2 Sheets—Sheet 1.

H. B. STEVENS.
Thrashing Machines.

No. 202,293. Patented April 9, 1878.

Fig. 1.

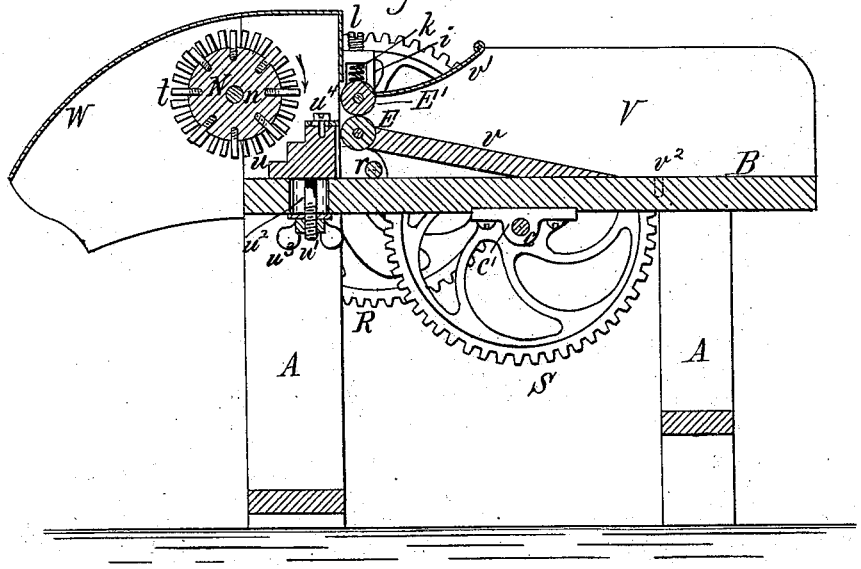
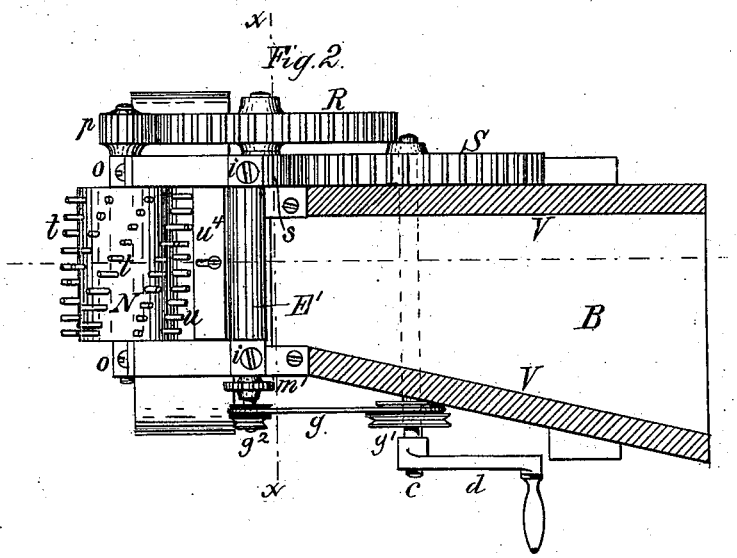


Fig. 2.



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2 Sheets—Sheet 2.

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Fig. 3.

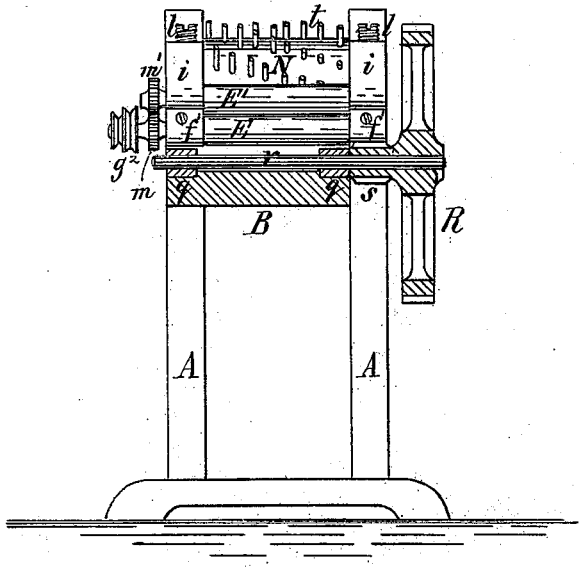


Fig. 4

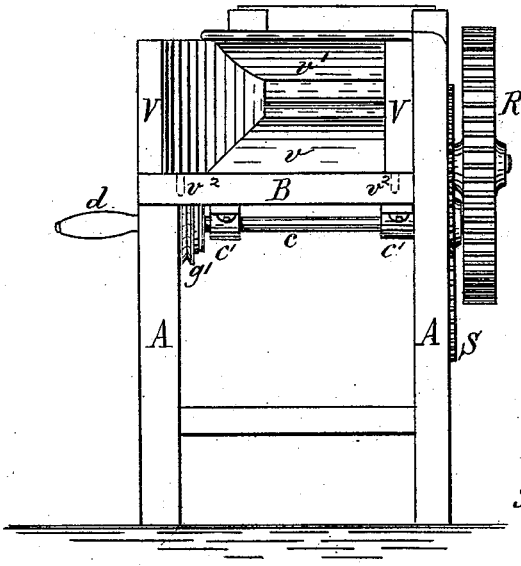
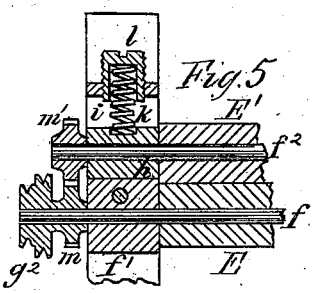


Fig. 5



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UNITED STATES PATENT OFFICE.

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

IMPROVEMENT IN THRASHING-MACHINES.

Specification forming part of Letters Patent No. **202,293**, dated April 9, 1878; application filed January 9, 1878.

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 new and useful Improvements in Machines for Thrashing Rice and other grains, of which the following is a specification, reference being had to the accompanying drawing.

My invention relates to a machine for thrashing rice and other grains, so constructed that it can be readily actuated by hand or other light power, and that it can be packed in a small space for transportation to distant countries.

The nature of my invention will be fully understood from the following description.

In the accompanying drawings, consisting of two sheets, Figure 1 is a longitudinal section of my improved machine. Fig. 2 is a top-plan view thereof, with the feed-chamber in section. Fig. 3 is a cross-section in line *x x*, Fig. 2. Fig. 4 is a front elevation of the machine. Fig. 5 is a vertical section, on an enlarged scale, of one end of the feed-rollers.

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

A A represent the legs of the machine, and B the feed-table, rigidly connected to the legs, and forming therewith the stationary frame of the machine. *c* is the driving-shaft, arranged transversely under the table B, and turning in bearings *c'*, secured to the latter. *d* is a hand-crank, mounted on the end of the shaft *c* when the machine is designed to be driven by hand; but when it is to be driven by power a suitable pulley may be substituted for the crank. E E′ represent two feed-rollers, arranged above the forward end of the table B. The shaft *f* of the lower feed-roller E turns in stationary bearings f^1, and is driven from the driving-shaft *c* by means of an endless belt, *g*, running over pulleys g^1 g^2, mounted, respectively, upon the shafts *c* and *f*. The pulleys g^1 g^2 are preferably made conical, to enable the speed of the feed-rollers to be varied. *h* are the boxes in which the shaft f^2 of the upper feed-roller E′ turns. The boxes *h* are arranged between vertical guides or ways *i*, so as to enable the feed-roller E′ to be raised and lowered with reference to the stationary roller E. *k* are spiral springs, bearing upon the sliding boxes *h*, and having their upper ends arranged in hollow sleeves *l*, provided with an exterior screw-thread, working in a threaded opening in the top of the guides *i*, so that by adjusting the hollow sleeve *l* the tension of the springs can be regulated. The hollow sleeves permit the use of comparatively long springs in a limited space, and enable the springs to be very nicely adjusted, and give a great range of adjustment. *m* *m′* represent two gear-wheels, mounted on the shafts f f^2 of the feed-rollers, for driving the upper adjustable roller from the lower stationary roller.

N is the thrashing or combing cylinder, mounted on a shaft, *n*, which turns in bearings *o*, secured to the legs A. *p* is a pinion, mounted on the end of the cylinder-shaft *n*, and meshing with a gear-wheel, R, secured to a counter-shaft, *r*, which turns in bearings *q*, secured to the front portions of the table B. *s* is a pinion, mounted on the counter-shaft *r*, and meshing with a gear-wheel, S, secured to the driving-shaft *c*.

By this arrangement of gear-wheels the thrashing-cylinder N is rotated at a considerably greater speed than the feed-rollers, the speed of the thrashing-cylinder being preferably about six times that of the feed-rollers.

t represents teeth, arranged upon the periphery of the thrashing-cylinder in spiral rows or sets, as clearly shown. *u* is a ledge or a series of ledges arranged between the feed-rollers E E′ and the thrashing-cylinder, so as to support the straw while it is subjected to the action of the teeth.

As shown in the drawing, the ledge *u* is composed of three offsets or steps, and made adjustable toward and from the thrashing-cylinder N, for regulating the position of the ledge with reference to the kind and condition of the grain to be thrashed. The ledge *u* is preferably attached to the feed-table B by means of a bolt, u^1, passing through a longitudinal slot, u^2, in the feed-table, and provided with a thumb-nut, u^3, on the under side thereof.

u^4 is an adjustable plate, secured to the upper side of the ledge *u*, so as to be capable of being moved backward or forward when the

ledge u is adjusted away from or toward the feed-rollers, thereby preventing an opening being formed between the feed-rollers and the ledge when the latter is adjusted. V V are the side pieces of the feed-chamber or hopper, connected at the bottom by an inclined bottom board or plate, v, which guides the straw to the feed-rollers, and at the same time protects the counter-shaft r and its boxes. v' is a throat or top piece, secured to the side pieces V V above the board v, for confining the straw and guiding it to the feed-rollers.

The side pieces V V, inclined bottom v, and top piece v^1 are permanently secured together and applied to the table B, so as to be readily removable and permit access to the feed-rollers and counter-shaft, when desired. The feed-chamber is held in place on the table B by pegs or lugs v^2, secured to the side pieces V V and entering openings in the table B, as indicated by dotted lines in Figs. 1 and 4.

The table B is made straight at one side or at right angles to the feed-rollers, while the other side is arranged at an angle to the feed-rollers, as clearly shown in Fig. 2.

The side pieces V V, bottom v, and throat-plate v^1 of the feed-chamber conform to the tapering shape of the feed-table B, so that the straw, as it is fed to the feed-rollers, is deflected by the inclined side of the feed-chamber toward one end of the feed-rollers, and presented to the thrashing-cylinder N in an inclined position, whereby the teeth t of the cylinder are caused to strike the straw sidewise to a certain extent, which results in a more complete separation of the kernels of rice from their stalks.

The spiral rows of teeth t are arranged in such manner on the cylinder that they will draw the straw from the side at which it is presented toward the other side of the cylinder, whereby the straw is thoroughly subjected to the action of the teeth.

W represents a removable hood, secured to the legs A, so as to cover and protect the thrashing-cylinder and to guide the straw to the floor or ground.

The grain in the straw is placed upon the inclined board v of the feed-chamber in thin layers, and guided between the feed-rollers, which latter grasp the grain and present it to the thrashing-cylinder, as above described.

The springs k render the upper feed-roller E′ self-adjustable, thereby enabling the feed-rollers to adapt themselves to the feed, whether light or heavy, and if, by carelessness of the attendant, an excessive quantity of grain is fed between the feed-rollers, the upper roller will be raised so high as to be thrown out of gear, when the feed will be stopped until the rollers are relieved.

The heads of the grain are slowly moved by the feed-rollers over the ledge u to the thrashing-cylinder, which rotates with great velocity, and detaches the kernels of grain from the stalks by a sort of combing action. This holding back of the straw by the feed-rollers until the teeth of the thrashing-cylinder have effectually combed the grain from the straw is especially important in the thrashing of rice, in which each grain is attached to the straw by a long slender foot-stalk, which frequently adheres to the grain when thrashed in an ordinary thrashing-machine, and which greatly impedes the process of cleaning the grain.

In my improved machine the grains are combed off the foot-stalks, leaving the latter attached to the straw. The bulk of the kernels is detached from the stalks at the upper edge of the ledge u, and the spaces between the several edges of the ledge-block enable the detached kernels to escape from the beating action of the teeth, thereby preventing the breaking of the kernels, which is of great importance in thrashing rice.

The gear-wheels connecting the thrashing-cylinder with the driving-shaft are arranged on the straight side of the feed-table B, thereby permitting the shafts to be made comparatively short, and rendering the machine very compact.

I claim as my invention—

1. The combination, with the toothed thrashing-cylinder N and feed-rollers E E′, arranged parallel therewith, and rotating with less speed than the thrashing-cylinder, of the feed-chamber, arranged at an oblique angle with the feed-rollers and thrashing-cylinder, substantially as and for the purpose set forth.

2. The combination, with the thrashing-cylinder, provided with teeth t, arranged in spiral rows, of a feed-chamber, arranged at an oblique angle to the cylinder, substantially as and for the purpose set forth.

3. The combination, with the toothed thrashing-cylinder N and feed-rollers E E′, of the adjustable block u, provided with two or more angular ledges, the upper one of which is arranged in line with the feed-rollers, or nearly so, substantially as and for the purpose set forth.

4. The combination, with the toothed cylinder N and feed-rollers E E′, of the adjustable ledge u, provided with adjustable top plate u^4, substantially as and for the purpose set forth.

5. In a thrashing-machine, the combination, with the toothed cylinder N, of the adjustable ledge u, stationary feed-roller E, and upper feed-roller E′, rendered self-adjusting by means of springs, the feed-rollers rotating with less speed than the thrashing-cylinder, substantially as set forth.

6. The combination, with the toothed cylinder N and fixed feed-table B, of a removable feed-chamber, composed of side pieces V V, inclined bottom v, and top plate v^1, substantially as set forth.

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