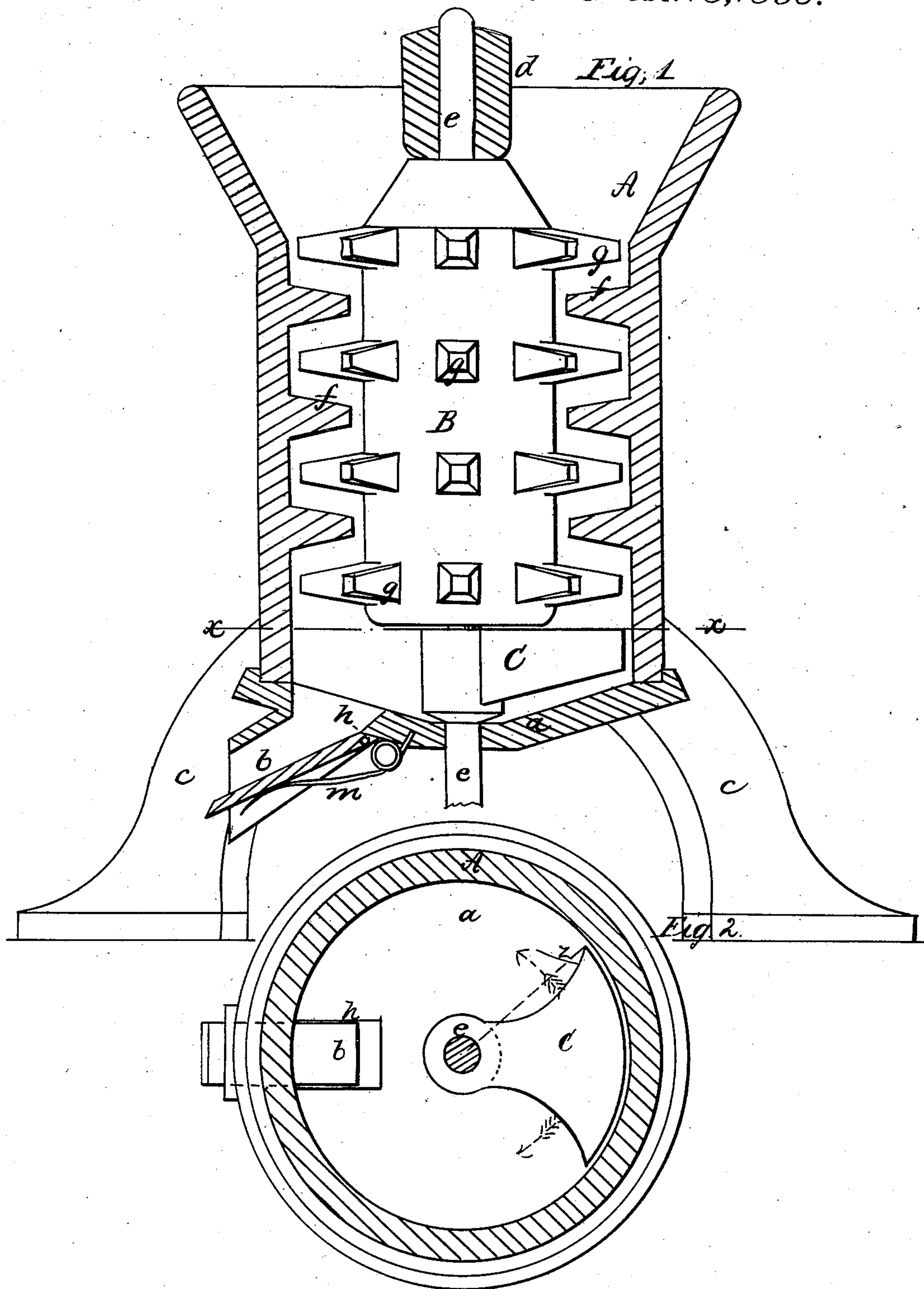


P. Dickenhof.

Rice Cleaner.

Nº 20,552.

Patented Jun. 15, 1858.



UNITED STATES PATENT OFFICE.

PHILIP DICKENHOF, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN MACHINES FOR HULLING RICE.

Specification forming part of Letters Patent No. 20,552, dated June 15, 1858.

To all whom it may concern:

Be it known that I, PHILIP DICKENHOF, of the city and county of Philadelphia, in the State of Pennsylvania, have invented a certain new and useful Improvement in Machines for Hulling Rice and other Grain or Seed, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which forms part of this specification, and in which—

Figure 1 represents a partly sectional elevation of the machine, and Fig. 2 a horizontal or transverse sectional view of operative parts only and taken as denoted by the line *x x* in Fig. 1.

My improvement has reference to that description of rice-hulling machines in which a cylinder armed with spikes is arranged to revolve in a vertical position, or thereabout, within another cylinder or case, also armed with spikes arranged so that the spikes of the revolving cylinder play within or under and over the spikes of the other cylinder, whereby the rice is hulled in its descent or passage through the mill by its contact with the cylinders and spikes and by the action of the latter and by the rubbing of the grains together in the agitation produced by such mechanism, and is discharged from the mill in a collected manner by a lateral spout at or near the bottom.

In the mill represented in the accompanying drawings the outer cylinder A is supposed to occupy a vertical position, and is shown with a flaring top or mouth for the convenience of receiving the rice, and with a covered-in bottom *a*, preferably made of cupped or shelving form, to carry off the rice after having passed the lower rows of spikes, said bottom being provided with a delivery-spout *b* on the one side. This cylinder may be supported by legs *c* or in any other way, and may be provided with a bridge-tree *d* at the top to act as a guide or bearing to the shaft *e* of the inner cylinder B, said shaft *e* of the inner cylinder also being extended through the bottom *a*, below which it may be driven by gearing, so as to cause the inner cylinder B to rapidly revolve. Both cylinders are studded, as specified—that is, the one internally and the other externally—with spikes *f g*, arranged for intermediate play. These spikes may be

of any form or number, and may be cast on their respective cylinders or be otherwise attached. In such mills the supply of the rice, which should be constant and copious, necessarily varies, and such variations prejudicially affect the hulling process, either by causing the descent of the rice to be too rapid or too slow, and by causing an unequal and obstructing accumulation of rice in the center of the bottom *a* on the inside, where—that is, between the end of the inner cylinder B and bottom *a*—it is desirable to have a free escape-space, and which obstructing accumulation variation in speed of the revolving cylinder also affects. To reduce or neutralize these defects in such mills, which are, as a general thing, well adapted for hulling, being simple, durable, free from clogging, and equal in their action all round, is the object of my invention in part or in whole. Thus I make the delivery-spout *b* to the cylinder A a compensating one by hinging it or bottom board of said spout at or near its top, say, by a pin *h*, and supporting the spout below its hinge by a spring *m*, or otherwise equivalently hanging and supporting the spout, using a weight instead of a spring, if preferred, so that, on the mill being too copiously supplied, the weight of the grain, acting on the spout, will cause it to enlarge the delivery-opening or increase the inclination of the spout, or both, and so, by giving a freer escape, relieve the mill and accelerate the descent of the grain therein, which should not be exposed for too long a period to the action of the spikes, or so that, on the mill being too scantily supplied, the diminished weight of the grain, acting on the spout, will have the effect of causing the spring *m* to lessen the delivery-opening or diminish the inclination of the spout, or both, and so, by retarding the escape, allow of accumulation in the mill to correspond with the diminution of supply and secure the exposure of the grain for its full and proper period to the action of the spikes. For the better performance of this result—that is, the regulating action of the compensating delivery-spout, to secure a proper action of the hulling mechanism on the grain, independent of the variation in the amount of supply, it is important that, as fast as hulled, the rice should be passed to

the spout, and, whether the supply be great or small, not be allowed to accumulate around the shaft of the runner in the space between the bottom of the runner B and bottom piece *a* of the case, otherwise the compensating-spout would act less perfectly in its regulation of exposure of the grain to the action of the two cylinders of spikes. I therefore attach to the shaft of the running cylinder B, beneath the bottom of said cylinder, a clearer C, whose office it is to prevent accumulation of hulled grain, and sweep it as it emerges from between the bottom rows of spikes into the delivery-spout *b*; and in order that it shall do this latter most effectually and not act as a beater to throw the grain towards the inner circumference of the outer cylinder by the centrifugal action of the edge of the clearer on the grain, but shall rather have an opposite effect in its range of action under the spikes, so as to prevent accumulation there and expedite the discharge of the hulled grain from the spikes, I construct the clearer C so that it shall have a tendency, at the outer end of its acting edge, to sweep the grain inward, in opposition to the effect of the centrifugal action, as clearly indicated by red line *z* in Fig. 2.

To enable the mill to run in both or opposite directions, I construct both edges or sides of the clearer C alike as regards their action on the grain, which implies reversal of bevel or curvature of said sides. By making the clearer C of wide form, as shown in Fig. 2, a free open space is constantly secured in its "wake" for the discharge of the grain from between the spikes, and the acting edge of the rapidly-revolving clearer, by reason of said wide body form, thrown in advance, so as to

catch such grain or a large portion of it and convey it to the spout before it has time to accumulate on the bottom of the outer cylinder. Further, said wide body form of the clearer enables the clearer to be used as a "stop" to the escape of any grain through the spout when the mill is arrested with grain not hulled in it, and which grain would run out and mix with the hulled grain, by simply stopping the cylinder B in its run when the clearer C is over the spout *b*, or turning the cylinder and clearer to such position, should no other mode of shutting off the discharge be employed. The compensating-spout *b* is kept lively and free from sticking by the momentary interference with the discharge of the revolving clearer C when at work and moving over the spout, whether said clearer be of the shape and build here described or of different form.

What I claim as new and useful herein, and desire to secure by Letters Patent, is—

1. The combination, with the compensating delivery-spout *b*, of a revolving clearer C, interposed between said spout and the hulling mechanism or surfaces, essentially as set forth.

2. The revolving clearer C, constructed as described, with its opposite acting sides or edges shaped to produce similar action in opposite directions of travel, and the outer ends of said edges formed to counteract the centrifugal throw of the clearer, as specified.

In testimony whereof I have hereunto subscribed my name.

PHILIP DICKENHOF.

Witnesses:

WM. P. HIBBERD,

BENJ^r FAGE.