No. 871,770.

PATENTED NOV. 26, 1907.

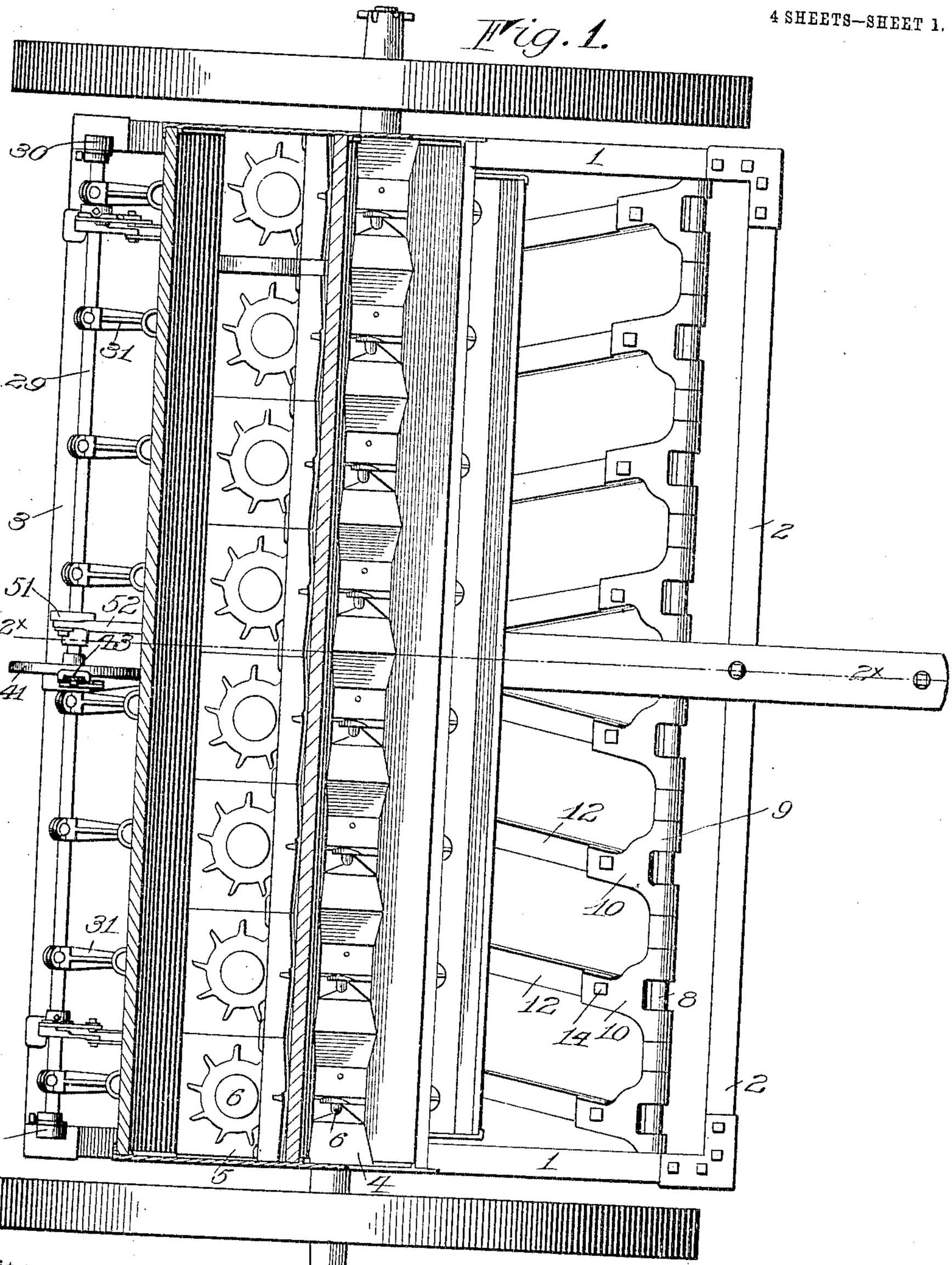
A. ARMITAGE & W. P. THISTLETHWAITE.

GRAIN DRILL.

APPLICATION FILED APR. 24, 1905.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses.

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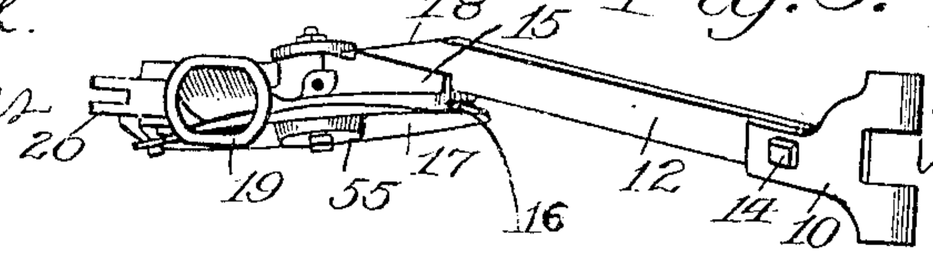
M. D. St. Helens.

Fig. 3.



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4 SHEETS—SHEET 2.

Fig. 2.

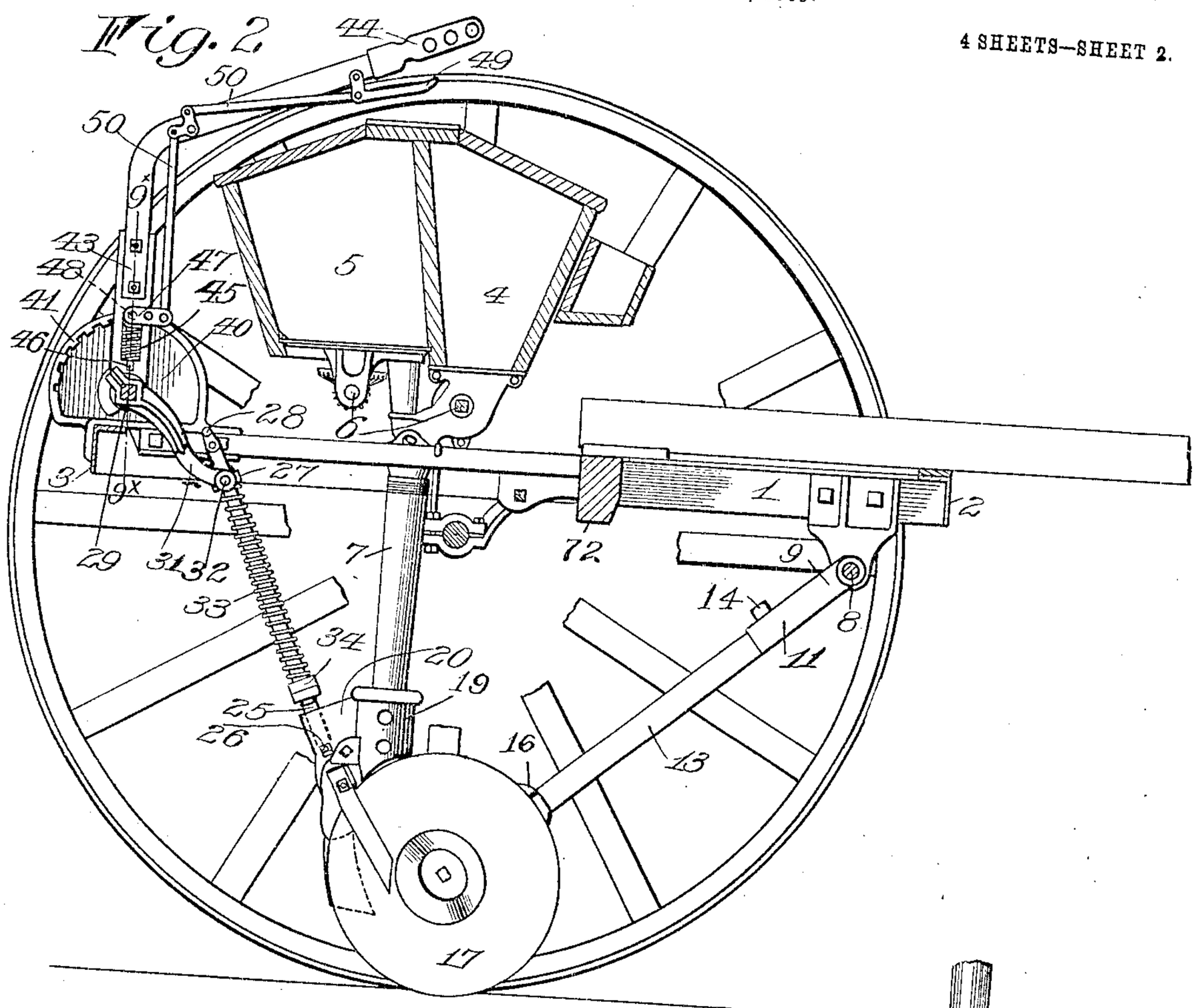

Fig. 8.

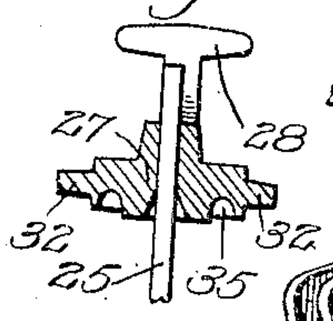

Fig. 6.

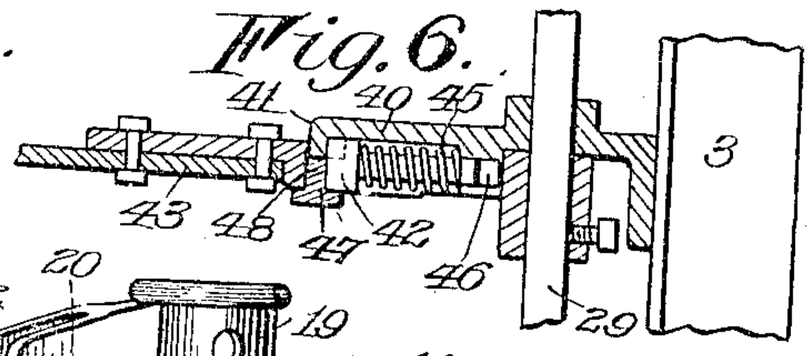

Fig. 7.

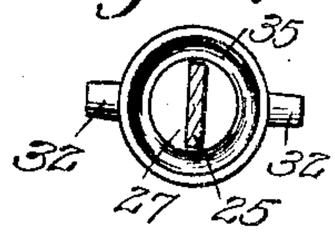

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Fig. 5.

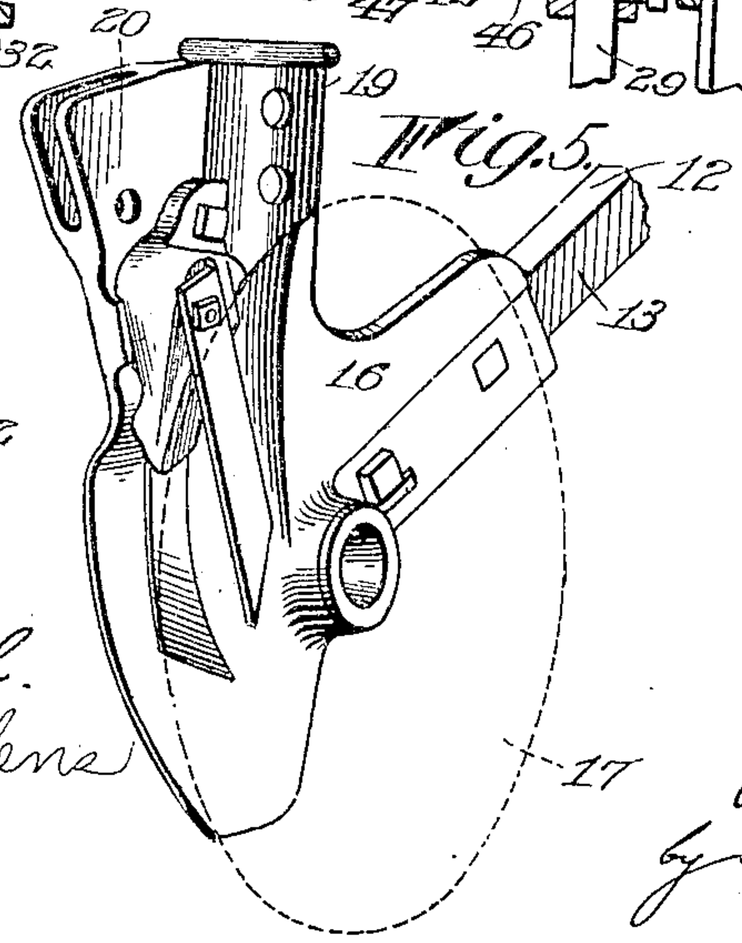
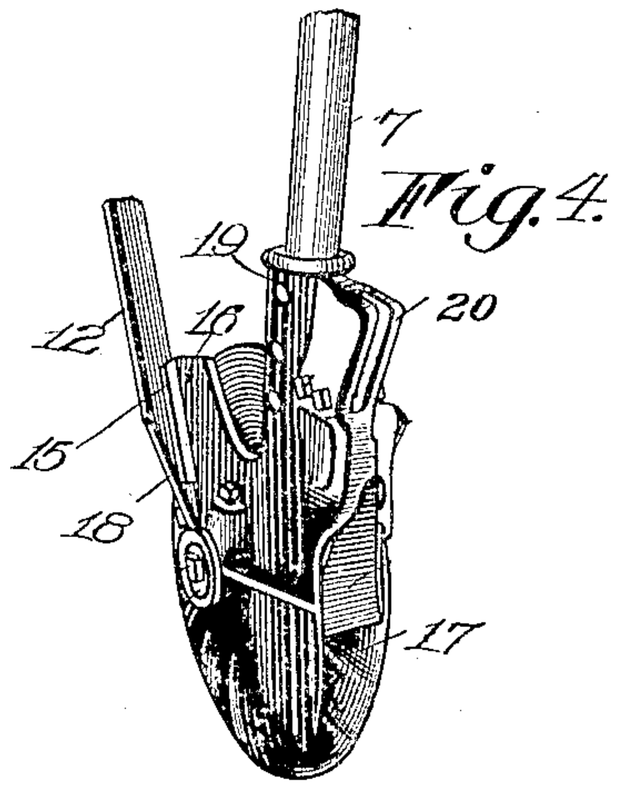


Fig. 4.



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4 SHEETS—SHEET 3.

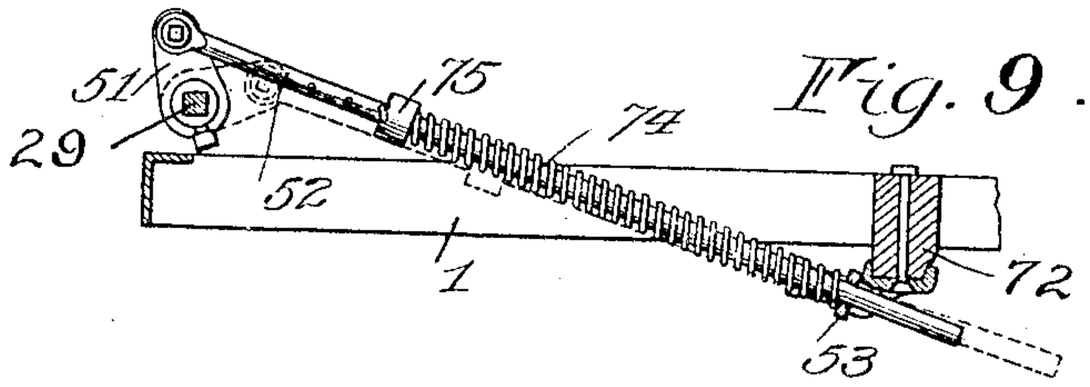

Fig. 9.

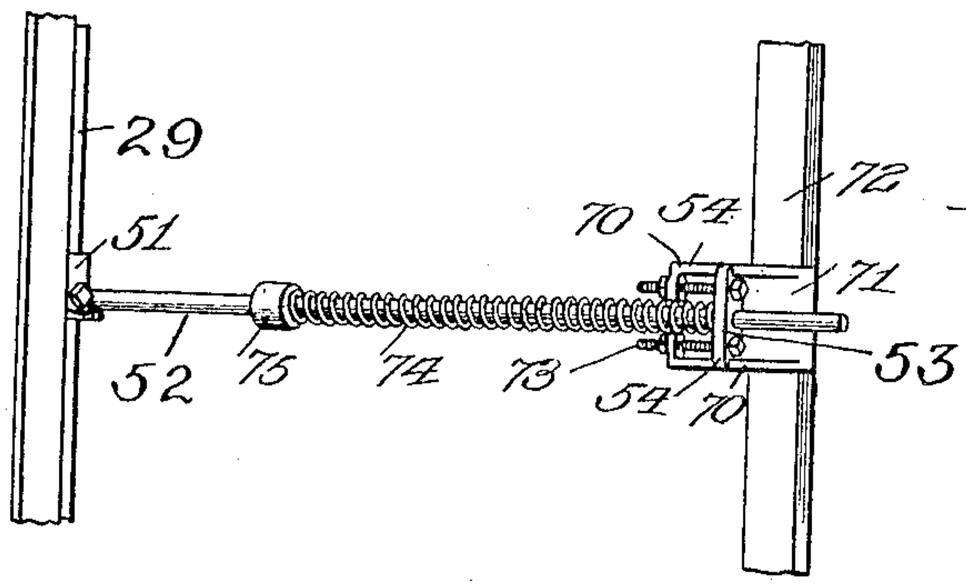

Fig. 10.

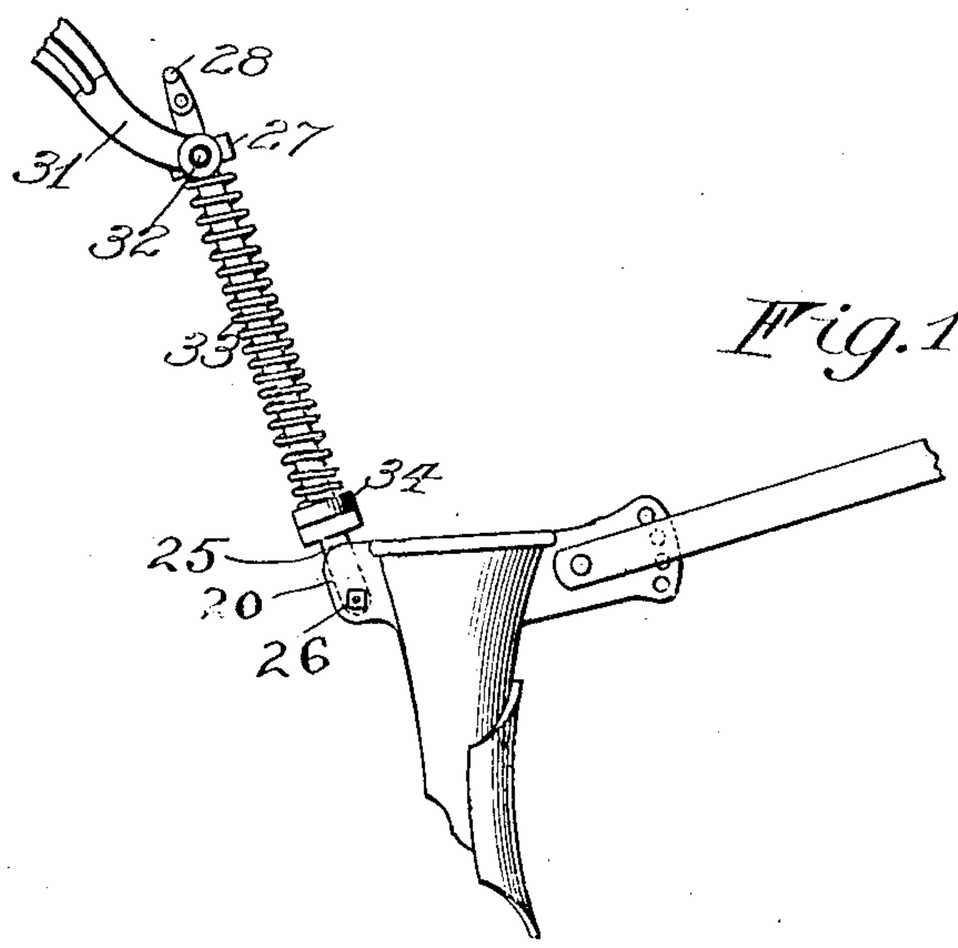

Fig. 11.

Witnesses
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No. 871,770.

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GRAIN DRILL.

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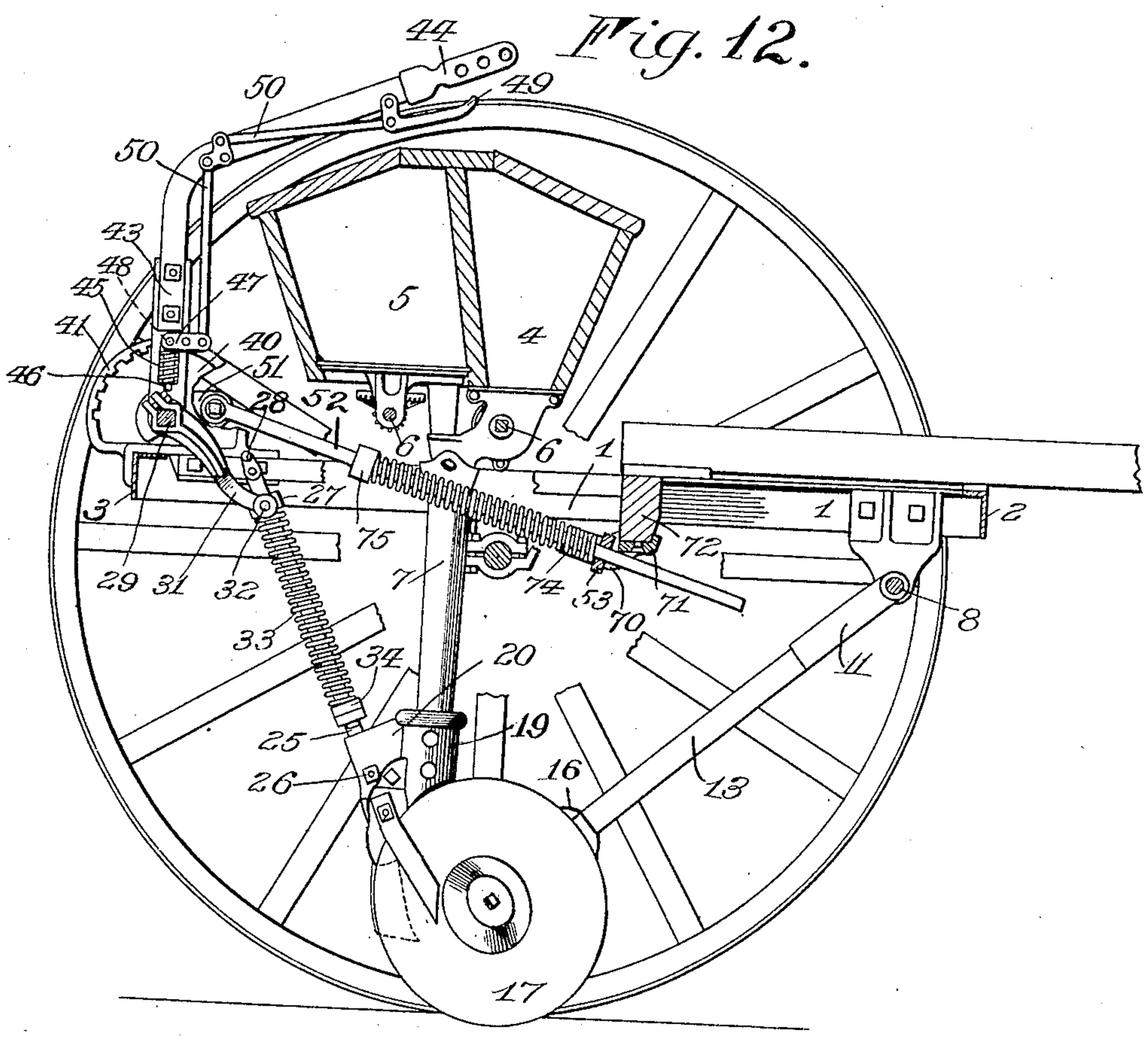
4 SHEETS—SHEET 4.

Fig. 12.



Witnesses

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Florence E. Franck.

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their Attorney

UNITED STATES PATENT OFFICE.

ALBERT ARMITAGE, OF FAIRPORT, AND WILLIAM P. THISTLETHWAITE, OF MACEDON, NEW YORK, ASSIGNORS TO ONTARIO DRILL COMPANY, OF DESPATCH, NEW YORK, A CORPORATION OF NEW YORK.

GRAIN-DRILL.

No. 871,770. Specification of Letters Patent. Patented Nov. 26, 1907.

Application filed April 24, 1905. Serial No. 257,053.

To all whom it may concern:

Be it known that ALBERT ARMITAGE, of Fairport, in the county of Monroe, and WILLIAM P. THISTLETHWAITE, of Macedon, in the county of Wayne, both in the State of New York, have invented certain new and useful Improvements in Grain-Drills; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of the specification, and to the reference numerals marked thereon.

Our present invention relates to grain drills and particularly to that class known as disk drills and it has for its object to provide improvements in the supporting devices for the tools and the operating mechanism for raising and lowering them.

To these and other ends the invention consists in certain improvements and combinations of parts all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings: Figure 1 is a top plan view of a grain drill to which the devices embodying the invention are applied. Fig. 2 is a detail longitudinal sectional view taken on the line $2^{\times}$ $2^{\times}$ of Fig. 1. Fig. 3 is a plan view of one of the tools or disks removed from the machine. Fig. 4 is a perspective view of one of the tools looking toward the rear side thereof. Fig. 5 is a similar detail view of the shoe and scraping devices operating on the disk. Fig. 6 is a sectional view illustrating the locking device of the operating handle for the elevating devices, taken on the line $9^{\times}$ $9^{\times}$ of Fig. 2. Fig. 7 is a detail plan view of the elevating rod guide and spring plate. Fig. 8 is a cross sectional view thereof. Fig. 9 is a detail longitudinal sectional view of the frame and tool elevating shaft showing the helper spring. Fig. 10 is a detail plan view of the supporting and adjusting device for said spring. Fig. 11 is a perspective view of a different form of tool showing the application of vertical supporting flanges thereon, and Fig. 12 is a view similar to Fig. 2 illustrating the operation of the helper spring shown in detail in Figs. 9 and 10.

Similar reference numerals in the several figures indicate similar parts.

In illustrating the invention it has been shown as applied to grain drills of the usual construction consisting generally of rectangular frame composed of side pieces 1 and front and rear pieces 2 and 3, respectively, on which is supported the box composing the seed and fertilizer hoppers 4 and 5 from which latter the material is distributed by suitable feeding mechanism 6 and conveyed by the conductor 7 to the rear of the tools.

At the forward side of the frame and supported on the side pieces 1 is a draw shaft 8 and mounted thereon are a plurality of draw heads 9 which are spaced equidistant and are provided with projections or arms. The latter comprise a top portion 10 and a side portion 11 disposed at an angle to each other which extend rearwardly from the head at an angle other than a right angle thereto for a purpose to be presently described. Fitted to the angle of each arm is a rearwardly extending tool bar, having a top 12 and a side 13, and secured to the head by a bolt 14.

The rear end of the tool bar is located out of alinement with its forward end and secured to the side 13 thereof is a shoe or support 16 provided with a rib or projection 15 embracing the top of the bar to steady it against the strain exerted during the operation of the disk 17 journaled thereon and supported at an angle to the direction of movement of the implement. In practice, these draw bars are formed of angle bars, as this construction gives the desired stability to the tools to prevent them from tipping over at the top or from moving laterally when operating in hard or stony ground without unnecessarily adding to the weight of the machine, and by extending the bars rearwardly and laterally and locating the tools behind them, as shown, the bars will extend diagonally across their paths and prevent brush and stubble from interfering with their operation. Those bars at one side of the center of the draw shaft 8 extend in lines converging toward the bars attached to the other end of said shaft, as shown in Fig. 1 and their top portions 12 are chamfered, as indicated at 18 in Fig. 3, on lines extending in the direction of movement of the implement to afford increased clearance between each of them and the adjacent tool, or disk.

Each of the shoes 16 is provided with a boot leg 19 receiving the end of the conduc-

tor 7 and having at its rear side projecting parallel flanges 20 between which the lower end of a lifting rod, or bar 25 is secured by a bolt 26. The upper end of the bar passes through the guide 27 and is provided with a handle formed by a casting having laterally projecting knobs 28 thereon which may be grasped by the operator to elevate a tool independently of the lifting mechanism. At the rear side of the implement frame is a rock shaft 29, supported in suitable bearings 30, carrying arms 31 the outer or lower ends of which embrace trunnions 32, on the guides 27, whereby as the shaft is rotated to move the arms upwardly the plates 27 engaging the handles 28 will lift the rods 25 and elevate the tools. When operating in hard or unplowed ground it is necessary to exert force to move the tools downwardly and for this reason the rods 25 are surrounded by coiled springs 33 which are compressed by rotating the shaft 29 to the position shown in Fig. 2, the lower ends of the springs operating against seats 34 on the rods. The seats 34 and the plates 27 are each provided with circular recesses 35 adapted to receive the ends of the springs to center them, as shown in Figs. 7 and 8. The arrangement shown in which the elevating rod 25 is located between the flanges 20 on the tool is an advantageous one as the rod serves to support the tool at its upper end, preventing it from being twisted or bent out of its normal vertical position on the draw bar.

At or about the center of the rear piece 3 of the frame is supported a plate or sector 40 having thereon a segmental rim 41 provided at its inner edge with notches, as shown in Fig. 2, with which coöperates a latch 42 carried on an arm 43, secured to the shaft 29 and provided at its outer end with a handle 44. The latch 42 and the surrounding coil spring 45 is located in an aperture in the arm 43 and is prevented from removal therefrom by its lower end which rests in a recess 46 and is held against displacement by the plate 40. The outer end of the latch also engages the plate 40 and projects through the aperture, before described, but is prevented from lateral movement therein by means of a pivoted plate 47 carrying a pin 48 engaging the end of the latch (see Fig. 6) and adapted to retract the latter when the plate is rotated by compression of the releasing lever 49 to which it is connected by rods 50. This construction of the operating arm and the plate or sector having a rim with the teeth or notches on its inner surface enables the parts to be made in such a form that they may be readily cast and assembled without the necessity of fitting them accurately by the aid of tools and machinery especially adapted for the purpose.

Connected to the rock shaft 29 is a crank arm 51 to which is pivotally attached a rod 52 guided loosely in a plate 53 adjustably supported at its ends in guides 54 on arms 70 of a support or casting 71 secured to a central cross bar 72 on the frame of the machine. The ends of the arms 70 extend inwardly toward each other forming lugs or ears which are perforated to receive adjusting screws or bolts 73 connected to the plate 53 whereby the position of the latter may be varied to increase or decrease the tension of the coil spring 74 which surrounds the rod 52 and abuts against a collar or projection 75 thereon. When the rock shaft is in its normal position the arm 51 projects upwardly as shown in full lines in Fig. 9, but when it is rotated to depress the tools by compressing the springs 33, it is moved into the position shown in dotted lines same figure. This causes the spring 74 to be compressed so that when the rock shaft is released it will assist the operator in raising the tools during the time the greatest effort is required to withdraw them from the ground. By providing means for adjusting the tension of the spring the latter may be regulated as required on machines carrying different numbers of tools.

In the claims:

1. In a grain drill, the combination with a frame and a transversely extending draw shaft thereon, of heads on the shaft, having arms extending rearwardly from the heads and at an angle other than a right angle to the shaft straight bars secured to said arms and tools supported on the bars.

2. In a grain drill, the combination with a frame and a transversely extending draw shaft thereon, of heads on the shaft, having arms extending rearwardly from the heads and at an angle to the shaft, bars secured to the arms and being arranged so that those at one side of the center of the shaft converge toward those at the other side and tools on the bars.

3. In a grain drill, the combination with a frame and a transversely extending draw shaft thereon, of heads disposed equidistantly on said shaft having ends extending rearwardly at an angle other than a right angle, bars attached to said ends, said bars at one side of the center of the shaft converging toward those at the other side and tools mounted on the rear sides of the bars.

4. In a grain drill, the combination with a frame, a draw bar thereon and a head pivoted on the bar, of a rearward extension on the head composed of top and side portions, disposed at an angle to each other, an L-shaped tool bar fitting said angle and secured to the extension and a tool on the bar.

5. In a grain drill, the combination with a frame, a draw bar thereon and a head pivoted on the bar, of an angular tool bar comprising top and side portions connected to the head and a tool secured to the side portion of the

bar having a projection extending over the top thereof.

6. In a grain drill, the combination with a frame, a draw bar thereon and a head on the bar, of a straight tool bar extending rearwardly from the head and having its rear end situated at one side of the plane of its forward end and a tool secured to said rear end.

7. In a grain drill, the combination with a frame, a draw bar thereon and a head on the bar, of a straight tool bar extending rearwardly from the head and arranged at an angle other than a right angle thereto and a tool secured to the bar and located in the rear thereof.

8. In a grain drill, the combination with a frame and a draw head having projections extending rearwardly at an angle other than a right angle and comprising angularly disposed top and side portions, of an angular tool bar fitting said extension and a tool secured to the side of the bar having a rib extending over the top thereof.

9. In a grain drill, the combination with a frame, vertically movable tools thereon, a rock shaft and connections between it and the tools, of a plate having a rim provided with notches in its inner side, an operating handle on the shaft having a recess in the side adjacent to the plate, a dog lying in the recess and a plate pivoted to the operating handle and carrying a pin engaging the end of the dog, and means for operating the plate.

10. In an agricultural implement, the combination with a frame, a vertically movable tool thereon and a rock shaft having an arm carrying a guide, of a bar connected to the tool and movable through the guide and a handle piece attached to the bar engaging the guide and having laterally projecting knobs thereon above the point where it engages the guide.

11. In an agricultural implement, the combination with a frame, a vertically movable tool thereon and an elevating device, of a bar attached to the tool, a spring surrounding the bar, and a seat on the bar for one end of the spring, a guide for the bar engaging the other end of the spring and carried on the elevating device, said seat and guide being provided with annular recesses receiving the ends of the spring.

12. In an agricultural implement, the combination with a frame, tools thereon, a rock shaft and connections between it and the tools, of a rod connected to the shaft and moved longitudinally thereby, a guide for the rod, a spring operating on the latter and means for adjusting the guide to vary the tension of the spring.

13. In an agricultural implement, the combination with a frame, tools thereon, a rock shaft and connections between it and the tools, of a rod connected to the shaft and moved longitudinally thereby, a guide for the rod and a support for the latter having ways thereon engaging the guide, means for adjusting the latter on the ways and a spring engaging the guide and operating the rod in one direction.

14. In an agricultural implement, the combination with a frame, tools thereon, a rock shaft and connections between it and the tools, of a rod connected to the shaft and moved longitudinally thereby, a guide for the rod and a support for the latter secured to the frame having depending arms engaging the guide, adjusting screws for moving the latter on the arms and a spring on the rod engaging the guide.

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