

the reproduction of pictures uniformly representing the exact colors and shades desired, the compound colors being produced by the superposition of primitive colors, when impressions are taken from two or three plates, this inventor has devised a novel color chart, in which the lithographer may always find the tones or shades of the design or sketch required, and a machine capable of preparing the plate in accordance with the chosen tones or shades. The electrically-controlled marking tool of the machine produces dots at regularly graduated distances from each other, the dots being more or less close together on the different stones, according to the shade desired to be produced by the different impressions, the shades being accurately determined by the chart, and the results being always certain and uniform.

MANUFACTURING CALCIUM ACETATE.—Martin F. Quinn, Straight, Pa. A simple apparatus by means of which the process of manufacture may be carried on at a comparatively small cost is provided by this inventor. It comprises a shell for the lime as received from the retort, the shell having a pitched roof with outlet for alcohol fumes, a trough at the junction of the walls and roof of the shell, a steam heating coil close to the inner surface of the side and end walls, and a steam jacket over the entire area of the bottom of the shell. The whole operation of separating alcohol from acetate of lime and preparing the lime for the kiln is completed in this one apparatus, thus saving handling, wastage and labor. The same inventor has obtained a further patent for a kiln for drying acetate of lime and making it ready for market. It has side and end walls, with troughs extended along the upper portions of the side walls, a trough or pipe receiving the discharge from the troughs, and a water spraying pipe extended along the apex of the roof, there being track rails in the kiln and steam heating pipes in its lower portion. With this construction lime once in the kiln may be quickly treated and placed upon cars without further work on the part of the attendant.

WHEELED VEHICLE.—Horatio B. Osgood, Binghamton, N. Y. To provide stronger and cheaper axles for heavy vehicles, such as trucks and skids, is the object of this invention, the vehicle being provided with a frame having projecting lugs, one face of each lug being convex, while the metal axles for the frame have in one end of each axle a depression formed by swaging to expand the end of the axle, the depressed and expanded ends of the axles being respectively cast into the lugs so that the axles will project perpendicularly from the convex faces of the lugs.

BARREL FILLING MACHINE.—Joseph E. J. Goodlett, Memphis, Tenn. This invention covers an improvement on a former patented invention of the same inventor, according to which a conducting tube with universal joint or coupling is attached to a valve and float mechanism attached to a gooseneck, the gooseneck and valve chamber being, according to the present invention, formed integrally and the valve chamber shortened, thus reducing the cost of manufacture. By providing a plug and shell or plug casing for each tank, the filler may be readily changed from one tank to another, thus saving time and labor as compared with filling apparatus having joints or couplings of ordinary construction.

PORTABLE FIRE EXTINGUISHER.—Clotilde F. B. Durand, Montreal, Canada. In extinguishers adapted to eject a saline solution by the pressure of a gas with which the extinguisher is charged, this invention provides a novel construction and arrangement of a lever in connection with the discharge nozzle and valve. The extinguisher is of glass, resembling an ordinary ginger ale bottle, with screw-threaded neck for the attachment of a metal head with lateral discharge nozzle, there being in the head a valve operated by a curved lever, which may be pulled back by the finger, the body of the extinguisher being held by the other hand.

CURTAIN ROLLER ATTACHMENT.—Martin L. Kullberg, Brooklyn, N. Y. This invention provides a superior curtain support comprising a pole with central bore, slotted radially, a plug having a knob at each end of the pole and a feather on each knob, the feathers fitting in the ends of the slot. Nails engage the plugs to hold the knobs in position, and a wire is secured to a cylindrical block slidable in the bore, the end portions of the wire extending through the slot, one end terminating with an eye and the other end having a spring-pin, the curtain being attached to the pin.

ADJUSTABLE SIGN AND FRAME.—Alvah C. Roebuck, Chicago, Ill. This is a device for use as a name plate or for other purposes, the frame being adapted to hold a long or short name or any reading matter required for display. The frame is simple, inexpensive, and may be applied to any surface, and consists of side pieces grooved on their inner edges, caps receiving the ends of the side pieces and engaging their grooves, each of the caps having a grooved projection on its inner face, while a back plate engages the grooves of the projections.

FISHING ROD REEL HOLDER.—Daniel L. Andrews, Webster, Mass. In this holder clamping bands are provided with adjustable clamps or tightening devices, in connection with a side adapted for attachment to a reel adjustably carried by the clamps, affording a rigid and firm contact between the reel holder and rod, and providing for an adjustment of the reel upon its holder and the adjustment of the holder upon a rod, so that when the holder is clamped upon a rod the reel will be simultaneously locked in position on the holder.

RAT AND MICE TRAP.—Theodore H. Bradish, Utica, N. Y. Instead of killing or imprisoning rats and mice, in what the inventor styles the present "cruel and inhuman" way, this trap is designed, when the animal enters the trap and approaches the bait, to release an elastic, held around the opening of the trap, the elastic then closing about the body of the rat. Attached to the elastic are bells and tufts of cotton or other material, painted or coated with phosphorescent material, etc., it being designed that the escaping rat shall thus effectually frighten away other rats.

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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.
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 Scientific American Supplements referred to may be had at the office. Price 10 cents each.
 Books referred to promptly supplied on receipt of price.
 Minerals sent for examination should be distinctly marked or labeled.

(7318) F. S. G. asks: How many 5 x 7 Crowfoot gravity batteries should I use on a 350 feet long telegraph line with two 5 ohm instruments and ground return? Line made of No. 12 galvanized iron wire. A. Two cells should be sufficient for this line.

(7319) E. E. G. writes: I would like a little information in regard to the Mesco dry battery. 1. Is the dry battery considered to be as good as the liquid for operating small call bells? A. Dry cells are useful because of their cleanliness and convenience, but they do not generally give as strong a current as a wet cell of the same materials. 2. How many cells of dry battery are required to ring a 4 inch bell through 100 feet of No. 18 wire? A. It would be advisable to use two cells, though one fresh cell would probably ring the bell. 3. What do you consider is the best liquid battery, the cheapest to keep running, the least liable to get out of order, of the open circuit kind? A. There are many forms of Leclanche cells about equally good. 4. How long will the dry battery last with ordinary usage on a call bell? A. Many months. 5. Please give me the number of cells required to ring the different sizes of bells, that is, from 2 1/2 inches to 6 inches? A. The size of the bell has nothing to do with the question. The resistance of the wire in the electromagnet is the quantity to be considered. 6. Does it make any difference in regard to the number of feet of wire used, that is, if I use more wire, will it require more cells of battery? A. Yes. 7. I intend to build a telephone line one mile in length to use three instruments; as I am not very well posted in the telephone business, do not hardly know what I want. What size wire shall I need? Will No. 14 be large enough? A. Use No. 12 galvanized iron wire. 8. Could I not have the call bell on the telephones work with a push button? A. Yes. 9. How many cells of battery will be required? A. Two at each end. See Lockwood's "Practical Information for 'Telephonists,'" price \$1 by mail.

(7320) C. D. W. asks (1) how large a storage battery it would require to maintain a current sufficient to run seven 16 candle power incandescent lamps at 110 volts for 6 hours. A. 55 cells in series will give the voltage required. The seven lamps require about 3 3/4 amperes. This will be given by type C of the chloride cells, with 7 plates per cell, each 4 x 4 1/2. They will discharge at this rate for ten hours. 2. Could this battery be charged through the same transformers as are used for the house circuit? A. No. A direct current must be used to charge them. 3. How long and how many watts would it take to charge the above? A. The time required for recharging depends on the amperes used at 110 volts. The ampere hours of the cell are 37 1/2. If 10 amperes are used in recharging, it would require 3 3/4 hours.

(7321) McL. P. says: A peddler recently passed through our city selling a compound of such a nature that when it was applied to a newspaper cut, colored or black, and a clean piece of paper placed upon it and heat or friction applied, the cut would be faithfully transferred to the clean paper. The compound had the appearance of an emulsion, being milk white and smelled strongly of turpentine. Can you give us its formula? A. Information on this subject, also formulas for the preparations for effecting the transfers are contained in SUPPLEMENT, Nos. 1062, 1122 and 1141, price 10 cents each by mail.

(7322) J. J. W. asks: Will you kindly inform me through your Notes and Queries of the SCIENTIFIC AMERICAN how to make a good black indelible ink, such as is used in marking and designing on linen and other goods and such that will not spread? A. See formula in SUPPLEMENT, No. 1121, price 10 cents by mail.

(7323) J. M. R. writes: Please inform me through your Notes and Queries how to make black ink like that sold in all stationery stores. A. See formulas in SUPPLEMENT, Nos. 157, 1119 and 1139, price 10 cents by mail.

(7324) A. W. B. asks for a formula for a roach food—one that will kill or drive away the roach and be absolutely harmless to human beings. The reason I want a roach food that kills is this: I have tried the various insect powders on the market, with no good results. A. Some years ago we analyzed a commercial roach food, and found it was composed of 90 per cent. borax and 10 per cent corn starch. The powder was colored with a little carmine. This is considered to make a very efficacious roach food. It would not be poisonous to a human being.

(7325) W. R., Eureka, Cal., asks: 1. Which bullet travels through more space—that fired perpendicularly upward, ascent and descent both included as distance traveled; or, one fired at any acute angle of elevation? A. A ball fired at 45° elevation is supposed to have the longest trajectory. 2. By which of the six mechanical powers can the same power overcome the greatest weight or resistance? A. The usually termed mechanical powers are the lever, the inclined plane, the screw, the wheel and axle, the wedge and the pulley. The one that has the least friction is the most efficient. This applies to the lever.

NEW BOOKS, ETC.

MECHANICAL DRAFT. A practical treatise. Boston, Mass.: B. F. Sturtevant. 1898. Pp. 385.

The subject of mechanical draught has been discussed at greater or less length in the technical press and before various engineering societies, but in all cases such discussion has been distinctly limited. Here for the first time the attempt is made to give the treatment its importance demands. Although its introduction is an evidence of a somewhat radical departure in certain features of boiler practice, yet extended and recent experience clearly indicates the permanence of this departure. Though published by a firm which has been prominently before the engineering world for many years as manufacturers of fans and blowers, still the work will prove of great value to all mechanical engineers, as it is filled with data and is well illustrated by diagrams and engravings, many of the latter being from plans which are in actual use.

THE TRAINING OF A CRAFTSMAN. By Fred Miller. New York: Truslove & Comba. 1898. Pp. 249, 161 illustrations. Price \$2.

This book is the outcome of a series of articles contributed to the Art Journal. The author's object is to bring to the notice of the reader, through the medium of illustrations, the work of some few representative craftsmen, with a few personal notes, the results of conversations with the craftsmen themselves, and also a general survey of the work being done to-day in some of the leading crafts. "Crafts" is an ugly word, but it is a very expressive one, and the beautiful examples of modern work which are given in the present book indicate what is now being done by workers who apply art to industry.

A SYSTEM OF EASY LETTERING. By J. Howard Cromwell, Ph. B. New York: Spon & Chamberlain. 1897. Pp. 68. Price 50 cents.

This is an admirable system of lettering, drawings and signs. We have but to divide any surface which we may wish to letter into squares or parallelograms, as the case may be, in pencil lines; form the required letters in ink or paint according to the style chosen, then erase the pencil lines, and the lettering is complete.

SUGGESTIONS FOR LABORATORY AND FIELD WORK IN HIGH SCHOOL GEOLOGY. Questions for use with Tarr's Elementary Geology. By Ralph S. Tarr. New York: The Macmillan Company. 1897. Pp. 100. Price 25 cents.

This little pamphlet gives valuable advice to the professor of geology as to taking students out on field expeditions and for work in the laboratory. It also contains questions for use with Tarr's Elementary Geology.

THE ROAD TO PROSPERITY. A treatise on political economy. Written upon various subjects, with a view of aiding in creating permanent prosperity and contentment of the people. By T. W. Wood. Chicago: Charles H. Kerr & Company. 1898. Pp. 78. Price 25 cents.

UNITED STATES DEPARTMENT OF AGRICULTURE. Weather Bureau Bulletin E. Floods of the Mississippi River. By Park Morrill. Washington. 1897. Pp. 58.

The present work attests the great value and thoroughness of the work accomplished by the Weather Bureau with the crippled means at their disposal, to which we have already referred. The large pamphlet is filled with interesting matter relating to the drainage basin of the Mississippi River, both under normal and flood conditions. The floods occurring during the past twenty-six years are made the chief subject of study, inasmuch as only during that time complete and reliable gage readings were available. Six notable flood years are included in this period, and for these six flood hydrographs have been drawn for several typical stations. The downflow of water from which each flood arose has been computed and the results are given in tabular form. The 58 maps and charts are well executed.

STEWART'S TELEGRAPHIC CODE. By means of which any number, from one to a million, can be expressed by a single word of not more than ten letters. By Charles Stewart. Saint Paul. 1897. Pp. 22. Price 25 cents.

This little book gives a convenient system for transmitting numbers by telegraph, and will undoubtedly prove useful to those who use telegraph codes.

MATHEMATICS. LOGARITHMS: THEIR NATURE, COMPUTATION AND USES, WITH LOGARITHMIC TABLES OF NUMBERS AND CIRCULAR FUNCTIONS TO TEN PLACES OF DECIMALS. By W. W. Duffield, Superintendent, Treasury Department, U. S. Coast and Geodetic Survey. Part 1. Appendix No. 12. Report for 1896. Washington. 1897. Pp. 327.

The present work, by the late superintendent of the United States Coast and Geodetic Survey, has been very severely criticised by the lay and scientific press. The tables will prove very useful to those who do not have access to Baron Von Vega's work on the same subject. The latter work has been corrected of all known errors, and it was reproduced in 1889, in Florence, Italy, by photo-zincography, which avoided the introduction of any more typographical errors.

A MANUAL OF MENTAL SCIENCE FOR TEACHERS AND PUPILS. Childhood: Its Character and Culture. By Jessie A. Fowler. New York: Fowler & Wells Company. Pp. 235. Price \$1.

MIT SCHLÄGEL UND EISEN. By Dr. Wilhelm Bersch. Vienna, Pesth and Leipzig: A. Hartleben. Twenty-five parts of 32 pages each, at the price of 30 kr. (15 cents) per part, or \$3.75 for the whole work.

It presents, in a popular way, all the subjects that pertain to mines and mining, such as geology, mineralogy, constructions, tools and machines used in mining, and the methods and apparatus for treating ores and other mining products. The book is illustrated by more than 300 cuts and 26 full page engravings. The paper, type and general get-up of the work are excellent, and the book will be similar in size and style to the popular works on electricity, railway construction and general scientific subjects issued by the same publishers.

We have received the Christmas number of the Northwestern Miller, and it is a remarkable specimen of trade journalism. The cover of the number is embossed in imitation of old ivory, representing Don Quixote making his fierce attack on the windmill of the Manchan plain. There is a colored frontispiece showing milling among the cliff dwellers of Arizona. Various articles in the number are contributed by such writers as Mary Halleck Foote, Octave Thanet, Bill Nye, Edward Everett Hale and others. Many of the illustrations are in color and the half-tones are superbly printed. There is also a map showing the winter and spring wheat sections of the United States, with valuable statistics. The holiday number is mailed by the publishers, from Minneapolis, for fifty cents.

TO INVENTORS.

An experience of nearly fifty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequaled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

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