SCIENCE RECORD FOR 1872.

We have in press, to be issued January 1st, a new and valuable book of 350 pages octavo, entitled as above, which, we think, will be read everywhere with interest. It will be a compendium of scientific progress of the present year, and is to be profusely illustrated with steel plate and wood engravings.

The following is a partial outline of the general contents of the *Science Record:*

Notices and descriptions of the leading discoveries and improvements invented or introduced during the present year, pertaining to Engineering, Mechanics, Chemistry, Philosophy, Natural History, Agriculture, Architecture, Domestic Economy, and the various Arts and Sciences, with many engravings.

Biographical notices of prominent men of science, with portraits.

Descriptions of the most important public works, began or completed during the year, with illustrations.

Notes of the progress and extension of railways, telegraphs, and other means of communication.

Descriptions of the new applications of steam, electricity, and other motive powers, with engravings.

Almanac for the year, and a chronological table of notable scientific events and phenomena.

Reports of Patent Office proceedings. Classification of inventions at the Patent Office, with the names of all exam iners, officials and employees.

Portrait and biographical sketch of the Hon. M. D. Leggett, Commissioner of Patents.

Description of that great engineering work, the Mount Cenis Tunnel through the Alps, with engravings of the tunneling machinery, portraits of the chief engineers of the work, and other illustrations.

Description of the great Government works at Hell Gate, New York, with many illustrations, showing the wonderful galleries now being cut in the rocks under the bed of the East River, preparatory to removal of these obstructions by explosion, the drilling machinery, the electric apparatus, and other interesting objects.

Description of the great Suspension Bridge between New York and Brooklyn, now in process of erection, with interesting engravings.

Steel plate engravings of the celebrated Gatling Gun or Mitrailleur, showing its construction and use in various forms, upon wheels, horseback, camels, boats, etc.

Illustrations of recent improvements in cannon, fire arms, etc.

Recent applications of science to the construction of steam and sailing vessels, with illustrations.

Reports of the important law trials, and decisions pertaining to inventions and scientific matters.

Proceedings of scientific bodies, with notes of interesting papers.

Illustrations of late improvements in all the leading bepartments of mechanics and science.

Useful tables and practical recipes pertaining to the principal branches of industry.

The whole forming a convenient and popular SCIENCE RECORD of the present year, of permanent value and importance necessary for reference and interesting to everybody. It should have a place in every library.

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One copy of the SCIENTIFIC AMERICAN for one year and a copy of the Science Record, $4.

University of the City of New York---Free Lectures.

We have received the prospectus of a course of lectures, to be delivered in the University Chapel, Washington Square, New York city. The admission to the lectures is free, and the reputation of the distinguished lecturers should attract a full attendance. The following gentlemen will lecture as follows.

December 14th. Professor John W. Draper, M.D., LL.D., on Spectrum Analysis.

December 21st. Professor George W. Coakley, LL.D, on The Physical Constitution of the Sun.

January 4th., 1872. Professor Benjamin N. Martin, D.D., L. H.D., on The Natural Theology of the Doctrine of the Forces.

January 11th. Professor Henry Draper, M.D., on Respiration.

January 18th. Professor Henry Draper, M.D., on Respiration. (Continued.)

February 1st. Professor George W. Coakley, LL.D., on Comets.

February 8th. Professor E. H. Gillett, D.D., on The Future of Society.

February 15th. Professor Henry M. Baird, Ph. D., on Homer and his English Translators.

February 29th. Professor Charles Carroll, A.M., on Robert Browning.

March 7th. Professor E. A. Johnson, LL. D., on The Industries of the Romans.

March 14th. Professor F. D. Weisse, M.D., on Sensation and Thought, (illustrated.)

March 21st. Professor John J. Stevenson, Ph. D., on American Geology.

March 28th. Professor T. Addison Richards, N.A., on The History and Criticism of Art.

April 4th. Whitelaw Reid, Esq., on Journalism.

THE British Museum has an anvil which, it is said, belonged to one of the Pharaohs.

SCIENTIFIC INTELLIGENCE.

DETECTING OZONE.

A Russian chemist has devised a simple method for detecting ozone. He inverts a Hoffmann eudiometer, and, after connecting the platinum wires with an induction apparatus, passes oxygen gas slowly through the tube, and afterwards through Liebig's potassa bulbs, in which is a solution of iodide of potassium and starch. The presence of ozone will presently be shown by the liberation of the iodine and the consequent blueing of the starch.

BROMIDE OF SULPHUR AND AMMONIA.

If bromine be left for some time in contact with an excess of flowers of sulphur in a well stoppered bottle, and afterwards filtered through asbestos, a liquid is obtained which is composed of 83·33 per cent of bromine and 16·77 per cent sulphur. When this compound is brought into contact with aqua ammonia, the action is so energetic that the liquid begins to boil; and presently the liberated gases burst into flame. Chlorine and sulphur afford similar reactions, and it is a question whether this phenomenon could not be used for the production of explosive mixtures and also for signals. If the action could be moderated, as is the case with chlorine, it is possible that use, in medicine and in bleaching, could be made of the compound. At any rate, it affords a beautiful lecture room experiment, if performed with due caution.

OXIDATION OF CARBON AND ARTIFICIAL PRODUCTION OF ANILINE.

At the meeting of the chemical section of the German Association for the Advancement of Science, at Rostock, on the 18th of September, 1871, the President, Professor Schulze, read a paper, on the direct oxidation of carbon by means of permanganate of potash in an alkaline solution, which excited lively debate, and was justly regarded as one of the most important chemical discoveries of the year. In addition to copious quantities of oxalic acid and of other products not yet determined, the author obtained an acid to which he has given the name of anthraconic, and which he found to closely resemble mellitic acid in its properties. The experiment was repeated with charcoal purified in a stream of chlorine gas, also by calcining cream of tartar, by the reduction of carbonic acid with phosphorus, and from graphite. All of these varieties of carbon yielded analogous results. So great was the interest manifested in the announcement, that the leading chemists adjourned to the Professor's laboratory, there to repeat the tests and to examine into the nature of the incidental products. They soon came to the conclusion that the new body was identical with mellitic acid. By treating the anthraconic acid with caustic soda, benzole was produced, which was converted into nitrobenzole in the usual manner, and from this product aniline was manufactured. We have in this way the artificial production of aniline from charcoal, and are brought nearer to an explanation, of the chemical properties of carbon and of important practical applications likely to grow out of such knowledge. It is another step in the distinguishing characteristic of modern research, namely, the synthetical method, or the building up of compounds from their constituent elements. It is easy to rend asunder and destroy, but to rebuild requires the application of the highest genius. The discovery of Professor Schulze is likely to prove of great importance, as soon as it is thoroughly understood and applied.

TO GROW LARGE CRYSTALS.

In order to grow large crystals of such substances as sugar, borax, alum, and the like, Professor Schulze recommends the use of gelatinous solutions, such as pectin and gelatin. The crystals separate, suspended in the mass, and go on growing uniformly on all sides. In this way, irregularities and distortions are avoided. The determination of the amount of gelatinous matter to be added must be the result of experiment. The chief advantage appears to be to make the liquid of such a specific gravity as will hold the crystals in suspension.

CONSUMPTION OF GAS IN LONDON, 1870.

According to official reports of the thirteen gas companies of London for the year 1870, the following were the

RECEIPTS.

For gas	£2,045,313	0	6
Rent of meters	31,558	2	4
Sale of old materials	5,766	5	4
Products	424,952	5	11
Miscellaneous	11,649	15	11
Total	£2,519,239	10	0

EXPENSES.

Coal	£1,004,300	3	7,
Purifying materials	22,235	16	7
Wages of workmen	224,432	3	10
Repairs	185,431	6	7
Taxes	63 172	2	1
Salaries	24,808	3	0
Commission of collectors	27,035	18	9
Office expenses	17,608	19	10
Directors	22,565	14	9
Auditors	1,314	10	0
Gas pipes	127,249	8	1
Gas meters	32,874	15	11
Lawyers' fees	3,643	16	9
Miscellaneous	29,736	11	2
Total	£1,786,409	16	9

Excess of receipts over expenditures, £722,829·13·3. The active capital and loan of the thirteen companies is £8,272,816; the receipts therefore exhibit an interest of 8·86 per cent on the capital stock. The private consumption of gas was 9,122,113,853 cubic feet: for the street lamps it was 1,500,000,000 cubic feet; the total consumption of gas in London for 1870 was therefore 10,622,000,000 cubic feet, which is double the consumption of Paris. Total quantity of coal used in making gas 1,225,839 tuns, and the average cost, including cannel, was 16s. 4½d. per tun. In New York the annual consumption of coal by three gas companies is 200,000 tuns.

PREPARATION OF SULPHUROUS ACID.

In order to prepare sulphurous acid from sulphuric acid and charcoal, it is better to employ an acid of 74 per cent, or 1·825 specific gravity. If we take a stronger acid, a part of it is entirely deoxidized to sulphur, and if weaker acid be employed, sulphuretted hydrogen is evolved. To obtain absolutely pure sulphurous acid, it is well to put sulphite of lead and coarse charcoal in the wash bottle. With these precautions, it is possible to obtain pure sulphurous acid from sulphuric acid and charcoal.

REPERTORY OF TECHNICAL LITERATURE.

Many of our readers may not be aware that a continuation of Schubarth's famous repertory of technical literature is now going through the press in Leipsic, under the editorial management of Professor Bruno Kerl. The first volume of 696 octavo pages, from A to K, is now complete, bringing down the literature to 1868. By reference to Schubarth's and Kerl's *repertorium*, it is possible to obtain a complete history of the leading papers and researches, published upon any given subject, in the technological journals of the world since 1823. The work is a dictionary of reference, and is the richest mine of information to be found in any language; and it is only possible to get up such a book in a country where the compiler has access to complete series of journals in all languages. For an inventor who wishes to make an exhaustive examination of what others have done before him, such a book of reference is indispensable; and it also follows that our libraries ought to contain all of the journals, in which the original publications first make their appearance, to which reference is made in this work.

TO CITY SUBSCRIBERS.

The SCIENTIFIC AMERICAN will hereafter be served to our city subscribers, either at their residences or places of business, at $3·50 a year, through the post office by mail carriers. The newsdealers throughout this city, Brooklyn, Jersey City, and Hoboken keep the SCIENTIFIC AMERICAN on sale, and supply subscribers regularly. Many prefer to receive their papers of dealers in their neighborhood. We recommend persons to patronize the local dealers if they wish the SCIENTIFIC AMERICAN or any other paper or magazine.

TIMELY SUGGESTIONS.

Every Employer should present his workmen and apprentices with a subscription to the SCIENTIFIC AMERICAN for the coming year.

Every Mechanic and Artisan whose employer does not take the SCIENTIFIC AMERICAN should solicit him to subscribe for 1872.

Now is the Time for old subscribers, whose subscriptions expire with the year, to renew.

Now is the Time for new subscribers to send $3 and commence with the new year.

Now is the Time for forming clubs for the new year.

It will pay any one to invest $3 for himself, his sons, or his workmen, for one year's subscription to the SCIENTIFIC AMERICAN.

It is easy for any one to get ten subscribers at $2·50 each, and for his trouble obtain the splendid large steel plate engraving, worth $10.

It is easy for any old subscriber to get a new one to join in taking the paper. Those who do will receive a bound volume of the "Science Record" for 1872. See description of this work on page 353, SCIENTIFIC AMERICAN, issue of December 2d.

It is no more trouble to remit $6 for two subscribers than $3 for one.

If any mechanic whom you ask to subscribe says he cannot afford it, tell him he cannot afford not to.

If any one wishes specimens of the paper to examine before subscribing, tell him to write to the publishers and they will cheerfully mail them.

If any one wishes an illuminated Calendar for 1872, to hang in his office or shop, he can have it sent free on sending a request to this office.

If handsome illustrated posters and prospectuses are wanted to assist in obtaining subscribers, send to the publishers of this paper.

It is the intention of the publishers of the SCIENTIFIC AMERICAN to make the paper next year better and handsomer than any previous year during the last quarter century it has been published.

It is the intention of the publishers to illustrate, by superb engravings, all new and practical inventions and discoveries that may be developed during the year.

For Prospectus and terms to Clubs see last page.

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Examples for the Ladies.

Mrs. E. J. Stout, Elkader, Iowa, besides doing all the housework for a family of four persons, made last year, with a Wheeler & Wilson Machine, one hundred and fifty fashionable dresses, hemmed over 2000 yards of biased ruffling, and made quite a number of under-garments. This is about her average work a year in all kinds of general sewing for seven years, with no repairs to her machine.

Burnett's Cocoaine is not greasy or sticky. As a hair dressing, it stands peerless and alone.

NEW BOOKS AND PUBLICATIONS.

A COMPENDIOUS GRAMMAR OF THE GREEK LANGUAGE. By Alpheus Crosby, Professor Emeritus of the Greek Language and Literature in Dartmouth College. Woolworth, Ainsworth & Co., 51, 53, and 55 John Street, New York; 111 State Street, Chicago.

This is an abridgement of the well known and long highly appreciated Greek Grammar by the same author, which has now reached its forty-fourth edition. The abridgement is, however, a sufficient *vade mecum* for the student in his progress through school and college. The intention has been to compress, as much as possible, the larger work, to form a portable simple grammar for the beginner, yet sufficiently comprehensive to accompany him throughout a whole course of Greek study as ordinarily pursued.

MAGNETISM AND ELECTRICITY. By William Allen Miller, M.D., LL.D., Professor of Chemistry in King's College, London, etc. Corrected from the Fourth London Edition. New York: John Wiley & Son, 15 Astor Place.

This work is identical with the portion of Miller's excellent work on Chemical Physics," from page 313 onward to the end of the book. Some tables, scarcely germane to the subject matter of the reprint, are added. The book forms a good manual of magnetism and electricity up to the date (1864) of the third edition of "Miller's Chemical Physics."

ÆSTHETICS, OR THE SCIENCE OF BEAUTY. By John Bascom, Professor in Williams College. New York and Chicago: Woolworth, Ainsworth & Co.

The pressure, upon our time, of other duties has precluded such a perusal of this work as a fair criticism demands. A cursory examination, however, leads us to pronounce it a very useful and entertaining volume. We discern, however, that the author does not abstract the conception of beauty from the conventionalities, religious belief, and even superstitions of mankind, since, in establishing his standards of beauty in literature and art, he defers to all these, deprecating that which violates the "proprieties" of society as below the true standard. Now, we respectfully suggest this is not a "science of beauty," as the author styles it in his preface, but a dissertation thereon, having reference, at least in part, to the moral and religious effect of certain things which, scientifically judged, are beautiful in the extreme, but which our author denounces as inconsistent with a taste for the beautiful, because, to the prurient mind, they suggest immoral ideas. To such an argument as this, the most fitting reply is that art "labors not for prurient minds."

SPEECHES, ADDRESSES, AND LETTERS On Industrial and Financial Questions, to which is added an Introduction, together with Copious Notes and an Index. By William D. Kelley, M. C. Philadelphia: Henry Carey Baird, Industrial Publisher, 406 Walnut Street. Price, $3.00.

To review this book adequately would require a column of our paper. It is a large octavo, filled with the views of a strong protective tariff advocate on questions, as its title indicates, intimately connected with production and labor. Such a book cannot fail to be interesting and profitable reading, when it is, as in the present case, the work of a strong mind devoted to the consideration of such topics through a life of public service. The social questions hinging upon the solution of the labor question are various and important. The book deserves, and will secure, a large sale, though many will doubtless take issue with the author in some of his views. But such a book, whether it agrees or disagrees with opinions already formed, arouses public attention to vitally important questions, the discussion and settlement of which cannot be delayed without danger. In this way the work before us will do good, and we cordially commend it to our readers.

FIRST HELP IN ACCIDENTS AND SICKNESS. A Guide in the Absence, or Before the Arrival of Medical Assistance. Published with the Recommendation of the Highest Medical Authority. Boston: Alexander Moore.

This appears to be a safe and comprehensive manual for the purpose set orth in its title.

THE AMERICAN JOURNAL OF MICROSCOPY, which was among the journals burned out in the recent Chicago fire, will hereafter be published at Racine, Wisconsin. By those interested in microscopic science, this publication will be cordially welcomed on its reappearance. Mr. George Mead is the editor and publisher. An advertisement appears on another page.

APPLICATIONS FOR EXTENSION OF PATENTS.

MACHINE FOR FORMING SHEET METAL PANS.—E. A. Smead, Corning, N. Y., has petitioned for an extension of the above patent. Day of hearing, February 14, 1872.

HARVESTER.—Joseph B. Butterfield, Philadelphia, Pa., administrator of Jesse S. Butterfield, deceased, has petitioned for an extension of the above patent. Day of hearing, February 14, 1872.

MACHINE FOR PACKING FLOUR.—J. Mattison, Oswego, N. Y., has petitioned for an extension of the above patent. Day of hearing, Feb. 21, 1872.

Value of Extended Patents.

Did patentees realize the fact that their inventions are likely to be more productive of profit during the seven years of extension than the first full term for which their patents were granted, we think more would avail themselves of the extension privilege. Patents granted prior to 1861 may be extended for seven years, for the benefit of the inventor, or of his heirs in case of the decease of the former, by due application to the Patent Office, ninety days before the termination of the patent. The extended time inures to the benefit of the inventor, the assignees under the first term having no rights under the extension, except by special agreement. The Government fee for an extension is $100, and it is necessary that good professional service be obtained to conduct the business before the Patent Office. Full information as to extensions may be had by addressing

MUNN & CO., 37 Park Row,

Inventions Patented in England by Americans.

From November 9 to November 11, 1871, inclusive.

[Compiled from the Commissioners of Patents' Journal.]

CANAL BOAT.—W. F. Goodwin, Metuchen, N. J.
HEATING BOLT RODS.—G. C. Bell, Buffalo, N. Y.
UTILIZATION OF TIN PICKLE.—G. Lander, New York city.
WATER METER.—G. W. Copeland, Malden, Mass.

Foreign Patents.

The population of Great Britain is 31,000,000; of France, 37,000,000 Belgium, 5,000,000; Austria, 36,000,000; Prussia, 40,000,000; and Russia, 70,000,000. Patents may be secured by American citizens in all of these countries. Now is the time, while business is dull at home, to take advantage of these immense foreign fields. Mechanical improvements of all kinds are always in demand in Europe. There will never be a better time than the present to take patents abroad. We have reliable business connections with the principal capitals of Europe. A large share of all the patents secured in foreign countries by Americans are obtained through our Agency. Address MUNN & CO., 37 Park Row, New York. Circulars with full information on foreign patents, furnished free.

Business and Personal.

The 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.

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

Francis Schleicher, Consulting, Analytical and Man'fg Chemist. Laboratory, Newark St., bet. Jackson and Harrison St., Box 172, Hoboken.

Information wanted of where could be purchased, by the quantity, L. A. M. Pascol's patent Burglar Alarm—patentee, George W. Biglow, New Haven, Conn. Please address M. K., Box 313, Shreveport.

I will send, to any address, a plan and specification of my improvements in setting Steam Boilers, together with a shop license, for $25. Address, for particulars O. Ranney, Corry, Pa., Box 264.

Basket Splint Machine Makers, address B. B. Eastman, Huntington, Mass.

Wanted, a Second Hand Boring Mill—6 ft. to 7 ft. Table—Bement or Sellers make preferred. Address P. O. Box 2459, Phila., Pa.

For Hydraulic Jacks and Presses, New or Second Hand, send for circular to E. Lyon, 470 Grand Street, New York.

The Valley of the Upper Missouri wants 1000 Traction Engines for agricultural purposes, for which it is peculiarly adapted, in surface and in soil. Send descriptive circulars and price list, J. Armstrong, Onawa City, Iowa.

Wanted, a Machinist thoroughly experienced in Milling up Gun Work, making Holders, Jigs, Gauges, and other Gun Tools. A. S. Babbit & Co., Plattsburgh, N. Y.

Williamson's Road Steamer and Steam Plow, with Thomson's Tires. Address D. D. Williamson, 32 Broadway, N. Y., or Box 1809.

Boynton's Lightning Saws. The genuine $500 challenge. Will cut five times as fast as an ax. A 6 foot cross cut and buck saw, $6. E. M. Boynton, 80 Beekman Street, New York, Sole Proprietor.

For Hand Fire Engines, address Rumsey & Co., Seneca Falls, N.Y.

Over 800 different style Pumps for Tanners, Paper Makers, Fire Purposes, etc. Send for Catalogue. Rumsey & Co., Seneca, Falls, N.Y.

Scale in Steam Boilers—To remove or prevent scale, use Allen's Patent Anti-Lamina. In use over Five Years. J. J. Allen, 4 South Delaware Avenue, Philadelphia, Pa.

Photographs.—Rockwood, 845 Broadway, will make 8x10 negative and six photographs of machinery, in any part of the city, for $10.

For Sale cheap, a Gear Cutter, nearly new—cuts 46 in. dia.—and a Drill Press. L. Duvenage, 208 Center Street, N. Y.

Presents—A Doty Washing Machine and Universal Clothes Wringer—warranted satisfactory. R. C. Browning, 32 Cortlandt St., N.Y.

Wanted, by an experienced Machinist, a situation to superintend, construct, or Book-keeping. Commands the best references as to ability. D. L. W., Station A., New York.

Improved Mode of Graining Wood, pat. July 5, '70, by J. J. Callow, of Cleveland, O., enabling inexperienced grainers ("without the long required study and practice of heretofore") to produce the most beautiful and Natural Graining with speed and facility. Send stamp for circular.

3 Hydraulic Presses for sale on reasonable terms. Apply to Whitneyville Armory, Conn.

Metallic Molding Letters, for Pattern Makers to put on patterns of Castings, all sizes, etc. H. W. Knight, Seneca Falls, N.Y.

Use Soluble Glass for fireproofing Wooden Pavements, Shanties, R. R. Bridges—also as common hardening Mortar and Cements, makes most durable Stove and Foundry Putty, Iron Cement. Apply to L. & J. W. Feuchtwanger, Chemists, 55 Cedar street, New York.

Portable Farm Engines, new and beautiful design, mounted on Springs. Compact, light, and efficient. Send for descriptive circular, Mansfield Machine Works, Mansfield, Ohio.

Stencil Tools & Steel Letters. J. C. Hilton, 66 W. Lake st. Chicago,

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

Shoe Peg Machinery. Address A. Gauntt, Chagrin Fall, Ohio

Builder's Scaffold—Patent for Sale—For further particulars, address Redick & Kunkle, Butler, O.

For Steam Fire Engines, address R. J. Gould, Newark, N. J.

Turkey Boxwood pieces for Sale, suitable for engravers and fancy turners' use. Address Stephens & Co., Riverton, Conn.

All kinds of Presses and Dies. Bliss & Williams, successors to Mays & Bliss, 118 to 122 Plymouth St., Brooklyn. Send for Catalogue.

The best lubricating oil in the world is Winter pressed Sperm. Sold in bottles, cans, and barrels, by Wm. F. Nye, New Bedford, Mass.

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

Presses, Dies, and Tinners' Tools. Conor & Mays, late Mays & Bliss, 4 to 8 Water st., opposite Fulton Ferry, Brooklyn, N. Y.

Over 1,000 Tanners, Paper-makers, Contractors, &c., use the Pumps of Heald, Sisco & Co. See advertisement.

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

Mining, Wrecking, Pumping, Drainage, or Irrigating Machinery, for sale or rent. See advertisement, Andrew's Patent, inside page.

Improved Foot Lathes, Hand Planers, etc. 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.

Chard & Howe's oils, of 134 Md'n Lane, neither gum nor chill.

Safety Store Elevators. Provision against Rope, Bolt, and Engine breaking. One third the cost of others claiming to be safe. Andrews Bro., 414 Water Street, New York.

For Best Galvanized Iron Cornice Machines in the United States, for both straight and circular work, address Calvin Carr & Co., 26 Merwin St., Cleveland, Ohio.

Boiler and Pipe Covering manufactured by the Chalmers Spence Non-Conductor Co. In use in the principal mills and factories Claims—Economy, Safety, and Durability. Offices and Manufactories, foo E. 9th street, New York, and 1202 N. 2d street, St. Louis, Mo.

Dickinson's Patent Shaped Diamond Carbon Points and Adjustable Holder for dressing emery wheels, grindstones, etc. See Scientific American, July 24 and Nov. 20, 1869. 64 Nassau st., New York.

Railway Turn Tables—Greenleaf's Patent. Drawings sent on application. Greenleaf Machine Works, Indianapolis, Ind.

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

To Ascertain where there will be a demand for new Machinery, mechanics, or manufacturers' supplies, see Manufacturing News of United States in Boston Commercial Bulletin. Terms $4.00 a year

Answers to Correspondents.

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 1·00 a line, under the head of "Business and Personal."

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

C. L., of Pa.—We cannot detect any silver in the mineral you send.

PREVENTION OF FERMENTATION.—Cider can be prevented from becoming fermented by passing ozone through it.—C. F. D.

INCRUSTATION IN BOILERS.—E. S. F. should put clean oyster shells in his boiler. These will keep it clean by attracting all the particles of carbonate of lime.—F. W. A. S., of Cal.

CANKER IN THE MOUTH.—In answer to F. S. C., November 18th, I will say: Take a piece of common blue vitriol, and either make a wash by diluting in water, or simply rub the vitriol over the affected part, taking care not to swallow any of the vitriol. I have used it a great many many times, and never knew it to fail.—J. C. C., of N. J.

S. H., of ——.—A perpetual motion, in the sense in which the term is used in mechanics, must supply its own power.

H. A. S., of N. Y.—A siphon cannot conduct water over a hight greater than that to which water can be raised by the pressure of the air at the point where the siphon is placed, less the hight of a column whose pressure would overcome the friction of the water in the short leg of the tube. It is atmospheric pressure alone that causes the water to rise in the short leg of the siphon. Your query relative to the motion of a rolling wheel has been repeatedly answered in this column.

W. M., of Pa.—The pressure of the atmosphere is all that raises water in an atmospheric pump. Such pumps are called suction pumps only by those unfamiliar with hydraulics.

WORMS IN HICKORY.—Cut the hickory at a time when the bark will peel off. That is generally from June to September. We, in the West, find this to be the right time.—G., of O.

SQUEAKING BOOTS.—In your issue of November 25, I noticed a remedy for squeaking boots, namely, to saturate the soles with kerosene oil. A much pleasanter way is to have your boots made to order, and, between each layer of leather in the sole, have a piece of oiled silk inserted. This is a sure preventive. Let Jones try it.—G. L. F., of N. Y.

CUTTING BEVELS.—In reply to C. H. S.: The surest, quickest, and best way to cut a bevel is to cut it in a box. To cut a miter on beveled work, place it in a miter box, giving it the same bevel in the box that it is to have in the work, and cut it with a saw, in the manner of cutting any other miter.—C. T., of Vt.

INCREASING POWER.—In answer to E. K., Nov. 4, I would like to say, it will be a disadvantage to put a fly wheel on his saw arbor. If his saw runs at a high speed, as it ought to, it will take a certain amount of power to run the fly wheel; this is always a dead loss. In sawing short work, it might serve to equalize the speed, but no one can gain power by its use.—F. C. S., of Conn.

BLAST FOR WASTE SHAFT.—J. H. B., of Ohio, writes: "I am producing an exhaust or suction in pipes with a blast from a fan, which draws up and discharges, with great force, dust, shavings, sticks, blocks, shelled corn, and all kinds of grain. This I do without anything going through the fan or blower. But, sir, do you know of anything in use that does this?" Answer—Machines for removing sawdust and small rubbish from shops have been constructed on this principle.

LAYING OUT HOPPERS, ETC.—C. H. S. asks for a rule for laying out the miter of hoppers, wagon seats, etc. I give the following simple and accurate rule: Bevel the top or bottom edge of the sides of the hopper to the same angle that the sides stand at; then lay a bevel set at a true miter on the beveled edge, and that will lay off the joint. When the sides stand at different angles, bevel the edge of each side to correspond with the angle of that side. If the corners are to be a square joint, lay a T square on the beveled edge instead of a true miter.—G. S. N.

SETTING SAW.—A circular saw that is filed and set right for splitting is not right for cross cutting, and *vice versa*. If J. H. M. wants a saw for doing both kinds of work, let him file the front edge of the teeth in a line with the center of the saw, giving the teeth a slight bevel top and front. In setting the saw, use a hammer, holding a piece of iron against the saw on the opposite side. Do not set the teeth at the points, but as near the base as possible. I think this will give him a saw that will cut smoothly, and as near right for both kinds of work as he can get.—F. C. S., of Conn.

SPRING IN SHAFTING.—Answer to query 5, No. 22, current volume. Ten years since, our factory, in the basement of which was shafting of cast iron, from three to four inches diameter, in sections about ten feet long, was burned down. These were entire, but crooked as snakes, six to ten inches out of line. When we rebuilt, they were utilized, by being heated (by wood fires, made on the ground) to a red heat at the point to be straightened. At those points a steady pressure was applied; the shafts were forced into line, fitted, and are now in use, "as good as new."—R. L. B.

EXTERMINATING RATS.—In your paper No. 14, Sept. 30, 1871, query 21, T. C. H. wishes to know some means of expelling rats from a building. Let him catch, by any ordinary trap, three rats, put them in a cage constructed of wire, in any place which is plagued by this animal, and give them no food whatever. On the third day he will find only two rats, one being eaten up by the two others, and on the sixth day, only a single rat in the cage. Let him give the survivor his liberty on the seventh day, and he will be, in the course of one week, rid of all the rats, except the one monster which ate up his two brothers, and which he may feed for sympathy's sake. This mode was adopted with great success in a building in the former Thiergarten, at Vienna, where all other means to expel these animals were useless.—L. S., of Vienna, Austria.

L. B. S., of Mass.—The compound engine is an engine having two cylinders, one a high pressure and the other a low pressure. In the high pressure cylinder the steam is used non-expansively, and it exhausts from this cylinder into the low pressure cylinder, where it is expanded as much as practicable, and then exhausted into a condenser. The method admits of more convenient application in marine engines, where, to obtain the same amount of expansion, a long cylinder would be needed. With the general adoption of surface condensers, marine boilers are not now liable to scale, and they carry a much higher pressure of steam than formerly, rendering the expansion of steam much more important than was the case when low pressures were the rule. For details of construction of various engines, made on the compound principle, you will find it necessary to read such works and publications as make marine engineering a specialty.

CURIOUS FREAK OF TWIN STEAM BOILERS.—Will you allow me to say, for the benefit of H. P. S., of Kansas City, Mo., that the difficulty lies only in his not having steam pipes large enough to allow the steam to pass freely from one boiler to the other, so as to equalize the pressure, attendant upon a larger amount of steam being generated in one boiler than the other and *vice versa*? No one can keep a fire perfectly regular, and therefore boilers set in the manner he states should be connected by a pipe of ample size to allow the pressure to equalize itself; when that is done there will be no trouble. The only curious freak about the boilers lies in the use of so small a pipe to connect them at the top. A six inch pipe would answer the purpose very well; then, if he chooses to use a two inch one to lead from that to the engine, good; but a four inch

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