L. H. WHITNEY.

Grain Huller.

No. 107,644. Patented Sept. 20, 1870.

Fig. 1.

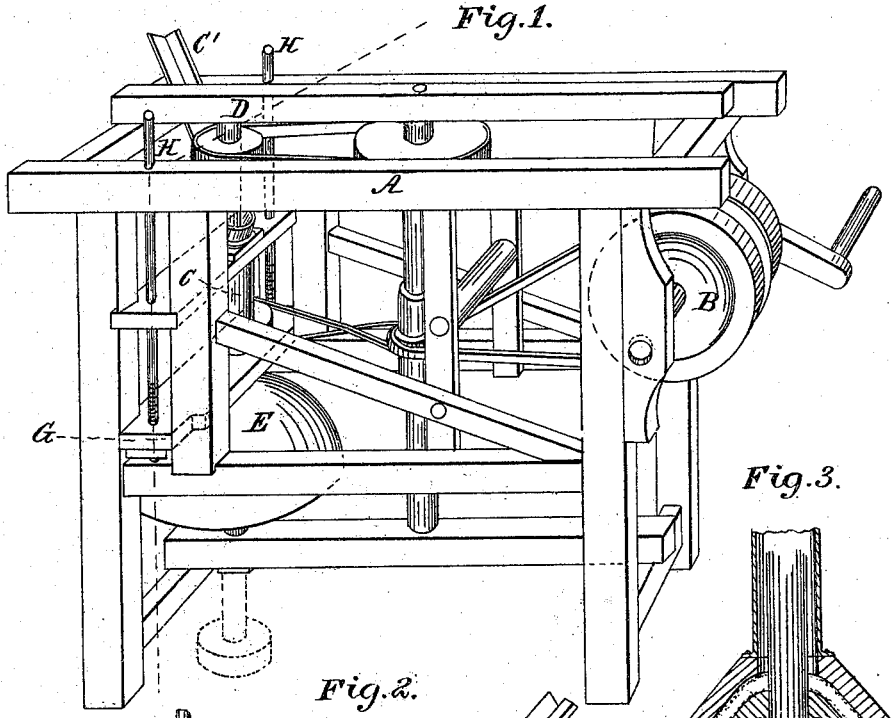


Fig. 2.

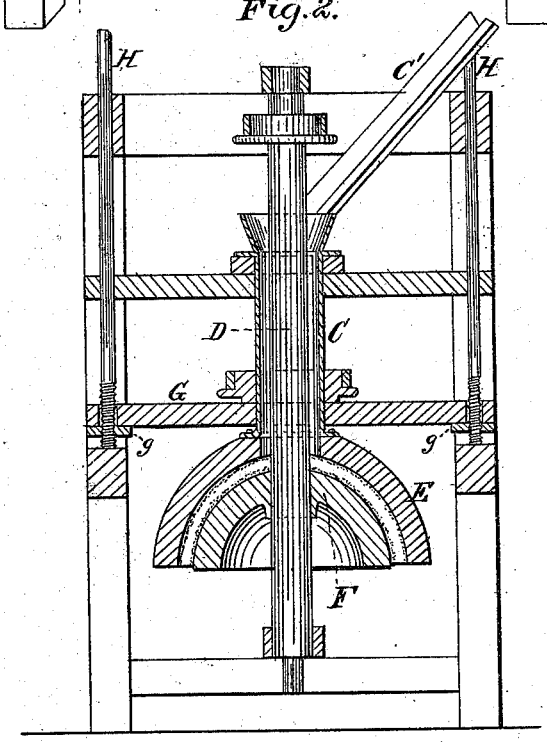


Fig. 3.

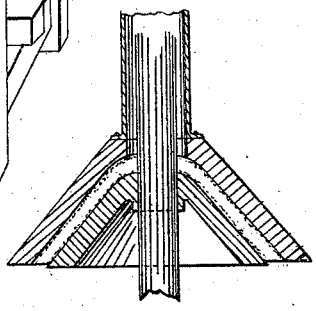
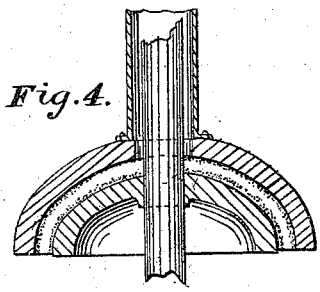


Fig. 4.



Witnesses:

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LEVI H. WHITNEY, OF WASHINGTON, DISTRICT OF COLUMBIA.

Letters Patent No. 107,644, *dated September* 20, 1870.

IMPROVEMENT IN MACHINES FOR HULLING AND SCOURING GRAIN, RICE, COFFEE, &c.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, LEVI H. WHITNEY, of Washington, in the District of Columbia, have invented certain Improvements in Machines for Hulling and Scouring Grain, Rice, Coffee, &c.; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the annexed drawing making part of this specification, in which—

Figure 1 is a perspective view of my improved machine.

Figure 2 is a transverse vertical section on the line *x x* of fig. 1.

Figures 3 and 4 are sectional views, showing modified forms of the emery surfaces.

The same letters are used in all the figures in the designation of identical parts.

This invention relates to that class of machines which is used for hulling and scouring grain, rice, coffee, &c., and to that division of such machines which operates upon the kernels by percussion, as contradistinguished from those which act by attrition.

My improvement consists in the employment of two hollow bodies of hemispherical or an equivalent form, arranged to revolve one within the other, on vertical shafts, and provided with a coat of emery upon the surfaces in juxtaposition, between which the grain or other substance is introduced from a hopper above, and discharged at the lower open end, after having been subjected to the scouring action of the emery surfaces; and secondly, in the means for regulating the space between the emery surfaces to adapt the machine for operation upon various substances, all as will be more specifically pointed out in the subjoined description and claims.

To enable those skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

The frame of the machine should be substantially made of wood or iron, and must be fashioned to adapt it to the particular place where it is to be employed.

The frame, shown in the annexed drawing and marked A, is provided at one end with a horizontal transverse shaft upon which the driving-pulley B is mounted.

From this motion is communicated through intermediate pulleys and belts, respectively, to the hollow shaft C, and the shaft D passing through the former, both being arranged in vertical position in bearings on the frame.

The hollow shaft C terminates at its upper end in a funnel-shaped mouth, into which the grain or other substance to be operated upon is fed from a suitable hopper, or directly from the thrashing-machine, as the case may be, by means of a spout, C'.

The hollow hemispherical bodies or wheels E and F are arranged one within the other, the former being secured to the lower end of the shaft C, and provided with a suitable aperture, corresponding with the bore of the shaft, for the admission of the grain between them, while the latter is firmly fastened upon the shaft D.

Those surfaces of the wheels which are in juxtaposition are provided with a coat of suitable thickness of emery, which is spread upon a base of wood or leather, riveted or cemented to the wheels, where the latter are made of boiler-iron. In working machines this latter material will be mostly employed for the wheels, struck up to the desired form in dies.

The arrangement of the driving mechanism is such as to impart a very rapid motion to the shaft D and wheel F in one direction, and a slow motion to the shaft C and wheel E in the opposite direction.

The relative speed of the wheels must be governed by the material upon which they are to act, and the work to be done.

The relative sizes of the wheels will be such that, when they are arranged concentrically, as shown in the drawing, the space between them will be one inch, more or less; but to adapt the machine for varying work, I arrange the outer wheel so as to be adjustable vertically. To this end its shaft is secured to a cross-head G, the ends of which slide between vertical ways of the frame, and which is provided with a tapped plate *g*, near each end, for the reception of screw-threaded spindles H H. These latter rest in steps upon cross-bars of the frame, and near their upper ends in bearings, in the manner shown. By turning these spindles in one direction or the other, the outer wheel E is raised or lowered, and thus the space between the working surfaces widened or contracted.

I regard the hemispherical form of wheel described as the most efficient for this purpose; but it is apparent that the cone-shaped form shown in fig. 3, or the semi-spheroidal form shown in fig. 4, may be employed with very good results.

The shaft D, instead of passing up through the hollow shaft C, may terminate on the upper surface of the inner wheel F, if preferred, and driven by a pulley below such wheel, as indicated in dotted lines in fig. 1.

The wheels and their shaft should be so arranged in their bearings that they may be readily removed for repairs.

In operating the machine, the grain is fed through the hollow shaft, and, falling upon the inner wheel, is instantly thrown forcibly against the rough, gritty emery surface of the outer one, from which it is immediately returned to the inner one, to be again thrown outward by the centrifugal force developed by the

rapid revolution of the said inner wheel; and thus it is constantly thrown back and forth, gradually working its way down to the lower end to be discharged, not only hulled but also freed from any smut or chit which may cover the cuticle of the kernel.

A suitable winnowing apparatus is to be used in connection with this machine to separate the grain, hulls, and dust as they leave the wheels.

Whenever the emery surfaces of the wheels become too smooth by wear to do good work another coat should be applied.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, in a machine for scouring grain, of the convex wheel E and concave wheel F, when the same are coated with emery and made to revolve in opposite directions, as and for the purpose described.

2. The combination and arrangement of the two emery-wheels, E F, of hemispherical or equivalent form, revolving one within the other, in opposite directions, cross-head G, screw-spindles H H, shaft D, and hollow shaft C, all constructed and operating substantially as shown and described, and for the purposes set forth.

In testimony whereof I have signed my name to the foregoing specification in the presence of two subscribing witnesses.

LEVI H. WHITNEY.

Witnesses:

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