

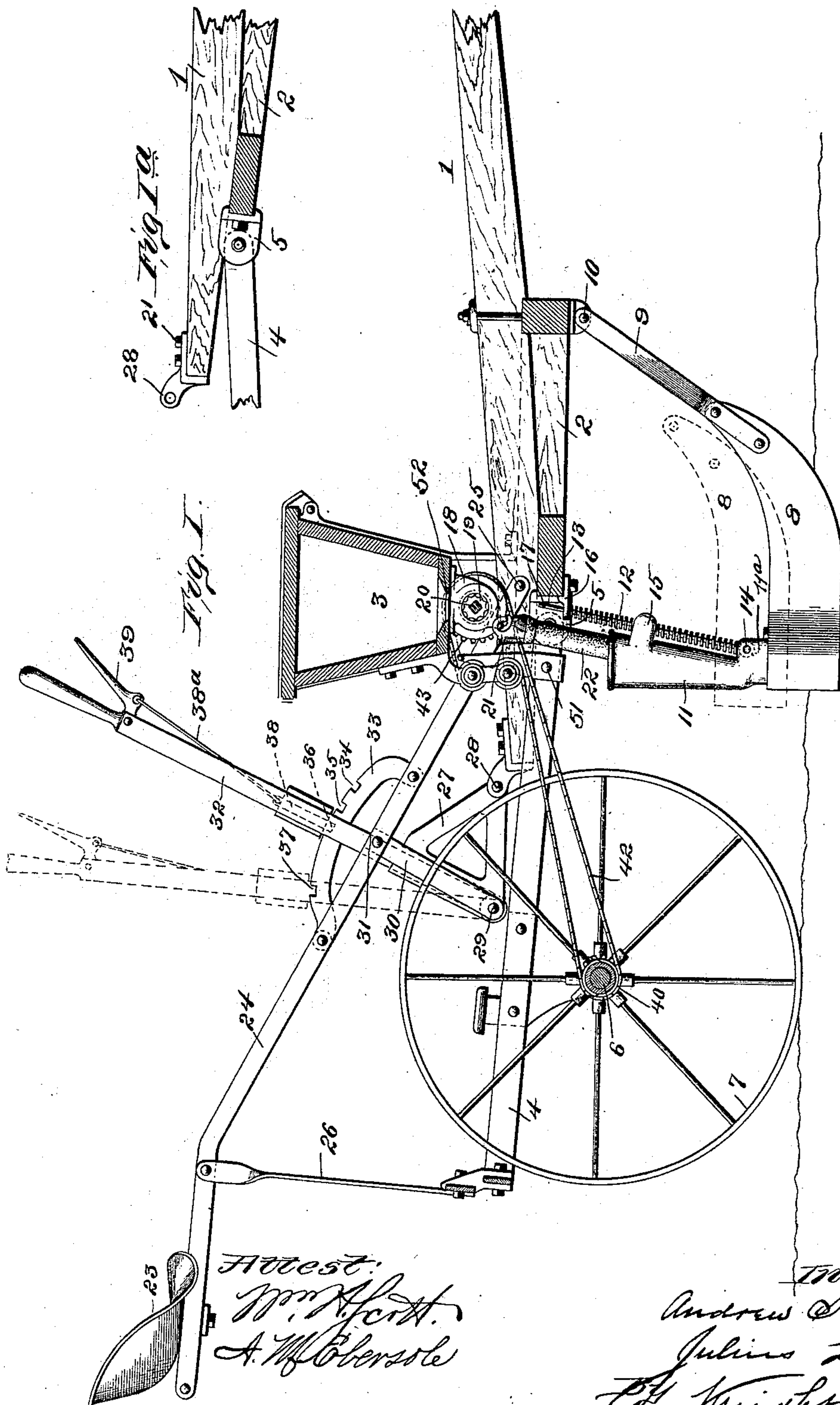
(No Model.)

A. SCHOPP & J. LIESE.  
GRAIN DRILL.

3 Sheets—Sheet 1.

No. 513,060.

Patented Jan. 16, 1894.



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3 Sheets—Sheet 2.

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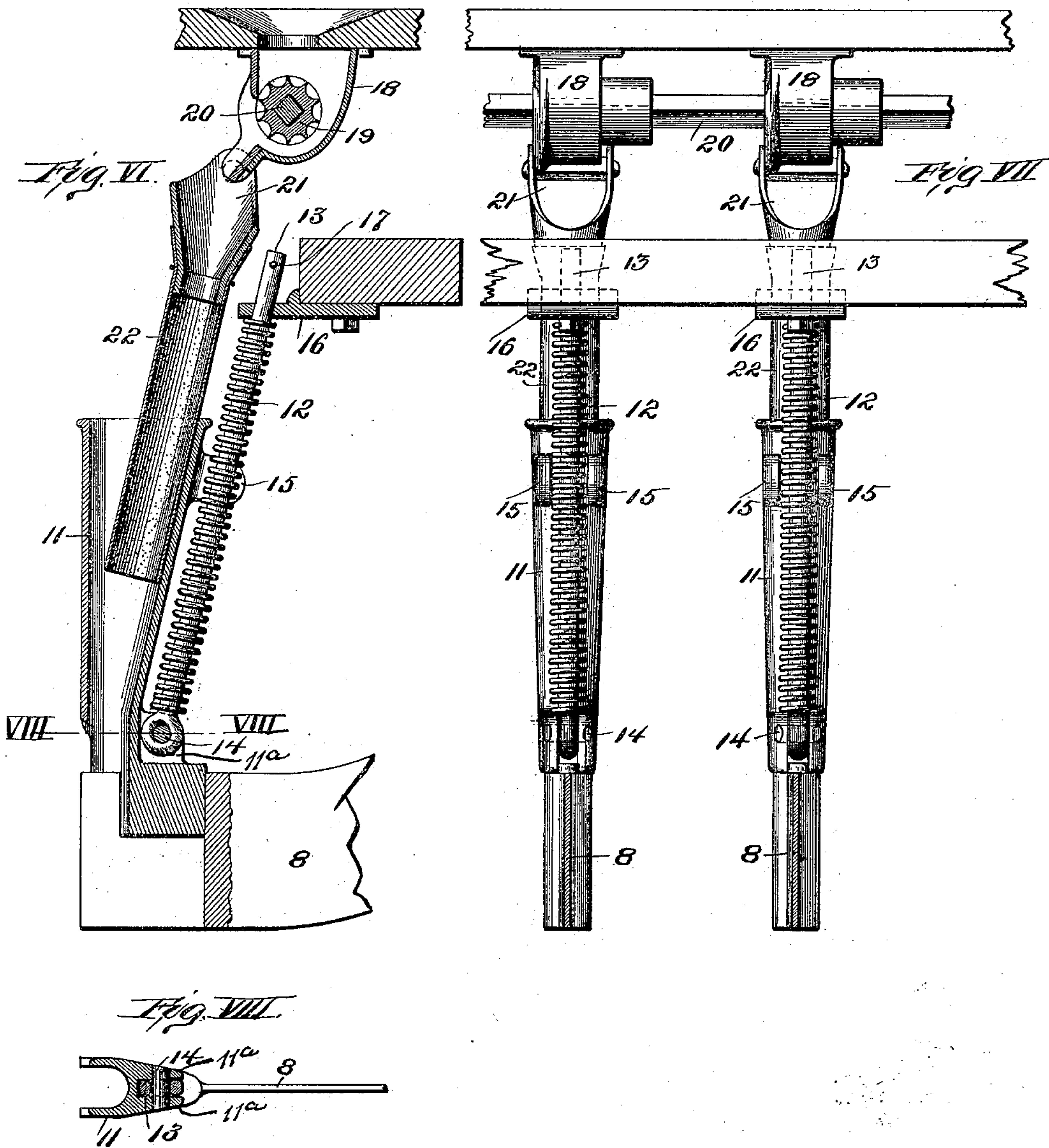
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Andrew Schopp  
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# UNITED STATES PATENT OFFICE.

ANDREW SCHOPP AND JULIUS LIESE, OF BELLEVILLE, ILLINOIS, ASSIGNORS  
TO THE SUCKER STATE DRILL COMPANY, OF SAME PLACE.

## GRAIN-DRILL.

SPECIFICATION forming part of Letters Patent No. 513,060, dated January 16, 1894.

Application filed May 22, 1893. Serial No. 475,184. (No model.)

*To all whom it may concern:*

Be it known that we, ANDREW SCHOPP and JULIUS LIESE, both of Belleville, in the county of St. Clair and State of Illinois, have invented  
5 a certain new and useful Improvement in Grain-Drills, of which the following is a full, clear, and exact description.

The subject of our invention is a grain drill, constructed with a runner frame and wheel  
10 frame jointed together, and in which each shoe is held down to its work independently, by a spring in such a manner that the principal part of the weight of the drill frame is exerted upon the said springs in holding the  
15 shoe runners in the ground, and in forcing them into the ground when the machine is thrown into working position by the action of the hand-lever. The shoes are lifted by means of rods pivoted thereto and sliding  
20 through plates on the drill-frame against which the springs have their bearing, so as to permit the independent rising and falling of the shoes in passing over obstructions. The lifting rods, together with the pressure springs  
25 through which they pass are stayed or supported intermediately of their ends by cheeks or lugs projecting forward from the shoes near the upper part. The pivot connection  
30 between the lifting rod and the shoe consists of a wooden pin, which is preferable to a screw or rivet, because it requires no projecting head or nut, as is the case with a screw bolt, and admits of being punched out, when occasion requires, for separating the parts, with-  
35 out cutting or drilling, as is necessary with a rivet. The rear member or wheel frame is connected with a clutch device, throwing the feed mechanism out of gear automatically  
40 when the shoes are lifted out of the ground, and springs are employed to automatically throw the feed into gear when the shoes are lowered.

The improvements also embrace other details hereinafter particularly referred to.

45 In the accompanying drawings, forming part of this specification:—Figure I is a vertical section of a drill, illustrating the invention on the broken line I—I, Fig. II, showing the parts in working position. Fig. I<sup>a</sup> is a  
50 detail, sectional elevation of the same parts,

showing the jointed connection between the runner frame and the wheel frame, when the shoes are raised out of the ground. Fig. II is a plan view of the drill, with part of the hopper removed to expose the automatic feed  
55 detaching device. Fig. III is a detail, plan on a larger scale of the automatic feed detaching device. Fig. IV is a rear elevation of the same. Fig. V is a longitudinal section thereof. Fig. VI is a detail, longitudinal section  
60 of the dropper, feed tube, shoe, and their accessories. Fig. VII is a front elevation of the same parts, showing the runners in section. Fig. VIII is a horizontal section on the line VIII—VIII, Fig. VI.

1 represents the tongue of the implement, permanently bolted in the customary manner to the runner frame 2, on which the hopper  
3 is mounted. The several bars 4 of the rear or wheel frame are jointed as at 5 to the main  
70 frame 2, permitting the frames to tilt relatively in a vertical plane, as illustrated in Fig. I<sup>a</sup>, for the purpose of raising and lowering the shoes as hereinafter described. The said wheel frame 4 is supported by an axle  
75 6, and roller wheels 7, following the drill shoes. The shoe runners 8 are connected by draft bars 9 to the main frame 2, by means of pivots 10, permitting them to rise and fall,  
80 and on the rear ends of the runners are mounted the drill shoes 11. The shoes are held down to their work independently by springs 12, supported by internal guide rods 13, which are connected to forwardly tapering ears 11<sup>a</sup>  
85 on the front of the shoes by wooden pins 14, as shown more clearly in Figs. VI and VIII, the ends of the said pins being finished flush with the face of the ears 11<sup>a</sup>, as shown in Fig. VIII, so as to offer no obstruction or projec-  
90 tion.

On the front face of each shoe 11, near the top, is formed a pair of projecting lugs or cheeks 15, between which the springs 12, and their guide rods 13 are stayed laterally. The  
95 springs 12 bear upward against plates 16, bolted to the rear part of the main frame 2, as shown in Figs. I and VI, through which plates the guide rods 13 pass, and move freely up and down, as the shoes rise and fall independently in passing over obstructions. In  
100



the upper ends of said guide rods are pins 17 which engage with the plates 16 in lifting the shoes bodily from the ground.

To the bottom of the hopper are secured 5 the customary feed boxes or cups 18, in which revolve the ribbed feed disks 19, carried by the shaft 20, and delivering the seed into the spouts 21 from which the flexible feed tubes 22 deliver it within the shoes 11, in the usual 10 way.

The driver's seat 23 is mounted upon bars 24, secured at their front ends by bolts 25 to the tongue or runner frame and supported at the back by standards 26 from the rear of the 15 wheel frame 4. The oblique bars 24, and supporting standards 26, will thus be seen to constitute a seat-frame supported in front upon the main frame 2, and at back upon the wheel frame 4.

20 For the purpose of tilting the connected frames 2 and 4 to the position illustrated in Fig. I<sup>a</sup>, in order to raise the shoes above the ground, we employ a bell-crank or triangular frame 27, fulcrumed at 28 to the rear of the 25 main frame 2, and connected by pivots 29 and hangers 30 to the seat bars 24, to which the said hangers are bolted at 31.

32 represents a hand-lever mortised into the side of the bell-crank frame 27, and securely bolted thereto, so as to form a rigid 30 part of the same, so that they move together about the fulcrum points 28, 29.

33 represents the customary segment, provided with notches 34, 35, 36, and 37 to receive a latch 38, operated by a rod 38<sup>a</sup>, and 35 finger-lever 39, fulcrumed to the hand lever 32, for the purpose of securing the hand lever 32 in any position to which it may be adjusted. It will be understood that by releasing the hand lever 32, and drawing it back to 40 the vertical position shown in dotted lines in Fig. I, the bell-crank frame 27, being thus turned on its supporting fulcrum 29, will raise the pivot point 28 by which it is connected to 45 the rear of the main frame 2, thus tilting the connected frames as illustrated in Fig I<sup>a</sup>, and through the medium of the suspension plates 16, and rods 13, lifting the whole rank of shoes bodily from the ground to the position 50 shown by dotted lines in Fig. I, in which position they are held by the engagement of the latch 38, with the rear notch 37. The shoes may thus be supported clear of the ground when the implement is to be moved from 55 place to place, without seeding.

The raising of the shoes by the relative tilting of the frames 2, 4, as above described, operates to automatically throw the feed 60 mechanism out of gear by means of the devices which will now be described. The rotation of the feed shaft 20 is effected through the medium of a sprocket wheel 40, upon a clutch sleeve 41, having the customary ratchet connection with one or more of the wheels 7, 65 as shown in Fig. II, so as to drive the dropping mechanism, when the machine is going forward, but admit of backing without trans-

mitting movement thereto. The driving chain 42 passes around a sprocket wheel 43, mounted 70 loosely on the feeder shaft 20, and placed in rotative connection therewith, by a sliding clutch sleeve 44 turning with said shaft, and moved longitudinally thereon by a bifurcated slide 45, engaging in an annular groove or gland 46 in the clutch sleeve, and actuated 75 by a bell crank lever 47 fulcrumed at 48, engaging by a pin 49 at one end with a slot in the slide 45, as shown in Fig. III, and drawn forward at the other end by a spring 50, so as to hold the clutch 41 in gear with the sprocket 80 wheel 43.

To automatically stop the feed when the shoes are raised, an arm or standard 51 is mounted rigidly on one of the bars 4, near the 85 joint 5, so that the tilting of the frame in raising the shoes will impart a backward, horizontal movement to the top of said standard 51, causing a pin 52 thereon to retract the free end of the bell crank 47 against the tension of the spring 50, and thus retract the clutch 41. 90 This movement is clearly illustrated in Figs. III, IV and V. The latch 38 of the hand lever 32 is then caught in the notch 37 of the segment 33. To lower the shoes 11 to working position, and force the runners 8 into the 95 ground, the operator withdraws the latch 38 and by an easy movement throws his weight forward against the hand lever 32, dropping the latch 38 into either of the notches 34, 35 or 36, according to the depth at which he de- 100 sires the shoes to work, and the construction and arrangement of the parts cause a large part of the weight of the drill to be thrown on the springs 12, and through them on the shoes, so as to force them into the ground, 105 and hold them at the desired depth of penetration.

Having thus described our invention, the following is what we claim as new therein and 110 desire to secure by Letters Patent:

1. The combination of the tilting or runner frame 2, independently pivoted shoes 11 having cheek plates 15 near their upper ends, lifting rods 13 pivoted to the shoes, and sliding through plates 16 on the frame and springs 115 12 bearing at bottom against shoulders on the shoes and at top against the plates 16; substantially as and for the purpose set forth.

2. The combination of the drill shoe 11 having forwardly tapering perforated ears 11<sup>a</sup>, 120 the lifting rod 13 passing between cheek plates 15 and the connecting pin 14 having its ends finished flush with the tapering sides of the ears as shown and explained.

3. The combination of the runner frame 2, 125 wheel frame 4, with seat frame 24 mounted thereon, the pivot connection 5, hangers 30, bell crank 27, fulcrumed at 29 to the hangers, and pivoted at 28 to the rear of the draft frame, the runners 8, drill shoes 11, lifting 130 rods 13, pivoted to the shoes, and passing through plates 16 in the rear of the draft frame, and springs 12 bearing upward against the plates 16, and downward against the drill



shoes, all as herein described, for the purposes set forth.

4. The combination of the tilting frames 2, 4, runners 8, draw bars 9, shoes 11, lifting rods 13, feed shaft 20, driving chain 42, sprocket wheel 43, clutch sleeve 44, bell crank lever 47, connected with said clutch sleeve a spring 50; and the rigid arm 51 projecting upward from the forward part of the frame 4, and engag-

ing with the said bell crank lever to unclutch the feed shaft when the shoes are raised, as explained.

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JUL. LIESE.

In presence of—  
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B. LENGFELDER.