(No Model.)

4 Sheets—Sheet 1.

C. E. PATRIC.

GRAIN DRILL.

No. 452,801. Patented May 26, 1891.

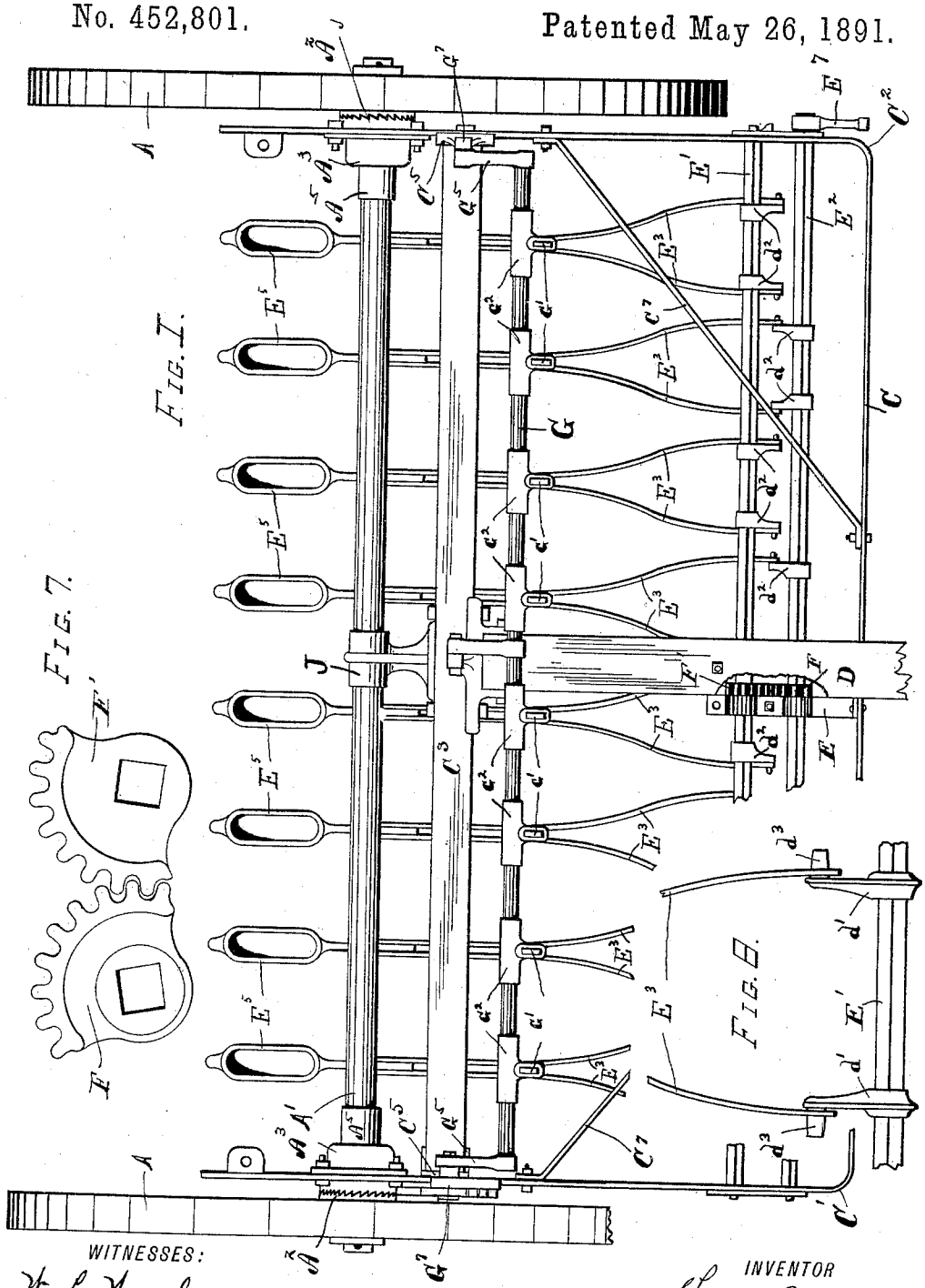

FIG. 1.

FIG. 7.

FIG. 8.

WITNESSES:

H. L. Wood

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(No Model.) 4 Sheets—Sheet 2.

C. E. PATRIC.

GRAIN DRILL.

No. 452,801. Patented May 26, 1891.

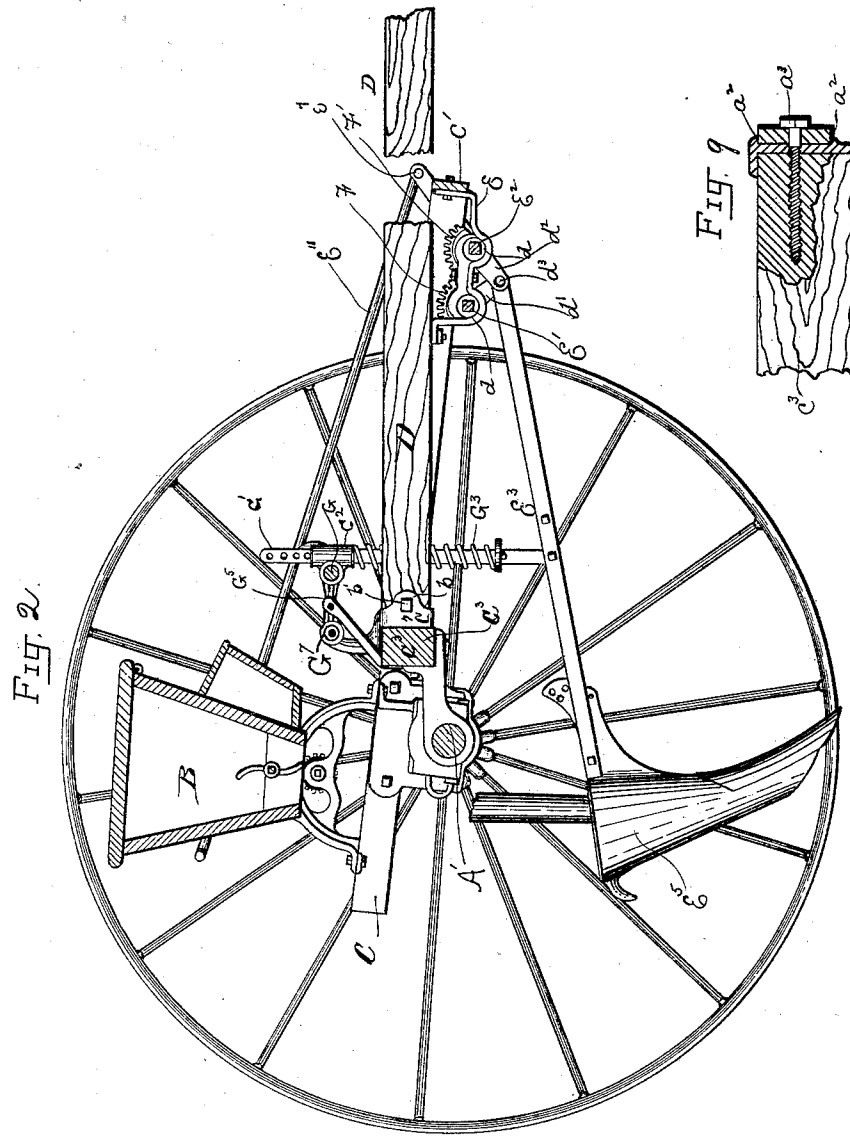

Fig. 2.

Fig. 9

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(No Model.)

4 Sheets—Sheet 3.

C. E. PATRIC.

GRAIN DRILL.

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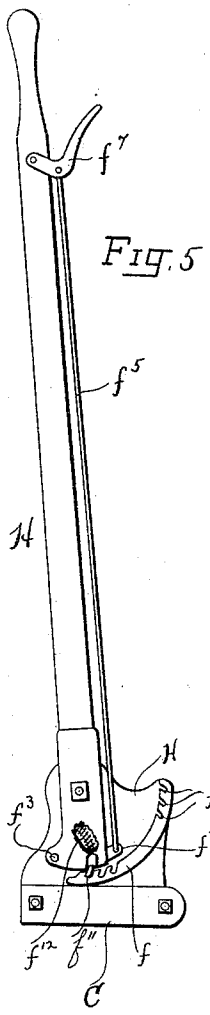

Fig. 5

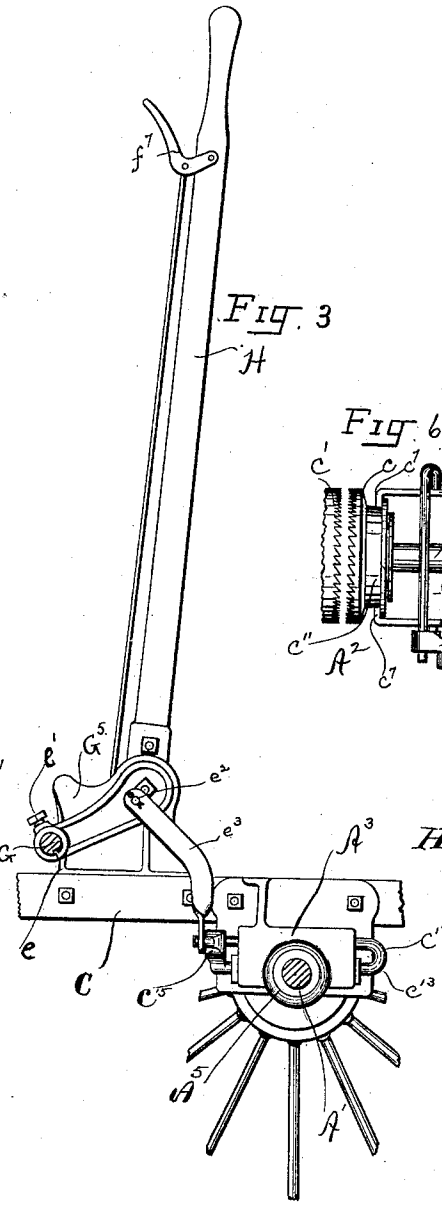

Fig. 3

Fig. 6

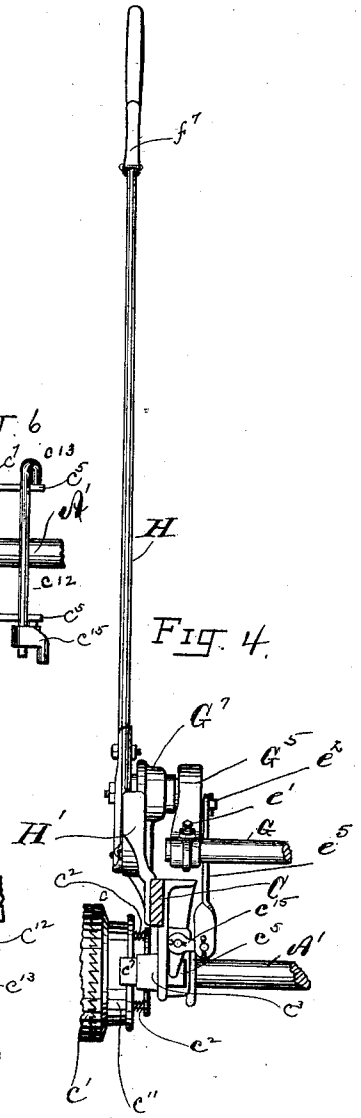

Fig. 4.

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(No Model.) 4 Sheets—Sheet 4.

C. E. PATRIC.

GRAIN DRILL.

No. 452,801. Patented May 26, 1891.

Fig 10

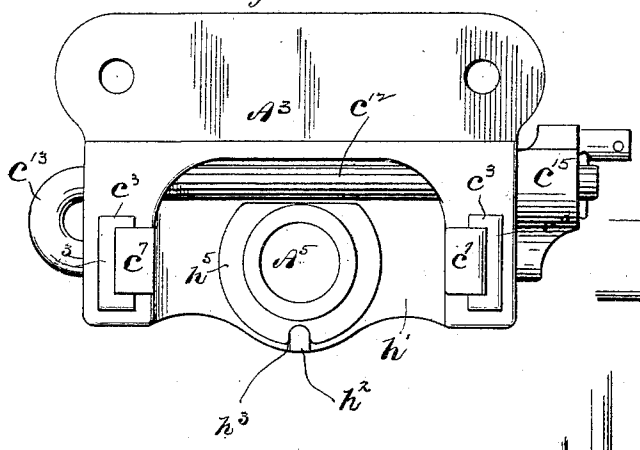


Fig. 11

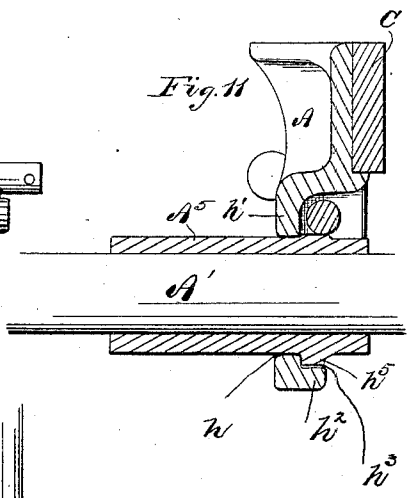


Fig. 12

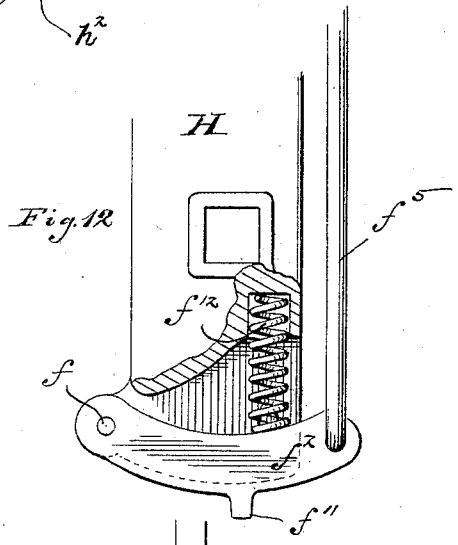


Fig. 13

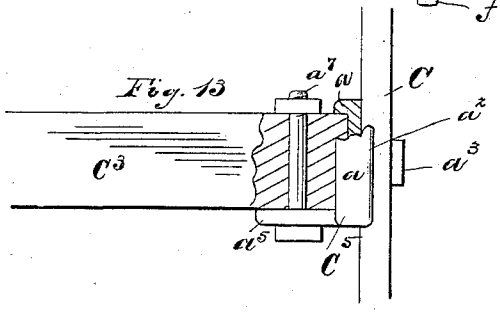
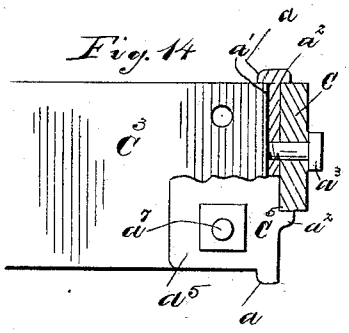


Fig. 14



WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES E. PATRIC, OF SPRINGFIELD, OHIO, ASSIGNOR TO THE SUPERIOR DRILL COMPANY, OF SAME PLACE.

GRAIN-DRILL.

SPECIFICATION forming part of Letters Patent No. 452,801, dated May 26, 1891.

Application filed August 23, 1890. Serial No. 362,882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. PATRIC, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Grain-Drills, of which the following is a specification.

My invention relates to improvements in grain-drills; and the object of my invention is to simplify the constructions heretofore employed.

My invention consists in the various constructions and combinations of parts hereinafter described, and set forth in the claims.

In the accompanying drawings, which form a part of this specification, Figure 1 is a plan view of a grain-drill embodying my invention, the hopper being shown removed and some of the parts broken away. Fig. 2 is a sectional elevation view of the same. Fig. 3 is an elevation showing a portion of the raising and lowering devices and the means for throwing the operating mechanism into and out of gear. Fig. 4 is a side elevation, partly in section, of the same. Fig. 5 is a detailed view of a portion of the same. Fig. 6 is a top view of the clutch device and the means for operating the same. Figs. 7 and 8 are details showing the construction of the drag-bars and the means employed for shifting the same to bring the shoes or hoes in double or single rank. Figs. 9, 13, and 14 are details of portions of the frame. Figs. 10 and 11 are front and sectional views, respectively, of the axle-box. Fig. 12 is a detail of a portion of the lifting-lever.

Like parts are indicated by similar letters of reference throughout the several views.

In the said drawings, A A represent the driving and carrying wheels on which the machine is supported and from which the power to drive the feeding mechanism is derived.

B is the hopper, C C the frame, and D the tongue.

The frame C C, I construct of a single bar or piece of flat metal bent at right angles, or substantially so, at the front corners C′ and C^2, with the side rails or wings connected together near the rear ends of said frame by a cross-bar C^3 Fig. 9 preferably of wood. This cross-bar C^3 is fitted at each end in a bearing-plate C^5, provided with projecting flanges a, adapted to form a socket a', into which the bar C^3 is adapted to fit, one of which flanges a^5 is extended along the side of the bar C^3 and adapted to receive two lateral bolts a^7, which extend through the said bar and flange. The bearing-plate is also provided on the opposite side with lateral flanges a^2, adapted to embrace the said frame and hold the bar against lateral movement, a wood or lag screw a^3 being preferably extended through the frame and bearing-plate and into the cross-bar C^3, thus firmly binding all the parts together.

The tongue D is secured at its inner end to the cross-bar C^3 by a plate C^7, which plate has projecting ears b, adapted to receive a fastening-bolt b', which passes through the said ears and the said tongue. The tongue D extends forward from the cross-bars C^3, passing over the front rail of the frame C.

Secured at one end to the tongue D and at the other to the front rail of the frame C is a bearing-support or hanger E, having bearings d for the rotating bars E′ E^2, which extend through the frame near the front thereof and are journaled at each end in suitable bearings attached to said frame. These bars are provided at suitable intervals with projecting arms or fingers d' d^2, each having a projecting boss d^3, on which are journaled the ends of the drag-bars E^3, attached to the hoes E^5. The rotating bars E′ E^2 are preferably made square, the arms d' d^2 being correspondingly formed to fit over the same. The drag-bars E^3 are bifurcated at their forward end and provided with openings adapted to slip over the lugs or projections d^3 on the arms d', one of said arms being employed for each fork of each drag-bar. The drag-bars are formed with sufficient resilience to permit them to be spread apart and forced over the lugs d^3, on which they are held by the elasticity or resilience of said bars. It will be noticed that the drag-bars while being placed in position are spread, so as to fit over the outside of the arms d^3, the resilience of said bars being adapted to close the forks thereof together. Any weight or longitudinal strain on the drag-bars tends to close them still farther, so that

the pressure on the shoes or hoes attached to said drag-bars when the machine is in operation tends to close the outer ends of said drag-bars more firmly against said arms and on the lugs or projections d^3, thus insuring them against accidental displacement.

Located on each of the bars E' E^2 is a gear-segment F and F', these gear-segments being preferably arranged at or near the centers of the bars and provided with hubs adapted to fit in the bearings d d in the bearing support or hanger E. These gear-segments are each provided at their extremities with a stop projection or lug d', against which the teeth of the opposite segment are adapted to come, thus preventing a further revolution of said gear-segments.

Motion is imparted to one of the bars E' E^2 through the medium of a lever or arm E^7, to which is attached a suitable operating-rod E^{11}, extended to a convenient point within reach of the operator. A movement of one of the rods or bars is immediately transmitted to the other through the medium of the gear-segments F F'. Each alternate drag-bar is connected to the opposite rotating bar E' or E^2, the arms d' d^2 on said bars being arranged so that when in the normal position the lugs d^3 thereon stand in line, as shown in Fig. 2, the hoes or shoes E^5 thus being arranged in single rank. When the bars are rotated, the arms are thrown out in opposite directions, thus throwing each alternate hoe or shoe backward and forward, thus bringing them into double rank or zigzag.

The hanger or bearing-support E being connected directly to the tongue D and to the frame C, the parts are held firmly in their respective positions, while the strain is transmitted directly from the tongue to the drag-bars, the frame being thus relieved, permitting a light and flexible frame to be used.

To secure rigidity in the parts of the frame I preferably supply corner-braces C^7, extending from the front rails to the side wings, as shown in Fig. 1. It will be understood that the power to drive the drill and the operating parts is applied directly from the tongue D through the medium of the double and single trees D' in the usual manner.

The power to drive the feeding mechanism is derived from the axle A' in any well-known manner, preferably by means of my improved changeable adjustable disk-wheel device, by means of which the speed of the feed-shaft may be varied by shifting the pinion to different positions on the disk-wheel in a well-known manner. The wheels A A are normally loose on the shaft or axle A', but are adapted to be connected thereto and revolve said shaft by the clutch device A^2, arranged at each end of the axle in connection with the hubs of the driving-wheels A. These clutches A^2 consist of a serrated clutch-collar c, adapted to slide longitudinally on the axle A', but connected thereto by a spline or in any other suitable manner, so as to cause said axle to revolve therewith, a similarly-serrated face or collar c' being provided on each of the hubs of the driving-wheels. The clutches A^2 are arranged just outside of the axle-boxes A^3, by which the axle A' is supported and connected to the frame C. The clutch-collar c is adapted to be held in contact with the serrated face c' by small springs c^2, which press against said collar. The axle-box A^3 is provided on each side of the main axle-bearing with small bearings c^3, through which are adapted to slide connecting-links c^5, each provided at one end with a lateral projecting flange or hook c^7, adapted to engage in a peripheral groove c^{11} in the clutch-collar c, these links c^5 being arranged at each side and parallel with the axle A'. Extending through a bearing A^3 at right angles to said axle and to said links, and preferably above the same, is a rock-shaft c^{12}, provided at one end with a hook-shaped projection c^{13}, adapted to engage with one of the links c^5, and provided at the other end with a bell-crank lever c^{15}, one arm of which engages with the opposite link c^5.

Means are provided for imparting motion to the bell-crank lever c^{15}, and thus to the rock-shaft c^{12}, thus producing a simultaneous movement of the links c^5, which movement is transmitted to the clutch-collar c to withdraw the same from the clutch-face c' on the hub of the wheel A.

The axle-boxes A are each constructed in two parts, the bearing proper A^5 being made separate from the main portion or frame. The bearing part is made to fit loosely in an opening h, formed in a web or flange h'. This web or flange is provided with a lug or projection h^2, adapted to fit in a notch or opening h^3 in an annular flange h^5, with which the bearing proper is provided. By this arrangement the bearing proper is adapted to adjust itself to a limited extent within the main or frame portion, and thus prevent cramping the axle in assembling the parts. The flange h^5 holds the bearing against end pressure from the wheels, while the lug or projection prevents the bearing from turning in the outer or frame portion.

A lifting-bar G, extending transversely across the machine above the drag-bars E^3, furnishes the means for raising and lowering said drag-bars through the medium of stirrups G' in a well-known manner. This lifting-bar G is provided at each end with arms G^5, pivoted to suitable bearing-supports G^7, arranged on each side of the frame C, the said arms being preferably connected to the lifting-bar at each end by a spline e, formed in an opening in each of said arms, in which the end of said shaft is adapted to fit, and a set-screw e', adapted to pass through said arm and bear against said bar. (See Fig. 3 for detail.) Each of the arms G^5 is provided with a projecting stud e^2, on which is journaled a connecting-link e^3, which extends downwardly and is connected to the bell-crank lever c^{15} of

the clutch-operating mechanism heretofore described. It will be seen, therefore, that as the lifting-bar G is raised or lowered to raise or lower the hoes or shoes motion is imparted to the operating mechanism of the clutches.

The groove c^{11}, in which the hook-shaped end of the links c^5 engage, is made sufficiently wide to permit a limited movement of said links after the clutch-faces are in engagement. This permits a limited movement of the lifting-bar G sufficient to regulate the depth of the hoes or the pressure thereon without disturbing the contact of the clutch-faces. When, however, the lifting-bar G is raised sufficient to raise the hoes or shoes from the ground, the clutch-faces are disengaged, thus throwing the operating parts out of gear.

The motion for operating the lifting-bar G is preferably secured from a lifting-lever H, journaled in a suitable bearing in a ratchet-stand H′, secured to the frame C and connected to one of the arms G^5. The ratchet-stand H′ is secured to the frame C and provided with a laterally-projecting flange *f*, arranged on the arc of a circle whose center is at the center of the pivoted connection of the hand-lever H, said flange being provided with a series of notches *f*′. Located in the end of the lever H and extending across the same at right angles thereto is a latch f^2, preferably formed on the arc of a circle, pivoted at f^3 to one side of said lever and connected at its opposite end by a suitable connection f^5 to a thumb-lever f^7. This latch f^2 is provided with a projection f^{11} on one side thereof, adapted to engage in the respective notches *f*′ of the segmental flange *f*, a spring f^{12}, arranged within the handle H, being adapted to press said latch outwardly from the end of said lever, means being thus furnished for holding the lever H and the lifting mechanism in any desired position. It will be seen that by the above constructions simple mechanism is provided to accomplish the various adjustments of the machine. The feeding mechanism is adapted to be operated from either or both of the driving-wheels, and means are provided for automatically disengaging said wheels and thus throwing the feeding mechanism out of gear when the shoes or hoes are raised. By the construction of the drag-bars and their connections, together with the frame, as described, a light, strong, and simple construction is secured.

Having thus described my invention, I claim—

1. The combination, in a grain-drill, with a frame consisting of the front and side rails, substantially at right angles, and a cross-bar, as described, and a tongue secured to said cross-bar and extending forward of the front rail of said frame, of the transverse rotating bars connected at each end to said frame and provided at or near the middle with a bearing-plate connected to said tongue and frame, and means for connecting the drag-bars to said rotating bars, substantially as specified.

2. The combination, with a frame having the front and side rails formed of a single piece of flat metal, as described, and a cross-bar connected at each end to said side rails and extending parallel with said front rail, of a tongue secured to said cross-bar, a transverse bar or bars attached to said tongue and to said frame, and means for connecting the drag-bars to said transverse bar or bars, substantially as specified.

3. The combination, with a frame, parallel rotating bars journaled at each end in said frame, each provided with projecting arms, and drag-bars connected to said projecting arms, of intermeshing gear-segments connecting said bars, so that a rotation of one bar produces a corresponding movement of the other bar, and stop projections in one segment adapted to come in contact with the teeth of the other segment and thus limit the rotary movement of said segments and bars, substantially as specified.

4. The combination, with the tongue and frame, of the transverse rotating bars extending across said frame, gear-segments on said bars, a bearing-plate connected to said tongue and to said frame and provided with bearings for the hubs of said gear-segments, projecting arms on said rotating bars, and means for connecting the drag-bars to said projecting arms, substantially as specified.

5. The combination, with the rotating bars having the arms or fingers with the connecting projections thereon, the gear-segments on said rotating bars having stop projections, and a bearing-support having bearings for said gear-segments, said bearing-support being connected to the tongue and frame, respectively, as described, of the bifurcated drag-bars formed of resilient metal and connected to said projections by being spread apart and forced over said projections, which project in opposite directions, substantially as specified.

6. The combination, with the frame having the front and side rails formed of a single bar of metal, as described, and a transverse wooden bar connecting said side rails, of connecting-pieces at each end of said transverse bar, each having a socket for said bar and laterally-projecting lugs adapted to embrace said frame, and means for connecting said frame, bar, and connecting-pieces, substantially as specified.

7. The combination, with a frame having the front and side rails formed of a single piece of metal, as described, and a transverse wooden bar connecting said side rails, of a tongue connected to said bar, and a bearing-support from said bar to the main axle, substantially as specified.

8. The combination, with the frame having the front and side rails formed of a single piece of flat metal, as described, and a transverse wooden bar connected at each end to said side rails and extended across the frame parallel to the front rail, of a tongue secured to said cross-bar, a bearing-support from

said cross-bar to the axle, transverse rotating bars on said frame, a bearing yoke or support connected to said tongue and to the front rail of said frame and provided with bearings for said transverse rotating bars, and means for connecting the drag-bars or shoes to said transverse rotating bars, substantially as specified.

9. The combination, with the main axle and a supporting or carrying wheel normally loose on said axle, of a clutch-collar adapted to engage with said wheel and cause the same to revolve with said axle, an axle-box having a main bearing for said axle, connecting-links extending through said axle-box at each side of said main bearing and engaging with said clutch-collar, and a rock-shaft supported in said axle-box and adapted to engage at each end with said links, substantially as and for the purpose specified.

10. The combination, with an axle-box and a clutch-collar, as described, of the connecting-links having bearings in said axle-box on each side of the main bearing, a rock-shaft journaled in said axle-box at right angles to the connecting-links, crank-arms on said rock-shaft adapted to engage with said connecting-links, and means for rotating said rock-shaft, substantially as specified.

11. The combination, with the main axle-box and a clutch-collar, as described, of the sliding links engaging with said clutch-collar and adapted to reciprocate through said axle-box, and a rock-shaft journaled in said axle-box and provided at one end with a crank adapted to engage one of said links and at the other with a bell-crank, one arm of which engages with the other link and the other arm being connected to mechanism for operating said rock-shaft, substantially as specified.

12. The combination, with the shoes or hoes and their drag-bars, of a lifting-bar extended over and connected to said drag-bars, a lifting-lever for operating said lifting-bar, a main axle-box and a clutch for one or both carrying-wheels, a rock-shaft and sliding connecting-links connected thereto in each axle-box, said sliding links being connected to said clutch, and a connection from each crank-arm on the end of the lifting-bar to the rock-shafts in said axle-boxes, substantially as specified.

13. The combination, with the lifting-lever, of a pivoted latch extending transversely across the end of the same, said latch being provided with an engaging projection substantially at right angles thereto, and a laterally-projecting flange formed on the arc of a circle and provided with notches with which said latch is adapted to engage, substantially as specified.

14. The combination, with the lifting-lever and its supporting-stand having a lateral flange or segment provided with notches therein, of a latch extending transversely across the end of said lever and pivoted at one end thereto, a spring engaging with said latch, a connection from the outer end of said latch to a thumb-lever, and an engaging projection on said latch adapted to engage in the notches of said flange or segment, substantially as specified.

15. The combination, with the frame and axle, of an axle-box having the main part or frame portion adapted to be secured to said frame and a bearing which fits loosely in said frame portion, said bearing being provided with an annular flange adapted to rest against the main or frame portion, and a stop projection to prevent the revolution of said bearing, substantially as specified.

16. The combination, with the main axle and the wheels and clutches, as described, of a bearing-box having a loose bearing portion with a projecting flange and a stop projection, as described, a rock-shaft journaled in said axle-box, and the reciprocating links connected to said rock-shaft and adapted to engage with said clutch, substantially as specified.

17. The combination, with the frame and axle, of an axle-box formed in two parts, one of said parts being provided with a web or flange portion having an opening therein and the other part being adapted to fit into said opening, having a stop-flange with a notch or opening therein, and a projecting lug on the main portion adapted to engage in said opening, substantially as specified.

18. The combination, with the main frame formed of a single piece of metal, of a transverse wooden connecting-bar, connecting-plates between said frame and bar, said plates being provided with an extended flange, and means connecting said bar to said extended flange, substantially as specified.

19. The combination, with the frame formed of a single piece of metal, as described, and a transverse wooden connecting-bar, of bearing-plates at each end of said bar, each having a socket to receive the end of said bar, and lateral projecting flanges to embrace said frame, one side of said socket being extended along the side of said bar and connected thereto, substantially as specified.

In testimony whereof I have hereunto set my hand this 20th day of August, A. D. 1890.

CHARLES E. PATRIC.

Witnesses:
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CHAS. I. WELCH.