

RECENTLY PATENTED INVENTIONS.

Engineering.

BLOWER OR PUMP.—Charles Rumley, Helena, Montana. This machine, to be used for either of the purposes named, has a nearly cylindrical case, with inlet and discharge ports and a side offset, a piston rotating in the case, with a valve arm journaled in the offset and pivoted to the piston, while a valvular extension on the arm extends into the offset and to one side of the discharge port. The invention is an improvement on a former patented invention of the same inventor, whereby the parts are so arranged as to prevent possible leakage, and the back pressure will be largely removed from the piston.

AIR CUT-OFF FOR FURNACES.—Robert D. Rhodes and Ludwig Kloz, Leadville, Col. A mechanism to control the air blast into the interior of the furnace has been devised by these inventors, to work in such manner that the air for oxidizing sulphur in ores or furnace products may be distributed into the mass to be calcined or roasted from the periphery of the revolving furnace, and will reach only those sections where the air is required. The improvement is more especially designed for revolving roasting furnaces having perforated pipes or flues in their interior to force blasts of air into the ore or furnace products undergoing treatment.

BOILER AND METALLURGICAL FURNACE.—James W. McGranahan, Harrison, N. J. The grate is, with this construction, at some distance from where the heat is applied, and the stream of gas produced is led through flues to the fire box or bed of the furnace, where a clear gas fire is maintained, without ashes or dirt, the air supply being conducted through flues or heaters contiguous to the smoke and gas flues, the walls of the air flues thus becoming highly heated, and correspondingly heating the air supplied for combustion. The grate may be of the ordinary type, or such as used in Siemens furnaces, producing a quantity of incompletely burned gases.

Railway Appliances.

CAR FENDER.—Edward K. Thoden, Brooklyn, N. Y. This is a foldable, downwardly spring-pressed catcher frame, projecting from a hanger frame, readily transferred from one end of the car to the other, the fender, when released by the driver, having enforced contact with the track rails, adapting it to catch a person struck by its elastic front edge portion. The guard rim of the fender, when struck by a falling body, is automatically elevated to prevent the person from falling off and hold up the limbs so that they will not drag on the roadbed.

CAR FENDER.—Andrew Mohn and August J. Bothur, Hoboken, N. J. This device consists of a brush held under each end of the car, and of a diameter to cover the roadway to the outer side of each rail, the brushes to be revolved by a mechanism connected with one of the car axles or by an electric motor. The axle of the brush may be connected or disconnected, by means of a clutch mechanism, with the power which rotates it, on moving a shifting lever, the brush being also moved down close to the track as desired, its revolution removing persons from the track without liability to serious injury.

SWITCH.—James Joyce, De Lamar, Idaho. This invention relates to switches operated by a moving train, and provides a working mechanism applicable to a two-way, three-way, or any ordinary switch, with means for throwing the switch by a passing train. Contact rails are arranged to be struck by mechanism on the car, working the switch in series so that they will be struck successively without severe shock, there being also contact wheels and operating mechanism on the car, whereby the wheels may be brought into contact with any desired series of contact rails on the track. The switch may also be thrown by hand as well as the ordinary switch.

SWITCH OPERATING DEVICE.—William Dryden, Brooklyn, N. Y. This improvement comprises a mechanism especially adapted for street railway cars, whereby the switch may be shifted in advance of a moving car, the operator on the platform throwing the shifting device into engagement with the switch points. A shoe pivotally connected with the car is adapted to engage one of the switch points, a spring normally holding up the shoe, which may be depressed by a screw shaft carried by the car, and there being a belt connection between the screw shaft and a hand shaft.

CAR COUPLING.—Charles D. Curry, Denison, Texas. This is an improvement in couplings of the side latching or Janney type, and which are arranged to be uncoupled from the side of the car. The recessed drawhead is channelled on one side and a latch-block pivoted in the recess, while a vertically sliding locking pin is recessed in its side, a detent hook with lateral arm being adapted to rock in the channel to engage the hook with the recess in the pin. The parts when partially detached are supported by other parts of the coupling, and thus prevented from falling on the track.

Electrical.

TROLLEY CATCHER.—Martin V. B. Nichols and James A. Fraser, Port Arthur, Canada. A guideway in which slides a weight is held on the car, according to this invention, the weight being flexibly connected with the trolley pole, and held elevated by a detent which is released by the upward movement of the trolley arm, automatically preventing it from flying up when disengaged from the trolley wire. The attachment is simple and inexpensive, can be quickly adjusted by the motorman to reset the wheel against the wire, and serves to pull the trolley arm down from the wire and supports as the wheel jumps therefrom.

Mechanical.

MOULD FORMING MACHINE.—Louis His, New York City. For forming and shaping moulds for castings, especially for preparing moulds for casting propellers, this inventor has devised an apparatus which is perfectly adjustable either vertically or laterally, and

is provided with a rotary knife or cutter head adapted to accurately form the mould, the cutter head being under perfect control while in motion, so that it may be given any desired pitch. The flask, with properly tamped sand, is placed beneath the cutter head, the latter being moved into contact by adjusting screws, and by its revolution scooping out the sand, the pitch, the height, and the longitudinal direction of the cutter head being readily changed and controlled as the operation proceeds.

Agricultural.

TRANSPLANTER.—Otto F. Mulhaupt, Shreveport, La. This is a box-like structure of very thin wood, designed to quickly decay, and with its sides and bottom having numerous apertures through which the roots of the plant may reach the surrounding ground and receive moisture. The bottom slides in side slots and may be removed if desired, the transplanter affording a perishable receptacle in which small plants may be raised from the seed and transferred to the ground without removing the earth from around the roots and disturbing the growth of the plant.

Miscellaneous.

NEWSPAPER WRAPPING MACHINE.—James T. McColgan, Nashville, Tenn. According to this improvement a presser cylinder is mounted to rotate in conjunction with an intermittently revolving core, the cylinder swinging toward and from the core, while a feed table guides the paper and wrapper between them, there being also a cutting mechanism, a paste supply roller, and a swinging frame carrying them both to move the roller in contact with the wrapping paper. Address pasters may be attached to the wrappers before or after wrapping, the machine being designed to automatically wrap newspapers and other publications for mailing in a most efficient manner.

DOOR LOCK ATTACHMENT.—Waldo G. Rex, Shelton, Washington. According to this invention certain devices are applied to the inner keyhole face plate of the door and to the interior of the lock, to afford increased protection against interference from the outside of the door, preventing the falling out of the key, its being forced out by a burglar, or being taken out by children and lost. The improvement also affords protection against picking by automatically closing the keyhole by the operation of the key in locking the door, also preventing listening or peeping through the keyhole of the lock or door by outsiders.

WINDOW SCREEN.—Harley E. Moyer, Conway Springs, Kansas. An outer frame, as provided by this invention, has aligning sockets in the opposing rails, a screen-covered frame with one of its bars perforated fitting in the outer frame, while a pintle in one bar of the screen-frame engages one of the sockets of the outer frame. A beaded pintle fits in the aperture of the screen-frame and the socket of the outer frame, and has a laterally projecting spring finger engaging a latch bolt secured to the screen frame. The device is readily removable, and the windows can be cleaned on both sides of the sash at any time.

DISINFECTING APPARATUS.—Frederick J. Mitchell, New York City. In this apparatus an atomizer adapted to draw from a disinfecting fluid receptacle is also connected with a compressed air reservoir by a pipe in which is an automatically operating valve, the discharge nozzle of the atomizer being connected with the object to be disinfected. The invention also provides for the automatic operation of the apparatus by hydraulic or equivalent power or by a pump, for the disinfection of drains of all descriptions, soil pipes, waste pipes, or for disinfecting the atmosphere of a compartment.

DUMPING MECHANISM.—Thomas Wright, Jersey City, N. J. This invention relates to coal or other freight dumping wagons, providing therefor a novel and effective adjusting mechanism, the body elevating mechanism being automatic in its adjustment from a folded condition to a complete elevation, effecting a sufficient inclination of the body rearwardly for the speedy and certain discharge of the load in bulk. After the load is discharged by gravity, the wagon body automatically returns to its place, the parts being then folded.

HAME STAPLE.—Riley Stoner, Grand Junction, Col. This staple comprises two independent limbs converging on inner faces at the same ends, a sleeve block fitting between the converging faces, while a clamping bolt engages perforations of the limbs and sleeve. The construction is such as to obviate abrasive wear on the body of the bolt which connects the limbs of the staple with the sleeve block that forms the bight of the latter, renders the staple strong and light and permits the ready removal and replacement of worn parts.

DETACHABLE PAD FOR BREAST STRAPS.—Gustav L. Heyman, Carlisle, Ky. This is a harness pad consisting of a rubber air chamber formed in one piece, with marginal overlapping lips or claws projecting upon the opposite side from the bearing surface of the pad. It is cheap and easily fitted to any breast strap, breeching or belly band, by means of its overlapping lips or claws, and is always smooth and pliable when inflated, preventing chafing and keeping the bearing surfaces of the animal cool and comfortable.

DENTAL PLUGGER.—James W. Dennis, Cincinnati, Ohio. Two patents thus entitled have been granted this inventor for an instrument having a yielding working face and especially adapted to facilitate the introduction of amalgamating filling into the cavity of a tooth, the yielding surface of the plugger conforming in a measure to the contour of the surface of the tooth being treated. In one case the working surface of the plugger consists of a removable shoe, preferably of soft rubber, and in the other the plugger has a socket in which a tip of yielding material is adjustably held to turn, so that by the use of the instrument the amalgam will be rapidly and efficiently distributed and the mercury worked to the surface of the filling, from whence it can be readily removed, leaving a very hard and unshrinkable filling in the tooth.

DENTAL MATRIX.—This is a further improvement of the same inventor in matrices to be

placed between the teeth to form a temporary wall for the cavity to be filled. The matrix comprises two plates adapted to embrace the edges of opposing teeth, the plates each having a rib, while a wedge with a longitudinal groove in its side face is adapted to be inserted between the plates. By making the ribs of softer metal than the plates, the wedge member when forced in does not grate upon a hard surface.

DENTAL CLAMP.—According to another invention of Mr. Dennis, the body of a dental clamp is so made that the jaws are readily removable, enabling a number of jaws to be fitted to a single body, the jaws being made in pairs and differently shaped to fit variously formed and inclined teeth. The jaws may also be adjustably located in the body of the clamp, and thus accurately fitted to a tooth, and the bearings or inner faces of the jaws are of yielding material, such as soft rubber, enabling the clamp to be used on extremely sensitive teeth without pain to the patient or without lacerating the gums.

FILLING FOR TEETH AND FILLING THE TEETH. are the titles of two additional patents also granted Mr. Dennis, the filling being especially prepared in stick form, so that particles may be removed and inserted in the cavity as a basis filling. The prepared filling is composed of copper, gutta percha and zinc, and the filling is designed to be an efficient preventive and arrester of decay, while capable of holding by amalgamation an indestructible cover or wearing surface. The process of filling patented consists in applying to the cavity a basis filling, faced with an amalgamating metal in a comminuted state, or in the form of filings applied to the facing, the interior copper or plastic filling being thus protected by a strong and reliable outer filling of gold or other suitable metal.

GARMENT PATTERNS.—Marie Tucek, New York City. This inventor has devised a new method of laying out and cutting patterns or garments, requiring but few measurements and comparatively little skill. For waists, a system of lines composed of a waist line and perpendicular lines are produced upon the material, with a line at an acute angle to the waist line and lines parallel to the acute angled line. On these lines are transferred measurements obtained from the body, in conjunction with unit measurements, thus laying out the individual parts of the pattern or garment, each part being laid out complete before the draughting of the next adjoining part is commenced.

GARMENT SUPPORTER.—Emma and Herbert Johnston, Cincinnati, Ohio. This is a simple device for attachment to one garment for the support of another garment, being especially adapted, when attached to the corset, for holding up ladies' skirts. It consists mainly of a wire spring frame, with an eccentric pintle and spring tongue, a pin secured to the pintle engaging the tongue. The device forms an efficient and quite inexpensive fastening.

BELT HOOK SLIDE.—Louis Sanders, Brooklyn, N. Y. This is a slide which may be attached to a belt which is on or off the person, the slide affording a support for the skirt and keeping the skirt band concealed beneath the belt. The slide is also so made that the belt will be prevented from wrinkling or puckering. The slide has an ornamented body on the outer face of the belt, and carries a pin extending down behind the belt, this pin engaging an eye at the lower end of the body and having at its lower end a hook. An auxiliary pin prevents the sliding or puckering of the belt.

CHEESE CUTTER.—Frederick J. Siewers, Galena, Ill. In this machine the cheese is supported on a platform or table connected with a dial, the moving of the platform a certain distance causing the dial to indicate a pound or fraction thereof or any desired weight, when a knife will be brought into operation to cut the exact amount designated on the dial from the cheese. The cut is made on a line drawn from the center, the operative mechanism of the dial having been previously set in accordance with the known weight of the entire cheese.

BUNDLING CIGARS.—Domingo Acosta, Key West, Florida. This inventor has devised a bundling cabinet of compact and inexpensive construction, which may be folded in a small and convenient package, and with which cigars may be bundled in any desired quantities, the cigars being thus held in uniform shape prior to bundling.

MECHANICAL TOY.—Abraham Martin, London, England. In this toy a magnetized spindle is mounted to rotate in bearings, while an armature is held by magnetic attraction in driving contact with the spindle, the armature carrying a figure or object to which eccentric movements are imparted by the revolution of the spindle, thus moving, in a manner not readily apparent to the beholder, toy ships, dancing figures, etc.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention, and date of this paper.

NEW BOOKS AND PUBLICATIONS.

MANUEL PRATIQUE DE L'AERONAUTE. Par W. de Fonvielle. Paris: Bernard Tignol, editeur. Librairie Scientifique, Industrielle et Agricole. Pp. iv, 246. Price \$1.25.

There are constant inquiries for books on balloons, giving practical information on ballooning and other subjects connected with the aeronautical science. Here at last we have the subject treated from the point of view of the practical aeronaut, with numerous illustrations, practical recipes, and advice on the subject.

THE FURNACE WORK MANUAL. An exposition of furnace work in all its branches. Compiled from files of the American Artisan. By Sidney P. Johnston. Chicago: The American Artisan Press. 1895. Pp. 268.

This thoroughly practical treatise, illustrated by over 200 cuts, treats of furnace work proper, tells how the pipes should be cut, how they should be laid and connected, and describes the construction of furnaces, all the

details of pipes, dampers, and the minutiae of hot air heaters. It is evident that it covers a ground heretofore but little treated, as this book works from the standpoint of the practical furnace builder or plumber who is called upon to introduce furnaces into houses. We anticipate for this book a circulation proportionate in great measure to the amount of interest taken by this class of artisans in their business, and in proportion to the height of the ideal which they have formed of their profession.

THE UNIVERSITY TUTORIAL SERIES. A text book of statics. By William Briggs and G. H. Bryan. London: W. B. Clive. Pp. vii, 220. Price 60 cents.

A cursory view of this work impresses one most favorably with it. Although it is an English book, it, fortunately, is not one that is restricted to one of the syllabus courses, but is simply intended to be adapted to the wants of the elementary student. With its very excellent illustrations, table of contents and answers to problems, little need be said about the absence of an index, for it hardly seems to be needed.

THE UNIVERSITY TUTORIAL SERIES. A text book of dynamics. By William Briggs and G. H. Bryan. London: W. B. Clive. Pp. 192, xiv. Price 80 cents.

What has been said about the preceding work applies equally to this one. The nice make-up of the book, its clear printing and excellent arrangement, go to impress one most favorably with it, and incline us to recommend it to our readers.

THE DYNAMICS OF LIFE. AN ADDRESS DELIVERED BEFORE THE MEDICAL SOCIETY OF MANCHESTER. October 3, 1894. By W. R. Gowers. Philadelphia: P. Blakiston, Son & Company. 1894. Pp. 70. Price 75 cents.

The author, in this treatise, which is an address reprinted from the pages of the Lancet, endeavors to account for the dynamics of the living being. How successful he is can only be judged by a full perusal of the work. Anything of the sort makes interesting reading, and we think that the work, short as it is, deserves an index.

SCIENTIFIC AMERICAN BUILDING EDITION.

JANUARY, 1895.—(No. 111.)

TABLE OF CONTENTS.

1. An elegant plate in colors, showing a Colonial cottage at Williamsbridge, N. Y., recently erected for Chas. H. Love, Esq. Two perspective elevations and floor plans. Cost complete \$4,250. Mr. Arthur C. Longyear, architect, New York City. A pleasing design.
2. A Colonial residence at New Rochelle, N. Y., recently erected for J. O. Noakes, Esq., at Iselin's Park. Two perspective elevations and floor plans. Cost \$5,000 complete. Mr. Manly N. Cutter, architect, New York City. An attractive design.
3. Colonial residence at Montclair, N. J., recently erected for Sylvester Post, Esq. Two perspective elevations and floor plans. Messrs. W. S. Knowles & A. H. Thorp, architects, New York City. A pleasing design.
4. A seaside cottage recently erected for C. H. Manning, Esq., at Kennebunkport, Me. Two perspective elevations and floor plans. A picturesque and unique design after the "New England" lean-to roof order. Mr. H. P. Clark, architect, Boston, Mass.
5. A residence at East Orange, N. J., erected at a cost of \$7,000. Architect Mr. W. F. Bower, Newark, N. J. Perspective elevation and floor plans.
6. The First Presbyterian Church at Stamford, Conn. Two perspective elevations and ground plan. A design of great architectural beauty, treated in the Romanesque style. Mr. J. C. Cady, architect, New York.
7. A residence at Scranton, Pa., erected for E. B. Sturges, Esq., at a cost of \$5,000 complete. Architect Mr. E. G. W. Dietrich, New York City. Perspective elevation and floor plans.
8. A summer residence at Cushing's Island, Me., recently erected at a cost of \$3,100 complete. Two perspective elevations and floor plans, also an interior view. Mr. John C. Stevens, architect, Portland, Me. An excellent example for a summer home.
9. View of the Armory of the Seventy-first Regiment, New York City. Architect Mr. J. R. Thomas, New York City.
10. Perspective view and floor plans of the fourteen story Reliance Building, Chicago.
11. Miscellaneous contents.—Buff brick popular.—Ceiling and cornice tinting.—Home ground arrangement of plants, illustrated.—Stone dressing by compressed air, illustrated.—Brick dust mortar.—Interesting ruin of cliff dwellers.—Removing the front wall of a warehouse, with sketches.—Improved woodworking machine, illustrated.—Buff brick in New York.—Ceiling paper.—"Decoreo," a new material for decorative purposes, illustrated.—Improved gutter hangers, illustrated.—Draughtsman's supplies, illustrated.

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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.

(6375) T. D. L. asks: Can a permanent magnet be made equally as strong as that of an electromagnet wound by any desired strength? A. No; an electromagnet may be much stronger.

(6376) E. C. S. writes: In a recent discussion as to the velocity of falling bodies, I made the general statement that all bodies fell with equal velocity, recognizing, of course, the apparent exceptions, such as feathers, etc. Will you kindly throw some light on the matter, as one of our local scientists maintains that a heavy body will fall with greater velocity than a lighter one. The Encyclopaedia Britannica, under the head of gravitation, states that bodies fall to the earth with equal velocity, irrespective of material of which they are composed. Upon this and the fact that there is a rule giving the velocity of falling bodies 16 1/2 feet for the first second, etc., I base my opinion. A. The law of falling bodies applies to bodies falling in vacuo. In the air a heavy body, ceteris paribus, falls faster than a light one. The Encyclopaedia Britannica statement applies to a vacuum. The air offers very high and generally underestimated resistance to falling objects.

(6377) H. A. says: Can you give a good recipe for renewing the ribbons of typewriters with good cord or with copying ink of different colors? A. Take vaseline (petroleum) of high boiling point, melt it on a water bath or slow fire, and incorporate by constant stirring as much lamp black or powdered drop black as it will take up without becoming granular. If the vaseline remains in excess, the print is liable to have a greasy outline; if the color is in excess, the print will not be clear. Remove the mixture from the fire, and while it is cooling mix equal parts of petroleum, benzine, and rectified oil of turpentine, in which dissolve the fatty ink, introduced in small portions by constant agitation. The volatile solvents should be in such quantity that the fluid ink is of the consistency of fresh oil paint. One secret of success lies in the proper application of the ink to the ribbon. Wind the ribbon on a piece of cardboard, spread on a table several layers of newspaper, then unwind the ribbon in such lengths as may be most convenient, and lay it flat on the paper. Apply the ink, after agitation, by means of a soft brush, and rub it well into the interstices of the ribbon with a toothbrush. Hardly any ink should remain visible on the surface. For colored inks use Prussian blue, red lead, etc., and especially the aniline colors.

Aniline black. 1/2 oz. Pure alcohol.15 " Concentrated glycerine.15 " Dissolve the aniline black in the alcohol, and add the glycerine. Ink as before. The aniline inks containing glycerine are copying inks.

(6378) The F. R. Co. asks: 1. Is it possible to charge an electro-magnet with the secondary current from an induction coil? If so, please name the

best form of construction. A. Not to advantage. It requires a very long coil and involves loss of efficiency. 2. Your description of the magneto bell requires the L shaped piece which holds the armature to be a permanent magnet. Why is this necessary? A. To polarize the electro-magnet.

(6379) P. asks: 1. What advantages are claimed for metal as a developer? Could you give me a receipt for a developer containing it, and directions for use? One with which I can have most control over the plate, and which will keep when mixed for use, as I often want to develop one or two plates at a time. A. Metal is very energetic in its action, has remarkable staying qualities, keeps clear, does not stain the film in the shadows, and is easy to work. The following is a good formula:

- Metal. 5 grains. Sodium sulphate crystals C. P. 25 " Water. 1 oz.

Dissolve metal first, then sodium sulphate. If kept in a tightly corked bottle, the solution will remain colorless for two or three months. This is a stock solution. To develop a 4x5 plate, take 1/4 ounce of the above, add 3/4 ounce water and pour over the plate; if fully timed, the picture will gradually appear and rapidly gain density and detail. If the time has been short, add to the solution a few drops, four or five at first, of a carbonate of potash solution, prepared by dissolving one ounce of potash in three ounces of water. Keep adding a little at a time until the development proceeds rapidly enough to suit. The used developer should be kept in another tightly corked bottle. Eight 4x5 plates can be developed with these 2 ounces of developer. At end of that time development will be very slow and the developer will have a peculiar pungent odor when the nostrils are placed near it. This signifies that it is ready to be thrown away. 2. An easy way of regaining gold from waste toning solution. A. Gold may be recovered from waste toning solutions by adding a solution containing 32 grains of proto-sulphate of iron to every gallon of waste. The gold will be precipitated to the bottom. The clear liquid should be drawn off by a siphon and the residue poured upon a filtering paper and washed by pouring over it boiling water until the wash water no longer produces a precipitate with a solution of barium chloride. The gold is now re-dissolved with aqua regia and the solution slowly evaporated to dryness over a sand bath. The yellow crystalline salt may then be dissolved in water to make up a fresh toning bath, or put in an airtight bottle. 3. What can I use to finish off the woodwork of a camera (tripod)? A. Fill the grain of the wood with a filler of appropriate color, and when dry give the tripod a flowing coat of shellac varnish.

(6380) C. K. H. asks: 1. What is considered the best material to put between the flooring to deaden sound? If felt or paper will do, what kind is the best? The floor is of a hall over a store and is to be sound proof at the least expense. As parties are figuring on putting in an electric lighting system in the building, a plant of from 100 to 150 incandescent lights, and running same with a gasoline engine, will you give an idea of which is the best engine and dynamo for the purpose and the cost of same? It will require from 10 to 15 horse power we are informed. A. A double floor with mortar between is probably the best sound insulator. For the address of engine and dynamo builders we refer you to our advertising columns. 2. Do you think it practicable to install an electric lighting plant for stores or hall and run same successfully with a gasoline engine? A. Gasoline engines have been successfully used for electric lighting; we believe they have proved to be economical.

(6381) J. H. L. asks: 1. How shall I wind the fan motor described in SUPPLEMENT, No. 767, so as to be suitable for a 100 volt circuit? A. We advise you not to try the motor on a current of such potential. You might wind with No. 36 wire and start with a rheostat. 2. Where can I get instructions for making a voltmeter? A. See our SUPPLEMENT, Nos. 556, 552, and 353, for descriptions of voltmeters. 3. Where can I get instructions for making a small fan motor of the alternating induction type? A. For alternating current motors, see our SUPPLEMENT, Nos. 601, 653, 692, 717, and 944. These describe different motors, but do not give full working details.

(6382) E. P. B. asks: 1. Is it feasible to make a storage battery for electric light work of one lead plate for a positive pole and a single zinc stick for a negative pole? A. This is hardly feasible. 2. State the amperes needed to charge 144 square inches (all total) of positive plate? A. 5 amperes. 3. What is the discharge for the above surface? A. 5 to 6 amperes. 4. Is asbestos a perfect insulator? A. Nothing is a perfect insulator; dry asbestos is almost a perfect one.

(6383) W. A. H. asks how to wind an induction coil, for use on a Hunning's transmitter. Crowfoot gravity batteries, three in number, to be used. I wish to know size and quantity of wire to be used on both primary and secondary. Which will give best results on Hunning's transmitters—open circuit or gravity cells? A. Wind primary to 3/8 ohm with No. 24 wire, secondary to 80 ohms with No. 36 wire. Use open circuit batteries; the Crowfoots will tend to local action by deposition of copper on the zinc.

(6384) A. N. X. asks: To persons using the same living rooms with a victim of consumption, and where cuspidors are used indiscriminately, is there any danger from contagion? A. There is no doubt that the practice is dangerous. Use individual cuspidors and place disinfectants, such as zinc sulphate, in them. See SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 782, 824, 959, and 973, for articles on consumption, its cure, prevention, etc.

(6385) S. J. R. asks: 1. How can I make a good but inexpensive microphone? A. See our SUPPLEMENT, No. 163. 2. I have two Samson batteries on a burglar alarm system. Before retiring last night I tested the alarm and it worked all right. About an hour after I heard a noise resembling an explosion, and opening the closet, in which I kept the batteries, I found that one of them had burst all to pieces, and the fluid was thrown all over everything. A. Possibly the glass battery jar was badly annealed. This or some accident throwing it down are the only causes assignable.

(6386) W. H. B. asks how to proportion a primary spark coil to get the best results with the least

amount of material, to best adapt it to a battery of known amperage and voltage. A. The calculation cannot be made except approximately. The voltage to be developed must be known. Then the size of core and turns of wire must be based on the ratio of 10⁹ lines of force cut per second for one volt produced. The great trouble is in the leakage coefficient for the lines of force.

(6387) F. X. W. asks: In regard to eight light dynamo in SUPPLEMENT, No. 600, what alterations, if any, are necessary in winding, to change said dynamo into motor, and what horse power would it develop if used as a motor? A. Wind in shunt. The size of wire depends on the voltage. It would give about one-half horse power.

(6388) F. W. G. asks how many volumes a mixture of gas and air—10 to 1 (at ordinary pressure) makes on explosion. A. It depends on the composition of the gas; from 6 to 10 times the original volume, but instantly going back to about the original volume.

(6389) C. R. B. asks: How much rainfall a fall of 12 inches of snow would represent, and if the snowfall of a year is counted in making up the report of the annual rainfall? A. If light snow, it would give a little over an inch of water. To get accurate results, the snow must be melted so as to give a determination for every snowfall. The value of the snow in water counts as rainfall.

(6390) P. E. A. asks: Can a person see the stars in broad daylight by descending into a deep well which is in darkness and looking up to the sky? How many feet down would a person have to descend? A. Stars can readily be seen in the day time from the bottom of deep wells and mines. A hundred or more feet down is sufficient. Stars of the 3rd and 4th magnitude are about as small as thus can be seen.

(6391) W. D. asks: What is the process of cleaning sea shells to make them look bright and clean? A. Dark-colored organic matter on the outer surface is first removed by making a thick mixture of one part bleaching powder to two parts of water and soaking the shell therein. On removing wash and scrub it. Thick incrustations of lime must be picked off with a sharp-edged hammer or some similar tool, and then the shell must be dipped in boiling dilute hydrochloric acid. Valuable shells may have the face or pearly portion covered with shellac varnish, which may be removed with alcohol after the acid bath. For strong, heavy shells use 1 acid to 3 of water; for delicate shells use 1 part acid to 10 of water. Dip the shell for a second only, wash and examine; if not enough, give it a second dip. Hold it in wooden forceps or attach it to a stick in any way to serve as its handle. The important point is not to let the acid stay long on the shell. For local spots it may be applied with a brush.

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Table with 2 columns: Invention name and Patent number. Includes items like 'Car coupling, R. F. Ludlow', 'Car fender, W. L. Fees', 'Car fender, Reynolds & Center', etc.