

Business and Personal.

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"U. S." metal polish. Indianapolis. Samples free. Cheap 2d-hand lathes & planers. S. M. York, Clev'd, O.

Best Handle Machinery. Trevor Mfg. Co., Lockport, N. Y. Fine manufacturing plant to let, sell, or invest in promising business.

Wanted—Catalogue and price list of Shell Button Machinery. C. C. Reynolds, Prescott, Arizona.

The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Centrifugal Pumps for paper and pulp mills. Irrigating and sand pumping plants. Irvin Van Wte, Syracuse, N. Y.

Portable engines and boilers. Yacht engines and boilers. B. W. Payne & Sons, Elmira, N. Y., and 41 Dey Street, New York.

Guild & Garrison, Brooklyn, N. Y., manufacture steam pumps, vacuum pumps, vacuum apparatus, air pumps, acid blowers, filter press pumps, etc.

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Fine Castings in Brass, Bronze, Composition (Gun Metal), German Silver. Unequaled facilities.

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The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins.

Kennedy Valve Mfg. Co., manufacturers of brass, iron gate valves, patent indicator valves, fire hydrants, globe, angle, check, radiator, and safety valves.

Competent persons who desire agencies for a new popular book, of ready sale, with handsome profit, may apply to Munn & Co., Scientific American office, 361 Broadway, New York.

Wanted—Traveling man for forge. One who understands the business and is capable of making estimates on marine, railroad, and machine forgings.

Pointer on Advertising.—Manufacturers who would advertise for profit in 1893 should write to the Manufacturers' Advertising Bureau and Press Agency, 111 Liberty Street, New York, for points.

Send for new and complete catalogue of Scientific and other Books for sale by Munn & Co., 361 Broadway, New York. Free on application.



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 This is for our information and not for publication.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.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

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.

(4645) F. D. B. asks: How many elements are known to chemists at the present day? What metals are lighter than water?

(4646) G. C. M. asks: What size wire shall I use to convey a current of electricity, E. M. F. 9 to 12 volts, 1 to 150 amperes, a distance of 25 to 30 feet?

(4647) H. & T. ask: Is there a pneumatic tube between Paris and Berlin, and if so, for what purpose is it used, and with what speed does the car travel?

(4648) J. O. and others ask how to ink typewriter ribbons. A. Take vaseline (petrolatum) of high boiling point, melt it on a water bath or slow fire.

(4649) J. P. B. asks: How narrow a belt will a four horse power engine run and develop all the power there is in the engine (steam or gasoline), also what number horse power steam or gasoline engine would be equal to three good (true pulling) horses in a sweep or lever power?

(4650) M. S. K. writes: A friend says that a man weighs more at the equator than at the north pole, owing to the increase of gravity as the equator is approached.

(4651) E. V. wishes to know the life and how many shots can be fired from the 124 ton gun to be exhibited by Krupp at the World's Fair.

two cities. The speed is about 20 miles per hour. Size of tube 2 1/4 inches.

(4648) J. O. and others ask how to ink typewriter ribbons. A. Take vaseline (petrolatum) of high boiling point, melt it on a water bath or slow fire.

Aniline black 1/2 oz.

Pure alcohol 15 "

Concentrated glycerine 15 "

Dissolve the aniline black in the alcohol and add the glycerine. Ink as before.

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(4652) O. D. R. asks: What is the difference in the power necessary to perform a certain amount of work with the usual piston, link and crank and with the power applied tangentially to a crank of the same radius?

(4653) C. A. G. writes: In a letter of the 13th century it is related that some Greenland fishermen on the 25th of July, 1286, were in a place where "the sun was shining both nights and days, and was as high at midnight as it used to be when seen north-west of their home."

(4654) G. H. asks: Which is the largest and best shipyard where a man can get a job as carpenter, and what are the average wages for carpenters?

(4655) X. Y. asks: Is there an acid or spirit that by placing on ordinary glassware will soften it so I can bore holes in it with a common awl?

(4656) P. G. asks: How fast can a man of ordinary strength row a sixteen foot boat containing one person besides himself?

hour? A. One man can row a light shell boat from 5 to 5 1/2 miles per hour. It will require a 12 inch diameter wheel, 2 feet pitch, 250 revolutions per minute to make 5 miles per hour.

(4657) Subscriber in Sweden asks: What is it to vulcanize railway sleepers, what way is it done, and what preparation is used for the purpose?

(4658) C. S. K. asks if the tension in a clock spring increases by winding the same amount as a spring in spring scales by pulling.

(4659) E. B.—Zinc has the greatest degree of expansion and contraction by changes in temperature of the common metals.

(4660) S. H. W.—Malleable iron can be nickel plated.

TO INVENTORS.

An experience of forty 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 unequalled facilities for procuring patents everywhere.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

January 17, 1893,

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Table listing inventions such as Account, blank form for keeping, T. M. Brown. 493,135; Advertising apparatus, S. Kuhn. 493,361; Alarm clock, electric, J. A. Nadeau. 493,171.

Table listing inventions such as Ceiling, metallic, L. J. Cherest. 490,186; Chair fan attachment, P. A. Tornwall. 490,234; Check or token and missive, combined, J. P. Stout. 490,048.