

No. 751,632.

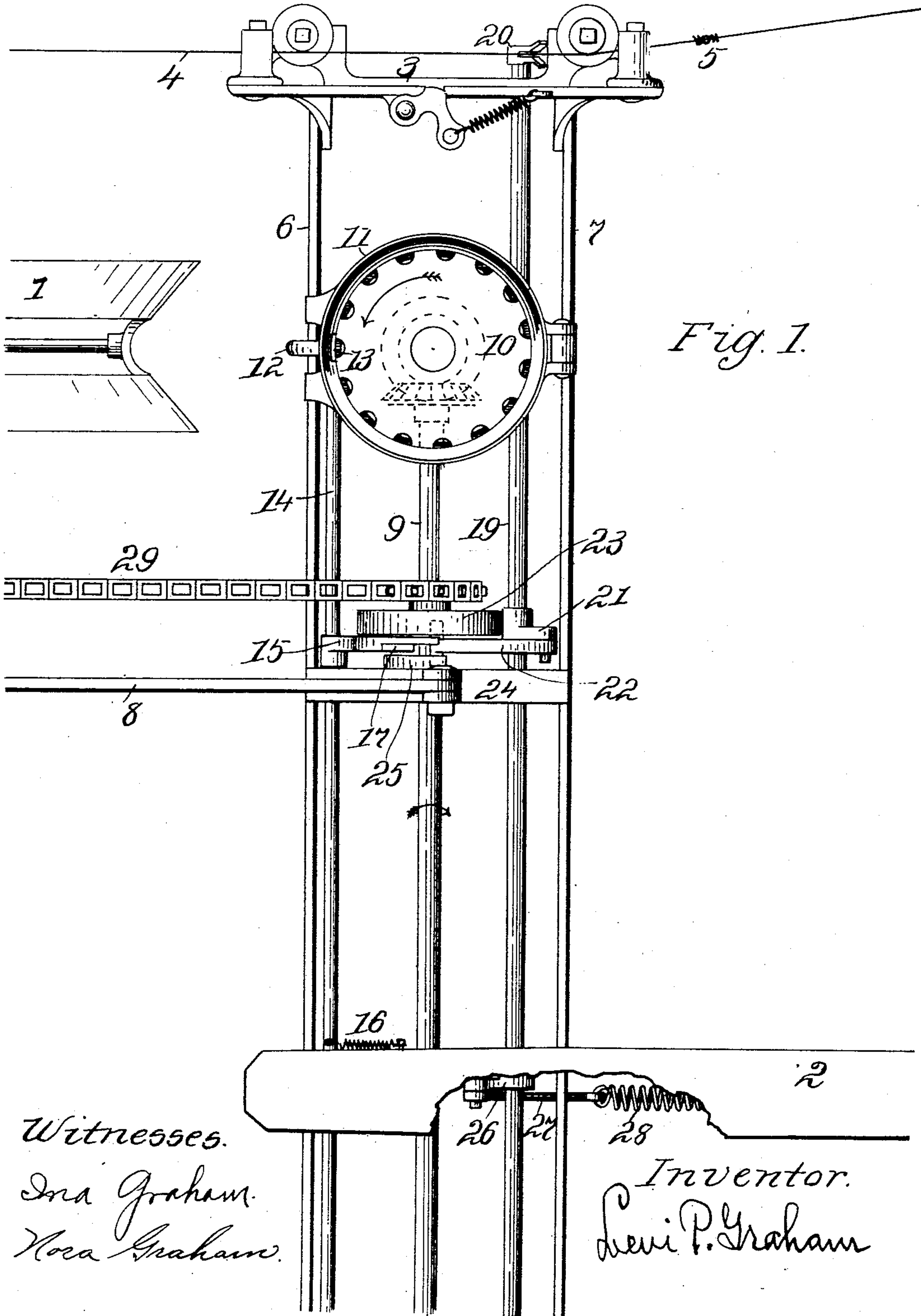
PATENTED FEB. 9, 1904.

L. P. GRAHAM.  
CORN PLANTER.

APPLICATION FILED OCT. 8, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



No. 751,632.

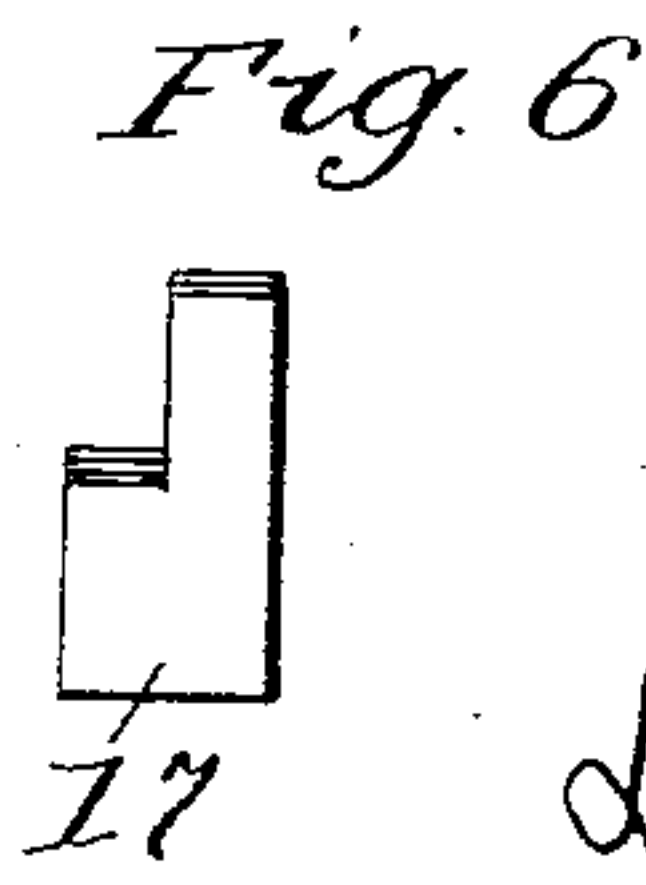
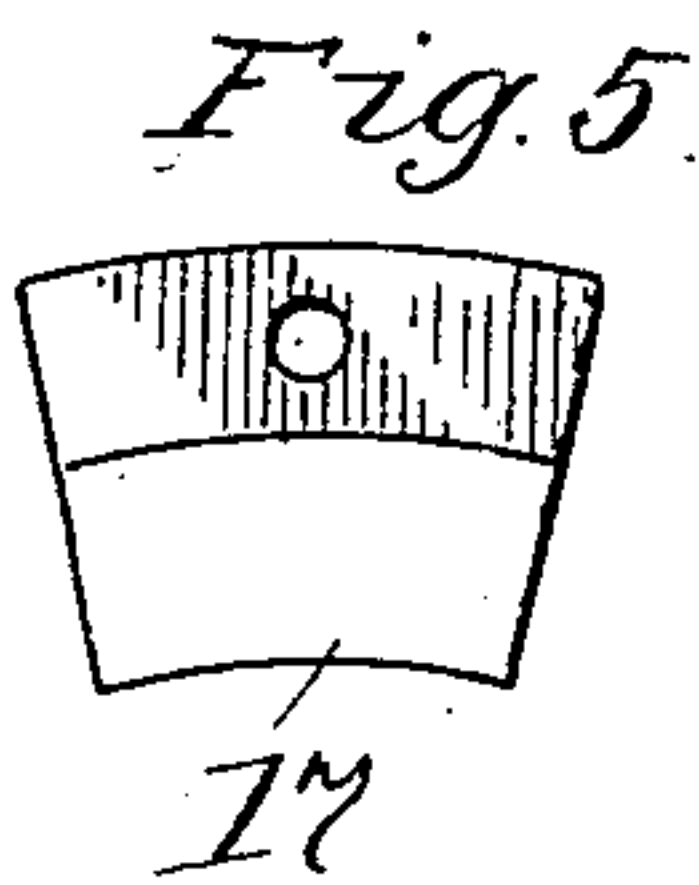
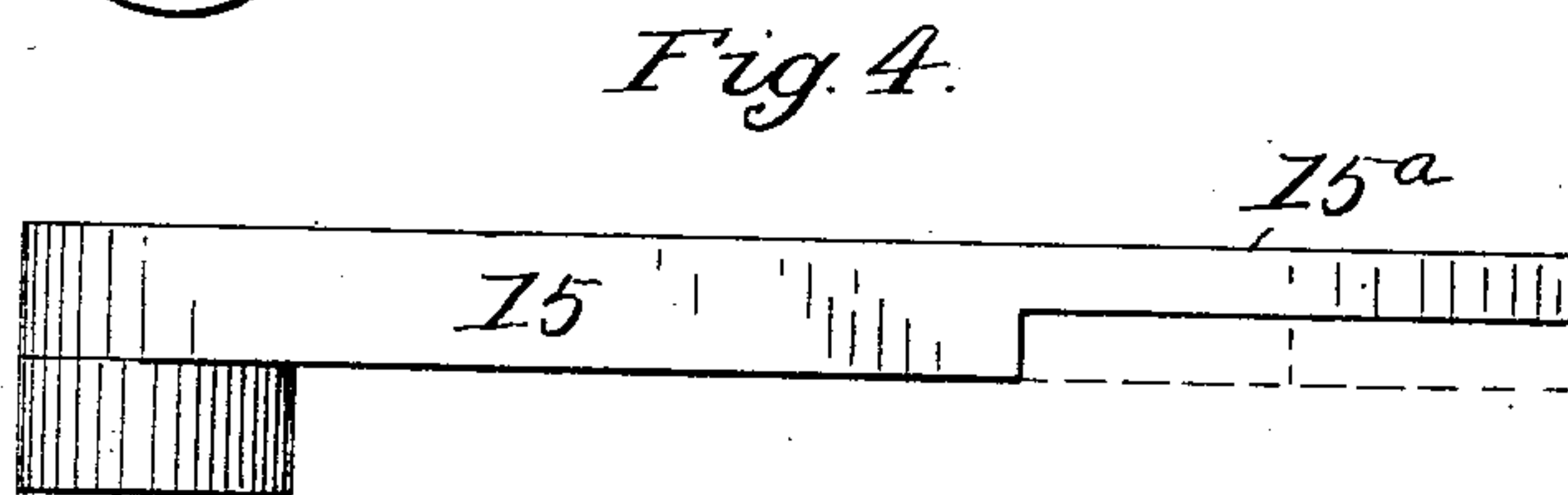
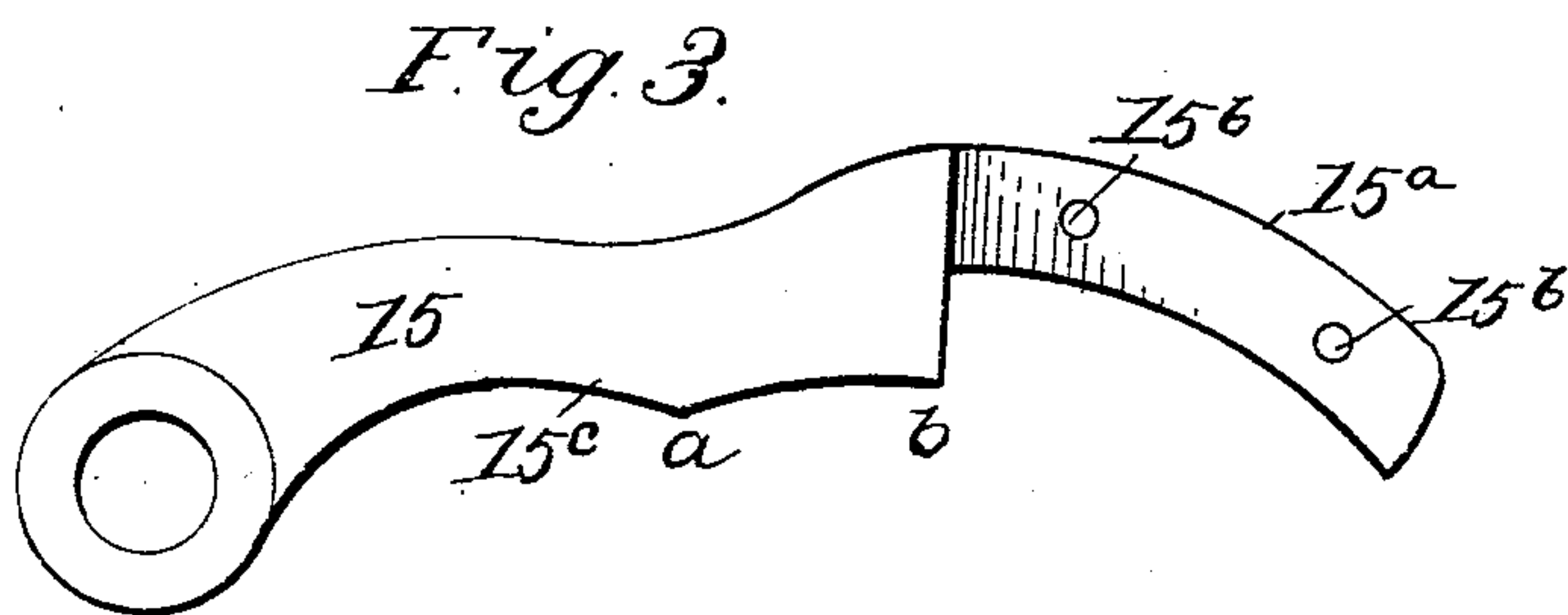
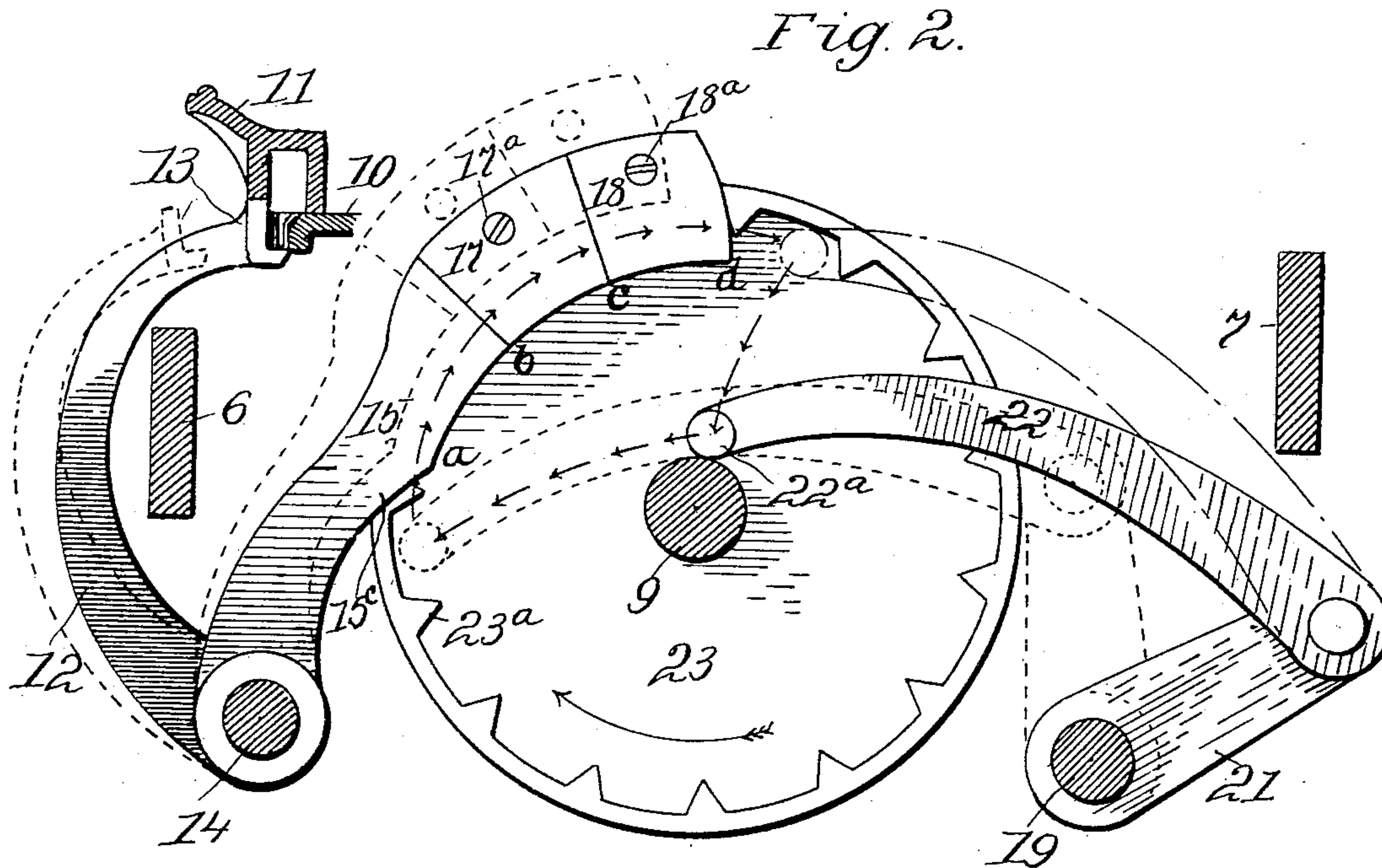
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NO MODEL.

2 SHEETS—SHEET 2.



Witnesses

Mr. Graham.

Hora Graham

*Inventor:*

Levi P. Graham



# UNITED STATES PATENT OFFICE.

LEVI P. GRAHAM, OF DECATUR, ILLINOIS.

## CORN-PLANTER.

SPECIFICATION forming part of Letters Patent No. 751,632, dated February 9, 1904.

Application filed October 8, 1903. Serial No. 176,293. (No model.)

*To all whom it may concern:*

Be it known that I, LEVI P. GRAHAM, of the city of Decatur, county of Macon, and State of Illinois, have invented certain new and useful Improvements in Corn-Planters, of which the following is a specification.

The object of this invention is to provide means for varying the number of grains dropped in a hill without changing the seed-plates or to make one plate do work heretofore divided among several; and the invention is in the nature of an improvement on the invention described in Patent No. 726,157, granted to me April 21, 1903.

The common mode of varying the number of grains in a hill has been to turn the seed-wheel a one-quarter rotation to drop a hill from the seedbox and to provide a separate plate for each variation. One plate would be provided with two cells in each quarter, another with three cells per quarter, and still another with four cells. In some cases still other variations have been provided for, and in all cases the variation has been made by substituting one plate for another at the expense of time and trouble. By the use of this invention one plate is made to drop twos, threes, or fours by means controlled outside the seedbox and without any manipulation of the plate.

In reducing the invention to practice a seedbox is provided with a bottom having a discharge-opening of a size to permit the discharge of a grain from a cell. A closure is made for the outlet and is ordinarily held closed to prevent the cells of the seed-plate from discharging their contents. A seed-plate is provided with a plurality of cells which travel over the outlet or discharge opening as the seed-plate rotates. The seed-plate is rotated continuously by motion derived from the travel of the planter. The seedbox-closure is opened through force derived from the travel of the planter at intervals determined in a general way by check-row mechanism, and the closure is held open for a longer or shorter time in order to plant the desired number of grains in a hill.

The novel feature comprises a pair of box-opening mechanical elements, one of which

travels along and against the other while holding the box-closure open and one of which is variable in length for the purpose of varying the time during which the box is held open. One of the elements is forced out of its normal position by the other in the act of opening the box, one travels along the other to hold the box open, and the length of the variable one determines whether the box shall remain open while two grains, three grains, or four grains are dropped from the seedbox. The bearing-surface of one of the box-opening elements is an irregular curve or cam, and its surface comprises two conjoined parts, one of which throws the box-closure open, while the other holds the closure open for a longer or shorter time. The box is preferably closed automatically by a spring as soon as the box-opening elements pass one out of contact with the other.

The invention is exemplified in the structure hereinafter described, and it is defined in the foregoing statement and the appended claims.

In the drawings forming part of this specification, Figure 1 is a plan of so much of a planter as is needed to explain this invention. Fig. 2 is diagram illustrative of the construction and operation of the box-opening elements, the diagram being a vertical section from front to rear through the runner-frame of the planter. Fig. 3 is a side elevation of one of the mechanical elements used to open the seedbox. Fig. 4 is a plan of the element shown in Fig. 3. Fig. 5 is a face view of one of the bearing-blocks used in this instance to lengthen the operative surface of the hold-out, and Fig. 6 is an edge view of the block shown in Fig. 5.

A fragment of a carrying-wheel is shown at 1, a tongue at 2, a check-row head at 3, and a check-row wire at 4. The check-row wire has knots, as 5, by means of which the second-drop mechanism is actuated and conditions are established which lead to the opening of the seedbox. The cross-bars of the front or runner frame are shown at 6 and 7, and a side bar of the rear or wheel frame is shown at 8. The side bars of the rear frame are hinged to the front frame in some suitable manner, and as a matter of preference the connections are



made through bridge-brackets 24. The drill-shaft 9 is driven continuously from a carrying-wheel through a chain 29, and it continuously turns a seed-plate 10. The seed-plate has a plurality of seed-cells in its periphery, and it turns on the bottom of seedbox 11. The discharge of the seedbox is large enough to permit the discharge of one grain at a time, and no more, from the seedbox, and it is normally closed by means of closure 13 on arm 12. The arm 12 is attached to rock-shaft 14. A spring 16 tends to hold the closure in a closing position, and a cam-finger 15 on shaft 14 constitutes an element of the box-opening mechanism. The check-row shaft 19 has forked levers, as 20, which coact with the knots of the check-row wire to rock the check-row shaft backward. An arm 21 is fastened onto the check-row shaft, and a pawl 22 is pivotally connected with the swinging end of arm 21. An internally-toothed ratchet-wheel 23 is fastened onto the drill-shaft 9, and the pawl 22 has a cross-head one end of which extends into the face of the ratchet-wheel in position to engage the teeth thereof when the check-row shaft is rocked backward. A cam-guide 25 is formed on a side of bracket 24 in position to the end of the cross-head projecting away from the ratchet-wheel and to hold the head of the pawl in contact with a tooth of the ratchet-wheel while the check-row shaft is being rocked forward to its initial position. An arm 26 is attached to the check-row shaft, preferably beneath tongue 2. A bent link 27 is pivotally connected at one end with the swinging end of arm 26, and a spring 28 connects with the opposite end of the link and with the tongue. The arm, the link, and the spring 28 form a dead-center lock for the check-row shaft when the shaft is rocked forward, and the spring aids in rocking the check-row shaft backward when the dead-center lock is broken by a check-row knot.

The ratchet-wheel 23 has the same number of teeth as the seed-plate has cells—fifteen in this instance—and the seed-plate is geared to travel at the same speed as the ratchet-wheel. When the check-row shaft is rocked backward, the cross-head 22<sup>a</sup> of pawl 22 is moved into position to engage a tooth of the ratchet-wheel, as shown in dotted lines in Fig. 2. When a tooth engages the pawl, the swinging end of the pawl is carried upward and forward until the position shown in broken lines is reached, at which time the cam-guide 25 (shown in Fig. 1) will have been passed, the check-row shaft will have been rocked forward, and the pawl will fall to the position shown by solid lines in Fig. 2. The short arrows in Fig. 2 define the path of motion of the cross-head of the pawl.

The cam-finger 15 has an inclined surface 15°, which extends obliquely across the upward path of the cross-head of the pawl when the box is closed, as shown in solid lines in Fig.

2, and beyond the incline the bearing-surface of the finger continues in a curved line which is coincident with the inner diameter of the rim of the ratchet-wheel when the seedbox is open. (See position of finger indicated by dotted lines in Fig. 2.) The curved line of the cam-surface extending from the incline 15° a distance equal to the pitch of the ratchet-teeth is in this instance formed by an integral part of the cam-finger; but further extension of the cam-surface is formed by means of detachable blocks 17 and 18, which are secured to an extension of the cam-finger by means of screws 17<sup>a</sup> and 18<sup>a</sup>. The screws extend through holes in the blocks and are screwed into interiorly-threaded holes 15<sup>b</sup> in the extension 15<sup>a</sup> of the cam-finger. The screws represent the general idea of a detachable fastening for the blocks. The extension 15<sup>a</sup> of the cam-finger is above the line of the cam-surface sufficiently far to be inoperative as a hold-out to keep the box open.

The seed-plate is so timed with relation to the ratchet-wheel, the pawl, and the cam that a cell will be in position to drop its grain when the closure is forced open by action of the pawl on the incline 15° of the cam, and one cell will discharge when the cross-head is opposite the point designated by *a* in Fig. 2 and the cam and closure are carried to the positions shown by dotted lines. When the cross-head reaches the point indicated by *b*, a second grain will be dropped. When the point *c* is reached, a third grain will be dropped, and the fourth grain will be dropped as the cross-head passes the point designated by *d*. After the cross-head passes *d* the arm 12 is free to carry its closure 13 to a closing position, and the spring 16 effects the closure before another grain reaches the discharge-opening.

When it is desired to drop three grains in a hill, block 18 is removed, and when it is desired to drop two grains at a time the block 17 is also removed.

As the grains fall from the seedbox they accumulate in a second drop of the planter, from which they are discharged into the soil when a cross-row is reached.

I claim—

1. In a planter, the combination of a seedbox, a bottom for the seedbox having a discharge-opening, a closure for the discharge-opening of the seedbox, a seed-plate in the seedbox, means for rotating the seed-plate, means for opening the seedbox-closure at intervals and a variable-length cam element for holding the closure open for a longer or shorter time.

2. In a planter, the combination of a seedbox, a seed-plate in the box having a plurality of cells, check-row mechanism, a closure for the box, gear for driving the seed-plate from the travel of the planter and box-opening gearing including a pair of contacting mechanical elements one of which moves along the other



to hold the box open and one of which is variable in length to permit variation in the time the box is held open; the box-opening mechanism being actuated from the travel of the planter at times determined in a general way by the check-row mechanism.

3. In a planter, the combination of a seed-box, a seed-plate in the box having a plurality of cells, check-row mechanism, a closure for the box, a ratchet-wheel having teeth corresponding in number to the cells of the seed-plate, means for driving the seed-plate and the ratchet-wheel at equal speeds from the travel of the planter, a box-opening cam of variable length, and means controlled by the check-row mechanism for opening the seedbox through action of the ratchet-wheel and the cam.

4. In a planter, the combination of a seed-box, a bottom for the seedbox having a discharge-opening, a closure for the discharge-

opening of the box, a seed-plate in the seed-box, means for rotating the seed-plate, means for opening the box-closure at intervals and a variable-length cam for holding the box open.

5. In a planter, the combination of a seed-box, a bottom for the seedbox having a discharge-opening, a closure for the discharge-opening of the box, a seed-plate in the seed-box, means for rotating the seed-plate, means for opening the box-closure at intervals and a cam element for holding the box open, said cam element being extended lengthwise by means of detachable sections.

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

LEVI P. GRAHAM.

Witnesses:

INA GRAHAM,  
NORA GRAHAM.