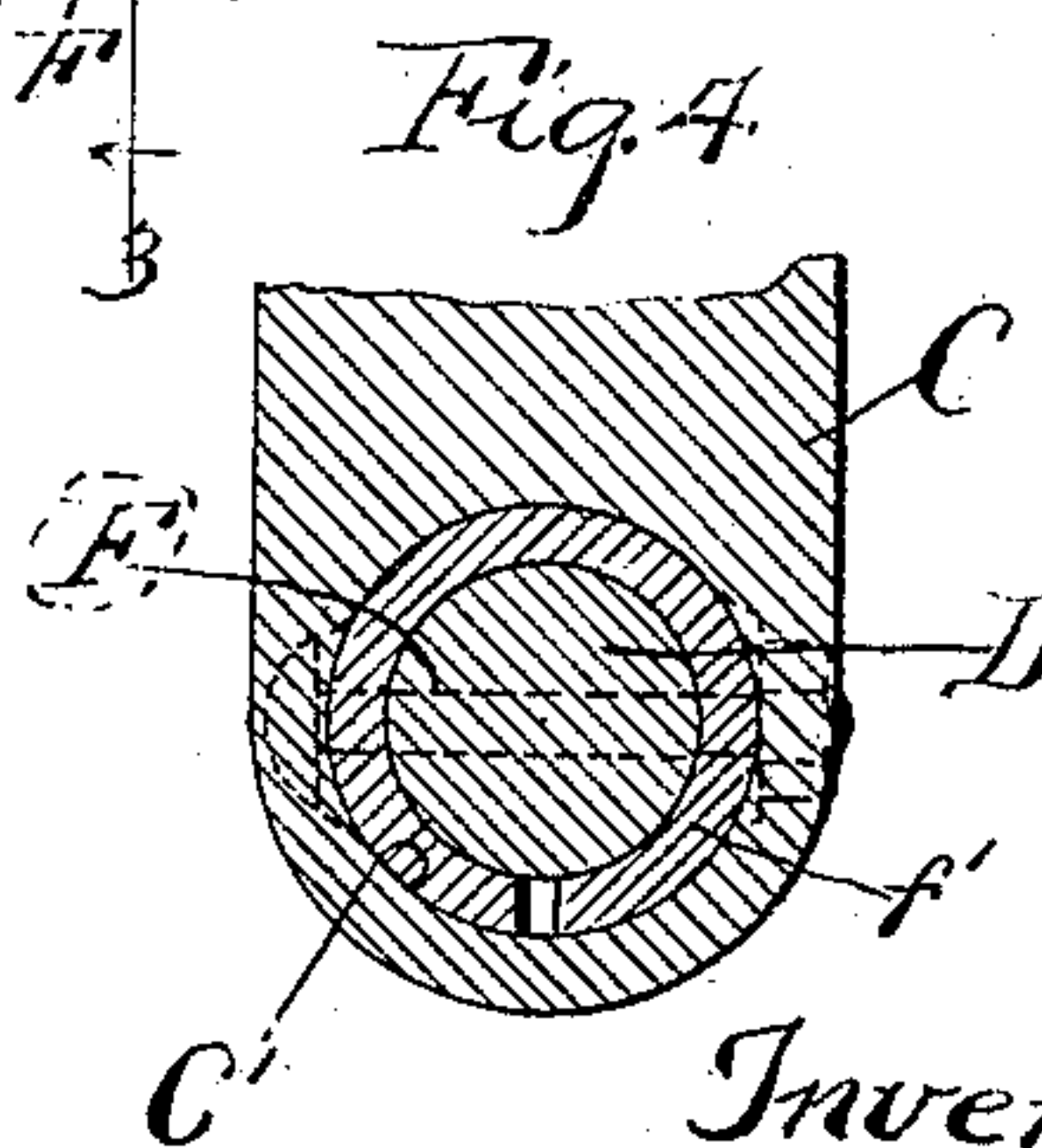
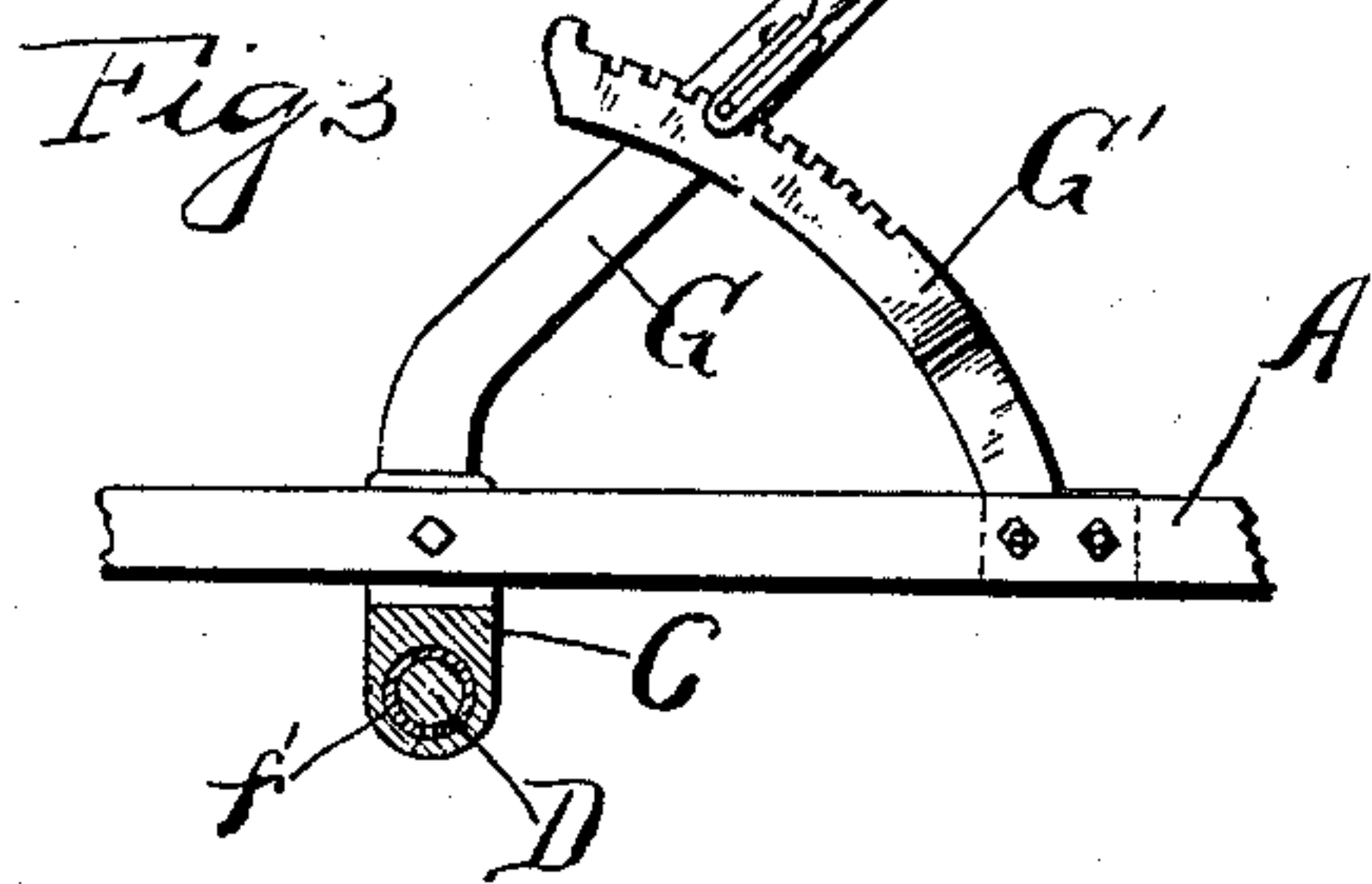
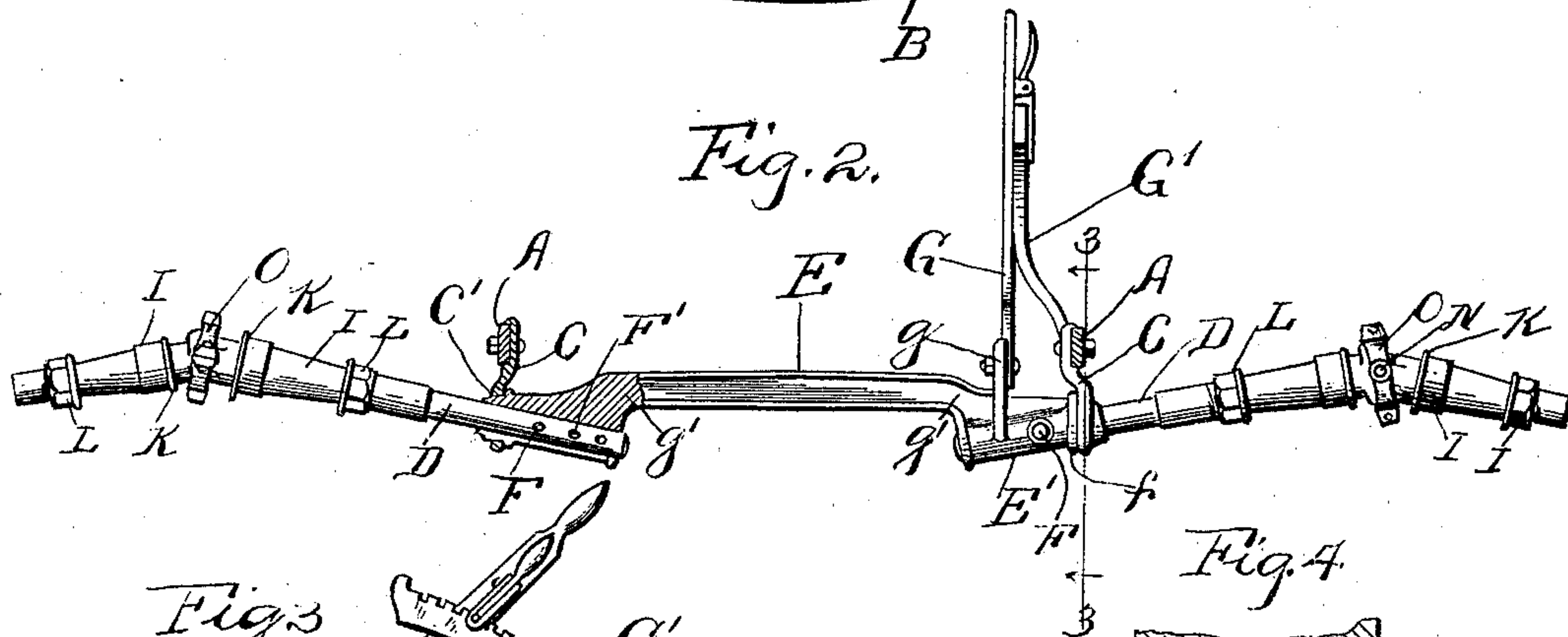
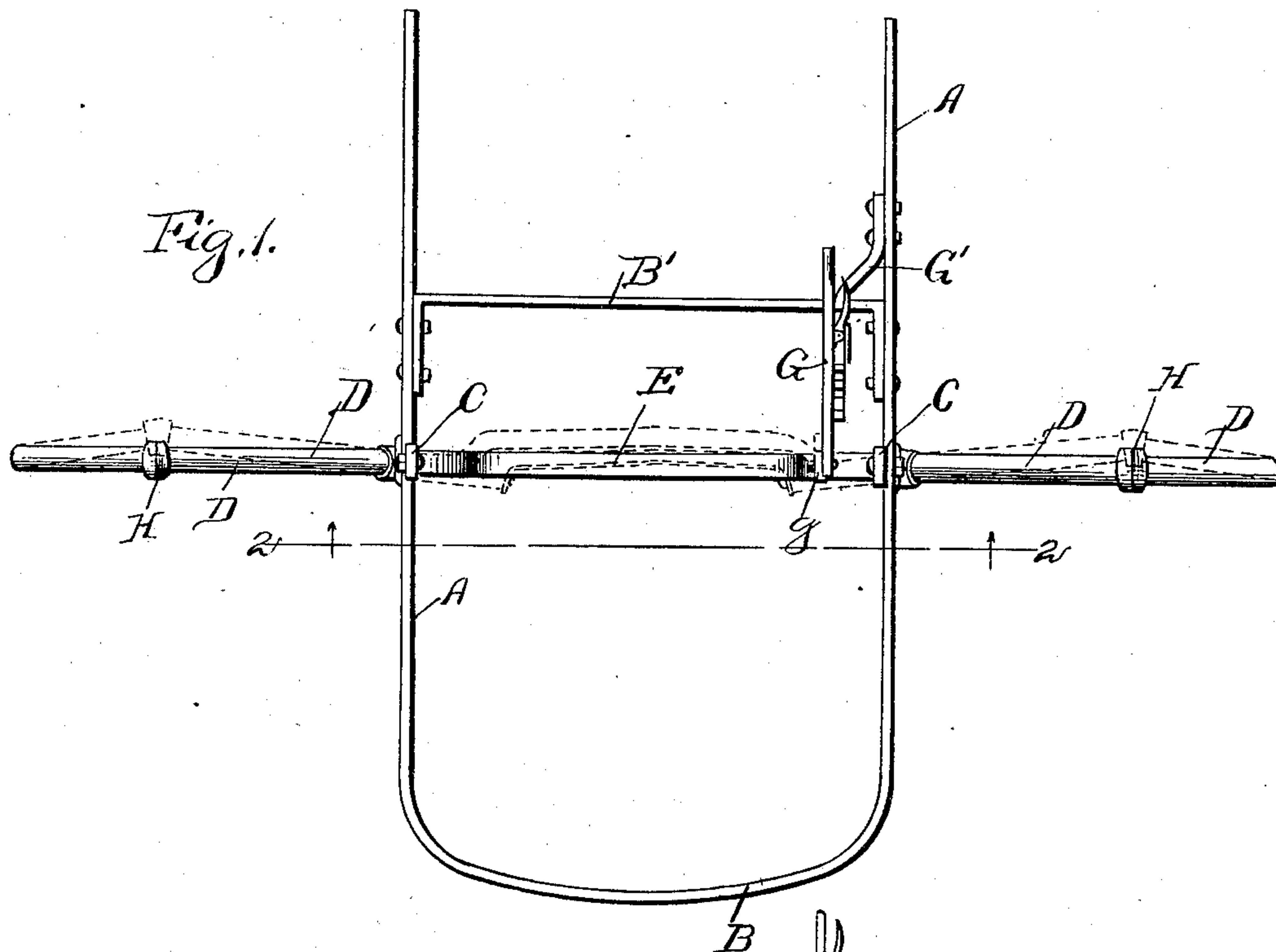


L. E. WATERMAN.  
ROCKING AXLE FOR CORN PLANTERS.

(Application filed Nov. 18, 1899.)

(No Model.)

2 Sheets—Sheet 1.



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No. 671,462.

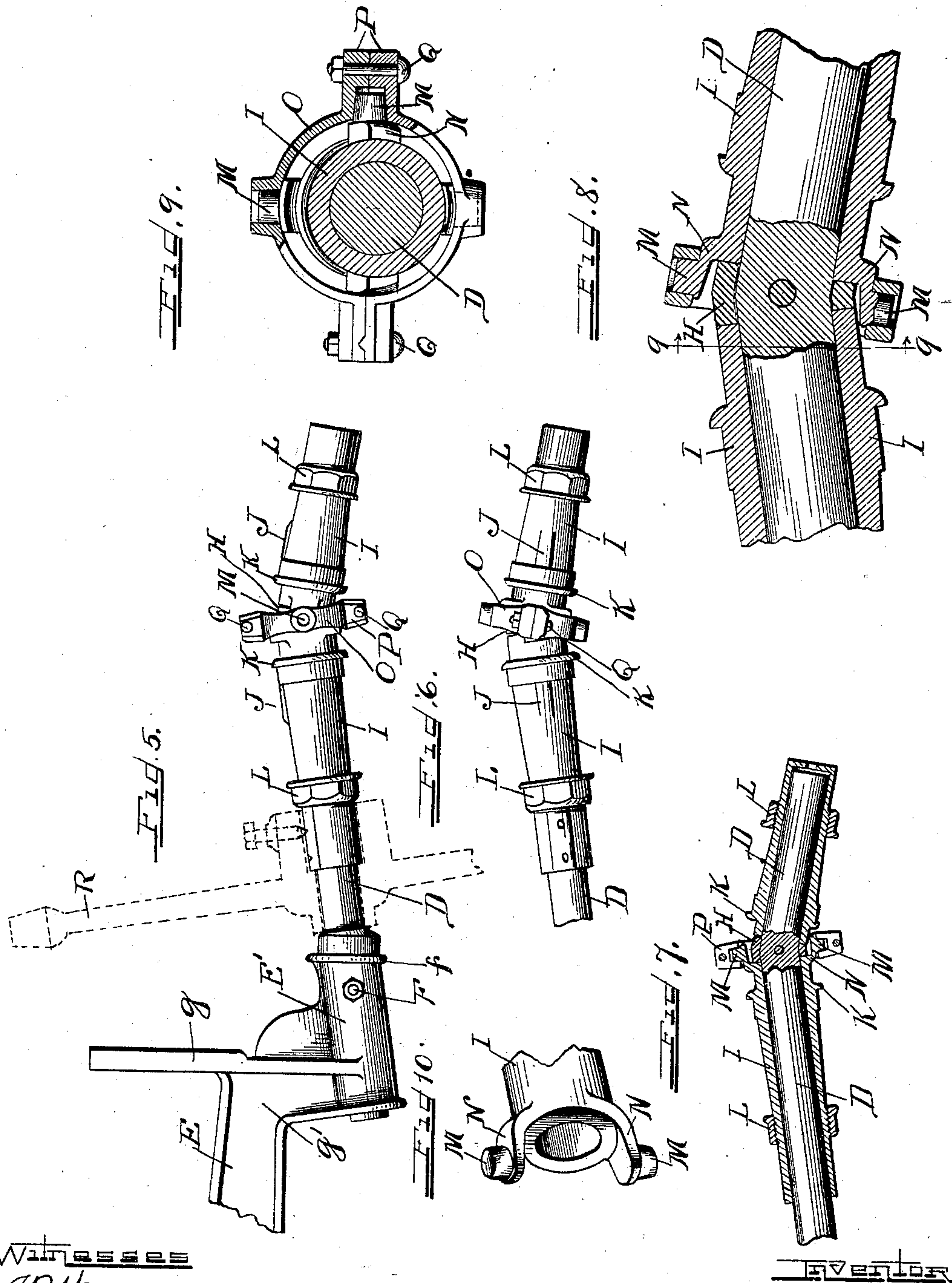
Patented Apr. 9, 1901.

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2 Sheets--Sheet 2.



Witnesses

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# UNITED STATES PATENT OFFICE.

LEWIS E. WATERMAN, OF MOLINE, ILLINOIS, ASSIGNOR TO THE DEERE & MANSUR COMPANY, OF SAME PLACE.

## ROCKING AXLE FOR CORN-PLANTERS.

SPECIFICATION forming part of Letters Patent No. 671,462, dated April 9, 1901.

Application filed November 18, 1899. Serial No. 737,504. (No model.)

*To all whom it may concern:*

Be it known that I, LEWIS E. WATERMAN, a citizen of the United States, residing at Moline, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Rocking Axles for Corn-Planters, of which the following is a specification.

My invention relates to that type of axle wherein two wheels inclined to each other are arranged on bent spindles at either end and the angle of their inclination to the ground is varied by rocking the axle as a whole. Heretofore axles of this type have been suspended from the frame of the machine in such manner that the rocking movement is accompanied and induced by a bodily-swinging movement. In the present invention I propose, among other things, to journal the axle adjacent to and inside of the inner wheels of each pair in fixed bearings beneath the main frame and rock it therein by a lever rigidly connected with said axle. I also propose to connect the spindles by a rigid coupling of novel construction, to connect the coupling to the bent spindles by upwardly-inclined sleeves rigid with said coupling and journaled at their distal ends in the aforesaid bearings, to construct the coupling integrally with upwardly-inclined split sleeves, in which the inner ends of the bent spindles are confined and clamped by a single through-bolt, and to so arrange the various parts that by the withdrawal of a single bolt the corresponding bent spindle may be at once detached.

A further purpose of my present invention is to cause both wheels of either one or both pair thereof to rotate in unison by means of a coupling of a novel character and which does not in any wise interfere with the adjustments of the axle.

In the drawings, Figure 1 is a top plan view of so much of a machine embodying my invention as is necessary to an intelligible description thereof, the parts shown being the rear frame of a planter, the axle, and its lever, and the rack for the latter. Fig. 2 is a transverse section on the line 2 2 in Fig. 1 viewed in the direction indicated by the arrows. Fig. 3 is a transverse vertical section on the line 3 3 of Fig. 2 looking in the direction

indicated by the arrows. Fig. 4 is an enlarged detail sectional view taken on the same line and looking in the same direction as Fig. 3. Fig. 5 is an enlarged front elevation of one end of the axle. Fig. 6 is a view similar to Fig. 5, but showing the coupling turned one-quarter. Fig. 7 is a central longitudinal section through the parts and in the position shown in Fig. 5. Fig. 8 is an enlarged sectional elevation through the coupling with the parts in the position shown in Fig. 6. Fig. 9 is a vertical sectional elevation on the line 9 9 of Fig. 8 looking in the direction indicated by the arrows, and Fig. 10 is a detail perspective view of the end of one of the coupling-sleeves.

A designates the side bars of any suitable main frame or "back," which for the purposes of the present description may be assumed to be composed of a single metallic rail bent to form the side bars in one piece with a rear transverse bar B and tied and braced by a second transverse bar B', bolted to and uniting the side bars in advance of the axle, as will directly appear.

Rigidly bolted to each side bar of the frame are hangers C, having at their lower ends or feet horizontal bearings C', in which the rocking axle is journaled at opposite points along the inner reaches of the bent spindles D and just inside the hubs of the inner wheels. At these two points, however, the trend of the axle is downwardly inclined, while the common axis of the bearings, being horizontal, is at an angle to this inclination. Horizontal journals are therefore necessary upon the axle, and as these cannot be formed in the substance of the bent spindles, since the latter are necessarily detachable and must be capable of being withdrawn through the inner wheels, it is proposed herein to form them upon sleeves embracing said spindles and constituting part of means for uniting them rigidly together in the axle, as will now be explained.

E is a rigid coupling-bracket bridging the space between the two bent spindles and having at each end upwardly-inclined split sleeves E', which receive the approximate ends of said spindles and in which they are individually secured by a single clamping-



bolt F, passing through one of a lengthwise series of bolt-holes F', pierced through their inner ends. These split sleeves have near their ends annular shoulders *f*, described in a vertical plane, to abut against the depending bearings C', these shoulders being immediately succeeded by horizontal journals *f'*, surrounding the bore of the sleeve, which enter the bearings and rock therein. By this construction the coupling-bracket is permanently mounted in the bearings, with its split sleeves or sockets opening through said bearings for the reception of the bent spindles.

The coupling-bracket is rocked, thereby rocking the axle as a whole, by means of a lever G, advisably affixed rigidly thereto, which lever latches into a segment-rack G' on the frame. Preferably the bracket is cast in one piece, with its split sleeves and with an upstanding ear *g* for the reception and securing of the lever-stock, all of the outline shown—that is to say, with the bridge *g'* springing slightly upward from the lower ends of the inclined split sleeves and extending in a flattened arch from one sleeve to the other and with the ear rising vertically from one of said sleeves at its point of junction with the bridge.

In practice it is desirable that the two wheels of the pair intended to operate the seed-dropping mechanism (not shown) should be coupled together, so that either wheel that is upon the ground becomes the driving-wheel, both being compelled to always rotate in unison upon the bent spindle, and as the operating-gear, which may be appropriately a sprocket chain and wheel connection between one of the wheels and the seed-dropping mechanism, the driving sprocket-wheel is suitably attached to one of the wheels, preferably the inner one of a pair. Of course if both ends of the axle are equipped alike then one side may be used for driving the seed-dropping mechanism and the other for operating the reel. To this end I mount upon the bent spindle, at each side of the fixed butting-ring H, located at the bend therein, a bearing-sleeve I for the hubs of the wheels. Of course so far as relates to the broad idea of my invention these sleeves may be dispensed with and the hubs be directly mounted upon the spindles; but for convenience in assembling the parts and renewing worn or broken parts I prefer to employ these sleeves, which, in fact, become a part of the hubs of the ground-wheels, with which they have a non-rotative connection afforded by interlocking features provided upon the hubs and sleeves, respectively, such as the projections J on the sleeves and corresponding grooves (not shown) formed in the hubs of the wheels. Each of these sleeves is provided with an annular shoulder K at its inner end and a nut L mounted thereon near its outer end to hold the wheels in place upon the sleeves, which fit loosely upon the spindles. The sleeves at their

opposing inner ends are each provided with oppositely and radially disposed studs M, supported upon extensions N, projecting beyond the ends of the sleeves, so that when the ends of the sleeves are brought together, with all of the studs in the same circumferential line or plane, they are engaged by a coupling-ring O, which is provided with four sockets to receive the four studs upon the sleeves. This coupling-ring is preferably made in two sections, each provided with radial ears P at their ends, through which pass the fastening-bolts Q, and each section of the coupling-ring carries at its center a socket to receive one of the studs M and at its end in the ear P a half-socket to receive the studs of the other sleeve. This coupling, in effect, provides a knuckle-joint between the two bearing-sleeves, which permits the free rotation of the sleeves on the spindles without binding regardless of the position in which the spindles may be placed or adjusted, permits free adjustment of the axle at all times, and requires, in point of fact, only the single fixed butting-ring H to maintain both wheels in position, because the sleeves cannot separate from each other, being held by the coupling-ring, while the wheels cannot leave the bearing-sleeves because of the presence of the nuts L. Of course when the sleeves are dispensed with and the studs M are placed directly upon the hubs of the wheels the nuts L would also be dispensed with.

As a convenient means for driving the seed-dropping mechanism I have shown by dotted lines in Fig. 5 the mounting of the driving sprocket-wheel R upon the spindle between the inner sleeve I and the outer end of the coupling-bracket. The hub of the sprocket-wheel is extended over the end of the sleeve, with which it is caused to be non-rotatively engaged by the provision of interlocking features upon the sleeve and hub, respectively, or by the provision of a set-screw, which may, however, be supplemental to the interlocking features, as clearly shown in Fig. 5.

I have found by practical use of my invention that a rocking bent axle journaled in the frame of the planter in accordance with my invention is very easy to manipulate and to adjust in the most trying positions, and the ease of such manipulation is in no small degree contributed to by the coupling between the ground-wheels of the character shown and described, which reduces the tendency to lateral strain and friction to the minimum degree, as it balances the wheels against one another, so as to equalize the tendency to separate.

Obviously various modifications and changes in the construction and arrangement of the parts may be made without departing from the spirit of my invention, and I therefore intend that all such modifications and changes shall fall within the scope of the following claims.



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

1. The combination with the main frame 5 and with the rocking axle and its bent spindles, of bearing fixed to the frame, in which said axle rocks, substantially as described.
2. The combination with the main frame, of the bent spindles journaled in bearings having a common axis at an angle to said spindles, the coupling-bracket rigidly connecting the inner ends of said spindles between the bearings, and a lever for rocking said bracket and spindles, substantially as described.
3. The combination with the main frame, of the hangers rigidly affixed thereto, the horizontal bearings in said hangers, the bent spindles passing through said bearings, the coupling-bracket extending from spindle to spindle and journaled in the bearings, and means for rigidly securing said spindles to the bracket, substantially as described.
4. The combination with the main frame, of the hangers rigidly affixed thereto and having horizontal bearings, with a common axis, the bent spindles passing through said bearings, and the coupling-bracket having sockets for the reception of said spindles and horizontal journals surrounding said sockets for engagement with said bearings, substantially as described.
5. The combination with the main frame, of the hangers rigidly affixed thereto, the horizontal bearings in said hangers, the bent spindles passing through said bearings, the coupling-bracket having upwardly-inclined split sleeves journaled in said bearings and receiving the inner ends of the spindles, and the bolts passing through said split sleeves and spindles to hold the parts together, substantially as described.
6. The combination of the main frame, the horizontal fixed bearings, the coupling-bracket having upwardly-inclined split sleeves with peripheral horizontal journals entering said bearings and butting-ring extensions beyond said journals, and the bent spindles received and secured in said sleeves, substantially as described.
7. The combination of the main frame, the horizontal bearings, the bent spindles passing through said bearings, the bridging-bracket journaled in said bearings and rigidly connecting said spindles, and means for rocking said bracket and spindles, substantially as described.
8. The combination of the main frame, the hangers rigidly depending therefrom, the horizontal bearings at the lower ends of said hangers, the bent spindles, the bridging-bracket with its upwardly-inclined split sleeves abutting against said bearings and journaled therein, the rocking lever and means for locking the same, substantially as described.

9. The coupling-bracket cast in one piece 65 with the upwardly-inclined split sleeves having peripheral horizontal journals at their distal ends, substantially as described.

10. The coupling-bracket cast in one piece with the upwardly-inclined split sleeves, and 70 the horizontal journals at the distal ends of said sleeves, substantially as described.

11. The coupling-bracket cast in one piece with the upwardly-inclined split sleeves, the elevated bridge, and the upstanding ear for 75 the lever-stock, substantially as described.

12. The coupling-bracket cast in one piece with the upwardly-inclined split sleeves, the peripheral journals and butting-rings thereon, the elevated bridge, and the upstanding ear 80 for the lever-stock, substantially as described.

13. The combination with a planter-frame, wheels, and an axle of the type described, of radial studs upon the adjacent ends of the hubs of a pair of said wheels, and a coupling- 85 ring provided with sockets to receive said studs, substantially as described.

14. The combination with a planter-frame, wheels, and an axle of the type described, of radial studs upon the adjacent ends of the 90 hubs of a pair of said wheels, and a sectional coupling-ring provided with sockets to receive said studs, substantially as described.

15. The combination with a planter-frame, wheels, and an axle of the type described, of 95 a pair of coupling-sleeves, said sleeves and the hubs of the wheels having interlocking features, radial studs upon the opposing ends of said sleeves and a coupling-ring provided with sockets to receive said studs, substan- 100 tially as described.

16. The combination with a planter-frame, wheels, and an axle of the type described, of a pair of coupling-sleeves, said sleeves and the hubs of the wheels having interlocking 105 features, radial studs upon the opposing ends of said sleeves, a sectional coupling provided with sockets to receive said studs, each section being provided with a socket at its center, with a pair of ears at its ends and with 110 half-sockets in said ears and fastening-bolts passing through said ears beyond the half-sockets, substantially as described.

17. The combination with a planter-frame, wheels, an axle of the type described and a 115 fixed butting-ring, of a pair of sleeves mounted on the bent spindle of said axle at opposite sides of said butting-ring, said sleeves and the hubs of the wheels having interlocking features, radial studs upon the opposing 120 ends of said sleeves overlying the butting-ring and a coupling-ring provided with sockets to receive said studs, substantially as described.

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