

W. S. GRAHAM.
COTTON SEED DROPPING MECHANISM.
APPLICATION FILED AUG. 31, 1916

Patented May 7, 1918.
4 SHEETS—SHEET 1.

1,265,323.

Fig. 1.

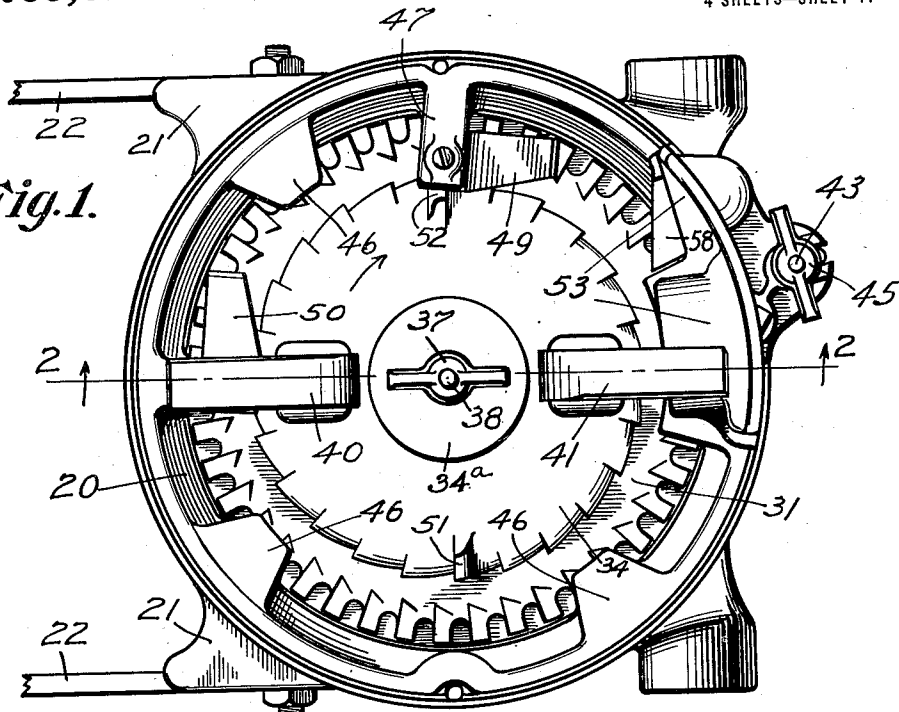
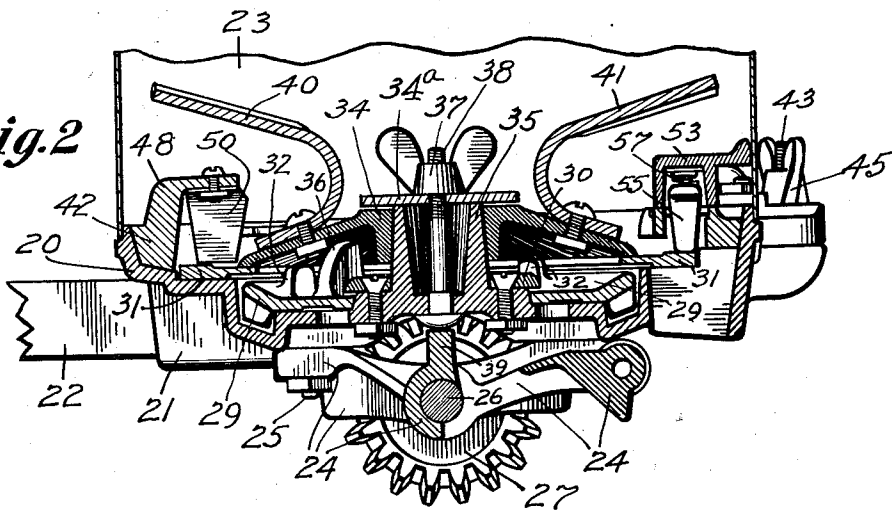


Fig. 2.



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Fig. 3.

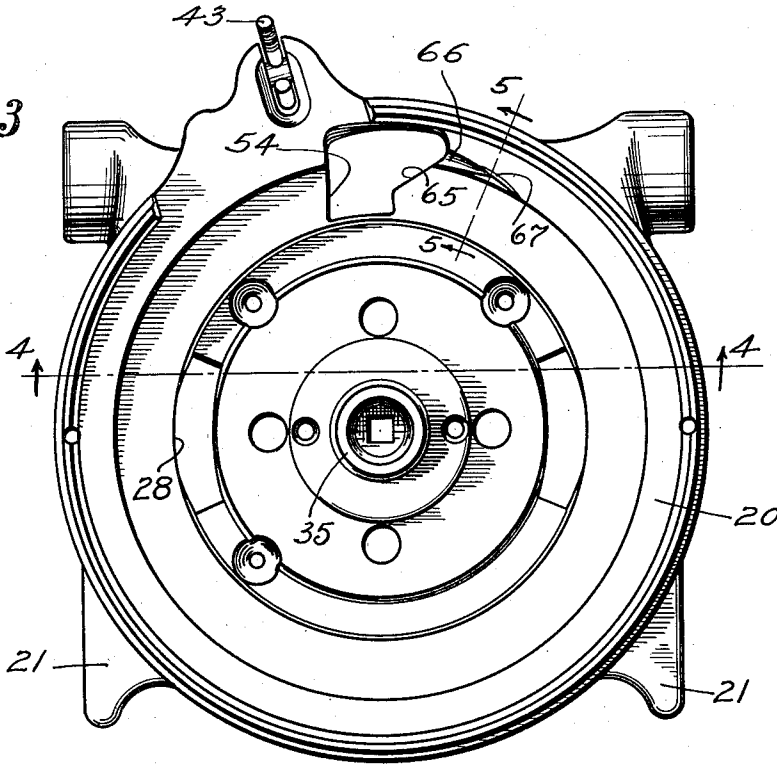


Fig. 4.

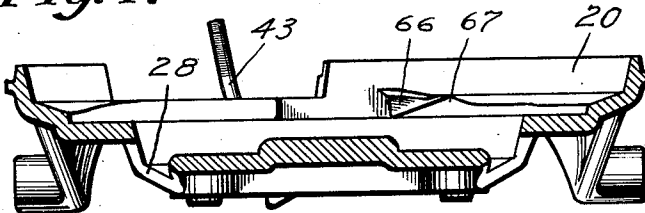
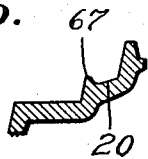


Fig. 5.



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4 SHEETS—SHEET 3.

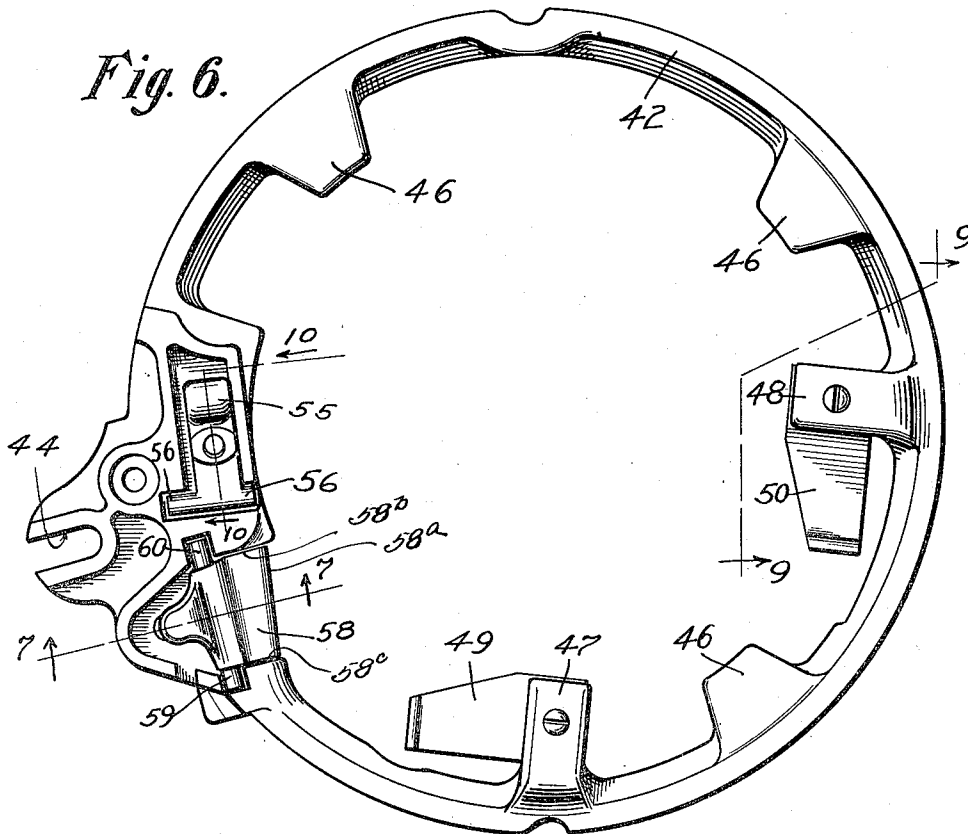


Fig. 7.

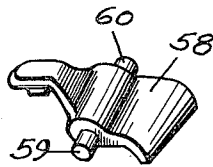
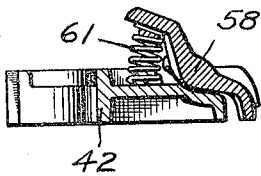


Fig. 8.

Fig. 9.

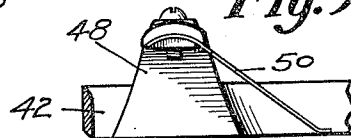
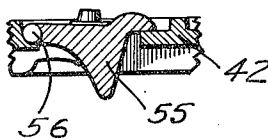


Fig. 10.



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4 SHEETS—SHEET 4.

Fig. 11.

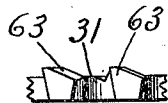
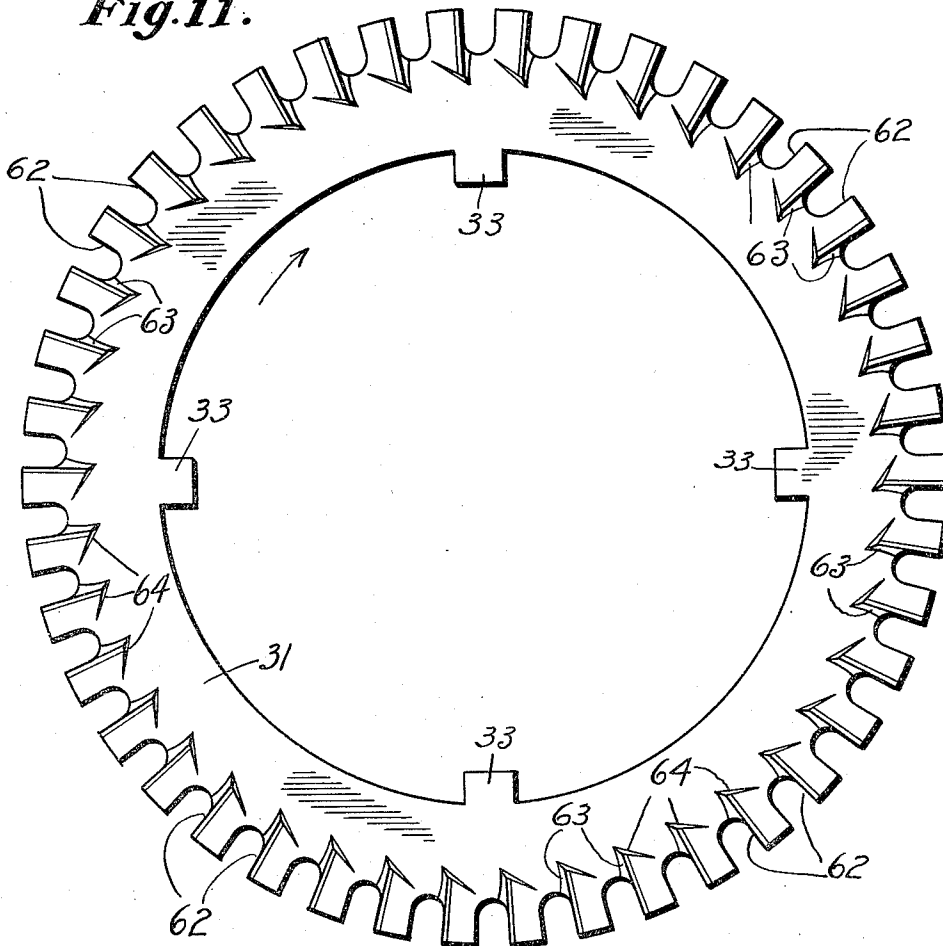


Fig. 12

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UNITED STATES PATENT OFFICE.

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COTTON-SEED-DROPPING MECHANISM.

1,265,323.

Specification of Letters Patent.

Patented May 7, 1918.

Application filed August 31, 1916. Serial No. 117,915.

To all whom it may concern:

Be it known that I, WILLIAM S. GRAHAM, a citizen of the United States, and a resident of Canton, in the county of Fulton, State of Illinois, have invented certain new and useful Improvements in Cotton-Seed-Dropping Mechanisms, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to cotton-seed dropping mechanisms of a type for dropping one seed at a time designed for use in connection with a planter. It is necessary to provide in a cotton-seed dropping device means for separating the individual seeds, owing to the lumpy nature of the seed which causes them to stick together. At the same time it is necessary that care be used to prevent any crushing of the seed. It is one of the objects of my invention to provide a new and improved form and arrangement of cooperating parts by which the seed will be properly stirred up and agitated for separating the seed and to this end a new and improved form of seed plate has been provided having seed cells so shaped as to be adapted to assist in securing the entrance of a single seed in each cell. It is another object of my invention to provide means, at the point where the cells pass the delivery opening in the bottom of the hopper, for removing from each cell as it passes any seed which may be lodged in or about the cell, such means being designed to effect the desired result without crushing or otherwise injuring the seed. In the construction shown this result is brought about by the provision of a beveled face or shoulder just below the seed plate which causes a seed lodged in one of the cells to ride outward along the bevel beyond the outer end of the cell. It is another object of my invention to provide a by-pass or opening which is adapted to receive a seed so forced out of a cell by the said beveled face and to return it to the hopper in position to be taken up again by the seed plate for dropping in the normal manner. It is another object of my invention to provide a new and improved form of cut-off plate having its operative edge extending diagonally across the row of cells of the plate, being adapted to force the

seed in the several cells toward the inner ends of the cells. It is another object of my invention to provide a diagonally-extending cut-off plate of this type so arranged and constructed that the outermost portion of the diagonally-disposed cut-off which first engages the seed in a cell is adapted to have a smaller upward movement as the cut-off rises to permit the passage of the seed than that of the innermost portion of the cut-off plate with which the seed is brought in contact as it moves forward with the cell. It is another object of my invention to improve dropping mechanisms of this type in sundry details hereinafter pointed out. The preferred means by which I have accomplished my several objects are illustrated in the drawings and are hereinafter specifically described. That which I believe to be new and desire to cover by this application is set forth in the claims.

In the drawings:—

Figure 1 is a top or plan view of my improved seed dropping mechanism;

Fig. 2 is a central vertical section through my improved mechanism, being taken substantially on line 2—2 of Fig. 1;

Fig. 3 is a top or plan view of the bottom plate of my improved mechanism by which connection is effected with the planter with which the mechanism is to be used;

Fig. 4 is a vertical section taken on line 4—4 of Fig. 3;

Fig. 5 is a fragmentary sectional view, being taken on line 5—5 of Fig. 3;

Fig. 6 is a top or plan view of the cut-off plate;

Fig. 7 is a cross section taken on line 7—7 of Fig. 6, showing a central vertical section through the cut-off device;

Fig. 8 is a perspective view of the cut-off device;

Fig. 9 is a view showing one of the springs provided for forcing the seed into the cells of the plate, being partly in section, taken substantially on line 9—9 of Fig. 6;

Fig. 10 is a central vertical section through the device provided for removing the seed from the cells under the cut-off, being taken substantially at line 10—10 of Fig. 6;

Fig. 11 is a top or plan view of my improved seed plate; and

Fig. 12 is a fragmentary view showing a portion of the plate as seen from one side.

Referring to the several figures of the drawings in which corresponding parts are indicated by the same reference characters,—

20 indicates the bottom plate connected by means of lugs 21 with a suitable portion of the framework 22 of a planter. A hopper 23 (see Fig. 2) is secured in any suitable manner upon the bottom plate 20 about its outer edge. A bracket or plate 24 is secured below the bottom plate 20 by means of bolts 25 having mounted therein a shaft 26 having fixedly mounted thereon at one end a bevel gear 27 which extends upward through an opening 28 at one side of the bottom plate 20 (see Fig. 3). A bevel gear 29, in the form of a ring and revolubly mounted upon the upper face of the bottom plate 20, meshes with the gear 27 whereby the gear 29 is adapted to be driven through the medium of the gear 27 and the shaft 26 from any suitable source of power. The gear 29 is held in position upon the bottom plate 20 by means of a plate 30 secured upon the bottom plate 20 and overlying the inner edge of the gear 29.

31 indicates my improved seed plate, being in the form of a ring resting upon a suitable portion of the bottom plate 20. The seed plate 31 is adapted to be rotated with the gear 29 by means of upwardly-extending lugs 32 on said gear adapted to engage inwardly-extending lugs or ears 33 on the seed plate. An agitator plate 34 is revolubly mounted upon a boss or lug 35 rising from the bottom plate 20, the plate 34 bearing at its outer edges upon the seed plate 31, as best shown in Figs. 1 and 2. The plate 34 is rotated with the gear 29 by means of lugs 36 mounted on said gear and engaging a suitable portion of the plate 34. The plate 34 is held in position upon the boss 35 by means of a washer 34^a which in turn is held in position by means of a thumb-nut 37 mounted upon a bolt 38 extending upward from the bottom plate 20 through the boss 35, the bolt 38 being held in position by a lug 39 extending upward from the plate or bracket 24. As is best shown in Fig. 1, the outer edge of the plate 34 is provided with ratchet-like teeth, the square faces of which are in advance when the plate rotates in clockwise direction in Fig. 1. The plate 34 is also provided with two agitating wings 40—41 fixed thereon in any suitable manner (as for example by bolts 40^a as clearly shown in Fig. 2) and extending outward over the periphery of the seed plate 31.

42 indicates a cut-off plate (see Fig. 6), the plate 42 also being in the form of a ring adapted to fit down on a suitable shoulder in the bottom plate 20 as best shown in Fig. 2. The plate 42 is held in position at one side by an eye-bolt 43 pivotally mounted

upon the bottom plate 20 at one side thereof, and adapted to be turned up into position in a notch 44 in the cut-off plate 42, the eye-bolt 43 being provided with a thumb-nut 45 for holding the plate 42 in position, as will be readily understood. The cut-off plate 42 is provided at intervals about its periphery with inwardly-extending lugs or shelves 46, as best shown in Fig. 6, such lugs or shelves being located a short distance above the seed plate 31 and being adapted to pass under the outwardly-extending agitating wings 40—41. The cut-off plate 42 is further provided with inwardly-extending lugs 47—48 provided with spring-scrappers 49—50, respectively, which extend diagonally downward into position to scrape lightly the upper face of the seed plate along its outer edge. When the seed plate 31 and the agitator plate 34 are driven in clockwise direction in Fig. 1, with a quantity of cotton-seed in the hopper 23, the seed are stirred up and kept in constant agitation by the agitating wings 40—41, by the teeth on the agitator plate 34, by the inwardly-extending shelves 46 and by the lugs 47—48 and their diagonally-disposed spring-scrappers 49—50. The plate 34 is further provided with upwardly-extending lugs 51—52 which are adapted to pass under and in close proximity to the springs 49—50, being adapted to loosen any seed that may have accumulated under the said springs 49—50.

The cut-off plate 42 is provided at one side with a housing member 53 (see Fig. 2) which serves as a cover plate for the cut-off device and the spring knock-out device by which a seed is normally freed from the seed plate, the housing 53 being located directly above the seed discharge-opening 54 of the bottom plate. The knock-out device is in the form of a hammer 55 provided with trunnions 56 which have suitable bearings in the cut-off plate 42, as best shown in Fig. 6, being held in position in the bearings by the housing 53. A spring 57 (see Fig. 2) is interposed between the hammer 55 and the upper wall of the housing 53, serving to hold the hammer 55 yieldingly in its lowermost position, in engagement with the seed plate 31, ready to drop into the several seed cells in succession as the seed plate is rotated thereby, serving to force out of the cell any seed which may have stuck therein.

The cut-off device 58 is provided with trunnions 59—60 having suitable bearings in the cut-off plate 42, as best shown in Fig. 6, being retained in position by the housing 53. These trunnions are arranged so that the cut-off device 58 will pivot about an axis extending substantially tangentially with the plate 42. The operative edge 58^a of the cut-off device 58 is diagonally disposed across the row of cells in the seed plate 31, as is best shown in Fig. 1, with its for-

ward portion 58^b of the edge extending farther inwardly from its axis than the rear portion 58^c, this effect being attained by making the device broader at one side than at the other. A spring 61 tends to hold the cut-off device turned to the limit of its movement in clockwise direction in Fig. 7 so that the operative edge of the device is held yielding in contact with the upper face of the seed plate 31. As the seed plate is rotated, bringing the seed cells successively under the cut-off device 58, the seed in any cell is forced inward toward the inner end of the cell by its bearing upon the diagonally-extending operative edge of the cut-off device 58 which at the same time serves to scrape away from the cell the surplus seed. In case the cut-off plate 58 is raised slightly by its engagement with a portion of a seed protruding from one of the cells, the rear portion of the cut-off device with which the seed first comes in contact is not raised as high as the front portion of the cut-off device by reason of being closer to the axis upon which the cut-off device 58 is pivotally mounted. It, therefore, follows that the rear portion of the cut-off device is not raised high enough to admit a second seed to a cell even in the event that the forward portion of the cut-off device, which extends farther toward the center of the hopper, may be raised sufficiently to permit the passage of a seed under it. The arrangement of the cut-off device as above described is believed to be of considerable importance in attaining the desired control of the dropping. It will be understood that in the above description the terms forward and rearward are used with reference to the direction of rotation of the seed plate rather than with reference to the direction of movement of the planter upon which the seed-dropping device may be located.

The seed cells provided in the seed plate 31 are indicated by reference numeral 62. The forward wall of each of the seed cells 62 with reference to the direction of rotation of the seed plate 31,—being in clockwise direction in Fig. 11,—is of a height substantially corresponding to the thickness of the plate 31. The rear wall of each cell, however, extends upward some little distance higher than the forward wall, the upper face of each of the divisions between the cells 62 being beveled downward toward the rear, as is best shown in Fig. 12. There is thus provided on each of the divisions between cells substantially a ratchet tooth device extending above the normal face of the seed plate 31, such ratchet tooth devices being extended inward beyond the inner ends of the cells, as indicated at 63 in Fig. 11. As is best shown in Fig. 11, the inner end of each of the ratchet tooth extensions 63 is beveled outward and to the rear as at 64. With the

seed plate 31 being driven at a comparatively rapid rate, the ratchet-shaped extensions 63 serve not only to tear the seed apart but also to force the seed into the cells.

In case the knock-out device 55 fails to free the seed from one of the cells 62, the seed is brought into contact at its lower portion with the diagonally-disposed front wall 65 of the discharge-opening 54 in the bottom plate 20. The seed by its contact with the diagonally-disposed wall 65 is moved outward along the cell, being in most cases dislodged from the cell so as to be delivered in the ordinary manner. In case the seed is not completely dislodged from the seed plate, such seed is brought into contact with the shoulder of the bottom plate 20 at the forward end of the discharge opening 54. In order to prevent such a seed from being crushed between the plate 31 and the bottom plate 20, I have provided a recess or by-pass 66, as best shown in Figs. 3 and 4, which is in a position to receive the seed carried forward by the plate 31, being adapted as the seed is moved forward with the plate to raise the seed out of engagement with the plate, the bottom face of the recess 66 being beveled for the accomplishment of this end, and the bevel of the recess 66 being carried by means of a ridge 67 to a point slightly above the tops of the ratchet tooth extensions 63 of the plate 31.

What I claim as my invention and desire to secure by Letters Patent, is—

1. In a cotton-seed dropping mechanism, the combination of a seed plate having a series of cells in its outer periphery, and a cut-off pivotally mounted on an axis substantially tangential to the outer periphery of the seed plate and having an operative edge extending diagonally across the row of cells in the seed plate.

2. In a cotton-seed dropping mechanism, the combination of a seed plate having a series of cells in its outer periphery, and a pivotally-mounted cut-off having an operative edge extending diagonally relative to the axis upon which it is mounted, the portion of said operative edge which is in advance in the direction of rotation of the seed plate being extended farther from the axis than the rear portion.

3. In a cotton-seed dropping mechanism, the combination of a seed plate having a series of cells in its outer periphery, and a pivotally-mounted cut-off adjacent to said seed plate, the forward portion of the operative edge of said cut-off in the direction of rotation of the seed plate being adapted when the cut-off turns on its axis to have a greater upward movement away from the seed plate than does the rear portion of said operative edge.

4. In a cotton-seed dropping mechanism, the combination of a seed plate having a

- series of cells in its outer periphery, means for rotating said seed plate, a spring-scraper extending into close proximity to said seed plate, and a lug movable with the seed plate adjacent to said scraper adapted to loosen any seed which has accumulated under or behind said scraper.
5. In a cotton-seed dropping mechanism, the combination of a seed plate having a series of cells in its outer periphery, means for rotating said seed plate, an agitating plate adapted to rotate with said seed plate, a spring-scraper held in fixed position extending into close proximity to the seed cells in said seed plate, and a lug on said agitating plate adapted to revolve close to said scraper adapted to loosen any seed which may have accumulated under or behind said scraper.
6. In a cotton-seed dropping mechanism, the combination of a seed plate having a series of cells in its outer periphery, means for rotating said seed plate, an agitating plate adapted to rotate with said seed plate, shelves extending inwardly a short distance above said seed plate, and agitating wings mounted on said agitating plate and extending outward above said shelves.
7. In a cotton-seed dropping mechanism, the combination of a bottom plate, a seed plate revolubly mounted thereon, means for rotating said seed plate, a cut-off plate in the form of a ring mounted on said bottom plate about said seed plate, shelves mounted on said cut-off plate and extending inwardly a short distance above said seed plate, and a spring-scraper mounted on said cut-off plate and extending into close proximity to the seed cells in said seed plate.
8. In a cotton-seed dropping mechanism, the combination of a bottom plate, a seed plate revolubly mounted thereon, means for rotating said seed plate, a cut-off plate in the form of a ring mounted on said bottom plate about said seed plate, and a cut-off pivotally mounted on said cut-off plate on an axis substantially tangential to the outer periphery of the seed plate and having an operative edge extending diagonally across the row of cells in the seed plate.
9. A seed plate for dropping cotton-seed having a series of seed cells in its outer periphery, each of the cells having a ratchet-like extension along its rear wall in the direction of rotation of the seed plate extending radially inward beyond the inner end of the cell, the inner end of each of said extensions being beveled rearwardly and outwardly toward the inner end of the adjacent cell.
10. In a cotton-seed dropping mechanism, the combination of a hopper, a seed plate having a series of cells in its outer periphery, means for rotating said seed plate, and diagonally-disposed means with which the lower face of said seed plate engages adapted for forcing the seed radially out of said cells as the seed plate rotates.
11. In a cotton-seed dropping mechanism, the combination of a hopper, a seed plate having a series of cells in its outer periphery, means for rotating said seed plate, and a seed discharge opening from said hopper at one side thereof, the forward edge of said discharge opening in the direction of rotation of said seed plate being beveled for forcing the seed radially out of said cells.
12. In a cotton-seed dropping mechanism, the combination of a hopper, a seed plate having a series of cells in its outer periphery, means for rotating said seed plate, diagonally-disposed means with which the lower face of said seed plate engages adapted for forcing the seed radially out of said cells as the seed plate rotates, and a by-pass along which a seed so forced out of a cell may be returned to the hopper.
13. In a cotton-seed dropping mechanism, the combination of a hopper, a seed plate having a series of cells in its outer periphery, means for rotating said seed plate, diagonally-disposed means with which the lower face of said seed plate engages adapted for forcing the seed radially out of said cells as the seed plate rotates, and a by-pass leading upward and inward into said hopper from approximately the point where the cells pass successively out of position to cooperate with said diagonally-disposed means.
14. In a cotton-seed dropping mechanism, the combination of a hopper, a seed plate having a series of cells in its outer periphery, means for rotating said seed plate, a seed discharge-opening from said hopper at one side thereof, the forward edge of said discharge-opening in the direction of rotation of said seed plate being beveled for forcing the seed radially out of said cells, and a by-pass leading from the forward edge of said discharge-opening upward and inward into said hopper.
15. In a cotton-seed dropping mechanism, the combination of a bottom plate, a seed plate having a series of cells in its outer periphery revolubly mounted on said bottom plate, means for rotating said seed plate, and a seed discharge-opening through said bottom plate underneath said seed plate, the forward edge of said discharge-opening in the direction of rotation of said seed plate being beveled for forcing the seed radially out of said cells, the bottom plate being cut away on a bevel at the forward end of said seed discharge-opening to permit a seed which may be clinging to the seed plate to be moved out of engagement

with the seed plate as the seed plate advances without being crushed between the seed plate and the bottom plate.

16. In a cotton-seed dropping mechanism, the combination of a bottom plate, a seed plate having a series of cells in its outer periphery revolubly mounted on said bottom plate, means for rotating said seed plate, and a seed discharge-opening through said bottom plate underneath said seed plate, the forward edge of said discharge-opening in the direction of rotation of said

seed plate being beveled for forcing the seed radially out of said cells, the bottom plate being cut away at its upper portion adjacent to the seed plate at the forward end of the seed discharge-opening on a bevel upward and inward, providing a by-pass along which a seed which may be clinging to the seed plate is moved out of engagement with the seed plate as the seed plate advances.

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