

No. 774,904.

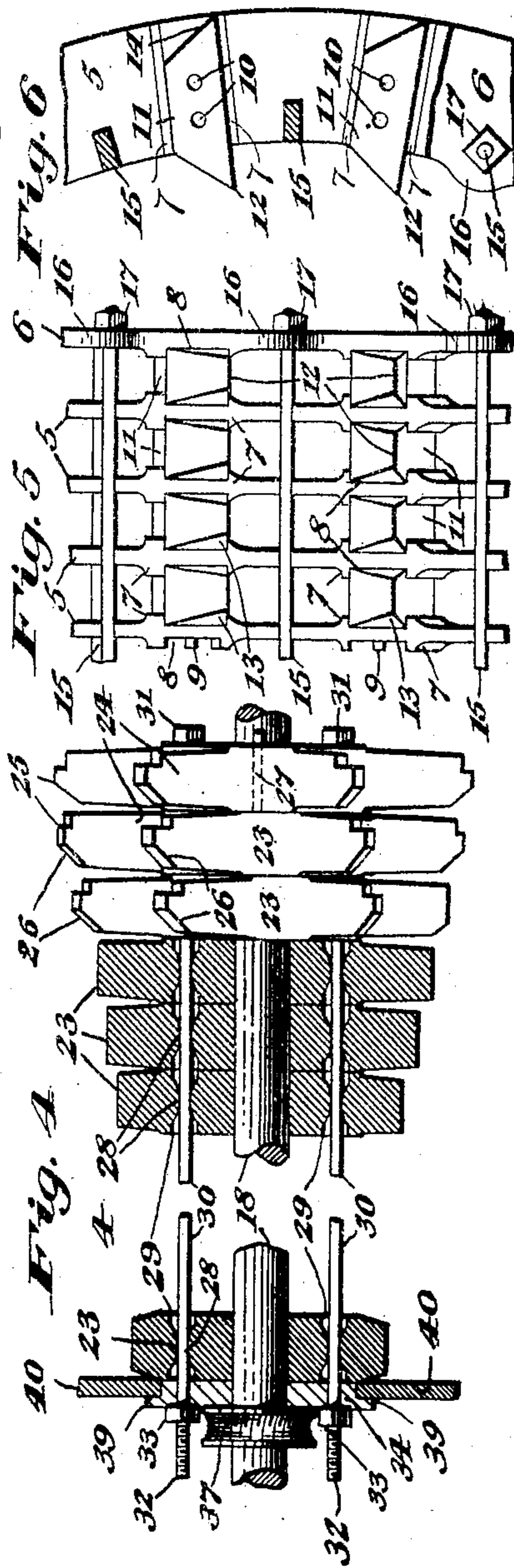
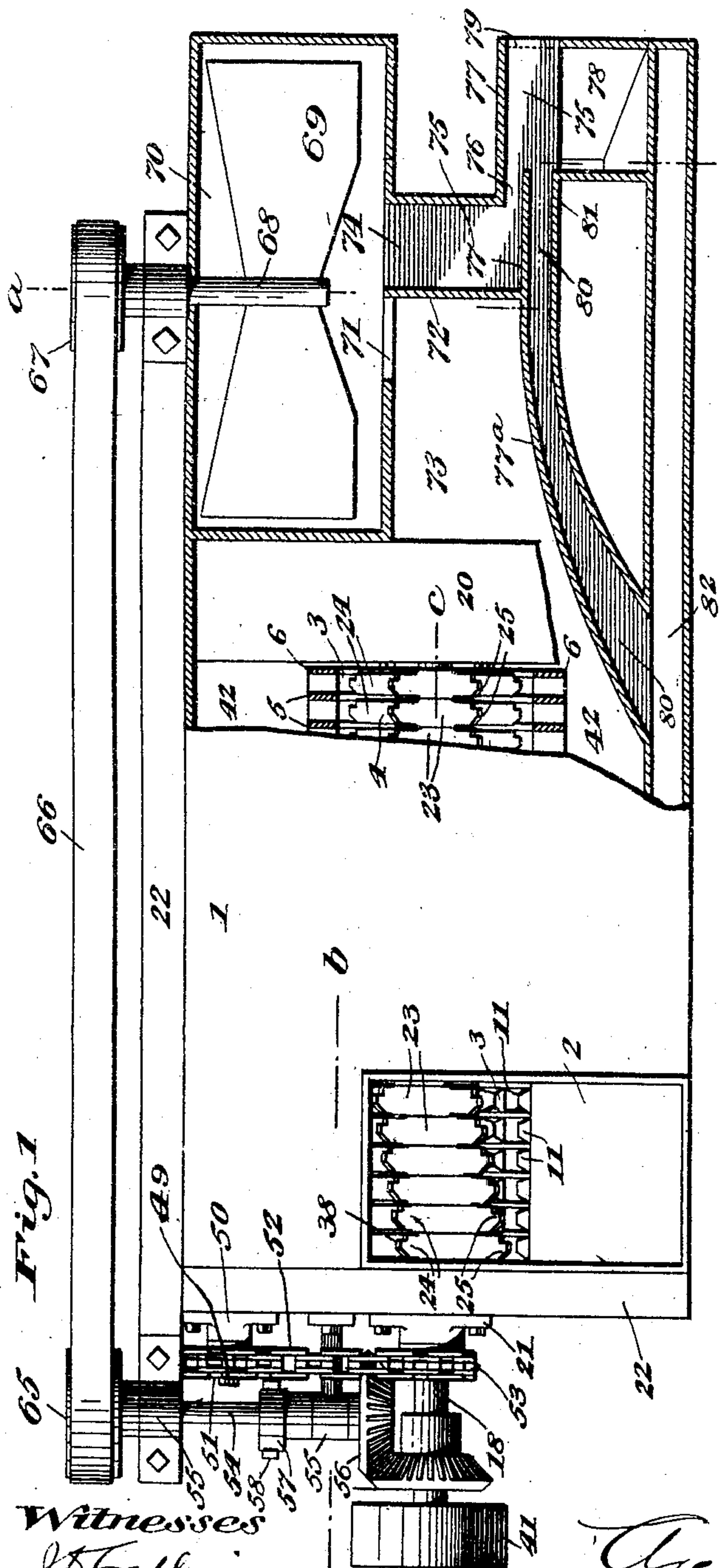
PATENTED NOV. 15, 1904.

A. ANDERSON.
CORN SHELLER.

APPLICATION FILED MAR. 10, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses

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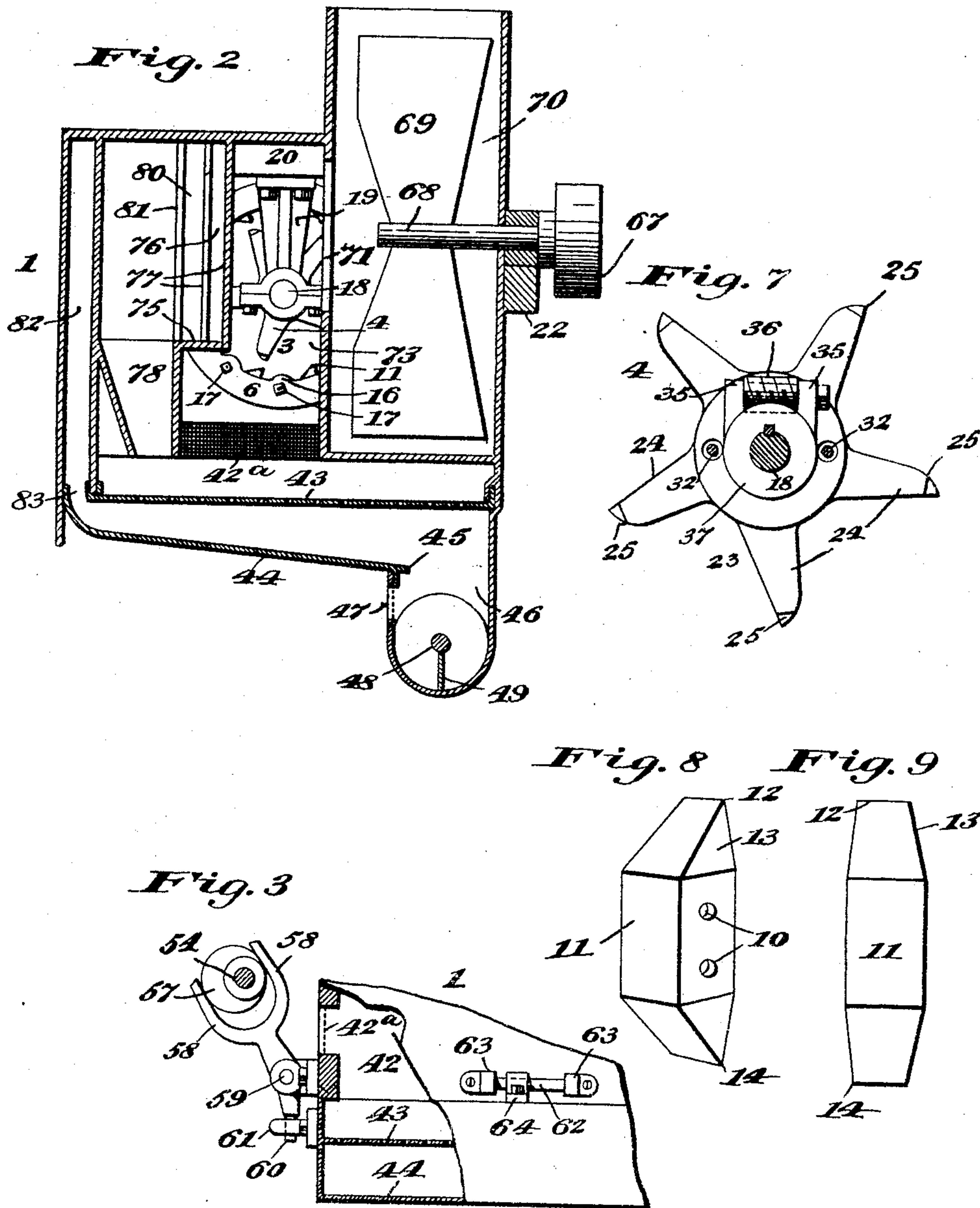
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UNITED STATES PATENT OFFICE.

AXEL ANDERSON, OF CHICAGO, ILLINOIS.

CORN-SHELLER.

SPECIFICATION forming part of Letters Patent No. 774,904, dated November 15, 1904.

Application filed March 10, 1904. Serial No. 197,423. (No model.)

To all whom it may concern:

Be it known that I, AXEL ANDERSON, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Corn-Shellers, of which the following is a specification.

This invention relates to certain improvements in corn-shellers, and more especially in that class of such devices wherein means are provided for cleaning the shelled corn; and the object of the invention is to provide a device of this character of a simple and inexpensive nature and of a compact, strong, and durable construction, wherein the shelled corn will be thoroughly cleaned upon its passage through the device and by means of which an increased capacity and efficiency is afforded.

The invention consists in certain novel features of the construction, combination, and arrangement of the several parts of the improved corn-sheller whereby certain important advantages are attained and the device is made simpler, cheaper, and otherwise better adapted and more convenient for use than various other forms of corn-sheller heretofore employed, all as will be hereinafter fully set forth.

The novel features of the invention will be carefully defined in the claims.

In the accompanying drawings, which serve to illustrate my invention, Figure 1 is a plan view of the corn-sheller constructed according to my invention, one end portion of the device being shown in section in order to illustrate certain of the internal parts of the device. Fig. 2 is a transverse section taken vertically through the improved corn-sheller in the broken plane indicated by the line *a a* in Fig. 1. Fig. 3 is a fragmentary sectional detail view showing certain details of the means for supporting and operating the shaking sieve or screen forming part of the improved corn-sheller, the plane in which parts of the operating devices are shown in section being indicated in Fig. 1 by the line *b b*. Fig. 4 is an enlarged broken view showing certain details of construction of the cylinder of the device, certain parts thereof being shown in section in the plane indicated by line *c c* in

Fig. 1. Fig. 5 is an enlarged view showing a fragment of the concave of the improved corn-sheller for illustration of the sectional structure thereof, and Fig. 6 is a transverse section showing a fragment of said concave for illustration of certain details to be hereinafter more fully described. Fig. 7 is an end view showing certain details of the worm-gearing for use in varying the lead of the toothed sections of the cylinder of the device. Fig. 8 is a perspective view showing one of the teeth of the concave detached and enlarged, and Fig. 9 is an elevation of the same part.

As shown in the views, 1 indicates the casing of the device, which may be made from wood or metal, as desired, and 2 indicates a feed-hopper located near one end of the corn-sheller and adapted to direct the ear-corn within the interior chamber or hollow of the concave, which latter is indicated as a whole at 3.

4 indicates as a whole the cylinder arranged for turning movement in the concave 3.

The concave is constructed from a number of annular parts or rings, between which are interposed spaced teeth designed for coaction with toothed arms upon the sections of the cylinder 4 in such a way that the ear of corn from the feed-hopper 2 will be drawn around in the space between said cylinder and concave and will during its progress through said space be shelled and completely stripped of the grains of corn.

5 5 indicate the intermediate rings or sections of the concave, and 6 indicates the end rings or sections thereof. These rings or sections 5 and 6 are similarly formed with integral lugs or projections 7 on their lateral surfaces, between which lugs or projections are produced sockets or recesses 8, adapted to receive the edge portions of the removable teeth 11 of the device, said teeth being, as shown in Figs. 1 and 5, of sufficient thickness to hold the intervening portions of the rings or sections spaced apart, so that openings are provided in the concave between the teeth and rings for the outward passage of the grains of corn during the operation of the device. For holding the teeth 11 in position I provide the rings or sections 6 and 5 with pins or studs 9,

as seen in Fig. 5, which pins or studs have engagement in openings 10 in the sides of the teeth, and thereby serve to lock the teeth to the sections when the concave is assembled.

5 The parts 11 have angular points or teeth 12 upon their outer ends for engagement with the corn, and upon the sides of said projecting teeth, adjacent to the feed end of the machine, are produced bevels 13, over which the
10 silks and husks are adapted to more freely pass in their course toward the discharge end of the machine than would be possible were said surfaces made straight. The opposite
15 ends of the teeth or parts 11 are also by preference formed with pointed or beveled extremities, as seen at 14, so that the ends of the teeth are made interchangeable.

15 indicates strips of metal extended lengthwise of the concave, with intermediate flattened portions embedded in notches in the intermediate rings or sections 5 5 of the device and with rounded end portions which are screw-threaded after the fashion of bolts and are passed through apertured lugs 16, integral upon the end rings or sections 6 of the
20 concave and have outside of said end rings or sections nuts 17, whereby the parts of the concave when assembled are securely bound together, while being at the same time capable
25 of ready dismemberment in case of required repair.

The cylinder 4 of the improved corn-sheller is formed of a plurality of sections arranged end to end along the axis of the concave, and
35 said sections are toothed or pointed and are adapted for a certain extent of relative movement whereby in the operation of the machine the teeth near the feed end of the device may be given a certain lead over those adjacent
40 to the discharge end, so as to insure the proper carrying of the ear-corn and cobs from the feed to the discharge end of the concave and also to promote the efficiency of the improved corn-sheller in actual use.

45 18 indicates the shaft upon which the cylinder 4 is mounted, this shaft constituting the driving-shaft of the machine and extending axially within the concave, with one end adjacent to but beyond the discharge end of the
50 concave held in a bearing 19, extended down from a cross-beam 20 at the upper part of the device, as shown in Fig. 2, and its other end extended through the feed end of the machine and held in a bearing 21 upon a frame
55 22, suitably located along that end of the machine, which frame is also, as seen in Fig. 1, extended along one side of the casing to afford support for certain shaft-bearings, as will be hereinafter explained.

60 23 23 indicate the sections or members from which the cylinder 4 is produced, and these sections are similar in form and have each five arms 24, as seen in Figs. 1, 2, 4, and 7, which arms have teeth 25 at their extremities for
65 coaction with the teeth of the concave to shell

the ear-corn fed to the machine. Upon the sides adjacent to the feed end of the machine said teeth 25 are beveled, as seen at 26, similarly to the teeth 11 of the concave and for a similar purpose—namely, to insure the proper
70 course of the material from the feed to the discharge end of the device. That section or member 23 which is adjacent to the bearing 19 at the discharge end of the device is held to turn in unison with shaft 18 by means of
75 a key 27 or the like, and the remaining sections or members 23 23 are free for a certain extent of turning movement on said shaft 18, and in each member or section 23 are produced at diametrically opposite points openings 28,
80 extended through them and adapted to stand in alinement when the parts are assembled, so that elastic or spring-metal rods or bars 30 may be extended through said openings from one end of the cylinder to the other, said rods
85 30 forming flexible connections between the sections and having heads 31 adjacent to the discharge end of the device. The openings 28 in each section have enlarged end portions 29, so that a certain extent of flexure of the
90 bars or rods 30 is permitted when one section is moved or turned on shaft 18 relative to another, and at the feed end of the cylinder the bars or rods 30 have threaded ends 32 passed through openings at opposite sides of a disk
95 or member 34, which fits flush upon the end section 23 at that point and has a grooved perimeter 39, wherein is adapted to fit a dust-cap 40, which forms a head or closure within the concave at that end of the machine to prevent
100 escape of corn at that point. Nuts 33 are also provided on said threaded ends of rods 30 for purposes to be hereinafter explained.

On disk 34 are spaced lugs 35, as seen in
105 Fig. 7, and these lugs serve as bearings wherein turns a worm 36, the threads or teeth of which engage the similar parts of a worm-wheel 37, keyed or otherwise held on the shaft 18 at that end of the machine, the worm-shaft having a
110 squared head to be engaged by a wrench, so that it may be turned. By this construction it will be seen that when the parts of the cylinder are assembled the worm 36 may be turned and will impart its rotation to the disk 34
115 whereon said worm is held, the worm-wheel being held from such turning movement by its key, and the turning of disk 34 will serve to impart to the members or sections 23 23, and especially those at the feed end of the device, a certain spiral or twisted arrangement,
120 as seen at 38 on Fig. 1, whereby those teeth adjacent to the feed end of the machine are given the required lead over the successive teeth to insure the travel of the material within the concave toward the discharge end thereof. When the required adjustment has been attained, nuts 33 may be screwed up to disk 34 to prevent further endwise movement of rods
125 30, which in the operation of the machine

would result in increased twisting of the sections of the cylinder 4.

As above stated, shaft 18 is the driving-shaft of the machine, for which reason it is provided with a pulley 41, over which may be passed a belt or band to drive the shaft from a suitable source of power.

42 indicates a space or chamber within the casing and surrounding the concave 3 at all points, both above, below, and at the sides thereof, and in this space or chamber the shelled corn, together with dust, silks, particles of the cobs, &c., are adapted to pass from within the concave. Air is admitted to this space or chamber through a screened opening 42^a in the feed end of the casing 1, and below said space or chamber is a shaking sieve or separator formed of an upper screen 43 and a lower inclined bottom 44, of imperforate material, the lower edge portion 45 of which overhangs a channel 46, extended lengthwise of the machine, in which channel is a shaft 48, carrying a screw conveyer 49 for carrying the shelled corn toward the discharge end of the machine.

At the feed end of the machine shaft 49 is held in a bearing 50, as seen in Fig. 1, and outside the casing a sprocket-wheel 51 is held on said shaft, over which wheel is extended a sprocket-chain 52, the opposite end of which is extended upward around a larger wheel 53 on the driving-shaft 18, whereby turning movement is imparted from shaft 18 to the screw conveyer at a reduced speed.

47 indicates a screened opening extended lengthwise in the side of the channel 46 immediately beneath the overhanging edge of the bottom 44 of the shaking-separator, and, as will be hereinafter described, air is drawn in at this opening 47 in the operation of the machine and serves in passing across the path of the falling shelled corn from the edge 45 to separate from said corn the dust and particles mixed therewith, which waste substances are carried upward and discharged from the machine separately from the shelled corn, as will be hereinafter explained.

54 indicates a cross-shaft journaled in bearings 55 55 at the feed end of the machine and having bevel-gears 56 for driving it from shaft 18, and on said shaft 54 is a cam 57, which is engaged between the forks 58 of a lever pivoted at 59 at the lower part of the frame of the machine and having a downwardly-directed arm 60, engaged in an eye or bail 61 at the adjacent end of the shaking-separator formed of screen 43 and bottom 44. By this arrangement it will be readily seen that as shaft 18 turns its rotation will be imparted to shaft 54, and through the cam-and-lever arrangement the separator will be reciprocated endwise of the machine at a suitable speed to agitate the materials falling from the concave to the screen 43, whereby the shelled corn is caused to pass through the openings in screen

43 and fall on the inclined bottom 44, down which it will pass in the reciprocatory movements of the separator to the overhanging edge 45, whence it will be discharged into the conveyer-channel 46.

For supporting the separator any desired means may be employed; but in Fig. 3 I have shown an arrangement of guide-rod 62, supported at its ends in brackets 63 63 on the casing of the machine, the separator having an upwardly-extended eye or perforated part 64 secured to it and adapted for play lengthwise of said guide-rod 62 as the separator is reciprocated. This form of support is very convenient and simple; but its employment is not arbitrary.

On shaft 54 is a pulley 65, over which extends a belt 66, which is carried along frame 22 to the discharge end of the machine, at which point it is passed round a pulley 67 on a fan-shaft 68, whereon is a fan 69 within a chamber 70, which has at one side a circular draft-opening through which air is adapted to be drawn in the operation of the machine. 71 indicates the said opening, which is divided by a transverse partition 72 into two ports or ducts 73 and 74, the port 73 having communication with the chamber or space 42 surrounding the concave, so that in the operation of the fan air will be drawn in said chamber or space at the feed end of the machine through the screened opening 42^a, and such air will traverse the chamber and serve to separate the silks, dust, and particles from the corn falling from the concave onto the screen 43, this separation being effected in as complete a way as possible and the separated waste substances being drawn in at the port 73 through the fan-chamber 70 and therefrom discharged.

The port or duct 74 has a flat floor or bottom 75 and is in communication with an angular passage 76, formed between two partitions or walls 77 77, extended vertically at the discharge end of the casing, as seen at Figs. 1 and 2. The passage 76 is also adapted for communication around the forward end of one of the partitions 77 with a passage 80, extended between vertical walls 77^a and 81 toward the central part of the length of the machine, at which point the said passage 80 is laterally deflected toward one side of the casing and has communication with a vertical chamber or passage 82, which is extended vertically along the length of the casing of the machine and has its lower part, as seen at 83, adapted for communication with the space of the separator below screen 43 at the higher part of the inclined bottom of said separator.

Adjacent to the forward communicating parts of passages 76 and 80 is arranged a screened air-inlet 79, and at this point is also located a hopper 78, wherein is received such grains of corn as may be carried along by the draft to this point, it being evident that in

the operation of the machine air will be drawn in at the longitudinal screened opening 47 in conveyer-channel 46 and will pass through the stream of falling corn discharged from the overhanging edge 45 of the separator-bottom, so as to separate from said falling grain any impurities which may be therein, and said impurities will by said ascending air-current be carried upward along the space below screen 43 to the lower part 83 of chamber 82 and will at that point be deflected upward into said chamber and thence carried into the duct or passage 80 and along the same to the point of communication of the passages 80 and 76, whence such impurities will be drawn into the passage 76 and carried through duct 74 into the fan-chamber. Should any grains of corn be carried along with the impurities to the forward end of passage 80, such corn will by its greater specific gravity strike on partition 77 and be deflected out of passage 76 into hopper 78, whence it will be discharged onto the screen 43 of the separator with which the hopper communicates, as seen in Fig. 2. Such heavy particles of impurities as strike on partition 77 being lighter than the corn will not be so far deflected and will fall on the floor or bottom 75, which is extended at this point to form a shelf, as seen in Figs. 1 and 2, and thus will not enter the hopper.

From the above description it will be seen that the improved corn-sheller is of an extremely simple and inexpensive nature, since it requires for practical operation but one exhaust device, the air-current created thereby being divided in two parts, one of which is passed through the concave-chamber and the other through the separator-chamber in such a way as to thoroughly clean the shelled corn from the impurities with which it would be mixed when discharged from the machine were such a separating means not provided. It will also be apparent that the specific construction of the concave and cylinder shown are of an extremely simple and efficient nature and permit of readily assembling these parts and also of making required repairs in addition to the increased efficiency of the machine attained through their use. It will also be apparent from the above description that the improved corn-sheller constructed according to my invention is capable of considerable modification without material departure from the principles and spirit of the invention, and for this reason I do not wish to be understood as limiting myself to the precise form and arrangement of the several parts of the device herein shown in carrying out my invention in practice.

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

1. A corn-sheller comprising a casing having a chamber wherein is a concave, a separator below said chamber and provided with

a screen and a chamber beneath the same, means for admitting air to the respective concave and separator chambers, an exhaust device, an air duct or passage leading from the separator-chamber to said exhaust device and another air duct or passage leading from the concave-chamber to said exhaust device.

2. A corn-sheller comprising a casing having a chamber wherein is a concave, a separator below said chamber and provided with a screen and a chamber beneath the same, means for admitting air to the respective concave and separator chambers, an exhaust device having a chamber provided with an inlet, a partition extended across the said inlet and air-passages having communication with said inlet on opposite sides of said partition and leading, respectively, from the concave and separator chambers.

3. A corn-sheller comprising a casing having shelling devices, a separator below said devices and having a screen and a chamber below the same, an exhaust device, passages extended from the exhaust device and from the separator-chamber, respectively and having communicating end portions, a wall erected at the point of communication between the passages and a hopper extended alongside said wall and having communication at its lower part with the separator-screen.

4. A corn-sheller comprising a casing, shelling devices therein, a separator below said devices and having a screen, an inclined bottom below the screen and a chamber interposed between said bottom and screen, a draft-chamber extended vertically along one side of the casing and having communication along its bottom with the separator-chamber, an exhaust device and a passage extended from the exhaust device and having communication with the central part of the draft-chamber.

5. A corn-sheller comprising a casing, shelling devices therein, a separator below said devices and having a screen, an inclined bottom beneath the screen, a conveyer-channel the upper part of which has communication with the lower part of the inclined bottom, said inclined bottom having an edge portion overhanging the side wall of the conveyer-channel and said side wall having an air-inlet extended along it beneath said overhanging edge of the inclined bottom, and an air-chamber interposed between the inclined bottom and said screen, an exhaust device and a passage extended from the separator-chamber to said exhaust device.

6. In a device of the character described, a concave comprising a plurality of rings, teeth separately formed from said rings and interposed between the same and means for holding said rings and teeth in relation.

7. In a device of the character described, a concave comprising a plurality of rings having engaging devices on their lateral surfaces,

teeth separately formed from said rings and having means for reciprocal engagement with the devices thereof and means for holding the rings and teeth in relation.

5 8. In a device of the character described, a concave comprising a plurality of rings, teeth separately formed from the rings and interposed between the same, said concave having a feed-hopper at one end and having its opposite end adapted for discharge of substances passing through it and means for holding the rings and teeth of the concave in relation, the teeth of the concave having on their sides adjacent to the feed end of the device beveled surfaces to direct the substances passed over them toward the discharge end of the concave.

15 9. In a device of the character described, a concave formed of a plurality of rings, teeth separately formed from the rings and interposed between the same, the intermediate rings having notches and the end rings having lugs provided with perforations, strips extended lengthwise of the concave with intermediate portions held in the notches of the intermediate rings and end portions passed through the perforated lugs of the end rings and screw-threaded and nuts screwed on the end portions of the strips outside said perforated lugs.

25 10. In a device of the character described, the combination of a concave, a shaft extended axially therein, a cylinder held on the shaft and comprising a series of sections extended lengthwise of the shaft and provided with teeth for coaction with the concave, said cylinder-sections being provided with means for moving them around the shaft relatively to each other and means for rotating the shaft.

35 11. In a device of the character described, the combination of a concave, a shaft extend-

ed therein and provided with driving means, a cylinder comprising a plurality of sections extended lengthwise on the shaft and adapted for movement relatively to each other around the shaft, one end section of the cylinder being held to turn with the shaft, and each section having an opening extended in it, an elastic piece extended through the openings in the sections, and a device at the other end section of the series and connected with said elastic piece and adapted for adjustment around the shaft. 45 50

12. A corn-sheller comprising a casing having shelling devices, a separator below said devices having a screen and a chamber below the same, an exhaust device, passages extended, respectively, from the exhaust device and from the separator-chamber and having communicating portions out of alinement, a wall extended upward at the connection of said passages, a shelf extended from said wall at the base of the passage which communicates with the separator-chamber and a hopper extended beneath and alongside of said shelf and adapted to receive corn deflected from said wall. 55 60 65

13. In a device of the character described, a concave comprising a plurality of rings, teeth separately formed from said rings and interposed between the same, each tooth being reversible and having oppositely-pointed ends and means for holding said rings and teeth in relation. 70

Signed at Chicago, Illinois, this 5th day of March, 1904.

AXEL ANDERSON.

Witnesses:

A. GUSTAFSON,
CHAS. C. TILLMAN.