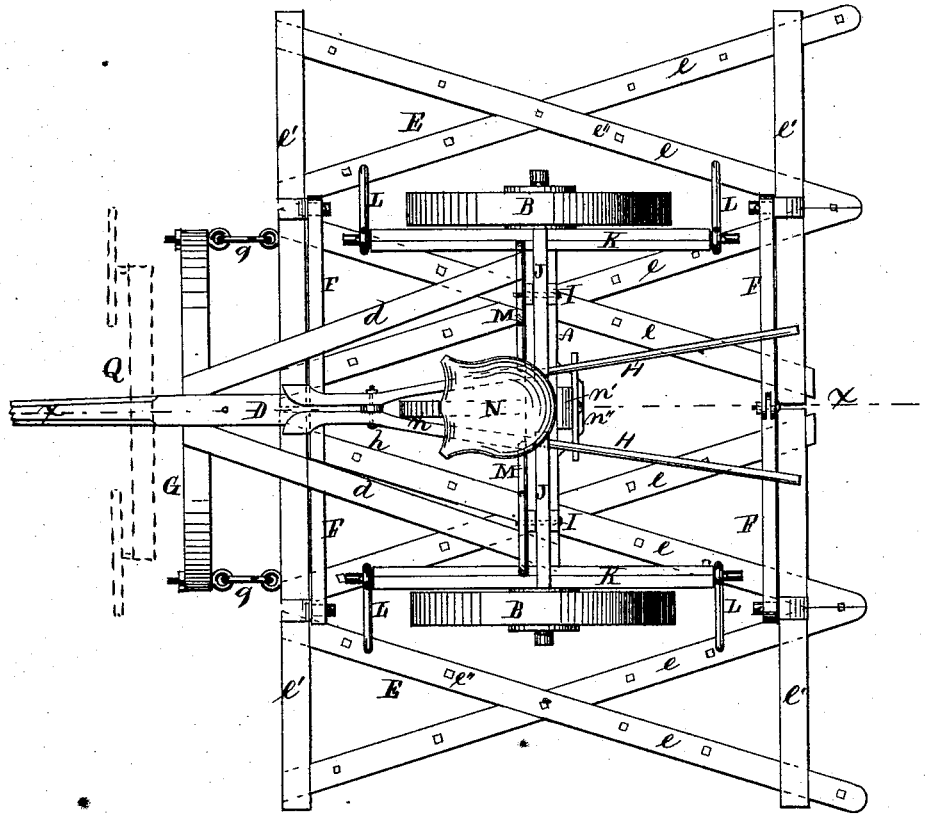
2 Sheets--Sheet 1.

J. KIMBALL.

Sulky-Harrow.

No. 160,335. Patented March 2, 1875.

Fig. 1.



Witnesses.

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D. G. Stuart

Inventor.

Joseph Kimball,

By W. B. Richards,

atty.

2 Sheets--Sheet 2.

J. KIMBALL.

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Fig. 2.

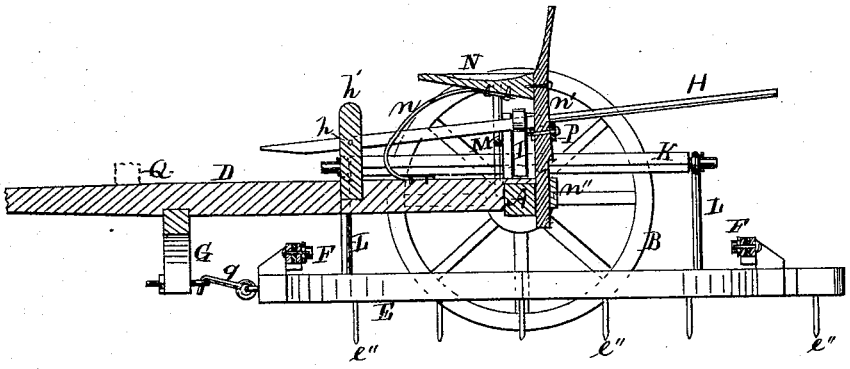
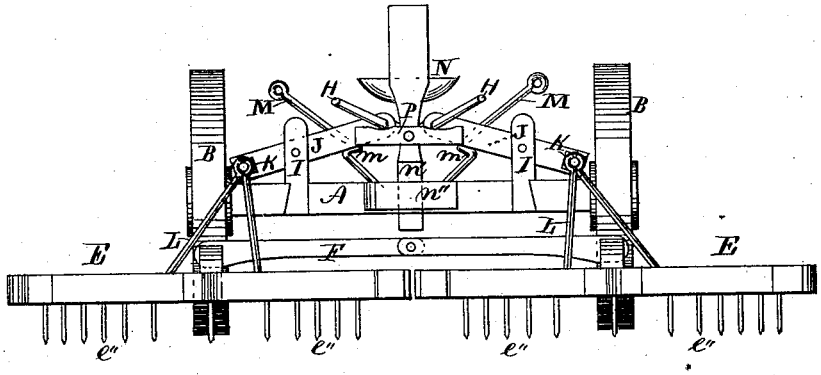


Fig. 3.



Witnesses
A. McWallum
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Inventor
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UNITED STATES PATENT OFFICE.

JOSEPH KIMBALL, OF PLEASANT HOME, NEBRASKA.

IMPROVEMENT IN SULKY-HARROWS.

Specification forming part of Letters Patent No. **160,335**, dated March 2, 1875; application filed January 6, 1875.

To all whom it may concern:

Be it known that I, JOSEPH KIMBALL, of Pleasant Home, county of Polk and State of Nebraska, have invented certain Improvements in Sulky-Harrows, of which the following is a specification:

This invention relates to that class of harrows which are supported on wheels, which also carry a driver's seat; and the invention consists in an arrangement of levers and connecting-rods by means of which the harrows, which are jointed or hinged to each other, may be raised or lowered, or the pressure on them regulated, all as hereinafter fully described.

To enable others skilled in the art to make and use my invention, I will now proceed to describe the same with reference to the accompanying drawing, in which—

Figure 1 is a top-plan view of a machine embodying my invention. Fig. 2 is a vertical sectional view on the plane of the line *x x* in Fig. 1; and Fig. 3 is an elevation, rear.

Referring to the parts by letters, letter A represents the axle; B B, the supporting-wheels, and D the tongue or draft-pole, stayed by ordinary hounds *d d*. E E are the harrows, formed of diagonal bars *e* and transverse bars *e'*, and provided with ordinary teeth *e''*. The harrows E are placed on each side of the machine, and in such a manner that one of the wheels B stands in the central part of each harrow. The harrows are connected to each other by bars F, which are pivoted to each other and to each harrow, so as to allow of independent motion to a certain extent of each harrow. G is a curved bar attached centrally to the tongue, and *g g* are links by which the harrows E are attached to the ends of the bar G. H H are levers, pivoted at *h* in a standard, *h'*, from the tongue. I I are standards projecting upward from each end of the axle. J J are transverse levers, pivoted centrally in the standards I, their inner ends journaled on the levers H, and their outer ends carrying each a bar, K. L L are rods journaled on the ends of the rods K, and their lower ends attached to the harrows. M M are catches, their lower ends pivoted to the axle A, and their central portions having catches *m*. N is the driver's seat, supported on a spring-bar, *n*, which rises and curves backward above the tongue, and is provided at its rear end with a vertical bar, *n'*, which extends downward and through a guide-loop, *n''*, on the axle. The bar *n'* is pierced with holes, through which a bolt may be inserted to secure a cross-bar, P, as shown at Fig. 3, when desired. Q is a double-tree mounted on the tongue, and to which the draft-animals are attached.

The operation is as follows: The driver from his seat may place his feet upon the levers H, in rear of their pivot-points *h*, and, by pressure thereon, may raise the harrows separately or both at once, and as desired, to pass over obstructions, or for other purposes, and may, in the same manner, raise them entirely above the ground and retain them there for transportation, &c., by pressing over the catch-bars M, so that the catches *m* will pass over the tops of the levers H.

When in operation it is desired to increase the pressure on the harrows, it may be done by the driver placing his feet on the levers H, forward of the pivot-points *h*, in which manner he may, by pressure with his feet, regulate the pressure on the harrows for hard places in the soil, and for other purposes.

The levers H extend back far enough so that the driver may walk and operate the machine by hand, in which case the bar P is put in place in such manner as to sustain a portion of the downward pressure on the levers H on the bar *n'*, and hence on the spring seat-bar *n*, giving the advantage of the spring-bar *n* thus to the easy motion of the harrows.

It will be obvious that, by hand as by feet, the rear ends of the levers H may be raised to increase the weight on the harrows.

By removing the harrow-teeth immediately in front and rear of the wheels B, the machine may be used as a corn-marker.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The levers H H and J J, arranged to operate with the bars K, rods L, harrows E E, axle A, and wheels B B, substantially as described, and for the purpose specified.

2. The driver's seat, combined with the levers H H and J J, bars K, rods L, harrows E E, axle A, and wheels B B, substantially as described, and for the purpose specified.

Witnesses: JOSEPH KIMBALL.
THOS. M. HOPKINS,
HOSEA FISH.