

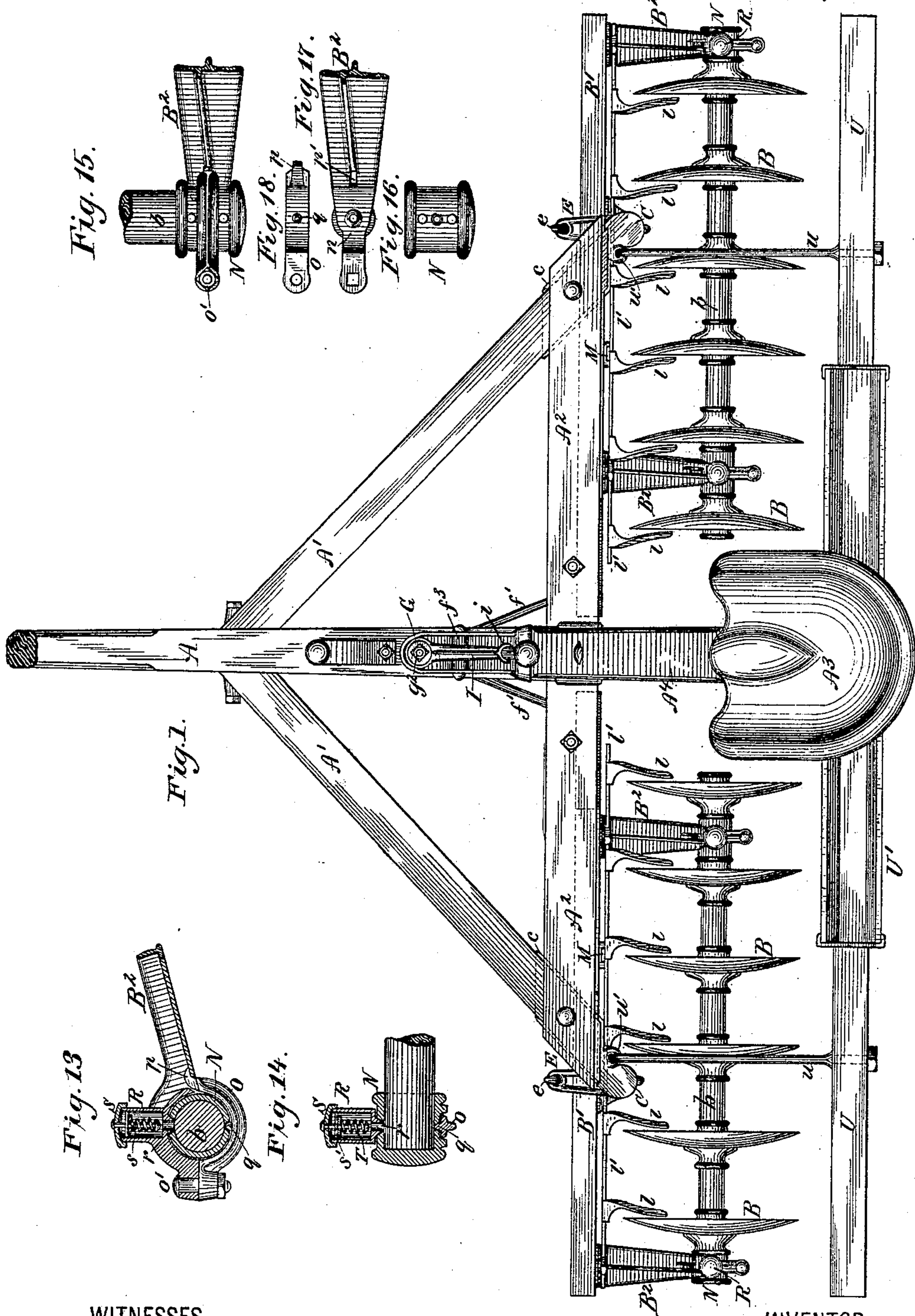
(No Model.)

3 Sheets—Sheet 1.

G. G. CROWLEY.  
DISK HARROW.

**No. 300,697.**

Patented June 17, 1884.



WITNESSES

Wm A. Skink.

H. W. Elmore,

INVENTOR

*George G. Crowley.*

*By his Attorneys*

Wilhelm & Bonner.

(No Model.)

3 Sheets—Sheet 2.

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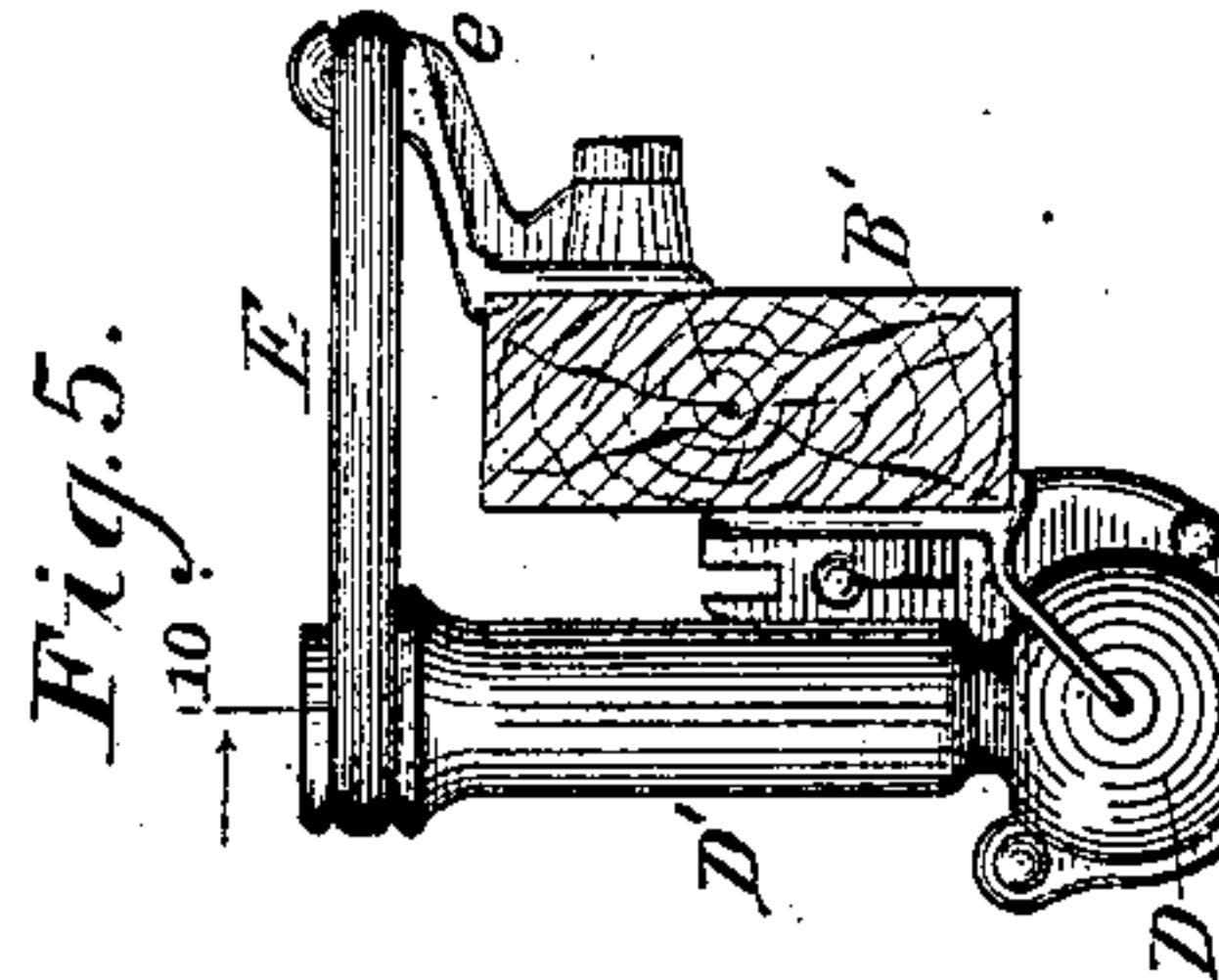
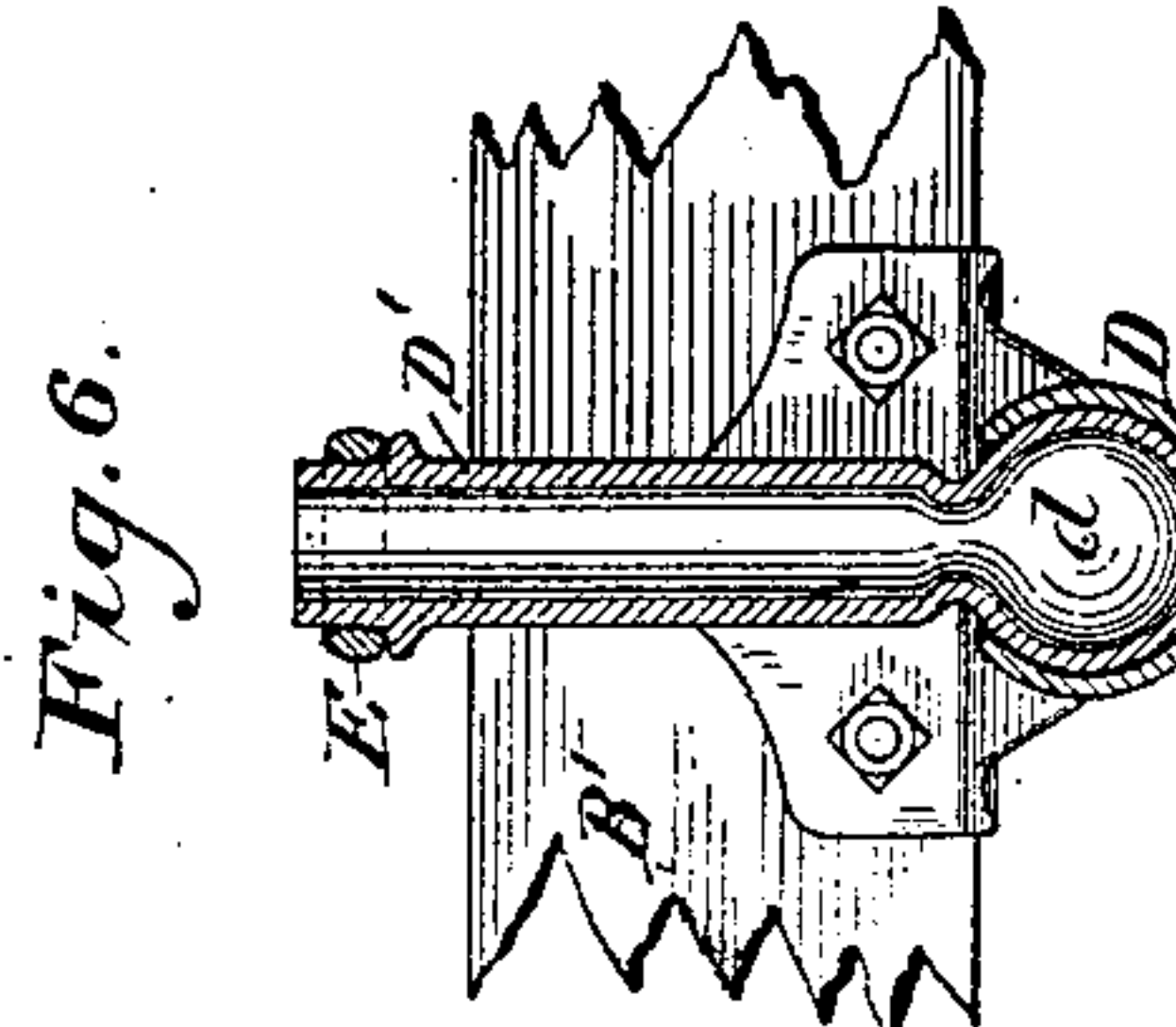
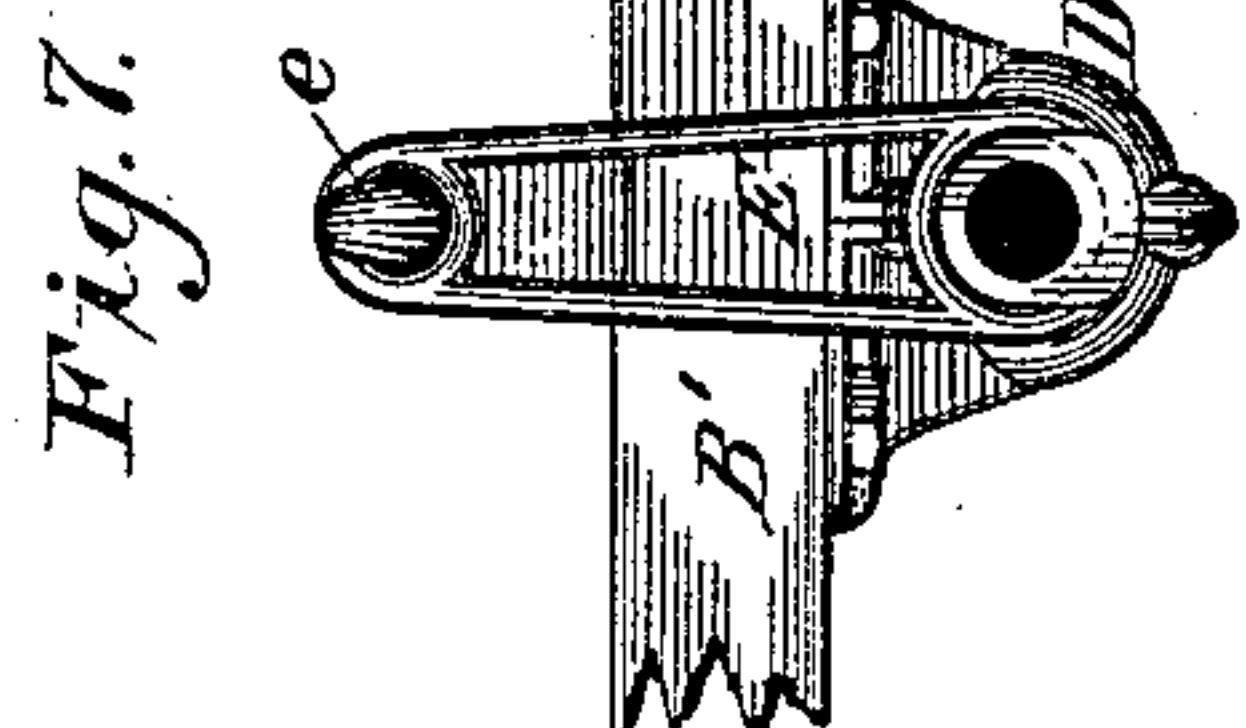
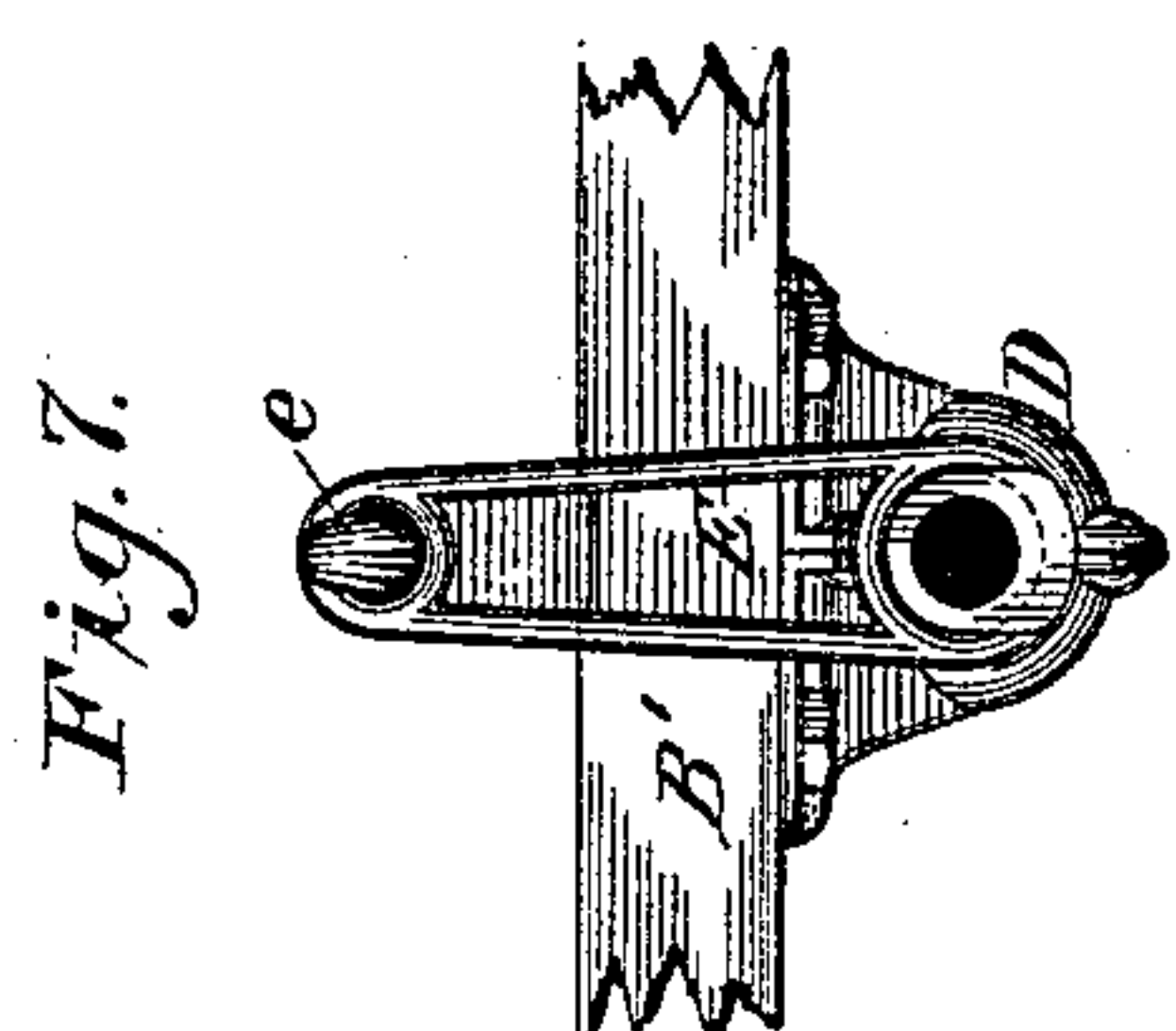
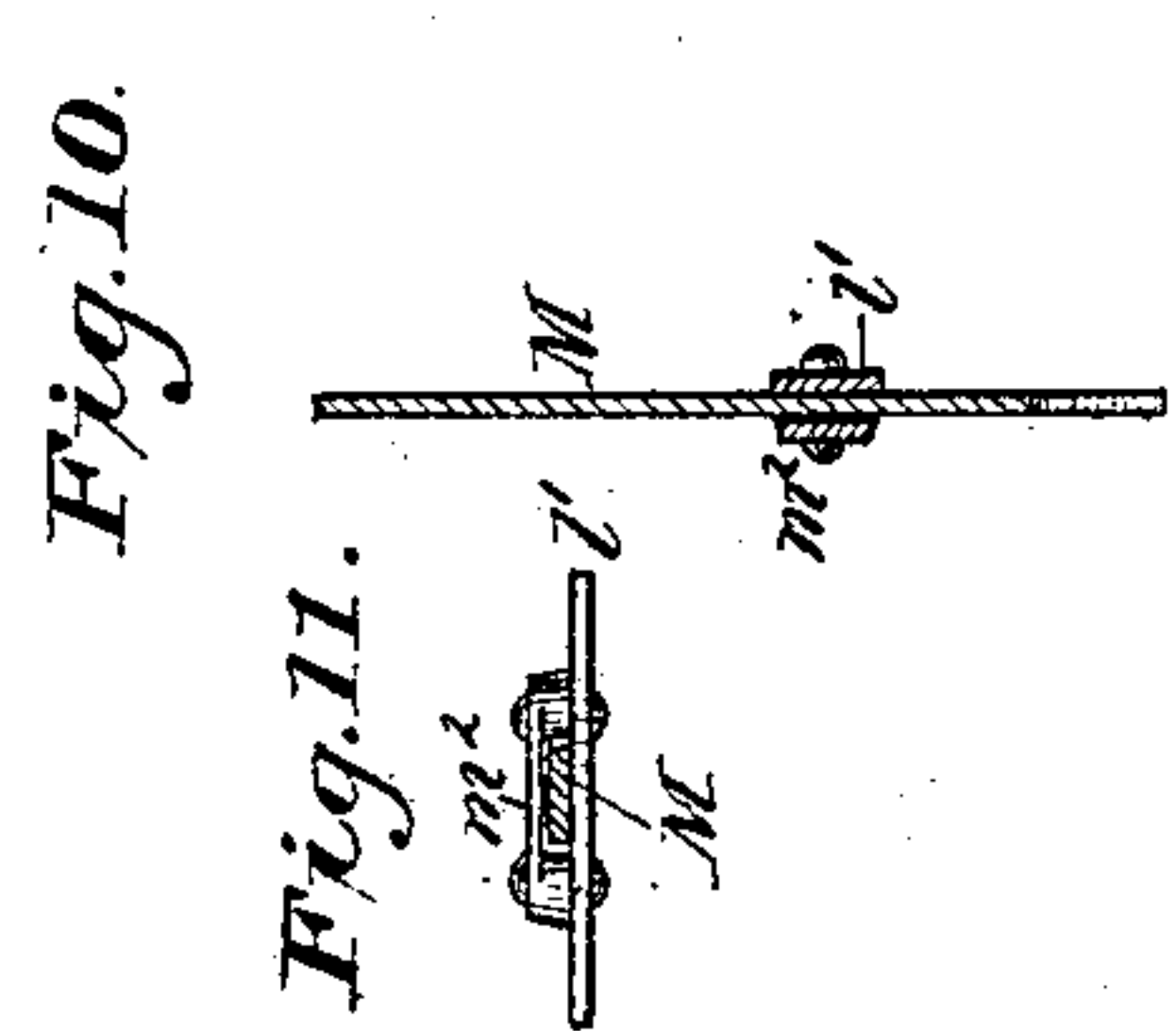
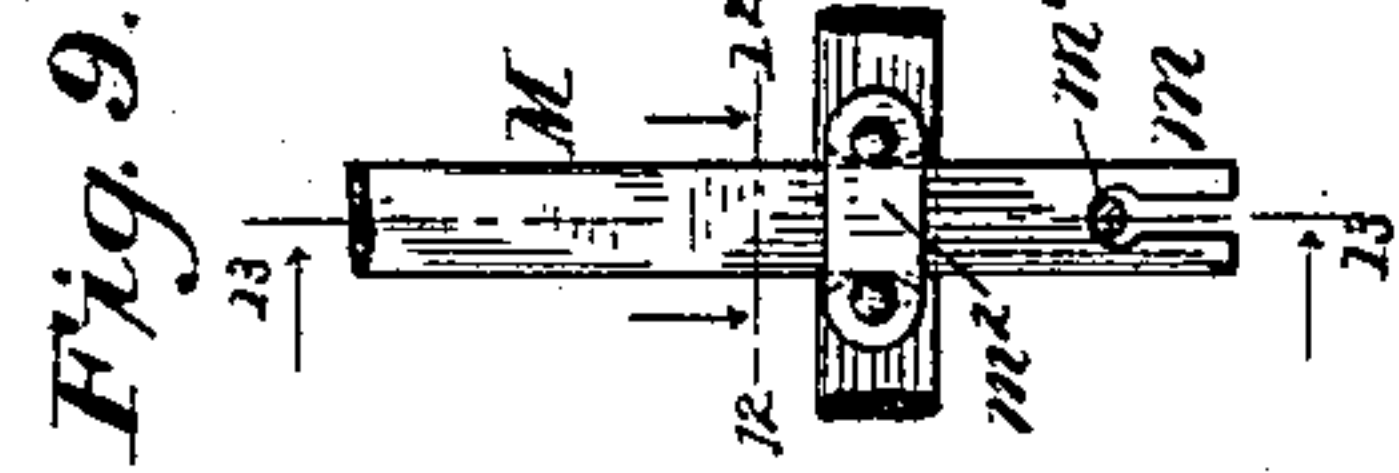
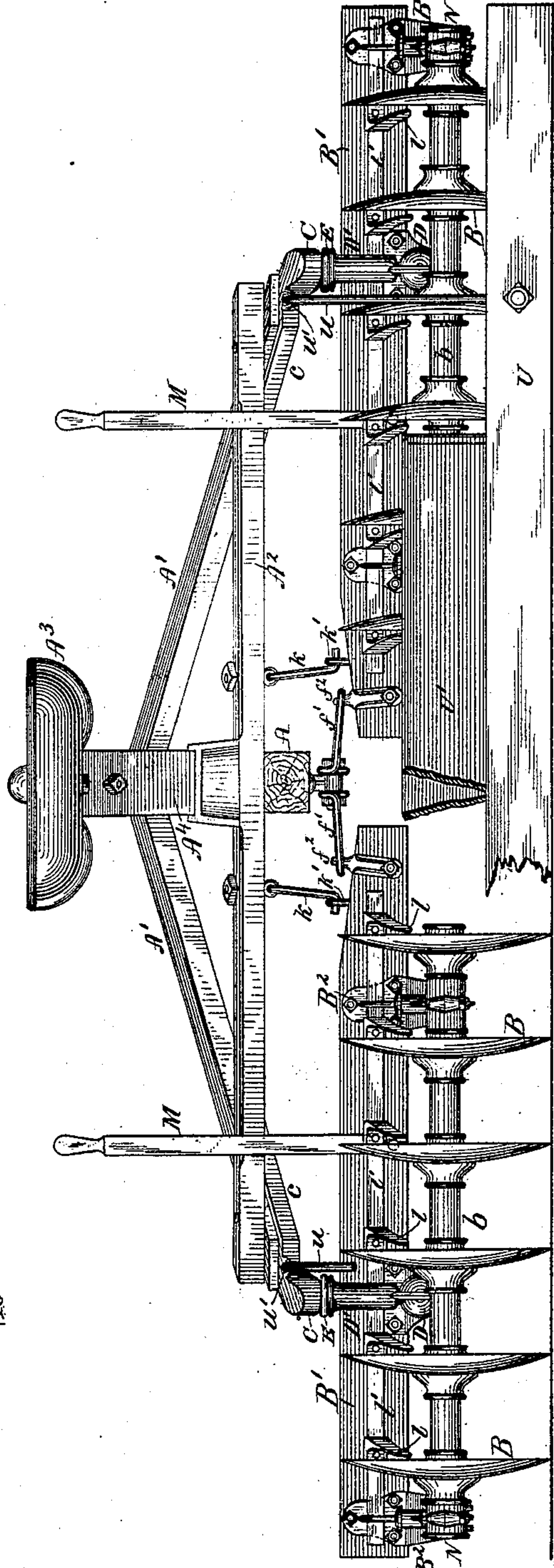


Fig. 2.



WITNESSES

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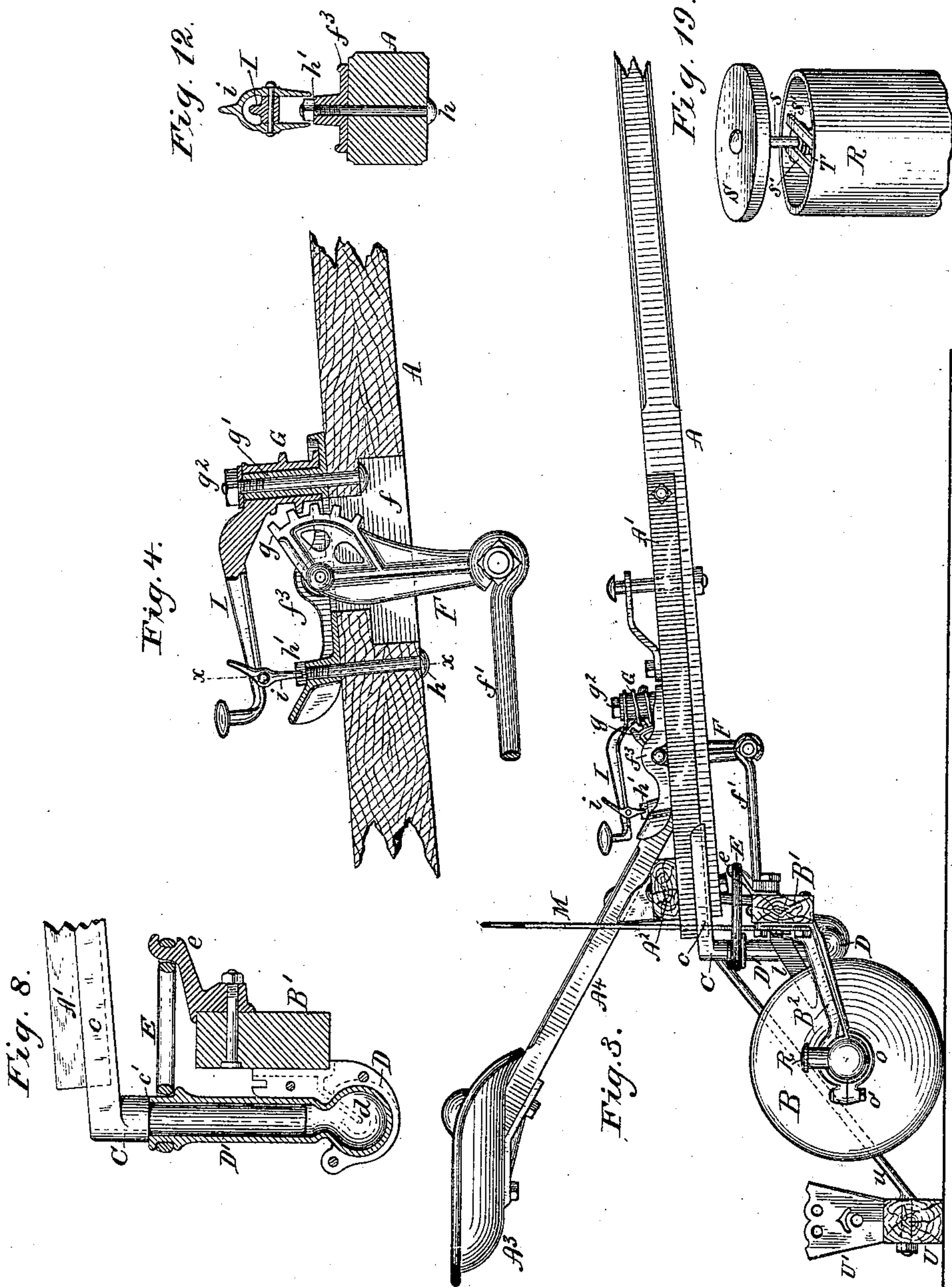
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# UNITED STATES PATENT OFFICE.

GEORGE G. CROWLEY, OF LITTLE FALLS, NEW YORK.

## DISK-HARROW.

SPECIFICATION forming part of Letters Patent No. 300,697, dated June 17, 1884.

Application filed December 12, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE G. CROWLEY, of Little Falls, in the county of Herkimer and State of New York, have invented a new and useful Improvement in Disk-Harrows, of which the following is a specification.

This invention relates to an improvement in that class of disk-harrows in which the disks are arranged in gangs attached to planks or bars which are connected with the main frame of the harrow by a movable joint, so that the gangs can adjust themselves to the inequalities of the ground.

The object of my invention is to improve the means whereby the disks are connected with the main frame, and by which the position of the disk-gangs is adjusted; also, in providing means for leveling the ridges which are produced by the revolving disks; and, finally, to provide means for keeping the journals of the disk-gangs oiled and excluding dirt from the journals.

My invention consists, to these ends, of the improvements in the construction of the harrow which will be hereinafter fully set forth, and pointed out in the claims.

In the accompanying drawings, consisting of three sheets, Figure 1 is a top plan view of a harrow provided with my improvements. Fig. 2 is a rear elevation with a portion of the leveling device broken away. Fig. 3 is a side elevation of the harrow. Fig. 4 is a sectional elevation, on an enlarged scale, of the device whereby the disk-gangs are adjusted. Fig. 5 is a side elevation of the socket attached to the gang-plank. Fig. 6 is a cross-section of the same. Fig. 7 is a top plan view of the same. Fig. 8 is a sectional elevation of the joint whereby the disk-gang is connected with the main frame. Fig. 9 is an elevation of the lower end of the lever whereby the scrapers are adjusted. Fig. 10 is a vertical section of the same, and Fig. 11 is a horizontal section thereof. Fig. 12 is a cross-section on an enlarged scale in line *x x*, Fig. 4. Fig. 13 is a cross-section, and Fig. 14 a longitudinal section, of one of the bearings of the disk-shaft. Fig. 15 is a bottom plan view of said bearing. Fig. 16 is a plan view of the bearing-box. Fig. 17 is a bottom plan view of the arm in which the bearing-box is seated. Fig. 18 is a top plan view of the cup which is applied to

the under side of the bearing-box. Fig. 19 is a perspective view of the oil-cup with the cover raised.

Like letters of reference refer to like parts in the several figures.

A represents the draft-pole, A' the diagonal braces, and A<sup>2</sup> the rear cross-bar, of the main frame.

A<sup>3</sup> represents the seat, and A<sup>4</sup> the inclined bar whereby the seat is supported on the main frame.

B represents the harrow-disks, mounted upon two shafts, *b b*, in a well-known manner; and B' represents the gang-planks, to which the gangs of disks B are attached by bracket-bearings B<sup>2</sup>, extending rearwardly from the gang-planks.

C represents downwardly-projecting pins secured to the rear corners of the main frame by flanged plates *c*, which are secured to the under sides of the rear portions of the diagonal braces A'.

D represents a spherical socket secured to the rear side of each gang-plank B', and D' is a pin-socket, which is provided at its lower end with a spherical knuckle, *d*, which is seated in the spherical socket D. The latter is rigidly secured to the gang-plank B', and the pin-socket D' is movably secured to the gang-plank by means of a link, E, which surrounds with its rear end the upper portion of the pin-socket D', and connects at its front end with a hook or eye, *e*, secured to the upper or front side of the gang-plank, as clearly represented in Figs. 5 and 7. The link E swivels on the hook or eye *e*, and permits the pin-socket D' to move in the spherical socket D when the disk-gangs change their position with reference to the main frame. The pins C are loosely fitted in the sockets D', as represented in Fig. 8, and rest on the upper ends of the sockets by means of shoulders *c'*, formed on said pins. The pins C and sockets D' may be round or square in cross-section, as may be preferred. When the pins are inserted in the sockets D', the latter are held in position by the pins, and the gang-planks move freely on the ball-and-socket joints at the lower ends of the pin-sockets in adapting themselves to the inequalities of the ground.

F represents an adjusting-lever arranged in a mortise, *f*, in the draft-pole A, and having



its lower end connected by rods  $f'$  with the inner ends of the gang-planks  $B'$ . The latter are provided with eyes  $f^2$ , in which the hook-shaped rear ends of the connecting-rods  $f'$  engage. The lever  $F$  is pivoted in a bearing,  $f^3$ , secured to the upper side of the draft-pole  $A$ , and provided on its front side with a gear-segment,  $g$ .

$G$  represents a worm-wheel which engages with the gear-segment  $g$ , and turns on a sleeve or hub,  $g'$ , extending upwardly from the bearing  $f^3$ . The worm-wheel is held on its hub by a bolt,  $g^2$ , extending through the hub and draft-pole  $A$ . This bolt  $g^2$  also serves to secure the front end of the bearing  $f^3$  to the draft-pole. The rear end of the bearing  $f^3$  is secured to the draft-pole by a bolt,  $h$ , provided at its upper end with a square screw-nut,  $h'$ .

$I$  represents a lever cast with or secured to the worm-wheel  $G$ , for turning the same. The lever  $I$  is provided with a pivoted catch,  $i$ , which embraces with its lower end the nut  $h'$ , as represented in Fig. 12, and thereby locks the lever in position. Upon turning the catch  $i$  on its pivot, so as to disconnect its lower end from the screw-nut  $h'$ , the lever  $I$  is released, whereby the worm-wheel is released for adjusting the lever  $F$ . Upon turning the screw-wheel  $G$  in one or the other direction, the lever  $F$  is turned on its pivot, and the inner ends of the gang-planks are moved forwardly or backwardly, as may be desired, for adjusting the inclination or pitch of the disk-gangs with reference to the main frame.

$k$  represents hooks attached to the rear cross-piece,  $A^2$ , of the main frame, and adapted to engage in eyes  $k'$ , secured to the gang-planks in such position that the hooks  $k$  will hold the gang-planks rigidly in a position parallel with the rear cross-piece,  $A^2$ , of the main frame when desired. Upon disconnecting the hooks  $k$  and the connecting-rods  $f'$  from the gang-planks, the pins  $C$  can be lifted out of the sockets  $D'$ , thereby disconnecting the disk-gangs from the main frame in a very simple and expeditious manner.

$l$  represents scrapers adapted to bear against the inner sides of the disks  $B$ , and secured rigidly to bars  $l'$ , which are guided in openings formed in the brackets  $B^2$ , so that upon sliding the bar  $l'$  in said openings the scrapers can be brought in contact with the inner sides of the disks  $B$ , or may be removed therefrom, as may be required. This movement of each of the bars  $l'$  is effected by a lever,  $M$ , which is provided at its lower end with a fork,  $m$ . This fork straddles a pin,  $m'$ , secured to the gang-plank  $B'$ , and forming a fulcrum for the lever. The lower portion of the latter passes through a strap,  $m^2$ , secured to the bar  $l'$ , and whereby the movement of the lever is transmitted to the bar. The lever  $M$  is disconnected from the gang-plank by simply drawing it out of the socket or strap  $m^2$ , thereby facilitating the packing and shipping of the machine.

$N$  represents a cylindrical bearing-box applied to each end of the shafts  $b$ .

$n$  represents a semi-cylindrical recess formed in the under side of the rear portion of the bracket-bearing  $B^2$ , for the reception of this bearing-box.  $o$  represents a cap which surrounds the lower side of the bearing-box, and is secured to the rear end of the bracket  $B^2$  by a bolt,  $o'$ . The front end of the cap  $o$  is provided with a hook,  $p$ , which is passed through an opening,  $p'$ , in the bracket  $B^2$ . The cap  $o$  is provided on its upper side with a stud,  $q$ , which enters a recess in the box  $N$  and prevents the latter from turning.

$R$  represents the oil-cup cast on the bracket  $B^2$ , and provided in its bottom with a channel,  $r$ , through which the oil passes to the shaft  $b$ . This channel is surrounded by a conical boss, which fits into a conical seat in the upper side of the box  $N$ , whereby a tight joint is formed between the box and the oil-cup, and which also assists in preventing the box  $N$  from turning.

$S$  represents the cover of the oil-cup, which is provided at its under side with a rod,  $s$ , extending downwardly into the oil-cup between two parallel bars,  $s' s'$ , secured transversely in the upper portion of the oil-cup.

$T$  represents a spiral spring arranged around the bar  $s$  below the transverse bars  $s' s'$ , and adapted to hold the cover  $S$  tightly against the upper end of the oil-cup. Upon lifting the cover  $S$  the spring is compressed and the cover can be moved sidewise far enough to expose the upper end of the oil-cup on one side thereof, giving access to the oil-cup for supplying oil thereto; but the cover cannot be detached from the oil-cup, and upon releasing it it seats itself upon the upper end of the oil-cup and excludes dirt and dust therefrom.

$U$  represents the leveler or drag-bar, arranged in rear of the disks  $B$ , and adapted to drag upon the ground and smooth the ridges which are formed by the disks. The drag-bar  $U$  is attached to the main frame by rods  $u$ , connected with their hook-shaped front ends to eyes  $u'$ , secured to the main frame.

$U'$  represents a receptacle or box secured to the upper side of the drag-bar  $U$ , and adapted to hold stones or other heavy material, whereby the drag-bar can be weighted if its own weight is not sufficient to properly level the ridges. This drag-bar does away with the objectionable feature existing in disk-harrows, which is, that they leave the ground in a ridged condition and require a smoothing harrow or brush to finish the work. When the drag-bar is not required for use, it is easily detached by disconnecting the rods  $u$  from the eyes  $u'$ .

I claim as my invention—

1. The combination, with the main frame, of a gang plank or frame, a ball-and-socket joint, whereby the gang plank or frame is attached to the main frame, shaft-bearings secured to the gang plank or frame, and a disk-gang having its shaft journaled in said bearings, substantially as set forth.



2. The combination, with the disk-gang, of a spherical socket rigidly secured to the gang-plank, and a pin-socket movably attached to the gang-plank, and provided with a spherical knuckle seated in said spherical socket, substantially as set forth.

3. The combination, with the main frame and the disk-gang, of a pin secured to the main frame, a spherical socket secured to the disk-gang, and a pin-socket adapted to receive the pin of the main frame, and provided with a spherical knuckle seated in said spherical socket, substantially as set forth.

4. The combination, with the gang-plank, of the spherical socket D, pin-socket D', having a spherical knuckle, *d*, hooks *e*, and link E, substantially as set forth.

5. The combination, with the main frame, of disk-gangs, ball-and-socket joints, whereby the disk-gangs are attached to the main frame, and hooks *k*, whereby the inner ends of the disk-planks can be rigidly secured to the main frame, substantially as set forth.

6. The combination, with the main frame and disk-gangs, of an arm, F, having a gear-seg-

ment, *g*, connecting-rods *f'*, and a worm-wheel, G, substantially as set forth.

7. The combination, with the main frame and disk-gangs, of an arm, F, having a gear-segment, *g*, connecting-rods *f'*, worm-wheel G, provided with arm I, and catch *i*, substantially as set forth.

8. The combination, with the main frame, of disk-gangs attached to the main frame by swiveling connections, whereby each gang is adapted to adjust itself independently to the inequalities of the ground, and a drag or leveler arranged in rear of the disk-gangs and attached loosely to the main frame, substantially as set forth.

9. The combination, with the disk-gang and disk-plank, of bearings B<sup>2</sup>, oil-cups R, having bars *s'*, cover S, rod *s*, and spring T, substantially as set forth.

Signed this 6th day of December, 1883.

G. G. CROWLEY.

In presence of—

WATTS T. LOOMIS,  
EDWARD WILHELM.