

(No Model.)

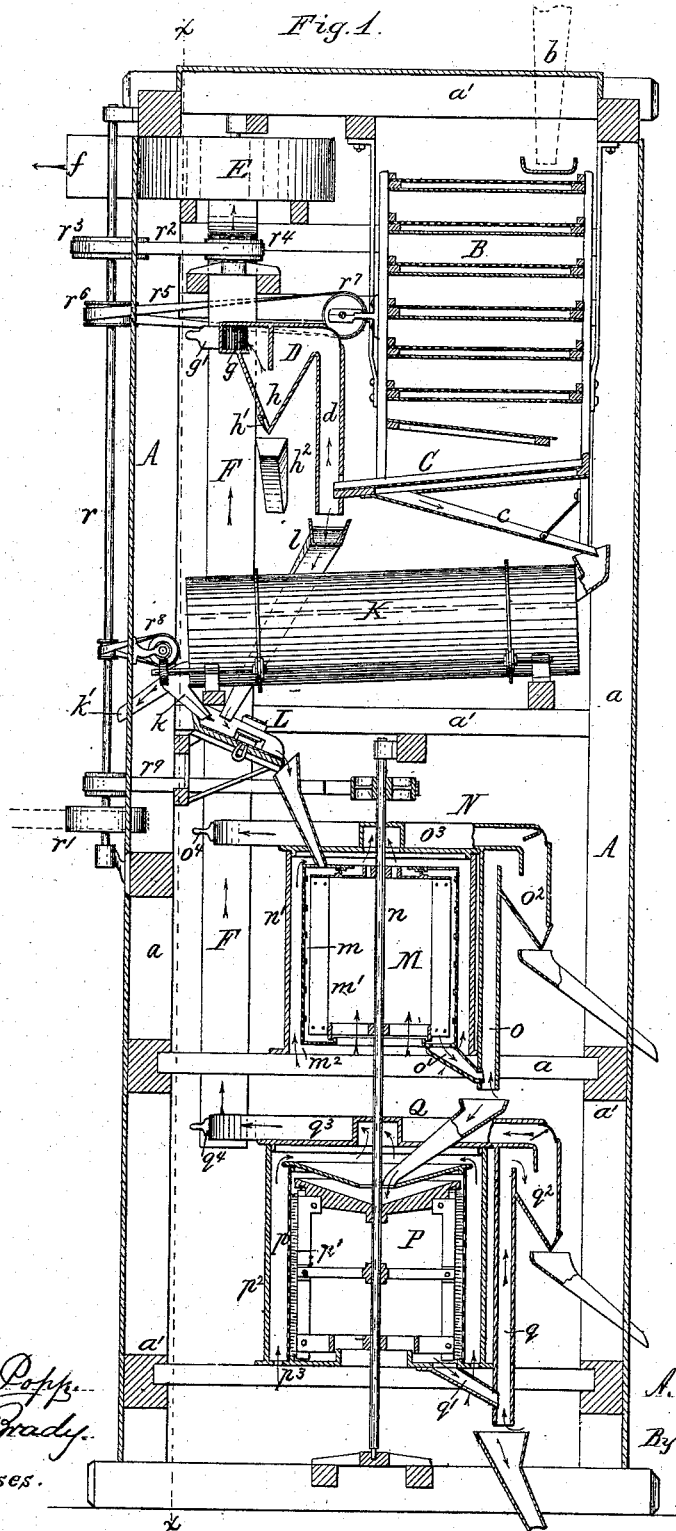
2 Sheets—Sheet 1.

A. B. KELLOGG.

MACHINE FOR CLEANING GRAIN.

No. 263,913

Patented Sept. 5, 1882.



Theo. L. Popp.
 Edw. J. Brady.
 Witnesses.

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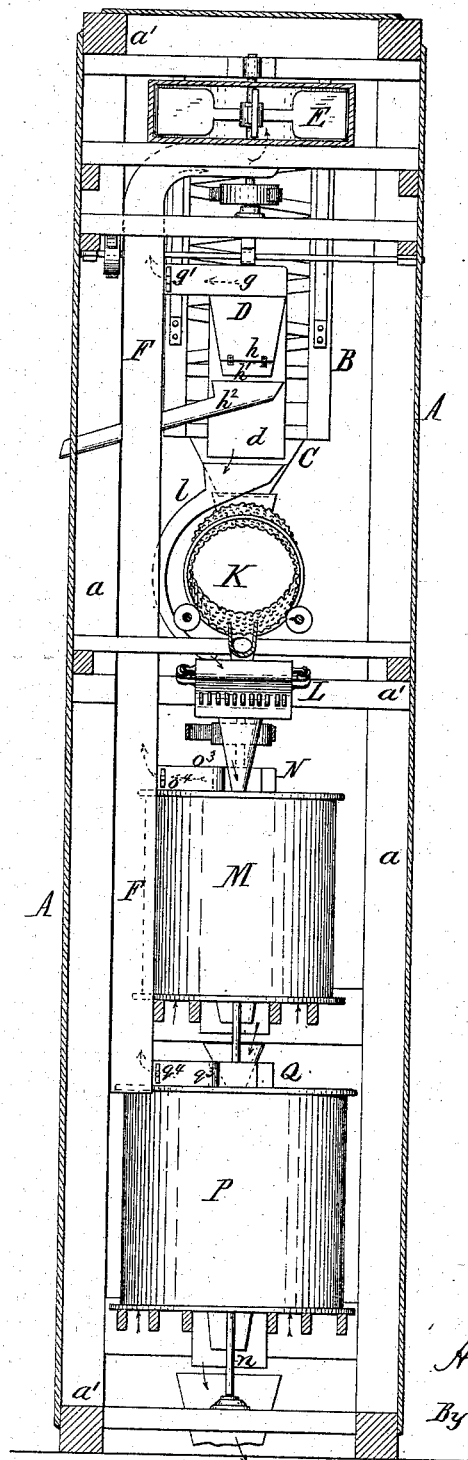
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Fig. 2.



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UNITED STATES PATENT OFFICE.

AUGUSTUS B. KELLOGG, OF BUFFALO, NEW YORK.

MACHINE FOR CLEANING GRAIN.

SPECIFICATION forming part of Letters Patent No. 263,913, dated September 5, 1882.

Application filed May 16, 1882. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS B. KELLOGG, of the city of Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Machines for Cleaning Grain, of which the following is a specification.

This invention relates to a machine whereby the grain is freed from its impurities and prepared for grinding in a continuous operation, consisting of several successive steps or treatments; and it has for its object to avoid the repeated elevating and conveying of the grain from one cleaning-machine to another, and to simplify the construction of the cleaning machinery and to reduce the space which such machinery occupies in the mill.

My invention consists of the combination in one machine of several cleaning machines or mechanisms connected together, as will be hereinafter fully set forth, and pointed out in the claims.

In the accompanying drawings, consisting of two sheets, Figure 1 is a vertical section of my improved machine. Fig. 2 is a vertical section in line *x x*, Fig. 1.

Like letters of reference refer to like parts in both figures.

A represents the stationary frame of the machine, consisting of upright posts *a* and horizontal pieces *a'*, which are adapted to support the several cleaning-machines.

b represents the spout which conducts the grain to be cleaned to the machine from a suitable bin or receptacle, and B represents a shaking zigzag separator or other suitable separating-machine, which receives the grain from the spout *b*, and which serves to separate the grain from stones, sticks, straw, sand, oats, and other like seeds or foreign matters which are required to be eliminated from the grain before grinding.

C represents a grading-sieve arranged to receive the grain from the separator B, and adapted to separate the small grains, cockle, grass-seed, &c., from the heavy or plump grain. The small grains pass through the sieve C and fall upon an inclined plate or spout, *c*, while the large grains pass over the tail end of the sieve C and into an air-trunk, *d*, of an atmospheric

separator, D. The grading-sieve C is preferably attached to the separator B, as represented in the drawings, so as to take part in its reciprocating movement.

E represents a suction-fan located in the upper part of the machine, and provided with a wind-trunk, F, which extends from the eye of the fan downward and connects with the wind-trunk of the various cleaning-machines, which are provided with atmospheric separators.

f represents the blast or discharge spout through which the dust-laden air which is drawn into the fan is discharged outdoors or into a suitable dust-room.

g represents an air-trunk, which connects the separator D with the main air-trunk F, and which is provided with a damper or slide, *g'*, for regulating the volume and force of the air-current which passes through this separator.

h represents a chess-hopper with which the separator D is provided for permitting the light and broken grains, chess, &c., which are lifted by the air-current in the ascending leg *d*, to drop out of the air-current, while the dust passes onward with the air-current into the main air-trunk F and to the fan.

The material which is deposited in the chess-hopper *h* is discharged therefrom from time to time, in a well-known manner, through an opening provided with an automatic valve, *h'*, into a spout, *h''*, which conducts this material to a suitable receptacle.

K represents a machine, of well-known construction, adapted to separate the cockle and other small round seeds from the grain, and arranged below the grading-sieve C and separator D. This machine consists essentially of a rotating hollow cylinder provided on its inner surface with cells or indentations, which receive the cockle and reject the grain, and a catch-board which receives the cockle elevated by the cells of the cylinder, while the grain passes on through the cylinder. The latter is slightly inclined from its head toward its tail, and the grain is finally discharged from the tail end of the cylinder through a spout, K. The cockle falls from the catch-board into the trough of a screw-conveyer, and is discharged therefrom through a spout, K'. The cockle-separator and its catch-board and screw-con-

veyer are of the usual and well-known construction.

L represents a magnetic separator whereby nails, pieces of wire, and other fragments of iron, or articles consisting of iron, are separated from the grain. This separator is arranged below the cockle-separator K, and receives the separated grain which escapes from the cockle-separator through the spout *k* and the plump grain which escapes from the lower end of the air-trunk *d*, which is conducted to the magnetic separator by a spout, *l*.

M represents a smut-machine of any suitable and well-known construction, which is arranged below the magnetic separator, and which receives the grain from the latter after the grain has been freed from the particles of iron. This smut-machine consists preferably of a perforated scouring-case, *m*, and revolving beaters *m'*, mounted on a vertical shaft, *n*, whereby the grain is driven against the scouring-case and freed from the smut and other impurities adhering to the grain. *n'* represents a tight jacket or case, which incloses the scouring-case *m*, and which is provided at its lower end with an inlet-opening, *m*², through which air is admitted to the annular space between the perforated scouring-case and the surrounding jacket.

N represents an atmospheric separator, connected with the smut-machine M, and provided with an ascending leg, *o*, into which the grain is discharged by a spout, *o'*, after it has passed through the scouring-case of the smut-machine.

*o*² represents the chess-hopper of the separator N, and *o*³ the air-spout which connects said separator with the main air-trunk F, and which is provided with a slide or damper, *o*⁴, for regulating the air-current.

The upper end of the outer case, *n'*, is closed by a tight plate or head, which is provided with an opening communicating with the air-trunk *o*³, so that air-currents are drawn upwardly through the annular space between the perforated scouring-case and the inclosing tight jacket and through the scouring-case itself, whereby the dust and smut which is detached from the grain by the scouring mechanism is carried into the air-trunk *o*³, and thence to the main air-trunk F and the fan E.

P represents a brush grain-cleaner, which is arranged below the smut-machine M, and which receives the grain from the latter and removes the remaining impurities from the grain. The brush-machine P consists essentially of a perforated scouring-case, *p*, and revolving brushes *p'*, which detach the impurities adhering to the grain. The scouring-case *p* is surrounded by a tight jacket or casing, *p*², having openings *p*³ at its lower end, through which the external air is admitted to the annular space between the scouring-case and the outer jacket.

Q represents an atmospheric separator connected with the brush-machine P, and provided with an ascending leg, *q*, which receives the grain from a spout, *q'*, after it has passed

through the scouring-case of the brush-machine.

*q*² represents the chess-hopper of the separator Q, and *q*³ the air-spout which connects said separator with the main air-trunk F, and which is provided with a slide or damper, *q*⁴, for regulating the air-current.

The upper end of the outer case, *p*², is closed by a tight plate, which is provided with an opening whereby the annular space between the scouring-case and the inclosing jacket and the interior of the scouring-case communicates with the air-trunk *q*³, so that air-currents are drawn upwardly through said annular space and the interior of the scouring-case, whereby the detached dust is carried to the air-trunk *q*³.

The brushes *p'* are preferably mounted upon the vertical shaft *n*, to which the beaters *m'* of the smut-machine are secured, as shown in the drawings, so that both the beaters and the brushes can be actuated by the same mechanism.

r represents the vertical driving-shaft, to which motion is imparted by a pulley, *r'*, or other suitable means. This driving-shaft is connected with the shaft of the fan E by an endless belt, *r*², and pulleys *r*³ *r*⁴, and with the separator B by an endless belt, *r*⁵, and pulleys *r*⁶ *r*⁷.

*r*⁸ represents an endless belt by which motion is transmitted from the shaft *r* to the cockle-separator K.

*r*⁹ represents an endless belt whereby motion is transmitted from the shaft *r* to the shaft *n*, which actuates the beaters and brushes.

The grain in passing through the machine is first freed from the sticks, stones, oats, and other impurities by the separator B. It is next freed from the cockle and other small seeds by the separator K. It is next freed from the accompanying particles of iron by the magnetic separator L. It is then freed from the smut and chaff and dust by the smut-machine M, and it is finished and freed from the remaining dust, &c., by the brush-machine P, whereby the operation of cleaning the grain is finished and from which the grain is discharged clean and ready for grinding.

It will be seen from the foregoing that the several operations to which the grain is subjected in order to prepare it for grinding are carried on without interruption, whereby the repeated elevating and conveying of the grain from one machine to another is avoided; that the use of a number of fans is avoided, and that the several machines are arranged compactly, so as to occupy very little space in the mill, and that the actuating mechanism is greatly simplified.

When the grain to be cleaned does not contain any cockle or particles of iron, the separator K and the magnetic separator L may be dispensed with.

I claim as my invention—

1. In a machine for cleaning grain, the combination, with a sieve-separator, B, of a smut-

machine, M, a brush cleaning-machine, P, a fan, E, and an air-trunk, whereby the sieve-separator and the smut and brush machines are connected with said fan, substantially as set forth.

2. In a machine for cleaning grain, the combination, with a sieve-separator, B, provided with an atmospheric separator, D, of a smut-machine, M, provided with an atmospheric separator, N, a brush cleaning-machine, P, provided with an atmospheric separator, Q, a fan, E, and an air-spout, whereby said atmospheric separators are connected with the fan, substantially as set forth.

3. In a machine for cleaning grain, the combination, with a suitable supporting-frame, of a sieve-separator, B, and a grading-sieve, C, a cockle-separator, K, a smut-machine, M, and a brush cleaning-machine, P, and suitable spouts, whereby the large grain is conducted

from the grading-sieve to the smut-machine, while the small grain is conducted from said sieve to and through the cockle-separator and then to the smut-machine, substantially as set forth.

4. In a machine for cleaning grain, the combination, with a sieve-separator, B, of a grading-sieve, C, a cockle-separator, K, a magnetic separator, L, and suitable conduits, whereby the heavy grain is conducted from the grading-sieve to the magnetic separator and the small grain is conducted from the grading-sieve to the cockle-separator, and the separated grain thence to the magnetic separator, substantially as set forth.

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Witnesses:

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