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Incombustible Smut Machine.

Machines of some kind for separating smut from grain are indispensable adjuncts of the modern flouring establishment, and the perfection of the flour of commerce is due, in a great degree, to these inventions. The action is always mechanical, and consists in a species of scouring and winnowing of the grains. Ordinary smut mills, however, are so constructed as to allow of an accumulation of smut and dust about the step of the rapidly rotating cylinder, and the exterior being of wood, many fires have occurred by the combustion of the whole, due to the heat evolved from friction.

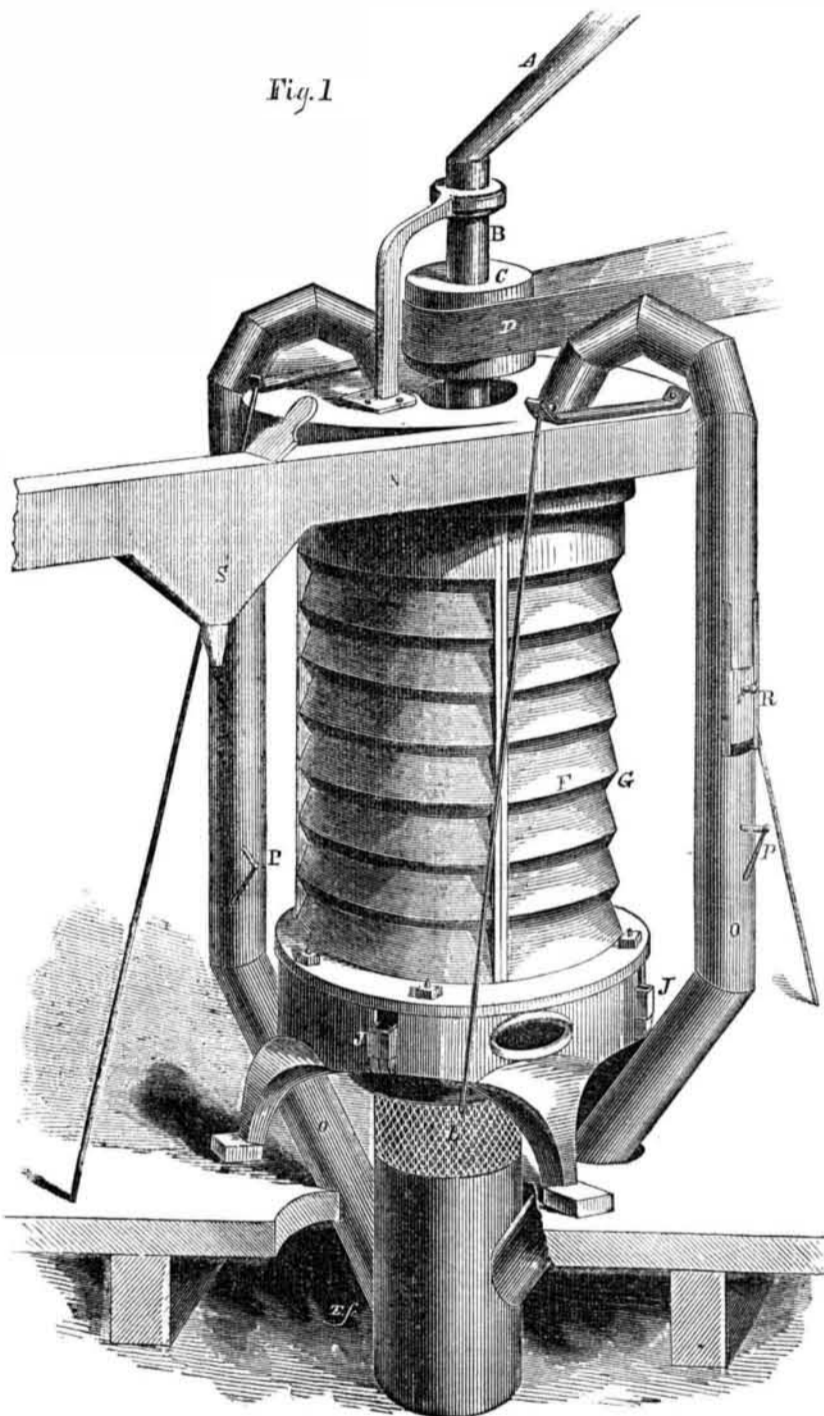
Jonathan L. Booth, of Cuyahoga Falls, O., patented, Dec. 18, 1855, the form of smut mill represented in the accompanying engravings, which is acknowledged far superior to the ordinary smut mills, on the score of perfect safety from fire. Fig. 1 is a perspective view, and Fig. 2 a vertical section. All the parts are of metal, and the step is mounted in a spider frame, the arms of which are hollow, the better to allow a perfectly free communication of oil from the exterior. The whole is admirably ventilated, and its action is very perfect.

The mill consists, like ordinary smut mills, of an upright frame or cylinder, rotating rapidly within a case, and ventilated by a fan attached. A is the feeding spout or hose, through which the grain is supplied, B is the vertical shaft, hollow at its upper extremity, C is a pulley, and D the driving belt. E is a cross tube, which allows the discharge of the grain through the hollow top of B. The exterior of the case is represented by the two letters, F G, being ridged around as represented. F is the upper and G the under side of each ridge. The interior of the inclined portions, F, are corrugated or grooved in lines proceeding up and down the inclined interior. H represents curved pieces corrugated vertically along their exterior faces, and fixed on the interior cylinder, H', which latter is connected to the shaft, B, by arms, as represented, and necessarily revolves with it. I represents horizontal plates which extend around the cylinder, and revolve with it. J is a hollow tube or radial frame, which supports the step of the shaft, B, and conveys oil thereto, from the exterior.

The rapid rotation of the pulley, C, expels the grain through the horizontal cross tube, E, and throws it with great violence against the corrugations on the interior of the outside case. These corrugations on the interior of the inclined surfaces, F, effectually destroy the motions of the grains thus projected, thereby imparting another shock thereto, and compel them to drop quietly upon the inclined surfaces, G, from which they are deflected inwards, and exposed to the action of the next set of curved pieces, H, below. These, in their turn, impart another smart blow to the grains, and cause them to impinge anew against the corrugations on the interior of the case, a stage below that where the previous effect was produced. This operation is repeated, each grain being alternately pro-

BOOTH'S INCOMBUSTIBLE SMUT MILL.

Fig. 1



jected against the corrugations on the interior of F, then descending is deflected inward by the inclined surface of G, and again exposed to the action of H. The horizontal plates, I, simply prevent the possibility of any grain descending vertically through the whole machine, and compels each grain to pursue the zigzag course described, exposed to the violent percussion, first from the rotating, and next from the fixed surfaces.

K is a hollow inverted cone suspended below the working portion of the machine. L is a large tube below, containing a cylindrical sieve, introduced as shown, to allow the free admission of air, but to prevent the escape of any grains which might chance to be thrown laterally. M is a fan at the top, mounted on the shaft, B, and receiving motion therefrom. N is a discharge passage extending tangentially from the periphery of the case which encloses M. O are side tubes leading from the lower portion of the sieve tube, L, to the central portion of the fan on its upper side. The action of M draws air from its own interior, and expels it through the passage, N. This air is received through two channels; one, the most important, is a current flowing inward through the sieve, L, and upward through the annular space between the re-

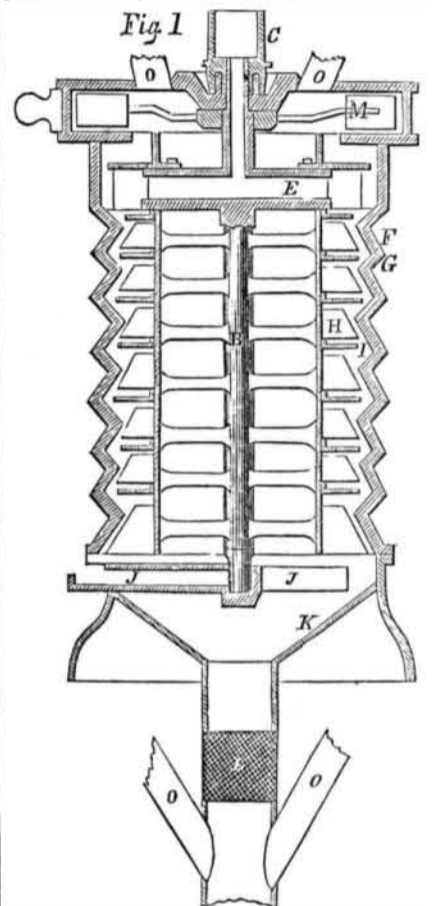
volving cylinder, H', and the case, F G. This exposes the grains in their passage downwards through the mill, to an upward draft of air, which carries off all the dust as fast as separated therefrom. The side pipes, O, also deliver a portion, which is drawn from a lower point. P represent the handles of throttle valves, or dampers, by which the movement or draft through the tubes, O, can be easily controlled, and R represent doors or openings in the side of O, which admit air freely to supply the fan, should the upward draft through the mill be found so strong as to prevent the sufficiently rapid descent of the grains. The flow of air through O is beneficial in two respects; it furnishes the means for controlling the upward draft through the mill proper, and also insures a sufficiently powerful upward draft through the lower portion of the tube L, to suck up any very light or false grains which may be mingled with the heavy ones. The effect is, therefore, to discharge through the bottom of the tube, L, all the sound and heavy grains in a condition perfectly clean or scoured, and to eject through the passage, N, a current of air loaded with dust or smut, and also with light grains, if any such there be. S is a pocket or space provided on the lower side of N, in which the

light grains may lodge, and be withdrawn at intervals by opening a door at its lowest point.

This smut mill is already in quite extensive use, and has so far proved entirely free from all danger of heating of the bearings, while it is obvious that, should such heating occur in consequence of careless management, no danger to the building could ensue.

It will be seen that the machine can be placed at any convenient location in the

Fig. 2



mill, as there is no dust emanating from it except through the spout, which can be extended to any distance from the mill, throwing all the smut dust entirely out of the mill, and requiring no separate room or enclosure for its reception.

For further particulars the inventor may be addressed at Room 42, Depot Buildings, corner of Elm and Franklin sts., New York.

The "Madeira Pet."

The arrival of the *Madeira Pet*, which we last week alluded to as having performed a voyage direct from Liverpool to Chicago, was announced on 'Change by the President of the Board of Trade, and a series of resolutions were offered and passed by that body, congratulating the captain, consignees and others interested in the successful voyage made. The captain was introduced to the Board, the members of which received him with enthusiasm, while he made a few remarks relative to the success of the trip.

A committee was despatched with a steam-tug, who had the schooner towed up from the mouth of the harbor to the dock near the Board of Trade rooms. As she neared the dock, with a number of British ensigns floating from her rigging, she was received with three cheers by those on shore. She is but a small schooner, having brought over a cargo of only 240 tons. Her grain capacity is some 8000 to 10,000 bushels. She was built at the Isle of Guernsey for the fruit trade between London and Madeira.

Christianity and Science.

Professor Joseph Henry, the distinguished head of the Smithsonian Institute, testifies that he knows but one man among the scientific men of the United States who is an infidel.