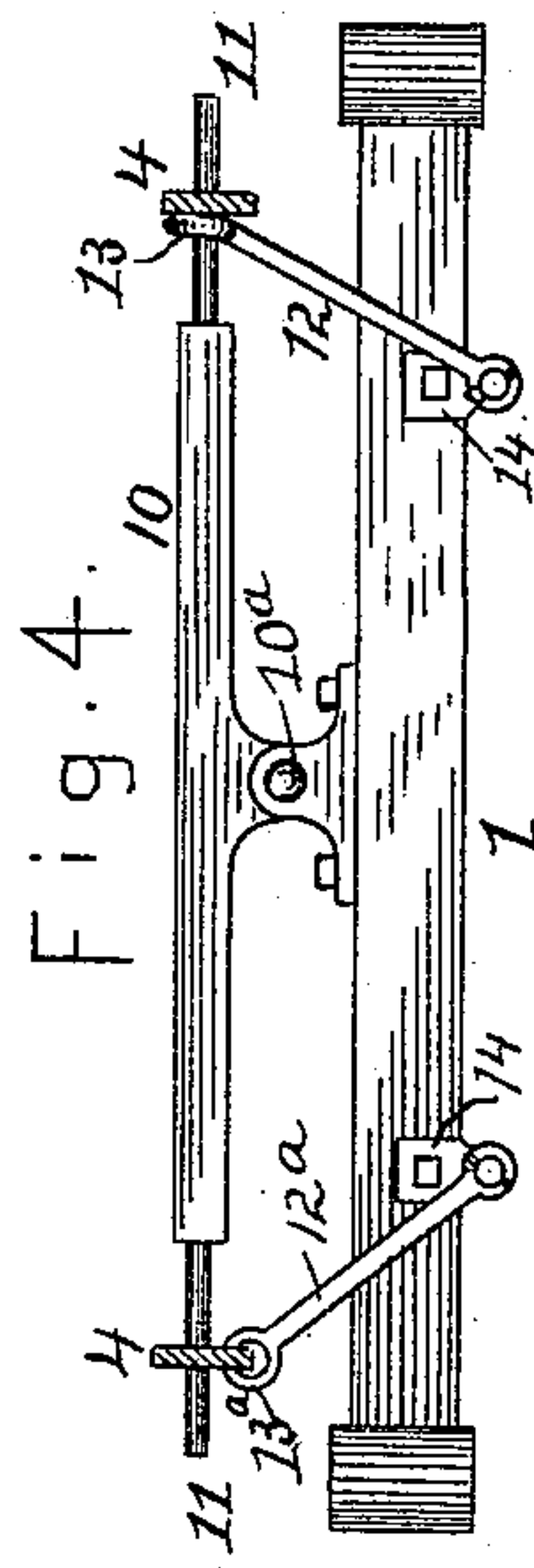
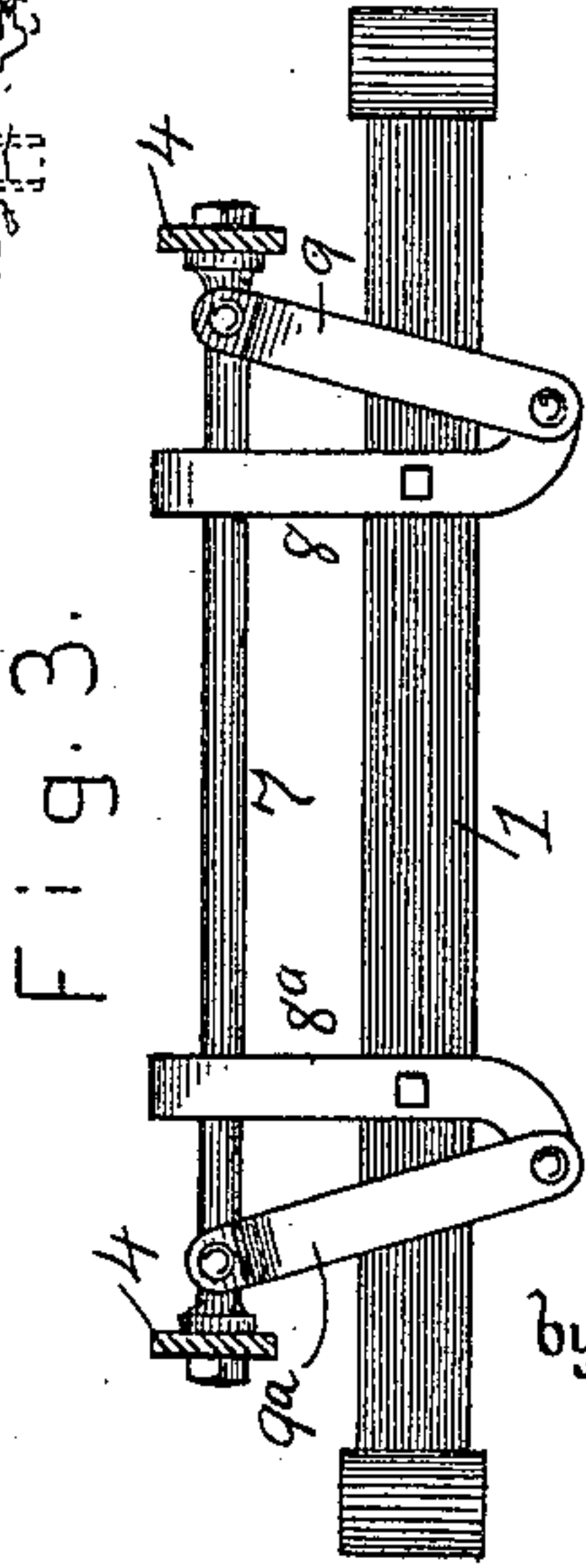
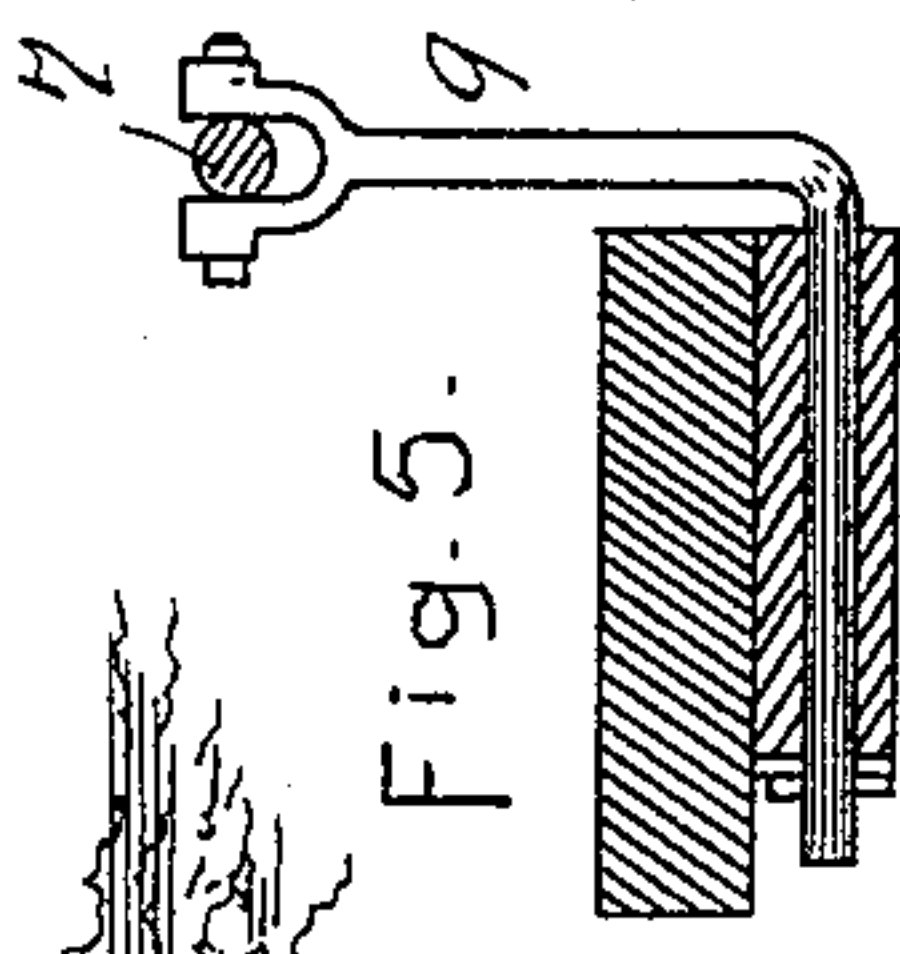
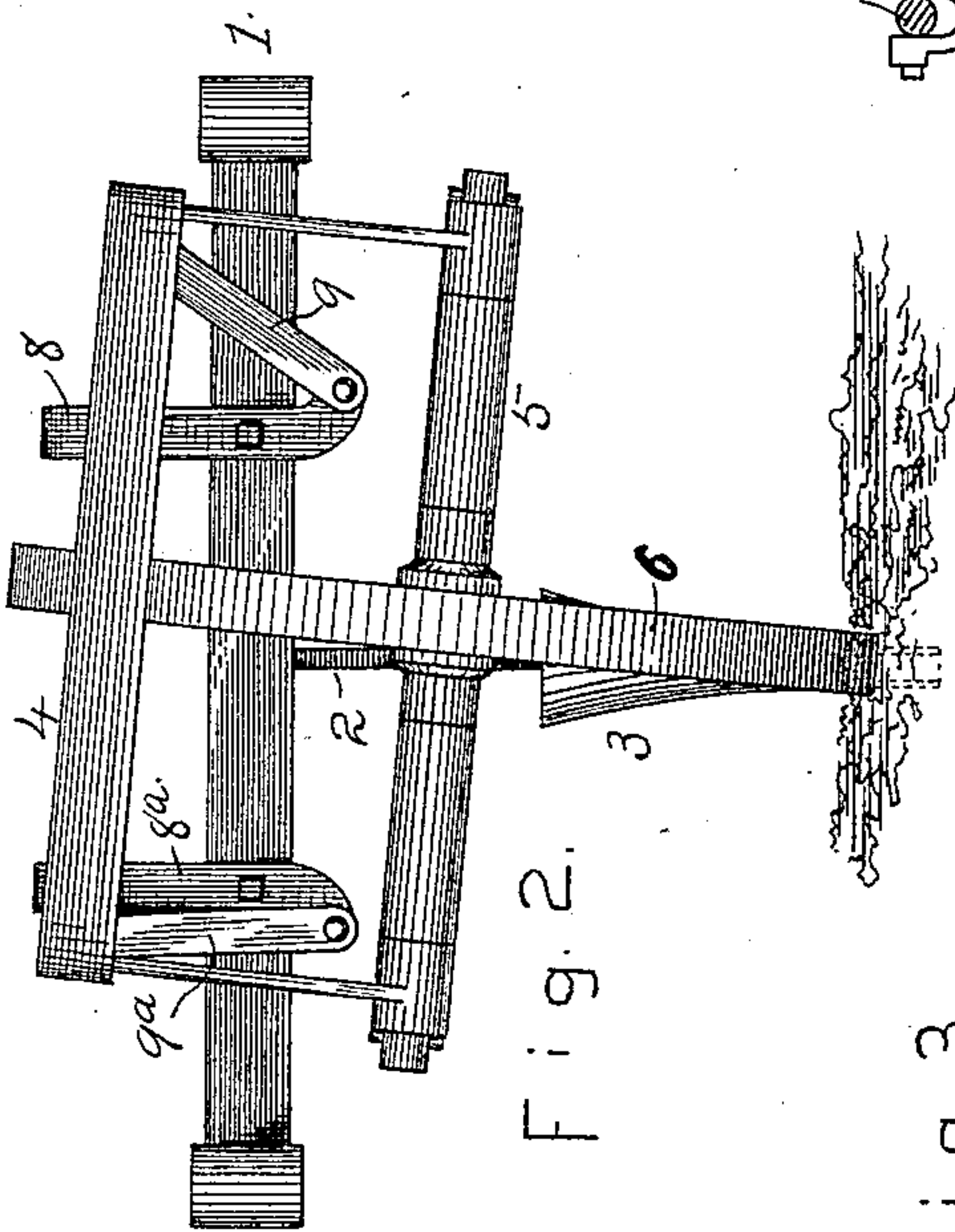
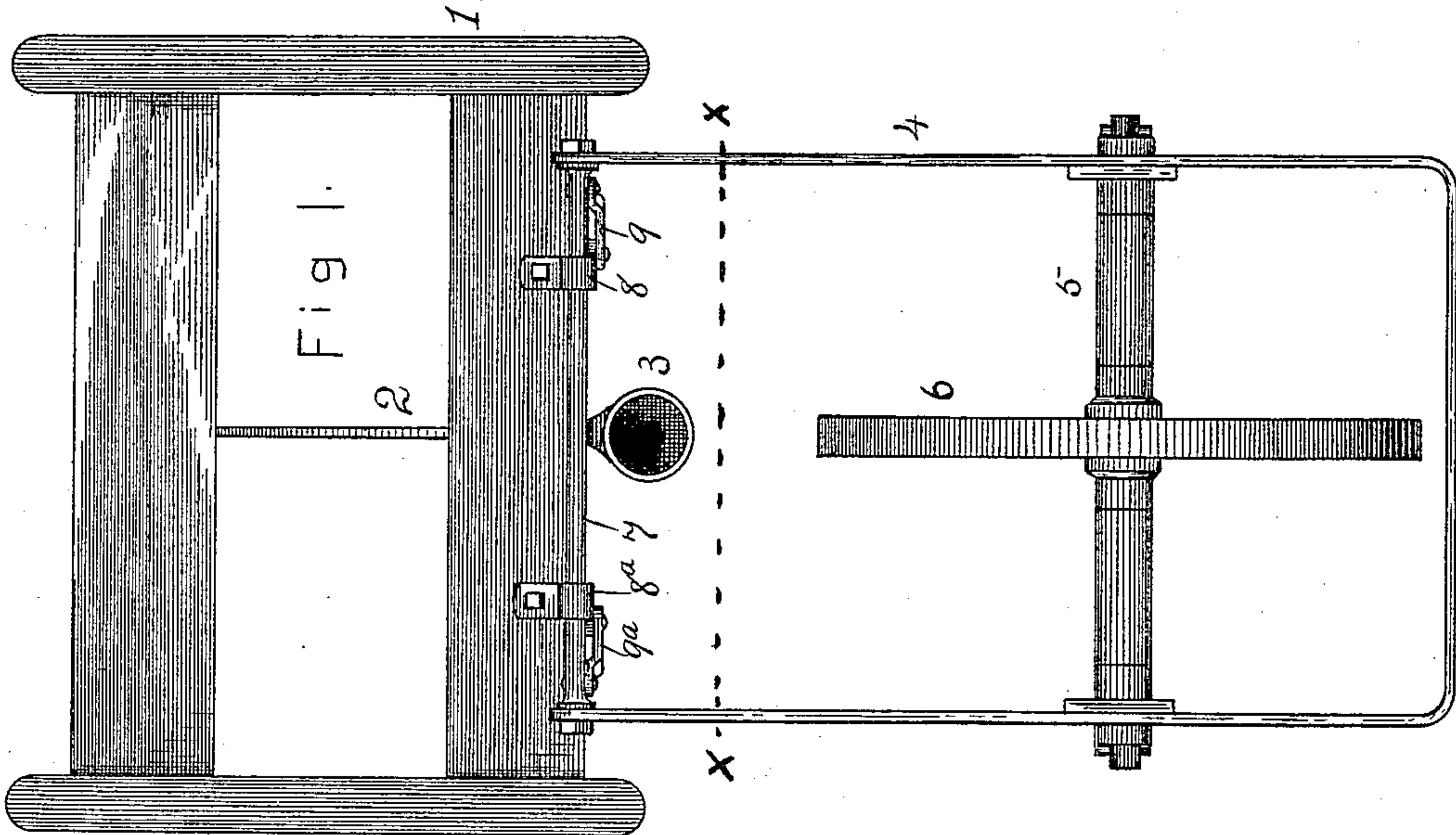


(No Model.)

H. J. PHELPS.
GRAIN DRILL.

No. 448,991.

Patented Mar. 24, 1891.



ATTEST.

Helen Graham
W. W. Graham.

INVENTOR

H. J. PHELPS.
by P. P. Graham
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UNITED STATES PATENT OFFICE.

HARVEY J. PHELPS, OF HAVANA, ILLINOIS, ASSIGNOR OF ONE-HALF TO
O. B. THORP, OF SAME PLACE.

GRAIN-DRILL.

SPECIFICATION forming part of Letters Patent No. 448,991, dated March 24, 1891.

Application filed December 1, 1890. Serial No. 373,243. (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 grain-drills in which a front planting-frame having furrow-forming runners is followed by a set of frames having wheels adapted to follow the furrows; and the object is to connect the wheel-frames to the runner-frame in a manner to permit independent tilting motion in the different frames, while holding each wheel directly in the track of its preceding runner.

The invention consists, broadly, in vertical oblique links, or possibly a link, connecting with the wheel-frame at the sides thereof and extending downward and inward to pivotal connections on the runner-frame. It also consists in the details of construction and combinations of parts hereinafter set forth.

In the drawings accompanying and forming a part of this specification my invention is illustrated in connection with a runner-frame having a single runner and a single-wheel frame having a single wheel, the effect being substantially the same as if the runner-frame had a complete set of runners and was followed by several wheel-frames, each having several wheels.

Figure 1 is a plan of the two frames. Fig. 2 is a rear view of the same. Fig. 3 is a rear view of the preferred form of connection, taken on section-line X in Fig. 1. Fig. 4 is a similar view, taken at the same point, of modified forms of connection. Fig. 5 is a side view of a simplification of the form of link shown in Fig. 4, the bearing being shown in cross-section.

The frame 1 is to have a set of runners, as 2, properly spaced, suitably constructed, and provided each with a seed-depositing tubular shank, as 3. It is also to have the customary seed-box and dropping mechanism. The frame 4, of which two or more usually follow the runner-frame, may have a number of wheels, as 6, mounted on axle 5, each directly in the rear of a runner. The front bar of the wheel-frame may be connected rigidly with the side

bars, as seen at 7 in Fig. 1, or the side bars may slide thereon, as shown at 11 in Fig. 4.

In Figs. 1, 2, and 3, 8 represents a vertical slotted standard or guide-bar secured to the runner-frame at one side of the longitudinal center thereof, and 8^a represents a similar standard secured to the opposite side of the runner-frame. Links 9 and 9^a connect pivotally with the lower ends of standards 8 and 8^a, respectively, and extending upward and outward they connect with cross-bar 7 near the ends thereof.

When the ground is perfectly level, the wheel-frames will run horizontally parallel with the runner-frame; but when an uneven surface causes a wheel-frame to tilt with relation to the runner-frame the entire upper portion of the wheel-frame and wheels will be forced to one side, while the track of the wheels will be in accurate line with the furrows, as shown in Fig. 2.

In Fig. 4 the cross-bar 10 of the wheel-frame is pivoted centrally at 10^a on the runner-frame, and the side bars 4 slide lengthwise of the diminished ends 11. The link 12 is pivotally connected at its lower end with the runner-frame, and it has an eye 13 at its upper end that embraces a diminished end 11 of bar 10 and bears against a side bar 4. With two such links, one on each side, the effect is to force the side bars from side to side on the cross-bar as the wheel-frame tilts, the result being the same as if the cross-bar also moved with the side bars.

In the form shown in Fig. 5 the links have long bearings, which enables them to act as draft-couplings in addition to their frame-tilting function.

Link 12^a has an eye 13^a that engages a side bar in a manner to both push and pull, and this modification is capable of effecting the necessary lateral shift in the wheel-frame unaided.

In the form shown in Figs. 1, 2, and 3 the wheel-frame is drawn by the standards 8 8^a, through the slots of which bar 7 passes, and in the form shown in Fig. 4 draft is effected through the pivotal connection 10^a. In both cases, however, auxiliary draft chains or links may extend from the runner-frame to some

part of the wheel-frame at or near the axle and take the strain off the shifting connections.

5 In one case the cross-bar moves with the side bar; in the others it does not; but in all cases the side bars and wheels are moved side-wise by the oblique links whenever tilting occurs.

10 The degree of obliquity to be given to the links is approximated in the drawings, but it depends of course on the proportion of the various parts and can always be determined by experiment.

I claim—

15 1. In grain-drills, the combination of a runner-frame, a wheel-frame, and a link connected pivotally with the runner-frame at its lower

end, extended obliquely upward and outward, and connected at its upper end with the wheel-frame, as set forth.

20 2. In grain-drills, the combination, with a runner-frame and a wheel-frame, of slotted standards rising from the runner-frame and receiving the front bar of the wheel-frame, and oblique links having their upper outer 25 ends connected with the wheel-frame and their lower inner ends connected with the runner-frame in a pivotal manner, as set forth.

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

HARVEY J. PHELPS.

Attest:

LYMAN LACEY, Jr.,
T. H. MEHAN.