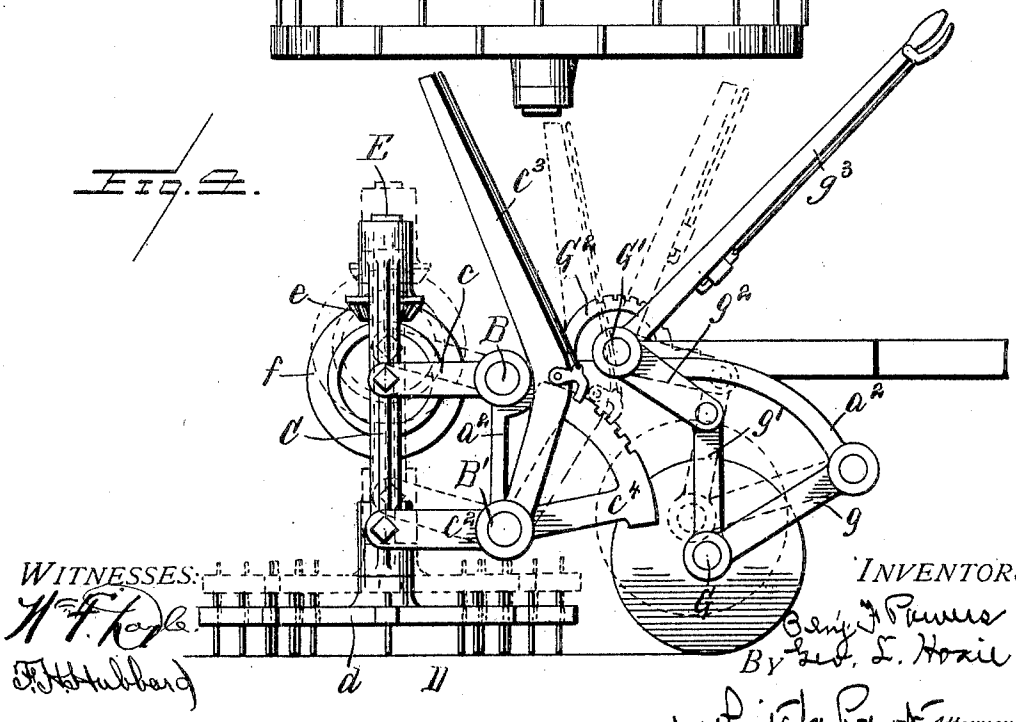


Fig. 2.



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ROTARY HARROW.

No. 802,708. Specification of Letters Patent. Patented Oct. 24, 1905.

Application filed May 18, 1905. Serial No. 261,091.

To all whom it may concern:

Be it known that we, BENJAMIN F. POWERS and GEORGE L. HOXIE, citizens of the United States, residing at Florence, in the county of Lauderdale and State of Alabama, have invented certain new and useful Improvements in Rotary Harrows; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our present invention relates to the class of harrows, and more particularly to the class of rotary harrows; and it consists in certain improved constructions and combinations of parts whereby a more efficient and durable harrow is produced.

In the accompanying drawings we have illustrated the best form in which we have contemplated embodying our invention, and the same is disclosed in the following description and claims.

In the said drawings, Figure 1 is a view of our improved harrow in rear elevation. Fig. 2 is a like view in elevation of the left side of the harrow. Fig. 3 is a top or plan view thereof, and Fig. 4 is a view of the right side of the harrow.

In the drawings, A is the main frame of the harrow, to which a tongue for the draft-animals is attached. The rear end of this frame is provided with bearings a' a' a', in which is journaled a shaft B and to which are secured the supporting and driving wheels. We prefer to connect the wheels to the shaft through the intervention of a ratchet-and-pawl construction, permitting the backward movement of the wheels without turning the shaft in the ordinary way adopted in other agricultural machines in order that the turning of the machine may be made as easy as possible.

At each side of the frame is a bracket a^2 depending therefrom, either integral with or secured to the frame, and in the lower ends of these brackets is journaled a shaft B'.

D D are two revolving harrows which are constructed of radially-disposed arms d, secured at their inner ends to a hub, which is in turn rigidly secured to the lower end of a shaft E. The arms d are provided with spike harrow-teeth and may, if preferred, be braced or connected by bars or rods extending from one to another. The harrow-shafts are journaled in a vertically-disposed frame C, and this frame is held in its upright position by links c c, one at each side, pivoted to the frame in line with shaft F, carried thereby, and upon the shaft B and by arms c' c^2, pivoted to the lower part of the frame C and rigidly secured to the shaft B'. The arm c^2 is an extension of the lever c^3, located at the right of the seat for the driver. This lever is provided with a pawl to engage a notched segment c^4, and by this lever the frame C and the harrows can be raised and lowered and when the pawl engages the segment the harrows will be held in a certain relation to the main frame and will engage the ground to the depth permitted thereby. This construction it is to be noted serves to maintain the harrow-supporting frame in a vertical position regardless of the degree it is raised or depressed.

Each of the harrow-shafts E is provided with a bevel gear-wheel e, which mesh with two bevel gear-wheels f f, rigidly secured to a shaft F, which is mounted in two standards f' f', connecting the upper and lower cross-bars of the frame C, and is provided centrally with the spur-pinion f^2. This pinion meshes with the gear-wheel b, loosely mounted on the shaft B. The hub of the gear-wheel b and a collar b', constructed to slide upon but rotate with the shaft B, form the two members of a clutch construction, by which the gear-wheel b is made to revolve with the shaft B whenever it is desired to do so. The movable clutch member b' may be normally held by a spring, as at b^2, unless moved out of operative position by the foot-lever b^3, in which position it may be secured by the catch b^4 or a like retaining device. The links c c being pivoted upon the shaft B and to the frame C in line with the shaft F, pinion and gear are maintained in constant mesh regardless of the raising and lowering of the frame C.

The main frame A is also provided with the forwardly and downwardly extending extensions a^2, one on each side. To the extensions are pivoted links g g, in the rear ends of which are journaled the ends of the shaft G of a disk harrow. The ends of the shaft G are also connected by links g' g', which are pivotally connected to arms g^2 g^2 of a shaft G'. To this shaft is rigidly secured the arm or lever g^3, which is provided with a pawl to engage a notched segment G^2, mounted on the main frame at the left of the seat for the driver.

This arrangement enables the disk harrow to be raised or lowered at will and the depth of its working fixed, as the harrow can be retained in the position desired.

In the drawings we have represented the disk harrows as composed of flat disks with the shaft extending at right angles to the draft of the harrow; but it will be obvious that the disks may be made concavo-convex and the shaft set at an inclination to the line of draft, if this be preferred.

The two revolving spike-tooth harrows are connected with the devices for rotating them, that they move synchronously, and the arms *d* of the harrow-frames are made long enough to have their ends overlap in the center of the machine. This arrangement is only possible when the two harrows move in a fixed relation to each other. The two harrow parts are rotated so that the arms and spike-teeth move forwardly on the outer sides of the harrow and backwardly at the center of the harrow. As the entire harrow is also moving forward at the same time, the teeth at the central portion of the harrow do not move as far in respect to the ground as those at the sides of the machine. It is therefore arranged that a greater number of teeth shall engage the ground at this point, and the approach and receding of these teeth from the central line of the path of the harrow supplies this deficiency and equalizes the work of the harrow.

It will be seen that when desired to transport the harrow from one place to another both harrows can be raised out of contact with the ground and the spike-tooth harrow can be thrown out of operative connection with the shaft, so that they remain at rest when the harrow is thus moved.

The harrow is provided with a seat for the driver or operator, and said seat is secured in any of the well-known ways for securing a like seat on other agricultural implements or machines. Such seat is indicated in the drawings by the reference-letter H.

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

1. In a harrow, the combination with a disk harrow, of a horizontally-revolving spike-tooth harrow located in rear of the same, substantially as described.

2. In a harrow, the combination with the main frame and its supporting-wheels, of a disk harrow propelled from said main frame and a spike-tooth harrow horizontally rotated from the said supporting-wheels, substantially as described.

3. In a harrow, the combination with the main frame and supporting-wheels, of a disk harrow and a horizontally-rotating harrow following the disk harrow, both of said harrows being adjustable to different heights in a fixed relation to the main frame, substantially as described.

4. In a harrow, the combination with the main frame and supporting-wheels, of a vertically-disposed harrow-supporting frame, a shaft connected therewith by arms pivoted to said harrow-supporting frame near the lower side of the same, a lever for rotating said shaft and links controlling the position of the upper part of the said frame, substantially as described.

5. In a harrow, the combination with a main frame, supporting-wheels and shaft connecting the same, of a vertically-disposed harrow-supporting frame, gearing for rotating the harrows from the said shaft, means for raising and lowering the said harrow-supporting frame, including means for maintaining the harrow-supporting frame in a vertical position and maintaining the gearing on the shaft and on the harrow-supporting frame in operative relation, substantially as described.

6. In a harrow, the combination with the main frame, supporting-wheels and a shaft connecting said wheels, of a vertically-disposed harrow-supporting frame, a driving-gear on said shaft, a pinion on said harrow-supporting frame meshing with the gear on the said shaft, means for raising and lowering the said harrow-supporting frame, and maintaining it in a vertical position including links pivoted to said harrow-frame and upon the said shaft to maintain the said gear and pinion in constant mesh, substantially as described.

In testimony whereof we affix our signatures in the presence of two witnesses.

BENJAMIN F. POWERS
GEORGE L. HOXIE.

Witnesses:
SAMUEL H. MALONE,
JOHN L. MCCLURE.