

(67) N. S. J. asks: How can I make a desirable cement for leather? A. The following water-proof cement has been highly recommended: Melt together in an iron pot equal parts of common pitch and gutta percha, and stir well. This may be kept liquid under water, or solid, to be re-melted when wanted. It is not attacked by water, and adheres very strongly to leather.

(68) J. L. W. asks: How are pictures properly transferred to vehicle panels? A. Cover the picture entirely (taking care not to go beyond the outlines) with a slight coat of fixing varnish, then put the picture on the object to be ornamented, being careful to place it properly at once, to avoid spoiling it by moving. The varnish newly applied being too liquid, the picture should be allowed to dry for about ten minutes, and placed on the object to be ornamented, when just damp enough to be adherent; this done, cover the back of the picture with a piece of cloth steeped in water, then, by means of a knife or penholder, rub it all over, so as to fix every part of it; then remove the piece of cloth and rinse the paper with a paint brush steeped in water; at the end of a few minutes the paper will come off, leaving the painting transferred. Care must be taken that the piece of cloth, without being too wet, is sufficiently so for the paper to be entirely saturated. The picture must now be washed with a wet brush, and dried very lightly with some blotting paper. Keep the ornamented article in a warm, dry place, until dry. The polishing varnish should not be applied until the next day, keeping the pictures meanwhile out of the dust. The latter varnish should be applied as lightly as possible. If dark colored objects are to be ornamented, the picture should first be covered with a mixture of white lead and turpentine, following the outlines of the design, and covering it entirely. When this coat is perfectly dry, proceed as above.

(69) T. K. G. asks: Will a mixture of two parts chlorate potassa and one part sulphur answer as a compound for explosive bullets? A. Use chlorate of potash 6 parts, sulphur 1 part.

(70) J. B. W. says: I have industriously sought for a long time to find the genuine article of camphene. I am informed that it is nothing but spirits of turpentine doubly refined, but no one can tell me the exact process of making. I want such an article as used to be made for burning purposes. A. The so-called camphene is ordinary refined spirits of turpentine. In some cases a little alcohol was added to render the flame less smoky.

(71) J. P. N. says: I have noticed two blue flagstones which appeared to have been outside layers in the quarry, each having on them grooves, the hollows of which were about one fourth inch deep, leaving the ridges some two inches apart; but the grooves, instead of being straight, were regularly zigzagged. I can readily see how straight grooves and scratches are made by the action of glaciers; but how can these zigzag grooves be produced? A. It is not certain that the lines are due to the action of the glaciers; they may have been formed in the rock itself.

(72) A. R., Marienbad, Bohemia, says: Let me correct your answer to W. H. W., on p. 138, vol. 33. The addition of a small quantity of cyanide of potassium to a solution of copper will completely discolor it, even in the presence of an excess of ammonia.

(73) F. McC. and others ask such questions as the following: Are the chances favorable for a young man aged 23, with good English education, a strong love for mathematics and the profession of civil engineering, and some knowledge of algebra and geometry, to become a good civil engineer, by spending his evenings in the study of mathematics? If so, what knowledge of mathematics would be necessary before beginning the practice of the profession? A. Our advice to such a young man is to get a position, if possible, with a civil engineer engaged in active work, such as surveying, prospecting, or constructing. No matter how humble the position at first, if the young man has it in him he is pretty sure to rise; and his own experience will tell him what studies he had best pursue.

(74) H. L. C. says: In answer to R. L. S.'s query as to stone arrow heads, you say "that they were used before the discovery of America." I will add that they are used at the present day by the Indians of the Far West, where they use them for shooting game; but the arrowheads are small compared with some of those found in this State. The size of those now in use is from 1/2 x 1 1/4 inches to 3/4 x 1 1/2 inches; while I have found several in this State as large as 1 1/2 x 4 inches.

(75) O. C. L., says, in reply to R. H., who asks if it is not unusual for flies to be magnetic; I would say that I have often observed it in our own flies, but especially in a small punch, which was capable of supporting the weight of a tack. In the case of the punch, it was probably caused by the hammering.

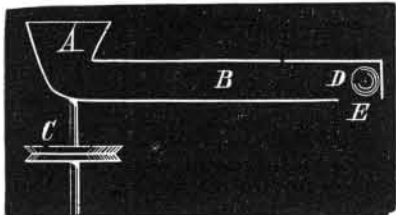
(76) W. E. S. says, in answer to J. H. R. who asks how to make an electro-magnet that will work very slowly: There is really nothing easier than to regulate the ultimate quickness of electro-magnetic action, with a given electromotive force. Everything depends upon the length of the iron core, its thickness, and the adjustment of the armature. For instance, the core of an electro-magnet, which includes not only that portion of the metal which is encased in the helices, but the back connecting piece, may, with a single cell of battery, attract its armature, adjusted to a certain tension, at the rate of 1,000 times per minute; while if we double the length of the core, the armature will be attracted to a bearing, under the same tension and with the same battery, but 500 times per minute. I have a very long electro-magnet which will exert its maximum force but 25 times per minute, while I have another, the

core of which is less than 2 inches long, which will attract its armature between 4,000 and 6,000 times per minute. A great deal depends upon the thickness of the iron core; much upon the resistance of the helix; but most upon the length of the core. If I. H. R. will construct an electro-magnet of 1/2 inch round iron, each limb of which shall be 12 inches long, with a resistance of say 200 ohms of No. 24 wire, I fancy he will have a sufficiently slowly acting apparatus, provided his battery has not too great electro-motive force, and his armature adjustment be proper. Such a magnet could be regulated to exert its maximum force as slowly as 60 times per minute.

(77) E. D. R. says, in reply to a correspondent who asked: "What is bird pepper?" I enclose a specimen with a small limb of the plant. It grows wild all over Southwestern Texas, and is called by Mexicans and Spaniards *chili colorado* which, translated, means red hot. If you taste the enclosed specimen, you will find the name is a good one. It grows up from the root every year. Where it is abundant, the turkeys and prairie chickens feeding upon it become so saturated that it is impossible to eat them. A. The specimen sent is very similar to the cherry pepper of West Africa, which is eaten by small birds, and is used by the natives to spice their favorite dish, palaver sauce, with.

(78) A. S. says, in reply to E. N., and others, who asked how to remove superfluous hair: *Aurum pigmentum* (sulphuret of arsenic) mixed with slaked lime to the consistence of paste, is used in Europe to remove the beard from the face, without soap or razor.

H. A. P. asks: Where is the deepest mine in the world?—G. W. P. asks: Is there anything that will render wood proof against the action of nitrate of silver, which has been used in sensitizing collodion? I want a solution which will not dissolve in either alcohol or ether. I have used asphalt and beeswax; but as they have to be applied hot, they are not very convenient.—R. F. H. asks: If a ball, D, is dropped in hopper, A, while the square



tube, B, is revolved horizontally at a high rate of speed, by means of shaft and pulley, C, it will be thrown by centrifugal force against the end of the tube. Will it be held there, or will it drop through the opening, E?—H. C. asks: How are the edges of the leaves of a book arranged to show a gold edge when closed, and a red edge when open?

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges, with much pleasure, the receipt of original papers and contributions upon the following subjects:

- On Large and Small Wagon Wheels. By M. G. P.
On Stealing Brains. By E. C.
On Some Curious Properties of the Figure 5. By G. R. B.
On American Grape Vines. By S. F.
Also inquiries and answers from the following:
R. K.—J. C. W.—R. G. S.—E. T. H.—F. J.—H. D.—
W. J. S.—C. E. S.—N. D. T.—G. M.—C. C.—G. A. S.

HINTS TO CORRESPONDENTS.

Correspondents whose inquiries fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them. The address of the writer should always be given.

Enquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address is given.

Hundreds of inquiries analogous to the following are sent: "Who sells pyrometers? What is the price of a good aneroid barometer? Who deals in mica? Who sells theodolites? What does a binocular microscope cost?" All such personal inquiries are printed, as will be observed, in the column of "Business and Personal," which is specially set apart for that purpose, subject to the obargementioned at the head of that column. Almost any desired information can in this way be expeditiously obtained.

[OFFICIAL.]

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- 8,673.—LAMP CHIMNEY, ETC.—T. B. Atterbury, Pitts-
burgh, Pa.
8,674.—OIL CLOTHS.—J. Barrett, New York city.
8,675 and 8,676.—CASSIMERE.—F. Bosworth, Providence,
R. I.
8,677 to 8,679.—CARPETS.—O. Hehnigke, New Utrecht,
N. Y.
8,680 to 8,684.—CARPETS.—H. Horan, East Orange, N. J.
8,685.—COOK STOVES.—W. J. Keep, Troy, N. Y.
8,686.—TRIMMING.—S. McLaughlin, Philadelphia, Pa.
8,687.—CARPETS.—E. J. Ney, Dracut, Mass.
8,688.—BUST.—W. Page, New York city.
8,689.—OIL CLOTH.—F. H. Randall, Camden, N. J.
8,690.—COFFIN SCREWS.—C. B. Rogers, West Meriden,
Conn.
8,691.—CARPETS.—T. J. Stearns, Boston, Mass.
8,692.—CASSIMERE.—W. A. Walton, Providence, R. I.
8,693.—CARD BORDER.—M. Bolton, Jr. Philadelphia, Pa.
8,694 and 8,695.—BRACKET.—C. Herter, New York city.
8,696 to 8,698.—GASLIGHTS.—C. Herter, New York city.
8,699.—CHANDLIER.—C. Herter, New York city.
8,700.—LIGHT.—C. Herter, New York city.
8,701.—LAMP.—C. Herter, New York city.
8,702.—WALL POCKETS.—J. C. Lamm, Hopedale, Ill.
8,703.—DESK.—J. S. Morgan, Brooklyn, N. Y.
8,704.—PROVISION SAFE.—F. Northrup, Detroit, Mich.
8,705.—EMBROIDERY.—E. Crisand, New Haven, Conn.

SCHEDULE OF PATENT FEES.

On each caveat.....\$10
On each Trade mark.....\$25
On filing each application for a Patent (17 years).....\$15
On issuing each original Patent.....\$30
On appeal to Examiners-in-Chief.....\$10
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On filing a Disclaimer.....\$10
On an application for Design (3 1/2 years).....\$10
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