

**Coal for the Navy.**

The subject of coal for the navy has been of great importance since the war with Spain began, not because of danger to the vessels themselves, as was so strongly suggested in the recent case of spontaneous combustion in the bunkers of the battleship "Oregon," at the New York navy yard, but because of the apprehension that enough might not be obtained for the ships, in view of the effect of the neutrality laws. This question has been recently discussed by The Evening Post, from which we glean the following facts. There was no apprehension felt that there would be any famine in anthracite, of which the United States is, of course, the great producer; but inasmuch as nearly all the vessels of the navy are fitted with boilers and grate bars for the use of bituminous or soft coal, the problem was one that was feared might become vexatious, as the vessels would have to return to the United States or be supplied from colliers at sea. The situation was particularly embarrassing for Dewey's fleet, and for the "Oregon" and for the vessels of Schley's command when cruising in search of Cervera's fleet before it was safely locked up at Santiago. This is a great argument for coaling stations at a distance from home ports.

Recently the Anthracite Coal Association has made strong efforts to have the navy introduce that variety of fuel, without apparent success. It is claimed by the officers who were in the fleet that destroyed the Spanish vessels at Santiago on July 3 that it was the excellent American soft coal that enabled them to bring the vessels up to their highest efficiency, and that if the American ships had been using anthracite coal and the Spaniards bituminous, the latter would have gotten away from the American fleet. The subject of the relative values of anthracite and bituminous coal for the navy has been a matter of careful inquiry by the Navy Department for years, and a recent report says:

"When it is considered that nowadays one fleet under full steam might be alongside of another at anchor in a little more than an hour after they sighted each other, it will be seen that, even under heavily banked fires of anthracite, the fleet at anchor would be at a greater disadvantage for maneuvering; while with low and dirty fires, or with cold boilers, the destruction of that fleet could only be prevented by means extraneous to itself. Promptness of ignition may also be of vital importance on a lee shore, or in a sudden gale in a harbor, and under other circumstances. Nor is it in emergencies alone that rapidity of ignition is useful, for it gives much more uniform action in all

steaming, since the fires quickly attain their maximum efficiency, instead of, as with anthracite, being almost inert for twenty minutes or more after each coaling. In short, the board is of opinion that this quality is so valuable in a naval vessel that it almost precludes the employment of anthracite in time of war, in favor of more free-burning coal, and that it has considerable advantages in time of peace also."

A narrow escape from disastrous fires in several war ships from spontaneous ignition of the coal would suggest that it was a very dangerous cargo. The examination into the causes of the spontaneous ignition on board ship shows that it is due primarily to the absorption by coal of the oxygen of the air. This raises the temperature of the coal and this augments the rate at which the oxygen is received. The increase of temperature so caused is rarely sufficient in itself to bring about spontaneous ignition in coal, but the oxygen itself becomes chemically active and in bituminous coal it combines with hydrogen and carbon, further raising the temperature, and if such action takes place in the center of a heap of small coal, a sufficient quantity of air being supplied, spontaneous combustion will probably follow. The introduction of high steam pressures, with the consequent increase of fire-room temperatures, has been followed by an increase in the number of cases of spontaneous ignition on ship board. It is also claimed that the pyrites in coal plays an important part in promoting spontaneous combustion.

Coaling stations have often been a subject of serious consideration, and the navy is now about to establish one at Pagopago, Samoa. This is the only landlocked port of refuge in the Samoan group and it is the best harbor among the islands of the Pacific. The war with Spain has demonstrated that coal is a contraband of war, and in time of war, when away from their home ports, United States steamers are practically useless for fighting purposes unless they can obtain coal from their colliers; so that coaling stations at various points are not only important, but are absolutely necessary.

**Increase of Cancer in England.**

In England four and a half times as many people die now from cancer as half a century ago, and no other disease can show anything like such an immense increase. W. Roger Williams says in The Lancet. "Probably no single factor is more potent in determining the outbreak of cancer in the predisposed than high feeding. There can be no doubt that the greed for

food manifested by modern communities is altogether out of proportion to their present requirements. Many indications point to the gluttonous consumption of meat, which is such a characteristic feature of this age, as likely to be especially harmful in this respect. Statistics show that the consumption of meat has for many years been increasing by leaps and bounds, till it now has reached the amazing total of 131 pounds per head per year, which is more than double what it was half a century ago, when the conditions of life were more compatible with high feeding. When excessive quantities of such highly stimulating forms of nutriment are ingested by persons whose cellular metabolism is defective, it seems probable that there may thus be excited in those parts of the body where vital processes are still active such excessive and disorderly cellular proliferation as may eventuate in cancer. No doubt other factors co-operate, and among these I should be especially inclined to name deficient exercise and probably also deficiency in fresh vegetable food."

**The Current Supplement.**

The current SUPPLEMENT, No. 1200, marks the end of the forty-sixth volume of this unique publication, which was started twenty-three years ago. It contains many articles of exceptional interest. "Games Among Criminals and Savages" is a paper by the great criminologist, Prof. Lombroso. "How to Grow Mushrooms" is an illustrated article giving government directions for growing them. It is fully illustrated. "Roentgen Rays" is another original memoir by Prof. Roentgen. "The Engineer and His Work" is the presidential address of Charles Wallace Hunt, delivered before the American Society of Mechanical Engineers. "An Outline of the History of Geological Societies of America" completes this very interesting paper.

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**RECENTLY PATENTED INVENTIONS.****Agricultural Implements.**

**HILLSIDE OR REVERSIBLE PLOW.**—EDSON C. ROBINSON, Canandaigua, N. Y. A simple and durable jointer has been devised by this inventor, which is of duplex form, and is made in one piece, one point being a duplicate of the other, occupying, however, a reversed position, while the moldboards are in the same horizontal plane. An effective and light reversing device is also provided and a means whereby the jointer-standard will be inclined usually in a forward direction, the inclination permitting the jointer's being reversed at the rear of the standard, according to the direction of the inclination. A frog-box is likewise provided, which receives the pivot-post on the beam, and which obviates the present necessity of frequently removing the frog.

**LAWN-MOWER.**—MARK N. CORMACK, New York city. The mower of this inventor is provided with a series of separate individual cutters traveling in a continuous endless line and disposed in two oppositely moving runs, situated one above the other, in direct contact with each other, so that the edges of the cutters move directly past one another to perform the cutting. By the peculiar construction of the cutters, it is possible to cut grass of any height without danger of clogging the machine.

**Bicycle-Appliances.**

**SPROCKET-CHAIN.**—CHARLES J. COOK, New York city. The bicycle sprocket-chain patented by this inventor is especially designed for use on bicycles, and has alternate block and plate links. The block-links have oil-cups, by means of which every pintle can be lubricated. The chain may be readily separated, and is so constructed that the parts run easily without undue friction.

**FOOT-PROPELLED VEHICLE.**—THOMAS H. BROSNIHAN, Livermore Falls, Me. This vehicle is a tricycle, having a frame in the front end of which a steering wheel is fitted. On an axle carried by the rear end of the frame, wheels are mounted, one of which is fixed and the other loose. On the rear of the frame a seat is mounted. Crank-shafts in front of the axle are provided with gear-wheels, one of which meshes with a pinion on the axle. A clutch on the axle carries a pinion in mesh with the other gear-wheel of the other crank shaft. Arms are pivoted at their upper ends to the frame below the rear portion of the seat. Links connect the arms with the crank-shafts. Two pairs of foot-levers are pivoted at their lower ends to the forward part of the frame and project up in front of the seat. Links connect the foot-levers and arms.

**STEERING-GEAR.**—ARTHUR DOYLE, Seattle, Wash. The steering-gear forming the subject of this invention comprises a transverse fixed bearing; a slide mounted to slide thereon; and a link pivotally connected with the slide, and attached to the fork, and made in telescoping parts. When the slide is shifted to turn the wheel, the rider, by clamping both the slide and the bearing, can readily lock the slide in place until the turn has been made.

**Electrical Contrivances.**

**LAMP.**—WALTER S. DOE, Jersey City, N. J. This invention is an improvement upon a lamp patented by the same inventor. The improved lamp has a battery-jar formed with one or more cells, each containing an exciting fluid. A cathode in the form of a hollow perforated cylinder of carbon contains a suspended perforated tube of non-conducting material, within which tube an anode is adapted to be dropped. A contact-wire is held in the tube, and on it the anode rests. The contact-wire and the cathode are connected with the filament of the electric incandescent lamp.

**Engineering Improvements.**

**LINK VALVE-GEAR.**—JOHN A. ROSE, Axtell, Neb. The purpose of this invention is to provide a link valve-gear for steam engines, which is arranged to produce a complete center action by placing the eccentric and valve in a true line at all times, thereby preventing undue friction and pinching of the parts under heavy pressure. The valve-gear is provided with a yoke adapted to be raised or lowered. To a link made in sections fastened together, trunnions are secured and mounted to turn in bearings on the yoke. Link-blocks fitted to slide in the link are connected with the valve-stem. Lugs projecting from the link are adapted to receive the pivot-pins for the eccentric-rod heads.

**Mechanical Devices.**

**REGISTERING DEVICE.**—JESSE ALEXANDER, New York city. This register is especially designed to be applied to type-writers, in order to show the number of folios written. The register is also applicable to all other purposes in which it is desired to keep a consecutive count. The spacing-bar of the type-writer is made to actuate a finger, playing over a registering dial, through the medium of ratchet wheels and levers. By pressing down upon the central spindle, the locking devices are thrown out of engagement with the registering mechanism, thus enabling various springs to return the registering mechanism to its initial position.

**LOCK.**—ALBERT E. ORMOND, Winnipeg, Canada. The purpose of this invention is to provide a lock which may be freely operated by the knob at the inner side of the door, but which cannot be operated from the outside without first manipulating a predetermined combination. The lock comprises a series of notched tumbler-disks, means for imparting a step-by-step rotary movement to the tumbler disks, a spring-pressed dog controlled by the tumbler, a bolt-actuating plate, an outer knob, a clutch operated by a movement of the dog to put the outer knob in operative position with the plate, and an inner knob having connection with the plate, whereby the bolt may be operated by rotating the inner knob.

**Railway-Appliances.**

**AUTOMATIC RAILWAY-GATE.**—DOSITHES BERNARDIN, St. Eustache, and ZENOPHILE PATTEAUX, Winnipeg, Canada. These inventors have devised an apparatus which is automatically operated by a railway-train or its motor to close a highway-crossing of a rail-

way before the approach of a train, and to open the crossing after the train has passed. The apparatus consists of two principal parts: an improved operating mechanism which is provided with a bar so placed as to be engaged by the tread of the wheels, and a novel gate or closing mechanism, which is operated by the bar through the medium of connecting mechanism. The gate being entirely automatic in operation, dispenses with the use of a gateman, and thus removes the danger of accidents resulting from the carelessness of the men placed in charge of the usual railroad-crossing gate.

**RAILWAY TIME-SIGNAL.**—HENRY J. WEMETT, Lima, N. Y. In this improved device a signal is operated in such a manner that it will clearly indicate to an engineer what length of time has elapsed since the preceding train passed a certain point. The signal comprises a clock-mechanism adapted to be mounted adjacent to the track. The mechanism is provided with an easily visible clock-face and dial, and with a hand which may be freed from the clock-mechanism and returned to zero by the action of a trip operated by a passing train.

**CAR-COUPLING.**—WILLIAM C. SHAW, White Plains, Md. The improved pivoted jaw-coupler patented by this inventor has a lateral shoulder and a coupling hook pivoted on one side of the draw-head. A locking or safety catch is pivoted on the opposite side of the draw-head, adjacent to the shoulder, and is adapted to engage the coupling hook. Uncoupling is effected by the use of a lever and rod without difficulty or danger, and the coupling devices may be set in position to hold them out of action by the same means employed in uncoupling. The car-coupler is designed automatically to couple cars on the shortest curves as easily as on straight tracks.

**RAILWAY-CROSSING SIGNAL.**—JOHN D. TAYLOR, Chillicothe, Ohio. This invention seeks to provide an automatic alarm-signal to be placed at a railway-crossing, which signal will sound an alarm when a train is approaching the crossing; but only when the train is actually approaching and not when it is standing or backing. The invention consists in the novel arrangement of a signal-sounding mechanism; an open track-circuit at one side of a crossing; a resistance connecting one portion of the track-circuit with another, the resistance diminishing as they approach the crossing; a primary coil in the track-circuit; a secondary coil operating by an induced current from the primary to actuate the signal; and another primary to bring the signal to rest.

**Miscellaneous Inventions.**

**TEMPLE FOR LOOMS.**—PATRICK DUFFY, New Bedford, Mass. By means of this invention, cloth may be drawn longitudinally and kept properly extended in a transverse direction to permit the filling to be properly beaten in by the lay without injury to the cloth and without danger of the selvage's chafing. A ribbed roll is employed, which turns but does not slide axially. On this roll a ribbed loose cover is superimposed, between which and the roll the fabric passes. The cover automatically adjusts itself according to the pull on the cloth and its thickness, so that there is no strain on the loose cover when pulling transversely on the cloth. The cloth,

consequently, is not jammed against the ribs of the roll. The roll is thus permitted to revolve freely with the forward movement of the cloth.

**DRESS-STIFFENER.**—MINNIE T. SELLERS, New York city. Stiffeners made of wire, reed, or whalebone are objectionable because they become easily broken and the projecting ends are liable to tear the clothing. The present stiffener, in order to be free from these faults, is made of a facing of fabric to which a strip of haircloth is secured, having one edge folded upon and extending partly across the main portion of the material. A greater rigidity is thus obtained at one edge of the stiffener than at the other, whereby a skirt may be made to hang better than would otherwise be possible.

**LOCKING DEVICE FOR TELESCOPING-BOXES.**—OLIVER B. HICKS, Chicago, Ill. This invention seeks to provide an improved locking device for telescoping cases such as are used by commercial travelers. The device comprises a combined ratchet and guide plate; a casing having a sliding engagement with the guide; a bolt fitted to slide in the casing and adapted to engage the ratchet-plate; a spring-pressed lever engaging the bolt to withdraw it; a finger-piece to actuate the lever; and a locking-lever actuated by a key and arranged to swing into the path of the bolt to lock it against withdrawal.

**BOOK-SHELF BLOCK-CASE.**—ADELBERT E. FOUTCH, New York city. The case is especially designed to receive photographic views, and is so constructed that it may be used as a book-shelf block to hold books in place. The case has an unbroken front wall and is open at the rear. Drawers are mounted in the case and may be withdrawn from the rear. A spring-actuated presser plate is hinged to the upper front edge of the case and lies over the top thereof to engage the shelf above the case and to hold the case in place. The presser-plate has flanges at its side and rear edges, which flanges project down outside of the upper portion of the case. When in place, the case cannot be distinguished from the usual book-shelf blocks.

**NON-REFILLABLE BOTTLE.**—EDWIN WILBUR, Newport, R. I. In making non-refillable bottles after the design of this inventor, a valve-seat is formed in the bottle-neck, and a ring is fitted above the valve-seat and provided with a central cup projecting down within the ring and connected with the upper portion of the ring by arms. A ball is adapted to be seated in the valve-seat. The ball will drop into the cup whenever the bottle is turned up. When the bottle is turned right side up, the ball will drop into its seat and prevent the entrance of all liquid.

**FENCE-POST.**—ARPHAD SNELL, Tice, Ill. The purpose of this invention is to provide a clay fence-post and a simple means for securing the wires thereto. The fence-post is provided with a series of transverse notches and an opening below the lowermost notch. A binding strip crosses the notches in the post and is provided with a flange at its lower end, which flange enters the opening in the post. A flange at the upper end engages with the top of the post. Clamps secure the binding strip to the post. The wire which forms the fence is passed around the end post between the post and the

binding strip, and enters the notches or grooves. The wires are then twisted around the strands and the strands secured to the intermediate posts.

AUTOMATIC WAGON-BRAKE.—ORION A. LITTLE, Oxford, Kans. To provide an automatically-operated mechanism by which a wagon is made to stop when running forward upon the horses, this inventor has devised a brake having a shaft with a gear thereon. An intermeshing gear is rotated from a carriage-wheel. A drum is loosely mounted on the shaft, and a spring-held clutch-mechanism is adapted to connect the drum with the shaft. A cable fastened to the drum is connected with the brake, and connections from the shaft-mechanism to the clutch separate the parts by the operation of the draft-mechanism. The brake is applied by a forward motion of the wagon and is released by the team's pulling forward upon the double-tree.

GATE.—WASHINGTON CROSS, Roseland, La. The gate of this inventor is mounted to swing on a vertical axis and is provided with a latch-mechanism and with devices by which the latch is operated in order to enable the gate to open. The devices in question comprise an operating lever fulcrumed on the gate-spindle and having connection at one end with the gate. A bell-crank lever is mounted in the other end of the lever and is connected with the gate-latch. An anti-friction roller having stationary bearings is engaged by the spindle of the bell-crank lever. In opening the gate, a cord is pulled, whereby the spindle is turned to cause the bell-crank lever to turn and release the latch. The gate will then be cant and swung open by gravity.

ATTACHMENT FOR PAPER-COATING MACHINES.—WILLIAM H. WALDRON, New Brunswick, N. J. In this attachment, two brushes are adapted to have the web of the stock passed between them and to be driven transversely of the web, so as to treat the stock as it passes between the brushes.

APPARATUS FOR HANDLING FABRICS.—HAMILTON K. PARRY, Lucas, Ohio. An apparatus on which rolls of fabric may be mounted, displayed, unwound, and measured, has been patented by this inventor. The fabric is mounted between cleats on rods or rolls, is laid over a cutter-bar, and extended over a rack by which it may be profitably displayed. When it is desired to cut off a portion of the fabric, the roll upon which it is carried is unwound. By means of a tape-measure carried on the frame of the apparatus, the fabric is measured, and, with the assistance of the cutter-bar and a knife, is cut from the roll.

FIREPLACE-FENDER.—LORENZO P. LEGG, Jefferson, Ga. This invention provides an improved fender adapted to be transferred from one fireplace to another, to be adjusted to permit free access to the fire, and to prevent the flying of sparks. The fender has two side frames, each embodying a top rail and a bottom rail. Each bottom rail has a forwardly-extending hook and each top rail has a pivot. The front frame of the fender has two side bars rigidly joined by horizontally-extending front bars, each side bar having a slot in which the pivots of the side frames are received. The lower end of each bar is adapted to be removably engaged with the hooks of the bottom rails of the side frames. A keeper-sleeve slides on each top rail of the side frames. The front frame and side frames are covered with wire netting. The front frame may be rocked up when it is necessary to clean the furnace.

GREAT CIRCLE COURSE-INDICATOR.—STEPHEN R. KIRBY, New York city. The arc of a great circle being the shortest distance between two points, navigators generally prefer to sail on such an arc. From the many charts now in existence it cannot be readily determined by most shipmasters on what course they should sail. The present device overcomes this difficulty. The apparatus consists of an equatorial arc connected with meridian-arcs. The meridian-arcs are connected with a polar pivot, so that the meridians may be swung to any desired point. The polar pivot is also mounted upon a meridian-plane so pivoted at a point representing the center of the earth, that the pole may be swung in this meridian-plane to adjust the device for any latitude. Passing through a central point representing the ship's position, is a great circle arc which has a pivot located in the meridian-plane and extended toward the center upon which the plane is pivoted. The distance between two points upon the arc of a great circle may be read from the great circle arc.

ADJUSTABLE DENTAL RUBBER DAM CLAMP.—ARTHUR S. COOPER, McMinnville, Ore. The dental device patented by this inventor is provided with a clamp which will grasp and tightly hold the tooth to which it is applied, regardless of the location of the cavity. An adjustable arm can be employed in connection with the clamp for working purposes, the arm and the clamp being adjustable vertically, laterally and to and from the tooth.

THERMOCAUTER.—LANCET.—Dr. WILLIAM H. BEACH, Bridgerton, England. This invention provides an instrument which may be used for surgical purposes and for pyrographic etching on glass. The working point of such thermocauters is usually made of platinum, and often adheres to the fused particles of glass. Iridium, being free from this objection, is used by the inventor in his instrument. An improvement is provided by which the transmission of heat from the incandescent point to the hydrocarbon vaporizing chamber forming the handle of the instrument, is more effectually prevented than hitherto. In order that the mixture of air and vapor may be properly dosed, air is blown directly into the passage leading to the combustion-chamber, without first passing through the vaporizing chamber.

GATE.—WILLIAM A. WHITCOMB, Downs, Ill. This gate is provided with posts located near the gate and carrying levers projecting at opposite sides of the gate. The levers are connected through links with the latch of the gate. By pulling upon one lever the gate is unlocked and opened; by pulling upon the other lever the gate may be closed. Gates thus constructed are especially adapted for farms and country-seats.

PIN-HOLDER.—ALBERT E. ORMOND, Winnipeg, Canada. The pin-holder of this inventor is so constructed that a strip of paper containing pins is automatically fed to bring the pins, one at a time, to a discharge-opening, through which they are forced by a lever. The device may also be used as a paper-weight for use upon desks.

DOOR-HANGER.—RICHARD B. BROWNE, New York city. This invention is an improvement in means for suspending a door from a track-rail so as to permit the door to be readily moved along the track-rail. To this end an anti-friction, self-leveling door-hanger has been devised, comprising two spaced oppositely-slotted side plates; a journaled sheave, the journals of which project loosely into the slots; and an eyebolt whereon the lower ends of the side plates are pivoted, the eyebolt being adapted to hang a door in place.

SNOW-PLOW.—CYRILLE DUFF, Millbury, Mass. The body of this plow consists of two shovel-blades joined at an angle. The lower edges of the blades at the point of the nose extend beyond the upper edges, while the upper edges of the blades overhang the lower edges from a point near the center to their rear ends. Rearwardly-extending tapering pockets are formed in each blade. Correspondingly-tapering screws are held to turn in the pockets, and carry the snow back, keep the blades properly cleaned and cause the bulk of the snow to be delivered at the rear ends of the blades.

Designs.

SKIRT-PROTECTOR.—HUGO MAUL, Rahway, N. J. This skirt-protector has a head with a plain upper edge; a brush hanging from the lower edge of the head; and two rows of spaced ornaments, extending transversely of the head and raised on the sides of the head.

COVERED DISH.—ADOLPH PAROUTAUD, New York city. The body of this dish is depressed near its base and formed with a horizontal ridge between the base and the depression. The surface between the ridge and the top edge of the body is given an outward swell. The handles of the dish and cover are ribbon-like in form. The body and cover are decorated with raised figures.

FOOT FOR STOOLS.—WILLIAM R. SHAW, New York city. The body members of this design combine at their converging ends to form a foot member. The upper ends of the body members diverge and are furnished with oppositely extended arms, so as to permit the foot to be readily secured to a stool.

CARPET.—ALFRED BUNEL, New Rochelle, N. Y. This design consists of a central bouquet of flowers and foliage, the flowers being roses and daisies. Smaller bouquets of similar flowers and foliage are grouped around the main figure.

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

NEW BOOKS, ETC.

RAILWAY ENGINEERING, MECHANICAL AND ELECTRICAL. By J. W. C. Haldane. With many plates and other illustrations. London: E. & F. N. Spon, Limited. New York: Spon & Chamberlain. 1897. Pp. 562. Price \$6.

The volume before us is of a popular nature, and is largely made up of pictures of machine tools, wood working tools, rolls, hammers, engines, boilers, etc., and as it is written in popular style intended for the lay reader it will doubtless appeal to many readers. Various railways and railway plants are considered and the subjects of bridges, electric railways, locomotives, boilers, etc., are taken up. The volume is freely illustrated.

THE THETA-PHI DIAGRAM. Practically Applied to Steam, Gas, Oil, and Air Engines. By Henry A. Golding. London: John Heywood, Manchester; The Technical Publishing Company, Limited. 1898. Pp. 127. Price 3 shillings net; \$1.25.

In the present volume the author has presented in as simple and practical manner as possible the use of the temperature entropy diagram and the various methods of drawing it for different heat motors. Most of the literature upon the subject has presented the mathematical rather than the graphical side of the question, with the result that the students have become afraid of both, and with what they believe to be an intricate mathematical investigation. The present volume will do much to disabuse their minds of this idea, and all engineers and gas engine men will find it eminently useful.

AN INTRODUCTION TO MACHINE DRAWING AND DESIGN. By David Allan Low. Eighth Edition. Revised and Enlarged. New York and Bombay: Longmans, Green & Company. 1898. Pp. 187. Price 75 cents.

Most practical work upon machine drawing and design is before us. We have rarely seen a book of the same compass which contains so much valuable information regarding the essentials which all draughtsmen should know. As an introduction to mechanical drawing, either alone or supplementary to other books, it is to be recommended. It is unfortunately tangled up by the examination papers of the Departments of Science and Arts. Fortunately, we have nothing of this kind to hamper our progress in this country, and this section of the book, which is less than twenty pages, may be disregarded by the student.

BULLETIN OF THE UNITED STATES GEOLOGICAL SURVEY. No. 149. Bibliography and Index of North American Geology, Paleontology, Petrology, and Mineralogy for 1896. Weeks, Washington: Government Printing Office. 1897. Pp. 152, ix.

BULLETIN OF THE UNITED STATES GEOLOGICAL SURVEY. No. 89. Some Lava Flows of the Western Slope of the Sierra Nevada, California. Ransome. Washington: Government Printing Office. 1898. Pp. 74, ix.

BULLETIN OF THE UNITED STATES GEOLOGICAL SURVEY. No. 88. The Craceous Foraminifera of New Jersey. Bagg. Washington: Government Printing Office. 1898. Pp. 89, ix.

Business and Personal.

The charge for insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in the following week's issue.

Marine Iron Works. Chicago. Catalogue free. For mining engines. J. S. Mundy, Newark, N. J. "U. S." Metal Polish. Indianapolis. Samples free.

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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 those 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.

(7538) H. W. asks: 1. What is the best insulating compound to apply on armature? I have used shellac, but after the machine has been run for an hour or so the shellac, begins to blister. A. The bars of an armature should be separated from each other by mica. If the insulation has been destroyed, it cannot be permanently repaired by any liquid insulator. The proper remedy is to have the armature taken apart so far as is necessary and new insulation put in as when it was built. 2. What is the most reliable material to put on a pulley to stop belt from slipping? A. A piece of beeswax rubbed on the belt and pulley occasionally is probably the best application that can be made.

(7539) F. A. M. asks: 1. Is there anything better or more adhesive than shellac for cementing the convolutions of the armature coils together on simple electric motor? A. There is nothing better than shellac for coating coils after they are wound. It is one of the best insulators and is quite strong when well dried. You can tie the coils with a cord. 2. Would it do any harm to put a few coats of furniture glue on the coils? A. The objection to the use of glue to bind the wires together is that it will soften if it is in a wet place at any time. If it absorbs water, the insulation is injured.

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DECEMBER 20, 1898,

AND EACH BEARING THAT DATE.

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