

he makes an earnest plea for assistance to be given to investigators in these lines. Our readers are already familiar with some of this class of work, from our description of Professor Pickering's work at the Harvard College observatory, and considerable space is given to the results of the Henry Draper memorial investigations in the book before us.

CATALOGUE OF PRACTICAL AND SCIENTIFIC BOOKS. Published by Henry Carey Baird & Co., 810 Walnut Street, Philadelphia, Pa., U. S. A.

We have received a copy of the above catalogue, which is devoted to the publications of this well known house. Space does not permit us to more than hint at its contents. It comprises a large assortment of standard works on technical subjects, and the principal works have a synopsis of the contents given, so that a buyer can order safely from the catalogue, knowing in advance whether what he is buying will be likely to suit his requirements.



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 This is for our information, and not for publication.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.

(1) N. B. D. asks: 1. How many gear wheels would make a good set for ordinary use on a small Barnes lathe, which I wish to convert from a hand feed to an automatic screw-cutting feed? How many teeth should the several wheels contain? A. For a small lathe for amateur work the screw should be 10 threads to an inch.

Table with 3 columns: Stud gear, Screw gear, Teeth. Rows include 10 threads, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30.

2. Which would be the most economical and practical form of rotary engine—one of large diameter and short through shaft, or small diameter and greater length? Would not the first develop greater power at slower speed? Theoretically, the rotary engine would seem to be the best form of steam motor, as there are no dead centers and motion is continuous in one direction.

(2) J. A. asks how he can make a magnet exert its magnetic attraction through 6 inches of metal—alternate layers of steel (hardened) and iron. A. This is practically impossible. The mass of iron distributes the magnetism so as to act as a magnetic shield.

(3) S. M. L.—The springs of steam gauges are made of seamless tubing flattened by drawing over a flat mandrel, and bent to the proper form after being filled with resin or fusible metal, the filling melted out, and the springs then burnished. They are generally made of an alloy of copper 1 pound, tin 1 ounce, zinc 4 ounces. Very small gauges have been made for special purposes, having springs 1 1/4 to 2 inches diameter.

(4) J. B. asks a cure or, at least, a relief for chilblains. A. Dissolve 1 ounce ammonium chloride in 1/2 pint cider vinegar, and apply frequently: 1/2 pint alcohol may be added to this lotion with good effect.

on the next. The first may be of shellac and lampblack only. The Harvard liquid slating sold by paint houses is likewise an excellent preparation for this purpose.

(6) C. W. F. asks: 1. How can I make a good sticky fly paper? A. In a tin vessel melt together 1 pound resin and add 2 fluid drachms of linseed oil. While the mixture is warm dip a spatula into it and spread what adheres to the blade on foolscap paper. Different samples of resin require varying proportions of oil to make it spread properly.

(7) E. A. J. asks (1) how to make a strong parchment paper. A. Mix dilute strong sulphuric acid with 1/2 its volume of water and allow it to cool to about 65° Fah. Then immerse unsized paper in the cold acid for 10 to 50 seconds, according to its thickness. The paper is then well washed in cold running water, and dipped in dilute ammonia, again washed in water and finally dried.

(8) E. T. S. asks: 1. How can I give pine wood an ebony finish? A. Use the following: Dissolve 4 ounces shellac with 2 ounces borax in 1/2 gallon water. Boil until a perfect solution is obtained, then add 1/2 ounce glycerine, after which add sufficient aniline black (soluble in water), and it is ready for use. 2. How to crystallize glass so that it will not wash off. I have used salts and sour beer, but the least moisture destroys it.

(9) C. P. S. asks (1) the point at which gasoline becomes a vapor or gas so that it can be burned. A. Gasoline is inflammable at the ordinary temperature, and can be burned. In using this as a gas, it is generally the habit to force air through a convenient vessel filled with shavings, saturated with gasoline, and as it comes out it may be ignited.

(10) W. S. desires a recipe for the padding glue so commonly used by printers throughout the country. A. Use a cheap glue, with five per cent glycerine, made into a mixture with any suitable coloring material. Some use ordinary rubber cement, made by dissolving rubber in carbon disulphide.

(11) A. G. M. asks how to clean kid gloves. A. Provide a tall glass cylinder, in the bottom of which place strong aqua ammonia. Be careful to remove from the sides of the jar any ammonia that may have been splattered upon them. Suspend the gloves to the stopper of the jar and allow them to remain for a day in the atmosphere of ammonia.

(12) L. S. C. asks the formula used in making oil coats (the light yellow ones worn by teamsters). A. As far as we can learn, the process consists simply in dipping the articles into boiled linseed oil. An excellent receipt is boiled oil 15 pounds, beeswax 1 pound, ground litharge 13 pounds. Mix and apply with a brush to the article, previously stretched against a wall or a table, first well washing and drying each article before applying the composition.

(13) H. G. H. asks for information on the following points concerning the construction of an induction coil, similar to the one described in SUPPLEMENT, No. 160, but 16 inches in length. What size of wire should be used for the primary coil? How many thicknesses of varnished paper should be placed between the layers of the secondary coil, the layers being wrapped entirely across the coil? A condenser of how many square feet should be used? How many cells bichromate of potash battery will best operate the coil? How long sparks ought such a coil to give? A. Use the same wire as specified in the article in SUPPLEMENT, No. 160, for a 16 inch induction coil.

(14) S. J. S. asks (1) a receipt for a dead black paint for photo. use and inside of optical instruments. A. For a dead black for inside of tubes use lampblack or artists' boneblack mixed with alcohol in which a few drops of shellac varnish have been mixed. No more shellac than will just make the black stick. Make a trial on a piece of metal. If, on drying, it shows the least shining surface, there is too much shellac. If, on the contrary, the black readily rubs off with the fingers, there is not enough shellac. A drop of shellac varnish to a tablespoonful of the mixture may change its drying character to a shining or a dead surface.

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