

No. 630,891.

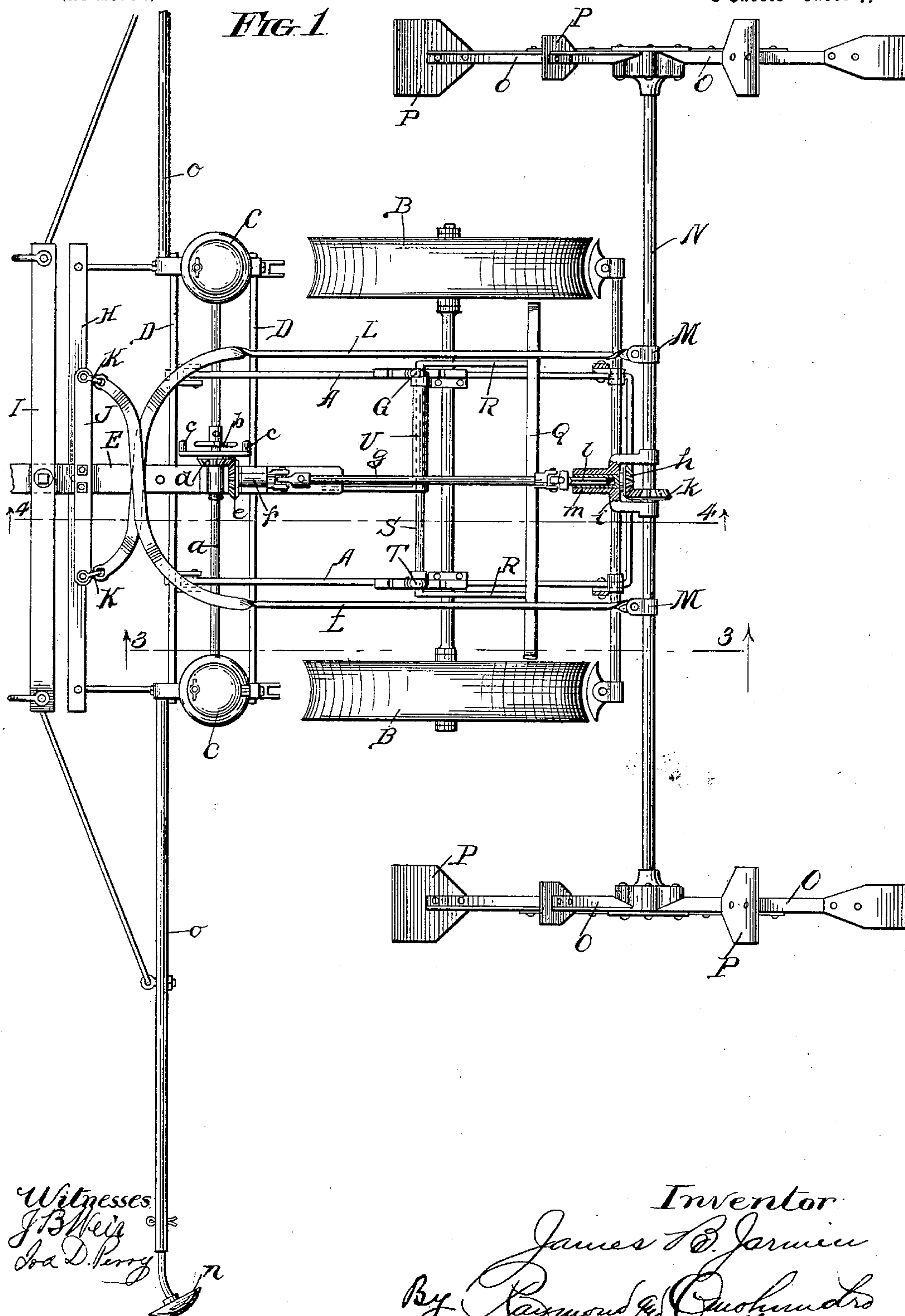
Patented Aug. 15, 1899.

J. B. JARMIN.
AUTOMATIC CHECK ROW CORN PLANTER.

(Application filed June 26, 1899.)

(No Model.)

3 Sheets—Sheet 1.



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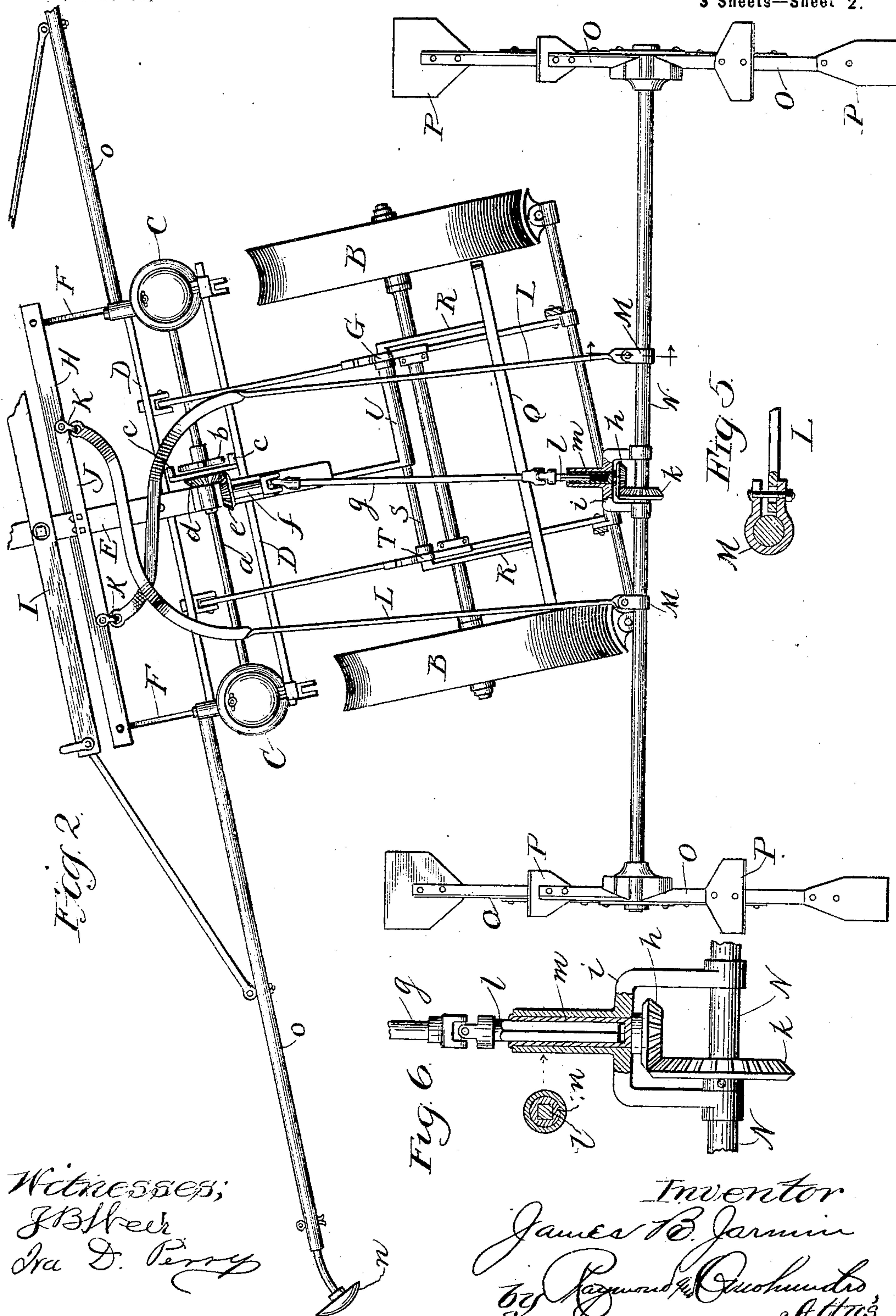
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3 Sheets—Sheet 2.

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3 Sheets—Sheet 3.

FIG. 3.

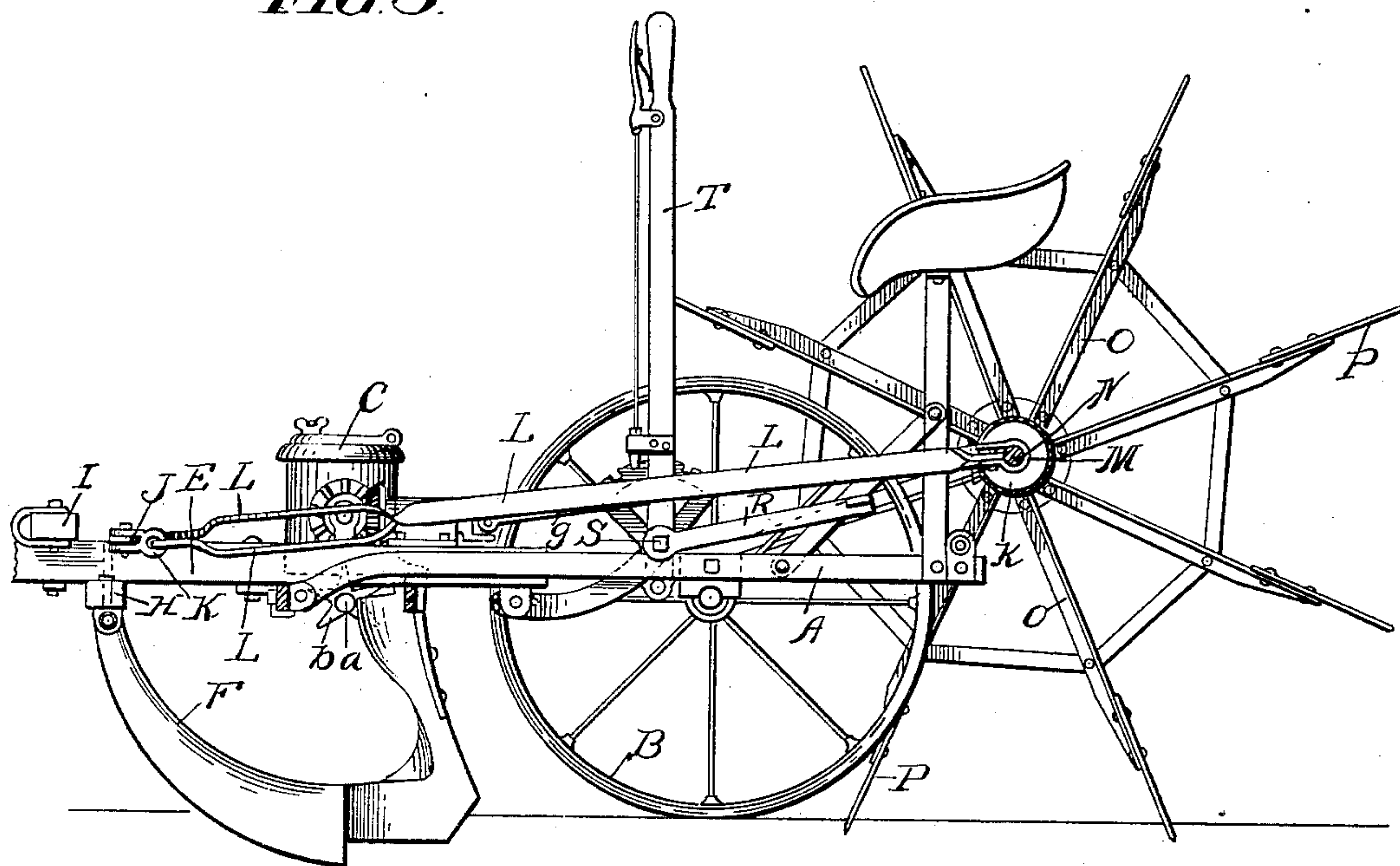
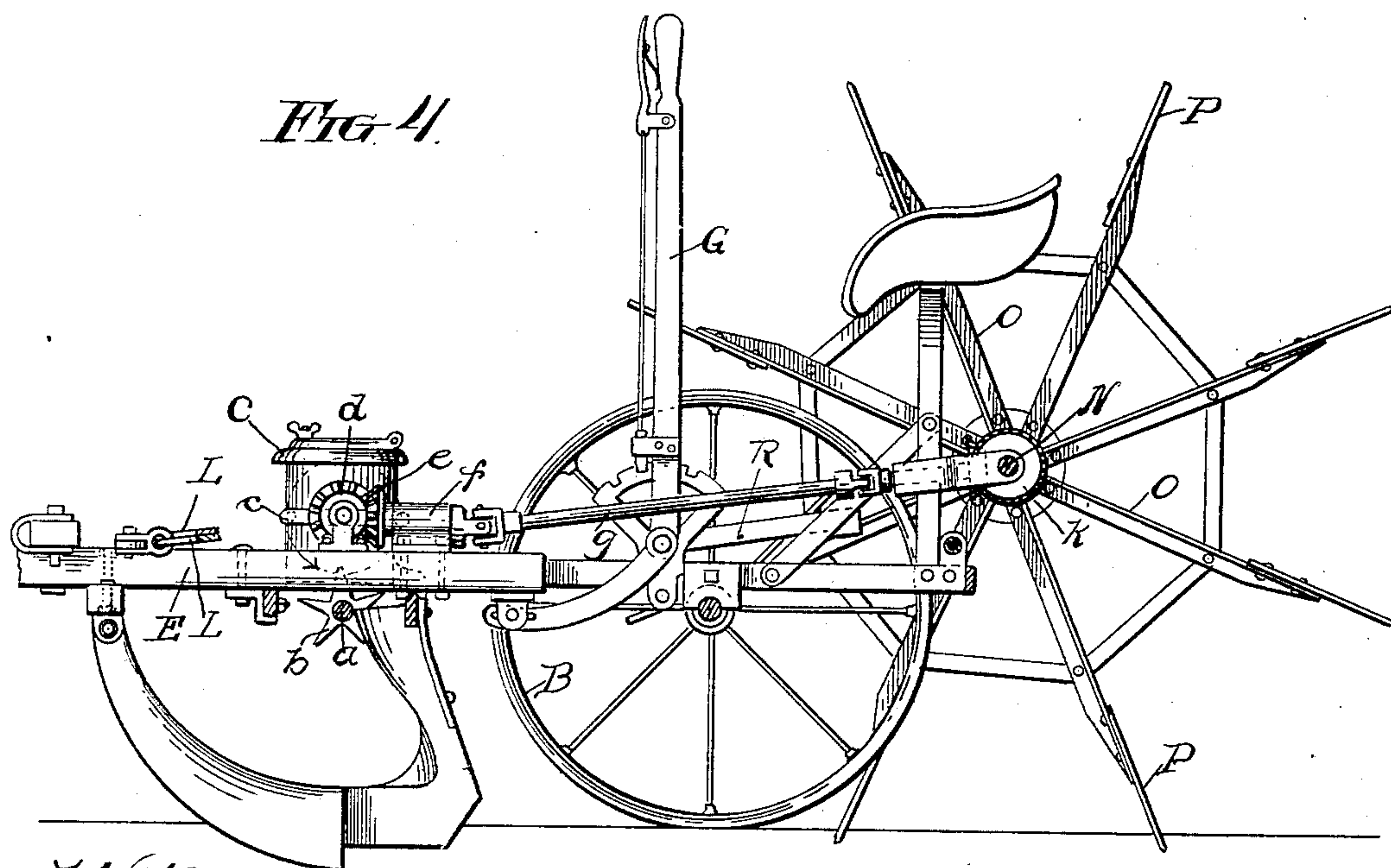


FIG. 4.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC CHECK-ROW CORN-PLANTER.

SPECIFICATION forming part of Letters Patent No. 630,891, dated August 15, 1899.

Application filed June 26, 1899. Serial No. 721,853. (No model.)

To all whom it may concern:

Be it known that I, JAMES B. JARMIN, a citizen of the United States, residing at Osceola in the county of Polk and State of Nebraska, have invented certain new and useful Improvements in Automatic Check-Row Corn-Planters, of which the following is a specification.

This invention relates to improvements in automatic check-row corn-planters of the "wireless" type or that class in which the marking, checking, and planting devices all form a part of the machine and no check-row wire is employed.

My invention more particularly relates to that class of automatic check-rowers having trailing markers—that is, marker-wheels that are attached to and trail on the ground behind the machine proper, but are connected by suitable gearing with the seed-dropping mechanism, so as to operate the same. This class of machines is exemplified by that shown in my application for Letters Patent of the United States Serial No. 719,484, which was filed on the 5th day of June, A. D. 1899, and allowed on the 19th day of June, A. D. 1899. This machine also embodies in one form the broad idea of the invention which I shall herein claim, but differs materially from the machine illustrated in this application in the means and mechanism for attaching the marker to the planter and operating the seed-dropping mechanism therefrom. In all prior machines of this class, excepting, of course, that illustrated in my above-mentioned application, there exists an inherent defect which is a practical bar to the successful operation of such machines, which is due primarily to the means and manner of connecting the marker with the planter and in a less degree to the manner of communicating power from the marker to the seed-dropping mechanism of the planter. In all machines of this class the tongue of the planter is necessarily relied upon to guide the machine across a field, and for this reason the tongue must be so connected with the planter-frame as that neither one can move laterally independent of the other, although vertical pivotal movement as between the planter and tongue is generally provided to enable the raising of

the runners or furrow-openers from the ground in hauling the machine from one field to another. Now in all prior patented machines in this art the marker is so connected with the planter either by parallel pivoted bars or by a universal coupling forward of the center of the machine that whenever the planter swerves to either side from a straight line, due to careless driving, unruly draft-animals, or to the necessity for avoiding sinks or obstructions in the field, the marker is correspondingly deflected from a straight line, the checking and seed-dropping mechanisms are thrown out of line and synchronism, and frequently the marker-blades are broken off in the ground, because in such turning or swerving one marker-wheel traverses a different arc from the other, and consequently the blades of the pivot-wheel must either drag through the ground or be broken. It is manifest that machines so constructed and operating are wholly impractical for ordinary use, and even extraordinary care in handling the machines cannot overcome these inherent defects. Consequently such machines have found no place in the market.

In those prior machines where there are two points of attachment for the trailing marker, whether it be by parallel bars pivoted to the machine or otherwise, while the trailing marker is free to rise and fall independent of the planter it is in all respects practically rigid therewith, and whenever the planter turns in any direction the marker must turn correspondingly, and hence machines of this class can have no bearing upon my invention. In those machines, of which there are but two in the prior art known to me, in which the marker has flexible or universal coupling with the planter such coupling is at such point as that the marker must swing out of line whenever the planter is turned out of line to either side just the same as those of the other class above referred to, besides which the means for driving the planting mechanism from the marker is of such character that it would in practice twist and bind beyond usefulness, because the marker in practice must be absolutely free in trailing along to adapt itself to the necessary unevenness of the soil, which keeps the marker constantly

rising and falling and canting or inclining wholly independent of the planter, which must also rock and roll along, following the unevenness of the ground, the planter and the marker sometimes leaning to one side or the other simultaneously and at other times leaning in opposite directions and at almost all times assuming different relative positions. All of this is manifestly impossible with the constructions of the prior machines and the manner and point of attachment of the marker to the planter.

The primary object of this invention is to have the marker so attached to the planter as that it shall be unaffected by lateral deflection or turning of the planter in either direction, whereby the marker will continue trailing in a straight line notwithstanding the planter may swerve to the right or to the left, and thus all of the objections hereinbefore enumerated are avoided, while the machine is rendered strong, durable, and efficient.

Another object is to have the marker attached to the planter at any desired point by universally-flexible connection in such manner that the deflection or turning of the planter from a straight line does not affect the rectilinear travel of the marker, whereby is avoided all danger of twisting the blades of the marker, the throwing of the machine out of check, and the provision of safeguards against a degree of carelessness in the use of the machine that would not be possible with any other machine of this class.

A further object is to have the universally-flexible coupling between the marker and the machine of such character that it may be connected directly with the tongue of the machine, so as to equalize the lateral deflection of the tongue and planter without turning the marker from a straight line and at the same time have a central gear connection between the marker and the seed-dropping mechanism which shall be unaffected as to its operativeness by the changes in the angularity of the position of the planter with relation to the marker.

These and such other objects as may hereinafter appear are attained by the devices illustrated in the accompanying drawings, in which—

Figure 1 represents a plan view of a planter with a marker applied thereto embodying my invention, showing the manner and proper relative position of the planter and marker. Fig. 2 is a view similar to Fig. 1, but showing the planter turned at an angle to the marker. Fig. 3 is a vertical section on the line 3 3 of Fig. 1, looking in the direction indicated by the arrows. Fig. 4 is a vertical section on the line 4 4 of Fig. 1, looking in the direction indicated by the arrows. Figs. 5 and 6 are detail views.

Similar letters of reference indicate the same parts in the several figures of the drawings.

I will now describe the embodiment of my

invention illustrated in the drawings, in which A indicates the planter-frame, which may be of any desired construction; B, the ground-wheels thereof; C, the seedboxes, which may contain any suitable kind of seed-dropping mechanism; D, the runner-frame, pivotally connected to the frame A in the usual manner, and E the tongue, which is rigidly connected with the runner-frame as against lateral movement with relation thereto, and hence by reason of the usual connection between the planter-frame and the runner-frame is rigid as against any lateral movement with respect to the planter-frame, although, of course, provision is made for vertical movement as between the tongue and the planter-frame for the purpose of permitting the raising of the runners or furrow-openers F clear of the ground through the medium of the lifting-lever G, of ordinary construction, all of which will be readily understood without further detail description.

I may here state that the construction of the planter, including the connection between the frame thereof and the runner-frame and the tongue, is wholly immaterial to my invention, so long as the tongue cannot turn laterally—that is, to either the right or the left independently of the planter-frame—so that when I hereinafter refer to the planter as a whole I intend to comprehend the tongue as a part thereof, and while I have shown the forward ends of the runners pivotally connected to the supplemental cross-bar H just to the rear of the doubletree I such bar is not essential, and any other construction than that herein shown of the parts described may be employed without departing from the spirit of my invention.

Preferably to the tongue and forward of the runner-frame is rigidly secured a draw-bar J, having pivotally connected to the ends thereof by the links K the forward ends of a pair of coupling-bars L, extending rearwardly above the frame and at their rear ends coupled loosely to boxes M, constituting bearings for the transverse marker-shaft N, which extends across the rear of the machine just back of the ground-wheels, said shaft carrying upon each end thereof a marker-wheel comprising a series of spokes O, each carrying a spade P upon the end thereof, each alternate spade being large in comparison with the intermediate spades. The large spades I prefer to be the marker-blades connecting the dropping of the seed whenever such blades are engaged with the ground, the larger or marker blades proper being distanced apart corresponding with the distance between the hills of corn.

It will be observed that the eyes in the forward ends of the coupling-bars L are somewhat larger than the diameter of the links connecting them with the draw-bar, and as the links pass through the eyes in a vertical plane there is provision here not only for a vertical movement of the coupling-bars independent of the draw-bars and in unison with

each other, but also for an independent vertical movement of the coupling-bars in the same or in opposite directions. It will also be observed by reference to Fig. 5 that the eyes at the rear ends of the coupling-bars are of greater diameter than the bolts connecting them with the bearings M, and also that the distance between the ears of the bearings is somewhat greater than the thickness of the bars, so that here again is provided a flexibility that permits of a substantially universal movement between the bars and the bearings. In fact, the play allowed in the connections at the ends of the coupling-bars, both to the draw-bar and the bearings of the marker-shaft, is intended to give not only flexibility between the marker and the planter, but substantially universal flexibility, and obviously any kind of flexible joint between the coupling-bars, the planter, and the marker may be employed and substituted for those shown in the drawings without departing from the spirit of my invention. This connection also provides for still another and more important movement—to wit, a lateral movement of the planter with reference to the marker, whereby the planter may assume an angular position with relation to the marker when swerved to one side or the other without drawing the marker around with it and causing it to trail the planter, but, on the contrary, leaving the marker free to continue its travel in a straight line, which it will do, because the marker-blades in operation sink into and engage the ground, so as to hold itself in line unless a laterally-deflecting power be directly applied thereto. Thus the coupling-bars serve as equalizers to maintain a forward draft upon the marker from the planter without putting any side strain or laterally-deflecting force upon the marker. This will be readily understood by reference to Fig. 2, in which the planter is shown as swung out of line to the left in its extreme position, in which position it will be seen that the equalizer-bars have simply changed position and so shifted that they exert practically no side draft upon the marker, which remains in its original line of travel. Of course the planter after being deflected is soon brought back to line again to the position shown in Fig. 1 and with perfect freedom with relation to the marker, and with equal freedom it may be swung to the right of the center and back again without affecting the rectilinear travel of the marker, thus giving to the driver a freedom and range in driving without disturbance of the marking mechanism that it is not possible to secure in any other kind of planter.

It will be noted that the coupling-bars, (illustrated in the drawings,) to subserve their purpose as equalizers, are each bent at their forward ends in opposite directions, so that each bar is connected at its ends, respectively, with the planter and the marker at opposite sides of the longitudinal center of the ma-

chine, so that when the planter is turning out of a straight line one of the bars swings in toward the center of the planter, while the other swings outwardly, and vice versa when the planter is turned in the opposite direction, thus equalizing the changing distance between the points of attachment of said bars to the planter and the marker.

I may here state that it is not necessary to attach the coupling-bars to the draw-bar on the tongue, but that, on the contrary, such draw-bar may be dispensed with, and the coupling-bars may be either made longer or shorter and attached to any other part of the planter or to a draw-bar located at a different point; but I prefer the construction shown in the drawings because of the greater flexibility secured by the long coupling-bars and the greater range of action allowed thereby, for with the parts as shown in the drawings the front end of the planter-tongue may be swung between three and four feet out of line in either direction without causing the coupling-bars to come in contact with the ground-wheels or with any stationary part of the machine.

For raising the marker clear of the ground I provide a cross-bar Q, underlying the coupling-bars, and mounted upon the ends are crank-arms R, secured to rock-shaft S, suitably journaled on the frame A of the planter, which shaft is rocked by a lock-lever T, of usual form, at the opposite side of the machine from the lifting-lever G, which latter lever is preferably secured to a sleeve U upon the shaft S, which constitutes a pivot therefor.

As a means for operating the seed-dropping mechanism from the marker I provide a rotating shaft *a*, suitably journaled in the runner-frame and having mounted thereon a star-wheel *b*, located in proper position to be engaged by tappets *c*, projecting from the hub of a pinion *d*, loosely journaled upon a stud-shaft above the shaft *a*, with which pinion meshes another pinion *e*, suitably journaled in a box *f*, secured to the runner-frame. The shaft of the pinion *e* is connected by a flexible shaft *g* with the stem of a pinion *h*, journaled in a yoke *i*, bearing upon the marker-shaft N, which shaft has rigidly mounted thereon a pinion *k*, which meshes with the pinion *h*, and through said pinion the flexible shaft *g* and the pinions *d* and *e* drive the shaft *a*, and consequently operates the seed-dropping mechanism in the seedboxes C in any desired manner, there being so many examples of seed-dropping mechanism in the art that it is not deemed necessary to herein illustrate or describe any of them in connection herewith.

To provide for the changes in the relative positions of the marker and the planter, I provide a telescope or extensible connection in the gearing, preferably at the point shown in the drawings and in detail in Fig. 6. This connection in this instance consists of the

square stem *l* upon the coupling of the flexible shaft *g*, which stem enters the correspondingly square socket in the hollow stem *m* of the pinion *h*, which hollow stem finds a cylindric bearing in the hub of the yoke *i*, so that as the machine turns in and out of line to the right or left the stem *l* may slide in and out of the hollow stem of the pinion, and yet at all times communicates its rotary movement thereto. Of course other forms of couplings and connections may be employed without departing from the spirit of my invention, and, indeed, a flexible spring-shaft might be employed instead of the shaft *g* shown in the drawings, in connection with which no telescope coupling would be required; but on account of the rough surface and irregular movements of the part with relation to each other I prefer the simple construction shown in the drawings.

It will be observed that the marker-wheels are positioned outside of the ground-wheels of the planter a distance equal to about half of the distance between said ground-wheels, so that in traveling back and forth across the field one wheel retraces its steps, and by care in starting either at the end of a row or in the middle of rows where interruption is caused for any reason to insure the replacing of the broad blades of the marker-wheels in the holes originally made by them the checking back and forth will be rendered perfectly accurate. Of course in traversing a field first the marker next the unplanted part of the field going in one direction will retrace its steps in returning across the field, while in planting the next two rows the other marker will retrace its steps.

At opposite sides of the machine and connected in any suitable manner is the usual disk marker, which might of course be a shoe-marker *n*, mounted on the end of a rod *o*, attached to the side of the planter-frame, it being preferable to use two of such markers, which need not be raised from the ground at any time unless it becomes necessary in turning or by reason of obstruction, although obviously the usual single marker pivoted at the center of the machine may be employed instead thereof, being swung from side to side of the machine as it traverses the field back and forth. The mark made by the disk *n* is the guide-mark for the driver, who endeavors to keep the tongue as near as possible over this mark in driving across the field, as usual in devices of this class.

From the foregoing it will be understood that the broad idea of my invention is a flexible coupling between the marker and the planter at any point and of such character that the planter may swing out of line without affecting the line of travel of the marker—in other words, such a coupling as enables movement of either the planter or the marker in any direction independent of each other—and while I have shown and described in this case a novel and effective means for carrying

out this broad idea of my invention I wish it to be understood that this is but one embodiment of my invention to which I shall make claim herein in addition to the broad idea. The broad idea of my invention, however, is also embodied and carried out in the machine illustrated in my before-mentioned application, in which the flexible coupling that enables the planter to swing out of line without affecting the line of travel of the marker is in the form of a single universal coupling between the marker and the planter, approximately at the center of the planter between the ground-wheels. It is also embodied and illustrated in another application which I am about to file, in which the flexible coupling is in the form of a pair of parallel coupling-bars instead of the bent and crossed coupling-bars shown in this application, the connection of the ends of the parallel bars with the planter being also by a single pivot instead of with two independent pivots, as in the form shown in this application. In fact, the broad idea of my invention may be embodied in many other forms, the essential feature of my invention being the flexible coupling that renders the movements of the planter and the marker independent of each other, so that the planter may be swung out of line without affecting the line of travel of the marker.

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

1. The combination with a corn-planter and the seed-dropping mechanism thereof, of an automatic check-rower attachment comprising a pair of spade marker-wheels operatively connected with the seed-dropping mechanism and a flexible connection between said planter and marker attachment permitting lateral turning of the planter without deflecting the marker, substantially as described.

2. The combination with a corn-planter and the seed-dropping mechanism thereof, of an automatic check-rower attachment comprising a pair of spade marker-wheels operatively connected with the seed-dropping mechanism and a flexible connection between said planter and marker permitting a universal movement of the planter independent of the marker, substantially as described.

3. The combination with a corn-planter and the seed-dropping mechanism thereof, of an automatic check-rower attachment comprising a pair of spade marker-wheels, a flexible connection between said planter and marker permitting lateral turning of the planter without deflecting the marker and a gear connection between said marker and the seed-dropping mechanism of the planter at the longitudinal center of the planter and marker, substantially as described.

4. The combination with a corn-planter and the seed-dropping mechanism thereof, of an automatic check-rower attachment comprising a pair of spade marker-wheels operatively

connected with the seed-dropping mechanism and a pair of coupling-bars flexibly connected at their ends, respectively, with said planter and marker so as to permit lateral turning of the planter without deflecting the marker, substantially as described.

5. The combination with a corn-planter and the seed-dropping mechanism thereof, of an automatic check-rower attachment comprising a pair of spade marker-wheels operatively connected with the seed-dropping mechanism of the planter and a pair of coupling-bars flexibly connected at their ends, respectively, to said planter and marker, the connection of each bar being at opposite sides of the longitudinal center of the machine, substantially as described.

6. The combination with a planter, the tongue thereof and a trailing marker, said marker being operatively connected with the seed-dropping mechanism of the planter, of a draw-bar rigidly secured to the planter-tongue and a pair of coupling-bars flexibly connected at their ends respectively to the marker and the draw-bar at opposite sides of the longitudinal center of the machine, substantially as described.

7. The combination with a planter, a trailing marker and a flexible connection between said planter and marker, of a shaft connected with, so as to operate, the seed-dropping mechanism of the planter, a star-wheel on said shaft, a tappet and a gear connection between said tappet and the marker, substantially as described.

8. The combination with a planter, a trailing marker and a flexible connection between said planter and marker, of a shaft connected with, so as to operate, the seed-dropping mechanism of the planter, a star-wheel on said shaft, a tappet, a shaft loosely journaled on the planter-frame, a gear connection between said shaft and tappet and a flexible shaft connecting said first-mentioned shaft and the marker, substantially as described.

9. The combination with a planter, a trail-

ing marker and a flexible connection between said planter and marker, of a shaft connected with, so as to operate, the seed-dropping mechanism of the planter, a star-wheel on said shaft, a tappet, a shaft loosely journaled on the planter-frame, a yoke pivoted to the marker, a short shaft loosely journaled therein, a gear connection between said shaft and the marker-shaft and a flexible shaft connecting said shaft and the first-mentioned shaft, substantially as described.

10. The combination with a planter, a trailing marker and a flexible connection between said planter and marker, of a shaft connected with, so as to operate, the seed-dropping mechanism of the planter, a star-wheel on said shaft, a tappet, a shaft loosely journaled on the planter-frame, a yoke pivoted to the marker, a short shaft loosely journaled therein, a gear connection between said shaft and the marker-shaft and a flexible shaft connecting said shaft and the first-mentioned shaft comprising a telescope connection with one of said shafts, substantially as described.

11. The combination with a planter, a trailing marker and a pair of coupling-bars flexibly connecting said marker and planter, of a lifting-bar underlying said coupling-bars, crank-arms carrying the same and means for operating said arms, substantially as described.

12. The combination with a planter, a trailing marker and a pair of coupling-bars flexibly connected at their ends respectively with said marker and planter at opposite sides of the longitudinal center of the machine, of a lifting-bar underlying said coupling-bars, crank-arms carrying said lifting-bar, a rock-shaft to which said arms are secured and a lock-lever for operating said arms, substantially as described.

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