

(No Model.)

4 Sheets—Sheet 1.

H. J. PHELPS.  
GRAIN DRILL.

No. 433,027.

Patented July 29, 1890.

Fig. 1.

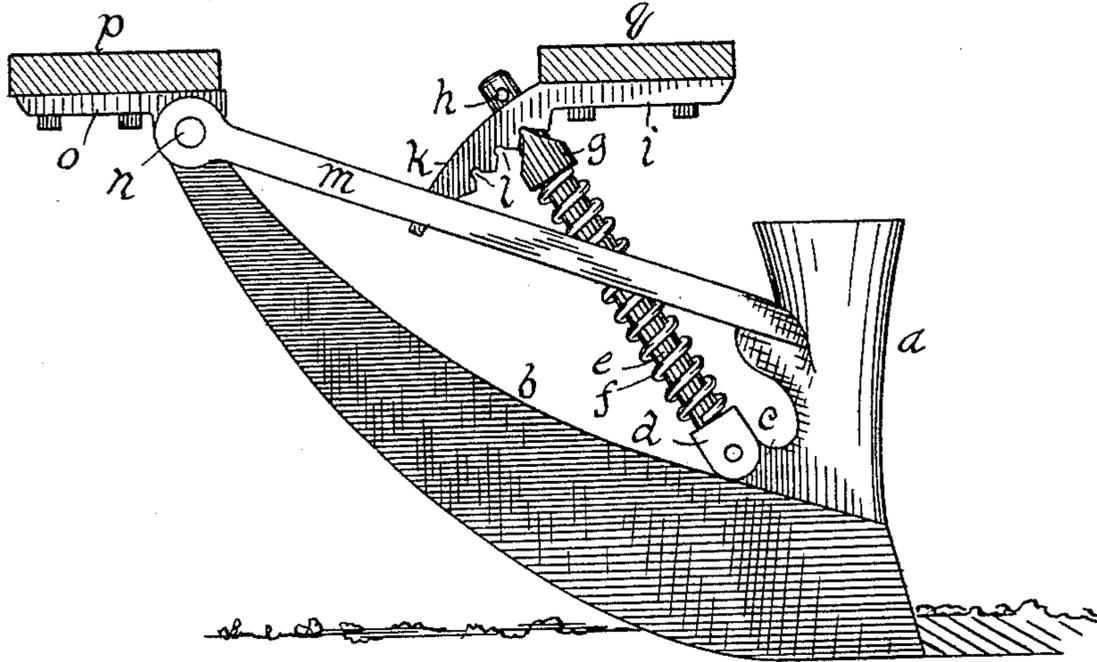
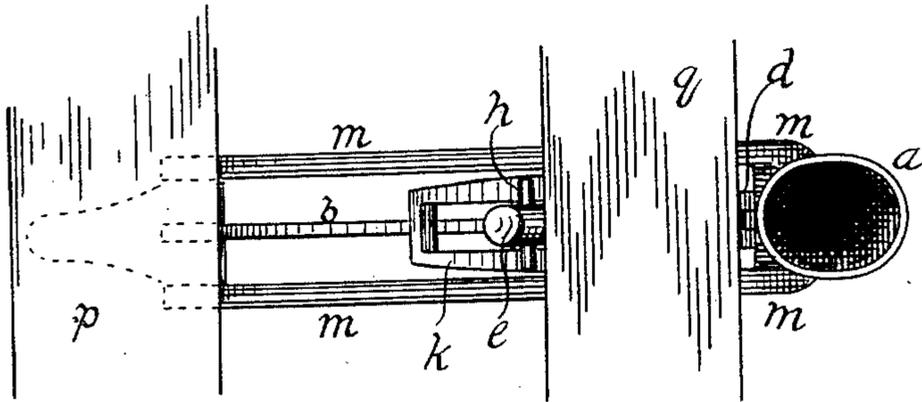


Fig. 2.



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Fig. 3.

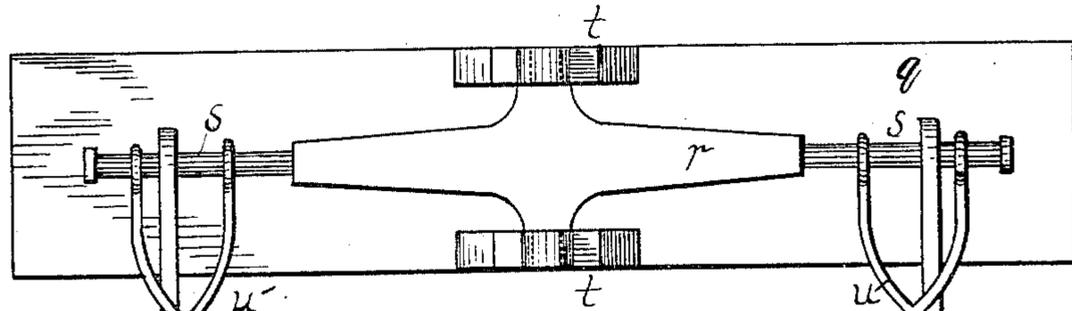
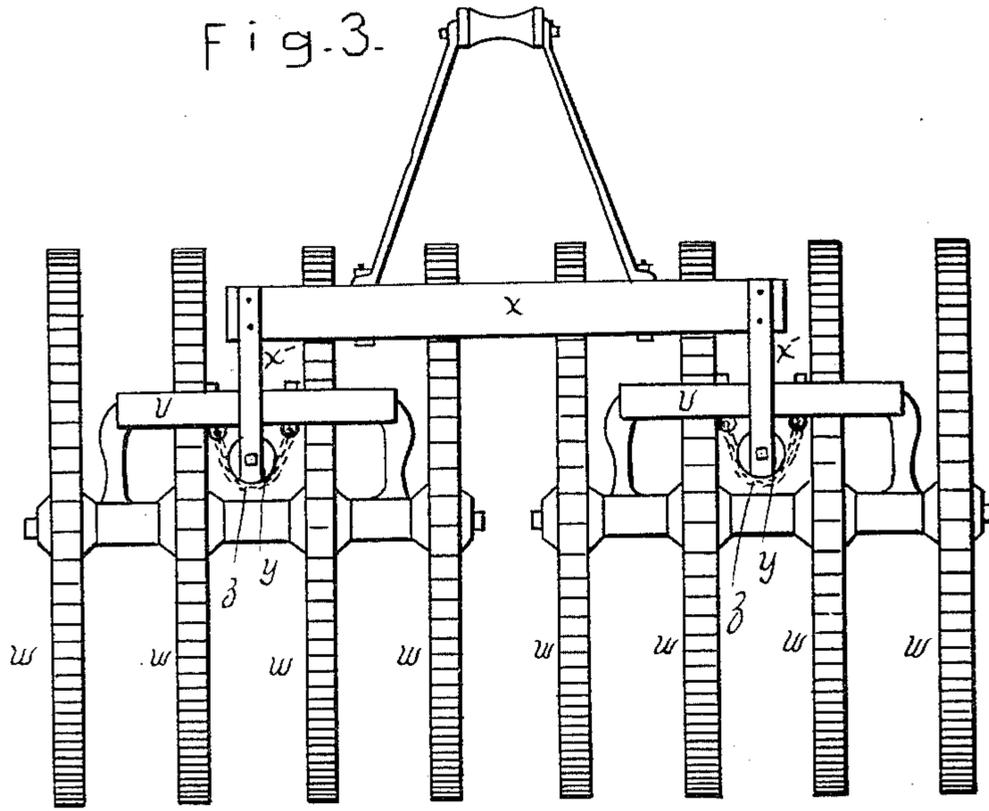
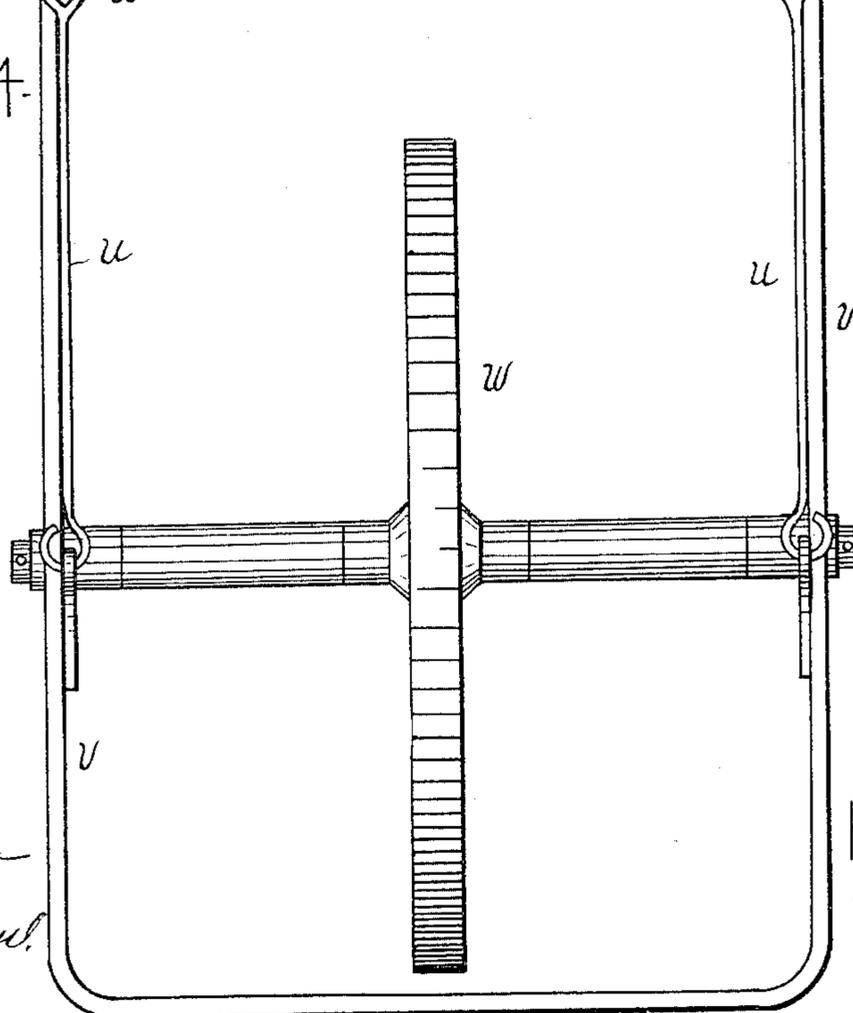


Fig. 4.



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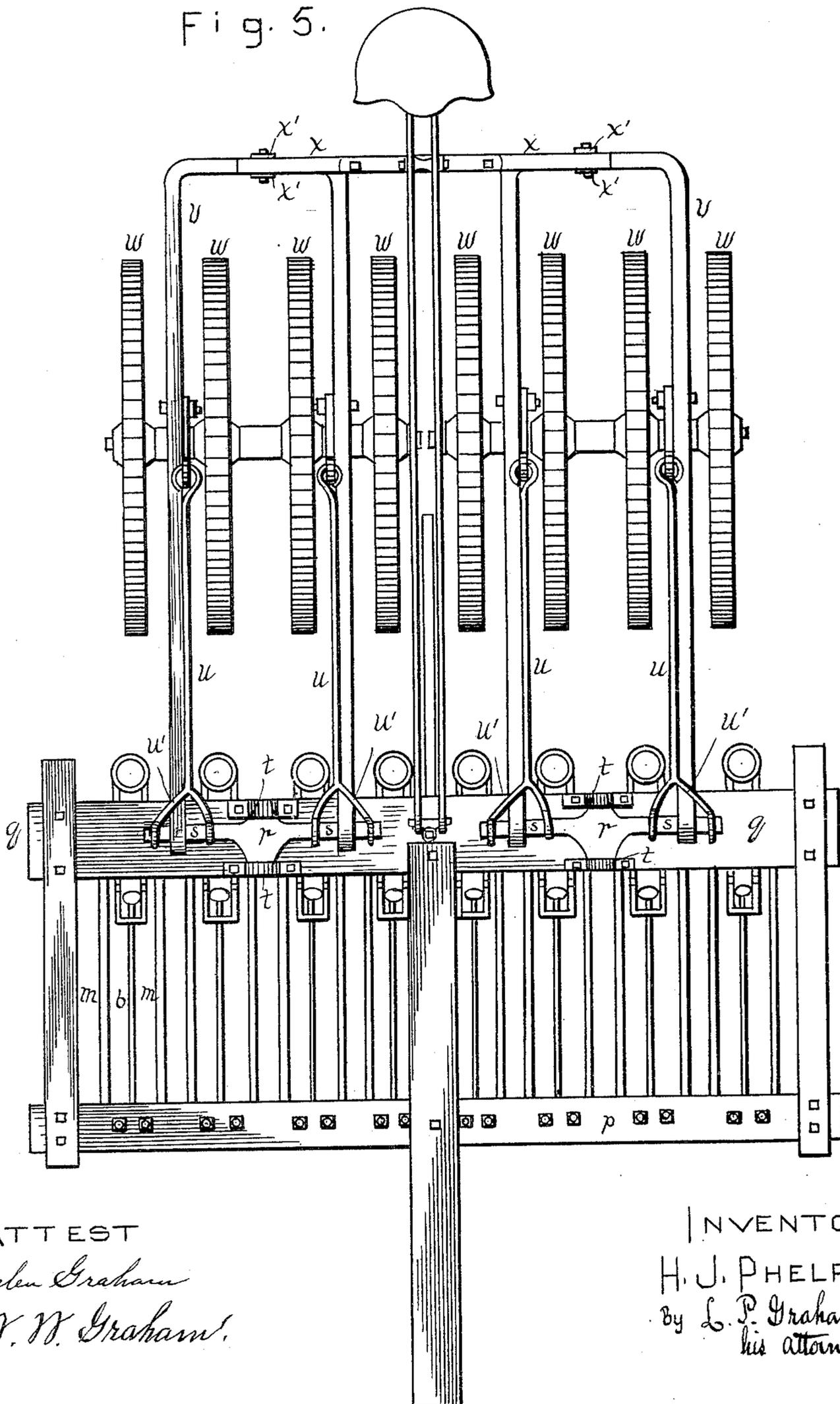
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Fig. 5.



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(No Model.)

4 Sheets—Sheet 4.

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GRAIN DRILL.

No. 433,027.

Patented July 29, 1890.

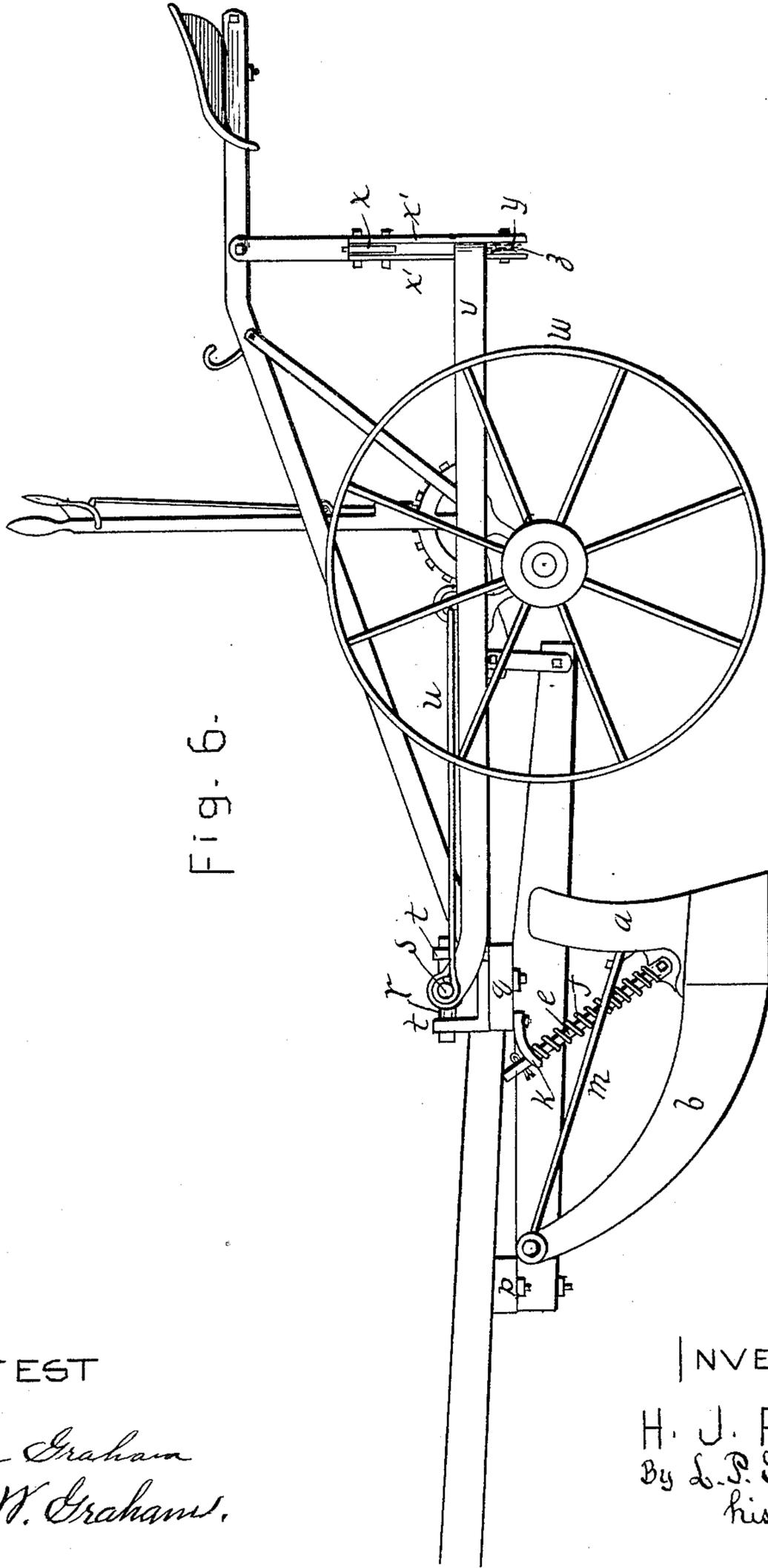


Fig. 6.

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# UNITED STATES PATENT OFFICE.

HARVEY J. PHELPS, OF HAVANA, ILLINOIS.

## GRAIN-DRILL.

SPECIFICATION forming part of Letters Patent No. 433,027, dated July 29, 1890.

Application filed February 27, 1890. Serial No. 342,028. (No model.)

To all whom it may concern:

Be it known that I, HARVEY J. PHELPS, of Havana, in the county of Mason and State of Illinois, have invented certain new and useful Improvements in Grain-Drills, of which the following is a specification.

This invention relates to the manner of imparting yielding pressure to the rear ends of the runners of grain-drills, to the manner of causing or enabling the following-wheels to accurately track the runners, and to the manner of distributing weight among the different wheel-frames.

It consists in the details of construction and combinations of parts hereinafter set forth and claimed.

The essential feature of the device used to impart yielding pressure to the runners is a contraction-spring bearing against the swinging end of a runner and extending obliquely upward and forward to an opposing bearing in such manner that as the runner rises the increasing tension of the spring is neutralized by the increasing obliquity of the direction of pressure. This provision assures uniform depth of planting in all conditions of soil, as a runner riding a ridge or passing over an elevation is subject to no greater pressure and will penetrate the ground no deeper than a runner in a comparative depression or hollow.

The device or construction that causes the wheels to track the runners and cover the grain regularly in all conditions of ground comprises yokes connected with the runner-frame in a manner permitting vertical tilting, frame-bars connected with the ends of the yokes in a manner to slide thereon, and draft-links connecting the wheel-frames with the yokes. The wheels in frames so connected are permitted to follow their natural tendencies and tilt to conform to uneven ground and move sidewise to follow the furrows of the runners.

The device used to connect the equalizing-bar with the wheel-frames in such manner that the weight imposed on the frames shall be equally distributed while permitting independent side motion in each frame consists in pulleys held in rigid extensions of the equalizing-bar, and chains swung from the wheel-frames in position to sustain the pulleys and their load.

In the drawings accompanying and forming a part of this specification, Figure 1 is an enlarged side elevation of a runner constructed and equipped in accordance with my invention. Fig. 2 is a plan of the construction shown in Fig. 1. Fig. 3 is a rear elevation of the wheel-frames and the weight-distributing appliance. Fig. 4 is a plan of a wheel-frame and the pivoting-yoke used to connect the wheel-frame with the runner-frame. Fig. 5 is a plan of all the parts of a drill relating to my invention, and Fig. 6 is a side elevation of the same.

The runner-shank is indicated by reference-letter *a* and the runner itself by *b*. Parallel bars *m m* extend from the shank to the pivot *n* of the runner, which pivot is formed on bracket *o*, which is in turn secured to cross-bar *p* of the runner-frame. The shank has a forward extension *c* that provides a bearing for block *d*. The rod *e* extends obliquely upward and forward from block *c*, and it carries spring *f*, which bears against extension *k* of block or bracket *i*. The extension is slotted to receive the end of rod *e*, and it is secured to the rear bar *q* of the runner-frame. It may be provided with a set of notches *l*, and the spring may have a collar, as *g*, adapted to the notches. As the runner rises, the resistance of the spring increases; but its constantly-increasing tendency is to press rearward instead of downward, thus equalizing the action of the spring, as hereinbefore stated.

The yoke *r* pivots in bearings *t t* of bar *q*, and it has the sliding bearings *s s* for wheel-frame *v*. Draft-bars *u* have the bifurcated terminations *u'*, which connect with the yoke in a manner permitting sliding motion in the wheel-frame. They extend rearward from the yoke and connect with the wheel-frame at points more or less near the axle, as seen in the drawings. This construction enables each wheel-frame to tilt vertically while maintaining horizontal rigidity with relation to the runner-frame, and also permits side motion in the frames, which enables the wheels *w* to track the runners.

The bar *x* sustains the weight of the driver and it has strips *x'* that extend downward on opposite sides of the rear ends of the wheel-frames and carry pulleys *y y* at their lower ends. Chains *z* are connected with the ends

of the wheel-frames at different points. They hang loosely between their connections, and they support the pulleys in a manner permitting a limited amount of independent motion in the different frames.

5 Having thus described my invention, I claim—

1. In grain-drills, in combination, a runner-frame, runners pivotally connected at their forward ends thereto, and contraction-springs interposed obliquely between the rear ends of the runners and a relatively forward portion of the frame, as set forth.

15 2. In grain-drills, in combination, a runner-frame, runners pivotally connected at their forward ends therewith, rods connecting with the rear ends of the runners and extending upward obliquely through slots in a comparatively forward portion of the frame, and contraction-springs on the rods bearing against the runners and the frame, as set forth.

3. In grain-drills, in combination, a runner-frame, a yoke swung on a central pivot in a manner permitting vertical and precluding horizontal tilting, a wheel-frame mounted slidingly on the ends of the yoke, and swinging draft-bars secured to the wheel-frame and to the yoke, as set forth.

4. In grain-drills, in combination, an equalizing-bar having downward extensions carrying pulleys, and chains having their ends connected with the rear ends of wheel-frames and supporting the pulleys and their load, as set forth.

In testimony whereof I sign my name in the presence of two subscribing witnesses.

HARVEY J. PHELPS.

Attest:

LYMAN LACEY, Jr.,  
O. B. THORP.