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V. T. should send further particulars as to the sewing machine motor, and also his name and ad dress.-J. A. S. will find directions for tinning small articles of iron on p. 378, vol. 29.-W. W. will find directions for soldering all metals on p. 251, vol. 28.-B. A. H. will find directions for building houses on pp. 52, 90, vol. 28. -R. S. can mold rubber by following the directions on p. 283, vol. 29.—C. B. L. M. can cut glass bottles by the process described on p. 399, vol. 26.—L. N. L. will find that the effect of the variation of temperature on cast iron is discussed on p. 304, vol. 29.—C. L. M. S. will find a recipe for making parlor matches on p. 75, vol. 29.— C. L. M.'s musical queries are not suited to our columns -M. G. P. will find directions for making vinegar on p.

J. E. D. says: I have a lot of type metal which has passed through the fire. Can I use it as lead s used for fastening iron into stone? If not, how can it be freed from other material so as to be used for such purpose? A. No doubt you can use it for the purpose ou mention; but it is probably of more value to a type founder than for any other purpose.

J. H. P. asks: What transparent varnish or other substance can I apply to polished tin or brass to preserve its luster? A. Pale lacquer will probably serve your purpose. Take 1 gallon methylated spirit 5 ozs. shellac, 4 ozs.gum sandarac, 1 oz. gum elemi; mix in a tin flask, expose to gentle heat for a day or two strain off, and add % gallon of spirit to the sediment

J. B. says: The edges of the leaves of several of my books have been, as it were, eaten away by an insect, or some agent that is as yet invisible. Some leaves have been eaten as deep as one inch and a half from the edge. What do you think the insects are, and what means shall I adopt to save my books from destruction? A. The leaves have been torn. There is no insect which eats paper to such an extent or in such a manner as these leaves would indicate. Acids also could not have produced it, because more or less of a stain would remain; and, moreover, acids eat paper in such a way as to leave a square and cleanly cut edge that is, they eat through the entire thickness of the pa per, while in this case the edge is feathery. Moreover only half the thickness of the paper (to the depth of % to % inch from the edge) is taken away, sometimes on one side, sometimes on the other. The "invisible agent" in this case is some mischievous person.

F. H. D. asks: 1. What population have France and Germany respectively? A. By the last census, Germany 38,5 0,000, France 38,000,000. 2. Of what ma tionality was the late Professor Agassiz? A. He wa born in Switzerland. 3. Is there a drink known as mpm? A. Mum is been made from wheat malt, and its use is chiefly confined to Germany, and especially to Bruns

S. H. B. asks: I. What is the article used by glass blowers to prevent glass from burning or state. ing while being heated in the lamp? A. The staining is due to the oxide of lead present in the glass, and to prevent it a glass free from lead must be used. 2. What are the chemical elements of coal ashes? A. Principally silica, alumina, sesquioxide of iron, lime, and magnesis sometimes there are also found potash, soda, sulphuriand phosphoric acids,

R. E. S. asks: What can I use for dipping brass to give a darkiblue color, also a black? A.W know of a blue dip for brass, but a blue japanned surfac is produced as follows: Bright Prussian blue or smalt should be washed and ground with one sixth its weight of starch, dried, and tempered with mastic varnish. Lay on the brass, and varnish with 5 or 6 coats of: Seed lac 2 ozs., gumanime 3 ozs., reduced to coarse powder and dissolved in 1 quart alcohol. For black, dip yourarticles in aquafortis till bright, then in the following till black: Hydrochloric acid 12 lbs., 'sulphate of iron 1 lb. pure white arsenic 1 lb. Take out, rinse in cold water and lacquer with green lacquer.

C. H. A. asks: 1. Can you tell me of some books on the distillation of coal tar? A. "The Manu-facture of Photogenic or Hydrocarbon Oils from Coal and other Bituminous Substances." by T. Antisell Treatise on Coal, Petroleum, and other Distilled Oils, by A. Gesner. 2. What are the ingredients of black varnish, used on roofs and outdoor iron work? A. Two lbs. tar oil, 1/2 lb. asphaltum, 1/2 lb. pounded rosin. Mix hot, in an iron kettle, taking care to prevent ignition. Use cold. 3. Will boiling coal tar act on galvanized iron? A. No.

A. B. L. asks: What is the diminution in bulk of snow when melted? A. Freshly fallen snow weighs from 5 to 12 lbs, per cubic foot. As to your fishhook question, apply to a dealer.

G. M. asks: 1. Are any instruments in existence by which we can determine to what extent (if any) the light and heat of the sun are of electric origin?

A. It has been determined that the heat of the sun is due to combustion, and its principal source is burning, glowing hydrogen gas. 2. Is the all-pervading ether a perfect conductor of electricity? A. Electricity passes readily through space deprived of atmospheric air; and if we suppose this space to be filled with an imponderable ether, we can believe it to be a conductor of elec-tricity. 3. Is the fact generally known that iron and steel possess magnetic polarity, when the force shaping them proceeds in a given continuous direction? For instance, most of the common cut nails, and nearly all ron and steel tools, are magnetic; the head of the nail is the negative or south pole, and the other end is the positive or north pole, and so with all tools where the machine shaping them operates in a given direction, or where the iron or steel is forced through the machine in a given continuous direction. A. It is known that hammering steel or iron induces magnetism, and this method has been recommended for inducing magnetism in steel bars. Such magnetism, however, is feeble compared with that induced be other highly magnetized bars, or by the electric current.

W. K. asks: Is there any chemical solution which will renew the color of bronze stenciling upon iron? A. Dissolve the covering of varnish by alcohol or spirits of turpentine, and then rub with a strong solu ion of oxalic acid; then dry and revarnish.

C. R. asks: In what form is platinum used in the nickel plating bath? A. The solution used in the nickel plating bath consists of the double sulphate of nickel anclammonia, so as to obtain a plating of nickel. When platinum is required to be deposited, the double chloride of platinum and potassium, dissolved in a solution of caustic potash, is used as the bath.

W. L. L. says: I have a house standing north and south with addition on north side and chimney on east side of addition. When the wind is in the northeast, the stove will not draw well; the smoke blows down the chimney. What is the best thing that I can put on it to prevent this? A. The most complete remedy would be to rebuild your chimney within the main house, at the center of the north end, to terminate above the ridge of the roof. If you cannot do this, you might construct a rectangular flue of galvanized iron and attach it to the outside of main house at the center of north end, to terminate well above the main ridge, and constructed and painted to imitate a chimney; the side towards the house should be made double, with an air space of two cr three inshes between the sheets for safety. This pipe or tube could be extended to the celling of the interior, and the stove pipe conducted to it, the tube being also made double below where it enters

 $N.\ J.\ W.$ says: It has recently been stated that, in the Turkish baths in New York, patients are treated with vapor at a temperature of 240° to 260°. This statement seems incredible in view of the popular belief that water boils at 212°. Can you explain? A. In the Russian bath, where the vapor of water is employed, the ordinary heat of the bath of vapor is from 120° to 140° Fah. Steam at 240° or 260° would scald or burn the skin and would have to be superheated besides In the Turkish bath, however, where hot air is used, a much higher temperature can be employed on account of the rapid evaporation from the surface of the body, With moderately dry air, a temperature of from 200° to 270° Fah. has been borne.

R. J. P. asks: How is compressed yeast ade? A. One mode of preparation is as follows: Previously malted barley and rye are ground up and mixed ext put into water at a temperature of 65° to 75°; after a few hours the saccharine liquid is decanted from the dregs, and the clear liquid brought into a state of fer-mentation by the aid of some yeast. The fermentation becomes very strong; and by the force of the carbonic acid which is evolved, the yeast globules are carried to the surface of the liquid, and, forming a thick scum, are removed by a skimmer, then placed on cloth filters, drained, washed with a little distilled water, and next pressed into any desired shape by means of hydraulic pressure, and covered with a strong and well woven canvas. Itkeeps from eight to fourteen days, accordin the season, and is excellent

W. L. T. asks: 1. How much wire will it take to make a helix for magnetizing steel bars 6 inches long? How long should the coil be and of what diame. A helix an inch in inside diameter, and made out of 20 feet of copper wire, will answer. 2. What should be the size of the cups for a Grove battery, and how many cups should I need? A. Use from two to six cups of six inches diameter and 8 inches hight accord ing to the rapidity and amount of charge desired.

L. A. G. says: 1. What is the melting point of platinum? A. It is shove 4.000° Fab. He has not been certainly determined. 2. What is the greatest artificial cold which can be made? A. By mixing liquid nitrous oxide with bisulphide of carbon, and placing the bath in a vacuum. The lowest temperature thus obtained is -220° Fah. 3. Is there any difference between a square foot and a foot square? A. No.

G B asks: Is the difference between soft brass and spring brass (sheet and wire) a difference of composition or of manufacture? A. A difference of composition, principally.

G. E. S. asks: Will a body projected vertically upward into the air return to the earth with as great a velocity as it had on leaving the earth? A. No.

B. G. asks: How is chloride of calcium pre-ared? I have tried to dissolve chalk in muriatic acid, outcouldnot succeed. A. There must have been som thing wrong in the acid you employed. Powdered chalk is added to muriatic acid until the effervescence entirely ceases. The liquid thus obtained, which is a solution of chloride of calcium, yields the solidbodyon evaporation

A. M. Y. asks: 1. What is the acknowledged opinion as to the comparative merits of vessels with turrets, such as the Monarch, compared to the classof the Hercules? Does the fact of the Captain turning out a failure alter the high opinion previously held of such a system of construction? A. Opinions are about evenly divided on these points. 2. What yessel do you consider represents the type upon which all modern improvements have been successively applied?

J. C. asks: Of what horse power will arengine of the following dimensions be: Cylinder 1 inches in diameter, stroke 21 inches, steam 601bs, press ure, and cut-off at half stroke, running at 90 revolutions a minute? A. Multiply the mean effective pressure per square inch (probably between 40 and 45 pounds) by the area of the piston in square inches (78.54), and by the piston speed in feet per minute (210), and divide the product b v 33.000.

T. S. P. asks: 1. Will a gun scatter as much with a bore larger at the muzzle than at the breech? Λ. Yes. 2. What kind of oil is the best to oil gun stocks with? A. Olive oil. 3. How many cells are there in the battery of the miniature telegraph? A. One. 1. Has it a recording apparatus with it? A. No.

E. C. C. asks: 1. Will there be any advantage in the application of a continuous stroke of a steam engine to the face of a cogged wheel or wheels, efect in diameter, instead of using a 12 incherank, applying the power at the most available point? It requires three strokes of a twenty-four inch engine to perform one revolution of the wheel or wheels; it only requires two strokes with the crank. I use a self-acting or double clutch for regulating the movements. A. We do not think that any advantage will be derived from this arrangement. 2. I claim to be the projector of an invention lately sent to the Patent Office by certain parties in this vicinity, to one of whom I confidentially divulged my device, making it so plain as to enable him and his partners to contrive an exact model of it, which they did without my knowledge. He admits that I told him of it, but claims to have conceived the idea long before, the contrary of which I think I am able to sustain. How shall I proceed? A. Make application for patent, and produce your proofs of priority of inven-

C. E. M. says: A contends that it would be simply impossible for modern brains and appliances to move a 40 foot cube of granite 10 feet in any limited time, and that it never has been done except by the ancients. B. thinks that there is nothing impossible in accomplishing the work in a comparatively short time. foot cube of granite would weigh 10,500 tuns, nearly Modern appliances would, we think, be found equal to thetaskof moving such a weight. Perhaps one of themost recent jobs of the sort was the movement of he Great Eastern steamer, from shore into the water, at the time of her launch, a distance of 150 feet. This was done by means of hydraulic rams. The weight of the hull was between 7,000 and 8,000 tuns.

S. W. W. asks: 1. If the size of the second cylinder in a compound engine could be changed at will, would it be the same as a variable cut of in other engines, and wouldit be any advantage? A. We do not think there would be any advantage. 2. What advantages would a rotary engine have over other kinds, pro vided it could be as well packed? A. Cheapness, light ness, compactness.

J. H. D. asks: Can an office 10 feet × 20 feet be sufficiently warmed by the exhaust from a 10 horse engine, situated about 100 feet distant, the pipe to pass underground? A. Yes. 2. How large a conducting pipe would be required, and of what metal should it be made? A. Iron pipe, 1½ inches in diameter.

J.M. asks: What size is necessary for the square bar of iron to make a specified size of half round ron. A. Make the side of the square bar 0.62665 of the liameter of the half round piece.

V. C. says: I am running four stationary boilers all connected together, and I am troubled with the scale gathering over the bridge wall and causing the boilers to burn. What is the cause and how can I prevent it? The boilers are level, and I have them cleaned every two weeks. A. Probably it will be necessary for you to change the feed water, or use some scale preventive. It is difficult, however, to give a definite opinion without knowing more of the case. It is quite mmon for scale to form on the crown sheet of a boller, when the circulation is bad in that part. This can ometimes be remedied by changing the position of the feedpipe, and arranging an internal pipe so asto cause a circulation of the water.

C. F. S. asks: Does the principle that wheels, chains, beams, cranes, and other iron structures (after being long subjected to blows or to distinct jarring of any kind) at length break without adequate cause, hold true in regard to the wire cables of snspension bridges? If so, ought not the cables to be renewed everyfew years? A. Engineers are divided in opinion on this matter, but many thinkthat a possibility of such action is a serious objection to suspension bridges.

G. E. C. asks: Can small articles punched out of common scrap tin be silver plated? What is the best process? Will it be necessary to re-tin the pieces in order to have the edges plated? A. It would be difficult to silver them well without first giving them a layer of copper by means of the battery, and a bath of sulphate of copper. Then a bath is used, consisting of two parts of cyanide of silver and two parts of cyanide of potassium dissolved in 250 parts of water.

A. H. asks: Afterice is formed, perhaps to some feet in thickness, does a vapor pass from the water through the ice, and congeal on the top of it, or is the thickness of the ice increased by the water freezing underit? A. In still water, as in ponds, lakes, and rivers generally, ice having formed on the surface, its thickess increases according to the intensity and duration of the coldfrom the surface downward, by the cold layer of ice above abstracting the heat from the water below, the ice formed being reduced below the freezing point be the cold exterior atmosphere, and acting like any other solid.

A. L. K. asks: 1. What is the hest treatise on prehistoric nations? A. Lyell's "Antiquity of Man" also "The Stone Age, Past and Present," by E. B. Tay. lor, and No. 9 of Estes & Lauriat's "Half Hour Recreations in Popular Science." 2. Is there a treatise on the mound builders separately? A. We know of none