H. E. COOK & J. B. THAYER.

Magnetic Grain Separator.

No. 214,025. Patented April 8, 1879.

Fig. 1.

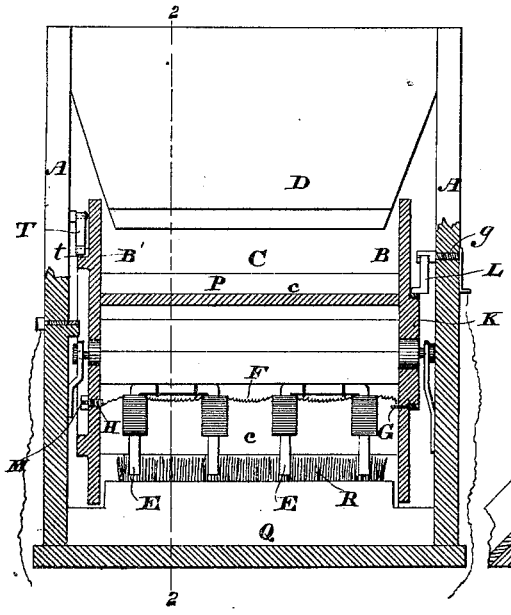


Fig. 2.

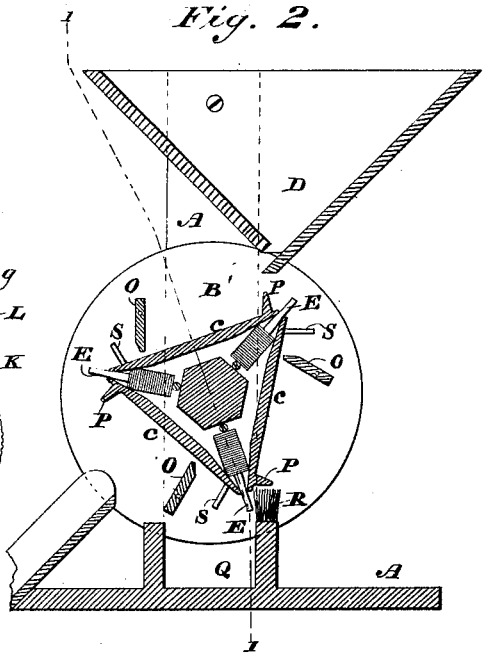


Fig 3.

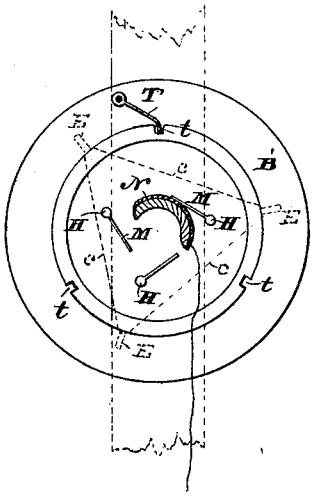
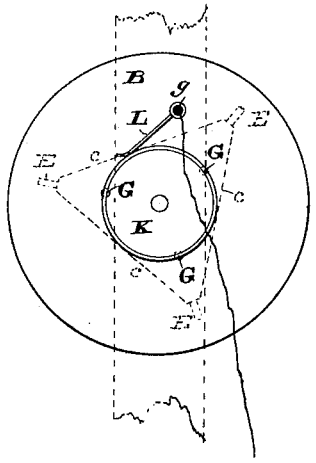


Fig 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

HENRY E. COOK AND JESSE B. THAYER, OF RIVER FALLS, WISCONSIN.

IMPROVEMENT IN MAGNETIC GRAIN-SEPARATORS.

Specification forming part of Letters Patent No. **214,025**, dated April 8, 1879; application filed February 20, 1879.

To all whom it may concern:

Be it known that we, HENRY E. COOK and JESSE B. THAYER, of River Falls, county of Pierce, and State of Wisconsin, have invented a new and useful Machine for the Purpose of Removing Magnetic Bodies from Grain or other Finely-Subdivided Materials, of which the following is a specification:

Our invention relates mainly to the removal of particles of iron, steel, and other magnetic substances from grain and other materials by the use of magnets combined with a movable conveyer, arranged under a hopper in such a manner as to cause the grain or other material to flow over and around the magnets, to facilitate the attraction of the magnets upon such particles of iron, steel, and other magnetic material.

Our invention also relates to a speedy and convenient method of removing such particles of iron and steel from such magnets, and to a convenient method of changing the positions of the magnets for the purpose of removing the particles adhering thereto by rotating the conveyers to which they are attached.

In the accompanying drawings, which illustrate a good form of our invention, Figure 1 is a side elevation of our apparatus, partly in section, on the line 1 1 of Fig. 2. Fig. 2 is a vertical section through the line 2 2 of Fig. 1. Fig. 3 is an end view, showing one disk of the conveyer and connected mechanism; and Fig. 4 is an opposite end view, showing the other disk and connected mechanism.

A indicates the frame-work of the machine, arranged to support the working parts. B and B′ are disks or plates, between which is a triangular box, C, of which *c c c* are the sides, the said disks forming, with the sides *c*, when in position, conduits or chutes for the passage of the grain that is fed from the hopper D. Within this box C, and projecting at each of its three corners, so as to be in the path of the descending grain, are the magnets E, which may be either permanent or induced magnets.

Where induced magnets are employed, the magnet-wires F are attached on one side of the apparatus respectively to one of the three pins G, and on the other side to one of the three pins H. These pins G have an electric connection with the metallic band of a small wheel, K, secured on the disk B, and thus connect with one pole of the battery by means of a metallic spring, L, which presses upon this metallic band continuously, and is attached to the battery-wire pin *g*. On the outside of the other disk, B′, the pins H are connected with the springs M, adjusted alternately to bear upon a segmental connector, N, to which is attached the other pole of the battery or electric machine through the battery-wire pin *g′*.

O O O are adjustable slides to control the flow of the grain. P P P are side pieces to prevent the grain from falling backward in the rear of the machine. Q is a receptacle for the particles of iron. R is a stationary brush to assist in removing the particles of iron and steel adhering to the magnets; and S S are pins or deflectors placed above the magnets, equidistant from them, to direct the grain upon them.

The operation of our machine is as follows: The material is introduced through the hopper, falls upon one of the shelves or chutes *c*, and passes over and around the magnets, the particles of iron being retained by them, and the grain passing off by a suitable conveyer, as at X. At suitable intervals the disks B B′ are rotated one-third of a revolution by an attendant, or clock-work may be employed to effect this automatically. The conveyer may be stopped in the proper position by a three-notched ratchet and spring-pawl, as at T *t*. By this partial rotation one of the springs M passes off the connector N, thus breaking the circuit for one set of magnets, which demagnetizes that set and causes the particles of iron to fall into the receptacle Q. Any particles retained by residual magnetism, or where permanent magnets are used, are removed by the sweep of the magnets against the brush R. At the same time another spring M passes on to the connector N, and closes the circuit for another set of magnets, so that the operation of separating the metal from the grain may continue.

It is obvious that by mere formal modification, without departing from the substance of my invention, the rotating conveyer may be made with four or even more sides instead of

three; and of course such a construction would require a corresponding modification of the pole-changing mechanism.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a magnetic separator, a rotary conveyer formed with plane conveying-surfaces, and having magnets projecting into the path of the grain.

2. The combination of a rotary conveyer, magnets projecting therefrom, and pins or guides to deflect the flow of the grain upon the magnets, substantially as described.

3. The combination of a rotary conveyer having magnets projecting therefrom and adjustable slides to control the flow of the grain, substantially as described.

4. The combination of a rotary conveyer having magnets projecting therefrom and side pieces, P, to prevent the grain from falling backward in the rear of the machine, substantially as described.

HENRY E. COOK.
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Witnesses:
ALLEN P. WELD,
EDWARD BELL.