(Model.)

H. B. STEVENS.

MACHINE FOR HULLING RICE, &c.

No. 264,786. Patented Sept. 19, 1882.

Fig. 1

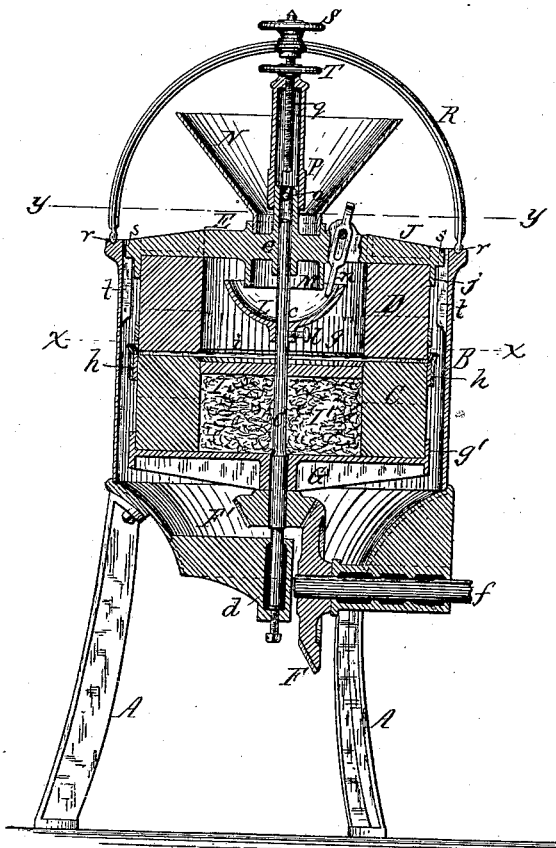


Fig. 2.

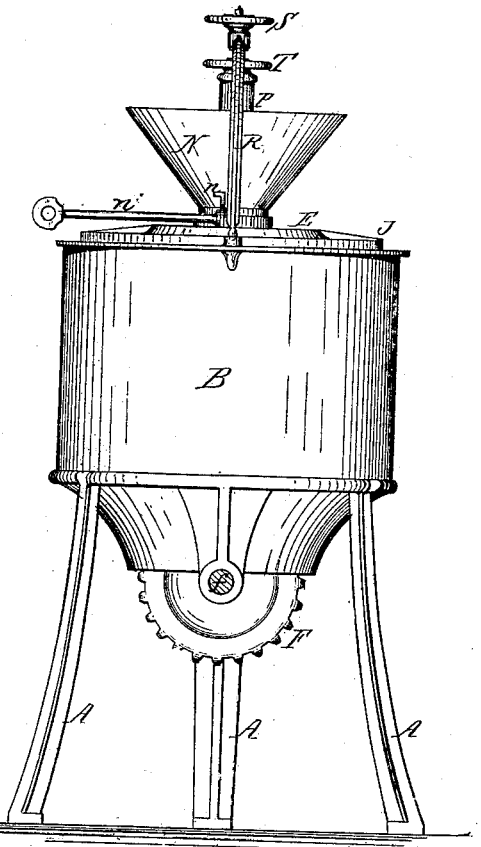


Fig. 3

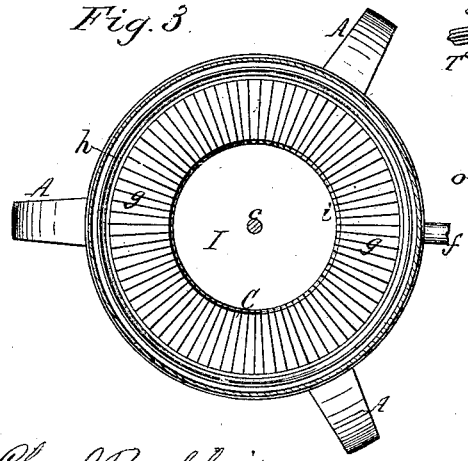


Fig. 5

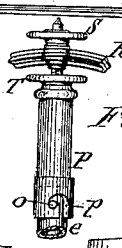
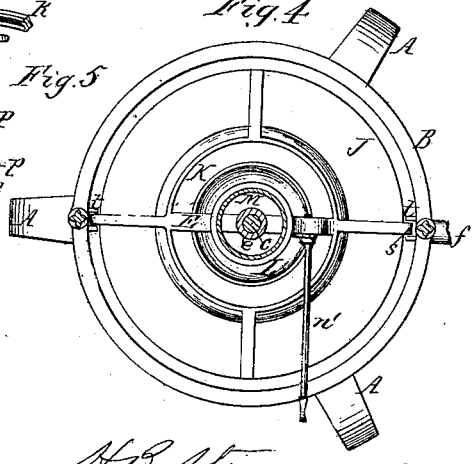


Fig. 4



Witnesses:
Chas. J. Buchheit, Jr.
Edw. J. Brady.

Inventor:
H. B. Stevens
By Wilhelm & Bonner
Attorneys.

UNITED STATES PATENT OFFICE.

HENRY B. STEVENS, OF BUFFALO, NEW YORK, ASSIGNOR TO GEORGE L. SQUIER, OF SAME PLACE.

MACHINE FOR HULLING RICE, &c.

SPECIFICATION forming part of Letters Patent No. 264,786, dated September 19, 1882.

Application filed March 6, 1880. (Model.)

To all whom it may concern:

Be it known that I, HENRY B. STEVENS, of the city of Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Machines for Hulling Rice and other Grains, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to a machine for hulling rice and other seeds and grains; and the object of my invention is to produce a machine by which the hulling can be easily and rapidly carried on without heating or breaking the grains or injuring the enamel.

My invention consists of the peculiar construction of the hulling-disks and their connecting parts; also, of the peculiar construction of the feed mechanism; also, in the means by which the upper stationary hulling-disk is supported and adjusted; and, finally, of the combination of various elements in the organization of the machine, as will be hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a sectional elevation of my improved hulling-machine. Fig. 2 is an elevation thereof at right angles to Fig. 1. Fig. 3 is a horizontal section in line *x x*, Fig. 1. Fig. 4 is a horizontal section in line *y y*, Fig. 1. Fig. 5 is a detached elevation of the adjusting device of the upper hulling-disk.

Like letters of reference refer to like parts in the several figures.

A represents three posts or legs supporting the curb B, which incloses the hulling mechanism.

C represents the lower movable hulling-disk or runner, and D the upper stationary disk.

c is the vertical spindle, to which the runner C is attached, and which is supported with its lower end in a step-bearing, *d*, secured to the frame of the apparatus, and with its upper end in a bearing, *e*, formed in a bridge-tree, E, secured to the frame of the stationary disk D.

f is the horizontal driving-shaft, provided with a bevel-wheel, F, which meshes with a similar wheel, F′, mounted on the spindle *c*, whereby the rotary or reciprocating motion of the driving-shaft is transmitted to the spindle and runner.

Both hulling-disks are composed of a suitable number of wooden blocks arranged in the form of a hollow cylinder, and having their contiguous annular surfaces provided with radial kerfs, slits, or narrow grooves *g*, formed by cutting about half-way down into the disks with a coarse saw.

The blocks forming the runner C are secured to a metallic disk, G, which is mounted upon the spindle *c*, and has an upwardly-projecting marginal flange, *g′*, overlapping the lower outer edges of the blocks, and forming, with the disk G, a socket in which the blocks are securely held.

h is a metallic hoop or ring, surrounding the upper edge of the wooden blocks composing the runner C. The ring *h* projects upwardly beyond the surface of the blocks, and is preferably made flaring or curving outwardly at its upper edge to facilitate the discharge of the hulled grain over the top of the ring. The latter serves to hold the blocks together, and at the same time retards the escape of the grain, so as to retain it between the hulling-surfaces until it is thoroughly hulled. The ring or hoop *h* fits snugly around the blocks of the runner, and can be driven down as the hulling-surface wears away, so as to retain about the same projection above the face of the runner at all times.

I is a circular plate, fitted snugly into the central circular space of the runner C around the spindle *c*, and depressed a little below the surface of the disk for the reception of the unhulled grain, which is introduced through the eye of the upper stationary disk, D. The upper inner edge of the blocks of the runner is preferably beveled, as shown at *i*, to facilitate the entrance of the grain between the hulling-surfaces. The space I′ below the plate I may be filled with hulls, straw, or other light material to prevent the grain working into this space through the grooves *g* of the blocks. As the face of the disk C wears down the plate I is driven down so as to be always about the same distance below the face of the disk.

The blocks of the upper disk, D, are provided with kerfs, slits, or grooves, like those formed in the lower disk, C, and the blocks are secured in an annular metallic frame or socket, J, provided with a downwardly-projecting marginal flange, *j*, and an eye or central opening, K, as shown. The bridge-tree E, by which the upper end of the spindle *c* is supported, is arranged diametrically in the eye K and secured to or cast with the annular frame or socket J.

L is a deep cup or receptacle, secured to the spindle *c* above the runner C by a set-screw, *l*, so as to be adjustable on the spindle.

M is a cylindrical sleeve, cast with or secured to the bridge-tree E, concentric with the spindle *c*, and projecting downward into the cup L.

N is the feed-hopper, resting with its lower end upon the cylindrical sleeve M, as shown in Fig. 1. The cup L is made so deep that it retains the grain which it receives through the sleeve M against the centrifugal force tending to scatter the grain over the rim of the cup.

n is a narrow bar or finger, secured to the bridge-tree E by a set-screw, *n'*, passing through a slot in the finger, so as to render the latter vertically adjustable. The lower end of the finger *n* projects into the cup L, and serves to scoop the grain out of the cup as the latter rotates. The quantity of grain removed from the cup at every revolution of the latter is readily regulated by raising or lowering the finger *n*.

The bearing *e*, in which the upper end of the spindle *c* rotates, and which is arranged centrally in the bridge-tree E, is provided near its upper end, and on opposite sides thereof, with two laterally-projecting pins or trunnions, *o*.

P is a hollow cylindrical sleeve, provided near its lower end with two curved notches, *p*, in which the pins *o* engage, as shown in Fig. 5.

q is a screw-spindle working in a threaded opening in the upper end of the sleeve P, and passing loosely through the hub of a yoke, R, which is composed of two curved legs, resting with their rounded ends in depressions or sockets *r*, formed in the top of the curb B.

S is a hand wheel or disk, secured to the upper end of the screw-spindle *q* above the hub of the yoke R, and T is a jam-nut arranged on the spindle *q* between the hub of the yoke R and the upper end of the sleeve P. The screw-spindle *q* is suspended from the yoke R by the disk S resting upon the hub of the same and the sleeve P being attached at its upper end to the spindle *q* and at its lower end to the bearing of the bridge-tree E, which latter forms part of the upper hulling-disk, D. The entire weight of the latter is thrown upon the yoke R. By turning the screw-spindle *q* in one or the other direction the disk D is raised or lowered, and by tightening the jam-nut T it is held in the desired position. In this manner the upper disk is readily adjusted with reference to the runner as the kind and condition of the grain may render necessary.

The trunnions *o*, by which the disk D is suspended from the sleeve P, permit the disk to swing on them as an axis, and the yoke R, which is arranged at right angles to the axis of the trunnions *o*, permits the disk D to swing on an axis drawn through the points of support of the yoke, thereby giving the upper disk, D, a universal adjustment with reference to the runner C, and enabling it to assume that position in which the hulling-surfaces of the two disks are parallel.

s are two laterally-projecting lugs or ears formed on opposite sides of the annular frame J of the upper disk, D, and entering sockets *t* on the inner sides of the curb. The lugs *s* fit loosely into the sockets *t*, so as to permit the upper disk to freely adjust itself to the runner, while at the same time preventing the upper disk from rotating with the runner.

The operation of my improved machine is as follows: The rice or other grain to be hulled is fed into the hopper N, and passes from there through the sleeve M into the cup L. By raising and lowering the latter upon the spindle *c* the quantity of grain passing into the cup from the sleeve is readily regulated. The grain is dipped or scooped out of the cup L by the finger *n* and falls upon the central plate, I, of the lower disk, upon which it accumulates in a small annular layer, and whence it is carried between the hulling-surfaces of the disks C D by the rotation of the lower disk. The slits or grooves of the hulling-disks roll the grain over and loosen and rub off the hulls without breaking the grain or injuring the enamel. The grain is retained between the hulling-surfaces by the ring *h* until the hulls are completely removed. The hulled grain is discharged over the hoop *h* into the curb B, which collects the hulled grain and conducts the same to a suitable receptacle below. The motion imparted to the runner C may be reciprocating or rotary. When the machine is operated by power, rotary motion is employed.

I claim as my invention—

1. In a hulling-machine, the runner C, composed of wooden blocks provided with radial slits *g*, disk G, central plate, I, and projecting ring *h*, substantially as set forth.

2. The combination, with the stationary disk D and rotating disk C, mounted on a spindle, *c*, of a feed-cup, L, secured to the spindle *c*, and a stationary finger, *n*, projecting into the feed-cup, substantially as set forth.

3. The combination, with the stationary disk D and rotating disk C, mounted on a spindle, *c*, of a feed-cup, L, secured to the spindle *c*, and a finger, *n*, adjustably secured to a bridge-tree, E, substantially as set forth.

4. In a hulling-machine, the combination, with the stationary upper disk, D, and lower running disk, C, of the hopper N, sleeve M, rotating cup L, and finger *n*, substantially as set forth.

5. The combination, with the frame of the upper disk, D, provided with trunnions *o*, of the connecting-sleeve P and supporting-yoke R, arranged at right angles to the axis of the trunnions *o*, substantially as set forth.

6. The combination, with the annular frame J, of the upper disk, having a central bearing, *e*, provided with trunnions *o*, of the screw-sleeve P, screw-spindle *q*, provided with hand-wheel S, yoke R, and jam-nut T, substantially as set forth.

7. The combination, with the curb B, provided with sockets *t*, of the frame J, having lugs *s* and trunnions *o*, sleeve P, and yoke R, substantially as set forth.

H. B. STEVENS.

Witnesses:
EDWARD WILHELM,
JNO. J. BONNER.