

Science and Art.

New Floor Covering Material.

The production of a good, durable and cheap covering for floors, embracing the advantages of softness and elasticity has long been sought for. The London *Mechanics' Magazine* states that a very original material for floor covering has recently been patented by Mr. Dunn, member of C. Goodyear's India-Rubber Company, London, which meets all these conditions. It consists of a composition of cork, flock, cotton, wool, and other fine fibrous materials of various colors, mixed with india-rubber. These are spread on a canvas back and embossed. The result is a material of great permanence and beauty, having all the softness of a carpet, with the elasticity and noiseless tread which constitute the beauty of a real "velvet pile Brussels."

New Smut Machine.

There is nothing in the range of common substances which is so full of pleasure as flour. It is agreeable to the touch and taste and sight, and whenever one sees a barrel of fine flour opened, the impulse is to bury one's hands in it and move the fingers among its fine smooth particles. It is so suggestive, too, of bread—the staff of life, and cakes—the ivory handles and silver mounting to the same. Let the fable say what it likes, "There is nothing like flour," say we. But flour would lose these pleasant qualities and half its value, were the grains of wheat not cleaned before being ground in the mill, and ridded of all impurities; the parasitic fungus, "smut" being the chief of them. For this purpose, the smut machine has been invented, of which there are many forms and kinds; the subject of our engravings being that invented by J. A. Woodward, of Burlington, Iowa, which also acts as a seed separator. This machine was patented December 21, 1858. In our engravings, Fig. 1 is a vertical central section of the whole machine and Fig. 2 is a detached cross section of the deflecting bar and shoe, taken in a line at right angles to Fig. 1.

The machine will be well understood by our description of the operation:—

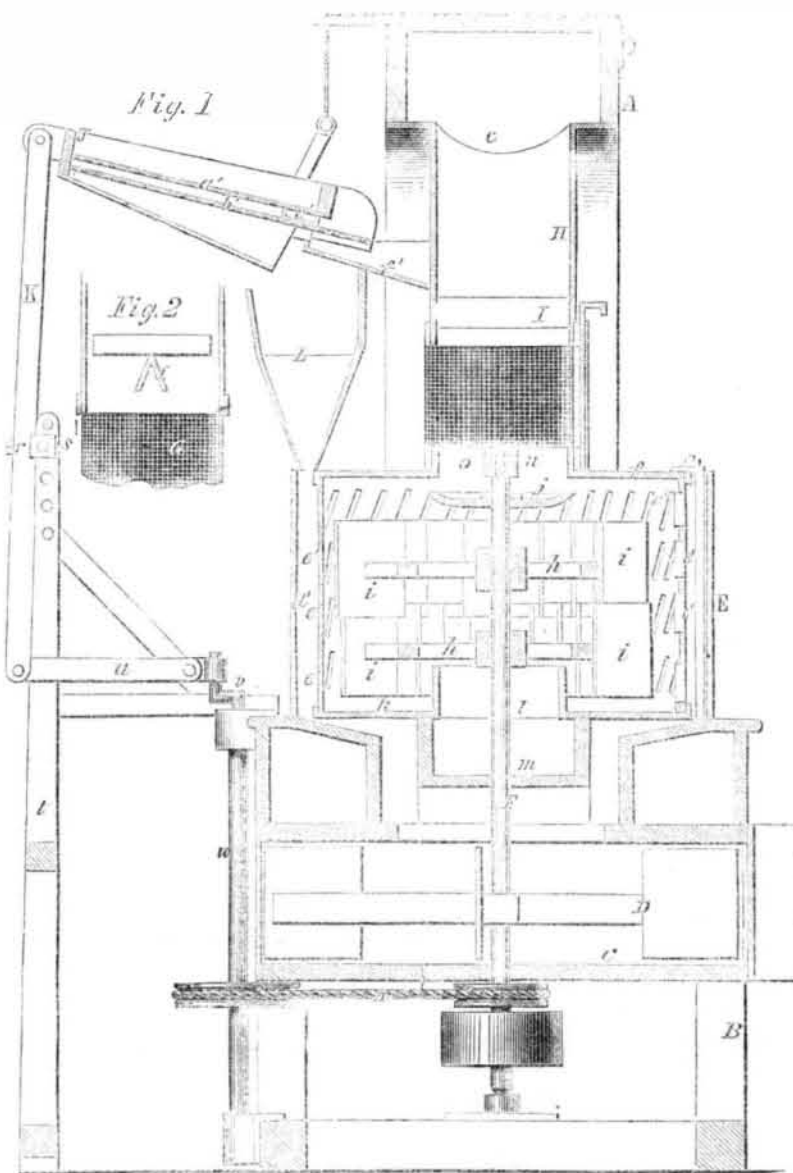
Power is applied to the shaft, F, in any proper way, and rotary motion is communicated therefrom by means of the belt, x, to the shaft, w, that by means of the crank, v, and connecting rod, u, gives motion to the bar, k, and shoe, J. The bar, k, is pivoted to the upright, t, by the pin, s, and it is capable of being lengthened or shortened by the set screw, r.

The grain to be cleaned falls on a screen, a', in the shoe, J, and passes through this screen, the large foreign substances passing off through the spout, c'. The grain cannot pass through the screen, b', but is conducted by it and the spout, f', into the cylinder, H, and it falls into the scourer, E, being divided in its descent by the bar, I. The cockle and fine seed pass off the inclined bottom of the shoe into the hopper, L, and thence through an opening, into the fan-box, C. The fan, D, causes a blast to pass vertically upward through the spout, m, and scourer, E, and the same fan also causes a blast to pass through the spout, A, a current also passing through the wire cloth cylinder, G, upward through the cylinder, H, into the part, c, of the blast-spout, A. The grain therefore is subjected to a blast as it descends into the scourer, and the bar, I, divides or scatters the grain in its descent, so that the blast—which will have a whirling motion in the wire cloth cylinder, owing to the junction of the upward current from the scourer—will effectually take up all light foreign substances into the spout, A. The grain, as it enters the scourer, E, (through the opening, n, the flange, o, of the top-plate, supporting G,) will be deprived of all loose dirt and smut, which is an important feature, as it lightens the work of the scourer and prevents it from grinding the smut and dirt

into the eye of the grain. The grain is spread by the concave, j, and operated upon by the wings or beaters, i, in a very effectual manner, the position of the beaters operating in a very direct manner against the grain, so as to

subject it to the greatest possible amount of attrition without breaking it; the dirt and smut passing through the perforations, e', and through e'' into the fan-box. The beaters are attached to F by arms, k. The cleaned

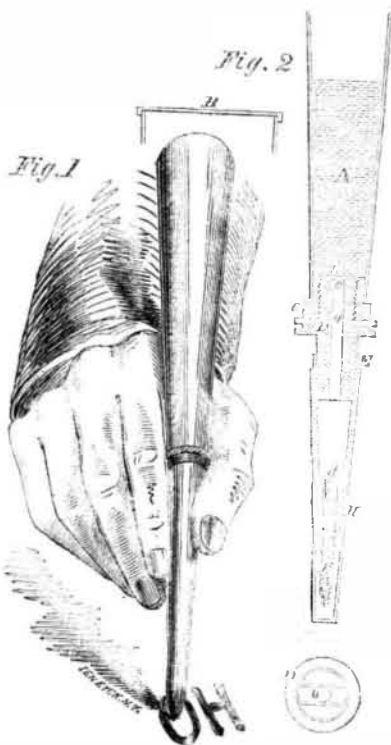
WOODWARD'S SMUT MACHINE.



grain passes down a spout into the lower part of A, where it is subjected to a second blast, and falls away in a perfectly clean state. All light grain is carried by the blast to one discharge spout and the heavier into another, the

separation of the grain depending upon the adjustment of a gate in the lower part of A. Any further information concerning this excellent invention may be obtained by addressing the inventor as above.

Hoit's Marking Brush.



The trouble of dipping the brush into ink or paint and the consequent mess which it produces, are entirely avoided by the use of

the invention which is illustrated in the engraving, Fig. 1 being a perspective view in use, and Fig. 2 a vertical central section reduced. A is a cistern of sheet-brass, tin, or iron, closed at the top by a cover, B, and forming a handle of the brush. Its lower end is open and provided with a bushing, C, that holds the hollow screw, D, and at the same time strengthens A. Through D is a passage, a, the top of which is protected with a cross-piece, b, having a projection, c, to regulate the flow of ink or paint. To D a tube, E, is secured, and the hairs, F, that form the brush being attached to the outside of a small tube, G, when G is pushed down E, the hairs are held tight and a passage left for the ink or paint to flow to the brush and cap or tube, E. Ink is introduced into the cistern by turning it upside down, and taking out D, and when the desired quantity is placed in, the whole can be screwed up air-tight by D, the valve, c, closing the passage, a. In order to use the brush, the passage, a, is opened by unscrewing D a little, and any quantity can be supplied to the brush, and at any speed.

The inventor, L. B. Hoit, of New York, will be happy to furnish any further information upon being addressed at 335 Broadway, room No. 34. It is a convenient little thing, and was patented Feb. 22, 1859. We have tried it, and can recommend it to all shipping clerks, freight agents, and others who have to do any marking quickly, or carry marking utensils from one point to another.

Duty of Steamships.

A committee of the British Association for the Advancement of Science—of which W. Fairbairn was chairman—appointed to consider the above subject, recommends that all the owners of steamships adopt means to register their efficiency. The rule which they lay down for testing vessels, is to multiply the cube of the speed by the square root of the cube of the displacement, and divide the product by the consumption of fuel per hour in hundred-weights. Thus, if a steamer, A, performed a voyage of 7,200 miles in 652 hours—on an average speed of 11.04 knots—and the consumption of coal was 47 cwts. per hour, and the mean displacement 2934 tons. The co-efficient of dynamic duty indicating the merits of the performance would be—

$$(11.04)^3 \times (2,934)^2 \div 47 = 5,870.$$

Suppose another steamer, B, having a displacement of 840 tons, average speed 12.78 knots per hour, consumption of coal 50.3 cwts. then the co-efficient of duty is—

$$(12.78)^3 \times (840)^2 \div 50.3 = 3,693.$$

In the first case A performs as much work with 1 cwt. of coal as B with 1 1-16th cwt. It is only by computing the amount of coal used, with the displacement of the vessel and its speed, that we can arrive at any data regarding the efficiency of steamers. The cause of superiority in one vessel may be in its form or the machinery, but, whatever it may be, there is no possibility of finding this out, unless the displacement, speed, and coal consumed, are known. A series of statistics of the performances of steamers under such a test, would lead to a close investigation as to the causes of superiority in one over another, and the result would be a general adoption of those improvements by which advantages were secured. At present there are steamers which do the same duty as others with one-fourth less fuel, but no person can really tell whether this is owing to their models or machinery or some other cause.



INVENTORS, MILLWRIGHTS, FARMERS AND MANUFACTURERS.

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