No. 749,298. PATENTED JAN. 12, 1904.

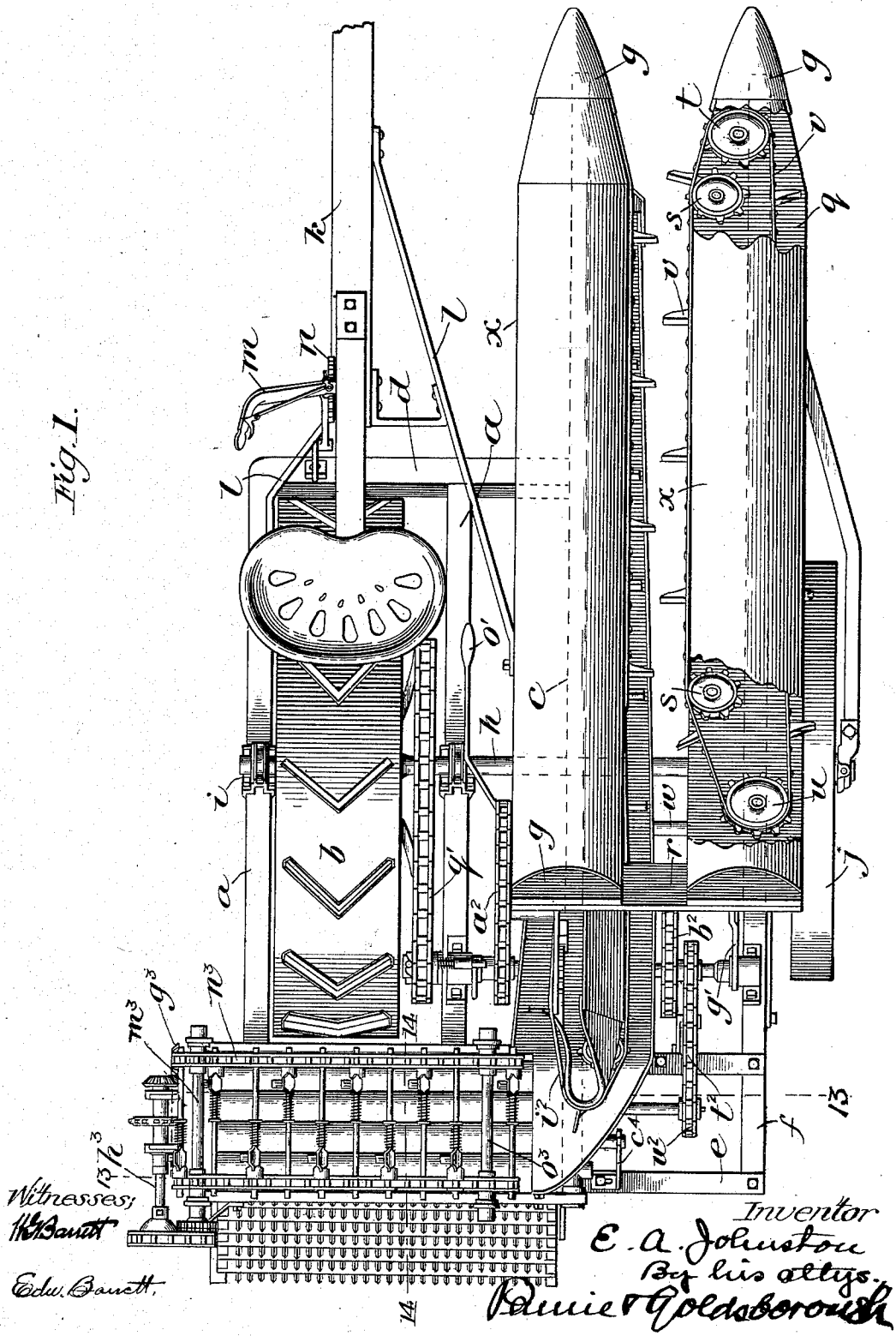
E. A. JOHNSTON.

CORN HARVESTER.

APPLICATION FILED APR. 16, 1902.

NO MODEL. 7 SHEETS—SHEET 1.

Fig. 1.



Witnesses;
H. G. Barrett
Edw. Barrett.

Inventor
E. A. Johnston
By his attys.
Bowie & Goldsborough

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

No. 749,298. PATENTED JAN. 12, 1904.

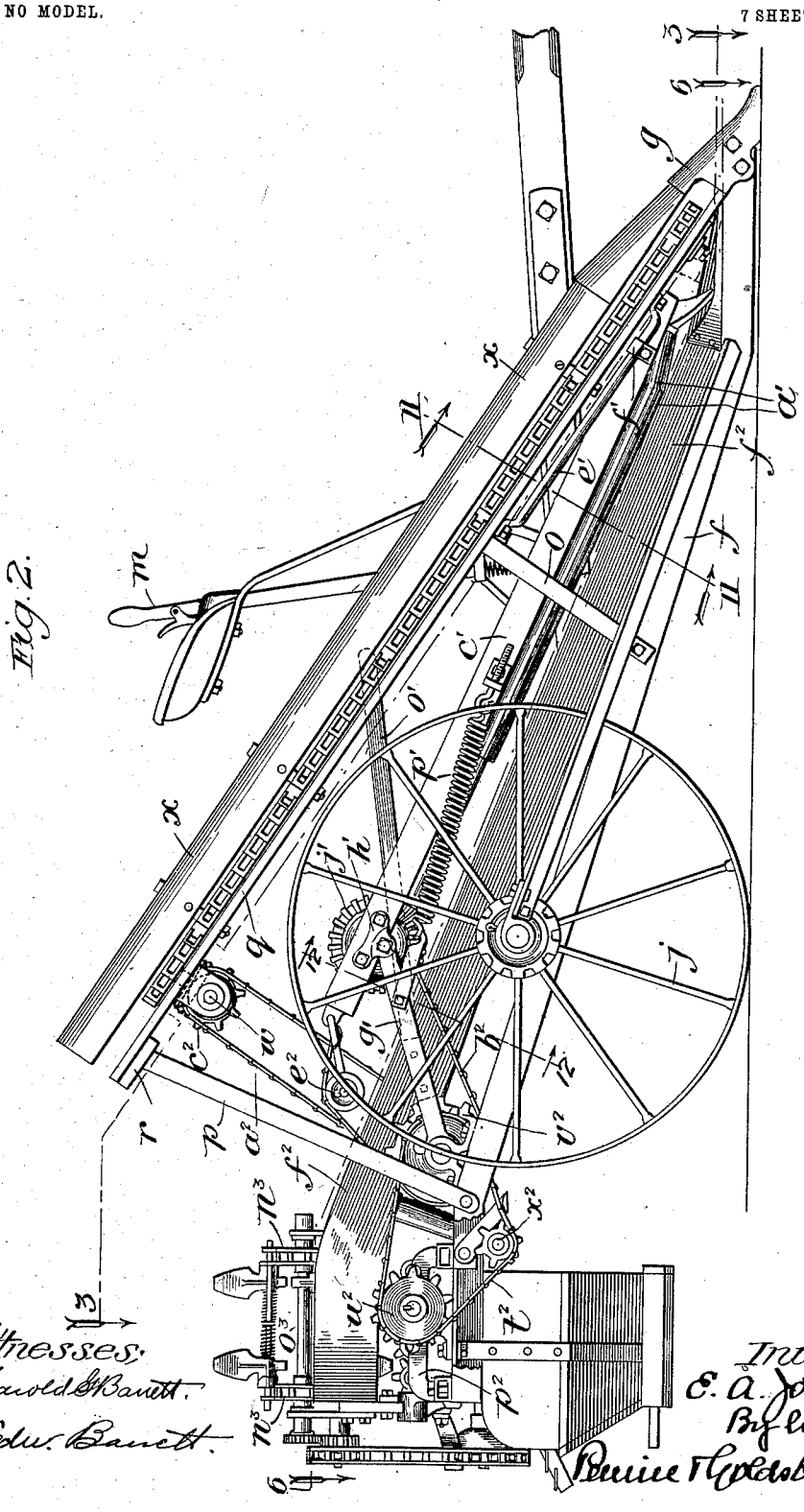
E. A. JOHNSTON.

CORN HARVESTER.

APPLICATION FILED APR. 16, 1902.

NO MODEL. 7 SHEETS—SHEET 2.

Fig. 2.



Witnesses:
Harold S. Barrett.
Edw. Barrett.

Inventor
E. A. Johnston
By his attys,
Bruce & Middleborough

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

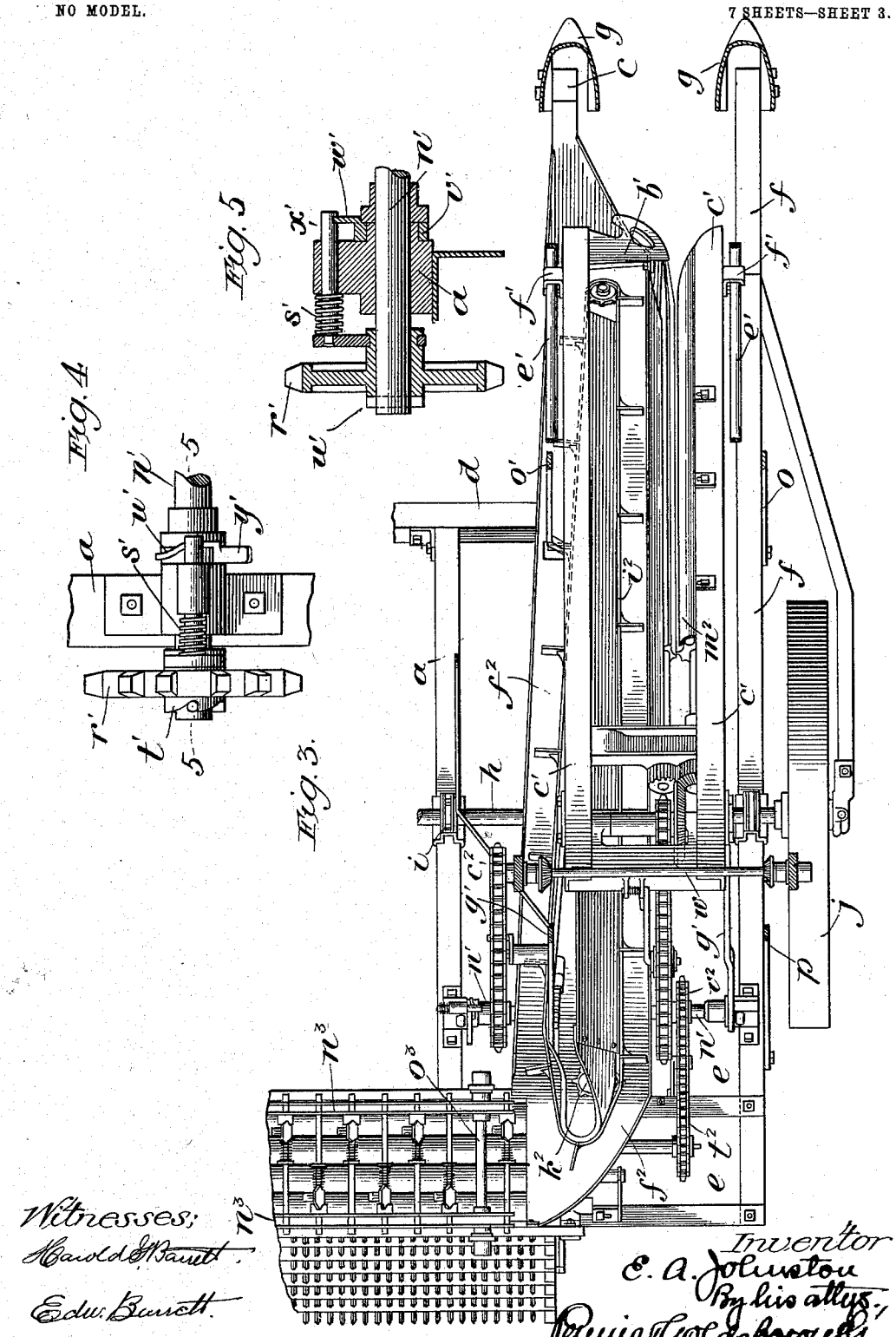
No. 749,298. PATENTED JAN. 12, 1904.

E. A. JOHNSTON.

CORN HARVESTER.

APPLICATION FILED APR. 16, 1902.

NO MODEL. 7 SHEETS—SHEET 3.



Witnesses;
Harold J. Barnett.
Edw. Barnett.

Inventor
E. A. Johnston
By his attys.,
Pennie Goe & Boroughs

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

No. 749,298. PATENTED JAN. 12, 1904.

E. A. JOHNSTON.

CORN HARVESTER.

APPLICATION FILED APR. 16, 1902.

NO MODEL. 7 SHEETS—SHEET 4.

Fig. 6

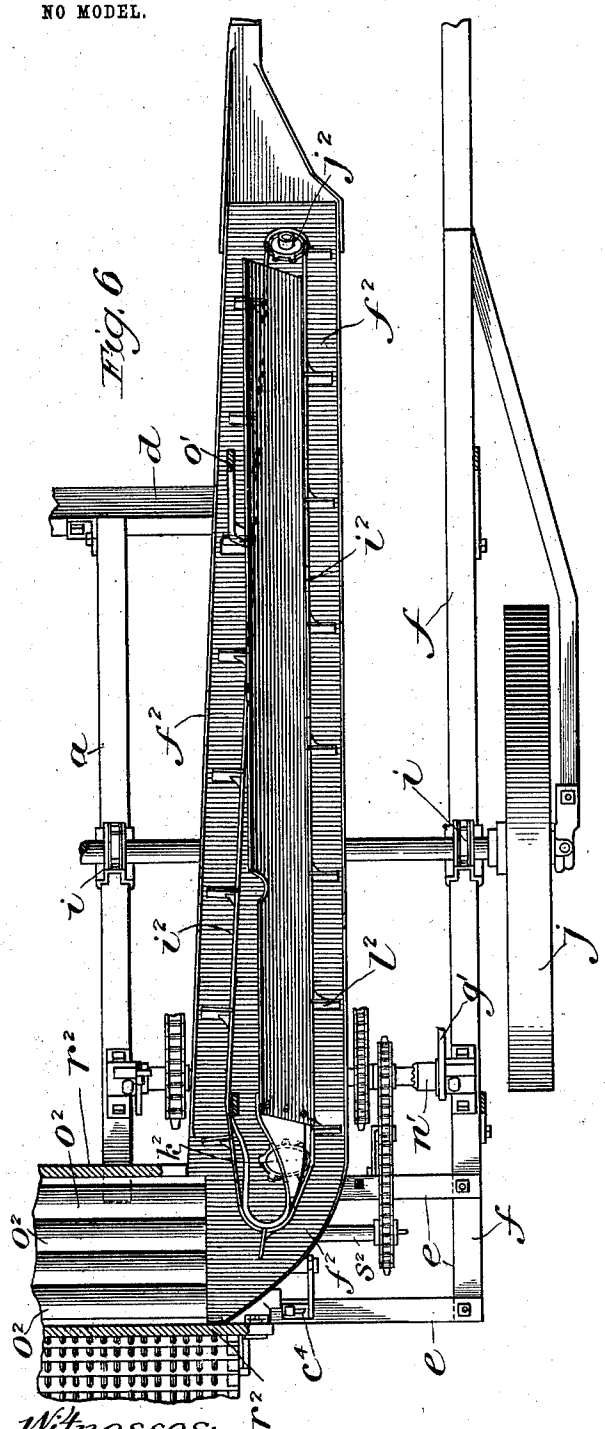
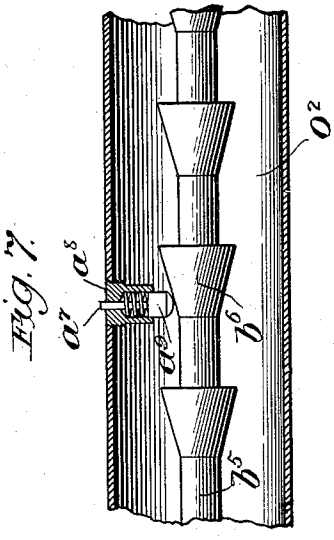


Fig. 7.



Witnesses;
Harold G. Barrett.
Edw. Barrett.

Inventor
E. A. Johnston
By his attys,
Pennie & Goldsborough

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

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E. A. JOHNSTON.

CORN HARVESTER.

APPLICATION FILED APR. 16, 1902.

NO MODEL. 7 SHEETS—SHEET 5.

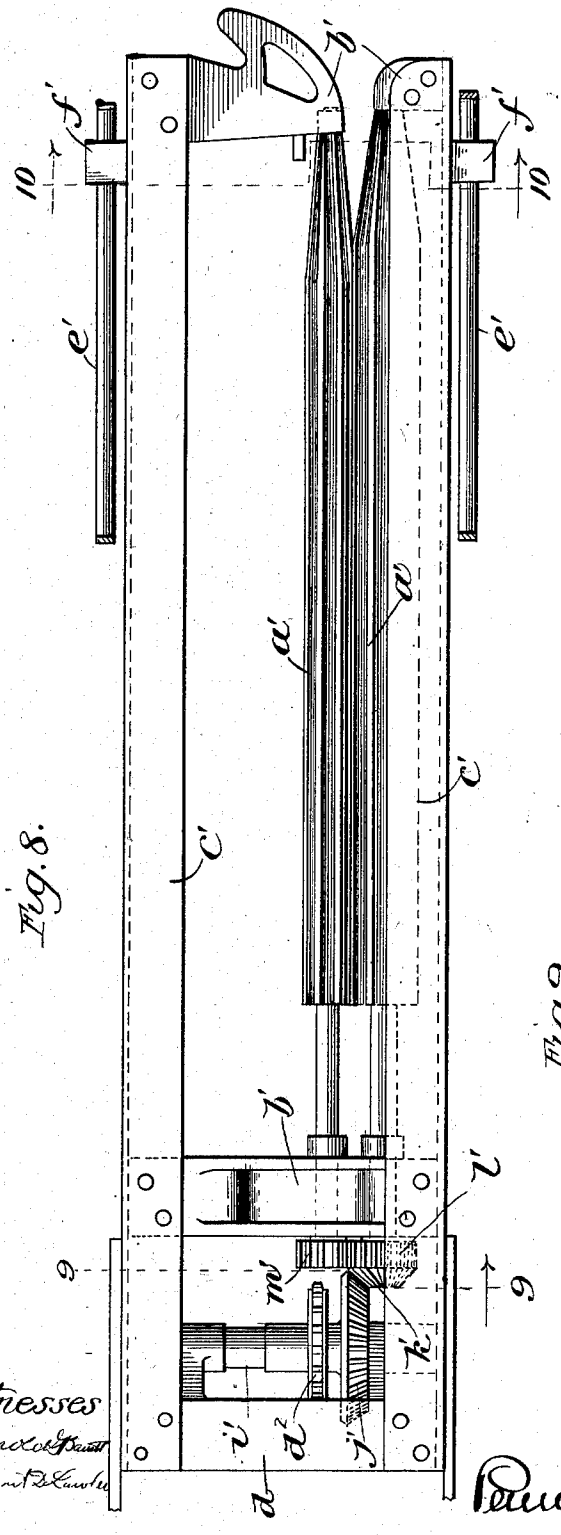


Fig. 8.

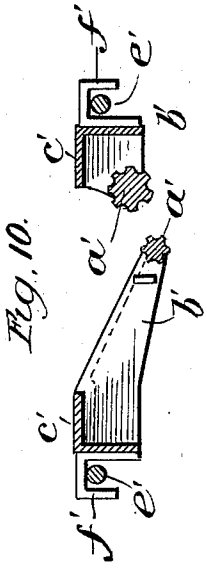


Fig. 10.

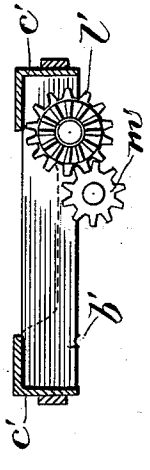


Fig. 9.

Witnesses

Inventor

E. A. Johnston

By his attys.

Pennie & Goldsborough

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

No. 749,298. PATENTED JAN. 12, 1904.

E. A. JOHNSTON.

CORN HARVESTER.

APPLICATION FILED APR. 16, 1902.

NO MODEL. 7 SHEETS—SHEET 6.

Fig. 12.

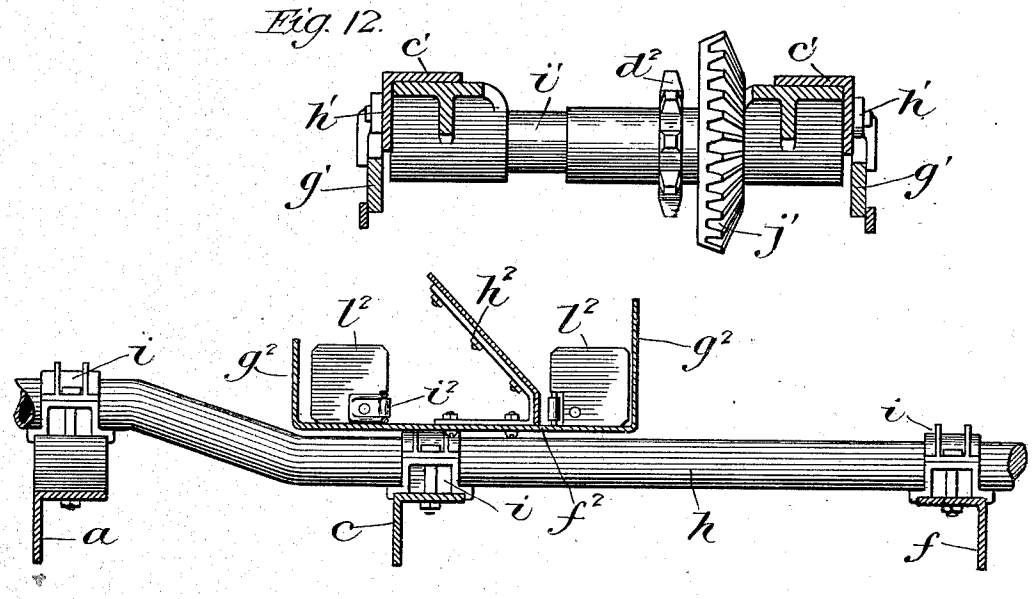
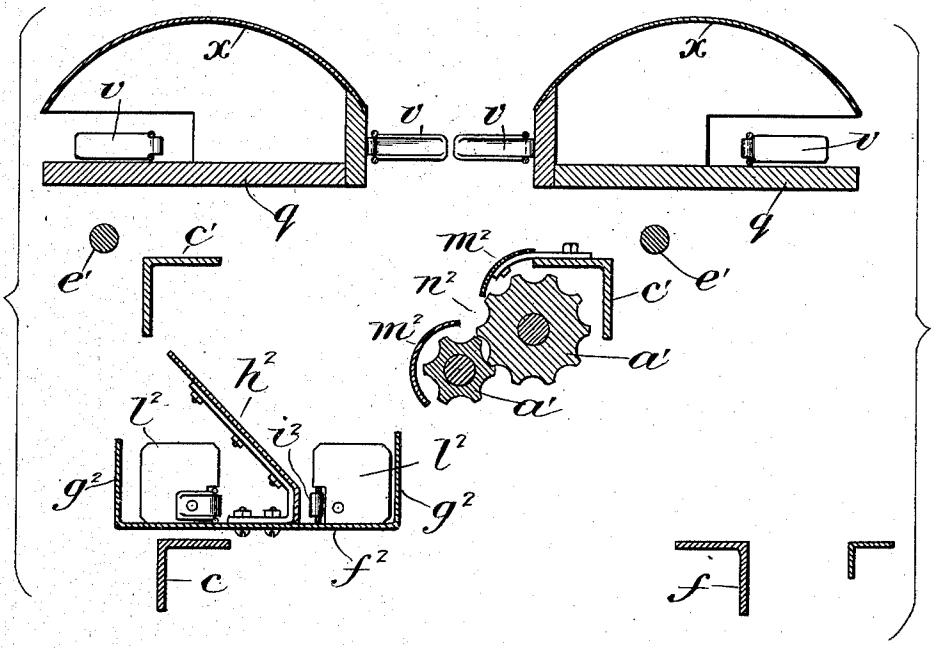


Fig. 11.



Witnesses:

Harold M. Bancett.

Edw. Bancett

Inventor

E. A. Johnston

By his attys.

Munn & Goldsborough

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

No. 749,298. PATENTED JAN. 12, 1904.

E. A. JOHNSTON.

CORN HARVESTER.

APPLICATION FILED APR. 16, 1902.

NO MODEL. 7 SHEETS—SHEET 7.

Fig. 13.

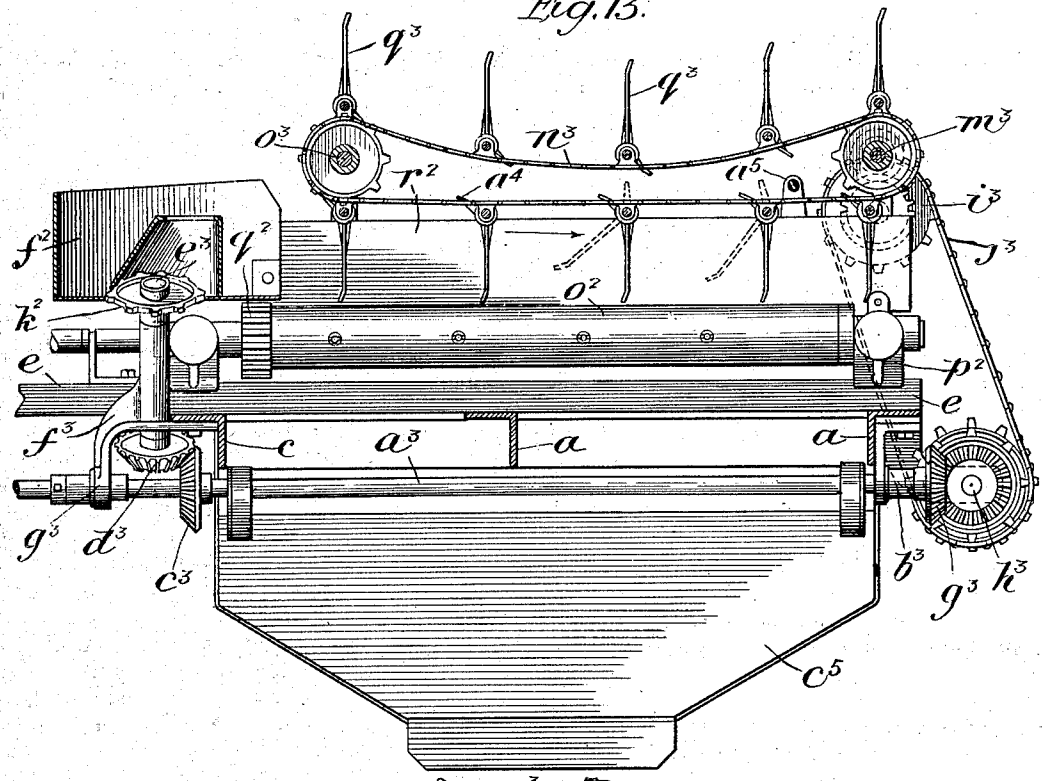
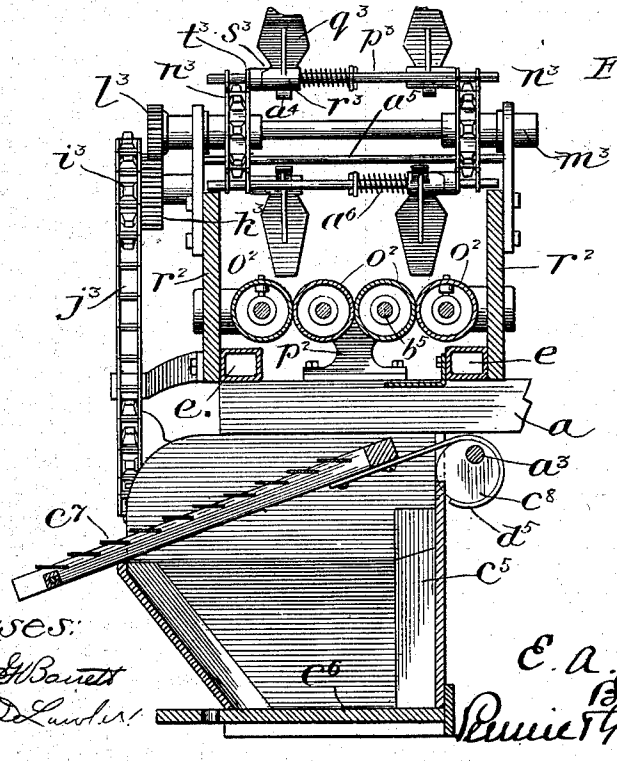


Fig. 14.



Witnesses:
Harold G. Barnett
Vincent DeLander

Inventor:
E. A. Johnston
By his attys
Daniel Goldsborough & Co

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

No. 749,298. Patented January 12, 1904.

UNITED STATES PATENT OFFICE.

EDWARD A. JOHNSTON, OF CHICAGO, ILLINOIS, ASSIGNOR TO McCORMICK HARVESTING MACHINE COMPANY, OF CHICAGO, ILLINOIS.

CORN-HARVESTER.

SPECIFICATION forming part of Letters Patent No. 749,298, dated January 12, 1904.

Application filed April 16, 1902. Serial No. 103,086. (No model.)

To all whom it may concern:

Be it known that I, EDWARD A. JOHNSTON, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented certain new and useful Improvements in Corn-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 invention relates more especially to that class of machines which harvest the ears from the stalks and leave the latter standing in the field.

In operation the machine straddles a row of corn and the stalks pass between a pair of inclined corrugated rolls which snap or strip off the ears. The rolls are positioned so that the ears fall naturally into a trough that extends alongside the rolls and has a traveling conveyer by means of which the ears are carried back and either delivered to other rolls for husking them or dropped into a receptacle without being husked.

The particular improvements will be understood from the following description, taken in connection with the accompanying drawings, wherein—

Figure 1 is a plan view of the complete machine. Fig. 2 is a side elevation of the same. Fig. 3 is a sectional plan on the line 3 3, Fig. 2. Fig. 4 is a detail of the clutch between the counter-shaft and its driving-sprocket. Fig. 5 is a section of the same on the line 5 5, Fig. 4. Fig. 6 is a sectional plan on the line 6 6, Fig. 2. Fig. 7 is a detail of one of the husking-rolls, showing the adjustment of its pins. Fig. 8 is a plan view of the snapping-rolls and the frame which carries them. Fig. 9 is a cross-section of the same on the line 9 9, Fig. 8. Fig. 10 is a similar section on the line 10 10, Fig. 8. Fig. 11 is a vertical cross-section of the whole machine on the line 11 11, Fig. 2. Fig. 12 is a similar section of the underneath parts of the machine on the line 12 12 of the same figure, and Figs. 13 and 14 are respectively longitudinal and cross-sectional views showing in detail the husker attachment.

The invention is not particularly concerned with the construction of the main frame of the machine, and although an especially desirable construction is illustrated herein it is to be understood that the invention is in no way restricted thereto. As shown herein, it is made up principally of angle-iron and consists of fore and aft bars *a a*, one on each side of the main wheel *b*, a cross-bar *d* joining these bars in front of the wheel, and another longitudinal bar *c* lying about centrally of the machine, considered as a whole, and uniting the front cross-bar *d* to a pair of cross-bars *e e*, to which the rear ends of the fore and aft bars *a a* are secured. The opposite ends of these rear cross-bars are extended considerably beyond the bar *c* and at their outer ends are joined to a side bar *f*. This bar and the bar *c* are parallel with each other and both extend forward of the cross-bar *d* to form supports for the front ends *g g* of the prongs, which are spaced apart, as shown in Fig. 1, so as to straddle the row of stalks.

The axle *n* of the machine is mounted in bearings *i i i i* on the fore and aft bars *a a c f* and carries the main wheel at one end of it between the bars *a a* and the grain-wheel *j* at the other end of it outside the bar *f*. The tongue *k* is secured to the frame by straps *l l* and is adjustable to raise and lower the front ends of the prongs by means of a hand-lever *m*, having a latch and a locking-segment *n*.

The stalk lifting and guiding prongs are erected upon the frame in a fixed position, as best shown in Figs. 1 and 2, where it will be seen that they overlie the bars *c* and *f*, and are supported on an incline by posts *o p*. The prongs consist of flat boards *q q*, secured at their rear ends to a cross-plank *r* and at their forward ends to the points *g g*. They have small sprocket-idlers *s s*, journaled on studs near their inner edges, a larger sprocket-wheel *t*, journaled on a similar stud at their lower ends, and a driving-sprocket *u* at the upper end in line with *t*. Around these sprocket-wheels travel the stalk-forwarding toothed chains *v v*. There is a short shaft *w* journaled in brackets at the upper ends of the boards *q q*, from which the driving-sprock-

ets of the chains are operated. An arched sheet-metal shield x extends the entire length of each prong and covers and protects the chains, but leaving a narrow space between its edges and the upper surface of the planks for the teeth to project through.

Referring now to Figs. 8 to 12, a' a' denote the snapping-rolls. They are corrugated, as shown, and extend in a fore and aft direction in the vertical plane of the stalk passage-way between the prongs and a little to one side of the center of the same, as best shown in the diagram Fig. 11. These rolls are journaled at their front and rear ends in suitable bearing-brackets b' b' in a supplemental frame that is composed of longitudinal side bars c', a cross-bar d' at the rear, and which is open at the front end, as shown in Fig. 8. This roll-frame is supported at its front end by rods e' e', that are secured to the under sides of the boards q q, the frame being adjustably connected to and supported by these rods by means of hooks or clips f' f' on its side bars which hook over the rods. At its rear end the frame is upheld by supporting-links g' g', that are pivoted to side brackets h' concentrically with a shaft i', that is journaled in the side bars c' c' and drives the snapping-rolls by means of gearing j' k', the rolls themselves being intergeared by means of spur-pinions l' m'. The supporting-links g' g' are journaled at their lower ends concentrically with the shaft n', which extends from the inner fore and aft bar a clear across the machine to the outer bar f and constitutes the counter-shaft, which takes power from the traction-wheel b by means of an ordinary chain belt and distributes it to the various parts of the machine to be driven.

As will be seen from Fig. 2, the roll-carrying frame is inclined upwardly toward the rear, but at a less inclination than the overlying prongs, and the above-described arrangement for supporting the frame permits its height and inclination to be adjusted as the condition of the crop may require. To put this adjustability of the snapping-rolls under the driver's control, the roll-frame is provided with a hand-lever o', which extends within reach of the driver's seat and may have any suitable devices for locking it in different positions, and in order to render the adjustment easy for the driver I have provided a stout coil-spring p', which is connected to the outer side bar c' at one end and to the supporting-link g' at the other, so as to counterbalance the weight of the rear end of the frame and assist the driver in lifting the parts. The chain belt which drives the counter-shaft is denoted by q' in Fig. 1. It is thrown around a driving-sprocket r', which is loose on the shaft, but is normally clutched thereto by a spring s', which presses it outward, so that the notches t' in its hub engage a pin u' projecting from the shaft. In order to permit the counter-shaft to be unclutched from its driving-sprocket, there is provided a shipper consisting of a ring v', sleeved on the shaft and having a spiral flange w', which fits into a notch in the pin x', which controls the sliding movement of the sprocket on the shaft. This ring also has a handpiece y', by means of which it can be given a partial rotation around the shaft, so as to shift the sprocket along the shaft and lock it to or unlock it from the pin. In this manner the entire operative mechanism of the machine may be thrown out of action when the machine is traveling from one place to another.

The stalk-forwarding chains and the snapping-rolls are driven from the counter-shaft, respectively, by means of chain belts a^2 b^2, the former of which runs around a driving-sprocket c^2 on the shaft w and the latter of which is thrown around a similar sprocket d^2 on the shaft i', a spring tightener e^2 being applied to the chain b^2 to keep it taut in the various adjustments of the snapping-rolls and frame.

As before described, the snapping-rolls are positioned under the prongs a little to one side of the center of the stalk passage-way. On the other side of this center line and parallel with the snapping-rolls there is a trough f^2 to receive the ears as they are detached by the rolls a' a'. The trough lies a little below the rolls, so that the ears as they are snapped off the stalks will fall naturally into it, and it extends, as best shown in Figs. 2, 3, and 6, from the lower end of the rolls to and beyond their upper rear ends, where it turns around, so as to deliver the ears transversely to the movement of the machine into a husking attachment to be presently described or to any suitable box or receptacle if it is not desired to husk the ears immediately. The construction of the trough is best shown in Figs. 11 and 12, where it will be seen that it has upstanding edge flanges g^2 and an intermediate inclined flange h^2. The edge flanges are simply the sides of the trough; but the intermediate flange constitutes a partition dividing the trough lengthwise into two passages, one of which receives the ears from the snapping-rolls and constitutes the trough proper and the other of which simply forms a passage-way for the return ply of the ear-forwarding belt i^2. This belt runs around an idle sprocket j^2 at the front end of the trough and a driving-sprocket k^2 at the rear end and is provided with blades or paddles l^2 for pushing the ears along the trough to its upper end and around the bend, so as to deliver them to the husking attachment. The trough is mounted in fixed position and is secured at its lower end to the inner long bar c and near its upper end to one of the bearings i for the main axle h. Its inclination is substantially as shown in Fig. 2.

The relative positions of the snapping-rolls and the ear-receiving trough are best shown in Fig. 11. As here seen, the rolls are pro-

vided with curved shields m^2 m^2, practically covering the rolls except for a narrow passage n^2, which is left between the adjacent edges of the shields just over the meeting-line between the rolls. The ear-receiving trough is arranged with one edge below and a little to one side of the shield of the lower roll, and the partition h^2 is inclined away from this edge for the twofold purpose of more effectually directing the falling ears into the trough and covering and protecting the return ply of the ear-forwarding chain and its paddles.

The husking attachment consists of two pairs of rolls o^2 o^2, that are mounted transversely of the machine at the rear on the cross-bars e e. The bearings for these rolls are carried by arched yokes p^2 p^2 at opposite ends, and the rolls are intergeared at one end in the usual way by spur-pinions q^2. Side boards r^2 r^2 are erected at the sides of the rolls to prevent the ears being jolted off and form a sort of trough or way to deliver the husked ears at one side of the machine, where they may be received into any sort of a receptacle or simply dropped on the ground. One of the rolls at the driving end has its shaft s^2 extended, as shown in Fig. 6, and a chain belt t^2, that is thrown around a driving-sprocket u^2 on this extension, takes power to drive the rolls from a similar sprocket v^2 on the counter-shaft n'. On its way around these sprockets the chain runs under a sprocket x^2 on the end of a line-shaft a^3, that is mounted in bearings underneath the innermost of the cross-bars e and extends to and beyond the discharge ends of the husking-rolls, where it has a bearing b^3, depending from the side bar a on the outer side of the traction-wheel b. Near its driven end this shaft has a bevel-pinion c^3, which gears with a similar pinion d^3 on a short vertically-inclined shaft e^3, that is mounted in a yoke f^3, having a sleeve inclosing the shaft. The yoke is bolted to the fore-and-aft bar c and also provides a bearing g^3 for the shaft a^3. The shaft e^3 carries at its upper end the driving-sprocket k^2 for the forwarding-chain, already described, which works in the ear-receiving trough. At the opposite end of the line-shaft a^3 there is a bevel-pinion g^3, which drives a short cross-shaft h^3, and from a driving-sprocket on this shaft a chain belt j^3 runs over a driven sprocket i^3 on a stud at the rear end of the outer side board r^2 above the level of the husking-rolls. Rigid with the sprocket i^3 there is a spur-gear k^3, which meshes with a similar pinion l^3 on an overhead shaft m^3, which is mounted in bearings projecting above the side boards at the discharge end of the attachment. This is the shaft of the ear-discharger, which consists of a pair of endless chains n^3, traveling around sprockets on this and another shaft o^3 over the opposite end of the husking-rolls. The chains n^3 n^3 are connected together by rods p^3, and these rods carry blades or paddles q^3, that travel constantly in one direction above the meeting-line of the husking-rolls, so as to sweep the ears off the rolls as they are husked. The blades are preferably arranged in alternate positions on adjacent rods p^3, as clearly shown in Figs. 1 and 3, and they are connected to the rods in the following manner, so as to yield when engaging ears that are held by their husks in the rolls o^2 o^3: Each blade is mounted upon its rod by means of a hub r^3, having a cam-shaped end s^3, which engages with a collar on the rod having a similar cam-shaped end. A spiral spring a^6 reacts against a pin in the rod and the opposite end of the hub r^3 and holds the hub yieldingly against the collar t^3 with sufficient tension to prevent the blades from turning on the rod under the resistance opposed by the ears on the rolls. When, however, the blades encounter ears that are for the moment held by the grip which the rolls have on the husks, the spring yields and permits the blade to turn back on its rod into the position shown in dotted lines in Fig. 13. It is then free to pass over the ears; but as it must be restored to working position before it again comes around the hub has a small projection a^4, projecting in almost an opposite direction to the blade, and a fixed rod a^5 is extended across the discharger near the delivery end, in such position that the projection on the hub will strike it just before the blade reaches the end of the husking-rolls. This knocks the blade back into working position again, so that when it comes around the next time it will hang vertically, as shown in Fig. 13.

The construction of the husking-rolls is best illustrated in Figs. 7 and 14. They are hollow metallic cylinders. One of each pair is provided with lines of husking-pins a^7, and the other with corresponding recesses a^8 running lengthwise. The pins are seated in hollow nipples and have springs reacting between the bottoms of the nipples and heads a^9 on their inner ends. The pins are adjustably mounted in the rolls—that is to say, they are adapted to be projected from the face of the roll to a greater or less extent, dependent upon the condition of the husks or to compensate for wear, and the means for adjusting them consists of the shaft b^5, extending centrally through each roll and having cone-shaped cams b^6, which when the shaft is moved in one direction forces the pin out and when moved in the other direction allows the springs to withdraw the pins. Each roll having pins is provided with one of these shafts, and they are made adjustable by being mounted at one end in brackets c^4, that are adjustably connected to the rear cross-bar e.

Beneath the husking-rolls a receptacle c^5 for shelled corn is provided. It consists of an ordinary box having a sliding bottom c^6 and hung from the frame-bars in any suitable way. An inclined screen c^7 is arranged over the top

of this box and under the husking-rolls, as shown in Fig. 14. One end of the screen rests loosely on the rear edge of the box and the other is connected by bent straps d^5 to eccentrics c^8 on the shaft a^3. This arrangement affords an effective means for shaking the screen.

The construction of the machine being in detail as thus described, it is to be noted that the stalk-forwarding chains v v are intended to be driven at a speed sufficient to give the stalks a rearward inclination. This enables the snapping-rolls to handle them more rapidly and effectually than if they act upon them when in vertical position. The points g g pick up the bent and downhanging stalks, and the prongs straighten them up. The chains then coming into action carry the stalks over backward, and they go through the snapping-rolls diagonally with a rearward inclination, thereby enabling the rolls to get a better hold upon them and snap off the ears quickly and easily with a more positive and certain action. A further feature of advantage is the position of the rolls with respect to each other whereby the stalks and ears are inclined laterally, so that when the ears pop off they fall naturally into the trough beneath. The method of supporting and adjusting the rolls whereby they may be raised and lowered and set at any required angle is an important feature of the invention, especially as the range of adjustment is considerable and is under control by the driver without stopping the machine. It is also to be noted that the transverse arrangement of the husking-rolls at the rear shortens up the machine and delivers the husked corn out of the way of the machine on the succeeding round, while the husks are discharged at the rear, falling down the incline formed by the screen c^7. The corn which is unavoidably shelled by the action of the husking-rolls is meantime received into the receptacle beneath the screen. The construction of the husking-rolls themselves and also the arrangement and construction of the ear-discharger are also important features, the advantage of which has already been described. The adjustment of the cam-carrying shaft in the interior of the husking-rolls effects the simultaneous projection or withdrawal of the husking-pins a^7, so that these pins are easily adjusted, as the condition of the crop may require. The rolls o^2 are shown herein as each provided with but a single line of husking-pins. They may, however, be provided with any desired number of rows; but however this may be the gearing should be so arranged that the rows of pins on one roll will meet a corresponding row of holes on the adjacent roll as the rolls revolve together, thereby nipping the husks, stripping them from the ears, and carrying them down between the rolls and dropping them on top of the inclined screen, the ears being meanwhile swept lengthwise along the rolls and delivered at one side, as above described.

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

1. In a corn-harvester, the combination of stalk-forwarding chains on opposite sides of the stalk passage-way, and ear-snapping rolls located under the chains, the inclination of the rolls with respect to the chains being adjustable.

2. In a corn-harvester, the combination of stalk-forwarding chains on opposite sides of the stalk passage-way, a pair of snapping-rolls located under the chains toward one side of the passage-way, and an ear-receiving trough below the snapping-rolls on the other side of the passage-way.

3. In a corn-harvester, the combination of stalk-forwarding chains on opposite sides of the stalk passage-way, a pair of snapping-rolls located under the chains toward one side of the passage-way, that one of said rolls nearest the center of the passage-way being lower than the other.

4. In a corn-harvester, the combination of stalk-forwarding chains on opposite sides of the stalk passage-way, ear-snapping rolls located under the chains, said rolls being bodily adjustable lengthwise the chains and also adjustable as to inclination with respect to the chains.

5. In a corn-harvester, the combination of the upwardly and rearwardly inclined prongs on opposite sides of the passage-way, stalk-forwarding chains on said prongs, a pair of snapping-rolls carried by an upwardly and rearwardly inclined frame under the prongs, a sliding connection between the frame and the prongs at the forward end, pivoted links supporting the frame at the rear, and means for adjusting the inclination of the frame.

6. In a corn-harvester, the combination of the upwardly and rearwardly inclined prongs on opposite sides of the passage-way, supporting-rods e', e', at the forward ends of the prongs, an adjustable frame underlying said prongs and carrying snapping-rolls, sliding hangers f', f', on the front end of the frame engaging the supporting-rods, pivoted links g', g' supporting the rear end of the frame, and a hand-lever o' for adjusting the frame.

7. In a corn-harvester, the combination of the upwardly and rearwardly inclined prongs on opposite sides of the passage-way, an adjustable roll-carrying frame underlying the prongs and having a sliding connection therewith at the front end, pivoted links g', g' supporting the frame at the rear, a hand-lever o' for effecting the adjustment, and a spring p' for assisting the action of the lever.

8. In a corn-harvester, the combination of a pair of snapping-rolls between which the standing stalks pass, an ear-receiving trough alongside said rolls, and an endless ear-con-

veyer both plies of which work in said trough, the trough having a longitudinal flange or partition to cover and protect the return ply of the conveyer.

9. In a corn-harvester, the combination of rearwardly and upwardly inclined stalk lifting and guiding prongs, ear-snapping rolls extending lengthwise under the prongs, and means for separately adjusting the inclination of the prongs and the rolls.

10. In a corn-harvester, the combination of upwardly and rearwardly inclined, rearwardly-traveling stalk-forwarding devices, means for adjusting the same vertically, ear-snapping rolls located under the forwarding devices, and means for adjusting the rolls vertically independently of the forwarding devices.

11. In a corn-harvester, the combination with rearwardly-moving stalk-forwarding devices, of ear-snapping rolls underlying said forwarding devices and adjustable lengthwise.

12. In a corn-harvester, the combination with rearwardly-moving stalk-forwarding devices, of a pair of ear-snapping rolls located under said forwarding devices, one of said rolls being located higher than the other, and means for adjusting the rolls vertically independently of the forwarding devices.

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

EDWARD A. JOHNSTON.

Witnesses:

CHAS. N. CHAMBERS,

F. H. GERE.