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

J. B. will find directions for making an æolian harp on p. 315, vol. 33.—J. M. McG., Jr., should read Paddlefast's articles in the SCIENTIFIC AMERICAN SUPPLEMENT.—S. B. W. should read our article on p. 33, vol. 33, on the horse power of an engine.—C. S. S. can calculate the proportions of gear wheels by following the directions on p. 107, vol. 34.—C. D. L. will find on p. 26, vol. 33, an excellent recipe for paint for outdoor work.—C. A. S. should vulcanize his iron castings. See p. 315, vol. 33. This also answers S. T. B.—A. S. C. will find directions for fastening leather or rubber to metal on p. 101, vol. 34.—H. W. S. will find directions for making printers' rollers on p. 283, vol. 31.—C. S. M. will find directions for raising mushrooms on p. 129, vol. 34.—R. B. L. will find on p. 360, vol. 34, directions for renovating clothing.—A. T. N. is informed that the galvanic action set up by putting zinc into an iron boiler is supposed to prevent the formation of scale.—J. W. G. & Co. will find tables of the specific gravity of water in Box's "Practical Treatise on Heat."—B. B. will find something on the passage of water through pipes on p. 48, vol. 29.—I. P. I. will find directions for making wood incombustible on p. 103, vol. 34.—J. J. will find a good recipe for liquid blacking on p. 73, vol. 26.

(1) A. B. R. and many others: The Spitz dog is very closely related to the white or arctic wolf, and has much of the same habit and temperament. Dr. Hammond thinks that the Spitz is a cross between the Pomeranian hound and the arctic fox, and that it is probable that the saliva of the animal is nearly always poisonous in our climate, and particularly so when the dog is at all irritated or excited. It is safe to say that the Spitz dog has never been completely domesticated, no matter how many years have been spent in his education. Nature has fitted him with a very warm and thick coat of fur, which allows him to be acclimated only in the arctic regions, whence he has evidently been brought, an unwilling captive. In appearance, the dog, at maturity, generally averages 26 inches from the tip of his sharply pointed snout to his tail, which is quite bushy, and in general curls up over his back. He stands about 12 or 15 inches high. His head much resembles the fox in shape; the ears are small, and the entire body is thickly covered with beautifully white, stiff hair, that stands more or less straight out from the body. This hair is very long—in some cases as much as three inches—especially around the head, throat, and flanks, and gives the dog the appearance of having a much larger body than is really the case.

(2) C. S. V. says: A friend argues that a cow can at will hold up her milk, that she can purposely hold it to go dry. Can this be true? A. The secretion of milk by the cow is wholly involuntary. But it is within her power to prevent the flow of milk from the udder under ordinary circumstances. It is best that the animal be relieved of her milk whenever the udder becomes fully distended.

(3) E. T. V. asks: What is the law as to the examination of druggists' clerks in New York city? A. All pharmacists must present satisfactory credentials or certificates of competency and qualifications to the Board of Pharmacy, when, on payment of a fee of two dollars, and enrolling their names and places of business upon the register, they are entitled to a certificate from the Board. In order to register, the person must be a graduate in pharmacy, a licentiate in pharmacy, or a graduate having a diploma from some legally constituted medical college or society. Graduates, in the meaning of the law, are those persons who have had at least four years' experience in stores where prescriptions of medical practitioners have been compounded, and who have a diploma from any college of pharmacy within the United States, or from some authorized foreign institution or Examining Board. Licentiates are those who have had at least four years' experience in stores, etc., and who shall have passed an examination before the Examining Board or Board of Pharmacy. Applicants for examination must pay a fee of five dollars to the Board, and pass examination before receiving a certificate. Persons failing to comply with the law are subject to a heavy fine.

(4) H. W. S. says: We use wood baskets for throwing charcoal on forge fires, and they are thus exposed to the fire, and are charred and burned. What cheap preparation can we use as a coating to protect them? A. Use a strong solution of tungstate of soda in hot water, or one of water glass. The tungstate costs about 25 cents per lb. The fireproof asbestos paint is, we believe, a waterglass mixture of the asbestos powder. See our advertising columns.

(5) T. McC. asks: 1. Is it possible to mix benzine and water? A. No. 2. Is it possible to mix linseed oil and water? A. No; but the oil may be saponified by heating with an alkali, and the soap so formed dissolved in water. 3. Is there anything that will dissolve glue without heat or water? A. Try strong acetic acid. 4. Is there anything that, if put on rosin, will destroy it? A roof that is newly tinned has streaks of rosin on the joints, and I want to get it off without damaging the paint. A. We do not know of anything of the kind. Rosin is quite soluble in turpentine, benzine, naphtha, etc. 5. What is the quickest dryer for distemper color? A. See answer to C. D. R., p. 300, vol. 36.

(6) C. H. W. asks: What is there about concentrated lye to cause an explosion? A short time since a lady near Crawfordsville, Ind., was making soap and was using concentrated lye; she had put a box of lye in a kettle, and when she thought it was boiled out, she took it in her hands, and it exploded (there being a small quantity left in the can), injuring her hand very much. She has since taken lockjaw from the injury. A. We are at a loss to explain this strange occurrence. You evidently have not given us all the facts in the matter. You should have stated what kind of a box contained the lye, and what else was in the boiler at the time. Ordinarily there is nothing in potash or soda lye that can directly cause an explosion such as you describe.

(7) C., in speaking of an article published in our issue of March 24 on "Light and the Distances of the Stars," says: I question a problem that finds the distance of stars by the light which comes from them at a rate of 185,000 miles per second without knowing how long the light has been traveling. A. We reply by saying there are no such problems, the distances of but very few of the stars have been or ever can be measured; these are measured by accurately observing their position with regard to other stars; and then, six months after, when the earth has made one half of a revolution around the sun, or, in other words, has moved 185,000,000 of miles to the right or left of its former position, observations are again taken. And if there is no apparent change in the position, then we have no means of determining their distance; but if there should be a slight change of position, the same as there is when a person moves his head while looking at objects at different distances from him, then, knowing the distance we have moved and the amount of displacement produced, we may compute the relative distances of the objects. With those which have no apparent displacement, their distance is only a matter of reasoning: Take a group of stars like the *Pleiades;* if they are not at a very great distance from us, then they are quite near to each other; and as they have no motion to prevent, they would be drawn together by their mutual attraction. Therefore we reason that they are immense distances away from us and from each other, and the apparently small motions which they have are velocities which we have no conception of. But whether it takes light thirty years or thirty thousand to reach us makes very little difference, as the distance of either is incomprehensible. Some persons have asserted that the immensity of space must be filled with stars, or else the outside ones would be attracted toward the center, and thus fall together. But this is not so, for a group of stars may have an orbital motion in which the centripetal and centrifugal forces are balanced, in which case it requires no outside attraction to keep them in position.

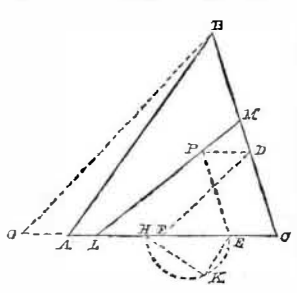
(8) S. B. G. asks: Why is it stated in textbooks that a degree is longer at the pole than at the equator of the earth? A. It is because the length of the degree on the earth is not measured from its center, any more than a degree on an ellipse is measured from its center of gravity. It is measured from the center of a circle of which the curve between the points measured is a part; therefore a degree at the equator is measured on a circle of shorter radius than at the pole. The length of the degree being proportional to the radius of the circle on which it is measured, it will be longest at the pole.

(9) T. H. L. asks: 1. Why is it that some people, who seem to be quite strong in other respects, find it so difficult to climb hills, while others, whose physical development seems to be no better, walk up them without any apparent difficulty? A. The only assignable cause is an existing difference in the physical powers—strength of muscle and lung capacity—in comparison with the total weight. The difference between many people in this respect is often a radical one. 2. What is the best means that may be used to overcome the difficulty? A. Physical culture in general is the only thing to be observed. Work in the open air and partake in moderation of nutritive food.

(10) J. O. M. asks: How is the copper plating deposited on iron? A. It is usually applied by dipping the chemically cleaned iron in a hot bath of solution of sulphate of copper.

(11) D. C. H. says: Some months ago there appeared in a journal of *materia medica* an article describing a new kind of pottery which was said to stand wonderful fire tests. Can such an article be used in restoring sulphuric acid after the oil refiners have used it? A. There is no ware of this kind that we know of that would prove of much service for your purpose. See p. 268 (No. 17), vol. 1, of SCIENTIFIC AMERICAN SUPPLEMENT.

(12) W. E. B. says, in reply to W. H. B.'s query as to bisecting a triangle by a line passing through a given point:



The following solution is from Gillespie's "Land Surveying." Let A B C be the given triangle, and P be the given point. From P draw P D parallel to A C and P E parallel to B C. Bisect A C in F, and join F D. From B draw B G parallel to FD, and bisect G C in H. On H E describe a semicircle. On it set off E K = E C. Join K H and set off H L = K H. Then L M, drawn from L through P, will be the required line bisecting the triangle.

(13) A. C. says, in reply to C. A. C., in regard to circumferential velocity of disk to cut cold iron: We find the best speed to be that which gives a circumferential velocity of about 24,000 feet per minute, using a steel disk 42 inches in diameter, and from ¼ inch to $\frac{5}{16}$ inch in thickness.

(14) W. A. M. asks: What is boro-silicate of soda? A. It is a glass or enamel made with borax (biborate of soda), soda and silicic acid (sand).

(15) E. W. asks: How can I make a cement or wax, suitable for sealing glass bottles containing a liquid? A. Fused paraffin is often employed for the purpose, also sealing wax. Sealing wax may be made according to the following recipes: Fine red, No. 1: Shellac (bleached), 4 ozs., cautiously melted in a bright copper pan over a clean charcoal fire. When fused add 1¼ ozs. Venice turpentine, and 3 ozs. vermilion. No. 2: Shellac 3 lbs., Venice turpentine 19 ozs., finest cinnabar 2 lbs.; mix, and fuse as before. No. 3.—Same as last, but use half the amount of vermilion. Common red: Resin 4 lbs., shellac 2 lbs., Venice turpentine and red lead, each, 1½ lbs. Bottle wax, No. 1.—Black resin 6¾ lbs., beeswax 2 ozs., finely powdered ivory black 1 lb. No. 2.—As last, but substitute Venetian red or red lead for ivory black. Fine black, No. 1.—Shellac 60 parts; very fine ivory black in impalpable powder, 30 parts, Venice turpentine 2 parts. No. 2: Resin 6 parts, shellac and Venice turpentine, each 2 parts. Soft red: Beeswax 8 parts, olive oil 5 parts, Venice turpentine 15 parts, and red lead to color. Green: As last, but substitute powdered verdigris for red lead. The addition of a little camphor makes the wax burn better. The bottles should be dry, and, if possible, warm.

(16) J. S. B. and others, who ask about postage stamp mucilage: The government mucilage, used for postage stamps and envelopes, is said to be made as follows: Gum dextrin 2 parts, acetic acid 1 part, water 5 parts. Dissolve in a hot water bath, and add 1 part alcohol.

(17) H. G. says: I am running a horizontal engine of 4 inch cylinder and 6 inch stroke, with an upright tubular boiler, the outside measure of which is 30 inches by 6 feet; and I experience considerable difficulty in keeping up steam, and am in doubt as to whether the trouble lies in the engine, which is a pretty old one and loses steam somewhat, or whether the boiler is too small. What is the nominal horse power of the engine and of the boiler? A. You might settle the question definitely by measuring the water evaporated by the boiler, and using a brake at the same time to determine the power exerted by the engine. Any guess we could give from the data sent would be of very little value.

(18) R. G. G. asks: Will you please inform me how a compass is carried on an ironclad vessel, so that the iron will not have any effect on it? A. It is either put up so high as to be out of the influence of the iron, or the effect is counteracted by magnets.

(19) J. H. M. says: 1. I have a 1½ horse power steam engine, and an upright boiler 22 inches high and 16 inches in diameter. The boiler has twenty 1⅝ inch tubes. Cylinder is 3x4 inches, pipe from boiler to cylinder is ⅝, and exhaust pipe ⅞ inch. Engine when started frequently throws water up the exhaust pipe; and when at work it will often throw up a stream of water, which, unless shut off, puts out the fire. Sometimes it will run all day without throwing water. What are the cause and the remedy? A. You do not send sufficient particulars to enable us to form a decided opinion. From your statement, it seems probable that the circulation in the boiler is not very good, and that the water level is not maintained constant. If this is a correct view of the case, you may derive some advantage by introducing a dry pipe, such as is used on locomotives. 2. The pump on the engine also troubles me occasionally, unless I loosen the cap of the first supply valve and let in a little air to start the suction, it will not pump. With a little air, it works all right, but causes a leak of water. A. It may be that the connections are too small for the speed at which it is run.

(20) B. S. asks: What are the advantages of cars running on trucks with 4 or 6 wheels *vis à vis* to the cars of two axles, with 4 wheels only? A. Every one does not think that trucks are an advantage, as you doubtless know; but their advocates consider that larger cars can be used, that will run more steadily, and go around sharper curves. You will find a good discussion of the subject in the "Catechism of the Locomotive."

(21) W. D. D. says: I have a tank which holds 800 barrels of water, and one 3 inch pipe from bottom of tank 300 feet long, to fill a street sprinkling wagon tank. The water does not half fill the 3 inch pipe. What is the cause? A. It is quite likely that the pipe has high points in which the air collects, and thus reduces the effective area.

(22) G. W. B. asks: If a gallon bucket be placed 20 feet under water, the top of the bucket being closed and a ½ inch pipe placed in the top and reaching up through the water through which the air may pass out, the bottom of the bucket being open, how long will it take for the bucket to fill with water? How long will it take for each distance under water for a ¾ inch pipe? A. The difference of time in the several cases would vary as the square roots of the depths. There would be no appreciable difference with the two pipes.

(23) T. H. says: In your reply to W. L.'s query as to why a gun barrel scatters the shot, you said: Generally it is due to the fact that the barrel is not true or is foul, or to the shape of the breech. I have got a rifle and it is an easy matter to hit a nail head in a fence 20 feet off with a bullet: but I cannot hit a cap book cover with 20 shot, as they scatter from 4 to 5 feet from the mark? A. You are confounding two distinct articles.

(24) E. H. says: A. claims that, when a steam fire engine goes to work from a cistern she is pumping water, and, when the same engine goes to a plug and receives all the water she wants, that she is only discharging what she receives in her pumps or wells. B. claims that a steam fire engine is pumping water, no matter how or by what means she gets it. A. There seems to be some confusion of terms in these questions, but we answer according to our understanding of them, that the pump when at the well both draws and forces water, while at the hydrant it only forces.

Why are the front wheels of a wagon so much smaller than the hind ones? A. Principally to enable it to turn readily.

(25) L.F. C. asks: Why does the light coming to us from fixed stars appear to twinkle? A. Because of the sudden changes in the refractive powers of different strata of the atmosphere, which are not sensible in the case of stars that have perceptible disks.

(26) J. H. S. says: 1. I have an engine of 16 inches bore and 36 inches stroke. I am driving the same at 75 revolutions, with steam 10 lbs. to the inch, cut-off at half stroke. The engine is doing all that it is safe to drive with it, by shaft 8 inches in diameter. Belt is so large that it will hold the engine still at any part of the stroke. I wish to drive two engines, each as powerful as the one I now have; and I propose to add one of the same size on the other end of the shaft. The experts here say that I must make the shaft as large again as it is, and the belt also. I say that both belt and shaft are as large as is required, as they have beaten the full power of the one engine. A. It is possible that you are right; but you cannot know without making an experiment. At most, however, the size of the shaft will not have to be greatly increased. 2. How long is the expanding steam useful after being cut off? Condensation has nothing to do with this; I take the ground that there is useful effect in steam until it is down to the pressure of the atmosphere, assuming in this case that there is no condensation. My opponents say that if the engine takes 10 lbs. of steam to turn it over the center, that the expansion is of no use after the pressure has fallen below 10 lbs. I say that there is useful effect in steam as long as it is above the atmosphere, and so long will it give out useful effect on the piston. A. You have the right idea, but somewhat too extended. If there is any back pressure, that is the limit of the expansion. 3. Is there any advantage in the engine valves like Corliss' over ordinary valves? Take the common slide valve with a cut-off on the back of the main valve, the top valve to be worked by the governor so as to cut off the steam at any part of the stroke. Is this advantageous, and which is the best of the two systems? A. The valve that closes most quickly, and is the most nearly balanced, will give the best results, other things being equal.

(27) H. T. says: I see in your SUPPLEMENT an article on compressed air, stating that there is at least 50 per cent lost. How does this loss occur? If I force 10 cubic feet air into 1 cubic foot space, would it exert a force of 150 lbs. to the square inch, and would it not give back all the power that it cost to compress it, less the friction for packing, etc.? A. The statement to which you refer gives the reason. The air, instead of being allowed to expand and give back the power required to compress it, is supposed to be admitted for the whole of the stroke.

(28) J. H. G. says: 1. I am building an engine 4¼ x 4½ inches, and wish to put it into a boat, with fine lines, 30 feet long, of 7 feet beam and 30 inches draught. Please give me the probable speed obtainable, the engine using steam at 100 lbs. pressure for ¾ of the stroke and making 500 revolutions per minute? A. Probable speed from 9 to 10 miles an hour. 2. What should be the heating surface of boiler and diameter and pitch of the screw? A. Heating surface of boiler, 150 square feet. Propeller, as large as can be submerged, of 3 feet pitch.

(29) M. T. S. says: I am making a machine of cast iron for cutting fruits and vegetables. What paint or varnish should I put on it to keep it from rusting? A. Paints or varnishes will not answer for this purpose. It is best to have the iron nickel or silver plated. See p. 232, vol. 36. "Prevention of Rust on Iron."

(30) G. C. Q. asks: 1. What volume of water in the state of vapor can be absorbed by a given volume of sulphuric acid before the acid becomes completely saturated? A. Strong oil of vitriol will absorb more than twice its volume of water vapor, but as the dilution proceeds, the absorbing power of the acid decreases proportionately. 2. What is the most simple method by which the acid can be rid of the water it has absorbed, so that it is ready to absorb again? A. The only way is by evaporation with the aid of heat in glass, porcelain, or platinum vessels.

(31) G. E. asks: How can I mix paint that will do for painting steam pipes or the parts of an engine which are heated by steam? If I use water color it rubs off; if oil, it turns dark from the heat? A. If you do not wish to use a dark color, mix your paint to a lighter shade than it is permanently to be, and let the heat deepen to the color till it sets.

(32) J. V. B. says, in reply to D. D., who asks what is the cheapest and best preparation for the preservation of shingles: Use 3 lbs. of green vitriol in water to the 1,000 shingles. This preserves the shingles and renders them to a great extent fireproof. Shingles made from wood of evergreen trees are best.

(33) R. B. R. asks: Is there any instrument in which, as in a reservoir, electricity could be stored up, so as to be used occasionally as need might require to produce motion? If I should employ a windmill to generate electricity by a Gramme machine, could I store up the electricity until it acquired a certain and sufficient tension, and then draw from it as I choose, without the necessity of using plates, porous cells, carbons, etc., and without danger? A. No. A battery composed of Leyden jars may be charged with statical electricity, but the quantity of electricity that can be so stored is limited, and it is difficult to retain the charge for any length of time. Low tension electricity, such as is used on telegraph lines, cannot be stored.

(34) J. F. D. says: Some time ago I made a voltaic pile, which I cannot get to work. I put circular blanks, 4 inches in diameter, thus: Copper, zinc, fabric, copper, zinc, fabric, etc., punched holes in center of them, and piled them up around a stick. Please tell me what is necessary to make it work? A. Remove the stick and moisten the pieces of cloth. The shape of the disks does not in any way influence the strength of current. Make the cloth the same size as the disks with which it is in contact. It will require several hundred of the couples to produce a sensible spark.

(35) A. B. asks: How can get I rid of lice in poultry? A. Make the roosts perfectly clean with hot soap and water, and afterwards apply spirits of turpentine or kerosene oil. Also strew some sprigs and branches over the floor of the coop. The building should be kept clean.

(36) S. R. S. says: Having read that an engine has been disabled by putting a bar of soap in the tank, I wish to know what the action of the soap in the boiler was? Did it cause foaming? A. Yes.

How can I take grease spots out of fine felt cloth without injuring the cloth? A. Moisten the spotted parts thoroughly with pure benzole, and immediately cover them on both sides of the cloth with dry pipeclay or tripoli powder. Then place under a weight for some time, and the spots will disappear.

(37) H. E. L. asks: Is there anything that will remove Indian ink stains from drawing paper? A. There is nothing that we know of, except a good steel eraser or sanded rubber. Indian ink contains finely divided carbon, which is unaffected by any ordinary solvent.

(38) J. A. H. asks: What size of wire and how much in length shall I use for magnets for the electro-magnetic engine described in SCIENTIFIC AMERICAN SUPPLEMENT No. 19, to give the most power with a single Calland cell? If I use 2 cells, how shall I connect them? What is the rule for estimating the resistance of batteries and of magnets and other wire connections, in order to proportion one to the other? Mr. Sawyer says, in describing the engine above referred to: "No. 31 wire is the best size for magnets;" you say, in answer to a subsequent inquiry on the same subject, "use No. 18 wire." Can you explain this? A. With a given battery the greatest magnetic effect is obtained when the resistances of the battery and magnetizing helix are equal. The average resistance of a medium size Calland cell in good condition is about 1·5 ohms, consequently the resistance of the helix should be the same according to the above statement, and this is equivalent to about 350 feet of No. 18 or 90 feet of No. 23 pure copper wire. With a Grove cell, large wire and fewer convolutions would be best.

(39) H., I., & Co. ask: Does the putting of concentrated lye in boilers, to soften the scale, injure the iron? A. The lye will have little effect on the iron, but may cause the water to foam.

(40) C. R. asks: How can the lambskin aprons used by freemasons be cleaned? I used benzine; it frees them of dirt, but makes them look dingy and yellow. A. Have you tried soap and water? It is not probable that the benzine would leave a stain on the wool if used in excess. Bisulphide of carbon is among the best solvents for oil and grease, and will perhaps give better results than the benzine. Try also wood naphtha. If too little of the solvent is used, it will only carry the stain from the surface further into the material. It should be observed that all of these oil solvents tend to destroy the pliability of the leather and necessitate its re-priming or oiling after drying.

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

D. M. B.—It is a coarse sand formed by the disintegration of granite. If you look at it with a strong magnifying glass, or low power microscope, you will find it composed of films of mica, orthoclase, and quartz crystals. It contains some iron oxide and pyrites.—N. B. B. —They appear to be all carbonate of lime crystals—calcite. The varieties of calcite are very numerous and diverse in their diaphaneity, crystalline structure, and color, the variation being due to the different modes of origin and impurities.—W. R. L.—It is graphite or plumbago, mixed with clay.—E. D. R.—We have not been able to classify the shells, as they were very much broken and imperfect.—M. M. B.—It is a hematitic iron ore, containing crystals of iron pyrites. See p. 7, vol. 36. It is of little value.—A., Bros.—It is graphite, an allotropic form of carbon, sometimes called plumbago and black lead. It is found associated with sphene, tabular spar in granular limestones, with pyroxene, spinel, chondrolite, hornblende, scapolite, syenite, and gneiss, and in some iron ores. It is used for lead pencils, in black-lead crucibles, and as a substitute for oil in lubricating machinery; and it constitutes what is known as stove blacking. It is found in many parts of the United States, and is mined at Ticonderoga and Fishkill, N. Y., at Brandon, Vt., and in North Carolina. Its market price is from 3 to 6½ cents per lb.

COMMUNICATIONS RECEIVED.

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

On Flying Machines. By D. J. C.
On Fire Escapes. By J. M. C.
On Interference Colors. By H. M.
On Compressed Air. By F. G. W.
On a Snake-Eating Frog. By C. F. S.
On a Needed Invention. By J. E. E.
On Microscopy. By P. T.
On the Flight of Birds. By J. H. H.
On Cutting Gears. By M. J. S.

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 hydraulic rams, and where can circulars descriptive of them be obtained? Who makes steel wire, suitable for spiral springs, to be wound cold? Who sells sal soda and soda ash? Who buys bones, and what are they worth? Who sells machines for setting pins in rubber cloth, for making metallic hair brushes?" 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

Letters Patent of the United States were Granted in the Week Ending

April 24, 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.

Air, cooling, etc., M. J. Kelly (r) ... 7,643
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Anvil, cast iron, C. Fisher ... 189,892
Awl, G. P. Harley ... 189,934
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Beer forcing apparatus, J. S. Von Nieda ... 190,103
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Blind slat adjuster, J. G. Broemser ... 189,995
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Boot uppers, crimping, E. Corbett ... 189,945
Boot making, nailed, L. R. Blake ... 189,834
Bottle stopper, C. Sedgwick ... 189,906
Box scraper, J. P. Tierney ... 188,967
Bracket, E. H. Bates ... 189,833
Breech loading fire arm, H. Updegraff ... 189,973
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DESIGNS PATENTED.

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9,902.—CORSET CLASP EYE.—M. Adler, New Haven, Conn.
9,903.—CARPETS.—A. Baye, London, England.
9,904.—CHAIRS.—P. Diehl, New York city.
9,905, 9,906.—BUTTON CARDS.—J. Fenton, Birmingham, England.
9,907 to 9,913.—OIL CLOTH.—C. T. Meyer *et al.*, Bergen, N. J.
9,914.—ORGAN CASES.—J. R. Lomas, New Haven, Conn.
9,915.—GLASSWARE.—J. B. Lyon, Pittsburgh, Pa.
9,916.—BOTTLE.—E. Raynaud, Paris, France.
9,917.—BAS RELIEF.—G. Beck, Highland, N. Y.
9,918.—BADGE.—J. McCoy, Ypsilanti, Mich.
9,919.—DRESS FRINGE.—M. Blau, New York city.
9,920, 9,921.—CARPETS.—E. Daniel, Paris, France.
9,922 to 9,931.—CARPETING.—J. L. Folsom, Brooklyn, N.Y.
9,932 to 9,935.—CARPETING.—O. Heinigke, New Utrecht, N. Y.
9,936 to 9,940.—CARPETING.—H. Horan, East Orange, N.J.
9,941.—LOCKET.—F. Keller *et al.*, New York city.
9,942, 9,943.—CARPETING.—G. W. Piggott, New York city.
9,944 to 9,946.—CARPETING.—J. E. Rollings, N. Y. city.
9,947.—TOWEL BORDERS, ETC.—R. T. Webb, Randallstown, Ireland.
9,948.—POCKETBOOK FASTENERS.—L. Prahar, N.Y. city.

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