No. 683,174. Patented Sept. 24, 1901.

J. E. GOODHUE.

CORN HUSKING MACHINE.

(Application filed Feb. 15, 1901.)

(No Model.) 4 Sheets—Sheet 1.

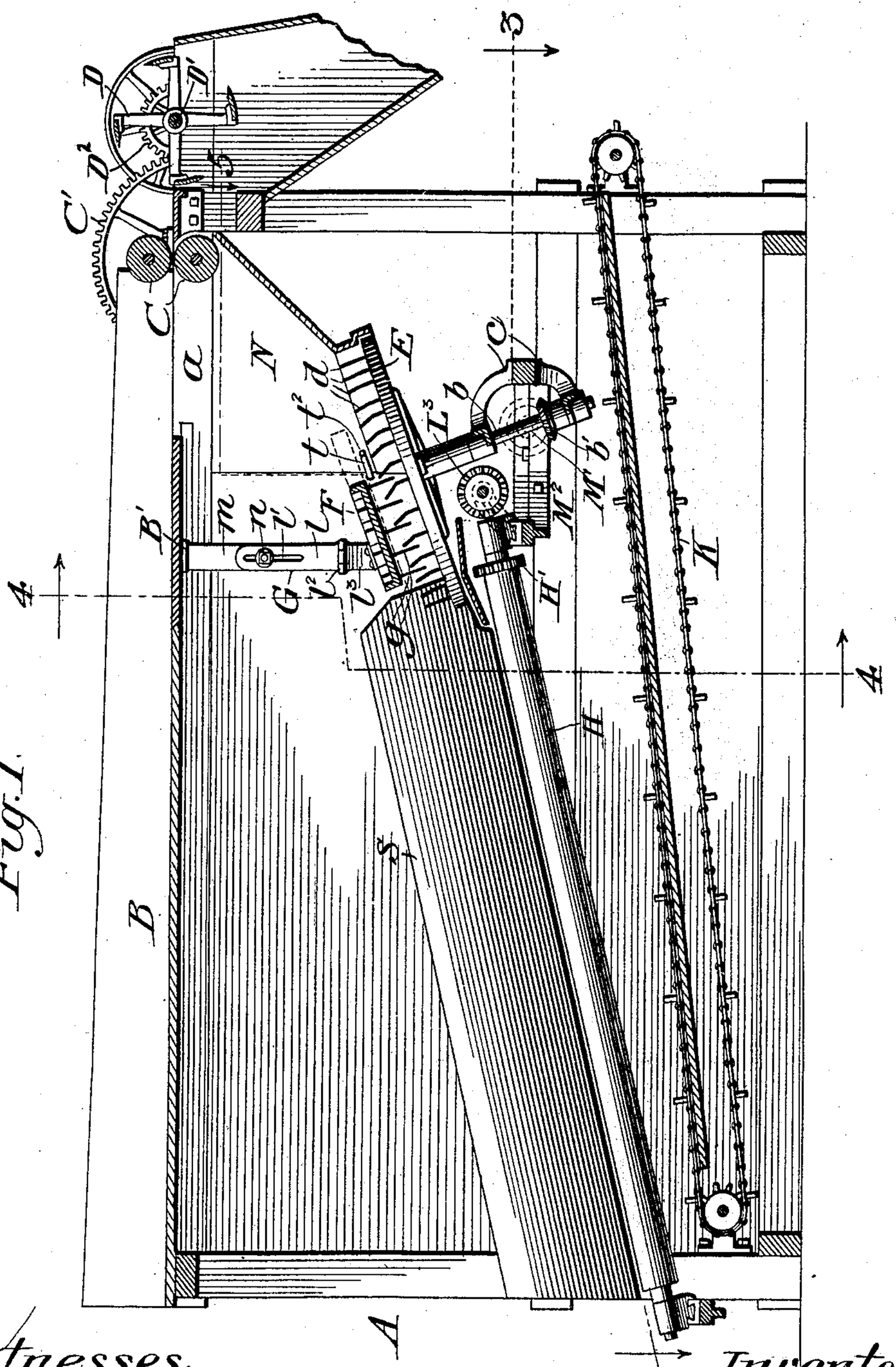

Fig. 1.

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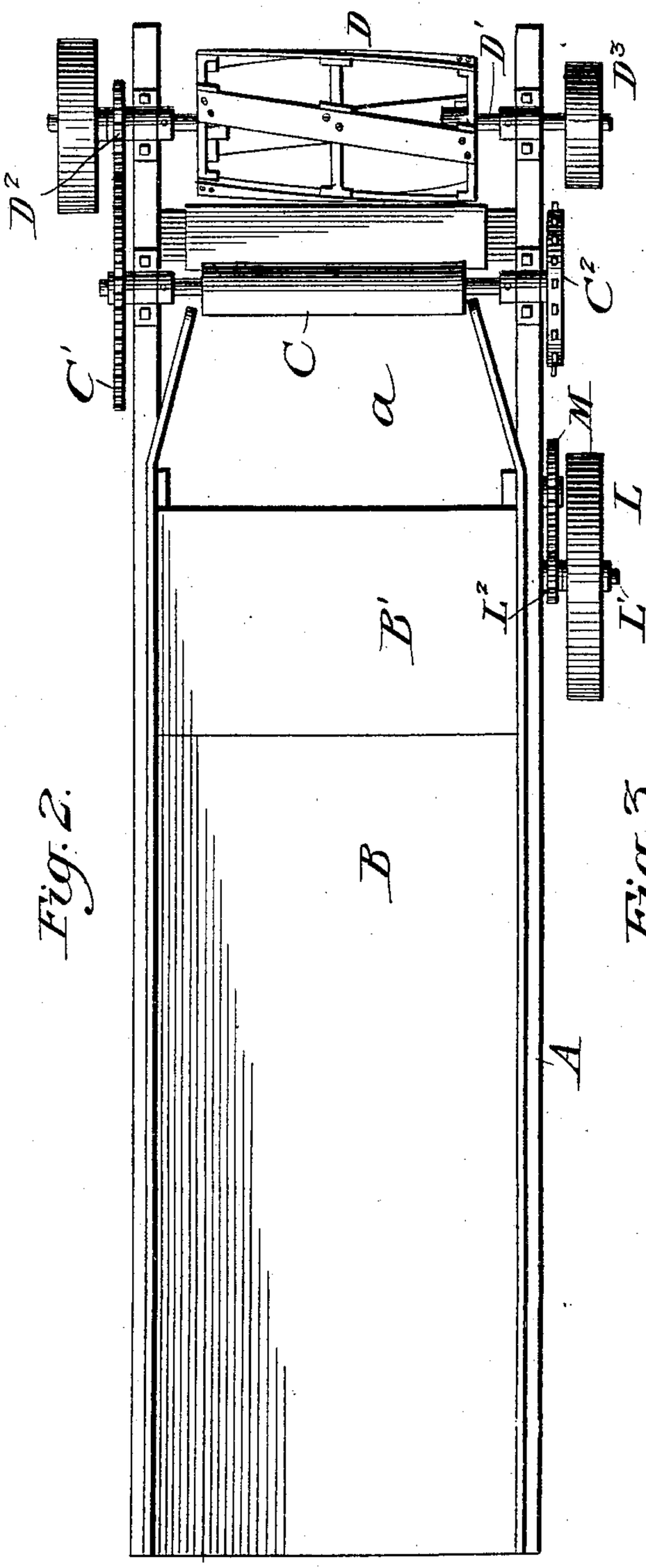

Fig. 2.

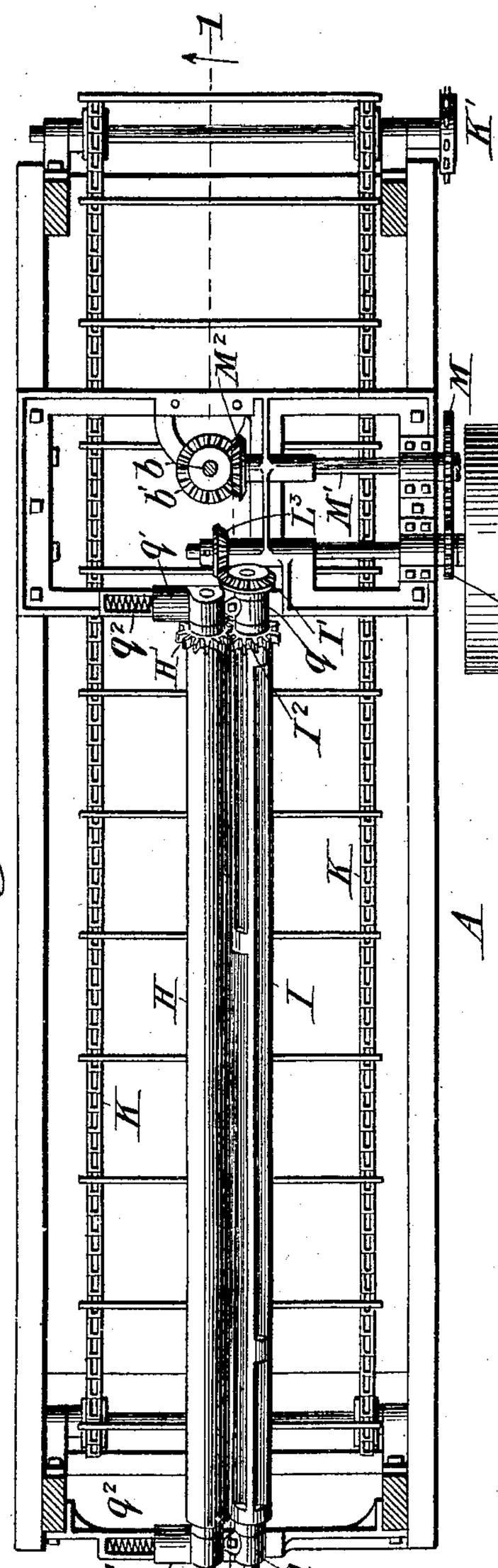

Fig. 3.

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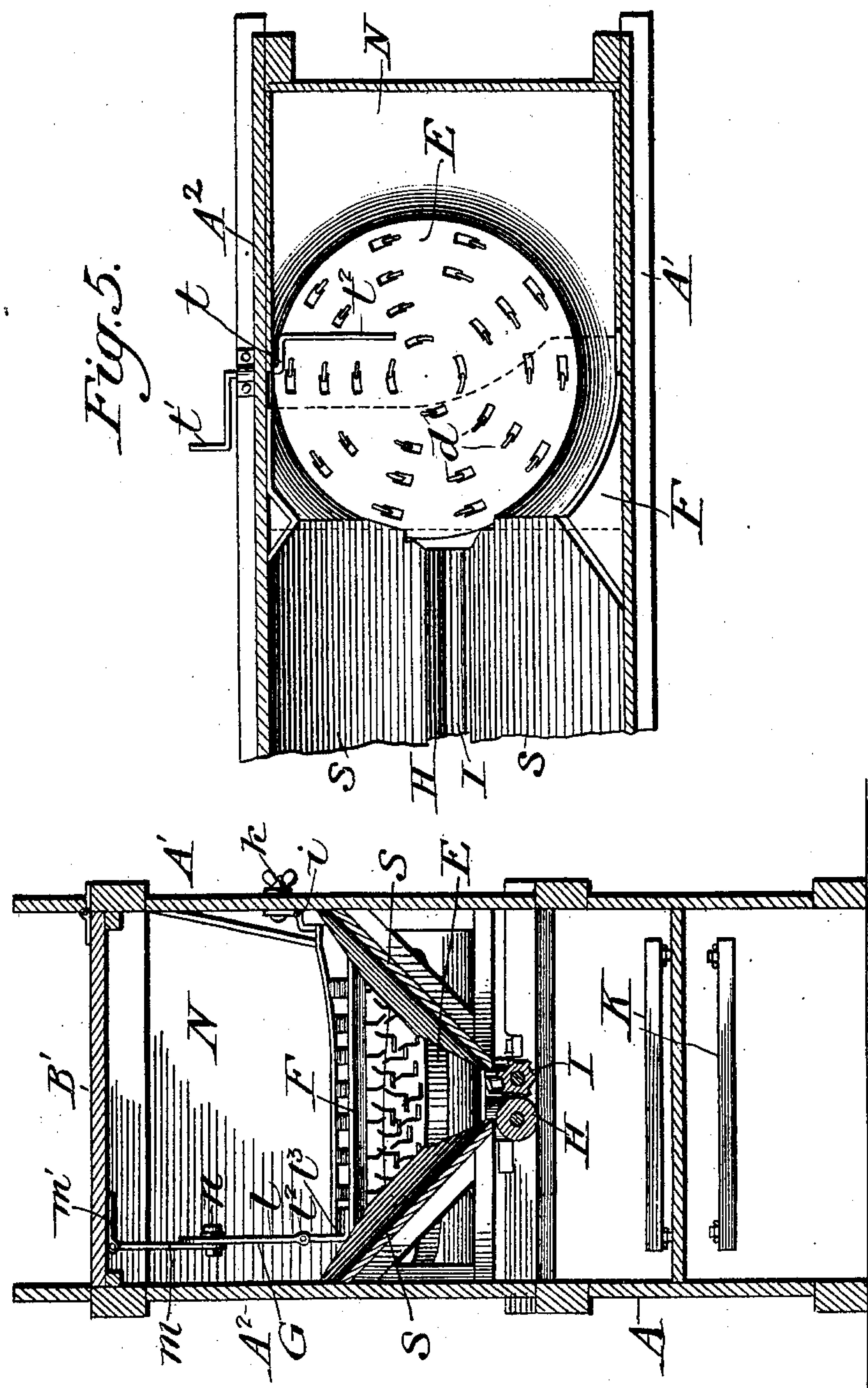

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No. 683,174.

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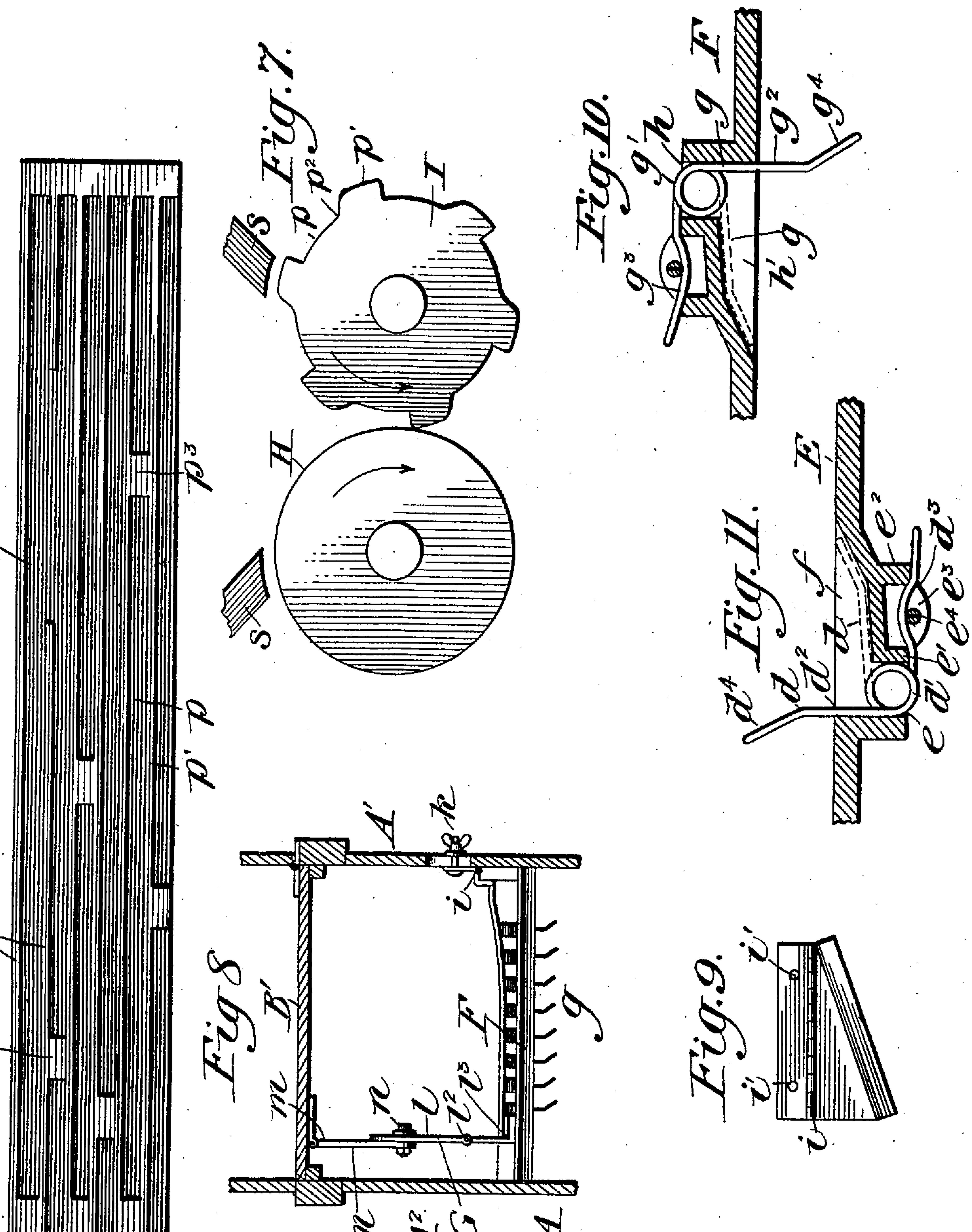
(Application filed Feb. 15, 1901.)

(No Model.)

4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

JAMES E. GOODHUE, OF ST. CHARLES, ILLINOIS.

CORN-HUSKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 683,174, dated September 24, 1901.

Application filed February 15, 1901. Serial No. 47,443. (No model.)

To all whom it may concern:

Be it known that I, JAMES E. GOODHUE, a citizen of the United States, residing at St. Charles, in the county of Kane and State of Illinois, have invented a new and useful Improvement in Corn-Husking Machines, of which the following is a specification.

In machines of the general type to which this invention relates the cornstalks are fed through snapping-rollers, which snap off the ears, causing them to fall upon and be engaged by husking-rollers, which remove the husks and silk, while the stalks pass beyond the snapping-rollers to feed-cutters.

My object is more especially to provide certain improvements in the construction of the husking mechanism whereby the husks and silk may be quickly and effectually removed from the ears without injury to the kernels.

In the drawings, Figure 1 is a vertical section taken longitudinally through my improved machine on irregular line 1 1 in Fig. 3; Fig. 2, a top plan view of the machine; Fig. 3, a plan section taken on irregular line 3 3 in Fig. 1; Fig. 4, a vertical section taken on irregular line 4 4 in Fig. 1 and viewed in the direction of the arrows; Fig. 5, a broken plan section on line 5 in Fig. 1; Fig. 6, a developed view of one of the husking-rollers forming a feature of my improvements; Fig. 7, an enlarged broken section through the husking-rollers; Fig. 8, a broken section also taken on line 4 in Fig. 1 and showing an upper stationary and adjustable plate carrying spring husk-loosening fingers with means for adjusting the plate; Fig. 9, a detail view of an end of the stationary plate or board shown in Fig. 8, illustrating its hinge connection; Figs. 10 and 11, enlarged broken sectional detail views showing spring husk-loosening fingers and the way they are mounted in the upper stationary plate or board and a lower rotating plate or disk.

A is the frame of the machine, provided on its upper side with a platform B, along which the cornstalks are moved to be engaged by snapping-rollers C. Mounted in the upper end of the frame beyond the snapping-rollers is the rotary feed-cutter D. Between the platform B and the snapping-rollers is an opening *a*, through which the ears drop when removed from the stalks by the snapping-rollers.

E is a support, preferably a disk-shaped board or plate, mounted upon the upper end of a shaft *b*, which may be journaled in a suitable yoke-frame *c*, held rigidly in the frame A. On the disk E are preferably concentric series of spring-fingers *d*, which may be fastened to the disk, as shown most plainly in Fig. 11. The disk is provided with narrow openings *e*, from which extend narrow recesses *f* in the upper side of the disk. The fingers *d* are formed of spring-wire, each with a coil *d'* between ends and arms d^2 d^3. The coil portion *d'* of each finger rests in an opening *e*, and the arm d^3 rests against the flanges e' e^2 on the under side of the disk. At opposite ends of the flanges e' e^2 are perforated ears e^3, through which a cotter-pin e^4 is passed to clamp the arm d^3 firmly in place against the flanges e' e^2, as shown in Fig. 11. The outer end portion of the arm d^2 is bent to produce the inclined husk-engaging end d^4. The disk E inclines toward the front end of the machine, as shown most plainly in Fig. 1.

Above and parallel with the disk E is a relatively stationary support board or plate F, provided with downward-projecting spring-fingers *g*. Each finger *g* is formed with a coil *g'* and arms g^2 g^3. The coil *g'* rests in a narrow slot *h* in the board F, and the arm g^3 is fastened in the same way as the arms d^3 of the fingers *d*. The projecting end portion of the arm g^2 of each finger is bent to produce the inclined husk-engaging end g^4. Extending from each slot *h* is a narrow recess *h'* in the under side of the board. The board F is of the shape indicated by dotted lines in Fig. 5, being wide at one end and narrower at the other. At opposite ends of the board F are stationary guide-boards A' A^2, which may be integral parts of the main frame A. The board F is inclined to extend parallel or nearly so with the disk E and is fastened at one end to the lower leaf of a hinge *i*. The upper leaf of the hinge is provided with bolt-holes *i'*, at which it is adjustably fastened, by means of bolts *k*, in vertically-elongated slots in the guide-board A'. Thus the hinge may be raised and lowered on the guide-board to adjust the board F with relation to the disk

E, and the board F may be swung upward upon the hinge. Toward its opposite end portion the board F is fastened to a vertical hanging bar or support G. The support G is formed of two relatively adjustable members *l m*, the member *l* being provided with an elongated slot *l'*. A bolt *n*, fastened in a bolt-opening in the member *m*, extends through the elongated slot *l'* and is provided with a thumb-nut, whereby the support G may be lengthened and shortened. The member *m* has a hinge connection *m'* with the under side of a hinged section B' of the platform B, and the lower end of the member *l* is pivotally connected at l^2 with a part l^3, fastened against the upper side of the board F. The support G holds that end of the board F firmly in its lowered position parallel with the disk E. The platform-section B' is hinged at the same side as the board F. When raised on its hinge, it also raises the board F. The object of this construction is to permit ready access to the spring-fingers to clean or repair them when necessary or to change the number of fingers to suit the varying conditions of the ears of corn.

Extending in a downward-inclined direction from a point below the disk E to the forward end of the machine are husking-rollers H I, which are parallel with and normally in contact with each other. The roller H may be comparatively smooth or its surface may be roughened with corrugations or in any desired way. The roller I, however, is provided with longitudinally-extending grooves or recesses *p*, arranged parallel in break-joint relation to each other, as illustrated, for example, in the diagram or developed view Fig. 6. The parts of the roller between the recesses *p* form longitudinally-extending teeth *p'*, which may be straight, as shown, or slightly spiral, with somewhat extended bearing-surfaces in the arc of a circle of which the axis of rotation of the roller is the center. The forward sides of these teeth are inclined to form cam-surfaces p^2, while the opposite sides of the teeth may be abrupt, all as shown most plainly in Fig. 7. The break-joint arrangement leaves occasional relatively wide tooth portions or gripping-surfaces p^3, which are arbitrarily arranged as to position and length, but should suitably answer the purpose of enlarging the gripping-surfaces of the roller I at intervals along its length. The roller I is mounted toward opposite ends in stationary journal-boxes *q*, while the roller H is journaled at opposite ends in sliding journal-boxes *q'*. The sliding journal-boxes are pressed upon by springs q^2, which tend to hold the rollers in contact with each other, but permit them to separate against the resistance of the springs. Beneath the rollers H and I is the usual conveyer K.

The shaft D' of the feed-cutter is the drive-shaft of the machine. This shaft carries a pinion D^2 in mesh with a gear-wheel C' on the shaft of one of the snapping-rollers. The snapping-rollers may be geared together in any common manner. The shaft of the gear-wheel C' carries a sprocket-wheel C^2, which may be geared by a link-belt (not shown) to a sprocket-wheel K' on the drive-shaft of the conveyer K. The drive-shaft D' carries a pulley D^3, which through a belt (not shown) may drive the pulley L upon a shaft L', journaled in the frame A. On the shaft L' is a pinion L^2, meshing with a pinion M on a shaft M'. The shaft M' at its inner end carries a beveled gear M^2, which meshes with a beveled gear *b'* on the shaft *b*, carrying the disk E. The shaft L' also carries a beveled gear L^3, which meshes with a beveled gear I' on the husking-roller I. The husking-roller I also carries a pinion I^2, meshing with a pinion H' on the husking-roller H. While the means shown for driving the various parts are preferred, of course they may be varied as desired.

Journaled in the side A^2 is a rod or wiper *t*, having a crank-handle *t'* and a crank-stem t^2, which extends over the disk E. When desired, the crank may be turned slightly to lower the stem t^2 into the path of the spring-fingers *d* to depress and wipe across them and cause them when released to spring outward and loosen any parts of husks or silk that may tend to clog them and interfere with their operation.

The operation is as follows: When the ears are snapped from the stalks by the rollers C, they drop upon the rotating disk E, the direction of rotation being that in which the projecting ends of the spring-fingers are inclined. The direction of inclination of the spring-fingers *g* on the board F is approximately opposite to that of the fingers *d*. The ears are guided to fall upon the disk E by the hopper-shaped sides N of a compartment of which the disk forms the base. The fingers *d* carry the ears beneath the board F, where the spring-fingers *g* engage and tend to retard the ears. The engagement of the spring-fingers *d* and *g* with the ears of corn causes the ears to be rotated on their axes and their husks and silk to be loosened. The yielding nature of the fingers prevents their pressing rigidly against opposite sides of the ears and also prevents the fingers from digging deeply into the sides of the ears in a manner to injure or loosen the kernels. Under sufficient resistance the spring-fingers may turn backward to extend entirely in the recesses *f* or *h'*, as indicated, for example, by dotted lines in Figs. 10 and 11. Owing to the rotation of the disk E and the inclination thereof the ears as the husks and silk are loosened are moved to drop to the husking-rollers H I. On opposite sides of the husking-rollers are inclined sides *s s*, forming a longitudinal hopper-shaped trough, of which the rollers are the base. As the ears rest upon the rollers, projecting ends or edges of the husks which have been loosened by the spring-fingers will enter the bite of the rollers in the

recesses p of the roller I. They are then acted upon by the cam-surfaces p^2, which tend slightly to raise the ears as the husks are gripped. The surfaces p' and roller H then grip and draw the husks and silk downward from the ear, depositing it upon the conveyer K, which discharges it from the machine. While the length and shape of the grooves p in the roller I may be more or less arbitrary, I have found it of great advantage to stagger them in some such manner as shown. By this means the husks and silk will fill the recesses and be gripped and drawn down, as described, along the greater length of the roller; but the operation of tearing off the husks and silk is facilitated by their coming in occasional contact with plain peripheral surfaces, whereby the drawing engagement is extended. The fact that the inclined parts p^2 of the roller I operate as cams to slightly raise the ears as they are passed by the grooves also facilitates the removal of the husks and silk. The withdrawing of the husks and silk from the ears and the inclination of the rollers H I causes the ears to be moved along the rollers until they are entirely stripped and discharged at the lower end of the rollers. When desired, the fingers d may be cleaned by turning the wiper t into their paths, as described.

My invention, broadly stated, lies first in mechanism for loosening the husks and silk before the ears are operated upon by the husking-rollers, and the mechanism for performing this operation may be variously modified without departing from the spirit of my invention as defined by the claims. My invention consists, also, in the general construction of the husking-roller I, with its longitudinal teeth, grooves, and cam-surfaces, though the form may obviously be variously modified without departing from the spirit of the invention as defined by the claims.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a corn-husking machine, the combination with the husk-removing mechanism of a husk-loosening device provided in advance of the husk-removing mechanism and comprising approximately parallel supports, one of which is movable to advance the ears of corn between them, and coöperating husk engaging and loosening fingers projecting from both the supports into the path of the ears of corn and adapted to yield relatively under the feeding pressure of the ears of corn to avoid injury to the kernels.

2. In a corn-husking machine, the combination with the husk-removing mechanism of a husk-loosening device provided in advance of the husk-removing mechanism and comprising a stationary support and a rotary support forming a passage between them for the ears of corn, means for turning the rotary support to feed the ears of corn through said passage, and coöperating husk engaging and loosening fingers projecting from both the supports into the path of the ears of corn and adapted to yield relatively under the feeding pressure of the ears of corn to avoid injury to the kernels.

3. In a corn-husking machine, the combination, with the husk-removing mechanism, of a husk-loosening device, supported in advance of the husk-removing mechanism, and comprising an upper stationary support, provided with downward-projecting fingers, and a lower rotary support, approximately parallel with the stationary support and having upwardly-projecting fingers, and means for turning the rotary support, substantially as and for the purpose set forth.

4. In a corn-husking machine, the combination, with the corn-husking mechanism, of a husk-loosening device comprising a lower rotary support, having upwardly-projecting fingers, means for rotating said support, and an upper support, approximately parallel with the lower support, provided with downwardly-projecting fingers and vertically adjustable with relation to said lower support, substantially as and for the purpose set forth.

5. In a corn-husking machine, the combination, with the husk-removing mechanism, of a husk-loosening device, comprising a lower rotary support having upwardly-projecting fingers, means for rotating said support, and an upper stationary support, approximately parallel with the lower support, provided with downwardly-projecting fingers and hinged at one side, substantially as and for the purpose set forth.

6. In a corn-husking machine, the combination, with the husk-removing mechanism, of a husk-loosening device comprising upper and lower approximately parallel supports, one of which is movable, finger sockets and recesses in the adjacent faces of said supports, and spring-fingers in said sockets mounted to yield into said recesses, substantially as and for the purpose set forth.

7. In a corn-husking machine, the combination, with the husk-removing mechanism, of a husk-loosening device comprising upper and lower approximately parallel supports, one of which has means for moving it, and spring-fingers on said supports comprising lengths of wire bent between ends to produce arms and coils, one arm being fastened to the support and the other arm extending yieldingly in the direction of the other support, substantially as set forth.

8. In a corn-husking machine, the combination, with a husk-removing roller H, of a companion husk-removing roller I provided with longitudinally-extending recesses p, teeth p' separating the recesses, and cam-surfaces p^2 at the forward sides of the teeth, substantially as and for the purpose set forth.

9. In a corn-husking machine, the combination, with a husk-removing roller H, of a companion husk-removing roller I provided with longitudinally-extending recesses p, teeth p' separating the recesses, cam-surfaces p^2 at

the forward sides of the teeth, and break-joint surfaces p^3 interposed in the recesses, substantially as and for the purpose set forth.

10. In a corn-husking machine, the combination, with the husk-removing mechanism, of a husk-loosening device comprising upper and lower supports, one of which is rotary, spring-fingers upon the supports and a finger-cleaning device movable into the path of the fingers on the rotary support, substantially as and for the purpose set forth.

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In presence of—
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D. W. LEE.