(No Model.) 2 Sheets—Sheet 1.

I. SHERCK.

Thrashing and Clover Hulling Machine.

No. 239,349. **Patented March 29, 1881.**

Fig. 1.

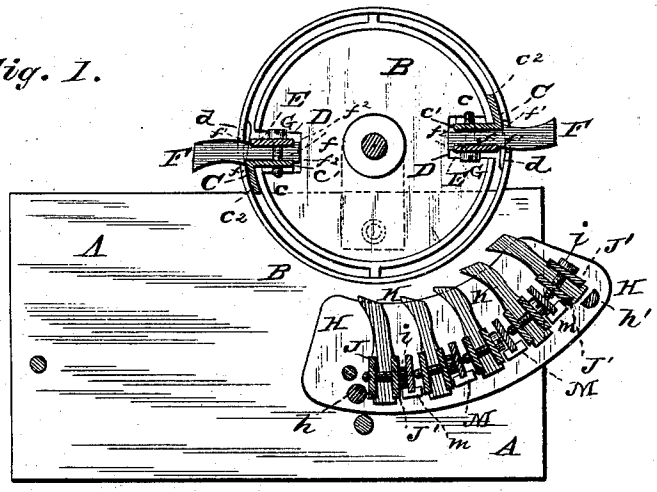


Fig. 2.

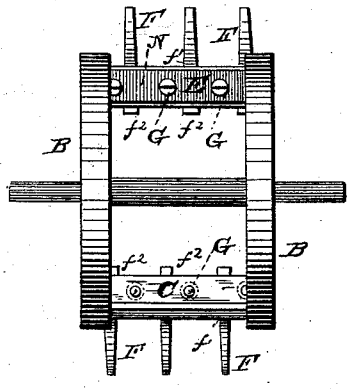


Fig. 3.

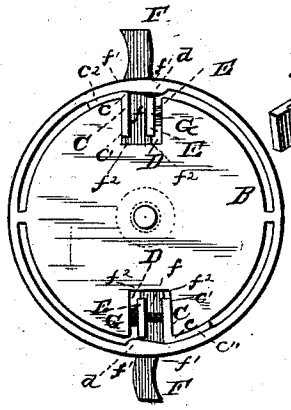


Fig. 4.

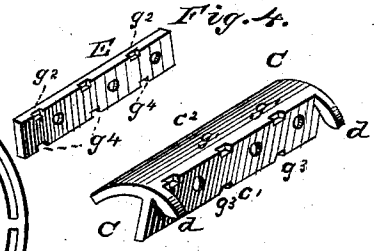


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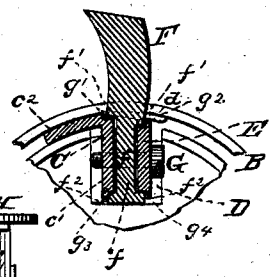
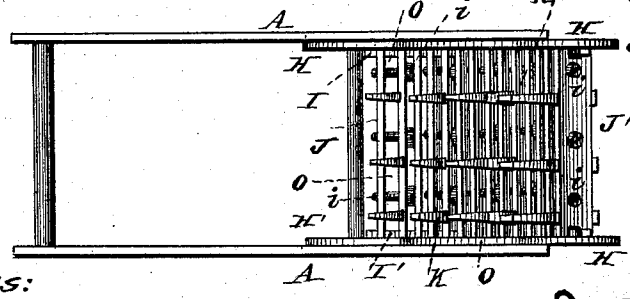


Fig. 6.



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(No Model.) 2 Sheets—Sheet 2.

I. SHERCK.

Thrashing and Clover Hulling Machine.

No. 239,349. **Patented March 29, 1881.**

Fig. 7.

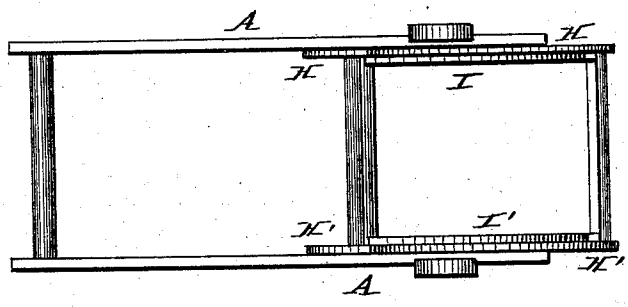


Fig. 8.

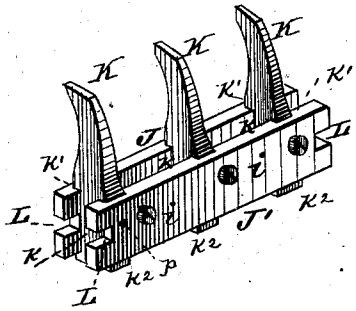


Fig. 9.

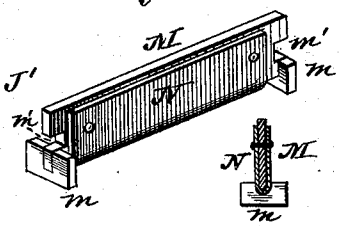


Fig. 10.

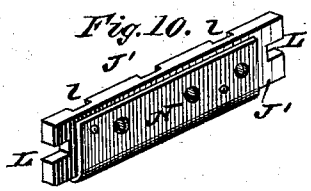


Fig. 11.

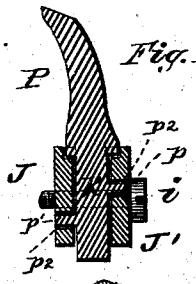


Fig. 12.

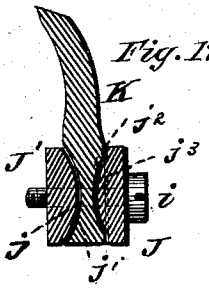


Fig. 13.

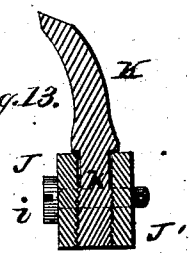


Fig. 14.

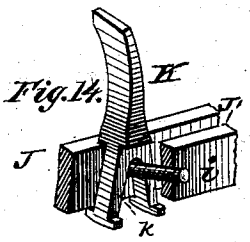


Fig. 15.

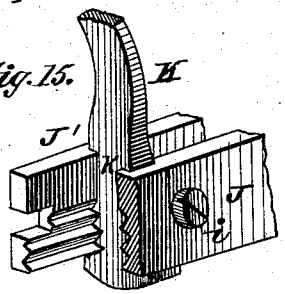


Fig. 16.

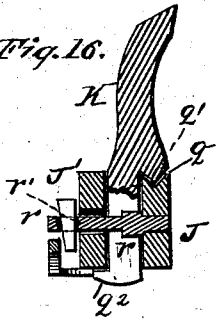
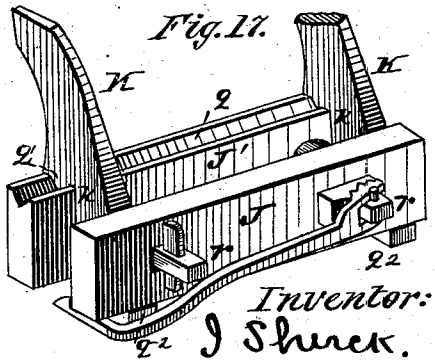


Fig. 17.



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UNITED STATES PATENT OFFICE.

ISAAC SHERCK, OF FREMONT, OHIO, ASSIGNOR TO HIMSELF, GEORGE E. RAYMOND, OF SAME PLACE, AND WILLIAM F. JOBBINS, OF NEW YORK, N. Y.

THRASHING AND CLOVER-HULLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 239,349, dated March 29, 1881.

Application filed May 5, 1880. (No model.)

To all whom it may concern:

Be it known that I, ISAAC SHERCK, of Fremont, in the county of Sandusky and State of Ohio, have invented certain new and useful Improvements in Thrashing and Clover-Hulling Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in thrashing or clover-hulling machines, the object of the invention being to provide simple and efficient means for securing the teeth in the thrashing concave and cylinder in such a manner that they will be securely retained against displacement while in use, and adapted to be readily removed for repairs or renewal when worn or broken.

Another object of my invention is to provide appliances for a thrashing cylinder or concave to prevent the crushing or breaking of the grain as it is being separated from the straw.

With these ends in view my invention consists in certain details of construction and combination of parts, as will hereinafter be explained, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view, in vertical longitudinal section, of a thrashing cylinder and concave embodying my invention. Fig. 2 is an end view (with respect to the machine) of the thrashing-cylinder. Fig. 3 is a side view, taken in the same sense, of same. Fig. 4 is a detached view of one of the stationary cross-bars of the thrashing-cylinder. Fig. 5 is a vertical section, taken through one of the teeth and the fastening-bars of the cylinder. Fig. 6 is a plan view of the concave. Fig. 7 is a plan view of the concave supporting-frame. Fig. 8 is a detached view of one row of concave teeth secured between the fastening-bars. Fig. 9 is a view of the spacing-bars provided with yielding surface. Fig. 10 is a view of the teeth-supporting bars provided with yielding surface. Figs. 11, 12, 13, 14, 15, 16, and 17 are modifications.

A represents the sides of a thrashing-machine, and B the thrashing-cylinder, the latter being pivoted with the arc-shaped slots or openings near its periphery to allow of the insertion of lead or other metal to balance the cylinder.

C are stationary bars, secured at opposite ends to the opposite ends *c* of the thrashing-cylinder, said bars being L-shaped and formed of the parts c' c^2. The opposite ends of the thrashing-cylinder are provided with openings D for the insertion of the fastening-bars E. At the outer end of opening D is formed an incline, *d*, against which impinges the outer edge of the fastening-bar when it is secured in place, the incline serving to draw the bar toward the center of the thrashing-cylinder, for a purpose hereinafter explained.

F are the cylinder-teeth, each being formed with an elongated shank, *f*, having two shoulders, f' f^2, on opposite edges thereof. Shoulders f' on opposite sides of shanks *f* are seated in the depressions g' g^2 formed, respectively, in the outer surfaces of the stationary and movable teeth-fastening bars, while the shoulders f^2 on the other end of the shank are seated in depressions g^3 g^4, formed on the inner surface of said bars. The several teeth having been placed between the two bars and arranged as described, the screws G are inserted in place and serve to draw the movable bar toward the stationary bar, and thereby firmly clamp the cylinder-teeth between their adjacent surfaces. As the movable bar is drawn toward the stationary bar it will have a slight radial movement imparted thereto by means of the incline *d*, and thereby draw the shoulders formed on the shanks of the several teeth in snug contact with said bars. This form of fastening is most secure, for the reason that each tooth has an extended bearing between the comparatively-wide bars, and all endwise movement of the teeth is prevented by means of the shoulders on the shanks of the teeth being drawn snugly within the depressions formed for their reception in the stationary and movable fastening-bars. The stationary bar is of such form as to impart strength and rigidity thereto to resist the strain exerted thereon as the machine is in operation. Should

any of the teeth become worn or broken they may be readily removed and renewed by loosening the movable fastening-bar. Any desired number of rows of teeth may be connected with the cylinder.

H H′ represent the sides of the concave-frame, which is pivoted at *h*, and connected at its outer end by the rod or cross-bar *h′*. To the inner surfaces of the sides H H′ are secured the curved supporting-flanges I I′. My improved concave is composed of a series of rows of teeth, each row being secured between two cross-bars or plates, as will be explained.

J J′ designate the cross-bars, between the adjacent surfaces of which are secured the concave-teeth K by means of the fastening-screws *i*, which also form spacing or distance lugs. Teeth K are formed with elongated shanks *k*, each having two shoulders, *k′* *k²*, on opposite sides thereof, the shoulder *k′*, near the base of the tooth, fitting into depressions or mortises *l*, formed in the upper edges of the cross-bars, and the shoulders *k²* fitting into shoulder *l′*, formed in the lower edges of the same. The opposite ends of the cross-bars are furnished with open slots L, which fit the curved supporting-flanges on the sides of the concave.

M is a spacing-bar having transverse flanges *m* on opposite ends thereof, and open slots *m′* in its opposite ends. Spacing-bar M may be covered with yielding material N—as, for example, rawhide or any equivalent material—to prevent the grain from being broken as it strikes the same. Any desired number of spacing-bars M may be employed and inserted between the teeth-fastening bars.

It will be observed that my improved concave is formed with transverse openings O throughout its length, through which openings the grain falls as it is separated from the straw. The comparatively-wide cross-bars serve to hold the teeth very firmly, and being arranged on the arc of a circle serve as deflectors to deflect the grain as it is separated from the straw, and cause it to fall down through the openings in the concave, instead of being carried out with the straw. Should any of the teeth in the concave become broken or unduly worn, they may be readily replaced without disturbing the teeth of the other rows.

By means of my improved devices for securing the teeth in place I am enabled to use concave-teeth of any desired length and prevent any grinding or crushing action of the grain as it passes between the cylinder and concave, as each tooth has a long and firm bearing between the wide surfaces of the two cross-bars of each series or rows of teeth.

My improved concave being composed of independent concave-sections, any desired number of teeth may be used, as any particular section may be removed and a spacing-bar substituted in lieu thereof, if desired.

Fig. 11 is a vertical section of a modified form of construction. J J′ are the cross-bars, and P is the tooth, the shank of which latter is provided on opposite edges with the studs *p p′*, which enter holes *p²* in the cross-bars, and thereby assist in holding the tooth against displacement.

Fig. 12 represents a vertical section of another modification. The cross-bar J′ is constructed with a convex inner surface, *j*, which fits within the concave-surface *j′*, formed on one side of the shank of the tooth. The opposite edges of the shank of the tooth may be made plain, or it may be formed with a slot, *j²*, and receive the flange *j³*, projecting from the other cross-bar.

Fig. 13 represents another modification, wherein opposite edges of the shank of the tooth are serrated or corrugated, and fit within corresponding serrations or corrugations formed on the inner surface of the cross-bars.

Fig. 14 shows another modification, the shank of the tooth being bifurcated and the fastening-screw inserted between its branches.

Fig. 15 is another modification, the inner surfaces of the cross-bars being corrugated lengthwise, and the shank portion of the teeth formed with transverse grooves on their opposite edges.

Fig. 16 is another modification, showing one cross-bar provided with a groove, *q*, on its upper edge, into which is received the shoulder *q′* on the base of the tooth, while the shank is provided at its end with a projection, *q²*, which bears upon the lower edge of the opposite bar. In this form of construction a bolt, *r*, is rigidly secured to one of the cross-bars, and extends through an opening, *r′*, in the outer cross-bar. The bolt is formed inclined to draw the movable bar downward when secured in place, to firmly secure the tooth against displacement, as shown in Fig. 17. The wearing-surface of the cylinder or concave teeth may be of any desired form or size.

The teeth may be corrugated, if desired, and may be adapted for clover-hullers as well as for thrashing-machines. For a clover-huller the teeth would be made to come in close contact with the upper edge of the cross-bars forming the grater-concave, and said cross-bars would preferably be serrated upon the upper edges. Also, the teeth of the concave would be made corrugated and extend upward in close contact with the cylinder. Thus the thrashing-machine may be readily converted into a hulling-machine by simply removing one set of cylinder and concave teeth and substituting another therefor.

My improvement may be embodied in ore-crushers, bark-mills, or, in fact, in any type of machine or apparatus when substance or material is desired to be disintegrated or subdivided.

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

1. The combination, with a stationary bar secured at opposite ends to the heads of the thrashing or hulling cylinder, of a movable bar and teeth secured between the stationary

and movable bars by means of screws arranged to force the movable bar toward the stationary bar, substantially as set forth.

2. The combination, with the heads of a thrashing or hulling cylinder having slots D formed therein, and inclines *d* formed at the entrance of the radial portion of said slots, of stationary and adjustable cross-bars and teeth having elongated shanks which fit against the adjacent surfaces of said bars, said shanks provided with shoulders which bear against the opposite edges of the bars and screws for securing the teeth between the bars, substantially as set forth.

3. The combination, with curved supporting-flanges on the sides of the concave, of a series of cross-bars having slotted ends fitting said curved flanges, the teeth of the concave being fastened between the adjacent sides of the cross-bars, and openings formed between the latter for the discharge of the grain, substantially as set forth.

4. The concave of a thrashing or hulling cylinder composed of separate and independent rows of teeth secured between the adjacent sides of wide cross-bars, provided with devices for retaining the teeth against displacement, said cross-bars constructed and arranged to form intervening transverse openings extending the entire width and length of the concave, substantially as set forth.

5. The combination, with separate and independent rows of teeth secured between the adjacent sides of cross bars or plates, secured together by screws or bolts forming distance-lugs, of a spacing-bar interposed between two of said series or rows of teeth, substantially as set forth.

6. The spacing-bar of the concave covered with yielding material, substantially as set forth.

7. The tooth-holding bar covered with yielding material, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand.

ISAAC SHERCK.

Witnesses:
CHARLES P. WEBSTER,
A. W. BRIGHT.