

No. 730,563.

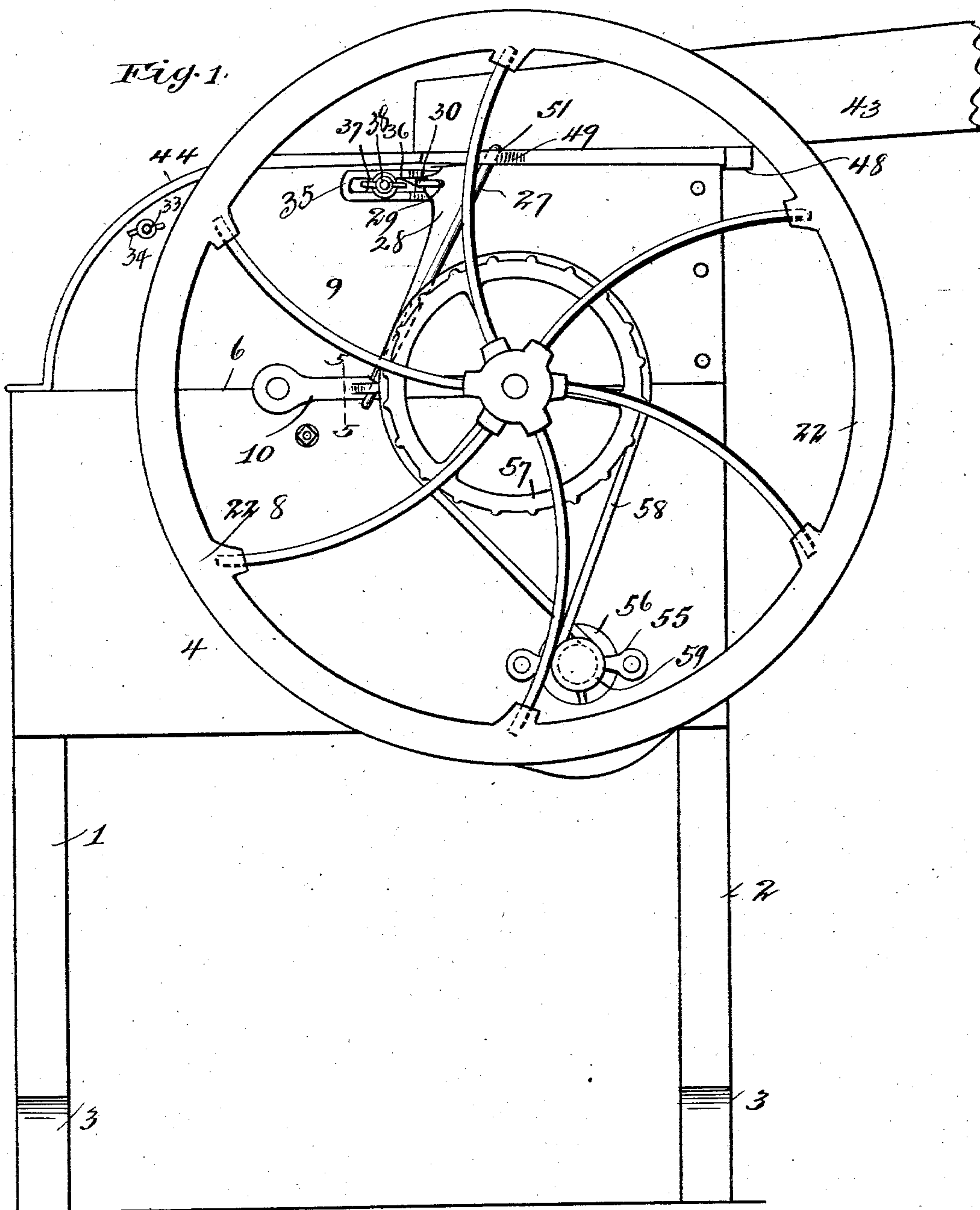
PATENTED JUNE 9, 1903.

F. C. PATTEN.
CORN SHELLER.

APPLICATION FILED APR. 28, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



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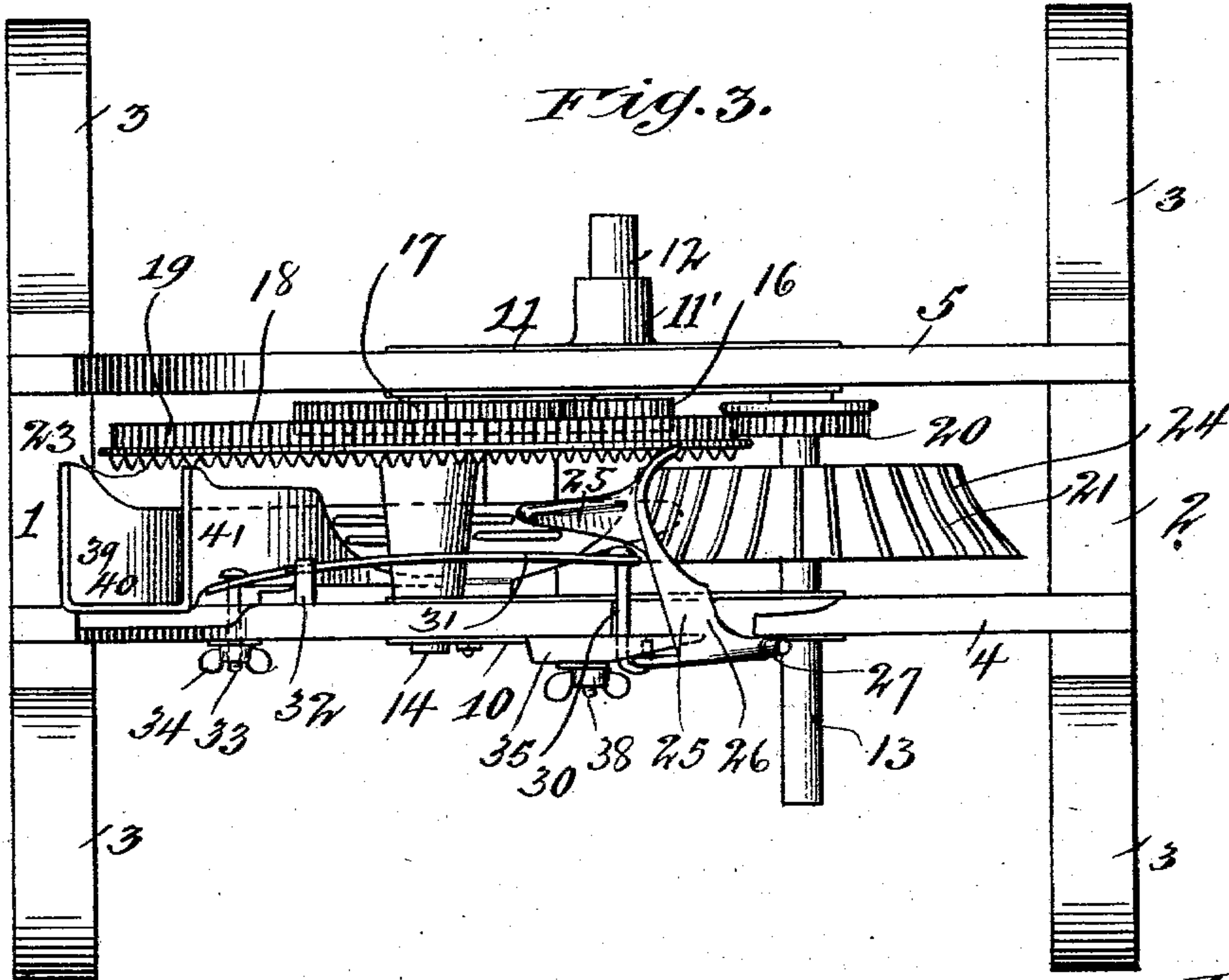
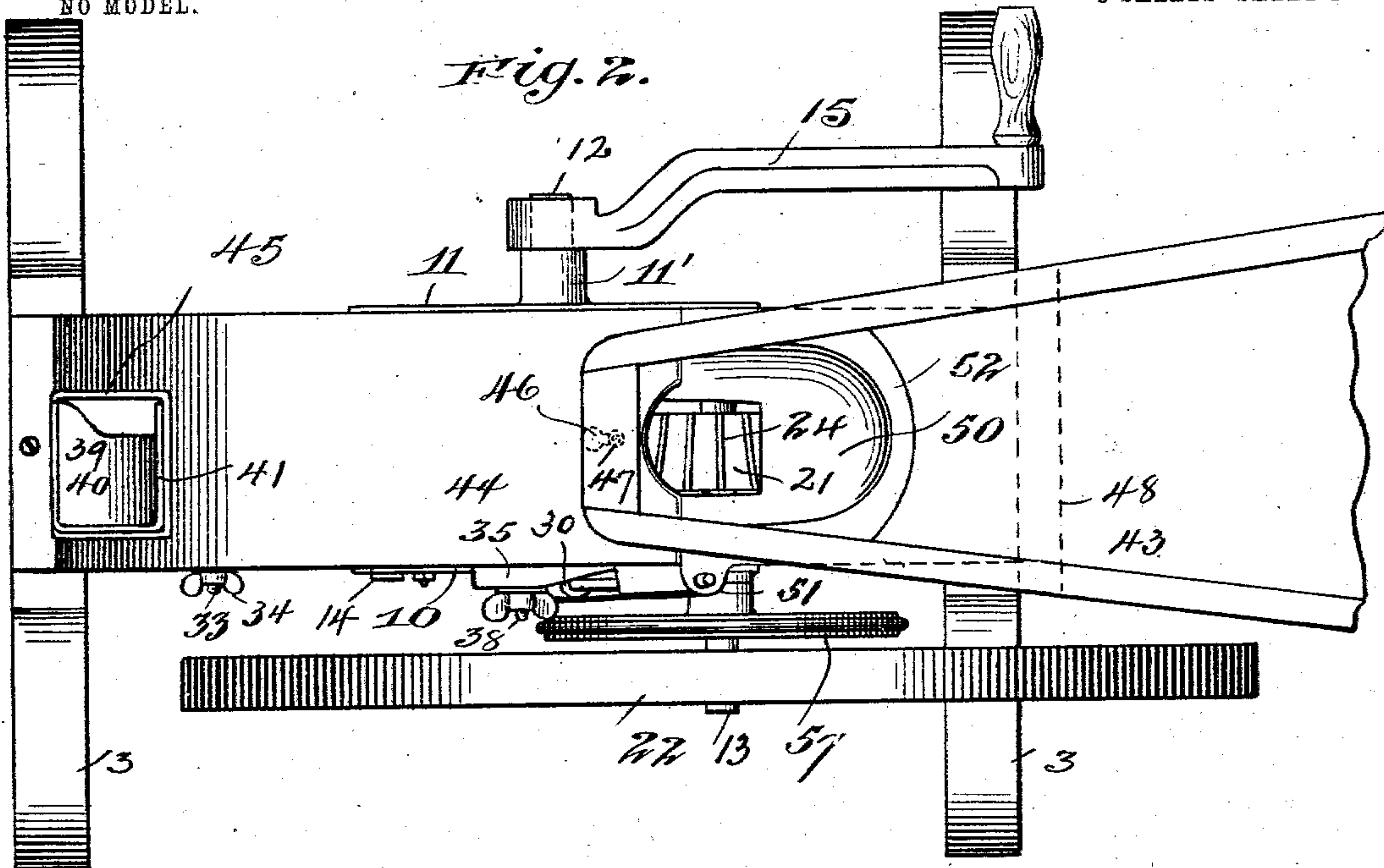
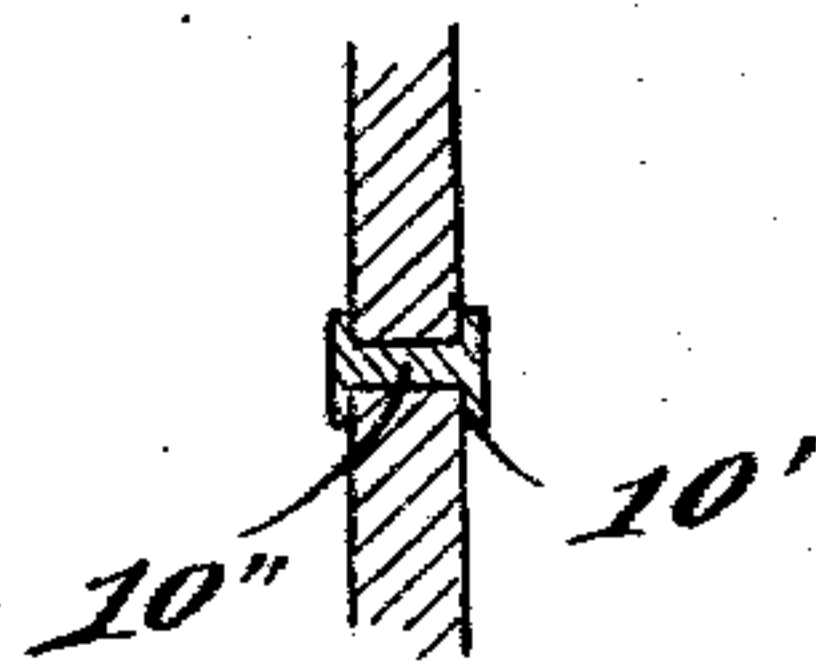


Fig. 5.



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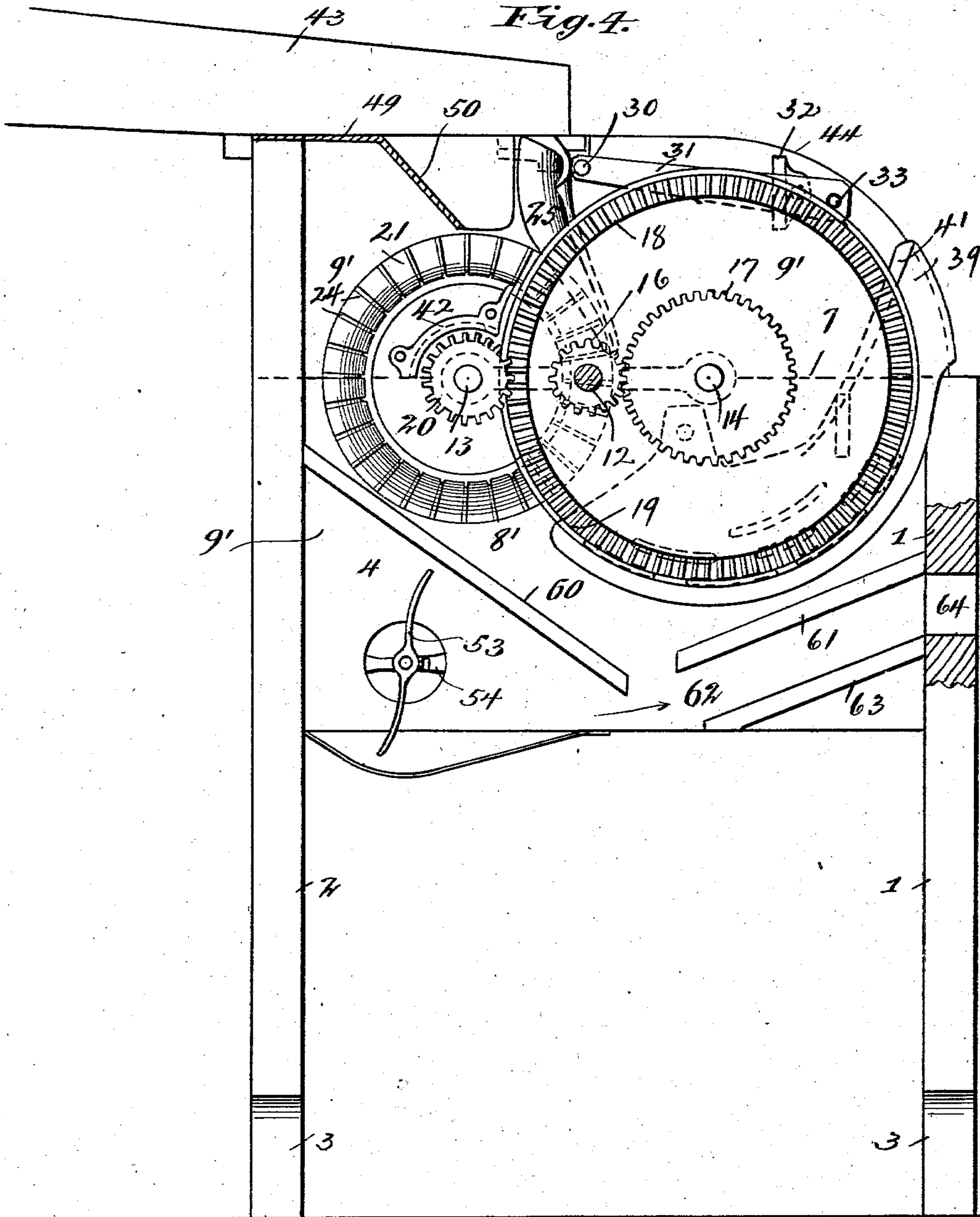
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

FRANK C. PATTEN, OF SYCAMORE, ILLINOIS.

CORN-SHELLER.

SPECIFICATION forming part of Letters Patent No. 730,563, dated June 9, 1903.

Application filed April 23, 1902. Serial No. 105,013. (No model.)

To all whom it may concern:

Be it known that I, FRANK C. PATTEN, of the city of Sycamore, county of Dekalb, 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 improvements in corn-shellers, and refers more specifically to improvements of that type of corn-sheller commonly known as "hand-shellers," as distinguished from those which are operated by horse or other power.

Among the salient objects of the invention are to provide a sheller having an improved compensating jaw which automatically adjusts itself to ears of widely-varying size, thereby both rendering the sheller more effective and thorough in its operation and operable with less power, to provide improvements in the details of construction of said jaw and coöperating parts, to simplify the structural features of the device in general, and to so construct the parts as to render their assembling both inexpensive and capable of being accomplished with a minimum expenditure of labor and fitting of parts, and, in general, to simplify and improve the construction of a device of the character referred to.

To the above ends the invention consists in the matters hereinafter described, and more particularly pointed out in the appended claims, and the same will be readily understood from the following description, in which—

Figure 1 is a view in side elevation of a sheller embodying my invention, the device being viewed from the side opposite that to which the crank is applied. Fig. 2 is a top plan view. Fig. 3 is a top plan view with the top casing removed. Fig. 4 is a side view from the side opposite that shown in Fig. 1 with the side casing, however, removed and certain parts shown in section; and Fig. 5 is a sectional detail taken on line 5 5 of Fig. 1.

Referring to the drawings, 1 2 designate the end frame-standards, which in addition to forming the supports or lugs for the main frame also form the end walls of the casing of the machine, as best indicated in Fig. 3, said standards being conveniently provided at their lower ends with lateral extensions 3 to form a sufficient base width to afford suit-

able stability to the structure. Across the upper portions of the end standards 1 and 2 are secured the side frame members or casings, (designated as a whole 4 and 5,) these side casings being in the most approved construction made sectional, so as to provide horizontal joints or meeting lines (designated 6 and 7) at the opposite sides of the machine intermediate of the vertical width of the casings. Between the meeting edges of the sections 8 and 9 and 8' and 9' are interposed journal-castings 10 and 11, respectively, which are of peculiar construction, as will hereinafter appear, and which serve to support the three main shafts 12, 13, and 14 of the mechanism.

The shaft 12, which will for convenience of description be hereinafter termed the "main" shaft, is extended out through the casing at the right-hand side of the machine and through the journal-boss 11', formed upon the casting 11, and is provided at its said outer end with a suitable crank-handle 15. At a point immediately inside of the casing 5 said main shaft is provided with a pinion 16, which is arranged to intermesh with a larger pinion or spur-gear 17, mounted upon the shaft 14, which latter carries also the toothed picker-wheel 18 of the sheller. The picker-wheel is preferably and as shown herein cast integral with the gear 17, and said wheel is likewise provided with an integral second larger gear 19, which intermeshes with a pinion 20, rigidly mounted upon the shaft 13, which carries the feed-wheel 21 and also at its outer end outside of the casing of the machine the balance-wheel 22.

The picker-wheel 18 so far as its acting face is concerned is of the usual construction and provided with the usual teeth 23, arranged at suitable spaces apart over the greater part of that one of its faces which is adjacent to the feed-wheel 21, and the feed-wheel 21 is also of substantially the construction heretofore common, except that I have found that the efficiency of the combination is increased by making the feed-ribs 24 of the feed-wheel to extend across the operating-face of the wheel in lines parallel with the axis of the wheel instead of more or less spirally, as has heretofore been usual.

25 designates the rag-iron or third element of the three members which act upon the ear

simultaneously to shell the corn therefrom, and the peculiar mounting and construction of this rag-iron constitutes one of the salient features of the present invention. Heretofore it has been common to mount the rag-iron upon spring-supports which were adjustable in direct lines and in the direction of a line dividing the angle between the face of the feed-wheel and the face of the picker-wheel, or approximately so. Obviously when thus mounted and adjusted the movement of the rag-iron in its direction of adjustment served to increase or decrease the approximately triangular opening or throat through which the ear is passed in the shelling operation and preserved substantially the same relation of the parts to each other during the different positions of adjustment.

In the improved construction illustrated the rag-iron is arranged to extend downwardly into the angle between the picker-wheel and feed-wheel, substantially in the manner heretofore common, and said rag-iron is provided at its upper end with an outwardly-extending arm portion 26, which engages a shaft or axis member 27, having its lower end engaged with a journal-aperture formed through the journal-casting 10 (see particularly Fig. 1) and its upper end engaged with a spring mechanism now to be described, the axis member being arranged to extend in a direction approximately parallel with the general direction of the length of the rag-iron and also parallel with the outer face of the casing, adjacent to which it is mounted.

At its rear side the axis member 27 of the rag-iron is provided with a rearwardly-projecting extension 28, which is apertured, as indicated at 29, to receive the hooked end of a tension-bolt 30, which extends inwardly through a suitable aperture in the side casing of the machine and is at its opposite end connected with a plate-spring 31, mounted upon the interior face of said side casing, as shown clearly in Fig. 3. The opposite end of said spring 31 passes through a fulcrum-block 32 and at its extreme end is attached to an adjusting-bolt 33, seated in a suitable aperture, so as to extend through the side casing, and provided at its outer end with a thumb-nut 24, whereby the tension upon the spring may be adjusted by shortening or lengthening the bolt. Obviously the degree of pressure with which the spring 31 draws the tension-bolt inwardly determines the pressure which will be exerted by the rag-iron upon the ear passing through the throat, since movement of the rag-iron will be upon the axis of the shaft 27 and will therefore be in opposition to or under the tension of the spring 31.

In order to adjustably limit the approach of the rag-iron to the cooperating sheller-wheels, I provide a wedge-shaped or tapering slide-block 35, having its tapered end slotted or forked to embrace the tension-bolt, as indicated at 36, and provided also with a slot 37, through which extends the bolt 38, where-

by it is adjustably secured to the side casing of the machine. The inclined or wedge-shaped portion of the slide-block 35 underlies the projection 28 of the axis member of the rag-iron, and thus serves to limit the inward movement of the latter under the tension of the spring 31, and by adjustment of the block toward or from said projection the position of the rag-iron will be correspondingly varied, while it is in all positions of adjustment free to yield outwardly to any extent necessary within reasonable limits.

39 designates a thin plate-like member secured to the interior of the casing of the machine and forming in conjunction with the face of the picker-wheel the cob-chute, into which the cob drops after being stripped of its kernels and through which it is conveyed and discharged through the rectangular opening 40 at the rear side of the machine. Said member 39 is preferably in the form of a casting, the lower edge of which is curved approximately concentric with the periphery of the picker-wheel and is inclined from the side casing obliquely downwardly and inwardly toward the picker-wheel and approaches at its lower edge sufficiently near the latter to prevent the cobs from dropping through, while permitting free discharge of the shelled corn. The rear end of the casting is suitably shaped to provide the discharge-opening 40, as indicated clearly in Fig. 3, an overlying or upper side extension 41 being provided, which prevents the cobs from being thrown upwardly by the impetus imparted thereto by the picker-wheel and insuring their discharge outwardly through the opening.

42 (see Fig. 4) designates a guard secured to the interior of the side casing 5 in position to overlie the pinion 20 and the adjacent portion of the picker-wheel, so as to prevent the kernels of corn and pieces of cob from dropping into the intermeshing gears over which said guard extends.

As a feature of simplified and improved construction I form that portion of the casing which forms the top, which extends from the feed-hopper 43 rearwardly and downwardly to the upper end of the rear end standard 1, as a casting 44, which is provided with a suitable aperture 45 to receive and support the discharge end of the member 39, said casting 44 also affording a suitable means of detachably supporting the feed-hopper 43, as will now be described. To this end the upper and forward end of said casting is provided at a point in alinement with the center of the throat of the machine with a keyhole-like aperture 46, (see Fig. 2,) adapted to receive a button 47, fixed upon the under side of the feed-hopper 43, and the feed-hopper is provided at a suitable point upon its under side with a cleat 48, (see Fig. 1,) which when the button is engaged with the slot 46 serves to hold the button in the narrow part thereof, and thus holds the hopper securely in place.

As a further improvement in the details of

construction I form that part of the top of the casing which contains the throat, leading from the hopper to the sheller mechanism, of a casting 49, secured upon the upper edges of the side and end frames and having an integral throat portion 50 extending obliquely downwardly and rearwardly to direct the ears of corn into suitable shelling position. The casting 49 is provided at one edge with a bearing-aperture 51, which receives and supports the upper end of the axis member 27 of the rag-iron, hereinbefore described, as shown clearly in Fig. 1. The hopper 43 is of usual construction and is provided at its discharge end with a suitable aperture 52, which registers with the throat member 50 of the casting 49 when the hopper is in position.

Referring again to the manner in which the three main shafts 12, 13, and 14 of the mechanism are mounted and supported, this constitutes one of the features of improvement of the present invention which contributes greatly to the economy of construction and lessens the amount of labor involved in assembling the machine. To this end each of the castings 10 and 11 is made of I shape in cross-section, as best shown in detail, Fig. 5, throughout its principal length and enlarged and apertured at suitable points to receive the several journal portions of the shafts 12, 13, and 14. As hereinbefore mentioned, the castings 10 and 11 are interposed between the meeting edges of the joints of the side casing members, and when thus arranged the lateral webs or flanges 10' serve to hold the castings accurately and securely mounted upon the side frame members, it being understood that the width between the flanges of the opposite sides of the castings is equal to the thickness of the side casing, as shown clearly in said detail, Fig. 5. In order to mount the castings, therefore, it is only necessary to cut away the edges of the meeting casing members slightly to accommodate the central portion 10'' of the casting and to accommodate the enlargements which receive the several shafts, it being understood that the flanges 10' will be continued around the enlargement, as well as through the intervening portions of the castings.

The sheller is provided in the lower part of its casing with the usual fan 53, the shaft of which is journaled in suitable bearings 54 and 55, which extend diametrically across the air-inlet openings 56 and are suitably secured to the exterior sides of the casing. Between the balance-wheel on the proximate side of the casing is secured a belt-wheel 57, which carries a belt 58, arranged to drive the fan 53 through the medium of a small belt-wheel 59, secured upon the fan-shaft. The interior of the sheller is provided with the usual inclined partition-guides 60 and 61, which direct the shelled corn to the central part of the machine and discharge it in the form of a broad and relatively thin stream or sheet which intersects the discharge-passage 62 of the fan.

The bottom side of said passage 62 is formed by a third partition member 63, said passage opening out through the rear side of the sheller through an aperture 64, formed through the end member 1.

The operation of the machine is probably entirely obvious from the foregoing description; but it should be mentioned in this connection that owing to the pivotal mounting of the rag-iron upon an axis located concentrically thereto a peculiar and most effective operation of the shelling mechanism is secured. This may be explained as being due to the fact that as the rag-iron recedes from the cooperating sheller-wheels to accommodate the larger ears it also changes its angle, so as to press the ear more directly between itself and the picker-wheel. The result of this operation is that the larger ears are rotated about their own axes or bodily more rapidly than the smaller ears and are fed forwardly by the feed-wheel perhaps somewhat less rapidly than are the smaller ears. The result is that the corn is stripped from the cob by the ribs of the feed-wheel notwithstanding its rapid rotation, while the prongs of the picker-wheel retard it sufficiently to insure such stripping action, and in practice the arrangement of the parts results in shelling the corn much more rapidly and with the expenditure of less power than has been the case with shellers heretofore constructed. In the case of small ears the rag-iron swings into a position to effect a more direct bearing upon the feed-wheel, resulting in a less rapid rotation of the ear of corn corresponding to the lesser diameter of the latter, and consequently shorter circumferential distance which the ear travels in having successive spirals of kernels removed.

Another feature of importance which I secure by the construction and arrangement shown is the much greater range of movement of the rag-iron without very substantially changing the tension of the spring and without readjustment. Owing to the peculiar arrangement of parts it is entirely practicable to shell ears of extremely small diameter and ears of extremely large diameter alternately without changing the adjustment of the machine and in each case to shell the ear thoroughly, rapidly, and with the expenditure of a minimum amount of power.

While I have herein shown and described what I deem to be a preferred embodiment of my invention, it will be obvious that the details of the construction, and particularly those relating to the manner of mounting the rag-iron to operate in the peculiar manner described, may be varied without in any sense departing from the spirit of the invention. I do not, therefore, wish to be limited to the details set forth except to such extent as these details are made the subject of specific claims.

I claim as my invention—

1. In a corn-sheller, the combination with

coöperating picker and feed wheels arranged to form an angle between their acting faces which is not greater than ninety degrees, of a rag-iron mounted to move in the angle between said wheels in a curved path, the tangents of which curve constantly approach parallelism with a line perpendicular to the face of the picker-wheel as said rag-iron recedes from the wheels.

2. In a corn-sheller, the combination with picker and feed wheels arranged to form an angle between their acting faces which is not greater than ninety degrees, of a spring-pressed rag-iron mounted to move in the angle between said wheels in a curved path upon an axis located eccentrically of the longitudinal axis of the rag-iron, whereby the pressure of which at its inner limit of movement is chiefly against the face of the feed-wheel but changes as said rag-iron recedes to act more and more directly against the picker-wheel.

3. In a corn-sheller, the combination with a picker-wheel and a feed-wheel, of a spring-pressed rag-iron mounted to extend into the angle formed between the operating face portions of said sheller-wheels and inclined downwardly and rearwardly, an axis member mounted with its axis arranged to extend substantially parallel to the general direction of the rag-iron and at a distance therefrom, and a lateral extension connecting said rag-iron and axis member whereby the former is mounted to reciprocate in a curved path, substantially as described.

4. In a corn-sheller, the combination with a picker-wheel and a feed-wheel arranged in co-operative relation to each other, of a rag-iron arranged to extend into the angle formed between the operating-faces of said sheller-wheels and provided with a lateral extension at its upper end, a rock-shaft or axis member with which said lateral extension of the rag-iron is rigidly connected, a crank-arm projection rigid with said axis member, and a spring arranged to act upon said crank-arm projection to force the rag-iron normally toward the sheller-wheels.

5. In a corn-sheller, the combination with a picker-wheel and a feed-wheel arranged in co-operative relation to each other, of a rag-iron arranged to extend into the angle formed between the operating-faces of said sheller-wheels and provided with a lateral extension at its upper end, a rock-shaft or axis member with which said lateral extension of the rag-iron is rigidly connected, a crank-arm projection rigid with said axis member, and a spring arranged to act upon said crank-arm projection to force the rag-iron normally toward the sheller-wheels, and an adjustable stop for limiting the approach of the rag-iron under the action of said spring.

6. In a corn-sheller of the character described, the combination with the main frame provided with the side casings, of the picker-wheel and feed-wheel journaled to rotate be-

tween said side casings, a rag-iron arranged to extend into the angle formed between the operating-faces of said sheller-wheels and obliquely downwardly and rearwardly, an axis member or rock-shaft journaled upon the exterior of one of the side casings to extend in a direction substantially parallel with the general direction of the rag-iron, a lateral extension connecting the upper portion of the rag-iron rigidly with said rock-shaft, a crank projection rigid with said rock-shaft, a plate-spring mounted upon the interior of the casing member which supports the rock-shaft, a tension-bolt connecting the vibratory end of said spring with the crank projection of the rock-shaft, and an adjustable stop for limiting the extent of movement of the rag-iron under the tension of the spring.

7. In a corn-sheller of the character described, the combination with the main frame provided with the side casings of the picker-wheel, a feed-wheel journaled to rotate between said side casings, a rag-iron arranged to extend into the angle formed between the operating-faces of said sheller-wheels and obliquely downwardly and rearwardly, an axis member or rock-shaft journaled upon the exterior of the side casings to extend in a direction substantially parallel with the general direction of the rag-iron, a lateral extension connecting the upper portion of the rag-iron rigidly with said rock-shaft, a crank projection rigid with said rock-shaft, a plate-spring mounted upon the interior of the casing member which supports the rock-shaft and supported from an adjustable bearing whereby its tension may be varied, a tension-bolt connecting the vibratory end of said spring with the crank projection of the rock-shaft, and an adjustable stop for limiting the extent of movement of the rag-iron under the tension of the spring.

8. In a sheller, the combination with the operating mechanism and the transverse shafts upon which said mechanism is mounted, of means for journaling and supporting said shafts from the side casings comprising castings adapted to be inserted between the meeting edges of two adjacent sections of the side casing and each provided at its opposite sides with confining-flanges and intervening grooves adapted to receive the edges of the casing members and whereby the castings are held immovably in position.

9. In combination with a sheller mechanism, and the main frame within which the latter is mounted, of a casting, as 10, made of eye shape in cross-section throughout its main length and provided at suitable points with journal enlargements and apertures to receive the several journal-shafts, as and for the purpose set forth.

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