

Science and Art.

Treatment of Copper Ores.

A patent has recently been obtained by Mr. Henderson, of Bristol, for a method of obtaining copper and other metals associated with it in quartzose copper ores in the wet way. This method appears likely to be of considerable value for working ores containing a large admixture of gangue. In the case of ores containing only oxyds, carbonates, arseniates, phosphates, and similar compound, no preliminary treatment is requisite; but ores containing chiefly sulphides must be first roasted, for the purpose of driving off the sulphur, and converting the metal into the state of oxyds. The crushed ore is introduced into vats, with perforated false bottoms, raised some inches from the true bottoms, and covered with a layer of brushwood or straw, to prevent the ore falling through. When the vats are filled, hydrochloric acid is poured on the top of the ore, so as gradually to filter downwards through it, dissolving out the metallic oxyds meanwhile. The liquid that accumulates at the bottom of the vats is pumped up, and made to pass several times through the ore, so as to saturate the acid as much as possible; or a series of vats may be used, through which the liquid is passed successively. When the metallic oxyd, &c., is dissolved out of the ore, the residue is washed with water, removed, and a fresh charge of ore put into the vats. The strength of the acid to be used varies according to the nature of the ore operated upon. A loose, porous, and poor ore requires a weaker acid than a more compact, richer ore. The liquid thus obtained contains the metals—copper, iron, lead, &c.—in the state of chlorides. If it contains any iron in the state of protochloride, enough chlorine is added to convert it into perchloride of iron; and, after this has been effected, finely powdered carbonate of lime is added in slight excess, for the purpose of precipitating oxyd of iron. Lead and some other metals are also separated from the liquid by this means. The clear liquid from which the precipitate has been separated will then contain copper, which is precipitated as oxyd by means of quicklime. This is effected best at a boiling temperature. The precipitation may also be effected at the boiling point by carbonates of lime, baryta, magnesia, &c., sulphides of barium, calcium, &c., or the lime waste from soda works. In this way an oxyd, carbonate, together with, in all cases, a solution of chloride of calcium, is produced. The precipitate is washed, dried, and smelted in the ordinary way.—*Mining Chronicle.*

Improved Grain Cleaner.

The ordinary grain cleaner is imperfect in one essential point, viz., the feeding of the grain. The invention we are about to describe is designed to remedy this defect, and consists in delivering the seeds or grain to the blasts by the centrifugal action of a revolving disk plate placed in the wind trunk, so that the seeds or grains shall be thrown out horizontally in a thin sheet across the blast, and the unbroken ascending current take the lighter grains immediately from the heavier ones, and thus separate them.

In our illustration, which is a vertical longitudinal section through the invention, A is the outside case. The fan, b, is rotated by a crank and gear wheel, and moves in the direction of the arrow, l, so as to draw a current of air through the machine, and force it out at D. The fan blower runs in a case, E, which is closed except at the eyes, F, the air passing from the machine through side ducts, and through F into the fan box. H is a vertical wind flue, open at its lower end, but closed at the top. Through the center of this wind flue there passes a feeding tube, I, which rests by its flanges, c, on the top of H, and by means of set screws, d, this tube can be raised or lowered in H, to regulate the feeding in of the grain, and in its upper end is placed

a hopper, J, in which the seed or grain is placed. Two bridge trees, K L, form bearings for a shaft, e, that passes through I, and this shaft has on its upper end a bevel wheel, f, which is rotated by the bevel, g, on the shaft, h, moved by the band, i, and band wheel, M, from the wheel, N, on the crank axle. Near the bottom of e there is placed upon it the disk cup, O, which may be termed a "distributor." This being rapidly rotated throws the grain off by its centrifugal force, the

quantity being regulated by the set screws, d. The grain thus thrown off pass in a thin sheet across the current of air ascending through the wind trunk, the lighter particles or grains, as well as the impurities, being carried up with the blast, whilst the heavier grains fall through the trunk. By this throwing off horizontally across the blast the seeds or grains, the heavy grains do not strike and carry down with them the lighter ones, as is generally the case when they are

in bearings, i, in which it can slide. A rack, j, is on one side of the rod, K, and the pinion, f, gears into the rack when J is in the trunk, H. H has a slit, k, in its end near g, to allow the plunger to pass through, and a slit, k', is made in the trunk, H, near its junction with the nozzle, I. From the end, K, an arm, l, projects.

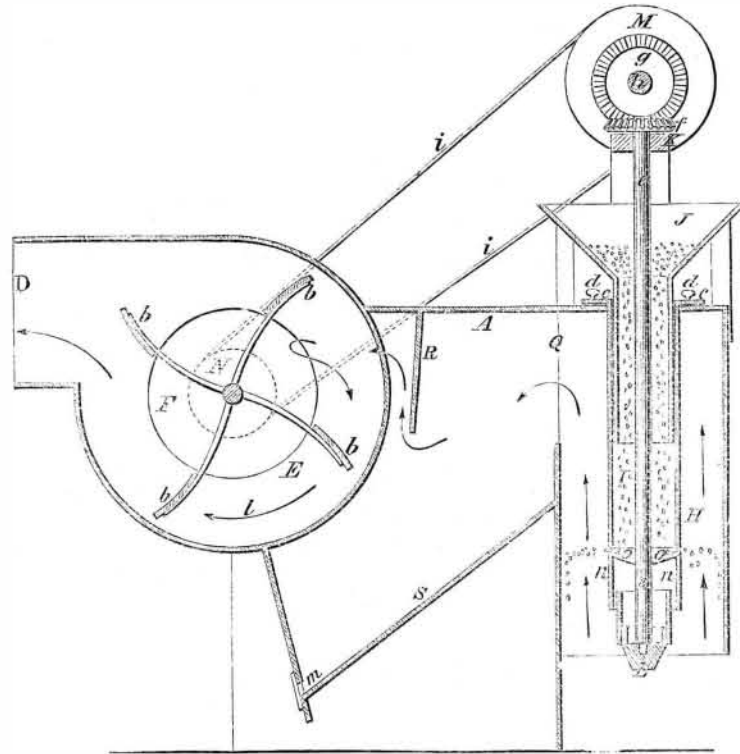
The operation is as follows:—The meat is placed in the box, B, through the hole, m, and motion is given D by any suitable means. The meat is cut by the teeth, d, as they pass between the plates, e, and it is fed along to g by the spiral arrangement of the cutters, d, and consequently the meat is subject to the action of each tooth, and when it reaches the passage, g, it will be cut quite fine. The cut meat then passes into H, and the operator, by grasping the handle or projection, l, and turning the rod, K, passes the plunger, J, into the trunk at k, and the pinion, f, gearing into the rack, j, pulls J along, and thus forces the cut meat through I into the case; when the plunger arrives at k', it is turned out by the operator, and again, by pushing K back, and turning it, the plunger assumes the position shown in our engraving.

W. Sniff, of Fultonham, Ohio, is the inventor, and from him any further particulars can be obtained. It was patented December 1, 1857.

How to Dye Green with Picric Acid.

Dissolve the picric acid in water, add sufficient sulphuric acid to give the mixture a slightly acidulous taste, and then add carmine of indigo according to the shade of green desired. To die silk a little alum should be added, which is not necessary for wool.

VANDEGRIFT'S GRAIN CLEANER.

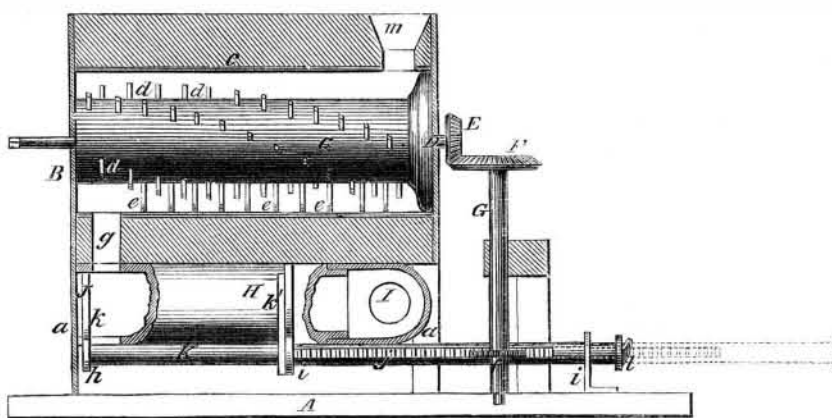


fed in, in the ordinary way, but the separation of the light from the heavier products takes place when the grain or seeds are thrown across the blast, there being a momentary cessation of motion as the momentum of the grain thus thrown from the distributor gives way to the superior force of the ascending column of air, and whilst at this almost apparent state of rest, the heavier products fall, by their gravitation, and the lighter ones pass up with the blast, the strength of which may be regulated by slides. The hopper or feeding tube, I, should be kept full of grain, so that no air can pass through

the tube. The light grains pass through the opening, Q, into the box, and fall down upon S, from which they can be withdrawn by a gate m. A board, R, prevents any from passing into the fan box. The smut, chaff, dirt, &c., pass through the fan box, and are discharged at D. The cylinder, n, below the distributor, O, is intended to prevent a counter current or eddy below the distributor—it being important that the ascending current should not be broken by any disturbing force.

It was patented June 8, 1858, by the inventor, A. J. Vandegrift, of Lexington, Ky., who will give any further information.

SNIFF'S SAUSAGE MACHINE.



This machine makes sausages direct from the meat at one operation, without any handling or chance of uncleanly treatment. Our engraving is a transverse vertical section of one of these machines, which the following description will explain:—

A is a bed piece on which a rectangular box, B, is supported by uprights, a. The box, B, is formed of two parts connected by hinges, and each part contains a semi-cylindrical concave, c, the two concaves when the box is closed forming a cylinder in which a drum, C, is placed, the shaft of which, D, has its bearings in the ends of the box, B. The drum, C, has teeth, d, projecting from its periphery, and placed in spiral rows and in the lower half of B there is placed a series of

stationary metal plates, e. These plates are all parallel with each other, and equal distances apart so that the teeth, d, can work between them, as the drum rotates. To one end of the axle, D, is attached a bevel wheel, E, that gears into another wheel, F, on a shaft, G, the lower end being stepped into A. There is a pinion, j, on G. To the underside of B there is attached a cylindrical chamber, H, one end of which communicates with the interior of the box, B, by a passage, g. The opposite ends of this trunk has a nozzle, I, attached to it at right angles, and a plunger, J, is fitted within the trunk, A, the plunger working freely within it. The plunger is connected with a rod, K, by means of an eye, k; the rod being outside and below H, and fitted



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