

## RECENTLY PATENTED INVENTIONS.

## Engineering.

**EXHAUST NOZZLE.**—John H. McIndoe and William Meredith, Mount Pleasant, Pa. This is a nozzle adapted for the smoke box of a locomotive engine, with sliding block for controlling the capacity and top opening, which does not, when fully adjusted inward, lap over the opening below it to baffle the escaping steam, but insures a free or uninterrupted discharge from the channel through the nozzle.

## Railway Appliances.

**DUMPING CAR.**—Ferdinand E. Cancla, New York City. This car is of the kind having one or more discharge apertures in its floor, closed by sliding doors, the invention covering novel features whereby the sills are kept intact, and serve to carry the door, and whereby great strength and thorough efficiency are secured.

**SINGLE RAIL RAILWAY.**—Rufus H. Brown, Peabody, Mass. This invention provides means and mechanism whereby the car is not only supported in upright position, but is allowed a certain amount of play vertically and laterally, that it may ride over obstacles and inequalities, springs being arranged in different positions to effect such object.

## Mechanical.

**COTTON COMPRESS.**—George Taylor, Hillsborough, Texas. This press has opposing sets of toggle levers, one set connecting each end of the sliding platen with the frame, the duplicate sets of toggles being each united to the stud of the piston by single links, making a simple and efficient device, securing economy in power and in construction.

**CONVEYING BELT.**—Daniel Brennan, Jr., Saltersville, N. J. This belt is made of a pair of endless ropes, covered, connected, and held apart throughout, by narrow metallic bars or wires looped over and upon them, and is capable of being driven by ordinary machine pulleys, the cross bars and attachments being of shapes to form sides, flights, buckets, etc., upon the belt, to adapt it to work horizontally, vertically, or at any required angle, to convey materials and transmit power.

**MOTION CONVERTING MECHANISM.**—John De Monnin, Corvallis, Oregon. This mechanism is specially designed for application to a steam engine, to convert rectilinear into rotary motion, and comprises a swiveled or pivoted cam or lever, combined with and engaging in opposite directions spiral grooves in a cylinder applied to a shaft, with stationary or fixed cams for shifting or switching the pivoted cam.

**BUSH HAMMER.**—Luther H. Rowell, South Thomaston, Me. This is a hammer for dressing stone, in which two pole plates are used, with integral shank sections, united by a sleeve, which forms a socket for the handle, the cuts being made in the form of long blades, each in one piece, extending between and beyond the pole plates, the plates and cuts being held together by transverse bolts.

**SEAMLESS PULP TUBES.**—Horace J. Medbery, Ballston, N. Y. This invention covers a peculiar construction and arrangement of parts in a machine adapted to form straight sections of seamless tubes, pipes, or other analogous articles of a uniform diameter throughout, of paper or wood pulp.

**ELEVATOR INDICATOR.**—Oliver C. Hayward, New York City. Within the elevator shaft, or in a casing auxiliary thereto, the several indicators are pivoted, and adapted for engagement with the car, the invention providing a simple and economical attachment whereby the approach of the elevator from above or below will be indicated and its position shown.

## Agricultural.

**PLOW.**—Jeremiah R. White, Raymond, Miss. This plow has a reversible scraper blade, made of oblong diamond form and cylindrical in curve, so that all the corners will touch a flat surface, and having a central bolt hole and indentations or gashes on either side of the center, whereby the scraper can be adjusted to trim off the row between the bar of the plow and the plants.

**FEED TROUGH.**—Martin V. B. Stevenson, Jesup, Iowa. The main feed receptacle has a laterally swinging U-shaped agitator, which is operated by the horse or other animal bringing its nostrils close to the bottom of the feed trough, whereby the grain or feed is fed to the trough in limited quantities, and the animal will be compelled to feed slowly.

**HARVESTER AND THRASHER.**—Lester A. Gillett, Leonardville, Kansas. The cutter bar is carried by a swinging frame which the operator can raise and lower or lock in position, according to the depth to which the grain is to be cut, the grain being fed into the front open end of the thrashing machine by a belt, the straw, after thrashing, passing out of the rear of the casing, while the kernels are passed through a chute into bags.

**CORN CUTTER.**—George W. Gibson, Kimbolton, Ohio. The frame of the machine has side extensions forming horizontal tables on which the cornstalks cut by knives fitted at the front edge of the tables fall as the cutter is drawn forward, while the machine has an attachment by which shocks are readily formed after enough stalks have been cut for the purpose.

**HAND PLANTER.**—Wilber S. Winkle, Union, West Va. This planter has two vertical arms, hinged at their lower ends by plates, the arms having at their sides metal casings adapted to project downward to form a chute or mouth which is opened as the arms are brought together and closed as they are drawn apart, with other novel features, whereby corn and beans may be planted at the same time and fertilizer simultaneously distributed.

## Miscellaneous.

**CARTRIDGE LOADER.**—James V. Thompson, Fort Madison, Iowa. The device has a powder and a shot magazine and a wad box, and is adapted to fill either a paper or metal shell, regulating the amount of charge as desired, while it is durable in construction and may be expeditiously and conveniently manipulated without danger of exploding the primer.

**ATTACHING EYEGLASSES.**—William H. Brownlow, Brockville, Ontario, Canada, and Joel S. Warner, Ogdensburg, N. Y. A plate is secured to the under front surface of the visor or brim of a hat, and eyeglass frame and lazy tongs connected therewith, in such way that the glasses may be easily drawn downward and adjusted, or will be held out of the way, against the hat brim, when moved upward.

**CHALK HOLDER.**—Fannie Chambers, New York City. Within the holder is an operating screw rod, on which is mounted a traveling nut, and a chalk-holding clamp, to firmly hold the chalk as it is projected out of and withdrawn into the casing by the operation of the screw rod, the device being for use with tailor's chalk, the holder feeding the chalk down as its edge becomes worn.

**HEAT RADIATOR.**—Asa C. Edwards, Westfield, Mass. It consists of a heating drum having transverse rotary tubes with open ends, the apparatus being provided with means by which the dampers of the radiator may be automatically opened and closed and the radiator tubes be cleansed from soot.

**GATE.**—Joseph Albers, Wells, Oregon. Combined with a pair of pivoted gates are pivoted opening levers and a rod connected to the pivots of the gates, with other novel features, whereby the gates may be opened for the passage of teams, and closed, without the dismounting of the driver, or the gates may be held in open position.

**GATE.**—Hiram S. Harris, Cincinnati, Ohio. This invention relates to sliding gates operated by levers actuated by persons passing, and provides simple and positively acting devices by which the gate may be slid open or shut easily, and without derangement of the levers, pull cords and drum.

**VEHICLE SHAFT.**—William B. Farrar, Greensborough, N. C. This shaft has a peculiar joint in its length that permits its position to be changed laterally and the shaft tightened up in a new position, to increase or diminish the space between the shafts, to adapt them to larger or smaller horses.

**HAME TUG.**—George W. Moliere, Ocean View, Cal. It has a hollow leather casing for the reception of the entire end of the trace, a metal eye or clip with shanks extending along the inside of the casing, with space for the tug and a set screw, the extended shanks and the trace, so that there is no projecting end of the trace, the latter being neatly housed.

**END GATE.**—Frank S. Sears, Atkinson, Ill. This is a wagon end gate, resting on a projecting strip or ledge at the rear end of the wagon body, and connected to the body by metallic straps and hooks, so that the gate can be readily opened and held in horizontal position, or swung beneath the body, or so that a part only of the end gate may be opened.

**WHIP SOCKET.**—Herbert Elder, Harrisburg, Pa. Combined with the whip socket are attaching plates, between which an arm is pivoted having a projection on its inner side, and a vertically sliding hook or catch, whereby a whip may be securely held and locked, the whip being clamped against the interior wall of the socket.

**MILLSTONE DRESS.**—Joseph H. Brown, Social Circle, Ga. This invention provides a millstone dress with auxiliary transverse furrows to check or retard the progress of the partially ground material and prevent it from passing too rapidly from the eye outward, making a combination dress for use with wheat and corn, middlings, and all varieties of grain, and with which the stone can be run rapidly and will keep cool.

**ASH SIFTER.**—Edward E. Smith, New York City. The stove, below its grate and base flange, is made a little deeper than usual, to accommodate the sifter devices and give room for the ashes and cinders, which are discharged into two separate compartments at opposite sides of a partition across the bottom plate, and the invention covers novel features of construction in a sifter adapted for use in such place.

**SASH FASTENER.**—John G. Erickson, Hadley, Minn. This is a sash fastener and holder, consisting in a casing having an inclined locking bolt, to lock the sash when closed, and a vertically and outwardly movable friction holder for holding the sash open at any desired height, the device being automatic in its action, strong and durable, and having no springs.

**STEERING DEVICE.**—Charles D. Wooley, Walden, N. Y. This invention covers an auxiliary steering device to be readily arranged for use in case of accident to the main steering gear, the vessel being made with a downwardly opening rudder recess, at the rear part of the keel, in which is secured a vertically adjustable rudder post carrying a rudder, the construction being such that the rudder can be retracted wholly within its recess or projected completely below the bottom of the vessel.

**LAMP COVERING.**—George H. Dean, St. Louis, Mo. This covering is for inclosing the glass globes of incandescent lamps while out of use, and consists in a case formed of two similar hollow halves, a hinge connecting the lower ends of the halves with a spring bearing on the halves at their hinged ends and holding them normally closed.

**HEAD PROTECTOR.**—George H. Chapell, William Brown, and John Brown, Brownston, Minn. This protector consists of a ring with sliding ribs, supports, shoulder pieces, web and covering, adapted to be worn upon the shoulders and around and over the head, to protect the face and neck of the wearer in inclement weather.

**FIRE ESCAPE.**—John D. Rullmann, San Antonio, Texas. This escape consists of an extensible tower having a series of platforms, a series of lifting toggle levers arranged in pairs as lazy tongs at the four corners, with a series of bracing toggle levers arranged to work reversely to the lifting toggles, the construction being also adapted for use as an observation tower or for other analogous purpose.

**HORSE BOOT.**—Thomas B. Mason, Trenton, N. J. This boot is preferably made of a divided soft rubber ring, to be fastened around the horse's leg with a hasp, the inner edge of the ring having flanges over which is stitched a padded cushion covered with enameled leather or analogous material, making a boot which will not absorb moisture, will retain its form, and may be readily put on and taken off.

**DRESS STEEL.**—Mary E. Whalen, New York City. This steel has a bow having metallic straps secured to it and forming a bow with double ends, that it may be maintained without strain on the dress, to give the desired set, without the front of the dress being drawn too tightly, while retaining the fullness of the skirt at the back without necessitating "shirring."

**TRUSS.**—James A. Tigner, Rome, Ga. This invention relates to trusses having a vertical spring carrying the abdominal and hernial pads, and a transverse spring to the ends of which the strap or band is secured, the invention covering a special construction of the truss.

**GATE.**—Harvey C. Riley, Perryville, Mo. This is a swinging gate with novel mechanism for operating it, so constructed and arranged that the gate may be readily opened by a person in a vehicle approaching the gate in either direction, and closed after the vehicle has passed through, without alighting from the vehicle.

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## Notes &amp; Queries

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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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(242) F. V. H. asks: 1. I have a large picture frame to gild; what shade of gold leaf is used—light, medium, or deep? A. It is all a matter of taste. The deep color perhaps is most used. 2. How can I make a good sizing, so that the leaf will adhere to the frame evenly? A. Buy burnish-gold size ready mixed, and apply six or eight coats to the frame; polish the mat parts, before the size is quite dry, with a woolen cloth; give the parts to be polished another coat of size. The frame is moistened and the gold leaf is laid on. 3. I want to get a high polish on the smooth parts of the frame; how is it done? A. The bright parts are burnished when the frame is at a particular stage of dryness; flint oragate burnishers are employed, of different shapes. 4. I suppose it (the frame) will need varnishing after the gilding is done. What varnish is used? A. Use white hard spirit varnish, such as gum sandarac or yellow gold lacquer. The whole process of gilding a frame requires much skill, and we advise you to consult Spon's Workshop Receipts, first series, for an elaborate description of it. We can send the book free by mail for \$2.00.

(243) J. C. W. asks: Does Germany own and control the railroad and telegraph systems within her domain? If so, how did she gain possession of them—by purchase? And how do the rates of transportation compare with the rates charged here in America, and is the revenue therefrom in excess of the expenditure? If Germany owns the railroad and telegraph, what influence, if any, does it make in politics, and are the masses of the people benefited, apparently, by government control, if such be the case, and how are they managed—by a government bureau? A. The railroads in Germany are comprised in three classes, viz., owned and controlled by the several state governments, 32,174 kilometers; private companies with roads under state control, 674 kilometers; private companies controlling their own roads, 4,286 kilometers. The state governments built some of the railroads, and purchased others from private companies. The revenue

derived from the railroads is in excess of the expenditures, with the exception of a few secondary lines. The German telegraph lines are owned and controlled by the imperial government. Politics have no significance whatever in railroad or telegraph matters. The service is excellent, and the people are no doubt benefited by the unity of state management, the rates being less than in the United States. The management is under an imperial bureau located in Berlin.

(244) J. M. asks: 1. What kind of battery and how many cells would it take to light an ordinary house of six rooms? A. Use a secondary battery if you have any way of charging it. Thirty cells would suffice. 2. What power lamps would it take, and the probable cost per hour of this system of lighting? A. Twelve to twenty lamps would be required, and each lamp would cost about one-fifth cent per hour. 3. Would it be advisable to make the simple electric motor described in your issue of March last to drive the eight light dynamo? A. No. Drive the dynamo by power—by steam, water, or gas motor.

(245) C. T. I. asks: 1. Will inclosed wire answer for winding armature core (or ring) of electric motor, in March 17, 1888? Would it hurt to anneal it, as it is very stiff? A. Yes. Anneal it before making into ring. 2. Would wood soaked in hot paraffine do for disk in place of fiber? A. Yes. 3. Could I use five or six pieces of sheet zinc (riveted together) to produce the required thickness (3/4 inch) of battery plates? A. You will have much difficulty in amalgamating the zincs without their breaking. We advise you to use solid plates. 4. Would four cells with 4 zincs and 4 carbons have the same power as eight cells of 2 zincs and 2 carbons? I want the battery as compact as possible, to be used on a tricycle. A. The larger number of cells give higher electromotive force, but also higher resistance. You can use either arrangement.

(246) J. M. R. asks how to clean zinc lining to refrigerators, stove zincs, etc., also how to clean silver, filigree jewelry, etc. A. Clean zinc with sapollo, or with ground pumice, soap and water. Clean silver filigree work by boiling in dilute sulphuric acid.

(247) R. A. B. asks how to make paint stick to bright metal tin roofs. A. Sandpaper the metal. It is better to put the paint directly on the new tin. Use metallic (iron oxide) paint with boiled oil.

(248) C. W. asks: Will you inform me how Pond's extract hammamelis is prepared? A. It is said to be made by distilling the bark with 6 per cent alcohol. Any certain knowledge of the virtues of witch hazel is disclaimed by the pharmacopoeia.

(249) R. V. J. writes: 1. Please give the weight of water gas. A. Its specific gravity varies from 0.500 up to 0.650; 100 cubic inches will weigh from 15 to 20 grains. 2. Also the best and cheapest way to make hydrogen when but 6,000 to 8,000 cubic feet is required. Also how large a pipe will be required for 5,000 cubic feet of coal gas to pass through in one hour under ordinary pressure from our city works. A. Probably from iron scrap and sulphuric acid. You might do it more cheaply by passing steam over red hot iron borings, but it would hardly pay to set up the furnace, etc., for one operation. It depends on the length of pipe.

(250) H. D. L. writes: Is December 21 the shortest day in the year, or are there two or more days of the same length as the 21st? A. One day is always the shortest. Sometimes it is the 20th, sometimes the 21st, and sometimes the 22d.

(251) A. B. H. writes: What is cologne spirits? I want the information as a matter of information. It is used, I understand, principally in the adulteration of whiskies and brandies. I have looked in some of the encyclopedias, and cannot find it. I have taken your journal for a dozen years or more, and as a last resort concluded to trouble you. I would like the information in detail briefly put, so that in lectures on temperance I know what I am talking about. A. Appleton's Encyclopedia says (vol. vi., p. 144): "About three-fifths of the products of distillation in the United States are what are termed highwines or whisky, containing about 75 per cent of alcohol. This as it comes from the still contains a good deal of fusel oil. Some of it is made into cheap whisky, and the remainder is rectified and redistilled into French spirit. When the percentage of alcohol is high, it forms cologne spirit." Cologne spirit contains 93.075 to 94.075 per cent by volume of alcohol.

(252) H. P. asks: What sized dynamo (candle power or volt) is considered dangerous on coming in contact with the wires? A. This is a disputed point. An alternating current of 200-500 volts, with 300 alternations per second, is considered very dangerous. The best rule is to avoid touching electric wires.

(253) M. S. asks: 1. Some time ago we made an electrophorus by casting ordinary sealing wax in a metallic mould about an inch deep. As upper plate we used a circular disk of zinc attached to an insulating handle. On rubbing the sealing wax with a cat skin we failed to electrify it; none of the experiments given in connection with the instrument could be performed. Could you tell us our mistake? Is it perhaps the sealing wax? [A. Your electrophorus may have had too smooth a surface. Try a cake of shellac instead of sealing wax. If your sealing wax refused absolutely to become electrified, it was of poor quality. Such material never gives satisfaction. 2. Could you recommend to us any reliable work on electroplating telling how to prepare the silver bath for electroplating? A. For full information on electroplating, baths, etc., we refer you to our SUPPLEMENT, Nos. 157, 158, 159. 3. How many Bunsen cells would be required to run a bath containing about 6 or 7 gallons of nickel-plating solution? A. Two one-quart cells in good order will suffice. 4. Is it necessary that the zincs and carbons of the bichromate battery be in separate cells? Could they not be put into one trough as well and produce the same current? If so, what would be the maximum number for a trough 2 1/2 feet long, 1 foot high, 1 foot wide? A. Distinct effects are produced by separate couples in series or by one couple of large area of plates. The subject belongs to elementary electricity, and is treated in manuals of physics under Ohm's law. We recommend Naudet's Electric Batteries, which we send you by mail for \$2.50.

(254) W. R. K. asks: 1. Why a telephone will not operate long distances as well as the telegraph? A. The pulsations succeed each other with such rapidity that a long line becomes too sluggish in charging and discharging itself to act well. 2. Is there a fluid or solution that can be applied to paper to make it a good conductor of electricity? A. Solutions of chemical salts, such as sulphate of zinc, make paper conduct electricity, but not well. 3. Is there a first-class practical work on electricity brought down to the present time? Where can it be obtained, and the price? A. There are a large number of such works. Consult our book catalogue. We recommend Ayrton's "Practical Electricity," which we can send free by mail for \$2.50, or Atkinson's "Electric Lighting," \$1.50.

(255) S. O. N. writes: Could a man who is handy with hammer and saw and who has a little chemical knowledge and less money do some electrotyping? A. Electrotyping is done by electroplating processes described in our SUPPLEMENT No. 310 and others. The impression of the type is taken in wax, coated with plumbago, and copper is deposited on it. Afterward the thin sheet is "backed up" with type metal.

(256) J. M. C. asks the size in feet and inches of the Ark and Great Eastern. I see by a Western paper that the carrying capacity of the Ark was 500 times greater than the Great Eastern, and I want to know the reason why. A. Size of the Great Eastern, 692' x 83' x 60' hold—18,914 tons. Ark, 450' x 75' x 45' high. It may be estimated that the Ark had probably nearly one-half the tonnage of the Great Eastern.

(257) R. I. F. writes: I am oxidizing silver by the use of a hot solution of sulphuret of potash, but cannot get the color dark enough. A. Immerse the articles in a solution of mercurous nitrate and then treat with the sulphuret of potash.

(258) D. & A. write: We wish to know if riding in an electric street car will injure a watch. A. It is liable to do so.

(259) W. B. R. asks how coal tar and pitch, after having been melted by heat, can be prevented from hardening when cool. A. By mixing turpentine, naphtha, or some oil (linseed, fish oil, etc.) with the melted material.

(260) J. E. K. asks: What is meant by the ruling or reigning planet, as given in some of the almanacs? A. It is the brightest planet of the evening sky, and may refer to Venus, Mars, Jupiter, or Saturn, when we see them in their positions of greatest brilliancy.

(261) E. E. S. writes: 1. Will 35 feet or 80 ohms No. 36 copper wire (silk-covered) answer for one of the telephones described in SUPPLEMENT, No. 142? A. Yes. 2. How much wire will it require to wind magnets for first call bells (telephone) described in SUPPLEMENT, No. 162, and will No. 32 cotton-covered answer? The telephones are for less than a mile (Bell phones as No. 1). A. Wind the bobbins to the size shown; with No. 32 cotton-covered wire. 3. What is meant by a single contact transmitter, and how are they constructed? A. One employing a single carbon electrode against a metallic point, or a pair of carbon electrodes against each other. See SUPPLEMENT, No. 250. 4. Should the spools on a pair of Bell telephones both be on the north or positive pole of the magnet, or one positive and one negative? A. It is immaterial.

(262) T. T. H. asks if there is any way in which the presence of coal gas can be detected in a house aside from the smell and taste. A. Chloride of palladium paper has been suggested. How to use it is described in SCIENTIFIC AMERICAN, June 11, 1887, page 376. 2. Whether furnaces are considered as healthful without water as with? A. Not generally; water is considered an improvement.

(263) C. R. H. writes: Will you give the formula for making mucilage, such as is sold in stationary stores at five cents per bottle?

A. Dextrine.....2 parts.  
Acetic acid.....1 "  
Water......5 "  
Alcohol......1 "

(264) H. B. writes: I have a telegraph instrument, and the coils are wound for a much greater current than I am able to produce. Can I wind the coils for 15 or 20 ohms resistance? If so, what size wire and how many feet will it take? A. There is no particular art about winding your coils. If you use No. 30 wire, you can allow ten feet to the ohm and have a close approximation to the true resistance. One hundred and fifty to two hundred feet will give the desired resistance; 1,000 feet No. 30 pure copper wire at 75° Fah. have a resistance of 107.391 ohms.

(265) J. H. W. says: I have some 9 x 9 No. 20 sheet iron that I wish to thoroughly tin; will you please give me the best method through the SCIENTIFIC AMERICAN for cleaning and tinning the iron? A. Pickle the sheets in a bath of muriatic acid 1 part, water 4 parts, until the scale is removed, and dip in hot water. Then scour the sheets with a brush and sand, dry, and dip in a solution of muriate of zinc and ammonia, made by saturating muriatic acid with zinc and adding 10 per cent of sal-ammoniac. Dip only for a few moments, dry, and dip in the tin bath, holding the corner of the plate with a small tongs. The tin bath should have the surface kept clean by sprinkling with powdered sal-ammoniac and skimming the dross.

(266) B. J. K. writes: Can you give a way to make an electrical call bell? I would like to put it from one room to another, and desire to make it myself instead of buying it. A. For magneto call bell we refer you to our SUPPLEMENT, No. 162, which we can send you by mail for 10 cents; for general information, to Bell Hanger's Hand Book, which we can send you by mail for \$1.

(267) A. E. M. asks for calculation for stay of boiler, and also for finding the horse power of engine. A. The United States boiler inspectors allow 6,000 pounds per square inch strain upon a stay. The total strain depends on its position, and must be calculated for each one. For non-expanding engine, multiply area of piston in square inches by steam pressure

in pounds by length of stroke in feet and strokes per minute; divide result by 33,000; this gives indicated horse power. If engine has a cut-off, the average steam pressure must be used as a factor.

(268) E. E. V. writes: How may I construct several cells to produce power enough to run two 16 candle power incandescent lamps? How may I make them the simplest way possible, and how many cells will I have to use? A. Many batteries are described in our SUPPLEMENT, Nos. 157, 158, and 159, and in other numbers. A set of large two quart Bunsen cells is best, allowing three or four cells for each lamp.

(269) F. W. K. asks how to manufacture a bronze printing ink, an ink which shall retain its brilliancy, also how to dissolve bronze powder. A. Use bronze powder for printing; print with size and dust on the powder. No way of really dissolving it without destroying it is known.

(270) L. R. F. asks if there are any minerals or oxides that will change the color of Portland cement. We use oxide of iron for obtaining red color. Can we produce other colors? A. Others will give you other shades, and ultramarine will give blue. The mixture of colors will produce intermediate colors, subject, however, to a restriction in effect on account of the color of the cement itself. The ultramarine will not be very permanent; if not too expensive, some special make of blue smalt might be available. Oxide of manganese or graphite could be used for black.

(271) J. H. M. asks (1) what difference there is between bisulphite and crystal bisulphite of soda. A. Properly speaking there is no difference. 2. Would it do any harm to a gold solution to use a tank lined with common coal tar? A. No. 3. How to throw the gold down in a metallic state from an old plating solution and purify it without melting. A. Add ferrous sulphate (green vitriol).

(272) L. O. B. writes: I have read a great many pieces on the new phonograph, but there is one question I cannot find an answer to, and would like to have you tell me. Will the new phonograph chronicle anything said in a room, whether the person has mouth to mouthpiece or not? Could one be in a court room and chronicle all said by witnesses, or in a hall where a singer or speaker was and receive song or speech? A. The phonograph does not record sounds well, except such as are spoken into its mouthpiece.

(273) J. H. P.—For Paas or Easter egg dyes, use aniline colors. Do not eat the eggs if the shells crack.

(274) A. L. L. writes: 1. I wish to make an inexpensive solution, that shall be so clear as to resemble ordinary water, and upon dropping into it a small lump or crystal of some chemical, will (within the space of eight or ten seconds) change the solution to a jet black, one resembling ink. I wish it to work quickly and the substance dropped in to be small enough to be concealed between the fingers, as it is to be dropped in secretly. About a quart of the solution to be used at a time. A. Use aniline black in water. Your trouble will be in the slow mixing of the fluid; you should be able to stir it. It will also tend to blacken your hand. 2. I wish to insert into the top of a table, and flush with the surface, a metal plate about five inches square. The top of the table, including the plate, is then to be covered with cloth glued or cemented on, same as a desk top. I am advised to use a zinc plate, but wish to use a brass one. Will the cloth adhere to a brass plate as well as to zinc? What is the best glue or cement to use for the purpose? A. Brass will answer perfectly. Use a solution of gum tragacanth. For marbles apply to toy stores.

(275) W. F. G. says: 1. I wish to make some small iron castings, but have no cupola. Can you tell me how to melt the iron? A. You can readily melt 4 to 6 lb. of cast iron in a black lead crucible in a forge fire. Put some bricks around to deepen the fire. 2. Can you give me a receipt for a cement that will fasten hard rubber to iron? A. Dissolve pulverized shellac in ten times its weight of strong ammonia, in a closed bottle; let it stand two or three weeks, when it becomes a jelly. Smear the parts and press together. 3. What is a good japan for the iron? A. You can purchase air-drying or baking japans through the varnish trade. Also see SCIENTIFIC AMERICAN SUPPLEMENT, No. 316, Japans and Japanning.

(276) G. S. B. asks the kind of a reflector he would require for a four inch double condenser. State how far I must place it from the condenser, how large it must be, and how much it must concave. A. A silvered copper reflector, 4 in. diameter. Radius of the concave surface to be the same as the distance of the light from the first condensing lens, and placed back from the light a distance equal to its radius.

(277) J. E. W. asks how to make glue water proof? A. Dissolve of gum sandarach and mastic each 5 drachms in one-half pint alcohol, and add 5 drachms turpentine. Place the solution in a glue boiler over the fire and gradually stir into it an equal quantity of a strong hot solution of glue and isinglass; strain, while hot, through a cloth. Or to plain glue solution add bichromate of potash; on exposure to light it becomes waterproof.

(278) A. J. B. asks: 1. How to obtain a black cold dye for goatskins with the hair on? A. Rub into the hair, with a brush, a solution of 1/2 oz. nitrate of silver in 1 pint soft water, and hang in sun to dry. Afterward apply, in same way, a solution of 1 oz. sulphate of potash in 1 pint of water. Dry in sun; afterward rub off and dry in shade; work occasionally while drying. To intensify, apply a solution of pyrogallol acid before rinsing. 2. Also how to make sensitized paper for photographs, brown or black preferred, which can be fixed by immersing in cold water? A. No such process is known.

(279) I. G. asks: What cheap substance will prevent from freezing a cologne made with oil of verbena without destroying the odor and color? Rock salt and alcohol do not answer the purpose? A. Glycerine: a sufficient quantity, however, may impair the cologne, as it will prevent it from drying; alcohol is the proper substance.

(280) L. B. asks: With six or seven volts E. M. F., how many amperes of current will be required from a battery in order to run a two candle power incandescent lamp? A. 4 1/2 to 5 1/2 volts with 1.20 amperes will light a 2 C. P. lamp. 7 volts with 1.50 amperes will light a 3 C. P. lamp.

(281) R. M., Jr., says: I read with interest your article in a late issue about a railroad being built across the Rocky Mountains in the State of Colorado. I am a young man 21 years of age. What I would like to know is this: Is there any chance for me to get outdoor work in the region where this road is being built? I have no trade; worked two years as brakeman on elevated railroad, resigned on account of throat trouble; five years' experience in retail grocery business in New York City. A. Colorado is a new and flourishing State. Its interior position makes the climate dry and healthy. Your chances in finding employment to suit your taste are problematical.

(282) G. K. writes: Can you inform me how to clean the stencil paper (after printing) of the cyclostyle patent? I wish to remove the surplus ink from the letters; have used blotters; they do not seem to answer fully the purpose of removal; cannot get a clear copy after being laid aside for some days. A. Try sponging off with benzine or kerosene oil.

(283) W. H. T. asks how brass wire spiral springs are so made that the spirals close together when the tension is removed? And how brass is tempered? A. Flat or volute springs are wound in a narrow groove or between two plates made to separate, to allow the spring to be taken out. Helical springs are wound on a mandrel, and at the moment of winding drawn hard against the last turn, so that when finished all the coils touch. Brass cannot be tempered; sheet and wire spring brass is a special composition, which is rolled or drawn very hard, and is then called spring brass in the hardware trade.

(284) E. D. S. asks: 1. For the composition used for cleaning carpets on the floor; it looks a good deal like soft soap. A. Use 1 pint oxgall to a pailful of water; after washing apply cold water to rinse out the oxgall, and finally sponge as dry as possible. 2. Composition for cleaning wall paper on the wall. This composition is used in bread crumbs. A. For wall paper use plain bread crumbs.

(285) W. F. asks: 1. Please tell me, through your paper, if there is a way of blue printing so that we may have a white ground and blue lines, instead of the opposite? A. Yes; See SCIENTIFIC AMERICAN SUPPLEMENT, 584, p. 9320, for description of Pellet's process. 2. If a current of electricity is passing over a naked copper wire, is there a way known to propel a trolley along wire, without a motor being attached to trolley to drag or propel same? A. Consult our SUPPLEMENT, Nos. 417 and 420, for description of telerage, a system of electrical cable transportation that includes a self-propelled trolley.

(286) E. H. asks: Does drawing steel wire crystallize it? A. No. It laminates and strengthens steel wire to draw it to smaller sizes. When properly done, the tests show increased tensile strength and elasticity.

(287) — writes: What will it cost, and what size of an electrical machine will it take, to turn a wheel 9 in. in diameter, having paddles 3 in. wide and 4 in. high, when partly submerged in water? A. Use simple electric motor described in SUPPLEMENT, No. 641. You should sign your letters.

(288) Subscriber writes: Will you please give me the formula for making blue black ink, that is, ink that writes blue and turns black? A. For inks, consult our SUPPLEMENT, No. 157, also Techno-chemical Hand Book. We can send the latter free by mail for \$2.

(289) W. R. asks: Which would you recommend for an electric light, say to be worked five hours every day—a secondary battery of 20 small couples or 30 Grove batteries, platina, 3 in. by 1 in.? A. The secondary battery. The Grove battery will be very expensive and troublesome.

(290) N. B. C.—The samples sent are talcose clay.

(291) A. L. C. asks: 1. For the correct pronunciation of the word ampere? A. Pronounce it with stress on the second syllable, thus: "ampeer." 2. The meaning of ampere hours? A. See answer to query 236. 3. In the 8 light dynamo, I have broken off one of the armature wires; is there any way of remedying this except by rewinding? A. Wrap a thin piece of brass or copper foil around the ends, flow with solder, and wrap with shellacked tape. 4. How much will it cost to build the simple electric motor? A. From \$3 to \$25. The first figure covers materials only. The other covers time and material.

(292) J. D. E. asks: How much harm, if any, is done to the springs of drays by letting their customary loads remain on them overnight, or for 48 hours? It doesn't seem to me that more harm will arise than comes to them from jolting over the rough pavements. A. All springs weaken and finally give out from use. Anything that lessens their use or strain adds to their life. A load left on a wagon overnight occasionally would not be perceptible in its wear.

(293) W. H. H. asks: How to make phosphor bronze? A. The phosphor bronzes vary somewhat, for various purposes, from two to three ounces of tin to a pound of copper; to which is added a small portion of phosphide of copper or phosphide of tin as a flux—the exact proportions for special alloys being held as trade secrets by parties manufacturing these alloys.

(294) H. H. H. says: I wish to heat a store with steam, room 22 x 115 x 14 ft. 2 in. By running pipes in cellar to and from radiators, it takes considerable pipe, that will condense a quantity of steam. If I carry the steam directly from the boiler to a coil of pipes (bronzed) suspended from the ceiling directly over the counters, of sufficient height so they can be used for the display of goods, can I get heat on the floors? It has been suggested to me that the lower part



of the room will not be heated unless I have the coils or radiators on the floor. How many feet of inch pipe will be required to heat the room? A. The overhead system of heating by steam is largely used in factories, and occasionally in closed rooms. In factories where the belting produces circulation, it is very desirable. We do not advise the use of this system for heating a store, where the constant opening of doors will precipitate cold air upon the floor. Coils in stacks or along vacant spaces or counter fronts, or radiators, are more suitable for stores. It will require 900 feet of 1 in. pipe or its equivalent in radiator surface to heat your store.

(295) C. J. H. writes: I saw a receipt in the SCIENTIFIC AMERICAN about a year ago for making a substitute for ivory out of potatoes. Can you give me the reference? A. See SCIENTIFIC AMERICAN, June 18, 1887, p. 392. The potatoes are washed in dilute sulphuric acid, then boiled in same until solid and dense. They are then washed free from acid and dried.

(296) R. J. L. asks: 1. Will carbons used in lighting street lamps answer instead of carbon plates in plunging battery, SCIENTIFIC AMERICAN SUPPLEMENT, No. 157? A. Yes. See SCIENTIFIC AMERICAN, October 27, 1888, p. 264. 2. How can I attach wires, handles, etc., to a galvanic battery? A. Use binding screws or wires cast in metal tops.

(297) O. S. asks how to make a good violin bow resin? A. A leading authority gives the following: "Put a quantity of Venice turpentine in a pipkin, add a little water to it, and boil for two or three hours over a slow fire. As it rises pour in small quantities of cold water to keep it from overflowing, and allow a drop now and again to cool on a plate; when it rubs clear between the fingers without sticking, it is sufficiently boiled; when thus boiled, pour it into cold water; work it well with the hands to press out the water, and break it into pieces when cold; expose to the sun and air until all the moisture is evaporated and the resin is quite transparent. Many violinists adopt a method of purifying and rendering the resin more transparent by boiling it in vinegar, and while it is exposed some time to the sun and air."

(298) P. N. asks: 1. Is there anything a person can rub on the hands, to keep cement from burning, and making them sore, without the use of gloves? A. Use oil or tallow. 2. The best remedy to use when they get that way? A. Use oil as a remedy. 3. Is not cement supposed to set in water? A. Hydraulic cement sets in water. 4. What is the time to allow cement to get properly set? A. From a few hours to several days. 5. Is there anything that can be mixed with oil to take the stickiness from it and make it thinner, such as castor or olive oil? A. Turpentine or benzine; for castor oil, you may use alcohol. 6. What is the reason that they always put the small wheels of a wagon or carriage in front? Is it for handiness in getting around, or does it run easier? A. To facilitate turning the wagon.

(299) H. B. asks: Please tell me how to make a Bunsen battery, and how long the acid can be used before changing? A. See our SUPPLEMENT, Nos. 157, 158, and 159, for descriptions, with illustrations, of all leading forms of batteries. A solution in a Bunsen battery will last from four hours to several days, according to the demand made upon it.

(300) F. W. writes: I desire to get some information on the manufacture of wood alcohol. Will you please advise me where I can get it? A. Spens' Encyclopedia of Industrial Arts, Part I., treats of wood alcohol. We can supply it for 75 cents.

(301) J. O. B. asks: 1. What is the greatest power yet obtained in experimentation with a dry electric battery? A. Results comparable with those from good gravity batteries have been obtained with dry batteries. 2. What are the electric generating substances employed? A. Sulphuric acid or caustic soda may be used as exciting agents, with zinc as the positive plate. 3. What is the commercial value of aluminum steel, containing 175 per cent of aluminum? A. No particular value could be assigned it. 4. As a general rule, is blue clay rich in aluminum? A. Blue clay may or may not contain a large proportion of aluminum. There is no general rule.

(302) H. N. B. asks: 1. What are the formulae for commercial cream tartar? A. Hydro-potassium tartrate,  $\text{KHC}_4\text{H}_4\text{O}_6$ . 2. Salt of tartar. A. Purified pearlash or potassium carbonate,  $(\text{K}_2\text{CO}_3)_2 \cdot 3\text{H}_2\text{O}$ .

(303) A. L. asks: Can paraffin be made transparent without making it liquid? A. No.

(304) For waterproofing processes we refer M. to our SUPPLEMENT, Nos. 577, 137, 373, and 410.

(305) R. M. asks: What proportions of bromide of ammonium and cadmium are employed in formula for collodio-bromide emulsion in query 22, November 24, 1888, issue of the SCIENTIFIC AMERICAN. A. The double salts spoken of are not commonly found in this country. Use instead bromide of cadmium 44 grains, bromide of ammonium 12 grains. After drying and washing the emulsion, it is redissolved in equal parts of alcohol and ether, in the proportion of 24 grains to the ounce of these mixed solvents. See SUPPLEMENT No. 572 for full particulars on collodion emulsions for window transparencies. No preservative is required for washed emulsions. Camphor is used as a preservative for starch pastes. For enameling add 4 parts castor oil to 100 parts plain collodion. To recover gold from toning baths add to each gallon of toning solution a solution containing thirty grains of protosulphate of iron. Put the gold solution into a barrel or, better still, a special shaped vessel having the bottom pointed like a wedge, with a faucet a third of the distance up from the bottom. Let the solution stand for twelve hours. The gold will settle to the bottom, then decant off by a siphon the supernatant liquor, leaving the residue of metallic gold, together with waste liquor in the bottom, at a depth of three or four inches. This latter material is then removed and thrown on a filter of bibulous paper, washed by pouring hot water over it, and, when dry, the gold is converted into chloride of

gold. The hot water should constantly be poured on it until the wash water no longer produces a precipitate with a solution of barium chloride, proving that the gold is free from the excess of sulphate of iron. The washed precipitate of gold is now dissolved in aqua regia, and the solution evaporated nearly to dryness, the latter operation being carried on slowly on a water bath to prevent spitting. The yellow chloride of gold thus prepared should be preserved in a well stoppered bottle or in a sealed tube, as the salt is very deliquescent.

(306) W. B. asks for the composition of the small pellets used in the toy called Pharaoh's serpents. A. Sulphocyanide of mercury is the basis of the ordinary preparation. We refer you to our SUPPLEMENT, No. 259, for description and illustration. As the vapors from the burning sulphocyanide of mercury are injurious, the following is recommended as a substitute: Bichromate of potash..... 2 parts. Nitrate of potash..... 1 " White sugar..... 2 " Pulverize each ingredient separately and mix intimately, and slightly moisten. Press into small paper cones and when perfectly dry they will be ready for use. This preparation is poisonous, but emits no injurious vapors.

(307) E. M. O. writes: 1. I have a short telegraph line which works by a battery of four Daniell cells. It has worked very well for two weeks, but lately, when I close the circuit, the current seems to grow weaker and weaker, till it stops entirely and the armature flies up. I will be very much obliged if you will tell me what is the matter? A. Your battery has run down. It probably needs more blue vitriol, possibly some of the solution should be removed and replaced by water. The zincs also may need scraping. 2. What is the most simple storage battery to make and how many does it take to run an Edison eight candle power miniature incandescent lamp? A. 17 or 18 cells. You will find many forms described in our SUPPLEMENTS. None are easy to make. It is probably better policy to buy them.

(308) S. C. T. asks (1) how to melt or dissolve rubber to use similar to varnish or paint, or process of using it preparatory to making balls of the clear article. Foot balls or syringe bulbs. A. India rubber cannot be practically treated as you describe. We refer you to our SUPPLEMENT, Nos. 249, 251, and 252, for description of the treatment and manufacture of this product. 2. Can old rubber be worked over? A. Old rubber can be mixed with new and thus made over, but the result is always inferior.

(309) J. F. D. says: I am at work on a grape basket. My difficulty lies in the breaking of the veneer. Can you give me a receipt for the bending of the veneer, by using chemicals or soaking otherwise than by steaming, as it takes them so long to dry after being formed into the basket. I mean something to make the veneer flexible, so it can be bent up in any shape without breaking. A. There is nothing but steaming that is practicable for bending basket veneers. They should be bent hot, when they will be dry enough to finish in a very short time. A warm room will finish the drying in a reasonable time. Steam or boiling water only is used by basket makers, when necessary, otherwise cold water.

(310) C. McE. asks: Can an oil stove be so constructed so that the smoke, odor, etc., can be drawn up through the chimney of a house like any other stove? A. Yes; there is no reason for mingling the gases of combustion with the air we breathe, when there is a chimney opening convenient.

(311) Milwaukee asks if anything will prevent the constant cracking and breaking of the shades and globes around gas jets. No matter how carefully shielded from draughts, they still continue to crack and break. A. The opening at the top of the shade is too small or the gas jet is too large. There is no trouble where they are properly proportioned.

(312) W. S. asks: 1. What horse power can I get from 150 inches of water, velocity 257 feet per minute, on 15 feet overshot wheel? A. The whole value of your water-flow and fall is  $\frac{7}{8}$  horsepower, of which you may realize, with a good overshot wheel, 5 horse power. 2. Is the pressure on inclined water pipe computed by its perpendicular only? A. The value of the pressure is due to the vertical height.

(313) J. L. C. asks for a receipt for making shampoo for cleaning the scalp, also from sandruff, not to in any way damage the hair or scalp? A. Rum 1,000 parts, alcohol 120, tincture of cantharides 5, carbonate of ammonium 5, salt of tartar 10; after shampooing wash with cold water.

(314) E. R. asks for a receipt for a good stencil ink for marking boxes, barrels, etc., through a stencil. Also a paint for marking with brush, not using stencil. A. For a fine preparation use shellac 2 ounces, borax 2 ounces, water 25 ounces, gum arabic 2 ounces. Color with fine lampblack, to desired consistency. You may use turpentine and lampblack with a little linseed oil, or even glue and water with lampblack. Thin for use as a paint; use somewhat thicker for stencil.

(315) B. O. H.—The removal of superfluous hair by electrolysis is treated of in our SUPPLEMENT, Nos. 176 and 353, which we can send you by mail for ten cents. A really simple way of removing hair is not known.

(316) G. R. writes: I would like to know how to construct a plunging bichromate battery, and what size required to run a one man power motor, also a field magnet. A. For directions relative to construction we refer you to the SCIENTIFIC AMERICAN, August 20, 1887. From 100 to 150 such cells will represent one horse power, for one man power use 10 to 20. The larger number is to be preferred. For field magnet construction see our SUPPLEMENT, Nos. 160, 600, and 641, which we can send you for 10 cents each.

(317) O. F. S. writes: 1. Will you inform me how long an ordinary incandescent lamp carbon will burn in air? A. It will instantly be destroyed by access of air. 2. And if there is any liquid that will be attracted by a permanent magnet? A. No.

### Enquiries to be Answered.

The following enquiries have been sent in by some of our subscribers, and doubtless others of our readers will take pleasure in answering them. The number of the enquiry should head the reply.

(318) E. E. P. asks how a preparation called plastic is made. It is used in decorative and fresco painting. It is applied with a brush by one man, who goes ahead and is followed by another, who stipple it with something like a broom scrub brush. And this preparation pulls out and becomes rough like a scratchcoat of plaster. Designs are then scratched on this to suit tastes.

(319) W. E. asks: When will occur the next total eclipse of the sun visible in the vicinity of New York?

(320) S. L. F. asks: Will you kindly give me a rule for working out the following problem. What is the areal strain on  $\frac{3}{4}$  inch staybolts placed 6 inches apart, with one hundred pounds pressure of steam?

(321) S. H. P. says: I should like to ascertain, if possible, the diameter, area, and number of blades of a propeller, and power required, to drive a vessel having a resistance of 3,000 pounds through the water at the rate of 7 knots per hour.

### Replies to Enquiries.

The following replies relate to enquiries recently published in SCIENTIFIC AMERICAN, and to the numbers therein given:

(72) K. C.—Petrifying Springs.—There are such reported springs in the Yellowstone Park, and other parts of the United States. They are not petrifying waters, but rather incrusting waters. An object placed in the water will soon be covered with a coating of carbonate of lime. This is an entirely different operation from petrification, which is a chemical interchange of elements, by which the wood becomes silicified entirely, though retaining its wood identity. We do not know that there is such petrification now taking place. It is now only known as the fossil remains of a previous geological age.

(76) F. R.—The relief valve is known, and can be obtained through the pipe trade, as a back pressure valve. 2. In piping drying kilns, the coils should be so arranged as to allow more than the full area of the exhaust pipe throughout the system to avoid back pressure. 3. Bridge wall should be from 7 to 10 inches from the boiler and may be straight or curved. Both forms have their advocates among mechanical engineers.

(79) K. & W.—Running Engine.—You fail to state the number of revolutions required, or the condition of the cut-off: 50 to 55 pounds boiler pressure should enable you to give the piston a mean pressure of 40 pounds per square inch, which, with a speed of 75 revolutions per minute, will make 30 horse power. The pipe should be placed in a box at least 10 inches square inside, and filled with sawdust if better material is not at hand. Pulverized charcoal, mineral wool, or asbestos is preferable.

(80) G. A. S.—Smoke Stack Protection.—Your smoke stack will be safe from lightning if you make a good iron or copper connection from the base to the water way in the ground. This may be done by driving an iron rod to the water level, or sinking a drive well pipe where you can be sure that you have a water connection. If you have a well, it will answer the purpose to connect with the water in it.

(85) A. J. C.—Damp Walls.—Paint the outside of your rough-cast walls with raw linseed oil. When the oil has become set or dry, paint again with any desirable color, mixed with boiled linseed oil. The dampness inside may also arise from the faulty method of plastering upon the wall, instead of furring and lathing. If the dampness is at the bottom or next to the base board, it may be derived from the ground by absorption through the brickwork. In such cases, clearing away the soil to two feet below the floor beams and plastering with asphalt, or painting the wall with two coats coal tar, will remedy the dampness.

(126) B. L. A.—Heating Room.—You are right. Fresh air must enter to take the place of air ejected by ventilation. If cold, it will fall to the floor unless arrangement is made for its contact with heating pipes in room. 2. It can if air is provided by special inlet to supply combustion within the stove. 3. Yes; Heat is transmitted by radiation, and also imparted by convection or contact with a conveying medium, as air or other gases and fluids.

(128) O. S.—Violin Bow Resin.—Select the best clear brown resin, melt it in a clean basin, to nearly a boil, which will clear it of turpentine or other volatile oils. Pour in paper moulds.

(130) P. C. W.—Old Gold Braid.—The old and soiled gold braid cannot be restored. Replace it with new.

(131) S. B.—Work of Pulleys.—The set screw power, as you call it, or resistance, depends upon the product of the leverage or semi-diameter of the pulley multiplied by the tension of the belt in each case; the difference in the diameter of the respective shafts being also a factor.

(132) W. H. M.—Razors.—Razors are hardened and tempered in the rough with the cutting edge thick, to avoid cracking, and then ground thin. You cannot harden your razor. Try a new one.

(134) C.—Engine and Boiler.—For your 20 H. P. engine, a 30 H. P. boiler is the cheapest in the fuel account.

(135) A. A.—Electro-Plating.—You will find the subject fully treated in a work on "Electro-Deposition," by Watt, \$3.50, which we can mail.

(136) C. B. S.—Thrashing Machine and Engineering.—If the tumbling rod connection is properly made and free running, you should lose less than 10 per cent of the power. 2. Study electrical works in the special line that you wish to pursue. (See our catalogue for valuable works which we can furnish.) 3. As a profession, electrical engineering is progressive, and com-

pares very favorably with civil and other branches of engineering.

(139) A. G. D.—Cold Box in Ice House.—You must have ice packed around and above the cold box. The tendency of cold air from the ice is always downward.

(140) F. W. E.—Poisonous Cookery.—There is nothing made better than the porcelain lined kettles for cooking fruit. We fear that you will find the trouble somewhere else. Systematic search may reward you with the information requested.

(141) H. B.—High Explosives.—A work on "Modern High Explosives," by Eisler, treats of the chemistry, manufacture, and use of the best high explosives used in the United States. The names that you mention are mostly foreign explosives that have been experimented with by U. S. naval officers. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 674, for an account of them.

Books or other publications referred to above can, in most cases, be promptly obtained through the SCIENTIFIC AMERICAN office, Munn & Co., 361 Broadway, New York.

### NEW BOOKS AND PUBLICATIONS.

TOWN AND COUNTRY SCHOOL BUILDINGS. A collection of designs for schools of various sizes, graded and ungraded, with descriptions of construction of sanitary arrangements, light, heat, and ventilation. By E. C. Gardner. E. L. Kellogg & Co., New York and Chicago. 1888. Price \$2.50.

In this work the whole operation of building country schools, from the preparation of the ground to the development of the best sanitary appliances, is treated. The book begins with a description of a log building of one room for pioneers. It then gradually develops the subject until the large brick building for graded work is reached. Alterations, ventilation, out of door surroundings, and detached suggestions are also treated of. The designs for buildings, accompanied by their plans, are numerous and tasteful, the author departing radically from the idea that the school house must be plain and ugly. The cuts number 124.

GORED MAPS OF THE NORTHERN AND SOUTHERN HEMISPHERES. Chicago: E. Hollenshead.

These gored maps are printed on two sides of a sheet 28x30 inches in size, one side representing the southern and the other the northern hemisphere, with their respective poles in the center. They are each designed to represent the true surface of a hemisphere, so that if folded over a spherical mould, the gores, or unprinted portions, would be found to be surplus, and the printed or pictorial portions of the surface present the precise relations that different and widely separated divisions of the earth bear to each other latitudinally and longitudinally.

Messrs. Styles & Cash, the well known New York printers and stationers, get out an unusually large and handsome calendar this year, and, in addition to the dial for marking the days as on the face of a clock, there are fine surrounding views of the homes and haunts of Washington, especially appropriate for this centennial year of Washington's inauguration.

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