

**Zinc to Bleach Molasses.**

The adulteration of New Orleans molasses with sulphate of zinc is again attracting attention. The same question has been brought before the trade in various forms within the past ten years, but reports from various sections of the country now indicate a more vigorous investigation of the methods being practiced by New Orleans and other shippers. According to a member of the New York trade, nearly 95 per cent of molasses received in this market is adulterated; but, on the other hand, it is explained that it is hard to sell straight goods, and that molasses is brightened so that it will sell more readily. It is denied, however, that the introduction of sulphate of zinc is injurious, and to substantiate this several houses that deal in large quantities of molasses contend that zinc not only brightens the goods, but purifies it. At any rate, the proportion of zinc used, they say, is so small that it is harmless.

It is claimed for the zinc that it has peculiar properties which allow it to precipitate all foreign matter, and rise to the surface as a scum, which is then cleared off and the molasses is left a pure amber color. The fact that molasses is "bleached" in order to compete with New Orleans wholesalers was freely admitted in the local trade.

It was said that the New Orleans Board of Health had prohibited the use of sulphate of zinc in the adulteration of molasses, and for some time the practice ceased. The manufacturers of preserves, etc., declared that the enforcement of such an order would practically ruin their business; but nevertheless it was heeded until recently, when fresh complaints were made to the health authorities that sulphate of zinc was entering into the clarifying process of molasses more largely than ever.

Mr. H. L. Hobart said in reply to inquiries: "There is nothing in the story worth discussing. Zinc is used to purify and brighten molasses, but not in sufficient quantities to harm anybody. It is an old matter often before the trade, and that's about all there is to it."

Mr. Post, of B. H. Howell's Son & Co., replied: "Sulphate of zinc is one of the ingredients used in a formula to clarify molasses, but I don't believe enough of it is used to injure anybody. The adulteration can only be detected by an analysis. There are houses in this market that brighten molasses. I believe that the zinc precipitates any foreign matter which the molasses may contain, and then rises to the surface, where it is

recovered. I don't think enough remains to harm us."

A member of the firm of Gustave Jahn & Co. answered: "Yes; sulphate of zinc enters into the clarifying process of molasses. We have a formula for brightening our goods, but it is a common practice in the trade. Very few straight goods are received from New Orleans, and when we do get straight goods it is difficult to dispose of them when shown with brightened goods. It is a miserable practice, however, and I wish it could be stopped."

A dispatch from Columbus, Ohio, states that a plan of adulterating New Orleans molasses came to the attention of Dairy and Food Commissioner McBall, of Ohio. A very extensive dealer in molasses and preserves sent him two samples of the classes—one bleached and the other unbleached. The manufacturer in question stated that this "bleached" article is the unbleached with sulphate of zinc added. The zinc is poisonous. The manufacturer in question said he had been forced to "bleach" his sirup in this manner in order to compete with the New Orleans wholesalers, who first inaugurated the process.—N. Y. Journal of Commerce.

**Four Hundred and Twenty-four Degrees Below Zero.**

Four hundred and twenty-four degrees Fahrenheit below zero! Just what this means it is almost impossible to imagine, and, yet, it is one of the temperatures which have been reached and used in laboratory research, and has been made the subject of some highly interesting experiments and explanations by Prof. Dewar before the British Royal Institution. Four hundred degrees below zero is not an everyday temperature, nor can it be reached by more everyday means than the expansion of liquid air, which latter Prof. Dewar has succeeded in producing in comparatively large quantities, and in storing by novel and ingenious methods, to be used as required in the study of matter at abnormally low temperature, exactly as a spirit lamp or a Bunsen burner is used in studying the properties of different bodies at the higher temperatures.

The tensile strength of iron at 400° below zero is just twice what it is at 60° above. It will take a strain of 60 instead of 30 tons to the square inch, and equally curious results have come out as to the elongation of metals under these conditions. It was an idea of Faraday

that the magnetism in a permanent magnet would be increased at very low temperatures, and experiments with comparatively low temperatures had rather negated Faraday's suggestion, but Prof. Dewar has completely verified the opinion of the famous savant, having shown that a magnet at the extremely low temperature made possible by the liquid air had its power increased by about 50 per cent.—Cassier's Magazine.

**Work of the Cold Spring Harbor Hatchery During 1894.**

The fish hatchery at Cold Spring Harbor, Long Island, has done much good work during the year 1894. This hatchery is probably the most prominent and efficient of the seven stations of the New York Fish Commission. During the past year it has turned out 33,250,000 tom cods and 22,500,000 smelts, which have been liberated in the harbors on the northern shore of Long Island. There have also been some 300,000 trout placed in local streams and in the Adirondacks. About 100,000 salmon and 700,000 shad have been sent to the head waters of the Hudson, and 500,000 lobsters have been freed in Long Island Sound.

At present the propagation of trout engages most of the time of the hatchery. The spawn this year number 1,500,000 eggs. Besides this interest, much is being done to supply adequate quantities of tom cods, and at present there are 60,000,000 tom cod eggs in the hatchery in various stages of incubation. One of the most important results of the year has been the experience gained concerning the propagation of lobsters. The 500,000 lobsters raised last year were from spawn taken from females captured off Sound Beach, Connecticut. Superintendent Mather believes, however, that in a few years lobsters will be cultivated as easily as trout.

**A Microscopical Exhibition.**

The eighth annual exhibition of the Department of Microscopy of the Brooklyn Institute of Arts and Sciences was held in Art Association Hall, Monday, Jan. 14, 1895. The exhibition was one of the most successful ever held under the auspices of the Institute, eighty-six microscopes being used, the visitors passing from instrument to instrument. The present officers of the department are: H. F. Calef, president; H. S. Woodman, vice president; A. H. Ehrman, secretary; C. P. Abbey, treasurer; James Walker, curator.

**RECENTLY PATENTED INVENTIONS.****Engineering.**

**INJECTOR.**—Benjamin M. Throop, Geneva, Ohio. This injector has a steam inlet and a water inlet connected by a set of lift nozzles with an interior compartment, while forcing nozzles connect the latter with the outlet, there being a double valve arranged in the casing and adapted to connect the steam inlet with the steam nozzle of the set of forcing nozzles, and the interior compartment with the outlet to the boiler. The construction is very simple and inexpensive, and may be easily operated to force water under either normal or increased pressure to the boiler.

**BOILER BRACE.**—Peter McGregor, Chicago, Ill. The body of this brace is preferably of light flat metal, having one end slitted to form two members, which are twisted and semicircular in cross section, diverging laterally, and having their ends bent outwardly to form opposite outwardly extending feet. The improvement is intended as an inside brace for the heads or other flat surfaces of the boiler, and is very simple and inexpensive while yet having great strength.

**Railway Appliances.**

**CAR COUPLING.**—Carman Frost, Hewlett's, N. Y. This is an improvement on a formerly patented invention of the same inventor, providing a gravity coupling dog which will automatically couple with an opposing drawhead, a spring being applied to the coupling dog to insure its returning to its coupling or normal position and remaining straight. A section is combined with the drawhead section, the two sections being side by side, and so located that the line of draught will be immediately through the center of the drawbar and the center of the coupling proper.

**CAR COUPLING.**—Edward C. Inderlied, Rock Rift, N. Y. This invention consists principally of a link adapted to engage hooks on the opposing drawbars and means for raising and lowering the link to engage or disengage the link with or from the drawbar hooks. Cars of different heights may be readily coupled with this coupling, the several parts are positively connected with each other, so that none are liable to be lost, and the coupling or uncoupling is easily effected without the trainman going between the cars.

**TIE AND RAIL FASTENING.**—Ellery C. Davis, Crookston, Minn. This is an improvement in metallic ties and rail fastenings, according to which the tie is channeled and a flanged inverted chair permanently secured to it, both having coincident bolt holes and one of them having lateral slots, flanged and notched clamping bolts being used, engaging a detachable locking device. For use on curves, the bolt holes of the ties and chairs are located at different distances, and the improvement is designed to afford the maximum of simplicity, strength, cheapness, and durability.

**Electrical.**

**CLOSED CONDUIT FOR ELECTRICAL RAILWAYS.**—Frank Winkle, Philadelphia, Pa. Spring

plates, to be depressed by the trolley, extend beneath the slot of the conduit, according to this improvement, a conductor in the conduit being insulated from a longitudinal support, while springs in contact with the conductor have upwardly curved arms with which the spring plates engage. The conduit may be very shallow, and the contact strips are held normally out of circuit, but are pressed automatically into circuit by the passage of a car, so that only certain sections of the strips are energized at any one time, thus rendering the system very safe and preventing any great loss of energy.

**RAIL FOR ELECTRIC ROADS.**—Charles Sill, New York City. This is a rail upon which the cars may travel in the usual manner, while it also affords a housing for the electric conductor and trolley wire. The rail has a base from which extend upward two parallel webs upon which is bolted a top plate forming the rail tread, the rail thus affording a longitudinal duct for the conducting cable, while from the duct lead apertures to a recess in the rail carrying the trolley wire.

**Mining, Etc.**

**APPARATUS FOR TREATING ORES.**—Norris H. Cone, Leadville, Col. This is an apparatus more especially designed for roasting and chloridizing gold, silver, copper and other ores. It comprises a revolving cylinder on the inner face of which are arranged pipes communicating with a main gas or air chamber, a stationary cut-off covering some of the pipes, whereby they will be successively closed on their upward movement and opened on the downward movement, the pipes being held within a fire brick lining, and connected with means of heating and cooling.

**SEPARATING PRECIOUS METALS FROM SAND, GRAVEL, ETC.**—Pascal P. Cuplin, West Bend, Iowa. This invention relates to dry placer mining, and the separation is provided for without the use of water by means of an apparatus combining a revolving inclined screen with different degrees of fineness of mesh in connection with tubes leading from an air supply, chutes leading from the screens discharging into the tubes, and hinged gates in the chutes. The air pressure is supplied by bellows and a blower, and varies in the different tubes according to the grading of the material by the several sieves, each pan of the separated metals differing from the finest flour gold to grain gold.

**Mechanical.**

**PORTABLE HYDRAULIC PUNCH.**—Elijah B. Cornell, Philadelphia, Pa. This punch may be quickly placed in position for effective operation and as readily released from the work, being especially designed to facilitate the punching of the webs of railway rails, metal beams and plates, and structural, architectural or bridge work of all kinds. In connection with the punch piston is a coil spring, whose tension may be regulated, and which facilitates the backward movement of the piston after the punching has been effected, the liquid employed then escaping into the reservoir.

**NUT LOCK.**—Conrad Hahn, Pittsburg, Pa. This improvement comprises a plate adapted to be supported from the bolts, and having offsets which hold a bar over which is fitted a locking plate held in place by keys which engage the offsets. The device is simple and easily applied, and will positively lock the nut or nuts in place on rail joints, or in other places where it may be applied.

**TAP AND REAMER WRENCH.**—Elmer J. Nichols, Pawtucket, R. I. This tool comprises a stock with threaded neck on which screws a sleeve, the sleeve being mounted to turn on a handle connected with a movable jaw sliding in the stock. The handle connected with the movable jaw does not turn, but is moved bodily in or out to open or close the jaws.

**Agricultural.**

**HARROW.**—Joseph B. Morrison, Fort Madison, Iowa. The tooth holder of this harrow has upper and lower laterally projecting clamps which fit around the tooth, the inner ends of the side arms of the clamps being extended or prolonged over the body, forming flange-like portions separated from the body to form a seat for the rail plates, and separated from each other to avoid any obstruction to clamping the tooth against the rail. This improved tooth holder not only clamps the tooth firmly, but also braces and gives rigidity to the beam.

**PLANTER ATTACHMENT.**—William L. Stickle, Churchtown, N. Y. This is an attachment for a marker runner or shoe of a planter to form a clean cut bed and without cloas to interfere with the growing plants, the ground at each side of the furrow being left very light. The improvement also provides a furrow attachment for the runners, especially those adapted for marking a field to be planted by hand, and one which may be readily adjusted to run as deeply in the ground as desired.

**INCUBATOR.**—Archibald Kerr, Carmichael's, Pa. According to this improvement the eggs contained in the incubator may be bodily turned over, being manipulated from the outside of the machine. The eggs are contained in revolving trays perforated at top and bottom, enabling the hot air to circulate freely through them, the trays having doors or removable sections in one of their sides, permitting the trays to be lifted out singly without removing the tray drawer.

**FOLDING COOP, ETC.**—Thomas A. Allen, Astor, West Va. This is a coop or crate in which the sides and ends are jointed to the bottom, the sides folding inward and outward between the ends, and links connecting the ends and top and forming stops to limit the outward movement of the sides. It may be easily opened for use or folded into small space, being especially designed to facilitate the shipping of chickens, turkeys, pigs, rabbits, etc.

**Miscellaneous.**

**BICYCLE SUPPORT.**—Harry A. Brooks, Rapid City, So. Dakota. A leg member held to swing

parallel with the machine is, according to this invention, pivoted and held by means of a lock lug from a penient pivotal plate, in such manner that it will be held to a supporting position by the weight of the tilted machine standing alone, and will automatically swing up out of the way when such weight is removed. The device can be quickly secured to and removed from the frame of an ordinary bicycle, and when attached does not appear clumsy or otherwise mar the general effect of the machine.

**BICYCLE SUPPORT.**—Abraham H. Ribbany, Wauseon, Ohio. In guides at the front of the machine, according to this invention, is supported a rod at whose lower end is a fork straddling the front wheel, and links pivotally connect the lower ends of the fork with legs pivoted adjacent to the axle, whereby the legs may be thrown down into contact with the ground to support the wheel in upright position. This device is readily applicable to a new or an old machine, but in applying the improvement when a machine is built, the swinging legs may be pivoted to lugs extended from prongs of the steering fork.

**SCALE BEAM COMPUTING ATTACHMENT.**—Edward W. Wise, Las Vegas, New Mexico. According to this invention the weight held to slide upon the scale beam actuates a screw shaft and the gear connection of a computing cylinder, whose surface is arranged in columns bearing computed rates, in such way as to indicate both the weight and the price of the article being weighed, the movement of sliding the weight upon the beam causing the computation to be automatically performed, and the beam being capable of use in the ordinary manner at any time.

**FINISHING COVERINGS OF BRAIDED MOULDS.**—Franz Markgraf, New York City. The bulbous effects in gimp, trimmings, tassels, etc., heretofore principally finished by hand, are provided for by this invention by a new method of and device for finishing the braided ends of covered moulds by a special machine, the braided projecting ends of mould coverings being inserted by a special progressive movement, whereby the work is performed in a superior manner and at greater speed.

**SPECTACLE CASE HOLDER.**—Robert T. Roberts, La Harpe, Ill. This is a simple device or clasp for fastening a spectacle case to the pocket of a garment. It consists of two lengths of wire, to be passed singly around and looped permanently upon the case, the wire being twisted together at the meeting point, and two hooks forming the terminals of a small length of twisted wire.

**INK WELL.**—John Werner, Brooklyn, N. Y. A tube is held in this well and a bucket slides in the tube, a stopper closing the tube and the neck of the well. A bail pivotally connected with the bucket is secured on the stopper, the bail having lugs fitting in slots in the tube to guide the bucket in its up and down movement. The construction prevents the writer from wiping the pen too far into the ink, which does not evaporate and become thick, and prevents the spilling of the ink if the well is upset.

FENCE.—Lorenzo M. Shirtcliff, Lynnville, Ill. This inventor has devised an improved wire fence with metal channel bar posts, each having a foot flange seated on and attached to an angle-bent anchor plate, another angle anchor plate being attached to the side flange.

WINDOW GUARD.—Charles E. Sowaal, New York City. To prevent people from falling through open windows, this inventor has devised a cheap and strong guard, which is readily applied or removed, and which permits of raising or lowering the window with the guard in place.

WHIFFLETREE.—Lorenzo D. Brown, Shawnee, Ohio. This whiffletree has a bearing ring on its underside, the base plate having a groove to receive the ring, and an upturned hook on the base plate engaging one side of the ring, while a slide bolt engages the opposite side.

HEATER.—Herman Gutscheid, Jersey City, N. J. For conveniently and rapidly heating a room by the employment of a lamp this inventor has devised a simple form of heater in which water is made hot and caused to circulate rapidly in a corrugated shell presenting large exposed surfaces to the air.

BLACKING CASING.—Louis Nearing, Morris Run, Pa. This is a simple form of casing adapted to contain blacking, a dauber, and a brush, the back of the brush forming the lid of the casing, and the dauber and a blacking bottle being received in side pockets.

DETACHABLE COFFIN HANDLE.—Jacob Klar, Rodney, Miss. Each handle bar is, according to this invention, connected by a flexible depending loop with a flexible carrier strand adapted to be passed under the coffin, there being a transverse bearing block held in a tight in the strand, to be brought into position at the lower corners of the casket.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention, and date of this paper.

NEW BOOKS AND PUBLICATIONS.

PROCEEDINGS OF THE INTERNATIONAL ELECTRICAL CONGRESS HELD IN THE CITY OF CHICAGO. August 21 to 25, 1893. New York: American Institute of Engineers. 1894. Pp. xxiv, 488. Price \$3.

It seems hardly necessary for us to do more than give the title of this work. The proceedings of the institute have acquired so high standing that any of their publications may be pronounced a sine qua non in every scientific library. As a matter of course, the present work represents the highest grade of publication in its own line.

INEBRIETY OR NARCOMANIA: ITS ETIOLOGY, PATHOLOGY, TREATMENT, AND JURISPRUDENCE. By Norman Kerr. Third edition. New York: J. Selwin Tait & Sons. Pp. xxxv, 605. Price \$3.50.

This exhaustive monograph represents an enormous amount of labor. It reviews the particular subject from the medical standpoint in the first part of the work, and afterward in the medico-legal aspects, the latter, of course, referring to the English court procedure. It contains a vast amount of very curious information, personal traits of inebriates, instances of false arrests and of decisions by magistrates in these cases.

A TREATISE ON INDUSTRIAL PHOTO-METRY, WITH SPECIAL APPLICATION TO ELECTRIC LIGHTING. By A. Palaz. Authorized translation from the French. By George W. Patterson and Merib Rowley Patterson. New York: D. Van Nostrand Company. London: Sampson Low, Marston & Company. Limited. 1894. Pp. vii, 322. Price \$4.

The astonishing development of photometry has been brought about largely by the electric light. This book is very complete, being written in the well known French style of exactness; yet, although France is not an island, we do find a certain amount of insularity in its treatment of the subject, some apparatus very extensively used in England and America being entirely

omitted. The indexes seem hardly adequate to the amount of text. It is possible that upon looking through the book we might find much which the index does not show. We do not find the jet photometer for instance, and the registering jet photometer operated by the photographic process is not given either. The word burner and the proper name "Sugg" do not appear in the index at all. It would be impossible to imagine an American author writing on photometry without mentioning Sugg's London Argand gas burner as a standard burner for valuing gas. It is, however, but fair to say that the work is written with especial application to electric lighting, which would, of course, excuse, to a certain extent, the omission of gas photometry, something whose inclusion in the work would certainly have added much to its value.

THE FOREST TREE PLANTER'S MANUAL. 1894. By J. O. Barrett. Minneapolis, Minn.: The Progressive Age Publishing Company. Pp. 128.

We take especial pleasure in noticing this little pamphlet, which is sent free to all applicants who will remit 4 cents for postage. It gives a popular description of a number of trees and their availability, tells how to manage forest seedlings and cuttings, teaches applied entomology, zoology, and the economic and climatic conditions of the science of forestry and the local aspects thereof.

BREAD FROM STONES. A new and rational system of land fertilization and physical regeneration. Translated from the German. Philadelphia, Pa.: A. J. Tafel. 1894. Pp. 135. No index. Price 25 cents.

This work, translated from the German of Julius Hensel and others, touches on the subject of fertilization and advocates the use of clean fertilization. In the primeval rocks, it claims, can be found adequate fertilizers; these rocks being reduced to dust to become assimilable by plants or decomposable by the soil influences are the fertilizer it recommends. The subject is a curious one, and whether its premises are all correct or not, there is no question that the fine pulverization of barren material often makes it assimilable by plants under the influence of earth acids.

SCIENTIFIC AMERICAN BUILDING EDITION.

JANUARY, 1895.—(No. 111.)

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- 1. An elegant plan in colors, showing a Colonial cottage at Williamsbridge, N. Y., recently erected for Chas. H. Love, Esq. Two perspective elevations and floor plans. Cost complete \$4,250. Mr. Arthur C. Longyear, architect, New York City. A pleasing design.
2. A Colonial residence at New Rochelle, N. Y., recently erected for J. O. Noakes, Esq., at Iselin's Park. Two perspective elevations and floor plans. Cost \$5,000 complete. Mr. Manly N. Cutter, architect, New York City. An attractive design.
3. Colonial residence at Montclair, N. J., recently erected for Sylvester Post, Esq. Two perspective elevations and floor plans. Messrs. W. S. Knowles & A. H. Thorp, architects, New York City. A pleasing design.
4. A seaside cottage recently erected for C. H. Manning, Esq., at Kennebunkport, Me. Two perspective elevations and floor plans. A picturesque and unique design after the "New England" lean-to roof order. Mr. H. P. Clark, architect, Boston, Mass.
5. A residence at East Orange, N. J., erected at a cost of \$7,000. Architect Mr. W. F. Bower, Newark, N. J. Perspective elevation and floor plans.
6. The First Presbyterian Church at Stamford, Conn. Two perspective elevations and ground plan. A design of great architectural beauty, treated in the Romanesque style. Mr. J. C. Cadz, architect, New York.
7. A residence at Scranton, Pa., erected for E. B. Sturges, Esq., at a cost of \$5,000 complete. Architect Mr. E. G. W. Dietrich, New York City. Perspective elevation and floor plans.
8. A summer residence at Cushing's Island, Me., recently erected at a cost of \$3,100 complete. Two perspective elevations and floor plans, also an interior view. Mr. John C. Stevens, architect, Portland, Me. An excellent example for a summer home.
9. View of the Army of the Seventy-first Regiment, New York City. Architect Mr. J. R. Thomas, New York City.
10. Perspective view and floor plans of the fourteen story Reliance Building, Chicago.
11. Miscellaneous contents.—Buff brick popular.—Ceiling and cornice tinting.—Home ground arrangement of plants, illustrated.—Stone dressing by compressed air, illustrated.—Brick dust mortar.—Interesting ruin of cliff dwellers.—Removing the front wall of a warehouse, with sketches.—Improved woodworking machine, illustrated.—Buff brick in New York.—Ceiling paper.—"Deco-re-o," a new material for decorative purposes, illustrated.—Improved gutter hangers, illustrated.—Draughtsman's supplies, illustrated.

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Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information and not for publication.
References to former articles or answers should give date of paper and page or number of question.
Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.
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Scientific American Supplements referred to may be had at the office. Price 10 cents each.
Books referred to promptly supplied on receipt of price.
Minerals sent for examination should be distinctly marked or labeled.

(6357) Old Mechanic writes for information with regard to the process of tempering edge tools called the lead process. Is the steel injured in the process of heating in lead, and what of the uniformity and toughness of such temper? A. The lead heating process for hardening edge tools is almost universal use in all large establishments, and was only so largely adopted for its uniform control of the proper heat for hardening. By this process the burning of corners and thin edges is prevented by maintaining the temperature of the lead pot at the exact heat for hardening any particular brand of steel. There is nothing in the contact of the hot lead that will injure the steel, but rather, on the contrary, preserve it from burning or overheating, which is a great drawback in the uncertainty of fire heating.

(6358) L. D. W. writes: To answer a question, please state through your paper whether or not more steam is required to run a given amount of machinery when the exhaust from the engine is used for heating purposes than is required when the exhaust is allowed to escape in the open air? If so, please state what per cent more. A. To use the exhaust steam for any purpose is economy of the first order. Even if a small additional back pressure is made upon the engine. No high pressure engine exhausting through a pipe to and above the roof is free from back pressure. When a delicate pressure gauge is attached to the exhaust pipe close to the engine, the back pressure in most engines will be found to be from 1/2 to 1 1/2 pounds. From the lowest pressure of 1/4 to 1/2 pound, it is a saving to take the exhaust steam in a direct line from the exhaust port of the steam chest to be used for heating purposes, and, with proper precaution in the use of large pipe and its best distribution for facilitating the circulation with the least obstruction, it should not increase the back pressure. There are many examples in and around New York where a 3/4 inch back pressure has been reduced to 1/4 inch by the proper lay-out of an exhaust heating system.

(6359) D. S. says: I have made violin as described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 930. I have done a good job and wish to have it finished in the best manner. Please let me know what to stain it with, also the kind of varnish to use.
Sandarac.....12 parts.
Shellac..... 6 "
Mastic..... 6 "
Elemi..... 3 "

In 150 parts 95 per cent alcohol which has been colored red with cochineal, or if a darker red is required, add dragon's blood gum. When the above is dissolved add 6 parts Venice turpentine. As this varnish is highly inflammable, use caution as to fire. Find the tone of a piece of wood by direct comparison with similar notes on the piano or any standard instrument. A violin in tone at the proper pitch by a tuning fork is very convenient. Tone of Wood for Same.—Dissolve by heat 2 ounce's amber in oil of turpentine, 5 ounces, and drying linseed oil, 5 ounces. Color with dragon's blood or extract alkanet root. The tone given by a piece of wood depends upon its size, thickness, etc. Therefore, a test must be comparative. Cut square plates of equal size and thickness of a known wood and of the wood to be tried. Place the center of the plate upon end of a cork or spool placed upon a table near the edge. Press the center of the plate of wood with the thumb and bow it near one of the corners. This will give the lowest note such a plate can produce, or the normal tone. The higher the tone, the better the wood. From the "Sci-

entific American Cyclopaedia of Receipts, Notes and Queries."

(6360) H. L. S. says: Will you advise me as to the best preparation for filling worm holes in wood? A. Put any quantity of fine sawdust of the same kind of wood into an earthen pan, and pour boiling water on it; stir it well, and let it remain for a week or ten days, occasionally stirring it; then boil it for some time, and it will be of the consistence of pulp or paste; put it into a coarse cloth and squeeze all the moisture from it. Keep for use, and, when wanted, mix a sufficient quantity of thin glue to make it into a paste; rub it well into the cracks, or fill up the holes in your work with it. When quite hard and dry, clean the work off, and if carefully done, you will scarcely discern the imperfection.

(6361) A. J. B. says: Will you please inform me, through the columns of your valuable paper, to what species does the whale belong; is it a fish or an animal? A. A whale is an animal inhabiting the ocean; it belongs to the class of mammals, tribe of mutilates and family of the cetacea.

(6362) C. E. McM. writes: 1. I saw some time ago that a storage battery would give approximately one ampere for each square foot of positive plate; does that mean the entire surface of positive plate? A. A discharge rate of 6 amperes per square foot of positive plate may be allowed. This is per square foot of plate immersed, not of area. It is one-half the area. 2. I have two storage batteries, 8 plates each, plates 6x7, and are pasted with red lead. What would be about the electromotive force and internal resistance of each? Can I run a one candle power incandescent lamp with them both? A. For each couple allow two volts, and calculate discharge rate as above. The resistance may be very much less than the above would give—perhaps 001 ohm. Your batteries should be ample for the lamp named.

(6363) H. C. L. asks (1) how to make the best kind of batteries to run sewing machines by? A. Practically speaking, you can only use a storage battery. The primary battery is expensive and troublesome. See our SUPPLEMENT, No. 845, for storage batteries. 2. How much will it cost per day? A. We cannot give accurate figures—probably two or three dollars. 3. What are the rules for calculating the resistance to give electromagnets at various distances from the battery, as in telegraphy? A. In general the resistance of the line and battery are made equal. There is no exact rule for what you ask. 4. How many watts are necessary to run a sewing machine? A. Twenty to fifty, according to size and work done.

(6364) C. G. C. writes: I have an electro-magnet (horse-shoe form), 1 1/2 inch between poles; spools are 3/8 inch diameter. What size horse-shoe magnet would I have to use with it to make a satisfactory magneto-electric machine for medical use? A. Use a 6 or 8 inch machine magnet. 2. In building tall chimneys for factory use (say 100 feet) is it usual to lessen the size of flue toward the top? A. No. 3. What is Lapis Calaminaris, and what is its use? A. Zinc silicate or calamine, an ore of zinc. 4. From whom can I buy the weights and measures of the metric system? Is it probable that the system will before long come into general use in this country? A. Address Queen & Co., Philadelphia, Pa. It seems doubtful if they will come into general use for many years.

(6365) F. B. C. asks: How many cubic feet of illuminating gas (from gasoline) can be compressed into a vessel containing 10 liquid gallons, at 5 pounds and 10 pounds pressure per cubic inch? A. If a permanent gas is made, then at 5 pounds pressure the vessel will hold about 13 gallons, and at 10 pounds about 17 gallons. If the gas is partly condensed to a liquid under the given pressure, much more will be held.

(6366) M. F. P. asks how gas can be prevented from smoking. A. If the gas is very rich, it should be burned in small size excavated head burners. Proper burners prevent gas from smoking. The richer the gas, the harder it is to overcome this trouble.

(6367) H. I. P. asks for more information about Mr. Vaughan-Sherrin's new electric boat, described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 786, January 24, 1891. A. We have nothing additional to the article referred to.

(6368) T. P. M. says: Will you please give me a good receipt for an oil wood filler, and one that is not an oil filler, for hard woods where a very fine surface is required? Also a filler for cast iron, such as the fields of dynamos and castings of engines, etc. A. Hard Wood Filler.—Use boiled oil and enough corn starch to make a very thick paste. Add a little japan, and reduce with turpentine. Add no color for white oak; for dark ash and chestnut use a little raw sienna; for walnut, burnt umber and a very little Venetian red; for bay wood, burnt sienna. Use enough color to cover the white of the starch. Apply with brush and rags. Let it dry forty-eight hours, or until it is in condition to rub down with No. 0 sandpaper, without much gumming up, and if an extra fine finish is desired, fill again with the same materials, using less oil, but more of japan and turpentine. The second coat will not shrink, it being supported by the first coat. When the second coat is hard, the wood is ready for finishing in any desired style or to any degree of nicety by following up the usual methods. This formula is not intended for rose-wood, and will not be satisfactory if used therefor. American Wood Filler.—Apply to the wood with a brush the following mixture: Pulverized starch by weight, 3 parts; heavy spar, 3 parts; 1/2 part by weight of siccativ, with enough turpentine to make the consistency of ordinary varnish. For dark woods add to the siccativ umber up to 1/2 part. Rub across the grain of the wood with a piece of felt fastened to a piece of wood. Let the wood dry about eight hours, rub with glass paper, then polish and varnish. Composition to Fill Holes in Castings.—1. Dry clay, 6 parts; borax in solution, 1 1/2 parts. Mix. 2. Make a thick paste of pulverized binoxide of manganese and a strong solution of silicate of soda.

(6369) R. W. S. asks: 1. With a potential of 25 volts and a current of 8 amperes, how many 6