

## ENGINEERING INVENTIONS.

A hydrocarbon burner has been patented by Mr. Lewis B. White, of New York City. It is primarily for burning crude petroleum for steam boilers, and combines with the boiler a steam jacket with a retort, a tank, and steam jet apparatus for converting the residuum from the retort into spray, in a way that is intended to avoid overheating of parts of the burner.

A muffler for steam valves has been patented by Mr. Thomas E. Hill, of Rahway, N. J. It has such perforations and slots to retard and subdivide the steam that there will be little hissing and disagreeable sound, and the steam so acts as to raise the valve and permit the escape of steam, if desired, beyond the capacity of the boiler to generate.

## MECHANICAL INVENTION.

An outlining tool has been patented by Mr. Robert A. MacKenzie, of New York City. It is a tool designed particularly for carpenters' use in the work of dressing doors and similar pieces of stuff to their frames, to secure a perfect fit without the necessity of frequently setting the door up in the frame to test it as the work proceeds, and for similar uses.

## AGRICULTURAL INVENTIONS.

A corn sheller has been patented by Mr. Asahel H. Patch, of Clarksville, Tenn. It is so made that, the ears of corn being put in a hopper, and a crank turned, the teeth of a wheel cause each ear to revolve and carry it down, spiral ribs engaging the surface of the ear and controlling the speed while the teeth remove the kernels from the cob, the machine being simple, light, and inexpensive.

A derrick for loading and stacking hay has been patented by Messrs. Thor O. Thorson and Peter S. and Michael W. Peterson, of Elliott, Ill. It is adapted for use in connection with a hay wagon, and also for general use as a derrick, and may be operated either by hand or horse power, the invention covering improvements in the construction and combination of the several parts.

## MISCELLANEOUS INVENTIONS.

A carpet stretcher has been patented by Mr. Charles R. Gincley, of West Chester, Pa. This invention provides an implement designed to stretch the carpet to place and there hold it by a tack carried by a magnetized plunger, arranged to be forced downward by a properly mounted lever.

A table has been patented by Mr. Harley A. Barnhart, of Adelphi, O. This invention relates to extension tables formerly patented by the same inventor, and provides that the extra leaves will have direct support from the floor by an independent leg, thereby making the table more substantial.

A fur skirt has been patented by Messrs. Phillip Weinberg and Louis Clark, Jr., of New York City. The invention covers a novel form of a garment to be supported at the waist, having a fly at the waist placket, and a waist band with an adjustable fastening, so that the garment will fit persons of different sizes.

An exercising machine has been patented by Mr. John A. Smith, of New York City. It is a device by which the operator can lift weights attached to a rope by pulling in any direction upon handles, the pulley over which the rope passes turning easily on a swivel, the weight to be lifted being readily adjustable.

A pencil sharpener has been patented by Mr. Thomas A. Henderson, of Natchez, Miss. Combined with a sliding and rotating pencil holder is a spring-supported plate having an abrasive surface, with other special features, whereby both the wood and the lead of the pencil may be rapidly reduced to the required form.

A hand sled has been patented by Mr. Herman Lindenberg, of Jersey City, N. J. This invention consists principally in providing the sled with a sliding bar having penetrating points for forcing the sled forward as the rider draws backward upon handles attached to the sliding bar, making a practical self-propelling hand sled.

A kneading machine has been patented by Mr. James F. Hughes, of Georgetown, Texas. Its construction is such that the flour, seasoning, etc., may be placed in a tray or receptacle, when the operator turns with one hand a crank arm rotating a rod in the receptacle, and with his other hand turns the receptacle in various ways until the dough is thoroughly kneaded.

A tank has been patented by Mr. Antonio O. y Ponce, of Brooklyn, N. Y. It is for water closets and similar uses, and, being connected with a water supply pipe, is intended to fill itself automatically and discharge any desired amount of water into the basin when the operator actuates a lever or arm controlling the basin discharge cup.

A piston packing has been patented by Mr. John W. Dudley, of Portland, Ore. Bevel faced split metallic rings are held between opposite fixed and movable heads of the piston, and an elastic packing placed within said rings, and tending to force them outward, making a simple and efficient packing, which may be readily tightened, and will have an elastic bearing.

A drag saw has been patented by Mr. Cornelius W. Wright, of Democracy, O. It is so constructed that U-shaped irons on the end of the beam engage the log, and prevent vibration during sawing, and as the saw travels through the log it can be adjusted to the depth of cut by a lever, so that it will constantly move substantially upon a level.

A draught equalizer has been patented by Mr. John L. Powles, of Goodland, Ind. This invention covers an arrangement of levers, yoke, and a chain, etc., especially adapted for four horses, though the number is not limited, and by which side draught will practically be obviated, and the draught apportioned to the animals according to the work and their strength.

A beer faucet has been patented by Mr. John Walsh, of New York City. It has a metallic stock and peculiarly fitted and readily inserted rubber tube, the whole being so designed, in various novel features of construction, that the liquid will be kept from coming in contact with the metal of the faucets and contaminated thereby.

The manufacture of artificial leather or leather cloth forms the subject of a patent issued to Messrs. William V. Wilson, of Jubilee St., Middlesex Co., and Joseph Story, of Lancaster, Eng. It is for a new article of manufacture, a fabric coated with the residuum from a solution of mononitro-cellulose in acetate of amyl, in admixture with oil and a pigmentary matter.

A dental articulator gauge has been patented by Mr. Josiah B. Crist, of Hummelstown, Pa. It is a metal plate of elongated and tapered form, which has an arc bar with graduated marks, the device being adapted for measuring the approach of the gums when the mouth is closed, to indicate what length teeth are to be used, in putting in new ones, to preserve the comfort and symmetry of the mouth.

The manufacture of white lead forms the subject of a patent issued to Mr. William E. Harris, of New York City. Certain proportions of carbonate of soda and sublimed lead are well mixed in a tank with a due amount of water for about five hours; the top liquid having been drawn off, the lead is washed again with water, and afterward put in an evaporating furnace to finish its preparation.

A baling press has been patented by Mr. Joseph L. Gilbert, of Lebanon, Ore. The invention covers a novel arrangement of the baling chamber, and a novel way whereby the rope through which the power is applied is automatically locked in place when the power is relaxed; also in a new form of knotted adapted to operate on cords or wires held by a special kind of spools, with various other novel features.

An automatic attachment for stove or range dampers has been patented by Mr. Isaac A. Abbot, of Denver, Col. Combined with the damper is a vessel with trunnions, having brackets with slots for the trunnions to ride in, a piston and a spring, with a mechanism for establishing a connection between the damper and a piston, whereby the heat of ovens or other portions of a stove may be regulated.

A hose nozzle holder has been patented by Mary Lane, of Hot Springs, Ark. A turn table, with clamps for locking it in position, is mounted on a support, uprights projecting from the table, and a shaft journaled in their upper ends, to which the hose holder is secured, with a setscrew for locking the shaft in position, whereby the nozzle may be easily held for directing the stream in any direction.

A burglar alarm has been patented by Mr. Charles H. Dowden, of Newark, N. J. It consists of two sliding metallic buttons, each in a metallic shell attached to the window jamb, a metallic strip being on one edge of each window sash, with wires, each attached to a shell and connected with a battery, and a device for giving the alarm, which will continue to sound as long as the sashes are out of proper position.

A cop winding machine has been patented by Mr. George H. McCausland, of Philadelphia, Pa. The invention covers a novel construction and arrangement of parts of a machine, which can be readily adjusted to suit and wind fine, coarse, and all grades of yarn, it being possible to cop all kinds of yarn by simply changing the speed of a shaft and the up and down movement of a cross piece.

A wagon tongue has been patented by Mr. George W. Avery, of Fort Ransom, Dakota Ter. A socket is fitted to the end of the tongue, with a notched end in which the neck yoke ring is received, and a spring-acted bolt for closing the notch, a rod connected with the bolt extending nearly the whole length of the tongue, by which the neck yoke ring is securely held, or may be readily released by moving a handle at either end of the tongue.

A fence machine has been patented by Mr. Robert F. Deering, of Washington, Kansas. The machine is mounted on a frame, and has hollow twisting spindles, connected by gear wheels, each spindle having rectangular arms, each carrying a wire reel, there being a tension device, and various other special features combined in a novel way, for making a combined wire and picket fence of any desired height and length.

A sash balance has been patented by Alois Lang and Thomas W. Talbot, of Florence, S. C. A pivoted lever, with one end adapted to be connected with the object to be counterbalanced, has a spring connected to its opposite end, to adjust along the same near the fulcrum, so that when compressed it will exert the greatest force on the lever, the device being also applicable as a counterbalance for weights, or in gasometers, and for other purposes.

A vehicle spring has been patented by Mr. Edward Bowman, of Santa Cruz, Cal. The spring has slots in its ends, a socket with downwardly projecting pins, a wearing plate, and a clip for securing the socket to the axle, with other novel features, the arrangement being such that the heavier a vehicle is loaded, the nearer the center will be the bearing of the spring, the rigidity being increased according to the load.

A vertical draught attachment has been patented by Mr. George W. Wheeler, of Ogdensburg, N. Y. There is a series of transverse pivoted deflecting plates below the grate, links pivotally connecting the plates beyond their pivoted points, and a rod for adjusting the plates at any desired angle, the device being applicable to almost any form of furnace, in order to distribute the draught more equally throughout the length of the fire.

A process of and apparatus for manufacturing concentrated extract of cod livers has been patented by Messrs. James W. Stairs and John Craig, of Halifax, Nova Scotia, Canada. The apparatus com-

prises a steam-heated vat, evaporating pan, filter, and press, and the process is designed to make an extract soluble in water, and readily assimilated, which shall have all the valuable properties of cod liver oil without the fat or oil.

A check receiver has been patented by Mr. John Casey, of Jersey City, N. J. It is for receiving and holding checks of metal, celluloid, or other suitable material, as used in making payments of small amounts in many kinds of business, and holds a number of checks in view before they are finally discharged into a receiver, the invention being an improvement on formerly patented inventions of the same inventor in this line.

A brick machine has been patented by Mr. William Thaison, of Austin, Texas. The mould wheel has six, eight, or more radial mould cavities, in each of which is fitted a plunger, and for each revolution as many bricks are made as there are cavities, the cavities and plungers being shaped according to the shape of the bricks desired, the invention covering various novel features in a machine which will occupy but little space and produce a large number of bricks in a short time.

An apparatus for preparing wood and other fibrous material for conversion into pulp has been patented by Mr. Franklin B. Erwin, of Elkhart, Ind. This invention relates to apparatus in which sulphurous acid is used in treating the fiber, and covers a method of producing the acid in the digester under pressure, there being in connection with the digester a furnace for burning the sulphur, a pump for drawing the fumes from the furnace and forcing them into the digester, means for producing a circulation, and various other special features.

## Special.

## NEW YORK CITY—THE EXPERIENCE OF MR. HETTRICK.

There was a time in the history of New York when the whole provision business of the city centered in Washington and Fulton Markets. These markets were queer old collections of tumble-down sheds, and, to speak as mildly as possible, were not an ornament to the city. They have within a few years been rebuilt, and are now spacious and elegant. But much of the provision business has scattered itself around town among the stores of the green-grocers, and a great deal of it has gone to certain new markets which have been built up-town. One of the most elegant of these markets is the "Central," at Broadway and Forty-eighth Street. For convenience and for perfect cleanliness it is a model market. Passing through it we find, among the butter and produce men, Matthew Hettrick, Esq., one of the largest dealers in butter and cheese in the city. Mr. Hettrick has grown up in the business, and is thoroughly familiar with every detail of it.

Although Mr. Hettrick had long been a prosperous butter merchant, he was for many years severely annoyed with catarrh, bronchitis, and dyspepsia. A combination like this is enough to make any man miserable.

To our New York correspondent, Mr. Hettrick gave an account of his diseases and his recovery.

"For twenty-five years I had a great deal of trouble with my head and throat. I had both catarrh and bronchitis, which were not only annoying, but very painful. I was treated by the regular doctors, and by specialists who gave their whole attention to these diseases. But neither the regulars nor the specialists did me any lasting good. I must have inherited these diseases, for two brothers of mine also had them, and died of them. I am nearly sure that one of these brothers could have been saved, had he taken in time the remedy which has now restored me to health."

"And may I ask what that remedy is, Mr. Hettrick?" "It is what they call Compound Oxygen. About a year ago I heard of this—I had seen it advertised. First, I sent to Philadelphia for it—the headquarters. Then I found they had an office here on Fifth Avenue—No. 148—and I got a treatment or two there, together with a good deal of advice from the physician in charge. Did it do me good? Well, you see me now; you ought to have seen me before I took this Compound Oxygen. My catarrhal discharge was very profuse. My voice was hollow. I was suffering about equal distress from the catarrh and the bronchitis, and added to these was the distress of the dyspepsia. Every little cold I caught would make me worse. I am exposed to a great deal here in the market, where I spend much of my time. There are draughts in all directions, and in raw weather, when doors are constantly opening and shutting, it is enough to give a well man consumption or pneumonia."

"Three days after I began to inhale Compound Oxygen my voice became better, and I was much encouraged by seeing that there was a chance for me to mend, generally. I was surprised and gladdened to see how soon the Oxygen did its work on the catarrh. It was not a mere drying up of the discharges. That I had had before, by the aid of some of the specialists; but let me tell you what a man needs who has catarrh. He wants all the organs of his head and throat put in such healthy condition that the discharges don't come. That is what Compound Oxygen did for me. I can't account for it except on the theory that this remedy strengthened and built up my whole system. It certainly helped me out of all these three troubles together, and at about the same time—catarrh, bronchitis, dyspepsia. My recovery was steady; I was gaining all the time. Sometimes, if I caught cold, I would lose a little, but I always gained more than I lost, and so I went on until I got to where you see me now."

"Well, Mr. Hettrick, you now look like a perfectly well man."

"That is exactly what I am, abating only a little for wear and tear, and considering what I endured for so many years. Once in a while I find I have a little catarrh left, and sometimes I feel a little inconvenience from an attack of indigestion. But these things are trifles compared with what I used to suffer. My general health is very good. I can stand all the duties of my business. I can bear exposure to the weather. I eat pretty much what other folks eat, and I have a fair appetite; and I think people who see me would not take me for a man who had been sick."

A remedy which can thus drive out such a three-fold combination of twenty-five year old disorders as catarrh, bronchitis, and dyspepsia is something of which every invalid ought to know. Compound Oxygen works such wonders that all people, sick or well, should read the interesting little brochure about it which is published and mailed free of charge by Drs. Starkey & Palen, 1529 Arch Street, Philadelphia. Also several other works on chronic diseases.

## Business and Personal.

The charge for insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

Wanted—20 inch throat boiler-makers' punch and shear in good order. S. P. Hedges, Greenport, N. Y.

Mechanic's Own Book. Full instructions for drawing, casting, founding, forging, soldering, carpentry, carving, polishing wood and metals, turning, roofing, etc. 702 pages; 1,420 illustrations. \$2.50, post paid. E. & F. N. Spon, 35 Murray St., N. Y.

Railroad Engineer's Transition Curves. A simple and rapid method for laying out. By B. H. Hardaway. With transit book combined. Price, \$2.00. E. & F. N. Spon, 35 Murray St., N. Y.

Texas.—Ice Factory, Cotton Gins, Corn Mill; all run by water power. Heirs wish immediate sale. Address W. J. G. Jones, 113 East 14th St., New York.

## Protection for Watches.

Anti-magnetic shields—an absolute protection from all electric and magnetic influences. Can be applied to any watch. Experimental exhibition and explanation at "Anti-Magnetic Shield & Watch Case Co.," 18 John St., New York. F. S. Giles, Agt., or Giles Bro. & Co., Chicago where full assortment of Anti-Magnetic Watches can be had. Send for full descriptive circular.

Walrus Leather, Emery, Glue, and Manufacturers' Supplies generally. Greene, Tweed & Co., 83 Chambers St., New York.

Wanted—Patented novelties to manufacture on royalty, or would purchase patent outright. Household or articles in general use preferred. Address, with full particulars, Hardware, Plantsville, Conn.

Complete Practical Machinist, embracing lathe work, vise work, drills and drilling, taps and dies, hardening and tempering, the making and use of tools, tool grinding, marking out work, etc. By Joshua Rose. Illustrated by 356 engravings. Thirteenth edition, thoroughly revised and in great part rewritten. In one volume, 12mo, 439 pages. \$2.50. For sale by Munn & Co., 361 Broadway, New York.

Blake's Improved Belt Studs are the best fastening for Leather or Rubber Belts. Greene, Tweed & Co., New York.

The Railroad Gazette, handsomely illustrated, published weekly, at 73 Broadway, New York. Specimen copies free. Send for catalogue of railroad books.

Concrete patents for sale. E. L. Ransome, S. F., Cal.

Machinist Foreman wanted who can handle fifty men to advantage and increase their production by latest improved ways of doing work. Address P., care of Wilkinson & Co., 352 Atlantic Ave., Boston, Mass.

Friction Clutches from \$2.25 on. J. C. Blevney, New-Yark, N. J.

Woodworking Machinery of all kinds. The Bentel & Margendat Co., 116 Fourth St., Hamilton, O.

A Catechism on the Locomotive. By M. N. Forney. With 19 plates, 227 engravings, and 600 pages. \$2.50. Sent on receipt of the price by Munn & Co., 361 Broadway, New York.

Guild & Garrison's Steam Pump Works, Brooklyn, N. Y. Pumps for liquids, air, and gases. New catalogue now ready.

The Knowles Steam Pump Works, 44 Washington St., Boston, and 38 Liberty St., New York, have just issued a new catalogue, in which are many new and improved forms of Pumping Machinery of the single and duplex, steam and power type. This catalogue will be mailed free of charge on application.

Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J.

Nickel Plating.—Sole manufacturers cast nickel anodes, pure nickel salts, polishing compositions, etc. \$100 "Little Wonder." A perfect Electro Plating Machine. Sole manufacturers of the new Dip Lacquer Kristalline. Complete outfit for plating, etc. Hanson, Van Winkle & Co., Newark, N. J., and 92 and 94 Liberty St., New York.

Iron Planer, Lathe, Drill, and other machine tools of modern design. New Haven Mfg. Co., New Haven, Conn.

Wrinkles and Recipes. Compiled from the SCIENTIFIC AMERICAN. A collection of practical suggestions, processes, and directions, for the Mechanic, Engineer, Farmer, and Housekeeper. With a Color Tempering Scale, and numerous wood engravings. Revised by Prof. Thurston and Vander Weyde, and Engineers Buel and Rose. 12mo, cloth, \$2.00. For sale by Munn & Co., 361 Broadway, New York.

## "He Never Smiled Again!"

No "hardly ever" about it. He had an attack of what people call "biliousness," and to smile was impossible. Yet a man may "smile and smile, and be a villain still," still he was no villain, but a plain, blunt, honest man, that needed a remedy such as Dr. Pierce's "Pleasant Purgative Pellets," which never fail to cure biliousness and diseased or torpid liver, dyspepsia, and chronic constipation. Of druggists.

Curtis Pressure Regulator and Steam Trap. See p. 142.

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Iron and Steel Wire, Wire Rope, Wire Rope Tramways. Trenton Iron Company, Trenton, N. J.

Astronomical Telescopes, from 6" to largest size. Observatory Domes, all sizes. Warner & Swasey, Cleveland, O.

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If an invention has not been patented in the United States for more than one year, it may still be patented in Canada. Cost for Canadian patent, \$40. Various other foreign patents may also be obtained. For instructions address Munn & Co., SCIENTIFIC AMERICAN patent agency, 361 Broadway, New York.

## 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.

**Special Written Information** on matters of personal rather than general interest cannot be expected without remuneration.

**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.

(1) W. K. writes: The question came up a few days ago here, How far would one million silver dollars reach, they being laid down side by side, touching each other? This we found would be 23 miles 118 yards and 2 feet. Then the question was asked, How large a circle would the one million dollars make, laid the same as above? Some claim it cannot be worked out accurately. Bringing them into a circle, they will lose some of the above length. The question we ask you to decide is how much of the above length would they lose? A. The coins will form a circle whose perimeter will be slightly less than the length of the straight line, in the ratio of the chord of 180° (or 360°

diameter) to the chord of 180°— $\frac{1,000,000}{1,000,000}$ . This is most easily solved by the rule of the square of the hypotenuse, taking the diameter of the circle as the hypotenuse, one millionth part of the semi-perimeter as altitude, and the third side to be solved as the chord. This only involves the error of assuming an arc of 1°29'6" to coincide with its sine, which error is infinitesimal for all ordinary dimensions. Then, solving the triangle, we find the perimeter of the circle of dollars would be to the straight line of dollars in the ratio of 999,999,999,995,609 to 1,000,000,000,000,000, or about  $\frac{6}{1,000,000}$  of the diameter of a silver dollar.

(2) E. S.—Turpentine varnish is simply clear, pale resin dissolved in oil of turpentine.

(3) E. F. F. asks: How can I clean a fine chromo which has become dirty and fly specked, also what kind of varnish shall I use to varnish it? A. Keep a wet towel lying on its face till the dirt is thoroughly softened, say 3 or 4 days, occasionally rubbing off carefully with a sponge; then rub with clear nut or linseed oil.

(4) M. B. B. asks: 1. Is the daily use of soap injurious to the skin, as is often said? A. No; but to not thoroughly rinse and dry the hands makes the skin rough. 2. What kind of soap is the most healthy? A. The purest is the best, and white castile is generally recommended by the doctors. 3. Is there anything to remove freckles? A. It is often quite difficult to remove freckles. The following has been recommended 1 drachm each of white precipitate and subnitrate of potash in one ounce of glycerine ointment. This is to be applied in a thin layer every other night for from four to six weeks.

(5) M. L. asks: What will take the dirt off book leaves without injuring the printing? A. Besides the ordinary use of bread crumbs, for the removal of stains, a solution of oxalic acid, citric acid, or tartaric acid may be used; these acids do not attack printing ink, but will remove marginal notes in writing ink, etc.

(6) J. T. asks why objects appear inverted on the ground glass of a photographic camera. A. Because the rays of light from the bottom of the object pass in straight lines through the lens, crossing its axis, and continue upward until they reach the upper side of the ground glass. The rays from the top of the object pass downward, and strike the bottom of the ground glass. See Ganot's Physics for further explanation.—To clean brass, use oxalic acid and water.—Goodman & Wightman, Boston, Mass., will make small engines for you.

(7) J. L. O. asks: 1. Which President of the United States first issued a Thanksgiving proclamation, and in which year? A. George Washington, in 1789. 2. After once issued by the President, was it any following year omitted? If so, which, and by whom? A. The second Thanksgiving proclamation was issued in 1795, by George Washington. 3. Was a Thanksgiving proclamation made by any governor before same was issued by any President? And if so, by whom? A. Occasional Thanksgiving days were appointed by the Dutch governors of the New Netherlands in 1644, 1645, 1655, and 1664; and by the English governors of New York in 1755 and 1760. Regular annual recommendations of a thanksgiving day were prevalent in the New England States from a very early period,

but the custom did not extend throughout the Union until within the last thirty years.

(8) G. Z. asks (1) how to kill or keep roaches away? A. Use borax or Persian insect powder. These must be renewed frequently, as they deteriorate by exposure to the air, and lose their power. 2. How to remove printer's ink from a tin can? A. Use benzine or caustic soda.

(9) W. W. W. asks if there is any preparation which, applied to windows, will prevent their frosting. A. Covering the glass with a thin coat of glycerine is the simplest method; where there are objections to this, make a double window, with a ventilating chamber between the glass walls.

(10) C. H. asks for a recipe for making javelle water. A. Add carbonate of potash to a solution of chloride of lime, with agitation as long as a precipitate forms, the liquid being afterward decanted or filtered.

(11) S. G. D. asks for a method of tinning brass, and if there is a way to tin a brass shell on the inside and nickel-plate same on outside. A. See the article on the "Tin Plating Process," in SCIENTIFIC AMERICAN SUPPLEMENT, No. 310, under the title of "Electro-Metallurgy."

(12) B. W. B. asks: Which plan is the most efficient for heating workshops—steam pipes around the walls at the floor, or steam pipes overhead just under the ceiling? A. In workshops and factories where the side walls are clear for the reception of pipes, the wall coils near the floor are the most efficient, and generally preferred for equal distribution of heat. There are many workshops and factories in which the wall spaces are occupied with machinery, benches, or goods. In such the hanging system is much in vogue, and is considered very efficient.

(13) R. B. asks (1) how to take grease stains out of paper. A. Oil stains may be removed from paper by applying pipe clay, powdered and mixed with water to the thickness of cream; leave it on for four hours. 2. I have some bronze, and would like to know how to make some glue to use on anything I want to bronze. A. Ordinarily, a coating of common sizing will do, but it depends largely upon the article you desire to have bronzed. We would advise you to consult Spon's "Workshop Receipts," first series, which we can send you for two dollars.

(14) "Information."—A structure along or over a marsh is often more correctly styled a causeway than a bridge. The Tay Bridge, Scotland, is 3,600 yards long. A railroad bridge over the Volga is 1 1/4 miles long. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 256. The Garabit in France is 413 feet high. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 391. The Kinzua viaduct is 301 feet high. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 369. The St. Gothard tunnel 48,840 feet long. The Mt. Cenis tunnel 37,840 feet long.

(15) P. H. R. asks: 1. Where is a good school to study mining engineering? A. There are schools of mining engineering in Ann Arbor, Michigan; Golden, Colorado; Rolla, Missouri; and in New York city. 2. What is the proper preparatory course to pursue? A. This information can be best acquired from the catalogues of the institutions referred to. One essential requirement is a thorough knowledge of mathematics. 3. A receipt for a tooth paste that does not contain pumice stone. A. Take ordinary charcoal and beat it up with pure honey; or powdered willow charcoal 1 part, cinchona bark and sugar of milk in powder each 4 parts; add transparent soap in powder 1 part. Mix in a mortar, sift through bolting cloth, and perfume.

(16) J. F. asks: What is the process for etching on steel shears? A. Etching upon cutlery is done by printing the design or lettering with a rubber stamp, using as ink a wax composed of equal parts asphalt, Burgundy pitch, and beeswax, melted and thoroughly mixed. Place some of the wax upon a smooth plate of iron, warmed so as to just melt the wax. Use a small pad to distribute the wax evenly, as in printing. Warm the cutlery just enough to receive the print without spreading. Charge the rubber stamp and print the device, or paint all parts of the piece not required to be etched with a varnish of asphalt and turpentine. In either case, when dry, dip for a few seconds in a bath of 1 part nitric acid, 4 parts of water. Then dip in boiling hot water, wipe dry, and remove the traces of wax and varnish with turpentine. The rubber stamp may be made for bright letters or device on etched ground. The rubber-stamp makers can make the stamp. Any special device will have to be engraved, from which the rubber stamp can be made.

(17) C. A. A. asks as to the connections between an engine and boiler. The boiler is 80 feet from engine, and the question is as to the best way to make the connection, whether by steam pipe laid in a box underground or by a pipe (well covered) overhead. A. It matters not whether steam pipe is placed above or below, as long as the most direct connection is made, and in a way to take care of the expansion and contraction of the pipe. The water condensing in the pipe or foam from the boiler will not run back while the engine is running. When not running, the overhead pipe, if properly inclined, will return the water of condensation to the boiler. There is no exception to the necessity of a drip pipe close to the engine valve for clearing the pipe of all water before starting, whether it is above or below. In all events, the most convenient way with a proper drip discharge near the engine is the best, and with thorough felting of the pipe is the most economical. A wrapping of sheet asbestos covered with one inch hair felting and canvas, painted, loses but very little heat.

(18) H. R. T. asks: 1. What is the greatest distance the telephone described in SUPPLEMENT, No. 142, will work? A. The magneto telephone described in SUPPLEMENT, No. 142, will, if on an isolated line, work over 3 or 4 miles of wire. 2. How many square feet of surface (cast iron plate) will it take to ground the wire? A. It depends on the moisture in the ground. A plate one or two feet square, and bedded

in charcoal in damp soil, is enough. 3. How much pressure will best wrought iron pipe with malleable fittings stand (air), and how much steam? Is there any difference in steam pressure and air pressure? A. Allow a strength of 500 pounds to the square inch for butt-welded pipe of best description, for either air or steam pressure. Steam is no more disastrous in exploding a pipe than air, except for its heat.

(19) G. S. W. asks: 1. Would you please inform me how to make a hard alloy that can be easily melted on an ordinary fire and that would be suitable to make a small model? A. A hard alloy suitable for casting is made of 80 pounds lead and 20 pounds antimony. 2. Also is the wire part of No. 16 covered electric wire the same size as No. 16 uncovered wire? A. The wire part of No. 16 wire is of the same size, whether covered or uncovered.

(20) H. S. S. inquires what talcum venetum and glass gall (sandiver) are. A. The first, probably Venetian talc, which is the same thing as soapstone or French chalk. Sandiver is skimmed off the surface of glass while in fusion.

(21) F. P. asks how to make cider brandy. A. Ordinary brandy is distilled from grape wine. If you distill cider instead of wine, you have cider brandy. Caramel or burned sugar can be added to color.

(22) H. A. W. writes: 1. A house is infested with red ants. How can they be removed? Powdered borax and Cayenne pepper have been used without effect. A. A strong solution of carbolic acid and water poured into holes kills the ants it touches. Lime and chalk are also recommended. 2. What will prevent grass from growing between the bricks in a side yard? A. Use common salt in the crevices.

(23) E. W. asks a receipt to make a cement that will stand considerable heat after it is cooled. A. Mix a handful of quicklime in 4 ounces of linseed oil; boil to a good thickness; then spread on thin plates in the shade, and it will become exceedingly hard, but may be easily dissolved over the fire, and used as ordinary glue.

(24) W. B. asks for receipt for flour paste that will not sour under a reasonable time. A. Mix smoothly flour and water till a thin batter is formed; put in a pinch of pulverized alum, and pour in boiling water until a thick paste is formed. Let it boil a minute or two; add a few drops of carbolic acid or oil of cloves. Put in a wide necked bottle. The oil of cloves acts as a germicide, and prevents the growth of mould.

(25) J. K. wants to know how to make prints from the plate sold with the "Ready Photographer." A. After the negative is developed, fixed, and dried, place it film side upward in a photographic printing frame and put in contact with the plate a piece of ready sensitized sensitive silver paper. Then expose to the sun until the picture is printed out. The paper is removed, toned, and fixed. Duplicates can be made to any amount. The frame, paper, and other materials can be had from any photographers' supply house.

(26) C. J. H. asks how to make a dye for coloring hair—one that will be black as soon as the operation is complete, without waiting several hours for the sun to produce the change. A. An instantaneous hair dye, contained in two bottles, consists of the following: a. To 1 ounce pyrogallol acid add 1 quarter ounce of tannin, dissolved in two ounces of alcohol. Add 1 quart of soft water. b. To 1 ounce of crystallized nitrate of silver, dissolved in one ounce concentrated aqua ammonia and one ounce soft water, add one-half ounce gum arabic and 14 ounces soft water. Keep the mixtures in the dark. The hair must be thoroughly cleansed of all grease, then every part dampened with mixture a, all surplus moisture being removed, so there will be no dripping, when the mixture b must be applied with great care, and so as not to touch the skin.

(27) J. M. B. asks a receipt for making the "Elixir of Calisaya" that is sold in the drug stores. A. Take of quinine sulphate 72 grains, cinchonine sulphate 24 grains, quindine sulphate 20 grains, cinchonidine sulphate 12 grains, elixir of orange 128 fluid ounces, and of caramel a sufficient quantity to color. Triturate the mixed sulphates with 1 pint of the elixir, pour the mixture into a glass flask, and heat in a water bath until the solution is effected. While still hot, add the remainder of the elixir and caramel; when cold, filter.

(28) B. B. asks (1) how to dye or stain white and faded stag horn or buck horn to black. A. 0.14 ounce of silver is dissolved in 2.1 ounces nitric acid (aqua fortis). This solution must be applied several times to the article to be stained, but it is absolutely necessary that one coat should be dry before another is applied. 2. To a dark red color necessary for coloring knife handles? A. Take 17.5 ounces red Brazil wood, and boil for 1 hour in 4.4 milk of lime, and filter through a cloth. The articles to be stained are boiled for an hour in a solution of 1 ounce alum to 17 ounces water. They are then placed in the dye, and allowed to remain until the desired color is produced.

(29) G. C. asks how to make orange wine. A. The English pharmacopoeial name is vinum aurantii, and it is made by the fermentation of a saccharine solution to which the fresh peel of the bitter orange has been added. It contains about 12 per cent of alcohol, and is but slightly acid to test paper.

(30) R. L. asks (1) a receipt for making common black blasting powder. A. Ordinary blasting powder consists of 15 parts of carbon, 20 parts of sulphur, and 65 parts of saltpeter. 2. Is blasting powder best adapted for splitting timber and stumps? A. Various preparations of nitro-glycerine are used for this purpose.

(31) A. B. C. asks for a quick method of cleaning and brightening the brass fixtures of a railway coach. A. Brass may be cleaned with sweet oil and tripoli, powdered bath brick, rotten stone, or red brick dust, rubbed on with flannel and polished with

leather. A solution of oxalic acid rubbed over tarnished brass with a cotton rag soon removes the tarnish, rendering the metal bright. The acid must be washed off with water, and the brass must be rubbed off with powdered whiting and soft leather.

**MINERALS, ETC.**—Specimens have been received from the following correspondents, and have been examined, with the results stated.

H. D. S.—The mineral is a limestone of no value.

### TO INVENTORS.

An experience of forty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequalled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

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November 23, 1886,

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

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