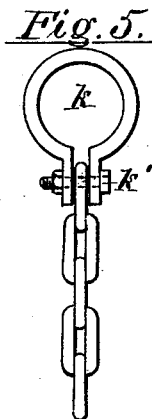
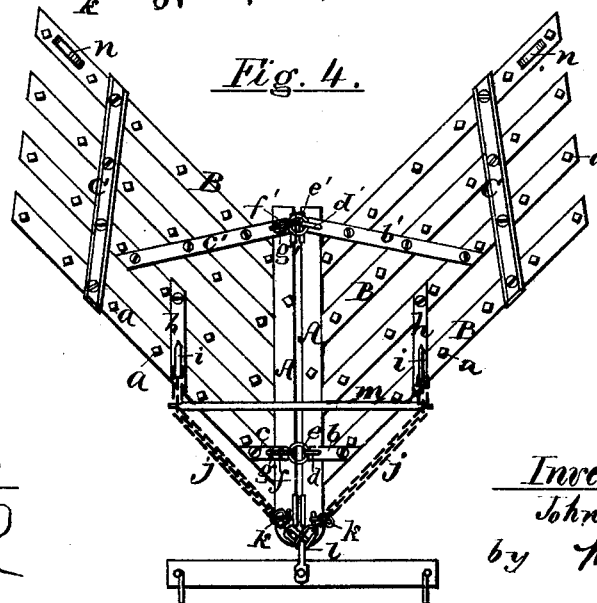
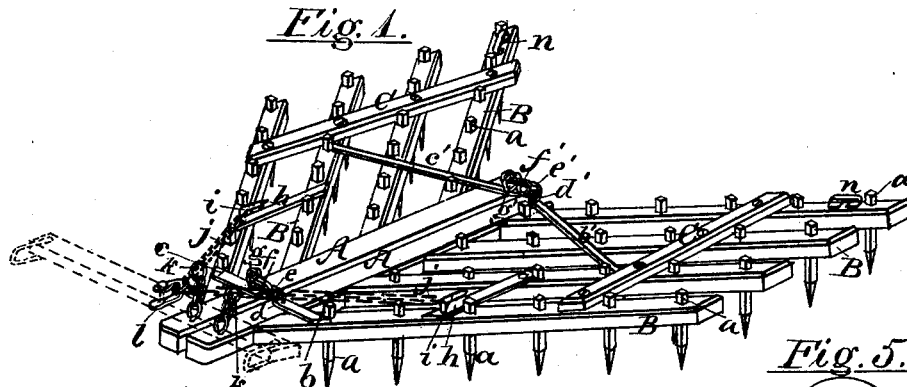
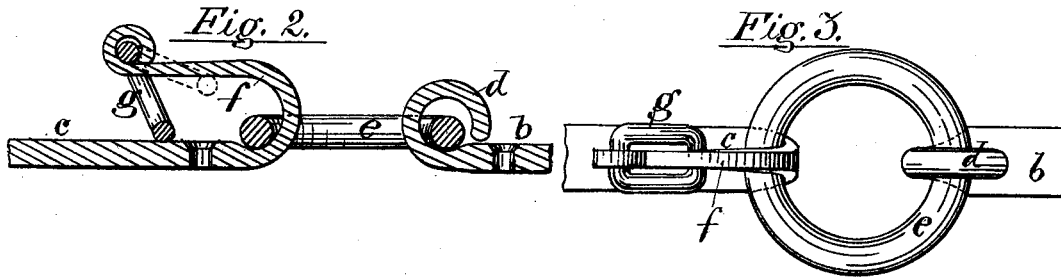


J. C. JOHNSON.  
Harrow.

No. 219,953.

Patented Sept. 23, 1879.



Witnesses:  
*Georgio*  
*J. H. Nixon*

Inventor:  
*John C. Johnson,*  
by *M. Bailey*  
his Attorney

# UNITED STATES PATENT OFFICE.

JOHN C. JOHNSON, OF BRANDON, OHIO.

## IMPROVEMENT IN HARROWS.

Specification forming part of Letters Patent No. **219,953**, dated September 23, 1879; application filed June 6, 1879.

### *To all whom it may concern:*

Be it known that I, JOHN C. JOHNSON, of Brandon, Knox county, Ohio, have invented certain new and useful Improvements in Harrows, of which the following is a specification.

My invention relates to that kind of harrow which is composed of two sections jointed together centrally or in the line of draft, and it has reference, principally, to the manner of constructing and hinging together the sections, and to the arrangement of the draft devices.

My improvements can best be explained and understood by reference to the accompanying drawings, in which—

Figure 1 is an isometric perspective view of a harrow embodying my invention. Fig. 2 is a vertical central section, and Fig. 3 is a plan, on an enlarged scale, of one of the slack coupling-hinges. Fig. 4 is a plan of the harrow, and Fig. 5 is an enlarged view of one of the guide-rings and a portion of its connecting-chain.

The two sections of the harrow are similar in construction and proportions. Each is composed of a head-piece, A, four slanting or inclined side pieces, B, and a brace-piece, C. The adjoining faces of the head-pieces A are shod at front and rear with metal plates to prevent wear. The slanting side pieces carry the harrow-teeth *a*, which are set in such manner that when the harrow is in use each tooth travels in a different path from the others. The harrow-sections are united by what I term a "slack coupling-hinge," and are thus hinged at two points in the present instance.

The front hinge consists of a metal bar or strap, *b*, which is bolted to the head-piece and first side piece of one of the sections, and a like bar or strap, *c*, which is united in a similar way to the head-piece and first side piece of the other section. The bar *b* is provided with the eye or closed hook *d*, which holds the coupling-ring *e*. The bar *c* is provided with the hook *f*, in which the coupling-ring catches. The rear hinge is the same as the front hinge, save that the straps or bars *b'* and *c'* are of greater length, and are bolted to the head-piece and to the three rear side pieces.

In order to prevent the coupling-rings from accidentally working or jumping out from the open hooks *f* and *f'* of the bars C C', I swivel

or joint to the end of each hook a link, *g g'*, or its equivalent, which, when the harrow is in use, drops down and closes the opened end of the hook. Whenever it is desired to separate the harrow-sections all that is necessary is to lift the section that carries the hooks *f f'* until it is nearly upright. In this position the links *g g'* will drop back against the upper parts of their hooks, thus leaving the way clear for the passage of the coupling-rings out from the hooks.

On each section is a draft-bar, *h*, which is bolted to the second and first side pieces, B, with the front bolt formed also with a hook, *i*, to receive the draft rod or chain.

It will be noticed that the bars or straps *b b'* *h* of the one section and the corresponding straps or bars *c c'* *h* of the other section brace and essentially strengthen their respective sections, acting, as they do, in conjunction with the brace-pieces C to give great solidity to the parts without materially increasing the weight or bulk of the harrow. The slack coupling-hinge not only acts as a joint to permit one side to tilt on it as an axis, but also, inasmuch as it is a slack connection, allows one section to rise or fall bodily above or below the plane of the other section. It also allows each section to tilt from front to rear independently of the other section. The draft chains or rods *j* extend from the draft-hooks *i* through the front guide-rings, *k*, to the clevis *l*. There are two guide-rings, one for each section, and each guide-ring is attached by a short flexible or chain connection, or its equivalent, to the front end of the head-piece of its section. The two guide-rings are close together, thus causing the draft chains or rods to converge and join the clevis at a point in the line of junction of the two sections. Each guide-ring, as shown in Fig. 5, is an open ring closed by a screw-bolt and nut, *k'*, which can be removed to permit the ring to be moved or changed from one to the other link of its connecting-chain.

The object of thus making the guide-ring adjustable is to provide for regulating the height of the draft-chains, in order to cause the harrow to run level—that is to say, to cause the harrow-teeth to cut to an equal depth at rear and front. This is regulated and deter-

mined by the distance the guide-rings are above the harrow; and it is for this reason that provision is made for vertical adjustment of the rings.

I have described one way of effecting the vertical adjustment, and this is with me the preferred way. It is, however, manifest that the adjustment can be effected in other ways, and by various mechanical expedients. A stretcher-rod, *m*, is employed to engage and hold apart the two chains near the draft-hooks, in order to prevent the two parts of the harrow from cramping or binding in the center. Handles *n* are provided on the rear of the harrow-sections, to permit either section to be readily lifted whenever necessary.

The harrow is well balanced, and the arrangement of the draft devices is such that it has what may be termed a "down-draft," which causes it to cut the ground much deeper than other harrows of the same weight. Each harrow-section is balanced from extreme front end of head-piece to extreme rear end of the last side piece, and as they are connected by a slack coupling-hinge, with the draft connected to and coming from each section separately, each readily adapts or adjusts itself to the ground, and is capable of all movement necessary for this purpose independently of the other.

I would remark in conclusion that the brace-pieces *C* may be either wood or metal. I propose to use for this purpose interchangeable brace-pieces—wooden brace-pieces, when the harrow is to be used for light work, and metal brace-pieces when it is to be used for heavy work or on stiff ground. These pieces will be properly notched and socketed or bored, so that they may be interchangeably applied to

the harrow-sections, and so that the same bolts or fastening devices may be used to secure either kind of brace-piece in proper place thereon.

When metal brace-pieces are used the draft chains or rods will require to be raised a little higher than when the wooden pieces are used to insure that the harrow shall run level; and the metal brace should at the rear end be made thicker, and extend back a little farther than at the front, in order to retain the balancing principle of the harrow. In this way the harrow will serve both as a heavy and as a light harrow.

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

1. The harrow-sections consisting each of head, slanting side, and brace-pieces, as specified, in combination with the front and rear straps or bars, carrying the hinges which unite the sections, and the draft straps or bars, the same being arranged to form a connected system of bracing, in the manner and for the purposes hereinbefore set forth.

2. In combination with the hinged harrow-sections, the draft-bars and hooks arranged on the sections, as described, the draft chains or rods, and the guide-rings, one on the front of each section, through which the said chains or rods pass, all arranged as hereinbefore shown and set forth.

In testimony whereof I have hereunto set my hand this 2d day of June, A. D. 1879.

JOHN C. JOHNSON.

Witnesses:

JOHN S. BRADDOCK,  
B. A. F. GREER.