J. WOOLRIDGE.

HARROWS.

No. 184,489. Patented Nov. 21, 1876.

Fig 1

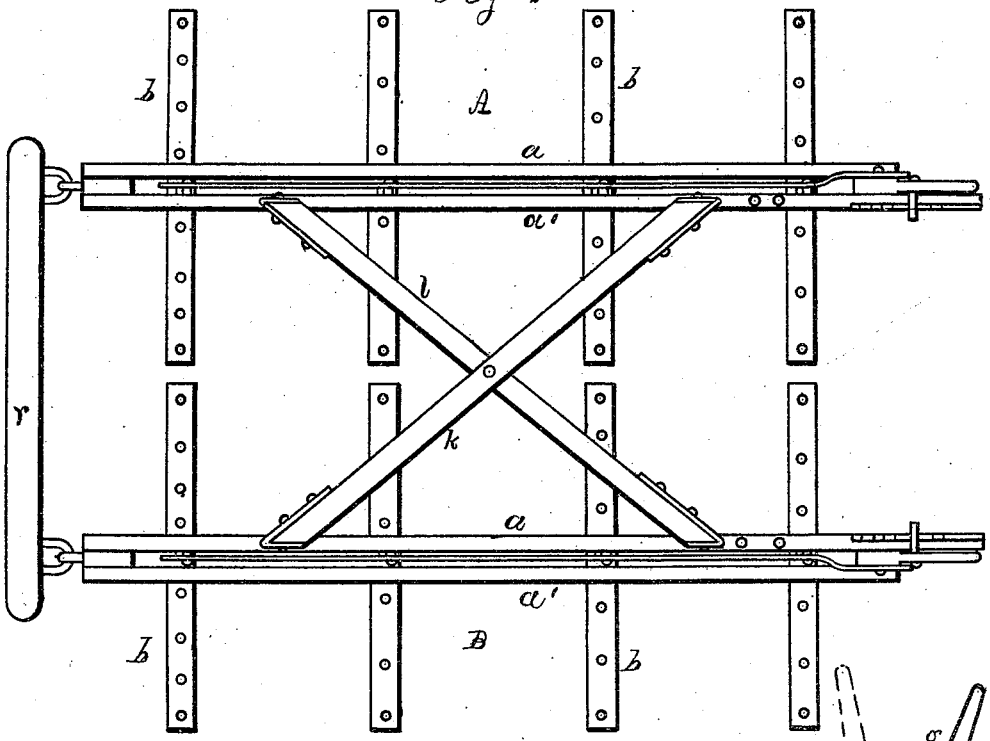


Fig 2

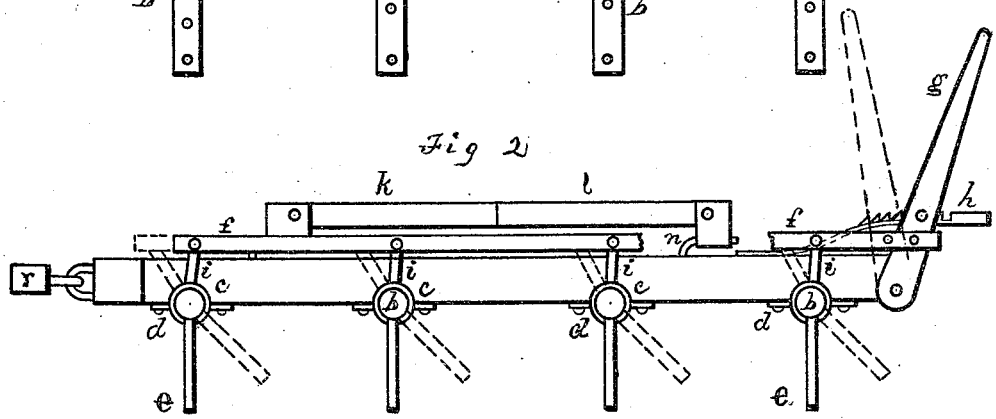


Fig 3

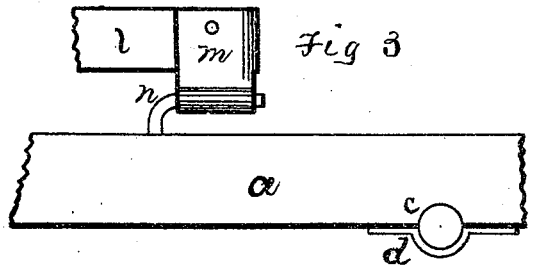
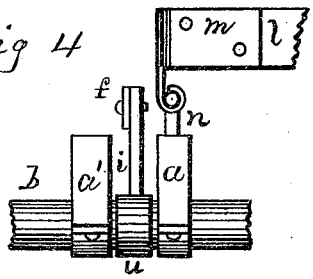


Fig 4



Witnesses,

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UNITED STATES PATENT OFFICE.

JOHN WOOLRIDGE, OF DEAN'S CORNERS, ILLINOIS.

IMPROVEMENT IN HARROWS.

Specification forming part of Letters Patent No. **184,489**, dated November 21, 1876; application filed July 20, 1874.

To all whom it may concern:

Be it known that I, JOHN WOOLRIDGE, of Dean's Corners, in the county of Lake and State of Illinois, have invented new and useful Improvements in Harrows, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view; Fig. 2, a side view, with the bar *a'* removed; Figs. 3 and 4, enlarged details.

It is desirable that the teeth of harrows be set at different angles, depending upon the nature of the soil and the work to be done. The chief objects of my invention are to so construct a harrow that the teeth can be readily adjusted at any desired angle, and to provide for the free movement of two single harrows constructed as described.

In the drawings, A B represent two single harrows, each consisting of a longitudinal bar, to which the cross-bars which carry the teeth are loosely connected. As represented, the longitudinal bar is composed of two parts, *a a'*, placed a little distance apart, with blocks between them at the ends. *b* are cross-bars, which carry the teeth *e*. They are round, and fit loosely in a circular recess, *c*, on the under side of the longitudinal bars *a a'*, and are held in place by means of the bearings *d* secured to the longitudinal bars, so as to permit the free movement of the bars *b*. *i* is a strong pin or post firmly secured to each of the cross-bars *b*. A collar, *u*, Fig. 4, may be secured to the cross-bars *b* between the two parts *a a'*, to prevent lateral movement. *f* is a longitudinal bar, to which the pins or posts *i* are pivoted. *g* is a lever, the lower end of which is pivoted to the longitudinal bars *a a'*, to which the outer end of *f* is pivoted. H is a spring-bar, provided with notches to hold the lever *g* in position. *k l* are two cross-bars, the ends of which are provided with sockets *m*, which slip over pins or rods *n*, which are secured to the longitudinal bars *a*. *r* is a draw-bar.

As shown in Fig. 2, the teeth *e* stand at right angles with the longitudinal bar; but, by means of the lever *g*, bar *f*, and pins *i*, the position of the teeth can be changed to any required angle, as indicated by the dotted lines, and when in position they will be prevented from moving by the lever *g* engaging with some one of the notches in the spring-bar *h*. At the same time the two harrows are so connected by the bars *k l*, sockets *m*, and pins *n* that they are loosely hinged together, and each is free to move independent of the other. As shown, the round bars *b* are placed at right angles with the longitudinal bars *a a'*; but they may be placed at a different angle thereto.

It is not essential to make the longitudinal bar of two parts, as shown, because the devices for changing the position of the teeth may be placed outside of the bar, if desired; but the construction described is preferred, among other reasons, because a better bearing is furnished with the same amount of material for the bars *b*.

It is evident that a single harrow may be constructed substantially upon the plan described.

The bars *b* might be connected with the longitudinal bars without providing them with the recesses *c*, suitable boxes being used.

This harrow may be constructed without the adjusting devices, in which case the cross-bars *b* may be permanently attached to the longitudinal bar. This construction will be found very cheap, and the harrow very efficient, its open form being well adapted to prevent clogging.

What I claim as new is as follows:

The sections A B, each having longitudinal central bars *a a'*, pivoted cross-bars *b*, with teeth *e*, in combination with the pivoted connecting-bars *k l*, and devices for changing the angle of the teeth, as and for the purpose described.

JOHN WOOLRIDGE.

Witnesses:

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