

metal of which the latter is composed. The cylinder is made thin toward its free end, so that when the charge, which is partially enveloped by it, is fired, the cylinder will be expanded and forced tightly against the walls and into the rifled grooves of the gun.

From the examiner's report it appears that lead, molded into a similar form, and similarly attached, had previously been proposed for an expanding sabot upon heavy projectiles.

It is beyond question, however, that Read produced largely superior results by the substitution of the wrought iron; and his experiments doubtless had much to do with demonstrating the feasibility of using the hard metals for the expanding sabots of rifle projectiles, and thus insuring the success of rifled ordnance of large caliber.

His net receipts in excess of cash expenditures are about ten thousand dollars; but in stating this no allowance is made for nearly three years time devoted to the conducting of experiments at a point distant from his place of residence, and for the consequent serious interruption of his professional practices.

In view of the importance of the invention the inference is justified that the petitioner has not been reasonably remunerated. This evidently is the judgment of the Committee on Military Affairs and the Militia in the Senate of the United States, by whom, at the last session of Congress, a report was made upon a memorial of Dr. Read, asking for compensation for his invention, in which report they recommended an appropriation of seventeen thousand dollars "as remuneration for the use of his (Read's) improvements, and as indemnity for his actual expenses in perfecting them, as well as for the time and attention devoted to them."

It is beyond question, however, that Read produced largely superior results by the substitution of the wrought iron; and his experiments doubtless had much to do with demonstrating the feasibility of using the hard metals for the expanding sabots of rifle projectiles, and thus insuring the success of rifled ordnance of large caliber. His net receipts in excess of cash expenditures are about ten thousand dollars; but in stating this no allowance is made for nearly three years time devoted to the conducting of experiments at a point distant from his place of residence, and for the consequent serious interruption of his professional practices.

For his great mistake in this regard he has no one to blame but himself. The presumption is that he intelligently resolved to forego the superior opportunities which he must have known a course of loyalty would insure him, and with equal deliberation accepted the uncertainties in which his erratic course involved him. He cannot be permitted now to plead that this action involved no fault on his part, and that in thus deserting his country in her hour of peril he was guilty of no neglect of the rights secured to him by his patent.

I am constrained to hold that his failure to receive the remuneration to which he deems himself entitled under his patent, has arisen mainly from his own fault and neglect, and I am therefore powerless to afford him the relief which he now asks. The extension cannot be refused.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address correspondents by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at 100 a line, under the head of "Business and Personal."

All reference to back numbers must be by volume and page.

H. & R., of Ontario.—The amount of air to be admitted, through perforated pipe at back of the bridge wall, across a boiler furnace, to effect perfect combustion, will vary according to circumstances. Provision should be made for maximum admission, and regulating the same down to a point where just enough air is admitted to consume the smoke and no more. Every pound of air admitted beyond this point will result in loss of heat. Therefore we advise you to err on the safe side, if you err at all, by making the admission free, and the perforations in the pipe numerous and of good size. We cannot even approximate to proportions, as you give no data, but you need not fear to go ahead with the work, if you do not stint the capacity for the admission of air. With a good damper you can control it perfectly, and get good results.

A. J. H. & Co., of Mass.—We have never seen a y iron so badly sealed or incrustated with oxide, that it could not be cleaned with a solution of one part sulphuric acid in ten parts water. Paradical as it may seem, strong sulphuric acid will not attack iron with anything like the energy of a solution of the same. On withdrawing the pieces from the weak solution of acid, they should be dipped in a bath of hot lime water, and held there till they become so heated that they will dry immediately when taken out. Then if they are rubbed with dry bran or sawdust, there will be an almost chemically clean surface left, to which zinc will adhere readily. We think you have been using too strong acid.

T. G., of N. Y.—The brown powder collecting on the zinc of your Danell's battery, is an oxide of copper deposit. This deposit and the copper deposit on the surface of the cup cannot be wholly avoided, but, according to Pope, it may be greatly lessened, by suspending the zinc so that it will not touch the porous cup below the surface of the liquid, and by saturating the bottom of the porous cup to the height of half an inch with paraffin. For answers to your other queries, we refer you to standard treatises on electricity. We cannot give space to them here.

M. L. W., of N.—If a pipe containing water have its lower end open beneath the surface of mercury, upon opening the upper end of the pipe, the water will fall in the pipe and bubble up to the surface of the mercury, until the column in the pipe just balances the pressure of the mercury, when the flow will cease. The specific gravity of mercury at 60° Fah., is 13.56, water being 1. We cannot give you its price per pound.

F. X. L., of Md.—There are many flexible transparent substances beside Isinglass (mica). Thin plates of gelatin, or horn, films of collodion, tracing paper such as is used by artists, are articles which we think might some of them answer your purpose.

RESTORING THE COLOR OF GOLD AFTER SOLDERING.—Let R. R. boil the gold, after soldering, in diluted oil of vitriol; rinse in clean water, polish with tripoli mixed in oil (sweet oil is best), wash and gloss with crocus on a clean cloth.—C. J. C., of Iowa.

BORING OUT SEGMENT OF CYLINDRICAL RING.—Having published a practical method for performing the above work, we take this means of notifying correspondents that their communications upon this subject are no longer of value. We cannot undertake to reply to this effect to each personally. We have on hand a number of designs, few of which are practical, and none of which we shall use. We are much obliged to all for their attention, and shall be glad to hear from them on any other practical subject within the scope of the SCIENTIFIC AMERICAN.

TO FASTEN CHAMOIS AND OTHER LEATHER TO IRON AND STEEL.—Dr. Carl W. Heinschen, of Dresden, gives the following recipe for the above purpose: "Spread over the metal a thin, hot solution of good glue; soak your leather with a warm solution of gallnuts before placing on the metal, and leave to dry under an even pressure. If fastened in this manner it is impossible to separate the leather from the metal without tearing it.—G. E. M., of Texas.

R., of Va.—You will find information in regard to windmills in Craik's "Practical Millwright and Miller," published by Henry Carey Baird, Philadelphia, Pa.

J. H. W., of Cal.—The density of proof spirits is not materially affected by pressure, and the hydrometer would show the same results on the mountain as in the valley.

Business and Personal.

Charge for Insertion under this head is One Dollar a Line. If the Notices exceed Four Lines, One Dollar and a Half per Line will be charged.

"Edson's Recording Steam Gage and Alarm," 91 Liberty st., N. Y. Recommended by U. S. Inspectors as protection to good engineers, the charts showing quality of work performed.

\$3.—The Celebrated Craig Microscope and two mounted Entomological objects sent prepaid for \$3. Magnifies 100 diameters, or 10,000 times. If not as represented money refunded. Over 60,000 sold during the past five years. Theo. Tusch, 37 Park Row, New York.

The paper that meets the eye of manufacturers throughout the United States—Boston Bulletin, \$4 00 a year. Advertisements 17c. a line.

Wanted.—A good, second-hand, small Engine Lathe, complete. Address, with description and price, Box 1166, Galesburg, Ill.

Manufacturers of Brick Machines please send Circulars to O. S. Lee, Lexington, Miss.

For Sale.—Stereopticon, 150 Views, all complete. A. Dougherty, 75 Dykeman st., South Brooklyn, L. I., N. Y.

For Sale.—The Combined Tool illustrated in Scientific American, Jan'y 28, 1871. Wilkinson & Boyle, Plattsburgh, N. Y.

For Sale.—A valuable Water Power, Mills, etc. Peach Orchard in Delaware. I. J. W. Adams, Salisbury, Md.

Wanted, by a first-class Machinist, some article to manufacture. D. E. Cain, Hingham, Mass.

Wanted.—The address of every reader of the SCIENTIFIC AMERICAN, to whom will be sent FREE a specimen number of that first-class Family Magazine, THE PHRENOLOGICAL JOURNAL. Address S. R. Wells, 389 Broadway, N. Y.

Band Saws for Re-sawing, with Patent Elastic Wrought-Iron Wheels, 4 to 10 ft. in diameter, made by Richards, Kelley & Co., Philadelphia.

Marietta Grindstones. J. E. Mitchell, Philadelphia, Pa.

American Wickersly Grindstones. J. E. Mitchell, Philadelphia.

Drain Pipe and Brick Molding Machinery wanted. Address Wm. S. Tilton, Augusta, Me.

Brown's Coal-yard Quarry & Contractors' Apparatus for hoisting and conveying material by iron cable. W. D. Andrews & Bro., 414 Water st., N. Y.

First-class Gage Cocks, at E. H. Ashcroft's, 55 Sudbury st., Boston, for \$10.80 per dozen.

Wanted.—A practical Cotton Spinner, to go to Mexico, under contract; one understanding self-acting mules preferred. For further particulars address Mr. Michael Bittler, Eagle Hotel, Bethlehem, Pa.

McCauley's Improved Force Pump, especially adapted to deep wells. Send for Circular. R. A. McCauley, Baltimore, Md.

2d hand Worthington, Woodward and Novelty Pumps, Engines 25 to 100 H. P., 60 Horse Loc. Boiler. W. D. Andrews & Bro., 414 Water st., N. Y.

Wanted.—A Partner, with capital, in a newly invented Gun. Address A. H. Townsend, Georgetown, Colorado.

Agents wanted, to sell the Star Bevel. It supersedes the old style. Send for Circular. Hallett & White, West Meriden, Conn.

Japanese Paper-ware Spittoons, Wash Basins, Bowls, Pails, Milk Pans, Slop Jars, Commode Pails, Trays. Perfectly water-proof. Will not break or rust. Send for circulars. Jennings Brothers, 352 Pearl st., N. Y.

House Planning.—Geo. J. Colby, Waterbury, Vt., offers information of value to all in planning a House. Send him your address.

Manufacturers and Patentees.—Agencies for the Pacific Coast wanted by Nathan Joseph & Co., 619 Washington st., San Francisco, who are already acting for several firms in the United States and Europe, to whom they can give references.

Valuable property and machinery for manufacturing in P'keep-sie, N. Y. Apply to W. H. Crosby, 261 Mill st., or on the premises, Bayeaux st.

For small, soft, Gray Iron Castings, Japanned, Tinned, or Bronzed, address Enterprise Manufacturing Company, Philadelphia.

The best place to get Working Models and parts is at T. B. Jeffery's, 160 South Water st., Chicago.

E. Howard & Co., 15 Maiden Lane, New York, and 114 Tremont st., Boston, make the best Stem-winding Watch in the country. Ask for it at all the dealers.

Improved Foot Lathes. Many a reader of this paper has one of them. Selling in all parts of the country, Canada, Europe, etc. Catalogue free. N. H. Baldwin, Laconia, N. H.

Steel name stamps, figures, etc. E. H. Payn, M'fr, Burlington, Vt.

Sold Rolled—Shafting, piston rods, pump rods, Collins pat. double compression couplings, manufactured by Jones & Laughlin, Pittsburgh, Pa.

Keuffel & Esser 116 Fulton st., N. Y., the best place to get 1st-class Drawing Materials, Swiss Instruments, and Rubber Triangles and Curves

For mining, wrecking, pumping, drainage, and irrigating machinery, see advertisement of Andrews' Patents in another column.

For Solid Wrought-iron Beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, etc.

For the best Self-regulating Windmill in the world, to pump water for residences, farms, city buildings, drainage, and irrigation, address Con. Windmill Co., 5 College Place, New York.

Conklin's Detachable Rubber Lip, for bowls, etc., works like a charm. For Rights, address O. P. Conklin, Worcester, Mass., or A. Daul, Philadelphia, Pa.

For the latest and best Improved Hub Lathe, Hub Mortising Machine, Spoke Lathe, Spoke Tenoning and Throating Machine, address Kettering, Strong & Lauster, Defiance, Ohio.

Thomson Road Steamers save 50 per cent over horses D. D. Williamson, 32 Broadway, New York.

Automatic 10-spindle drill, 5,000 to 20,000 holes a day in castors, etc. Tin presses and dies for cans. Ferracute Machine Works, Bridgeton, N. J.

Diamonds and Carbon turned and shaped for Philosophical and Mechanical purposes, also Glazier's Diamonds, manufactured and reset by J. Dickinson, 64 Nassau st., New York.

Shive's Pat. Governor, with Automatic Safety Check, which prevents the Engine from running away, received three highest premiums. A. B. Lawrence, General Agent, 38 Cortland st., New York.

Patent Elliptic-gear PUNCHES and Shears.—The greatest economy of power, space, and labor. Can be seen in operation at our factory, in Trenton, N. J. Address American Saw Co., 1 Ferry st., New York.

Hand Screw PUNCHES and Lever PUNCHES. American Saw Co. New York.

Peck's Patent Drop Press. For circulars address the sole manufacturers, Milo, Peck & Co., New Haven, Ct.

English and American Cotton Machinery and Yarns, Beam Warps and Machine Tools. Thos. Pray, Jr., 57 Weybosset st., Providence, R. I.

Self-testing Steam Gage—Will tell you if it is tampered with, or out of order. The only reliable gage. Send for circular. E. H. Ashcroft, Boston, Mass.

The Merriman Bolt Cutter—the best made. Send for circulars. H. B. Brown & Co., Fair Haven, Conn.

Taft's Portable Hot Air, Vapor and Shower Bathing Apparatus. Address Portable Bath Co., Sag Harbor, N. Y. (Send for Circular.)

Glynn's Anti-Incrustator for Steam Boilers—The only reliable preventive. No foaming, and does not attack metals of boilers. Price 25 cents per lb. C. D. Fredricks, 587 Broadway, New York.

For Fruit-Can Tools, Presses, Dies for all Metals, apply to Bliss & Williams, successor to May & Bliss, 118, 120, and 122 Plymouth st., Brooklyn, N. Y. Send for catalogue.

Belting that is Belting.—Always send for the Best Philadelphia Oak-Tanned, to C. W. Army, Manufacturer, 301 Cherry st., Phila.

To Ascertain where there will be a demand for new machinery or manufacturers' supplies read Boston Commercial Bulletin's Manufacturing News of the United States. Terms \$4 00 a year

Queries.

[We present herewith a series of inquiries embracing a variety of topics of greater or less general interest. The questions are simple, it is true, but we prefer to elicit practical answers from our readers, and hope to be able to make this column of inquiries and answers a popular and useful feature of the paper.]

1.—SILVER GILT MOLDINGS.—I wish a recipe for making silver gilt moldings to imitate gold.—N. B.

2.—CORE OVEN.—What is the best plan upon which to construct a core oven, to dry and bake cores, for all kinds of core work where bituminous coal is used? I find cores very expensive, and would like the most economical plan of doing this kind of work.—W. M. J.

3.—SILVER SOLDER.—How can I make an easy flowing silver solder, suitable for joining saw blades and other thin plate?—C. P.

4.—CRYSTALLING GLASS FRONTS.—How can I produce a crystalline surface on glass for shop fronts, church windows, etc., that will withstand the action of frost?—G. H. W.

5.—LETTERING STEEL PLATE.—I wish a method of transferring letters or designs to the surface of steel plate, that may be used instead of the old method of coating with wax. My impression is that there is such a process, in which the work is facilitated by the use of an elastic stamp.—J. G. H.

6.—GLUE.—I would like to have a recipe for a rapidly hardening and tenacious glue for fastening pine cones, etc., to wood, in making fancy picture frames. If you or your readers know of any such, please give it in your valuable journal.—J. F. K.

7.—MIXING IRON.—I am having considerable trouble in mixing iron. The metal I use is old car wheels with chilled rims. I use about twenty-five per cent of No. 1 Scotch pig to soften with, but it does not appear to mix. Parts of the castings are soft, and others hard. Can some of your correspondents suggest the cause and remedy?—G. H. P.

8.—JOURNAL OF MILL SPINDLE.—What substance shall I use for filling the cast iron journals for the spindle of a grist mill to run in? None of the anti-friction metals will answer, because the poisonous particles worn off pass into the meal.—H. A. S.

Inventions Patented in England by Americans.

[Compiled from the Commissioners of Patents' Journal.] APPLICATIONS FOR LETTERS PATENT.

- 184.—LIQUID METER.—José Francisco de Navarro, New York city. January 24, 1871.
206.—PRINTING PRESSES.—Earle Henry Smith, New York city. January 26, 1871.
209.—SEWING MACHINE.—Henry Graham Thompson, New York city. January 26, 1871.
212.—STEAM BOILER.—Jacob Lorillard, New York city. January 26, 1871.
231.—BALE TIES.—John Scott Leng, New York city. January 28, 1871.
234.—OLEAGINOUS COATING FOR WALLS AND CEILINGS.—Charles F. Kemmer, Cleveland, Ohio. January 28, 1871.
235.—PILLOWS, BOLSTERS, ETC.—Timothy S. Sperry, Chicago, Ill. January 28, 1871.
237.—VESSELS FOR VOLATILE OILS, SPIRITS, ETC.—Melssner, Ackermann & Co., New York city. January 31, 1871.
240.—PADLOCKS.—William H. Atkins, Ithaca, N. Y. January 30, 1871.
246.—COMBS FOR WORSTED MACHINERY.—Charles Weiler, Philadelphia, Pa. January 30, 1871.

NEW BOOKS AND PUBLICATIONS.

GIXX'S BABY: His Birth and other Misfortunes.

This book is a satire, cleverly written, to show up the modern baby question that so nearly concerns us all, and in respect to which there are diverse opinions and practices. The contents discuss "What Ginx did with him," "What Charity and the Churches did with him," "What the Parish did with him," "What the Clubs and the Politicians did with him," and "What Ginx's Baby did with himself." It is a very humorous book, and is published by George Routledge & Son, 416 Broome street, New York.

THE CONVERSION OF ST. PAUL. By Geo. Jarvis Geer, D.D. One vol., 12mo., 80 pp. New York: S. R. Wells, 389 Broadway.

The book is handsomely printed on toned paper, bound in fancy muslin beveled boards, and is sold at \$1. Plain Edition, 75 cents.

LIFE OF JOHN J. CRITTENDEN.

Messrs. J. B. Lippincott & Co., of Philadelphia, announce their purpose to publish the life of this deceased statesman, edited by his gifted daughter, Mrs. Chapman Coleman, provided a sufficient number of subscribers can be obtained. The proposed work will embrace two large 8vo. volumes. Price, \$5 each. The work will be one of great value to all who feel interested in the political history of the times of Crittenden and his contemporaries.

THE LOVER'S LIBRARY.

J. S. Redfield, No. 140 Fulton st., N. Y., proposes to publish a popular series of sentimental stories, under the above caption, the first volume having appeared. It contains the "Devil's Pool," by George Sand; "The Story of Leonard and Margaret," from Southey's "Doctor"; "The Maid of Malines," by Bulwer, and "Patty's Revenge." Price, in paper cover, 50 cts.

THE ALDINE PRESS, for February, is a splendid number. It contains eight very fine illustrations, three of which are full page. With this number is also a handsome oil chromo, "Ducks," which is sent as a premium, with the paper, for \$2-50. As a specimen of typography, the "Press" is an honor to American art.

THEODORE TILTON, having retired from the editorship of the Independent, proposes to start a new paper, to be called "The Golden Age," to be devoted to the free discussion of all living questions in Church, State, Society, Literature, Art, and Moral Reform. Price, \$3-00 a year. Mr. Tilton's address is box 2,848, New York city.