(No Model.) 2 Sheets—Sheet 1.

F. R. PACKHAM.

GRAIN DRILL.

No. 410,436. Patented Sept. 3, 1889.

Fig. 1

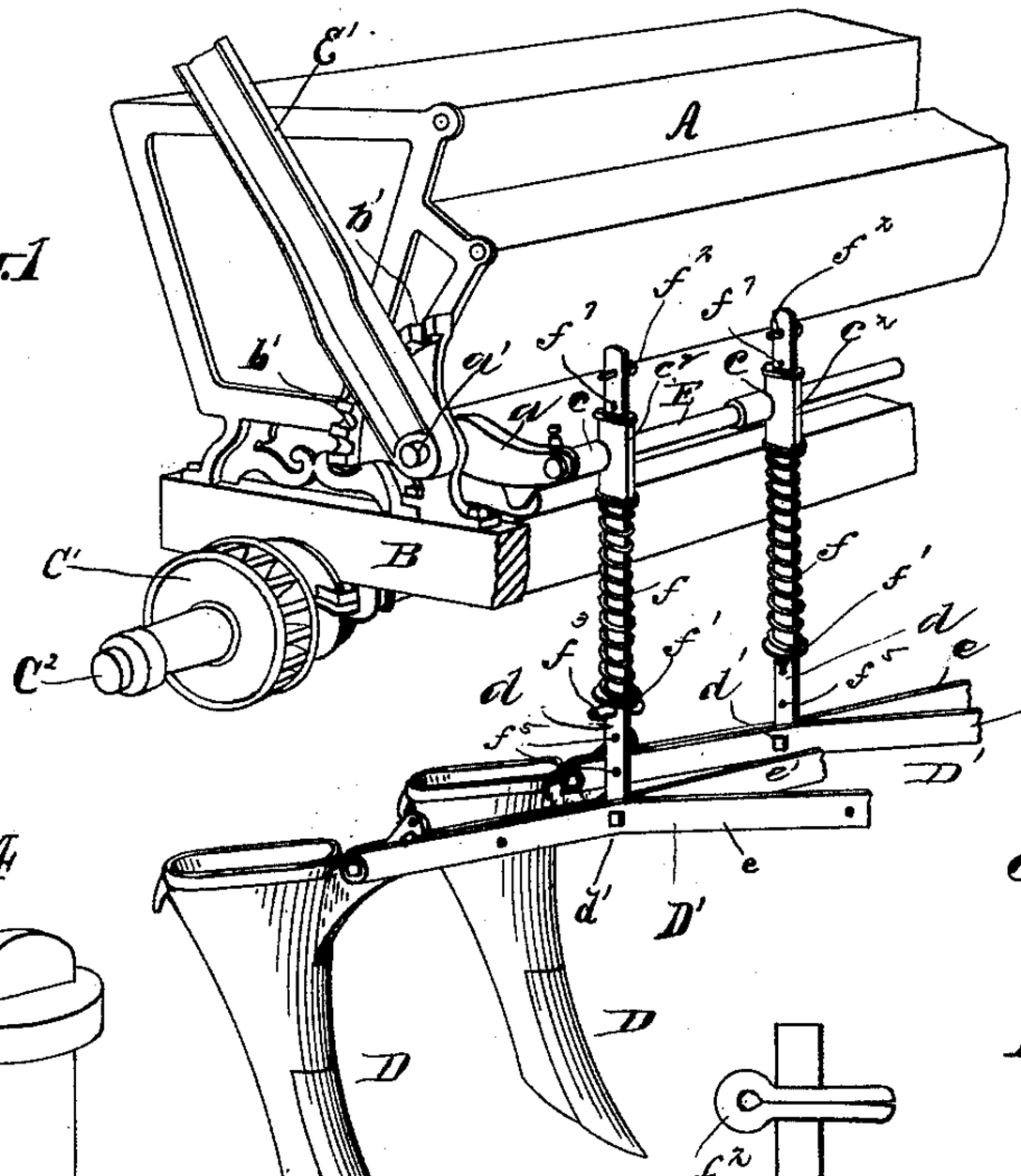


Fig. 4

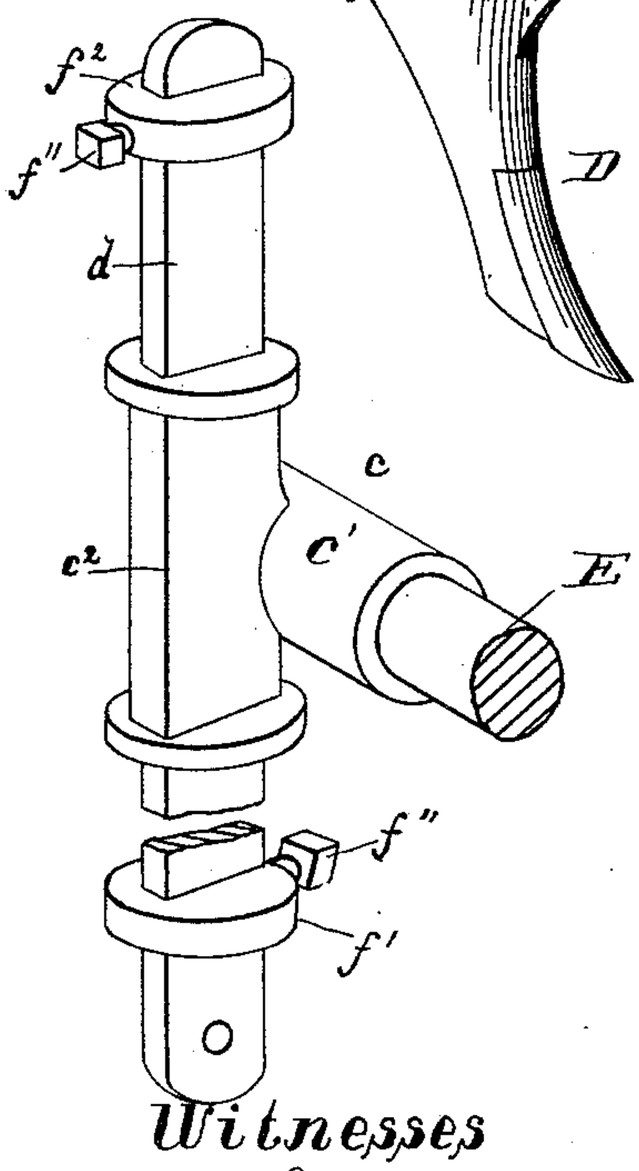


Fig. 3

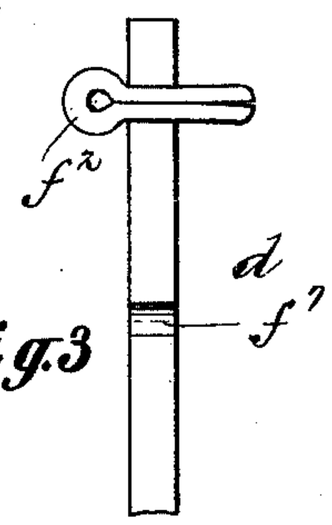
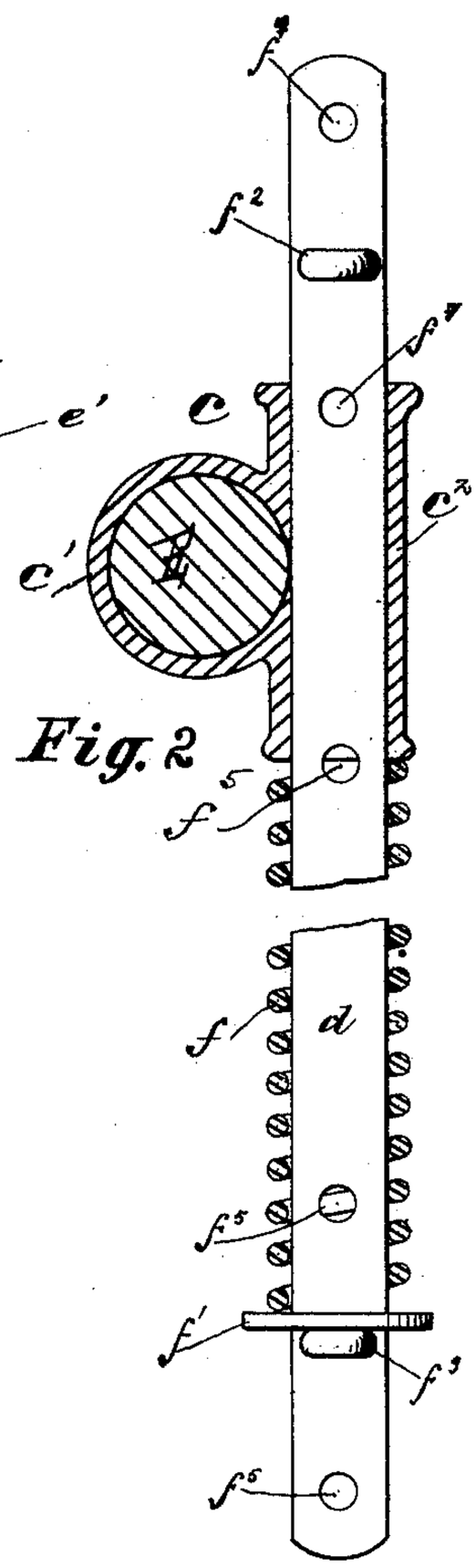


Fig. 2



Witnesses

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(No Model.) 2 Sheets—Sheet 2.

F. R. PACKHAM.

GRAIN DRILL.

No. 410,436. Patented Sept. 3, 1889.

Fig. 5

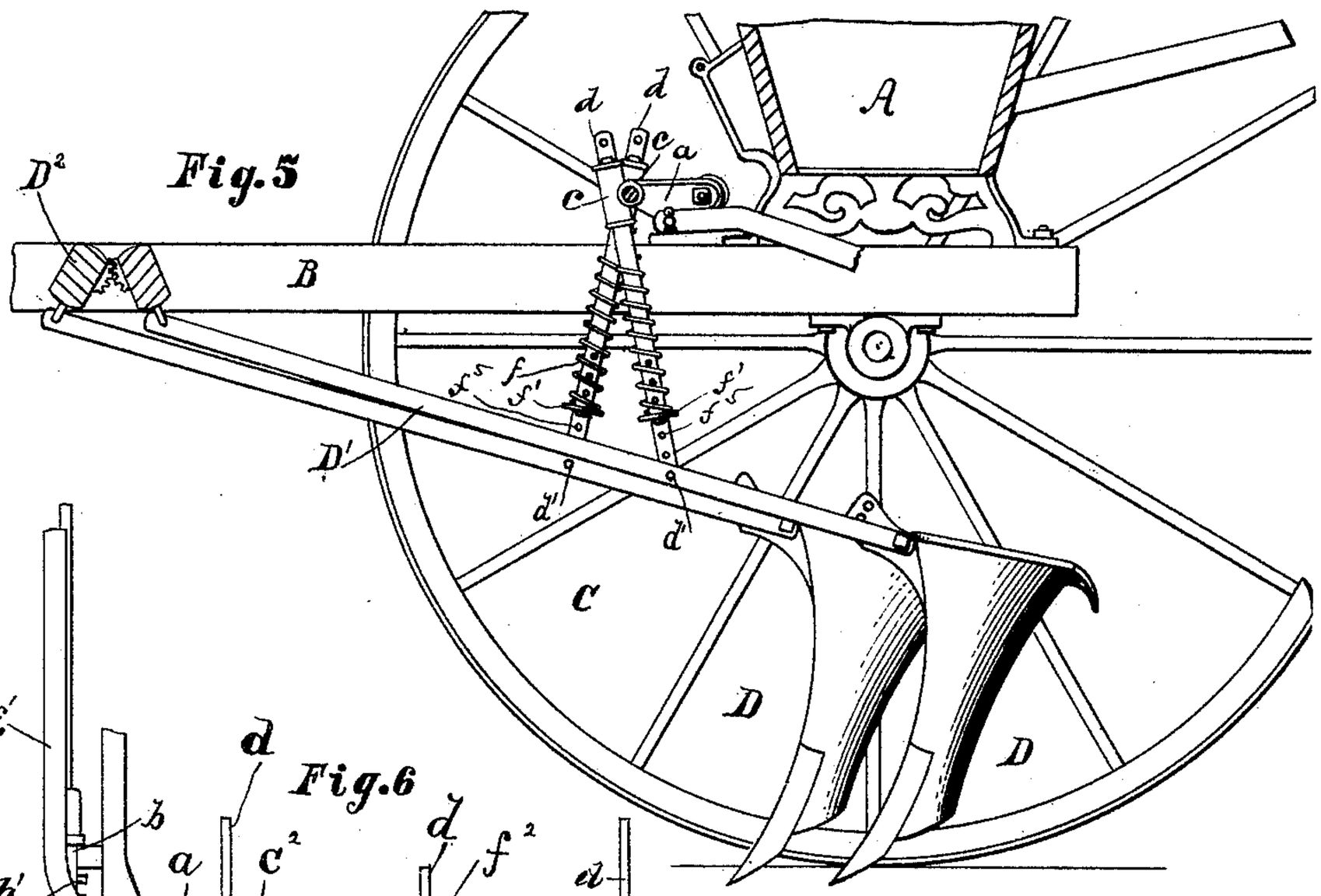


Fig. 6

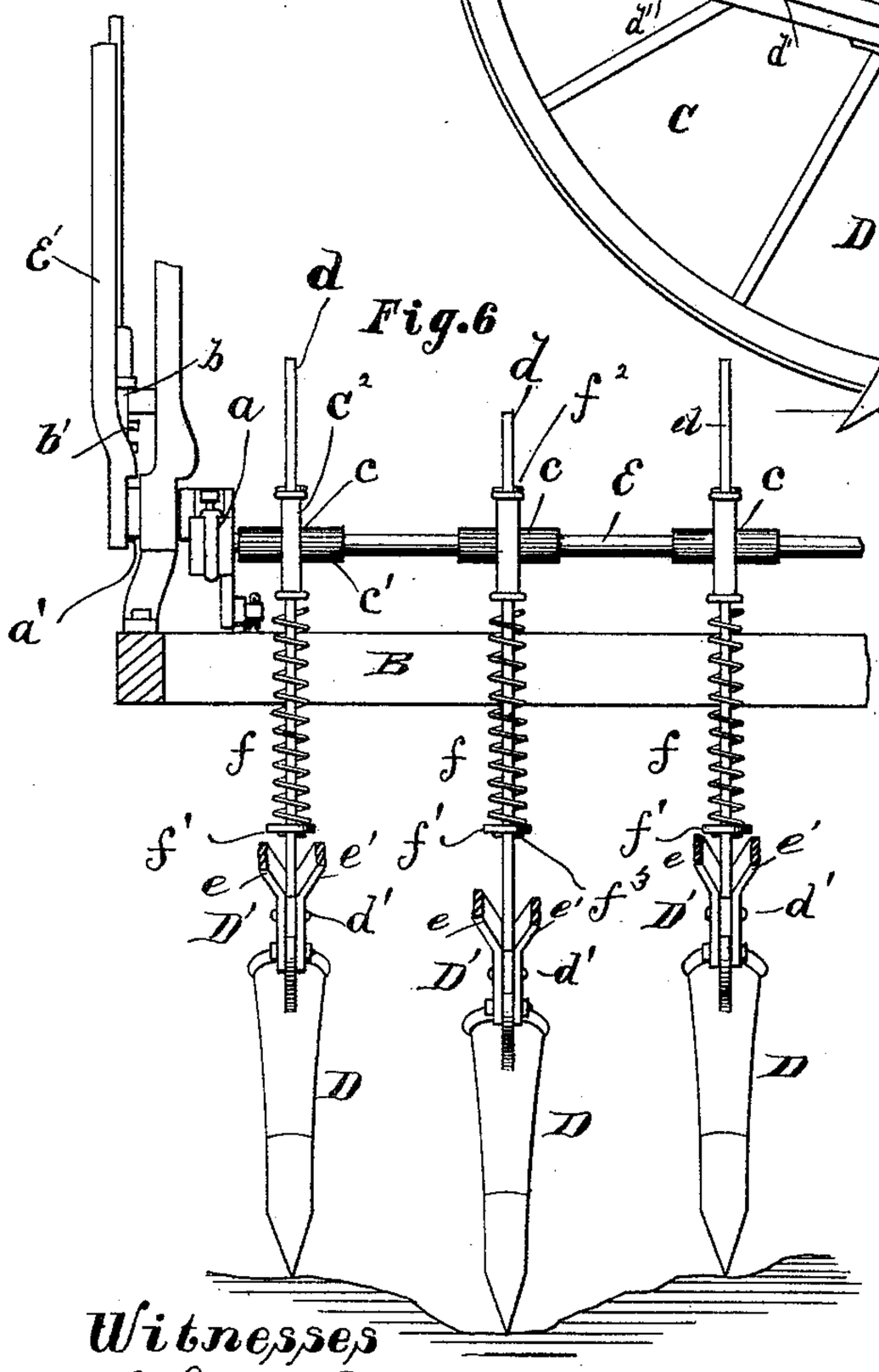
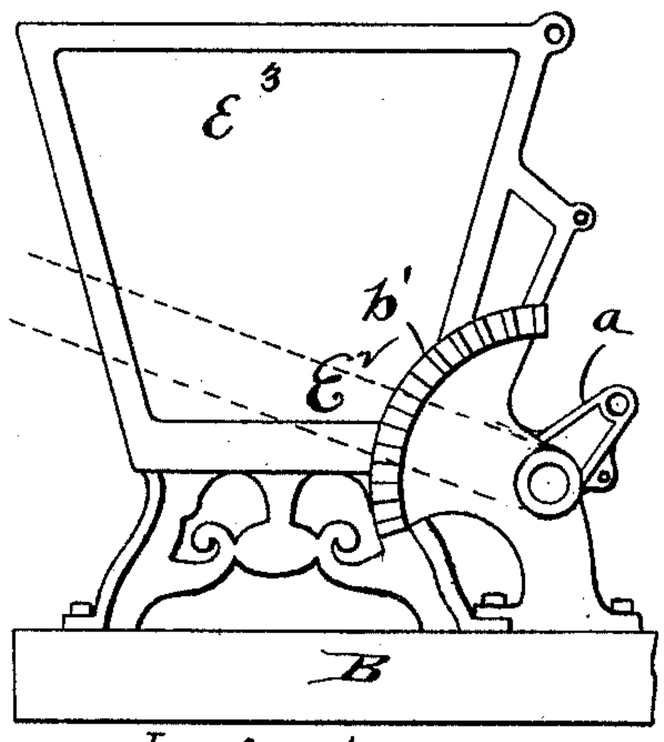


Fig. 7



Witnesses

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Frank R. Packham

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UNITED STATES PATENT OFFICE.

FRANK R. PACKHAM, OF SPRINGFIELD, OHIO, ASSIGNOR TO THE SUPERIOR DRILL COMPANY, OF SAME PLACE.

GRAIN-DRILL.

SPECIFICATION forming part of Letters Patent No. 410,436, dated September 3, 1889.

Application filed June 28, 1889. Serial No. 315,944. (No model.)

To all whom it may concern:

Be it known that I, FRANK R. PACKHAM, 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.

This invention relates to improvements in grain-drills; and it especially relates, in grain-drills, to mechanism for raising and lowering the hoes or shoes and applying a yielding pressure thereto.

The object of the invention is to provide novel means for raising and lowering the shoes or hoes, to provide for adjusting the said hoes and lifting mechanism to regulate the depth of planting, and to provide a yielding pressure for said hoes or shoes, which may be regulated or graduated to the work to be performed.

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

In the accompanying drawings, Figure 1 is a perspective view of a portion of a grain-drill to which my invention has been applied. Fig. 2 is a detailed view, in section, of one of the lifting-links and its bearing upon the pressure-bar. Figs. 3 and 4 are detailed views of the same and modifications of the same, hereinafter referred to. Fig. 5 is a sectional elevation showing the adjustment of the pressure device when the hoes or shoes are arranged in double rank, or zigzag. Fig. 6 is a rear elevation of the pressure-bar, lifting-lever, and connection. Fig. 7 is an end view of the hopper, showing the ratchet for the lifting-lever.

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

In the said drawings, A represents the hopper of a grain-drill; B, the frame, and C, one of the carrying-wheels. In Fig. 1 a hub C′ only of the carrying-wheel is shown on the axle C^2.

D D are shoes or hoes connected by drag-bars D′ to the frame B through the medium of any suitable shifting or zigzag device D^2, to cause the hoes or shoes to assume a position in double rank, commonly known as "zigzag."

E is the lifting and pressure bar, which is preferably supported at each end in rocking arms *a a*, journaled in suitable bearings on the frame B. One or both of the rocking arms *a* is provided with a trunnion *a′*, which extends through the said bearing on the frame. To this trunnion *a′* is attached the lifting lever or levers E′. The lifting-lever E′ is provided with a suitable spring-catch *b*, adapted to engage in notches *b′* in a ratchet-stand E^2.

Arranged at intervals along the pressure-bar E, in number corresponding to the number of hoes or shoes, is provided a series of supporting-bearings *c c c*, each of which is provided with a horizontal sleeve portion *c′* and a vertical sleeve c^2, formed integral and at right angles therewith. The horizontal sleeve portion *c′* is cored out or otherwise prepared to fit the lifting and pressure bar E, on which it is adapted to turn. The other sleeve portion c^2 is made of suitable form and properly cored out or otherwise prepared to fit over connecting-links *d*, which pass loosely through said sleeve portion c^2, and are pivotally connected at their lower ends at *d′* to the drag-bars D′. These drag-bars D′ are each formed of two parts *e* and *e′*, in the usual manner, which parts stand in close proximity to each other at the point where the links *d* are pivoted thereto, the said links being placed between the said parts and held firmly therein by a bolt or other form of pivotal connection *d′*.

Located on the links *d*, between the bearing-supports *c* and the drag-bars D′, are springs *f*, these springs *f* being preferably coiled about the links *d*, so as to bear at one end against the lower end of the vertical portion c^2 of the bearing-support and at the other against an adjustable collar *f′* on the link *d*. An adjustable stop f^2 is provided on each of the links *d* above the vertical portion c^2 of the bearing-support *c*. The adjustable collar *f′* preferably consists of a washer resting on top of a spring cotter or pin f^3, adapted to be inserted in a series of openings f^5 in the link *d*, the adjustable stop f^2 being also preferably formed by a similar pin or cotter adapted to be inserted in openings f^7 in the upper end of said link. If desired, however, the stop

f^2 and the adjustable collar f' may be each formed in the nature of collars having suitable set-screws f'', to vary their position, on the links d, as shown in Fig. 4, or other suitable manner. It will be seen by this construction that as the lifting and pressure bar is raised the bearing-supports c, coming against the stops f^2 on the links d, will cause the hoes to rise therewith. When the pressure and lifting bar E is lowered, the bearing-supports c come against the springs f and force the hoes or shoes downwardly with a yielding pressure.

By having the adjustable collar f' the tension of the springs may be varied as desired.

By providing the adjustable stops f^2 in connection with the adjustable collar f' any shoe or hoe may be adjusted independently of any other, so as to drop down farther, or not so far, and still receive an equal amount of pressure with the other shoes when desired, as indicated in Fig. 6, such an adjustment being desirable in planting fields in which a long dead-furrow occurs in the direction in which the planting is done. The adjustable stop f^2 permits the link d to be adjusted as desired through the vertical portion c^2 of the supporting-bearings c, so as to regulate in any desired manner the lift or drop of the shoes with reference to the lifting and pressure-bar E.

If desired, a stop may also be provided immediately below the vertical portion c^2 of the supporting-bearing, as indicated in Fig. 2, so that the shoes or hoes will be forced positively downward, instead of acting through the medium of the springs f.

By the use of the bearing-supports c, journaled on the lifting and pressure bar E, and the links, with their pivotal connection to the drag-bars, a uniform pressure is secured on each drag-bar or shoe, no matter what position it may occupy, whether in double or single rank. The links d being always pivoted to the drag-bars D′ at the same distance from the point of connection between said drag-bars and frame, the pressure is always applied at the same point in the length of the drag-bars, the links d being adapted to assume an angular position with reference to the pressure-bar, as shown in Fig. 5, when the hoes are shifted zigzag, or in double rank.

By having the links d pivoted directly to the drag-bars D′ and between the respective parts e and e' of said drag-bar, and by providing the sleeve portion c' on the bearing-supports on the pressure-bar E, the links d are held in a vertical position and adapted to slide freely through said bearing-supports in their proper position without the use of intervening sleeves or stops on the pressure-bar between the respective links.

The vertical portion c^2 of the bearing-support c is formed in close proximity to the sleeve portion c' which fits on the pressure-bar E. These parts, in fact, are preferably constructed so that the openings or chambers in the said parts cut into each other, as shown in Fig. 2, thus bringing the pressure-bar close up to or against the links d, and thus prevent a cramping of parts in raising or lowering or applying pressure to the shoes or hoes.

By having the links d connected or pivoted at their lower ends to the drag-bars D′ the said links, as the pressure is applied, pass upwardly through the bearing-support c^2, instead of downwardly through the drag-bars, as has heretofore been common in pressure devices where springs and stirrups or links were used. By this construction the ends of the links never come below the drag-bars, so as to catch on the accumulated weeds or other foreign substances which may come in front of the hoes or shoes.

It is obvious that the shape and size of the respective parts and their connections may be variously modified without departing from the spirit of the invention.

I claim—

1. In a grain-drill, the combination of the shoes and the pressure-bar, bearing-supports on said pressure-bar, links passing through said bearing-supports and attached to said hoes, and springs between said bearing-supports and hoes, substantially as specified.

2. The combination of the hoes and pressure-bar, the links attached to said hoes, springs on said links, and an adjustable collar below said springs on said links, and bearing-support journaled on said pressure-bar, through which said links pass, substantially as specified.

3. In a lifting device for grain-drills, the combination, with a lifting-bar, of a bearing-support journaled on said lifting-bar and a vertical sleeve for the lifting-links, and adjustable stops on said links above and below said bearing-support, substantially as specified.

4. In a grain-drill, lifting-links attached to the shoes or hoes, a lifting-bar adapted to be raised and lowered on the supporting-frame, bearing-supports on said lifting-bar adapted to form a variable connection between said bar and links, substantially as specified.

5. In a grain-drill, the lifting-links attached to the shoes or hoes, a lifting-bar adapted to be raised or lowered on the supporting-frame, and bearing-supports on said lifting-bar to form a variable connection between said links and bar, said bearing-supports being each provided with vertical and longitudinal sleeves to form bearings for the links and bar, respectively, said links and sleeves being joined together in close proximity, so as to bring the strain as close as possible to the centers of said bar and links, substantially as specified.

6. In a grain-drill, the combination of the hoes or shoes and their drag-bars and a movable bar arranged transversely across and above said drag-bars, lifting-links pivotally secured to said drag-bars, bearing-supports on said lifting-bar and connected to said links, springs on said links, and adjustable stops

above and below said bearing-supports, substantially as specified.

7. The combination, in a grain-drill, of the shoes or hoes and their drag-bars, said drag-bars being attached at different points to the main frame to provide for a zigzag adjustment thereof, lifting-links pivotally secured to said drag-bars, a lifting-bar above said drag-bars, bearing-supports journaled on said lifting-bar, and lifting-links forming a connection between the same, substantially as specified.

8. The combination, in a grain-drill, of the shoes or hoes and their drag-bars, lifting-links pivoted to said drag-bars, adjustable collars on said links, springs above said collars, a lifting-bar above said drag-bars, bearing-supports journaled on said lifting-bar and having a sleeve portion for said links above said springs, and adjustable stops on said links above said bearing-supports, substantially as specified.

9. The combination, in a grain-drill, of the shoes or hoes and their drag-bars, lifting-links pivoted to said drag-bars, adjustable collars on said links, springs above said collars, a lifting-bar above said drag-bars, bearing-supports connecting said links and lifting-bar, rocking arms attached to said bar, and a lifting-lever adapted to operate said lifting-bar, substantially as specified.

In testimony whereof I have hereunto set my hand this 15th day of June, A. D. 1889.

FRANK R. PACKHAM.

Witnesses:
CHASE STEWART,
CHAS. I. WELCH.