

(No Model.)

2 Sheets—Sheet 1.

F. X. KRABACH.
HARROW FRAME.

No. 501,724.

Patented July 18, 1893.

Fig. 1.

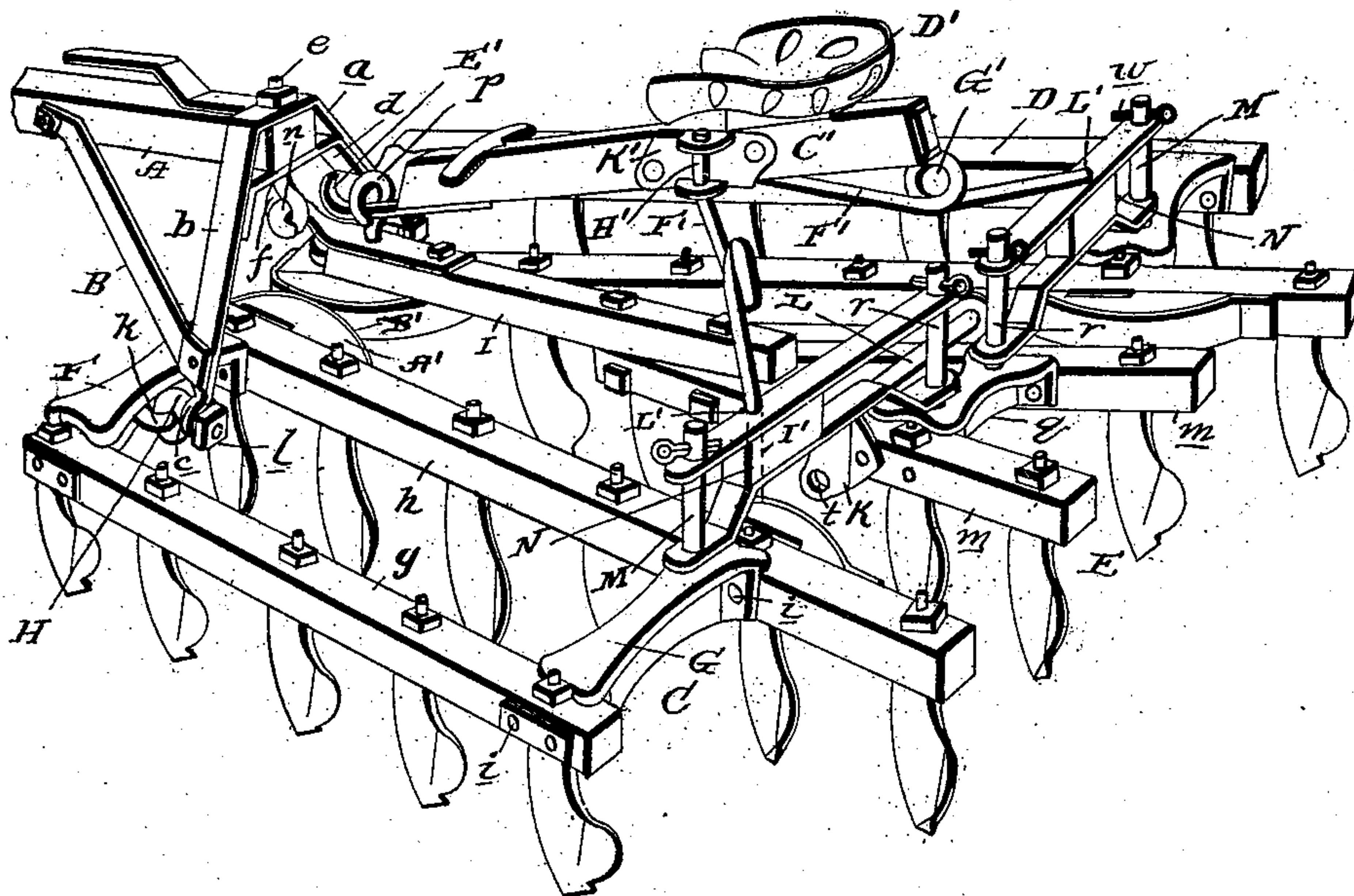
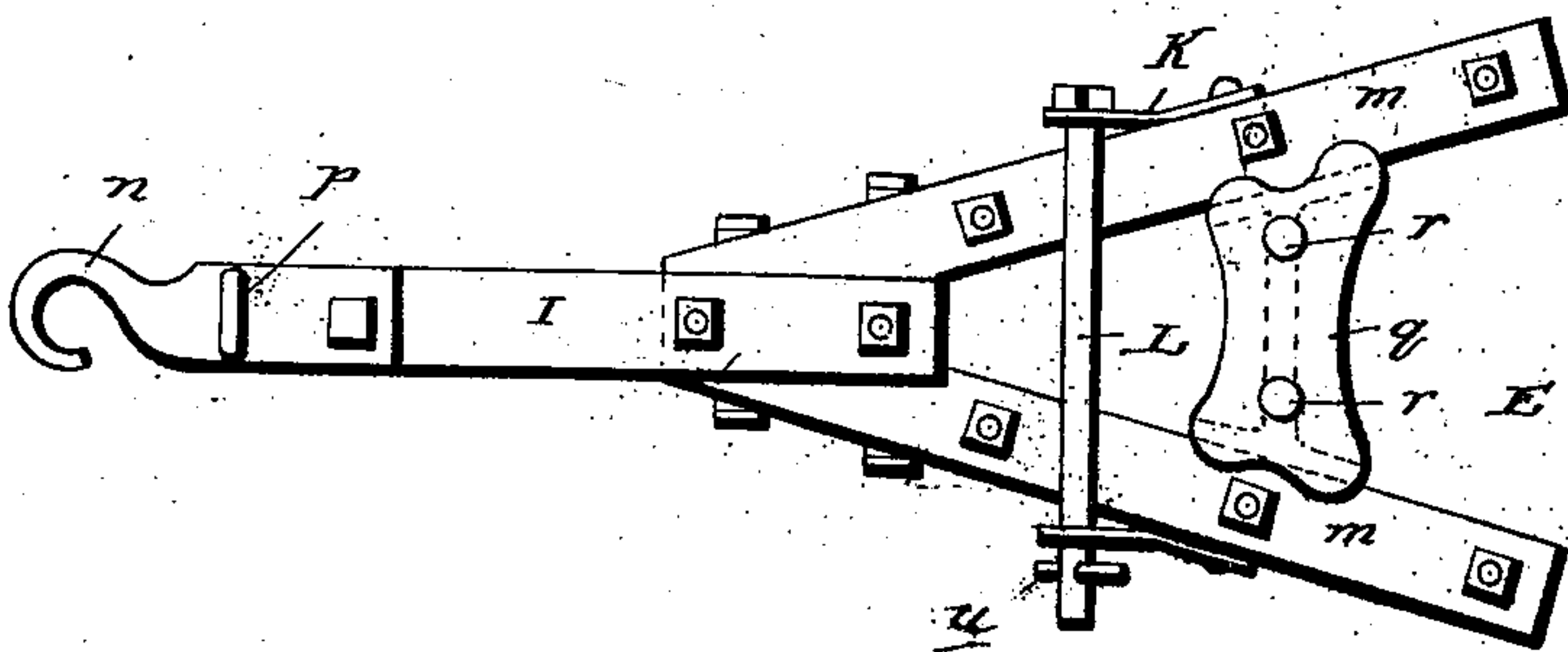


Fig. 2.



Witnesses:

C. H. Raeder
W. F. Matthews.

Inventor

Frank X. Krabach.

By James Shuey.

Attorney

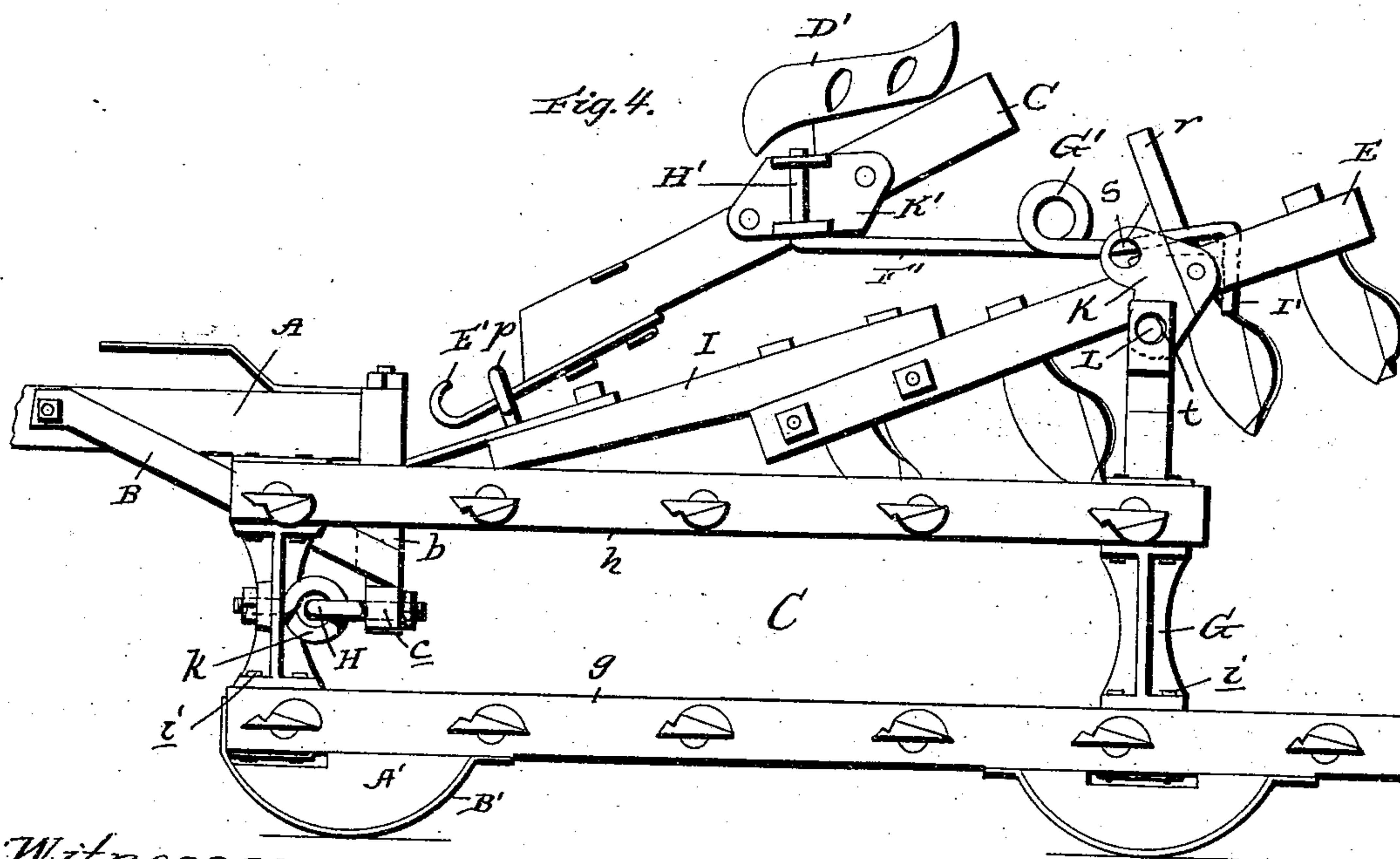
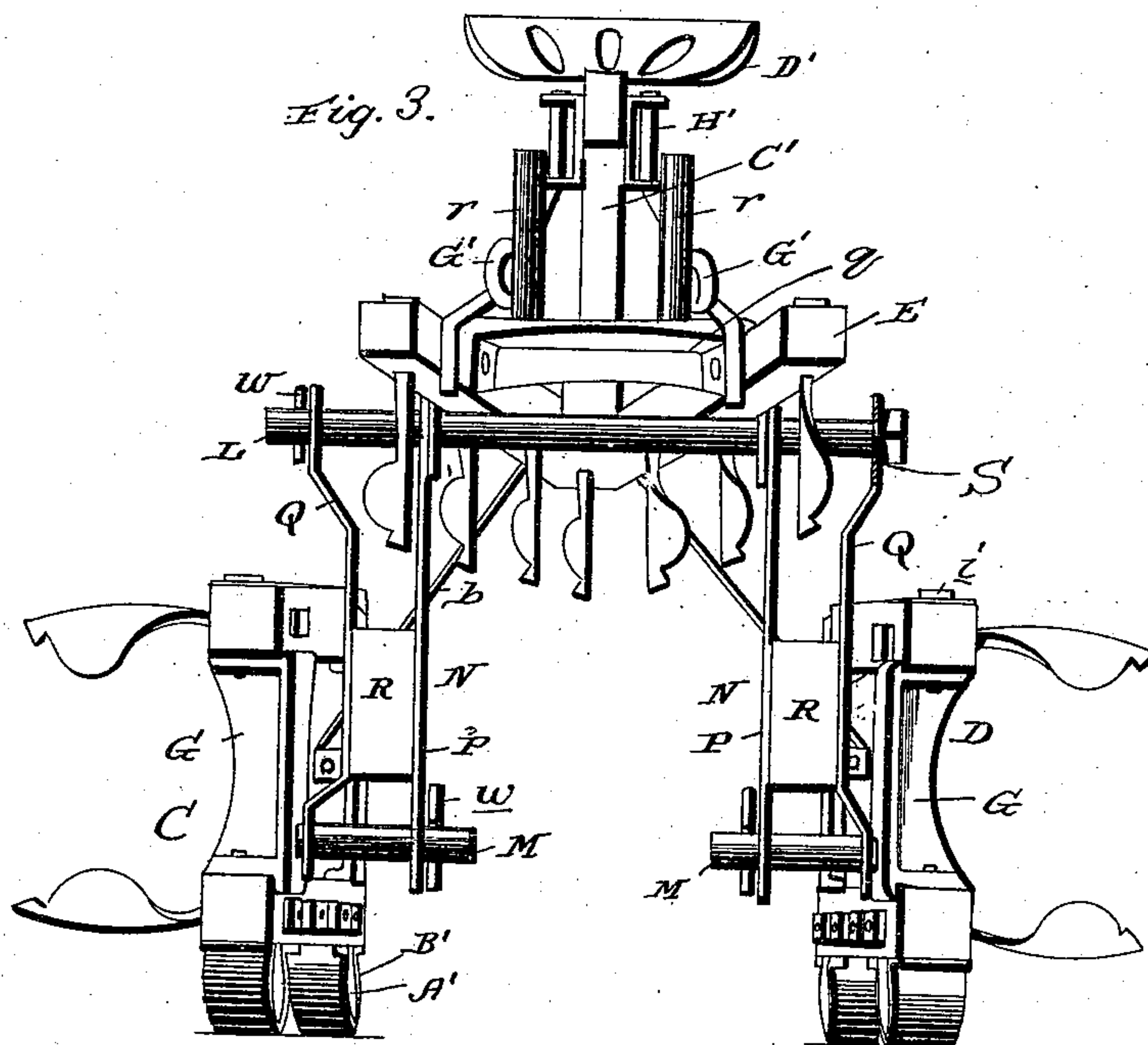
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UNITED STATES PATENT OFFICE.

FRANK X. KRABACH, OF DEFIANCE, OHIO.

HARROW-FRAME.

SPECIFICATION forming part of Letters Patent No. 501,724, dated July 18, 1893.

Application filed November 7, 1892. Serial No. 451,275. (No model.)

To all whom it may concern:

Be it known that I, FRANK X. KRABACH, a citizen of the United States, residing at Defiance, in the county of Defiance and State of Ohio, have invented certain new and useful Improvements in Harrow-Frames; and I do declare the following to be a full, clear, and exact description of the invention, such as it appertains to make and use the same.

This invention relates to improvements in harrows, cultivators, and crushers, and among other things it has for its object to provide a frame of a substantial construction, and one in which the forward portion will adapt itself to the unevenness of the ground, while the main or rear portion will remain stiff or uniform in its movements.

A further object of the invention is to construct the frame in sections and so connect the sections that they can be quickly and conveniently folded for storage or transportation, and when being moved from place to place, the inner beams of the outer or lateral sections will serve as runners for the entire device.

A further object of the invention is to provide a flexible and universal connection between the draft pole and respective sections of the frame so that each section will be allowed an unlimited and independent movement, and a further object of the invention is to provide means whereby the forward ends of the respective sections of the frame, are close together and may be allowed vertical play and bodily lengthwise movement, while the rear portions of said frame, will be so connected together as to move as a single frame, and thereby preserve a certain amount of stiffness or rigidity as it were, so that while the forward portion of the frame is adapted to give to the unevenness of the ground, the rear portions are wide apart and will move together when met with vertical resistance.

Other objects and advantages will appear from the following description and claims when taken in connection with the annexed drawings, in which—

Figure 1, is a perspective view of my improved device, showing the frame provided with harrow teeth and the tongue or draft beam partly broken away. Fig. 2, is a plan

view of the center or intermediate section of frame removed. Fig. 3, is a view of a rear elevation showing the same in a folded position, such as when stored away or in moving from place to place, and Fig. 4, is a side elevation of the parts folded, and the draft beam or tongue partly broken away.

Referring by letter to said drawings:—A, indicates the draft beam or tongue, there being but the rear portion illustrated. This draft beam has secured to its rear end an angular cross piece *a*, preferably composed of flat bar metal, although it may be formed of any suitable material. This angular cross piece which has its branches directed downwardly and outwardly from its point of connection with the beam, as shown at *b*, has its lower ends terminating in eyes *c*, and is braced in position by means of a plate *d*, which plate and the angular cross piece are secured above and below the rear end of the draft beam, by means of a vertical bolt *e*, which has its lower end terminating below said beam in an eye *f*, for a purpose which will be presently explained. Diagonal braces *B*, are provided for fixing the lower ends of the angular cross piece *a*, to the beam, as shown.

The harrow frame is composed of two similar outer or lateral sections *C*, and *D*, and a central or intermediate section *E*. The lateral wings or sections are composed of two or more longitudinal beams *g*, and *h*, which are parallel, or approximately so, and are secured together, at or near opposite ends by means of cross bars or plates *F*, and *G*. These cross plates are preferably composed of metal, and provided at opposite ends with flanges, whereby they are secured by means of bolts *i*, and nuts or other suitable fastening devices to said beams. The forward cross bars or plates *F*, are provided on their rear central sides with eyes *k*, which may be either formed in the plates or secured thereto by nuts or the like, and the lower ends of the angular cross head or bar *a*, are connected to said eyes by the employment of an eye bolt *H*, which is secured in the eyes on the lower ends of said angular branches by means of a nut *l*, or the like. It will thus be seen that the forward ends of the lateral wings or sections of the harrow frame, are connected with the draft beam and its angular cross head *a*, by uni-

versal joints, so that said forward ends may be allowed a rocking longitudinal and lateral motion, at their point of connection, while they may be allowed a bodily lengthwise movement independent of each other.

The central or intermediate section of the harrow frame is here shown as composed of two oblique or diagonal beams *m*, although it is obvious that more might be employed. These beams have rigidly secured to their forward ends a central longitudinal beam I, which is provided at its forward end with a hook *n*, designed to receive the eye *f*, depending from the rear underside of the draft beam so that said central or intermediate section will also have a universal and yet detachable connection with said beam, and the forward end of the beam I, is also provided with an eye *p*, for a purpose which will be presently explained.

The oblique or diagonal beams *m*, of the central section E, are firmly braced in position by means of a cross plate or bar *q*, and this plate is provided at a suitable distance apart with two upright fixed posts or studs *r*, which for the sake of cheapness may be cast integral with the plate. The beams *m*, are furthermore provided on their outer sides and slightly in advance of the cross plate, with vertically disposed plates K, which are each provided with two eyes *s*, and *t*, at varying altitudes; there being one set of eyes disposed opposite each other above the beams to receive a removable bolt or rod L, and another set of eyes disposed in a similar manner beneath the beams to receive the same rod or bolt when the harrow has been folded for transportation or storage, as will be presently explained; a cotter pin or key *u*, being employed for securing the bolt in position.

The plates or cross bars G, at the rear ends of the lateral wings or sections are also provided with vertically disposed fixed studs or posts M. The rear portions of the respective frame sections, are designed to be connected to each other in such a manner that each section may have a lengthwise movement independent of the other, but be prevented from lifting or moving vertically without effecting a similar movement in the other sections. The connections are preferably made by means of a pair of bars or straps N, and each of these bars or straps comprises a straight plate or bar P, and an angular plate or bar Q, connected together with a block R, interposed between them, and the said plates or bars are respectively provided at opposite ends with transversely arranged coinciding apertures or eyes S.

In using the harrow the eyes at the inner ends of the connections N, are placed over the studs or posts *r*, of the intermediate section and the opposite or outer ends of the connections are placed so that their eyes will receive the posts or studs M, rising from the lateral wings or sections, after which cotter pins or keys *u*, are placed in holes at the up-

per ends of the respective posts or studs, when a hinge connection is effected between the respective sections of the frame and at their rear ends. It will be observed however that the frame sections are prevented from vertical movement at their rear ends independent of each other; the play or movement being lengthwise only.

The inner sides of the inner longitudinal beams *h*, of the lateral wings or sections, are provided at or near their forward and rear ends with curvilinear blocks or shoes A', and these shoes are preferably faced with metal straps B', the whole being designed to form runners when the frame has been folded into the position shown in Figs. 3, and 4, of the drawings, such as when being transported or stored away.

C', indicates the seat beam. This beam carries the seat D', fixed to the upper side at its rear end and its forward end has fixed to it a hook E', which is designed to engage the eye *p*, on the beam I, of the intermediate frame section.

F', indicates two similar legs which are preferably composed of stout spring wire. These legs for the purpose of obtaining a spring for the seat are provided at a suitable point in their length with a coil or loop G', and one end of each leg, terminates in an upward angular branch H', and the opposite ends terminate in a downward angular branch I'. The sides of the seat beam have fixed to them, plates or castings K', bearing vertically disposed eyes, and the forward vertical branches of the legs are let into these eyes in a pivotal manner. After placing the hook E', in the eye *p*, of the intermediate section, the outer ends of the legs are placed in vertical holes L', of the connections N, so that they may be readily removed and the seat taken off when desired.

The frame being in a position for use, as shown in Fig. 1, of the drawings and it being desirable to transport the harrow, or place it away, it is simply necessary to detach the connections N, from the posts or studs of the center or intermediate section and after removing the outer ends of the seat legs from the holes in said connections, the center section should be raised and the lateral sections turned inwardly so as to have their shoes or runners bear upon the ground. The bolt L, is then removed from the position shown in Fig. 2, of the drawings, and placed in the eyes of the plates K, beneath the beams *m*, and through the eyes at the inner ends of the connections N, which connections have been swung vertically into the position shown in Fig. 3, of the drawings, and the bolt or rod thus secured in position. The rear branches of the seat legs are then placed on the inner sides of the beams *m*, above the plate *q*, and on the outer sides of the studs or posts *r*. The device may then be driven from place to place without operating in any manner whatever upon the ground, and it will also be found that

the parts thus connected will be held very secure and compact for packing or transporting.

I have not given any detail description of the harrow teeth which I have shown in connection with my frame, as such teeth form the subject of a separate application for patent, although it is obvious that teeth of any suitable form or character might be employed, or in using the device as a crusher, disks or rollers, or teeth in connection with disks, may be used, and it is also obvious that the frame may be made small or large and used as a cultivator with either one or two draft animals.

While I have described specifically and in detail the parts of the exact construction, and combination shown, yet I do not wish to be understood as confining myself to such precise construction or manner of connecting the parts, but I attach importance to the fact that the sections are so connected that while their forward ends may be allowed a universal movement, independent of each other, the rear ends are so connected that the lifting movement of one will similarly effect the other. The manner of folding the parts is another essential feature as it permits of holding them compact while occupying comparatively little space in shipment. The sections of the frame being close together at their forward ends and wide apart at their rear ends, it will be seen that it has no side draft when its sides cut through or pass over obstructions, which is an important advantage.

Having described my invention, what I claim is—

1. In a harrow frame, the combination with a central section; of two lateral wings or sections, having a universal connection with the draft beam or frame and close together at their forward ends, and a detachable hinged connection and wide apart at their rear ends, whereby said lateral sections may be turned on their inner sides and the rear connections made to secure the same in such position, substantially as specified.

2. The combination with a central section,

having the vertical studs or posts thereon; of the two lateral sections provided with shoes or runners on their inner longitudinal beams, and also having vertical studs or posts at their rear portions and connected by a loose or universal joint at their forward portions, and the detachable connection to take over the respective posts or studs and secure the sections together in a horizontal position, and also secure the lateral sections in a vertical position so as to bear upon their shoes or runners, substantially as specified.

3. The combination with the central or intermediate section; of the lateral sections, the connections for the rear portions of said sections, each having a vertical aperture, the seat having its forward end connected to the central harrow section, and the legs supporting said seat, and bearing in the apertures of the connections, substantially as specified.

4. The combination with the central or intermediate section, having the hook at its forward end, and the cross bar or plate at its rear portion provided with vertical studs or posts; of the two lateral sections adapted to be turned upon their sides and provided on their inner longitudinal beams with shoes or runners, and also having cross bars or plates at their rear ends carrying vertical studs or posts, and the respective sections connected to the draft beam at their forward portions, the connections for the rear portions having eyes at opposite ends to receive the respective studs or posts, and the plates on the intermediate section having eyes to receive a bolt designed to also take through the apertures in one end of the rear connection when the frame has been folded, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK X. KRABACH.

Witnesses:

F. L. HAY,
HATTIE BLAIR.