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flesh and smoke well; the squaws, who always do this work, being obliged to work the skins with great thoroughness.

(12) J. B. F. M. asks: 1. Is the Blake transmitter as good as any? A. For general purposes, yes; it, however, lacks power for long distances.

INDEX OF INVENTIONS For which Letters Patent of the United States were Granted February 5, 1884, AND EACH BEARING THAT DATE.

Aerial cable, W. R. Patterson... 292,847 Air apparatus for producing compressed, J. Schweizer... 292,967 Air compressor, hydraulic, C. H. Hill... 292,814 Alarm. See Burglar alarm.

NEW BOOKS AND PUBLICATIONS.

BLEACHING, DYEING, AND CALICO PRINTING Edited by John Gardner, F.I.C., F.C.S. P. Blakiston, Son & Co., Philadelphia. Price, \$1.75.

This book presents mainly a condensed summary of what has heretofore been presented in more elaborate works. It will make, however, a convenient manual for practical workers who do not wish to give the time and trouble required for more extended research.

THE MODERN HOUSE CARPENTER'S COMPANION AND BUILDER'S GUIDE. By W. A. Sylvester. Cupples, Upham & Co., Boston. Price, \$2.00.

This is a standard book of its kind, and has reached its third edition. It is written for workmen, by one who commenced his preparation for the task in the memoranda made during early experience at the trade.

HINTS ON THE DRAINAGE AND SEWERAGE OF DWELLINGS. By William Paul Gerhard, C.E. William T. Comstock, New York. Price, \$2.50.

Every topic of importance touching dwelling house sanitation here receives some attention. Illustrations are given of many different kinds of closets, traps, sinks, piping, etc., with practical directions for securing good plumbing and detecting that which is bad.

GEOLOGICAL SURVEY OF ALABAMA, 1881-82, WITH AGRICULTURAL FEATURES. By Eugene A. Smith, Ph.D., State Geologist.

This is an eminently practical book, containing a great deal of what might be styled basic information for all present or would-be agriculturists in the State of Alabama. So far as the geology of the State is concerned, there are, perhaps, no points of especial scientific interest to be developed.

Notes & Queries

HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

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

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from \$1 to \$5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at the office. Price 10 cents each.

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark or label their specimens so as to avoid error in their identification.

(1) G. H. B., Cleveland, O., asks how skins are dressed to render them soft enough to make clothes of, and what is the Indian process? A. Most of the buffalo robes and other heavy skins are either lightly tanned in bark liquors, or tawed with alum and salt, and well worked and dressed with oil.

(3) J. T. asks: How can I unite by casting a piece of mshett steel to the end of a piece of cast iron 1 1/2 square by 7 in. long? The steel is 1 1/2 square by 1/2 in. thickness. A. Make a core print to correspond with the steel, lay the steel in the mould, gate beneath to allow the iron to escape, and pour and waste perhaps one or two pounds so as to heat the steel; then plug up the waste gate and fill the mould.

(4) C. A. K. asks: What kind of liquids or gas are fire extinguishers charged with, especially the new hand grenade of Chicago, Ill.? A. Fire extinguishers are generally charged with carbonate of lime or carbonate of soda and water, with a combining quantity of sulphuric acid in a position to be discharged into the water at the required time.

(5) H. B. C. says: In answer to D. D. L., query No. 19, Dec. 22, I clean my mica as follows: Take them out of stove, lay on a smooth board, and with a stiff bristle brush dipped in concentrated ammonia brush the surface until it feels smooth and glossy, then wash off the dirt and rinse with soft water.

(6) W. H. writes: Will you tell me the reason that an ax at one corner and sometimes both cracks in tempering it, and how to prevent? Also a good receipt for small springs, such as main spring to gun locks, and other small springs? A. To prevent the cracking of an ax in hardening, have the iron poll split to receive the steel bit; not the bit to receive the poll.

(7) J. W. H.—Inquiry No. 8, SCIENTIFIC AMERICAN of Dec. 1, 1883, concerning quantity of water for boiler. In our reply we should have said cubic foot instead of gallon. The inquiry and answer as corrected stand as follows: How many gallons of water are required for a steam boiler per horse power, say at 60 pounds pressure? A. At the Centennial Exhibition and tests, 30 pounds steam per horse power per hour was taken as standard; this is a little less than half a cubic foot of water, but it depends much on the character and condition of the engine through which the steam is worked.

(8) S. R. asks: Will any fellow reader acquaintance with any cheap liquid that will keep an even temperature (or nearly so) the year round? What are the non-conducting properties of oils or water glass? (9) H. S., of Russell, Kas., asks the specific gravity of pure milk by a lactometer? A. The specific gravity of milk varies with the different breeds and age of cattle, the season of year, and kind of feed.

(10) H. W., of Frankfort, Ky., asks about ventilating a drying room 8 x 12, and 6 ft. high, in which there are 400 ft. 1 in. pipe for heating, present arrangement not working well? A. The steam coil should be 5 or 6 in. above floor; the flat kinds are the most efficient. The ventilation inlet should be under the coil so as to spread the air as much as possible; the outlet also should be at several places, so that the current through the room will be nearly equal in all parts.

(11) W. T. says: I am told that a thermometer in which, on being inverted, the mercury breaks in running to the top of the tube is not reliable; that instead it should form a vacuum in the bulb. Is this right? A. Theoretically, and with an absolute vacuum above the mercury, the latter should, when inverted, fill the tube. But when the latter is very small a slight cause, a little roughness, or obstruction too diminutive to be seen with the naked eye, may cause a parting, and the instrument still be practically useful.

(12) J. B. F. M. asks: 1. Is the Blake transmitter as good as any? A. For general purposes, yes; it, however, lacks power for long distances. The Hopkins transmitter, by actual test, has proved the best for long distances. 2. Is the induction coil in the Blake transmitter composed of more than one sized wire, and what sizes and amounts are used? A. Yes, two layers of Nos. 16 and 18 insulated copper wire are wound in a coil 1/2 in. diameter by 1 1/2 in. long for the primary, and over that is wound from five to six layers of No. 34 silk covered wire for the secondary wire.

(13) A. S. P. writes: I have been trying to electroplate with two jars, Grenet battery, 7 in. high, object about 1 1/2 in. square. I get a deposit of copper, but it takes a long time and consumes too much zinc. What is the fault? Can I not get good effects with that battery? A. Use two or three cells of gravity battery. The Grenet is not well adapted to electroplating.

(14) W. W. M. says: I have a glass wheel, the remnant of an old electrical machine. It is about 2 ft. in diameter and 3/4 in. thick. Can it be utilized in making a Holtz machine? If so, what thickness would be best for the additional wheel? A. It is a curious fact that plate glass is worthless for a Holtz machine. The natural surface of ordinary blown glass seems to be necessary to the successful working of the machine. Your plate would answer for a frictional machine.

(15) J. H. B. asks: 1. Is not properly secured cistern or rain water the best for drinking and cooking purposes? A. We do not consider that cistern water in its best condition is equal to water drawn from sand or rock beds, but is no doubt better than the water of many wells. 2. Is there any danger arising from the use of water in brass or copper vessels? A. Brass and copper vessels that are kept scrupulously clean are suitable for cooking in or holding water for drinking. Brass pipe for conveying water is now much used, and is not considered more dangerous than lead pipe. 3. What effect, if any, has the rubber pipe upon water secured through it, such as our lawn and sidewalk hose? A. Rubber hose has no deleterious effect upon water. 4. Where is the best water found when exposed to the sun and air, and standing in open vessels—at the top or bottom of the vessel? A. We do not know that there is any difference in the quality of water drawn from the top or bottom of an open vessel, provided both vessel and water are clean.

(16) W. W. asks: What is the best material to mix with gas tar to form a durable waterproof coating for tin, shingle, or paper roof? A. Boil the tar with lime, stir in powdered slate, and then apply.

(17) F. T. K. G. writes: I was much interested in the article entitled "The re-enforcement of deficient water supply in wells," which appeared in the SCIENTIFIC AMERICAN of November 10, but it does not explain how to manage where there are large quantities of granite bowlders, which is the case in many parts of the country. A. The deepening or re-enforcing of wells located in bowlder strata is not easy work. It requires much judgment and patience to bore out the sand and fish out the bowlders as they are laid bare. The strainer pipe should be much larger than those used for wells in clear sand strata. Sounding the substratum of the well with a small iron rod pointed and driven down several feet at different places close together and near the center of the well will generally reveal its condition as to the number and size of the bowlders, and will suggest the size of the strainer, which should be large enough to allow the bowlders to be drawn up with a finger grapple. The sand may be taken out as in the process before described. The bowlders can be loosened with a hook and taken up with the finger grapple. If the bowlder catch under the edge of the tube, bore down near it and below it and work the bowlder toward the center with a hook, where it can be caught with the grapple.

(18) E. D. C. asks for a rule by which he can solve the following problem:

O Ball weighing one pound.



Question: With what force will the ball weighing one pound strike an upright at D, having traveled the ten foot incline? A. A body acquires the same velocity in descending any inclined plane as by falling freely through a distance equal to the height of the plane minus the friction due to the manner of moving down the plane. The impact in foot pounds equals the velocity multiplied by the weight. To get the velocity, multiply the space fallen through by 64.333, and the square root of the product will give the velocity acquired in feet per second. In your case 1/2 x 64.333 = 11.334 feet per second. 11.334 x 1 lb. = 11.333 foot pounds. In practice this has been exceeded under favorable circumstances 4-426 times, so that you may obtain in practice any value in pounds for a one pound ball, from 11 to 44 pounds.

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

J. N. T.—The specimen is probably infusorial earth, but it is too gritty to be of much use for polishing purposes. It has no commercial value in New York.