

**TO INVENTORS.**

An experience of more than thirty years, and the preparation of not less 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. In addition to our facilities for preparing drawings and specifications quickly, the applicant can rest assured that his case will be filed in the Patent Office without delay. Every application, in which the fees have been paid, is sent complete—including the model—to the Patent Office the same day the papers are signed at our office, or received by mail, so there is no delay in filing the case, a complaint we often hear from other sources. Another advantage to the inventor in securing his patent through the Scientific American Patent Agency, it insures a special notice of the invention in the SCIENTIFIC AMERICAN, which publication often opens negotiations for the sale of the patent or manufacture of the article. A synopsis of the patent laws in foreign countries may be found on another page, and persons contemplating the securing of patents abroad are invited to write to this office for prices, which have been reduced in accordance with the times, and our perfected facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN.

**Business and Personal.**

*The Charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.*

Magic Lanterns and Stereopticons of all prices. Views illustrating every subject for public exhibitions. Profitable business for a man with a small capital. Also lanterns for college and home amusement. 14 page catalogue free. McAllister, Mf. Optician, 49 Nassau St., N.Y.

1,000 2d hand machines for sale. Send stamp for descriptive pricelist. Forsaith & Co., Manchester N. H.

PATERSON, N. J., Sep. 6, 1877. H. W. JOHNS MANUFACTURING CO. Dear Sirs: The following is the result of your Asbestos Covering on boilers for Department of Streets and Sewers. June (boiler uncovered), 24 days, consumed 16 tons coal—1,333 lbs. per day. July (boiler covered), 26 1/2 days, consumed 12 tons coal—905 lbs. per day. Saving in fuel, 32 per cent. Yours truly, J. WILKS KOCH.

Nickel Plating.—Wenzel's Patent Perforated Carbon Anode for holding Grain Nickel. A. C. Wenzel, 114 Center St., New York City.

Flore & Smith, San Francisco, make a specialty of introducing useful inventions in the Pacific States.

A Mechanical Engineer of over 25 years' experience wishes a situation as constructing engineer, draughtsman, or manager of a shop. Best references given. Address A. Becher, 158 S. 4th St., Brooklyn, E. D.

J. C. Hoadley, Consulting Engineer and Mechanical and Scientific Expert, Lawrence, Mass.

Brick Presses for Fire and Red Brick. S. P. Miller & Son, 309 S. 5th St., Philadelphia, Pa.

For Sale Cheap.—All sizes of second-hand Engines and Boilers, in good condition. Correspondence solicited. E. R. Young, Titusville, Pa.

Brush Electric Light.—20 lights from one machine. Latest & best light. Telegraph Supply Co., Cleveland, O.

Valuable Patent for sale.—See Protractor illustrated in SCIENTIFIC AMERICAN of October 26. F. L. Cook, Fairfield, Iowa.

Interstate and International Mechanical Exchange. Explanatory circular free. A. S. Gear, Manager, 20 E. 13th St., N. Y., U. S. A.

Steam, Water, Gas, Valves, Hydrants. Prices reduced. Send for catalogue. Chapman Valve Mf. Co., Boston.

The Goddard Emery Wheel. Best, strongest, and cheapest. Satisfaction guaranteed. E. A. Goddard, General Sales Agent, also dealer in Machinists' Supplies, 176 Fulton St., N. Y. city. Send for catalogue.

The Lathes, Planers, Drills, and other Tools, new and second-hand, of the Wood & Light Machine Company, Worcester, are to be sold out very low by the George Place Machinery Agency, 121 Chambers St., New York.

For the best advertising at lowest prices in Scientific, Mechanical, and other Newspapers, write to E. N. Freshman & Bros., Advertising Agents, 136 W. 4th St., Cin., O.

For Town and Village use, comb'd Hand Fire Engine & Hose Carriage, \$350. Forsaith & Co., Manchester, N. H.

Manufacturers of Improved Goods who desire to build up a lucrative foreign trade, will do well to insert a well displayed advertisement in the SCIENTIFIC AMERICAN Export Edition. This paper has a very large foreign circulation.

The Lawrence Engine is the best. See ad. page 349.

Sheet Metal Presses, Ferracute Co., Bridgeton, N. J.

Brick Presses for Fire and Red Brick. Factory, 309 S. 5th St., Philadelphia, Pa. S. P. Miller & Son.

Punching Presses, Drop Hammers, and Dies for working Metals, etc. The Stiles & Parker Press Co., Middletown, Conn.

Hydraulic Presses and Jacks, new and second hand. Lathes and Machinery for Polishing and Burring Metals. E. Lyon & Co., 470 Grand St., N. Y.

Wanted.—Articulate to manuf. D. J. Miller, Mohawk, N. Y.

Fine Gray Iron Castings a specialty, also Wire Workers' Pickets and Rosetts in stock. A. Winterburn's Foundry, 16 De Witt St., Albany, N. Y.

Bolt Forging Machine & Power Hammers a specialty. Send for circulars. Forsaith & Co., Manchester, N. H.

The SCIENTIFIC AMERICAN Export Edition is published monthly, about the 15th of each month. Every number comprises most of the plates of the four preceding weekly numbers of the SCIENTIFIC AMERICAN, with other appropriate contents, business announcements, etc. It forms a large and splendid periodical of nearly one hundred quarto pages, each number illustrated with about one hundred engravings. It is a complete record of American progress in the arts.

Books for Engineers and Machinists. Catalogues free. E. & F. N. Spon, 446 Broome St., N. Y.

Northrop's Sheet Iron Roofing makes most durable fireproof roof. Used on all kinds of buildings. Send for circular and prices. Northrop & Co., Pittsburgh, Pa.

Nickel Plating.—A white deposit guaranteed by using our material. Condit, Hanson & Van Winkle, Newark, N. J. English Agency, 18 Caroline St., Birmingham.

Wm. Sellers & Co., Phila., have introduced a new Injector, worked by a single motion of a lever.

H. Prentiss & Co., 14 Dey St., N. Y., Manufs. Taps, Dies, Screw Plates, Reamers, etc. Send for list.

Solid Emery Vulcanite Wheels—The Solid Original Emery Wheel—other kinds imitations and inferior. Caution.—Our name is stamped in full on all our best Standard Belting, Packing, and Hose. Buy that only. The best is the cheapest. New York Belting and Packing Company, 37 and 38 Park Row, N. Y.

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

Presses, Dies, and Tools for working Sheet Metals, etc. Fruit and other Can Tools. Bliss & Williams, Brooklyn, N. Y., and Paris Exposition, 1876.

North's Lathe Dog. 347 N. 4th St., Philadelphia, Pa.

The Cameron Steam Pump mounted in Phosphor Bronze is an indestructible machine. See advertisement.

Wheel Press, Cotton Press, Pipe Line, and Test Mercury Gauges. T. Shaw, 915 Ridge Ave., Philadelphia, Pa.

Best Wood Cutting Machinery, of the latest improved kinds, eminently superior, manufactured by Bentel, Margedant & Co., Hamilton, Ohio, at lowest prices.

We make steel castings from 1/4 to 10,000 lbs. weight, 3 times as strong as cast iron. 12,000 Crank Shafts of this steel now running and proved superior to wrought iron. Circulars and price list free. Address Chester Steel Castings Co., Evelina St., Philadelphia, Pa.

Mill Stone Dressing Diamonds. Simple, effective, and durable. J. Dickinson, 64 Nassau St., N. Y.

Machine Cut Brass Gear Wheels for Models, etc. (new list). Models, experimental work, and machine work generally. D. Gilbert & Son, 212 Chester St., Phila., Pa.

Elevators, Freight and Passenger, Shafting, Pulleys, and Hangers. L. S. Graves & Son, Rochester, N. Y.

Holly System of Water Supply and Fire Protection for Cities and Villages, is fully described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 140.

Diamond Self-clamp Paper Cutter and Bookbinders' Machinery. Howard Iron Works, Buffalo, N. Y.

Cutters shaped entirely by machinery for cutting teeth of gear wheels. Pratt & Whitney Co., Hartford, Conn.

Improved Steel Castings; stiff and durable; as soft and easily worked as wrought iron; tensile strength not less than 65,000 lbs. to sq. in. Circulars free. Pittsburg Steel Casting Company, Pittsburg, Pa.

Hand Fire Engines, Lift and Force Pumps for fire and all other purposes. Address Rumsey & Co., Seneca Falls, N. Y., U. S. A.

The Turbine Wheel made by Risdon & Co., Mt. Holly, N. J., gave the best results at Centennial test.

For Shafts, Pulleys, or Hangers, call and see stock kept at 79 Liberty St. Wm. Sellers & Co.

**NEW BOOKS AND PUBLICATIONS.**

WRINKLES AND RECIPES. New York: John Wiley & Sons, 15 Astor Place.

Another new edition (the thirteenth) of this useful handbook, enlarged and improved, has just been issued by the above well known importing and publishing firm. To the new edition has been added a number of useful recipes, a few pages illustrating and descriptive of the phonograph, microphone, telephone, and electric light, the latter subjects of special interest at the present time. But the most important addition is the introduction of a color tempering scale, illustrating a new and ingenious method which has been patented, showing by gradation of shading the precise color tools of every variety should be kept up to, to produce a right temper. The object of the inventor and author of this chart is not only to teach apprentices and other inexperienced persons the art of tempering, but to make it an exact standard for all metal workers. This work as now revised and improved, with the addition of the new tempering chart, renders it a desirable companion for the mechanic and artisan, and not less useful in the household.

BOLETIN DE LA SOCIEDAD DE GEOGRAFICA Y Estadística de la Republica Mexicana. Tomo IV., No. 1. 1878.

The Geographical and Statistical Society of the Republic of Mexico was established by an act of the Congress of the Union in 1851. Its meetings are held every Saturday evening in the hospital of Terceros (where also are its museum and library), in the city of Mexico. The "Bulletin," now in its seventeenth volume, is the official organ of the corporation, and is not only designed as a permanent record of the Society's proceedings, but also as a medium through which information concerning all matters that pertain to the prosperity of Mexico may be promulgated so cheaply as to place it within the reach of all classes of people. This being the patriotic object of the Society, it is very unfortunate that, owing to a want of harmony between it and the then Minister of Agriculture, and the revolutionary state of the country, it was obliged to suspend the publication of the "Bulletin" at the beginning of 1876, and not able to resume it again until the present year. In the initial number of the new volume, which we have just received, the editor says: "Fortunately this third interruption that our Bulletin has suffered during the long existence of the Society has ceased, and we will commence our task anew, confident that we will, as ever, be honored by public attention in our own country, and that foreign societies will continue kindly to exchange with us. The members of the Society, devoting themselves to the study of the numerous questions that are embraced in the extended scientific programme of our institution, have given by preference more especial attention to those that relate to the interests of our country. In the interim a great mass of material has accumulated, which will hereafter be published regularly, and that which was already in press will form the first fasciculus of the present Volume IV. of our third series." This number contains the Proceedings of the Society for April, 1875; Notice of the International Congress of Geographical Sciences (Paris 1875) Statistical Notes regarding the Municipality of Ameca de Jalisco, Mexico; "El Torito," a beautiful orchidaceous flower; Memoir on a Meteor observed at Oaxaca, in 1874; The Native Navigators of the time of the Conquest; Statistical Notes on the State of San Luis Potosi; Letter from Associate Member Boguslawski to the Secretary We congratulate the Society on the typographical appearance of its

Bulletin, which will compare favorably with like publications issued in more favored climes; the typography is a model of good taste, the American paper (*magnifico papel Americano*, as the editor calls it) is of good quality, and the whole make up of the publication is of a character that any American or European society might be proud of. We wish the Society success in this, the beginning of its third like undertaking.

EL PORVENIR. *Periodico Quincenal de Literatura, Ciencias y Artes.* Guatemala. 1878.

Among other esteemed exchanges from our sister republics of Central America, we are in regular receipt of *El Porvenir* ("The Future"), the organ of a literary society of the same name in the city of Guatemala. This periodical, of 16 pages, has now reached the 31st number of its second volume. Every issue is filled with literary, art and scientific matters of great interest, the perusal of which cannot fail to be a source of the greatest pleasure and instruction to the citizens, old and young, of the beautiful capital city of the republic. We wish the periodical, as well as the society under whose auspices it is issued, a long life of prosperity and usefulness.

LA AGRICULTURA VALENCIANA. *Revista Mensual de la Sociedad de Agricultura de Valencia.* Spain. Vol. XV., No. 1. 1878.

Undoubtedly one of the best means of lifting the agricultural population of any country out of the rut in which its forefathers moved, and which it instinctively adheres to more persistently than do the members of any other branch of human industry, is the dissemination of useful information through the medium of well conducted agricultural journals or the publications of agricultural societies. In our own country, where education is so universally diffused, and the masses so well educated, agriculture has long been pursued in a somewhat scientific manner, and there can be found few farmers, even those in the humblest circumstances, who do not keep informed in regard to the latest improvements in implements relating to their occupation, and who do not manage to obtain them and avail themselves of the advantages proceeding from their use. In those countries less favored than ours in this respect, where farming utensils of the most primitive character are still employed, and where agriculturists yet adhere to the traditions of their forefathers with an obstinacy worthy of a better cause, the association of well informed men into societies for the promulgation of advanced and practical ideas cannot fall in time to have a beneficial effect in ameliorating the condition of the agricultural class, thereby promoting the prosperity of the country. We are pleased to note the existence of several such societies in the Spanish-speaking States of Central and South America, and are gratified to learn from the bulletin which they issue that they are apparently meeting with much success in promoting the adoption of new and scientific methods in the practice of farming. In Spain, too, considerable attention is being paid to agricultural matters, as we judge from the exchanges which we receive from that country. Among these publications we wish, at the present time, to speak more particularly of one whose title heads this notice, inasmuch as it is the official organ of one of the most flourishing institutions of the kind in Spain—the Agricultural Society of Valencia. In the first number of the fifteenth volume, lately received by us, we find a great deal of interesting matter that might well be read with profit by agriculturists of other countries than the one for which it was written. The scientific articles are well written, and show that the authors keep pace with the latest discoveries of the times. The contents of this number are: (1) Editorials; (2) On the bringing to light of Subterranean waters; (3) Agriculture and Botany in Valencia; (4) Inauguration of the Agricultural Station in the Garden of Acclimatization, under the auspices of the Valencian Society of Agriculture; and (5) The Atmosphere in its relation to Agriculture and the forecasting of the weather. This publication is a large octavo of 32 pages, beautifully printed on a fine quality of paper with wide margins, occasionally illustrated, and is issued by the Society every month. We trust that the succeeding volumes of the second series, which the present number begins, will meet with the same success that has attended those of the past fifteen years.

LA EMULACION. No. 13. *Merida de Yucatan.* 1878.

This interesting little periodical, now in its third volume, is the organ of the Medico-Pharmaceutical Society of the flourishing city of Merida, the capital of Yucatan. Although the paging of the number before us is somewhat peculiar, due no doubt to its being the organ of two professions, and although the arrangement of the matter betrays its foreign origin, yet in general typographical appearance it will compare favorably with many of our American periodicals. The present number contains (1) an article calling attention to the need that Merida has of some competent physician to be consulted in medico-legal cases, as well as of city physicians for the poor; (2) On a new application of the Esmarch Bandage; (3) Botanical Calendar of Merida and vicinity; (4) A Case of Hydrophobia and successful cure; (5, 6, and 7), articles on "Cabalsit," "Chuchik," and "Sida Crispa," plants with remedial virtues; (8) Notes from exchanges. Merida, with its colleges of medicine and pharmacy, and such an exponent of the two professions as this, ought certainly to be a healthy city.

LAS CLASES PRODUCTORAS. *Organo de la Sociedad de este Nombre.* Guadalajara, Mexico. EL PABELLON MEXICANO, *Periodico Religioso, Político, Científico, Literario, etc.* Guadalajara, Mexico.

Among other exchanges printed in the Spanish language, we have to acknowledge the regular receipt of the two named at the head of this notice, both published at Guadalajara, the second city of importance in Mexico. The former of these two papers is the organ of a society of progress whose motto is "Intelligence, Capital, Labor," and whose programme embraces the establishment of banks; mutual security of life and property; mutual aid; railroads and roadways; telegraphs; privileges to inventors; scientific publications; and a host of other like objects. The society is ex-

remely liberal in its religious views, asking no one to make a profession of his creed for admission, but receiving all honorable men who, desiring the public good, wish to associate together to promote this object. The society carries on, in addition to its other good works, both a night and a day school, which from the published curriculum appear to be capable of giving the pupil a thorough education in all the useful branches of knowledge. The periodical published under its auspices is devoted mainly to instruction; the number before us, for instance, containing, in addition to an editorial: (1) "Object Teaching—Stone;" (2) "History of a loaf of Sugar—The sugar talks about Botany;" (3) Instructive paragraphs. The other paper (*El Pabellon*) is conservative, and strongly devoted to the church; its motto being, "The religion of new Spain is and shall be Catholic, Apostolic, Roman, tolerating no other." As we might expect of two periodicals holding such diverse views, we find our two esteemed contemporaries, in our latest files, engaged in a controversy over religion. The editor of *El Pabellon* remarks of his brother editor of the *Clases Productoras*: "We highly appreciate Senor Matute for his unspotted honor, and for the purity and rectitude of his intentions, but we distrust his ideas in regard to free communication with infidels and heretics: they are not those of the Catholic Church. She has always forbidden her sons to mingle and communicate with those who are infected with the prevalent epidemic heresies. This has been her practice from apostolic times, making use of excommunication on the one hand, and of anathemas on the other; and this is the way we understand the sublime precept of the Master: 'Love ye one another'" (1) Wars of religion never lead to any good, and we trust when our next files of *El Pabellon* and *Las Clases Productoras* reach us, that the editors will have ceased to dip their pens in gall, and that each will have determined to hereafter conduct his journal according to the policy marked out for it—policies each of them excellent in its way.



(1) O. B. asks: Will you name a good work on the fabrication of soap? A. Dussauce's "Practical Treatise on the Fabrication of Soap and Candles."

(2) C. M. D. writes that porous cups for a battery may be made by forming a paper mould and covering it, by means of a brush, with a mixture of plaster of Paris, repeating the application until the required thickness is obtained. The paper mould will be destroyed by the acid.

(3) W. P. T. asks: What preparation can I coat paper with to render it impervious to oil? A. Try thistle size.

(4) F. R. asks: 1. Would lampblack pressed into moulds answer for the carbon in the Bunsen battery? A. No. 2. How is the gravity battery made? A. Solder the clean end of a piece of gutta percha covered copper wire to a plate of copper, which place in the bottom of a glass jar of suitable size; cover this with a few crystals of copper sulphate, and nearly fill the jar with water containing an ounce per quart of zinc sulphate. Then suspend a piece of clean zinc at the surface of the solution. Electricity will pass through a wire from the copper to the zinc. A few hours on closed circuit will develop the full strength of the battery.

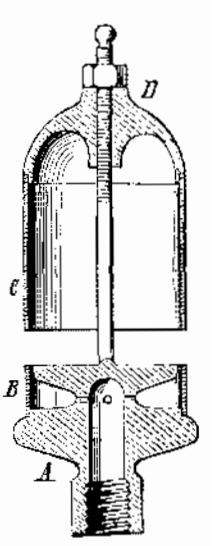
What is phosphide of calcium, and how is it made? A. Calcium phosphide is prepared by passing vapor of phosphorus over fragments of lime heated to redness in a porcelain crucible. The chocolate-brown product yields spontaneously inflammable hydrogen phosphide when thrown upon water. Its formula is Ca P.

(5) C. E. S. and others.—We intend publishing at an early date in the SCIENTIFIC AMERICAN or SUPPLEMENT full directions for making an induction coil.

(6) M. & S.—The incrustation consists chiefly of lime carbonate and fine argillaceous sand. Frequent blowing out is one of the best preventives.

(7) W. H. G. writes: My marble top table has been injured with lemon juice; marble mantel stained with kerosene oil. How can I restore each to its original beauty? A. Cover the soiled parts with a paste of quick lime moistened with a strong aqueous solution of sal soda for several hours; then remove the paste and wash the parts thoroughly and polish.

(8) E. C. H. and others.—The construction of a steam whistle will be readily understood from the accompanying engraving. The casting, A, has a stem for supporting the bell, and there is a deep groove around it forming a steam passage. A short piece, B, of brass tubing is fitted and soldered to it, leaving an annular space of about 1/16 inch between its upper edges and the casting. The bell, C, is of the same diameter as the part, B, and it has a cast head, D, which is screwed on the stem of the casting, A. The steam passages are so clearly indicated in the cut as to require no description. The proportions of the bell may be varied. By lengthening the bell the tone may be made lower.



(9) J. H. P. asks: Can there be sound without a hearer? A. The word sound has two meanings: (a) a certain sensation; (b) the physical cause of that sensation. In the first sense there would be no sound in the absence of a hearer; in the second sense there would be, for the physical disturbance—sound waves, sonorous vibrations, or what not, would be set going.