C. E. PATRIC.

Spring-Hoes for Grain-Drills.

No. 204,365. Patented May 28, 1878.

Fig. 1.

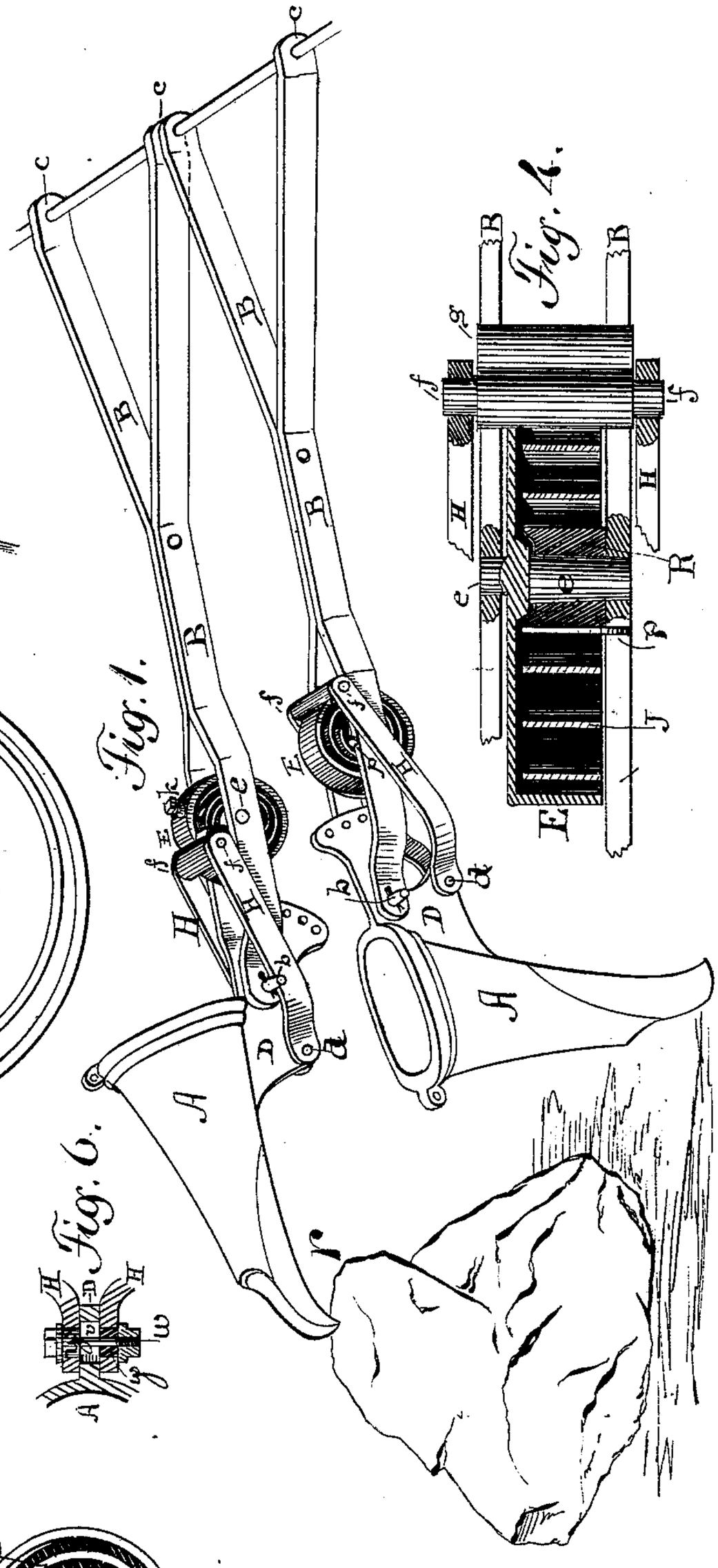


Fig. 2

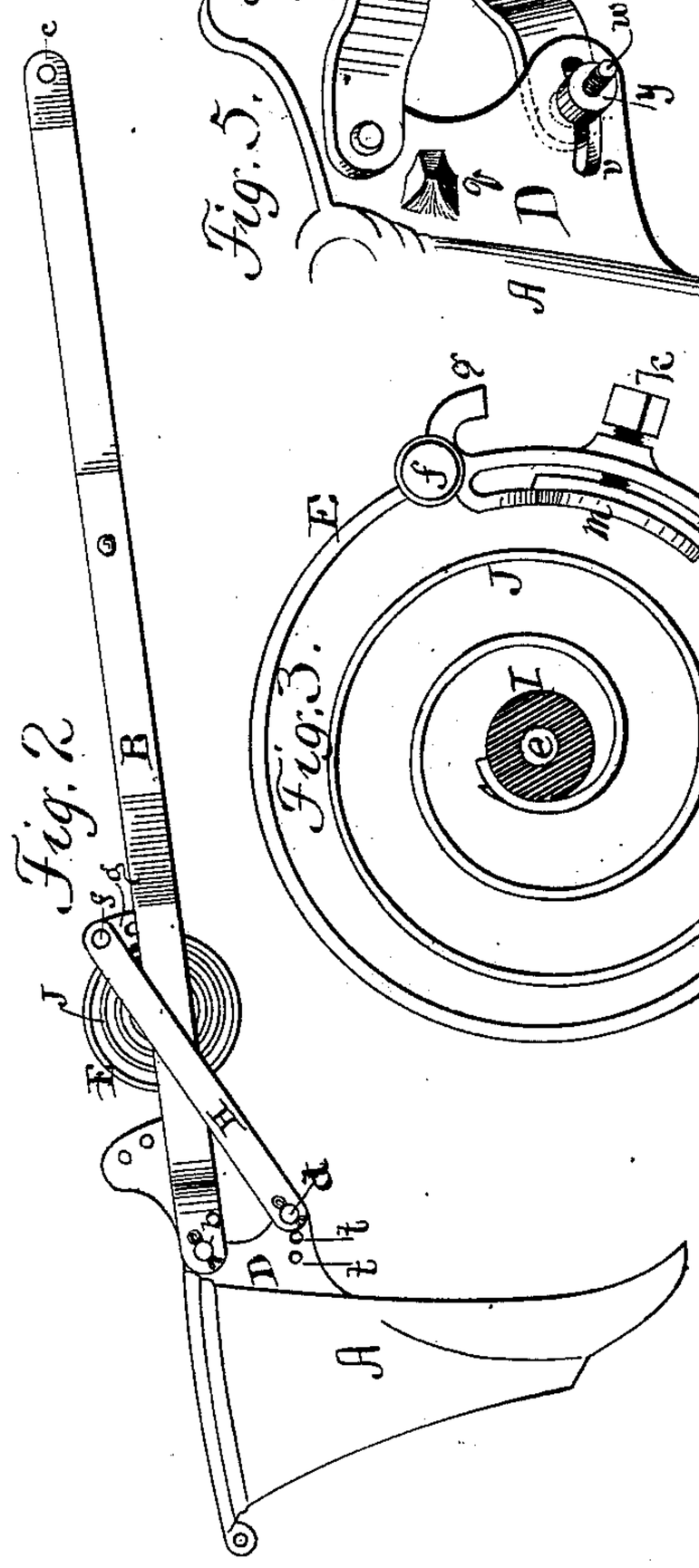


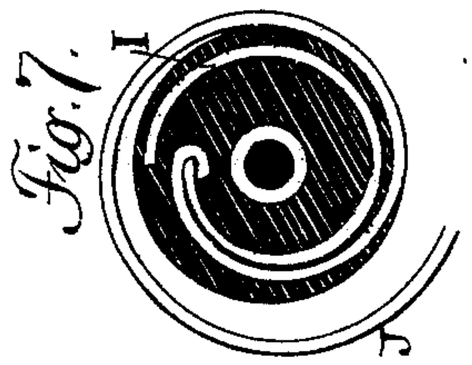
Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.



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CHARLES E. PATRIC, OF SPRINGFIELD, OHIO.

IMPROVEMENT IN SPRING-HOES FOR GRAIN-DRILLS.

Specification forming part of Letters Patent No. **204,365**, dated May 28, 1878; application filed March 19, 1878.

To all whom it may concern:

Be it known that I, CHARLES E. PATRIC, of Springfield, Clarke county, Ohio, have invented a new and useful Improvement in Spring Hoes or Teeth for Grain-Drills, of which the following is a full and complete description, having reference to the accompanying drawings, wherein—

Figure 1 represents in perspective my spring-hoe in action. Fig. 2 is a side elevation of the same. Fig. 3 is a side view of the spring-case and spring. Fig. 4 is a horizontal central section of the same. Fig. 5 is a perspective view of a portion of the hoe, showing modifications of structure and adjustment. Fig. 6 is a horizontal section through the adjusting-slot of Fig. 5. Fig. 7 shows a modified method of spring attachment.

The necessity for some provision to permit a temporary yielding of the hoe when it encounters an immovable object in its way has long been known, and many devices for that purpose have been produced. Those which have been most favorably received have some elastic arrangement which permits an automatic recovery when such obstacle has been passed.

The object of my improvement is to secure greater compactness and facility for adjustment and cheapness in construction than has heretofore been attained, without sacrificing anything in the way of efficiency.

My invention therefore consists of a rotating barrel or case containing a coiled spring, said barrel being axially mounted upon the drag-bar, and its periphery being connected to the hoe below its pivotal center by side arms, so that when the point of the hoe encounters an obstacle of certain resistance it may be enabled to overcome the tension of the spring and cause the partial rotation of said barrel, and regain its position by the reaction of the spring when the obstacle has been passed.

That others may fully understand my invention, I will particularly describe it.

A is the hoe, and B is the drag-bar, both of which may be made in any usual and proper way. The method or structure of the drag-bar shown comprises two bars of wrought-iron, each lettered B, riveted together at their central part, and with the ends properly spread to give jointed connections with the hoe, and with the frame of the machine having the greatest available width and stiffness.

The rear end of the drag-bar is pivoted at *b* to the front lug D of the hoe A, and the front end of said drag-bar is pivoted at *c* to the frame of the machine.

The cylindrical spring-case E is provided with a central axle, *e*, projecting at either side, and two peripheral studs, *f f*, projecting in a line parallel with the axle, for the attachment of the side arms H H.

The studs *f f* project from the shoulders *g g*, which extend laterally far enough to rest upon the upper edges of the side bars B B when the hoe is in operative position, and thereby said shoulders *g g* act as stops to limit the forward rotation of the spring-case. It is manifest that detachable pins or bolts may be substituted for the lugs *f;* but I prefer to cast them with the case E.

A hub, I, is secured to the inner side of one of the side bars B, and one of the axial studs *e* has its bearing in a central hole in said hub, which projects forward within the case E, and forms the abutment to support the inner end of the coiled spring J. The outer end of said spring is conveniently secured by a screw, *k*, which penetrates the peripheral flange of the shell E in a radial direction, and clamps the spring near its outer end against an inner rib or abutment, *m*, which projects from the bottom or web of the case E, and concentric with the peripheral flange. This arrangement also renders the spring easily adjustable as to tension by slipping its end to a greater or less distance past the clamping-screw *k*.

The inner end of the spring J may be secured in a variety of ways. The usual method of securing coiled springs is shown in Fig. 3—*i. e.*, by a hook upon the hub. I prefer, however, to make a lateral hook, *p*, on the spring itself, to project over and rest on the upper edge of the bar B, or some other independent attachment to the frame. I am then enabled to employ a loose roller or fulcrum, R, as shown

in Fig. 4, mounted upon the axial stud *e*, to support the inner end of the spring.

Another method of attachment is shown in Fig. 7, where the fulcrum-hub I is represented as a spiral rib, and the end of the spring turned over to form a hook capable of catching over the inner end of said rib. This last modification provides a support for the spring across its entire width and additional security against breakage.

The side bars H H, being pivoted at their front ends to the studs *f f*, extend backward and downward therefrom, crossing the drag-bar B, and are pivoted to the lower part of the lug D by the pin *d*. A line extending from the center of pin *d* to the center of the stud *f* will pass a little above the axis of the stud *e*. If said line crossed said axis exactly, no force applied to the point of the hoe would cause a displacement of the relative positions of the side arms and drag-bar; but when said line passes above said axis, then the parts represent a lever with unequal arms, the shorter arm being equal to the distance between said line and said axis, and the longer arm being the distance between said axis *e* and the stud *f*.

The force of the spring J is applied to the longer arm. When power applied to the point of the hoe and acting through the short arm above mentioned becomes sufficient to overcome the spring J, acting on the long arm, then the hoe will yield, and may assume the position shown at *r* in Fig. 1.

In practice, the length of said short arm is about one-thirty-second part of one inch. This approach to coincidence produces a practical lock capable of resisting all usual strains, but sure to yield before the safety of the apparatus becomes endangered.

It will be observed that as the spring-case E rotates to permit the hoe to swing backward, as shown at *r*, Fig. 1, the before-mentioned short arm becomes rapidly elongated, and therefore from the moment of starting the resistance of the spring becomes relatively weaker, so that when the lock is once overcome the hoe will swing backward with ease until the obstacle is passed, when the retractile power of the spring will cause it to resume its operative position immediately.

The ends of the pivot-pins *b* are made to project sufficiently far to act as stops to arrest the backward movement of the hoe. Otherwise, if said movement should be continued until the axis of the side bars had passed the axis of the pin *b*, the spring J would be unable to retract the hoe.

If desired, permanent studs *q*, as shown in Fig. 5, may be substituted for the bolt *b* as stops for the side bar B. In order to set the hoe—*i. e.*, advance the point more or less to make it run properly in the ground—I sometimes make a series of holes, *t t*, in the lug D, through either one of which the joint-pin *u* may pass. Said series of holes are arranged on the arc of a circle about the axis of *b*, so that the shifting of the pin *q* will not disturb the adjustment of the side bars H H in relation to the drag-bar. The side bars are secured upon the joint-pin by means of common spring-keys, as shown, or in any other convenient way.

Another method of arranging this adjustment is shown in Figs. 5 and 6, and consists of a curved slot or orifice, *v*, with a clamp-bolt, *w*, and two buttons or rollers, *y*, upon which the side arms H H have their bearings, but which receive the pressure of the clamping-nut without cramping the side arm.

The front end of the lug D may be provided with a series of holes, in one of which a wooden pin may be placed in the old way, if by any accident the spring or other automatic attachments become disabled.

In practice, it is not often necessary to vary the adjustment of side arms H in reference to the drag-bar. But this may sometimes occur, and I therefore make the slot *v* sufficiently wide to permit the rear ends of the side bars H H to be adjusted up and down, and thus vary the distance between the axis of said side bar H and the axis of pivot *e*, and thus vary the power of the lock.

Having described my invention, what I claim as new is—

1. The hoe A and drag-bar B, combined with a rotary spring-case, E, provided with a coiled spring, J, and side arms H, attached to said case at one side of the drag-bar, and to the lug D at the other side of said drag-bar, substantially as and for the purpose set forth.

2. The spring-case E, substantially as described, provided with the stop-shoulders *g*, and side-arm pivot-studs *f*, combined with the drag-bar B and side arms H, as set forth.

3. The spring-case E, provided with the inner rib or abutment *m* and the clamp-screw *k*, as a means of adjusting the tension of and securely holding the spring J, as set forth.

4. The rotary spring case or lever E, mounted upon the drag-bar, and provided with a stop to limit its movement in a forward direction, combined with the side arms pivoted to the periphery of said case, and a stop upon the hoe, to which the rear ends of said side arms are attached, whereby the movement in a backward direction is limited, for the purpose set forth.

5. A drag-bar, B, substantially as set forth, attached at its front end to the frame of the machine, and at its rear end, by the pin *b*, to to the lug D of the hoe A, and a cylindrical case or lever, E, pivoted to said drag-bar, combined with side arms H, pivoted to said case or lever at one side of said drag-bar, and to the lug D at the other side thereof, and suitable stops, whereby the movements of said side arms are limited between the axes of said case E and pin *b*.

6. The rotary spring-case E, combined with the loose roller or fulcrum R upon the axis

of said case, and the spring J, the inner end whereof is independently attached to the frame upon which said case is pivoted.

7. The drag-bar B and the side arms H, provided with a rotating spring-lever, E, and rollers *y*, combined with the hoe A and lug D, provided with an orifice or slot, *v*, through which the pivot-pin or clamping-bolt passes, and may be adjusted vertically or laterally, as set forth.

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Witnesses:

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