

(No Model.)

2 Sheets—Sheet 1.

J. W. RHODES.  
GRAIN DRILL.

No. 420,521.

Patented Feb. 4, 1890.

Fig-1-

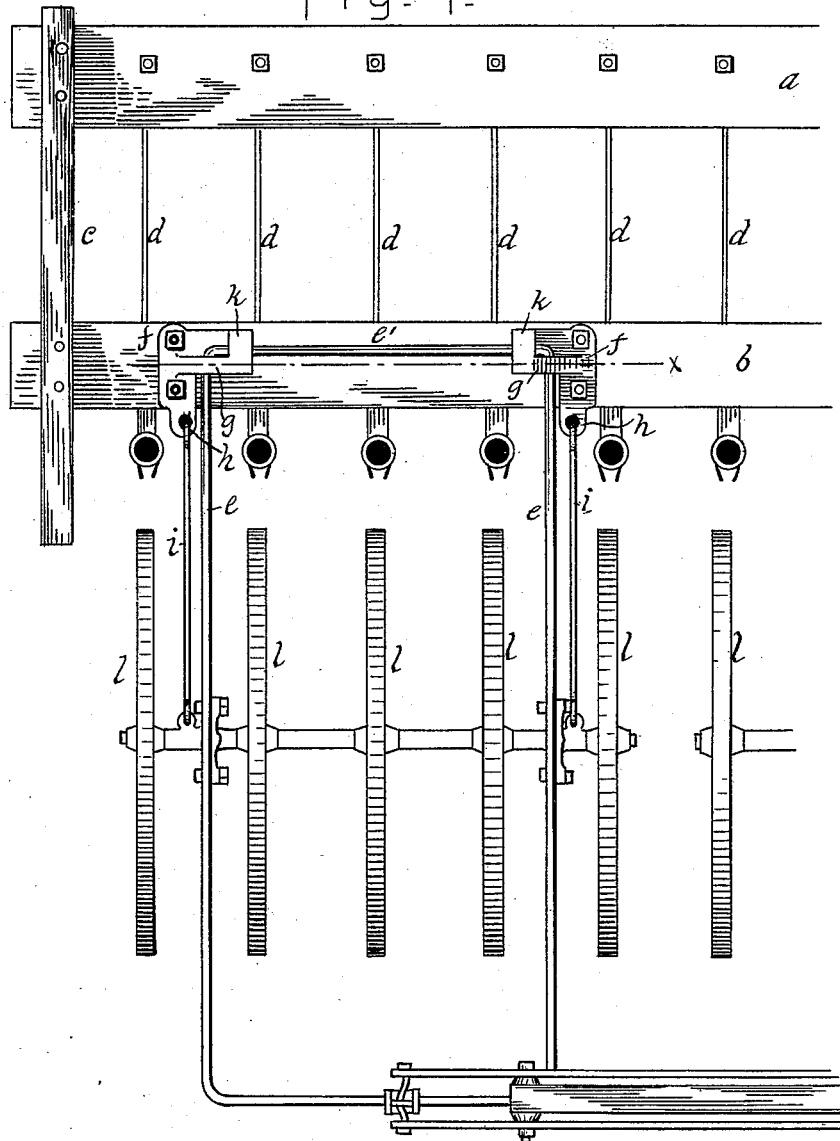
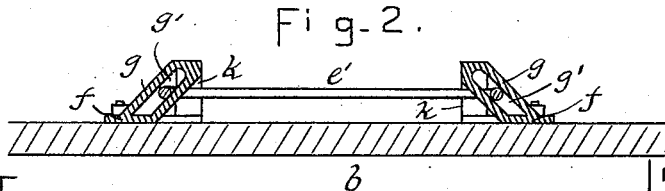


Fig-2.



ATTEST

Helen Graham  
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John W. Rhodes.  
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his attorney

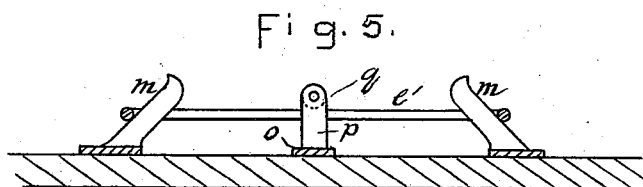
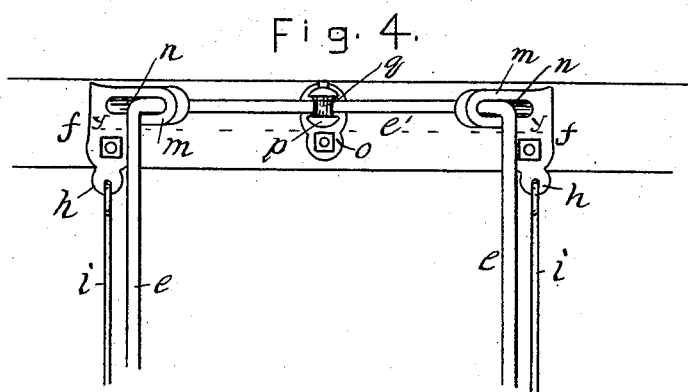
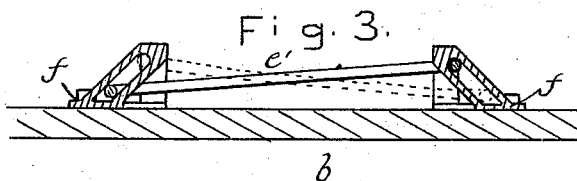
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2 Sheets—Sheet 2.

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ATTEST

*W. W. Graham*  
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INVENTOR

*John W. Rhodes*  
*By L. P. Graham*  
*his attorney*

# UNITED STATES PATENT OFFICE.

JOHN W. RHODES, OF HAVANA, ILLINOIS.

## GRAIN-DRILL.

SPECIFICATION forming part of Letters Patent No. 420,521, dated February 4, 1890.

Application filed November 1, 1889. Serial No. 328,901. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN W. RHODES, 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.

My invention relates to drills in which seed-depositing runners are followed by covering-wheels arranged in gangs or sets; and it is my object to compel the wheels to accurately follow the runners.

Heretofore following-wheels have been connected with the runner-frame in such manner that when, through unevenness in the surface of the ground or by casual obstructions, a wheel-frame was tilted sidewise the swing would be on an axis extending through a point of the axle, and the lower surfaces of the wheels would move laterally with relation to the furrows and imperfectly cover the grain. This I obviate by connecting the wheel-frames with the runner-frames in such a way that the tilting motion of the former shall be from pivotal points at the surface of the ground, the lower surfaces of the wheels remaining in line with the furrows and the axle and the upper portions of the wheels tilting laterally. In providing the connections it is necessary to prevent the wheel-frames from swinging horizontally with relation to the runner-frame, and I attain this object incidentally, as will hereinafter appear.

In the drawings accompanying and forming a part of this specification, Figure 1 is a plan of a portion of a grain-drill with the seed-box removed to expose the connection of the runner-frame with the wheel-frame. Fig. 2 is a section on dotted line *x* in Fig. 1. Fig. 3 is the same section showing the front bar of the wheel-frame in oblique positions. Fig. 4 is a plan of a modification of the connection. Fig. 5 is a section on broken line *y* in Fig. 4.

The front frame is composed of the front cross-bar *a*, the rear cross-bar *b*, and connecting-bars, as *c*, and it has the customary runners *d*, each of which yields independently in a vertical direction. The frame *e* has the front cross-bar *e'*, and it carries the set of wheels *l*. Brackets *f* are bolted to bar *b*, and they extend upward and incline one toward

the other. They have each an oblique slot *g'* in the upwardly-extended portion *g*, and they also have a vertical slot *k* or its equivalent to prevent bar *e'* from moving forward. Lugs *h* on the brackets provide points of pivotal connection for the draft-links *i*, which connect with the wheel-axle and relieve the frame *e* from draft tension.

In operation, when an obstruction or incline tilts a wheel-frame sidewise, the lower surfaces of the wheels remain in contact with the ground in line with the furrows, while all of the frame, axle, and wheels above the ground swings to one side in assuming a position in conformity to the surface of the ground. This is indicated in Fig. 3, where one extreme position of the wheel-frame is indicated by solid lines and the other extreme position is shown in broken lines, and it is caused by the obliquity of the sliding bearings, which make it impossible for the frame to tilt in either direction without moving bodily to one side, or to maintain a horizontal position without assuming a central position with relation to the guide-brackets. As shown in Figs. 1, 2, and 3, the slots *g'* form positive guides for the side bars of the wheel-frame, and the vertical slots *k* hold the front bar of the frame in horizontal parallelism with the rear bar of the runner-frame. In Figs. 4 and 5 the cross-bar *e'* is extended through the vertical slots *n* of oblique guides *m* and the side bars rest on the upper surfaces of such guides. The base *o* of standard *p* is secured to bar *b* midway between the guide-brackets, and a roller *q* or equivalent bearing is held by the standard over the bar *e'*. The inclined guides *m*, aided by the central bearing *q*, assure the requisite side motion when the wheel-frame tilts, and the slots insure the required horizontal parallelism between the frames. The draft-links *i* aid the adjustment of the frames by taking the strain off the frame *e* and so avoiding friction, but they are not entirely essential to the operation of the device.

It will be observed that in the forms of the invention herein set forth, as well as in other modifications that are naturally suggested, the essential features are guides that compel side motion when the wheel-frame tilts, while maintaining horizontal rigidity, and I therefore do not restrict myself to the precise form,

proportion, or relative arrangement of parts set forth herein.

I claim as new and desire to secure by Letters Patent—

5 1. The combination, in grain-drills, of a runner-frame, a wheel-frame, and a connection permitting tilting and compelling side motion in the wheel-frame, as set forth.

10 2. The combination, in grain-drills, of a runner-frame, a wheel-frame, and a connection horizontally rigid and permitting vertical tilting and side motion, as set forth.

15 3. The combination, in grain-drills, of a runner-frame, a wheel-frame, and a coupling comprising reversely-oblique guideways in which the wheel-frame tilts and moves side-

4. A coupling for the frames of grain-drills,

comprising reversely-oblique guides, as set forth. 20

5. The combination, in grain-drills, of a runner-frame, a wheel-frame, a coupling comprising reversely-oblique guideways in which the wheel-frame tilts and moves sidewise, and independent draft-links connecting the two 25 frames, as set forth.

6. The combination, with the two frames of a grain-drill, of brackets *f*, having oblique slots *g'* and vertical slots *h*, as and for the purpose set forth. 30

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

JNO. W. RHODES.

Attest:

ISAAC N. MITCHELL,

FRANK I. MITCHELL.