

the motor require? A. It will run if connected with an Edison dynamo. It is not adapted to gravity batteries.

(6) J. C. R. asks: How would a hoop of iron, secured by brass clamps at ends and angles, make needed width, work for constructing field magnet of simple motor, instead of sheet iron? A. Hoop iron will answer.

(7) H. S. D. writes: I want to make a dynamo after the pattern of the eight light described in the SCIENTIFIC AMERICAN and SUPPLEMENT, but of larger capacity. If I make it 1/2 larger, will it increase the amount of wire more than 1/2, and how many 16 candle power incandescent lamps will it run? How many lights will it run if it (the eight light machine) was doubled in all its dimensions? A. If you double the width of the field magnet, and also the length of the core of the armature, and wind the armature with No. 19 wire, and the field magnet with No. 12, you will be able to run from 16 to 20 16 candle power lamps. We shall probably at an early day describe a larger machine, of about the size you require.

(8) C. T. T. asks (1) for a process for making acid to eat metal, to make rough cuts for printing. A. See articles on Zincography, in SUPPLEMENT, Nos. 584 and 587. 2. Information telling how to read a horoscope. A. For good idea of the mysticism and illusion of astrology, subjects in which we do not assume to be conversant, read Walter Scott's "Guy Mannering."

(9) A. B. O. desires a formula for making a cheap, white soap from tallow. A. Dissolve 2 pounds sal soda in 1 gallon boiling soft water, mix into it 2 pounds freshly slaked lime, stirring occasionally for a few hours, then let it settle, pour off the clear liquid, and boil 2 pounds tallow in it until all the tallow is dissolved. Add salt to precipitate the soap, and wash and dissolve in a little hot water. Cool it in a flat box, and cut it into bars or cakes. It can be scented by stirring in the desired perfume when cool. 2. One for same, by using cotton seed oil in place of tallow? A. See Carpenter on Soaps, Candles, Lubricants, and Glycerine, which we mail for \$4.

(10) J. W. C. asks how to make old fashioned molasses candy not turn soft or sticky in warm or damp weather. A. Take 1 quart molasses, 1 1/2 pounds brown sugar, the juice of a large lemon, and 12 drops of oil of lemon; mix the molasses and sugar together, butter the inside of a kettle and put it in. Let it boil over a moderate fire for 2 hours, then add the lemon juice, and boil 1/2 hour; stir it often to prevent it from burning, then butter a pan and put it in to cool; if sufficiently done, it will be crisp and brittle, if not, it will be tough and ropy.

(11) A. B. U. desires a receipt for an enamel or glaze for wood, to be impervious to water. A. Coat the article several times with hot linseed oil varnish.

(12) E. B. asks for something to make the teeth white. A. Take of dry hypochlorite of lime 1/2 drachm, red coral 2 drachms, triturate well and mix thoroughly. 2. What kind of flute is used for general orchestra work, and if an ordinary 12 keyed flute will do? A. Any flute will do.

(13) J. P. K. asks for an article for cleaning carpets without lifting them from the floor, one about as thick as muckilage, and in using which a quantity is taken on a brush and rubbed over the carpet, which is then washed up with clear water, leaving the carpet like new. A. Ox gall is the article to which you refer, and it is used in the proportion of three gills of ox gall in a pail of water.

(14) J. H. S. desires (1) a receipt for tanning buckskin, such as used in making gloves, and one for tanning with hair on. A. The manufacturers' processes are very elaborate, but an amateur can always preserve and tan such skins by treating them with salt and alum, after the skins have been well cleaned and softened through with water and working. The time necessary is from one to two weeks. 2. A receipt for making black ink, one that becomes very brilliant after writing, and free from sediment, and will not corrode the pen. A. Take 11 parts gall nuts, 2 of iron sulphate, 1/2 part of sulphate of indigo, and 33 parts of water, and add a small quantity of sugar. See also SCIENTIFIC AMERICAN SUPPLEMENT, No. 157, for numerous receipts on making inks.

(15) C. F. B. asks how to wash a chamois skin. If washed in an ordinary way, they are very stiff afterward. A. Use a weak solution of soda and warm water, rub plenty of soft soap into the leather, and allow it to remain in, soak for two hours, then rub it sufficiently, and rinse in a weak solution of warm water, soda, and yellow soap. If rinsed in water only, it becomes hard when dry and unfit for use. After rinsing, wring out in a rough towel, and dry quickly, then pull it about and brush it well.

(16) W. S. asks: What is "putz" pomade composed of, and how made? A. Take of oxalic acid 1 part, iron peroxide 15 parts, powdered rotten stone 20 parts, palm oil 60 parts, petrolatum 4 parts. Pulverize the oxalic acid, and add rouge and rotten stone, mixing thoroughly, and sift to remove all grit, then add gradually the palm oil and petrolatum, incorporating thoroughly.

(17) S. C. D. asks: Is there any way to color a meerscham pipe that has been used and colored to bottom of bowl in good shape? Bowl will not color. A. Bowl colors better when stem portion is of meerscham up as high as the top of bowl, otherwise it is difficult to color all of bowl.

(18) C. E. H. asks the proper way to prevent an ingrowing toe nail, and to prevent it getting worse. A. Begin the cure by simple application to the tender part of a small quantity of perchloride of iron, which can be readily procured either in fluid form or powder at a drug store. The tender flesh is dried and tanned by this application, and ceases to be painful.

When this hardened flesh has remained on two or three weeks, it can be easily removed by soaking in warm water. Further trouble can only be prevented by cutting the nail to proper shape and wearing shoes of reasonable size.

(19) L. D. W. asks: Is there any way to clean a marble bust which has become soiled by dust and finger marks? A. Mix quicklime with strong lye, so as to form a mixture having the consistency of cream, and apply it immediately with a brush. If this composition be allowed to remain for a day or two, and be then washed off with soap and water, the marble will appear as though it were new.

(20) J. T. M. asks why it is that the secondary coil of an induction coil is always composed of very fine wire, and will not coarser wire do equally well? A. By using fine wire in the secondary of an induction coil, more convolutions are obtained for the same volume, with consequent increased tension. Large wire would make the coil too bulky; small wire is used as a matter of convenience, and also to keep the secondary well within the influence of the primary.

(21) C. N.—Your greatest trouble probably arises from the burning of the corners of the chisels in forging. The corners should be no hotter at any time than the center. A slow fire or low blast is always necessary to the successful forging of steel-cutting tools. For various instructions in tempering, see SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 95, 103, 105.

(22) T. W. M. Co.—If you wish to make a chilled surface against a cold iron mould, use No. 2 American pig, with 1/4 good scrap. If you wish simply to make hard castings in sand moulds, use No. 3 or 4 pig or No. 2 with 1/4 scrap.

(23) V. S. M. asks for the best lubricant for central fire rifle cartridges. I have used tallow and wax, and mutton tallow alone, and in cold weather they scale off badly. A. Try paraffine or vaseline.

(24) J. A. R. writes: I have in my house brass door knobs. When they were purchased, we were told that they would not tarnish, but they do. I now want to turn them black without waiting the slow process of time. How can I do it? A. Thoroughly clean the varnish from the knobs with alcohol, and scrub with a brush and solution of soda. Then dip for a few seconds in sulphuric acid, rinse clean, and dip in a mixture of hydrochloric acid 12 parts, sulphate of iron 1 part, white arsenic 1 part, until the articles turn black. Rinse in clean hot water and dry in sawdust. Brush with black lead and varnish.

(25) E. D. D. asks: Does the mariner's compass in the neighborhood of the equator point north and south with the same certainty that it does in other latitudes? A. The magnetic needle does not point with certainty to the north except in a few places. It is better, on general principles, the nearer it is to the equator.

(26) C. M. R. asks if it is possible to take a 15 horse power engine and make it do 30 horse powers of work. The engine in question is high speed, and the boiler of 18 horse power. A. You can generally make a nominal 15 horse power engine do an indicated 30 H. P. of work. The point to gain is to double the steam pressure, which depends upon the strength of the boiler.

(27) M. R. asks: 1. Why should a wagon with solid iron axle run harder than with wooden axle? A. The coefficient of friction between iron and iron is probably higher than that between the hard wood of an axle and the iron of the box. 2. Would it not be better to have the feed water enter a steam boiler through the top of a good sized mud drum instead of entering through the top of the boiler? A. Modern experience and practice favor a surface feed. The mud drum should catch and hold the sediment ready to be blown out, and not be stirred up by feeding in that direction.

(28) G. W. S.—It will not pay you to undertake to make emery strips for your own use. For their manufacture you will require strong iron moulds with followers driven by a powerful press, capable of a pressure of a ton for each square inch. The cementing material may be glue and tannic acid, gutta percha or silicate of soda. The quantity must be so small that it does not adhere to the mould. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 125, on Emery and Corundum Wheels.

(29) E. J. T. asks: What would be the superior quality of copper pipe over iron pipe of same dimensions for hot water heating? A. Copper pipe is but slightly better than iron for radiating heat, although it is a much better conductor of heat. The difference in effect does not warrant the difference in cost for any ordinary purpose. The copper must be black for best effect.

(30) F. L. G.—A composition of 75 parts lead, 16 7-10 parts antimony, and 8 3-10 parts bismuth expands in becoming solid from a fluid state.

(31) W. K. asks the best solution for pickling iron and steel. A. Hydrochloric acid 1 part, water 3 to 4 parts, for quick or slow pickle.

(32) C. W. asks what the best journal and journal box are made from. And how would a cast iron journal running in a cast iron box compare with the best? A. Cast iron journals and boxes run well together with heavy lubricating oil mixed with graphite. The best is a steel journal running in a hard box made of copper 1 lb. to tin 3 oz.

(33) R. W. asks if there is any acid in which brass may be dipped, to clean it, which will clean it without hurting the article in any way? A. Oxalic acid solution in water is excellent for cleaning brass that can be brushed or rubbed. If you only wish to dip quickly, use strong nitric acid, dip for 1, 2, or 3 seconds and rinse in hot water.

(34) E. K. H. asks: 1. What metal, mineral, or other material can I use to keep heat in an iron vessel that is heated by hot air? I want it to radiate the heat if possible, several hours after the supply of heat is cut off, and iron alone will not answer the purpose. A. Water is a suitable material to store heat;

also a solution of acetate of soda so strong that it will crystallize on cooling, thus giving off its "latent heat." 2. Would a double iron vessel with a dead air space between to store hot air be a good device? A. The storage of hot air for use is of no value. Its specific heat is very low, a great deal less than that of water. 3. If a permanent magnet becomes rusty will it spoil the magnetic properties, and to what extent or percentage? A. Not materially. 4. Is there any flexible tubing that is fire proof, so that it can be coupled in same manner as Westinghouse air brake hose? A. None to our knowledge. 5. Is hot water, hot air, or steam the healthiest for heating purposes, provided the hot air is perfectly pure and entirely free from gas? A. They are all equally healthy under the specified conditions of purity of the air itself. 6. In using hypochlorite of lime and chalk for a dentifrice, is there any powder that would not destroy the cleaning properties, that could be mixed with it to disguise the compound? A. Use ground arrowroot and scent with oil of rose or other essential oils or myrrh.

(35) J. A. P.—You can melt 8 or 10 lb. of old brass boxes readily in a blacksmith's forge by building a brick cylinder or square box around the tuyere large enough to have a clearance of 3 or 4 inches all around the crucible. Make it high enough to have 6 in. of fire under the crucible, and also to cover the top with coal. Charcoal is the best for fuel. Coke may also be used. Soft coal may be used, but requires good management. We can send you the Brass Founder's Manual, by Graham, for \$1.

(36) R. H.—Moulding for and casting of iron is a difficult matter for a novice. We recommend you to study the subject by visiting an iron foundry and observing their methods. We can send you a book on iron founding, by Claude Wylie, for \$1. Your engine should weigh not less than 150 lb. A 9 horse boiler may be made with 3-16 plates for shell, 1/4 in. heads.

(37) A. M. Co. asks: How can we keep jelly from moulding? A. First cover the jelly with a piece of paper that has been dipped in brandy, and fits quite close to the jar at the edges, then cover tight with another piece of paper, so as to prevent as far as possible any entrance of air.

(38) C. P. M. asks the best method of driving boiler rivets. A. Hand and machine riveting are equally good, if both be honestly and faithfully done. Canted rivets, from their being too small or from the drifting of ill-matched holes, make most of the trouble, and lead to fault finding with the system, instead of the dishonest practices in the boiler shop.

(39) J. M. A. writes: 1. In the SCIENTIFIC AMERICAN of two weeks ago you gave instructions for making small electric motor. What battery is best to use, where can it be had, about what cost, or could it be made cheaper by procuring materials? A. A plunging bichromate battery is probably the best for the motor. 2. Would the field magnet work as well if made of solid iron as if of strips of stove pipe iron? A. You can make the field magnet of solid iron if you prefer it. 3. Could a cheap electric light be made that motor would drive to give light sufficient for an ordinary dwelling house? A. It would be better to, produce your electric light directly from batteries if you are unable to use a dynamo and steam power.

(40) H. H. writes: I found some difficulty in making the iron wire core of the armature for the simple electric motor recently described in the SCIENTIFIC AMERICAN. For the benefit of others who may undertake to make the motor, I describe my method: Take two pieces of wood about 1 1/2 inches thick, with a piece of cigar box wood between them, and secure them together where the flanges will come, then turn the spool as described and cut in two at the center at right angles to its axis. The spool will then be in six pieces, and will be easily separated after driving out the cigar box wood.

(41) J. W. L. asks (1) if a solid cast iron field magnet will answer as well as Russia sheet iron, for the simple electric motor described by George M. Hopkins, in No. 11, current volume of SCIENTIFIC AMERICAN. A. Cast iron will answer nearly as well as Russia iron. 2. If not, will solid wrought iron do? A. Wrought iron will answer the purpose. 3. Will a solid wrought iron ring answer for the armature, instead of a No. 18 soft iron wire coil? A. Wrought iron will do, but the iron wire is preferable. 4. How are carbon plates made? A. By mixing pulverized coke with pulverized bituminous coal, and baking the mixture in a mould in an oven at red heat while covered with powdered coke to exclude the air. The mould should be inclosed in an iron box.

(42) Mrs. H. asks (1) how to make koumiss out of buttermilk. A. See the article on "The Preparation of Koumiss," in SCIENTIFIC AMERICAN SUPPLEMENT, No. 130. 2. If I have a stream running on my farm, and my neighbor has none, does the law compel me to allow the stream to run to accommodate him? A. If the stream on your land runs to or borders on your neighbor's land, you cannot alter the course of the stream to deprive him of it.

(43) W. S. P. writes: Suppose a bar of iron surrounded by an armature excited by current from some electric source be withdrawn from said armature nearly its full length, will it return entirely within said armature, and with what force? What per cent of the power excited in the armature? A. Send a sketch of the experiment you propose, together with more explicit description.

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March 27, 1888,

AND EACH BEARING THAT DATE. (See note at end of list about copies of these patents.)

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