(Model.)

R. J. BOWMAN.

2 Sheets—Sheet 1.

Gang Plow, Planter and Cultivator.

No. 236,536. **Patented Jan. 11, 1881.**

Fig: 1.

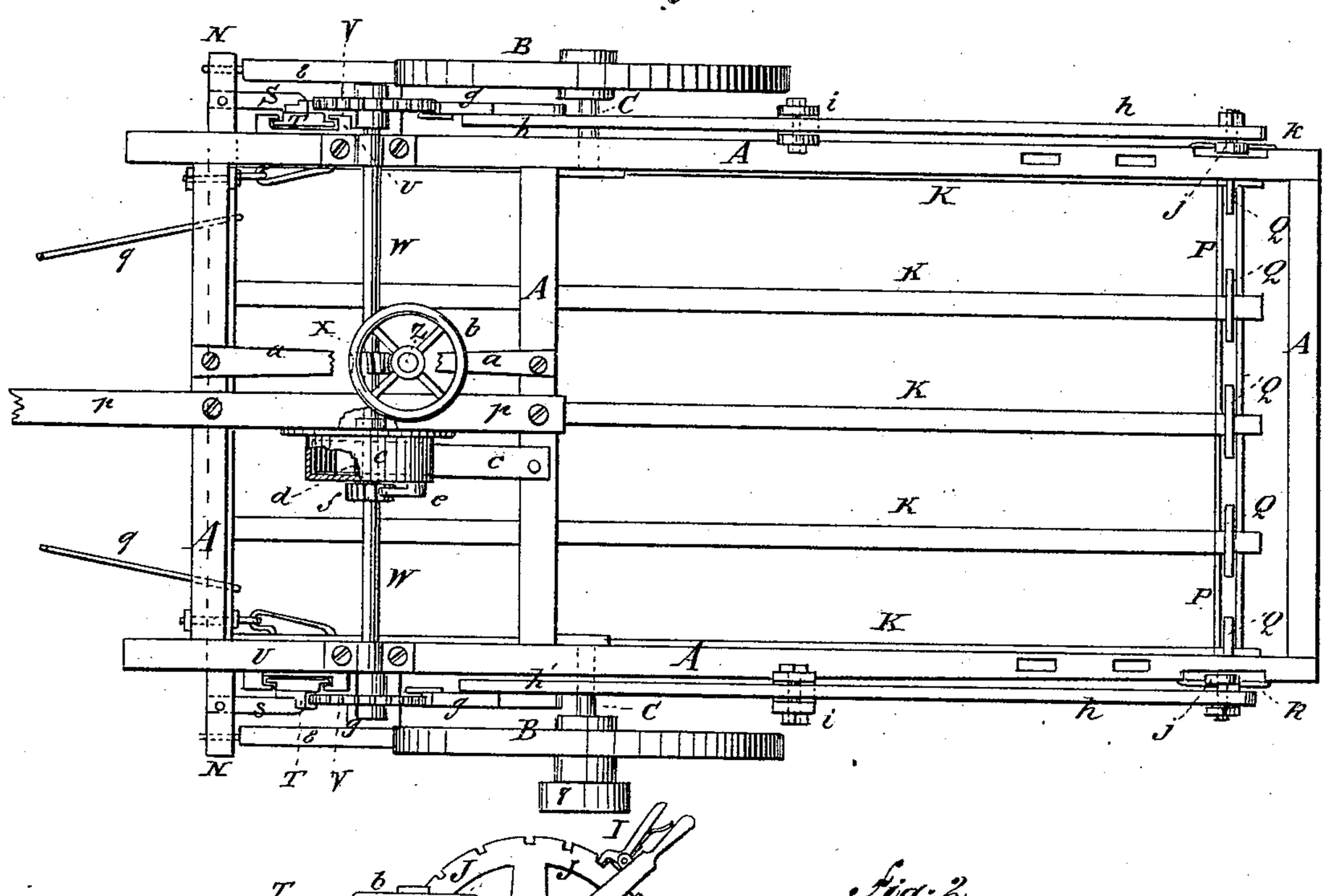

Fig: 2

WITNESSES:

Chas. Nida

C. Sedgwick

INVENTOR:

R. J. Bowman

BY Munn & Co

ATTORNEYS.

(Model.) 2 Sheets—Sheet 2.

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Gang Plow, Planter and Cultivator.

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Fig: 3.

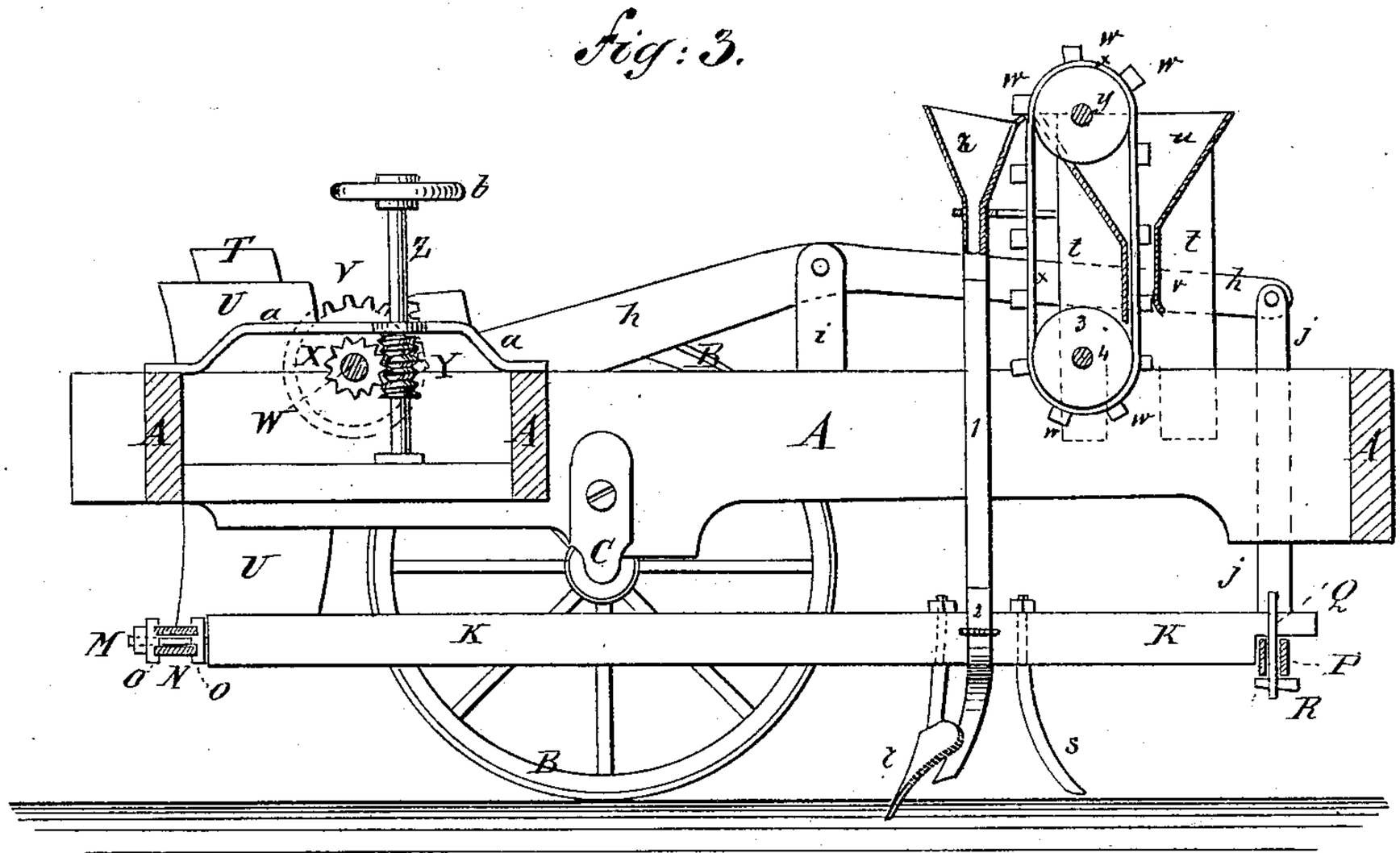

Fig: 4.

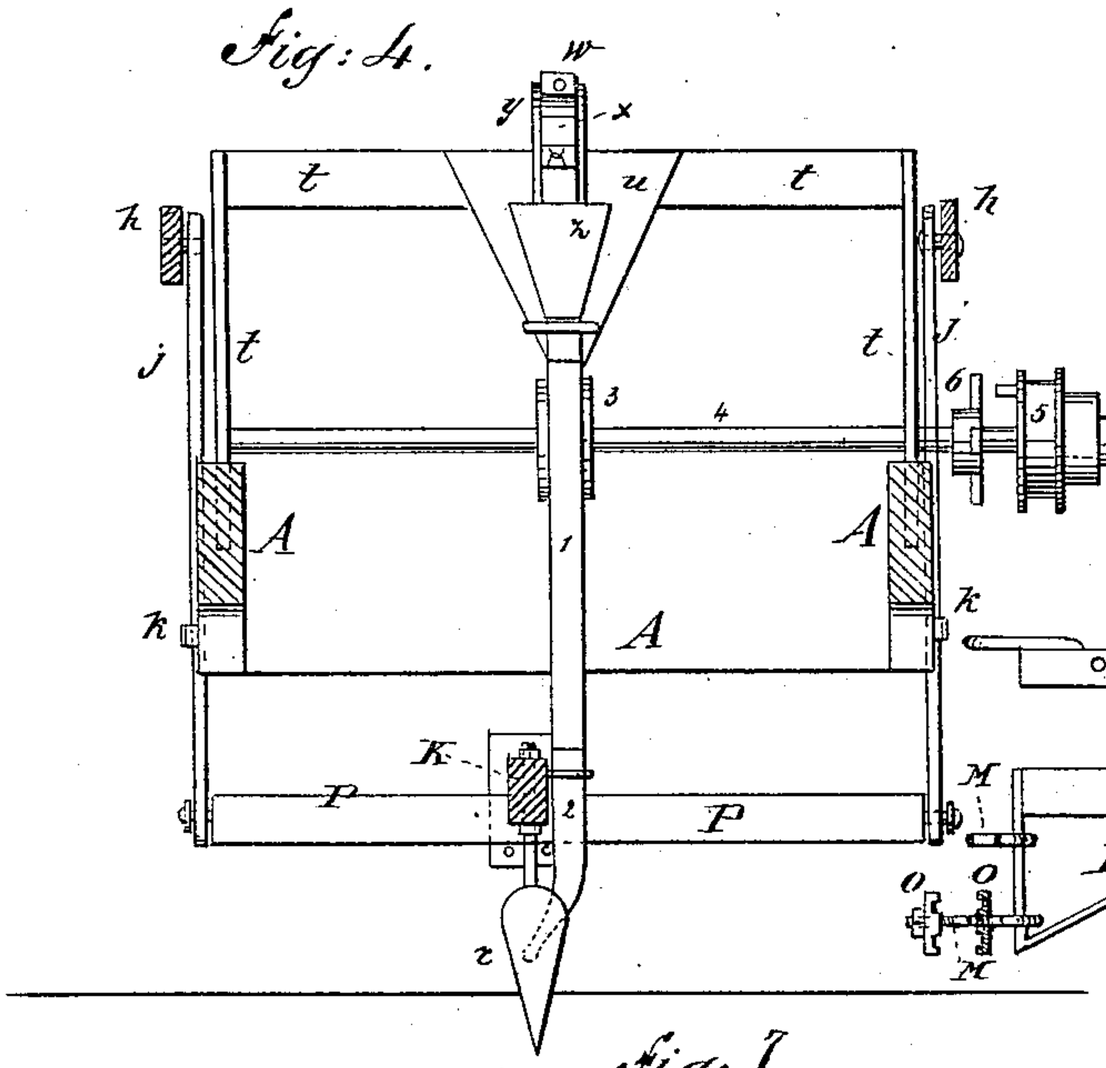

Fig: 6.

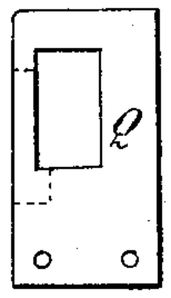

Fig: 5

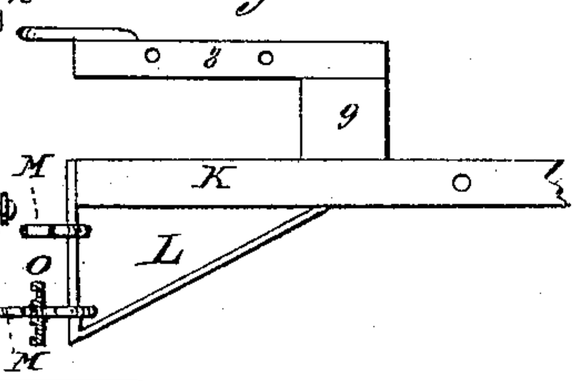

Fig: 7.

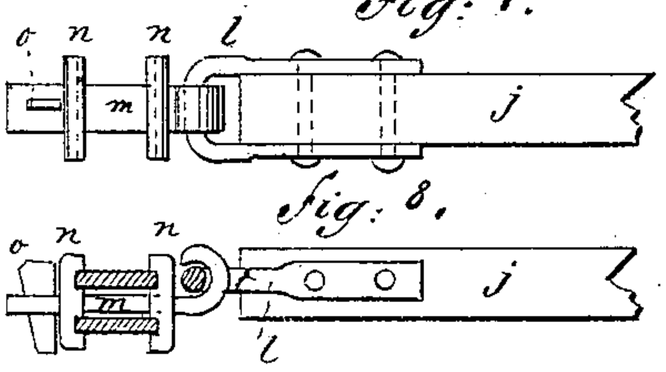

Fig: 8.

WITNESSES:

Chas. Nida.

C. Sedgwick

INVENTOR:

R. J. Bowman

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

ROBERT J. BOWMAN, OF ALEXANDRIA, LOUISIANA.

GANG-PLOW, PLANTER, AND CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 236,536, dated January 11, 1881.

Application filed July 9, 1880. (Model.)

To all whom it may concern:

Be it known that I, ROBERT JAMES BOWMAN, of Alexandria, in the parish of Rapides and State of Louisiana, have invented a new and useful Improvement in Combined Gang-Plows, Planters, and Cultivators, of which the following is a specification.

Figure 1, Sheet 1, is a plan view of the improvement. Fig. 2, Sheet 1, is a side elevation. Fig. 3, Sheet 2, is a sectional side elevation. Fig. 4, Sheet 2, is a sectional end elevation. Fig. 5, Sheet 2, is a plan view of the forward end of one of the plow-beams, and showing the short beam. Fig. 6, Sheet 2, is an elevation of one of the clamps for securing the rear end of the plow-beams to the rear cross-beam. Figs. 7 and 8, Sheet 2, represent a coupling for securing the ends of the upright connecting-bars to the ends of the rear cross-beam.

Similar letters of reference indicate corresponding parts.

The object of this invention is to furnish combined gang-plows, planters, and cultivators so constructed that they can be readily adjusted for either use, can be readily controlled, and will be convenient in use and effective and reliable in operation in either capacity.

A is a rectangular frame, formed of two side bars and three or more cross-bars, so constructed that the machine may be widened and narrowed to suit different widths of rows, and which are securely framed together. The frame A is supported at points a little in front of the centers of its side bars by wheels B, the short axles C of which are rigidly attached to the lower ends of upright bars D, which may be attached to the said side bars of the frame A, but which I prefer to extend upward and pass them through keepers E, attached to the side bars of the said frame. In this case the upper parts of the bars D should be made with an outward offset to pass the levers, hereinafter described. To the upper ends of the upright bars D are pivoted the upper ends of short connecting-bars F, to the lower ends of which are pivoted the ends of the short arms of the bent levers G. The bent levers G are pivoted at their angles to standards H, attached to the side bars of the frame A. To the upper parts of the levers G are pivoted spring lever-pawls I, which engage with teeth or notches in the arched bars J, connected with and supported from the standards H or the side bars of the frame A. With this construction the frame A can be adjusted at any desired distance from the ground, and when adjusted will be held securely in place.

K are the plow-beams, any desired number of which may be used, as the strength of the team or the character of the work to be done may require. To the beams K are attached turn-plows, subsoil-plows, cultivator-plows or harrow-teeth, circular colters, or any other form of plow or scraper, as may be required, and which are secured to the said beams in the same manner as such implements are usually secured to their beams. To the side of the forward end of each beam K is bolted a right-angled clevis, L, with its shortest side at right angles with the said beam. The forward bar of the clevis L is hooked upon hook-bolts M, which pass through the slot of the forward cross-beam, N, and through washers O, placed upon the opposite sides of the said beam. The inner sides of the washers O have flanges or projections formed upon them to fit into the slot of the said beam and overlap its upper and lower sides, or grooves formed in them to receive the edges of the said cross-beam. In the outer side of the inner washer O is formed a groove to receive the forward bar of the clevis L. With this construction the forward ends of the plow-beams K will have a hinge-connection with the cross-beam N, but cannot turn or move vertically or laterally. The forward ends of the plow-beams K can be adjusted at any desired distance apart by loosening the nuts of the bolts M. The rear ends of the plow-beams rest upon or under, as desired, the rear cross-beam, P, and are secured to the said beam by the clamping-plates Q, which have holes formed through them, or by clips or stirrups passing over the ends of said beams K and through the slot of the beam P, and secured by screws, nuts, and washers. The lower parts of the clamping-plates Q pass through the slot in the cross-beam P, and have holes formed through them to receive the wedge-keys R.

The cross-beams N P are each formed of two

parallel bars secured together at their ends and kept at a proper distance apart by blocks interposed between the said ends and by the washers O. The ends of the forward cross-beam, N, are secured to arms S, formed upon or rigidly attached to the lower ends of the curved rack-bars T, which are curved in arcs of circles and slide in circular T-grooves in the circular plates or bars U, firmly secured to the side bars of the frame A, with their concave edges forward. The teeth of the rack-bars T are formed upon the rear or convex sides of the said bars, and mesh into the teeth of the gear-wheels V, attached to the ends of the shaft W, which works in bearings attached to the side bars of the frame A, so that the forward ends of the plow-beams K can be raised and lowered by turning the said shaft W.

To the shaft W is attached, or upon it is formed, a worm or screw wheel, X, the teeth of which mesh into the threads of an endless screw, Y, attached to or formed upon the vertical shaft Z. The vertical shaft Z works in bearings in bars *a*, attached to the cross-bars of the frame A, and to the upper end of the said shaft is attached a hand or crank wheel, *b*, for convenience in turning the said shaft Z, so that the shaft W can be turned to raise and lower the forward ends of the plow-beams K.

c is a coiled spring, the outer end of which is attached to a cross-bar of the frame A. The spring *c* is coiled around, and its inner end is attached to a sleeve, *d*, placed upon the shaft W, and which is made of such a length that its ends may project beyond the sides of the said spring *c*. One of the ends of the sleeve *d* is squared to receive a wrench for turning the said sleeve to coil up the spring *c*. To the other end of the sleeve *d* is attached a pawl, *e*, which engages with the teeth of a ratchet-wheel, *f*, keyed or otherwise secured to the shaft W. The sleeve *d* is kept in place against the side of the ratchet-wheel *f* by a collar secured to the shaft W at the other end of the said sleeve *d*. With this construction the spring *c* is coiled by turning the sleeve *d* until the tension of the said spring *c* balances the weight of the plow-beams K and their attachments, so that the plowman will be relieved from the said weight in raising and lowering the said plow-beams.

Into the teeth of the gear-wheels V, at the rear sides of the said gear-wheels, mesh the teeth of the rack-bars *g*, which are curved upon arcs whose radii are half the length of the levers *h*, and have their teeth formed upon their convex sides. The rack-bars *g* have flanges upon their inner sides to overlap the inner sides of the gear-wheels V and prevent the said rack-bars from moving outward. The rack-bars *g* are kept from moving inward by the side bars of the frame A. The rack-bars *g* at the centers of their concave sides are rigidly attached to the forward ends of the levers *h*, which are pivoted at their centers to standards *i*, attached to the side bars of the frame A.

To the rear ends of the levers *h* are pivoted the upper ends of the connecting-bars *j*, which pass down through keepers *k*, attached to the side bars of the frame A.

To the lower ends of the connecting-bars *j* are attached clevises *l*, the bends of which receive hooks formed upon the upper ends of the plates *m*. The plates *m* pass down through the slot in the projecting ends of the rear cross-beam, P, through washers *n*, placed above and below the said cross-beam, and have holes in their lower parts to receive the wedge-keys *o*, by which they are secured in place. The washers *n* have flanges or projections upon their inner sides to enter the slot of the cross-beam P, and overlap its sides to prevent the connecting-bars *j* and the cross-beam P from getting out of their proper relative positions, while allowing the said cross-beam to have the slight hinge movement required for adjusting the plow-beams.

p is the tongue, the rear part of which is attached to the forward cross-bars of the frame A.

To the forward cross-beam, N, at a suitable distance from and upon the opposite sides of its center, are attached the rear ends of the rods *q*, which extend forward in the direction of and forming radii of the arcs of the curved bars U, and their forward ends are attached to the forward part of the tongue *p*, so that the draft will be applied directly to the cross-beam N, to which the forward ends of the plow-beams K are attached, instead of being communicated to the said beams through the frame A. This is the arrangement when the machine is drawn by oxen and all the draft is applied to the forward end of the tongue. When horses are used the double-trees of the forward teams are connected with the forward end of the tongue and the double-tree of the rear team is connected with the forward cross-beam, N.

When the machine is to be used for planting or drilling, or for planting small grain, one of the plow-beams K, or a number of them corresponding to the number of drills planted at each furrow, is adjusted at the centers of the cross-beams N P, and to it is attached a plow, *r*, to open a furrow to receive the seed, and a coverer, *s*, to cover the seed. In case the soil is light a former or shoe is attached to the beam K, in the rear of the opening-plow *r*, to pack the side of the furrow and prevent the soil from falling in before the seed has been deposited in it, and to give it a uniform depth. A leveler may also be attached to the beam K, in front of the opener *r*, to level off and give proper form to the surface of the ridge to be opened, and a molder in the rear of the coverer *s*, to shape and pack the furrow. To a detachable stand or frame, *t*, attached to the frame A, is attached a hopper, *u*, which has a square tube or spout, *v*, secured in an opening in its bottom of such a size that the blocks *w*, attached to the endless belt *x*, will pass through it readily, and will fit it so snugly

that the grain cannot escape through the tube *v* around a block, *w*. The tube *v* is made of such a length that a following block, *w*, will always enter its lower end before the preceding block *w* has passed out of its upper end, so that no grain can pass out between the blocks. In the forward end of each block *w* is formed a cavity to receive a seed-cup, so that more or less seed can be dropped by changing the seed-cups for larger or smaller ones. As each block *w* of the belt *x* passes over the wheel or pulley *y* it discharges the seed from its seed-cup into the flaring upper end of the spout *z*, attached to the frame *t*, that supports the hopper *u*.

To the lower end of the spout *z* is attached the upper end of a flexible tube, 1, the lower end of which is attached to the upper end of a tube, 2. The tube 2 passes through and is secured to the plow-beam K in such a position as to drop the seed into the furrow close in the rear of the opening-plow *r*.

The journals of the pulley *y* revolve in bearings in the upper part of the hopper *u*. From the pulley *y* the outer part of the belt *x* passes down at the outer side of the hopper *u*, and passes around a pulley, 3, attached to the shaft 4, in such a position that the belt *x* can pass directly into the lower end of the tube *v*.

The shaft 4 revolves in bearings attached to the side bars of the frame A, or to the detachable frame *t*. One end of the shaft 4 projects, and upon it is placed a cone-pulley, 5, so that the rapidity of the feed, and consequently the distance apart of the hills, may be regulated by adjusting the driving-belt upon the pulley 5. The pulley 5 runs loose upon the shaft 4, and is made to carry the said shaft with it in its revolution by a sliding clutch, 6, placed upon the said shaft 4. The pulley 5 is driven by a belt which passes around a cone-pulley, 7, attached to the hub of the wheel B.

When the machine is to be used as a cultivator the cross-beams N P are replaced by others made in two parts, with a sufficient space between their adjacent ends for the passage of the plants. In this case the inner ends of the parts of the forward cross-beam should be provided with curved slide-bars U and curved bars, which, at their upper ends, are attached to a bar passing from one rack-bar T to the other, and attached to the said rack-bars at their upper ends. The inner ends of the parts of the rear cross-beam, P, may be connected with the connecting-bars *j* by inclined braces or other suitable means.

When the machine is used as a planter the side beams, K, may be provided with turn-plows, subsoil-plows, cultivator-plows, or harrow-teeth to stir up the soil in advance of the planting.

To the end parts of the forward cross-beam, N, are attached the forward ends of short beams S, which are placed directly in front of the wheels B, and their rear ends are connected with the side beams, K, by blocks or bars 9.

To the beams S are attached small plows 10, which open small furrows to serve as tracks for the wheels B, so that the said wheels may have smooth and level paths, and will thus cause the machine to work the ground to a uniform depth.

To the beams 8, in front of the plows 10, as well as in front of all other plows, cultivators, or subsoilers used, may be attached rotary colters 11, to cause the plows 10 to pass through the ground more easily.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a combined gang-plow, planter, and cultivator, the combination, with the frame A, the plow-beams K, and the gear-wheels V, of the cross-beam P, the connecting-bars *j*, the pivoted equal-armed levers *h*, and the curved rack-bars *g*, substantially as herein shown and described, whereby the rear ends of the plow-beams will be raised at the same time and by the same movement as the forward ends, as set forth.

2. In a combined gang-plow, planter, and cultivator, the combination, with the frame A and the shaft W, that carries the gear-wheels V, of the coiled spring *c*, the sleeve *d*, the pawl *e*, and the ratchet-wheel *f*, substantially as herein shown and described, whereby the weight of the beams and their attachments are balanced, and the plowman relieved from the said weight when adjusting the machine, as set forth.

3. In a combined gang-plow, planter, and cultivator, the combination, with the plow-beams K and the forward cross-beam, N, of the right-angled clevis L, the two eyebolts M, and the grooved or flanged washers O, substantially as herein shown and described, whereby the plow-beams are adjustably and firmly connected with the forward cross-beam, as set forth.

4. In a combined gang-plow, planter, and cultivator, the combination, with the plow-beams K and the rear cross-beam, P, of the plates Q, having aperture, and the wedge-keys R, substantially as herein shown and described, whereby the plow-beams are connected with the rear cross-beam adjustably and firmly, as set forth.

5. In a combined gang-plow, planter, and cultivator, the combination, with the connecting-bars *j* and the rear cross-beam, P, of the clevis *l*, the eyebolt or plate *m*, the flanged or grooved plates or washers *n*, and the wedge-keys *o*, substantially as herein shown and described, whereby the cross-beam is held from longitudinal movement, as set forth.

ROBERT JAMES BOWMAN.

Witnesses:
M. BLOOM,
L. B. BAYNARD.