(No Model.) 6 Sheets—Sheet 1.

E. MOON.

PLANTER.

No. 563,503. Patented July 7, 1896.

Fig. 1.

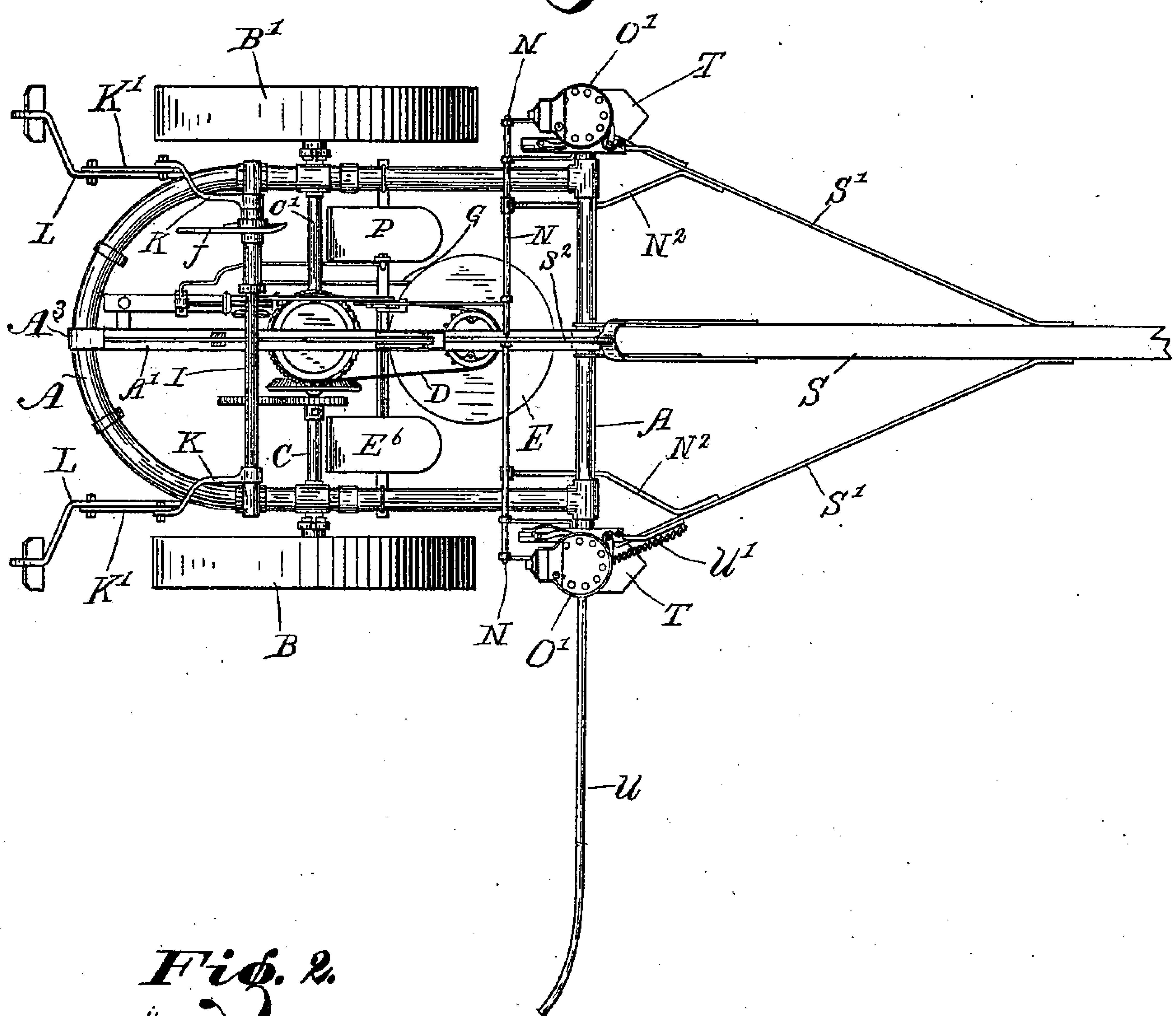
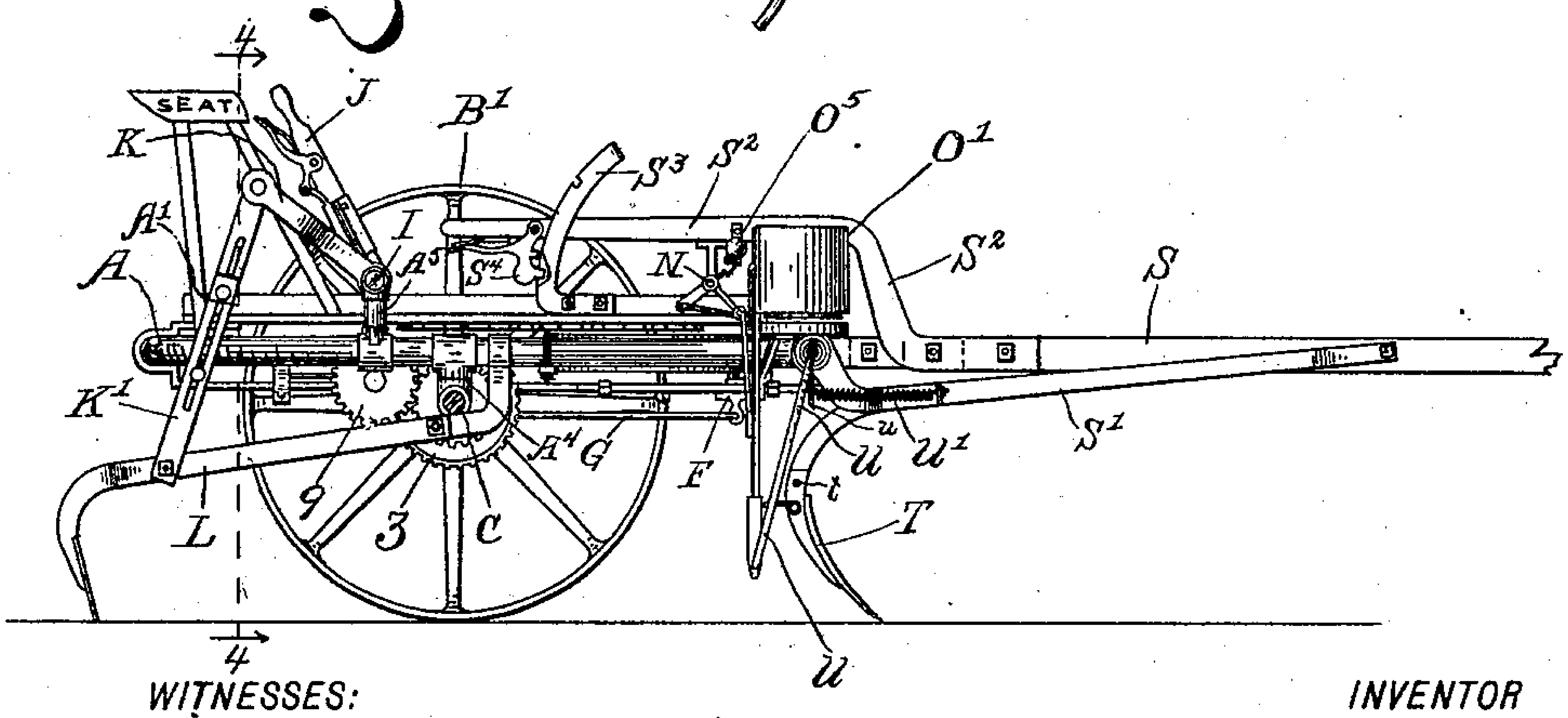


Fig. 2.



WITNESSES:

E. A. Kingsley.

H. D. Nealy.

INVENTOR

Elkanah Moon,

BY

Chester Bradford,

ATTORNEY.

(No Model.) 6 Sheets—Sheet 2.

E. MOON.

PLANTER.

No. 563,503. Patented July 7, 1896.

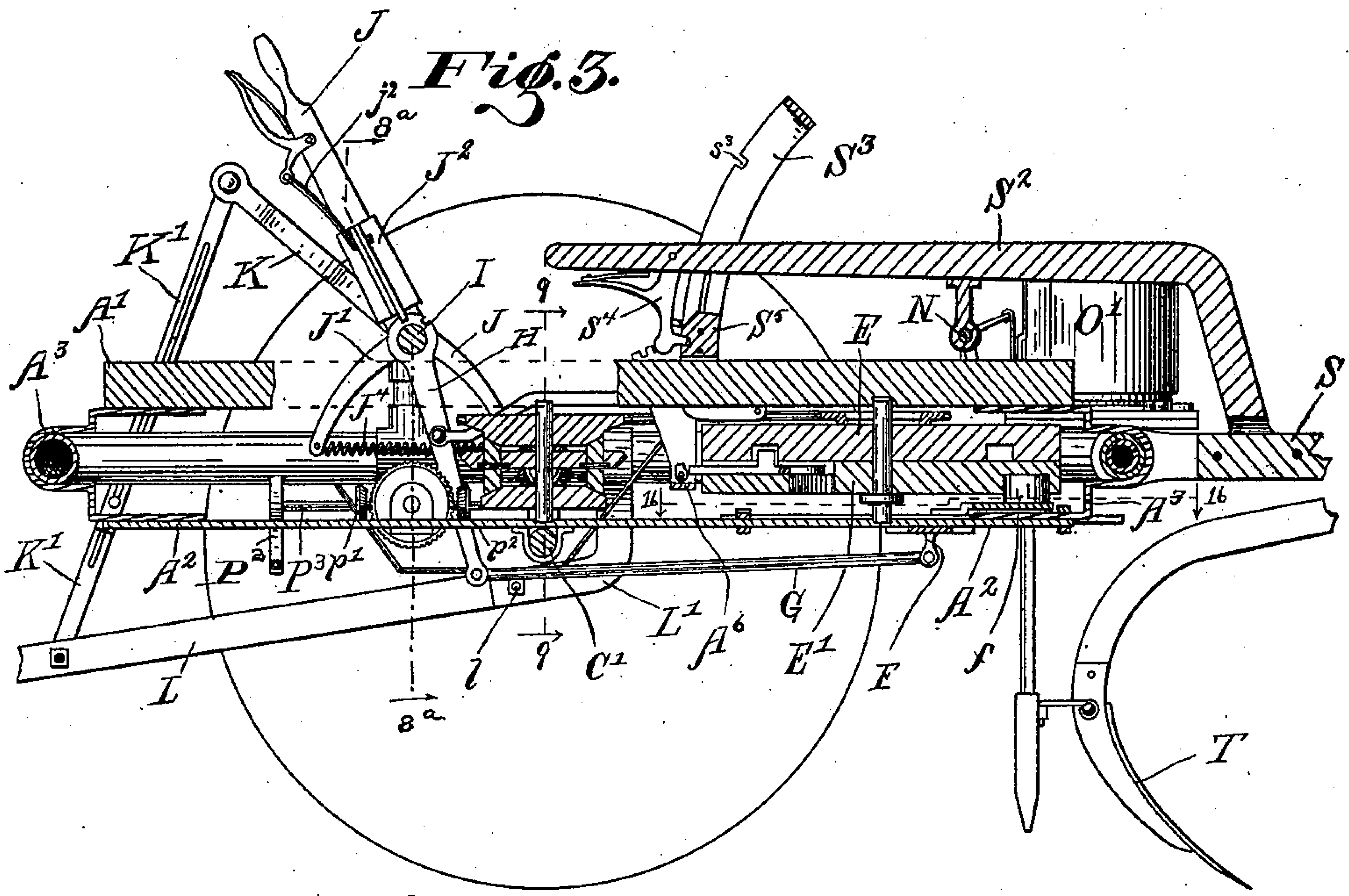


Fig. 3.

Fig. 4.

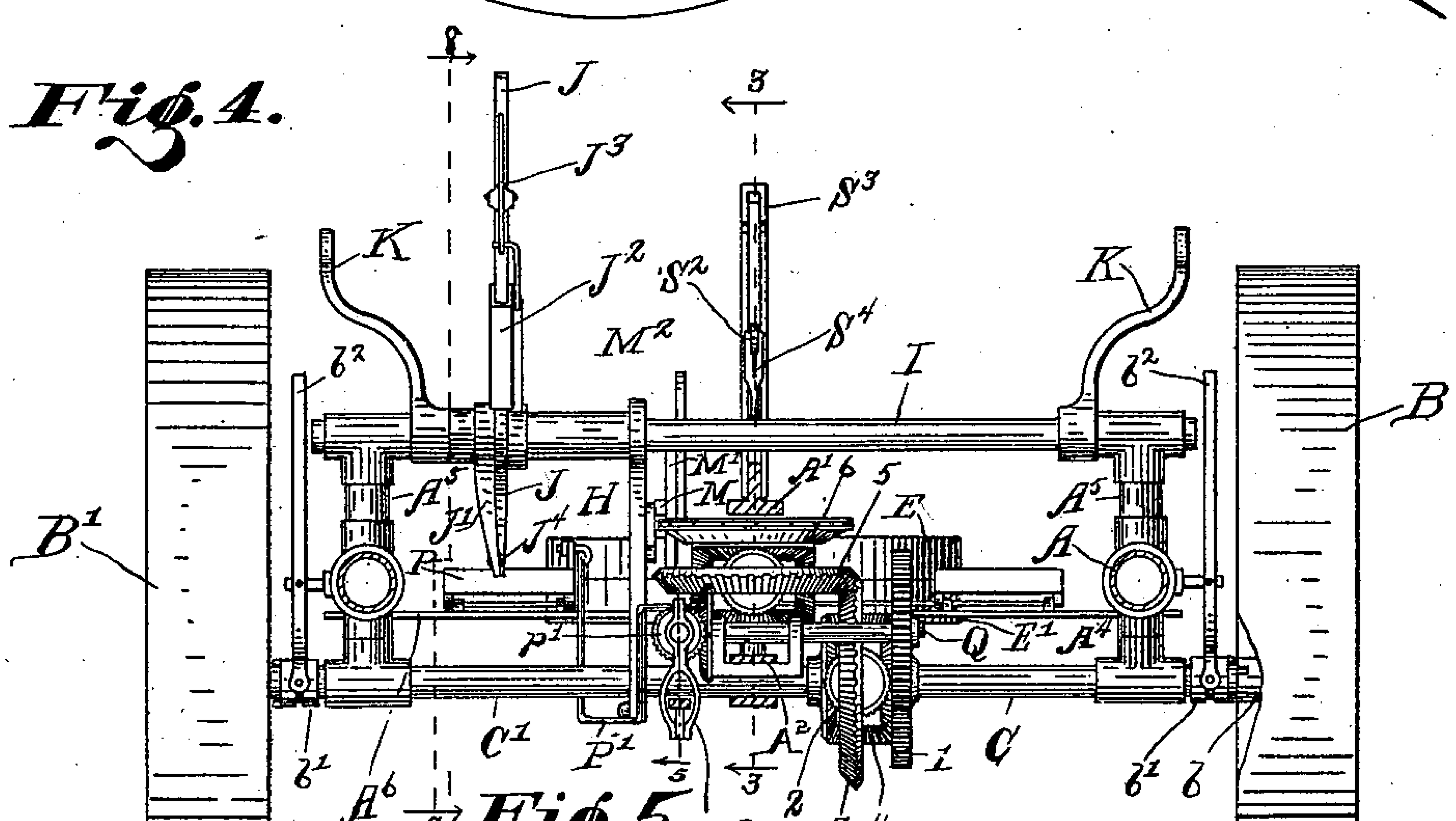
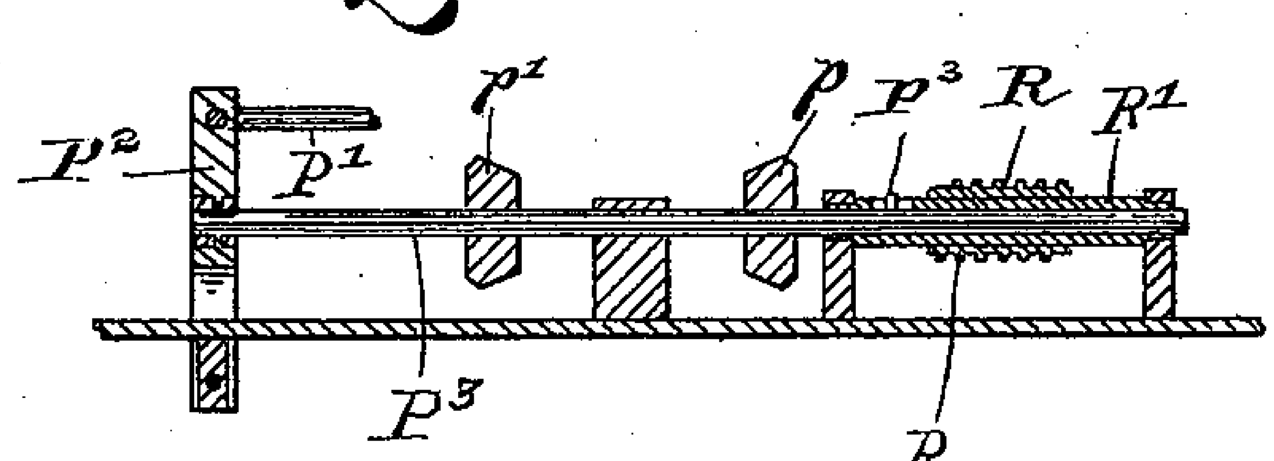


Fig. 5.



WITNESSES:

E. A. Kingsley

H. D. Nealy

INVENTOR

Elkanah Moon,

BY

Chester Bradford,

ATTORNEY.

(No Model.) 6 Sheets—Sheet 3.

E. MOON.
PLANTER.

No. 563,503. Patented July 7, 1896.

Fig. 6.

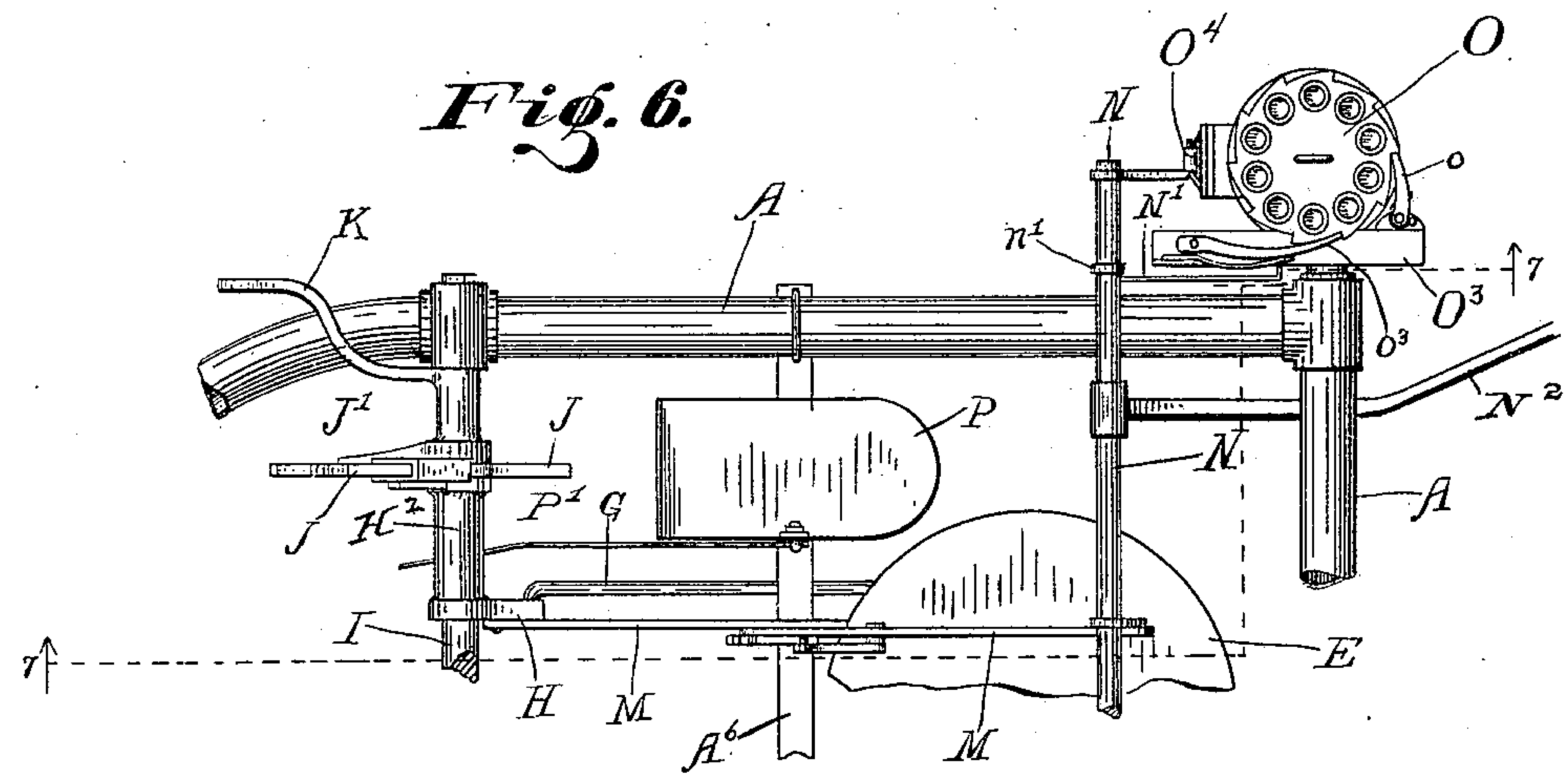
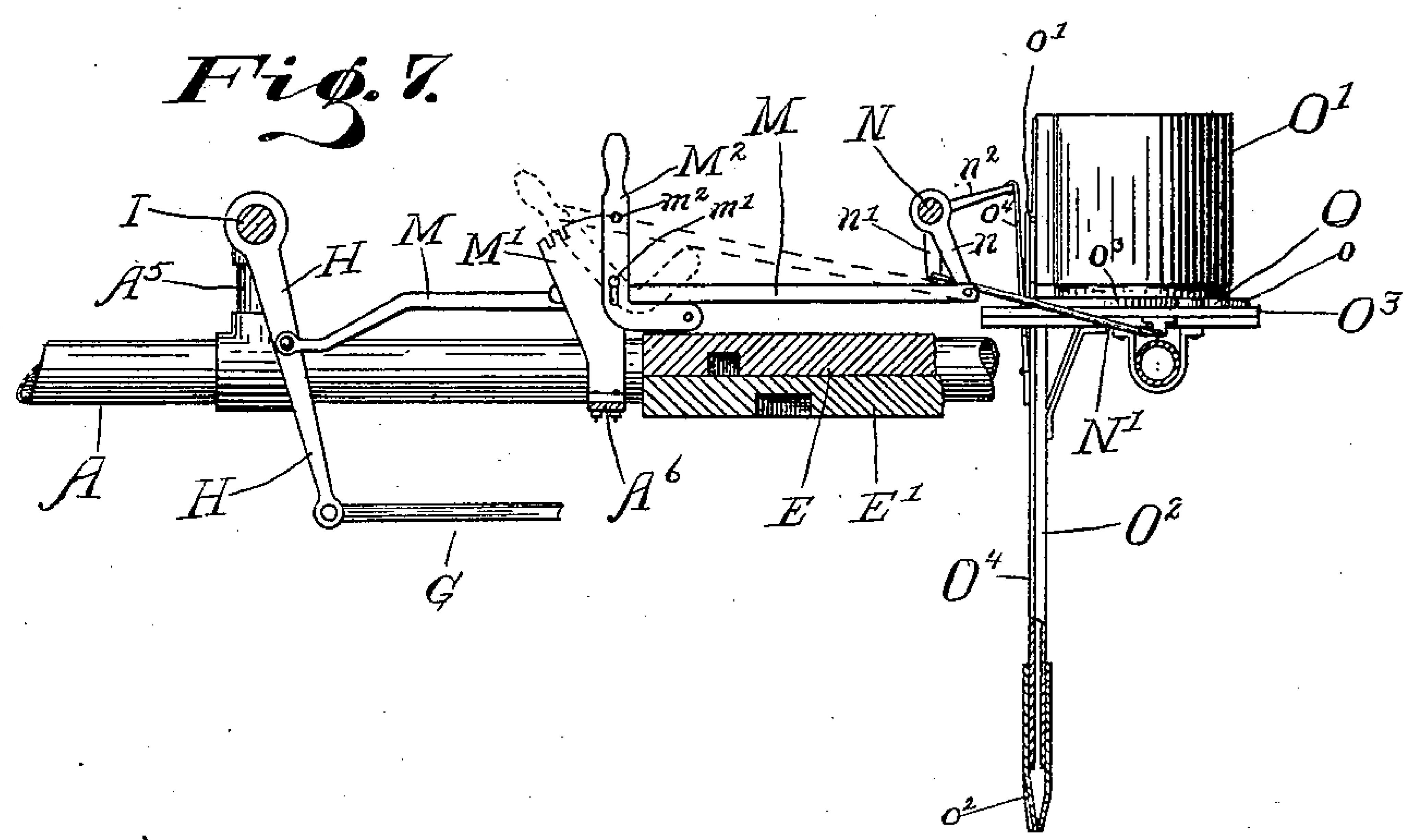


Fig. 7.



WITNESSES:

E. A. Kingsley,

H. D. Nealy

INVENTOR

Elkanah Moon,

BY Chester Bradford,

ATTORNEY.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 6 Sheets—Sheet 4.

E. MOON.

PLANTER.

No. 563,503. Patented July 7, 1896.

Fig. 8.

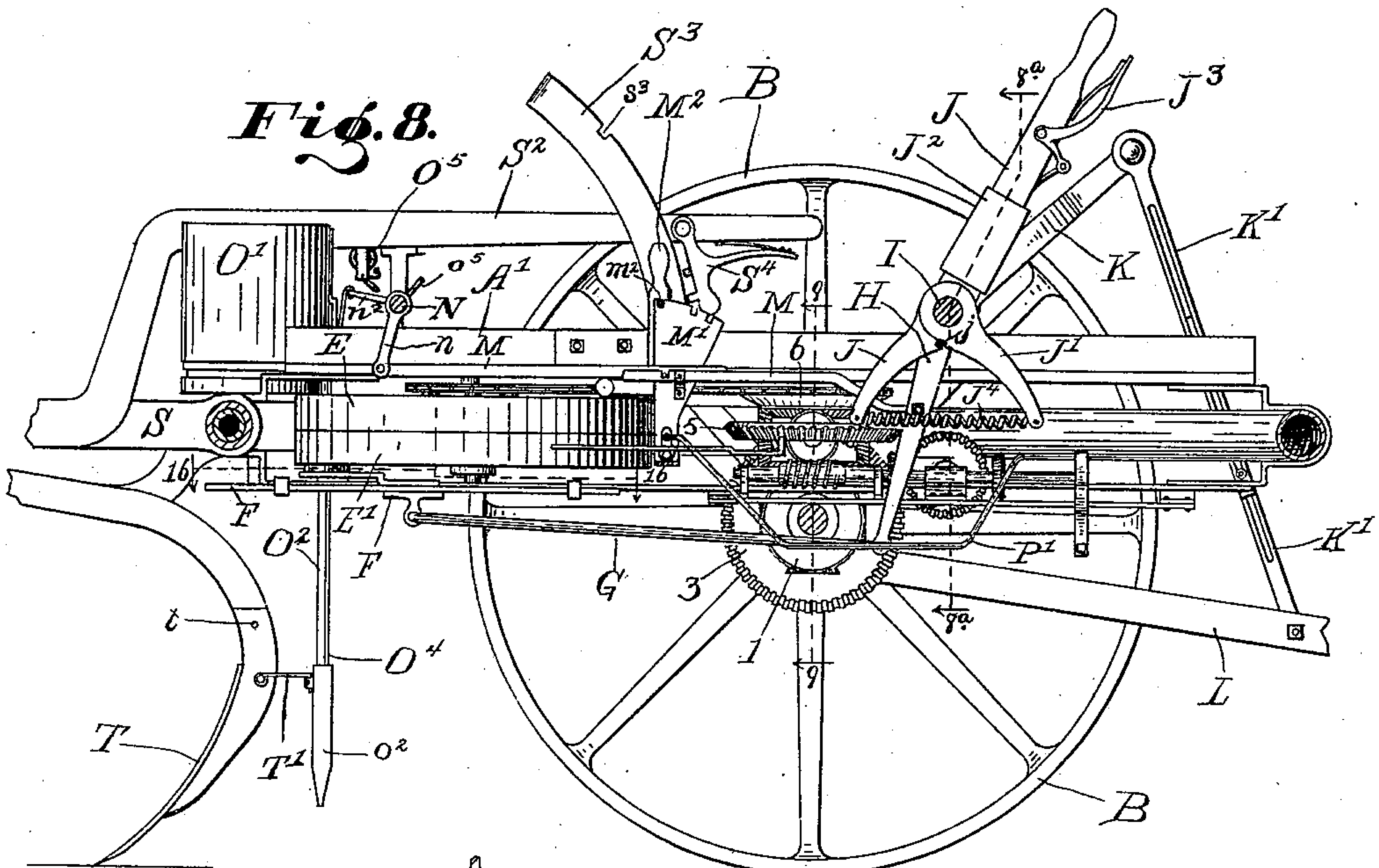


Fig. 8a

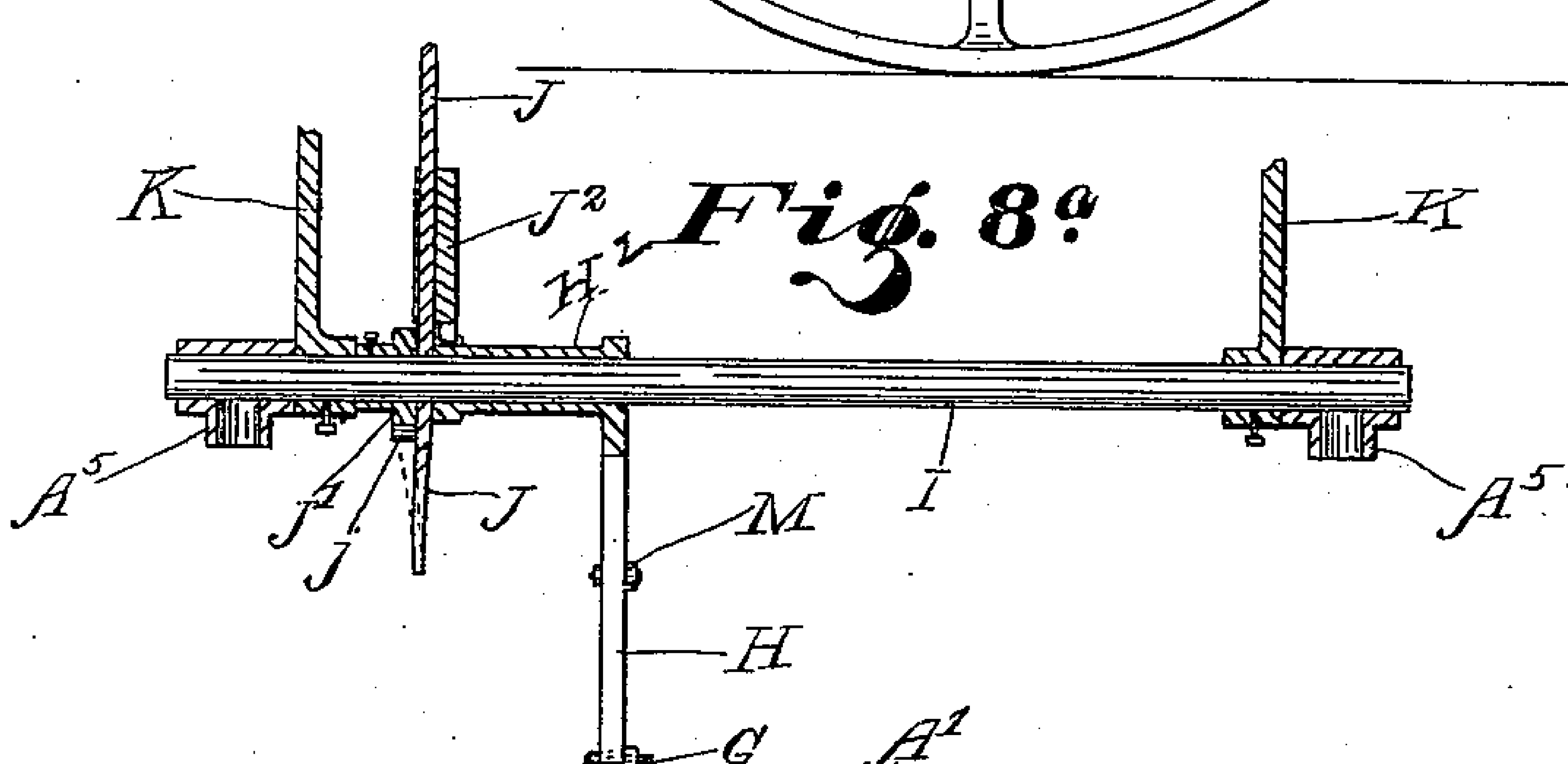
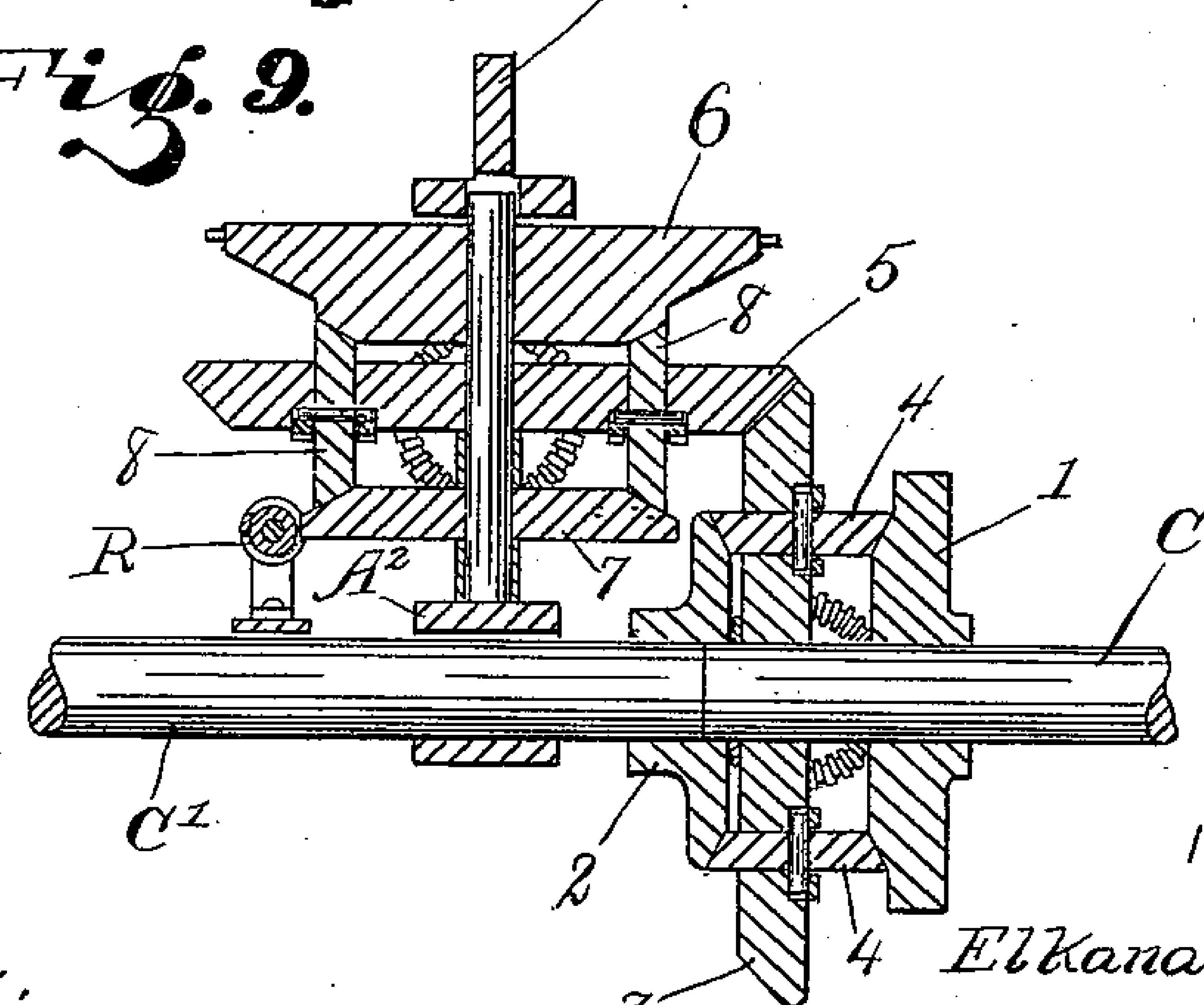


Fig. 9.



WITNESSES:

E. A. Kingsley.

H. D. Nealy.

INVENTOR

Elkanah Moon,

BY

Chester Bradford,

ATTORNEY.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 6 Sheets—Sheet 5.

E. MOON.

PLANTER.

No. 563,503. Patented July 7, 1896.

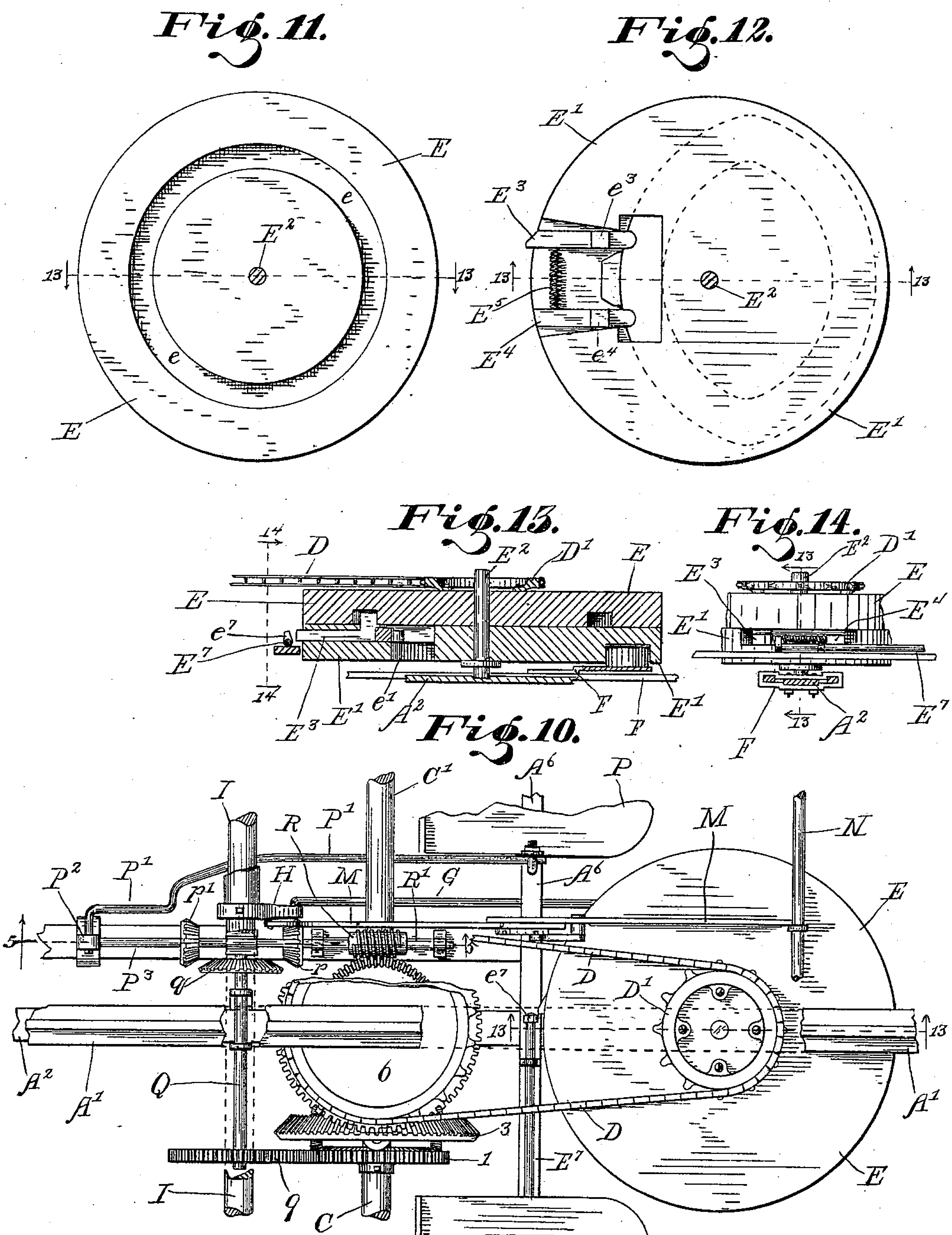


Fig. 11. Fig. 12. Fig. 13. Fig. 14. Fig. 10.

WITNESSES:

E.A. Kingsley.

H. D. Nealy.

INVENTOR

Elkanah Moon,

BY Chester Bradford,

ATTORNEY.

(No Model.)

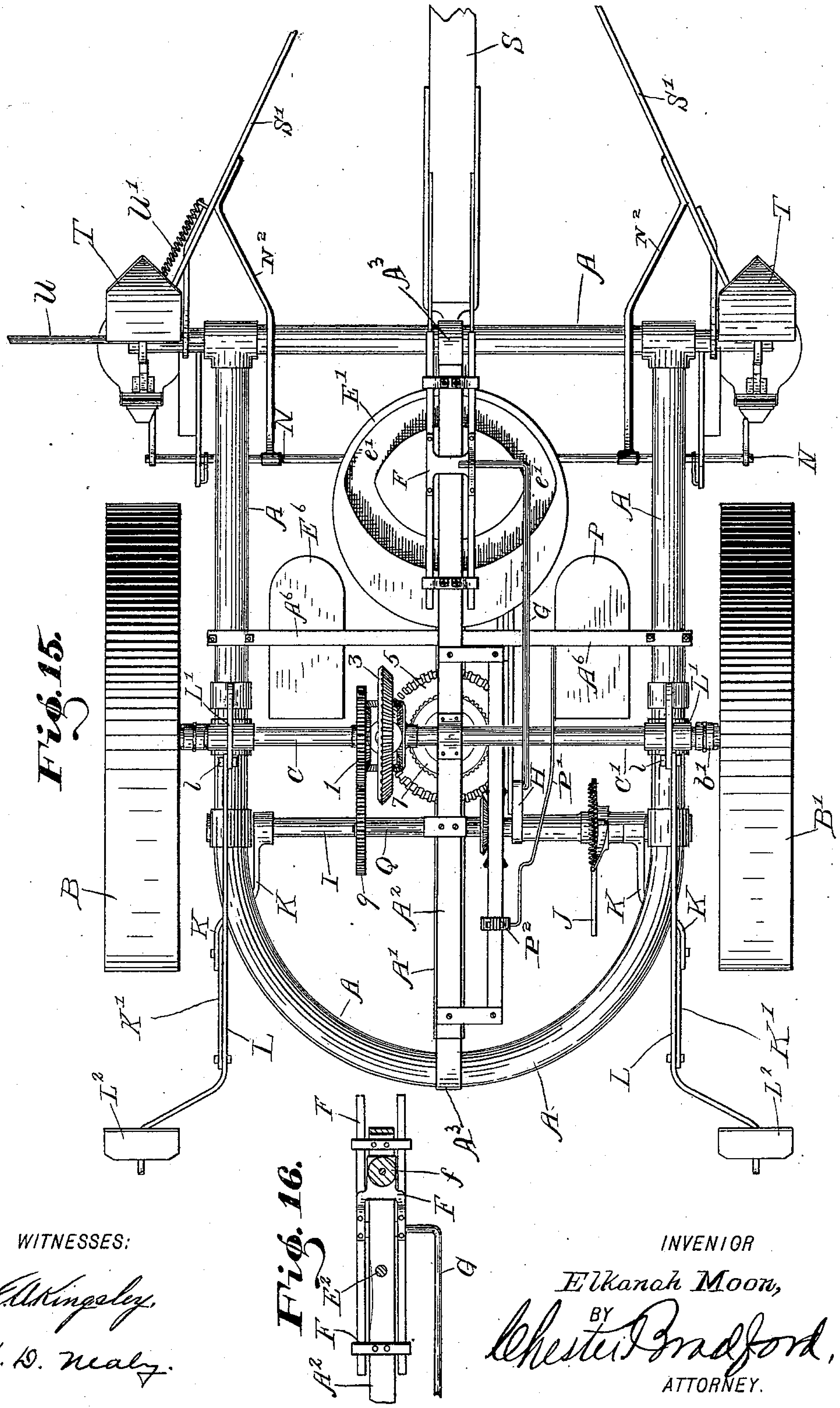
6 Sheets—Sheet 6.

E. MOON.

PLANTER.

No. 563,503.

Patented July 7, 1896.



WITNESSES:

E. L. Kingsley,

H. D. Nealy.

INVENTOR

Elkanah Moon,

BY

Chester Bradford,

ATTORNEY.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ELKANAH MOON, OF MUNCIE, INDIANA.

PLANTER.

SPECIFICATION forming part of Letters Patent No. 563,503, dated July 7, 1896.

Application filed October 8, 1894. Serial No. 525,235. (No model.)

To all whom it may concern:

Be it known that I, ELKANAH MOON, a citizen of the United States, residing at Muncie, in the county of Delaware and State of Indiana, have invented certain new and useful Improvements in Planters, of which the following is a specification.

It is desirable, in order to reach the best results, that the earth shall be packed closely about the seed in order that it may be enabled to sprout and take root to the best advantage, and that the surrounding earth may hold moisture well, and, further, that the surface of the ground may be loosened and broken up, instead of being left hard and smooth, in order that caking under the influence of the rain and sun, and consequent difficulty of penetration by the young plants, may be avoided. Heretofore, in many cases, the first result has been reached by running the wheels of the planter over the seed after it is deposited in the ground, but this produces a condition open to the second objection.

The main object of my present invention is to produce a planter by which all of these advantages may be obtained and which shall be subject to none of these objections; and it consists in various constructions and arrangements of parts by which these and other advantages are attained, and in certain details of construction, all as will be hereinafter more fully described and claimed.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a top or plan view of a planter embodying my said invention; Fig. 2, a side elevation of the same, with one wheel cut off or broken away to show the mechanism more clearly; Fig. 3, a detail sectional view through the principal mechanism on the dotted line 3 3 in Fig. 4; Fig. 4, a rear elevation through the principal mechanism as seen from the dotted line 4 4 in Fig. 2, the framework and some parts of the mechanism being cut away; Fig. 5, a detail sectional view on the dotted line 5 5 in Fig. 10; Fig. 6, a detail top or plan view of the feed-operating mechanism and the operating devices therefor; Fig. 7, a detail side elevation of the same, with some parts in section, as seen from the dotted line 7 7 in Fig. 6; Fig. 8, a detail elevation of the principal mechanism from the opposite side to that seen in Fig 3, as seen from the dotted line 8 8 in Fig. 4, the outer portion of the framework being broken away; Fig. 8^a, a detail sectional view as seen from the dotted line 8^a 8^a in Figs. 3 and 8; Fig. 9, a detail sectional view on the dotted line 9 9 in Figs. 3 and 8; Fig. 10, a detail top or plan view similar to a portion of Fig. 1, but on a much larger scale and with some of the parts broken away; Fig. 11, an under side plan view of one disk of the operating-wheel; Fig. 12, a top or plan view of the other disk of the operating-wheel; Fig. 13, a central sectional view of said wheel on the dotted line 13 13 in Figs. 11 and 12; Fig. 14, a fragmentary front elevation of said wheel as seen from the dotted line 14 14 in Fig. 13; Fig. 15, an under side plan of the machine, and Fig. 16 a detail horizontal sectional view as seen from the dotted line 16 16 in Fig. 3.

In said drawings, the portions marked A represent the main frame of the machine; B B′, carrying and driving wheels; C C′, the two parts of the axle; 1, 2, 3, 4, 5, 6, 7, and 8, a train of gears mounted and driven as will be presently explained; D, a chain belt driven from a sprocket on the wheel 6, and driving the "operating-wheel;" E E′, the two halves or disks of said operating-wheel; F, a slide or cross-head operated from said operating-wheel; G, a pitman connected to said slide; H, an arm operated by said pitman; I, a shaft carrying the arm H and other parts; J, a hand-lever on the shaft I, with a latch by which it may be thrown into engagement with the arm H; K, rigid arms on the shafts I, connected with the hoe-beams; L, said hoe-beams; M, a rod running also from the arm H and connecting to the dropping mechanism; N, a rock-shaft for operating said dropping mechanism; O, the seed-dropping plate; P, a treadle for shifting the relation of the gearing; Q, a shaft for driving the shifting mechanism; R, a worm-gear forming part of said shifting mechanism; S, the tongue of the planter; T, the furrowing plows or hoes, and U a pointer, whereby the accuracy of the work may be determined, or the necessity for adjustment observed, when it exists.

The main part of the frame A, I have shown as constructed out of tubular iron, but manifestly it may be formed in any desired manner. A longitudinal frame-bar A' of T-iron is shown as extending along the top, and another frame-bar A^2 of flat iron is shown as extending along the bottom, being connected at the front and rear ends of the main frame structure by the clips A^3. There are vertical downwardly-extending portions A^4 about midway of this frame, which carry the axles of the machine, and other vertical portions A^5, somewhat to the rear of the middle, extending upwardly, which carry the shaft I.

The wheels B B' are mounted upon the axle parts C C', and serve to carry the structure and drive the mechanism, as such wheels usually do. They are loosely mounted on the axles, so that they may revolve freely thereon when the machine is being transported from place to place without driving the mechanism. In order to drive the mechanism, clutches are provided, as shown in Fig. 4, and the clutch parts b b' are thrown into engagement when the mechanism is to be driven, by means of a lever b^2 or otherwise, and are thrown out of engagement when the machine is to be transported, as above described.

The axle is composed of two parts C C', the part C being driven, when the mechanism is in operation, from the wheel B and the part C' from the wheel B'. As shown most plainly in Fig. 9, the axle part C carries a bevel gear-wheel 1, while the part C' carries a bevel gear-wheel 2, these gear-wheels being respectively rigidly attached to said respective parts. The extreme inner end of the axle part C extends somewhat into the bore of the wheel 2, thus forming somewhat of a bearing therefor, and insuring that the two parts of the shaft or axle shall always be perfectly in line where they come together. Loosely mounted upon the part C, between the two gear-wheels 1 and 2, is a third gear-wheel 3, of somewhat larger size, and which is driven by having small gear-wheels 4, mounted in slots therein, the teeth of which engage with the teeth of the gear-wheels 1 and 2. When both the clutches on the wheels B and B' are engaged and the machine is moving steadily forward, the effect is the same as if the shaft C C' were a single solid shaft and the gear-wheel 3 rigidly attached thereto. When, however, as is often the case, after turning the machine, and sometimes in other cases, it becomes necessary to line up the machine, it may be easily done by throwing the clutch connected to one of the wheels B B' out of engagement, permitting the corresponding wheel to revolve loosely on the shaft until, by the revolution of one of the wheels 1 and 2 and the non-revolution of the other, the desired relation is restored; and while this is going on the small wheels 4 revolve on their shafts, as will be readily understood. This furnishes an excellent and efficient means for the purpose. The wheel 1 is extended somewhat, and becomes also a spur gear-wheel on its outer edge, for the purposes which will be presently explained. The bevel gear-wheel 3 engages with and drives the bevel gear-wheel 5, which, through the small gears 8, mounted therein, engage with and drive the main gear-wheel 6, from which much of the mechanism is driven. The gear-wheel 7 is generally stationary, being so held by the worm R, and the effect of the interposition of the small gears 8 during the time the wheel 7 is stationary is to drive the wheel 6 at a greater speed than if the wheel 3 were in direct engagement therewith. The operation of the worm-gear R will be explained hereinafter.

The chain belt D, as best shown in Fig. 10, is driven from the wheel 6, which has its upper edge extended so as to become a sprocket-wheel on said edge, and it runs to a sprocket-wheel or rim D', secured to the upper surface of the wheel E, and thus said wheel is driven, through said chain, from the wheel 6.

The operating-wheel is composed of the two halves E and E', mounted on an upright journal E^2, secured to the frame-bar A^2. The part E is in continual rotation, being driven by the chain belt D, as before explained. It has an annular groove e in its under surface, as plainly shown in Fig. 11, which receives the points e^3 e^4 of locks E^3 and E^4, mounted in the lower half E', whereby said lower part is caused to revolve with said upper part, as will be presently more fully explained. The lower part E' has a cam-groove e', as plainly shown in Fig. 15, and as indicated by the dotted lines in Fig. 12, which engages with and operates a cross-head or slide F, connected to the pitman G, as will be presently explained. The parts E and E' are caused to revolve together by the locking devices E^3 E^4, the points e^3 e^4 whereon extend up into the groove e in the upper part E, as before stated. These projections e^3 and e^4 are caused to impinge on the sides of the groove e by means of a spring E^5, which pulls them toward each other, as best shown in Fig. 12. When it is desired, however, that the planting shall cease, as while turning corners, &c., such result may be reached by operating the treadle E^6, which rocks the small rock-shaft E^7, on the end of which is a catch e^7, which is thus thrown into engagement with the projecting lock E^3, thus swinging said lock part E^3 around and distending the spring E^5, and disengaging the projection e^3 from frictional contact with the interior of the groove e, or so nearly so that the upper part E is permitted to continue to revolve without revolving the part E', and the planting operation is thus suspended. This is so that the machine in starting a row of planting may always be made to start evenly with preceding rows.

The slide or cross-head F is mounted upon the frame-bar A^2, and is operated from the part E' of the operating-wheel E by the cam-groove therein and a projecting wrist-pin (preferably bearing an antifriction-wheel f)

extending up from said slide or cross-head into said groove, as shown most plainly in Figs. 3, 15, and 16.

The pitman G is operated from the slide or cross-head F, and operates the arm H on the shaft I, as will be readily understood.

The arm H is, as shown most plainly in Figs. 3, 8^a, and 15, provided with a long sleeve or hub H^2, and is loosely mounted on the shaft I, but is adapted to be locked, and to move said shaft, together with such parts as are rigidly mounted thereon, as will be presently explained. It is also connected to and operates the rock-shaft N.

The shaft I is mounted in bearings in the upwardly-projecting portions A^5 of the frame A, and is adapted to remain stationary or to be rocked by the operation of the arm H. It bears the lever J, the arm J', which is connected thereto, and the arms K. The relation of these parts is best shown in Fig. 8^a, although their operation is illustrated better in Figs. 3, 4, and 8.

The lever J is mounted loosely upon the shaft I, which serves as a fulcrum for said lever. Its upper portion terminates in a handle, while it is surrounded by a sleeve J^2 near the shaft, having, as is best shown in Fig. 3, an engaging point or latch which engages with notches in the arm H of the hub H^2, this being operated by the usual auxiliary or latch-lever J^3, which is connected to said sleeve J^2 by a link j^2. Alongside this lever J on the shaft I is an arm J', which is rigidly secured to said shaft, and extends down, as shown in Figs. 3, 4, and 8^a, to about the same distance below the shaft I that the lower end of the lever J itself extends. A stop-pin j extends out from the lever J alongside the hub of this arm J', and is adapted to rest against a surface, formed for the pupose, next said hub. The lower ends are connected by a spring J^4, and the effect is that the lever J is normally held up to the position shown at all times, except so far as the same may be varied by the rocking of the shaft, although it is capable of being moved to a position more nearly approaching horizontal, in which case the spring J^4 is distended. The operation is, when the sleeve J^2 is down and its latch-point in engagement with a notch on the hub H^2 of the arm H, as shown in Fig. 3, that as the arm H moves backwardly it will rock the shaft I, rigidity of connection in this direction being transmitted from the arm J' through the lever J and said arm H to said shaft I, while as the arm H moves forward the other parts simply follow it to wherever the movement may be stopped by other means, the only force usually exerted in this direction being the tensional pull of the spring J^4.

The arms K are rigidly attached to the ends of the shaft I, and are connected by links K' to the beams L of the covering plows or shovels. These links K' are preferably formed in two parts, which parts are adjustable on each other, so that their length may be varied, as shown (see particularly Fig. 8) and as will be readily understood. Obviously, when the shaft I is rocked by the backward movement of the arm H, these beams L are raised, while during the forward movement of said arm H they are permitted to descend.

The plow-beams L are connected to suitable elbows or clips L' by pivots l, and said elbows or clips are connected to the frame A. Said plow-beams carry upon their rear ends the covering hoes or plows L^2. In the operation of these plows or hoes resides one of the peculiar merits of my invention. The mechanism is so timed that the raising of the hoes occurs just at the point where a hill of seed has been planted. Briefly, the operation is that the seed is first deposited in the ground by the dropper, in the furrow or trench formed by the furrowing hoe or plow T, and is then covered somewhat and the ground impacted by the wheel passing over it, and afterward these covering hoes or plows L^2 hoe and break up the smooth surface left by the wheels, thus precluding the caking of the earth, which often occurs, under the operation of rain and sun, on such smooth surfaces. This operation, if continued, would obviously be to dig up the seed which has just been planted; but by means of the mechanism H, I, J, J', K, and K', operating as described, these hoes are lifted as they come to each hill of seed and the loosened earth is thus deposited in hills or heaps above the seed, thus adding to the slight covering before made by the wheels a heap of loosened earth. The raising is but momentary, just enough to pass the hill of seed, when the hoes are dropped for further similar operation. By this arrangement I achieve a leading object of my invention, which is, as before stated, to pack the earth closely around the seed, and at the same time secure that it shall be covered by a sufficient quantity of loosened or pulverized earth. A further object is accomplished, *i. e.*, that the hills are rendered conspicuous and easily visible, so that they may be kept in "check," or even cross-rows, by observation, aided by my pointing or indicating devices, which will be presently described.

The rod M is also connected to the arm H, and extends forward and operates the rock-shaft N. This rod is preferably divided into two parts, which may be disconnected, and the rock-shaft N and parts driven thereby thus thrown out of operation. This is best illustrated in Figs. 6 and 7. As shown in Fig. 7, a standard M' is secured to and extends up from the frame cross-bar A^6, and is provided with one or more notches on its upper edge. A bell-crank lever M^2 is mounted on a stud m' extending out from this standard. The upper end of this lever is a handle, and the lower end has a side projection which extends under the forward half of the rod M. Near the upper end of this lever a stud m^2 is placed, which projects upon the side where the standard M' is, and is adapted to drop into one of the notches in the upper edge of said standard. Said lever is slotted where it passes over the stud m', and this enables said lever M^2 to be raised sufficiently to enable the stud m^2 to engage with either of the notches in the upper end of the standard M'. By raising this lever and swinging it backward, the forward half of the rod M will be raised out of connection with the rear half, as indicated by the dotted lines in Fig. 7, and the operation of the shaft N and the parts connected thereby will then, of course, cease. This is so that when the edge of the field is reached seed-dropping may be stopped in time, so that the last hill dropped may be covered by the covering mechanism, thus avoiding the wasting of seed, which would otherwise occur.

The shaft N is a rock-shaft and is mounted at the forward portion of the machine on arms N^2, which are connected to the shovel-bars S', and is operated from the arm H through the rod M, which connects to an arm n on said rock-shaft.

The dropping-plate O is or may be of a usual and well-known form, and is at the bottom of the seed-box O', while the orifices therein are above the seed-spout O^2. Said dropping-plate O is revolved by means of a slide O^3, driven from the rock-shaft N by a rod N', connected to an arm n' and carrying a pawl o^3, which engages with notches in the edge of said plate. A stationary pawl o prevents said plate from receding in any case. Each of these pawls o^3 and o is provided with a spring by which it is held into engagement. The seed-tube O^2 leading from the dropping mechanism is similar in most respects to ordinary seed-dropping tubes, and serves substantially the same purposes. Its construction, however, is somewhat different. Its point is composed of two plates which normally come close together, the rear plate o^2 being a spring-plate and adapted to be forced apart from its fellow. The rear side of the tube O^2 is in the form of a slide O^4, which passes inside this spring-plate o^2 at the bottom end, and inside a suitable guide o' on the seed-box O' at the upper end, and is adapted to be driven up and down from an arm n^2 on the rock-shaft N and the link o^4, which connects said slide O^4 to said arm n^2. The operation is that the seed which is dropped into the tube falls to the bottom thereof, where it is held between the spring-plate o^2 and its fellow until the slide O^4 descends, and, forcing the spring-plate open, drives the seed through and out of the tube, whence it falls into the ground. By this means an absolutely accurate depositing of the seed may be secured. In order that the moment of dropping may be rendered certainly apparent to the operator, I have provided a bell O^5, which is adapted to be operated by an arm o^5 on the shaft N just at the instant the plunger O^4 forces the seed through to the outside. Observation of the pointer U and the sound of the bell will indicate certainly the relation of the seed being planted to the hill which has been planted.

The treadle P is mounted on bearings on the frame cross-bar A^6, and is connected by means of a rod P' to a lever P^2, containing a bearing for a shaft P^3, and this shaft carries two small bevel-pinions p p'. By operating said treadle P this shaft can be thrust endwise in either direction, and the pinions thereon brought into engagement with the bevel gear-wheel q on the shaft Q.

The shaft Q is driven directly from the spur-teeth on the gear-wheel 1, which engage with a corresponding spur gear-wheel 9 on said shaft Q, and said shaft Q is in continual rotation as long as the axle or main shaft is. Consequently, when either of the pinions p or p' is thrown into engagement with the gear-wheel q, the shaft P^3 is revolved in one direction or the other, according to which of the pinions is thrown into engagement, as will be readily understood.

The worm-gear R is mounted on a shaft R', which, as clearly shown in Fig. 5, is held from endwise movement by its bearings, between which said shaft is shouldered or provided with collars. As also shown in said figure, said shaft is hollow, and the end of the shaft P^3 extends into it, while a pin p^3, extending out from said shaft, engages with a slot in the shaft R'. The shaft R' and worm-gear R are thus revolved whenever the shaft P^3 is, but said worm-gear and its shaft do not partake of the longitudinal movement of said shaft P^3. The worm-gear R engages with worm-teeth on the edge of the gear-wheel 7, and, when said worm-gear is at rest, said gear 7 is held stationary, and the operation heretofore described of said wheel 7 is its only operation. When, however, the worm R, by the means described, is set in motion, it revolves this wheel 7 and thus changes the relation of the parts. The object of this is that when the alinement of planting is lost, as it may frequently be, in turning the machine and otherwise, it can be restored by throwing this gearing into operation, which causes the operating-wheel E E' to be more slowly or more rapidly revolved than in the ordinary operation until the pointer indicates that the alinement of planting has been overtaken.

The tongue S is hung pivotally on the forward member of the frame A, and, in itself, is free to swing up and down thereon. It is held in line by the combined braces and hoe-bars S', which extend back and connect, one branch to the hoes or plows and another branch to the same member of the frame A to which the rear end of the tongue itself is connected. Rigidly secured to the tongue S is a lever S^2, which extends back over the machine to substantially midway thereof, and passes through a segment-shaped holder S^3, which latter is secured to the frame-bar A'. A small catch-lever S^4 is connected to the lever S^2, and is provided with two engaging points, as shown, one of which is adapted to engage with the adjustable block S^5 and hold the lever down in the position shown in the drawings and maintain the machine in operative position, and the other of which is adapted to engage with a notch s^3 in the upper part of the segment-shaped holder S^3, and when the machine is thrown into this condition its frame is out of level, that part of the frame to which the tongue is pivoted being raised so that the frame and tongue form an obtuse angle in relation to each other, which will manifestly raise the furrowing plows or hoes out of contact with the ground. At the same time, by proper manipulation of the lever J, the rear or covering hoes or plows may also be raised, and, the operating mechanism being disconnected, and the wheels B B′ out of engagement, the machine is in position for transporting, with all the mechanism at rest. Adjustment of the catch-block S^5 causes the furrowing-hoes T to penetrate the ground more or less deeply.

The furrowing hoes or plows T are ordinary pointed shovel-plows of a common or any desired construction, and are mounted upon the downwardly-curved portions of the hoe-bars S′ by suitable ordinary devices, including, preferably, break-pins t. The seed-tubes O^2 are held in position by hooks or similar devices T′, extending from these hoe or plow shanks, below the break-pins, with suitable eyes on said seed-tubes. The seed-tubes being pivotally or flexibly mounted, the operation is, should the hoes come in contact with any obstruction and the break-pins be broken, that the hooks T′ would be disengaged and the seed-tubes themselves swing back to whatever extent required, without any damage to the parts. These hoes T are arranged directly in front of the wheels B B′, and are designed to make a shallow furrow in which the seed may be dropped, the seed-dropping tubes being arranged directly behind them and between them and the wheels. When the lever S^2 is operated, as above described, these plows or furrowing-hoes are raised out of operative position.

The pointer U is a rod which extends out from one side of the machine, the distance of the width between two rows as they are being planted, and bends down to near the surface of the ground, the point being adjusted to be exactly opposite the point of the seed-dropping tube, so that, if the end of said pointer is above a hill which has already been planted, and the mechanism has been properly adjusted as to timing, the seed is sure to be dropped in line with such previously-planted hill. As before stated, the hills are rendered visible by the operation of the covering-hoes, and the mechanism can easily be brought into proper relation by means of the worm-gear R and its connected devices, so that occasional observation on the part of the operator, with suitable corrections of the operating-wheel position made from time to time, secures absolute uniformity in the matter of arrangement of the hills and rows, without any of the devices usually denominated "check-row" mechanism. As shown in Fig. 2, a small arm u extends down from the main pointer, and to this arm a spring U′ is connected, and, the pointer being mounted to move yieldingly to the rear, if its lower end shall come in contact with a clod or other obstruction it will yield and pass over it without being bent, and when it has passed will be returned to proper position by the spring.

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

1. The combination, in a planter, of the framework; an axle carrying the driving mechanism, mounted on said framework and formed in two parts; the driving-wheels mounted on the axle, and suitable clutches whereby said driving-wheel may be caused to drive the axle when said clutches are engaged, or permitted to run loosely on the axle when disengaged, substantially as and for the purposes set forth.

2. The combination, in a planter, of a normally fixed but adjustable gear-wheel; a revoluble gear-wheel; a loosely-mounted driving-wheel between the two, and small intermediate gear-wheels mounted in said driving-wheel and engaging with the two first-named gear-wheels, whereby the revoluble gear-wheel is given a greater speed than the driving gear-wheel, substantially as set forth.

3. The combination, in a planter, with the other planter mechanism, of an operating-wheel consisting of two disks E and E′, one of which is constantly driven in operation, and is provided with a suitable engaging surface; and the other of which revolves upon the same axis, is provided with suitable locking devices engaging with the engaging surface of the first, and devices for disengaging said locking devices upon occasion, and also with a cam-groove engaging with the mechanism to be driven; whereby, by operating said locking devices, the mechanism can be thrown into and out of operative condition, as may be desired.

4. The combination, in a planter, with an operating-wheel composed of two disks provided with engaging devices whereby they may be caused to rotate together; of a rock-shaft E^7 having a catch e^7 and a treadle or other suitable operating device E^6, whereby said engaging devices can be thrown out of operation and the movement of that disk immediately connected to the planting mechanism of the planter stopped, substantially as set forth.

5. The combination, in a planter, of the operating-wheels having a cam-groove; a slide or cross-head mounted on the frame-work, and provided with a projection which engages with said groove; a pitman connected to said slide or cross-head and to a

loosely-mounted arm H on a rock-shaft I; said rock-shaft; a lever on said rock-shaft alongside the hub of said arm, and a latch on said lever adapted to engage with said hub or be disengaged therefrom, substantially as set forth.

6. The combination, in a planter, of a rock-shaft I; a loosely-mounted arm thereon, connected to the operating mechanism; a loosely-mounted lever on said shaft alongside the hub of said arm, and carrying a latch by which engagement may be made with said hub; a second arm fixedly mounted on said shaft alongside said lever, with a pin j projecting from said lever to in front of a suitable bearing-face on said arm; a spring connecting the lower end of said lever and the lower end of said second arm, and other arms on said rock-shaft connected to the plow-beams, whereby the plows may be raised at predetermined periods by the rocking of said shaft, and then permitted to fall, substantially as set forth.

7. The combination, in a planter, of hinged plow-beams carrying covering plows or hoes; a rock-shaft having fixedly-mounted arms; links connecting said arms and said plow-beams, and mechanism for rocking said shaft, whereby the covering plows or hoes may be periodically raised, substantially as set forth.

8. The combination, in a planter, with the operating mechanism, and the planting mechanism, of a rock-shaft for immediately operating said planting mechanism; an arm thereon; and a connecting-rod M, connecting said operating mechanism to said arm, said connecting-rod being divided and detachably coupled together, and a lever whereby one part of said rod may be detached from the other, and the planting mechanism thus disconnected from the operating mechanism, substantially as shown and described.

9. The combination, in a planter, of the operating mechanism; the planting mechanism; the connecting-rod M running from said planting mechanism to said operating mechanism, and formed in two parts; the standard M′ provided with notches in its upper edge and a stud m', and the bent and slotted lever M^2 mounted on said stud and provided with a stud or pin m^2 adapted to engage in said notches, substantially as and for the purposes set forth.

10. The combination, in a planter, with the operating mechanism embodying a normally stationary gear-wheel having a worm-wheel embodied in or connected thereto, of a worm engaging therewith whereby it is held to its normally-fixed position, and mechanism whereby said worm may be periodically driven and the normally-fixed gear put in motion, thus changing the relation of the parts, substantially as and for the purposes set forth.

11. The combination, in a planter, with the driving mechanism embodying a normally-fixed gear-wheel provided with or connected to a worm-gear portion; of a worm R engaging therewith and mounted on a revoluble shaft not capable of longitudinal movement; a driving-shaft connected thereto and capable of both longitudinal and rotary movement; pinions on said last-named shaft, and a constantly-revolving shaft having a gear-wheel with which said pinions are adapted to be engaged as the shaft bearing them is moved longitudinally in one direction or the other, and means for longitudinally moving the shaft bearing the pinions, substantially as set forth.

12. The combination, in a planter, with the framework and planter mechanism; of a tongue S hinged to said framework, a lever S^2 fixedly secured to said tongue, a segment-shaped holder with which said lever may engage, and wings or braces extending from said tongue back to the framework and having branches which carry the furrowing shovels or hoes; whereby, by raising said lever, the forward end of the framework is raised, and said furrowing shovels or hoes lifted from the ground, substantially as set forth.

13. The combination, in a planter, of a tongue and hoe-beams rigidly attached and pivoted at the front end of the machine; a lever rigidly connected thereto, a lever-holder, a catch thereon, and an adjustable catch-plate with which said catch is adapted to engage; whereby the depth to which the furrowing-hoes shall penetrate the ground may be adjusted, substantially as set forth.

14. The combination, in a planter adapted to form visible hills, of a pointer extending out over such hills, a positive operating feeding device for the seed, and an audible indicator whereby the instant of planting is made manifest, substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 29th day of September, A. D. 1894.

ELKANAH MOON. [L. S.]

Witnesses:

CHESTER BRADFORD,
JAMES A. WALSH.