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Patented Aug. 15, 1899.

W. F. JOHNSTON & W. J. CLOKEY.

DISK HARROW.

(Application filed Aug. 12, 1897.)

(No Model.)

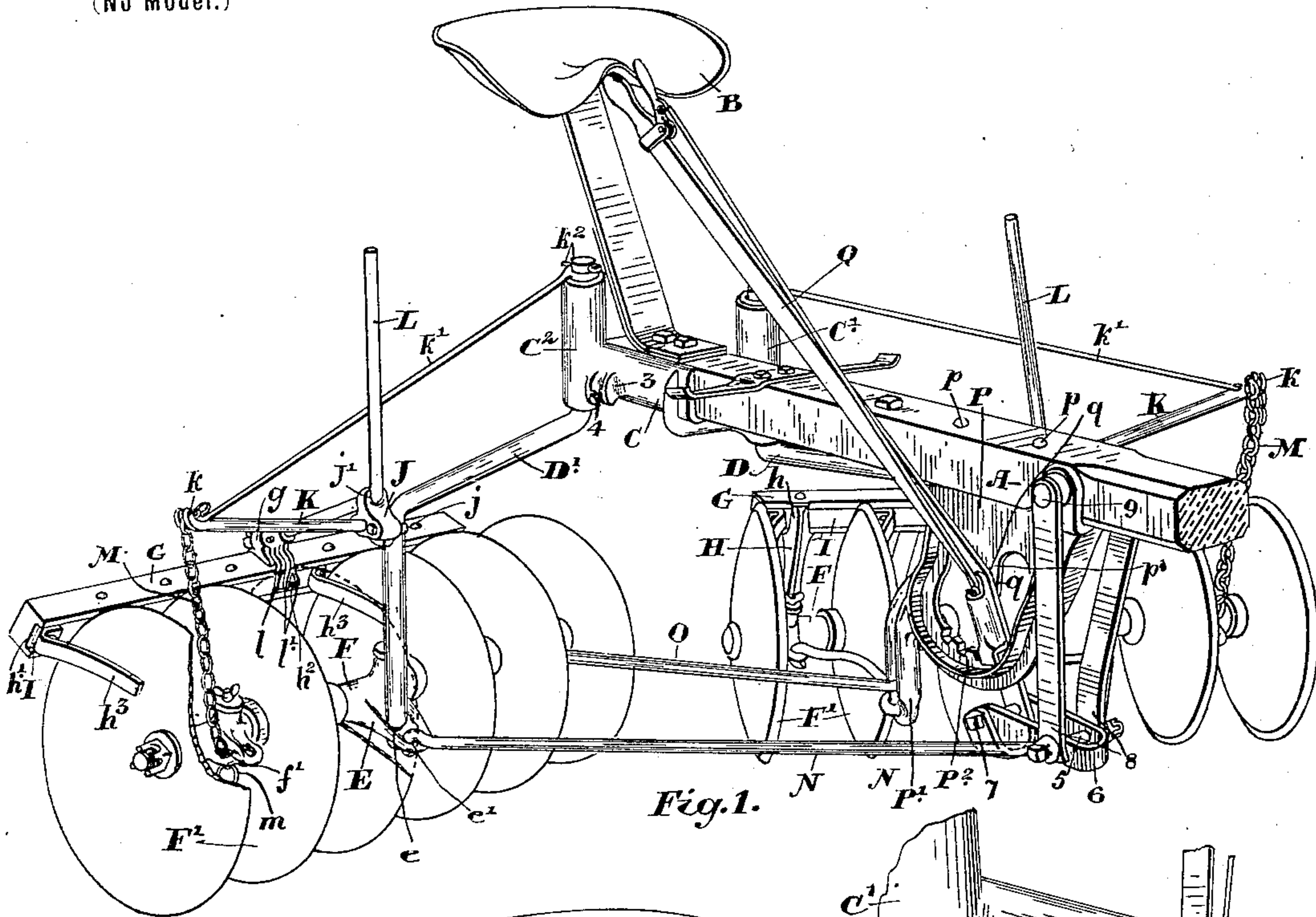


Fig. 1.

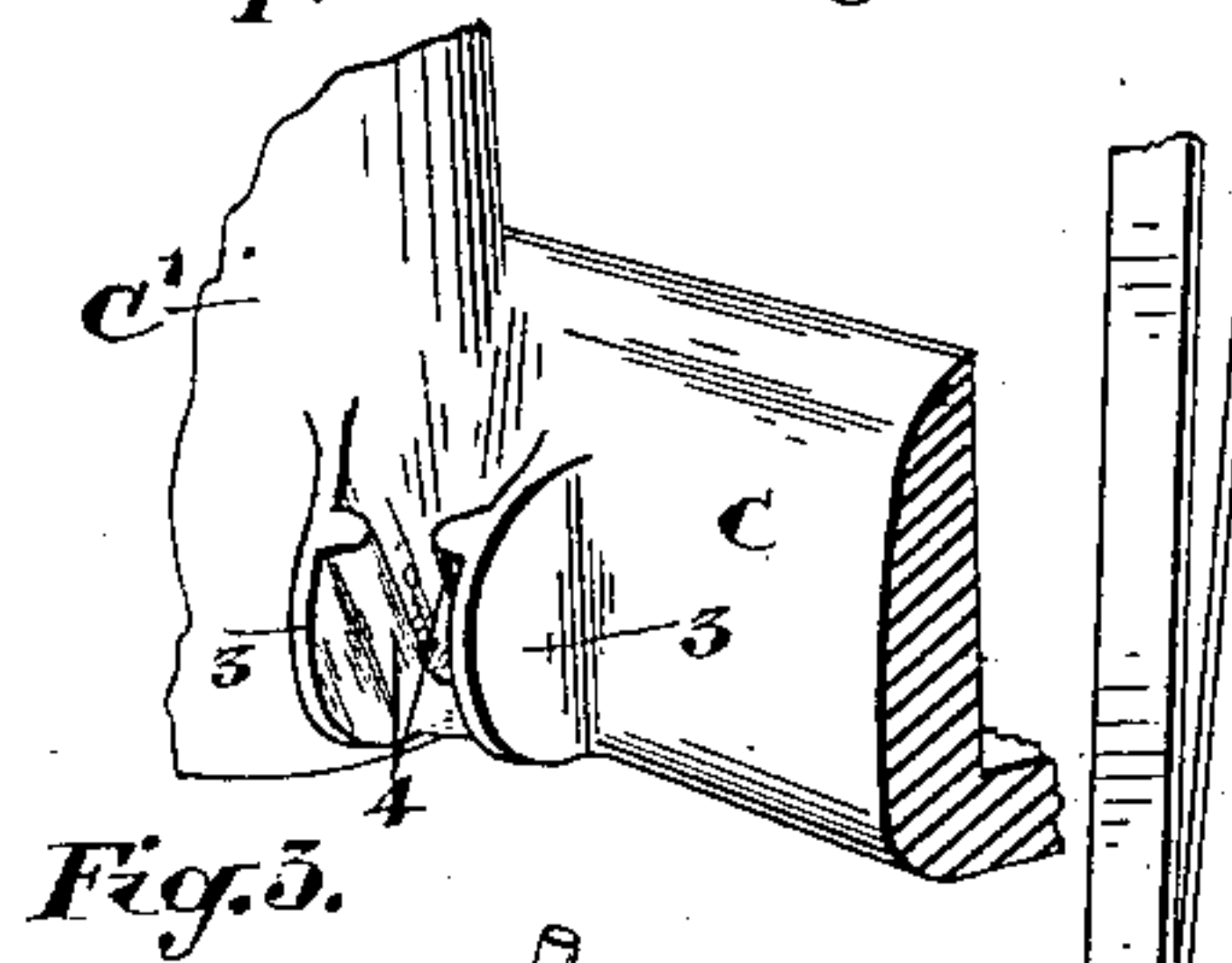


Fig. 5.

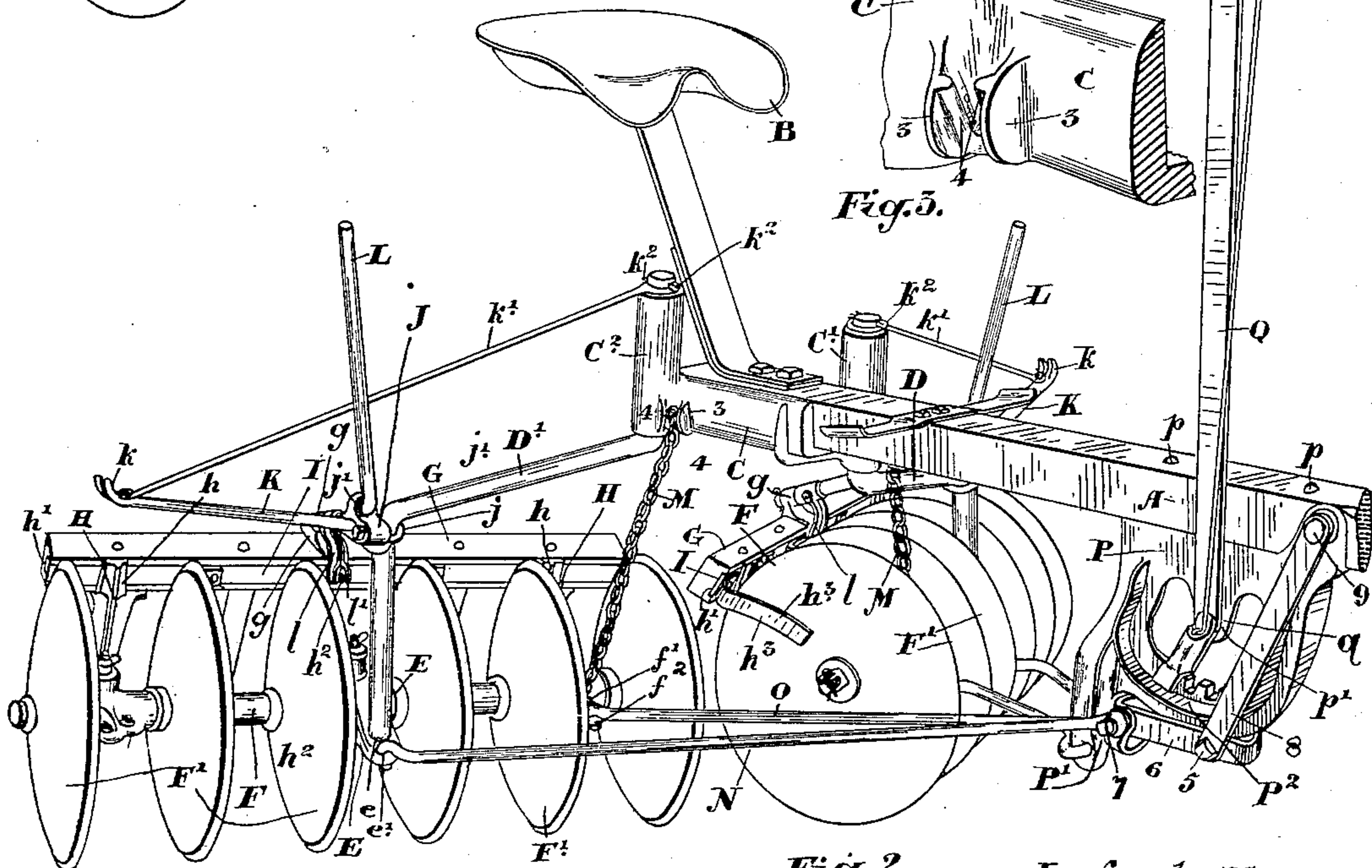


Fig. 2.

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UNITED STATES PATENT OFFICE.

WILLIAM F. JOHNSTON AND WILLIAM JOHN CLOKEY, OF TORONTO, CANADA, ASSIGNORS TO THE MASSEY-HARRIS COMPANY, OF SAME PLACE.

DISK HARROW.

SPECIFICATION forming part of Letters Patent No. 630,981, dated August 15, 1899.

Application filed August 12, 1897. Serial No. 648,037. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM F. JOHNSTON, manufacturer, and WILLIAM JOHN CLOKEY, pattern-maker, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Disk Harrows, of which the following is a specification.

Our invention relates to improvements in disk harrows; and the object of the invention is, first, to design a positive and effectual support for the forwardly-extending ends of the disk gangs, so as to prevent such ends from diving too deep in the soil, thereby causing the rear ends to rise and leave the ground and not perform their function; secondly, to provide for the adjustment of each gang according to the nature of ground it is desired to operate upon; thirdly, to provide for the handy adjustment of the scrapers by the foot or hand; fourthly, to provide for an easy and simple reversing of the gangs, and fifthly, to provide for a more easy angling of the gangs; and it consists, essentially, in the construction and arrangement of the independent swiveled arms, operating-levers, and draft-rods, as hereinafter more particularly explained.

Figure 1 is a perspective view of our improved harrow, showing the gangs angled and arranged to throw the soil outwardly. Fig. 2 is a view of our improved harrow, showing the gangs arranged to throw the soil inwardly. Fig. 3 is a detail of the inner chain-support.

In the drawings like letters and numerals of reference indicate corresponding parts in each figure.

A is the tongue of the harrow.

B is the driver's seat, which is secured to the rear of the tongue.

C is a bracket, U-shaped in cross-section, secured to the rear end of the tongue A and provided with the upright sleeves C' and C². It will be noticed that the sleeve C' is located forward of the sleeve C² and extends below the tongue A farther than the sleeve C², so that when the horses are attached to the tongue the bottom of the sleeves are practically on a level.

D and D' are substantially L-shaped arms, the upper vertical portions of which are jour-

naled in the sleeves C' and C². The lower portion of the arms D and D' extends through eyes e, formed at the front end of the bearings E of the gangs F. The gangs F consist of the disks F', connected together by a central rod and intermediate sleeves.

G are the scraper-beams, which are each supported behind its respective gang by the standards H H, which are attached to or form part of the end journal-boxes of the gangs. A portion h of the standard extends directly across the front of the scraper-beams.

I are the scraper-bars, which fit into a groove h' at the front side of the scraper-beams.

J are brackets which are fastened to the outside of the outer angle of the arms D and D' by the staple-bolts j.

K are supplemental arms which are screwed into the brackets J and extend outwardly on a line with the upper end of the arms D and D'. The arms K are provided with forked ends k, which are braced by the rods k' to the upper ends of the arms D and D' above the sleeves C' and C², a split pin k² serving to hold the eye-shaped inner end of the rods k' and the arms D and D' in position.

L are L-shaped levers which extend through an eye j' in the top of the bracket J and backwardly at a slant into the bracket g on the scraper-beam in which the rear end is journaled.

l is a depending arm secured to the lower end of the lever L and depending as shown. The lower end of the arm l is provided with a forked end l', which straddles the pin h², extending forwardly from the scraper-bar I.

It will now be seen that by means of the lever L the scrapers h³, attached to the scraper-bar I, may be adjusted laterally to and from the disks of the gang, as required.

M is a chain which is provided with an enlarged lower ring m, the chain being designed to be passed up through the eye f' of the journal-box (see Fig. 1) and through the curved forked end k of the rod K, so that the cross-links engage with the forks and hold the outer end of each of the gangs in position, so as to prevent them from diving too deep into the soil, whereby the rear end would be caused to rise or leave the ground and not perform

its function. The chain M, when the harrow is reversed, as shown in Fig. 2, so as to throw the soil inwardly, is passed through an eye f' and extends upwardly between the pair of lugs 3, which have inclined ribs 4. (See detail Fig. 3.) The cross-link engaging on the ribs and sinking to the inner and lower side of them securely holds the inner ends of the gangs from dipping or diving into the soil, whereby the now outer ends of the gangs are prevented from rising or leaving the ground and not performing their function. The chains and their corresponding supporting lugs and arms are exactly the same on each side of the machine and as to each gang.

N are the draft-rods, which are connected at the rear end to the eye e' of one of the journal-brackets and at the forward end are connected, as shown in Fig. 1, to the ends of the bolt 5 which pass through the forward end of the U-shaped link 6.

O are the tie-rods, which are connected at the rear end to the eye f^2 , formed on the inner bearing-journals of the gangs, and at the outer end to eyes in the lower end of the depending arm P' of the bracket P. The bracket P is secured underneath the tongue A by suitable bolts p , passing through the tongue.

Q is a lever pivoted at q on the hangers p' , forming part of the bracket P and extending into the open portion thereof. The lever Q is provided with the usual spring-actuated plunger, which is designed to mesh with the toothed quadrant P^2 , formed at the lower side of the open portion of the bracket P. The lower end of the lever is U-shaped in form, and, as shown in Fig. 1, is connected to the rear end of the U-shaped link 6 by the bolt 7. 8 are hangers pivotally connected to the upper portion of the bracket P and the tongue by the bolt 9 and pivotally connected at the lower ends to the bolt 5 on each side of the U-shaped link 6.

It will be noticed on reference to Fig. 1 that the cultivator is set so that the gangs are arranged to throw the soil outwardly. By manipulating the lever Q the rods N may be thrown rearwardly or forwardly, so as to throw the gangs at any desired angle, the arms D and D' being likewise thrown to the same angle and always remaining in alignment with the gangs. The arms D and D' being swiveled in their respective sleeves C' and C^2 permit of the adjustment of the angles of the gangs with the greatest of ease. The chains M in this figure serve to support the forward and in this case the outer ends of the gangs and prevent them dipping too deep in soil, thus effectually keeping the inner or rear ends of the gangs from rising or leaving the ground and not performing their function.

In Fig. 2 it will be noticed that the draft-bars N have their forward ends removed to the bolt 7, passing through the link 6. The gangs are reversed, so that the concave side is to the inside, and the soil consequently will be thrown inwardly.

To reverse the harrows, it is simply necessary to remove the lower ends of the arms D and D' from the eyes e , the chain from the eye f' and the forks k of the rod K, and to place them, as shown in Fig. 2, with the chains M having the lower end extending through the eyes f^2 and the upper end held by the inclined ribs formed on the lugs 4. It will be noticed that the chain M in this instance also serves to support the forward and inner ends of the gangs, and thereby prevent the disks at this end from diving too deep into the soil. The outer or rear end of the gang is consequently prevented from rising or leaving the ground and not performing its function.

The harrow shown in the drawings is a reversible harrow; but in a non-reversible harrow the rods K might be entirely dispensed with, as it will only be necessary to support the gangs from the inside by the chain M.

The chain M, it will be seen, serves, as shown in Figs. 1 and 2, to keep the gangs in alinement with the arms and yet form a flexible connection directly underneath the sleeve or pivot-point upon which the gangs are swung. In a former machine of this class it was attempted to hold down the gangs by pressure; but from experience in the past this has been found to be unsuccessful. By our device, however, the distance from the gang to the pivot-point of the swing always remains the same, and consequently the outer and inner ends of the gangs are supported positively without any variation. Both gangs, however, are independent of each other to this extent: that one or the other may be let down by the chain, according to the nature of the ground it is desired to till. The form of lever utilized in our construction also is much more advantageous than that heretofore employed, as a much greater leverage can be obtained by the driver in order to vary the angles of the gangs into any position he may desire.

What we claim as our invention is—

1. In a disk harrow, in combination the pole or tongue, the gangs, the bracket embracing the rear end of the pole and provided with two vertical sleeves one forward of the other and at opposite sides of the pole in proximity to the inner end of the gangs, the L-shaped arms journaled at the inner end in the sleeves having a horizontal portion extending substantially parallel with the axle of the gangs above the same and having the outer vertical end flexibly connected to the center of the gangs as and for the purpose specified.

2. In a disk harrow, in combination, the pole or tongue, the gangs, the vertical sleeves secured to the rear end of the pole, the independent arms journaled at the inner end in the sleeves and having a flexible connection at the outer end to the center of the gangs, eyes on the inner end of the journals, retaining-lugs having inclined interior ribs and a chain connection extending through eyes formed on the journals at the inner end of the gangs and held at the upper end within

the inclined ribs of the lugs as and for the purpose specified.

3. A disk harrow comprising a stationary center frame, upright sleeves forming part thereof, laterally-extending arms journaled at their inner ends in such sleeves, the gangs flexibly connected at or near the center to the outer ends of the arms, a bracket on the tongue provided with an open center and an internal quadrant, the tie-rods flexibly connected to eyes on the inner ends of the gangs and eyes on the lower rear ends of the bracket, the draft-rods flexibly connected at the rear end to eyes in the center of the gangs, the adjusting-lever having a plunger designed to engage with the internal quadrant of the bracket and having a U-shaped lower end, a U-shaped link, hangers supporting the same from the tongue and a bolt extending through the rear of the U-shaped link, U-shaped lower end of the lever and the forward ends of the draft-rods as and for the purpose specified.

4. In a disk harrow, in combination, the pole or tongue, the gangs, the vertical sleeves secured to the rear end of the pole, the independent arms journaled at the inner end in the sleeves and having a flexible connection at the outer end to the center of the gangs, the supplemental arms extending laterally outwardly from the ends of the main arms and a chain connection between the outer end of such supplemental arms and the outer ends of the gangs when such gangs are arranged to throw the soil outwardly as and for the purpose specified.

5. In a disk harrow in combination the pole

or tongue, the gangs, the vertical sleeves secured to the rear end of the pole, the independent arms journaled at the inner ends in the sleeves and having a flexible connection at the outer end to the center of the gangs, a bracket secured at the outer angles of the arms by a staple-bolt, supplemental arms secured at the inner ends in such brackets and having forked ends, bracing-rods connecting the outer ends of the supplemental arms to the inner ends of the main arm over its pivot-point and a chain connection extending at the lower end through eyes in the journal-box and held in the forks of the supplemental arms at the upper end when the gangs are arranged to throw the soil outwardly as and for the purpose specified.

6. In a disk harrow, in combination, the pole or tongue, the gangs, the vertical sleeves secured to the rear end of the pole, the independent arms journaled at the inner end in the sleeves and having a flexible connection at the outer end to the center of the gangs, the scraper beams and standards connecting them to the gangs, the scraper-rods and scraper L-shaped lever suitably journaled at the outer angle of the arms, the bracket on the scraper-beam to receive the rear end of the lever, the fork-shaped hanger secured to the lever and the pin on the scraper-rod, which such fork-shaped hanger straddles as and for the purpose specified.

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Witnesses:

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