Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion. If the Notice exceeds four lines, One Dollar and a Half per line will be charged.

Notes & Queries

H. B., Jr., will find a good recipe for aquarium cement on p. 202, vol. 28.—C. R. is informed that the apparent spontaneous cracking of glass tumblers is by no means an uncommon occurrence.—P. B. B. will find directions for brazing band saws on p. 194, vol. 31.—C. H. B. will find directions for removing inkstains from clothing on p. 410, vol. 32. For polishing castings, see p. 57, vol. 34.—F. B. S. does not send data enough as to his engine. He will find a formula for ascertaining the horse power on p. 33, vol. 33. For a rule for calculating the dimensions of a flywheel, see p. 251, vol. 32.—J. P. N. will find a recipe for prepared glue on p. 43, vol. 32. For a recipe for mucilage, see p. 27, vol. 34.—R. P. C. is informed that the only non-conductor of magnetism is a sufficient interval of space.—E. G. will find an explanation of horse power on p. 33, vol. 33.—A. J. will find something on tempering chisels, etc., on p. 220, vol. 31.—H. L. H. should address a pump manufacturer.—H. H. will find directions for making shoe polish on p. 107, vol. 36. To season timber of all kinds, follow the directions on p. 58, vol. 32.—F. C. will find a formula for the lifting power of coal gas on p. 65, vol. 32.—C. H. B. will find directions for removing inkstains on p. 410, vol. 32. Brass castings can be polished by following the directions on p. 57, vol. 34. Steel can be etched by the process described on p. 250, vol. 27.—F. J. S. should send us a sample of the efflorescence on the ash heap.—D. W. will find a description of making gas with a hydrocarbon fluid on p. 65, vol. 32.—R. W. K. will find answers to his queries as to ice boats in No. 63 SCIENTIFIC AMERICAN SUPPLEMENT.—U. D. M. is informed that oxychloride of zinc may be used to cement silica together; but we do not think he will succeed very well with the material of which he sent us a sample.—J. C. B. can solder brass by the process described on p. 251, vol. 28. To mend rubber boots, follow the instructions given on p. 203, vol 30.—A. L. F. will find on p. 119, vol. 28, a recipe for a cement for mending leather shoes.—C. A. D. will find a recipe for red fire on p. 171, vol. 36.—J. D. will find directions for fireproofing clothing on p. 282, vol. 32.—A. D. A. will find directions for mounting chromos on p. 91, vol. 31. This also answers T. S. R.—G. K., who asks as to the U. S. Coast Survey, should sign his letters with his name and address.—E. C. S. will find on p. 319, vol. 35, a recipe for a cement wash for woodwork.—A. B. C. will find formulæ for the passage of water through pipes on p. 48, vol. 29.—W. L. B., A. J. W., W. G. L., E. K., C. F. W., J. G., N. T., W. P. B., and others, who ask us to recommend books on industrial and scientific subjects, should address the booksellers who advertise in our columns, all of whom are trustworthy firms, for catalogues.

(1) T. A. D. asks: 1. What kind, diameter, and focus should a lens be for a photographic camera to take photographs 4½ inches by 3½ inches, principally landscape views? A. An achromatic of about ½ inch diameter and 5 or 6 inches focus. 2. At about what distance should the lens be placed from the photographic plate? A. Where the image will be sharpest on a ground glass, placed where the photographic plate is to be. 3. If stops or diaphragms are used, what kind is necessary and where should they be placed? A. If the instrument is a double combination, the diaphragm should be placed midway between the lenses. If a single lens, place it in front. A piece of cardboard with a round hole in the center is all that is wanted. The smaller the diaphragm, the sharper the picture will be, and the longer the necessary exposure.

(2) F. I. E. says: I have several photographic lenses; and wishing to form some kind of instrument on the principle of the "Wonder" camera, so that objects and pictures may be projected on a screen without much trouble or expense, I would like to know how the glasses are arranged, and what kind of light is best? A. Your ¼ portrait lens is just what is wanted for the objective. Then, in addition to this, you need two condensing lenses, and (if gas or oil is used) a reflector behind the light, the same as in a magic lantern with the "Wonder" attachment.

(3) A. B. C. asks: Can stereoscope lenses, or the lenses of a small spyglass, be used in constructing the home-made magic lantern? A. The usual stereoscopic lenses cannot be used, because they are ground thicker on one side than the other. The lens of a small spyglass would do if not of too long focus. It will make the picture small unless the lantern is placed at some distance from the screen. A lens of about 6 inches focus is the best; and in small rooms, even shorter focus is preferable.

(4) E. J. B. asks: Will a photographic camera, with three lenses and four inches focus, do as an objective for a magic lantern? Will the "Wonder" camera as described in *Science Record* for 1875 do? Could the object glass of an opera glass be used for the purpose? A. If the photographic combination was made for a portrait camera to be used without a diaphragm, then it will answer the purpose very well. Also the opera glass objectives may be used, either singly or in combination. If one will make the picture on the screen as large as you wish, it will give you more light than the two together.

(5) J. L. K. says: I would like to make a 1 inch hole in a window pane, and have tried several ways, but broke the glass every time. How can it be done? A. Bore a hole in the center by means of a hard steel drill moistened with turpentine. Cut the circle with a good glazier's diamond guided by a small piece of copper wire centered in the hole just bored, and by means of cuts radiating from the center to the circumference divide the circle into numerous small sectors. Then, with a small piece of metal, tap the glass on the posterior side gently, following each cut throughout its extent. When this has been properly done, fasten a piece of putty over the area of the circle on the cut side of the glass; and, while holding the putty, tap the glass on the other side firmly in the center of the circle. Too much pressure on the diamond will cause it to scratch without cutting the glass.

(6) E. B. asks: 1. How shall I treat hickory to prevent its becoming powder-post, as we term it? A. The trouble is due to a diseased state of the timber, which reduces its substance to a mass of dry dust, by the decomposition of its fibers. It is caused by the growth of a species of fungus in those parts of the timber which have not been properly dried or seasoned. One of the best preventives of this disease is a solution of corrosive sublimate forced into the pores of the wood by means of an air pump. 2. When shall I cut it? A. It is best to cut the timber in the late fall or early winter.

(7) E. T. says: In speaking of leaky roofs, you say that the best job would be to put on a new tin roof in small sheets. Which kind of tin is most durable, the leaded or dark lead-colored tin or the bright light-colored tin? A. Use the best charcoal tin, which is bright-colored, and solder the joints securely.

(8) J. H. W. says: We have had an explosion in our foundry that we are not able to explain. The shop is a frame building 50 feet square. We had not made a heat for 24 days; and when we made one and proceeded to drop the bottom as usual, the instant the doors dropped we had a tremendous explosion, breaking some 250 panes of glass. It tore a door that was standing open off its hinges, and made a report that was heard at a distance, shaking the windows in houses squares away. Our shop is quite open, and two doors were standing open at the time. The prop that the cupola man used in dropping the bottom was some 10 feet long and 4 inches square. It was shivered up just as though it had been struck by lightning. There was some ice under the cupola at the time; but we threw, as we thought, sufficient sand on it to prevent the iron coming in contact with it. Are such explosions of common occurrence in foundries? A. We imagine that explosions of such violence are not usual, although those of similar kind are not uncommon, when heated iron comes in contact with moisture. Possibly some of our readers may have knowledge of explosions quite as violent as the one described above, and will favor us with descriptions.

(9) J. M. L. says: I wish to build an air stack with sufficient draught for two furnaces. Can you give me the proportion existing between area of stack at bottom and top and height, and the areas of the flues from furnaces? A. It will be sufficient to make the cross section of the stack equal to the combined cross sections of the flues. You can decrease the cross section towards the top if desirable, but there will probably be no advantage in doing so. Build the chimney at least 40 or 50 feet in height, and as much higher, up to 100 feet, as is convenient.

(10) J. J. says: 1. I wish to make a pair of sleigh runners. I have been told that the rim of a wagon wheel steamed and straightened out is very good to make them out of. But I do not know how to straighten them. Could not I get two pieces of oak, of the same thickness and width of a rim of a wheel, and bend them? A. When the wood is softened, secure it by clamps to a former. Perhaps it cannot be bent into shape all at once, but must be heated several times. 2. For a small 1 horse cutter, how far apart should the runners be at the bottom, and how far at the top? A. Distance between runners, 30 to 36 inches at top, and from 2 to 4 inches more at bottom.

(11) W. S. says: 1. I am building a ditcher for drain tile. It is to be drawn by a rope passing a sufficient number of times around a capstan to prevent its slipping, the free end being wound on a reel. The capstan is to be 18 inches in diameter, and the levers 12 feet from center of capstan to where the horses are hitched. What kind and size of rope will be best if two horses are used, and also if our horses are used? A. You can use hemp rope 1¼ inches in diameter for 2 horses, and 2 inches in diameter for 4 horses. 2. If wire rope should break, how can I mend it? A. By splicing.

(12) E. L. L. asks: Do the rubber covers upon telegraph instruments increase the sound perceptibly? A. No.

(13) C. F. A. asks: 1. What size of boiler should I use for an engine of ½ inch bore and 4 inches stroke? A. Make one 12 inches in diameter and 20 inches high. 2. Can you recommend to me a book on the construction of the marine engine? A. We do not know any work that covers the construction of the modern marine engine. You will find much that is useful in Bourne's and Burgh's treatises.

(14) G. F. asks: 1. What I wish to know is how much power could I expect from an engine 2 x 5 inches, 60 lbs. pressure, 150 revolutions? A. From ⅓ to ¾ of a horse power. 2. What size of boiler would I require if it were a plain cylinder, set in brickwork? A. Make a cylinder boiler with about 11 square feet of heating surface.

(15) W. H. K. asks: Which will bear the greater weight, applied laterally, a round or a square rod of metal or wood, of the same circumference? A. The round one.

(16) J. N. A. asks: What has been the highest result in foot lbs., by any steam engine, per 1 lb. of best coal? A. A horse power for 1·5 lbs. of coal per hour is among the best results; this corresponds to foot lbs. per pound of coal.

(17) C. P. P. says: What size of boiler would run to best advantage an engine 3 x 1½ inches? Of what should it be made? A. You can use a vertical boiler, made of wrought iron, 10 inches in diameter and 18 inches high.

(18) C. R. W. asks: Please tell me how to calculate the number of yards of excavation in digging a pond or lake 100 feet by 80, in form an ellipse, 9 feet deep with banks sloped 1½ feet to 1 foot of depth? A. Add together the top area, the bottom area, and the area of their mean proportional, and multiply the sum by ⅓ the depth.

(19) W. L. F. says: I am making an electro-magnetic machine for medical purposes. I made a spool of wood about 5 inches long, the core of which is a hollow cylinder ¾ of an inch in diameter, containing a bundle of iron wire. For the first coil, I wound about 50 feet copper wire (insulated No. 16) around this, and separate from it. I wound about 500 feet silk insulated wire, No. 22. I connected the ends of the primary coil with 1 cell of carbon battery, but could not get a secondary current. Please tell me where the difficulty lies? A. Your arrangement will give you a secondary current by breaking and making the primary. If you require more power, increase the length of your secondary wire and use more battery.

(20) A. S. asks: I have a battery with two copper cylinders 8 inches and 3 inches in diameter, and a zinc cylinder 16 inches in diameter. What must I put in it to make it work? A. Blue vitriol and water.

(21) L. G. W. says: In making a Camacho electro-magnetic engine, can I construct the tubular magnets, and what should be the size of and length of wire used in making magnets? A. It is not worth while to make the magnets less than an inch in length. Wind each tube separately and then place one over the other. No. 23 silk covered wire will do. The turns on each tube should be in the same direction.

(22) J. S. W. asks: 1. Which will give the longest spark, an induction coil made with 2,000 feet of No. 32 wire or with 2,000 feet of No. 36? A. One with the 2,000 feet No. 36. 2. Will 4,000 feet No. 32 give a longer spark than 3,000 feet No. 36? A. No, not with same primary. 3. Which is best for the primary coil, No. 16 or No. 18 wire? A. That depends upon the size of the core and battery used. Make the resistance of primary about the same as that of the battery. 4. How long a spark ought 2,000 feet of No. 32 wire to give? A. Up to a certain limit, about 1 inch spark per mile of secondary can be obtained.

(23) A. R. asks: 1. Does the Atlantic telegraph work upon the same principle as do telegraph lines in general? It has been stated that the electricity is drawn from the cables. A. The batteries are not connected directly to the cable, but to one side of a condenser and to earth; the opposite side of condenser is connected to the cable. 2. What is the strength of the current used? A. Ten or twelve cells is about the number used to charge the condenser. 3. What is the strength at the receiving station as compared with that at the sending station? A. About 99·5 per cent after 3 seconds contact with battery.

(24) H. S. C. says: In your answer to F. H., you say that an engine generally works more economically when running at its full capacity. This is undoubtedly true of single valve engines, as a single valve cannot cut off at less than ¾ stroke without choking the exhaust and impairing its efficiency in a greater or less degree, according to the point of cut-off. But with an automatic cut-off, or even with a fixed one, I think it can be demonstrated theoretically, as it has been demonstrated practically, that there is great economy in having considerable surplus power in your engine. A. You have misunderstood our reply to F. H. The idea we intended to convey was, that under given conditions there is a point at which an engine will work most economically. This is the point at which it should be run, a point probably far within its full capacity.

(25) I. H. D. asks: 1. Why is a chamber used in a condenser for the exhaust steam to flow in? A. With a view to economy of space and efficiency of action. 2. Could not the steam be condensed in an exhaust pipe, and this pipe be connected with the air pump? A. Yes. 3. How much pressure must be given to a jet of water in the combining tube of an injector, so that it will gain velocity enough to enter a boiler, without flowing back into the overflow? A. It depends upon the proportions of the parts. As usually made, the injector will readily force water into the boiler from which it draws its supply of steam, and could be arranged so as to force against much higher pressure than that under which it was working.

(26) G. F. asks: 1. How large an engine could I supply steam to from a plain cylinder boiler, 9 feet long and 14 inches in diameter, of ¼ inch iron? A. You can use an engine of from 2 to 3 horse power. 2. Is a plain boiler safer than one with flues? A. Not necessarily.

(27) G. L. K. asks: 1. Can steam from a boiler with 60 lbs. force water into a cold boiler? A. Yes. 2. Is it possible to get a pressure in the cold boiler above the steam pressure in the steam boiler? I have seen an injector that is said to have forced water into a boiler having 80 lbs. pressure, the injector being operated from a boiler with 20 lbs. pressure. A. Yes. The philosophy of the matter is that a great deal of steam is used, and comparatively little water is forced into the boiler. It is something like a steam pump in which the water cylinder is only ½ as large as the steam cylinder, so that the water pressure can be 5 times the steam pressure.

(28) H. C. asks: 1. What pressure will a locomotive boiler of copper plates of $\frac{1}{10}$ of an inch thick, 6 inches in diameter, double riveted, stand? A. 40 lbs. 2. How large an engine will it run with firebox 8 x 8 inches and 8 inches high, and 22 half inch tubes 12 inches long. A. Make one 2 x 3 inches. 3. Which of these two engines, 5 x 6 or 4½ x 8 inches, is best for a boat 25 feet long and of 6 feet beam, drawing 6 inches at bow and 24 inches at stern? A. If you wish to compare them when running at the same power, we think the first is preferable on some accounts.

(29) O. A., Jr., says: 1. I have a steam engine with a plain slide valve. The cylinder is 7 inches bore by 9 inches stroke. Steam ports are ½ by 5⅛ inches, exhaust port is 1 inch by 5⅛ inches. Valve travels 1¼ inch; lead of valve is about $\frac{1}{16}$ inch, lap about $\frac{7}{16}$ inch, cutting off at about ¾ stroke. Engine runs about 240 revolutions per minute with 70 lbs. steam. Can I get more power out of the engine by changing those proportions? A. We do not think, from your account, that there is any need of a change. 2. Which kind of a return flue boiler is the most economical in fuel and water: the boiler that will hold 1½ barrel of water or the boiler that will hold 4½ barrels, the heating surface being the same in both boilers, and each being of 10 horse power? A. We imagine the difference, if any, would be unimportant.

(30) G. W. A. says: We use 60 lbs. steam on a 12 x 20 inches engine, running three burrs. If we keep just 60 lbs., it is pretty hard work; and it seems easier to let the engine stand and generate 80 lbs. What is the cause of this? A. Generally, an increase of pressure decreases the steam used per horse power, so that although it takes a little more fuel to make 1 lb. of steam at the higher pressure, there are fewer lbs. used to do the same work, and the high pressure is the most economical.

(31) J. R. B. says: I propose running a boat by a screw. She is to be 16 feet long and of sharp bow; of how large a diameter should the screw be? A. Make one 18 to 22 inches in diameter and of 2½ to 3 feet pitch, with a length of blade of 5 or 6 inches. Run it at 300 or 400 revolutions per minute.

(32) C. W. H. says: A boat is 100 rods from a stationary stump. A man in the boat is pulling 50 lbs. on a rope attached to the stump to pull the boat to the stump; and two men are in two separate boats 100 rods apart. Each man is pulling 50 lbs. on opposite ends of a rope between the boats to pull the boats together. The two boats are of equal weight, and all other conditions are equal. Will the one boat arrive at the stump sooner, later, or at the same time as the two boats come together? If not at the same time, how much sooner or later? A. As you have stated the proposition, the two boats would approach each other twice as fast as the single boat approaches the stump—for the reason that the rope is hauled in twice as fast in the first instance, as there are two men hauling it in, one at each end; and in the second instance only one man is hauling in rope, at one end, at the same rate as is employed by each of the two others.

(33) J. J. T. says: I wish to build a locomotive engine with vertical boiler 2 feet high. The cylinders are to be 2½ inches bore by 5 inches stroke. What diameter will the boiler be, and how many 1 inch tubes should I use to get the most power? How much will such a boiler, with all attachments and full of water, weigh? How much power will it develop, if well

built, with pressure of 100 lbs. to the inch? A. The data sent are rather incomplete, but you will find rules by which you can calculate the answers to your questions on p. 225, vol. 33.

(34) S. D. C. asks: What is the complete formula for finding the radius of the earth at any place, when the force of gravity at that place, and at the equator, and the equatorial radius, are given? A. La Place's formula for the radius, at the latitude L, is: radius in feet=20888625×(1+0·0016742×cos. 2L). As we understand the premises in your other query, we do not think they are correct.

(35) W. S. says: 1. I am building a model horizontal engine 1½ x 3 inches, and wish to make a boiler for it capable of 65 lbs. pressure. What should be the size and the number of flues? A. You can make flues 1 inch in diameter, or less. 2. What would be the best speed to run it at, in order to get the most power? A. From 400 to 850 revolutions per minute.

(36) J. N. W. asks: How much suction power has a fan 2 feet in diameter, with four wings, 8 by 14 inches, revolving 2,000 times in a minute? The induction orifice is 1 x 24 inches. How many lbs. pressure can I produce at the orifice? A. If you wish more pressure than 1 lb. per square inch, it will be advisable to use some other form of blower.

(37) J. F. & G. W. M. says: There are two tanks for water located 900 feet apart. Each holds about 15,000 gallons. The bottom of one is 11 feet above level of ground and the tank itself is 14 feet high, making 25 feet from top of tank to level of ground. A pipe runs from this tank down into the ground, to sufficient depth to prevent freezing, and thence along on a level, 900 feet, to the other tank. The bottom of the last-named tank is 3 feet above top of the first-named tank, or 28 feet from level of ground. What size of pipe must I use to empty the water of the second tank into the first tank in 12 hours? What size of pipe will it take to do the same in 24 hours? A. To discharge the second tank into the first in 12 hours will require a pipe of 2 inches diameter, and in 24 hours 1½ inches diameter. The bends in the pipe should be easy, and no contraction of size, by valves or otherwise, should be allowed.

(38) W. J. M. asks: Do steam heating pipes consume the oxygen of the air, or is a degree of heat greater than that of pipes heated by steam necessary before the consumption of oxygen begins? Why is it that in an office, if doors or ventilators be closed for a few minutes only, the air becomes very oppressive and stupefying, while the temperature is yet not very high, and not as high as could be borne without any discomfort in a well ventilated room? Would a ventilating shaft, constructed so as to draw from a register in the floor, be of any benefit, or would the air, at the height of a man's hand, remain undisturbed and oppressive? A. Air when heated expands and becomes less capable of supporting animal life, because of the limited quantity of oxygen it then contains in a given volume. The breathing of persons engaged in a sedentary employment is slow, and a dense air would afford greater aliment to the blood in their case. There is no reason to believe that steampipes, when heated, consume the oxygen of the air to a greater extent than other heating surfaces. But there is, without doubt, a minute quantity of moisture driven from the pipes by the internal pressure, which soon renders the air humid, and this has the effect of making breathing more difficult. It is easily inferred from this that supplying fresh air brings no remedy, unless the strong dense air thus admitted is preserved in this state, without being rarefied by the heated pipes. By gradually accustoming yourself to a lower temperature, some relief may be found, or by adopting the plan of the open fireplace, you may be able the more effectually to preserve the air of your room in its natural state, neither too dry nor too humid for easy respiration.

(39) A. B. asks: What are gold and silver alloyed with at the United States mints? A. The gold coinage is $\frac{9}{10}$ pure gold and $\frac{1}{10}$ alloy. The alloy consists of $\frac{1}{12}$ silver and $\frac{1}{12}$ copper. The silver coinage also contains $\frac{1}{10}$ alloy, which is copper only.

(40) J. McT. says, in reply to M. G. P., who asks if meerschaum pipes, after they have been used a time, are not subjected to some process to bring out the color: I have seen meerschaum and imitation meerschaum pipes colored by the following process: Fill the pipe and smoke down about one third, or to the height to which you wish to color. Leave the remainder of the tobacco in the pipe, and do not empty it or disturb it for several weeks, or until the desired color is obtained. When smoking, put fresh tobacco on the top, and smoke to the same level.

(41) E. McD. asks: 1. What quantity of oil of vitriol should be used to the gallon of water, for sprinkling guano for artificial manure? A. Dilute the strong acid with about 30 parts of water. 2. Is it necessary to distribute the dilute liquid throughout the body of material, or merely sprinkle the surface? If the latter, how deep should the layer be? A. Spread the guano into a layer about 3 inches in depth, and sprinkle; then put together again. 3. What quantity of the dilute liquid would be required for 100 bushels? A. This depends upon the amount of ammonia or its volatile salts which are contained in the guano. If it contains 6 per cent, it will require about 32 pints of the acid solution, about 2 gallons to the ton. 4. Would superheated or dry steam do as a dryer? A. Heated air would be more suitable. 5. Would it be advisable to make the deposit perfectly dry, or to allow a small percentage of moisture to remain? A. You cannot hope to expel all the moisture; and it is better not. 6. If the natural state of the deposit is 50 per cent water and 6 per cent ammonia, would not the evaporation of the water double the percentage of ammonia? Yes. 7. After the deposit is dried, could it not be put up in bags and shipped without fear of deterioration? A. If not exposed to the weather or very moist air, it will not absorb moisture after drying to any extent if tightly packed in strong bags.

(42) M. B. says: Given two lamps, one with a round and the other with a flat wick, the same number of threads in each, and everything else equal, is there any difference in the amount of light? If so which gives the most? A. There will be a difference in favor of the round wick if properly adjusted; but it will consume more oil.

(43) H. C. asks: Is there a way of softening rams' horns so as to be able to mould them? A. There is no practicable method whereby this may be accomplished.

(44) E. E. C. asks: What acids are most destructive to steel dies? A. Nitric, muriatic, and sulphuric acids attack and dissolve the metal most rapidly. Nitric, or a mixture of nitric and muriatic acids (*aqua regia*), are the proper solvents.

(45) T. H. S. says: 1. I am using a liquid made of 1 lb. sal soda and ¼ lb. lime to 1 gallon of water, which, when boiled, comes out as a lye. Of this liquid I use 2 or 3 spoonsful for washing of a boiler of clothes of the capacity of 8 or 10 gallons, with plenty of water. Will the liquid be injurious to the fabrics? A. Under the conditions, the washing fluid will not injure the fabric to any extent. The fluid may be made stronger by boiling with excess of lime and carbonate of soda (sal soda). 2. I use chloride of lime in a liquid state for bleaching the cloth, letting the cloth remain in the rinsing water for an hour or more. Will the chloride water be injurious to the cloth? Please give a formula to make the chloride water of the proper strength. A. Pass the cloth first through a very dilute bath of sulphuric acid, and immediately through a bath of bleaching powder (chloride or hypochlorite of lime), made by dissolving the powder in 24 parts of cold water, and hang in a close room with as much exposure to bright sunlight as possible. When properly bleached, wash well in water and dry.

(46) C. H. B. asks: How can a sword blade be frosted? A. Clean and polish the metal, flow it quickly with dilute nitric acid; and, when the proper point is reached, wash well in running water.

(47) V. S. A. asks: 1. What will soften brushes after they are used in varnish or French dryer? A. Steep the brushes for 24 hours in good benzole, and then, if necessary, purify by washing them with soap and warm water. 2. How can I preserve photograph proofs? A. Wash them well in cold running water, dry, and keep in a dark place. Or, after washing, fix them by immersing for a few minutes in a strong solution of hyposulphite of soda in water and wash or soak in a copious supply of cold water for 10 to 12 hours.

(48) A. P. asks: Can you furnish me a recipe to make a solution for setting the color of crayon drawings? A. Use a dilute aqueous solution of gum arabic in water, with the addition of a very little oil of cloves.

(49) A. R. asks: What can I use to repair a glass bath, that will resist nitrate of silver in strong solution? A. Warm the fractured edges of the glass uniformly, and join with fused gutta percha. The edges should be pressed firmly together and allowed to remain in the clamp for an hour, or until perfectly cool.

(50) C. asks: Will you give a chemical analysis of ox blood? A. In 100 parts of ox blood corpuscles there are: Water 68·8, solids 31·2. The solids are: Hœmatin (with iron) 16·75, globulin and cell membrane 28·222, fat 0·231, extractive matter 0·260, mineral substances (without iron) 0·812. The minerals are: Chlorine 0·1686, sulphuric acid 0·0066, phosphoric acid 0·1184, potassium 0·3328, sodium 0·1052, oxygen 0·0667, calcic phosphate 0·0114, magnesic phosphate 0·0073. These blood corpuscles are suspended in a liquid containing, in 100 parts: Water 90·29, fibrin 0·405, albumen 7·884, fat 0·172, extractive matter 0·394, mineral substances 8·55.

(51) C. F. M. asks: Is there anything that will give raw hide a fine finish and at the same time be waterproof? A. Steep them in a strong, hot decoction of sumac, alum, and logwood, and dress with a mixture of beeswax, soap, oil, and ivory-black.

(52) P. S. K. W. asks: How may paper be prepared so that linseed oil will not soak into it and that the paper will remain flexible? A. Pass the paper rapidly through strong sulphuric acid and wash quickly with a copious supply of water. After drying, pass through an aqueous solution of dextrin, and then between smooth rollers heated to 500° Fah. The rollers should be under a very considerable pressure.

(53) C. B. W. asks: 1. Is it true, as a general thing, that dress goods, wall papers, etc., in which a green color predominates, are poisonous? A. No. Scheele's green (arsenite of copper), because of its brilliant hue, is often used as a pigment in painting and in designs on wall papers, but not so frequently on dress goods. 2. Is it necessary to use poisonous matters to make a green color? A. No. Fabrics which have been dyed with some of the aniline colors have, at times, produced poisonous effects, especially where they have been permitted to remain for any length of time in direct contact with the moist cuticle; but not otherwise. 3. Whence came the idea that all green dyes are poisonous? A. Cases of poisoning from Paris or Schweinfurt green, verdigris, and like compounds containing copper or arsenic (the prevailing color of which is green) have been so numerous that all similarly colored pigments, dyes, etc., have gradually come to be considered with more or less of distrust by the uninformed.

(54) J. A. W. asks: Is there an acid or chemical which will corrode paper postage stamps, but will not corrode gum arabic? A. No.

(55) G. W. S. asks: How can I make a loaf of bread which, after a year or so, I can lay my hand on and squeeze it down, and it will rise up again the same as when fresh baked? A. If the bread is not intended for food, such a loaf may be made from flour in the ordinary way, but with the addition of a little sulphate of copper (a very minute quantity only), glycerin, and a strong aqueous solution of salicylic acid.

(56) W. W. asks: What is the best covering for headed haystacks, portable, durable, waterproof, vermin-proof, and cheap? A. Try the following: Take any coarse fabric, steep it for a few hours in a strong aqueous solution of alum, dry, and coat the upper surface with a thin covering of tar.

(57) G. R. asks: 1. Will a soft metal, like copper, lead, or zinc, hold heat longer than a harder metal like cast or wrought iron of equal weight and the same shape? A. The loss of heat does not depend so much upon the hardness of the metal as upon its conductivity and the condition of its surface. If the surfaces of the metal be bright and polished, it retains its heat much longer than if it be dark and rough; or, in other words, the less rapidly will it part with its heat by radiation. The poorer the heat conductivity of the metal, the longer it will retain its heat, other conditions being the same. The conductivity of silver being 100, that of copper is 73·6, zinc 19·9, tin 14·5, steel 12·0, iron 11·9, lead 8·5. The time required to cool a large mass of hot metal is proportionately great compared with that required to reduce the temperature of a smaller mass the same number of thermometric degrees. 2. Will glass retain heat as long as soft or hard metals? A. Yes.

(58) C. A. B. says: I have eight or ten pieces of sponge rubber bought about two years ago; it was then very good and would clean paper very nicely. It is now hard, and slides over the paper without cleaning it. Can it be restored, so that it may clean paper as well as ever? A. No. The hardening is due to oxidation. The quality cannot be restored.

(59) O. H. N. asks: Is there any way of cleaning sulphur off horseshoes? When I weld the toe calk on, the sulphur gets under the toe calk, and I cannot weld it. A. Use common carbonate of potash or soda.

(60) H. & M. say: We wish to test the quality of different lots of coal oil sent from refineries. Could you give us a mode of doing this? A. Inexpensive instruments for this purpose are sold by dealers in thermometers, hygrometers, chemical utensils, etc. All that is necessary for ordinary purposes is to determine the specific gravity and point of ignition. The former is accomplished by means of an instrument resembling a hydrometer, and the latter by heating a small quantity of the oil in which the bulb of a thermometer is immersed to indicate the temperature, and a small ignited taper, held close to the surface of the oil, ignites the same when the temperature has risen sufficiently.

(61) M. N. asks: Is there any metal or composition which would stand the same usage as a cane, and could be moulded hollow? A. Steel or bronze would answer the purpose, if we understand you aright.

(62) C. B. P. asks: How can I platinize the silver plate of a Smee battery? A. Dip the plate in a strong solution of chloride of platinum, and expose it for a short time to the action of a stream of hydrogen or coal gas. 2. How can I prepare sulphur for making casts of coins, etc.? A. Fuse the sulphur and heat it to the point of sublimation, and while in this condition throw it into cold water.

(63) A. J. S. says: I have a lot of emery wheels that have been almost covered with japan dryer. What will remove the japan without injuring the wheels? A. Remove all you can by mechanical means, and then treat the parts with strong oil of vitriol (sulphuric acid) for a few minutes; then wash well, but quickly, in a stream of water. Repeat this treatment if necessary, and rub well with sawdust. The acid should not be permitted to remain for any length of time in contact with the stone, as it will injure it.

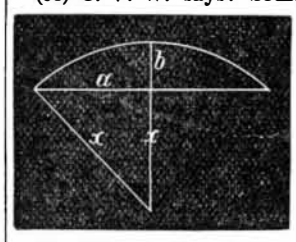
(64) C. W. C. asks: How can I keep lemons for 6 months or more? A. Packing them in salt and keeping in a cool place is one of the best methods; but even this will not always suffice.

(65) C. H. J. says: Some specimens of limestone rock were excavated from a quarry. The specimens taken out during the spring and summer, which were allowed to season, answered admirably, but those taken from the quarry during or just previous to a cold snap cracked by the action of frost. Can you suggest means by which these stones may be tested, other than by subjecting them to extreme cold? A. The cause of the cracking of the stone may have been the molecular energy of freezing water contained within cavities in the rock; but it is more probable that the rupture was due to the relaxation of strain to which the blocks had been subjected while in the quarry. Splitting up of blocks from this cause is by no means infrequent in some quarries. If the breaking is attributable to the action of frost, there is no other means than those you mention for testing the stone. If it is due to the unequal strain upon the block, the splitting cannot be avoided.

(66) M. asks: Can you give me a recipe for making concentrated starch? A. We do not know of any preparation by this name.

(67) G. S. says: I have some specimens of copper ore that are covered with verdigris. What shall I use to take it off? A. If it is really verdigris, a little dilute sulphuric or hydrochloric acid will remove it.

(68) C. V. W. says: Some of your correspondents ask for a method of finding the radius of a circle when the chord and versed sine are given. I give them a very simple formula based upon the well known property of the right angled triangle. Where



a=½ chord, b=height or versed sine, and x and x=radii,

$$a^2+(x-b)^2=x^2=\frac{a^2+b^2}{2b}=x \text{ or } \frac{\frac{1}{2}\text{ chord}^2+\text{height}^2}{2\text{ height}}$$

(69) J. H. M. says: I am running saws of 8 inches diameter, and smaller. I wish to know at what to run them in order to make the smoothest work? A. Nine thousand feet per minute, that is nearly two miles per minute, for the rim of a circular saw to travel, may be laid down as a rule. For example: a saw 12 inches in diameter. 3 feet around the rim, 3,000 revolutions; 24 inches in diameter, or 6 feet around the rim, 1,500 revolutions; 3 feet in diameter, or 9 feet around the rim, 1,000 revolutions; 4 feet in diameter, or 12 feet around the rim, 750 revolutions; 5 feet in diameter, or 15 feet around the rim, 600 revolutions. Of course it is understood that the rim of the saw will run a little faster than this reckoning on account of the circumference being more than three times as large as the diameter. Shingle and some other saws, either riveted to a cast iron collar or very thick at the center and thin at the rim, may be run with safety at a greater speed.—J. E. E., of Pa.

(70) D. B. says; I notice an article stating that Dr. Siemens had succeeded in producing permanent magnets capable of suspending 20 times their own weight, by mixing with steel a small proportion of tungsten. Can this be so? A. Yes, so far as we know; small artificial magnets have been made to sustain one hundred times their own weight.

(71) C. W. C. says: If a telegraph wire passes over a building, or in close proximity to it, does it endanger it during a thunderstorm? A. No. So far as it has any influence, it acts as a protector.

(72) J. W. T. asks: Is there any electric battery that will heat and keep a ¼ inch wire red hot or nearly so? A. The question is very indefinite, as everything depends upon the length and material of which the wire is composed. Probably a Bunsen cell could be made sufficiently large to heat a short length of platinum of that diameter.

(73) V. W. S. asks: If a dwelling is surrounded by trees, from 10 to 25 feet higher than the ridge or the chimney tops, and within one or two rods distance from the house, are not these trees some protection against lightning? And if not, would not conductors in the trees answer a better purpose than is secured by the usual mode of attachment to the building? A. Properly constructed rods on the building are much better in every respect.

(74) T. B. A. says: What size of wire do I want to make an induction coil, to be used to heat platinum wire? A. Use a Grove or Bunsen battery. Either is better than a coil.

(75) A. A. W. says: I have a book that gives a rule for finding the safe working pressure of any boiler, but I cannot work it satisfactorily. The rule is: Multiply the thickness of iron by 0·56 or 0·70, according as the boiler is single or double riveted, multiply this product by 10,000 (safe load), then divide this last product by the internal radius less the thickness of iron. The quotient will be the safe working pressure in lbs. per square inch. A. Calling C a coefficient 0·56 or 0·70, as the case may be; T, thickness of boiler in fractions per inch; R, internal radius of boiler in inches; L, safe load in lbs. per square inch. Working pressure= $\frac{C\times T\times L}{R}$

(76) J. P. asks: How can I make old copper and brass coins stick to a board without using tacks? A. Melt together in a suitable vessel equal parts of pitch or asphalt and gutta percha. Apply hot. Clean the coin with a little dilute nitric acid or oil of vitriol.

(77) J. Z. R. says: I inclose a small piece of carpet. I want to dye it some other color. Which will be the best? A. As the carpet already contains so many dark colors, it would be impossible to dye it any color but black, without first having bleached it; and this, in the present instance, is impracticable.

My kitchen ceiling blisters and scales off. It has been whitewashed sometimes with lime and sometimes with whiting. What shall I do with it? A. This is very probably due to dampness, in which case the best plan is to clean and paint the walls.

I want to make a photo background. What is the best color to use? A. Any of the aniline colors may be used for this purpose; you can purchase them, already prepared and with instructions for use, of any druggist. Any oil paint may be rendered flexible, when dry, by rubbing it up with a little soap and glycerin over a fire.

(78) A. S. C. asks: 1. What amount of carbolic acid is used in a lb. of carbolic soap? A. Samples of these soaps, that we have examined, contained about three per cent of the crude phenol in combination as a soda salt. 2. How is it mixed? A. In the coarser varieties of these soaps, the phenol is added directly to the lye during the latter part of the saponification; but in these cases the acid is very incompletely distributed through the body of the soap. A complete and uniform dissemination of the phenol may be obtained by dissolving soap and carbolate in hot spirits of wine or wood naphtha, and evaporating the solution to dryness.

(79) B. F. W. says: Joshua Rose says, in relation to sawing staves for cylinder or pipe patterns: "It will save time to resaw the pieces to give them the required bevel, which may be done by canting the saw table." A better practice is to cant the table before sawing at all, and then the staves will be of the right shape, with a saving of nearly two thirds of the sawing and considerable timber.

(80) C. H. says: We have in our possession an old-fashioned range; and whenever we draw hot water the water has the appearance of milk, but after standing a few minutes it regains its regular color. We have been advised not to use the water. A. This is due to the precipitation of the lime contained in the water. Lime is less soluble in hot than in cold water. It is not generally advisable to use water from the hot faucet for culinary purposes, as it may contain poisonous copper and lead salts.

(81) J. A. K. says: 1. I use oxalic acid for preparing pale leather boot work (a teaspoonful of oxalic acid in a pint of water). The mixture sometimes becomes a brownish color. Do you know of any kind of acid which would do instead of oxalic? A. Try moistening the leather first with oxalic acid, as usual, and then with a strong solution of chloride of lime (hypochlorite of lime) in cold water. 2. Do you know of anything to put in ink to give a good gloss? A. Use an alcoholic solution of wax.

(82) J. W. P. asks: What will remove stains of tannic acid from linen and other fabrics? A. Wash well with a little soda, moisten with very dilute sulphuric acid, and then with a strong solution of bleaching powder (chloride of lime) and expose for an hour to bright sunlight. Then wash well in water.

(83) X. Y. Z. asks: Can the skins of birds be tanned with the feathers on? A. Yes, but not without discoloring the feathers.

(84) E. W. W. asks: How can holes be readily pierced, or small holes enlarged, in rubber corks for the fitting of glass tubing? A. Force the stopper into the neck of a flask or large glass tube which it will just fit into, and use a well sharpened cork borer with gentle pressure and even turning. If you desire to enlarge a former hole, first plug it tightly with a piece of glass rod and proceed as before.

Is there any table published of relative chemical affinities by which one may get at the amount of force necessary to dissociate the elements in certain compounds? B. We know of no such table.

(85) W. A. H. says: I have a relay of the box pattern, containing a magnet of about 40 ohms. There is a certain peculiarity I notice, which I would like to have you explain. I notice that whenever the current is broken by opening of the key, a peculiar jump is heard, a kind of kick or hammering. At first I thought the magnet was loose; but after making it as tight as possible, it acted in the same manner. A. The noise is occasioned by a change in the molecular condition of the iron core when magnetized and demagnetized.

(86) S. I. asks: 1. What length and size of insulated wire is required to wind the magnets of a relay, such as is used on ordinary telegraph lines? A. About 1,000 feet of No. 32. 2. What would be the proper dimensions? A. The core can be 1¼ inch long and about ⅜ inch in diameter.

(87) H. L. J. says. Makers of telegraph apparatus use a kind of lacquer or varnish on their brass work which prevents tarnishing, while it is so thin as to avoid muffling the sound. What is it, and how is it prepared? A. Shellac and alcohol are the principal ingredients, colored by gamboge, saffron, turmeric, etc. About 2 gallons alcohol to 1 lb. shellac is the proportion.

(88) G. W. H. says: 1. I am making an induction coil to throw 1½ inches spark, to light gas. Of what diameter and length shall I turn my bobbin? A. Use about 2 miles of No. 36 wire for the secondary. 2. What size of wires shall I use? A. Make the core ¾ inch or an inch in diameter and about 8 inches long. 3. I have some tinfoil 5 inches wide to make a condenser with; how much in length will it take? A. One hundred feet of the foil will probably be enough.

(89) C. C. S. asks: Can I conduct the smoke and exhaust from a 4 or 6 horsepower farm engine through tile laid underground (on a constantly ascending grade; to a stack 100 or 125 feet distant? A. This is frequently done.

(90) A. V. V. says: Two boilers, one 8 feet in diameter and the other 6, each containing the same number of flues and each having a steam gauge indicating apparently the same number of lbs. of steam; which boiler has the most steam in it? A. If the larger boiler has the most steam room, it contains, of course, the greatest weight of steam.

(91) W. H. L. asks: Why is it objectionable to raise the safety valve of a boiler in case of low water and danger of explosion? A. It is not desirable to do anything that may cause the water to rise and come in contact with overheated iron.

(92) R. M. asks: How can I raise a valve by change of temperature? A. There are numerous devices of this kind in common use. By inserting a notice in the "Business and Personal" column, you can probably gain full information.

(93) A. B. says: Please give me the scientific definition of the word "inertia?" A. Brande says "This term is used to denote the principle or law of the material world, that all bodies are absolutely passive or indifferent to a state of rest or motion, and would continue for ever at rest, or persevere in the same uniform and rectilinear motion, unless disturbed by the action of some extrinsic force."

(94) A. B. S. asks: Will a pump draw water any easier by having the pipe to the well larger than the connection to the pump, and will an injector lift the water any easier by having the suction pipe in the well larger than the pipe to the boiler? A. By using a larger pipe, the friction is diminished.

(95) J. D. S. asks: What is the best manner of determining when a millstone is in wind? A. Use a red staff, or straight edge covered with red paint, which will show all the high spots.

(96) E. M. P. asks: What are the best methods of reversing motion? A force is used to accumulate or store up a certain amount of power, then that stored-up power is desired to produce or exert its force. By what mechanism can this be effected? A. Sometimes a flywheel is used, a spring may be compressed, a weight may be lifted, or a reservoir may be filled with water. Flywheels, springs, and weights are among the most common means employed.

(97) C. W. asks: What would be a safe steam pressure to carry in a cast iron cylindrical shell of 10 inches inside diameter and $\frac{5}{16}$ thick, with heads ⅝ thick? A. You can carry 200 lbs. if the casting is sound; but cast iron boilers frequently have points of weakness that render theoretical calculation of their strength of little value.

(98) W. L. M. says: Astronomers tell us that it has been calculated, from the rapidity of the rotation of the earth, that, if the earth were suddenly intercepted in its motion, sufficient heat would be generated to melt the earth instantaneously. What would be the generator of this heat? A. According to the modern theory of heat, a unit of heat and 772 foot lbs. of work are mutually convertible, motion being the generator of heat.

(99) T. A. asks: Can a turbine or other water wheel be considered an hydraulic power? A. It can, in a general sense, just as much as a steam engine may be spoken of as steam power. Strictly, the term applies to the power furnished by the motor.

(100) Y. M. asks: 1. What is the meaning of the mass of a body, when the weight is divided by the gravity to find it? A. It is a measure of the quantity of matter, and in order to give the same results with the same body at all places in the earth's surface. 2. What is a circular inch? A. It is the area of a circle having a diameter of 1 inch. 3. What is a cylindrical inch? A. It is the volume of a right cylinder with circular base, diameter of base 1 inch, altitude 1 inch.

(101) C. F. says: When the water in my boiler stands between the two gauges (about 3 inches above top flues) and I start the engine, the water will instantly rise from 6 to 8 inches or nearly up to the dry pipe. As soon as I stop the engine, the water drops back to its original position. We know it is not foaming, as we have blown off the boiler several times, and it is perfectly clean. We use soft water. A. The rise of the water is probably due to insufficient steam room, or possibly because the fire is forced too much. We judge, from your account, that no injurious action takes place. There are several other reasons that might be effective in causing the water to rise, but those given above are the most probable.

(102) I. W. L. says: 1. I have been told that I can make a battery for gold and silver plating as follows: Take a piece of copper 1½ inches in diameter and ¼ inch thick, and a piece of zinc of the same size. Attach a copper wire to each in a glass vessel ⅔ full with a piece of bluestone. The zinc is to be on the top. These wires are to go to the bath. Is this right? A. The plates should be much larger to give good results, and the copper need not be so thick. 2. How can I make the bath? A. Make a solution by dissolving cyanide of gold in cyanide of potassium, about ½ oz. of gold per gallon. Connect the article to be plated to the zinc of your battery. 3. How long should the articles be in the bath? A. Until the deposit is of the desired thickness.

(103) W. S. W. says, in answer to M. P., who asks for watch oil: Put 1 oz. pure olive oil in a tumbler, add 2 ozs. of 96 per cent alcohol, stirring well; set it away in a dark place for 24 hours or more, well covered, then pour into a clean bottle containing 10 ozs. distilled or clean rain water. Shake violently for 5 minutes, allow the mixture to stand ½ hour or so, then freeze with salt and ice. You will find a good article of fine limpid watch oil, perfectly fluid, at top. Draw off with a siphon.

(104) L. G. says: A string or cord being attached to a piston rod directly, the engine being of one horse power, what weight must I put on the cord to test the strength of the engine? A. This depends upon the speed of the piston. The measure of a horse power is the work of lifting 1 lb. 33,000 feet high in a minute, or 33,000 foot pounds per minute; so that if you divide 33,000 by the speed of the piston in feet per minute, the quotient will be the required weight.

(105) H. E. W. asks: 1. Why do nearly all manufacturers of electric annunciators and indicators for burglar alarms wind the magnets with wire of No. 28, and finer? Why not use No. 20 to 26? A. In many cases, Nos. 20 or 26 wire would be preferable; but with finer wire the battery does not require so much attention as might be necessary if coarser wire were used. 2. Will cotton covered answer as well as silk covered? A. Any kind of insulation will answer. Silk is better than cotton, as ordinarily put on, as it takes up less room. 3. What size of cores, and how many feet of wire on each core will give the best results? A. Cores are usually made about 1¼ inches long and ⅜ inch thick for annunciators; 250 feet of wire will answer for both cores. 4. Will an electro-magnet ever lose its power or become useless? A. Not with proper care, except that everything wears out with age.

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

G. M. P.—No. 1 is hauerite, sulphide of manganese. No. 2 is idocrace, a silicate of lime, alumina, and iron. No. 3 is tremolite, a silicate of lime and magnesia.—D. A. C.—S is a clay ironstone, containing much sulphide of iron (pyrites). G is graphite mixed with much clay. D appears to contain a small amount of sulphide of lead in a granite matrix. Your letters were insufficiently stamped to the amount of 24 cents.

R. K. says: A friend tells me that a single, a double, a triple, and quadruple thread, either right or left hand, can be cut by one and the same pair of ordinary stocks and dies. Can this possibly be true?—G. S. W. asks: Is there any rule for dividing a circle into 3, 4, or more equal parts by parallel lines?—G. E. C. asks: How can I bend the sides of a guitar? Should they be steamed?—W. H. B. asks Can you tell me how to bisect a triangle by a straight line passing through any given point within the triangle?

COMMUNICATIONS RECEIVED.

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

On Friction of Slide Valves. By F. G.
On Force. By——.
On Cleopatra's Needle. By J. W. P.
On an Old Problem. By B. B.

Also inquiries and answers from the following:

J. P. B.—T. H. C.—W. C. Y.—R. F.—E. P.—T. S. P.—C. W.—J. B. B.—J. K.—T. H. G.

HINTS TO CORRESPONDENTS.

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.

Hundreds of inquiries analogous to the following are sent: "Who sells blue glass lamp chimneys? Who sells machines for stitching magazines, etc., with wire? Who sells working models of steam engines? Who makes iron chain? Who makes the best medical electric apparatus?" 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

FOR WHICH

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February 13, 1877,

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

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 Munn & Co., 37 Park Row, New York city.

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DESIGNS PATENTED.

9,739.—PAPER BOXES.—N. D. Bill, Springfield, Mass.
9,740.—EMBROIDERY.—B. Dreyfuss, New York city.
9,741.—LICORICE.—H. T. Jarrett *et al.*, New York city.
9,742.—VAPOR STOVE.—E. F. Rogers, Chelsea, Mass.
9,743.—SCALE BASE.—F. W. Troemner, Philadelphia, Pa.
9,744.—GLASSWARE.—H. P. Pears, Pittsburgh, Pa.

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