RECENTLY PATENTED INVENTIONS.

Engineering.

STEAM ENGINE.—William F. and Eugene W. Cleveland, Rounthwaite, Canada. To prevent all possible back pressure, by affording a full and complete exhaust, thus utilizing the steam to its utmost efficiency, these inventors provide a hollow piston connected at all times with the exhaust, while valves mounted on the heads or faces of the piston alternately connect its interior with the ends of the cylinder.

Railway Appliances.

CAR FENDER — Michael F. Flynn, Stamford, Conn. This fender is normally carried in substantially vertical position in front of the dash board, but has a lower front cushioned roller adapted to strike and trip one caught in the path of a moving car, in which case the lower portion of the fender is automatically moved out to present a bed to receive the falling body. Simultaneously with this action a cable attached to the brake and another connected with the trolley arm are operated to apply the brakes and break the electric connection supplying power, or to release the grip in case the car is moved by cable.

AUTOMATIC REPEATING SIGNAL.—Robert H. Innes, San Antonio, Texas. This is an apparatus for use in connection with semaphore and other train signals to prevent mistakes when notifying the central official, and automatically report changes in the position or color of the signal to a central office over the ordinary telegraph wire. A wheel operates a key to send a message that the signal is changed to "danger," and the turning of the wheel engages the signal repeating device, so that when the latter is actuated to clear the signal a second message is sent to the central office to that effect.

Electrical.

ELECTRIC RAILWAY SYSTEM.—John F. Page, Chewacla, Ala. This is an improvement in systems where the main line conductor is underground, and has feeders, each consisting of a normally open partial circuit leading to a contact rail or plate, and having a circuit closing device. An endless driven cable carried on the car is arranged to contact with the contact rails or plates in the conduit, transmitting the current through the cable to the motor circuit, and improvements are introduced in the circuit closing devices to be actuated by the endless cable, the improved system being designed to be more safe and efficient than systems heretofore in use.

Mechanical.

TONGS.—John Quinn and William H. Bradley, Mingo Junction, Ohio. These tongs may be readily opened and closed or moved about, a uniform power being obtained for their opening and closing, while they securely hold or release the article. On one of the tong arms is a rock bar engaging a pinion on the other tong arm, there being a rein or handle for turning the pinion.

METALLIC PACKING.—Edward L. Raynsford, Susquehanna, Pa. This is an improvement on a formerly patented invention of the same inventor, providing a packing for use on piston rods, balance slide valves, etc., without the use of springs or glands, and consisting principally of a ring having an annular groove with outwardly beveled sides and a second ring with inwardly beveled sides fitting in the groove of the first ring. For balance slide valves the packing is made in straight form.

Miscellaneous.

BICYCLE SUNSHADE. — John Murgatroyd, New York City. By means of clips this sunshade may be connected to the frame of a bicycle and adjusted at any inclination desired, and there are mounted at the upper end of the staff ribs and braces of peculiar construction, whereby the forward ribs may be shortened and the rear ribs lengthened, to afford a shade with rearward extension that will offer but little resistance to the wind, the cloth being effectively prevented from tearing by the operation of the bows and braces.

BLOOMERS.—Thomas H. Royce, Brooklyn, N. Y. This invention is for a garment formed of two duplicate patterns or cuts designed to produce a graceful fullness at the lower portion of the bloomers, and cause them to appear as nearly like a skirt as possible.

RACE TRACK STARTER'S GATE.—Patrick Ryan, New York City. For stopping the horses where a false start has been made for a race, this invention provides, near the head of the race track, a pliable gate having hanger arms pivoted on posts, springs pressing the arms and gate normally upward, and a latching device holding the gate down, while a releasing mechanism may be operated by the starter. When the horses have made a good start, the starter shifts a lever which releases the gate, when it rises to clear the track, but the gate is allowed to remain down when a false start has been made

DUPLICATE WHIST BOARD. — Lucius C. Thompson, Rolfe, Pa. This invention provides means for attaching counters to the board, and also for holding cards in place on the board, the latter being so made that auxiliary counters may be placed on it without confusing the regular counters. The corners at opposite sides of the board are of different arrangement, to provide for a proper location of the board in original and duplicate.

MUSIC LEAF TURNER.—Peter H. Adams, Osorno, Chile. This device comprises a casing in which revolves a cylinder having projecting pins adapted to engage levers, the latter engaging a second series of spring actuated levers or arms whereby the leaves of sheet music may be successively turned, the casing being placed upon a piano with the leaves of music engaged by the arms, when each leaf is turned as the performer strikes a lever at one side.

PHOTOGRAPHER'S DARK ROOM.—Ferdinand A. Wattenberg, New York City. This is a portable apparatus, which may be readily folded up for transportation or storage, and when opened out and set up enables the user to develop sensitive plates, and fill holders and cameras, etc. It is made of flexible material to inclose the upper part of the body in one end, while in the end piece at the other end is a ruby glass window, and the bottom is formed with pipes or tubes which permit the entrance of air.

LAMP. — Jacob Weintraub, New York City. This invention relates especially to alcohol lamps, for which a cap or cover is provided to increase, diminish or extinguish the flame, the cap being operated from the exterior of the lamp. The horizontal combustion surface has a ring-shaped cover, the opening of which is regulated by segmental plates having pivotal connection at one end with the cover, in which is supported a ring having radial slots into which projections from the plates extend, there being on the ring a rack engaged by a pinion whose shaft extends outwardly and terminates in a hand wheel.

WATER COOLER AND FILTER.—Henry Roeske, Philadelphia, Pa. With this apparatus filtered water may be drawn directly from the water supply pipes or from the cooler, as desired, and the filtering material is designed to be impregnated with a mineral salt, as borax, or with salicylic acid, to temporarily prevent or arrest fermentation of impurities not removed by mechanical filtration. The filter occupies the bottom portion of a cylindrical tank in which is an ice surrounded receiving vessel connected with the water supply, the overflow of this vessel passing down through a central tube to the filter bed, while the water supply is also directly connected by another pipe with the central tube.

FENCE WIRE FASTENER.—Reuben E. Curtice, Spencer, Ohio. In wire fences where the wires are kept parallel by upright stay rods, this improvement provides readily applicable novel spring clasps to retain the stay rods in position, and permit their ready removal when desired. The clasp consists of a wire bent upon itself to form a loop and two parallel members, both of which are bent to form U-shaped loops, both the stay rods and the wire being embraced by the loops.

WIRE FENCE MACHINE. — Zachariah R. Kling, Laclede, Mo. Where wire fences are made up of palings or pickets and posts, the wires being attached to the posts and looped around the palings, this improvement provides a simple device whereby two or more wires may be readily twisted to hold between them a paling, the wires being at the same time stretched, and the stretching device being temporarily attached to the post over which the wires may be drawn. The wires are held parallel and taut by a clamping mechanism, some distance in advance of a twisting mechanism, through which the wires pass, being twisted by the turning of a crank as each picket is placed in position.

ROAD RAKE.—Albert Daggett, Strong, Me. This improvement comprises a vehicle from which is suspended a V-shaped rake, with its point forward, a lever mechanism being adapted to raise either side of the rake independently, and springs being arranged to press against the upper surface of the rake back. It is a simple machine for use on country or unpaved roads, being adapted to sweep away all loose stones, etc., without disturbing the roadbed or gravel, while also leveling the road by breaking up dried mud.

REIN HOLDER.—Granville Bartlett, Rushville, Ind. This holder is formed of wire, with side lengths adjusted on opposite sides of the dashboard, the wire having finger-hold loops and crimped holding portions, having a strong downward tension. By means of the finger holds the holder may be lifted to pass the reins between it and the dashboard, where they will be held by the tension of the holder.

SPOKE SOCKET.—Samuel S. Sheaffer, Veedersburg, Ind. An improved spoke adjuster and clip, by means of which the tires of a wheel can be readily and quickly tightened, is provided by this invention, comprising a socket to fit on the spoke, there being in the upper end of the socket a bolt having a conical upper end, while a clip fitting upon the felly has a socket to receive the conical end of the bolt. The device may be readily applied to old wheels whose tires have become loose as well as to new ones.

CHEESE CUTTER.—Nicholls J. Smith, Waycross, Ga. This is a simple mechanism by means of which cheese may be cut into slices of any desired weight, an indicator plate marking the width of cut necessary for a slice of the weight sought. The cheese is supported upon a revolving table, and a center rod projecting upward through the cheese forms a guide for the rear end of a vertically moving knife or cutter actuated by a rack bar by rotating a hand shaft. A graduated gage plate is adjustably supported above the cheese from a collar clamped to the center rod.

BOTTLE FILLING DEVICE.—James Iredale, Toronto, Canada. This is a simple and inexpensive device designed to be directly applied to a can or other receptacle, and having branching tubes each connecting with a single bottle, a valve opening or closing all the tubes simultaneously. In connection with the filling device, a tray is arranged to hold the bottles stationary when beneath the filling tubes.

COLLAR BUTTON.—Ferdinand A. Wattenberg, New York City. This button has the usual base, shank and head, but in the front of the head is a recess and an upwardly opening spring pressed hinged plate, on the back of which are prongs, which project downward when the plate is opened and swung up. The plate is closed when the button is placed in the neck band and the collar buttoned over it, but before tying the scarf the plate is swung upward, when its prongs hold the tie in position and prevent it from slipping upward or sidewise.

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.

THE INTELLECTUAL RISE IN ELECTRICITY. A History. By Park Benjamin, Ph.D., LL.B. New York: D. Appleton & Company. 1895. Pp. xi, 611. Price $4.

Dr. Benjamin's work on the early history of electricity contains, naturally, a quantity of interesting matter. It deals with the work of the early philosophers. Of course, the exact status of intellectual progress in the olden times is very difficult to get at, it being certain that, in our inability to get below the surface, we often misjudge the motives which actuated the people of past centuries. In Dr. Benjamin's book considerable readiness to criticise unfavorably these people of the past is shown, and the work cannot, we think, be accepted as a reliable exponent of the real intellectual life of the ages of which it treats, it being questionable if data enough exist for obtaining a true idea of those days. In other words, Dr. Benjamin's views seem to us to be decidedly one-sided, and he never hesitates to give his personal view of matters hardly appertaining to science.

LECTURE NOTES ON THEORETICAL CHEMISTRY. By Ferdinand G. Wiechmann. Second edition. New York: John Wiley & Sons. London: Chapman & Hall, Limited. 1895. Pp. xviii, 283. Price $2.50.

Dr. Wiechmann's work, now before us, attempts to review to an adequate extent the subjects of chemical physics, stoichiometry and chemical energy, thus giving a philosophical view of the entire theory on which modern chemistry is based, not touching upon chemistry pure and simple as such. The advanced chemist will find in it much to interest him, notably in the treatises on chemical notation and on the molecular theory. An excellent index of subjects, with a supplementary index of names and an adequate table of contents, are features of the book which still further commend it to us. It will be found an excellent work to remove from chemistry the dry aspect of a mere collection of facts, as it systematizes and puts the whole into concrete form.

THE ELECTRICAL TRANSMISSION OF ENERGY. A Manual for the Design of Electrical Circuits. By Arthur Vaughan Abbott, C.E. With nine folding plates. New York: D. Van Nostrand Company. London: Sampson Low, Marston & Company, Limited. 1895. Pp. xiv, 586. Price $4.50.

There is no question that the transmission of energy is now one of the most important functions of electricity. This excellent work, liberally illustrated, with excellent table of contents, list of plates and satisfactory index, is to be strongly commended as a valuable addition to technical literature in the larger field of electrical engineering. Its very numerous illustrations and diagrams alone almost suffice to tell its story, and we are glad to be able to commend it to the electric profession. It seems thoroughly up to date, something which it is very difficult to obtain in a work on electricity, but this one really seems adequate. The author, however, in one of his statements—that referring to electrolysis of water pipes—seems confused or unwilling to state the real cure for this evil, which he implies is "a metallic return circuit which shall be amply sufficient to convey to the power house all the energy required to operate the railway system." The real cure is, of course, to have the entire power circuit absolutely insulated from the ground.

DESCRIPTIVE CATALOGUE OF ESSENTIAL OILS AND ORGANIC CHEMICAL PREPARATIONS. Compiled by Frederick B. Power, Ph.G., Ph.D. New York and Garfield, N. J.: Fritzche Brothers, branch of Schimmel & Company, Leipsic and Prague. Pp. v, 96. Price $1.

THE JUCKLINS. A novel. By Opie Read. Chicago: Laird & Lee. 1896. Pp. 291, 12mo. Illustrated, cloth, gilt top. Price $1.

The Horseless Age, a monthly journal devoted to the interests of the motor vehicle industry, is published by E. P. Ingersoll, 157 and 159 William Street, New York City. The subscription price is $2 a year.

The Motocycle is published in Chicago, Ill., by the Motocycle Publishing Company. Price for the United States and Canada is $1 per year. Both of the above publications are liberally illustrated with engravings of the latest motocycles, etc.

Terrestrial Magnetism.—An international quarterly journal, published under the auspices of the Ryerson Physical Laboratory of the University of Chicago. It is edited by L. A. Bauer, with the co-operation of such well known scientists as C. Abbe, W. Von Bezold, T. C. Mendenhall and a number of others. The subscription price is $2 a year; the first number contains an article on electric currents induced by rotating magnets and their application to some phenomena of terrestrial magnetism, Halley's earliest equal variation chart, reproduced in fac-simile for the first time from a photograph furnished by the possessor of the chart. The rest of the periodical is made up of letters to the editor, etc.

The Digest of Physical Tests and Laboratory Practice is published quarterly, by Frederick A. Riehle, Philadelphia. This is a resume of practical tests made in the laboratories of the world. The subscription price is $1 per year. The present number gives an account of testing various engineering materials, such as cements, beams, cast iron car wheels and tests of iron, steel, tests of signal pipe connections, etc. The new publication is freely illustrated.

Good City Government Conferences form the subject of a 500 page octavo published by the National Municipal League, of Philadelphia. It includes the proceedings of the Second National Conference for Good City Government, at Minneapolis, in December, 1894, the first annual meeting of the National Municipal League, and a third national conference at Cleveland in May, 1895.

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.

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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.

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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.

(6718) J. H. F. says: Will you please give me a formula for making inking rollers for hand printing presses? A.

Best glue	10½ lb.
Black molasses or honey	2½ gal.
India rubber, dissolved in oil of turpentine	1 lb.
Venice turpentine	2 oz.
Glycerine	12 oz.
Vinegar	4 oz.

The above formula is given for the mysterious black composition, so durable and elastic, and known but to very few persons until recently. Purified India rubber only is used. To recast add 20 per cent new material. The old home receipt is, 2 lb. best glue, soaked over night, to 1 gal. New Orleans molasses. Will not recast.

(6719) B. P. asks: 1. Will it seriously interfere with the efficiency of a storage battery to have the area of the negative plate somewhat less than that of the positive? A. No. 2. How can I tell a charged cell from a discharged one? A. By the liquid giving off gas "boiling;" by the color of the positive plate—this is dark red at starting and becomes in the charged cell nearly black; by the specific gravity of solution. 3. Is there any danger of over-charging a cell? A. There is no great harm to be anticipated; it is wasteful of course and gets sulphuric acid into the air and on the connections and so does injury by impairing insulation. 4. What harm is done if the charging current is of too high a voltage? A. None in itself; you simply want to keep a proper amperage. Of course too high a voltage between the cell terminals might give a dangerous amperage. 5. What is a carbureter? A. An apparatus for charging a gas with hydrocarbon vapors. 6. How is petroleum vaporized in petroleum engines? A. It is atomized or blown into fine spray unless volatile enough to form a true vapor. 7. Have you any SUPPLEMENTS on petroleum and gasoline engines? A. We refer to our SUPPLEMENT, Nos. 535, 618, 715, 716, 993, 963, and 1024, price 10 cents each by mail.

(6720) W. S. P. asks: 1. "Experimental Science," page 398, says the Smee battery has an E.M.F. of 1.09 volts when not in action and 0.482 when in action. I don't understand why a cell has any E.M.F. when not in action. Please explain. A. A battery by chemical action maintains a potential difference or E.M.F. between its terminals. When on open circuit or not in action this E.M.F. is greatest; when on closed circuit the E.M.F. generally is reduced. The condition on open circuit is comparable to that of a charged Leyden jar; on closed circuit the condition is comparable to that of a jar kept excited while constantly discharging. 2. Is electrical force wasted when sent through a rheostat, i. e., isn't there more economy to use less cells when possible than to use a rheostat? A. Yes, in general terms rheostats are wasteful and their use is to be avoided if possible. 3. In running a small motor which would be the handier and cheaper, an 8 cell Edison-Lalande primary battery type W or a No. 413 chloride accumulator (storage) where it would have to be sent 12 miles for charging at a light station? The first cost of each is nearly the same. A. Probably the storage cell would be best, but no exact estimate of the relative cost can be given from your data. 4. Would the Gramme ring motor, nicely made, as given in SUPPLEMENT, No. 783, develop power enough to run a dental engine if it had battery power sufficient? A. Yes. 5. How large a 4 blade fan would it drive at 2,000 revolutions per minute? A. A twelve inch fan. 6. Does any SUPPLEMENT describe a motor fully that is between the one in SUPPLEMENT, No. 783, and SUPPLEMENT, No. 641, I mean in size? A. We suggest our SUPPLEMENT, Nos. 759, 761,