

TAIL PIECE FOR MUSICAL INSTRUMENTS.—Robert E. Lackner, Paragould, Ark. In stringed instruments, this invention provides means by which the tension of the strings may be readily increased or relaxed. The tail piece has two members connected by an eccentric with each other, whereby one of the members may be moved forward and rearward.

COOKING APPARATUS.—George D. Fox, Buffalo, N. Y. To facilitate roasting meats, etc., this invention provides a pan in which the meat may be thoroughly basted as often as required by operating a handle on the exterior of the pan. The pan is preferably cylindrical, divided into two longitudinal sections and held on a base to stand properly in the oven. Supported at a little distance above the bottom of the pan is a platform on which is placed the meat to be cooked, while below this platform extends a scoop adapted to receive the juices or gravy of the meat, the scoop being held so as to be revolved by a crank, by which means the juices of the meat may be taken up and poured over the meat, thus making unnecessary the hot and unpleasant work of basting by hand.

EGG BEATER.—Frank S. Bellanger, Waterbury, Conn. The frame of this beater is preferably made of a single piece of wire formed of parallel guideways connected with a handle, and also formed into short outer arms by doubling the wire, while the beater which revolves in the frame is likewise formed of a single piece of wire bent to form fingers to be revolved between the arms, such rotation being effected by moving a nut up and down on a screw rod which extends up between the guideways.

BED.—Elbert E. Munger, Spencer, Iowa. According to this invention, a mattress frame is mounted to rock on and swing within the bed frame, a leg hinged to one end of the mattress frame being capable of holding it in tilted position, while a seat is adjustably held by the bed frame and two limb supports are hinged to the seat board, means being provided for supporting the free ends of the limb supports. The mattress may be crumpled and folded to form a comfortable cushion upon the seat board and easy back and limb rests when the mattress support is swung into inclined position.

Designs.

PARASOL.—Oscar M. Arnold, New York City. A design for parasols to correspond with tailor-made gowns has been patented by this inventor, the ornamentation of the parasol consisting of raised and continuous embroidery ornamentation.

BICYCLE TOE CLIP.—David Basch, New York City. This toe clip has a horizontal body portion, a drop member and a toe piece, and the peculiarity of the design is in that portion of the clip which connects with the pedal, there being hook extensions of the body portion projecting rearward of the drop member.

SHOE HORN CLAMP.—William E. Gregory, Astoria, Oregon. This is a device for use in connection with a shoe horn, with which it has pivotal connection, and by means of which the horn may be clamped on the back seam as it is used to guide the foot to place in the shoe.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co. for 10 cents each. Please send name of the patentee, title of invention, and date of this paper.

NEW BOOKS, ETC.

SHOP AND ROAD TESTING OF DYNAMOS AND MOTORS. By Eugene C. Parham, Electrician of Johnstown Steel Motor Company, and John C. Shedd, Professor of Physics, Marietta College. New York: The W. J. Johnston Company. Pp. 576. Price \$2.

The authors have here provided a manual which is the outcome of their experience on the testing floor and road, and which is designed to be alike helpful to the student fresh from text book examinations and the self-taught practical man. The book is designed to give a complete theory of the commercial testing floor, so far as it relates to direct current machines, and of the applications of theory to practice, while also meeting the demand of operating companies for a manual that will enable them to do their own repair work and testing.

THE CALORIFIC POWER OF FUELS. By Herman Poole, F.C.S. New York: John Wiley & Sons. Pp. 279. Price \$3.

This book treats of a large and complex subject, in which engineers are always interested. The work was originally commenced by the author as a translation of M. Scheurer-Kestner's "Pouvoir Calorifique des Combustibles," changes in which have been made to adapt it to American methods and data, and there has been added a collection of tables of heats of combustion of fuels, solid, liquid and gaseous. The work embraces only that portion of calorimetric determinations having a bearing on fuel values, and a concise description is given of the leading calorimeters, with some examples of working and calculations. In an appendix is the report of the committee on boiler tests of the American Society of Mechanical Engineers, December, 1897.

ANGEWANDTE ELEKTROCHEMIE. Zweiter Band. Anorganische Elektrochemie. Erste Abtheilung. Elektrochemie der Metalloide und der Alkali-metalle. Von Dr. Franz Peters Leipzig: A. Hartleben's Verlag, 1898. Pp. 248. Elektro-technische Bibliothek. Band XLVIII.

ANGEWANDTE ELEKTROCHEMIE. Zweiter Band. Anorganische Elektrochemie. Zweite Abtheilung. Elektrochemie der Erdalkali, Erd und Schwermetalle. Von Dr. Franz Peters. Leipzig: A. Hartleben's Verlag. Elektro-technische Bibliothek. Band XLIX. 1898. Pp. 215.

LA PHOTOGRAPHIE ET L'ETUDE DES NUAGES. James Boyer. Paris: C. Mendel, publisher. 1898. Pp. 80. Price 40 cents.

The various observations recommended by the International Meteorological Congress for the observation of the clouds are given. The work was terminated in 1897. The present book gives details as to the method employed in photographing the clouds, and gives excellent examples of the results obtained.

THE X RAYS. Their Production and Application. By Frederick Strange Kelle, M.D. New York. Pp. 191. Price \$1.25.

In the present volume it has been the specific aim of the author to present to the reader, student or surgeon a concise treatise on the use and value of Prof. Roentgen's discovery.

ALUMINUM. The Pittsburg Reduction Company, Pittsburg, Pa. Second edition. 1898. Pp. 266, 16mo. Price \$1.50.

Though this book may be looked upon somewhat in the line of a trade publication, still it is of the greatest possible value. We do not know of any book on aluminum which contains so much practical information regarding the working of aluminum. It does not pretend to go into the subject of the manufacture of aluminum, like Richards' large work, but it is filled with valuable points for those who use aluminum in any form. It is eminently fitting that a publication of this kind should be issued by the largest producers of the metal in America, as no one is so well qualified to give reliable information regarding the metal. The arrangement of the book is excellent, and the supplementary tables are valuable. It is edited by Alfred E. Hunt, S.B.

RESULTS OF RAIN, RIVER AND EVAPORATION OBSERVATIONS. Made in New South Wales during 1896. With maps and diagrams. By H. C. Russell, Government Astronomer. Sydney: Department of Public Instruction. Meteorology of New South Wales. 1897. Pp. 209.

A CATALOGUE OF EARTHQUAKES ON THE PACIFIC COAST, 1769 TO 1897. By Edward S. Holden, LL.D. Smithsonian Miscellaneous Collections, 1087. Washington. 1898. Pp. 254.

THE LOCOMOTIVE. Published by the Hartford Steam Boiler Inspection and Insurance Company. New Series, No. XVII. Hartford, Conn. 1897. Pp. 191.

REPORT OF THE COMMISSIONER FOR THE YEAR ENDING JUNE 30, 1897. United States Commission of Fish and Fisheries. John J. Brace, Commissioner. Part XXIII. Washington. 1898.

L'ALGERIE. Le Sol et les Habitants, Flore, Faune, Géologie, Anthropologie, Ressources Agricoles et Economiques. Par J. A. Battandier and L. Trabut. Paris: Baillière et Fils. 1898. Pp. 360.

The Mechanical Engineer is the title of a new paper published by the Scientific Publishing Company, of Manchester, England. It is edited by the well known engineer, William H. Fowler. A careful examination of the first few numbers has proved very satisfactory. There has been no question that a paper of this kind has been needed in England for some time past. We are glad to see it is being conducted with a special view to accuracy—apart from which our Transatlantic brethren are not conspicuous for, specially regarding those things relating to America. There seems to be a brilliant future for this paper. The subscription price in the Postal Union is 25 shillings. It is excellently illustrated, and among the departments are: "Our Contemporaries," "Book Reviews," "Railroad Notes," "Electrical Notes," "Shipping Notes," "Industrial Notes" and "Correspondence."

Mahatma is a paper devoted to the interests of the magician, etc., has been revised and gives promise of a considerable popularity among those who are interested in magic. It is published by G. H. Little & Company, 493 Sixth Avenue, New York City, N. Y. Subscription price is \$1 per year.

We have received the descriptive catalogue of the Institute for Home Study of Engineering, Cleveland, Ohio. We judge from an examination of this catalogue that the Institute is well equipped for giving courses to those who are unable to attend a college or scientific school. This method of instruction is becoming deservedly popular, and the institution to which we refer seems to be well equipped for giving instructions of this nature. The instructors are all practical men with college educations who had considerable experience in actual work. All those thinking of taking a course in steam, electrical, mechanical, or hydraulic engineering should send for this catalogue.

Received.

"The Georgian Period," being measured drawings of colonial work, is the title of a series of handsome portfolios now being published by The American Architect and Building News, of which we have received Part I. They include some fine gelatine prints, and illustrate the details of domestic and public buildings in the New England, Middle and Southern States.

Some Homes built by Wendell & Smith is the title of a book in paper covers containing numerous well executed half tone illustrations from photographs of modern houses built by the publishers at Overbrook, Pelham, Wayne and St. David's, Pennsylvania. Copies may be had by addressing Wendell & Smith, Philadelphia, Pa.

Easy Lessons in Mechanical Drawing and Machine Design. By T. G. A. Meyer. New York: Arnold Publishing House. We have received Part I. of Volume I. of this excellently printed work, which is well adapted for beginners and students desiring to learn practical mechanical drawing. Price 50 cents.

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 the following week's issue.

Marine Iron Works. Chicago. Catalogue free.
"U. S." Metal Polish. Indianapolis. Samples free.
Emery, etc., etc. The Tanite Co., Stroudsburg, Pa.
Gasoline Brazing Forge, Turner Brass Works, Chicago
Yankee Notions. Waterbury Button Co., Waterbury, Ct.
Bicycle Electric Light Co., Cleveland, O., want agents.
Handle & Spoke Mch. Ober Lathe Co., Chagrin Falls, O.
FERRACUTE Machine Co., Bridgeton, N. J. Full line of Presses, Dies and other Sheet Metal Machinery.

Improved Bicycle Machinery of every description. The Garvin Machine Co., Spring and Varick Sts., N. Y.

Gasoline Engines and Launches. Free catalogue. Monitor Vapor Engine and P. Co. Grand Rapids, Mich.

The celebrated "Hornsby-Akroyd" Patent Safety Oil Engine is built by the De La Vergne Refrigerating Machine Company. Foot of East 138th Street, New York.

The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, \$4. Munn & Co., publishers, 361 Broadway, N. Y.

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

Notes & Queries

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, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.

Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same.

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.

(7414) W. J. W. asks: 1. Is not glass a non-conductor, and are the glass insulators used on the cross arms of poles so that no current can pass into the pole? A. Yes. 2. Will a growing tree conduct electricity or is it a non-conductor? A. Wet wood is a fairly good conductor. Dry wood is not. 3. Should the wires be carried through trees and in some cases actually wired onto the boughs? A. We think this is a bad practice, particularly to have the wires loose, so that they can swing and rub upon the boughs. 4. What would be the result if both wires should be rubbed bare on a tree (that is, the insulation rubbed off)? A. There would be a great deal of current lost by leakage. 5. Is there sufficient strength in 100 volts to seriously injure one, if wires should be broken and came in contact with a person passing by? A. No, if the current is direct, except an arc should form so as to burn him. There would be no shock through the body from 100 volts. If the current is alternating, it would be more than any one could safely receive. 6. Does the gage of wire make a difference in the strength of current? A. The size of wire is determined by the amperes of current it is to carry without overheating. 7. Does the current have the same effect on a person if standing on ground or on wood floor? A. That depends upon dryness and dampness, as in 2 above.

(7415) S. says: Please inform me how to back a map or other drawing with muslin, so it will lie smooth and not wrinkle; and if common flour paste will answer, and if the paste is put on the paper or cloth, etc. A. Stretch your muslin (ordinary cotton stuff) on a wooden stretcher by means of tacks; cover your map on the back with an even and thin coat of good boiled starch or flour paste or other sticking material, no matter what, if it only sticks. Lay the map on the cloth, only taking care to do this smoothly and to avoid wrinkles; rub it evenly down after temporarily covering the place you rub with a piece of clean paper, so as to avoid friction over the map itself. Let it dry, and the work is done. In order to avoid wrinkles, it is quite essential to let your paper map, after being covered with the starch paste, soak for a few minutes, so as to give the paper a chance to expand from the moisture. It will then, while contracting from the drying, obtain a very smoothly stretched surface.

(7416) F. E. writes: 1. I came in possession of an aneroid barometer and do not fully understand its markings. The outer circle is marked from 0 to 15,000 feet altitude; the inner circle, from 17 to 31 inches atmospheric pressure; but there are, besides the markings, rain, change, fair, on the north of the dial, and I cannot understand to what use they are put in case I am on the top of a mountain of 8,000 feet when the hand points south. A. The use of words rain, fair, clear, dry, etc., on a barometer is a survival of an old practice. These words have no connection whatever with the indications of the weather by the instrument and would be entirely wrong at different altitudes. With a falling barometer, storm is predicted; with a rising barometer, clear weather is indicated. 2. And what is the object of making the outer circle movable all round? A. The outer circle of your barometer, upon which feet are marked, is to be used as follows: Set the circle with its 0 feet coinciding with the index at any time. As one climbs or descends mountains, the barometer will then indicate his change of altitude. If this circle were set at the sea level, it would show one's altitude above sea level. This ring must be movable, to admit of adjustment to the rising and falling of the barometer.

(7417) D. McG. asks how to preserve a white pine flag pole (large size), leaving the sap wood on, the sap is somewhat thick, and to trim it off will reduce the pole too much. Would coal tar be better than white lead? Would like a lasting material and a preserving one as well, and at the same time not expensive. A. Answer by B. F. Fernow, Chief of Forestry Division, United States Department of Agriculture. No paints or coal tar are to be considered a satisfactory preservative to be applied to a flag pole with the sap wood left on. The best preservative for such a purpose is carbolineum, or any other heavy coal tar oil will answer. The pole should be left to season, under roof if possible, and the carbolineum should be supplied when the pole is dry. There are various brands of this preservative to be had, each claiming superiority. The so-called carbolineum avenarius is to be had through the Carbolineum Wood Preserving Company, Nashville, Tenn. Another, cheaper and perhaps for this purpose just as serviceable material is sold by Brume, Grosche & Company, 59 Terrace, Buffalo, N. Y. A half or five-eighths inch rod of iron will answer for the protection of a single pole like this from lightning. Joints should be coupled with firm screw couplings.

(7418) P. B. K. asks: 1. What would be the result if the wire gauze should be left out of an acetylene gas burner, and the orifice in the burner tip should become enlarged so as to allow the flame to enter the service pipes? A. Should there be no mixture of air with the acetylene, the gas would burn at the mouth of the pipe as ordinary gas does, but if any air is mixed with the gas, there would be an explosion. 2. Would it be advisable to force the gas through about one inch of water between the gas generator and the service pipes in the building as a precaution against the flame reaching the generator? A. A water seal is not necessary if proper care is exercised to prevent air from mixing with the acetylene gas. The holder should be thoroughly blown out to remove all the air before attempting to light the gas.

(7419) G. W. P. asks (1) how to make an induction coil for an experimental telephone transmitter. A. The induction coil of the Blake transmitter has a primary winding of about 180 turns of No. 22 A. W. G. single-covered copper wire, and the secondary coil has over 4,000 turns of No. 27 A. W. G. similar wire. The coil is made in the same manner as any other induction coil for a light current. For Blake transmitter see SCIENTIFIC AMERICAN SUPPLEMENT, No. 250, 10 cents by mail. 2. How are strong magnets made, of what kind of steel and temper? A. Permanent magnets should be made from the best tool steel, tempered hard at the ends only, but left soft in the middle. Stubbs' or Jessup's steel is commonly used. They are best charged by inserting them in a coil of wire through which a current of electricity is flowing. 3. A neighbor and myself have made a Hopkins (Bell) telephone which works ¼ of a mile with ground return. How can we make an inexpensive signaling device? A. There are numerous signaling devices. SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 162, 966, 10 cents each, will give you instruction with drawing for making several forms. 4. What can we employ as the simplest and best in the way of a lightning arrester for our experimental telephone? A. Lightning protection for telephones is treated in SCIENTIFIC AMERICAN SUPPLEMENT, No. 652, 10 cents. The ordinary saw tooth lightning arrester of telegraph instruments will probably serve your purpose.

(7420) H. M. M. asks: Is it good practice to varnish or shellac the disks of a Wimshurst influence machine, when vulcanite is used in place of glass? If so, may the shellac cover the tinfoil segments (except where the brushes of the neutralizer touch)? Is the 18 inch disk machine described in one of your SUPPLEMENTS of sufficient capacity for X ray work? A. The varnishing of the glass plates of Wimshurst and other static machines is to prevent the deposition of moisture upon them, since glass is very hygroscopic. It is not necessary to varnish well polished vulcanite, though there is no objection to doing so. The tinfoil can be left without shellac. For X ray work plates 18 inches in diameter may be used, but they must run very fast, 1,800 to 2,500 turns a minute, and there should be at least two revolving plates.

(7421) E. H. P. asks: 1. Is there a substance the thickness of paper or pasteboard through which the magnet would have no attraction for a needle? If so, what is it? A. A plate of sheet iron will produce this effect, and iron is the only known substance which will do so. 2. How long will a six-inch horse shoe magnet hold its attractive power with or without the armature? A. It is a matter of difficulty to so use a magnet as not to weaken its magnetism. Whenever the magnet is not in use, its armature should be on the poles. In this condition its magnetism will be retained for any length of time without change. If it be left without an armature, it is liable to loss of strength. It will also lose strength if the armature is slammed upon the poles, though the strength is not weakened by suddenly pulling the armature off the poles.

TO INVENTORS.

An experience of fifty 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. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

INDEX OF INVENTIONS

For which Letters Patent of the

United States were Granted

APRIL 19, 1898,

AND EACH BEARING THAT DATE.

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

Acetosulfanilate, making alkaline, Schaerges & Schwarz..... 602,646
Acetyl derivative of phenetidin, Schaerges & Schwarz..... 602,680
Acid, producing orthotoluene sulfonic, W. Dietterle..... 602,682