

New Industrial Applications of Salicylic Acid.

M. R. Wagner, in the *Technologist*, enumerates a large number of industrial uses to which the newly discovered salicylic acid can be applied in addition to its various medicinal uses. If during the past two years science had made no other discovery than this useful product, it would still have conferred a most important boon upon mankind. We enumerate, briefly, some of these numerous applications:

The Preservation of Food Products.

The antiseptic, tasteless and innocuous qualities of this acid render it of great value in this direction.

Fresh, uncooked meats, washed in an aqueous solution of salicylic acid and afterwards secured in hermetically sealed cans, and placed in a cellar, was kept, by Mr. Wagner, perfectly free from taint from April 28th, 1875, to June 25th.

When added to salt brines used for the preservation of food, it is found a great assistant and keeps the brine sweet.

It has been used with great benefit in the preparation of smoked meats.

One or two parts in one thousand kneaded into fresh butter will keep that article sweet in summer time from four to eight times as long as when nothing but salt is employed.

Its Use in Arts and Manufactures.

In the manufacture of wine it is thought (though not yet tried) that a very small quantity placed in each cask will so retard and modify the progress of fermentation as to be of great use in securing and preserving the delicate bouquet of that product. If so, its aid will also be valuable in the manufacture of vinegar.

In the manufacture of glue and gelatin, salicylic acid may be advantageously employed in the macerating vats, also in boiling it appears to facilitate the conversion of the tissues into gelatin.

The sizing used by weavers and the paste employed by bookbinders, paper-box makers, etc., is preserved from fermentation by this new and useful product.

The albumen of blood or eggs may be preserved by it for an indefinite length of time.

In tanning salicylic acid seems to promise a new and most important agent. Its presence in the "sour bath" prevents putrid exhalations and gives to the hide a decidedly improved appearance. It is also thought that it will facilitate the ordinary action of tanning materials in its action upon the gelatin and in preventing souring of the bark liquors, which produces gallic acid that works a hindrance to the tanning process.

Its employment is specially advantageous in the preparation of skins for gloves, and in the preparation of parchment, vellums, gold beater's skins, strings for musical instruments, etc.

It has also been found of great advantage in the preparation of dyes, inks, perfumery, etc.

The full value of this most important product is still far from being fully known. Mr. Wagner and other scientific investigators are continuing their researches, and will no doubt continue for a long time to come to announce further applications of this acid in chemical arts and in manufactures.

The New Metal, Gallium, and its Salts.

M. Lecoq, in a communication to the French Academy, states that he has succeeded in obtaining the metal gallium and its salts in a tolerably pure condition.

When deposited by electric action, gallium forms a very adherent layer; it is hard; it is polished with difficulty by friction with an agate brush. The metal thus acquires great brightness, and appears whiter than platinum. When the electric current and the relative dimensions of the electrodes are properly regulated, the gallium presents a beautiful dull surface of silvery white, finely granulated, and interspersed with small brilliant points, which the microscope shows to be crystals.

Gallium, deposited on a platinum plate, is not much oxidized during washing in cold or boiling water, nor on being dried in free air raised to about 200°. It decomposes water acidulated with hydrochloric acid in the cold state, and more rapidly in hot state, with a brisk liberation of hydrogen.

Notwithstanding the undoubted rarity of this new metal, close researches seem to indicate that it exists in small quantities in nearly all blends. The extreme sensibility of its spectral action is liable to lead to an over-estimate of its quantity.

M. Lecoq, after enumerating the actions and proportions of the various salts of gallium, adds: "If there is no error as to the nature of alum of gallium, the existence of this salt fixes the atomicity of the new element, and attributes to its oxide the same chemical functions as that of alumina. The oxide of gallium, then, will be written Ga₂O₃."

LOCOMOTIVES WITHOUT STEAM DOMES.—A correspondent of the *Scientific American* says: "The Boston and Albany railway company has some 240 locomotives, most of which have no steam domes; and if you ask the men who handle these engines how they carry their water, they will tell you that no engines work drier steam or less water than they do, under all circumstances. It is well known that much of the track of this line, on the mountain slope between Westfield and Washington, lays on a grade of 83 feet per mile. Steam domes are not only expensive, but are a decided injury to a boiler, and if locomotives work as well, they are certainly much better without them. This company is continually building locomotives without domes, which seems to be the best evidence possible that they are as useless as a steeple to a church." The journal from which we quote remarks upon the above: "There are many locomotives which have no steam domes. The celebrated Crampton engine, made in 1847, had none, and gave excellent results. It is usually considered, however, that drier steam is obtained from the top of the dome than from the shell of the boiler."

INVENTION RELATING TO CAR WHEELS.—A recent invention relating to the casting of chilled car wheels consists in constructing the metallic annular chill with annular air chambers at the points of the interior surface of the chill where the outer periphery of the flange of the wheel is formed, and also at the point where the outer horizontal surface of the tread is formed, by means of which the central portion of the tread, which receives the greatest wear, is allowed to harden; but the outer periphery of the flange and the outer surface of the tread are prevented from rapid cooling by the new conducting air chamber, and the metal at these points is molded and preserved in its full strength and tenacity, which is said to be a result to be greatly desired in view of the fact that, while the process of chilling hardens the iron, it greatly impairs its tenacity and strength.

A **PASSENGER** locomotive is being built in the machine-shop of the Philadelphia & Reading railroad company, at Reading, Pa., for exhibition at the Centennial. It is to be entirely the work of apprentices.

PACIFIC MAIL STEAMSHIP CO.

New York to San Francisco, via Panama.

RATES OF PASSAGE.



STEERAGE, CURRENCY.

CABIN, CURRENCY.

The Rates include the transit of the Isthmus of Panama via *Panama Railroad*. Also, Bedding, Board and all necessaries for the voyage. An experienced Surgeon is on each ship, and no charge is made for medicines or medical attendance.

Steamers leave New York every Saturday at 12 o'clock, Noon, AND MAKE THE TRIP TO SAN FRANCISCO IN THREE WEEKS.

This Route offers Special Inducements to EMIGRANTS, who will avoid the delays, discomfort and expense of the tedious trip overland by rail.

THE STEAMERS OF THIS LINE CONNECT AT NEW YORK WITH ALL THE TRANS-ATLANTIC LINES FROM EUROPE

Also at the Isthmus of Panama with Steamers of the Hamburg American Packet Company, from Hamburg and Havre, The Royal Mail Steam Packet Company, from Southampton, The West India and Pacific Steamship Company, from Liverpool, And the General Trans-Atlantic Company, from St. Nazaire.

All information regarding Through Rates of Passage, can be obtained from the Agents of the above Lines at any port in Europe, from whom Through Passage Tickets can be purchased.

THE OFFICE OF THE PACIFIC MAIL STEAMSHIP COMPANY, IN NEW YORK, IS ON THE WHARF, PIER 42 NORTH RIVER, FOOT OF CANAL STREET.

ROBERTS & CO. STEEL CASE HARDENED SET MACHINE AND GEAR SCREWS QUALITY AND FINISH UNSURPASSED. 7 & 9 S. JEFFERSON ST. CHICAGO

R. J. Trumbull, Dealer in and Grower of

SEEDS OF VEGETABLES, TREES, FLOWERS, Shrubs, BULBS, Etc.

For the GARDEN, FARM, and MANSION, 427 Sansome Street, San Francisco. Send a descriptive Catalogue on application.

PAPER WAREHOUSE. BLANK BOOKS & STATIONERY. Nos. 227, 229 and 231 Sansome Street, SA FRANCISCO.

Save \$35.00! PAY \$80.00! THE NEW IMPROVED HOME SHUTTLE Sewing Machine. PRICE, \$45.00. WE ALSO SELL The Home Sewing Machine. These machines use a shuttle, straight needle, and make the Lock Stitch. They are surpassed by none. They are the simplest and lightest-running machines in the world. Send for circulars. Mme. Demorest Reliable Patterns. SEND FOR A CATALOGUE. Royal Charts, \$2.50. E. W. HAINES, Agent, 17 New Montgomery Street (Grand Hotel Building), San Francisco.

Pelton's Six-Fold Horse Power. Having made new arrangements with Mr. McKenzie, I am prepared to supply my powers to all persons favoring me with their orders. All powers hereafter manufactured can only be obtained of me or my agents. In future they will be made under my directions and specifications, and nothing but a prime quality Machinery Iron will be used in their manufacture. I have greatly improved the application and bracing—my Levers—which will give them ample strength. All powers fully warranted. For further information, send for Circulars and Price List to Address, S. PELTON, Patentee, Salem, Oregon.

Scientific Press ENGRAVING COMPANY. OFFICE OF THE Engraving and Scientific Press, 224 Sansome St., San Francisco, CAL. MACHINERY, BUILDINGS, PORTRAITS, LANDSCAPES, TRADE-MARKS, LABELS, SEALS, MONOGRAMS, etc. DESIGNED AND ENGRAVED IN THE HIGHEST STYLE OF THE ART. E. SCHULTZE, MANAGER. DEWEY & CO., Publishers and Patent Agents.

VICK'S FLORAL GUIDE 1875. Published Quarterly. JANUARY NUMBER just issued, and contains over 100 PLANTS, 500 ILLUSTRATIONS, and more than 500 of our best Flowers and Vegetables, with Directions for Culture, COLORED PLATES, etc. The most useful and elegant work of the kind in the world—Only 25 cents for the year. Published in English and German. Address JAMES VICK, Rochester, N. Y.

BOWDITCH'S FLOWER GARDEN. I will send 12 Flowering Plants for One Dollar (your choice from 100 sorts), by MAIL OR EXPRESS. MY ILLUSTRATED CATALOGUE, SEED describes the culture of Plants & Seeds, in customers free; where, the Address W. E. BOWDITCH, 645 Warren St., Boston, Mass. Dewey & Co. (224 Sansome St.) Patent Agts.