2 Sheets--Sheet 1.

E. C. HINZEY.
Smut-Mills.

No. 151,979. Patented June 16, 1874.

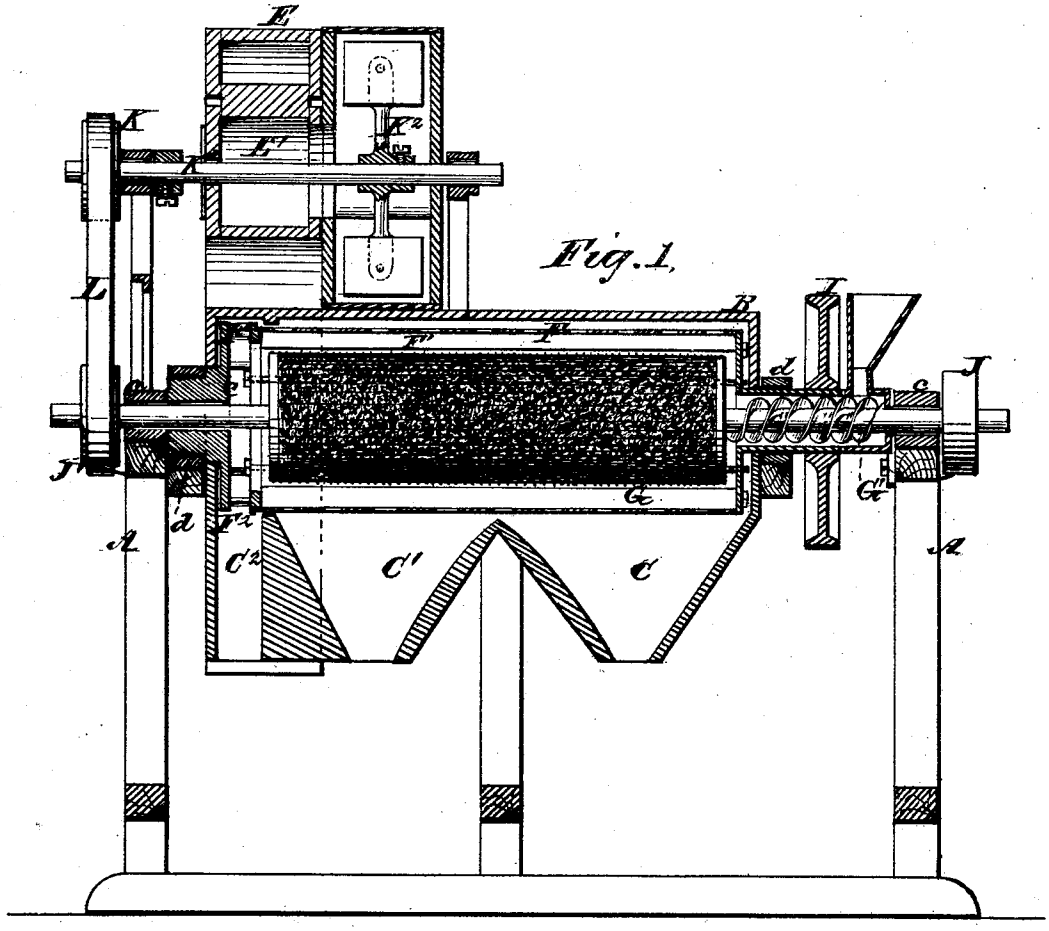
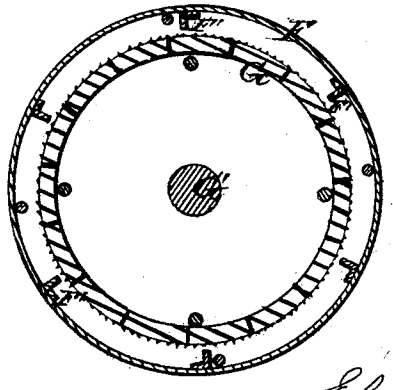


Fig. 1.

Fig. 2.



Witnesses.
James Martin Jr.
J. N. Campbell.

Inventor.
Elias C. Hinzey
by Mason Fenwick & Lawrence

AM. PHOTO-LITHOGRAPHIC Co. N. Y. (OSBORNE'S PROCESS.)

2 Sheets--Sheet 2.

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Fig. 5

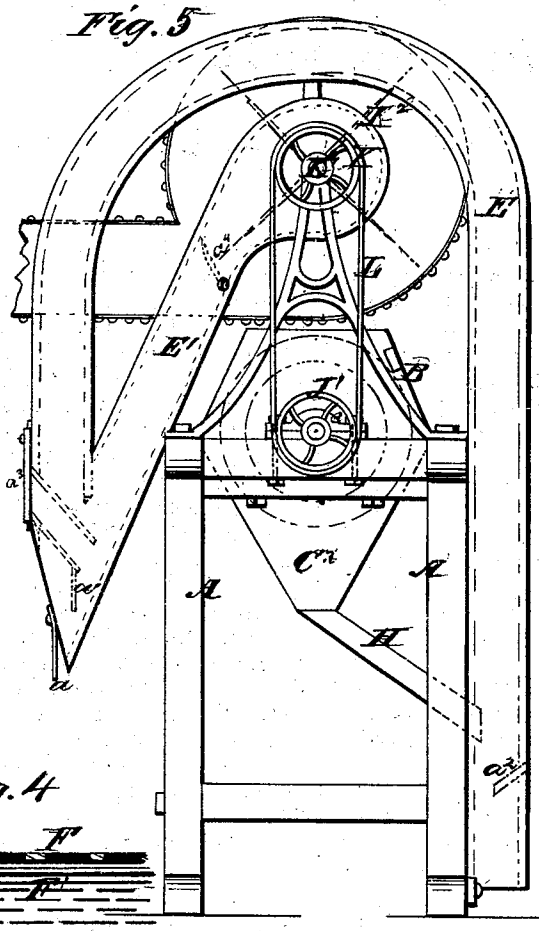


Fig. 4

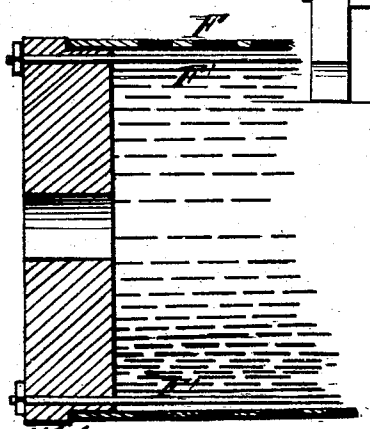
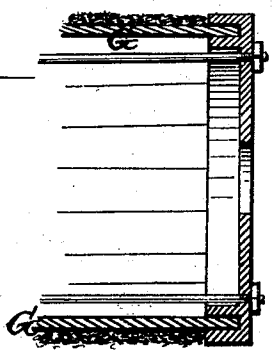


Fig. 3



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UNITED STATES PATENT OFFICE.

ELIAS C. HINZEY, OF IOWA CITY, IOWA, ASSIGNOR TO LOUISA M. HINZEY AND ALFRED JONES, OF SAME PLACE.

IMPROVEMENT IN SMUT-MILLS.

Specification forming part of Letters Patent No. **151,979**, dated June 16, 1874; application filed April 6, 1874.

To all whom it may concern:

Be it known that I, E. C. HINZEY, of Iowa City, in the county of Johnson and State of Iowa, have invented a new and useful Improvement in Smut-Mills; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings forming part of this specification, in which—

Figure 1 is a vertical longitudinal section of my improved machine. Fig. 2 is a vertical transverse section of the emery-cylinder and the perforated cylinder in which the smut is removed from the grain. Fig. 3 is a section showing how the emery-cylinder is constructed. Fig. 4 is a similar section, showing how the perforated jacket which is placed around the emery-cylinder is constructed. Fig. 5 is an end view of the smut-mill, showing the blast-fan, spout, and grain-hopper, and spout leading from it into the blast-spout.

The nature of my invention consists, first, in the combination of a feeding-screw, an independent and rapidly-revolving emery-cylinder, and an outer perforated and slowly-revolving jacket having distributing-blades on its inner circumference, in the manner hereinafter described. Second, it consists in an extension on the discharge end of the perforated jacket which has lateral openings through it all around, in combination with the grain-discharging hopper, its spout, the blast-pipe, and the fan. Third, it consists in the combination of the hoppers for smut, dust, or scourings with the closed outer casing, the perforated jacket, the emery-cylinder, the feeding-screw, the grain-hopper, the blast or suction spout, and the fan, in the manner hereinafter described.

To enable others skilled in the art to make and use my invention, I will proceed to describe it.

A represents the frame of the machine; B, an outer tight case, having only feed and discharge openings in it, and a remote communication with the suction or blasting apparatus. C C^1 C^2 are funnel-shaped discharge hoppers or tubes on the under side of this case. K^2 is a suction or blast fan mounted on top of the case near one end, and E an arched suction or blast tube or trunk, arranged laterally to the fan, across the case, and extended down on each side of the frame A. This trunk has a branch spout, E′, which extends up from the end where the chaff and light grain are separated, and connects with the blast-chamber of the fan. The blast-trunk has valves a a^1 in one of its ends, and a regulating discharge-slide, a^2, at the other. F is a sheet-metal jacket or casing, formed with strong annular cast-iron heads tied together by through screw-rods. This jacket is perforated with oblong narrow slits to permit the smut and scourings to escape. On the inside of this jacket narrow radial ribs or blades F′ are applied at proper distances apart for the purpose of uniformly distributing the grain during the operation of the machine. On the discharge end of the jacket, directly over the grain-discharge hopper, short extensions F^2, composed of widely-spaced bars and an annular head, is constructed. This extension is outside of the jacket, and it has discharge-openings all round its circumference. This extension retains the grain momentarily after it comes from the scouring-chamber, and causes it to be lifted and thrown about in such manner that the blast has a more perfect effect upon it than is secured when the grain falls through a stationary slotted bed into the conducting-tube. The jacket is fitted, by means of hollow journals, around the shaft of the scouring-cylinder G, which is made of staves held in form of a cylinder by means of strong metallic heads tied together by through screw-rods. The staves are heavily coated with emery on their outer surfaces. The shaft of the emery-cylinder has its support in boxes c c, and the tubular journals of the jacket have their bearings in boxes d d of the frame. Within the long tubular bearing of the jacket, at the feed end of the machine, a feed-screw, G′, which is on the shaft of the emery-cylinder, revolves freely. At the end of this tubular journal a hopper with a tubular formation at its lower end is fastened firmly upon the frame. The tubular portion of the hopper forms a continuation of the journal, and in it a portion of the thread of the screw G′ works. H is a branch spout leading from the grain-discharging hopper into the blast-spout. I is a pulley on the hollow journal of the perforated jacket. J J′

are pulleys on the shaft of the emery-cylinder; K, a pulley on the shaft K^1 of the fan K^2, and L a belt for driving the shaft from the shaft of the emery-cylinder. The emery-cylinder and fan revolve at about the rate of seven hundred to seven hundred and fifty revolutions to twenty to twenty-five revolutions of the jacket.

The operation is as follows: Grain is introduced into the hopper, carried by the screw into the jacket between the emery-cylinder and the perforated surface of the jacket, and, as the two cylinders are revolved at different speeds, it is scoured upon the one by the other, being laid evenly along the whole length of the scouring-surfaces by ribs or strips of the jacket, and also continually deposited from the jacket upon the emery-cylinder by said ribs. The emery-surface subjects the grain to the most effectual scouring operation of any other surface with which I am familiar, it grinding off the smut and polishing the grain to the nicest degree. As the grain is deprived of smut and foreign matter, and the said matter is beaten through the slots of the jacket and caused to deposit into the hoppers C C', the grain flows out around the end of the emery-cylinder into the extended open section of the jacket, and falls into the hopper C^2, from whence it passes to the blast-spout, where, in its descent, and before it discharges, it is subjected to the blast or suction of the fan. The light grain and chaff rise and pass around the suction or blast tube down on the opposite side, and here a further separation takes place before the said grain escapes through the valves. The chaff, dust, and other substances pass through the fan-case into the open air or into a receiver.

The fan can be set with its blast-nozzle on either side of the machine. At the end of the suction or blast spout where the dust and foreign matters are separated from light grain, two partial partitions are constructed, and the chamber between these partitions is always open to the chamber of the blast or suction spout, and it may be opened more or less to the atmosphere by means of the slide a^3. There is also to be, in the branch suction-spout, a wicket or valve, a^4, for regulating the blast.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the emery-cylinder, the perforated metal jacket having ribs on its inner side, and the feed-screw, the whole constructed and operating substantially as described.

2. The open-work extension F^2, formed on the outside of the perforated jacket F, at the discharge end thereof, and constructed to revolve with the same, in combination with the grain-discharging hopper, its spout, the suction-spout, and the fan, substantially as described.

3. The combination of the hoppers for the smut, dust, or scourings with the closed outer casing, the perforated jacket having the laterally-discharging extension, the emery-cylinder, the feeding-screw, the grain-hopper, the suction or blast spout, and fan, substantially as and for the purpose described.

ELIAS C. HINZEY.

Witnesses:
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JOHN GLENN.