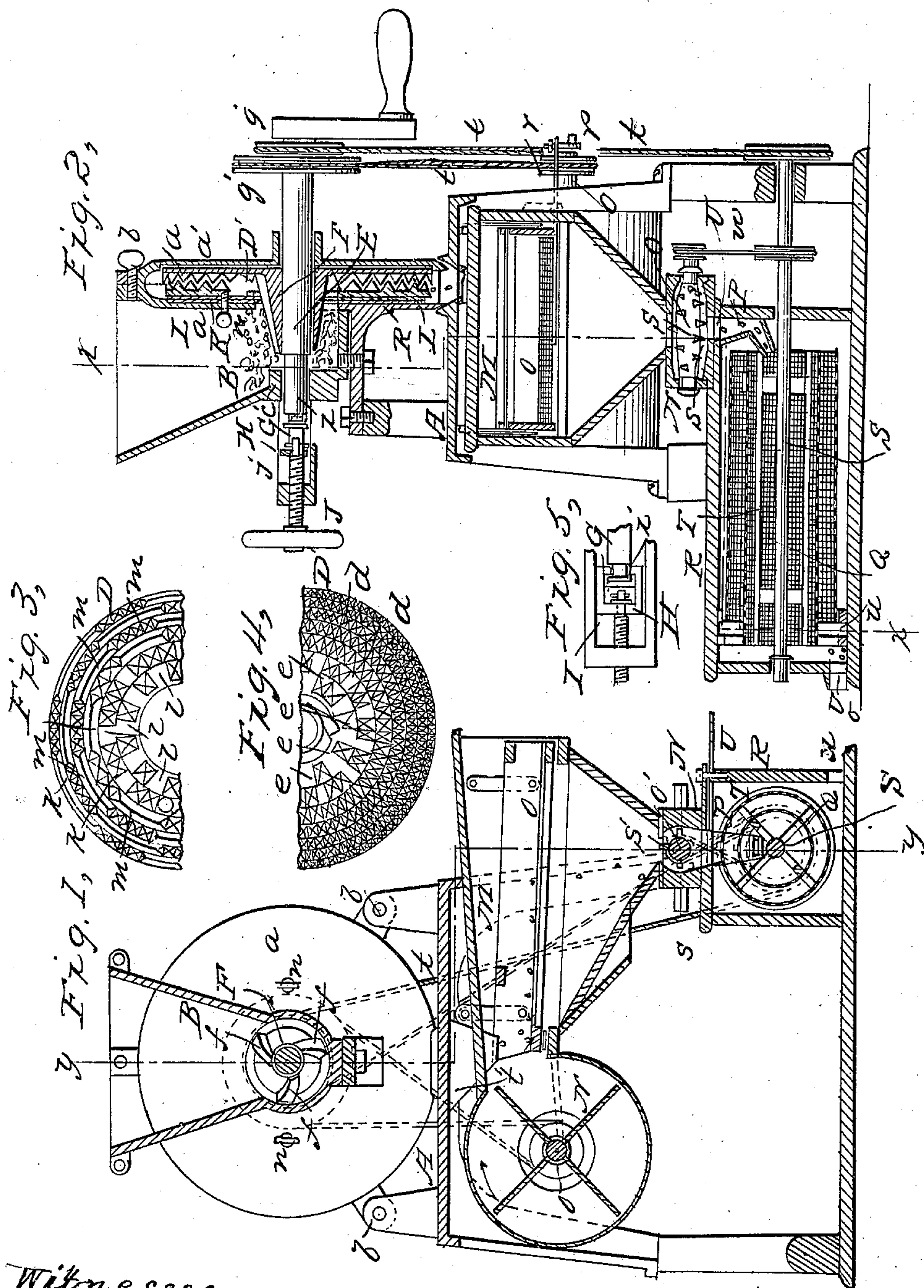


J. M. HENDRICKS.

Hulling Machine.

No. 36,350.

Patented Sept. 2, 1862.



Witnesses
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UNITED STATES PATENT OFFICE.

J. MOORE HENDRICKS, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN HULLING-MACHINES.

Specification forming part of Letters Patent No. 36,350, dated September 2, 1862.

To all whom it may concern:

Be it known that I, J. MOORE HENDRICKS, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and Improved Machine for Hulling and Cleaning Coffee, Cotton-Seed, and Grain of Different Kinds, the invention being also applicable to the grinding of coffee; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side sectional view of my invention, taken in the line *x x*, Fig. 2; Fig. 2, a front sectional view of the same, taken in the line *y y*, Fig. 1; Figs. 3 and 4, face views of portions of the two hulling-plates; Fig. 5, a detached view of the adjusting mechanism of the movable or adjustable hulling-plate.

Similar letters of reference indicate corresponding parts in the several figures.

The object of this invention is to obtain a machine of simple construction which will hull and cleanse from all impurities coffee, cotton-seed, and various kinds of grain, and also grind coffee and grain with the greatest facility and perform the work expeditiously and in a thorough and perfect manner.

To this end the invention consists in the employment or use of two toothed hulling-plates, one having a rotary motion and the other being stationary and provided with an elastic or yielding back, the rotary plate being so arranged as to be capable of being adjusted to regulate the pressure of the plates on the coffee, cotton-seed, or grain, and using in connection with the hulling-plates aforesaid a fan, screen, polishing device, and a separator arranged in such a manner as to cleanse the hulled grain and separate all impurities or foreign substances therefrom.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A represents a framing, which may be constructed in any proper manner to support the working parts of the machine. Upon the framing A there is permanently secured a hopper, B, and a case, C, the latter being composed of two vertical dish-shaped plates, *a a'*,

connected together by screws *b*, and forming, when in contact, a very oblate spheroid, as shown in Fig. 2. The plate *a* is connected to or may be cast with the hopper B in one piece, and within the case C there are two hulling-plates, D D'. These plates are of cast metal. Chilled cast-iron would be preferable material. The plate D' is fitted on a horizontal shaft, E, one bearing, *c*, of which is at the center of the plate *a'* of the case C, and the other bearing, *c'*, in the lower part of one side of the hopper B, as shown in Fig. 2. The plate D' is provided at its face side with a series of teeth, *d*, which are placed in circular rows concentric with each other and the plate, said teeth gradually diminishing in size from the innermost to the outermost row, as shown clearly in Fig. 4. The points of the teeth, however, all terminate in the same plane, and spaces *e* are allowed at intervals between the teeth of the innermost rows, as also shown in Fig. 4. At the center of the plate D' there is a conical projection, F, the periphery of which is provided with spiral flanges *f*. This conical projection F extends within the hopper B and serves as a feeder to feed the substance to be hulled into the case C and between the plates D D', as will be understood by referring to Fig. 2.

The shaft E at one end is provided with pulleys *g g'*, from which power is communicated to other working parts, hereinafter described, the power which drives the whole machine being applied to the shaft E. The opposite end of the shaft E has a groove, *i*, made in it circumferentially, in which a fork, G, is fitted, said fork being attached to a nut, H, which is fitted on a screw, I, that passes through a female screw, *j*, in a projection attached to the hopper B, and has a hand-wheel, J, on its outer end, as shown in Fig. 2.

The plate D is of the same diameter as the plate D', and is provided at its face side with teeth *k*, which are placed in circular rows concentric with each other and the plate, and which, like the teeth of plate D', diminish in size from the innermost to the outermost row, as shown in Fig. 3. Between the teeth of the innermost rows there are also allowed spaces *l* at intervals. The outermost rows of the teeth *k* have at regular intervals solid raised ledges,

or what may be termed "very long teeth," *m*. These ledges or long teeth are so arranged that those of one row will be in line with the teeth *k* between the ledges or teeth *k* of the adjoining rows, as shown clearly in Fig. 3. The plate D is secured to the plate *a* of the case C by means of screw-bolts *n*, and between said plate D and the plate *a* of the case C there is interposed a circular piece of india-rubber, K, having strips or layers of cork, L, secured to it. This india-rubber and cork form an elastic or yielding substance, which admits of a certain degree of lateral yielding of the plate D and prevents the coffee or other substance to be operated upon from being crushed or bruised. The india-rubber and cork, L, are secured in proper position by the same screw-bolts, *n*, which secure the plate D to the plate *a* of the case C. (See Fig. 2.)

The lower part of the case C communicates with a box or case, M, at the back part of which there is a blast-fan, N, which may be constructed in the usual or in any proper manner, and within said box or case, directly in front of the blast-fan, there is placed a screen, O, which has a longitudinal shake motion given it from the fan-shaft *o* by means of a crank, *p*, connecting-rod *q*, and lever *r*. (See Fig. 2.)

The bottom of the box or case M is made with inclined sides, so as to form a spout, to the lower end of which a box, N', is attached, having an interior of ellipsoidal form, and within which a shaft, O', is fitted or placed. This shaft is of double-taper form, being larger in diameter at its center, as shown in Fig. 2, and it is provided with radial teeth or spikes *s*. This toothed shaft placed within the box N' forms a polisher, and a spout, P, communicates with the lower part of said box and leads into a rotary screen, Q, which is placed within a case, R, and upon a shaft, S, which passes longitudinally through the case R and is driven from the pulley *g* of the shaft E by a cord, *t*. The screen Q is encompassed by another screen, T, which is attached to and rotates with it and is considerably larger in diameter than the screen Q and of finer mesh, but is not quite so long. This difference in the length of the two screens admits of each having a separate discharge-opening, that of Q being shown at *u* and that of T at *v*. (See Figs. 1 and 2.) At the upper part of the spout P there is a slide, U. (Shown in Figs. 1 and 2.)

The operation is as follows: The coffee to be hulled is placed in the hopper B and the shaft E is driven by any convenient power. The coffee is fed into the case C and between the plates D D' by the conical flanged projection F. The coffee is hulled between these plates by the rotation of plate D', the coffee by centrifugal force being driven outward to the periphery of the plates, and while passing between them being thoroughly hulled. The enlarged teeth of the rows near the center of the plates with the spaces *e l* between them

admit of the free entrance of the coffee between the plates, while the ledges *m* prevent the too free or rapid passage of the coffee between the plates and insure the coffee being thoroughly or perfectly hulled as it escapes from between them. The yielding of the plate D prevents the coffee being subjected to any undue pressure which would have a tendency to crush or break the same, and also to clog or choke up the plates. The hulled coffee is discharged into the box or case M, and is subjected therein to a blast from the fan N, which is rotated by a cord, *t'*, from the pulley *g*. The fan-blast expels the hulls and all light foreign substances from the box or case M, all heavy large foreign substances being discharged from the outer end of the screen O, the hulled coffee passing through the screen and into the box N', where it is subjected to a polishing or scouring operation by the rotation of the toothed shaft O', which is driven by a cord, *w*, from the shaft S. This scouring or polishing operation deprives the coffee-grains of the pellicle, leaving them with a clean exterior. The polished coffee passes down through the spout P into the rotary screen Q, the large grains of coffee being retained in said screen and discharged from the case R at *u*. The smaller grains of coffee pass through the screen Q into the larger screen T, the latter admitting of dust passing through it, but not the small coffee, which is discharged from the case R at *v*.

By adjusting the slide U the discharge of the coffee from the polisher or box N' may be regulated as desired. The whole arrangement is extremely simple and efficient.

The operation of the hulling of coffee as herein described will apply to the hulling and scouring of other grain, and also the grinding of coffee, as the space between the plates D D' may be regulated as desired by turning the screw I. In grinding coffee or grain the screens and polisher are dispensed with, the plates D D' being only used.

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

1. The two plates D D', provided with teeth, as shown, one, D', being arranged to rotate on an adjustable shaft, E, and the other, D, fitted permanently in the case C, with an elastic or yielding substance formed of india-rubber and cork interposed between it and the side or plate *a* of the case, as and for the purpose specified.

2. In combination with the plates D D', the blast-fan N and reciprocating screen O, placed within the box or case M and arranged in relation with the plates D D', to operate as and for the purpose herein set forth.

3. The polisher or scourer formed of the rotating toothed shaft O', placed within the box N', in combination with the screen O, blast-fan N, and plates D D', arranged as and for the purpose specified.

4. The rotating screens Q T, placed one within the other in the case R, in combination with the polisher O', reciprocating screen O, blast-fan N, and hulling-plates D D', the latter being placed within the case C and the plate D provided with the conical flanged feeder F, projecting within the hopper B, and all arranged to operate as and for the purpose specified.

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Witnesses:

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