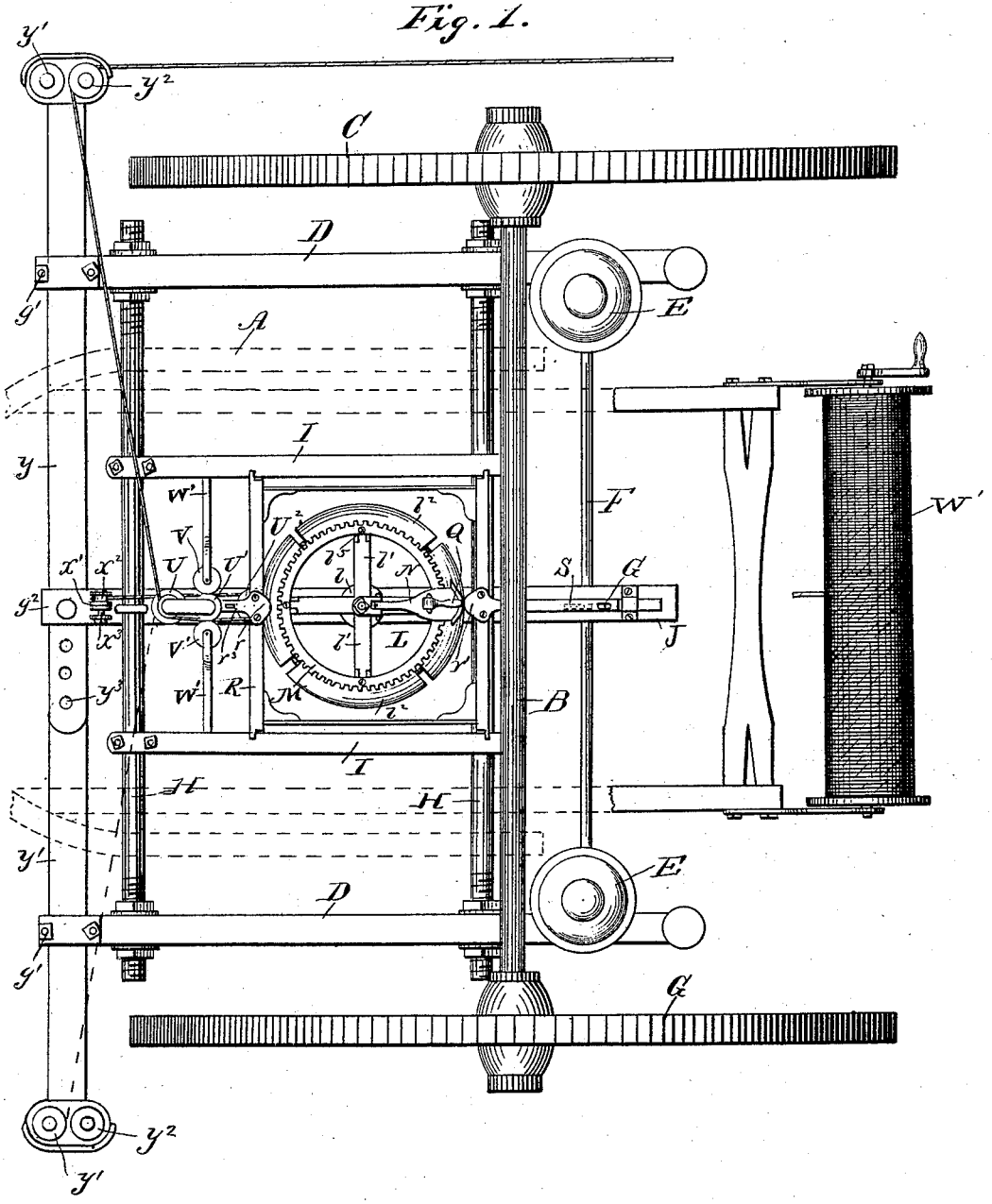
(No Model.) 3 Sheets—Sheet 1.

J. D. MILLS.

CHECK ROWER FOR CORN PLANTERS.

No. 302,514. Patented July 22, 1884.

Fig. 1.



WITNESSES

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(No Model.) 3 Sheets—Sheet 2.

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Fig. 2.

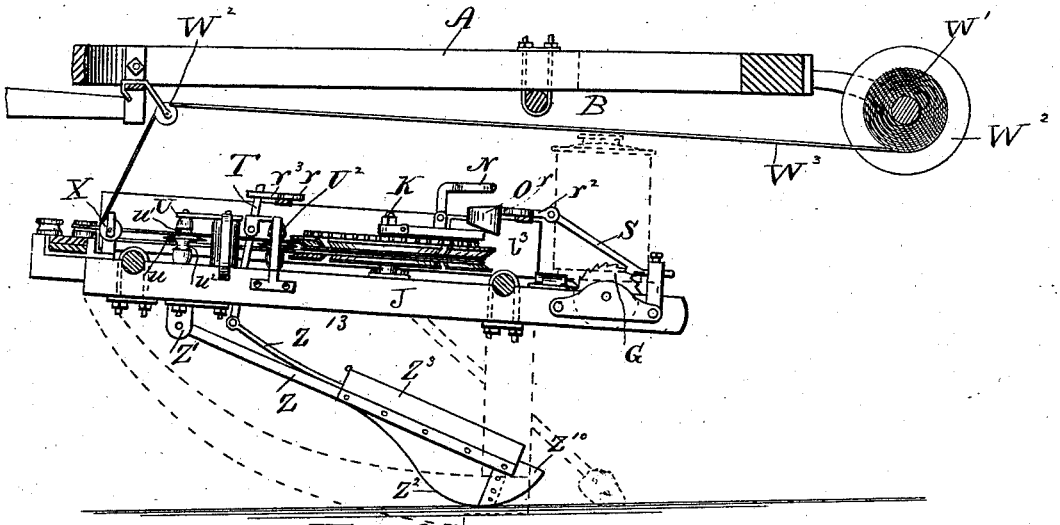

Fig. 3.

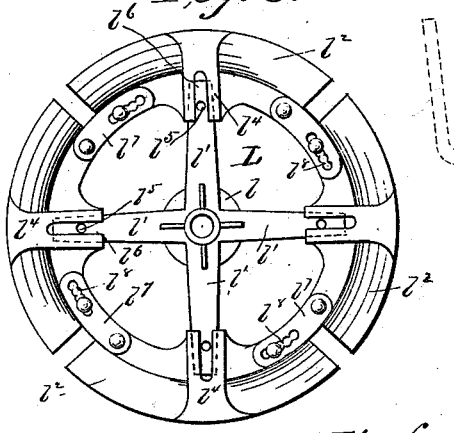

Fig. 4.

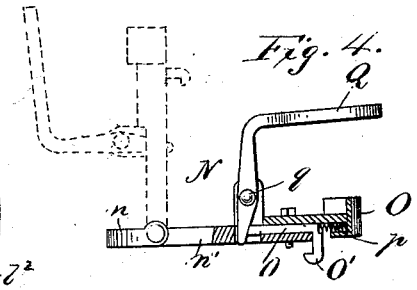

Fig. 5.

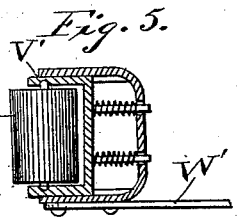

Fig. 6.

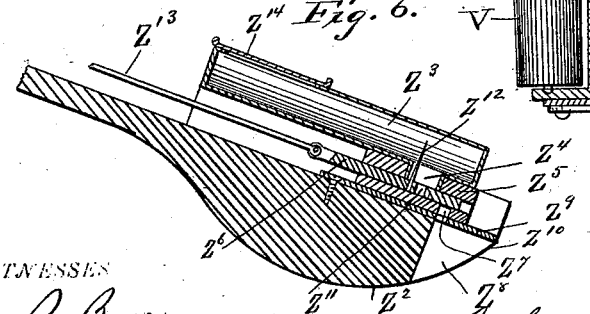

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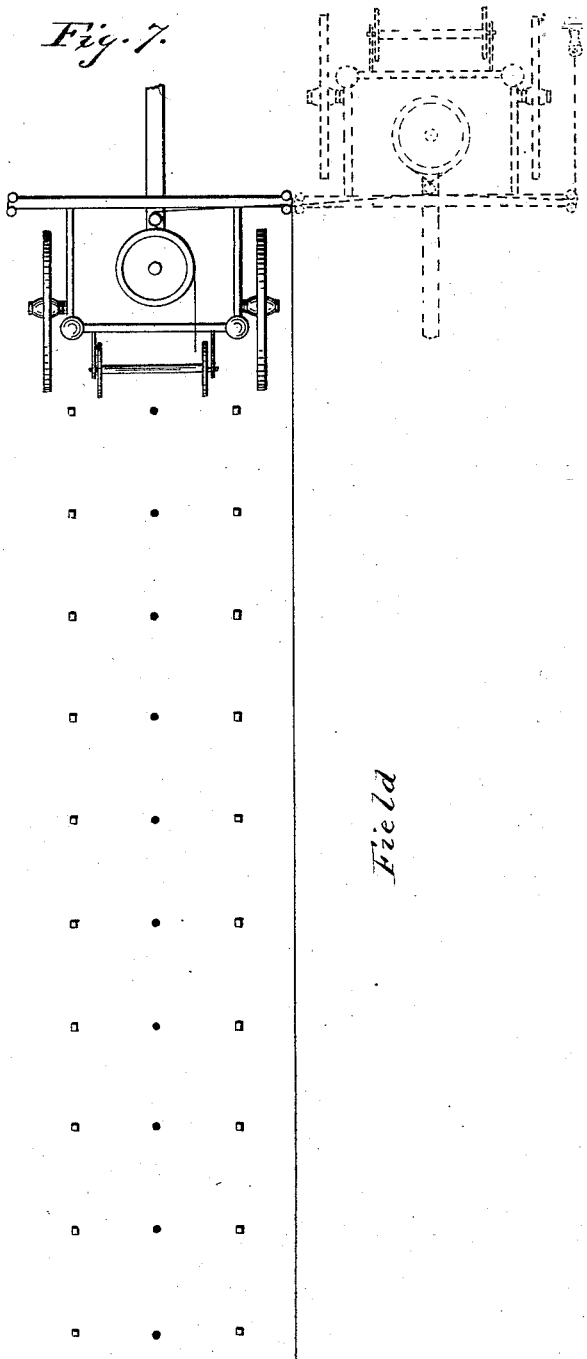
Fig. 7.



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UNITED STATES PATENT OFFICE.

JOHN DIX MILLS, OF CINCINNATI, OHIO.

CHECK-ROWER FOR CORN-PLANTERS.

SPECIFICATION forming part of Letters Patent No. 302,514, dated July 22, 1884.

Application filed January 3, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN DIX MILLS, of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improved Check-Rower for Corn-Planters; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, and to the figures and letters of reference marked thereon.

My invention relates to an improved check-rower susceptible of adaptation to the ordinary corn-planting machines now upon the market, but designed more particularly for use in connection with an improved sulky-planter of my own invention, forming the subject-matter of an application for Letters Patent filed contemporaneously herewith.

In order that a clear perception of my invention may be more readily obtained, I will first describe the construction and operation of one embodiment of it, which I have shown in the accompanying drawings, and will then point out particularly what I deem its novel features in the claims at the end of this specification.

In the drawings referred to, Figure 1 represents a top plan view of a portion of a corn-planter, showing the application of my check-rower thereto. Fig. 2 is a sectional view taken on the line *x x*, Fig. 1. Fig. 3 is a plan view of the expansible pulley around which the check line or rope passes. Fig. 4 is a detail view of the adjustable cam employed for operating the corn-dropping and surface-working mechanism. Fig. 5 is a view, partly in section, showing one of the tension-rollers and its supports. Fig. 6 is a longitudinal sectional view of the surface-marker. Fig. 7 is a diagrammatic view illustrating the practical working of my invention.

Similar letters of reference in the several figures indicate like parts.

Of the portion of the planter shown, the letter A represents the main frame hung upon the axle B, the latter being provided with large transporting-wheels C C, as shown. Suspended from the main frame at its forward end is a supplementary frame, the side bars, D D, of which constitute the beams of the planter. Said beams are each provided with a seed-dropping device, E, of any preferred construction, and also with an ordinary runner. A through-shaft, F, serves to operate simultaneously the seed-dropping devices on both the beams, motion being imparted to said shaft through a centrally-arranged ratchet-wheel, G.

For a more elaborate illustration and description of the planter thus far here described, reference is made to my contemporaneous application before referred to. Enough only of it is here shown to illustrate the application of my check-rower improvements.

To the cross-bars H H, which serve to unite the beams of the planter, are secured three bars, I, I, and J, all extending longitudinally of the machine. From the central bar, J, projects vertically a bolt or spindle, K, upon which is mounted a pulley, L. This pulley consists of a central portion composed of a hub, *l*, and radial arms *l'*, and an outer portion or rim composed of a series of segments or sections, l^2, each of which has a concaved periphery, l^3, and a socket, l^4, in which the corresponding end of one of the radial arms *l'* fits and works. A circular toothed rim, M, rests upon the socket portions of the pulley-rim sections, and is secured in place by means of bolts l^5, passing down through said toothed rim, through slots l^6 in the pulley-rim sections, and through perforations near the ends of the radial arms, as shown in Figs. 1 and 3. The adjoining sections of the pulley-rim are connected together by means of plates l^7, each having at one end a perforation through which to bolt it to one section, and at the other end a series of perforations, l^8, through one or the other of which passes a bolt to secure it to the other section. This construction of the pulley permits the rim-sections to be adjusted upon the radial arms out or in and to be held in adjusted position, thus enabling the pulley to be made of larger or smaller size, as preferred. Also mounted upon the bolt or spindle K is an adjustable self-locking actuating-cam, N, consisting of a short inner part, *n*, perforated for the passage of the spindle, and a longer outer part, *n'*, hinged to the part *n* and carrying a cam, O. Mounted upon or within the outer part, *n'*, is a sliding bolt, *o*, having one or more locking

projections or hooks, o', and adapted to be held retracted by a suitable spring, p, and to be outwardly projected against the tension of said spring by the operation of a lever, Q, pivoted at q, and arranged to bear with its lower end against the inner end of the sliding bolt, as shown clearly in Fig. 4. When the outer part, n', bearing the cam, is dropped down, the locking hook or hooks o of the spring-bolt automatically engage with one or more of the teeth of the toothed rim M and lock the parts securely together, so that whenever the pulley and toothed rim are rotated the cam will be also rotated with them. The face of the cam is projected out to or beyond the periphery of the pulley, and when the pulley is rotated strikes alternately projections r and r' upon the forward and rear portions of a sliding frame, R, and causes said frame to reciprocate back and forth above the pulley upon the bars I I, which form its guides.

To the rearward extension, r^2, of the sliding frame R is pivoted a dog or pawl, S, which operates upon the ratchet-wheel G on the feed-shaft of the dropping mechanism of the planter, while a forward extension, r^3, of said sliding frame operates upon a lever, T, which in turn operates a surface-marker, to be further on explained. The sliding frame is thus made to control both the seed-dropping and surface-marking mechanisms.

U U′ U² are three rollers mounted in fixed bearings upon the middle bar, J, and in line with each other. The front roller, U, which I term a "guide-roller," is constructed with a central peripheral flange, u, and is provided with two bearings, u' and u^2, for the check-rope, located above or below the said central flange, respectively. The rear roller, U², is similar in construction to roller U, and is also a guide-roller. The intermediate roller, U′, on the other hand is of a plain cylindrical form, and is located between two similarly-formed adjustable tension-rollers, V and V′. These last-named rollers are mounted, respectively, in adjustable spring-seated bearings v upon arms W and W′, which project inward from the bars I I, as shown in Fig. 1.

Upon the middle bar, J, forward of the roller U, is a grooved roller or pulley, X, mounted upon a fixed horizontal axis, and having a central flange, x', which divides it into two separate bearings, x^2 x^3, for receiving the check-cord.

Y and Y′ represent two adjustable bars extending transversely across the machine and supported in suitable guides at g' g^2 g', as shown. Upon the outer end of each of these bars are mounted a pair of friction-pulleys, y' y^2, over one or the other of which the check-rope passes, as will be further on explained. The inner ends of the bars overlap each other, and are provided with a series of perforations, y^3. A bolt passed down through a perforation in the guide g^2, and through any two corresponding perforations in the overlapped bars, serves to secure the bars rigidly in any position of adjustment.

The surface-marker consists of a beam, Z, hinged at Z′ to a bracket on the under side of the bar J, and having its lower end enlarged and provided with a curved bearing-surface, Z^2, to enable it to run easily and smoothly over the ground after the manner of a sled-runner. Upon the lower end of this beam is arranged a box or receptacle, Z^3, for containing a supply of ground plaster, lime, or other suitable material in a pulverulent state. An opening closed by a slide or cover, Z^4, is provided for the introduction of the material into the receptacle. In the bottom of the receptacle, near its lower end, is a discharge-passage, Z^4, leading down to a chambered block, Z^5, in which works a cut-off slide, Z^6. In addition to the opening communicating directly with the discharge-passage of the upper receptacle, and to the slot in which the cut-off slide works, the block Z^5 is provided with a discharge-orifice, Z^7, opening into an inclosure, Z^8, at the heel of the beam formed by the end of the beam, an upper plate, Z^9, and two side flanges, Z^{10}. From this construction the material dropped from the orifice Z^7 is completely shielded except at the rear, and reaches the ground in a body unaffected by any side winds or drafts. The slide Z^6 is provided with an opening, Z^{11}, for receiving the material from the discharge-passage Z^4, leading from the receptacle, and carrying the same to the discharge-opening Z^7. It is further provided with a stirrer or agitator, Z^{12}, which projects up through the passage Z^4 into the receptacle, and prevents the material from clogging or choking the passage, and insures a uniform and free discharge. A pitman or connecting rod, Z^{13}, is jointed at one end to the slide and at the other to the lower end of the vibrating lever T, so that each time the said lever is vibrated by the forward movement of the sliding frame R the slide of the surface-marker will be moved backward and caused to discharge a quantity of ground plaster or other material used through the opening Z^7 onto the ground. The discharge-opening Z^7 of the surface-marker is arranged on a line with the seed-depositing devices of the planter proper, so that a mark may be made opposite each hill that is planted, as will be further on explained.

Upon the main frame of the planter is arranged a reel, W, having wound upon it a knotless check-rope, W′, of a mile or less in length, as desired.

To prepare the check-rower attachment for operation, the end of the rope is taken from the reel and passed forward over an elevated pulley, W^2, thence down over the right-hand bearing, x^2, of the pulley X, thence back over the lower bearing, u^2, of the pulley U, thence between the fixed roller U′ and the adjustable spring-seated roller V on the right, thence over the lower bearing of the roller U², thence once or more around the grooved rim of the large

pulley L, thence back over the upper bearing of the roller U^2, thence out between the intermediate fixed roller, U', and the adjustable roller V on the left, thence out over the upper bearing, u', of the roller U, thence off to the right over the rear roller, y^2, on the outer end of the cross-bar Y and back to the rear of the machine, where it is secured to a suitable stake or anchor fastened in the ground or to any other stationary object. The runners and seed-dropping mechanism of the planter being properly adjusted, the team is started up and the machine is driven from one side of the field to the other. As it advances the rope is gradually unwound from the reel, and, passing around and over the various rollers and pulleys in the manner hereinbefore indicated, causes the large pulley L and its connected cam to be revolved, the rope being all the time kept taut and under proper tension. At each revolution of the pulley and cam the latter strikes the forward cam, r, on the sliding frame R and causes said frame to be moved forward and to operate on the one hand through the pawl S and ratchet-wheel G the driving-shaft of the seed-dropping mechanism, and thus effect the simultaneous planting of two hills of corn, and on the other hand, through the medium of the vibrating lever T and pitman Z' cause the surface-marker to drop a small quantity of plaster or other material of a color in contrast with the color of the ground between and exactly in line with the two hills of corn planted, these operations continuing uninterruptedly so long as the forward motion of the machine continues and the adjustment of the mechanism remains unchanged. The object of dropping the plaster or marking material in line with the hills of corn is to have it serve as a visible guide for the operator on the return trip of the machine and to enable him to align accurately succeeding rows of hills with those previously planted. The forward movement of the sliding frame R brings the rear cam, r', on the said frame forward into the path of the rotating cam, so that when the said cam moves around to the rear it strikes the cam, r', and causes the frame to be moved back to first position or starting-point, ready to again advance and operate the seed-dropping and surface-marking mechanisms. The adjustment of the large pulley L determines the distance apart of the successive hills in a row. When its movable sections are adjusted out so as to increase its diameter, its rotation by the check-rope applied to its circumference is slower, and consequently the intervals between the actions of the rotating cam on the sliding frame are increased and the hills planted and the surface-deposit of plaster made at farther distances apart, while the reverse is the case if the sections of the large pulley are adjusted so as to decrease its diameter.

The rope, it will be observed, is free from knots or obstructions of any kind, and while the machine is making its first trip across the field is carried upon the machine itself wound upon the reel. So effectively do the tension devices operate that there is not the slightest danger of the rope slipping, and hence its operation is just as reliable as though knots were employed as in ordinary check-rowers.

Not only can the intervals between the automatic operations of the planting and surface-marking mechanisms of my machine be increased or diminished as desired, but provision is also made for interrupting or stopping the operation of these mechanisms at the will of the driver without at all checking the advance of the machine by rendering the cam capable of being locked to or being disengaged from the rotating pulley at pleasure, as before described. For instance, if at any time and for any reason the driver wishes to throw the planter and surface-marker out of operation with his foot or hand, he pulls upward the upper portion or handle of the lever Q, which first causes the sliding bolt to move outward and become disengaged from the teeth of the circular toothed rim M, and then permits the whole outer portion, n', carrying the cam, to be swung up into the position shown in dotted lines in Fig. 4, entirely out of the way of the projections or cams in the sliding frame. While the cam is in this position the pulley may rotate indefinitely without at all influencing the sliding frame R. When, however, he desires to again commence planting and marking, the driver, with his hand or foot, moves the cam around till the proper point is reached, and then presses it down till it again becomes locked to the circular toothed rim in position for acting upon the sliding frame, as before.

A mile, more or less, of rope may be carried on the machine, and paid out as the machine advances across the field the first time. It will be found convenient to carry only about so much rope as is necessary to stretch across the field once.

At the end of the first excursion of the machine across the field, the machine is turned completely around, a point under the end of the cross-bar lying toward the body of the field being taken as a pivotal point, as shown in the diagram Fig. 7. When the machine is thus reversed, the portion of the rope which before passed around the rear pulley, y^2, on the end of the right cross-bar, for instance, will then be caused to pass around the front companion pulley, y', as also shown in the said diagram. The machine being reversed, the next for the driver to do will be to unwind the portion of the rope remaining on the reel, pull it through the pulleys W^2 and X, and then pass it out around the pulley, y', on the end of the cross-bar projecting toward the body of the field, and carry it to the rear a short distance and anchor it, as shown at S^2 in the diagram. This being done, the driver again takes his seat and causes the team to draw the machine to the opposite end of the field, the rope being

held under tension by the several rollers and pulleys, as before, and the automatic action of the seed dropping and the marking devices being continued. In making this back trip the driver, by giving attention to the little spots of plaster made at the preceding trip, and by being careful to observe that the revolving cam is so adjusted as to make the first hills planted and marked come in line with the previously planted and marked, will be enabled to plant all the successive hills of the second row in exact alignment with those before planted, and so on through the planting of the subsequent rows. Should it at any time be observed that, owing to inequalities of ground, &c., the planting and marking are being done too soon or too late, a readjustment of the position of the cam will quickly remedy the difficulty. When the machine has reached the end of its return-course, it is again turned, and the rope shifted and anchored, as before.

In the use of a great many check-rowers the machine, or, if not the machine, at least the team, has to travel completely across the field in order to lay out or stretch the check-rope before the planting can commence. In my invention, however, one end of the rope is fastened in the start and the whole body of the rope carried across the field and paid out while the planting and marking operations are going on uninterruptedly, thus involving no loss of time. After the rope is once stretched out it is no longer carried on the machine, and the remaining rope, reel and all, may be removed from the machine, if desired. The reel is preferably adapted to be mounted removably upon the machine, and is provided with a crank by which the rope may be wound upon it when the work is finished. There being an entire absence of knots upon the rope employed, a great length of rope can be carried without adding much weight.

The cross-bars Y Y′ are capable of adjustment in and out, and when the machine is being transported from place to place, they are preferably pushed in so as to come within the track of the transporting-wheels, and so as not to interfere with passage of the machine through gates and other contracted places.

Having thus described my invention, I claim as new—

1. In a check-rower, the combination, with the pulley or wheel constructed to receive a check-rope, and having the toothed rim, of the adjustable projection or cam mounted independently of the pulley, and carrying locking devices for engaging it with the toothed rim at any desired point, substantially as described.

2. The combination of the wheel or pulley formed to receive the check-rope, and having the toothed rim and the adjustable actuating-cam consisting of the inner part mounted upon the spindle or axis and an outer part hinged to the first-named part, and bearing locking devices for engaging with the toothed rim, substantially as described.

3. In a check-rower for corn-planters, the combination, with the wheel or pulley formed to receive the check-rope, and having the toothed rim, of the adjustable actuating-cam adapted to be locked to any part of the toothed rim, and the reciprocating sliding frame having the projections at opposite ends, with which the actuating-cam engages when rotated with the pulley, substantially as described.

4. The combination, with the wheel or pulley formed to receive the check-rope and having the toothed rim, of the adjustable cam and its locking-catches, and the lever for operating said catches, whereby when the lever is pulled upward the catches will be automatically disengaged from the rim, and the cam positively lifted out of the path of the parts of the sliding frame with which it would otherwise engage, substantially as described.

5. The combination, with the rotating pulley formed to receive the check-rope, of the cam adjustable to any part of the pulley, the sliding frame receiving motion from the cam, and the surface-marking mechanism connected to the sliding frame, whereby during the continuous rotation of the pulley the cam can be thrown in or out of engagement with the same, so as to actuate the surface-marking mechanism at longer or shorter intervals, while the forward speed of the machine remains unchanged, substantially as described.

6. The combination, with the wheel or pulley mounted upon the planter and formed to receive the check-rope, of the adjustable actuating-cam having locking means for securing it at will to the pulley at any desired point, the sliding frame operated upon by the cam, and the seed-dropping and surface-marking mechanisms both operated by the sliding frame, whereby while the speed at which the pulley rotates remains unchanged the seed-dropping and surface-marking mechanisms may be thrown into or out of operation at greater or less intervals by the shifting of the adjustable cam, substantially as described.

7. In a check-rower for corn-planters, the wheel or pulley consisting of the hub and radial arms, the series of segments or sections formed to receive the check-rope, and rendered adjustable in and out on the arms, and the adjustable plates for connecting the segments or sections together, substantially as described.

8. In a check-rower for corn-planters, the wheel or pulley consisting of the hub and radial arms, the rim sections or segments having the sockets fitting the radial arms, the adjustable plates for connecting the plates together, and the toothed rim secured to the radial arms, substantially as described.

9. In a check-rower for corn-planters, the combination of an expansible pulley mounted upon the planter and formed to receive a check-rope, a toothed non-adjustable rim, and an adjustable cam adapted to be engaged to the toothed rim at any desired point, and the

seed-dropping mechanism operated by the cam, whereby the normal periodic operation of the cam upon the seed-dropping mechanism may be regulated by increasing or diminishing the size of the pulley, as well as interrupted at will, by throwing the cam into or out of engagement with the toothed rim, substantially as described.

10. The combination of the rotating pulley formed to receive the check-rope, and having the adjustable cam, the check-rope, the guide-rollers having the upper and lower bearings for the check-rope, and the tension-rollers, whereby the check-rope is accurately guided to and from the pulley and held under proper tension, substantially as described.

11. The combination of the rotating pulley, the guide-rollers having the upper and lower bearings for keeping the strands of the check-rope separate, the tension-rollers for tightening the rope on the pulley, and the adjustable cross-bars having the guide-pulleys at their outer ends, substantially as described.

12. The combination, in an organized planter, of seed-dropping mechanism, a surface-marking mechanism, a rotary pulley or wheel with an actuating-cam thereon, means by which the cam is caused to actuate periodically the planting and marking mechanisms, a check-rope mounted on the machine, and the guiding and tension pulleys arranged as herein shown, whereby the planting and surface-marking are accomplished simultaneously and automatically, substantially as described.

13. The combination, with the planter, of the beam of the surface-marker hinged to the planter, as described, and having the curved lower end resting upon the ground, the receptacle for plaster or other pulverulent material, with the discharging-slide, and the stirrer or agitator on the slide for preventing choking, substantially as described.

14. The combination, with the planter, of the beam of the surface-marker hinged to the planter, and having the curved lower end resting and sliding upon the ground, the lateral and top flanges for preventing dispersion by lateral winds, and the receptacle for plaster, and the discharging-slide, the whole constructed and arranged substantially as described.

15. The combination, with the planter, of a wheel or pulley mounted thereon and formed to receive a check-rope, a cam or projection on the rotary pulley, a seed-dropping mechanism actuated by said cam when in rotation, and a check-rope operating upon the pulley, and having its body carried by the planter, and one end anchored to some stationary object, whereby as the planter proceeds across the field in its first trip the check-rope is automatically paid out, rotates the pulley, and causes the cam on the pulley to operate the seed-dropping mechanism, substantially as described.

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