No. 657,509. Patented Sept. 11, 1900.

# R. C. BRUBAKER.

## HARVESTER.

(Application filed June 19, 1899.)

(No Model.) 3 Sheets—Sheet 1.

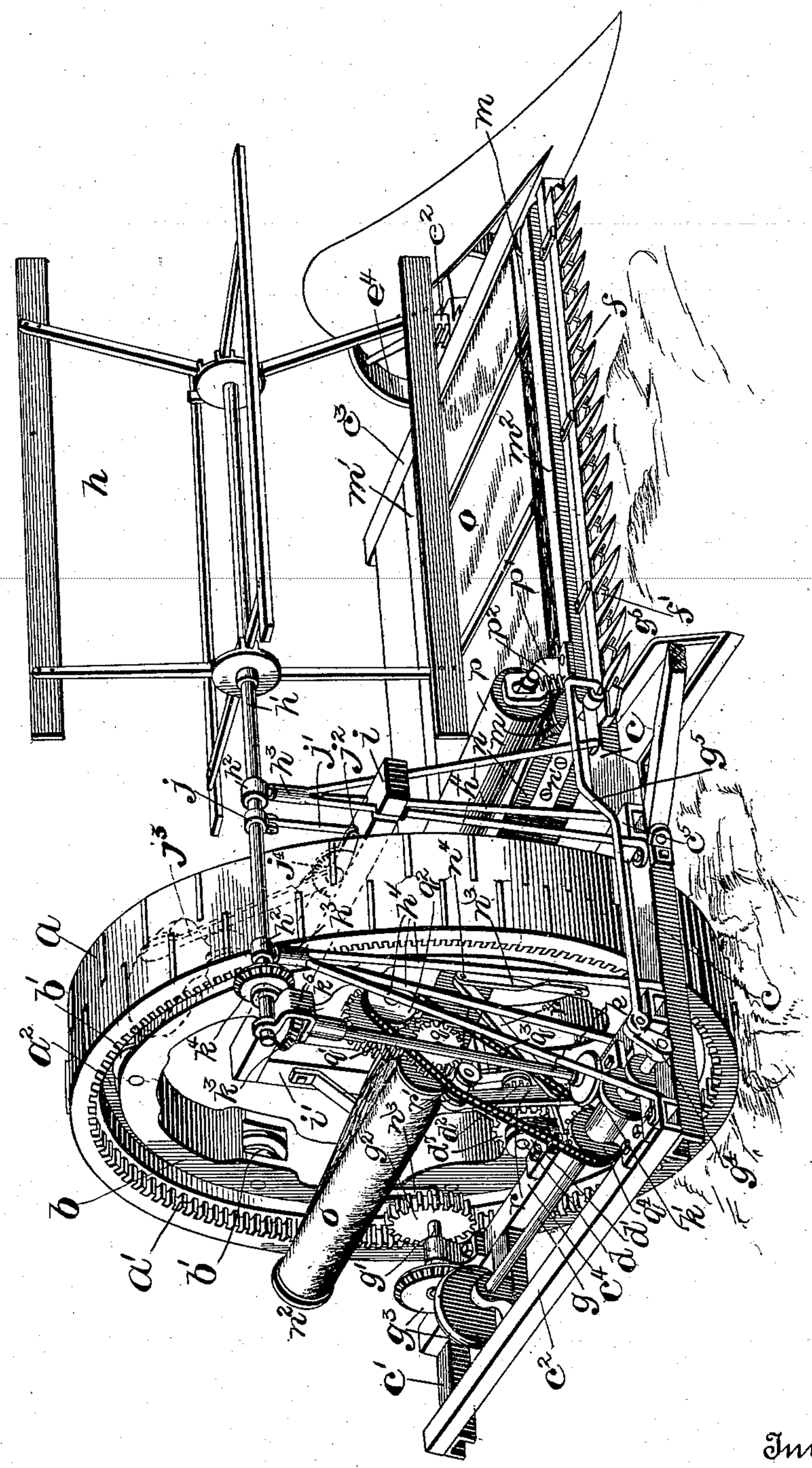

Fig. 1.

Witnesses
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(No Model.) 3 Sheets—Sheet 2.

*Fig. II.*

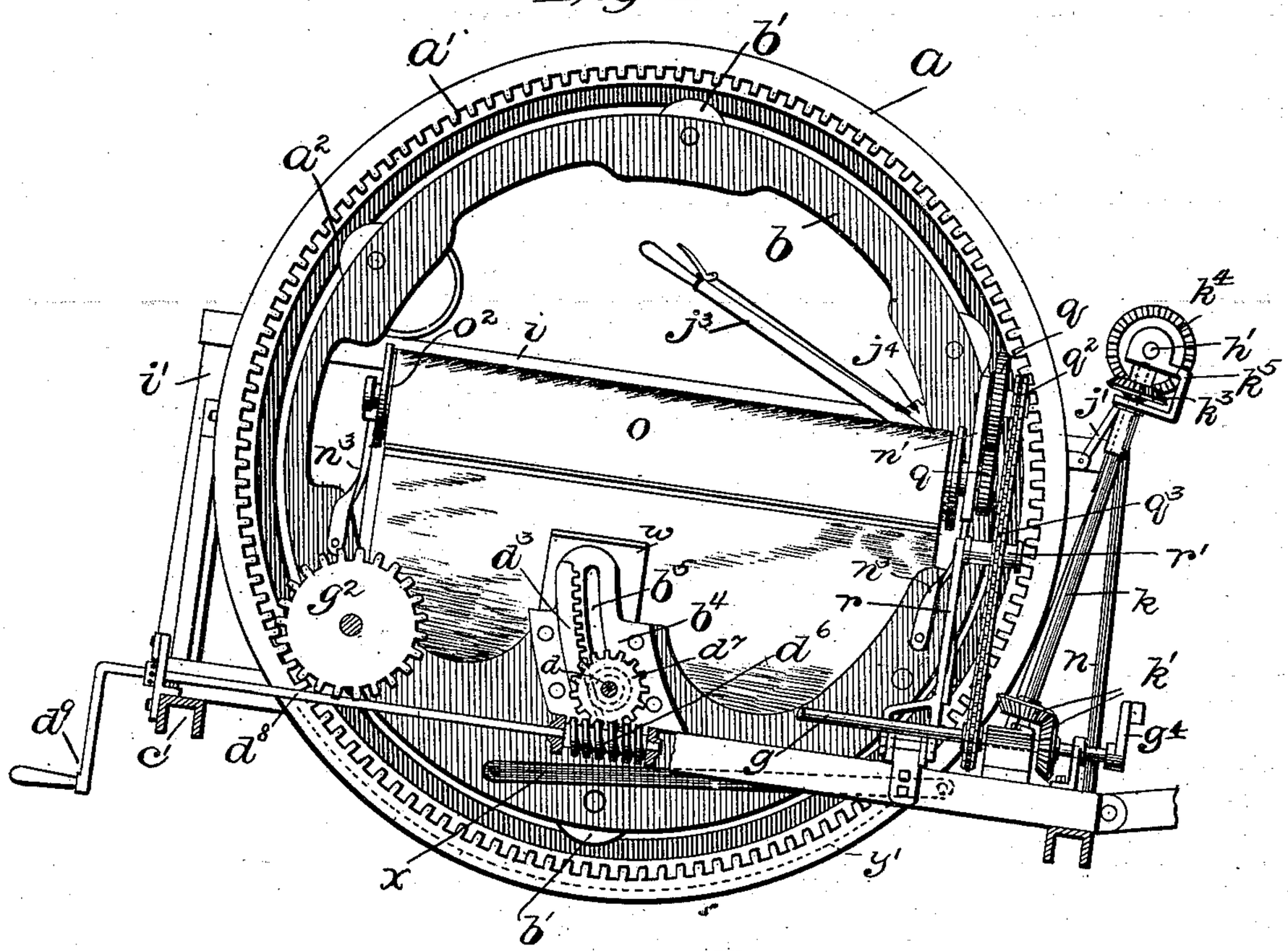
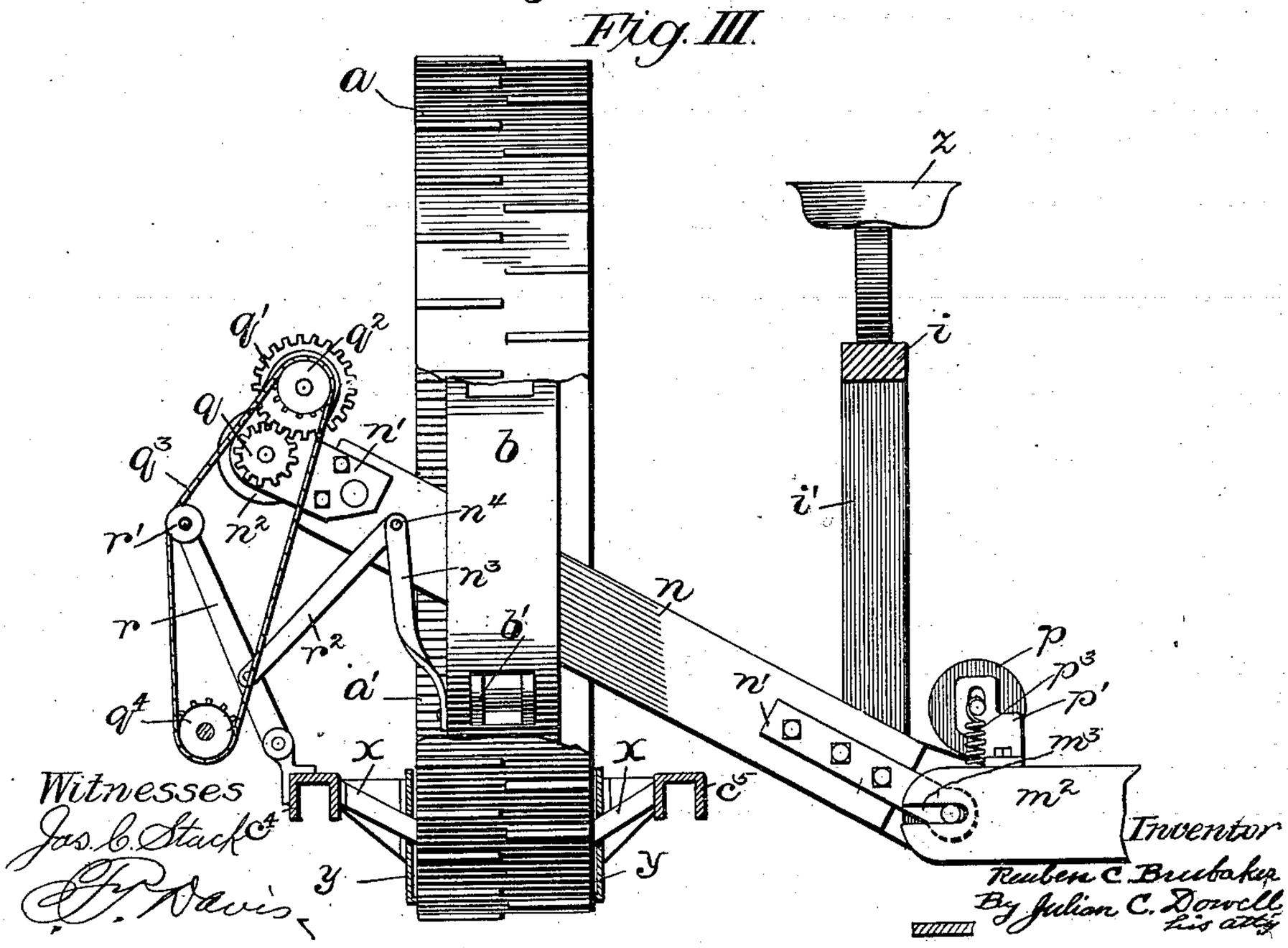



*Fig. III.*

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(No Model.) 3 Sheets—Sheet 3.

*Fig. IV.*

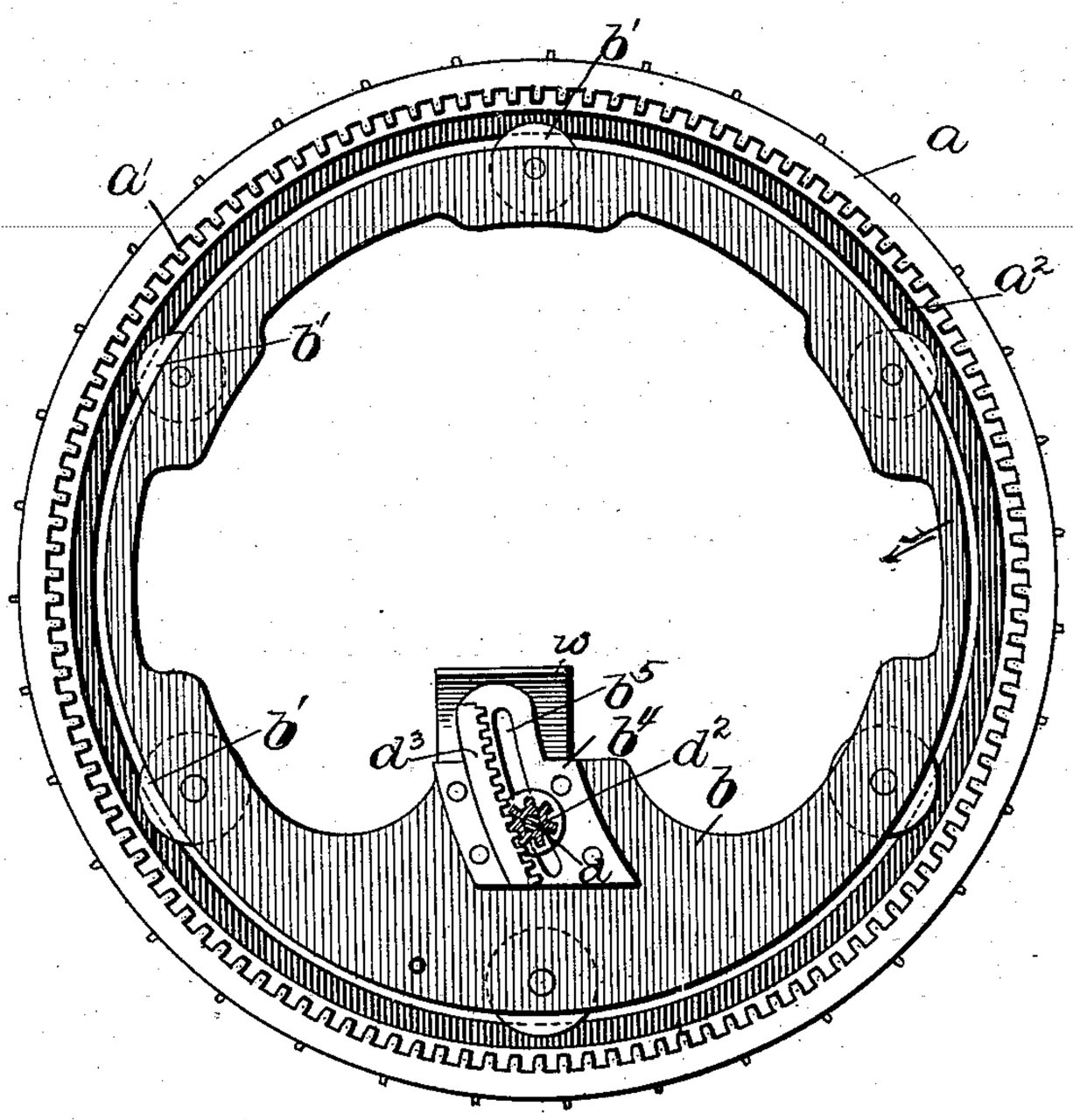



*Fig. V.*

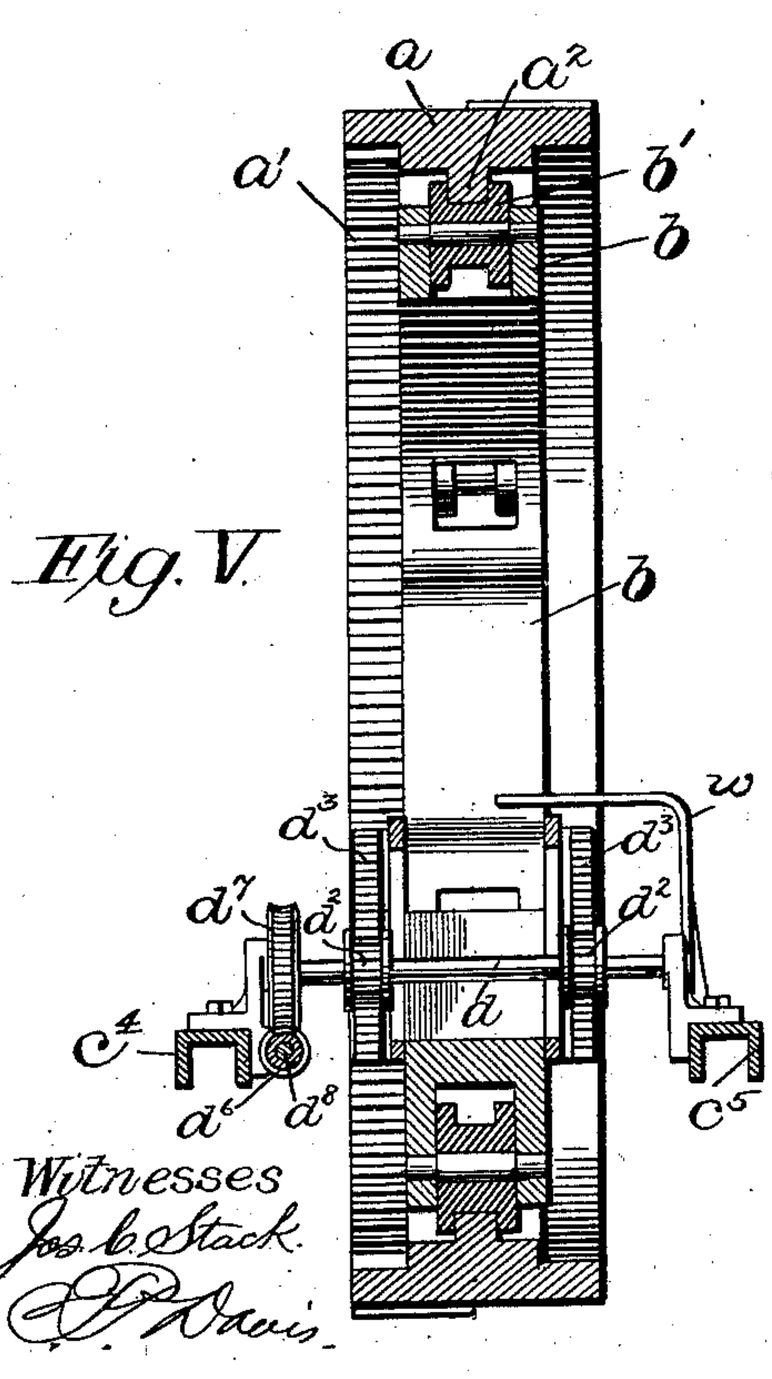



*Fig. VI.*

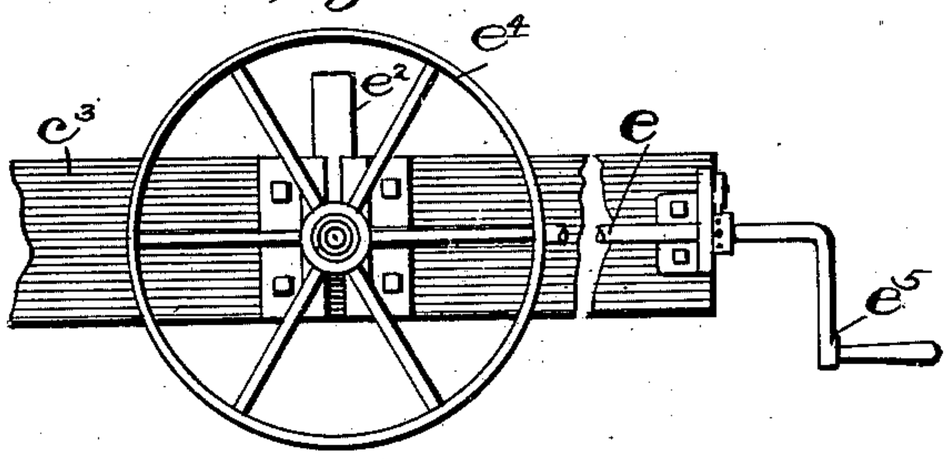
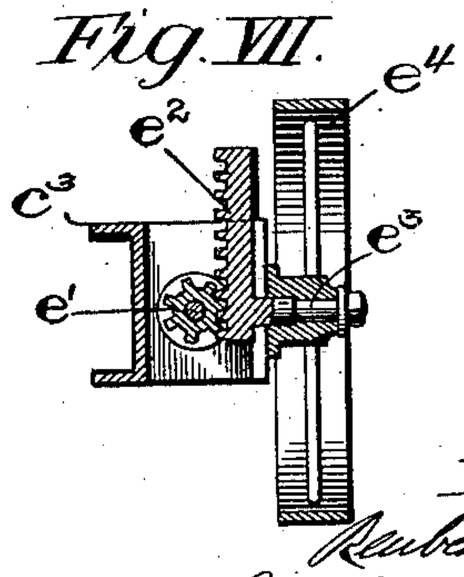



*Fig. VII.*




Witnesses
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# UNITED STATES PATENT OFFICE.

REUBEN C. BRUBAKER, OF EL DORADO, OHIO.

## HARVESTER.

SPECIFICATION forming part of Letters Patent No. 657,509, dated September 11, 1900.

Application filed June 19, 1899. Serial No. 721,172. (No model)

*To all whom it may concern:*

Be it known that I, REUBEN C. BRUBAKER, a citizen of the United States, residing at El Dorado, in the county of Preble and State of Ohio, have invented certain new and useful Improvements in Harvesters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to harvesters; and the principal object is to provide a construction of master-wheel and mode of mounting the same which will permit of the cut grain being taken through the wheel instead of over the same to the binder. By such an arrangement I obtain the advantage of lessening the angle of the elevating portion of the apron, so that a cover-apron can be dispensed with, and besides this I am enabled to make the machine more compact than the usual form of harvesting mechanism and better adapted for attachment of the binder, while at the same time it is feasible to employ a greater number of packers than heretofore. Incidental objects are to arrange for the transmission of power to the various moving parts of the mechanism from the master-wheel in a simple and practical manner and to automatically compensate for variations in the relative positions of the main frame and the supports for the inclined portion of the traveling apron, the main frame being vertically adjustable and gearing connecting a line-shaft on such frame with an apron carrying a roller whose position remains practically the same under all adjustments of the frame, so as not to disturb its proper relation to the binding attachment.

With the above-stated objects in view the invention consists in certain novel features of construction and combinations of parts, the essential elements of which are recited in the appended claims, and a preferred form of embodiment is specifically described hereinafter and illustrated in the accompanying drawings, which form a part of this specification.

Of said drawings, Figure I represents the complete machine in perspective. Fig. II is a sectionalized side elevation of the same. Fig. III shows a partial front elevation with certain parts broken away and others appearing in cross-section. Fig. IV shows the master-wheel and its ring-bearing in side elevation, together with certain gearing for adjusting the main frame. Fig. V shows the same parts in vertical cross-section, together with a portion of the main frame and certain parts supported thereby. Fig. VI is a fragmentary end elevation showing the grain-wheel, and Fig. VII is a vertical section of the same.

The master-wheel comprises a broad rim $a$, with a circular internal gear $a'$ at the outer side and a centrally-located internal rib $a^2$. The bearing for this master-wheel is in the form of a ring $b$, which is slotted at various points throughout its circumference to accommodate antifriction-rollers $b'$, grooved for engagement with the rib $a^2$, as clearly shown in Fig. V. This ring-bearing maintains practically a fixed position in the machine, and those of its rollers below a central horizontal line are preferably somewhat larger than those above, with a view to more effectually sustaining the superimposed weight which must be borne by this ring-bearing, as will presently appear.

The main frame of the machine is of generally rectangular form and comprises front and rear bars $c$ and $c'$, extending on either side of the master-wheel, end bars $c^2$ and $c^3$, and intermediate cross-bars $c^4$ and $c^5$ in proximity to the master-wheel. A shaft $d$ is supported in brackets $d'$, fastened to the said cross-bars $c^4$ and $c^5$, and said shaft carries a pair of pinions $d^2$, which engage racks $d^3$, fastened to the ring-bearing $b$, the lower central portion of the latter being widened and slotted for the passage of said shaft, and the said racks being formed upon brackets $b^4$, secured to said widened portion of the ring and projecting somewhat above the same and formed with slightly-curved slots $b^5$ to accommodate the shaft $d$, the said curvature being provided for a purpose to be more fully hereinafter explained. It will be seen that by turning the pinions $d^2$ the frame can be raised and lowered by reason of the travel of said pinions along the racks, and means of the following description are provided for the purpose of effecting such adjustments of the frame:

A worm-wheel $d^7$ is affixed to the shaft $d$ and meshes with a worm $d^6$ on a shaft $d^8$, which is supported in suitable bearings on the cross-bar $c^4$ and projects in rear of the machine, being there equipped with a suitable handle $d^9$ and a ratchet and pawl or other suitable arrangement for locking the shaft at different positions. The cross-bar $c^3$ at the opposite end of the frame is formed with bearings for a shaft $e$, carrying a pinion $e'$, in mesh with a rack $e^2$, having compounded with it a stud $e^3$, upon which the grain-wheel $e^4$ is journaled. The shaft $e$ extends in rear of the machine and is equipped with a handle $e^5$, similar to that on the shaft $d^8$, so that by turning the same the grain-wheel may be adjusted to correspond with the adjustment obtained by operating the shaft $d^8$.

The front bar of the frame where it extends on the grain side of the master-wheel constitutes a finger-bar to which the guard-fingers are secured, and the sickle $f'$ is arranged to slide through these guard-fingers in the usual or any suitable manner, reciprocations of said sickle being effected through the following-described connections with the internal gear $a'$ of the master-wheel:

A line-shaft $g$ is journaled in suitable bearings on the main frame at the stubble side of the master-wheel, and a short shaft $g'$ is journaled in a bearing on the cross-bar $c^4$, said shaft extending at right angles to the line-shaft $g$ and carrying a spur-gear $g^2$, which meshes with the internal gear $a'$ of the master-wheel. The two shafts $g$ and $g'$ are operatively connected together by means of bevel gear-wheels $g^3$, and the forward end of the line-shaft $g$ is equipped with a crank $g^4$, from which a pitman $g^5$ extends to the sickle-bar, with which it is suitably coupled, as shown at $g^6$ in Fig. I.

A reel $h$ of the usual construction is located above the sickle, the reel-shaft $h'$ being journaled in adjustable bearings $h^2$, here shown as formed with stems sliding through sleeves or bosses $h^3$ at the upper end of standards $h^4$ in the form of tripods erected upon the main frame. One of these tripods is also secured to an elevated bar $i$, mounted at its rear end upon an upright $i'$, which is erected upon the rear bar $c'$ of the main frame, the said elevated bar supporting the seat $z$, and also devices for vertically adjusting the reel. The reel-adjusting means here shown comprise a collar $j$, loosely mounted upon the reel-shaft $h'$ and coupled by a link $j'$ with one arm $j^2$ of a bell-crank lever pivoted to the elevated bar, the other arm $j^3$ of said lever extending rearwardly for convenient manipulation from the seat. A segment $j^4$ is fastened to the bar $i$ alongside the lever, and the latter is equipped with the ordinary form of locking-pawl.

The reel is driven from the line-shaft $g$ through an upright shaft $k$, stepped into one of the bearings of said line-shaft, intermeshing bevel-gears $k'$, affixed to the line-shaft and said upright shaft, respectively, and bevel-gears $k^3$ and $k^4$, one being splined to the upright shaft and supported by a bracket $k^5$, mounted upon the reel-shaft, and the other affixed to said reel-shaft. It will be seen that by this arrangement vertical adjustment of the reel does not disturb the gearing connecting the same with the line-shaft.

At the opposite ends of that portion of the frame immediately behind the sickle rollers $m$ are journaled in supplemental front and rear bars $m^2$ and $m'$ of the supporting-frame. These supplemental bars are slotted at their ends nearest the master-wheel, as shown at $m^3$ in Fig. III, to accommodate the journals upon one of the rollers $m$, which journals also constitute pivots for an elevator-frame, the side bars $n$ of which carry brackets $n'$, pivotally mounted on the said journals. The said elevator-frame extends on an inclination through the ring-bearing of the master-wheel and projects on the stubble side of the same, where it is equipped with brackets $n'$, supporting a roller $n^2$, and this elevator-frame is supported in its inclined position by means of arms $n^3$, which are secured to the ring-bearing $b$ and pivotally connected with the elevator-frame at $n^4$ to allow for a slight rocking of said frame when the main frame is moved up and down.

An endless apron $o$ passes around the rollers $n^2$ and the roller $m$ farthest therefrom and also passes above and below the other roller $m$, over which another roller $p$ is arranged, the same being journaled in slotted brackets $p'$, mounted upon the supplemental front and rear bars $m^2$ and $m'$, and spiral springs $p^2$ being arranged to press said roller $p$ downwardly upon the apron. This endless apron is designed to receive the grain as it is cut by the sickle and thrown down by the reel in the ordinary way, said cut grain passing under the spring-pressed roller $p$ and being carried up the inclined portion of the apron and delivered by the same to the binding attachment.

The mechanism for driving the apron is of the following description: The journal of the roller $n^2$ has affixed to it a spur-gear $q$, which is in mesh with a similar gear $q'$, carried by an upward extension of one of the brackets $n'$ and having compounded with it a sprocket-wheel $q^2$, which is connected by a chain $q^3$ with a sprocket-wheel $q^4$, affixed to the line-shaft $g$. It will be seen that the chain will be affected by vertical adjustment of the main frame, and therefore I provide automatic means for maintaining the proper tension of said chain, notwithstanding changes in relation between the main frame and the elevator-frame.

An arm $r$ is pivoted at its lower end to the cross-bar $c^4$ and carries at its upper end a roller $r'$, in engagement with the upper stretch of the chain, and a link $r^2$ connects the arm $r$ with one side bar of the elevator-frame, said link being pivotally mounted on the stud which supports the upper end of the arm $n^3$.

It will be seen that by this arrangement when the main frame is raised the chain is prevented from becoming slack by an outward movement of the roller $r'$, the arm $r$ and link $r^2$ forming a toggle which will be partially closed by movement of the main frame toward the elevator-frame. Of course downward movement of the main frame results in a partial straightening of the toggle and retracting of the roller $r'$.

Segmental plates $y$ are preferably fastened to the ring-bearing $b$ and overlap the master-wheel gear, so as to prevent the entrance therein of foreign matter which might clog the gears, the outline of the lower edge of one of said plates being indicated by dotted line $y'$ in Fig. II and the two plates appearing in cross-section in Fig. III. The ring-bearing and main frame are preferably connected by brace-bars $x$, (see Figs. II and III,) one on each side of the master-wheel and pivotally attached to the parts they connect.

The purpose of the curved slots $b^5$ will now be apparent. The shafts $g'$ and $d$ and the points of the frame at which the links $x$ are attached are fixed relative to each other, and by reason of the curvature of the said slots $b^5$ the gear $g^2$ remains in engagement with the internal gear $a'$ during all positions of the main frame.

In order to prevent the lower stretch of the elevating portion of the endless apron from interfering with the gearing for raising and lowering the frame, an angular guard-plate $w$ may be fastened to the cross-bar $c^5$, as shown in Figs. IV and V.

It will be seen that a harvester constructed as above described is peculiarly well adapted for coupling with a binding attachment, there being no mechanism to offer an obstruction to such attachment at the upper end of the elevator. It will also be seen that by reason of the elevating portion of the apron passing through the master-wheel instead of over the same not so great an elevation is required and the grain will be carried up the same more easily. Moreover, the arrangement of a large portion of the operating mechanism within the circle of the master-wheel results in a compactness of construction, which is an obvious advantage.

It is of course to be understood that the invention herein described may be embodied in other forms than here shown without departing from the spirit and scope thereof, and hence I do not desire to limit myself to the constructive details.

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

1. In a harvester, a master-wheel rim, a bearing therefor provided with a curved slot, a frame vertically adjustable on said bearing, a driving mechanism upon said frame, a power-transmitting member also on said frame and having connection with the said driving mechanism and including a rotatable member contacting with the said master-wheel rim, and a member upon the frame extending into the said slot in the wheel-bearing, whereby in the adjustment of the said frame the said rotatable member remains in contact with the said master-wheel rim; substantially as described.

2. In a harvester, a master-wheel rim, a bearing therefor provided with a curved slot, a curved rack upon said bearing in proximity to said slot, a frame vertically adjustable on said bearing, a driving mechanism upon said frame, a power-transmitting member also on said frame and having connection with the said driving mechanism and including a rotatable member contacting with the said master-wheel rim, a shaft journaled upon said frame and extending through said curved slot in the said wheel-rim bearing, a gear upon said shaft and engaging the said rack, and means for rotating the said shaft to cause adjustment of the frame upon the bearing, the said slot and shaft serving to maintain the said rotatable power-transmitting member in engagement with the wheel-rim in the various adjustments of the frame; substantially as described.

3. In a harvester, a master-wheel rim, a ring-bearing therefor, a frame, an elevator-apron having its support pivotally connected at one end to said frame and extending therefrom through said ring-bearing, a cutter, mechanism for imparting motion from said master-wheel rim to said cutter and elevator-apron, and a toggle connecting the elevator-apron support with said frame adapted to maintain the driving-gearing for said apron in operative position at different adjustments of the frame and means for adjusting said frame vertically upon the said bearing and for maintaining the same in its adjusted position, and a link pivotally connected to said bearing and to said frame; substantially as described.

4. In a harvester, a master-wheel rim having an internal gear, a ring-bearing therefor, a frame adjustably supported by said ring-bearing, standards upon said frame, journal-bearings having sliding connection upon said standards, a reel-shaft in said bearings, and means for adjusting said reel-shaft toward and away from the frame; together with a shaft mounted on said frame in gear with said master-wheel rim and with said reel-shaft for imparting motion to the latter substantially as described.

5. In a harvester, a master-wheel rim having an internal gear, a ring-bearing therefor, a frame adjustably supported by said ring-bearing, standards upon said frame, journal-bearings having sliding connection upon said standards, a reel-shaft in said bearings, a lever pivoted upon said frame, a collar loosely engaging said reel-shaft, and a link connecting said collar and lever whereby said reel-shaft can be adjusted toward and away from the frame by the movement of said lever; to-

gether with a shaft mounted on said frame in gear with said master-wheel rim and with said reel-shaft for imparting motion to the latter substantially as described.

6. In a harvester, a master-wheel rim, a ring-bearing therefor, a main frame adjustably supported by said ring-bearing, in combination with an inclined elevator-frame carrying an elevator-apron extending through said ring-bearing, means for vertically adjusting said main frame and simultaneously changing the inclination of the elevator-apron frame, a line-shaft journaled in bearings on the said main frame, gearing connecting said line-shaft with the master-wheel rim, chain-gearing connecting said line-shaft with the elevator-apron, and a toggle connecting said main frame and the elevator-apron frame, and adapted to automatically maintain said chain-gearing in operative position in different adjustments of the main frame and elevator-apron, substantially as described.

7. In a harvester, a master-wheel rim, a ring-bearing therefor, a main frame supported by said ring-bearing, an elevator-frame or apron-support carrying an elevator-apron extending through said ring-bearing, a frame pivotally connected with said main frame, means for vertically adjusting the latter frame, a line-shaft in bearings on said main frame, gearing connecting said line-shaft with the master-wheel, chain-gearing connecting said line-shaft with the elevator-apron, a swinging arm pivoted to the main frame and carrying a roller at one end in engagement with the chain to keep the same taut, and a link connecting said arm with the apron-support whereby the chain is automatically adjusted according to the height of the frame.

8. In a harvester, a master-wheel rim, a ring-bearing therefor, a frame supported at one side of the machine by said ring-bearing, a grain-wheel supporting said frame at the other side of the machine, means for adjusting the frame vertically, rollers in bearings on the portion of the frame between the two wheels, an inclined frame pivotally connected with the main frame and extending through and connected with the ring-bearing of the master-wheel, a roller supported by said inclined frame, an apron running over said roller and the rollers in the main frame, a line-shaft on the main frame, gearing connecting said shaft with the master-wheel, gearing connecting said shaft with one of the apron-rollers, and means for automatically maintaining the elevator-apron-driving gearing in operative position in different adjustments of the main frame.

9. In a harvester, a master-wheel rim, a ring-bearing therefor, a frame supported at one side of the machine by said ring-bearing, a grain-wheel supporting said frame at the other side of the machine, means for adjusting the frame vertically, rollers in bearings on the portion of the frame between the two wheels, an inclined frame pivotally connected with the main frame and extending through and connected with the ring-bearing of the master-wheel, a roller supported by said inclined frame, an apron running over said roller and the rollers in the main frame, a line-shaft on the main frame, gearing connecting said shaft with the master-wheel, chain-gearing connecting said shaft with the upper apron-roller, an arm pivoted at one end to the main frame and carrying a roller at its free end in engagement with the chain, and a link connecting said pivoted arm with the upper apron-roller-supporting frame said pivoted arm and link forming a toggle for automatically keeping said chain taut at different adjustments of the main frame, substantially as and for the purpose described.

10. In a harvester, a master-wheel rim, a ring-bearing therefor, a main frame supported by said ring-bearing, in combination with an inclined elevator frame or apron support pivotally connected to said main frame and carrying an apron extending through said ring-bearing, a line-shaft on said main frame geared to said master-wheel rim, and gearing connecting said line-shaft with the elevator-apron, together with mechanism for vertically adjusting said main frame and simultaneously changing the inclination of the elevator frame or apron support, and a toggle pivotally connecting said main frame and inclined elevator-frame, and adapted to keep the elevator-apron-driving gearing in operative connection with the line-shaft at different adjustments of the main frame, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

REUBEN C. BRUBAKER.

Witnesses:
J. L. BILLMAN,
CHRIS LOHSE.