

J. RANKIN.  
Corn-Shellers.

No. 135,362.

Patented Jan. 28, 1873.

Fig. 1.

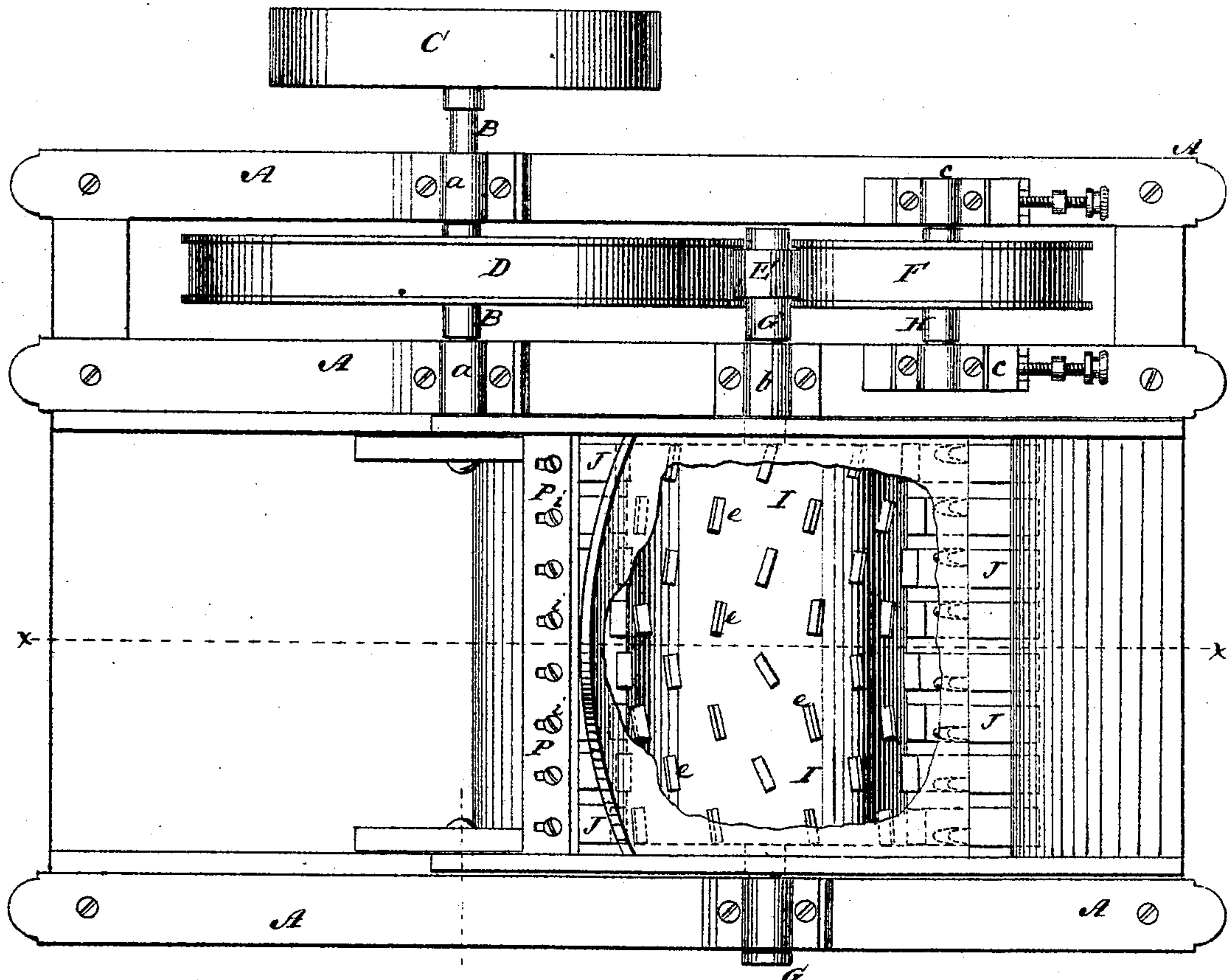
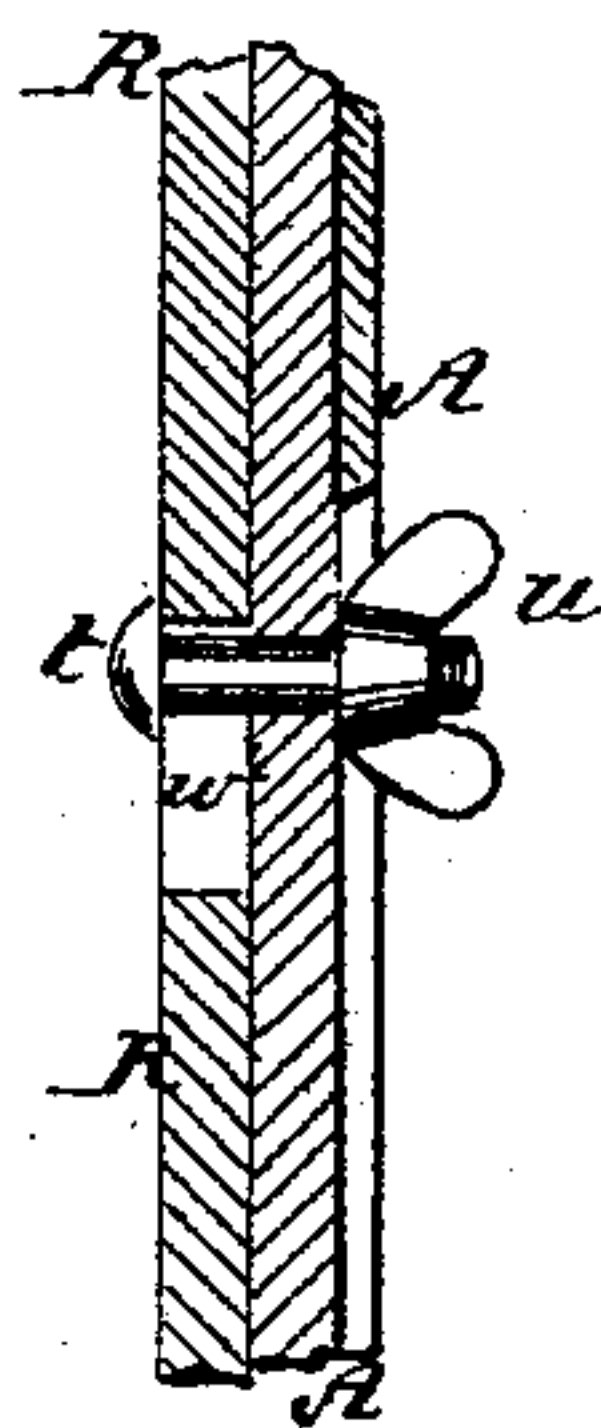


Fig. 5.



Witnesses:  
E. Wolff.  
J. Helbel.

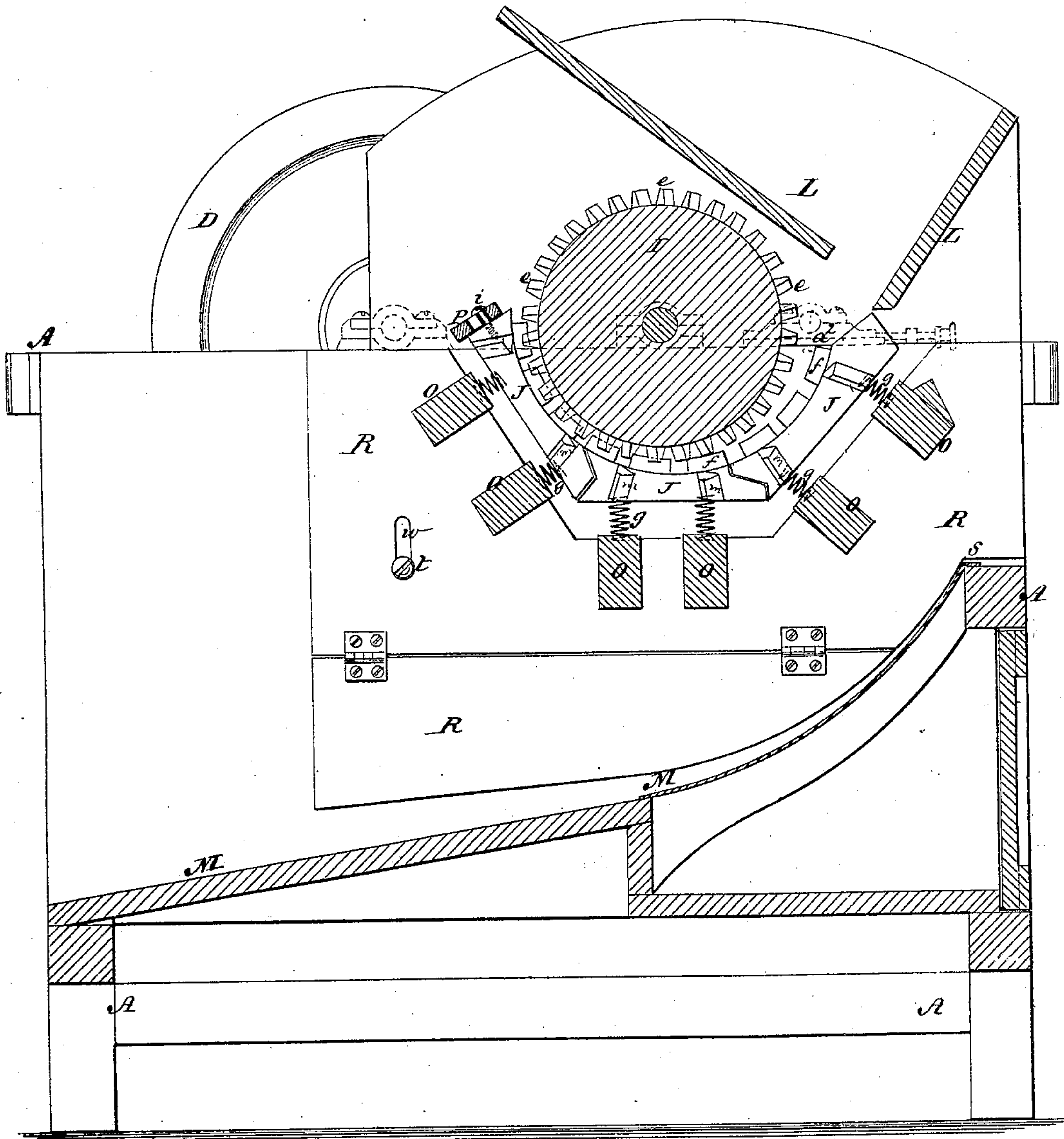
Inventor:  
John Rankin.  
By his attorney  
J. A. M. Intire.

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Fig. 2.



Witnesses:  
C. Wolff.  
J. Helbel.

Inventor:  
John Rankin.  
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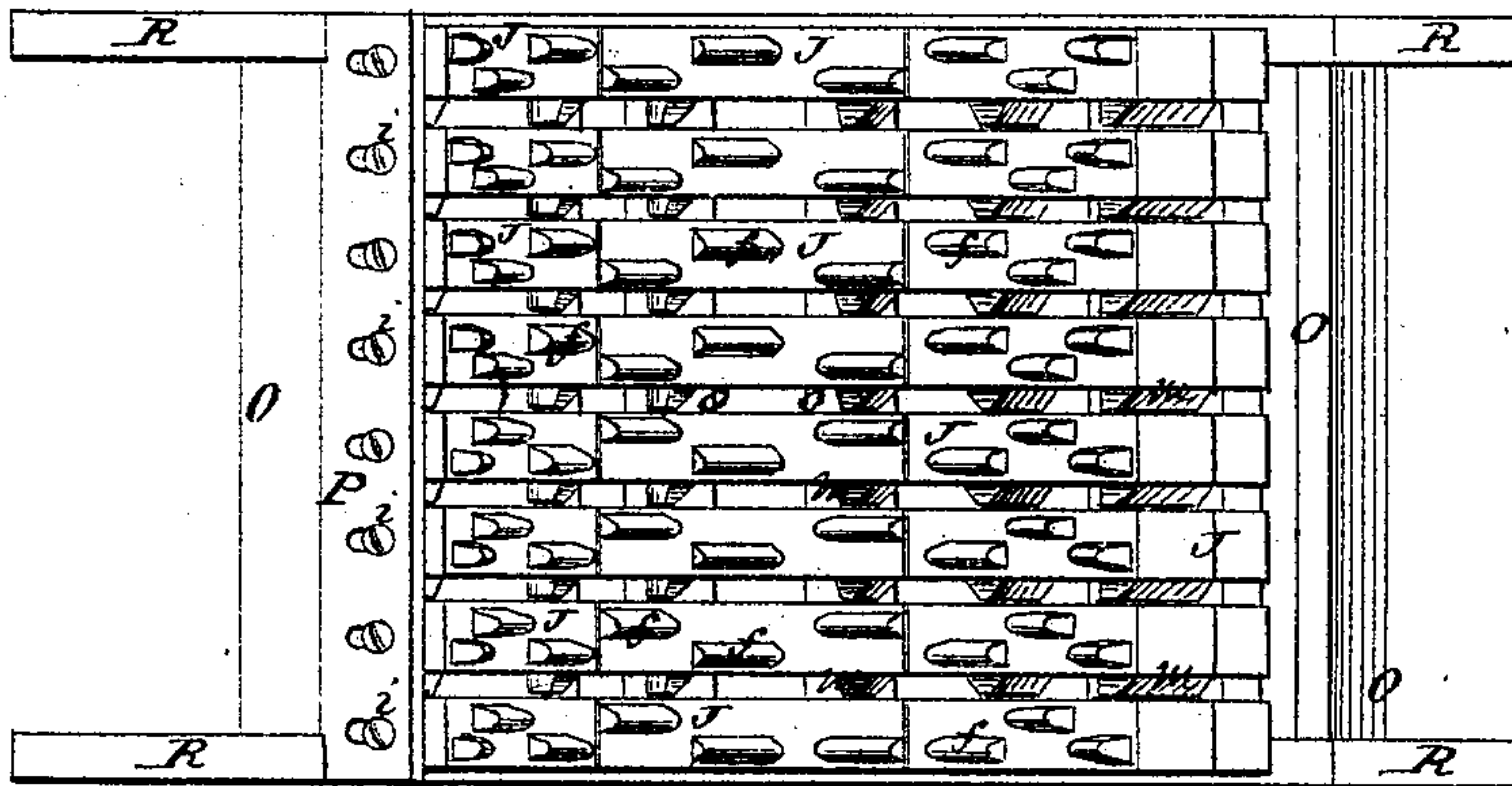


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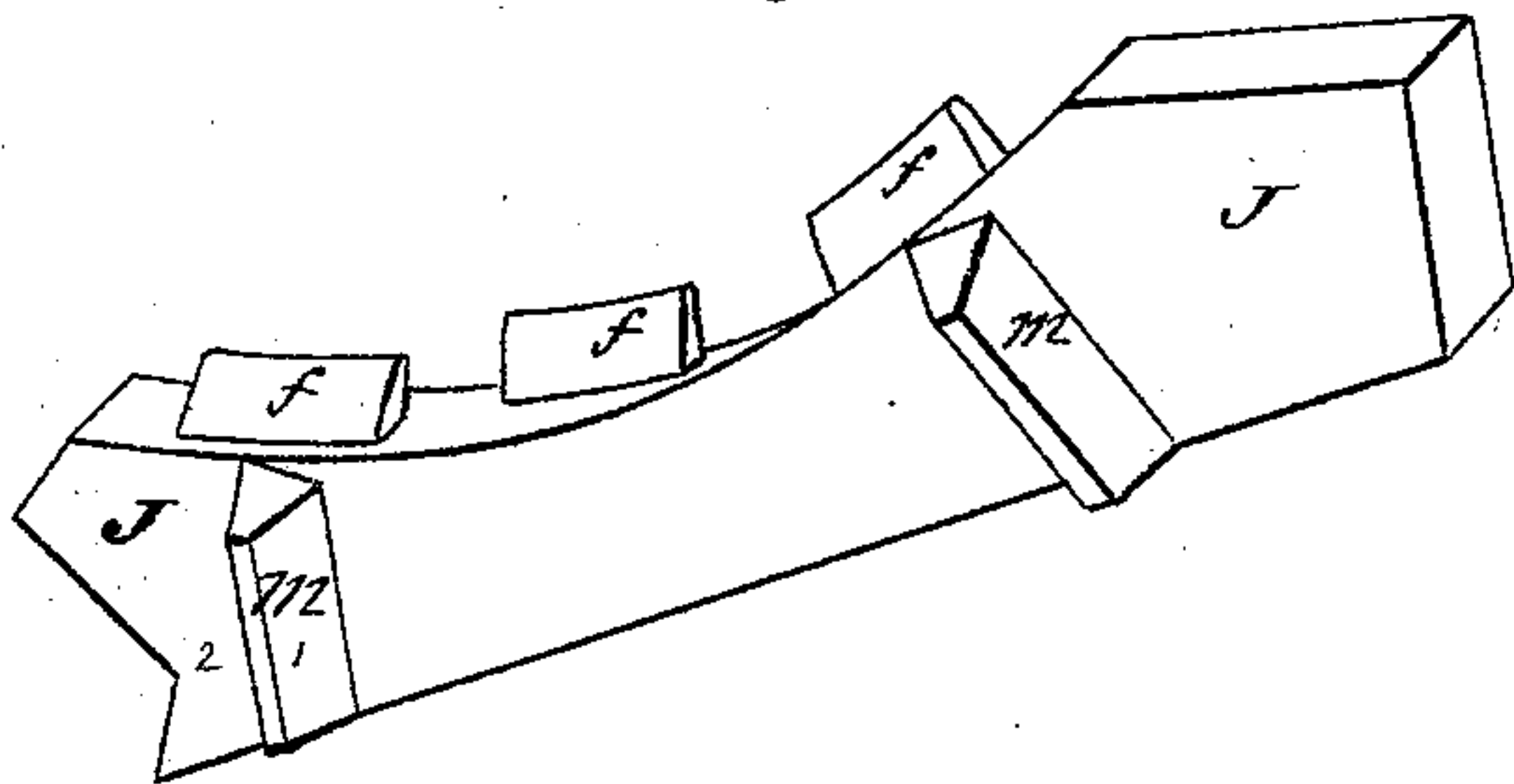
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*Fig. 3.*



*Fig. 4.*



Witnesses:  
E. Wolff.  
J. Felbel.

Inventor:  
John Rankin.  
By his attorney  
J. N. McIntire.



# UNITED STATES PATENT OFFICE.

JOHN RANKIN, OF BINGHAMTON, NEW YORK.

## IMPROVEMENT IN CORN-SHELLERS.

Specification forming part of Letters Patent No. 135,362, dated January 28, 1873.

*To all whom it may concern:*

Be it known that I, JOHN RANKIN, of Binghamton, in the county of Broome, in the State of New York, have invented an Improved Corn-Sheller; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing making part of this application.

My invention relates to certain improvements in machines for shelling corn.

In all the successfully operating or working machines heretofore made, to my knowledge, it has been customary to employ, in combination with the mechanism for stripping the corn from the cob, some sort of feeding mechanism, to insure the presentation of the ears, in the right position, to the shelling mechanism, to prevent clogging the mechanism and rendering it inoperative.

My invention has for its main object to avoid the use of any such feeding mechanism, and at the same time avoid any possibility of clogging in the shelling mechanism; and my invention has for a further object to provide a machine which, while it is capable of rapidly and perfectly separating the corn from the cob with a comparatively-small consumption of motive power, shall be exceedingly simple in its construction, manufacture, and durable; and to these ends and objects my invention consists in so constructing the mechanism for separating the corn from the cob that, while the grains can pass down from it as they are separated from the cob, the latter is carried through from a given point of entrance to a point of discharge, and cannot, during its passage, become wedged into the space through which the grain passes, as will be more fully explained hereafter; and my invention further consists in the combination and arrangement of devices, as hereinafter described, by which a simple, cheap, and efficient machine is produced, which is driven with a comparatively small consumption of the motive power.

To enable those skilled in the art to make and use my invention, I will proceed to more fully describe the construction and operation of my improved corn-shelling machine, referring by letters to the accompanying drawing, in which—

Figure 1 is a top view; Fig. 2 a vertical lon-

gitudinal section at *xx*, Fig. 1; and Figs. 3, 4, and 5, detail views, showing parts to be presently described.

In the several figures the same part will be found designated by the same letter of reference.

A represents the main frame-work of the machine, in which are mounted all the working-parts. B is the main driving-shaft, and C the pulley thereon, which is belted to the motor. D is a driving-wheel mounted fast on the shaft B, and running in contact with the small friction-pulley E and driving it. This wheel E is fast on the shaft G, and is held up against the face of D by the anti-friction wheel F, mounted on shaft H. The shafts B, G, and H are all mounted in suitable journal-boxes *a b c*, two of which, *b* and *c*, should be slightly movable horizontally, so that while the faces of the three wheels D, E, and F run in close contact under pressure, two of them, E and F, may be capable of yielding to accommodate any inequalities or eccentricities in the wheels.

By this arrangement of friction-wheels with the main shaft B, it will be seen that the power and motion of the latter will be imparted to the shaft G to drive the corn-shelling cylinder I, which is mounted thereon, as shown. This cylinder I has its face or periphery armed with a series of teeth, *e*, and is continuously rotated by the shaft G. Immediately beneath this cylinder is arranged a "concave" formed of yielding spring-supported sections J, which are provided with teeth *f*, which run in nearly an opposite direction to the line of the teeth on cylinder I, as will be presently explained; and over the cylinder I is arranged a suitable feed-hopper, L, into which the corn to be shelled is put, and from which it passes down into the concave, and between the sections J thereof and the toothed cylinder I. Below the corn-shelling mechanism is arranged a curved and inclined apron or floor, M, onto which the grain falls, and from which it passes or is conveyed to any desired receptacle.

The sections J are supported, as shown, by spiral springs *g*, one end of each of which is inserted in a socket or cavity in the said sections J, while the other rests in a similar seat in one of the stationary cross-beams *o*. At P is located a cross-bar or narrow board or strip in



which is a series of slots, through which pass screws *i*. These screws move freely in the slots of said bar P, and are fast to the sections J, each of said screws passing into one end of one of said sections, as clearly shown at Figs. 1 and 2. By this arrangement, while each bar is free to yield to a certain extent, and is independent of its neighbor, all are limited or checked by the screws *i* coming against the ends of the slots in bar P.

It is important and necessary for the successful working of the machine to prevent the possibility of a cob wedging itself in between any two of the sections J, while at the same time it is necessary that a sufficient space for the free passage of the grain should be left between each two of said sections. To prevent any cob which may happen to start in from the hopper, end first, from getting wedged in, I provide this means—viz., between each two sections, J, and fastened to one of them, are located or arranged deflecting-blocks *m*, the peculiar shape and arrangement of which are shown most clearly at Figs. 3 and 4. These blocks *m* serve, first, to prevent the sections J from being forced together laterally and maintain the proper degree of open space between them, while at the same time they are permitted to rock and yield with a spring-pressure to accommodate the cobs and corn during the shelling operation; and, second, to deflect any ears which may enter end first. It will be seen that these blocks *m* have one side of each and their upper ends flared, or chamfered off as at 1 2, so that any ear, entering end first and striking in between two of the sections J, will be deflected either by the inclined top end or side of the block *m*, and, being then struck quickly by one of the teeth of the cylinder I, will be settled into a position about parallel with the axis of said cylinder, and will be in this condition rolled through the machine, passing along between the said cylinder's toothed periphery and the toothed concave, and having its grain stripped off or shelled by the action of the teeth *e* and *f* as it rolls through. The concave (which is composed, as already described, of the spring-supported sections J and their accompanying devices) is attached to a case or frame, R, which rests upon a supporting-ledge or fulcrum at the point *s* of the main frame A, (see Fig. 2,) and is held in place by two set-screws, *t*, (one on each side of the machine,) which are arranged in the main frame A and are provided with thumb-nuts *u*, and pass through slots *w* formed in the case R. (See Figs. 2 and 5.) These screws with their thumb-nuts, and passing through the slots *w* as shown, serve as clamping devices to hold the case R fast at any point at which it may be set; and the said case resting at the point *s*, it will be seen, may be vibrated about this point of support, up and down, so as to vary the space between the concave and the periphery of cylinder I, according to the average size of the corn to be shelled. The lower end of the first

section of each row of sections J is so cut and combined with the adjacent end of the next section, or lower one, as seen at Fig. 2, that, as the first section is depressed, it carries with it one end of the second, and the second is so combined with the third that, as it is depressed, the adjacent end of the third has to yield with it; while at the same time the third or last section can be depressed without affecting the second or first; and the second and third can be depressed without affecting the first. By this arrangement, as the corn enters and passes through, each section J bears down the adjacent end of the succeeding section to make way for the corn, while no section, in its yielding, affects any preceding section.

This arrangement and operation I have found in practice to produce the most highly useful and desirable results, and in carrying it out I so shape the interlocking or overlapping ends that they cannot open and form crevices for the grain to fall in and prevent the return of the yielding sections to their nominal conditions. Very little explanation is needed, after the foregoing description of parts and the construction, to render clear the mode of operation of my improved machine.

The corn to be shelled is placed (or fed from the granary) in the hopper L, and the machine being put in motion by motive power, applied at the pulley C, the requisite power and motion are conveyed (as already explained) from the main driving-shaft B, through the medium of wheels D and F and E, to the shaft G of drum I; and this drum, with its teeth or projections *e*, is rotated at the proper velocity. As the ears of corn are fed from the hopper L they fall onto the upper surface of the concave, (at the point *a*<sup>2</sup>, Fig. 2,) and pass in between the teeth *f* of the yielding sections J and those *e* of the rotatory cylinder I. Any ears which happen to fall end first (and which might be small enough to wedge in between two of the sections J) and strike in between the sections J will be deflected by the deflectors *m* and struck by the teeth *e*, and thus settled down into a proper position to pass through between the cylinder and concave and be shelled without danger of clogging the machine. As the corn thus passes through the grain is separated from the cob, the former falling through the open spaces between sections J, while the latter passes along and is discharged at the other side of the concave, (where a receiver or conveyer may take it off.)

The arrangement of the rectangular teeth *c* on the surface of the cylinder I is made as follows: The face of the cylinder being divided up lengthwise, by circular lines, into any number of equal parts, the teeth are made somewhat less in length than the width of these spaces, and are arranged around in these spaces obliquely to the axis of the cylinder, and so that the teeth of one circular row come opposite the spaces of the next row; and this arrangement is started at each end of the face



and continued toward the middle, the direction of obliquity of one-half of the circular rows being opposite to that of the other half. The teeth *e* being less in their length than the spaces used for locating them, their ends are consequently apart a certain distance, which, by preference, is equal to the spaces between the semicircular rows of the sections forming the concave, which thus facilitates the egress of the grains separated from the cob. The teeth *f* are arranged in line with the arms *J* in rows, with the teeth of one row opposite the spaces of another row, all as shown.

By this arrangement of teeth and combination of devices I have produced the most desirable results in practice.

It will be understood that the prevention of any clogging in the concave is a great desideratum, since any such derangement necessitates the taking apart of the machine to clean it, and the consequent loss of time, trouble, &c., besides the liability of breakage.

Having so fully explained my improved corn-sheller that one skilled can make and use it, what I claim therein as new, and desire to secure by Letters Patent, is—

1. A machine constructed with a concave and cylinder, provided with suitable means for

separating the grain from the cob, and having combined with the yielding sections of the concave deflectors and retainers *m* for holding apart the sections of the concave and preventing the wedging in of any cob.

2. In combination with the main frame and cylinder, the sectional concave mounted in a case, *R*, which is adjustable so that it may be set and held with the concave at different distances from the cylinder, as and for the purposes as described.

3. A concave composed of semicircular rows of sections *J* provided with teeth *f*, and each section of each row overlapping the end of the next section, while all rest on sustaining-springs, substantially as and for the purposes described.

4. The peculiar combined arrangement of the shelling-teeth on the cylinder and concave, as hereinbefore described.

In testimony whereof I have hereunto set my hand and seal this 23th day of October, 1872.

JOHN RANKIN. [L. S.]

In presence of—

H. G. RODGERS,  
C. W. GENNET.