(No Model.)

2 Sheets—Sheet 1.

J. G. SMITH.

GARDENING MACHINE.

No. 318,047. Patented May 19, 1885.

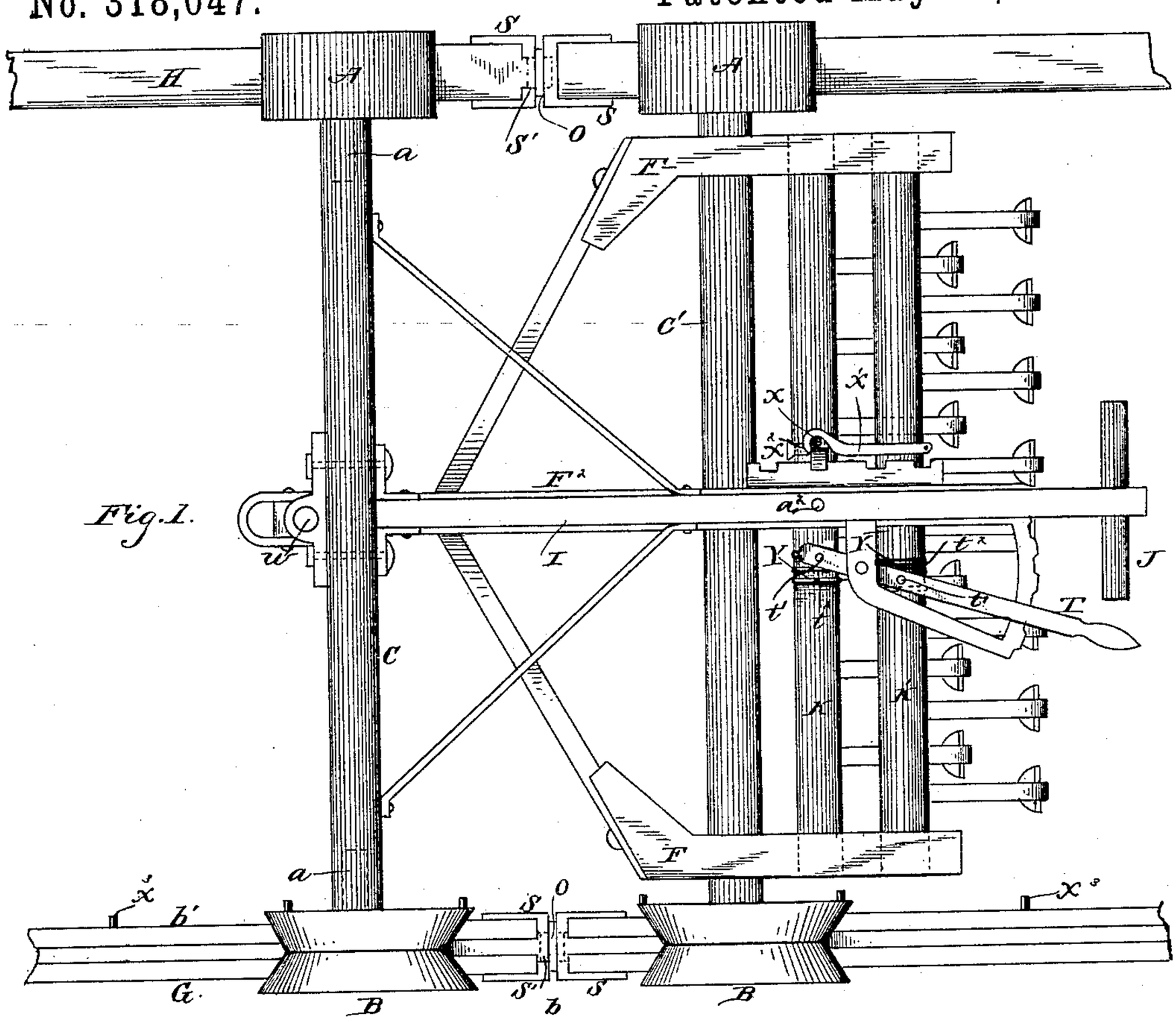

Fig. 1.

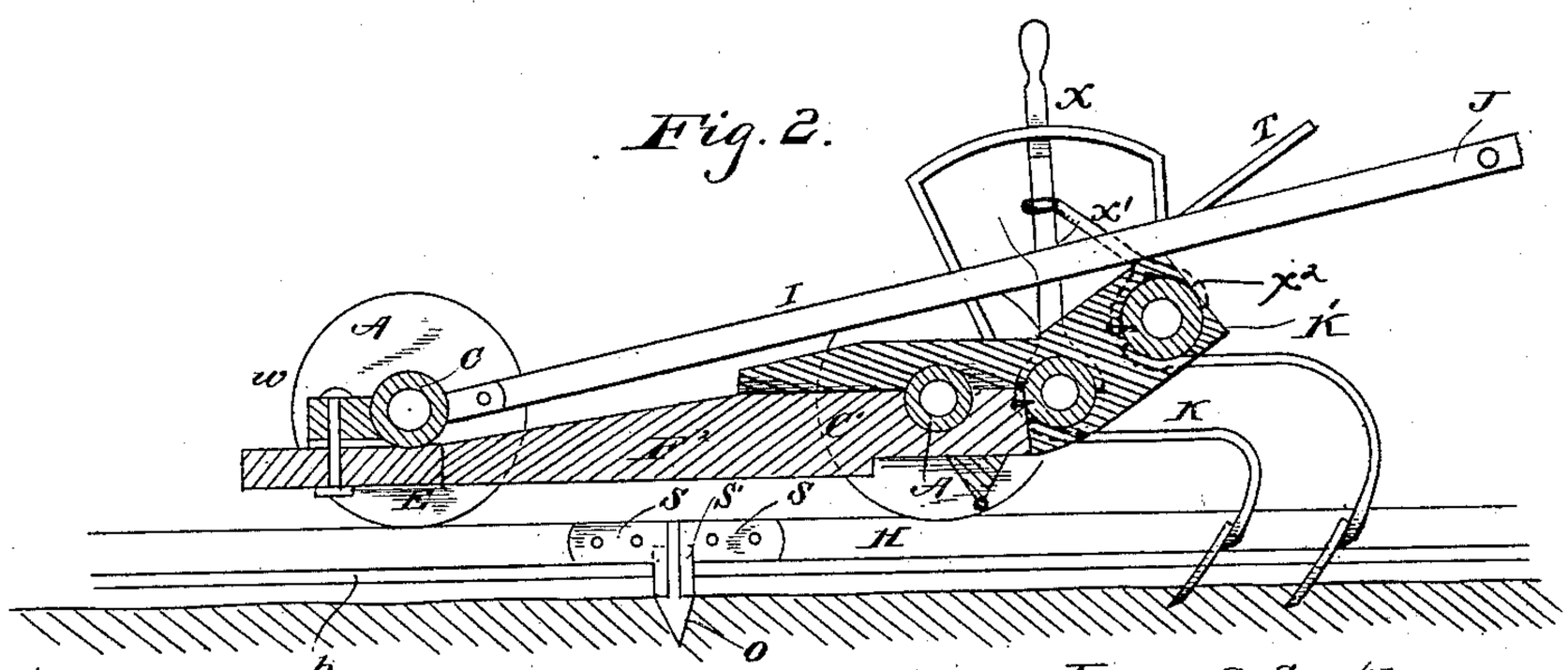

Fig. 2.

Fig. 3.

Fig. 4.

WITNESSES

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(No Model.)

2 Sheets—Sheet 2.

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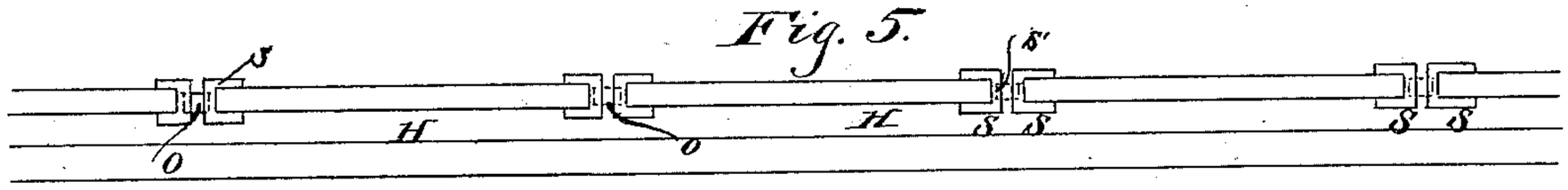
Fig. 5.



Lines indicating rows of plants to be cultivated.

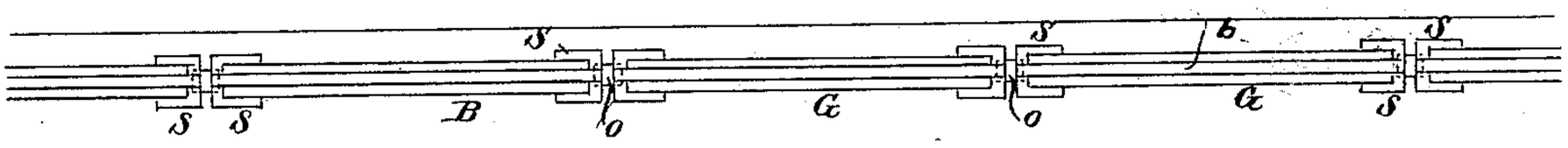


Fig. 7.

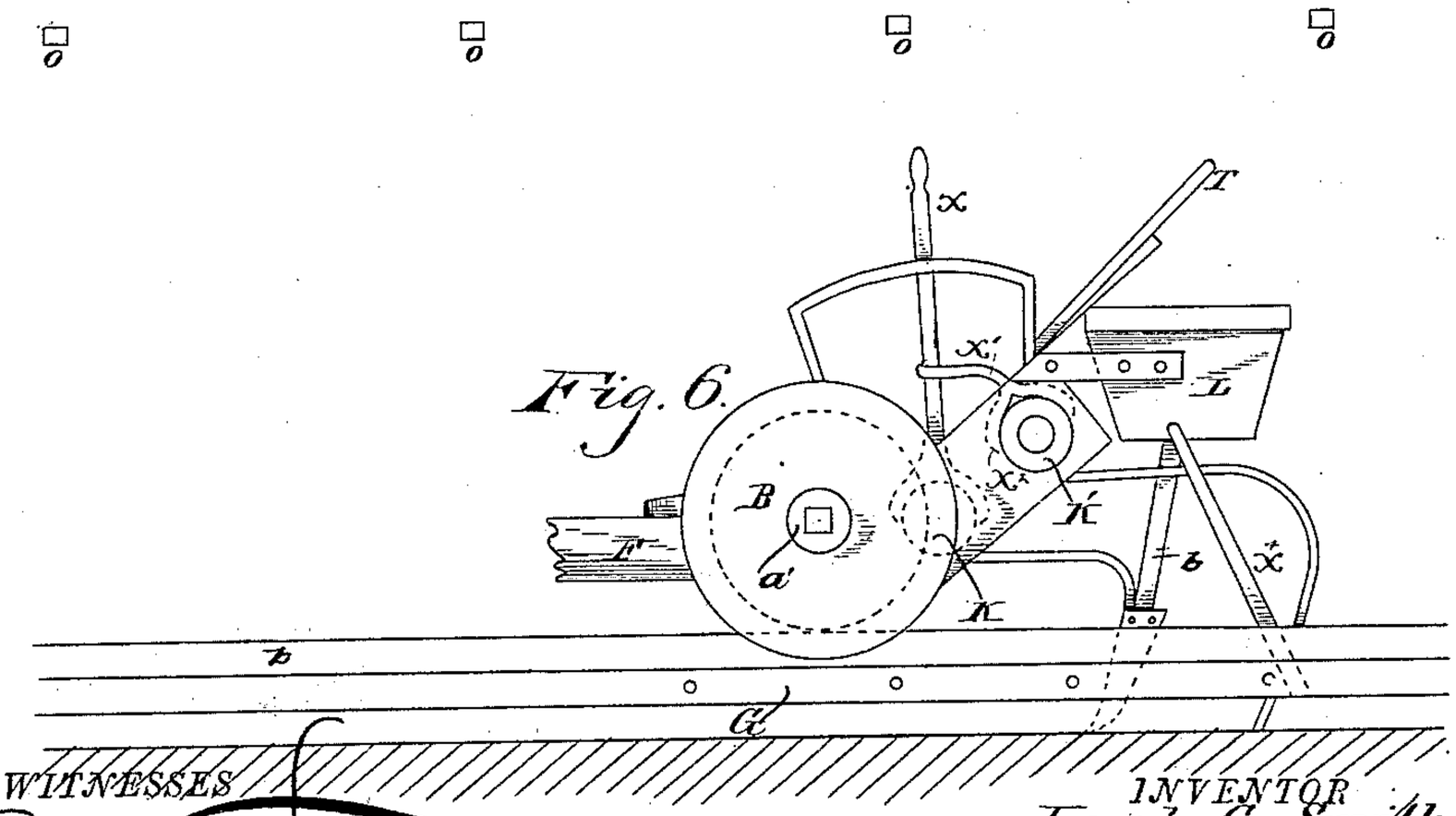


Fig. 6.

WITNESSES

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UNITED STATES PATENT OFFICE.

JOSEPH GRANDISON SMITH, OF KINDERHOOK, ILLINOIS.

GARDENING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 318,047, dated May 19, 1885.

Application filed December 13, 1884. (No model.)

To all whom it may concern:

Be it known that I, J. GRANDISON SMITH, a citizen of the United States, residing at Kinderhook, in the county of Pike and State of Illinois, have invented a new and useful Improvement in Gardening-Machines, of which the following is a specification, reference being had to the accompanying drawings.

This invention has relation to gardening-machines for marking, drilling, and cultivating a garden or field; and it has for its object to provide a machine of this class which will perform the necessary operations in a cheap and expeditious manner, which will be guided in a perfectly straight line, and which may be worked with but little resistance.

With these and other objects in view the said invention consists in the employment of track-rails for the wheels of the machine to run on, which rails are arranged in rows or parallel lines, and in the adaptation of the gardening-machine for this new construction or arrangement, as will be hereinafter fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of a machine embodying the improvement of my invention in place upon the track in connection with which it is used. Fig. 2 is a vertical longitudinal sectional view of the machine and the supporting-rail of the track. Fig. 3 is a cross-section of the rail H. Fig. 4 is a cross-section of the rail G. Fig. 5 shows a plan of the track-rail; and Fig. 6 is a side elevation of the machine, and arranged to receive the supporting-rail. Fig. 7 shows the arrangement of the posts for supporting the guide-rails.

Referring by letter to the accompanying drawings, *o o* designate the posts on which the track-rails are laid. These posts project a short distance above the ground, (see Fig. 2,) and are arranged as shown in Figs. 5 and 7. They should be set permanently in the ground at equal distances apart in rows, the distances between the track-row being equal from the vertical center of one post to the length of the track-rails G and H, the distances between the middle lines of the track-rails when in place being equal to the distance between the circumferential middle lines of the supporting and guiding wheels A A and B B of the machine.

The posts *o o* may be set out at the beginning of the season, and may remain permanently in place until the crop is made; or in the case of perennial crops the posts may remain from year to year, serving as guides for all subsequent operations.

The machine may be used first as a marker, then a drill, and afterward as a cultivator by some slight changes in the gangs of hoes, teeth, and shoes, as will be hereinafter explained, the posts serving as guides on which to lay the tracks, and causing the machine to travel in precisely the same track as when the crop was drilled off, the ground marked, and the seed sowed in by hand, as may be done, if desired.

If the machine and rails are so constructed that the distance between the rails is equal to the width of the machine, the posts may be placed at equal distances apart, and thereby form intersecting rows, so that the rails may be laid to mark the ground by furrows intersecting at right angles, and the seed may be dropped or growing plants transplanted at the intersecting points, and the plants be cultivated both ways.

The track may be laid entirely across the garden or field, which will expedite the working of the machine, or only a limited number—say, four or six rails—may be employed, and taken up behind the machine as it leaves them and placed down before to track the machine across the garden or field.

The track-rails are made light, and yet are made to have the requisite strength and durability in the following manner: I place two strips of metal in the form of light bars, *b b*, together to form a T in cross-section, as shown in Figs. 3 and 4, and in the inside angles of said T, I place two wooden rails, D D, and secure the whole together, as shown. The end castings, *s s*, are provided in their ends with rectangular recesses *s' s'*, each of which, when the rails are in place, receives one-half of the upper end of one of the posts *o o*. The rail G is the guide-rail, and is constructed in the same manner as the rail H, except that the end castings and the rail itself are inverted, so that the projecting edge of the stem of the T will be uppermost and will form the track for the grooved wheels B B, the plain wheels A A traveling on the plain rail H.

The object of the rail is not only to guide the machine always in the same track, but is also to lessen the friction by removing the wheels entirely from the ground, and thereby rendering the working of the machine far more easy than it would otherwise be.

The machine proper is mounted on four wheel, A A and B B, upon the ends of the hollow axles C C, the journals being formed by inserting into the ends of the axles the inner ends of the skeins *a a a a*, having their outer ends threaded for the reception of the nuts *a'* for securing the wheels in place.

The forward axle C is provided with the handle or tongue I, having the hand-rods J J for the purpose of turning the machine around when the end of the row is reached. This handle is secured upon a pin or stud, a^2, in the center piece, F^2, of the frame of the machine, and is keyed fast at its front end to the king-bolt *w*, serving to attach the front axle, C, to the frame piece F.

Through the end pieces, F F, and the intermediate piece, F^2, pass the hollow rods K K', carrying the gangs of shovels or hoes, &c., as the case may be. The rods K K' are adjustable lengthwise by means of the lever T, the pins *t t'* of which engage the grooves t^2 t^2 in the semicircular blocks Y Y, secured to the tops of the hollow shafts K K' near the center piece, F^2. Each of these blocks has two or more grooves, in order that the pins may be shifted from one pair to another to increase or diminish the longitudinal adjustment of the rods K K', thus enabling the operator to perform very close adjustments to the rows of plants under cultivation. One rod may be shifted in one direction and the other rod in the opposite direction, so as to allow the shovels or plows of the forward rod to extend into the space between the plows of the rear rod.

The gangs of shovels are adjustable through the lever X and its rack-bar. This lever X is a double or sectional lever, and it enables the operator to accurately adjust the depth to which the cultivators are to operate, or to lift them entirely from the ground when turning the machine or in moving from one field to another. The lever X consists of a long arm, to which is connected a short arm, *x'*, and the stirrups x^2 at the lower ends of X X' are pivoted to the shafts K K', to permit their longitudinal adjustment by the lever T independently of each other. The hollow rods, with the means for adjusting them longitudinally and for rotating them to adjust the plows vertically, not being claimed in this application, are incorporated and claimed in a pending application, No. 125,423, filed March 25, 1884.

To the rear of the machine is attached a seed-box, L, Fig. 6, having tubes *b*, connecting with the drill-shoes, and is operated by its lever x^4 striking pins on the inside of the rail. When the machine is to be used as a drill, one set or gang of shovels should be removed entirely, and the other one removed and replaced by the gang of drill-shoes.

In using the machine as a marker the gang of marking-hoes only are in place, and when used as a cultivator the two gangs of cultivator-hoes should be in place. The under portions of the frame-pieces F F and F^2 are bolted into the upper portions. This is for convenience in manufacturing, and renders it easier to change the gangs of cultivators, &c.

As many rows of plants may be cultivated at one time as there are shovels in the two gangs; but ordinarily it is intended to plow only one-half as many rows as there are shovels, thus allowing two shovels for each row.

In operation the machine is pushed by hand or drawn by horses; or a rope and windlass may be used to move the machine on the track. If only four rails are used, as the machine advances those in rear must be taken up and placed down in front. The operator may walk behind the machine, controlling the plows by the levers T and X. When the end of a row has been reached, the operator releases the handle from its pin, and, cramping the wheels, permits the machine to turn around like a carriage.

The means for operating the seeder in this machine are simple and complete. I make a row of holes in the inner face of the track-rail, in which I place removable pins x^3, against which a lever, x^4, connected to the seed-slide, strikes as the machine moves along, and causes the seed to be dropped at regular distances apart. To form rows both ways—*i. e.*, intersecting rows—it is unnecessary to mark off the ground when these pins are used, as they operate as a check-rower, and the distance between them may be varied for different kinds of seed.

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

1. The combination, with a guide or carrying rail having a row of removable pins projecting laterally from said rail, of a gardening-machine carrying the seed-box, and a lever, x^4, connected with the seed-slide and adapted to be struck by the pins, substantially as specified.

2. The combination, in a gardening-machine having a seed-box secured to the rear end thereof, of a guide and carrying rail and a lever adapted to strike in succession the row of pins placed in the side of the said carrying-rail, substantially as specified.

3. The combination, with a guide or carrying rail having projections fitted to or formed thereon, of a gardening-machine having its seeding devices arranged to be operated by the said projections to drop the seed at regular distances or intervals, as and for the purpose set forth.

4. The combination, with the posts set in the ground and guide and carrying rails supported on said posts, of a gardening-machine having its wheels running on the rails and

provided with implements or devices to act upon the crop or soil between the rails, as set forth.

5. The combination, with the guide or track rails supported above the ground in parallel rows or lines, one set having plain faces and the alternate set having flanged faces, of a gardening-machine having plain wheels at one side and grooved wheels at the other side to correspond with the rails, said machine carrying implements or devices for acting upon the crop or soil between the rails, as set forth.

6. The combination, with the guide and carrying rails arranged across the garden or field so as to subdivide the latter into parallel rows, of the gardening-machine mounted on wheels at each side which run on the rails, and implements carried by the machine between the wheels to act upon the soil or crop between the rails, as and for the purpose set forth.

7. The combination, with the guide or track rails arranged across the field in parallel rows, of a gardening-machine mounted on two sets of wheels which run on said rails, the axle of the forward set of wheels being pivoted, and an attachment for the said pivoted or movable axle, so as to allow the turning of the machine on the rails when the end of the row is reached, as set forth.

8. The combination, with the guide or track rails arranged across the field in parallel rows, of a gardening-machine mounted on wheels running on the rails, one set having a rigid axle and the other set having a pivoted axle, and a handle connected with the latter and extending back toward the rear of the machine, so as to operate the axle and turn the machine on the rails, as set forth.

9. The combination, with the guide or track rails arranged in a series of sets or rows extending across the field, and each set comprising a plain rail and a flanged rail, of a gardening-machine having a double set of wheels correspondingly plain and grooved to run on the rails, said machine carrying implements or devices to act upon the soil or crop between the rails, as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JOSEPH GRANDISON SMITH.

Witnesses:

MIFFLIN D. LIGGETT,

HENRY HOYLE.