(No Model.) 4 Sheets—Sheet 1.

J. A. STONE.

CORN HARVESTING MACHINE.

No. 521,679. Patented June 19, 1894.

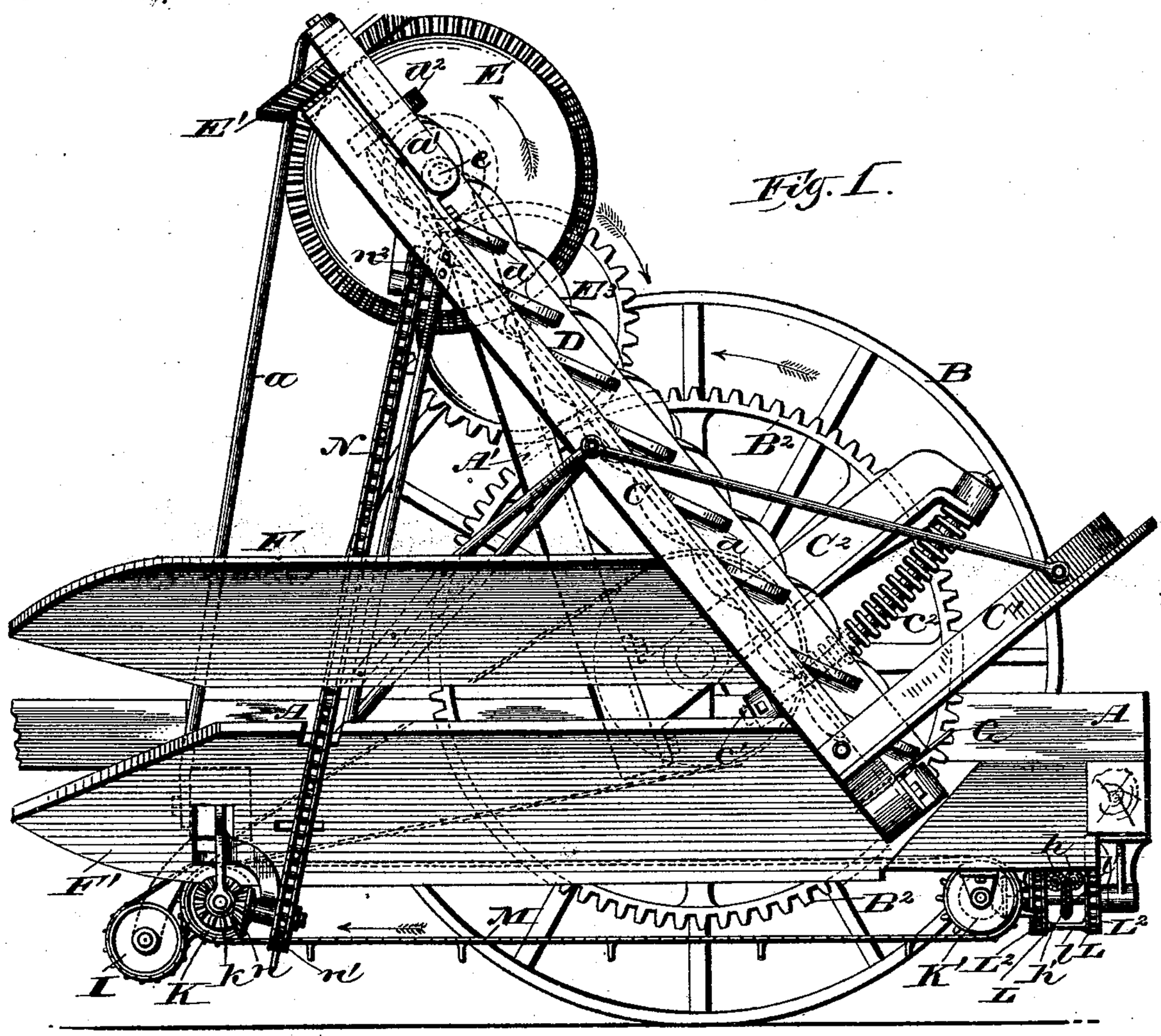

Fig. 1.

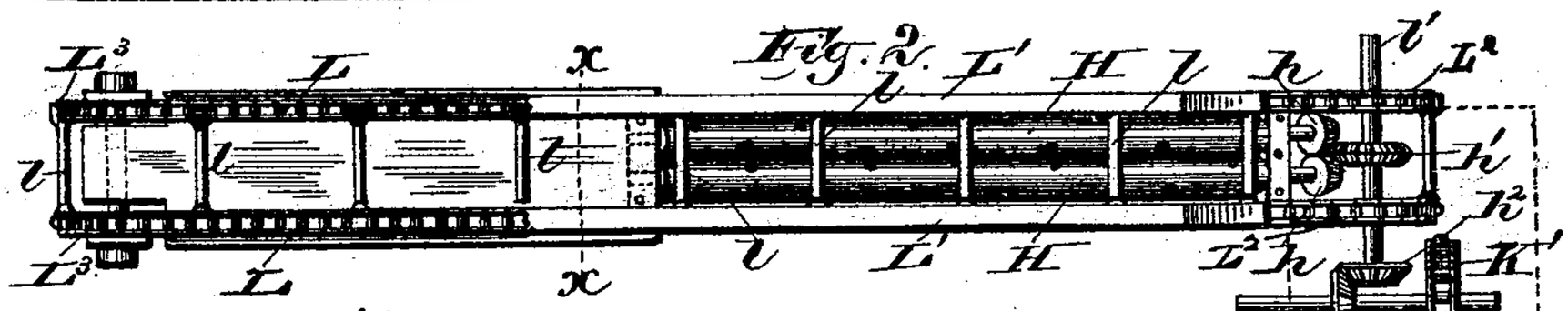

Fig. 2.

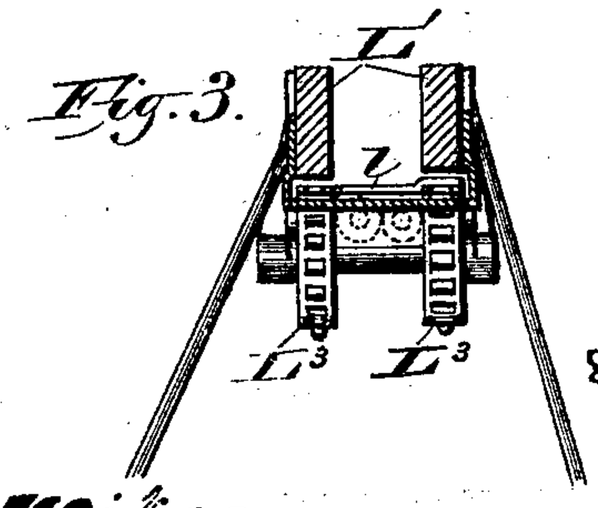

Fig. 3.

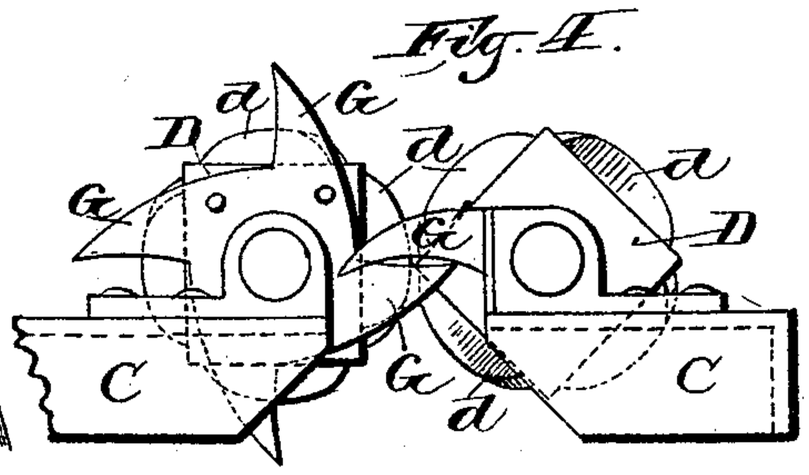

Fig. 4.

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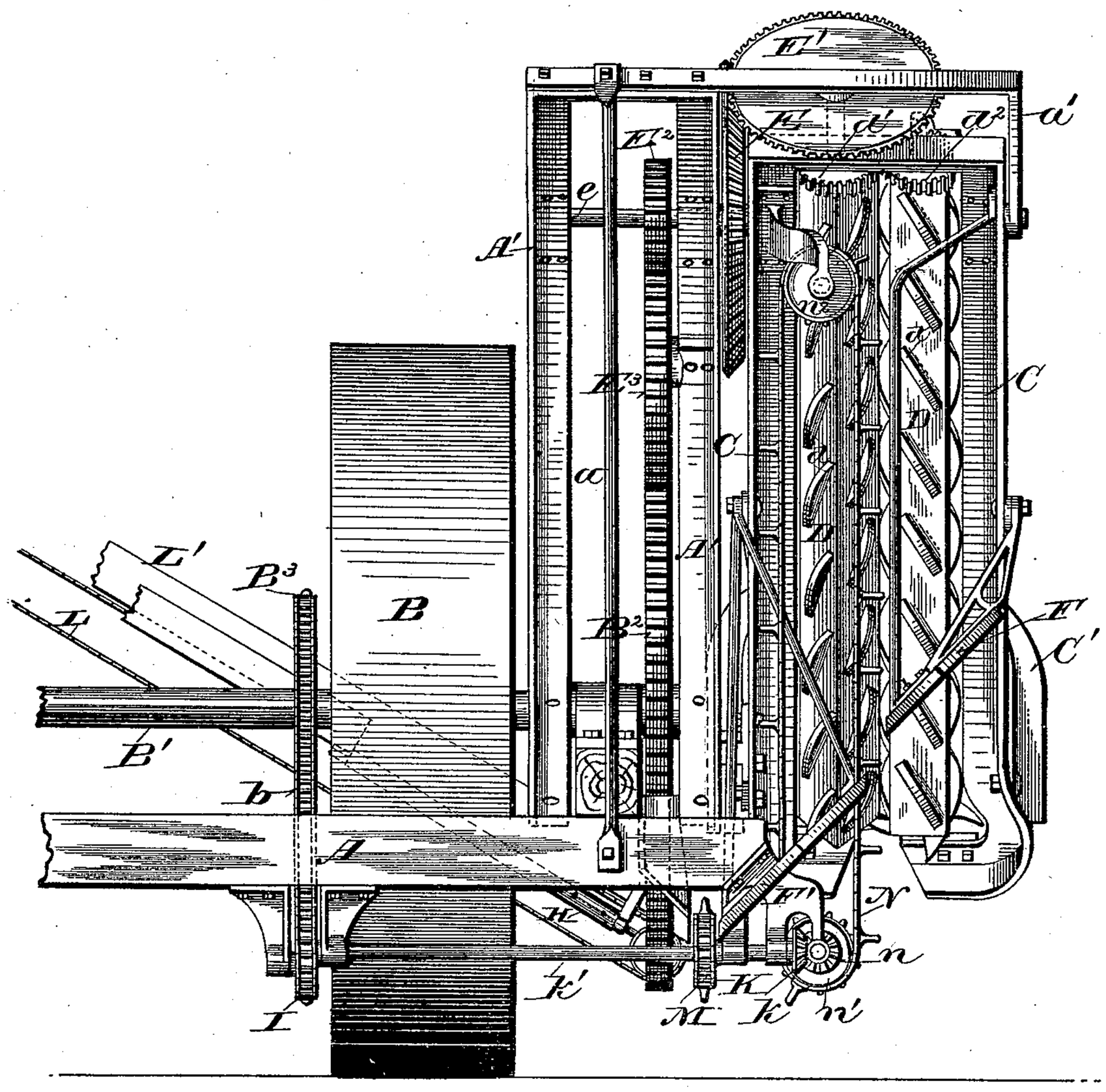
J. A. STONE.

CORN HARVESTING MACHINE.

No. 521,679. Patented June 19, 1894.

Fig. 5.



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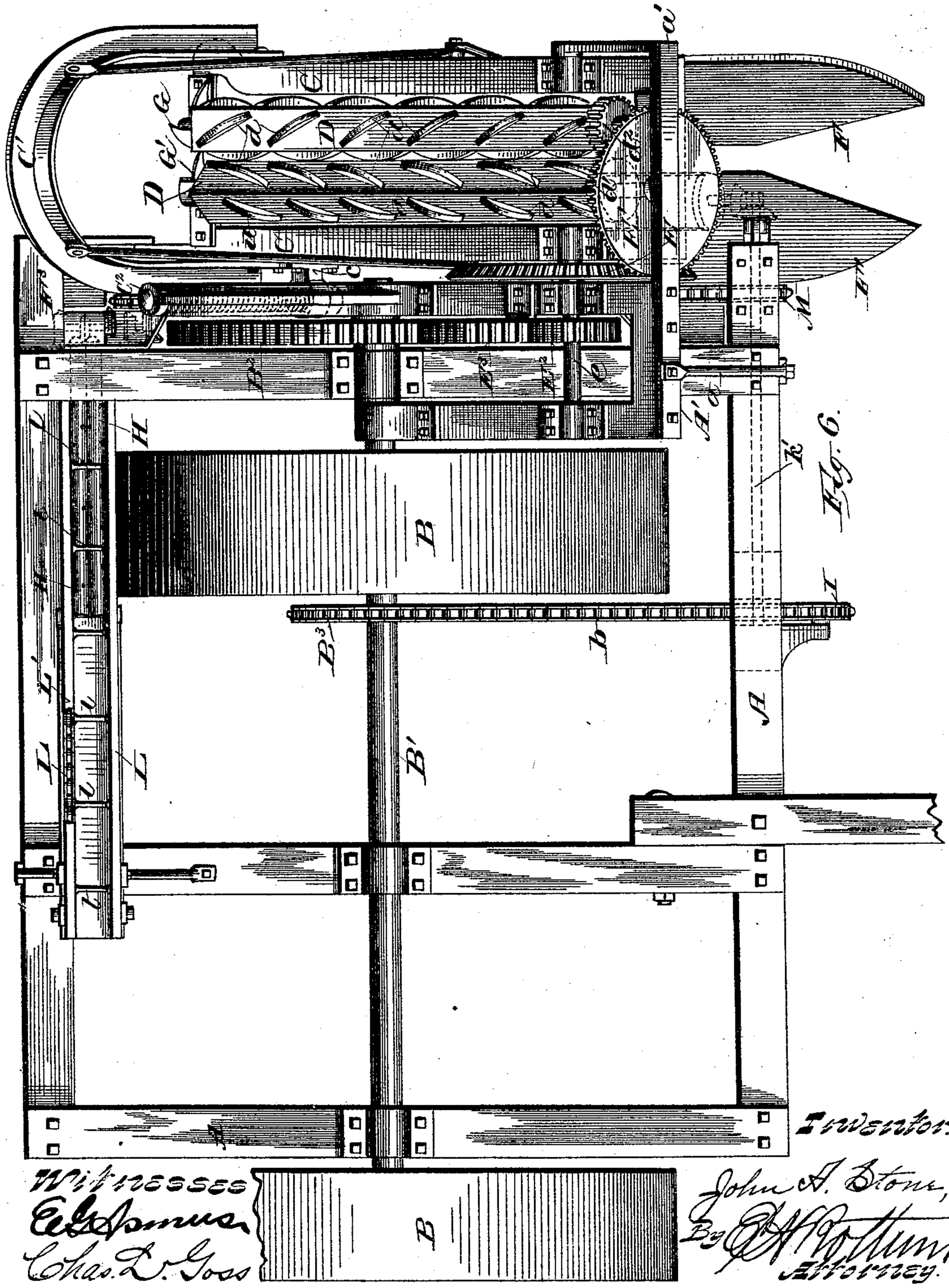
J. A. STONE.

CORN HARVESTING MACHINE.

No. 521,679. Patented June 19, 1894.



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J. A. STONE.

CORN HARVESTING MACHINE.

No. 521,679. Patented June 19, 1894.

Fig. 7

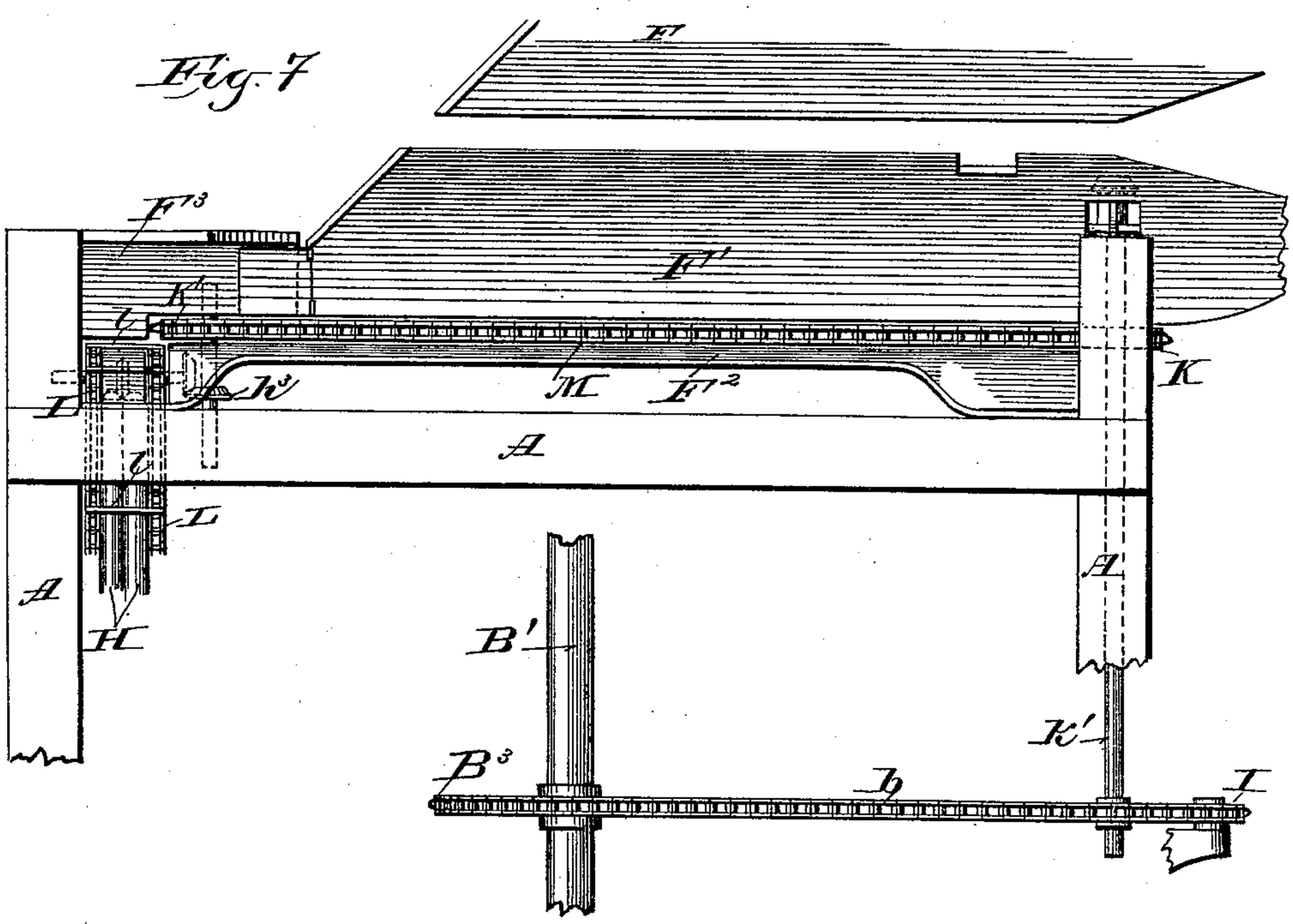
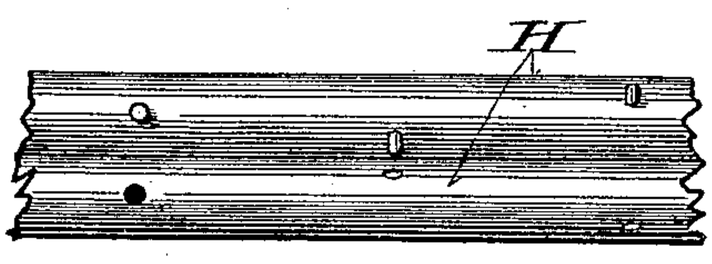


Fig. 8



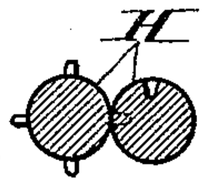


Fig. 9.

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UNITED STATES PATENT OFFICE.

JOHN A. STONE, OF VAIL, IOWA.

CORN-HARVESTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 521,679, dated June 19, 1894.

Application filed June 21, 1887. Serial No. 241,952. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. STONE, of Vail, in the county of Crawford and State of Iowa, have invented certain new and useful Improvements in Corn-Harvesting Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The object of my invention is to pick the ears from standing corn, to husk the same, and, when desired, to sever the stalks.

It consists essentially of a pair of inclined snapping rollers, arranged to yield or swing back at the lower ends, of mechanism for driving said rollers, of a device for catching the severed ears, of husking mechanism and of a cutter for severing the stalks from the ground, when desired.

In the accompanying drawings like letters designate the same parts in the several figures.

Figure 1 is a side elevation of my improved machine. Fig. 2 is a plan view of the husking or cleaning rollers and elevator. Fig. 3 is a cross section of the same on the line *x x*, Fig. 2. Fig. 4 is a view on an enlarged scale of the lower end of the snapping rollers and stalk cutters. Fig. 5 is a front elevation of the machine. Fig. 6 is a plan view of the same. Fig. 7 is a plan view of the ear catching trough and conveyer in and by which the ears are conducted to the husking mechanism. Fig. 8 is a plan view on an enlarged scale of a portion of the husking rollers and Fig. 9 is a cross section of the same.

Referring to the drawings, A A represents the main frame of the machine, B B the driving wheels fixed upon the axle B′, which rotates therewith and bears in boxes attached to said frame. Upon the rotary axle B′ are mounted at one end the main driving gear B^2, the sprocket wheel B^3 and at each side of the gear B^2 the lower ends of the inverted U-shaped frame A′, which is furnished with boxes bearing upon said axle. This frame extends upwardly and is forwardly inclined from said axle and is supported at its upper end and rigidly held in place by the rod or brace *a* attached to and rising from the main frame A.

e is a shaft supported parallel with the axle B′ in boxes attached to the inclined frame A′ near its upper end. Upon the shaft *e* are mounted the gear E^2 between the limbs of frame A′ and the bevel gear E outside of said frame. E^3 is an idle gear journaled upon a spindle secured to frame A′ and working on opposite sides with the gears B^2 and E^2.

To the upper end of the frame A′ is attached the right angled arm *a′* formed at the end in the same axial line with shaft *e* with an inwardly projecting trunnion upon which, and the extended end of said shaft *e*, the roller frame C is supported and swings as hereinafter explained.

D D are the snapping rollers for severing the ears from the stalks, preferably made square in cross section and provided on their faces with oblique wings or projections *d d*, those on either roller alternating with those on the other. Said rollers are set parallel with each other and are supported and turn in bearings provided therefor in frame C parallel therewith. To the upper end of the inner roller shaft is fixed the bevel gear E′, which works with the gear E and is driven thereby, and just below said gear E′ upon the same shaft is mounted the gear *d′* which works with a similar gear d^2 on the other roller shaft as shown in Figs. 5 and 6. The rollers D D are so geared that the angles of each will be presented to the faces of the other in their rotation, as shown in Figs. 1, 4 and 5. The lower ends of the frame C are connected and prevented from spreading by the yoke C′ attached thereto.

C^2 is a rearwardly extending arm or bracket attached to frame A′ and connected by a curved rod or bolt *c′* with an ear *c* attached to the inner section of frame C. A spiral spring c^2 is placed around said rod or bolt *c′* between said arm or bracket C^2 and ear *c*, which allows the lower end of said frame C and the snapping rollers D D to swing upon its bearings and recede whenever said rollers meet with sufficient obstruction.

F F′ are ear catching leaves or boards secured to the yielding frame C and set, one under each of the rollers D D, and trans-

versely inclined inwardly and downwardly, the outer board F being set a little higher than the other so as to cause the ears caught thereon to jump the space between said boards and prevent them from falling through it. The inner edges of the boards F F′ are beveled off at their front ends and form diverging gathering-points.

F^2 as shown in Figs. 5 and 7 is an inclined leaf attached to the frame of the machine parallel with the lower board F′ and forming therewith a conveyer trough across the adjacent end of the machine to the hopper F^3 at the lower end of the elevator and cleaning rollers.

k′ is a shaft supported in bearings attached to the front rail of the main frame A and provided at the inner end with a sprocket wheel, at the outer end with a bevel gear *k* and at an intermediate point under the front end of the conveyer trough with a sprocket wheel K. Said shaft *k′* is driven by a chain belt *b* passing over the sprocket wheel B^3 on the axle B′ and an idler I supported in a bracket in advance of said shaft, as shown in Figs. 1, 5, 6 and 7.

M is a conveyer chain provided at intervals with projections working in a longitudinal opening in the bottom of the conveyer-trough F′ F^2 parallel therewith upon sprocket wheels K K′.

N is an upright gathering chain provided with fingers similar to those on the conveyer chain M, and supported upon sprocket wheels $n' n^2$, which have bearings in brackets secured one to the frame C and the other to the main frame A. To the extended journal of the sprocket wheel *n′* is secured the bevel gear *n* which works with the gear *k* and drives said gathering chain. The sprocket wheel n^2 being close to the center on which frame C swings, the limited movement of said frame will not affect the proper working of the gathering chain.

L′ is an elevator trough supported at the rear of the machine transversely to the conveyer M and leading upwardly on an incline from the hopper F^3, as shown in Figs. 5 and 6.

H H are the husking or cleaning rollers working toward each other between the sides of the elevator trough and parallel therewith and serving as the bottom of said trough at its lower end. One or both of them is provided with spurs or projections working with corresponding indentations or perforations in the other as shown in Figs. 8 and 9.

L L are chain belts supported upon sprocket wheels L^2 L^3 at the upper and lower ends of the conveyer trough L′ so that their ascending sections will run close to and parallel with the upper sides of said cleaning rollers on each side of said trough. Upon the extended end of shaft *l′* of the lower pair of sprocket wheels L^2 L^2 is mounted the bevel gear h^2 which works with a similar gear h^3 on the shaft of sprocket wheel K′, as shown in Fig. 2 and drives the elevator chains L L and through a double bevel pinion *h′* mounted upon said shaft *l′* between said sprocket wheels and working with bevel gears *h h* on the lower ends of the shafts of rollers H H rotates the latter in opposite directions toward each other.

To the chains L L are secured cross bars or followers *l l*.

G′ is a fixed knife attached to the lower bearing or support of one of the snapping rollers D, and G is a rotary cutter attached to the other roller and working like a shear with said fixed knife, as shown in Figs. 4 and 6. These knives or cutters may be detached and removed from the snapping rollers whenever it is desired to leave the corn stalks standing.

My improved machine operates as follows:—The wheels B B being guided between rows of corn carry the diverging gathering points of the boards F F′ in the required position to take in a row of corn, which is thereby guided to the snapping rollers D D, said snapping rollers being rotated toward each other on the under side grasp the stalks and draw the same between them and the oblique wings *d d* engaging the ears and twisting them from side to side sever them from the stalks, which continue to pass between said rollers until they are discharged at the rear lower end thereof and severed from the ground by the cutters G G′, or, in case said cutters are removed, left standing. As the ears are severed from the stalks by said rollers they fall upon the inclined boards F F′ and are conducted thereby into the conveyer trough at the lower edge of the lower board F′. The gathering chain N engaging at its lower end which runs near the ground such stalks as are broken or inclined, so as not to be caught by the diverging gathering points of the boards F F′, raises said stalks between said boards into engagement with the snapping rollers. The conveyer chain M carries the ears caught in the trough at the lower edge of the board F′ into the hopper F^3 at the rear of the machine where they are engaged by the followers or cross bars *l l* of the elevator chains L L and carried up the trough L′ over the cleaning rollers H H which strip the husks and silks from said ears. Passing from said cleaning rollers the ears are elevated by the followers *l l* to the upper end of the trough L′ where they are discharged into a bag, basket or other suitable receptacle. Whenever the snapping rollers encounter a bunch or mass of stalks or other obstruction which will not pass readily between them the spring c^2 allows the roller frame C to swing back upon its axis and thus permit the obstructing mass of stalks or weeds to pass between said rollers without forcibly uprooting the corn, which would result if the snapping rollers D D were held rigidly in place. By drawing the stalks through the rollers from the under side the severed ears immediately fall and clear said rollers, thus avoiding their mutilation thereby; and by allowing the lower ends of said rollers to

yield the machine is caused to run more steadily and the forcible uprooting of the corn is prevented by giving said rollers a little more time to act upon obstructing masses of stalks, weeds or the like.

I claim—

1. The combination in a corn harvesting machine of a pair of snapping rollers set with their upper ends inclined forwardly and mechanism arranged to turn the under sides of said rollers toward each other whereby the corn is drawn between them from the under side, and a stalk cutter at the lower end of said rollers substantially as and for the purposes set forth.

2. The combination in a corn harvesting machine of a pair of snapping rollers set with their upper ends inclined forwardly and supported at their lower ends in rearwardly yielding bearings and mechanism arranged to rotate said rollers, substantially as and for the purposes set forth.

3. The combination in a corn harvesting machine of a pair of snapping rollers and an upwardly and forwardly inclined frame carrying said rollers arranged to swing in the direction of the travel of the machine upon an axis transverse thereto and near the upper end of said frame, and having a yielding connection at or near its lower end with some fixed part of the machine, substantially as and for the purposes set forth.

4. The combination in a corn harvesting machine of the snapping rollers inclined forwardly at their upper ends and rotating toward each other at their under sides so as to draw the stalks between them from underneath, and an ascending gathering chain extending from a point near the ground to a point adjacent to the under side and upper part of said rollers and provided with projections arranged to engage leaning or fallen stalks and to raise the same into position to be operated upon by said snapping rollers, substantially as and for the purposes set forth.

5. The combination in a corn harvesting machine of the snapping rollers inclined forwardly at their upper ends laterally inclined ear-catching leaves or boards placed under said rollers and formed at their front ends into diverging gathering guides or points, a gathering chain or belt provided with projections and extending upwardly between said leaves or boards, from a point near the ground to a point adjacent to the upper portions of said rollers, a trough formed along and parallel with the lower of said leaves or boards and a conveyer working in and lengthwise of said trough, substantially as and for the purposes set forth.

6. The combination in a corn harvesting machine of the upwardly and forwardly inclined snapping rollers, a rotary cutter attached to one of said rollers or its shaft, and a fixed cutter working with said rotary cutter, substantially as and for the purposes set forth.

7. The combination in a corn harvesting machine of the snapping rollers inclined forwardly at their upper ends and rotating toward each other at their under sides so as to draw the stalks between them from underneath, an ascending gathering chain extending from a point near the ground to a point adjacent to the under side and upper part of said rollers, laterally inclined catching boards placed underneath said rollers with a space between them, upwardly inclined cleaning rollers, an elevating chain or belt arranged to carry the ears over said cleaning rollers, an elevator trough arranged to retain the ears upon said cleaning rollers, and a conveyer arranged to conduct the corn from said gathering boards to said elevator and cleaning rollers, substantially as and for the purposes set forth.

8. The combination in a corn harvesting machine of the main frame, an upwardly and forwardly inclined frame fixed relatively thereto, a roller frame hinged at or near its upper end in or to said inclined frame and having a spring connection at or near its lower end with a fixed part of the machine, a pair of square snapping rollers furnished with oblique alternating wings and supported and bearing in said roller frame, and mechanism connecting said rollers with a driving wheel substantially as and for the purposes set forth.

9. In a corn harvesting machine a pair of upwardly extending parallel snapping rollers, capable of yielding rearwardly in the direction of the travel of the machine, substantially as and for the purposes set forth.

10. In a corn harvesting machine the combination with a pair of upwardly extending, rearwardly yielding stem severing rollers and driving mechanism connected therewith, of husk removing mechanism and a conveyer arranged to gather the ears as they leave the stem severing rollers and conduct the same to the said husk removing mechanism, substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JOHN A. STONE.

Witnesses:
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GEORGE M. GOLL.