

Business and Personal.

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Reliable information given on all subjects relating to Mechanics, Hydraulics, Pneumatics, Steam Engines, and Boilers, by A. F. Nagle, M. E., Providence, R. I.

(1) J. B. asks how to make resin more elastic, that is, overcome the brittleness, without making it expensive? A. Try fusing it with a little oil.

(2) C. B. R. asks for the process of making carbons for battery? A. The fine dust of coke and coking coal is first put into a close iron mould of the shape required for the carbon, and exposed to the heat of the furnace. When taken out, the burned mass is porous and unfit for use, but by repeatedly soaking it in thick sirup of gaster and heating it, it at length acquires the necessary solidity and conducting power.

(3) C. J. H. asks if the Colorado or potato beetle or bug is the same as the "cantharis vittata" or potato fly? A. No. 2. Has the Colorado beetle similar properties to the cantharides? A. No.

(4) W. A. P. says: I wish a recipe for keeping cider sweet otherwise than boiling? A. Add to it salicylic acid—about 15 grains to the gallon.

(5) C. R., Appingedam, Holland, asks how lard oil is made? A. Lard oil is chiefly obtained as a secondary product in the manufacture of stearin. It is

purified first by agitation with sulphuric acid, and afterwards by steaming it and washing it with water.

(6) T. A. asks: What is the value of sawed pine shingles, as regards durability, when compared with sawed cedar? A. Under ordinary circumstances, cedar shingles are at least 100 per cent, more durable than pine.

(7) C. W. B. says that an ounce of alum, added to a pint of flour paste when making it, is an effectual and harmless remedy to preserve it, even during very warm weather.

(8) W. H. H. says: I have a porch laid of pine floor-boards, and had it painted. The heat of the sun has drawn out the pitch or turpentine in large quantities, making it almost unfit for use. Is there any way to remedy the difficulty without taking up the boards? A. Scrape off the pitch and cover the bad places with a coat of shellac varnish, then paint it over again.

(9) A. L. D. M. says: We are troubled in this country with cotton worms, and to prevent their destroying our crops we are compelled to resort to poison. Arsenic proves to be the best remedy yet introduced, but a great many people are afraid it will make the land sterile. Some say it is a fertilizer, while others say it is a sterilizer. A. We do not find that, as usually applied, it has any notable effect in either direction. It would not in any case tend to sterilize the land, unless, perhaps, applied in great excess. In some cases it would doubtless prove beneficial in aiding the plant assimilation, but we would not counsel its use except in cases of necessity—for destruction of insects, etc.

(10) H. C. B. asks: Can india rubber be restored to its original elasticity, which has become hard by several years' exposure to a warm atmosphere? A. No.

Has steam or compressed air power been applied to private carriages? A. Steam has been successfully used. Compressed air has been tried and found inconvenient, owing to the large size of the air chambers required.

(11) M. B. asks how chromo-enameled iron show cards are made? A. They are prepared by dipping the hot metal in the paper pulp, or *papier maché* passing through a bath of alum solution and then through one of soap, alum sized, and hot pressed in the usual manner.

(12) J. M.—Trymethylamine is produced by heating under pressure, in enameled iron vessels, rosaniline, an alcoholic solution of soda or potassa and iodide of methyl.

(13) C. M. says: Not long ago I dug up a few shells from a blue clay bank which were quite soft. After allowing them to dry thoroughly in the sun, I gave them a coat of shellac varnish. They now seem to be covered with a white mould. How can I remove it without injuring the shells, as they are valuable fossils? A. It may be impurities in the varnish, moisture in the shell, or improper mode of varnishing. You can probably remove it with strong, hot alcohol. The varnish should have been made very thin with alcohol, and applied by dipping.

(14) J. H. N. asks how to clean the glass tubes of a fountain which have become muddy on the inside by the deposit of water passing slowly through them? A. It would be better to remove the tubes, if possible, and agitate in them a little water mixed with fine shot, as the dirt would resist most solvents.

(15) C. M. H. says: Please inform me of some recipe for removing superfluous hair? A. Make a strong solution of sulphuret of barium into a paste with powdered starch. Apply immediately after being mixed and allow to remain for ten or fifteen minutes.

(16) E. H. R. asks: Is the following a good recipe for making a good ink, and will it retain its color on books: Copperas  $\frac{1}{4}$  lb., brown sugar  $\frac{1}{4}$  lb., gum arabic  $\frac{1}{4}$  lb., powdered nutgalls  $\frac{1}{4}$  lb., rain water 2-gallons? A. Use less sugar and about a third less water. This will afford an excellent black ink if properly made.

(17) B. B. asks: What cement can I put on a leaky piazza roof to make it tight? A. Take 4 lbs. rosin, 1 pint linseed oil, 2 ozs. red lead, stir in fine sand until the proper consistency is secured, and apply warm. This cement becomes hard, and yet possesses considerable elasticity, is durable and waterproof.

(18) C. F. says: I have a lot of books and papers, bound and unbound, into which bedbugs have got. How can I exterminate them? A. A liberal application of insect powder will no doubt prove effectual or place the papers on a rack in a large close box, and on the bottom of the box place a dish in which burn a small quantity of brimstone.

(19) W. N. R. asks for the solution used for etching on steel and brass? A. For steel, iodine 1 oz., iron filings  $\frac{1}{2}$  drachm, water 4 ozs. Digest till the iron is dissolved. For brass, aqua fortis 2 ozs., water 5 ozs.

Is oil of vitriol injurious to leather when used in blacking? A. The amount used is too small to seriously injure the leather.

(20) P. R. H. and C. & Son ask for a japan that will give a good hard black finish on wood? A. Use common black baking japan, to be obtained of the varnish dealers, and when thickly coated on the work bake or dry in an oven or kiln the same as when this japan is put on iron or metal work.

(21) M. C. M. asks: Why is it that a small steam boiler will carry more pressure than a large one? A. Because it is generally stronger.

What simple rule is there for finding the relative value of dollars and pounds sterling? A. Multiply the amount in pounds sterling by 4/3, and the answer is in dollars. Divide dollars by this amount and the result will be pounds sterling. For accurate reduction the rate of foreign exchange and premium on gold over United States currency must be allowed for, for which see early financial quotations in the newspapers.

What is carbolic acid, and how is it made? A. It is a product of coal tar, obtained by distillation.

What is the best filtering material to put in a small

house filter for drinking purposes? A. A sponge answers very well.

(22) G. T. says: We have put up peaches and other fruit in cans which were sealed by soldering. After a few days most of the cans burst open. What was the reason of their bursting? A. The rupture of the cans may have been due either to the fermentation of the fruit, or by the formation of a partial vacuum within through contraction of contained vapor and air on cooling.

(23) W. P. M. says: 1. What length and number of cotton-covered wire shall I use to cover the armature of an electromotor with? A. You may use about 150 feet of No. 16 covered wire. 2. If, after winding one core, shall I continue the wire to the next arm and coil it, or make six separate coils? A. It is better to make separate coils. 3. Is it necessary that the circuit breaker should be insulated from the shaft which is in metallic contact with the magnet cores? Will such an engine, with 10 Grove cells, run a sewing machine? A. Yes.

(24) B. V. H. asks: What can I add to common plaster to make it set quick and hard and be very brittle? A. There is nothing possessed of all these requisite properties. Perhaps soluble alkaline silicates (water glass) may answer your purpose. Plaster made up with alum water instead of water alone, sets very hard, but not quickly.

(25) E. F. asks how to fasten photographs on glass without leaving air bubbles and not have them cleave off? Also how to make them transparent? A. If you refer to a photograph on paper, smooth and dry it perfectly, and coat the face uniformly with a thin hal-sam. Warm the plate and curl on the paper, letting the middle touch first, and immediately bring down the ends. Or attach one end of the paper and pass a small roller over it so as to place it in smooth contact at one motion. Finally, give the back of the picture a smooth flowing coat of good negative varnish.

How was the bread made that was used at the "dairy" on the Centennial ground? The loaves were about 2 feet long and 3 or 4 inches in diameter. A. See p. 240, vol. 34, of SCIENTIFIC AMERICAN.

(26) J. H. R. says, in answer to W. E. S., paragraph (18): The fulcrum is below the water line, and more or less near it as the ship has less or more ballast. If she is heavily ballasted and unladen the fulcrum will be near the bottom. If her load is near the water line and she has no ballast, the fulcrum will be near the water line.

(27) Subscriber asks: What ought to be the weight of a balance wheel for a foot lathe to turn wood? A. From 80 to 100 lbs.

(28) A. G. W. asks: Would it not be better to ventilate a stable from the top by extending a tube from the ceiling to the peak of the barn for the foul air to escape? Extend another one from some cold room or hayloft above down to within about one foot of the stable floor. Through this second tube the cold air will descend, as being heavier than the warmer foul air of the stable, it will take the lowest place, and drive the bad air up through the first tube. A. If the room above, from which the fresh air is to be drawn, is tight, the air cannot be supplied from it to a sufficient extent. The varying pressure of the atmosphere, arising from the winds and from barometric changes, would provide a more efficient ventilation in this case, which could be tempered and graduated as experience should dictate; the openings could be provided with graduated registers, or fixed blinds outside of sliding shutters.

(29) B. S. says: I want to paint the joints of some brickwork black. I would like to know what is mixed with the mortar in preparing it for use? A. Coal dust and English drop black are used for coloring. Prepare the mortar and mix in the color until black enough to suit.

(30) Novice, London, Canada, asks how to lay a tile pavement? A. Make a bed for the pavement of broken stones pounded together, over which spread a layer of cement. When dry, spread over this a layer of cement in which the tiles are carefully set.

(31) J. G., of Montreal, asks for a recipe to stiffen felt hats, and how prepared? A. Mix 18 lbs. of shellac with  $\frac{1}{2}$  lbs. salt of tartar (carbonate of potash) and  $\frac{1}{2}$  gallons of water. Put in a kettle and boil gradually until the shellac is dissolved, when the liquid will be clear as water. When cold dip the hats, and when nearly dry dip in a weak solution of acetic or sulphuric acid in order to neutralize the potash and cause the shellac to set.

(32) D. B. H. asks: Does it require battery power to work a telephone on a shortline, say half a mile? A. No battery is required. The telephone contains a small electrical device on which the force of the voice acts and produces an electrical current.

(33) C. M. K. asks if there is any difference in testing gas pipe with a mercury gauge, whether mercury or water be used in the gauge? A. Water can be used, but mercury is ordinarily more convenient in the case of an open gauge.

(34) T. P. B. says he has a lot of 1 inch steam pipe, and a four horse engine, and wishes to use the pipe in some way to make steam to run the engine? A. We know of no practical way to use pipe so small to make a serviceable boiler or steam generator.

(35) C. H. W. says: I want a method to prevent scale forming upon polished steel and iron while heating? A. If your steel is sufficiently heated it will scale when exposed to the air. If you wish to merely soften the work, you may prevent scaling by heating it enclosed in a box or tube filled with steel turnings, luting the box or tube with clay, and allowing the steel to cool before removing it.

(36) D. F. asks for information on bleaching hair, human or yak hair? A. Gaseous chlorine is the most effectual agent in bleaching. Clean the hair with a warm solution of soda, and wash thoroughly with warm water. While the hair is moist, put in an earthen jar and introduce the chlorine until the jar is

filled with the greenish gas. Allow to stand for twenty-four hours and repeat the operation if necessary.

(37) B. B. O. says: The waste pipe from my bathtub, located on the second floor, leads down to the basement, where it unites with the waste from the kitchen sink, and both pass out together into a terra cotta pipe, which after running some thirty feet from the house empties itself into a blind ditch about 2 feet or more below the surface. The ditch is made of stones laid in the bottom of the trench to a depth of 8 inches, then comes a layer of rye straw, and on top the earth. A rain spout leads into the terra cotta pipe, and both waste pipes are trapped before they unite. Is the arrangement a safe one against the escape of noxious gases? A. An accumulation of sediment is likely to take place at the blind ditch. It would be advisable to provide a large cesspool there with a movable cover below frost, and so built as to trap and overflow into the ditch—this can be conveniently cleaned out when necessary. The rain water pipe should act as a sufficient ventilator to your drain pipe.

(38) D. C. W. asks for a recipe for the varnish or lacquer which is used on gun barrels? A. Dissolve 1 oz. of shellac and 2 drachms of dragon's blood in 1 quart of alcohol. Filter through blotting paper and keep closely corked in a bottle. When put upon the barrel, and after becoming perfectly dry, rub with a burnisher to make it firm and glossy.

(39) J. J. R. R. asks: What is the greatest pressure per square inch that can be applied to a steel pivot or step turning on a steel surface or bearing, without destroying lubrication? A. About 2,200 lbs. 2. Does friction in turning or sliding surfaces increase with the pressure, and what is the ratio of increase of friction to increase of pressure? A. Some of the latest experiments are described on p. 1200 of the SCIENTIFIC AMERICAN SUPPLEMENT.

(40) F. E. P. says: I have an engine cylinder 2 x 4 inches, also a boiler shell 14 x 24 inches. Will the shell furnish steam for my cylinder? The shell is of  $\frac{1}{4}$  inch iron heavily riveted. Can I with safety put in cast heads? How many  $\frac{1}{2}$  inch gas pipe flues will I need in said boiler, using it as an upright boiler? A. It will be better to use wrought iron heads. Place the tubes from  $2\frac{1}{2}$  to 3 inches between centers.

(41) A. I. P. says: We use a band saw for sawing cane seat chair bottoms. The lumber is seasoned hard wood  $1\frac{1}{2}$  inches thick. The shaft makes 475 revolutions. The saw pulleys are iron, leather covered, 30 inches diameter. Saw frame all iron. Sometimes the saws break five times a day, at other times they will run two or three days without breaking. We have tried  $\frac{1}{2}$  inch,  $\frac{3}{8}$  and  $\frac{5}{8}$  inch saws of different makes, but with no better results. A sudden change in the speed of the saw, or great variations in the quality of the timber, is probably the cause of the break-ages.

(42) C. K. W. says: I have a small music box in which there are small bristles on the under side of the comb to stop the vibration of the same before it is reached by another tooth on the cylinder. What kind of cement can I use to make these bristles stick to the steel comb? A. You can attach them with shellac varnish.

(43) W. F. M. asks: How are chromos mounted? A. It is generally more convenient to attach the cloth to the frame after the picture is mounted. First stretch the cloth tightly on a board, securing it by tacks. Use common flour paste, and saturate the cloth with it. Cover the back of the chromo with paste, and apply it to the cloth, a little at a time, laying it smooth by gentle pressure.

(44) A. F. B. says: Would it be practicable to run a set of wheels and pinions with a weight, as follows: Five wheels of 6 inches diameter, gearing into 4 pinions of  $\frac{1}{2}$  the diameter of the wheels, and the fifth 6 inch wheel gearing into a 3 inch wheel, which would thus revolve 2,592 times for each revolution of the first 6 inch wheel? By applying a weight for motor to this first 6 inch wheel, of 400 lbs., what power would I have left for work? A. The loss from friction will depend upon the accuracy of workmanship. With nicely cut gear you may get an efficiency of from 60 to 70 per cent of the applied power.

(45) F. L. S. says: A friend makes the statement that the English Government has a gun capable of throwing a projectile from Dover to Calais. 1. What is the distance in a direct line between the cities? A. Twenty-six miles. 2. What is the greatest distance yet attained by any gun in throwing its projectile? A. About 6 miles.

(46) W. L. F. asks: 1. What is the proper breadth of beam and depth of a boat 16 feet long, clinker built? A. Beam 4 feet and depth 18 inches. 2. How high above the boiler will I have to place a cistern to overcome a pressure of 40 lbs. in order to feed the same by hydraulic pressure? A. About 93 feet.

(47) W. S. says: Supposing a locomotive engine, having one side unconnected, and the crank on the other side at right angles to the dead centers, and at the nearest point to the rails; when steam is admitted into the cylinder, why does the engine go forward when the force is applied in a backward direction? A. Because the rail cannot move backward.

(48) L. M. S. says: How can I make a preparation something like varnish, to dip pencil drawings in to give them a fine appearance and to preserve the paper? A. Dissolve 6 ozs. Canada balsam and 6 ozs. white resin in 1 quart of oil of turpentine.

(49) F. W. K. asks: I have a room 80x30 by 9 feet high, and wish to know about how much pipe it will require to heat it properly? A. The amount of radiating surface depends upon the character of building, number and size of windows, etc. Such a room as you speak of would need under ordinary circumstances from 150 to 175 square feet of radiating surface.

(50) K. Bros. say: Suppose there are 3 cast iron shafts 14 feet long and 8 inches diameter, one having a hole of 6 inches through the middle, the other be-

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ing cast solid metal throughout, and the third having a wrought iron shaft 4 inches in diameter cast in the middle the whole length of the shaft: which of the three will stand the greatest weight in the middle, if the shafts are suspended at both ends? A. The third.

(51) C. W. W. asks for a white fusible alloy that will take a fine impression when cast in plaster of Paris moulds? A. Lead 9 parts, antimony 2 parts, bismuth 1 part. This alloy expands as it cools and brings out a fine impression.

(52) G. N. asks for a process by which brass can be kept a bright color? A. In 1/2 pint of best alcohol dissolve 1/2 lb. of best seed lac. Warm the work and apply the dissolved lac, with a soft fine brush.

(53) C. L. asks how the process of enameling or glazing is done on cast iron? A. The enamel is made of powdered flints, ground with calcined borax, fine clay, and a little felspar. The mixture is made into a paste with water and brushed over the metal to be glazed, which has been previously cleaned and made bright with dilute sulphuric acid, and washed clean. While the glaze is still moist it is dusted over a mixture of felspar, carbonate of sodium, borax, and a little oxide of tin. The glaze is gradually dried and then fused in a muffle at a red heat.

(54) F. W. W. asks: Can you give me a recipe for making white ink, to write on a black or blue surface? A. With some papers an aqueous solution of bleaching powder with a little gum will answer. A solution of oxalic acid thickened somewhat with filtered dextrin solution has also been used. Or use a solution of gum arabic and sugar in water, through which has been diffused finest precipitated chalk or ground starch.

(55) N. H. says: I bought a piece of corned beef and cooked it. The following night I opened the refrigerator in the dark and the beef lighted up with a phosphorescent light. What was the cause and is the meat healthy to eat? A. The phosphorescence noted was very probably due to the saccharine matter or salts used in curing the meat. A change of temperature, which induces crystallization in solutions of these, often gives rise to the phenomena, after removal from strong light. The meat may be fit to eat.

(56) Mrs. G. W. L. asks for a recipe for canning green corn so it will keep? A. Among fruits, etc., green corn is one of the most difficult to preserve by canning. The following is the method in use by many of the large canning establishments. The corn, after removing from the cob, is filled into the clean cans so as to leave no air spaces. These are placed in a large oven or other airtight vessel, and subjected to hot steam under pressure. The harder the corn the longer the exposure required to thus cure it; it is said that in some cases as much as eight hours is requisite, but usually much less than this. A large vessel of boiling water, in which the cans are immersed, may be used instead of the steam oven, but is not so effective. On removal from the oven or water bath, as the case may be, each can (they must be filled to the cover with fruit) has the cap with a very small hole tapped in its center immediately soldered on. As soon thereafter as the can stops blowing, as the escape of steam and air through the vent is termed, the hole is quickly soldered. This must be done before the air begins to enter. Other fruit is cured and canned in like manner—tomatoes rarely require longer than 15 to 20 minutes steam curing. Where the pits are left in fruit a longer time is requisite to completely destroy all fermentative germs.

(57) J. F. C. asks, 1, for a quick process of bleaching cotton thread? A. In practice the following is found one of the best: The cotton is banked for 8 hours in a lye made from 6 1/4 lbs. soda crystals and 2 lbs. 3 ozs. quicklime. After washing out it is passed into a chloride of lime (bleaching powder) solution for two hours, and then at once into weak sulphuric acid for 20 minutes. Use 11 lbs. chloride of lime and 23 fluid ozs. sulphuric acid. These quantities are for 220 lbs. of cotton. The cotton is then washed in running water, and taken once or twice through a hand-warm soap beck, using for the above weight 2 lbs. 3 ozs. palm oil soap. 2. Is there more power in the same quantity of water after night than there is in daytime? A. No.

(58) J. H. D. S., in giving an account of a table knife that was left for a few days in the remains of a water melon, and found nearly eaten up or consumed, asks what acid there is in the melon to cause this? A. Carbonic, and the various vegetable and organic acids rapidly corrode iron or steel in the presence of air and moisture. In substance, over 89 per cent of the common, well-ripened watermelon consists of water. In summer weather the decay of broken melon, when once begun, is very rapid, and is accompanied by the formation of carbonic, acetic, and other peculiar organic acids. Under such favorable conditions it is not surprising that the knife was eaten by the melon.

(59) F. W. S., of Toronto, asks how to make a buff wheel for polishing steel? A. Turn up the wooden disk to form the wheel on the mandril on which it is to run. Cover the periphery of the wheel with good glue, prepared as for gluing wood, stretch the leather around and confine it with shoe pegs driven in about two inches apart. When dry turn off true with a sharp chisel. Give the leather a coat of glue and roll it in the emery, so as to make it retain it by being imbedded in the glue. Set the wheel dry until the glue is hard and it is ready for use.

(60) M. D. asks: 1. If limestone was put into a retort, what would be the gas that would pass off if heated red hot? A. Carbonic anhydride, often called carbonic acid; a gas composed of 12 parts carbon and 32 parts oxygen (by weight) in a state of combination. 2. Could one bushel of lime be so prepared as to absorb all of the carbon gas in three bushels of lime? A. No. 3. Would the carbon improve the cementing quality of the lime? A. No. It would have the opposite effect. 4. If charcoal was put into a retort and heated to a red heat, would it give off one quarter as much carbon gas as it would if it was wholly consumed? A. Freshly and thoroughly carbonized charcoal, if heated in a retort, would not yield a notable quantity of gas unless supplied with air, oxygen, steam, etc. With a plentiful supply of the former, carbonic acid would result; with air the same, but mixed with nitrogen; with steam the

principal product would be carbonic acid, hydrogen, and carbonic oxide—the latter gas is very poisonous and inflammable. The amount of gas would be directly proportional to the quantity of charcoal burned. 5. If charcoal was heated red hot and then cooled off, would it regain its carbon gas from the atmosphere? A. Charcoal is capable of absorbing about 35 times its bulk of carbonic acid. This it gives out on heating, and on cooling may absorb again. 6. Is not carbon gas heavier than the air? A. Yes, about half as heavy again. 7. What acids will dissolve carbon? A. It is insoluble in acids, but is oxidized by nitric acid. 8. Will not water boil quicker in a copper dish than in an iron dish, other things being equal? A. Yes, a little.

(61) F. P. asks how to make a faradic battery? A. For faradic currents you will require a small induction coil in addition to the batteries you mention, which are constructed on the correct principle. To make an induction coil, wrap a thick cylindrical penholder back and forth—the manner of spooled thread—with about a hundred feet of good copper wire, a fifth the size of telegraph line wire, and insulated by winding with silk or cotton. Wrap tightly around this coil a sheet of thin oil paper, and over this bind, in a manner as before, five hundred or more feet of the finest insulated copper wire obtainable. Then force out the penholder, being careful not to tear the insulation of the wire, and fill its place with a bundle of soft iron wires. Connect the battery wires (one from the zinc and the other from the copper) with the free ends of the thick wire in the coil; then, on making or breaking the battery circuit, temporary induced currents will be caused in the fine wire, and may be utilized by attaching wet sponges to the free ends of the wire and permitting them to come simultaneously in contact with the body while the instrument is working. The batteries must be excited with weak sulphuric acid. A simple interrupter for the primary circuit is a file attached to one end of the coil wire, while the free end (from the battery) is rasped over the rough part of the file. The withdrawal, more or less, of the soft wire core diminishes proportionately the intensity of the secondary currents.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated: L. F.—It is gypsum—a calcium sulphate.—J. M. F.—It is a variety of bituminous coal, yielding considerable ash. The freshly mined shale may be of some value for fuel and gas making.—J. W. E.—Your minerals do not come to hand. Send another specimen.—C. T.—It is mispikelle, or arsenical pyrites—a combination of sulphur, iron, and arsenic.—We have a number of packages of minerals, etc., without mark to designate the senders.

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges, with much pleasure, the receipt of original papers and contributions upon the following subjects:

- On the Sea. By D. G. E.
On Engines and Boilers of Screw Tug Boats. By D. L.
On Reforms. By R. H. L.
On Whence Came our Dry Land. By A. B.
On a Combat between a Squirrel and a Snake. By I. E. E.
On the Formation of a Sea in Sahara. By T. M. M.
On Rafts Floating Faster than the Current, etc. By W. M.
On Looking Backward Forty Years. By —
On Much Needed Postal Conveniences. By W. J. McG.
On Experience for Sixty Years. By —
On Employment of Capital. By —
Also inquiries and answers from the following: O. H. S.—F. H. B.—J. F.—J. B.—E. H.—M. A. L.—J. W. D.—W. S.—T. T. P.—C. H. L.—A. K. & Co.—C. P.—T. W. S.—C. B.—C. H. M.

HINTS TO CORRESPONDENTS.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them. The address of the writer should always be given.

Inquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address is given.

Hundred of inquiries analogous to the following are sent: "Who makes small engines suitable for running sewing machines? Who makes and sells wire rope? Who sells suitable instruction books for stationary engineers?" All such personal inquiries are printed, as will be observed, in the column of "Business and Personal," which is specially set apart for that purpose, subject to the charge mentioned at the head of that column. Almost any desired information can in this way be expeditiously obtained.

OFFICIAL.

INDEX OF INVENTIONS

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A complete copy of any patent in the annexed list including both the specifications and drawings, will be furnished from this office for one dollar. In ordering, please state the number and date of the patent desired, and remit to Munro & Co., 37 Park Row, New York city.

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- 10,146.—PATTERN IN SETTINGS.—N. Frye, Andover, Mass.
10,147.—HANDLES OF SPOONS AND TABLE CUTLERY.—G. Gill et al., Derby, Conn.
10,148 to 10,150.—CARPETS.—John Hamer, Matteawan, N.Y.
10,151.—MATCH SAFES.—W. Hamilton, New York city.
10,152.—ADVERTISING CARDS.—J. D. Holt, Philadelphia, Pa.
10,153, 10,154.—CARPETS.—T. J. Stearns, Boston, Mass.
10,155.—IRON GATE AND RAILS.—W. Tweeddale, Brooklyn, N. Y.
10,156.—WALL POCKETS.—D. Raup, Watertown, Pa.

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