

(No Model.)

2 Sheets—Sheet 1.

P. S. WILLIS.
GRAIN SEPARATOR.

No. 393,411.

Patented Nov. 27, 1888.

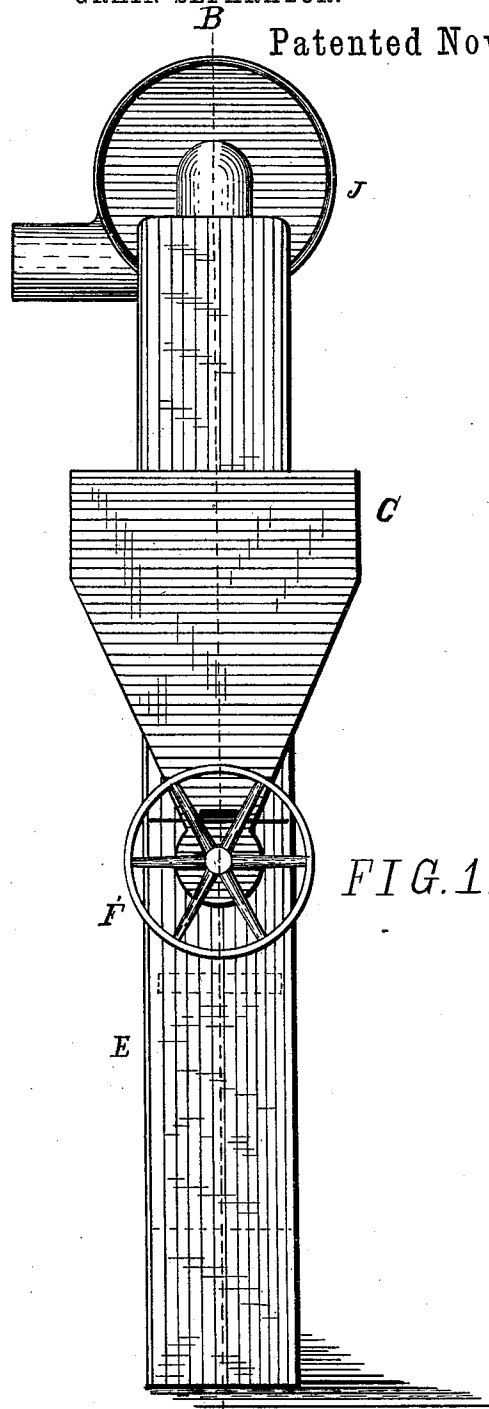


FIG. 1.

WITNESSES:

L. H. Colburn,
M. Friedlander,

INVENTOR:

Philip Sheridan Willis,

(No Model.)

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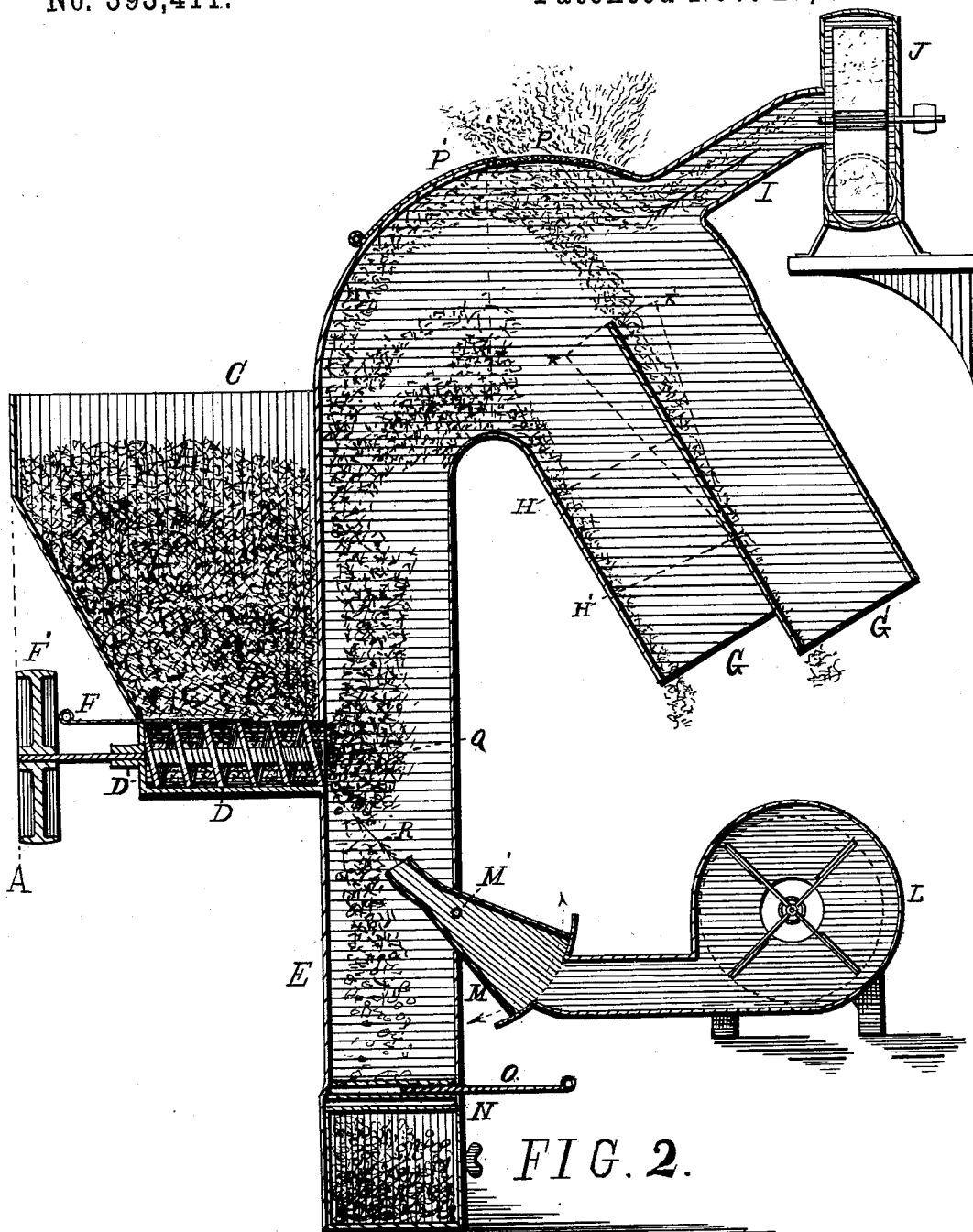


FIG. 2.

WITNESSES:

L. H. Colburn,
W. Friedlander,

INVENTOR:

Philip Sheridan Willis,

UNITED STATES PATENT OFFICE.

PHILIP SHERIDAN WILLIS, OF TOLEDO, OHIO.

GRAIN-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 393,411, dated November 27, 1888.

Application filed February 23, 1883. Serial No. 265,066. (No model.)

To all whom it may concern:

Be it known that I, PHILIP SHERIDAN WILLIS, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Grain Separators; 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 appertains to make and use the same.

My invention relates to improvements in machines for separating grain, more especially adapted to the cleaning of beans, seeds, coffee, and other like grains, and in separating them from foreign substances—such as stones and other grains and seeds of varying densities—which in commercial condition are often found commingled as a mechanical mixture.

It further relates to the cooling of coffee immediately succeeding the roasting process, which, for well-known reasons, must be quickly performed, and to the cooling and drying of grains which from any cause have become heated or wetted and require manipulating to divest them of contained heat or moisture.

I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my improved machine. Fig. 2 is a vertical section on line B, Fig. 1.

Similar letters refer to similar parts throughout the several views.

Referring to the drawings, Fig. 1 is only intended to show the breadth of the machine, its inside working parts being sufficiently delineated in Fig. 2.

In Fig. 2, C represents a reservoir or “hopper,” so called, wherein is placed the grain which is to be operated upon.

At D is located a spiral conveyer in a case, D', which is attached to and opens at one end into the vertical case E. Between the hopper C and the case D' is located a gate, F, which is adapted to entirely close or partly or wholly open the passage-way between the parts C and D'. The conveyer D is connected to a power-shaft, and may be rotated any desired velocity by means of the pulley F' in the ordinary manner of operating such conveyers. The case E, extending upward a suffi-

cient distance, which is fixed by the altitude at which it is desired to deliver the grain after it has been operated upon, terminates in a curved top, from which extends downward, at an angle preferably of about thirty degrees from the ascending limb of the said case E, and in a direction continuing the curve of said top, an arm, which in the illustration given is divided into two parts, G and G', and pivoted at H' within said arm is a swinging partition, H, which is adapted to be moved to the right or left to the position represented by dotted lines K K'. Connecting with the case E by means of the pipe I is a suction or exhaust fan, J, of ordinary well-known construction.

L is an ordinary blast-fan, which connects through the spout M with the case E. The spout M is made to swing on a horizontal pivot, M', passing laterally through said spout, at the point where the latter passes loosely through the wall of the case E, for the purpose of adjusting the direction of the blast from the fan L.

At N is located a receptacle, which in the illustration given is constructed in the form of a drawer, and having above it at O a gate which is adapted to open and close the connecting passage-way between the case E and the said drawer N.

At P, across the top of the case E, is an opening, which is covered with a screen, over which slides a gate, P', for tightly closing more or less of said opening, as may be desired, to regulate the machine, all as herein-after described.

The operation of this device is as follows: The material to be cleaned—such as ordinary coffee of commerce—is placed within the hopper C, or conducted thereto by means of any well-known mechanism for conveying such material, when, by means of the conveyer D, (which, as before described, is driven by means of the power-pulley F'), the said coffee is slowly delivered at a uniform rate, falling in a scattering stream within the case E, as shown at Q in Fig. 2, where it meets a blast of air coming from the fan L through the spout M. By this means the said coffee is forced upward through the case E in the direction of the arrow R, while heavier substances—such as stones, nails, &c.—fall by the force of gravity into the drawer N. Continuing on its course, the as-

ending volume of coffee arrives at the upper and enlarged curved part of the case E, where, in consequence of the decreasing pressure of the air at this point, (which decrease is due to the escape of a portion of said air through the openings in case E at P and at G and G',) the heavier and better part of the said coffee is precipitated down the arm G. Continuing on its course, the lighter part of said coffee in the ascending volume Q is carried over beyond the partition H and precipitated down the arm G', a part of the lighter dust passing out through the screen at P, and a part of the said lighter dust and such substances as leaves and strings and like material passing out by suction or by exhaustion through the exhauster J.

It is obvious that by a proper adjustment of the gate F, the spout M, the partition H, and gate P', in connection with a properly-speeded fan, L, and exhauster J, these separations may be controlled at will.

It is also obvious that for some simple separations the arm G' and exhauster J would not be required.

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

1. In a grain-separator, a vertical case, E,

having a curved top and a downwardly-inclined discharge-arm continuing the curve of said top, the curved top being provided with an opening, P, a screen covering said opening, a gate, P', for adjusting the size of said opening, an adjustable partition, H, within said discharge arm, a blast-fan, L, near the lower end of said case, a feed hopper, C, opening into said case above the mouth of said blast-fan, and a discharge-pipe, I, leading from said curved top at a point beyond said opening P and above the line of the upper end of said partition, substantially as and for the purpose set forth.

2. The blast-fan L, hopper C, and case E, in combination with the funnel-shaped spout M, passing loosely through the body of said case and pivoted therein at its point of passage, the larger end of said spout swinging over the mouth of said fan and the smaller end standing below the mouth of said hopper, substantially as and for the purpose set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

PHILIP SHERIDAN WILLIS.

Witnesses:

SAMUEL KOHN,
G. P. MORSE.