

that does not serve a useful purpose can permanently succeed. Frauds may flourish for a time, but their season is brief.

G. B. HECKEL.



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 This is for our information and not for publication.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.

(9934) A. C. A. says: Please inform me through the Notes and Queries column, how the number of lines of force in a magnet are calculated. A. To calculate the number of lines of force in air through a given coil of wire, multiply the amperes by the number of turns of wire and this by 0.4 or by 1.257.

(9935) B. F. B. asks: I wish to procure the best method for drilling glass. A. For drilling glass make a solution of 1 ounce gum camphor, 1 1/2 ounces spirits of turpentine, and 3 drachms of ether. Keep the end of the drilling tool wet with this fluid.

(9936) L. E. B. asks: Does the space occupied by the spokes in a carriage appear to be filled with black dots when the moving carriage is seen through a lace curtain? I did not notice it when the carriage moved rather slowly, but when it was moving at a brisk rate. A. The phenomenon of the moving wheel viewed through a mesh of lace is due to the persistence of vision.

(9937) W. W. G. says: We would consider it a great favor if you will have the kindness to advise regarding driftwood fire powder. This is a powder which, as we understand it, is thrown on the fire and produces the same lights as driftwood. Kindly advise if possible where same can be obtained. A. We do not know the composition of the driftwood powder. You can, however, make driftwood for yourself, which will give a color equal to any, by dissolving chloride of copper in water.

(9938) F. S. J. asks: 1. Can you tell me what a wattless current is? How is it caused? A. The so-called "wattless current" is the component of the total current which is in quadrature with the energy current. It may be found explained in Sloane's "Electricians' Handy Book," which we send for \$3.50. 2. Why do telephone companies always ground on a cold-water pipe? I know of a case where a lineman carried the ground wire past a hot-water pipe to a cold-water pipe. Why not ground on a gas or steam pipe? They are all connected to the ground. A. We cannot tell why telephone companies "always ground on a cold-water pipe," since we have just examined ours and find it grounded on the hot-water pipe.

(9939) T. W. B. asks: As it is an accepted fact that an electric current can be caused to flow between the poles in a circuit connecting two metals such as bismuth and antimony when the point of juncture is heated, I should like to know what voltage and amperage can be produced or caused to flow if the ends of two rods 1/4 inch in diameter, one of bismuth and the other of antimony, be joined together and heated in say 500 deg. of

heat. I have the electric library published by Munn & Co., but do not seem to be able to get this information from same. In one place they state that a combination of this kind will generate "1 microvolt," but nowhere in the book can I find a statement as to what constitutes a microvolt. I have an apparatus in which a large amount of heat is radiated or wasted, and thought possibly that I would be able to generate a current of about six volts, twenty amperes. If this is possible will you kindly give me some information as to how to go about the work of assembling the apparatus? A. A microvolt is one millionth of a volt. Probably any dictionary would contain the word, or else the prefix "micro," which is used as meaning a millionth part. Webster's Dictionary contains it. A treatise on electricity would assume that the reader had a dictionary and would not stop to define such a term. You cannot maintain a bismuth-antimony junction at 500 deg. F., since bismuth melts at 514 deg. F. Nor has anybody yet succeeded in making a thermo-electric generator which would produce six volts. One which gave about half this was on the market a few years ago, but cannot now be had. This one gave perhaps 1.5 amperes. We cannot encourage you to expect to invent a generator which would give 20 amperes.

(9940) H. E. E. asks: As a reader of your most valued publication, I am taking on myself the privilege of asking you where it would be possible to secure information regarding the latest or the best system of wireless telegraphy. I am seeking to build a system between two stations, about three hundred yards apart. Have been unable to secure anything satisfactory on the subject except from the columns of the AMERICAN, and that is all so condensed that it doesn't help much in putting in a system. I ask you, then, where I may secure a clear, concise treatise on the subject, which would enable an amateur to build his own system and at a nominal cost. A. Maver's "Wireless Telegraphy," price \$2, is a very good book upon the subject, although Collins is somewhat more recent and is reliable. Its price is \$3. We can send either or both upon your order. We have published in our SUPPLEMENT No. 1363, price ten cents, a very complete description of a set of instruments which will transmit much farther than you propose to send messages. We would advise you to get this, if you have not already done so, and to follow the instructions given therein. A large number of people have built sets from these instructions. We would say, however, that no one can build the instruments at a nominal cost. The coherer, the relay, and the induction coil must be well made or else they are worthless.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending March 27, 1906. AND EACH BEARING THAT DATE [See note at end of list about copies of these patents]

Table listing inventions and their patent numbers, including Account cabinet, Bed, invalid, Bicycle attachment, and various mechanical devices.

'Star' Lathe advertisement featuring an illustration of the lathe and text: 'FOR FINE, ACCURATE WORK. SENeca FALLS MFG. CO. 695 Water Street, Seneca Falls, N. Y., U. S. A.'

Engine and Foot Lathes advertisement: 'MACHINE SHOP OUTFITS, TOOLS AND SUPPLIES. BEST MATERIALS. BEST WORKMANSHIP. CATALOGUE FREE. SEBASTIAN LATHÉ CO., 120 Culvert St., Cincinnati, O.'

Foot and Power and Turret Lathes advertisement: 'SHEPARD LATHÉ CO., 133 W. 2d St., Cincinnati, O.'

Giant Steam Shovels advertisement: 'Toledo Ohio, USA. The Vulcan Iron Works Co. 125 Vulcan Place'

1/2 H. P. Marine Engine advertisement: '\$33.50 Engine Only. For your Row Boat, Sail Boat or Launch. DETROIT ENGINE WORKS, 1425 JEFFERSON AVE. DETROIT, MICH.'

A. M. Faber advertisement: 'Manufactory Established 1761. Lead-Colored & Slate Pencils, Rubber Bands, Erasers, Inks, Penholders, Rulers, Water Colors, Improved Calculating Rules. 44-60 East 23d Street, New York, N. Y.'

Original Barnes Upright Drills advertisement: 'Positive Feed. 10 to 30-inch Swing. W. F. & JNO. BARNES CO. (Established 1872) 1999 Ruby St., Rockford, Ill.'

Presses for Sub-Press Work advertisement: 'Five sizes. Sub-Presses and Tools to order. BLAKE & JOHNSON, P. O. Box 1054, WATERBURY, CONN'

The B. F. Barnes 14-Inch Drill advertisement: 'is adapted for work from 1-16 inch to 3/4 inch. A strong, substantial, well built drill. B. F. BARNES COMPANY, Rockford, Ill.'

Mustard & Company advertisement: 'GENERAL IMPORTERS AND COMMISSION AGENTS. Plumbing Supplies, Safes and Scales. The largest Hardware Machinery and Tool House in China. 9a NANKING ROAD SHANGHAI CHINA'

Reliable Marine Engines advertisement: 'Reliability under all conditions is the characteristic of the "Lamb" Engines. TERRY & CO. Managers Eastern and Foreign Branches. 92 Chambers St., New York'

Well Drilling Machines advertisement: 'Over 70 sizes and styles, for drilling either deep or shallow wells in any kind of soil or rock. WILLIAMS BROS., Ithaca, N. Y.'

Kerosene Oil Engines advertisement: 'Marine Stationary Portable. NO DANGER, Maximum Power. International Oil Engine Co. 253 Broadway, N. Y., U. S. A.'

Watch Tacoma Grow! advertisement: 'Leading manufacturing city of Pacific Northwest. Best steamship and railway terminals on Pacific Coast. POPULATION 1900, 37,714. 1906, 85,000.'

Large table listing various mechanical products and their prices, including Burglar alarm, Bushings, Car body bolster, and many other items.