

21.—PREPARING FABRICS FOR PAINT.—Will some one please inform me how to prepare white cotton cloth so that the oil from paint will not spread and leave a yellow streak around the paint? Some preparation that will not color the cloth, or render it hard and stiff, is desirable.—F. O. L.

22.—BLOWING OUT BOILER.—Having some doubts as to the propriety of our plan of blowing out, I was much interested in D. & N.'s query (21, March 9) hoping it would draw forth satisfactory information. The advice by S. F., of Pa., (April 6) is in my opinion very good; but it is so different from the general course that I am afraid there is prevalent a great error—and one that does not confine itself to this country—or else S. F. is over cautious. We work two boilers at 70 pounds to the square inch; they might be termed twin boilers, being equal in dimensions and style of build, return flues, etc. They are swung in the ordinary way, divided by midfeather or wall of brick. When the machinery is partially stopped for cleaning, etc., we can run very well with one boiler, the steam being at 55 or 60. We draw the fire from underneath one boiler, and leave open the furnace door, closing the damper and opening the lid in front of the flues. We shut off the connections with the other boiler and open the discharge. In 30 minutes the water is gone. We then open safety valve, close the discharge, open the supply, and commence pumping. In 30 or 40 minutes more our boiler is charged with fresh water, our steam all the time up at from 50 to 60. If this is wrong, will our friends set us right by showing how we ought to act, as I know from observation that many others act in a manner very similar to our own?—J. W. K.

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 100 a line, under the head of "Business and Personal."

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

S. W. S., of Mass., will find the desired information on page 9, Vol. XXIV. of the SCIENTIFIC AMERICAN.

R. T., of N. Y.—Butter is contained in little oil cells which float in the milk. In churning, the envelopes of these cells are burst, and the particles of oil coming together cohere in gradually increasing masses; this is called "gathering."

J. R. E., of N. Y., writes us that no wells are dug in his neighborhood without using a forked limb of plum wood as a divining rod to tell where water may be found. We believe that forked limbs of every kind of timber have been used by the ignorant and superstitious, in search of water or hidden treasure. The ones who pretend to have the power to use these rods for such purposes are forked limbs—that is, they are humbugs, either self deceived or wilfully deceiving. A man taking a pinch of snuff and digging on the spot where he first begins to sneeze will find water as many times as he will by the fancied indications of forked rods of plum, elder, birch, witch hazel, or any other wood where these varieties do not grow.

MEASURING GASES.—The temperature and pressure are always to be referred to a standard in measuring gases. In metering illuminating gas, temperature is not made standard, as it will average about the same under ordinary circumstances from year to year. The standards of pressure are generally fixed in the charters of gaslight companies, and if they deliver gas at lower pressures they violate their legal obligations to consumers.

F. A. K.—Shall be happy to receive your communication, and will consider it upon its merits.

M. B. C., of Canada.—You need and should get the advice of a practical engineer.

LUBRICATOR FOR STEAM ENGINE.—The best lubricator for a steam engine I ever found was beef tallow and beeswax.—T. W. K., of Texas.

COLORING CASTOR OIL.—To S. W. O., query 1, page 249.—Make a strong tincture of turmeric root with strong alcohol, and add a few drops to the oil until you have the desired color. Rather than being a disadvantage, it will prove a benefit, tending to prevent gripping.—E. H. H., of Mass.

NICKEL PLATING LEAD PIPE.—To B., query 9, page 249.—Lead pipe so coated will undoubtedly be good, and the water will be preserved from contamination with the lead, as occurs with all soft water. But, as a matter of economy, no advantage would be gained over the tin lined lead pipe.—E. H. H., of Mass.

DYEING.—S. W. O., query 5, page 249, does not state the particular fiber of which his goods, requiring to be dyed, are made. Wool, cotton, and silk, each requires a change in treatment.—E. H. H., of Mass.

DURABLE WHITEWASH.—Query 3, page 265.—Salt or glue size renders whitewash durable.—B.

LAMP CEMENT.—Query 7, page 265.—A high heat will calcine and thus soften the gypsum used to fasten lamp collars.—B.

DOMESTIC EMPLOYMENT.—Query 10, page 265.—Home employment for every working member of a family can be afforded by caning chair seats, making brushes, brooms, baskets, rag carpets, ink, dyes, flavoring extracts, yeast cakes, salves, or a hundred other articles. Don't forget the children's education.—B.

QUESTION IN OPTICS.—Query 12, March 23, 1872.—The magnifying power of a refracting telescope depends upon the relative focal distances of the object glass and eye glass, the exact magnifying power in diameter being found by dividing the focal length of the object glass by that of the eye glass. The illuminating power, or the power which makes objects appear brighter and enables us to see stars which are invisible to the unaided eye, depends upon the diameter and purity of the object glass employed, or, in other words, upon the increased amount of light which is conveyed to the eye by the object glass of the instrument. In the microscope the amplification is found by multiplying the magnifying power of the object glass by that of the eye glass.—J. B.

DOEBEREINER'S LAMP.—To L. G. G.—Take an ordinary fruit jar, with a cork stopper or leaden cover; procure any old bottle that will go into the jar, at least two thirds as tall as the jar. Cut off the bottom of the bottle either with a file, or by wrapping a piece of candle wick soaked in alcohol around it, burning the wick, and dipping in water while hot. A hole is cut in the cork or lead cover to admit the neck of the bottle and prevent it resting on the bottom of the jar. The bottle is closed with a cork fitted with a short glass tube bent at right angles and drawn to a fine opening. Some pieces of zinc are suspended in the bottom by a wire or little basket of lead. The jar is then filled to about one half with dilute sulphuric acid. The acid, coming in contact with the zinc, generates hydrogen gas which escapes from the glass tube. The mixture of air and gas being highly explosive, the lamp should not be ignited at first. After all the air has escaped, a piece of spongy platinum may be placed a little distance from the point of the tube. The gas, impinging on the platinum, heats it sufficiently to ignite itself. The escape of gas may be cut off by slipping a rubber tube closed at one end over the glass tube, or a tube with a stop cock may be used. As soon as the escape of gas is cut off, its pressure drives the acid out of the bottle into the jar, and no more gas is generated. Pieces of spongy platinum mounted on wires suitable for this use may be obtained of dealers in apparatus for thirty-five cents each, and can be sent in a letter.—J. S., of N. Y.

BLOWING OUT STEAM BOILERS.—D. and N., query 21, page 169, are informed that steam boilers should never be blown out under steam pressure. The safety valve should first be raised until the pressure is all removed by letting the steam escape as rapidly as possible; then the hand hole plate or other device should be opened, and the dirt and sediment will run out with the water. But if the boiler is allowed to cool off, the dirt will settle to the bottom and be fastened on by the heat. The dirt is always on the top of the water when there is any pressure of steam on it. I have practiced the above method for ten years, and have had no trouble whatever with scale, although the water was very hard.—J. C., of O.

CLEANSING BOILERS.—Hot water will do no harm to D. and N.'s boiler.—J. C., of O.

COPAL VARNISH.—Good varnish is difficult to get; one trick of the trade is to use but little gum, and putting into the linseed oil, white vitriol and sugar of lead, rendering the oil nearly thick enough for varnish before any gum is added. Another cheat is to make cheap, sticky, worthless stuff by using raw oil without dryers; because, forsooth, if a black, stiff, worthless article dries quickly (and cracks and scales quickly also), a light colored, limpid, slow drying article must be good. Twenty years ago we mechanics up here in Vermont made our own varnish and japan; it was the only way by which we could get anything reliable. In the meantime, Mr. Abbott, of New Hampshire, got Moses Bigelow to go up to Concord and make varnish for the carriage shops, and then we commenced buying of Mr. Abbott. Since that time, we have had dealings with all the manufacturers in Boston, New York, and Newark, and, until the recent war, generally got good varnish; but during the war, adulteration found its way into every manufactory, and even to-day a good article of varnish is, perhaps, stored in one cask out of a hundred, and there are two ways to get it. One is to make it, and the other is to eschew dealers and speculators; buy of the maker, pay just what he asks, and, if your custom is worth anything, you will get a good article. Otherwise—doubtful. The best copal varnish is made as follows: Take three pounds of the best Zanzibar copal gum to every gallon required, pulverize the gum in an iron mortar, and then put it into a copper pot which will hold double the quantity required; fit a cover to the pot with a small hole in the cover, through which to insert an iron rod to stir the gum when melting; heat over a slow fire until thoroughly melted, stirring it constantly during the process. In the meantime, put into another pot and over another fire 1½ pints of raw linseed oil to every pound of gum in the first pot, and add to the oil sufficient dryers to make a medium drying oil, boiling as usual for ordinary purposes, keeping it hot until the gum is thoroughly melted. Then remove from the fire to a distance of twenty or thirty feet, pour the oil in gradually, stirring at the same time; and, while still hot, add sufficient turpentine to reduce the gum to a proper consistency, which can be tested by dropping a little from the end of the rod on to a piece of glass to cool in the air. The gas arising from a hot pot of varnish is very inflammable; and if the steam, by floating around, reaches the fire, it will flash as quick as gunpowder, and the face and hands of the workman will be burned and the varnish set on fire; therefore remove to a distance before adding the turpentine; also have a wet cloth ready to throw over the fire in case of accident. When all is well mixed, strain, while quite hot, through a funnel partly filled with clean flax, through which not a speck of unmelted gum, dirt, or settlings will pass. If flowing varnish is required, add a trifle more oil, with no dryers except a little red lead. If hard or scraping varnish is required, use but half a pint of oil to each pound of gum, and boil hard with plenty of dryers.—C. T., of Vt.

Declined.

Communications upon the following subjects have been received and examined by the Editor, but their publication is respectfully declined:

BOILER EXPLOSION.—C. E. G.—G. J. E.

BROADWAY TRAFFIC.—G. E. N.

CANAL BOATS.—J. M. E.

CHLORO-ACETIC ACID.—

DOOR FASTENER.—J. M. P.

ENDORSEMENT ENVELOPE.—X. P. M.

PROPULSION OF CANAL BOATS.—J. N. P.

ROTARY ENGINES.—J. A. H.

TUBAL CAIN.—W. B.

VENTILATION.—C. G. V. P.

ANSWERS TO CORRESPONDENTS.—S.—X.—C., S., & Co.—J. B.—H. S. M.—T. W. K.

QUERIES.—S. A. E.—J. G. X.—L. S. F.—O. F. H.—H. N. M.—R. A. R.—W. N. B.—F. K.—J. H. W.—C. C. B.—V. P.—E. H. F.—C. O. D.—L. S. B.—H. B. H.—G. L. H.—T. K. McI.—J. B.—W. B. W.—J. H., Jr.—S. D. W.

NEW BOOKS AND PUBLICATIONS.

THE LAND OF DESOLATION: Being a Personal Narrative of Observation and Adventure in Greenland. By Isaac L. Hayes, M.D. New York: Harper & Brothers.

Dr. Hayes is well known as an arctic explorer. In 1869, he formed one of a party who accompanied the artist, William Bradford, to the icy regions of the North, and in this volume the author gives us many particulars about Greenland. Five hundred years ago this arctic continent, now so desolate, was the home of a large and enterprising population. They had churches, cathedrals, and the principal institutions of advanced civilization. From Greenland came the Northmen, who discovered this country and began settlements on the coast of Massachusetts, A. D. 1000—almost five hundred years before the discoveries of Columbus. But through the combined agencies of pestilence, the invasions of savage tribes from America, and finally, about A. D. 1500, by the attacks of the English, the settlements were destroyed. The present inhabitants, Christianized natives, few in number, are under Danish rule, and are employed in fishing and seal hunting. It is believed that the climate is now more rigorous than formerly. The interior of the country, as far as it has been penetrated, is covered with solid ice, thousands of feet in thickness, which finds its way to the sea through the valleys in the form of glaciers. One of these, the Humboldt glacier, is 60 miles wide and 2000 feet thick. The glaciers break into pieces on reaching the sea, forming icebergs, which float southward as far as Newfoundland. Dr. Hayes's book is full of useful and interesting information.

FARM GARDENING AND SEED SOWING. By Francis Brill.

This is another of the useful agricultural books from the publishing house of Orange Judd & Co., New York. This little book is devoted to farm gardening, by a practical market gardener, and contains full directions for raising vegetables of every variety, indicating the soil best adapted for each—best mode of propagating, storing, packing for market, and other matters of a practical sort pertaining to the management of a garden.

HINTS TO PERSONS ABOUT BUILDING IN THE COUNTRY. By A. J. Downing, Author of "Landscape Gardening, etc." And "Hints to Young Architects, Calculated to Facilitate their Practical Operations." By Geo. Wightwick, Architect, Author of the "Palace of Architecture," etc., with additional Notes by A. J. Downing. Third American Edition. New York: John Wiley & Son, 15 Astor Place.

These are two works in one volume, the price of which is \$2. The book is neatly printed and bound in cloth. The authors are well known to the public through their hitherto published works, and it is scarcely necessary to say that the present volume is likely to prove in the present, as in former editions, a valuable addition to the literature of architecture.

Recent American and Foreign Patents.

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

WINDOW SHADE.—Elliott Metcalf, of Taberg, N. Y. and Charles Allen of Woodstock, Canada.—This invention relates to venetian shades for windows. The shade consists of slats, which may be made of wood, metal, or other suitable material, connected together so as to lap onto each other, by means of a cord or cords, or by tapes or webs. This shade is opened, either in whole or in parts, by two cords, one of which is attached to the edge of the lower slat of the shade, and the other to the middle shade, or about the middle as may be desired. By pulling one of these cords the lower half of the shade will be opened while the upper half will remain closed. By pulling the other cord, the upper half will be opened while the lower half may be kept closed. These cords pass through holes in the lower edges of the slats, and are knotted, so as to raise the slats when their other ends are pulled down, as before stated. The cords pass over a pulley or through a screw eye at the upper corners from which point they are carried horizontally to the center confined by screw eyes, whence they drop down and are attached to the slats. On the other side of the window two cords are arranged, by means of which the shade is raised when both cords are pulled down. When one cord only is pulled down the shade is raised on one side only and thrown into the form of a fan or quarter circle. The shade may be attached to a rod, which is fastened to the casing of the window, or attached directly to the casing.

THRILL COUPLING.—Edward S. Roberts, of East Canaan, Conn.—This invention is an improved thrill coupling, claimed to be simple, strong, durable and reliable, and which will allow the thrills to be readily attached and detached when desired. It consists in the thrill coupling constructed so that by raising the thrills into a vertical position, to turn certain flanges out of their respective rabbets, the thrills may be moved laterally, uncoupling the coupling and detaching the thrills. A rubber block prevents rattling and the thrills cannot become detached while in the working position.

SASH HOLDER.—George H. Johnson and Frederick Botner, of Bridgeport, Conn.—This invention consists in a novel arrangement of a pivoted flexible pawl for supporting carriage and other window sashes, as hereinafter described. This fastener is particularly adapted to the doors and sashes of landaus, the sash being required to extend far up above the door, and be held so as to close the space between the two parts of the carriage top when the latter is closed; but it is useful also for holding the sashes of houses, etc. A flexible pawl and cord are combined with the sash; and a combination with a spring and an attaching plate, with some other arrangement, are used, which together make this an undoubtedly useful, as it is a somewhat unique, invention.

VELOCIPEDE.—Solon A. Gregg, of Oneida, N. Y.—This invention has for its object to furnish an improved velocipede wagon, so constructed as to adapt it for use upon common roads. The machine may be made with one or two forward wheels, and is designed to be made of such a size and strength that a pair of shafts may be attached to it when desired to use it with horse power. A combination of a hand bar, rod, lever, pitman, foot rests and crank with each other and with the frame and axle of the velocipede, gear wheels, and shaft; also a combination of a rod with the swiveled axle, hand bar, rod, lever, pitman, foot rests, crank, and axle; also a combination of a spring with the pitman, foot rests, crank, axle, lever, rod and hand bar constitute the claims on which a patent has been issued.

SEATS FOR VEHICLES.—John E. Linton, of New Bedford, Mass.—This invention has for its object to furnish an improved riser or base for the seats of vehicles, which shall be so constructed as to obtain the requisite strength and lightness combined with such a size as not to be out of proportion with the other parts of the vehicle. And it consists in a riser or base formed by the combination of a metallic brace or plate with a wooden frame of the riser or base, the bottom bar of which rests upon the rail or edge of the wagon box, and to the top bar of which the seat is attached. A brace, or plate made of wrought or cast metal, is attached to the wooden frame by screws, bolts or rivets. The brace or plate may be placed within the frame or upon its outer side, as may be desired, and may be made of any desired pattern or style and ornamented to any desired extent.

MEDICAL COMPOUND FOR HOGS.—John Shannon, of Palmyra, Me.—This invention consists in a compound formed of sulphur, copperas, alum, salt-peter, resin, fenugreek, antimony, assafœtida, soot, and salt. The peculiar diseases or ailments of the animal for which it is intended are not stated in the specification.

DENTAL PLUGGER.—White F. Griswold, of Leavenworth, Kan.—This invention consists of a plugging instrument in which the sliding mallet, with a spring for impelling it against the tool stock, is inclosed in a tubular stock and is provided with several studs projecting through slots in the stock at equal points of distance around it, to be used for forcing the mallet back against the springs, and so that the instrument may be rotated, as is often required while at work, and yet always have a stud at command for retracting the mallet. The invention also consists of notches in the end of the tube, out of which the tool stock projects, and pins in the latter, falling into said notches when the tool stock is retracted by its spring, and serving to hold the tool against turning on its axis while at work; also, to hold it for attaching and detaching the tools from the stock to change them, said tools screwing in and out of the stock, and thus saving the necessity of holding such stocks from turning in the tube holder by one hand while screwing the tools in and out by the other. In taking out and putting in tools by one hand, which is sometimes highly necessary, the stock is held against the palm of the hand by the third and fourth fingers and the tool actuated by the thumb and first finger. The stem of the mallet may be extended through the case or not, at will, and the tool may have a hole through it to introduce a lever for screwing it in or out.

SAW SET.—Hiram R. Lavey, of Bristol, Wis.—This invention relates to a new arrangement of rest, gage, guide, and punch in a saw set; and has for its object to so construct and combine these devices as to reduce the size and cost of the complete instrument to a minimum, and enable the punch holder and guide to be secured and adjusted by the same screw in order to facilitate the practical operation of the instrument. The slotted gage or guide and the punch holder provided with the horizontal slotted base, arranged in a peculiar way, and secured to a base, having ribs, by means of a screw, constitute the claim on which a patent has been issued.

COMBINED SHOVEL AND TONGS.—Thomas G. Newnam, of Pleasant Hill, Mo.—This invention is an implement for handling live or other coals, brands of fire, and other articles, designed to be used as a substitute for the separate shovel and tongs in common use. It consists in a shovel blade on a slotted handle, and in a wire brush or rake on the end of a handle, which works in the slot of the shovel handle. The shovel handle is bent so as to form two arcs of circles, with a ring handle at the end to take hold of. A brush or fine rake is on the end of a third handle. This handle passes through the slot in the shovel handle, where it is allowed to play longitudinally and up and down, according to the purpose for which the implement is to be used. A shoulder limits the distance which this handle extends through the slot. The shovel can be used to take up ashes, etc., and coals can be raked onto the shovel by a longitudinal movement of the rake handle, and a brand of fire, stick of wood, or other article can be gripped between the parts and handled as with a pair of tongs.

CASTING PIPE.—Charles J. Ellis, Louisville, Ky.—The invention consists in improving the usual means for casting pipe, by constructing the stools which support the flasks in arc sections, and thereby rendering them adjustable by the simple addition or subtraction of one or more sections.

CLEANING LAMP CHIMNEYS.—Henry W. Prouty, Boston, Mass.—In this case, a suitable handle is provided with rubber or other elastic disks or washers, so applied and adjusted as to admit of the use of a cloth or other material for cleaning chimneys with ease and rapidity.

BERRY BOX.—Charles Reese, Baltimore, Md.—The invention consists in improving the construction of paper fruit boxes by fastening the previously slitted and folded sides with tin clips. This method of construction involves so little expense on the articles as to make the cost inappreciable and to allow them to be given away with the fruit, while at the same time they are sufficiently strong for handling and transportation.