RECENTLY PATENTED INVENTIONS.

Engineering.

ROTARY ENGINE.—Claiborne W. Triplett, Leland, Ore. This engine has a cylinder with an internal offset containing the inlet and exhaust ports, the piston concentric in the cylinder having its peripheral surface in contact with the inner face of the offset, and the piston being secured on the main driving shaft, while piston heads sliding in the piston are adapted to be acted on by the steam passing into the working chamber by the inlet ports, the working chamber extending between the surface of the piston and the inner surface of the cylinder. The engine is designed to be very effective in operation, utilizing the motive agent to the fullest advantage, while simple and durable in construction.

Railway Appliances.

RAILWAY TIE PLATE.—William J. Allin, Clarendon, Ark. A rectangular metallic tie plate according to this invention has a turned-up lip cut from the body of the plate to engage the base flange of a rail, there being an aperture for a spike in alignment with the lip, and two parallel V-shaped ribs on the reverse side of the plate from the lip, adapted to be embedded in the tie lengthwise of the grain. The tie plates are inexpensive, and may be quickly locked securely in position on the ties, preventing the spreading of the rails.

SNOW PLOW.—William R. Lloyd, New York City. This plow is designed for convenient attachment to a locomotive or other motor, for readily removing snow and discharging it at the side of the track, the construction of the plow permitting convenient coupling of the locomotive to locomotives or cars ahead of it, thus allowing free use of the drawbar and the steam and air couplings. The body of the plow, of sheet metal, is arranged for extension over the pilot, and has on its upper end a movable clearer or deflector normally closing an opening in the body, but arranged for uncovering the opening for the passage of the drawbar and couplings.

Electrical.

ADJUSTABLE HANGER FOR INCANDESCENT LAMPS.—Fred C. Bell, Cœur d'Alene, Idaho. This invention relates to hangers in which the lamp is suspended from a cord wound in opposite directions upon a vertically movable spring-actuated drum, so that the light may be readily elevated and lowered and adjusted to any position desired. The device comprises a coiled spring within a rotatable drum with which the suspending cord is connected, a notched disk on the drum spindle being adapted to be engaged by pivoted dogs, and the operation being somewhat similar to that of the spring curtain roller.

MACHINE FOR RESTORING INSULATED WIRE.—Nelson Wilson, Portland, Ore. This machine comprises a winding device for winding up straightened and newly insulated wire and imparting a traveling motion to the wire, a straightening device for straightening old insulated wire, a stripping device for removing the insulation from the wire, and a covering or winding device for winding insulating fabric upon the stripped and straightened wire. The speed of the wire, as it is wound up on a drum, regulates the speed of the winding or covering device, so that the same number of turns of the insulating material is given to each foot of wire, thus insuring a uniform covering, and enabling electric companies to restore their old wire at slight expense.

Mining, Etc.

DUMP FOR ORE BUCKETS. — Hector Pepin, Victor, Col. A simple and inexpensive apparatus provided by this invention enables the engineer to attend to the dumping of the buckets as they are hoisted, thus dispensing with the services of one man, the top of the shaft being also covered while the bucket is being dumped, so that it is impossible for particles of ore to fall down the shaft. A ball or knob is suspended from the bottom of the bucket by a chain or similar connector, and a lever pivoted at one side terminates at its outer end in a fork or yoke, the lever being adapted to be swung beneath the raised bucket to embrace the knob.

Mechanical.

HACK SAW.—George N. Clemson, Middletown, N. Y. The blade of this saw is made with its cutting edge bent alternately in opposite directions, the bends being of rectangular form, with a uniform width and depth, and each bend extending over a number of teeth. It is designed in this way to reduce the friction to a minimum when the saw is used, to stiffen the blade and thus insure against breaking, and to prevent the usual binding of the blade.

WATER MOTOR.—Eli A. Rudasill, Shelby, N. C. This motor comprises a lever pivoted near its middle and having buckets pivoted to its ends, the buckets being mainly cylindrical but having tangential faces, while water-conveying spouts carried on the lever extend from the buckets upwardly and toward the center of the motor, a water delivery pipe discharging into the conveying pipes above the lever pivot. Two pivoted bars are connected to the buckets, whereby they are tipped to empty them at the limit of their downward swing. The device is entirely automatic, and will continue running as long as the water supply lasts, the construction being simple and not liable to get out of order.

Miscellaneous.

CALENDAR.—Martin Cowen, Bellaire, O. A disk in the nature of a leaf is mounted at the back of the front member of the frame of this calendar, the disk turning freely and having radial panels in which the dates of the days of a week are printed, and in each panel the name of the month, the device being in a measure a perpetual calendar, so constructed that the figures representing the days of one week only will appear at the face of the calendar, together with the name of the month, thus preventing confusion and enabling one to quickly and accurately ascertain a given date. The leaf or member bearing the dates and the names of the months may be quickly and conveniently replaced, and the leaf freely revolved upon the frame.

LIFE INSURANCE TABLE OR CHART.—Nathan P. Neal, Waxahachie, Tex. This table is designed to illustrate certain principles of life insurance and their practical application lineally, geometrically and mathematically, showing those living and paying premiums each year or any series of years, and also those who die each year or any series of years, enabling one to better understand the mathematical results. The table is based upon the number of ten thousand persons, all of whom are assumed to be insured at the age of twenty-five and all deceased at the age of ninety-one.

KINETOGRAPHIC CAMERA.—Warren B. Davis, Brooklyn, N. Y. This camera is particularly adapted for use in connection with a display device for kinetoscopic pictures devised by the same inventor, and has a master wheel for operating both the shutter and the film, the two parts being consecutively moved, whereby a series of negatives may be rapidly and conveniently made. It is also provided that whenever the shutter is brought in position for an exposure a predetermined area only of the surface of the film will be brought under the influence of the lens, the master wheel so acting upon the shutter and the film that one negative will so closely follow the other that there will be comparatively no space between them.

FLUID PRESSURE REGULATOR.—Jenkin Williams and Joseph R. Rees, Pueblo, Col. In regulators for use in supply pipes carrying natural or artificial gas, water, air, steam or other fluid, this invention provides an improved safety pressure device of simple and durable construction, very effective and automatic in operation. It comprises a chest having an inlet and an outlet orifice, one of the orifices commanded by a slide valve to which is attached a rod reciprocating through a packing gland in one wall of the chest, while a bellows attached to the rod has communication with the orifice commanded by the valve, and an expansive spring surrounds the rod and bears against the gland and bellows. In case of the breaking of the service pipe by accident or from fire, the supply of gas, water, etc., is automatically shut off.

CLOTH MEASURING AND CUTTING DEVICE.—William B. Hood, Waco, Texas. This invention comprises a support upon which a bolt or roll of cloth may be pivoted and two spaced bars by which the measuring is accomplished as the roll is unwound, means being also provided by which the cloth may be clamped close to the first one of the spaced bars and then cut by a movable knife mounted in one of the clamping bars. The device may be mounted on a plate secured to a counter at any convenient point, and is adapted to be turned as on a pivot to face in any desired direction.

BRAKE FOR DUMB WAITERS.—Charles W. Hoffman, New York City. The ends of the hoisting rope, according to this invention, are connected with slides having a limited sliding motion, and there are connections between the slides and a brake mechanism normally braking the counterbalance of the dumb waiter, whereby the brake is released when a pull is exerted on the rope. The mechanism is of simple and durable construction, not liable to get out of order, and automatically brakes the cage and its load whenever the operator lets go of the rope, on both the upward and downward movement of the waiter.

KNIT MITTEN.—Isaac W. Lamb, Perry, Mich. This invention relates to mittens in which the hand blank is knit flat and then folded over and the adjoining edges sewed together except at the thumb opening, the thumb blank being similarly folded and sewed and then sewed to the hand blank. The invention provides for a blank formed of a ribbed fabric having a main portion and a tip of a different rib style, the tip being formed by the stitches narrowed in all the courses at the inside, and with some of the stitches narrowed in the last courses at the outside of the tip.

STRAINER FOR COFFEE POTS.—Simon J. Freeman, Bradford, Pa. This is a removable strainer to be placed inside the coffee pot as an auxiliary to the usual fixed or stationary strainer. The device comprises two straining plates, an inner one with a flange and supports arranged for engagement with the body of the pot, and a forward straining plate having smaller openings than the rear one, the forward plate being supported by the flange of the rear plate. All parts of the attachment may be readily and thoroughly cleaned.

HAT PIN.—Felix Stefany, New York City. This device is designed to form a permanent fixture on the hat and be always ready for use. It consists principally of a flanged and curved sheath for attachment to the inside of the head gear, a pin sliding in the sheath, and an auxiliary pin moving with the sheath pin and extending at angles thereto outside of the sheath.

FARRIER'S PINCERS.—Hubert Wagner, Buffalo, North Dakota. This device comprises a pair of pivotally connected curved jaws with the handles curved adjacent to the pivot to conform to the curvature of the jaws and receive them when open. The pincers are arranged to open wide and permit of readily cutting into the flat surface of an animal's foot to remove undesirable matter and facilitate fitting the shoe.

BOTTLE.—Henry Weil, New York City. This is a "non-refillable" bottle, which prevents the introduction of inferior liquor after the original liquor shall have been discharged. It has a valve in its neck and a crossbar extended through a hole at one side of the neck, there being a head on the outer end of the bar, while a hole at the opposite side of the neck receives the end of the rod, a spring dog carried by the rod having locking engagement with the socket. The device is comparatively inexpensive, not adding materially to the cost of the bottle.

FLY TRAP.—William Engelbrecht, Ash Grove, Ill. This device comprises a cage in which the flies are imprisoned, and has an inlet funnel above a bait receptacle, so that the flies entering from the bait receptacle through the funnel to the cage are caught. The device is particularly adapted for catching flies in large numbers with little trouble, as the trap has to be emptied and reset only once a day.

Designs.

CUFF BUTTON. — Harold L. Palmer, Utica, N. Y. This button has a Y-shaped shank, with conical heads at the extremities of its diverging members and a base head of the ordinary button type.

WAGON BODY AND TOP.—Samuel V. Smith, Philadelphia, Pa. From an ordinary body, according to this design, rises a paneled portion simulating a greenhouse, the top having a pitch roof which is also paneled and projects forwardly beyond the body.

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.

DESCRIPTIONS OF NEW OR LITTLE KNOWN GENERA AND SPECIES OF FISHES FROM THE UNITED STATES. By Barton W. Evermann and William C. Kendall. Extracted from United States Commission Bulletin for 1897. Article 5. Pp. 125 to 133. Plates 6 to 9. Washington. Date of publication February 9, 1898.

ROOFS AND BRIDGES. Part IV. Higher Structures. By Mansfield Merriman and Henry S. Jacoby. New York: John Wiley & Sons. Pp. 276. Price $2 50.

The Lehigh and Cornell professors who are the authors of this series of volumes have found, in the successive editions through which the first volumes have passed, ample encouragement in the bringing out of the fourth volume. Part I. covered Stresses in Simple Trusses; Part II., Graphic Statics; Part III., Bridge Design, and in the present volume continuous swing bridges are treated of, and an exact method given of finding the true reactions and stresses, including the cantilever and suspension systems. Arches are treated in detail under different loadings, and the subject is presented concisely and clearly, with historical information and illustration of the theory by numerical examples.

PRACTICAL ELECTRICITY AND MAGNETISM. By John Henderson. London and New York: Longmans, Green & Company. Pp. 388. Price $2.

This volume is the second of a series of physical and electrical engineering laboratory manuals, five chapters being devoted respectively to the measurement of resistance of current, of electromotive force, of quantity of electricity and of capacity, and two chapters to magnetism and electromagnetic waves. It is the intention of the publishers in these volumes to provide a course of instruction for carrying out a progressive series of experiments, arranged so that the usual laboratory apparatus may be employed in a variety of experiments, and so that, so far as possible, a student working alone may obtain satisfactory results.

DE PONTIBUS. A Pocket-book for Bridge Engineers. By J. A. L. Waddell. New York: John Wiley & Sons. Pp. 403. Price $3.

The latest as well as one of the most original and valuable of all the publications on bridge engineering is here presented, by an author who has had wide experience in most important bridge work for many years. The use of a Latin title, equivalent to "Concerning Bridges," is humorously explained as being partly due to the fact that the author, in many years' work, had never before found opportunity to employ a laboriously acquired knowledge of Latin, and partly to intimate that the book is not a complete treatment of the subject on both theoretical and practical lines. It is, however, full of valuable suggestions for practicing bridge engineers and for young engineers in offices of bridge specialists and bridge manufacturing companies, while both professors and students of civil engineering will find that a consultation of its pages will tend to aid in the wise direction of all their studies to the best attainable ends.

METEOROLOGICAL OBSERVATIONS. Made at the Adelaide Observatory and other places in South Australia and the Northern Territory, during the year 1894, under the direction of Charles Todd. Adelaide: Published by authority of the government of South Australia. 1897. Pp. 177.

PRACTICAL CALCULATION OF DYNAMO-ELECTRIC MACHINES. By Alfred E. Wiener, E.E., M.E. New York: The W. J. Johnston Company. Pp. 683. Price $2.50.

A manual for electrical and mechanical engineers and a text book for students of electro-technics, this volume is based upon actual working results obtained in practice. It presents information derived from the data and tests of over two hundred of the best modern dynamos of American as well as European make, comprising all the usual types of field magnets and of armatures, and ranging in all existing sizes. The list contains the generators in the central stations of the principal cities here and abroad, and the author believes the abundance and variety of his working material entitles him to consider his formulæ and tables as universally applicable to the calculation of any dynamo, which may be worked out by any one possessing but a limited knowledge of mathematics.

NEUBAUTEN IN NORDAMERIKA. Blätter für Architektur und Kunstbandwerk. Paul Graef. 100 Lichtdrucktafeln mit Grundrissen und Erläuterndem Text. K. Hinckeldeyn. Lieferung 4. Berlin: Verlag von Julius Becker. Price $1.50.

This work consists of 100 plates, with the addition of floor plans. The plates are well selected and intended to give foreigners an excellent idea of some of our fine American homes. The plates are well executed. The present number contains ten plates.

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.

(7403) H. R. S. asks: Will you please tell me through the Notes and Queries of the SCIENTIFIC AMERICAN how or where I may find directions that will enable me to make a folding bellows such as are used on cameras. A. Full directions are given in SCIENTIFIC AMERICAN SUPPLEMENT, No. 625, price 10 cents by mail.

(7404) J. S. S. asks if dynamos, arcs, switches and exciters are liable to damage by lightning when working, from the fact of their being charged by artificial electricity, any more than what they would be if they were other than electrical machinery and appurtenances, or would the likelihood be greater when in a state of rest? Also is it feasible for an electrical plant (electrical machinery only) where power is generated to be struck by lightning, even where a detractor or lightning conductor is used? A. Electric lines and apparatus are probably more liable to be struck by lightning than adjacent buildings; but it is not probable that their potential due to the current they are carrying would render them more liable to such a stroke. The E. M. F. of a lightning flash is so enormous that a few hundred volts more or less makes no difference. Such lines are struck as lightning rods are because they are metallic and a better path for the current. Lighting arresters are usually effective in preventing injury to apparatus. It is thought by many that the lightning strikes less frequently in places where large numbers of electric wires are strung in the air.

(7405) T. M. P. asks (1) if the points on the interrupter of electric bells are platinum or not, and how are they soldered on or made fast to the spring of the interrupter? A. The contact points of an electric bell are best made of platinum, but in cheap bells the cost of the platinum prevents its use. Platinum can be soldered to copper in the usual manner with the ordinary soldering fluid. Clean the copper surface by scraping or by acid. Wash and coat it with solder. Clean the platinum. Lay it on the place where it is to be fixed, heat with a blowpipe or soldering copper till the solder flows. 2. About how many times the resistance of copper is water (for electricity)? A. The resistance of pure water is so high that an electric current cannot be sent through it. The addition of a minute quantity of sulphuric acid reduces the resistance greatly. Ordinary well or spring water usually will allow an electric current to flow through it; but no figure of resistance can be given for water in general. Scarcely two samples would have the same resistance.

(7406) A. E. writes: The following experiments are interesting, if not important; they may not be new, but I have never seen them or read of them. If you think them worthy a place in the SCIENTIFIC AMERICAN or SUPPLEMENT they are at your service. Cut a piece of paper or card about two inches square, and stick it against the glass of a window. Look at this card through a prism, and you will see blue at the top of the card and violet beneath the blue. At the bottom of the card you will see red, and yellow beneath it. So we get the most refrangible colors at top, and the least refrangible at bottom. Now place a second card same as the first just below, about half inch from the first, so that the blue at the top of the second card falls on or mixes with the yellow of the upper one, and the result of the union of the two, Y and B, is a beautiful green. I think this is not in accord with modern views, but the fact that blue and yellow light does produce green must be ac-

counted for. [A. This is a very pretty experiment, which we do not remember to have seen put in this form before. The principle is not new. The edges of all objects seen through a prism or unachromatic lens are fringed with colored bands by the decomposition of the light into its various wave lengths. The production of green light by passing white light through yellow and blue light is not difficult of explanation by "modern views" and accords with them, as may be easily proved by a spectroscope. The yellow seen in this case is opaque to and cuts off blue, indigo and violet; similarly the blue is opaque to and cuts off red, orange and yellow. The only color which can pass through both the yellow and the blue is green. It is therefore seen whenever yellow and blue are so placed that we look through or at them together. It is easy of proof that the yellow and blue lights when mixed form, not green, but white, that is, they are complementary colors. In a darkened room project upon the wall the yellow and then over it the blue, by some arrangement of mirrors or two lanterns, and where both lights fall on the same space, the wall is white.—EDS.]

(7407) S. M. P. writes: There is a large difference in opinion as to whether or not an object traveling a complete circle goes around everthing within that circle whether moving or not. A says a pulley fastened to a revolving shaft goes around the shaft. B claims that it does not, but that the pulley goes with the shaft. Which is right? A. A pulley or any other revolving body turns on its axis, which is an imaginary central line. The axis does not revolve. The shaft does revolve with the pulley; therefore, the pulley does not go around the shaft. B is correct.

(7408) W. L. E. asks: 1. If a ⅛ horse power motor is catalogued voltage 8, will an 8 volt current from four 2-volt accumulators run it for its full ⅛ horse power? A. An electrical horse power is 746 watts. One watt is 1 volt×1 ampere. Any number of volts multiplied by any number of amperes are so many watts. If then you have ⅛ horse power motor and the voltage is 8, the amperes to drive it will be found by dividing ⅛ of 746, or 373, by 8, which gives 47 about. You will need 47 amperes in your accumulators. 2. Can the rheostat described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 865, be used to regulate the speed of any motor, or is it only used to start the motor? A. A rheostat both starts and regulates the speed of a motor. Its office is to protect the armature coils from too much current while they are at rest or turning very slowly. 3. What is the voltage of the motors used in the World's Fair launches? If they had only 66 cells and they connected them in three sets of 22 each, they would only get 44 volts, wouldn't they? Or have the accumulators a strength of more than 2 volts. Please explain. A. See SCIENTIFIC AMERICAN for November 25, 1893, price 10 cents. There are no storage cells with more than 2 volts. 4. If a current of higher voltage than the motor is wound for is connected to the motor, will it burn the motor out? A. It will overheat or burn the coils. 5. In making accumulators, is the only advantage in size a greater ampere hour capacity? A. The size of the cell should be proportioned to the work. A cell too large wastes current.

(7409) E. A. B. asks for a receipt for making a kind of resin which is of a more sticky nature than the common resin used for violins, a kind of resin which is sticky enough so that, if applied to a violin bow and drawn across a steel string (touching very lightly), it will take effect A. 1. For violin resin boil down Venice turpentine with a little water until a drop cooled on a piece of glass is of proper consistency. During the boiling cold water must be added from time to time. When sufficiently thick pour into cold water, knead well, and when cold break into pieces. Expose to sun until dry and transparent. 2. Select the best clear brown resin, melt it in a clean basin to nearly a boil, which will clear it of turpentine or other volatile oils. Pour in paper moulds.

(7410) J T. H. asks which dynamo, the series or the shunt, is used to the best advantage? A. The series dynamo is not self-regulating. An increase in the resistance of the external circuit causes a decrease in the E. M. F. of the machine. This necessitates a separate regulator. The shunt dynamo acts just the reverse of this. A combination of those two, or a compound-wound dynamo, is self-regulating.

(7411) C. C. R. asks: What is the per cent of economy of a common turbine waterwheel over a Barker or reaction wheel, all things being equal? Also how much more economical is a good marine engine than a good steam turbine, under the same circumstances? A. A common turbine wheel may have any economy from 60 to 70 per cent. The best turbines have an economy of from 85 to 87 per cent. A Barker's mill seldom reaches an economy of 45 per cent. Reaction wheels of the Pelton and other types of impact jet wheels under high pressure range in economy from 80 to 87 per cent. The best types of triple or quadruple marine engines have reached an economy of 12½ to 12 pounds of steam per horse power hour; the steam turbine, from 25 to 30 pounds of steam per horse power hour.

(7412) C. A. H. says: I have understood that by introducing oxygen gas into an arc light (of the same intensity as used for street lighting purposes) that a heat could be obtained of 18,000 degrees Fahrenheit, or sufficient to fuse marble. Is it true? If not, will the introduction of oxygen gas into the arc light increase its intensity, and to what extent? A. The temperature of the arc light is quite high enough to reduce marble to calcium oxide without introducing oxygen. We doubt if an arc, except in the electric furnace, will fuse (melt) the calcium oxide. The introduction of a stream of oxygen blows the arc and cools it. If the arc were immersed in oxygen, it would doubtless be hotter and would consume the carbon more rapidly than in open air. The temperature of the electric arc is taken to be about 6,000 degrees Fahrenheit.

(7413) C. C. S. asks: 1. How to attach wires for charging American storage batteries? A. To charge a storage battery send the charging current in the opposite direction to that in which the discharging current flows. 2. How do you arrange the bank of lamps for resistance on 110 volt circuit? A. Connect the lamps in series for the amount of resistance needed to produce the drop in voltage required and then add similar series till the amount of current required will flow through the lamps.

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