

greater than 1:15708, the arc is greater than a semi-circle, and indeterminate by this means. As the ratio of the arc to the sine increases slower in the first half of the quadrant than in the last half, the number of degrees may be approximately estimated by the given lengths of the 1/2 arc and 1/2 chord; and by a few trials, the ratio can be found without going through the long process of making out a full table of the quadrant. A. This is not a new method, but is worth investigation.

(70) J. N. McC. says, in reply to several correspondents, who ask as to burning slack: "My experience is that slack requires the grate bars to be very open. I have always used the widest I could get, not less than an inch between the bars; I have used bars with openings of 1 1/2 inches. The only secret in using it with any kind of a furnace is to have the grate bars open enough, so that the fire can be kept open from the underside of the grates, with the poker. Some coal, of course, will go through at first; but coarse coal or wood can be used to start with, and you must rake out what falls through the grate, and put it in again. The coal will soon take so that it will not waste. To build a furnace for the purpose, I would make it wider than usual, with doors in the side of the front, similar to furnaces for burning sawdust. For some varieties of coal, it will be found beneficial to wet the coal before throwing it into the furnace; it helps it to run together. Then put in the coal at the side doors, and let it alone till it cakes; then take your poker and roll it into the center of the fire. It will then be in large lumps and will not waste; and you will always have a good fire in the center. Never smother it with fresh coal."

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the results stated:

R. B.—A very highly siliceous slate, perfectly compact and homogeneous.—J. E. E.—Your specimen does not contain silver.

J. E. D. asks: How can I make cream candy for feeding weak colonies of bees during the winter? How is the granular condition of the sugar overcome?—E. W. H. asks: How are honey locust seeds prepared for sowing?—N. N. asks: Can you tell me how to color coral after it has been burned?—P. W. says: I have a tame frog which in summer lives on flies. What shall I give it in winter?

COMMUNICATIONS RECEIVED.

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

- On Steam Boiler Explosions. By C. R. C. and by S. G. H.
On Brass Bearings. By T. J. B.
On Utilizing Water Power. By H. C. K.
On a Cheap Locomotive. By F. G. W.
On Springs and Wells of Water. By —
On Tunneling. By J. H. S.
On a Flying Machine. By M. B. E. and by L. S.
On Phosphorus. By —
On Multiplication and Division. By G. B. G.
Also enquiries and answers from the following:
E. S. V.—K.—M.—J. B.—L. R. C.—W. H. L.—T. A. J.—P. B. S.—L. W.—I. E. N.—C. O'B.

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 enquiries analogous to the following are sent: "Who makes balloons? Who sells machines for hulling barley, and also for grinding oatmeal? Where can machines for marking boxwood rules be obtained? Are there any makers of railway ticket printing machines in the United States?" All such personal enquiries are printed, as will be observed, in the column of "Business and Personal," which is specially set apart for that purpose, subject to the charge mentioned at the head of that column. Almost any desired information can in this way be expeditiously obtained.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH Letters Patent of the United States were Granted in the Week ending December 29, 1874, AND EACH BEARING THAT DATE. [Those marked (r) are reissued patents.]

Table listing inventions with names and dates, such as Air and gas, carbureting, Ammonia, manufacture of, L. S. Fales, 158,265.

Table listing inventions with names and dates, such as Bridge, truss, L. L. Buck, 158,191; Bridge, tuss, J. B. Winters, 158,347; Buckle, harness, P. Burns, 158,198.

Table listing inventions with names and dates, such as Stool, foot, E. H. Crooker, 158,250; Stop doubling machine, etc., W. Masterson, 158,295; Stove, J. H. Blake, 158,195.

DESIGNS PATENTED.

Table listing designs patented with names and dates, such as Soda water apparatus, G. F. Meacham, 7,957 & 7,958; Buckles, V. Price, Woodside, N. Y., 7,959.

TRADE MARKS REGISTERED.

Table listing trade marks registered with names and dates, such as Labels, Allen, Lane & Scott, Philadelphia, Pa., 2,140; Cigars, Goldsmith & Newburgh, Cincinnati, O., 2,141.

SCHEDULE OF PATENT FEES.

Table listing patent fees: On each caveat, \$10; On each Trade mark, \$25; On filing each application for a Patent (17 years), \$15.

CANADIAN PATENTS.

LIST OF PATENTS GRANTED IN CANADA, DECEMBER 23 to DECEMBER 29, 1874.

Table listing Canadian patents with names and dates, such as H. Smith, Hamburg, Waterloo county, Ont., 4,205; J. Tesseman and P. Smith, Dayton, Montgomery county, Ohio, U. S., 4,206.

Advertisements.

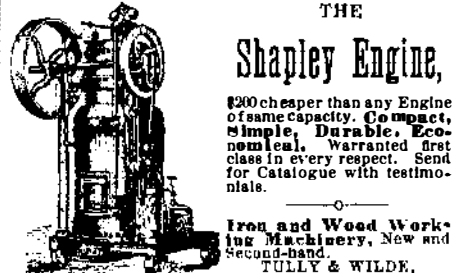
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