Notes & Queries.

[We present herewith a series of inquiries embracing a variety of topics of greater or less general interest. The questions are simple, it is true, but we prefer to elicit practical answers from our readers.]

1.—SUPERHEATING STEAM.—Can any of your readers inform me whether steam can be superheated to a red or higher heat, and how?—R. H. E.

2.—REMOVING NITRIC ACID STAINS.—Can some of your readers inform me if the yellow stains in cloth, caused by nitric acid, can be removed, and if so by what means?—S. H. F.

3.—DEPOSITING TIN BY ELECTRICITY.—Can thin sheet brass be galvanized on one side with tin? Can it be done without getting tin on both sides? Is there any preparation of tin that can be applied with a brush?—K. E. F.

4.—ACIDULATION OF ALE.—What is the cause, or what will prevent, ale in the process of brewing from running into the aceticacid state? In cleansing, should it be allowed to work until it is perfectly still, and then be bunged down?—W. H. C.

5.—ELECTRODEPOSITION OF IRON.—Can iron be deposited on brass or copper by the aid of a galvanic battery? Can any one give me a receipt to make a solution?—T. N. S.

6.—MEASURING THE FLOW OF STEAM.—How can I best ascertain the quantity of steam, in terms of horse power, passing through a given sized pipe, in a given time, the pressure in boiler averaging say 70 pounds per square inch? Do you know of a meter or other appliance which might be connected with the steam pipe which would indicate the amount of steam used in a given time?—J. W. G.

7.—WIRE ROPE FOR BALING PRESS.—I wish to know whether a wire rope would be suitable to use as a balance rope on a baling press, and what sized wire rope would be necessary where it has to hang on a foot roller and sustain 2,000 pounds attached to each end, each 2,600 pounds alternately passing up and down, and drawing the wire rope over the rollers? Would it weaken the rope to bend it over said roller?—A. J. B.

8.—PROPORTIONS OF ENGINE.—An engine, the cylinder of which is of eleven inches bore and three feet stroke, runs at forty revolutions per minute with fifty pounds pressure of steam, as shown by gage. Can I do the same work with an engine of seven inches bore and fourteen inches stroke, running at one hundred and fifty revolutions per minute, carrying eighty pounds of steam, or what part of the work per minute can I do?

9.—FANNING AND FLY BRUSHING MACHINE.—In our warm climate we need fanning and fly brushing machines, and the main trouble has always been the difficulty in securing some safe, light and steady power to run said machines. I think this difficulty can be overcome by constructing a wind mill which, night and day (whenever the wind is favorable) will force water up into an elevated tank. Said tank can be placed upon the roof of the house. This tank will supply water, by means of a pipe, to a turbine wheel placed over the well from which the water is first drawn, and will furnish, I think, ample and steady power for the purposes named, and will besides run the family sewing machine and supply the house throughout with all the water needed. Will some one get up the required machinery or else give us an idea of the sizes of the windmill, tank, turbine wheel, fans, etc?—S.

10.—CUTTING STEEL.—I wish to know the proper diameter and number of revolutions of a smooth-faced soft steel cutter, such as is used in cutting the screw point on augers.—A. V.

11.—WOODEN TANK FOR WATER.—Will some one inform me what is the most durable wood to use for a reservoir, to be placed on top of a house to hold water for domestic purposes? Of white poplar or pine, which would be preferable?—R. S. S. H.

Answers to Correspondents.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at 1·00 a line, under the head of "Business and Personal.

ALL reference to back numbers must be by volume and page.

SPECIMENS.—We are indebted to Mr. J. L. Rhodeback, of Norway, O., for specimens of petrified honey combs, a rare and beautiful petrifaction upon which we shall remark hereafter. Also for specimens of agate spear heads of aboriginal construction.

POUNDING OF PISTON.—To S. R., of Pa.—This question has been fully discussed in the current volume of the SCIENTIFIC AMERICAN. See pages 138, 155, 170, 217.

PROPORTIONS OF SAFETY VALVE.—To C. H. C., of N. Y.—We have frequently answered your question. You will find full particulars on page 106 of Vol. XXV. of the SCIENTIFIC AMERICAN.

E. K., of N. Y.—The mineral you send is anthracite coal. Thin seams of this coal occur in many places throughout the State of New York, but there are no workable beds.

N. B. D., of Ill.—The mineral you send is iron pyrites or "fools' gold," of no great value. It is used in the manufacture of copperas and for the sulphur it contains.

C. R., of Va.—In the mineral you send there is a small percentage of iron, not enough to make it an ore of any value.

B. F. R., of Ala.—The mineral you send is not graphite, but a highly carbonaceous slate, which would make but a poor substitute for "black lead."

J. W. B., writing from Fayette, Miss., says: I send you herewith a large bug found on the bank of a creek in this vicinity. As no one here knows what it is, I take the liberty of sending it to you to find out the name of the "critter." Answer: We are much obliged for the specimen. It is one of the largest beetles occurring in the United States, the *Dynastes tityrus* of Linnæus. It is kindred to the sacred *Scarabæus* of the Egyptians.

J. H. D., of Ohio, sends a mineral specimen which he states was taken from a wooden water conductor ten rods long, which drains a well on a descending grade. The water is used for watering stock. The red sediment collects in large quantities in the pipe and also in the trough. The water has the property of turning all vegetable matter, falling into it, black in a very short time. Answer: The mineral you send is hydrous oxide of iron, mixed with earthy matter, and contains no poison. The tannin in the vegetable matter unites with the iron, forming a black precipitate, resembling ink.

EYE STONE.—E. P. B. says: A difference of opinion having arisen between myself and a friend in regard to the nature of an eye stone, whether it is animate or not, we beg of you to enlighten us on the subject. Answer: The best form of eye stone is said to come from Venezuela, where it is found on the seashore. It is flat on one side, oval on the other. When introduced under the eyelid, the motion of the eye causes it to move about, and any particles of foreign matter in the eye adhere to the stone. The eye stone is as inert as any other pebble.

NEUTRAL NITRATE BATH IN PHOTOGRAPHY.—In photography, the most difficult thing is to preserve the nitrate bath completely neutral, as, at every dip of a plate, free nitric acid is liberated. If we allow a small piece of carbonate of lime or common marble to remain in the bath, will it not neutralize the acid without incurring the risk of making the bath alkaline? Iceland spar is said to be the purest form of carbonate of lime; where can it be procured? Answer: Photographers do not want the bath completely neutral; a slight acidity is the best preventive against fogging. A neutral bath requires a shorter exposure. We prefer to add a little carbonate of soda when our bath becomes too acid; but it is better to filter, boil down, and make a new bath. The use of lime, as you propose, would be an injury to the bath.

SIPHON.—To J. M. J.—It is not possible to raise water from a well by means of a siphon, unless the siphon discharges at a point lower in level than the water of the well. To draw water from a depth by means of a siphon would be making the water run up hill, which is proverbially impossible. The size of the pipe does not affect the efficiency of the siphon.

GREASING COGS OF REAPERS, ETC.—I would say, in answer to query 14, May 4, that I consider it best to oil cogs when there is no sand or grit to get into them. The grease lessens the wear; but if the sand gets to it, it will stick to the cogs and make the wear more rapid.—H. C. B., of O.

EXPANSION OF MERCURY BY HEAT.—Query 10, page 249.—If a given volume of mercury at 32° be taken as 1, when heated to 212° it will equal 1·02; that is, raising its temperature 180° increases its bulk ·02 of itself. But the increase in the bulk is not uniform, for the ratio of expansion for liquids and solids increases with the temperature. Of the metals, zinc expands most. If the length of a bar of zinc be taken as 1 when the temperature is 32°, when heated to 212° it will equal 1·002942—an expansion of ·002942 of its length for 180°. Lead is next, and shows 0028426.—X. P. M., of O.

GREASING COGS.—Query 4, page 297.—Having had some experience in this with a reaper, I would advise C. A. A. to put his grease where it will do some good and no harm. For, if he puts it on the gearing of a reaper or mower, he will soon find that it catches and holds every grain of sand that drops on the wheels (and a good many will fall there in a day), and thus help to wear away the cogs faster than is necessary. I found this when I tried it, so I quit greasing and cleaned off the cogs, and the wheels were soon bright and smooth, and ran as light as ever and with much less wear.—X. P. M., of O.

BLACKBOARD.—Query 17, page 297.—I have known silicate slating (a liquid) to be used with much success.—G. L. F., of N. Y.

WILD BEES.—Query 5, page 297.—C. J. M. should go to where the bees abound, put a little honey on a log, and when a bee alights and is well loaded, take him by the middle of the back and attach a light piece of cotton to his legs. Then letting him go, he will take a straight line for home. Marking the direction with a compass, it can easily be traced by means of the cotton.—G. L. F., of N. Y.

WILD TEA.—In your paper of February 24, you advise a correspondent that Jersey tea (*ceanothus Americanus*) is commonly known as wild tea, and was used during the Revolution of 1776 as a substitute for tea. I write to inform you that another plant called Labrador tea (*ledum latifolium*) was also used in New England and Nova Scotia as a substitute for tea by our forefathers. See Bigelow's "Plants of Boston and its Vicinity," page 183.—W. B. S., of Mass.

PAINTING THE INSIDE OF AN IRON WATER TANK.—Query 5, page 313.—I would recommend the coating of the inside of an iron tank with beeswax hardened by adding about one fourth part of rosin. Clean the tank and coat it well with the wax preparation, as hot as possible without burning your brush. A long experience convinces me that the above is the best possible coating for an iron water tank.—H. W. M., of Mass.

WILD BEES.—Query 5, May 4.—Take the bottom of an old sugar hogshead and keep it saturated with water; or place on it waste honeycomb. "Stink bait," however, will draw them much further from home. I have known bees to go two miles to this last; some people say they will go three or four.—H. W. S.

MAGNETIZATION.—Query 9, page 297.—A circular piece of steel can be magnetized as well as any other form. In this case the poles must be on opposite sides of the circle, and at right angles to those points, there will be points that will manifest little or no magnetism. The steel must be tempered, else the force is lost as soon as the magnet is removed. The best way is to apply the steel to a powerful electromagnet; this might prove the only effective way for a piece as large as the one mentioned. But if this cannot be done, take two pieces of loadstone with their opposite poles towards each other. Place them upon the center of the piece of steel, and slowly draw them to the edge. Remove them, replace them at the center, and again draw them to the edge. Continue the process until the steel becomes magnetized. This method will not give as good results as the electromagnet.—L. R. F. G., of Mass.

BRITTLE SPIRAL SPRING.—Query 12, page 297.—The spiral spring of a pegging machine breaks after it has been run for some time because the continual jarring causes the particles to assume the crystaline form. Not only does iron crystalize in casting, but a continued jar will cause cold iron and steel to crystalize. I cannot say that the steel becomes harder by use, but it is more brittle. If W. A. S. will take a magnifying glass and look at his broken spring, he will plainly see the crystals. The remedy is to reheat and retemper the spring occasionally.—L. R. F. G., of Mass.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

SOAP HOLDER.—Jacob A. Camp, of Sandusky, Ohio.—The invention consists in a perforated and handled soap cup by which all necessity for taking soap in the hands is removed, while a better lather, cleaner soap, and economy in use are all attained. All those who have used, and those who have omitted heretofore to use, soap will find it to their interest and convenience to have one of these soap holders.

CHURN AND BUTTER WORKER.—Wm. McKeever, of Staunton, Va.—The invention consists in a stop chamber, with stationary breaker thereunder, which is combined with a movable breaker, so that the milk or cream only moves backward and forward in a small arc. This compels the production of butter in three or four minutes. Its shaft is also provided with paddles which beat and work the butter, so that there is no need whatever to touch it with the hand. This invention doubtless possesses more real utility and novelty, and is a greater improvement in churns than has been made in the present century.

WHEAT SCOURING MACHINE.—George S. Newman, of Liberty Mills, Va.—The invention consists in a grain scourer which discharges the grain from the hopper around the shaft and upon a top cup, whence the centrifugal power forces the grain outward, over its concave sides, and rubs the pellicle with great friction. This detaches all or a large portion of the dirt. The grain is then conveyed down to the shaft and into one cup after another until the operation is completed.

MOLE TRAP.—Clark Polley, of McMinville, Tenn.—The invention consists mainly in applying a spiral spring to a mole trap, so as not only to impel the slide, but to hold together all the parts, and thus render them easily detachable. This greatly simplifies, cheapens, and makes more useful the whole trap.

OINTMENT.—Wm. C. Jones, of Henry County, Ala.—This ointment is a compound formed of beeswax, butter, honey, rosin, mutton suet, sugar, and verdigris, mixed in certain proportions and by certain successive manipulations. It is intended for cutaneous diseases, such as ulcer, tetter, scaldhead and sores of all kinds.

CULTIVATOR PLOW.—Cealy Billups, of Norfolk, Va.—The invention consists in providing a cultivator plow with wings, ratcheted on their shanks, and made fast, or adjusted by corresponding ratchets, on sides of shoe, and by having their front ends entered into the sockets of the shoe.

WASHING MACHINE.—John W. Hunt, of Liberty, Mo.—The box of the machine, the bottom of which is made inclined, contains a rack, the sidebars of which are set in inclined grooves in the sides of the box toward its forward or deeper end. The rounds or rods of the rack are arranged at a little distance apart, so that the water forced forward by the plunger or beater and the water squeezed out of the clothes may pass through freely into a space between the rack and the forward end of the box. This space is covered by a platform or apron, which is slightly inclined to the rearward, and is attached to the sides and end of the box a little below their upper edges. The apron keeps the water from dashing out of the end of the tub. The plunger is inclined to correspond with the inclination of the rack, so that the clothes may be pressed squarely between the plunger and the rack. To the rear side of the plunger is rigidly attached the end of an arm, to the rear end of which is pivoted the lower end of a lever which is attached to the center of a cross bar, the ends of which are pivoted to the sides of the box. The lever is curved so that the power may be conveniently applied to it.

MACHINE FOR MAKING COP TUBES.—Robert Douglas, of Lowell, Mass., assignor to himself and James Douglass, of same place.—The liability of the paper tube formed in the usual way to collapse as it is passed from the mandrel, in consequence of a partial vacuum formed therein for want of air to resist the external atmospheric pressure, is remedied in this invention by providing a hollow mandrel, having an opening therein for the admission of air to the tube as it passes from the mandrel. From this mandrel the tube is received between a gripping pawl and a fixed griping jaw on a bar, carried by an endless belt, to be drawn from the mandrel, cut into suitable lengths for drying, and carried to the apparatus for conveying to the dryer. There are preferably three of these gripers on the belt; also as many cutting shears just in advance of each griper, between the jaws or blades of which the tubes are drawn by the gripers in advance of them, and these shears are automatically closed upon the tube and cut it off immediately after the gripers behind have taken hold of the said tube. At the same time that the tube is cut, the gripers in advance of the shears are opened and the piece of tube cut off falls upon a chute, by which it is conducted to endless carriers to be conducted into the heating chamber.

CIDER MILL.—William Aiken and William W. Drummond, of Louisville, Ky.—The bottom of the hopper is formed of two inclines, the lower one of which inclines more steeply, and between the inner edges of which is formed the space through which the apples pass down to the grinding cylinder, the journals of which revolve in bearings attached to the frame, and to which are attached teeth to break up the apples against the crusher plate. The crusher plate is pivoted at its upper edge to the sides of the hopper, in front of the opening between the inclined parts of the bottom of said hopper, so that it may be swung forward to crush the apples against the toothed cylinder to enable them to pass down between the said toothed cylinder and the toothed concave attached to the frame, where the crushing, grinding, or mashing process is completed. To the main shaft is attached an eccentric wheel which bears against a projection formed upon the rear side of the lower part of the crusher plate, so that at each revolution of the eccentric wheel the lower part of the said plate may be forced forward to crush the apples against the toothed cylinder.

WAGON TIRE TIGHTENER.—John Kafader, of Jacksonville, Oregon.—This invention has for its object to furnish a device for tightening and securing tires upon the fellies of wheels, both when first applied and when they may have become loose from use. The adjacent ends of the fellies upon the opposite sides of the wheel are cut away, or made a little short, so as to leave narrow spaces between said ends. Within the space and resting against the ends of the fellies are placed two plates. The sides of the plates that rest against the ends of the fellies are made flat to bear squarely against said ends. The other or inner sides of the plates incline in both directions from the center. In holes in the plates, at their angles, are placed small rollers, said holes being so formed that the sides of the rollers may project sufficiently to receive the wear. Between the plates is placed a wedge shaped block, with its smaller end toward the hub of the wheel. Through the center of the wedge block is formed a screw hole to receive a screw which passes in from the inner side of the rim through the casing, against which a collar formed upon the said screw rests, so that by turning the screw forward the wedge block will be drawn between the plates, expanding the rim of the wheel, and thus tightening and securing the tire. The tubular casing is made of the same form and size as the fellies, and is let into the ends of said fellies, so that the outer surface of the case may be flush with the outer surface of the fellies. With this construction, should the tire become loose from use or other cause, a turn or two of the screws will expand the rim of the wheel and tighten the tire securely.

WAGON BRAKE.—Henry J. Hadden, Jr., of Catskill, N. Y.—This invention relates to that class of wagon brakes which are applied whenever the horses are held back. To the rear part of the under side of the wagon tongue is rigidly attached a downwardly projecting arm about twelve inches in length. To the lower end of the arm are pivoted the forward ends of two rods, which incline from each other and pass back beneath the forward axle with their rear ends attached to the brake bar. The brake bar is supported by and moves forward and back in keepers attached to the sway bar and hounds, and which is kept from longitudinal movement by guide pins attached to it, which strike against keepers. To the ends of the brake bar are pivoted or otherwise attached brake shoes, which bear against the rims of the forward wheels and thus check the advance of the wagon.

CATTLE POKE.—Orville Sweet and Clarence H. Sweet, of South Glen's Falls, N. Y.—This consists of a block of wood, which may vary in size and weight with the size and strength of the animal that is to wear it. To the forward side of the block, toward its ends, are attached two pins or prongs which project forward and incline slightly upward, and which are designed to keep the animal wearing the poke from using its horns. To the middle and upper part of the block is attached a longer pin, which projects upward and forward, and which is designed to prevent the animal wearing the poke from getting its head through or under the fence and throwing it down. Sharp pointed spikes or pins are attached to the middle part of the block, with their points projecting at the rear side of said blocks in such positions as to come in contact with the head of the animal wearing the poke, should the poke be jolted or should any pressure be applied to it. To the rear side of the block is attached a spring which rests against the animal's head, and which should have sufficient strength to hold the spikes away from the animal's head when grazing or walking, but which will yield and allow them to prick the animal should it attempt to run, jump, or push. The ends of a wire are passed through the block and coiled to form rings to receive the animal's horns; and they are then hooked to each other. The fastening thus constructed cannot injure the animal, and cannot shrink when it becomes wet, while at the same time it holds the poke securely in place.

TREE AND PLANT PROTECTOR.—William F. Eaton, of Cape Elizabeth, Me.—This consists of a standard or stake, the lower end of which is sharpened so that it may be readily thrust into the soil. The length and size of the standard is proportioned in size and length to the size of the plant to be supported. The upper end has two longitudinal slots formed in it, dividing it into three prongs. The ends of the side prongs are cut off, leaving the central prong the longest. There is a metallic strap, the middle part of which is bent into circular form. The arms of the strap are parallel with each other to pass through the slots of the standard, and their ends are bent outward at right angles to rest against the rear side of the standard. In using the support, the strap is passed around the plant, shrub, or tree. The parallel arms of the strap are then slipped down into the slots of the standard, the upwardly projecting central prong guiding them readily into place. The edges of the middle or ring part of the strap are turned or flared outward, so that they cannot chafe or rub the plant or tree.