

ENGINEERING INVENTIONS.

A governor for steam engines has been patented by Mr. Aaron J. Allen, of Hope, R. I. Combined with a governor of the ordinary type is a rotating sleeve, gearing, and sliding clutch, by which the spindle operating the cut-off or throttle is shortened and lengthened to give more or less steam as required by the load, without making any great change of speed.

An electric engine has been patented by Mr. William A. J. Kohn, of San Francisco, Cal. Combined with field magnets, swinging armatures with coils, and a battery connected with the field magnets, another battery is connected with the coils of the armature, and there are devices for automatically closing and opening the circuits of the field magnets and of the armatures, with other novel features.

A boiler feeder has been patented by Mr. Samuel Haigh, of Coquitlam, New Westminster, British Columbia, Canada. This invention relates to the use of water cylinders which are alternately filled and their contents run into the boiler in succession, there being a novel arrangement of floats, rods, and stops for actuating the valve of a steam cylinder in combination with the water cylinders.

MECHANICAL INVENTIONS.

A lathe for turning spirals has been patented by Mr. Silas Moore, of Cleveland, O. It feeds the work regularly against a revolving cutter, which may be quickly withdrawn and returned, so spirals may be cut either right or left handed, cylindrical, tapering, or wave pattern, and the pitch may be regulated at the beginning of each job by arranging the gear wheels in proper relation to the screw.

AGRICULTURAL INVENTIONS.

A cultivator has been patented by Mr. Jabez C. Nelson, of Marion, Ala. The tongue has a rounded forward end, a forked rear end, two arched bars attached to it, plow beams secured adjustably to the arms of the arched bars, with other novel features, making a cultivator which can be readily adjusted to a variety of different kinds of work.

MISCELLANEOUS INVENTIONS.

A table corner has been patented by Mr. Harvey N. Hall, of Evansville, Ind. It consists of a curved clamping iron and a curved stud or block, combined with a table frame and leg, the object being to thus provide firm and durable fastenings for securing table legs to the frames.

A trace carrier has been patented by Mr. Frank O. Derr, of Moulton, Iowa. It is made with side loops for the side straps of a harness, with a cross bar for the back strap, and a rear loop and keeper for the crupper strap, the device being cheap and durable and easily applied to any harness.

A salt boiler or pan has been patented by Mr. John Seely, of Warsaw, N. Y. Steam is used for heating, and wood is the principal material composing the boiler or pan, the construction being such that the different parts may be keyed up at any time to keep it from leaking in case of shrinkage.

A step ladder has been patented by Mr. William H. Klue, of Watertown, Pa. Combined with the ladder is a folding table and a drawer for holding small articles; the ladder is automatic in opening and closing, and is strengthened and made more firm than step ladders ordinarily are.

Window and other glass forms the subject of a patent issued to Mr. Michael Magrath, of New York city. The glass has a novel configuration on one of its faces, especially adapting it for fan lights, doors, etc., giving multiplied prismatic effects by the refrangibility of the rays of light upon a wall or other surface upon which the light is made to fall.

A rope clamp has been patented by Mr. Samuel H. Magee, of Galveston, Texas. It consists of a pair of clamping segments, combined with a wedge-shaped plate, for use in place of selvage straps, and purchases in setting up rigging, instead of catspaws, and also for joining two ends of a rope in place of splicing.

A velocipede has been patented by Mr. Lindsey Dickey, of Vibbard, Mo. The velocipede wheel is made with a wheel having an internal gear formed on its rim, spokes projecting from the rim of the said wheel, and a rim on the spokes, making a novel machine which can be driven at a high or low speed and easily steered.

An advertiser and card holder has been patented by Mr. John M. Hubbard, of Lake Village, N. H. A board is divided into spaces by transverse ridges, and on the side edges of the board are two pins for each space, on which are held cards which pass over the spaces and hold cards in place between the ridges, the holder being provided with means for hanging.

A pump has been patented by Mr. Charles H. Bennett, of Blossburg, Pa. This invention relates to improvements in that class of pumps where the piston is reciprocated vertically by the stand pipe through which the water rises, the construction being simple, the pump easily operated, and not liable to get out of order.

A thill coupling has been patented by Mr. George D. Umland, of Osceola Mills, Wis. The invention covers a specially formed block on a carriage axle clip, with other novel features, affording means whereby either a tongue or a pair of thills may be quickly attached to or detached from the axle of a carriage.

A fastening for bag, pocketbook, and purse frames has been patented by Mr. Charles S. Shepard, of Brooklyn, N. Y. A pair of studs is attached to one part of the frame, and studs with knobs to the other part of the frame, and a rod with a knob is hinged to the one pair of studs, shutting down between the knobs of the other pair.

A gas cautery has been patented by Mr. Charles Graefe, of Sandusky, Ohio. This invention re-

lates to cauteries heated by gas, for which the instrument is made with separate tubes, one for the gas and the other for the air, the ends being so bent that the current of air is discharged at right angles, or nearly so, to the flame.

A combined hammer and nail feeding device has been patented by Mr. Emmet Horton, of Dundee, N. Y. It is for use by carpenters, and for shingling, lathing, etc., having a nail receptacle which, by the swinging movement of the handle, is made to feed the nails by gravity, one at a time, to an attachment that places them in position for being driven.

A plaque or panel has been patented by Mr. Edward de Planque, of Hoboken, N. J. It is formed of two layers of canvas or duck united by a mixture of glue, whiting, and finely pulverized wood, the face or panel having a covering of whiting and glue on which the painting or drawing is produced, the plaque being readily pressed into any desired shape.

An ice creeper has been patented by Mr. Peter B. Laird, of Brooklyn, N. Y. It is made of two elastic wires, connected at their middle parts by a collar or band, and bent at their ends to form lugs to clasp the edges of the sole and heel, and points to engage the ice, the device being one readily applied to and detached from the soles of boots and shoes.

An adjusting device for rolling mills has been patented by Mr. John Wood, of Conshohocken, Pa. The invention consists in a wedge operated by a screw, and fitted between the breaker and bolster at one end of the top roll, whereby the adjustment of the roll to the lower one can be accomplished accurately and without loss of time.

A spectacle and eyeglass frame has been patented by Mr. Louis Lazarus, of Allegheny, Pa. The bows are divided to allow of the convenient insertion of new lenses, but have novel attachment of flexible metal tape or springs, which is scarcely perceptible, to hold the abutting ends of the divided bows pressed down upon the lenses.

A millstone dress has been patented by Mr. Robert Wilson, of Greenup, Ky. The millstone has furrows and lands, the latter with their tops rounded from the inner ends to a circle surrounding the eye, and with their remaining portions made flat, so the bran will not be cut or torn, and the stones are kept comparatively cool.

A combined reclining and rocking chair has been patented by Mr. Henry G. C. Lauer, of Iowa City, Iowa. The rockers are upon the rear legs only, and the arms are adapted to slide upon upwardly extended parts of the rear legs, and when used for reclining the chair will remain in any position to which it may be adjusted.

A truss frame for roofs of buildings has been patented by Mr. William P. Buckley, of Oxford, Chenango County, N. Y. This invention covers a special combination of rods with the framework and braces to support the weight of the roof in such manner as to give the greatest amount of strength and security from the building spreading or roof settling.

An ore and salt drier has been patented by Mr. Robert A. Nevin, of San Francisco, Cal. Combined with a rotating drier, ore roaster, and stack, are specially arranged flues and dampers, making an apparatus peculiarly adapted for drying ores preparatory to pulverizing and chloridizing, and also for drying the salt to be used in the chloridizing process.

A press for moulding ornamental tiles or other articles of cement has been patented by Mr. Jean Larmanjat, of Paris, France. By this invention a slight vertical movement is imparted to the mould table by means of counterweighted levers, springs, etc., to prevent the accumulation of dust and grit between the mould carrying table and the press frame, so the table will not become clogged.

A temporary binder for books, magazines, etc., has been patented by Mr. George E. Alvord, of St. Louis, Mo. A hollow body or back carries book covers of the usual form, and has two hooks, one movable and the other fixed, for engaging the leaves, the movable hook being drawn toward the fixed hook by means of a spring, the device being cheap and easily operated.

A staple has been patented by Mr. Abram Nelson, of New York city. This invention covers a new form of hook staple intended especially for binding the strands of wire fences to the post or framing, the body and point being such that it may be driven independently of the grain of the wood, and arranged vertically or horizontally or at any intermediate angle.

A furnace for annealing metals has been patented by Messrs. Edwin M. Herr, of Denver, Col., and George W. Cummins, of Vienna, N. J. This invention covers a novel construction and arrangement of parts for an annealing furnace in which is an air tight chamber with furnace surrounding it, a piston carrier, swinging gates, and other special features, whereby it can be automatically operated.

A brick machine has been patented by Mr. Charles A. Tarragon, of Portland, Ore. It is made with a sliding frame having cross bars and carrying moulds open at the corners and provided with lugs and pins, with which engage double hooks attached to shafts carrying cam plates, with other novel features, to facilitate the removal of bricks from the moulds of brick machines.

A cartridge loading board has been patented by Mr. Henry W. Howe, of Lawrence, Kan. It has any desired number of holes for receiving shells, and at the bottom side the holes are countersunk to receive the flanges, a hinge being on that side to close against the head of the shells, which are held by holding spurs made wedge-shaped and flat, preventing the shells from turning during crimping without injuring the rim. A cartridge shell creaser has also been patented by the same inventor, more particularly intended for loading apparatus of the foregoing kind, but the creaser, either with or without an attached trimmer, may be used separately or in connection with a hand brace or other means for turning it, so that shells may be creased, trimmed, and crimped without removing from the loading board.

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Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information, and not for publication.

References to former articles or answers should give date of paper and page or number of question. Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all, either by letter or in this department, each must take his turn.

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Scientific American Supplements referred to may be had at the office. Price 10 cents each. Minerals sent for examination should be distinctly marked or labeled.

(1) C. F. G.—Coke, or mixed coke and anthracite, or mixed coke and bituminous, are only injurious to boilers by the amount of sulphur contained. The heat is always supposed to be controllable. For locomotives we should not hesitate in using coke mixed with good bituminous coal.

(2) R. W. C.—There has been no vessel yet built or afloat that can withstand the destructive effect of the best guns now made. You will find most interesting accounts of the direction that active warfare may take in the future by reading the articles on the American cruisers in SCIENTIFIC AMERICAN SUPPLEMENT, No. 432. Also on Rifled Ordnance, SCIENTIFIC AMERICAN SUPPLEMENT, No. 437. On French Iron Clads, No. 442. Also a most interesting account, illustrated and tabulated, of the heavy guns of 1884, in SCIENTIFIC AMERICAN SUPPLEMENT, No. 450.

(3) L. E. I. asks: What size propeller wheel should a boat 25 feet keel 6 feet beam and carrying a 4 horse power engine, use? A. 24 inch 3 blade wheel.

(4) D. B. G. writes: Butterine is made from the best creamery butter and from the finest leaf lard deodorized and thoroughly mixed, a slight amount of butter color being added. It gets its flavor entirely from the butter used. Is there anything that will give this butter flavor, except butter? If so, is it safe to use it? A. Nothing but butter will give the desired flavor. It is safe enough to use oleomargarine, but the trouble is it is generally sold for what it is not—at a high price for deodorized lard, but a lower figure than good butter can be sold at.

(5) A. W. A.—The weights of the largest guns now being made are about 119 tons, 15 1/2 inches bore and 46 feet long, made by Krupp in Germany. The largest cast iron guns made in the United States are the 20 inch 100 ton guns cast at Pittsburg. In May, 1884, the heaviest gun yet made was cast at the South Boston Iron Works—12 inch rifled, 30 feet long, weighing 212,000 pounds finished.

(6) J. W. R. asks the proper way to test gum fire hose. A. Use any pump capable of making the pressure with a pressure gauge attached, fasten a 1/2 hose coupling to the pump, and to the other half fix a valve for letting out the air; attach the hose to the coupling in the usual way, pump in the water, and let out the air at the opposite end. Pump up by gauge to the required test.

(7) J. W. H.—The compound engine consists of two cylinders, or a combination of a high pressure and low pressure engine in one—the second and larger cylinder taking the exhaust from the first cylinder at about 5 pounds pressure working, as a low pressure engine with condenser and air pump. A triple expansion engine is a new experiment, consisting of three cylinders—a very high pressure in the first, exhausting at a medium pressure to a second, and from the second exhausting at a low pressure to the third cylinder which works under the same conditions as the large cylinder, in the compound type. Extraordinary claims have been made for economy in this class of engines, but possibly without due consideration to weight, complication, and friction. They are yet to be proved a success.

(8) A. H. L. asks: 1. What is the chemical constitution of carbide of iron, or spongy iron, used for filtering? A. Metallic iron. 2. How is it made commercially, and where can it be bought in large or small quantities? A. The carbide of iron is said to be prepared by heating hematite with sawdust. You will find in SCIENTIFIC AMERICAN SUPPLEMENT, No. 124, a description of just how "spongy iron" is made in England, but ordinary fragments of metallic iron are all that is necessary. 3. What literature is there on the subject? A. See the articles on "Filtration" in Cooley's Cyclopaedia of Practical Receipts; also "Spongy Iron and Putrescent Organic Material," SCIENTIFIC AMERICAN SUPPLEMENT, No. 87; "Experiments with the Silicated Carbon and Spongy Iron Filters," SCIENTIFIC AMERICAN SUPPLEMENT, No. 165; "Filtering and Purifying of Waters," SCIENTIFIC AMERICAN SUPPLEMENT, No. 195; "The Utility of Water Filters," SCIENTIFIC AMERICAN SUPPLEMENT, No. 209, etc.

(9) A. R. R. asks what is the best material to stick to metallic plate. A. Cloth can be cemented to polished iron shafts by first giving them a coat of best white lead paint; this being dried hard, coat with best Russian glue dissolved in water containing a little vinegar or acetic acid. See also SCIENTIFIC AMERICAN SUPPLEMENT, No. 158.

(10) B. D. A. writes: We have in our city 12 inch water mains and 6 inch mains. Our fire plugs have an outlet of 2 1/4 inches diameter; where connections are made to plugs, water pressure is about 45 pounds per square inch. Will a greater amount of water be discharged from the 12 inch main than from the 6 inch main through the connections? A. The discharge will be nearly the same for all parts of the system for a single hydrant. The largest by a small percentage will be found in the hydrants nearest the source of supply. The 12 inch main probably being nearest the source of supply, has the least friction, and will give the strongest stream.

(11) W. D. C. asks whether the figures 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, can be placed so as to make 100, that is, using every one and only once? A. 50+37+6+4+1=98+2=100. Several other arrangements are possible of the figures before the equality mark, or the same answer comes by variously using the minus and plus signs in a great number of ways.

(12) P. E. C. says: I have a large collection of French stereoscopic views on glass; they are beautiful, and I would like very much to use them as slides for my "sciopticons," but they are all damaged with spots, I think from dampness. I took the binding paper off of some of them to see if they could be cleaned, but have failed in cleaning them. Will you explain the cause, also the way after cleaning to make them fit for use in the magic lantern? A. The slides referred to are made on an albumen film, and are sulphur toned. There is no possibility of restoring them so as to get rid of the spots. To render such slides of use in the magic lantern, apply a coating of any good transparent varnish, and then touch out the defects by a scraper and the aid of transparent pigments.

(13) H. G. W. asks: 1. Have you ever published a description of an electrical annunciator? A. You will find descriptions of annunciators in the back numbers of our papers. You will find them also in all electrical books. 2. Can you give me directions for making an inexpensive electric battery for open circuit work, such as electric bells, etc.? A. Probably the easiest made and the most satisfactory battery for open circuit work is that known as the Fuller battery, which consists of a porous cell filled to a depth of about a quarter of an inch with mercury and containing a conical or cylindrical piece of zinc for one pole of the battery, the porous cell being placed in a glass jar along with a plate of carbon. The porous cell is filled with water, and the glass jar outside of the porous cell is filled with the ordinary bichromate solution, formed by dissolving bichromate of potash to saturation in hot water, and adding to the solution when cold one-fifth its bulk of sulphuric acid. This solution for the Fuller battery will bear reducing from one-third to one-half with water. 3. Where can I get a good small foot power lathe, for working wood and metal, with and without slide rest and chucks? A. You can obtain good small foot power lathes from any of the dealers in machinery who advertise in our columns. 4. How strong a current will the dynamo-electricity machine described in SUPPLEMENT, No. 161 (I think that is the number), give in volts? A. About six volts. 5. What is the cost of one of them? A. From 40 to 50 dollars. 6. Will a current passed through a No. 16 wire induce a current in a No. 32 insulated wire wound around the large wire at right angles to its axis? A. It will induce a slight current in a fine wire. 7. Can the carbon from gas retorts be sawed into slabs for Grenet battery? A. Yes, but it is an expensive operation. 8. Is this a good solution for Grenet battery. If not, which is the best—sulphuric acid 3 pounds, bichromate potash 1 pound, water 1 pound? A. The solution given above will suit you.

(14) H. H. F. writes: Yesterday, after a warm rain, thousands of fish worms were on the sidewalks. Many were crushed by pedestrians. In an hour not one was to be seen, nor even the remains of a crushed one. Neither were any holes visible where they could have burrowed, though the mud was streaked where they had crawled. From whence do they come, and where do they go? A. This is not at all an uncommon occurrence with the common angle worm. They often, in the earlier part of the year, leave the ground during or after a rain, in myriads. They enter it again just as quickly, i. e., those that are not captured and devoured by birds and numerous enemies. Hence they come from the soil and go back to it.

(15) F. A. B.—For luminous paint see SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 229, 249. Use 12 inch fly wheel, about 20 pounds. We recommend you to make a little more study of lathes, and try the operation of those in use before you make one.

(16) P. F. H.—The power of a jet depends entirely upon the pressure of steam and the form of the nozzle and jacket. In a plain pipe, as in your Fig. 1, a half pound pressure might be obtained under high pressure and best arrangement. Your Fig. 2 will have more power than Fig. 1. The pressure will vary with the size of the annular space between the jet and the outer pipe.

(17) F. F. C.—Tide mills seem to have gone out of use. We have no knowledge of makers. Any intelligent millwright should be able to construct an undershot tide wheel to work both ways by making a movable breast, or by setting the wheel in a movable frame to rise or fall with the tide. There are many ways of arranging such machines.

(18) P. M.—Devices for returning the tail race water to the flume are very old, the principle of which was by condensing steam in a large chamber, producing a vacuum, which would lift the water about 20 feet, when by operating large valves the water was discharged into the flume. It has no economy except under some peculiar circumstances.

(19) L. W. asks: 1. Is there a waste of fuel in using two boiler flues 8 inches by 8 inches in-

stead of one 8 inches by 12 inches? A. There should be no loss of heat from the use of the two flues. The friction on the increased wall surface will compensate for the larger size. If the boiler and the connecting flue to the chimneys are properly proportioned, there should be no waste of heat with any size chimney. 2. The party who put in the boiler advised me to fill it with water to prevent rusting, and a machinist advises me to drain it and build a kindling fire in it to dry out. Which is right? A. Lay up the boiler full of water that has been boiled, and close all air valves and vents while steam is on, to keep out air. Moist air rusts a boiler. Water that is free from air does not rust the boiler.

(20) J. W. asks: 1. How high are the highest buildings in New York? A. 125 to 175 feet. 2. What size rope is used for a life line? A. 3/4 to 1 1/2 inch diameter. 3. Is it necessary to have an invention patented before it is tested? A. You should at least have a caveat. 4. How can it be introduced? A. We think only by personal trial and business application.

(21) J. C. writes: If a chamber 2 feet long by 1 foot diameter is charged with the solution used in a fire extinguisher, how long would the pressure last and in what manner would the cylinder have to be charged in case you wished for a continuous exhaust through a 1/2 inch pipe? A. You may charge the cylinder to any desired pressure by varying the quantity of acid and carbonate. You cannot maintain a constant stream. The charge soon blows out, when a cleaning out and renewal is necessary. The cylinder should be charged nearly full with water, and with only enough chemicals to obtain the desired effect. The pressure may be anything from one to a hundred pounds.

(22) A. S.—We think you have selected a poor form of motor for your boat; better make a Trouve or a Depretz motor. You will find descriptions of Trouve's motor in SUPPLEMENT, No. 259, and Depretz motor in No. 212. You will also find a description of Grisoom's motor in SUPPLEMENT, No. 267. There is also a description of an electric motor as applied to small boats in SUPPLEMENT, No. 158. We would be unable say what the resistance of your wheel would be without knowing something of its form.

(23) W. A. H.—There are scientific theories in regard to celestial space set forth in the various later works on astronomy. Read Proctor's Myths and Marvels of Astronomy, which we can furnish for \$3. Meerschmum is said to absorb nicotine and oil from tobacco smoke.

(24) J. P. McN.—You can make the wire solder by first making a small float pan out of sheet iron, and punch some holes along one of its angles at bottom. Then pour the melted solder into the pan, and drag it along the surface of a piece of flat iron, so that the perforations will be close to the plate. The solder will flow through the holes and chill on the plate. A little practice will show you how fast to draw the pan. You cannot mix any acid with the solder. If the parts to be soldered are perfectly clean, good solder (2 parts tin 1 part lead) will take on the tin dry, but requires acid or resin to make it take on the iron.

(25) F. K.—Tarred roofing paper, or heavy building paper, if well fitted, so as to close all cracks and crannies, and folded against the framing, will make a great improvement in warmth over the naked siding, and may answer your purpose. It will not interfere with a further improvement hereafter by plastering or ceiling with wood, if found deficient on a winter's trial.

(26) A. E. C. writes: In a vessel that weighs 50 pounds, a fish weighing 5 pounds has been put. Will the vessel then weigh 55 pounds, or less? A. The water supports the fish, and both weigh 55 pounds.

(27) J. A.—The objective of a stereopticon would answer very well for a camera obscura. There should be placed above the objective a fine plate glass mirror at an angle of 45 degrees, to throw the image down through the objective. If you desire to show with a single lantern diagrams composed of white lines on blue ground, you should flow the glass with blue lacquer or with fine shellac or French spirit varnish colored with aniline blue. The common method of showing diagrams with a colored ground with two lanterns is to trace the diagram on a smoked glass for one lantern, and to project the blue by means of a blue glass placed in the other lantern.

(28) J. A. D. asks: 1. What causes a lobster to turn from green to red when boiled? A. From the action of the heat on its pigmentary matter; acids and also oil produce a similar effect, but in a manner not perfectly understood, except it is by the further oxidation of the coloring matter. 2. What the terms open and closed circuit infer; whether they are used synonymously with constant and not constant? A. An open circuit is one in which the current does not flow except when work is done. A closed circuit is one through which the current always flows, except when interrupted in doing work. The terms are not synonymous with "constant and not constant" currents. The current flowing from a battery like the gravity is said to be constant. The current from a battery like the Grenet is not constant, because it gradually and continually diminishes.

(29) W. E. McK. asks: 1. Where can I find a description of the compound microscope so clear that I could build one by it? I have all the tools and skill necessary for fine and accurate work, and would like to build a microscope such as would cost in the stores about one hundred dollars, and which would magnify from 50 to 600 diameters. A. We know of no description that would enable you to build such a microscope as you describe. Better borrow a stand and copy it. We would not advise you to try to make the objectives. 2. I am building an induction coil from the instruction given in SUPPLEMENT, No. 160, and would like to arrange it so that I could regulate the current so as to give shocks. Can I do so by fixing a brass tube to the plug (marked J in the drawing), and which would slide in between the tube, A, and the bundle of iron wires, I? A. Induction coil referred to is too large for giving shocks. You can regulate the current by making the magnetic core movable. Sliding it into the coil strengthens the current, and withdrawing it weakens

the current. 3. What is the object in having the secondary coil in two parts, and what is tea paper? A. To prevent short circuiting in the coil. Tea paper is a common white paper used in wrapping up tea. Any other paper of medium thickness will answer as well. 4. What is the melting point of the metal aluminum, and what solder can I use on it? It will not stand the heat to flow silver solder, and soft solder will not stick to it. A. About 700° C. We believe there is no good solder, at least not one that is generally known. 5. Please describe the manner in which pliers are made. What I want to find out is how they pass one jaw through the other and make such a nice fit. A. They pass one piece through a large enough opening in the other, then swage and finish them to shape, the one with the opening being cold, having already been shaped. 6. Jewelers use a metal disk for polishing flat surfaces; they call them laps; they are made of some alloy which looks as though lead, tin, or zinc was the principal metal, and are charged with emery. Can you tell me what the alloy is, and the proportions in which it is mixed? A. Laps are made of lead, an alloy of lead and tin, of copper, brass, or cast iron. 7. Would a small electric lamp made after the Brush model and with carbons 1/2 inch in diameter work well with 12 Bunsen cells, or what is called a carbon Smee battery, with bichromate solution? A. If well made, yes.

(30) T. J. writes: 1. I would like to know what nation has the largest man of war ship, name of, and the dimensions of it? A. We believe the British war ship Devastation is the most powerful afloat. Do not know its dimensions. 2. Also, I should like to know what is the best book I could procure to explain the difference of the different navies of the world, and where I could procure it? A. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 5, for comparison of German and American navy. Also No. 212 for Peruvian and Chilean iron clads in battle. Also No. 422 for an account of the largest ships of the British navy.

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

A. W. E.—The specimens are called fulgurites, and are vitrified sand tubes supposed to have been produced by the striking of lightning on sand.—D. S. H.—The specimen is sphalerite, or zinc blende, a valuable ore of zinc.

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