

(No Model.)

3 Sheets—Sheet 1.

J. MACPHAIL.
DISK HARROW.

No. 528,173.

Patented Oct. 30, 1894.

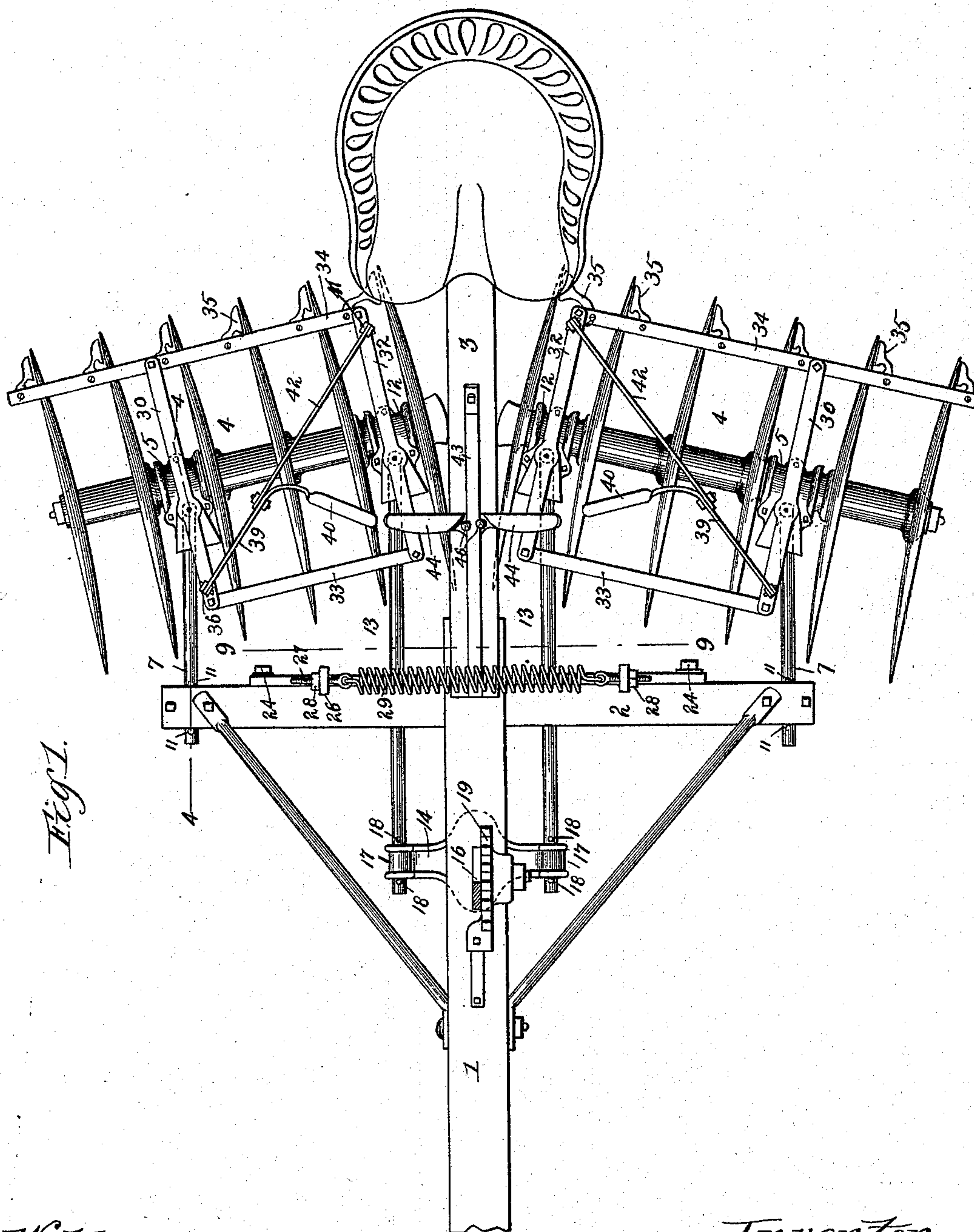


Fig. 1.

Witnesses.

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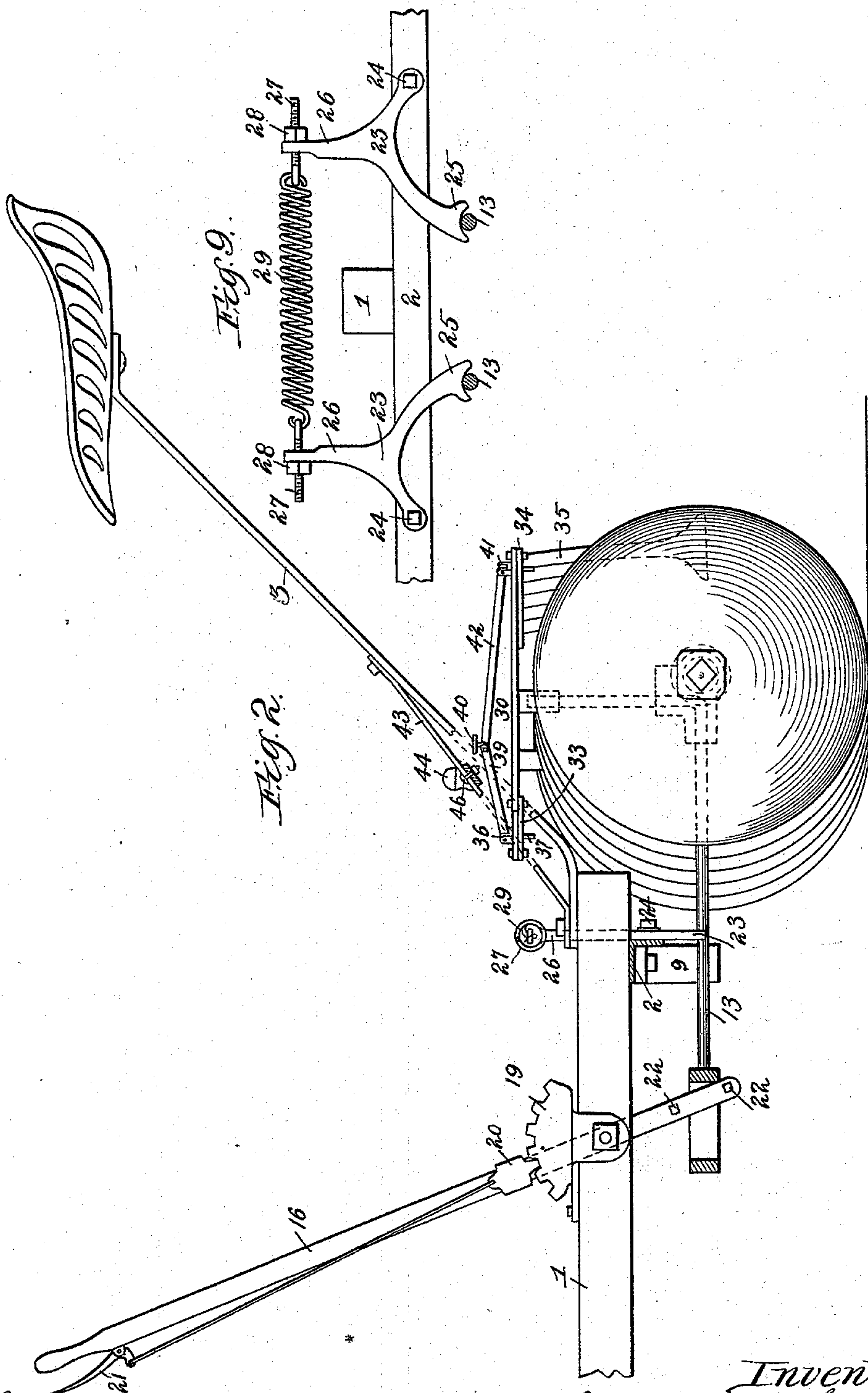
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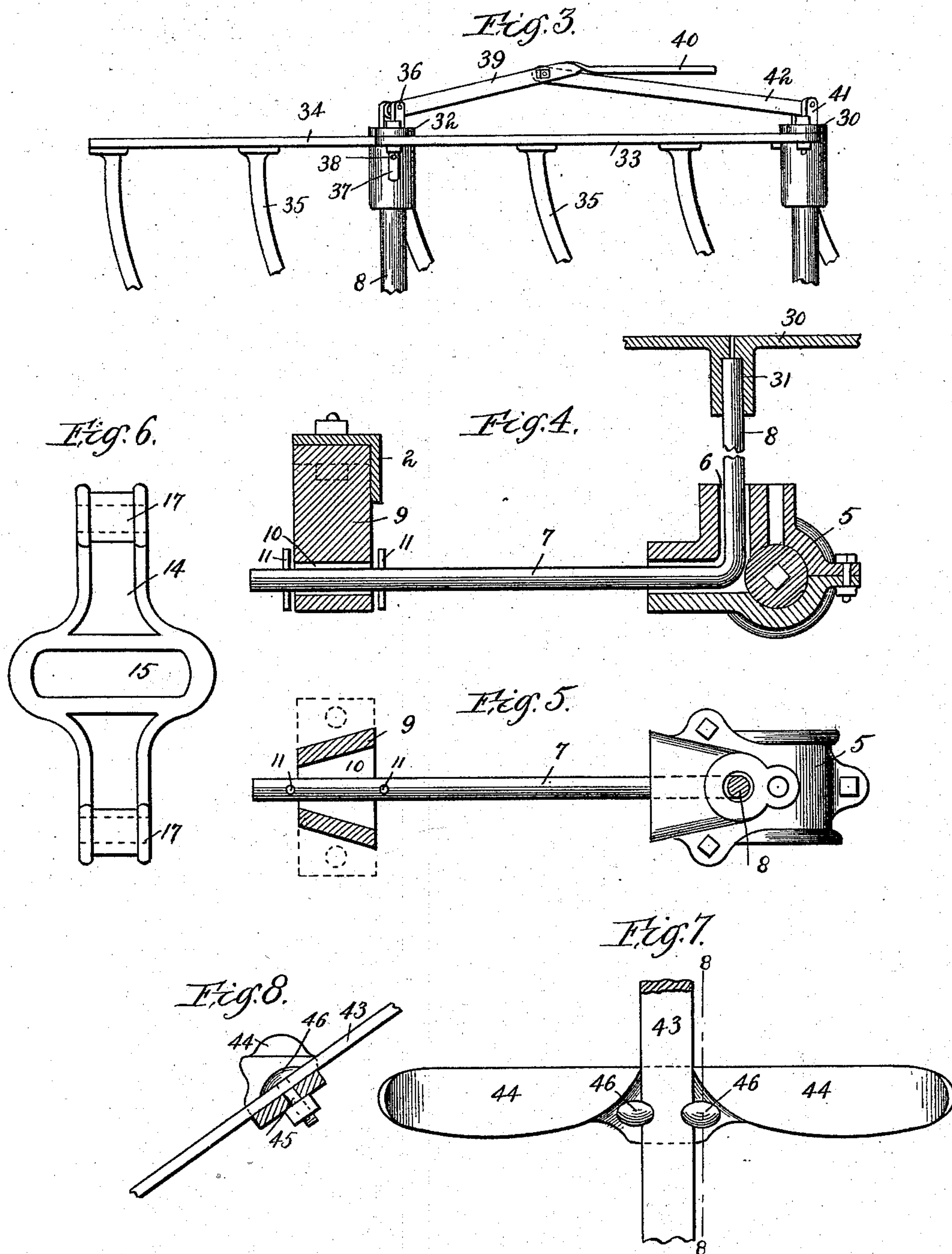
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UNITED STATES PATENT OFFICE.

JAMES MACPHAIL, OF ROCKFORD, ASSIGNOR TO ABRAM ELLWOOD, OF
DE KALB, ILLINOIS.

DISK HARROW.

SPECIFICATION forming part of Letters Patent No. 528,173, dated October 30, 1894.

Application filed July 31, 1893. Serial No. 482,035. (No model.)

To all whom it may concern:

Be it known that I, JAMES MACPHAIL, a citizen of the United States, residing at Rockford, Winnebago county, Illinois, have invented certain new and useful Improvements in Disk Harrows, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a top or plan view. Fig. 2 is a side elevation, partly in section, with one gang of disks removed. Fig. 3 is an enlarged detail, showing the devices by which the scrapers are forced into contact with the disks. Fig. 4 is an enlarged detail, being a section on line 4—4 of Fig. 1. Fig. 5 is an enlarged detail, being a top or plan view partly in section of the devices shown in Fig. 4. Fig. 6 is an enlarged detail, being a top or plan view of the device in which the lower end of the hand-lever moves for the purpose of adjusting the disks and to which the rods by which the disks are adjusted are secured. Fig. 7 is an enlarged detail, being a view of the foot-rest. Fig. 8 is an enlarged detail, being a cross section on line 8—8 of Fig. 7; and Fig. 9 is a detail, being a cross section on line 9—9 of Fig. 1.

The objects of my invention are to improve the construction of disk harrows; to provide new and improved mechanism for operating the scrapers by which the dirt is scraped from the disks as they revolve; to provide new and improved mechanism for adjusting the disks at varying angles with each other and with the line of draft; to provide new and improved mechanism by which the disks may be held in contact with and forced into the ground; and to provide a new and improved foot-rest of simple and cheap construction. I attain these objects as hereinafter specified and as illustrated in the drawings.

That which I regard as new will be set forth in the claims.

In the drawings,—1 indicates the tongue of the harrow. 2 indicates a cross beam secured to said tongue. I prefer to make this cross beam of angle iron, as is best shown in Fig. 2.

3 indicates a seat beam, which is secured to the rear end of the tongue and is of the usual form and construction.

4 indicates the disk gangs, which are of ordinary form and construction.

5 indicates journal-boxes of the form and construction best shown in Figs. 4 and 5. The journal boxes 5 are mounted upon the axles of the disk gangs 4 between two of the disks and toward the outer ends of said gangs, forming a journal box in which the axles of the disk gangs turn. The boxes 5 are provided in their front portion with an opening 6, which extends downward to a point opposite the axle and then extends forward and outward, as is best shown in Figs. 4 and 5. The portion of said opening 6 which extends downward is circular, and the portion extending forward and outward is flared, as is shown by dotted lines in Fig. 5, so as to permit a lateral play therein of the rods 7 hereinafter described.

7 indicates rods, which are wrought iron, steel, or other suitable material. The rear end 8 of each of said rods 7 is bent at right angles to the forward portion of the rod, and extends upward through the opening 6 of the journal box 5.

9 indicates castings, which are secured to the outer ends of the cross beam 2. The lower portion of said castings is provided with an opening 10 in order to receive the forward ends of the rods 7. The opening 10 is made flaring toward the rear, as is best shown in Fig. 5, for the purpose of permitting lateral movement therein of the rods 7. The forward ends of the rods 7 extend through said opening, and are prevented from forward and backward movement therein by two pins 11 (see Figs. 4 and 5) passing through said rods 7 and bearing against said castings. The rods 7 thus form a pivot upon which the disk gangs 4 turn, said journal boxes 5 rotating upon the upright portion 8 of the rods 7, and the flaring mouth of the opening 6 permitting lateral play of the rods 7 as said disk gangs are rotated.

12 indicates journal boxes of the same general shape and construction as the journal boxes 5 hereinbefore described. Said journal boxes 12 are mounted upon the disk gangs between the innermost pair of disks on each gang, the axles of said disk gangs being journaled therein in the same manner

as said axles are journaled in said journal boxes 5.

13 indicates rods of steel, wrought iron, or other suitable material, of the same shape as the rods 7 hereinbefore described, and mounted in said journal boxes 12 in the same way that the rods 7 are mounted in said journal boxes 5. The forward or horizontal portion of said rods 13, however, extend farther forward than do the rods 7.

14 indicates a casting, of the form best shown in Fig. 6. The casting 14 is provided with a slot 15 in which the lower end of the hand lever 16, hereinafter described, works. The ends of said casting 14 are provided with circular openings 17, through which the forward ends of the rods 13 pass, said rods being secured therein by pins 18 passing through said rods.

16 indicates a hand lever, which is mounted upon the tongue 1, and is provided with the usual segmental rack 19, dog 20, and bell crank lever 21. The lower end of the lever 16 passes into the slot 15 of the casting 14, which is held in place by pins 22 in the lower end of said lever. As the hand lever 16 is operated, the casting 14 is moved backward or forward according to the direction in which the hand lever is moved, carrying with it the rods 13, thus swinging the disks upon the upright portions 8 of the rods 7 as pivots, thereby varying the angle of said disk gangs with one another and with the draft of the machine, as may be desired.

23 indicates three-armed levers of the shape best shown in Fig. 9. Said levers 23 are pivoted at their outer arms 24 to the rear of the cross beam 2, as is best shown in Fig. 9. The inner arms 25 of said levers extend inward and downward, and are curved at their under portion, as shown in Fig. 9, so as to bear upon and against the rods 13. The upper arms 26 of said levers extend upward and above the cross beam 2.

27 indicates bolts, which pass through the upper portion of the arms 26 of the levers 23, and are provided with adjusting nuts 28 which bear against the outer surfaces of said arms 26.

29 indicates a spiral spring, which is secured at each end to the inner ends of the bolts 27 at any desired tension, which may be varied by means of the adjusting nuts 28. The spring 29 is of such length that when it is secured to the bolts 27 it is stretched. The tendency of the spring 29 to contract therefore draws the upper arms 26 of the levers 23 inward, forcing the arms 25 downward against the rods 13, thus forcing the rods 13 downward and thereby holding the disk gangs against and forcing them into the ground. As above stated, the tension of the spring may be adjusted by the adjusting nuts so that the downward pressure upon the rods 13 may be regulated as may be desired.

30 indicates bars, each of which—as is best shown in Fig. 4—is provided upon its under

surface with a socket 31. Each socket 31 is provided with an opening cylindrical in form, in which the upward projecting portions 8 of the rods 7 are journaled, as is best shown in Fig. 4.

32 indicates bars similar in size and shape to the bars 30, and provided with sockets similar to those upon said bars 30. The sockets upon the bars 32 are not shown, as they are of the same form as those illustrated in Fig. 4 upon the bars 30. The sockets upon the lower portions of the bars 32 are provided with openings similar to those in the sockets 31 of the bars 30, and within the openings the upward projecting portions of the rods 13 are journaled.

33 indicates cross bars, which are pivotally connected to the forward ends of the bars 30, and the bars 32, as is best shown in Fig. 1.

34 indicates bars which are pivotally connected to the rear ends of the bars 30—32, as is best shown in Fig. 1, and are of sufficient length to project beyond the outermost disk on each gang.

35 indicates scrapers of the ordinary form, which are secured to the under surfaces of the bars 34 and project downward opposite the concave surface of each disk, in the usual manner.

36 indicates ears, which are provided each with a cylindrical pin 37 which passes through a suitable opening near the forward end of each bar 32, so as to turn therein, and is prevented from being pulled out by a pin 38 passing through the cylindrical-pin 37 below the bar 32.

39 indicates levers, the forward ends of which are pivotally mounted in the ears 36 and the rear ends of which are bent inward, as is best shown in Fig. 1, to form foot-rests 40.

41 indicates ears of similar form and construction to the ears 36, and mounted in the same way as said ears 36 at points near the rear ends of the bars 30.

42 indicates levers, the rear ends of which are pivotally mounted upon the ears 41 and the forward ends of which are pivoted to the levers 39 at a suitable distance from the pivotal point of said levers 39, forming a toggle-joint lever. When the foot-rest 40 is pressed down, the forward ends of the levers 39 will be moved forward and the rear ends of the levers 42 moved backward, thus carrying the bars 34 inward and moving the scrapers 35 toward the concave surfaces of the disks; the scrapers 35 being so adjusted upon the bars 34 that when the foot lever is pressed down they will be brought into contact with the concave surfaces of the disks.

43 indicates a bar which is secured to the tongue at its lower end at a point forward of the seat beam 3, and at its upper end to said seat beam.

44 indicates a foot rest, which is provided with a depression in its center of size and shape adapted to slide freely upon the bar 43.

45 indicates bolts which pass through the

foot rest 44, and whose heads 46 are of such size as to project over above and bear upon the surface of the bar 43. When the nuts upon said bolts 45 are screwed up, the bar 43 is gripped between the foot-rest 44 and the under surfaces of the heads 46 of the bolts 45, so as to hold the foot-rest firmly in place. When it is desired to adjust the foot-rest to a different position, the nuts are loosened upon the bolts, the foot-rest is placed in the desired position, and the nuts screwed up again to hold it in place.

That which I claim as my invention, and desire to secure by Letters Patent, is—

1. In a disk harrow, the combination with a tongue 1, cross bar 2 mounted on said tongue, and disks mounted in two opposing gangs, of journal boxes 5 journaled upon said disk gangs and provided with an opening 6, rods 7 secured at their forward ends to the cross bar 2 and having their rear ends bent at right angles and mounted in the opening 6 of the journal boxes 5, journal boxes 12 journaled upon said disk gangs between the inner pair of disks of each gang, and provided with openings similar to those in the journal boxes 5, rods 13, having their rear ends bent at right angles and mounted in the openings of said journal boxes 12, a cross-piece 14 secured to the forward ends of said rods 13, and means for forcing said cross-piece 14 forward or backward, whereby the angle of said disk gangs is varied, substantially as described.

2. In a disk-harrow, the combination with a tongue, a cross-bar mounted on the tongue, disks mounted in two opposing gangs in rear of the cross-bar to swing horizontally on pivots and connected with said cross-bar, and a lever, of rods connected with the disk-gangs and with the lever to be operated by said lever for swinging the gangs upon their pivots, separately mounted levers carried on the cross-bar in front of the disk-gangs to bear downward upon the said rods intermediate the ends of the latter, and spring mechanism for automatically forcing said levers against said rods for forcing the inner ends of the disk-gangs into the ground, substantially as described.

3. In a disk harrow, the combination with a tongue, a cross bar mounted on the rear end of said tongue, disks mounted in two opposing gangs and adapted to be swung horizontally on a pivot, and connected with said cross bar, a lever, and rods operated by said lever to swing said gangs upon their respective pivots, of levers pivotally mounted on said cross bar and adapted to bear downward upon said rods, and a spring connecting said levers

and adapted by its tension to force said levers against said rods, whereby the inner ends of said disk gangs are forced into the ground, substantially as described.

4. In a disk harrow, the combination with a tongue, a cross bar mounted on the rear end of said tongue, disks mounted in two opposing gangs and adapted to be swung horizontally on a pivot, and connected with said cross bar, a lever, and rods operated by said lever to swing said gangs upon their respective pivots, of levers pivotally mounted on said cross bar and adapted to bear downward upon said rods, a spring connecting said levers and adapted by its tension to force said levers against said rods, whereby the inner ends of said disk gangs are forced into the ground, and means for adjusting the tension of said spring so as to regulate the downward pressure of said levers upon said rods, substantially as described.

5. In a disk harrow, the combination with disks mounted in gangs, of two bars pivotally mounted above said disks, cross bars pivotally mounted on and connecting said bars, scrapers secured to one of said cross bars, and a toggle-joint foot lever pivotally mounted on said bars and adapted to force said scrapers against said disks as said foot lever is depressed, substantially as described.

6. In a disk harrow, the combination with a tongue 1, cross bar 2, and disks mounted in two opposing gangs, of journal boxes 5 journaled on said disk gangs, rods 7 secured at their forward ends to said cross bar 2 and having their inner ends bent upward at right angles and pivotally mounted in said journal boxes 5, journal boxes 12 journaled upon said disk gangs between the inner pair of disks of each gang, rods 13 having their inner ends bent upward at right angles and pivotally mounted in said journal boxes 12, bars 30 journaled upon the upward projecting end of said bars 13, bars 32 journaled upon the upward projecting end of said bars 7, cross bars 33 pivotally connecting said bars 30 and 32, cross bar 34 pivoted to the ends of said bars 30 and 32, scrapers 35 secured to said cross bar 24, and a toggle-joint foot lever pivotally mounted upon the rear end of said bars 30 and upon the forward ends of said bars 32, and adapted to force said scrapers against said disks as said foot lever is depressed, substantially as described.

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Witnesses:

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