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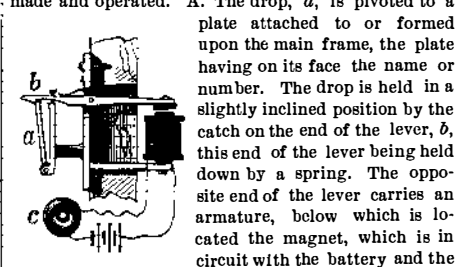
Machinists' Pattern Letters. Pattern Letters to order. Vanderburgh, Wells & Co., 110 Fulton St., New York.

Brass and Iron Working Machinery, Die Sinkers, and Screw Machines. Warner & Swasey, Cleveland, O.

Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works. Drinker St., Philadelphia, Pa.

reactionary effect of the wind might move, the boat backward as you suggest, and this effect would be greater without the sails.

(9) E. J. C. writes: Please describe how the drop shutter on annunciators and burglar alarms is made and operated.



A. The drop, a, is pivoted to a plate attached to or formed upon the main frame, the plate having on its face the name or number. The drop is held in a slightly inclined position by the catch on the end of the lever, b, this end of the lever being held down by a spring. The opposite end of the lever carries an armature, below which is located the magnet, which is in circuit with the battery and the push button, c. By pushing the button, c, the magnet is rendered active, and the armature is pulled down, raising the opposite end of the lever, b, releasing the drop, a, which thus falls of its own gravity. The action of the annunciator is rendered more or less sensitive by a screw which passes through the lever, b, and striking on the upper edge of the annunciator plate limits the downward movement of the catch.

(10) L. B. asks: How are the moulds obtained for making hollow rubber balls? If made in sections, how united? At what temperature are they vulcanized, and in dry heat or steam? A. The mould is a simple metallic mould made in halves. The rubber is placed in it so that it will join at the edges when the mould is closed, but before closing the mould a small quantity of water is placed in the rubber. This makes steam when the mould is heated, and forces the rubber into every part of the mould. Steam heat is used, and the temperature depends upon the time in which the work is to be done; 300° to 310° Fah. is about the right temperature for quick work. Consult SUPPLEMENT, Nos. 249, 251, and 252 for information on rubber manufacture.

(11) J. W. S. asks: What ingredients are used with corundum in making wheels and other forms for grinding and reducing metals, and the manipulative process? A. There are various cements employed in making emery and corundum wheels. Corundum wheels to be used with water are generally made of corundum and shellac. Dry corundum wheels are often made with glue only as a cement. Rubber (vulcanized), water glass, and oxychloride of zinc are also used.

(12) J. E. H. writes: 1. Given: two 4 inch achromatic objectives, properly corrected, one of five, the other six feet focal distance, which will make the better telescope? A. For comet seeking and similar uses, the short focus; for other work, the long focus. We think the long focus would be preferable for general use. 2. By what method is the focal distance of compound eyepieces determined? A. Consult SUPPLEMENT, No. 399. 3. Can the eyepieces of a microscope be used for a telescope? A. Yes. 4. What is the meaning of the term "ampere" as used in electrical technology? A. The unit of the current. It is found by dividing the electromotive force in volts by the resistance of the circuit in ohms: C = E / R

Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information, and not for publication.

References to former articles or answers should give date of paper and page or number of question. Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and though we endeavor to reply to all, either by letter or in this department, each must take his turn.

Special Information requests on matters of personal rather than general interest, and requests for Prompt Answers by Letter, should be accompanied with remittance of \$1 to \$5, according to the subject, as we cannot be expected to perform such service without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each. Minerals sent for examination should be distinctly marked or labeled.

(1) J. R. B. asks: 1. What effect has kerosene oil on metals? A. No effect. 2. Does it soften steel? A. No.

(2) H. M. L. writes: I have made an induction coil; it is 3 inches long, and 1 1/2 inches in diameter; it is wound with 4 layers of heavy and 13 layers of fine wire, and each layer is insulated by a layer of tissue paper; the current is interrupted by an electro-magnet. A child could bear the current at full strength. I would like to know how to make it stronger, and be able to regulate the current. When I put the bundle of wires in, the current increases; and if I put a steel rod in, it is still stronger; the spark it gives is hardly perceptible. I use a Grenet battery. A. It is probable that the resistance of your electro-magnetic interrupter, together with the primary wire of your coil, is too great. Either add another cell of battery or use some other form of interrupter. It is possible that your insulation may not be perfect enough; if so, you can improve it by soaking the coil for sometime in hot paraffin.

(3) W. A. S. writes: 1. Wishing to try an experiment, I should like to know through your valuable paper, the SCIENTIFIC AMERICAN: 1. What is the nature of a loadstone? A. Loadstone is a variety of magnetic iron ore. 2. Where can I obtain such a stone? A. From any dealer in mineral specimens. 3. What is a sympathetic magnetic needle? A. There is no such thing. 4. When the needle on a dial is attracted to a certain point by a loadstone, would a sympathetic needle on another dial placed at a considerable distance from the first move to a corresponding position on its own dial? A. No.

(4) J. C. N. asks: 1. For electro gold plating how long should an article remain in the bath to receive a good heavy coating of gold? For example, take a silver dollar; how long should it remain in the bath to receive one dollar's worth of gold, with a single cell Smee battery, size of zinc plates 3 1/2 x 7 inches, heat of bath 160° Fah? A. This depends on the strength of the gilding solution, the size of the anode, and the condition of the battery. The usual method of determining the amount of gold deposited in a given time is to weigh the cathode before gilding, and from time to time during the process. 2. Also, how often should it be taken out and brushed over with pumicestone or sand? A. It should be taken out and scratch-brushed soon after the first immersion, and a short time before the finish. 3. Can you give me the formula for making mercuric nitrate? A. You can make it by dissolving mercury in strong nitric acid. Another method is to saturate strong nitric acid, diluted with an equal measure of water, with oxide of mercury.

(5) H. M. N. asks (1) the reason why astronomers think the sun is not stationary? A. By observing a great number of stars, it has been ascertained that the solar system is moving toward the constellation Hercules. 2. Where can I find the sun's motions treated at length, with the supposed reasons assigned for the same? A. Newcomb's Popular Astronomy will give you information on this subject.

(6) C. E. A. asks. will it be practical to light my plating room by electricity. My dynamo has capacity to run 200 gallons solution. A. It is probable that your machine generates a current of low electromotive force, and is therefore not adapted to electric lighting.

(7) J. J. W. writes: There is considerable discussion in this shop as to what is known as India rubber, or pure rubber. I claim it is a popular name for caoutchouc, while others claim that it means gutta percha. As we all bank on the SCIENTIFIC AMERICAN, we have agreed to lay the matter before you, and accept your decision as final. A. You are right. Gutta percha is a different gum.

(8) R. T. M. writes: A gentleman not long ago asked whether a yacht would sail in a calm if a bellows sufficiently large to fill her sails were operated by steam, on board. The person to whom the question was addressed answered, "Not an inch." I differed with him, and held that the yacht would move backward. We cannot convince each other. Will you have the kindness to answer in your correspondence column? A. The yacht would not be moved by the action of the wind from the bellows on the sails. The

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted, September 29, 1885, AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Table listing inventions such as Addressing machine, Adjustable chair, Advertising device, Aeriform fluids, etc. with corresponding patent numbers.

Table listing inventions such as Brake, Brick machine, Bridge gate, Bridges, Bridle bit, Brush, etc. with corresponding patent numbers.

Table listing inventions such as Electric cable, Electric circuit, Electric conductor, Electric current meter, etc. with corresponding patent numbers.