

SCIENTIFIC AMERICAN

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY AND MANUFACTURES.

Vol. XXXI.—No. 21.
[NEW SERIES.]

NEW YORK, NOVEMBER 21, 1874.

\$3 per Annum,
[With Postage, \$3.20]

THE HAMILTON SURFACE PLANER.

We present herewith illustrations of a new surface planer, manufactured by the enterprising firm of Bentel, Margedant & Co., of Hamilton, Ohio, a concern which has gained an enviable reputation for the multiplicity as well as the value of the improved machines numbered among its recent products. Two views, end, Fig. 1, and side, Fig. 2, of the device are given, from which its uses will be readily recognized; while its symmetrical form and compact construction will commend it to the practical mechanic.

There are two planing tables, located respectively above and below the cylinder, both of which are adjustable. The upper table is made in two sections to plane above the cylinder, and the lower table or bed serves for thickening from five or six inches, if desired, down to one sixteenth of an inch below the cylinder.

In front of the knives the table rests on inclines, and can, by a hand screw shown in the engravings, be changed from a one sixteenth to one and a half inches below the cutting line. The back table remains for planing out of wind, etc., at the extreme right of the cutting line. A triangular cutter head of a peculiar form is provided; and although the knives are straight, similar to those generally used, they make a drawing cut, thereby insuring a smooth surface. The machine, thus arranged, can be used for planing out of wind, smoothing, squaring, making a glue joint, beveling, cornering, and tapering. Among other advantages claimed for this tool is that the material to be planed out of wind does not need to be leveled, fastened, and run back and forward before the cut is taken; for, since it rests on a level adjustable table before the cutter cylinder will operate upon it, the planed part glides upon the back table as soon as it passes the cutter cylinder. The tool, therefore, planes economically, not cutting away any more than is necessary to secure a smooth surface out of wind. After the work is planed out of wind, it is in the right position to be operated upon by the cutting cylinder to plane it to the required thickness (below the cylinder), requiring no rehandling to other machines used for this purpose only. Very short, narrow, and thin material can be planed out of wind by passing it over the cutter cylinder. Circular, oval, and square framed stuff, without regard to the running of the grain, can be passed over the cutter cylinder, planed, and finished.

Fig. 2 shows the machine arranged for planing boards or timber to the required thickness. The upper table, back of the knives, is swung back and brought forward by the hand screw. This part of the table is so constructed that it forms on the lower side a bonnet to direct the upright flying shavings toward the table in front of the cutter head, from which they are blown by the wind created by the revolving cutter head.

The work done above the cylinder is easily fed toward the knives by hand; while the feeding toward the cylinder, below the cutter head, is performed by geared feed rollers, which can be started or stopped by means of a tightening pulley connected with the feed lever. The latter is held in its position by a spring. The feed of the machine can be changed from fast to slow, or *vice versa*, to suit for hard or soft wood. An adjustable pressure bar, roller scraper, and a gage admit of the lower table being accurately set for any thickness of cut.

The machine is covered by several patents which have been secured through the Scientific American Patent Agency. The manufacturers, to whom further inquiries may be directed, as above, make several sizes and kinds of the tool, from 24 to 16 inches.

The right to manufacture the planer in the Eastern and Pacific States is, we are informed, open to purchasers.

We see, by the late report of the judges of the Cincinnati Industrial Exposition, that the merits of this machine won for it a first premium. Judging from samples of remarkably thin planing and other work, performed on the appara-

tus and sent for our examination, there is no question but that the distinction was well deserved.

Utilization of Tin Waste.

The process includes the following operations: Boiling the waste with water acidulated with hydrochloric and nitric acid, until the tin is completely dissolved. To 2,200 pounds

of lead and oxide of tin; this is mixed with double its weight of coke, and heated in a zinc furnace. Chloride of tin distills over, and metallic lead remains. The iron scrap, freed from tin, can be used in the manufacture of copperas, or in metallurgical operations. The process shows a profit.—*M. Künzel*

Spontaneous Combustion in Hay.

There are doubtless many farmers who have experienced sudden and destructive conflagrations in their hay lofts, which could not be ascribed to any exterior agency. Barns have been known to burst into flame, almost without warning, save perhaps a significant odor, for a few days previously, around the places where the hay was stored, and a summer's harvest is swept away in as many minutes as it has taken days to gather it. These unexpected conflagrations are generally accredited to tramps who have made the hay loft their sleeping resort, but it is now asserted that such calamities are frequently due to the spontaneous combustion of the hay, a circumstance theoretically quite possible, but rarely considered. Abbé Moigno, in *Les Mondes*, gives the following as the theory of the phenomenon: Hay, when piled damp and in too large masses, ferments and turns dark. In decomposing, sufficient heat is developed to be insupportable when the hand is thrust into the mass, and vapors begin to be emitted. When the water is almost entirely evaporated, the decomposition continues, and the hay becomes carbonized little by little; and then the charred portion, like peat, peat cinders mixed with charcoal, sulphurous pyrites and lignite, etc., becomes a kind of pyrophorus, by virtue of its great porosity and of the large quantity of matter exposed to high oxidation. Under the influence of air in large amount, this charcoal becomes concentrated on the surface to such a degree that the mass reaches a temperature which results in its bursting into flames.

The preventives for this danger are care that the hay in the loft is kept perfectly dry, that it is well packed, and that it is stored in small heaps rather than in large masses.

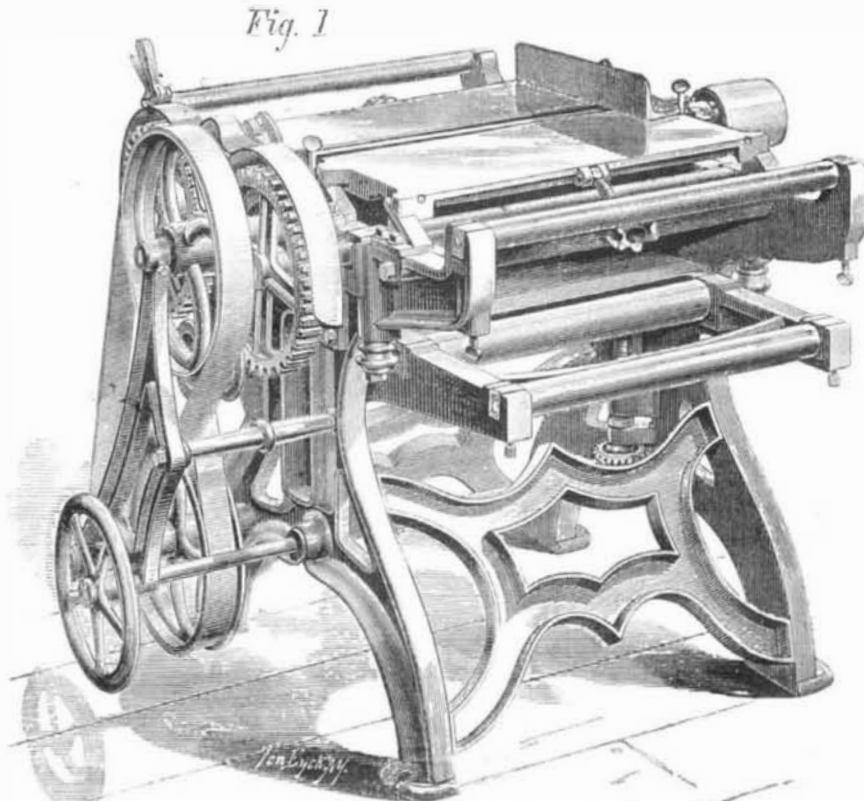
The Preservation of Wood.

A new work, exhaustively treating the above topic, has recently appeared in France from the pen of Maxime Paulet, a quite eminent chemist. The author advocates especially the use of sulphate of copper and creosoted oil, according to the circumstances under which the wood is employed. Sulphate of copper has a poisonous action upon the animal and vegetable parasites which appear at the beginning of organic decomposition. In treating wood which is to be buried in the earth or submerged in fresh water, the solution should be applied in excess, since the effect of moisture is slowly to dissolve the salt. Sea water acts in this manner so rapidly that sulphate of copper should not be employed for piles or similar marine structures. In wood soaked with the salt solution, a portion of the latter unites closely with the ligneous tissue, and another part, in excess, remains free. This last, first dissolved by the exterior liquids, slowly retards the removal of that combined with the wood; but the combined portion itself, though more stable, does not entirely escape subtraction, accelerated or retarded according to the rapidity of renewal of the dissolving liquid.

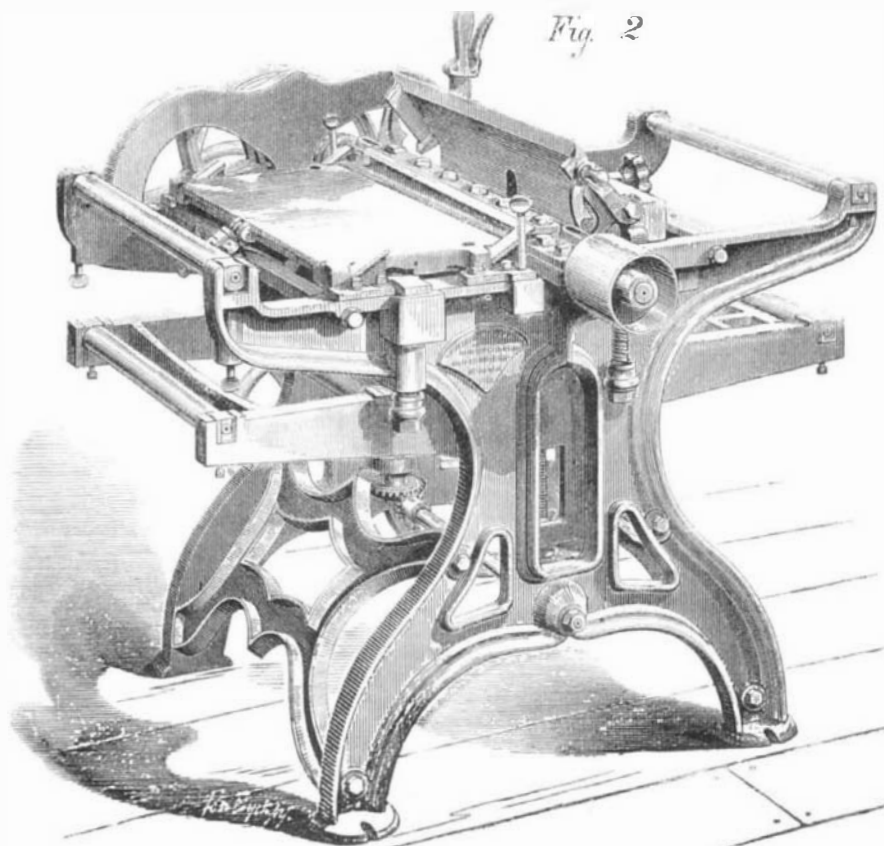
On the other hand, for wood destined for aerial structures, the quantity of solution should be diminished in order to prevent the mechanical effect of intervascular crystallizations.

Regarding creosoted oil, M. Paulet states that the tarry and carbolic compounds are much preferable to the metallic salts for wood exposed to sea water, because the naphthalene, aniline, and notably the carbolic acid

exercise an antiseptic action, coagulating the albumen and thus destroying both the circulation of the sap and also the organic parasites. It is pointed out, however, that these substances render the wood inflammable, while the metallic salts have just the contrary effect.



THE HAMILTON SURFACE PLANER.



the scrap iron washed, and the washings used in treating the next lot. The tin is precipitated in a spongy state by means of scrap zinc, 70 parts of which serve for 100 of tin. The precipitated mass is washed, and at once dissolved in hydrochloric acid. There remains a mass composed of chloride