

Salicylic Acid in the Household.

Dr. Von Heyden gives the following directions for using this newly introduced antiseptic in the preservation of food, and for other purposes in domestic economy:

1. Raw meat: It frequently happens, especially in the warm season, that meat which is otherwise faultless emits an unpleasant smell on boiling. This is often the case with certain kinds of meat, like tongues, etc., which contain readily decomposing particles of fat and blood. This is easily remedied by laying the meat, before cooking, in warm water which contains from half to one teaspoonful of salicylic acid to the quart; or by putting a little acid in the water in which it is boiled.

To protect meat from spoiling for a few days either of the following methods may be employed: Place it in water containing from $\frac{1}{2}$ to 1 teaspoonful of acid in a quart of water; or rub it with dry salicylic acid, especially near the bone and fat. The manner of keeping it, as well as the previous cleansing, is as usual. Although raw meat, when treated with salicylic acid, loses its fine red color on the surface, it suffers no change within. The meat also cooks soft in a short time. It is also advantageous to add $\frac{1}{2}$ teaspoonful of the acid to a quart of brine used in pickling meats.

2. Pure cow's milk: The addition of $\frac{1}{2}$ to 1 teaspoonful to a quart (or about $\frac{1}{2}$ to 1 gramme *per liter*) of dry crystallized acid—not in aqueous solution—prevents curdling for 36 hours longer than otherwise, and yet it retains the property of yielding cream and butter perfectly.

3. Butter: If butter be worked with water containing one teaspoonful of acid to the quart, and kept in such water, or packed in cloths soaked in an aqueous solution of the acid, it keeps much longer. Even butter which has begun to be rancid can be improved by carefully washing with salicylic water, 2 or 3 teaspoonfuls to the quart, and washing in clean water.

4. Preserved fruits: Cherries, currants, raspberries, plums, apricots, and peaches may, as experience has proved, be very advantageously treated in the following manner: The fruit is placed in a preserve jar, with not a very wide mouth, layers of fruit alternating with layers of sugar, but no water; and strewing over it a pinch of salicylic acid ($\frac{1}{2}$ gramme to the kilogramme, or $3\frac{1}{2}$ grains to the lb.), and covering the jar with parchment paper which has been softened in salicylic acid solution, and then boiling as usual in a water bath. Bilberries, or blueberries, are better boiled without sugar, allowed to cool, and put into narrow-mouthed bottles (some crystals of salicylic acid being strewed over them), corked and sealed. Fruit preserved in this way has kept well for two seasons. Others have recommended covering the fruit in the jar with a close-fitting strip of blotting paper, which has been saturated with a solution of salicylic acid in rum.

For cucumber pickles, and those put up with vinegar and sugar, a corresponding process is recommended; the acid being boiled in the vinegar, and when cold poured over the pickles. For salted cucumbers, salicylic acid is put in the water during the boiling ($\frac{1}{2}$ to 1 teaspoonful to 1 quart), and otherwise treated as usual. It is also recommended to sprinkle salicylic acid in the barrel on the surface of the pickles.

5. Boiled vegetables: An equally small amount of dry salicylic acid may be added to these to prevent their spoiling.

6. For disinfecting and purifying the air and walls of closed rooms, salicylic acid may be evaporated on a hot sheet of iron or tin.

7. Vessels, corks, etc., which have a disagreeable odor or taste, will be rendered perfectly sweet by washing with a solution of salicylic acid, a fact that deserves special attention.

The best method of preparing these salicylic acid solutions is to put 2 or 3 teaspoonfuls of acid in a quart of water, heat rapidly to boiling, and let cool. What separates on cooling is an excess of pure acid, which may be kept for subsequent use, or it may be well stirred up and used in suspension when more of the acid is wanted than will go into solution.

In this connection we may add that the purest form of salicylic acid is that obtained by dialysis, as it is impossible to remove all the tarry and resinous matter by recrystallization.

What's in a Name?

We recently published a description of an ingenious lantern improvement by President Henry Morton, of the Stevens Institute, which was reproduced by the *English Mechanic* as the discovery of Mr. Henry Norton. We also described the new resonant alloy invented by Professor Silliman, of Yale College, which our cotemporary also publishes, but credits the invention to Mr. Lilliman, of New Haven, Conn.

An Improved Indian Ink.

Most of the black Indian ink met with in commerce possess this disadvantage, that it blots when a damp is brush passed over it; or, as draughtsmen say, "it does not stand." The addition of alum does but little good; but G. Reisenbichler states that bichromate of potash accomplishes the object by rendering insoluble the glue which the ink contains, and thus making the ink permanent. Such an ink Reisenbichler calls "Hartusche," or "hard Indian ink." The bichromate of potash is not colorless; on the contrary, it possesses a deep yellow (almost red) color, but does not at all injure the shade of the ink, as 1 per cent. of it in a very fine powder, intimately mixed with the ink, which has already been mixed with glue and dried again, is sufficient. The salt must always

be mixed with the ink in a dry state; otherwise the ink might lose its friability in water.

A drawing which has been made with this ink in the dark, or by artificial light, must be exposed to sunlight for a few minutes, which renders the bichromated glue insoluble in water. Draughtsmen who cannot provide themselves with such ink make use of a dilute solution of bichromate of potash in rubbing up the ink. There is no danger of the yellow salt penetrating the paper, if the ink is thick enough.

DYEING DEEP ROSE.—This color is dyed in the beck in which cochineal reds have been dyed, adding, for 22 lbs. material, $10\frac{1}{2}$ ozs. oxalic acid, $5\frac{1}{2}$ ozs. tin crystals, and $3\frac{1}{2}$ ozs. cochineal. Boil up, cool, and dye boiling for 30 minutes.

Inventions Patented in England by Americans.

From October 24 to November 20, 1876, inclusive.

ATTACHING GEAR WHEELS.—B. T. Taylor *et al.*, Fall River, Mass.
BALE TIE, ETC.—W. B. Hayden, Columbus, Ohio.
CAR COUPLING.—G. H. Aves, Adrian, Mich.
CAR LAMP.—A. H. Phillippi *et al.*, Reading, Pa.
CASTOR.—L. P. Lawrence, Port Morris, N. J.
EGG BOX.—A. H. Lucas *et al.*, St. Louis, Mo.
ELECTRIC LIGHT BUOY.—P. E. Smith, Scotland Neck, N. C.
ELEVATOR.—B. H. Davis, Foxcroft, Me.
FEEDING PAPER TO PRESSES, ETC.—H. W. Covert, New York city.
FIRE EXTINGUISHER.—H. Conant, Pawtucket, R. I.
GRAIN SCOURER.—The Barnard and Leas Company, Moline, Ill.
IRONING TABLE.—L. P. Lawrence, Port Morris, N. J.
JAB, ETC.—A. Montgomery, New York city.
LAYING PIPES, ETC.—A. O'Neill, Baltimore, Md.
MAGNETIC ENGINE.—E. Weston, Newark, N. J.
MAKING GAS, ETC.—I. D. Bradley, Preston, Md.
MATCH FRAME.—E. B. Beecher, New Haven, Conn.
MOWER AND REAPER.—S. Sweet, Dansville, N. Y.
NAIL FEEDING MACHINE.—J. C. Gould, N. J.
OPENING CANS, ETC.—Meyer *et al.*, New York city.
OPENING CANS, ETC.—S. Poole, Boston, Mass.
PACKING BAGS, ETC.—H. L. Mattison, Oswego, N. Y.
PAPER BAG MACHINE.—E. Stanley *et al.*, Brooklyn.
PERFORATING PAPER.—W. Braidwood *et al.*, Mount Vernon, N. Y.
PIPE JOINT.—A. O'Neill, Baltimore, Md.
PIPE MACHINERY.—J. B. Root, New York city. Three patents.
POTATO DIGGER.—L. A. Aspinwall (of Albany, N. Y.), London, England.
PREPARING WOOD.—N. Wheeler, Bridgeport, Conn.
PRESSING SUGAR.—T. L. Wadsworth, San Francisco, Cal.
PULLEY, ETC.—A. A. Hall *et al.*, Nashville, Tenn.
RAILWAY RAIL.—J. T. Clark, Augusta, Ga.
RAISING WATER.—J. A. Ayres, Hartford, Conn.
RIBBON WIRE, ETC.—J. Fettes, New York city.
SCREW CUTTING.—S. W. Martin, Springfield, Ohio.
SETTING SPRINGS, ETC.—J. S. Passenger *et al.*, Birmingham, Conn.
SHEET METAL PIPES, ETC.—F. Heltge *et al.*, Cincinnati, Ohio.
SHOVEL.—H. W. Shepard *et al.*, Brooklyn, N. Y.
SMOKE CONSUMING FURNACE.—C. B. Bryant *et al.*, Stoneham, Mass.
SPEED GOVERNOR.—G. Westnighouse, Jr., Pittsburgh, Pa.
SPRAY APPARATUS.—M. A. Lake *et al.*, Chicago, Ill.
STEAM BOILER, ETC.—J. B. Herreshoff *et al.*, Bristol, R. I.
STORING FUEL, ETC.—E. R. Kerr, Kewanee, Ill.
SUGAR MAKING, ETC.—E. A. Corbin *et al.*, Philadelphia, Pa.
TREATING EXTRACTS, ETC.—W. Adamson, Philadelphia, Pa.
WIRE FENCE, ETC.—W. D. Hunt, Scott, N. Y.
WORKING HIDES, ETC.—A. Fitzhenry, Somerville, Mass.

Recent American and Foreign Patents.**NEW MECHANICAL AND ENGINEERING INVENTIONS.****IMPROVED COTTON GIN FEEDER AND PICKER.**

William T. Adams, Rienzi, Miss.—Cotton to be operated upon is placed on an apron, when it is carried forward to the picker, the apron being moved by a crank. The picker being revolved by a belt from the gin, acts upon the cotton as it comes over the roller and delivers it to the gin. The rapidity with which the cotton is fed into the machine may be varied. The picker cylinder has forked and curved teeth.

IMPROVED TIRE UPSETTER.

Morris W. Griffiths, Middle Granville, N. Y.—In using the machine the part of the tire to be upset is heated and is bent inward over the horn of an anvil, more or less, according as the tire is to be shortened. The bent part is then placed upon a plate, and is clamped by rough faced eccentrics. The bend is then hammered out of the tire, when the latter will be shortened.

PULVERIZED FUEL FEEDER FOR SMELTING FURNACES.

William West, of Golden City, assignor of one half his right to Ira S. Elkins, of Denver, Col. Ter.—This is a contrivance for feeding smelting furnaces with coal dust by means of the air blast. A screw conveyor feeds the dust into tubes, from which it drops through the funnel-mouthed pipes into the large blast pipes upon nozzles through which the blasts escape and force it into the furnace.

IMPROVED BOOT AND SHOE CRIMPING APPARATUS.

Henry Lampus, Enon Valley, Pa.—The leather to be crimped is placed under a plate, and it is forced down between other plates by a screw, the distance between the plates being adjustable. The form of the plates not only causes the leather to crimp smoothly and evenly without wrinkles, but the boot made of an upper crimped on this machine is claimed to be not liable to wrinkle in the instep, and is more comfortable to wear than those crimped in the usual way.

IMPROVED LABELING MACHINE.

Jonathan Bigelow, Boston, Mass.—This invention is an improvement in that class of labelling machines or apparatus in which the paste and label are applied to the can as it rolls down an inclined plane, of which the paste bed and label holder form a part. The invention relates to several features for improvement, for which reference must be made to the patent.

NEW MISCELLANEOUS INVENTIONS.**IMPROVED FIRE EXTINGUISHER.**

Amzi S. Dodd and Isaac C. Andrews, New York city, assignors to Home Fire Extinguisher Company, of same place.—A bottle containing part of the gas generating ingredients is held in a cage in the upper part of the can, and so disposed that, by screwing down a stem which is attached to a bell which rests above the bottle, the latter is forced down on a projection on the bottom of the cage and broken. The construction is such that it is impossible to break a charged bottle when adjusting it, from forgetting to raise the breaking devices. The second invention consists in ribs formed upon the inner sides of the bars of the cage to receive the ring rib formed upon the outer surface of the bottle, and support said bottle; and in the combination of a stopper with the stem and the bell in such a way that the bottle may drop away from said stopper when forced down through the cage.

IMPROVED PACKAGE BAND.

Owen I. Taylor and Thomas H. Patterson, Saginaw, Mich.—This package band consists of a connecting plate, with two elastic bands attached to

it at right angles to each other. The bands hook to the connecting plate after passing around the package in opposite directions.

IMPROVED APPARATUS FOR HANDLING HORSES.

William W. Winegar, Chambersburg, Ill.—This consists of a couple of upright crotches, together with cords and a tightening device therefor, mounted on a cranked axle of a pair of wheels, in such manner that, by adjusting the axle fore and aft under the body and between the legs of the animal, the cords may be arranged so as to confine him in a web in which he can be turned over on side or back, and can be moved about readily on the wheels.

IMPROVED PEW HAT HOLDER.

William H. Hampton, Luray, Va.—This invention consists in applying to the back of pews a wire holder that is capable, by a rotary movement, of placing a gentleman's hat under the seat in front, the hat being thus both out of the way and not at all liable to become soiled or injured. Patented April 18, 1876. See advertisement on another page.

IMPROVED PEA-NUT HEATER.

Jean Espito, New York city.—This consists of a top receptacle with a hinged cover, surrounded at the sides and bottom with a water chamber that is heated by a charcoal furnace in the base or supporting chamber. The charcoal furnace provides the steady heat required for heating the water bath, which again imparts the required heat to the pea-nuts without wilting, browning, or parching the same. They may thereby be kept in the heater for considerable time, and be sold at any moment in a fresh and heated state.

IMPROVED PROCESS OF MAKING BIRCH BEER.

Harvey Decker, Jersey City, N. J.—This process is for making beer from ground birch bark, and it consists in first extracting the strength thereof in hops and water without boiling; secondly, fermenting the liquor obtained with yeast; and, thirdly, in adding malt and sugar, the latter having been previously made to absorb oil of wintergreen.

IMPROVED LIQUID FILTER.

William Maynard, New York city.—This is a combination of the partitions and the screens with each other, and with a case to form a series of filtering and conducting spaces for the passage of the liquid. The construction is such as to enable the apparatus to be quickly and thoroughly cleaned.

IMPROVED STONE PAVEMENT.

John Murphy, Columbus, O.—This consists in laying blocks of stone with interspaces, filled with a composition consisting of pulverized slag, coal tar, fresh lime, sand, and pitch. A pavement laid in this manner is said to be impervious to water and is not acted upon by frost. The composition, being in a measure elastic, renders the pavement easy to travel on, and it also deadens the sound of vehicles passing over it.

COMBINED PENCIL SHARPENER, PROTECTOR AND ERASER.

Andrew Wilson, Providence, R. I.—This is a casting which resembles a human hand grasping a cone, and having the index finger extended. The cone is hollow, and has a section removed from one side. In one edge a knife is secured, for the purpose of sharpening the pencil. The lower end of the cone holds a rounded rubber eraser. The index finger is widened, and in it is secured a knife. The portion of the blade near the cone is made concave for cutting twine. The outer end is intended for cutting paper of different thicknesses. The arm of the casting is bored and threaded for receiving the point of the pencil, which it protects.

NEW WOODWORKING AND HOUSE AND CARRIAGE BUILDING INVENTIONS.**IMPROVED SPRING HINGE.**

Lorenz Bommer, Brooklyn, N. Y.—A flange or wing plate is cast in one piece with the ornamental top and bottom buttons of the hinge, and has a fixed pintle socket and detachable top socket, both provided with annular recesses. This dispenses with the separate casting, finishing, and attaching of the buttons, and imparts, by the greater bearing surface on the pintle, a more rigid connection with less friction on the faces or bearings of the seats.

IMPROVED WAGON BRAKE LEVER.

David McGuire, New Gordon, Mo.—This consists in the arrangement of a jointed lever for operating the brake connected with a pawl, that engages with rounded ratchet teeth on a curved bar attached to the side of the wagon. The pull of the brake rod on one part of the lever locks the pawl in the curved bar. The lever automatically unlocks the pawl when it is moved to relieve the brakes.

NEW AGRICULTURAL INVENTIONS.**IMPROVED GATE.**

William G. Hughes, Columbia City, Ind.—When the gate is closed its forward end enters the space between the two posts. The latch is placed across this space so that it may engage upon a catch and fasten the gate. By operating a lever a latch may be raised to unfasten the gate.

IMPROVED FEED TROUGH.

James H. Grundy and Thomas H. Carter, Bremen, Ky.—This trough is so constructed as to prevent fowls or other animals than those being fed from having access to the grain, and to prevent the animals being fed from wasting their food by throwing it out of the trough. It is provided with a cover sliding longitudinally, in which is a hole to receive the animal's nose. The cover is provided with suitable stops to limit its movements.

NEW HOUSEHOLD INVENTIONS.**IMPROVED WEATHER STRIP.**

John C. Fiester, Reading, Pa., assignor to himself and Jacob Schaeber, of same place.—This weather strip is made from two pieces of wood, one of which is fixed to the door and the other joined to it by a rule joint. Hinge plates are provided at each end and also springs for throwing the removable part down on the door sill. A spring bolt catches and retains the strip as it is raised by passing over the threshold, and is tripped by contact with the door casing as the door is closed.

IMPROVED PADLOCK.

Antho O. Kruger, Rock Harbor, Mich.—This consists of a pawl connected to the bolt and so held by a spring that it must be pushed by a thumb piece into the path of the key before the latter will engage it, so as to throw back the bolt. The thumb piece is locked by a spring pin inside of the lock, so that it cannot be moved until the spring pin is drawn out by the key. The invention also consists of a secondary bolt, to be worked by a key hole plate and a stud on it, which engages the bolt by a pawl, so as to swing into and out of the position to be engaged with the keyhole plate stud, which must itself be adjusted to a certain position to receive the pawl.

IMPROVED SCREW TAP.

Josiah W. Melvin, Houston, Texas.—This is an expanding tap or reamer having cutters placed in slots in the tapering portion of a mandrel, in which they are capable of being moved longitudinally. They are clamped by a thimble and nut upon the outer side, and a clamping bolt running through the mandrel.

IMPROVED SCREW PROPELLER.

Frank Maynard, North Dorset, Vt.—This is a motor for the propulsion of canal boats. It consists in arranging upon radial arms screw blades that extend inward from the circumference of the wheel through one half or less of the distance from the periphery of the shaft, and in making them of the same pitch at the inner and outer edges. The hoop that surrounds the wheel, as well as the peculiar construction of the hull, it is claimed to throw the water in a line parallel with the shaft.

Artificial Butter.

To the Editor of the Scientific American:

Owing to the receipt of much correspondence concerning my article on artificial butter, which appeared in the SCIENTIFIC AMERICAN SUPPLEMENT, N. Y., Nos. 48 and 49, I wish to state that I own no patent on the process. The only patent held is Mage's, which is owned by the United States Dairy Company, 6 New Churchstreet. All letters, therefore, should be forwarded to that address. The process I described in my article is simply an elaboration of that patented by Mage, and cannot be used without infringing on the United States Dairy Company's patent. HENRY A. MOTT, JR., E. M., PH. D. New York City.

Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion. If the Notice exceeds four lines, One Dollar and a Half per line will be charged.

All the best recipes published in SCIENTIFIC AMERICAN for several years back, are in "Wrinkle's and Recipes." Price \$1.50, postpaid. Book and SCIENTIFIC AMERICAN for 1877, for \$4.20. H. N. MUNN, Publisher, 37 Park Row.

Agricultural Implements and Industrial Machinery for export and domestic use. R. H. Allen & Co., N. Y.

Machine to Straighten Iron Piping and Shafting wanted. Thompson & Hart, Lake City, Fla.

Patent For Sale.—Twine Cutter, Letter Opener, and stamp moisture combined. Address Jno. Eitel, Sac., Cal.

Skinner Portable Engine Improved, 2 1-2 to 10 H. P. Skinner & Wood, Erie, Pa.

For Sale—A Patent, a novelty, an article of manufacture of undoubted merit and value in the hardware line. Apply to J. W. D. Eckles, Harmony Grove, Ga.

Wanted—To sell or lease patent on novel, cheap, indispensable, very practical article; jewelry line. Pat. October, 1876. Address M. P. Bowman, Youngstown, O.

Power & Foot Presses, Ferracute Co., Bridgeton, N. J.

Magic Lantern and Stereopticons for Parlor Entertainments and Public Exhibitions. Pays well on small capital. 4 page catalogue free. Centennial Medal and Diploma awarded. McAllister, 49 Nassau St., N. Y.

See Bault's Paneling, Moulding, and Dovetailing Machine at Centennial, B. 8-55. Send for pamphlet and sample of work. B. C. Mach'y Co., Battle Creek, Mich.

Wanted—Novel and practical invention, by a reliable house, for manufacturing. Address Post Office, Box 76, Chillicothe, Ohio.

Hyatt & Co.'s Varnishes and Japans, as to price, color, purity, and durability, are cheaper by comparison than any other extant. 216 Grand st., N. Y. Factory, Newark, N. J. Send for circular and descriptive price list.

Split-Pulleys and Split-Collars of same price, strength and appearance as Whole-Pulleys and Whole-Collars. Yocom & Son, Drinker st., below 147 North Second st., Philadelphia, Pa.

Excelsior Dry Level. Highest premium awarded. Patent for sale for the United States or for a single State. For particulars apply to H. S. Farr & Son, 710 Green st., Philadelphia, Pa.

Safety Hoses for Factories and other buildings. Light, cheap, durable. Greene, Tweed & Co., 18 Park Place, N. Y.

To avoid disappointment, order Yachts, Engines, etc., of Wm. J. Sanderson, Syracuse, N. Y.

Cotton Planters and Oil Mills make Millions with D. Kahnweller's Cotton Seed Huller. 120 Centre st., N. Y.

Wanted to Exchange.—A Merrick Hammer for a Root Blower. Address Wm. Moore, Portsmouth, O.

Chester Steel Castings Co. make castings twice as strong as malleable iron castings, at about the same price. See their advertisement, page 29.

Superior Lace Leather, all sizes, cheap. Hooks and Couplings for flat and round Belts. Send for catalogue. C. W. Army, 148 North 3d St., Philadelphia, Pa.

F. C. Beach & Co., makers of the Tom Thumb Telegraph and other electrical machines, have removed to 530 Water St., N. Y.

For Best Presses, Dies, and Fruit Can Tools, Bliss & Williams, cor. of Plymouth and Jay Sts., Brooklyn, N. Y.

Water, Gas, and Steam Pipe, Wrought Iron. Send for prices. Bailey, Farrell & Co., Pittsburgh, Pa.

Diamond Tools—J. Dickinson, 64 Nassau St., N. Y.

Hydraulic Presses and Jacks, new and second hand. Lathes and Machinery for Polishing and Buffing metals. E. Lyon, 470 Grand St., N. Y.

Solid Emery Vulcanite Wheels—The Solid Original Emery Wheel—other kinds imitations and inferior. Caution—Our name is stamped in full on all our best Standard Belting, Packing, and Hose. Buy that only. The best is the cheapest. New York Belting and Packing Company, 37 and 38 Park Row, New York.

Steel Castings from one lb. to five thousand lbs. Invaluable for strength and durability. Circulars free. Pittsburgh Steel Casting Co., Pittsburgh, Pa.

M. Shaw, Manufacturer of Insulated Wire for galvanic and telegraph purposes, &c., 259 W. 27th St., N. Y.

Shingle, Heading, and Stave Machine. See advertisement of Trevor & Co., Lockport, N. Y.

For Solid Wrought-iron Beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, etc.

Boiler Shop—now running, for rent low, to a competent man. Address Machinist, Baltimore, Md.

R. H. Norris & Co., Paterson, N. J., Steam Gauge Manufacturers; also Steam and Hydraulic Gauges of any make or pattern repaired.

Articles in Light Metal Work, Fine Castings in Brass, Malleable Iron, &c., Japanning, Tinning, Galvanizing. Welles Specialty Works, Chicago, Ill.

The "Triumph" is the Best Scroll Saw for Amateurs. Send stamp for Circular to A. W. Morton, 22 Platt St., N. Y.

Wanted—A man that thoroughly understands the Galvanizing of sheet iron, etc. None but first class men need apply. Address with references, P. O. Box 909, Montreal, Canada.

Boosey's Cheap Music and Music Books. Full Catalogues free by mail. Boosey & Co., 32 East 14th St., New York.

Notes & Queries

A. F. will find a recipe for a cement for china on p. 346, vol. 24.—N. T. will find directions for making silicate of soda on p. 225, vol. 23.—F. N. will find directions for getting rid of flesh worms on p. 233, vol. 31.—J. C. will find directions for making laundry bluing on p. 219, vol. 31.—H. T., J. K., B. L., J. H., T. W., J. D., W. R., and others who ask us to recommend books on industrial and scientific subjects, should address the booksellers who advertise in our columns, all of whom are trustworthy firms, for catalogues.

(1) F. W. C. says: I wish to convey hot water 1,000 feet from the heater through an iron pipe. Must the return or circulation pipe be as large as the supply, in order to keep the water hot at the terminus of supply? A. Yes.

1. I notice that in the vacuum chamber of a cold water pump, the water does not fill the chamber. What is it above the water, air or vacuum? A. It is air, and the pump does not draw it off because it is at a higher level. 2. Will the vacuum gauge work as well attached to the bottom? A. The gauge may be placed in any desired position.

(2) F. McL. asks: Is there any instrument by the aid of which a person can see the interior of his own eye? A. We know of none.

(3) C. H. H. asks: In regard to the water wheels at Fairmount Water Works, Philadelphia, does the water, or part of it, after being forced up, run back and act as power to raise more water? A. No.

(4) R. S. says: I have a floor made of alternate strips of black walnut and ash. I have great trouble in keeping it clean; in fact, it never really looks clean except immediately after washing. I have oiled it several times with boiled linseed oil, but it collects and holds the dust too much wherever any one walks. Under pianofortes, etc., it retains its brightness and beauty. What is the best substance or oil for me to use? A. Procure a liquid wax at your house painters; this is often applied for this purpose.

(5) A. says: Given a cast iron tank bolted together watertight, and intended to hold pure water. With what shall the inside be painted or covered, in order to effectually prevent rust? The required preparation must be inexpensive and be applied in liquid form. Nothing that will contaminate the water or dissolve, even slowly, will answer, a perfectly waterproof and innocuous preparation is the desideratum. A. Asbestos paint would probably fill most of the conditions required.

(6) A. M. H. says: The four chimneys of my three story brick dwelling did not draw well. This I attributed to the surrounding trees and houses, both of which are considerably higher than my dwelling, and although I had the chimneys well cleaned out to satisfy myself that there was no obstruction in them, I found a good and sufficient remedy only in placing upon each an iron pipe 8 feet high by 7/8 inches in diameter. I had the pipes made of galvanized sheet iron and strongly fastened with 1/2 inch iron rods. But a little while ago, after a two years' use of the pipes, the whole four pipes were swept away by the wind and broken into pieces as if they were pasteboard. Upon examination the pipes appeared to have been almost entirely rusted or eaten away from the inside, while upon the outside they were but a little discolored with rust. Why did they first go from the inside, and is there not some kind of durable paint or covering, not too brittle, that will prevent this? A. The soot upon the inside of the pipes develops an acid which assists in corroding the iron. The only satisfactory remedy is the extension of the brick chimney itself to the height required, and securing the same with iron braces.

(7) J. H. L. says: I claim that water is elastic and can be compressed. A friend claims that water is not elastic. A. Water is slightly compressible.

(8) N. A. asks: Will a fan, such as is used to make blast for melting iron, make more blast by having eight arms or wings than if there are but four? A. It would not necessarily be more effective with eight arms. It would be quite possible to build a fan of four vanes which was more effective than one having eight, and vice versa, on account of other considerations.

(9) E. L. asks: Can we change our mill, now driven by three wheels with direct gear, by transmitting power from wheels to one main shaft with quarter twist, and from this shaft with quarter twist to spindles? If the wheels will drive steadily, without any reaction, shall we lose any power by the indirect transmission? A. We think there will be no difficulty in making this change. As, however, you will have two belts and shafts to drive, in addition to the other gearing, the useful effect of your engine will be somewhat diminished.

(10) W. A. C. asks: Do you know of any steam boiler in this country built expressly to use salt water, and if so, has it proved a success? A. All marine boilers may properly be classed under this head. Such boilers are successful as long as they are kept reasonably free from scale. For land boilers, those of the cylindrical form have many advantages, when salt water is to be used, as they can be easily and quickly cleaned.

(11) F. G. asks: How much power will it take to force an inch stream of water through iron pipe 75 rods up a gradual rise or 75 feet, and what kind of pump would you recommend? A. Your question is rather indefinite, for almost any amount of power might be required to force water through the pipe, according to the velocity. We never recommend special manufactures in these columns.

(12) R. S. M. says: I want to run a cotton gin and press at a distance of 200 feet from my mill. Which is best, a shaft on ground, or wire rope? A. Either plan will answer very well, and we advise you to employ the one that you can arrange most cheaply.

(13) G. & B. ask: Has the ocean tide ever been used as a motor for driving machinery, otherwise than by water wheels driven by currents, or by the aid of dams and floodgates? A. We have read of propositions to this effect, but do not know of any that have been carried into practice.

(14) J. F. J. asks: How is the level of the sea (I mean the point a surveyor takes in saying that such a place is so far above the level of the sea) obtained? A. Just by taking it. For instance, if the surveyor notes that, at mean low tide, a given reference mark is at a certain elevation above the surface of the water, that becomes fixed, and all elevations can then be referred to mean sea level at any time—without a direct observation—by referring them to the fixed mark, and making the necessary correction.

(15) D. S. says: I am getting a small vertical steam boiler made from No. 20 galvanized sheet iron, I intend to put it on top of a box stove over the pipe hole with a 6 inch flue (that being the size of the pipe). The size of the boiler is 14 x 24 inches, and there will be 4 inches space for water between flue and shell. How much pressure will such a boiler stand? Will the flue stand as much as the shell, or will it collapse? A. The flue is somewhat weaker than the shell. You can carry about 15 lbs. steam. 2. Is there not a way to find the pressure of steam with the safety valve? A. If you buy a safety valve from a reliable maker, you will find it graduated with tolerable accuracy, so that the fall can be adjusted without any calculation. It is not a bad plan, however, to verify the graduation. You will find the manner of doing this fully explained in "Wrinkles and Recipes."

(16) T. M. says: You give Dr. Ferrier's remedy for cold in the head. How often should it be used as snuff? A. If the ailment is really a cold, one application of the preparation will be all that is necessary. It is not advisable to use it constantly for every ache or where neuralgia is suspected.

(17) S. W. asks: Can you tell me how to separate gold from iron when the two are mixed? A. Dissolve the gold in warm aqua regia (1 part nitric to 3 parts hydrochloric acid), evaporate nearly to dryness, redissolve in water, and add an excess of strong aqueous solution of sulphate of iron. Boil the liquid and allow to stand in a warm place for an hour. Then decant the clear liquid, gather the precipitate on a filter, wash with hot water, dry, and fuse in a small black lead crucible with a small quantity of anhydrous carbonate of soda. If the directions are closely followed, this will give you a button of the pure metal.

(18) D. asks: What will give a new appearance to old zinc? A. The structure and properties of zinc do not alter by age. You can remove the superficial coating of oxide by means of a little dilute acid and the scratch brush.

(19) W. T. B. asks: Can you give me a recipe for dissolving gutta serena, which is not combustible, and will not cost more than sulphuret of carbon? A. We do not know of such a solvent.

(20) C. E. A. asks: Are wood ashes a benefit to the growth of currant bushes or trees? A. Yes, if not used in excess.

(21) J. P. H. L. says: I have some fine specimens of copper ore. Is there anything that I can put on them that will not change the colors and will prevent their turning green? A. Varnish them with a little purified shellac in alcohol.

(22) W. P. T. says: In answer to H. G. you say that the change of color in hair is due to the loss of the iron salts which are the basis of the dark color. Can the dark brown hair of a young person be prevented from turning white? A. The only remedy that we can suggest is the reinvigoration of the blood by the proper use of animal nourishment and iron tonics. Avoid alcoholic stimulants and do not deprive yourself of needful sleep.

(23) H. L. G. asks: In electroplating, does a current that vibrates do better work than one which does not? A. No.

(24) C. W. W. asks: Of what size and thickness should a boiler be for an engine of 2 1/2 inches diameter of cylinders, and 4 inches length of stroke? A. Make a vertical one, 20 or 24 inches in diameter, and 3 feet high.

(25) G. A. W. says: I wish to build a propeller launch. I am making an engine 5 x 6 inches; how big a boat will it run at 8 miles an hour? How large should the boiler be, and how large a screw will it require? A. You can have a boat 30 feet long, with a boiler 3 feet in diameter and 4 1/2 feet high. Propeller should be 30 inches in diameter and of 3 1/2 to 4 feet pitch.

(26) F. D. W. asks: Is the following proposition correct? "It is a principle of mechanics that a force acting at right angles to the direction in which a body is moving, does no work, although it may continually and continuously alter the direction in which the body moves. No power, no energy is required to deflect a bullet from its path, provided the deflecting force acts always at right angles to that path." A. It might be true, if the conditions stated were possible; but it is evident that, when the body is deflected, its motion will not be at right angles to the deflecting force.

(27) N. asks: What is a good pickle or dip for copper-plated zinc work, to be used before gilding? A. Use very dilute oil of vitriol.

(28) J. G. W. asks: If the true meridian may not be obtained from the sun? A. Not unless you have true time, and know how much the sun is slow or fast.

(29) J. J. G. asks: Does a side wheel steam-boat or propeller draw more water when running than when still? A. Frequently when the boat is in motion the bow is elevated and the stern depressed.

(30) F. C. R. asks: 1. What size of boiler will be large enough to furnish steam for an engine 2 x 4 inches? A. One 20 inches in diameter and 3 feet high. 2. How large a boat will such an engine run at 3 or 4

miles an hour? A. One 15 feet long. 3. What size and pitch of screw will be necessary? A. Use one 18 to 20 inches in diameter and of 3 feet pitch.

(31) H. W. says: In a recent issue of your paper I see that S. N. W. asks who first applied steam power to the propulsion of boats, and is the inventor of steam navigation. You reply "that the Marquis de Jouffroy of France built a steamship some years before Fulton." But Dionis Papin (born August 22, 1647) of Paris, being a Protestant, fled from France after the repeal of the Edict of Nantes and went to England, and from there to Germany, where he was professor at the University of Marburg from 1687 to 1707. During this time he made several inventions, of which the most prominent was the steamship which he built and set to work in Hesse Cassel, on the river Fulda. What has become of the ship is not known.

(32) W. B. F. says: 1. I have an engine of 8 inches bore by 3 1/2 inches stroke, and I would like to know what sized three-bladed propeller I should use, and what horse power of boiler will it take to run a boat with a 25 feet keel, and 8 feet beam, drawing 2 feet of water? A. Use a propeller 24 or 26 inches in diameter, and of 3 feet pitch; and a boiler 28 or 30 inches in diameter and 3 1/2 feet high. 2. What speed would be realized? A. Probably 4 or 5 miles an hour in smooth water. 3. Where could I obtain directions for building such a boat? A. See the directions for building various kinds of boats, in back numbers of the SCIENTIFIC AMERICAN SUPPLEMENT.

(33) G. W. A. says: 1. We are running a 12 x 20 inches engine with a 9 flue boiler 48 inches in diameter by 20 feet long. The flues are 6 inches in diameter, and the stack is 23 inches in diameter and 40 feet high. She seems to have draft enough, but we cannot keep steam on her. We run her at 100 or 120 revolutions per minute, driving two 50-saw gins and two 30-inch burrs. The valve is a common slide valve, set with both ends equal with 1-16 in. lead. What is the matter? A. From your account the boiler should steam well if it is clean. Examine it to see if there is much scale in it, and test the engine to see whether there are any serious leaks. 2. Will a 2 inch shaft 100 feet long run two 50-saw gins and one 80-saw gin? A. It would be better to use a larger shaft. 3. Which runs the lightest, belts or iron cogs for driving burrs? A. More of the power applied is generally utilized by belts than by common gear wheels.

(34) B. S. says: I have made an induction coil (Ruhmkorff's method), 6 inches long and 3 1/2 inches in diameter. I get a spark from the induced current about 1-16 inch in length and a very severe shock. I would like to put on condensers to increase the spark as much as possible. Please tell me the proper number of sheets of tinfoil to use, their shape and size, and also give directions for connecting them in the main circuit from the battery. A. Thirty or forty square feet of foil will be sufficient. The sheets may be of any size and shape. Connect the condenser up so as to bring its opposite sides on each side of the vibrating break, that is, with contact points of break between its two coatings.

(35) J. H. asks: 1. Does nickel-plating cost as much as silver plating? A. Yes. 2. Does it require to be burnished after plating? A. Yes. 3. Does it require a battery as strong as for silver? A. It requires stronger battery power. 4. What is the best work on nickel plating? A. "Electricity; its Theory, Sources, and Applications," gives all the necessary instructions for nickel plating.

(36) J. T. D. says: Three months ago, I could not hold both ends of the wires from a gravity battery of large size (150 cups); now I can hold them for almost any length of time without feeling much current till I have held it for three or four minutes, and then I do not feel enough to make me let them go. The battery was tested with a galvanometer and proved to be as strong as ever. A. Your hands are probably dry and offer very considerable resistance to the current. When the latter has been allowed to flow a short time it starts perspiration and thus reduces the resistance. It is not difficult to take a continuous current from a battery; one can do this easily and retain hold of the terminal, when frequent interruptions of the circuit would be too severe for the majority of persons.

(37) W. T. N. says: I made a battery of three copper plates, 7 x 8 inches, tacked to slats 3/4 inch wide; between these plates were placed two 7 x 8 zincs. The two zincs and the three coppers were then connected with copper slips, and to the combined zincs and the combined coppers were attached the positive and negative wires. The plates were then placed in a common two gallon pail, full of sulphate of copper solution, the slats resting on the edges of the pail. I supposed I had a battery of about 200 inches of zinc surface, and I thought that this ought to produce some signs of magnetization in a bundle of wires (3/4 inch in diameter) in a coil of 180 feet 25 wire, and 600 feet of 35. But it did not, nor would it decompose water. The only sign of electricity was the strong salty-bitter taste on placing the poles on the tongue. What was the trouble? A. One hundred feet of No 16 copper wire will give better results with such a battery than all your wire together. It will take two such batteries to decompose water, and the decomposition would probably stop in 20 or 30 minutes.

(38) A. C. L. says: I want to lay a small lead pipe to bring water into my buildings, from a spring 1,600 feet distant, through hard rock, digging nearly all the way. How can we lay the pipe without going deep as ordinarily, but yet protecting it against any danger of freezing. Our idea is to dig a ditch 2 feet deep, fill it with 6 inches of sawdust then lay the pipe, then fill in over that with 12 inches more of sawdust, and then with the dirt taken from the ditch. Will that answer? How is the best way to construct the well at the spring? A. To give absolute security against freezing in our climate it has been found necessary to lay water pipes five feet below the surface of the ground. In one case the pipes of a good sized city being laid at 3 feet in depth, the water froze and the pipes burst in many places, so that the ground had to be opened again and the pipes re-laid at 5 feet in depth. During some winters the frost penetrates the ground very little, but the pipe must be so laid as to be secure in the severest seasons. It is doubtful if the sawdust filling would save it.