3 Sheets—Sheet 1.

W. N. ESSELSTYN.

Grain-Separators.

No. 204,889. Patented June 18, 1878.

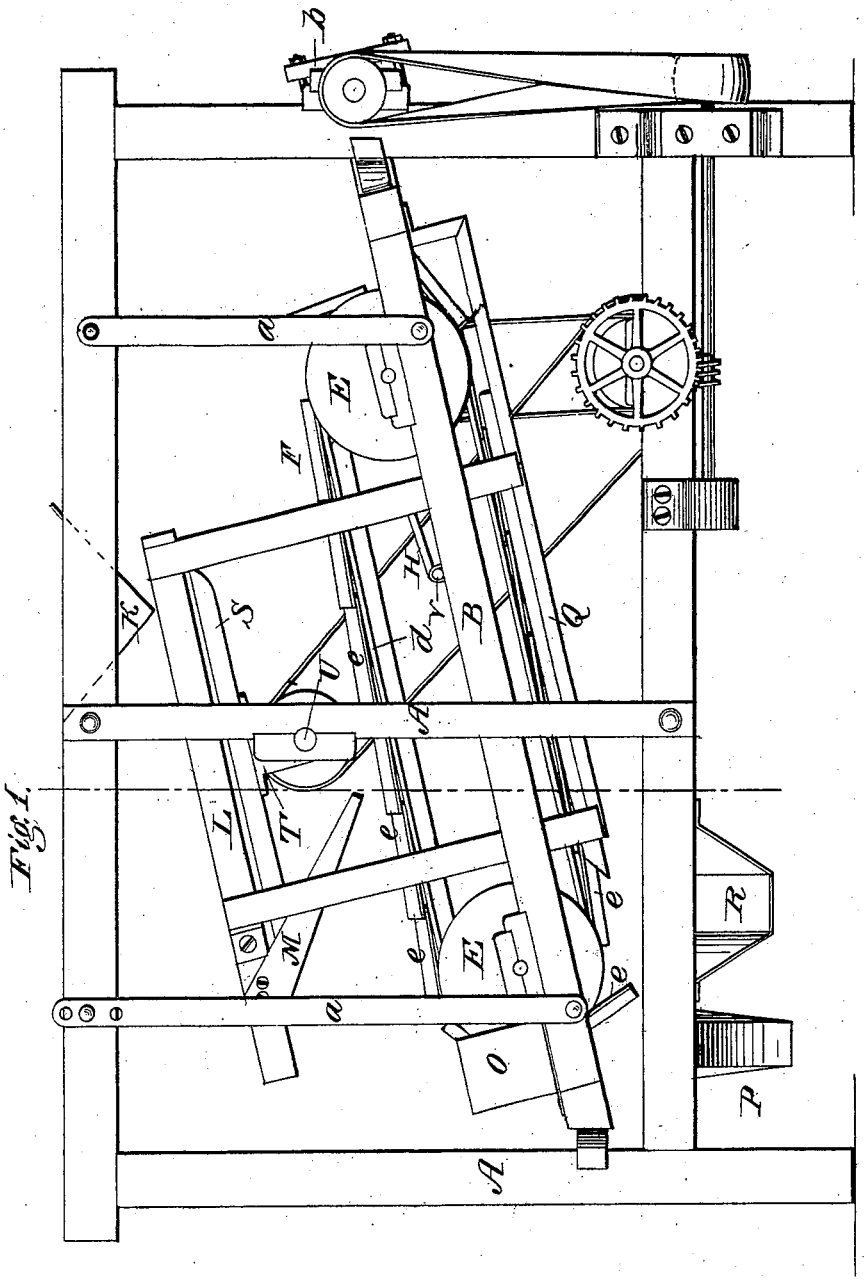

Fig. 1.

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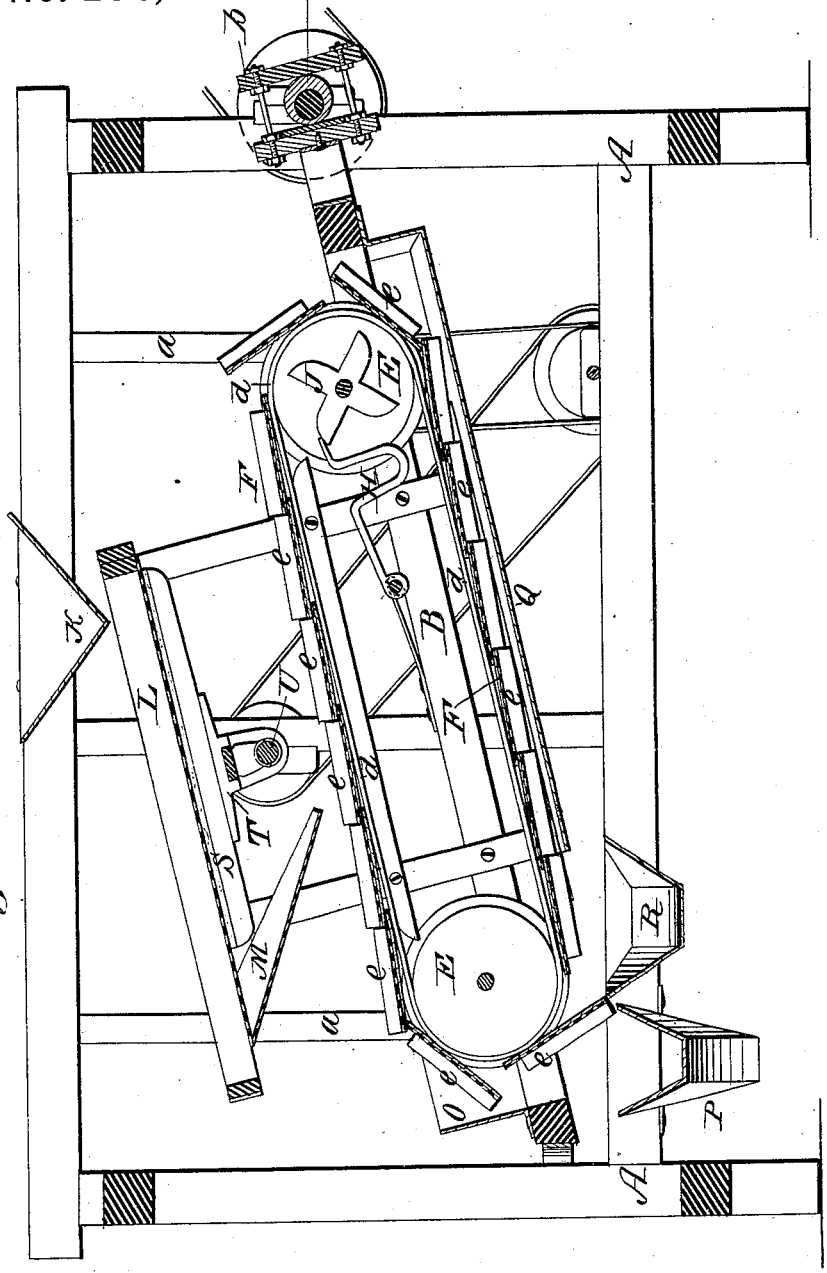

Fig. 2.

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3 Sheets—Sheet 3.

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Fig. 3.

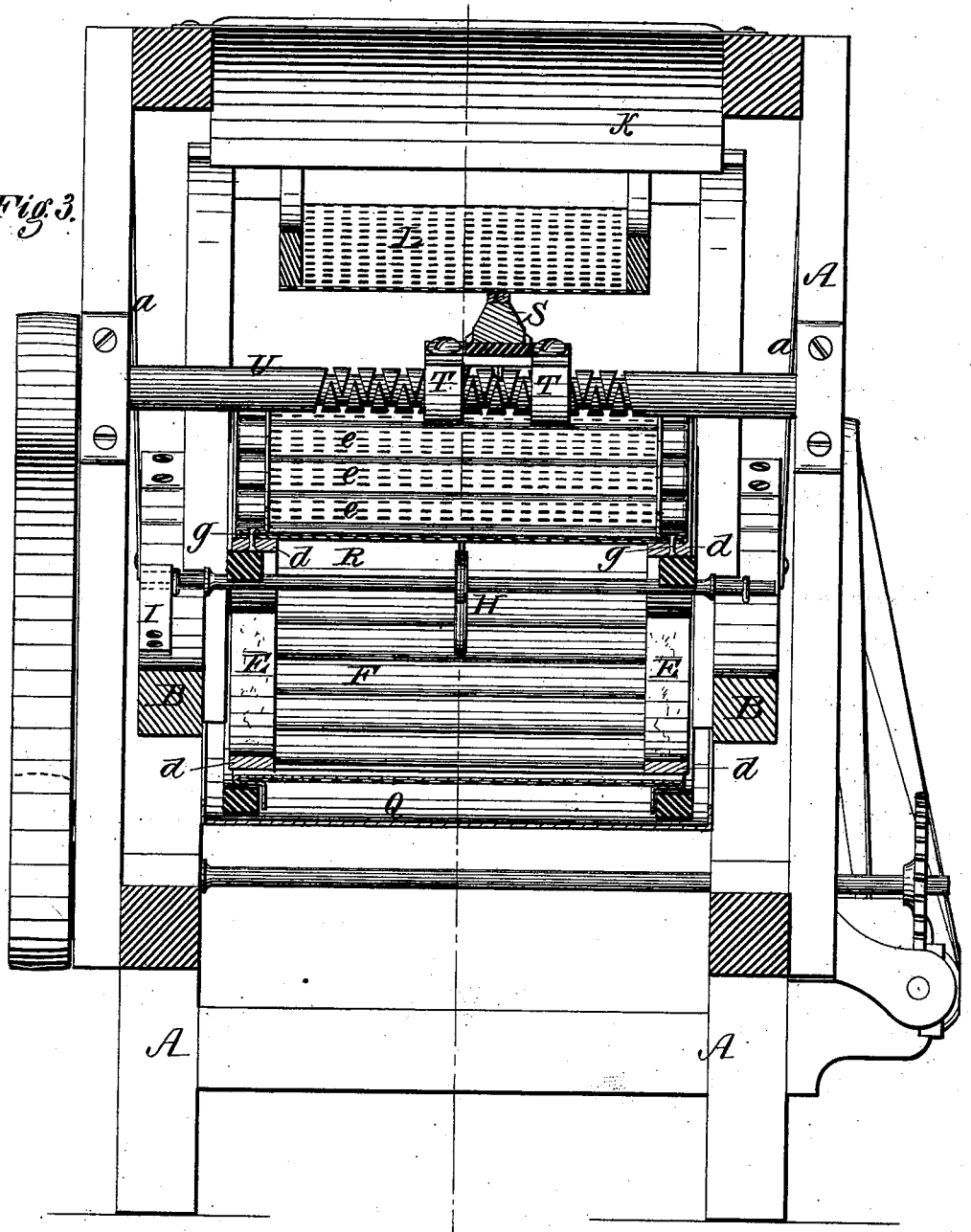


Fig. 4.

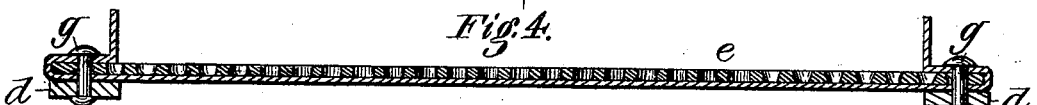
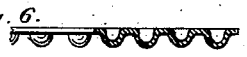


Fig. 5.

Fig. 6.



Witnesses:

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UNITED STATES PATENT OFFICE.

WILLIAM N. ESSELSTYN, OF FORT ATKINSON, WISCONSIN, ASSIGNOR OF TWO-THIRDS OF HIS RIGHT TO BARNARD & LEAS MANUFACTURING COMPANY.

IMPROVEMENT IN GRAIN-SEPARATORS.

Specification forming part of Letters Patent No. **204,889**, dated June 18, 1878; application filed November 13, 1877.

To all whom it may concern:

Be it known that I, WILLIAM N. ESSELSTYN, of Fort Atkinson, in the county of Jefferson and State of Wisconsin, have invented certain Improvements in Cockle-Separators, of which the following is a specification:

My invention relates to that class of machines in which an endless screen or apron having pockets in its face is employed to effect the separation of the wheat from the cockle and small grains and impurities; and the invention consists in the peculiar construction of the metallic sections of which the screen is composed; in the employment of a knocker in connection with said screen; in the arrangement of a primary screen above and in connection with the main screen; in the special arrangement of a scraper in connection with the primary screen; and in minor details, which will be hereinafter described in detail.

Figure 1 represents a side elevation of my machine; Fig. 2, a longitudinal vertical section of the same; Fig. 3, a vertical cross-section of the same; Fig. 4, a section through one of the lengths or sections of the screen, and Fig. 5 a section of a single-plate screen.

A represents a rigid rectangular main frame, and B an internal inclined frame, suspended by pendent rods *a*, and provided at one end with a yoke, *b*, embracing an eccentric, C, which imparts to the frame a rapid longitudinal reciprocation. In the ends of the reciprocating frame B there are mounted two transverse drums, E, which sustain a long endless screen, F, composed of two endless belts, *d*, and a series of transverse metal plates or sections, *e*, attached thereto. Each screen-section *e* is composed, as shown in Figs. 3 and 4, of two metal plates, one with and the other without perforations, arranged one upon the other. The imperforate plate, being placed under the other, closes its perforations at the bottom and converts them into cells or pockets, which are of such size as to admit the cockle and small impurities and exclude the wheat. The bottom plate is made of larger size than the other, and is folded over one edge and the two ends of the same, in the manner represented in Fig. 5, whereby the plates are secured together and the flanges or guards also formed at the ends of the sections to retain the grain thereon. A rivet, *g*, passed through each end of the section, serves the double purpose of preventing the two plates from sliding apart and of securing the end of the section to the carrying-belt. It will be noticed that along one edge the plates are not fastened together. This admits of their vibrating and separating to a limited extent, the effect of which is to secure more effectually the discharge of the foreign matters from the cells at the proper time, the solid plate rapping against the other and driving the seeds, &c., from the cells. In order to prevent the lodgment of seeds, &c., in the cells with such firmness as to prevent their discharge, the cells are made with tapering walls or sides, and of smaller diameter at the bottom than at the top, this form of cell being produced by making the holes through the top plate of a conical or tapering form, instead of making them of uniform diameter from one side of the plate to the other. Instead of giving them a regular or straight taper, their sides may be rounded, if preferred.

Referring to Fig. 4, the tapering cells or holes will be clearly seen, holes of a regular taper being shown on the right and those with rounding sides on the left. While it is preferred to make the screen-sections in two thicknesses, as above described, plates consisting of a single sheet with cells or pockets indented therein may be employed, a plate of this character being represented in Fig. 5. Plates or sections of this construction will operate in connection with the other devices and parts of the machine, as well as those made as in Fig. 4.

For the purpose of discharging the seeds from the cells, a knocker, H, is mounted on a rock-shaft, V, as shown in Fig. 2, to strike upon the backs of the sections as they pass under it, face downward. A spring, I, bearing on an arm on one end of the knocker-shaft causes the knocker to descend, while a cam, J, mounted on one of the drum-shafts acts against the knocker to raise it and permit it to fall.

In the top of the main frame there is mounted

a hopper, K, to receive the grain to be cleaned, and below said screen there is mounted an inclined reciprocating screen, L, sustained by rigid standards on the frame B. An inclined conducting-board, M, directs all grain and other matters which pass through the screen L into the main screen F.

On the frame B, at its lower end, there is mounted an upright guard or rim, O, which serves to direct the matters falling over the lower ends of the two screens into a transverse delivery-spout, P, arranged below, as shown in Figs. 1 and 2. Below the main screen F, and extending the entire length of the same, there is an inclined conducting-board, Q, the lower end of which terminates directly above a transverse delivery-spout, R, as shown. Below the upper screen L there is mounted, in contact therewith, a longitudinal scraper, S, having on its under side a metal block, T, which is mounted on and sustained by a transverse screw-shaft, U, which has its ends mounted in fixed bearings on the main frame.

The screw-shaft has, as shown, a double or right-and-left hand thread, and the block a spline bearing therein, so that the rotation of the shaft causes the scraper to move slowly to and fro over the under surface of the screen from side to side. As the screw-shaft is sustained in fixed bearings, the screen plays lengthwise upon the scraper at the same time that the latter moves sidewise, and thus the two have, in relation to each other, a compound motion, by which the efficiency of the scraper is greatly increased. The rotation of the screw-shaft is produced by means of a pulley attached to its end and driven by a belt from a pulley, *h*, on the end of a transverse shaft, *i*, which is also provided with a second pulley, *k*, which drives a belt passing to a pulley attached to the shaft of one of the drums by which the main screen is carried.

The shaft *i* is provided with and driven by a spur-wheel, *l*, driven by a worm, *m*, on a horizontal shaft, *n*, which is driven by means of a pulley and belt from the driving-shaft.

The operation of the machine is as follows: The grain to be purified is placed in the hopper and passes down onto the top screen L. The large wheat passes down over the tail of said screen, and falls into the trough or spout P. The smaller wheat and impurities fall through the screen L onto the endless screen F, from which the good wheat rolls down into the spout P, while the cockle, small seeds, and other small impurities are retained in the cells in the screen F, and carried at its upper end, where, as the plates pass around under the cylinder, they are discharged and fall upon the conveyer-board Q, down which they pass to the delivery-spout R. Were the sections of the screen fastened firmly, or at both edges, to the carrying-belts, there would be danger of the seed being caught between their overlapping edges as they pass down over the upper carrying-drum. To avoid trouble from this source, the sections of the screen are connected to the belts in such manner that their edges can rise therefrom when passing around the drums, in the manner shown in Fig. 2. This arrangement admits of the seed which may pass between the edges of the plates at the head of the machine falling through between the sections to the inside of the screen upon the back of the descending sections, down which they roll to the foot of the machine, where they escape between the sections and fall into the delivery-spout.

Having thus described my invention, what I claim is—

1. An endless longitudinally-inclined screen having seed cells or pockets in its surface, arranged to reciprocate longitudinally, substantially as shown and described.

2. The longitudinally-reciprocating frame, having the endless longitudinally-inclined revolving screen provided with the cells or pockets, and the inclined screen L, both mounted therein.

3. In a cockle-separator, the inclined endless pocketed screen P, inclined perforated screen L, both arranged to reciprocate longitudinally, and intermediate returning-board M, combined and arranged for joint operation in the manner shown.

4. The endless screen having its sections composed each of two plates, one perforated and the other imperforate, said plates being connected in such manner that they may separate and vibrate independently to a limited extent.

5. The endless screen composed of a series of sections, each section composed of a perforate and an imperforate plate, united by folding the edge of one over and upon that of the other.

6. In combination with the endless sectional pitted screen, the knocker H, arranged to act upon the backs of the sections as they pass thereunder.

7. In combination with the reciprocating screen L, the wiper S, mounted upon and sustained wholly by the right-and-left screw.

8. In combination with the inclined longitudinally-reciprocating screen L, the longitudinal transversely-reciprocating wiper S, sustained by and pivoted upon the operating-screw, as shown and described.

9. In a cockle-separating machine, the combination and arrangement for joint operation of the following members: the perforated screen L and endless pitted screen F, both arranged to reciprocate endwise, hopper K, conveyer-boards M Q, and spouts P R.

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Witnesses:

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