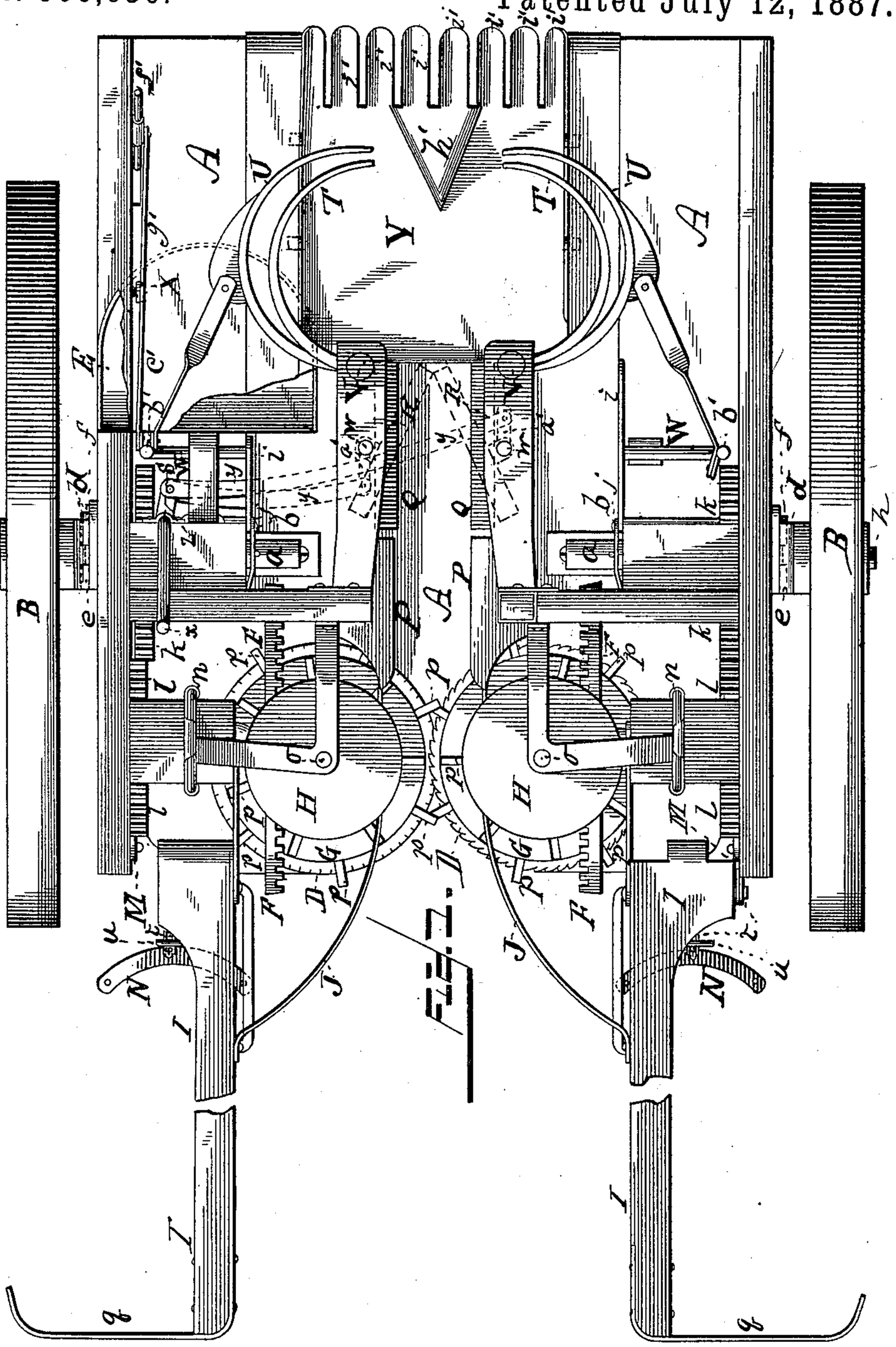
(No Model.)

5 Sheets—Sheet 1.

J. K. O'NEIL.

CORN HARVESTER.

No. 366,636. Patented July 12, 1887.



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(No Model.) 5 Sheets—Sheet 2.

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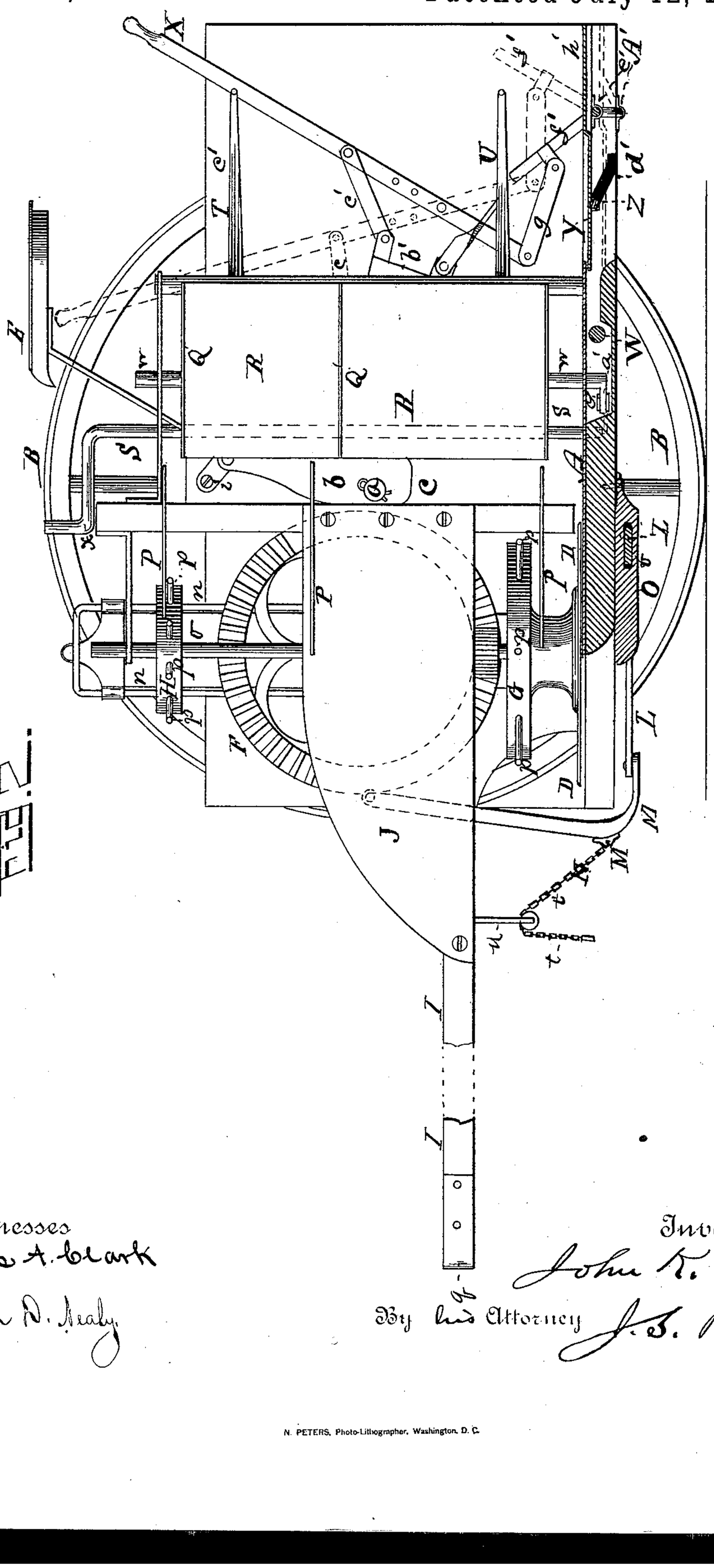

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(No Model.) 5 Sheets—Sheet 3.

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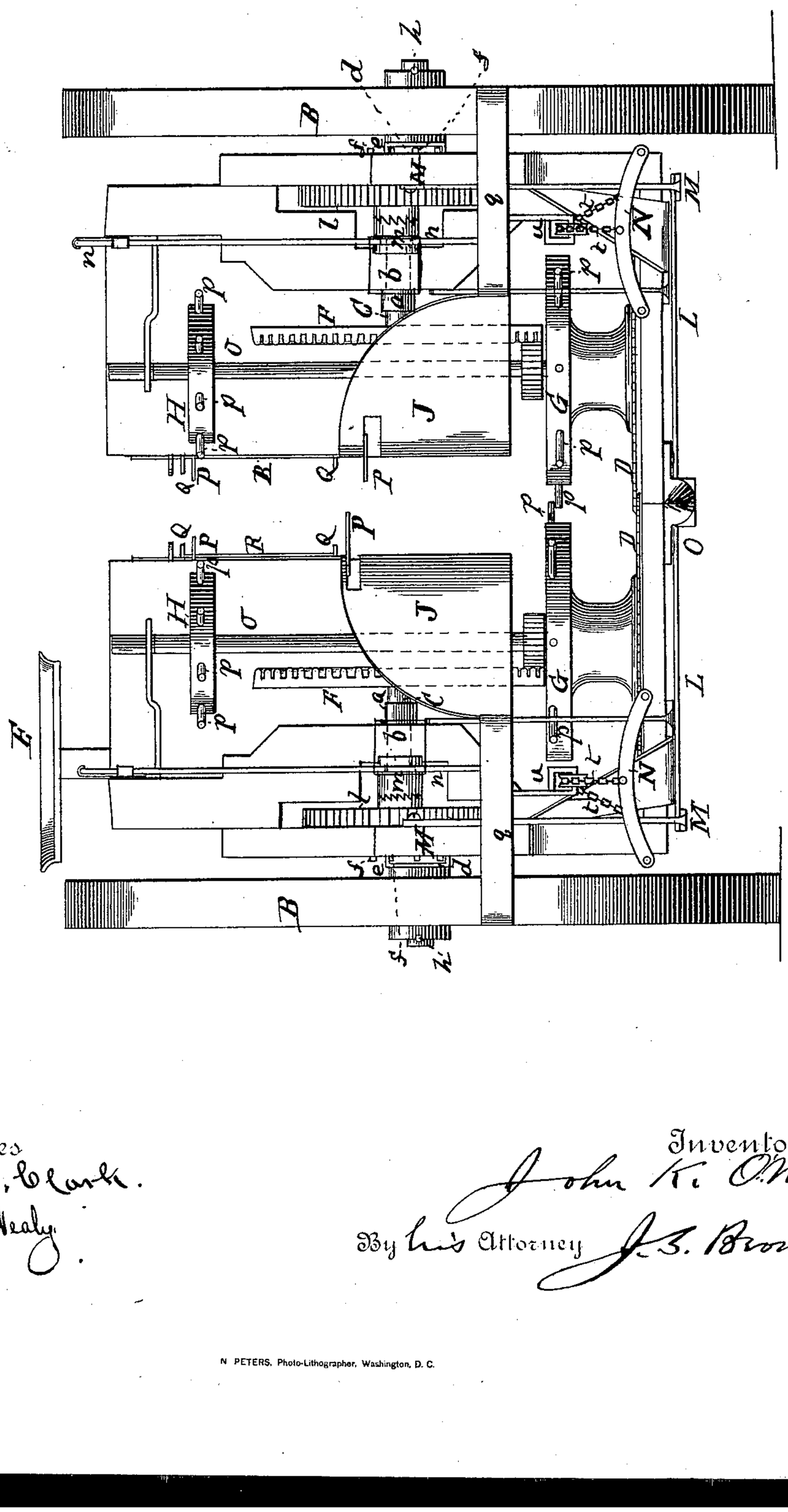
Fig. 2.



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(No Model.) 5 Sheets—Sheet 4.

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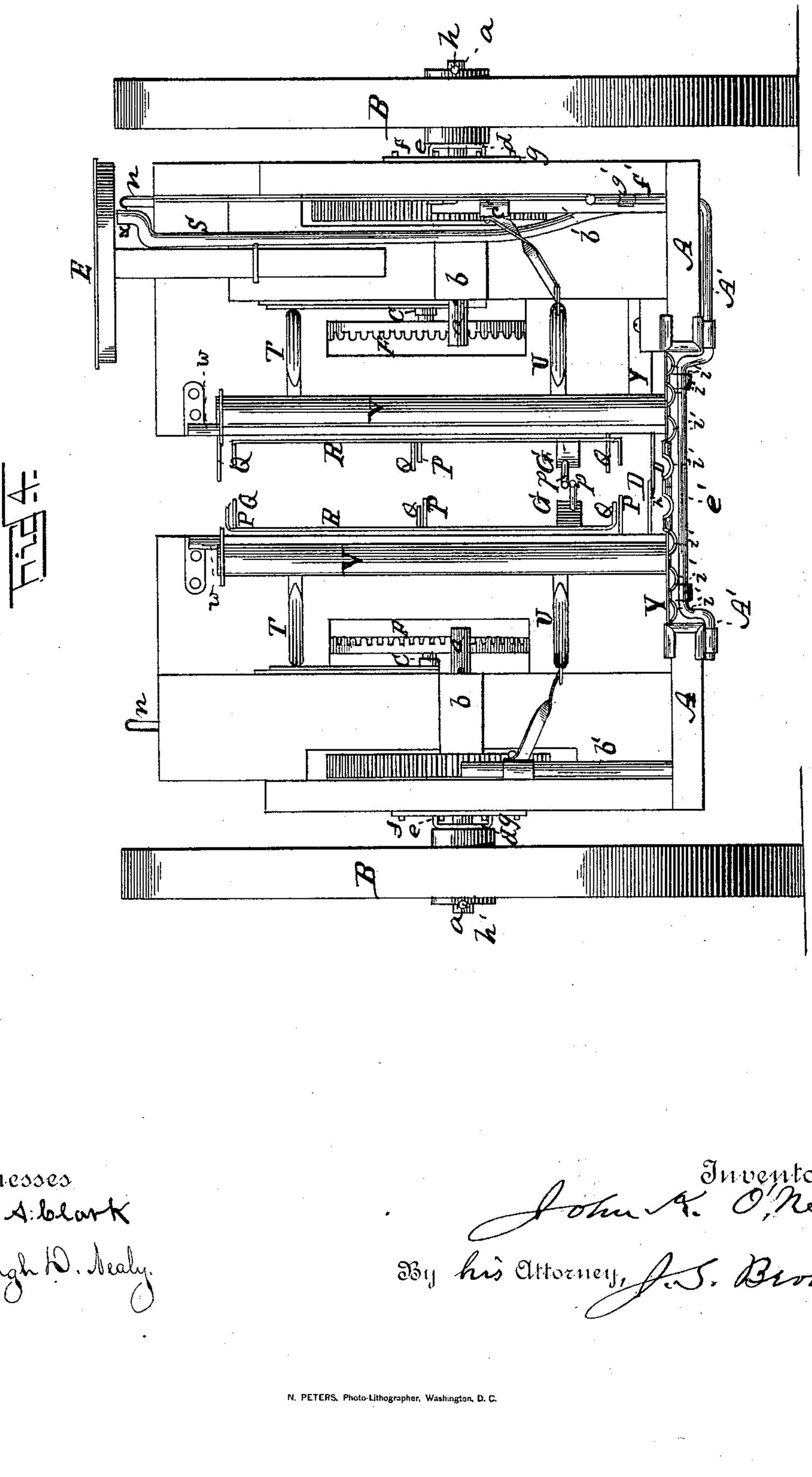
No. 366,636. Patented July 12, 1887.



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(No Model.) 5 Sheets—Sheet 5.

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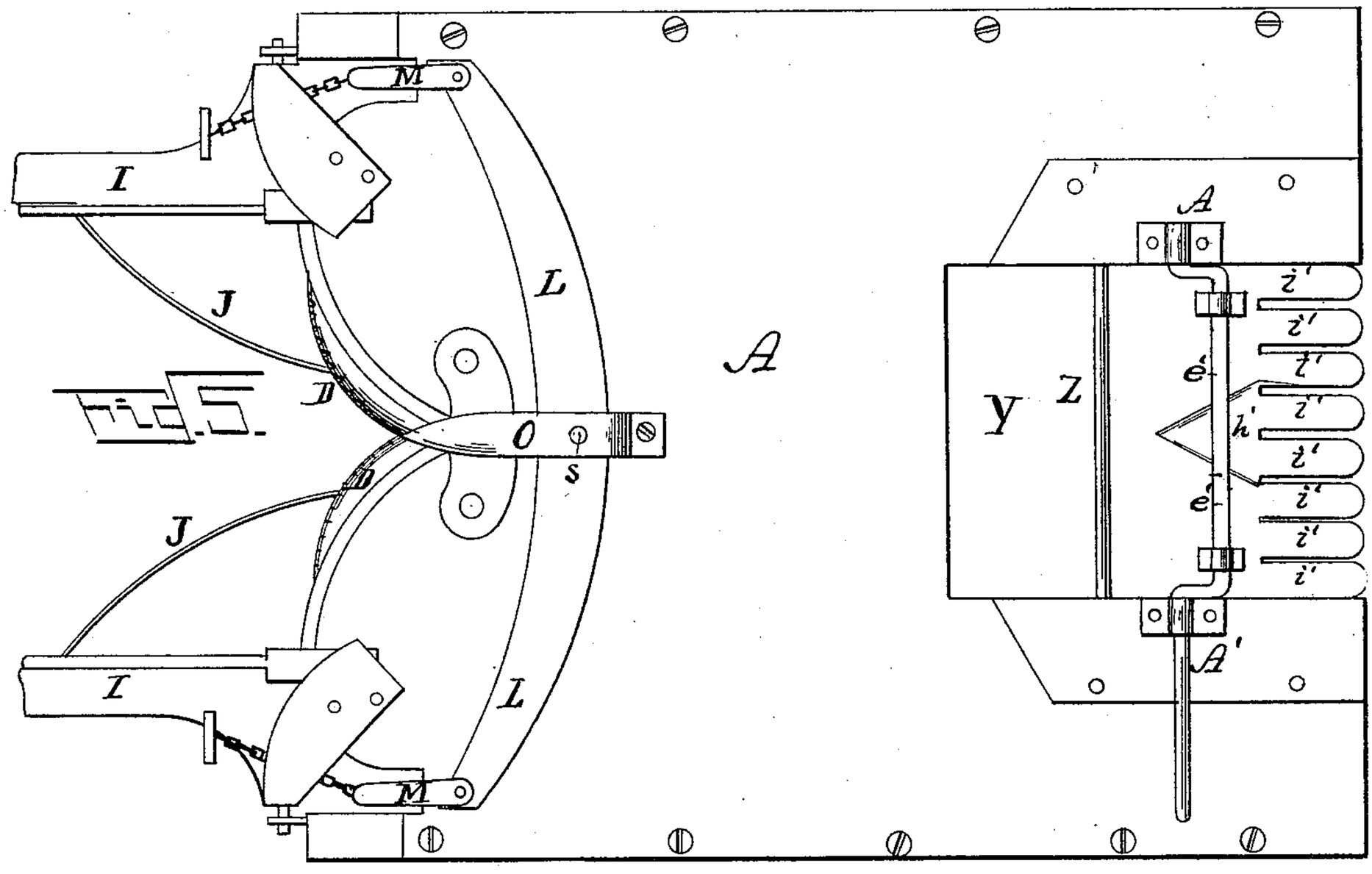


FIG. 6.

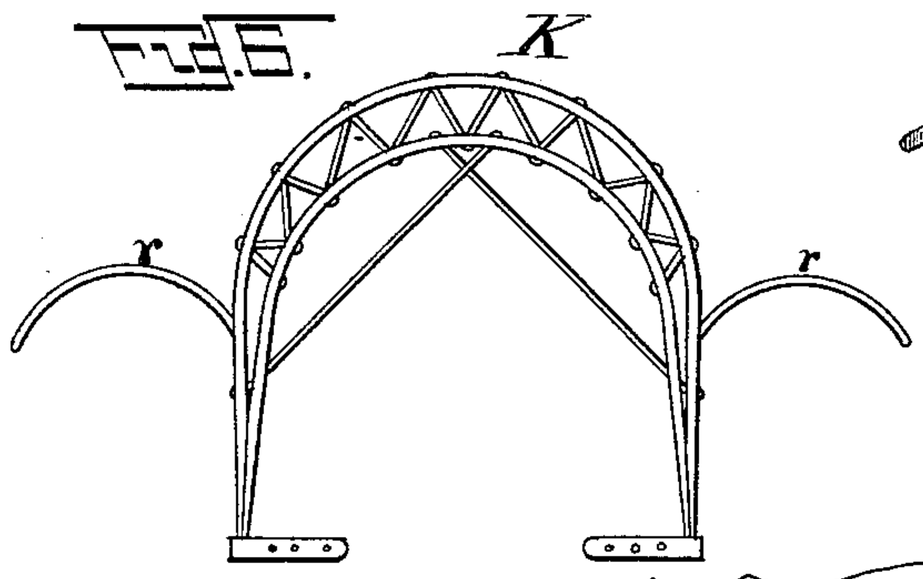


FIG. 7.

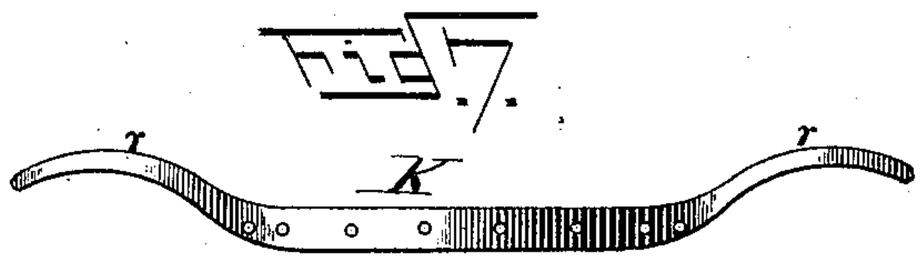


FIG. 8.

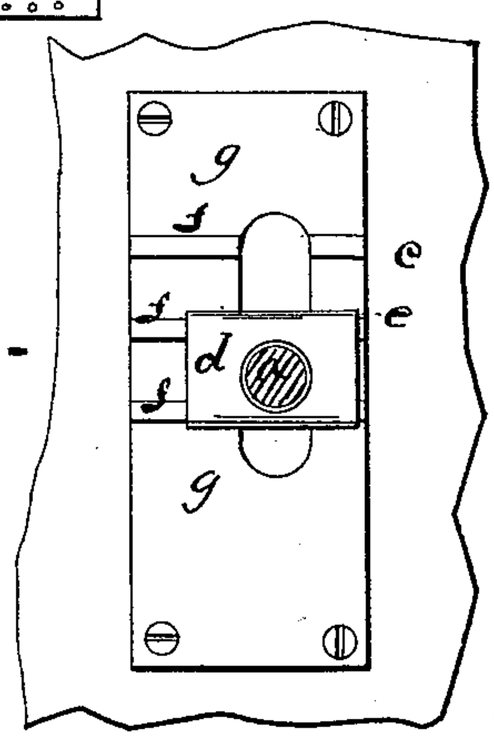
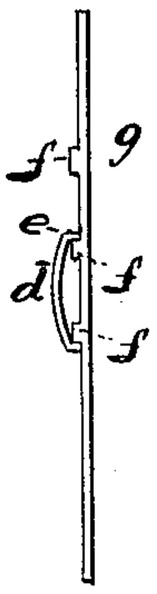


FIG. 9.



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UNITED STATES PATENT OFFICE.

JOHN K. O'NEIL, OF POUGHKEEPSIE, NEW YORK, ASSIGNOR OF ONE-HALF TO DORSEY NEVILLE, OF SAME PLACE.

CORN-HARVESTER.

SPECIFICATION forming part of Letters Patent No. 366,636, dated July 12, 1887.

Application filed May 8, 1886. Serial No. 201,513. (No model.)

To all whom it may concern:

Be it known that I, JOHN K. O'NEIL, of Poughkeepsie, in the county of Dutchess and State of New York, have invented an Improved Corn-Harvester; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, making part of this specification.

The leading object of my invention is to seize the corn as it stands in rows, cut off the stalks at the required height from the ground, retain all the stalks in an upright position while moving them back over the platform of the machine into a receptacle preparatory to binding them in shocks, to hold them in an upright position while they are retained in the binding-receptacle, and finally to discharge the bound shocks upon the ground in an upright position, where they may remain as long as required without any subsequent handling whatever. The means employed to perform the movements necessary to this result, as organized in this machine, and various specific improvements, which will be hereinafter specified, constitute my invention.

In the accompanying drawings, Figure 1 represents a top view of my machine; Fig. 2, a central vertical section thereof from front to rear; Fig. 3, a front view of the same; Fig. 4, a rear view thereof; Fig. 5, a bottom view of the same; Fig. 6, a side view of an improved yoke used in connection with the machine, so as not to interfere with the passage of the standing corn between the horses; Fig. 7, a top view of the same; Fig. 8, a partial side view of the frame, showing, also, one of the wheel-shafts in cross-section; Fig. 9, a view of a part detached.

Like letters designate corresponding parts in all of the figures.

The operative parts of the machine being mounted on a suitable platform, A, which is carried by two wheels, B B, which also operate the cutters and other mechanism as the machine is drawn along, the two short shafts *a a*, to which the wheels are respectively coupled, run in bearings *b b*, which are adjustable up and down on or in suitable uprights, *c c*, of the frame, in order that the cornstalks may be cut at any desired height above the ground, according to the growth or condition of the corn or the smoothness or roughness of the ground. There is one feature in my means of effecting this adjustment of the shafts which adds to the strength and steadiness of the parts employed in this portion of the machine. This is shown in Fig. 8. The outer part of each bearing has an extended flange or plate, *d*, which has an inwardly-turned lip or lips, *e*, as shown in Fig. 9, this lip resting upon a ledge or projection, *f*, on the frame, or upon a slotted plate, *g*, attached to the upright of the frame and serving as a guide to the wheel-shaft or its bearings as the platform is adjusted up or down. When the platform is to be adjusted, each wheel may be moved a little outward on its shaft after removing its linchpin *h*, so that the flange of the bearing may be moved over the ledge of the frame to another ledge or projection, on which it may rest. There may be several of these ledges at different heights, as shown in Fig. 8. The shaft-bearings may be raised or lowered by any suitable means, such as the lever *i*. (Shown in Fig. 2.)

I have represented in the drawings additional driving-shafts C C, which are driven by the wheel shafts through gear-wheels *k l* on the respective shafts; but I may operate the cutters D D directly from the wheel-shafts. The gear-wheel *l* on each driving-shaft C is made to run loose on the shaft or to be coupled thereto at will. When the machine is drawn along where there is no corn to be cut, it is of course desirable to not have the cutter and other operative parts in motion, and then the said gear-wheels are to be loose on their shafts. Any suitable clutching and unclutching device may be used. I have shown a sliding clutch-sleeve, *m*, on each shaft, matching the clutch-teeth on each wheel-hub, and a pivoted clutch-lever, *n*, taking into a groove of the clutch-sleeve and reaching up to a position where it can be reached conveniently by the driver as he sits on the seat E.

A driving crown-wheel, F, is attached to each driving-shaft C, and gears into a pinion on one of the shafts *o o* of the two revolving cutters D D for rotating the said cutters at the required speed. These shafts *o o* are vertical, and carry, besides the cutters at the bottom, also two pairs of feed disks or cylinders, G G

and H H, the former pair being located down near the cutters D D to feed along the butts of the cornstalks, and the latter being near the upper ends of the shafts and at a proper height to feed along the tops of the cornstalks evenly with the butts.

The several feed disks or cylinders are armed with radial pins or teeth *p p p*, those on one disk or cylinder projecting far enough, if desired, to reach to or lap beyond the sweep of those on the adjacent disk or cylinder; and in the latter case the pins on one disk or cylinder are above those of the other, as shown in Fig. 3, so that the teeth of one may not strike those of the other disk or cylinder. The disks or cylinders of each pair are sufficiently far from each other to allow the cornstalks to pass freely between them.

The cutters D D are preferably made with sickle-edges and of simple circular or disk form, one lapping over, but in close proximity to or in contact with, the other. The sickle-teeth are on the upper side of the upper cutter and upon the lower side of the lower cutter, so that the smooth sides of the cutters may be in contact with or next to each other.

Two tongues, I I, are employed for guiding and controlling the machine, and they are situated at a sufficient distance apart, as shown in Fig. 1, to embrace a row of standing corn, and they first direct the corn toward the cutting and feeding disks or cylinders. Then, from a position on the inside of each tongue, near its rear end, as indicated, extends a guide, J, gradually approaching the central line as it extends backward, so that the two guides bring the cornstalks into a central position between the cutters and feed disks or cylinders, where they will be cut and then directed backward over the platform of the machine. Outside of the tongues the horses travel, each tongue having an outwardly-turned arm or yoke, *q*, to which the harness is attached to keep the horse in position. Thus the horses, traveling on the two sides of the row of corn to be cut, do not interfere with the free passage of the corn to the machine. In order further that both horses may be guided by one pair of reins, and these not interfere with the corn, the heads of the horses are connected by an arched yoke, K, attached to the horses' heads by arms *r r* resting on the horses' necks, and by buckles connected with an ordinary headstall or by a headstall belonging to the yoke itself for this purpose, or by any other suitable means, this yoke reaching above the corn, or sufficiently high to not interfere injuriously with the passage of the corn. The yoke is to be made light in order to burden the horses' heads as little as possible; and for this purpose it is made in trussed or skeleton form, as shown, and in the lightest manner. Brace-rods also connect the sides of the arch, so that the yoke may not spread or contract. Thus the horses' heads move together as one, and both can be guided as well as one with a single pair of reins.

The doubletree L, by which the machine is drawn, is located under the platform A of the machine, and is pivoted at *s* centrally thereto. In this way only can a doubletree for two horses be used with the machine; and since the platform is low and the doubletree beneath it, the draft of the horses upon it tends to press its ends upward against the platform and to bind or produce friction and wear thereon. To obviate this objection, I connect with the doubletree, at each end of the same, a long brace-arm M, pivoted to the side frame of the machine as high up as practicable, and thence extending downward in front of the platform and backward beneath the platform till it reaches the doubletree. Its lower end is pivoted to or connected with the end of the doubletree. The points of suspension of these braces are so high that their lower ends swing nearly in horizontal lines as the doubletree vibrates, and thus they keep the doubletree out of contact with the platform. Chains *t t* extend from the lower ends of these brace-arms or from the doubletree forward and upward through guide-loops *u u*, and have singletrees N N respectively attached to their forward ends for the horses to draw by.

In order to protect the cutters D D from injury by any stump, stone, or other obstruction on the ground, I employ a guard, O, peculiarly situated, as shown in Figs. 2 and 5. It consists of a narrow or somewhat pointed finger, the forward end or point of which is in a position just below the cutting-point where the two cutters meet, not reaching far enough forward to interfere with the cornstalks before they are cut off. The guard is bolted by suitable flanges to the under side of the platform.

It is desirable to obstruct the under side of the platform as little as possible, and therefore to have the guard and doubletree occupy as little space as may be below the platform; and to make all firm and strong as against obstruction and violence, the guard has an extension-arm, *v*, reaching backward under the platform and notched at its upper side to admit the doubletree, which is pivoted to the said arm.

The guides J J, which extend from the tongues back to the cutters and feed disks or cylinders, about midway between the upper and lower pairs of the said disks or cylinders, also extend back somewhat beyond the same until they reach other guides, P P P, three pairs being shown at different heights. These guides are preferably made of thin plates, as shown, and placed in horizontal positions, so that their edges are presented to the cornstalks passing between and produce a minimum of friction. This arrangement of the guides also permits the undetached ears of corn to swing to one side and thus facilitate the passage of the severed stalks to the rear. They are also usefully thus formed and arranged in order more conveniently to connect with them a set of movable cut-off guides or holders, Q Q Q, also made of horizontally-

arranged plates mounted on cut-off gates R R R, hinged on vertical pivots *w w*, so that the gates may be held open and parallel, and let the cornstalks pass freely back to the receptacle, as shown by full lines in Fig. 1, or may be closed together at the rear end, as shown by dotted lines in the same figure, and thus prevent the passage of the cornstalks to the receptacle, as when binding the shocks. The gates are pivoted near the middle, so that as the rear edges are brought together to close the passage the forward edges are correspondingly separated, thereby affording room to receive a little accumulation of stalks while binding a shock. The gates are turned to effect these movements by means of a vertical rock-shaft, S, having a handle, *x*, and connecting-rods *y y*, reaching from a crank, *z*, on the said rock-shaft to cranks *a' a'*, respectively, on the two pivot-shafts *w w* of the gates, or by any suitable or equivalent means.

The binding-receptacle, in which the cornstalks are retained until a sufficient number of them has accumulated to make a shock or large bundle, is composed of four or more curved arms, T T and U U, secured in pairs, respectively, on two vertical rock-shafts, V V, arranged substantially as shown, the upper pair, T T, near the upper ends thereof, being shorter or inclosing a smaller space than the lower pair, U U, near the lower ends of the rock-shafts. The reason for making the upper arms shorter than the lower arms is because the cornstalks are smaller at the top and can be compressed into smaller compass, where they are to be bound, than the butt-ends, and because it is desirable to allow the lower part of the shock to spread out and form a base of a cone, in order that it may stand firmly on the ground after being discharged from the machine. The curved arms are to be nearly or quite closed together at their rear extremities, as shown by full lines in Fig. 1, to hold the cornstalks in the receptacle while filling the same, and then to be separated widely, as shown by dotted lines in the same figure, when the shock is to be discharged rearward from the machine. The movements necessary to bring these arms to the two positions may be effected in various ways. I have shown a simple and convenient means for the purpose, consisting of a horizontal rock-shaft, W, having arms *b' b'* projecting upward from its two ends, and of rods connecting these two arms respectively with the lower pair, U U, of curved arms, as shown most clearly in Fig. 1, so that by rocking the shaft W to the proper extent the movements are effected. Since the lower pair of curved arms are thus moved out or in, the shafts V V are oscillated, and, consequently, the upper curved arms are moved simultaneously with the lower arms. The shaft W is or may be rocked by means of an upright lever, X, pivoted to the side frame of the machine and connected by a connecting rod or bar, *c'*, with one of the upwardly-projecting arms *b' b'* of the said shaft. This rock-shaft W and bar X may also be employed to give the proper movements to the discharging-table Y, on which the stalks rest in the receptacle, for discharging the bound shocks upon the ground. This table is held substantially in a horizontal position while the stalks are accumulating in the receptacle and until the stalks are bound. A compound movement is then given to the table—namely, a downward movement, a backward movement, and a rearward tilting movement. The downward movement is for the purpose of bringing the stalks as close to the ground as practicable before they are discharged; the backward movement is for giving a backward throw to assist in discharging the shocks by a backward momentum while the machine itself is moving forward, and the rearward tilting movement renders the discharge easy. The combined movements let the shock down upon the ground in an upright position, as required, without failure. Now, to impart these combined movements to the discharging-table, I have employed two supports for the same, one consisting of a cross-rod or pair of pivots, Z, near the front end of the table, sliding laterally in rearwardly-inclined slots *d' d'* in the adjacent edges of the platform A, which is cut away for the reception of the discharging-table, and the other support, consisting of a crank-shaft, A', extending across and having bearings in the platform, while the crank part *e'* under the discharging-table has bearings in or under the same. This crank-shaft has an upwardly-extended arm, *f'*, which is connected by a rod, *g'*, with the lever X, above described. The arrangement of the crank-shaft A' is such that by bringing the crank *e'* into its highest position, not only is the rear part of the table raised to its highest position, but the pivot-rod Z is raised to the forward and highest end of the inclined slots *d' d'*, thus bringing the table into a horizontal position. Then for discharging the shocks the crank *e'* is turned backward and downward, thereby not only lowering the rear end of the table, but drawing the table backward, and the pivot-rod Z down the inclined slots *d' d'*. The crank *e'* is made of sufficient size or eccentricity to lower the rear end of the table as much as required to give the proper inclination to the table. Thus all three of the movements above set forth are produced by the turning of this crank-shaft.

It being important that the bottom of the shock shall be well spread out, I provide for the spreading of the same as the shock is discharged from the table Y. For this purpose the upper surface has a wedge-shaped ridge or raised surface, *h'*, Fig. 1, with the apex pointing forward, the action of which is obviously to spread apart the stalks of the shock as the same slides backward over the platform. Any desired form or arrangement may be given to this raised ridge to effect the purpose.

The rear end of the table Y is formed with fingers *i' i'* and narrow spaces between, through

which the butts of the stalks may project to touch the ground and produce friction or resistance, which will assist the discharge. The upper surfaces of these teeth are preferably made concave or longitudinally hollowed to direct the stalks backward. These teeth are preferably of nearly uniform width from end to end, and the spaces between them also of uniform width from front to rear.

I claim as my invention—

1. The combination of the revolving overlapping cutters D D, platform A, under the cutters, and the shield O, pointed at its forward end, located beneath the platform, whose front edge is curved outward from the said point and extended forward beyond the platform to a position beneath the overlapping edges of the cutters, substantially as and for the purpose herein specified.

2. The combination of the guide-plates and the swinging cut-off gates, having horizontal guide-plates on their surfaces, substantially as herein specified.

3. The combination of the binding or compressing receptacle, swinging cut-off gates R R, guide-plates Q Q thereon, and the guide-plates P P on the frame forward of the gates and leading thereto, substantially as and for the purposes herein specified.

4. In combination with the discharge-table, the forward supporting rod or pivots sliding rearward in inclined ways, and oscillating crank-shaft supporting the rear part of the table and adapted to impart the required movements to the table.

5. The discharge-table provided with the stalk-spreading forwardly-pointed ridge or projection, for the purpose herein specified.

6. The discharge table provided with parallel concave teeth at its rear end, with open spaces between the teeth.

7. The combination of the doubletree L, located under the platform of the harvester, the pivoted brace-arms M M, draft-chains *t t*, and guide-loops *u u*, substantially as and for the purpose herein specified.

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