(No Model.) 2 Sheets—Sheet 1.

G. A. SMITH.

GRAIN SCOURER.

No. 418,658. Patented Dec. 31, 1889.

Fig. 1.

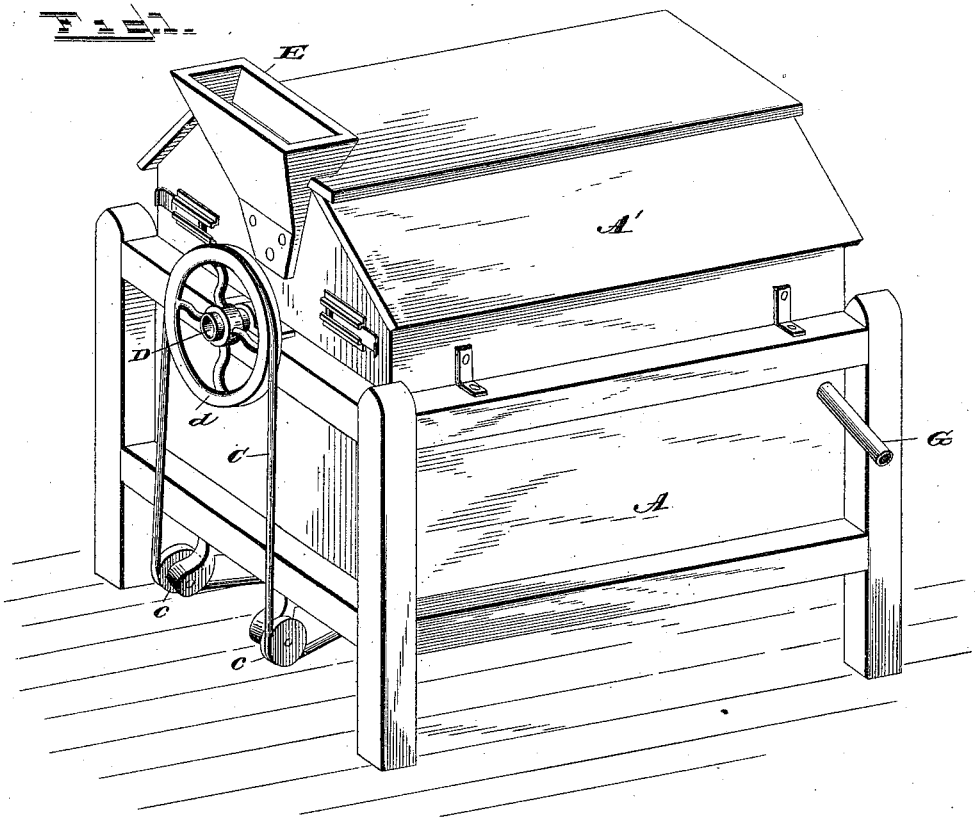
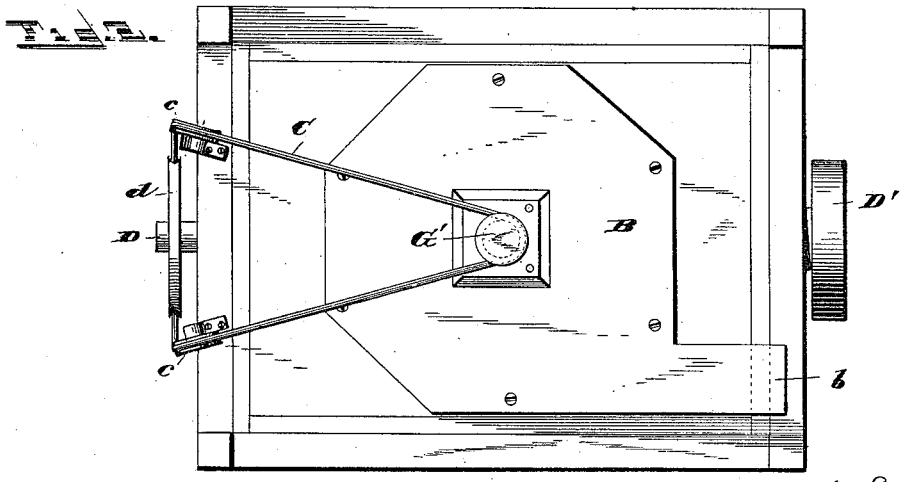


Fig. 2.



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E. M. Johnson

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Inventor

By his Attorneys

(No Model.) 2 Sheets—Sheet 2.

G. A. SMITH.

GRAIN SCOURER.

No. 418,658. Patented Dec. 31, 1889.

Fig. 3.

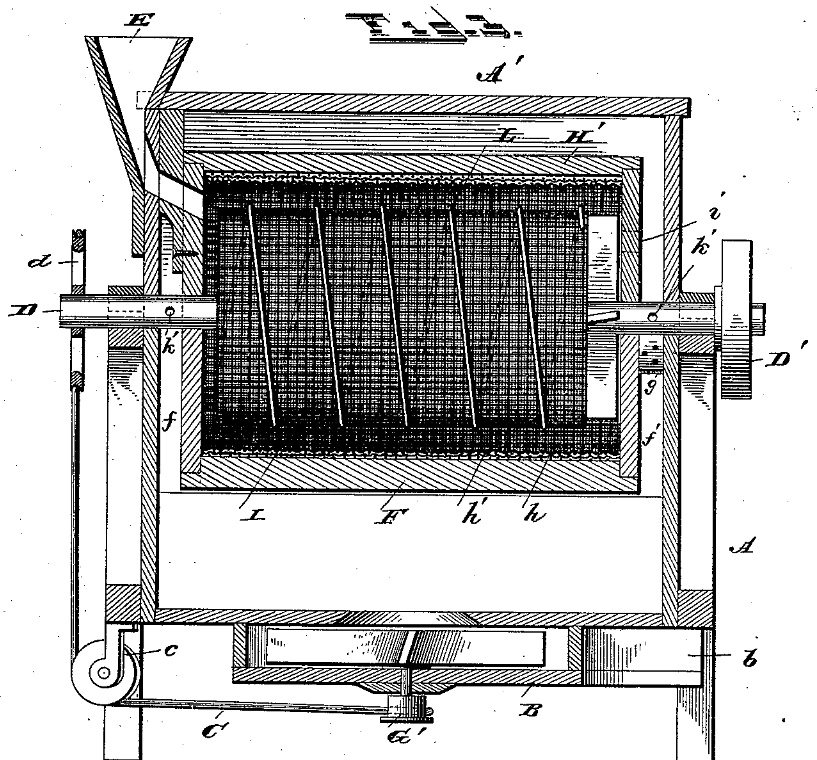
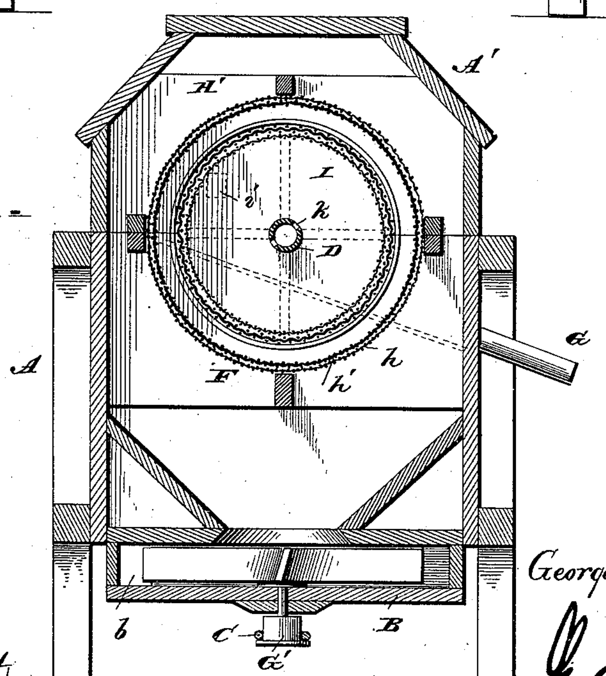


Fig. 4.



Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE A. SMITH, OF PAULDING, OHIO, ASSIGNOR OF THREE-FOURTHS TO LUTHER M. JOHNSON, CHARLES E. LOTT, GILBERT BARNES, AND ROBERT S. MURPHY, ALL OF SAME PLACE.

GRAIN-SCOURER.

SPECIFICATION forming part of Letters Patent No. 418,658, dated December 31, 1889.

Application filed May 9, 1889. Serial No. 310,173. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. SMITH, a citizen of the United States of America, residing at Paulding, in the county of Paulding and State of Ohio, have invented certain new and useful Improvements in Grain-Scouring 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 appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to certain new and useful improvements in grain-scourers or apparatus for cleaning wheat.

The object of my invention is to provide a simple, cheap, and effective wheat-scouring machine through which the grain can be passed and which will act thereupon by abrasion to remove from the berry or grain all adhering dirt, foreign matter, and external fibers, to thoroughly cleanse and polish the wheat; and it consists in the employment of a horizontal cylinder rotated within a stationary casing, the cylinder and casing being made up of wire fabric of different mesh, the coarser mesh being upon the external surface of the cylinder and internal surface of the casing.

My invention also consists in the construction and combination of the parts, as will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view of a grain-scouring machine constructed in accordance with my invention. Fig. 2 is a bottom view. Fig. 3 is a vertical longitudinal section, and Fig. 4 is a vertical transverse section.

Referring to the drawings, A represents the frame of the machine, the interior bottom boards thereof inclining toward each other, as shown, while said frame is provided with a horizontal bottom board, to which is secured a fan-casing B, this fan-casing inclosing a suitable suction-fan which communicates with an opening in the bottom board of the frame, said fan-casing having a discharge-spout *b*, through which the dust and impurities are forced.

To one end of the frame, near the bottom thereof, are journaled pulleys or belt-guides *c c*, over which a belt C passes, said belt passing around a pulley G′, mounted on the lower end of the fan-shaft, said shaft extending through the casing of the frame. This belt C also passes over a pulley *d*, mounted upon the projecting end of the hollow shaft D, upon which the cylinder is mounted, the opposite end of said shaft carrying a pulley D′, to which power is applied.

Above the frame A is suitably secured a top or covering-frame A′, which is provided at one end with a hopper E, an opening being formed in the end piece of the top, through which the grain passes to the interior of the apparatus. One of the end pieces of the cover may also be provided with openings or perforations covered by a suitable slide for regulating the inflow of air within the casing.

F refers to the lower internal frame, located within the casing and suitably supported, and this frame is of less length than the inner part of the external casing to provide spaces *f* and *f′* at each end of the same, and at the end opposite the hopper E is secured an inclined perforated strip *g*, the lower end thereof being located opposite the discharge-spout G, through which the cleansed or scoured grain passes. This lower frame F has secured thereto a semicircular strip of wire fabric *h* of comparatively fine mesh, while immediately above the same is placed a woven-wire fabric of coarser mesh, the latter fabric being referred to by the letter *h′*. The upper half H′ of the stationary cylinder is formed of similar fabric, and the frame is provided with an opening which registers with the opening in the top communicating with the hopper, so that the grain can pass from the hopper into the end of the stationary cylinder. The opposite end of this upper frame has an opening *i*, through which the cleansed grain is discharged upon the incline and out through the discharge-spout G.

The inner cylinder I has two closed heads

or ends, upon which is secured wire fabric, the inner fabric being of fine mesh, while the outer is of coarse mesh, and this inner cylinder is mounted upon the shaft D, said shaft being provided within the cylinder with perforations *k*, and beyond each end of the lower frame with perforations *k'*. The cylinder-head adjacent to the discharge-opening *i*, and at the end of the machine where the discharge-spout G is located, is provided with projecting pieces or lifters which will stir and elevate the grain at the end of the cylinder to cause it to be discharged through the opening *i* upon the inclined and perforated strip *g*.

The rotary cylinder is provided with a spiral rod L, which will assist in conveying the grain from the inlet-opening to the discharge-opening. This spiral conveyer may be dispensed with.

The construction of the internal and external casings may be varied, the essential features of said casings being to provide compartments between each of the ends, so that there may be a downdraft or air-suction in said end compartments as well as beneath the cylinder which will carry off the loosened fibers and other particles removed from the berries. The cylinder and casing within which it revolves are made up of wire fabric, the finer wire or fabric ranging from twelve to fourteen meshes to an inch, while the coarser wire or fabric ranges from four to six, thus providing the coarser fabric with which the wheat comes in direct contact with a mesh or space of sufficient size to permit the grain or berries to turn therein, also allowing the ends of the berries to come in direct contact with the finer wire, so that the larger part of abrasion will come upon the ends of the berries, where the fibers are more firmly united to the berry, and thus harder to remove.

Owing to the frictional contact of the wheat with the revolving cylinder and stationary casing and with itself it is heated, which results in toughening the bran.

In operation the wheat or grain is fed into the hopper and passes directly therefrom between the casing and cylinder, and the space between this casing and cylinder ranges from one-quarter to three-quarters of an inch, and may be either partially or completely filled with grain, and as the cylinder is rotated the berries are constantly turned and thoroughly abraded to remove all foreign or undesirable particles therefrom, and as said particles are released from the grain the suction of air draws said foreign particles from the inner portion of the cylinder through the hollow shaft, where they are discharged in the space between the inner and outer casings beneath the hopper, while the impurities which pass through the stationary cylinder are drawn through the bottom opening in the outer casing and discharged by the suction of the fan. The opening in the shaft above the incline *g* and the perforations in said incline will convey to the fan such impurities as may find their way near the discharge-opening. As the cylinder is revolved at from one hundred and fifty to three hundred revolutions to the minute, the strips or blades at the end thereof will carry the grain to the discharge-opening, through which it will pass to the perforated incline *g*, and from thence to the discharge-spout.

Having thus described my invention, I claim—

1. In a grain-scouring machine, a rotary cylinder therefor having a double covering of wire or rigid fabric, the external covering being of a coarser mesh than the internal covering.

2. In a grain-scouring apparatus, a rotary cylinder having a fabric of fine mesh on its interior and immediately above said fabric one of coarser mesh, and a rod or conveyer secured spirally above the outer mesh to the ends of the cylinder, substantially as shown.

3. In a grain-cleaning apparatus, the combination of an outer cylinder and an inner rotary cylinder, said cylinders being covered with fabric of different mesh, the coarser fabrics being adjacent to each other, substantially as shown.

4. In a machine for scouring wheat by attrition, the combination of a stationary outer cylinder and an inner concentric rotary cylinder, said cylinders being made up of fabric of different meshes, the rotary cylinder being mounted upon a hollow shaft with perforations, while the stationary cylinder is mounted on a frame having passage-ways communicating with a suction-fan, substantially as and for the purpose set forth.

5. In a wheat-scouring machine, the combination of an outer horizontal cylinder mounted in a suitable frame, one end of said frame having an inlet-opening, while the opposite end is provided with an outlet-opening, said inner frame having spaces between the outer casing, one of said spaces being occupied by a perforated incline which leads to the discharge-spout, an inner cylinder of less length than the outer cylinder, said cylinder being mounted upon a perforated hollow shaft and provided at one end adjacent to the discharge-opening with radial blades, a suction-fan secured within a casing, said fan-casing communicating with an opening in the bottom of the outer casing, and means for rotating said fan, substantially as shown, and for the purpose set forth.

GEORGE A. SMITH.

Witnesses:
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HORACE L. BEALL.