RECENTLY PATENTED INVENTIONS.

Agricultural Implements.

CULTIVATOR.—A. A. THOGERSEN, Brookings, S. D. The disks of this cultivator may be so adjusted relative to the main frame or to the rows of plants that the soil may be thrown toward or away from the plants, when needed. The ground-wheels and the bars or beams supporting them may be shifted laterally to permit the passage of large plants or bushes.

Electrical Devices.

ELECTRICAL SMELTING APPARATUS.—R. L. BARNHART, Charleroi, Penn. This mechanism is adapted for smelting minerals by the use of the electric arc, the minerals being suitably fluxed and prepared in the form of paste, which is then formed into bars, so that when electrically charged and brought in contact an arc is formed and the mineral is thereby smelted.

VOLTAMETER FOR THE ELECTROLYSIS OF WATER.—P. GARUTI and R. POMPILI, 11 Via Vesta, Tivoli, Italy. The inventors in this case make a new and radical improvement in their voltameters of a former patent, for electrolysis of water; and it consists, chiefly, in a modified form of the metallic diaphragm used in connection therewith. The present invention eliminates certain inconveniences by an improved construction of diaphram which will permit the use of larger electrodes without increasing the internal resistance.

ELECTRIC CONTROLLER.—C. T. J. OPPERMANN, 2 Wynyatt Street, London, England. This invention relates to a controller-switch for electrically-driven vehicles, and has for its object to enable, by means of one controller having comparatively few contact-pieces, four different speeds in the forward direction of running, to be obtained without the use of a separate reversing-switch.

Engineering Improvements.

DEVICE FOR REMOVING IMPURITIES FROM BOILER FEED-WATER.—G. T. CONKLING and C. C. MITCHELL, Plainfield, N. J. The purpose of this invention is to construct a filter which comprises a suitable hollow body having a removable cap and inlets and outlets in the body-section, together with straining cloths carried by supports of perforated metal, which supports and cloths are fitted in grooves in the body of the cap and are readily removable. The inlet is formed to deliver the incoming material to filtering members, the outlet placed to take the filtered liquid from the body. The invention provides a packing, to be used when a great body of filtering material is required.

CONVERTIBLE ENGINE FOR DERRICKS AND CABLEWAYS.—A. LAMBERT, Newark, N. J. In practice the endless traversing rope of a cableway is given a few turns around its drum, and the drum is therefore concave. In derrick-engines, the drums are cylindrical, the ropes being wound up or allowed to unwind, as desired. Again, the Lambert cableway system enables a drum of large diameter to be used for the haul-rope to obtain high speed for the carriage, while a drum in a corresponding position in a derrick must be of small diameter to obtain power. The invention provides means for readily converting a cableway-engine into a derrick-engine and vice versa.

SLIDE VALVE GEAR FOR STEAM ENGINES.—S. S. YOUNGHUSBAND, Granville Terrace, Darlington, England. Two patents have been granted to Mr. Younghusband for slide-valve gears for steam engines. His inventions relate to slide-valve reversing and expansion gear of the kind wherein motion is transmitted from the expansion and reversing link to the slide-valve through an intermediate lever, which is pivoted to the die-block of the link and connected by its shorter arm or arms to the valve rod, while its other and longer arm is pivoted to an arm or arms on the weigh-shaft, the expansion and reversing link vibrating as a whole about a fixed axis, to which it is connected by a pair of swing carrier-links, and the reversal of the engine being effected by moving the die-block along the slot of the link. This type of valve-gears gives a fixed amount of lead with all degrees of linking up, a quick port-opening for the admission of steam, a quick opening at the commencement of the exhaust, and a much larger steamport opening and more sudden cut-off than usual for all degrees of linking up, thus enabling the engine to be always readily started.

Heating and Lighting Apparatus.

HEATER.—O. JAHELKA, New York, N. Y. The object in view in this improvement is to provide a heater so arranged as to give out a high and practically constant degree of heat with a small amount of fuel consumed, and further, to provide means whereby obnoxious gases rising from a fresh supply of coal are prevented from entering the room in which the heater is placed.

GAS-BURNER AND REGULATOR FOR SAME.—A. A. PRATT, New York, N. Y. The present invention of Mr. Pratt relates to incandescent gas-burners as described in a former patent of his. The object is to provide a new and improved gas-burner and regulator arranged to allow minute regulation of the amount of gas passing into the mixing-chamber of the burner to insure a proper mixture and burning of the gas and air for producing a very bright light without waste of gas and irrespective of the prevailing pressure of the gas-supply.

GAS-BRACKET.—D. CAVANAGH, New York, N. Y. In this arrangement of a gas-bracket the user is permitted to burn the gas with a flame ranging from the maximum to the minimum power without turning the key ordinarily employed for turning the gas on or off, the bracket being very simple and durable in construction and easily manipulated to obtain a flame of the desired power.

HEATER.—M. BARMAN, Brooklyn, N. Y. This apparatus is of that order of heater particularly adapted for boiling water for laundry use; and the aim is to provide a heater comprising a fire-box and boiler so arranged that the box will occupy a comparatively small space of the boiler-bottom, thus increasing the area of water directly acted upon by the heat.

FEED-WATER HEATER FOR BOILERS.—C. G. TAYLOR, Farmington, Wash. This heater for boilers is so constructed that it is utilized as the sides and grate of a furnace except where a rocker-grate is required, when the device is used as the sides of the furnace only, and the sides are connected at a point beneath the rocker-grate. There is a double series of tubing, the inside pipe feeding water to the boiler, and the outside pipe giving free circulation of water from and to the boiler, whereby the heater is exposed to great heat, thus heating the feed-water to a high degree by what would otherwise be waste heat.

Mechanical Devices.

BALL-BEARING.—E. J. FARR, Boston, Mass. The object in view in this invention is to provide an improved ball-bearing which is simple and durable in construction and arranged to prevent the balls from rubbing one against the other, to reduce the friction to a minimum, and to allow of convenient and quick adjustment of the parts to compensate for wear.

SAW-FILER.—D. L. KELCHNER, Brooklyn, New York. This invention relates to improvements in machines for filing saws, the purpose being to provide a machine of this character and by means of which a saw may be quickly and uniformly filed. The file is connected with the carrier or rotary part by means of screws. Therefore when a file becomes worn out it is readily replaced by a new one.

POWER-TRANSMITTING MECHANISM.—F. SEDIVY, Globe, Arizona Ter. The mechanism in this case is in the nature of an improved construction of duplex screw gear or shaft and a traveler co-operatively connected therewith for converting a continuous rotary motion into a reciprocal motion; and the invention provides a mechanism simple, economical, and stable in construction, in which the operation of converting the motion is automatic and positive.

APPARATUS FOR WATERING COKE-OVENS.—D. B. STAUFT, Scottdale, Penn. Comprised in this invention is a novel sprinkling apparatus introduced through the oven-door into the oven, so as to lie over the bed of coke, and so constructed that it will automatically turn over the coke thoroughly for sprinkling. The sprinkler may be manually turned. The arrangement of the sprinkling pipe is such that the water is confined to the bed of coke and does not spray the oven walls, since the sudden cooling would tend to destroy them.

CARD-CONTROLLING ATTACHMENT FOR TYPE-WRITING MACHINES.—R. K. SLAUGHTER, Brooklyn, N. Y. This attachment includes an interchangeable line-spacer that sets the machine to print upon lines any desired distance apart. The attachment is adapted for rapidly feeding postal-cards, index and other cards, envelopes, etc., in position on the platen, where they may be printed upon and carried over the platen and deposited in a receptacle. The attachment will not require the machine to be raised after cards have been placed in a supply-receptacle and fed to guide devices, since by action of the machine, the cards may be printed and conducted to and deposited wherever desired.

TYPE-WRITER.—J. ALEXANDER, New York, N. Y. The invention relates particularly to improvements in carriage mechanism for type-writing machines. It comprises adjustable means for preventing upward movements of the carriage during operation; novel means for causing the step-by-step movements of the carriage; novel means for causing vertical movements of the roll-carrying frame; and means for stopping the carriage and locking the several finger levers at the end of the line.

TYPE-WRITER-BAR MOVEMENT.—J. ALEXANDER, New York. This invention relates particularly to improvements in the construction of the type-carrying bars and the mechanism for operating the bars, the object being to simplify the construction of the parts, and to so arrange them that they may be readily adjusted, assembled, or separated when required. This application is a division of an application for a patent formerly filed by Mr. Alexander.

MECHANICAL POWER.—S. HAYES, Macon, Neb. The object of the inventor's claim is the provision of a simple device employing a series of rolling weights for actuating pumping devices, air compressors, or similar machinery. A very small engine or like power will operate the device. The heavy weights serve by gravity as a means for increasing the power, as upon once starting its momentum will aid in carrying the rollers around the track.

METHOD OF EMPTYING BEATING-ENGINES.—E. A. JONES, Pittsfield, Mass. A new and improved method of emptying from beating-engines the finished pulp in a thorough, quick and economical manner without requiring manually-wielded rakes for moving the pulp to the discharge-pipe of the vat, is the claim of this invention. The method consists in subjecting the pulp in the vat of the beating-engine to the action of a forceful undercurrent to set the pulp in motion and direct it to the discharge-pipe of the vat.

CHEESE-CUTTER AND SLICE DISCHARGER.—H. ROSE, Shreveport, La. This machine is supported on a rotatable table, which is divided into sections. A knife mounted above may be depressed to sever sections from the cheese. By means of a gage-plate one may determine accurately the size of slice necessary for a desired weight of cheese. The severed slice may be slid into a receptacle by tilting the section of table on which it is resting.

Railway Improvements.

SWITCH-OPERATING MECHANISM.—J. M. WILBUR, Colorado Springs, Col. The invention in this case is an improvement in switch-operating mechanism and especially in the class of such mechanism described in Mr. Wilbur's former application for patent, in 1902. The present invention relates particularly to the means for supporting and operating the mechanism constituting the switching devices.

BRIDLE RODS FOR RAILROAD-RAILS.—J. R. JOHNSON, El Paso, Texas. The present invention provides a device for temporarily bridling or bracing the rails laid down by a track-laying machine, until they can be properly secured by the spikers. The bridle-rod will also be found useful for preventing lateral displacement of rails on curves or switches. The construction permits rapid attachment or removal of the device, so that it is particularly adapted for laying a temporary side-track around a wreck, etc. The bridle-rod consists of a stationary rod and two gage-bars mounted to slide thereon. The base flanges of the two rails to be bridled are securely held between the ends of the stationary rod and the movable gage bars which are held in position by spring catches.

Vehicles and Their Accessories.

PROPELLER-WHEEL FOR VEHICLES.—C. H. O. HAMANN, Bergedorf, Germany. This is a traction-wheel adapted to engage the ground for propelling vehicles and like service. It is mainly intended for use on bicycles, and automobiles, for propelling them over ice, although it should be understood that Mr. Hamann's invention is not limited to this use, but is also applicable for the purpose of propelling other vehicles and for analogous purposes.

WHEEL.—W. H. LASSWELL, San Angelo, Texas. In this wheel the frame is rigid, it being composed in part of hollow radial spokes, which are permanently connected with the central annular portion in which the hub proper is adapted to move radially. The hub is connected with the felly by spiral or coil springs and devices in the form of turn-buckles, these parts being arranged in the hollow spokes and annulus, and thus protected.

TRACE-DETACHER. — J. D. BLAKEMAN, Smith's Grove, Ky. This detacher is adapted for use on singletrees, and is an improvement in that class of trace-detachers represented by a former patent to J. D. Blakeman in 1890; and the present invention consists in certain novel constructions and combination of parts which provide means to free a horse in a moment, and in case he should run away, damage to the vehicle and injury to occupants will be avoided.

Miscellaneous.

FURNACE-GRATE.—C. P. ROBERTS and G. P. ROBERTS, Toledo, Ohio. In accomplishing these improvements relating to steam-boiler furnaces, the inventors are enabled to provide a grate of hollow bars through which atmospheric air may pass and become heated before it meets with the products of combustion.

TOY GUN.—MALINDA C. ANTHONY, Oakland, Cal. By means of certain improvements in toy-guns, this inventor provides a gun so arranged as to first discharge a target and then to discharge a projectile, thus not only providing amusement but offering a simple and harmless means for acquiring skill in marksmanship.

STEREOTYPE.—A. L. ANDERSON, Grundy Center, Iowa. This improvement relates to devices for locking stereotype plates and the base together in such manner as to lock the plate to the base securely when the foot-slug is placed in position, thus dispensing with brass strips at the top of the column or at the sides of the column and avoiding accidents by neglect in placing these strips in place to prevent the plate from slipping and damaging the press or other machinery.

FASTENING FOR BASKETS, ETC.—A. A. BENEDICT, Riverton Township, Mich. Several objectionable features in fastenings, particularly for fruit-baskets, are overcome in this invention In which the cleat of the cover of the basket is formed with a slot, and the nail after being driven through the parts is then returnbent, and its point is extended upward and passed into this slot which locks the point securely and prevents it from projecting out to tear the clothing or cut the skin of handlers of baskets.

OIL-TANK ATTACHMENT.—C. MOLLER and M. SALISBURY, Pensacola, Florida. In this attachment the Inventors furnish means for guarding against explosions in tanks containing volatile hydrocarbons and like substances. As is well known, such explosions are due to vapors in the tank, these vapors being continually given off from the oils. The invention involves an improved means for disposing of these vapors.

BOOKKEEPING.—J. C. MACNAMARA, New York, N. Y. The design in this process of keeping accounts by single or double entry, is to provide, first, internal proofs of the accuracy of the records without taking off trial balances; and, second, a means for obtaining results more expeditious and certain than by the double entry now used. A summarized double-entry record serves as a check on accounts kept in detail by single entry and provides means for obtaining a balance-sheet and profit and loss statement in a very quick and accurate way.

GAME APPARATUS.—H. J. FRYSINGER, Baltimore, Md. This improvement belongs especially to that class of game apparatus illustrated in a former patent of Mr. Frysinger's, designed for playing what is termed "royal pin-ball," and the present invention relates to the means for securing the canvas or netting to the end posts which support either of these materials.

DRAFT DEVICE.—T. V. ELLIOTT, Columbia, Penn. Mr. Elliott's invention is an improved draft device for furnace-stacks. By use of the construction a strong upward draft is caused in the stack of the furnace which is regulated by proper adjustment of a pin-valve, and where desired a valve may be provided to throttle or control the discharge of steam through the steam pipe leading from the dome of the boiler to the stack.

BALL-CATCHER.—S. A. COHEN, New York, N. Y. The aim in this invention is to furnish a ball-catcher more especially designed to enable the user to conveniently and quickly pick up a ping-pong ball from the floor, from under the furniture, and other places under which the ball may have strayed during the playing of the game. The device is easily handled, and arranged to allow picking up the ball without stooping down.

WATER-COOLER.—Z. F. BOWMAN, Washington, D. C. The inventor claims an improvement in coolers particularly designed for use in connection with railway cars, the object being to produce a cooler so arranged as to use circulated air in lieu of ice as the cooling medium, thus reducing the cost of labor in providing cool water in passenger-coaches or the like.

STAIR STRUCTURE.—N. BOIS, New York, N. Y. In this improvement in the construction of stairways, the object is to provide a stairway having a plurality of steps and risers formed of a continuous strip of sheet metal attached to sheet-metal string-pieces, thus not only making a fireproof stair, but materially reducing the labor and cost of stair building and placing.

KILN.—H. STEHMANN, Whitecliffs, Ark. This invention relates to cement-kilns, lime-kilns, and the like, such as shown in a patent granted in 1901 to Mr. Stehmann. The intention of the present invention is to provide a new and improved kiln arranged for continuous operation to produce Portland cement, lime, and the like of very high quality and at a low cost.

BANJO.—W. B. FARMER, New York, N. Y. This musical invention relates to banjos and like instruments in which strings extend over a stretched membrane. The object in view is to provide a new and improved banjo or similar musical instrument arranged to produce an exceedingly fine melodious tone when the instrument is played.

HEN'S NEST.—W. J. DILLARD, Santa Rosa, Cal. When eggs have been laid, this improvement will cause them to pass downward into one of a series of pockets in the receptacle below, thus obviating the danger of being damaged through remaining in the nest. When the egg passes through the passage between the nest and receptacle, it operates certain mechanism to revolve the receptacle, thus presenting an empty pocket beneath the chute. The receptacle is prevented from revolving until the egg is safely placed in its pocket. The nest is made so that all chaff, dust, straw or dirt will pass through.

BIFURCATED GARMENT.—E. ARPIN, Springfield, Mass. The object in view in this improvement is the provision of means by which chafing at the crotch is prevented, thus Increasing the comfort of the wearer of men's undergarments, chiefly in warm weather. The improvement tends to separate the organs from contact with the thighs, and it not only insures comfort, but reduces perspiration, and thereby conduces to cleanliness.

FIRE-LADDER.—J. C. SCHALLER, Hastings-upon-Hudson, N. Y. One object of the inventor is the provision of a metallic non-destructible ladder arranged to provide for the circulation of water through it, so as to stiffen the device by the water-pressure and to keep it cool. Another is to equip the ladder with means for distributing water toward a door, window, or other place, so as to quench the flames and enable the fireman to carry on the work of rescue.

SOLDERING IRON—C. R. GUTNER, Croton Falls, N. Y. The purpose of the invention is to so construct the iron that its body, which is in the form of an electric coil, will have an aluminium core, to make the body light, and to provide means whereby the sealing tip is detachably connected to the core of the coil. This enables a short piece of copper to be used and

the soldering tips cheaply replaced. The core for the coil is so constructed that acid from the sealing tip cannot reach it to scale off the metal and short-circuit the wire wound adjacent to the core. A mica insulation is furnished between the layers of the coil.

WATER COOLER OR HEATER.—J. H. ROSE, Shreveport, La. The inventor claims in this device an improvement in apparatus for cooling and heating water and the like, and the invention relates particularly to coolers and heaters in which the heating or cooling medium is placed within an air-tight can and the can immersed in the liquid to be heated or cooled.

SHUTTER-WORKER.—J. H. ROSE, Shreveport, La. Mr. Rose in this case makes an improvement in that class of shutter-workers which are adapted to be operated from the inside of a building. The apparatus is very easily operated for opening or closing the shutter and it consists of few parts, which are not liable to get out of order. It may be easily applied to window-frames and shutters by boring through the window-sill and then applying the several parts.

PACKING-BOX.—J. H. ROSE, Shreveport, La. The purpose of this invention is to complete an improvement in the covers and cover-fastenings of packing or shipping boxes. The covers are preferably constructed of sheet metal for the sake of economy in manufacture and of space in the box and also reduction of weight, and the invention relates in particular to the construction of the cover proper, whereby the fastening is formed.

BOTTLE CLOSURE.—C. W. SCOTT and H. HUGHES, Saratoga, Wyo., and C. E. SHIPLEY, Denver, Col. The closure consists of a plug having an interior chamber with outlet at the bottom. A ball-valve operates in the chamber and normally closes this outlet; but when the bottle is tipped the valve opens, permitting the contents of the bottle to flow into the chamber, whence they pass out of the bottle through a discharge passage in the plug.

SUSPENDERS.—M. GLUCKAUF, New York, N. Y. In these shoulder straps the web is in one piece. A specially constructed back-piece holds the web so that a strap will be in position over each shoulder. When the strap or web passes over the plate the suspenders will be flat and comfortable. Means are provided which serve the dual purpose of a buckle for the web when used as a belt, and for connecting the front suspender-ends with the webs. These means are concealed in the button loops through which the ends pass and have play. The suspenders may be readily converted into a belt.

SILK-HOLDER.—S. V. LUALLEN, Alva, Oklahoma Ter. The purpose in the present improvement is to provide means especially adapted to be attached to tooth-brushes and by which silk or the like may be held taut, so as to be useful in cleaning the teeth. The invention comprises means for carrying the silk in or on the handle of the brush or other supporting part and a bow for holding a part of the cord extended in position to be used.

SHADE-HOLDER.—C. J. KUSCHE, Oshkosh, Wis. Comprised in this invention is a certain specially-formed gripper for engaging a lamp. The gripper carries an adjustable arm, which in turn supports a frame or holder for the shade. This shade may consist of a cardboard or material of any degree of opacity. It may be either plain or ornamented, and owing to the construction provided, the shade may be made to occupy exactly the position desired.

PERPETUAL CALENDAR.—W. M. FINCH, Willow, Cal. By a novel construction and combination of parts, Mr. W. M. Finch is to provide a simple formation of a perpetual calendar which can be easily read and operated and which can be adapted to a pen holder, a pencil, or other cylindrical support or which can be used flat, as desired.

CANVAS-STRETCHER.—W. J. DORGAN, Chicago, Ill. The object in view in this invention is to provide a canvas-stretcher perfectly true, not liable to get out of shape, requiring no truing up before or after mounting the canvas thereon, and maintaining the canvas after the painting is finished, in the proper shape, thus requiring no remounting previous to securing the painting and its stretcher in a suitable frame.

BOTTLE.—H. DE ROCCO, Buenos Aires, Argentina. In this construction of a bottle certain novel valve devices render refilling impracticable after the orginal contents have been extracted. A sectional plug is employed in which a tortuous passage is formed, this passage constituting the outlet for the liquid. In such passage are placed valves which open outward, so that the liquid may be withdrawn, but which will seat to prevent any introduction. This plug is held in place by a cap fastened by cement in the extreme mouth of the bottle.

SCENIC APPARATUS.—F. W. THOMPSON, New York, N. Y. In this invention the underlying aim is to provide a device comprising a rocking platform having wings to represent an aerial ship, in connection with scenic effects so arranged as to give passengers the illusion of gradually ascending and descending through the air.

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Minerals sent for examination should be distinctly marked or labeled.

(8964) F. R. asks: I have a small battery motor which runs perfectly on one or a number of dry cells, or a sulphuric acid battery, and I put four gravity cells on, so it would be on closed circuit, and it would not move it. What is the trouble? A. We do not know why your motor would not run with four gravity cells when one dry cell will run it. The fault would naturally be sought in the gravity battery. 2. Can you give me a formula for making a good battery that would drive this motor for three or four hours or on closed circuit, other than bluestone? A. For a good battery to drive a motor see SUPPLEMENT, No. 792, in which plans and drawings are given for such a battery. 3. How long will a Mesco dry battery last closed? A. A dry cell does not last long on closed circuit.

(8965) H. P. D. asks: Could you, or any of your readers, please explain the following results, obtained with an electric light with a broken filament, and an induction coil giving one-fourth-inch sparks? When the current was too weak to produce any light in the globe, the approach of a strong horseshoe magnet caused a light in the tube, varying in intensity with the position and strength of the magnetic field. When only one terminal was connected to the coil, a faint light was produced. On touching the globe with my hand, the light greatly increased, and the place touched was surrounded by a bright spot, a dark band, and then a brighter band. A slight spark could be obtained from my finger to the glass if the other hand touched the other terminal of the coil. A. The experiments you describe are due to the fact that an electric light bulb is a vacuum tube, either a Geissler or a Crookes tube, according to the perfectness of the exhaustion. When brought into the field of a electro-magnetic coil, the tube fills with light, as you have observed. All lamps will not act in this manner. In the early days of the use of X-rays, some lamps were found which could be used for taking photographs by X-rays. These had a very high vacuum.

(8966) W. D. A. says: Can you give me any information concerning a water telescope? A. A water telescope consists of a tube of wood or of metal, closed at one end water-tight by a plate of glass. Plate or good window glass will answer the purpose. This is placed in the water, open end down, and by looking through the glass top of the box, one can see very distinctly to quite a depth; hence the name, water telescope. The apparent opacity of water is largely due to the ripples upon its surface, which break up the waves of light and prevent their accurate transmission from below. The surface of the water within the box is smooth and the glass top is smooth; for both reasons the light comes up through the box to the eye undisturbed. Such a box to be held over the side of a boat may be three or four feet long and six inches square in section, so that both eyes can look into it at once with ease.

(8967) F. I. G. says: Do heat rays other than those from the sun pass through glass? It is admitted that the heat from the sun does pass through glass, but "A" contends that the rays of heat from an oil lamp or an open wood fire will not pass through glass. If sun heat only passes through glass, why? I do not wish to know if glass conducts or radiates heat, but whether glass is transparent to artificial heat, and in what degree. A. Heat rays of all wave lengths may pass through glass, but not equally. The longer wave lengths are cut off by glass much more than are the shorter wave lengths. Heat from any luminous source passes easily through glass. The contention of "A" that heat from an oil lamp cannot pass through glass is not well taken. He cannot say that he never felt heat which had passed through a lamp chimney, or that a thermometer would not rise if held near the glass chimney of an oil lamp. A window pane in the same way cannot cut off all the heat of a wood fire.

F. I. G. writes further: Your kind favor of the 13th is at hand and the answer is as I supposed. "A," however, is not satisfied. He says the heat from a lamp chimney is radiated. He also states that you do not dare publish the answer and query in the Scientific American.

Your friend "A" is certainly very poorly informed upon the literature of this subject, if he supposes that our answer to your inquiry so differed from the text books and commonly received opinion of scientific men that we *dared not print* it in our columns. A very small portion of the hundreds of letters received and answered each week can be printed. The SCIENTIFIC AMERICAN would be filled with letters, should all be inserted. Only those are published which seem to have general interest. However, for the satisfaction of "A" we publish both inquiries. He will find in Ganot's Physics, 15th edition, price $5, page 425, the power of heat to pass through bodies "differs greatly with the radiation from different sources. Rock salt is here stated to transmit all kinds of heat with equal facility, and is the only substance which does so. Fluor spar transmits 78 per cent of the rays from a lamp, but only 33 of those from a blackened surface at the boiling point of water. A piece of plate glass one-tenth of an inch thick, and perfectly transparent to light, is opaque to all radiation from boiling water, transmits only 6 per cent of the heat of copper at 850 deg. Fahr. and 39 per cent of that from an oil lamp without a chimney." These results were attained by Melloni, who died in 1854. They have never been disproved nor doubted by scientific men. With higher degrees of temperature than can be given by a lamp, Tyndall carried the subject much farther. These researches may be found in his book "Heat as a Mode of Motion," price $2.50. The general subject is "diathermancy." We have many times lighted a match by heat rays which had passed through several lenses of the stereopticon and through iodine dissolved in carbon bisulphide, none of which were made hot by the heat rays. They were brought to a focus by the lenses and the heat without light was able to set the match on fire. This beautiful experiment we owe to Prof. Tyndall. It is not true that these heat rays were absorbed by the lenses and radiated on their farther side.

(8968) E. G. A. gives the following recipe for removing indelible ink stains: If the base of the ink is nitrate of silver, which is generally the case, the following is certain and easy. Paint the ink stains with tincture of iodine, and after a minute or two wash out the stain, iodine and all, with stronger ammonia or a strong solution of hyposulphite of soda. The iodine simply creates iodide of silver, which is easily soluble in either of the above solutions. It works especially well in nitrate of silver stains upon the flesh.

(8969) H. D. H. writes: 1. Please inform me how to make a liquid glue suitable for mountaing photographs which have a "glace" finish. The directions say: "Brush the backs with a very thin solution of pure white glue." I would like to know how to prepare such a solution that would remain liquid. A. The mountants for photographs which do not affect the gloss of the front are usually made of gelatine or of white glue. They do not remain fluid, but are placed in a dish of warm water and melted before use. The warm glue is applied rapidly with a brush, and the print must be in its place before the glue sets. 2. Is Sirius, the great dog star, variable? I notice this winter it does not appear nearly so large and bright as it did last year. A. Sirius is not a variable star in the sense that one can with the eye tell that it is dimmer this year than it was last. It has a dark companion. The system revolves once in 52 years. This companion was first seen by the late Alvan Clark, Jr., since which time it has not been classed as a dark star, though it gives less than one ten-thousandth as much light as is given by Sirius.

(8970) E. A. W. asks: Is there any extra wear on either rail of a double track, if the trains run respectively due north and south? If so, on which rail? Should trains travel north or south on a single track, would there be more wear on one rail than on the other, and why? A. On a railroad track laid due north and south, the car wheels bear against the east rail when running north and against the west rail when running south on a single-track railway. On a double-track road the wheel thrust is constantly on the outer rails of the double track. This effect is greatest at very high speed, and at 50 to 60 degrees north and south latitude, gradually decreasing to nothing at the equator. This is caused by the differential velocity of the earth's surface, which a train meets and which bears the track against the wheels on the west side when running south; on the contrary, when running north, the train is running toward a decreasing velocity of the earth's surface, and is borne against the east rail.

(8971) C. M. E. asks: 1. How can I make a good, strong baking powder that will not cake in tins? A. For baking powder, mix 80 parts dry bicarbonate of soda and 180 parts of cream of tartar. To the mixture add about 20 per cent to 25 per cent of starch; the object of the starch is solely to prevent caking and deterioration. 2. What is the formula for a strong liquid bluing? A. For liquid bluing: a. Dissolve indigo sulphate in cold water and filter. b. Dissolve Prussian blue by digesting with one-eighth its weight of oxalic acid in water solution. c. Dissolve 1½ parts of indigo carmine in 15 parts of water; add ¾ part gum arabic.