

## RECENTLY PATENTED INVENTIONS.

## Engineering.

**TUBULAR BOILER.**—Sweeney Munson, Sayre, Pa. This boiler has an outer and an inner shell, with manifold at each end of the latter and water flue connections between them, there being forward of the inner shell a crown sheet having a water leg, while circulating tubes having connection with arched braces extend through the crown sheet. It is designed that the boiler will require a less number of stay bolts than are at present necessary, to reduce the liability to leaky flues to a minimum, and afford greatly increased heating surface, the construction also being such that every flue can be easily inspected and cleaned.

**STACK DRAUGHT PRODUCING DEVICE.**—John C. Raymond, New York City. To secure induced draught and reduce the height and cost of chimneys and funnels by the use of fans, this invention provides for a mechanism in the funnel top comprising an arm mounted to swing and carrying at its free end a fan, there being a rack quadrant on the arm with which meshes a worm carried by the shaft of an electric motor. As applied to the chimneys of stationary boilers on land, the invention is designed to enable their height to be greatly reduced, effecting great economy in the cost of boiler installation, while in a steamship funnel a great increase of draught is attained without the disadvantage attending the employment of forced draught.

**COAL HANDLING APPARATUS.**—Ephraim Smith, West New Brighton, N. Y. To facilitate the transfer of coal from barges, boats and cars to bins, or from the latter to steam vessels, or for use in dredging and other purposes, this invention provides an elevator which slides and turns, and with the lower end of which is pivotally connected a conveyor adapted to discharge into the boxes of the elevator, the elevator boxes discharging into a chute fastened to the elevator frame, while a second chute slides in the first chute and a fixed inclined chute made circular is engaged by the lower end of the slide chute, so that when the elevator is moved up or down or turned a connection between the three chutes is maintained. The whole elevator and its conveyor part can be swung to either side out of the way of an approaching vessel.

**WATER ELEVATOR.**—Joseph McMurrin, Shoshone, Idaho. This invention is for an improvement on a former patented invention of the same inventor, and consists principally of an endless paddle wheel belt having its lower run extending into the water, while an endless bucket elevator has its lower run carried by the lower run of the paddle wheel belt, the endless paddle device propelling the elevator so that the buckets can be filled with water, be lifted a suitable height, and discharge the water into chutes. The elevator has a float with decks and forming a breakwater at one side, and is set at a quartering position in the running stream as a protection against drift, while also allowing the current to strike the paddles separately.

## Railway Appliances.

**CAR COUPLING.**—James E. Betts, Wilmington, Ohio. According to this invention the drawhead is chambered to receive a coupling link and transversely slotted to receive a pin, there being a pin lifter device comprising a rock arm having a member pivoted to the side of the drawhead, a transverse lever pivoted on the upper end of the rock arm, while a lifter arm having loose connection with the lever is looped to receive and lift the pin. A guide limb depending from the looped portion of the lifter arm is slidable in a vertical perforation of the drawhead. The improved coupling will automatically couple meeting cars, and the uncoupling may be readily effected without trainmen going between the cars.

## Mining, Etc.

**SLUICE BOX.**—Christoffer A. Christensen, Oretown, Oregon. To save the fine gold mixed with dirt and sand this inventor has devised a box in which two currents of water are employed, one to carry the sand and gold along the surface of a gathering bed of burlap or similar material, while the other is directed upward through the burlap surface, to keep the commingled sand and gold stirred from beneath by a sort of boiling movement, to promote the separation of the gold and facilitate the passage of the gold and sand along the burlap bed. The upward force of the water is designed to be strong enough to prevent any great amount of sand from falling down, but not strong enough to keep the gold from sinking through the burlap. The device is especially adapted for working black sand and other deposits carrying finely divided gold.

## Mechanical.

**REVERSING GEAR.**—Charles Wagner, New York City. For use on screw cutting and other machines this invention provides a device which may be set to reverse automatically when the desired length of thread has been cut. A clutch sleeve is held to slide and be controlled by the work or the carriage supporting the work, two clutches carried by the spindle being supported by the sleeve, and the clutches being adapted to engage driving pulleys rotating in opposite directions. The shifting of the clutch sleeve causes a turning of the spindle first in one and then in the opposite direction, the device being very strong, simple, positive in movement, and not liable to get out of order.

**GRINDING MILL.**—Jacob Pfeiffer, Kaiserslautern, Germany. This is a ball grinding mill with wind separator, in which the use of sieves is avoided, a casing through which extends centrally a feed hopper inclosing the grinding mechanism, while a vane rigid with the casing is interposed between an exhaust fan and the grinding mechanism, a ring held to the casing embracing the feed hopper. In the operation of the mill the reduced pulverized material rises upward in the casing and is drawn out by the fan and thrown into an annular space where it passes out through a discharge pipe, only reduced material being drawn out.

## Agricultural.

**FRUIT GRADER.**—Willis Brown, Portland, Ore. For the purpose more especially of grading dried prunes, this inventor provides an upright frame in which are supported three or more grading frames, held together by straps and suspended by links, the grading frames being alike except that each screen has a smaller mesh than the preceding one. Each grading frame has a bottom which delivers to the upper end of the next lower frame, and provision is made for jolting the screens by an operating shaft moved by hand or other power. The prunes passing from the discharge chute of the upper screen are the largest or first grade, and those from the successive screens below are of correspondingly diminished size.

**APPARATUS FOR UNCHAINING CATTLE.**—Joachim Viether, Kollmar, Germany. For simultaneously uncoupling and letting loose cattle when a fire breaks out in a stable in which they are confined, according to this invention, there are along the wall of the crib or manger clamping jaws, above each of which is a catch pivoted on a bolt, a shaft supported by brackets extending along the wall of the stable in front of the catches. The clamping jaws securely hold the chains attached to the animals, but by turning the shaft by means of a hand wheel, the catches are lifted, loosening the clamping jaws and withdrawing the bolts, thus releasing the animals.

## Miscellaneous.

**ICE VELOCIPED.**—Mathias Kolbensov, Marysville, Montana. The frame of this machine has an adjustably held front runner or skate and a rear driving wheel adapted to be operated from the pedal crank. A rear runner or skate has a central slot through which slightly projects the thin toothed periphery of the rear driving wheel, springs bearing upon this runner to press it normally downward, and there being means for regulating the tension of the springs to adjust the position of the skate relative to the driving wheel. The driving wheel may thus be caused to take more or less deep hold upon the ice or snow, and the springs also relieve the rider from jolting.

**CALCINING APPARATUS.**—Thomas McNeal, Gypsum City, Kansas. To cook or calcine plaster or similar material, the apparatus covered by this patent is of such construction that the whole body of plaster is subjected to a practically even degree of heat by an economical use of fuel. The calcining vessel is so supported within the casing or wall of the furnace that the products of combustion are directed over its entire bottom and side surfaces, while flues at different levels carry the products of combustion transversely through the vessel. Means are also provided for stirring or agitating the material while it is being calcined.

**DISPLAY STAND.**—Daniel Henderson, Kingsley, Iowa. For conveniently keeping sickle sections, ledger plates and similar articles usually kept in hardware stores and implement houses, in such arrangement that a salesman may readily pick out the article desired, this inventor has devised a stand in which horizontal spring arms connect posts, the arms being attached to a support on which the posts have movement to and from each other. The stand is adapted to receive the various articles as on a file, showing their different sizes, the year or years in which the machines were made to which the plates are adapted, the size of the rivets necessary, as well as the cost and sale price of the wares.

**SAVINGS BANK.**—Clarence L. Dawson, Tacoma, Washington. This is a pocket bank, or a device in the form of a watch, and is especially adapted for the reception of coins of a specified value. It has one or more depositories for coin, and cannot be opened without a proper key. It also has a registering device to indicate the amount of money that has been deposited in it.

**COMBINATION LOCK.**—Foster J. Heacock, Salem, Ind. A disk in the casing of this lock has sets of apertures and plugs for closing all except one aperture of each set, while a dial on the knob spindle is provided with shafts carrying pins on their inner ends. A second casing is secured to the inner end of the first casing with a knob spindle having a socket to receive the end of the outer sliding knob spindle. The combination admits of many changes, and may be readily changed as desired, while it cannot easily be tampered with.

**TRANSOM LIFTER AND LOCK.**—George M. Parsons, Carson, Nevada. This invention is for a simple, durable and inexpensive device by means of which the position of the transom may be quickly and conveniently adjusted by means of a cord which extends down to the hand. A spring-controlled sleeve slides on a support having a rack surface, the sleeve carrying a pivoted latch adapted to slide over and engage the rack, while an arm carried by the sleeve is arranged for connection with the transom.

**QUILTING FRAME.**—Mary Jenson (Mrs. Mary Butterfield), Ogden, Utah. For quilting or embroidery, or for stretching or drying lace curtains, this inventor has devised a simple style of frame which can be quickly and easily adjusted to suit various sized articles, and one which permits the rolling of the fabric on the frame as the work progresses. It has side and end bars which are made in sections and have a vertical portion provided with longitudinal grooves, a series of pins being set in the horizontal portion, and there being a detachable hinge connection between the sections. Slotted sliding sleeves are adapted to fit on the grooved portion of the bars.

**HARNESS NECK YOKE IRON.**—Welcome Craford and Joseph S. Atkinson, Bayfield, Wis. This device has a tubular body from whose lower rear portion projects a lip having on its under face a flange at each side of the center, there being a spring in the space between the flanges and its bearing being at the outer end portion of the body. A stirrup through which the spring passes is located between the ends of the lip flanges and the bearing. The device is very simple and inexpensive, and with the aid of but two snaps a teamster may, with this improvement, couple or un-

couple the horses in the coldest weather without removing his mittens or other coverings from the hand.

**REVERSIBLE SAD IRON.**—Elliott Preston, Sturgeon, Mo. This is a hollow iron to be heated by an ordinary spirit lamp, the handle of the iron having a spring seat for the lamp and two trunnions on which the iron turns. The rear trunnion carries clamping arms and a spirit lamp to engage the seat, its wick tube passing between the clamping arms to hold the lamp in place. The sides of the iron preferably have damper openings, buttons controlling the dampers conveniently.

**HINGE FOR COOKING UTENSILS.**—Eber W. Pratt, Ipava, Ill. This is a device especially adapted for attachment to the covers of pots, skillets, stew pans, etc., and may be readily secured to the pot or the body of the utensil to which the cover is to be fitted. It is made of bent wire, and is so formed as to constitute a hinge by which the cover may be tightly closed over the body of the utensil, or may be raised and held upright, preventing the cook or user from burning the fingers in removing the lid or cover.

**COFFEE ROASTER.**—John McLean, Miller's Ferry, Ala. This roaster comprises a casing in which is a spring-operated rotary drum, there being below the drum a burner and an extinguisher therefor, consisting of pivoted and spring-pressed plates, the latter connected to a lever adapted to be engaged by the operating spring as it uncoils. The device is simple and inexpensive, works in a measure automatically, and is arranged to prevent the coffee from being burned or smoked.

**PENHOLDER.**—William H. Walker, Dover, Del. An improved penholding attachment for a pen stock, adapted to readily clamp or release a pen, is provided by this invention. It comprises a barrel with interior sleeve having an interior projection, there being in the barrel a pivoted clamping plate. Two jaws are adapted to hold the shank of the pen, one of the jaws being pivoted and engaged by a laterally oscillating member whose movement is limited by a stop.

**TWINE HOLDER.**—Frank Bossong, Eilensburg, Washington. This device is of the class in which the twine receptacle is combined with a take-up rod to lift the end of the cord normally out of the way. The carriage with twine box is movable on a vertical track or guide, the twine passing over a roller above the box, and pivotally connected with the carriage is a take-up rod which is held upwardly inclined by a spring.

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

## NEW BOOKS AND PUBLICATIONS.

**SKETCHES IN CRUDE OIL.** Some accidents and incidents of the petroleum development in all parts of the globe, with portraits and illustrations. By John J. McLaurin. Harrisburg, Pa.: Published by the author. 1896. Pp. x, 406.

This very long work, for its fine and clear type make it longer than its pages would indicate, with numerous illustrations, is most instructive reading for those interested in the development of the oil industry in America. It is a book which details anecdotes and stories of life in the oil regions, which tells of the sudden rise to fortune of humble men, which gives the lives of members of the Standard Oil Company and of other magnates. Short stories and a generally narrative treatment add considerable interest to the work, besides which it gives very graphic illustrations of scenes connected with the oil industry. The point which we wish to emphasize is that it is a thoroughly popular book of the history of an important industry of America and of the fortunes which have been made by it, and is suited for the popular taste.

**GAS, GASOLINE, AND OIL VAPOR ENGINES.** By Gardner D. Hiscox, M. E. New York: Norman W. Henley & Company. Illustrated with 206 illustrations. Pp. 279. Large octavo. Price \$2.50.

The explosion motor in the form of gas or oil engine is constantly increasing in importance in the technical world. The ease of starting such motors, the absence of a boiler, the use of what may be termed concentrated heat in producing their motion, with the ensuing diminishing of the loss in economy under the second law of thermodynamics, have given them a value which is only beginning to have its proper effect. The public have at last awakened to their importance, and to the lateness of such awakening we may attribute the fact that so little literature on the subject exists. Mr. Hiscox's book, devoted to American practice, is practically unique in subject, and this fact, superadded to its merits and the authority of the widely known engineer who writes it, gives it a value all its own. The range of the work extends from theory to practice and includes the consideration of the features of economy and causes of waste. The book treats of the design of engines and proportion of parts, of their management, rating and determination of their efficiency. A valuable list of patents for ten years is included. The illustrations number over two hundred, nearly one for each page of the book, and their quality leaves nothing to be desired. An index is appended. The list of patents is interesting, showing for 1875 but three patents, including one under the classic name of Daimler, while for 1896 over eighty patents are registered.

**AN ECLIPSE PARTY IN AFRICA.** By Eben J. Loomis, of the United States Scientific Expedition to West Africa, 1889-90. Boston: Roberts Brothers. Pp. 218. Price \$4.50.

The contents of this sumptuously gotten up, handsomely illustrated book are wholly dissociated from the scientific work of the expedition in which its author bore a part, and cover only matters of popular interest, such as usually found in books of travel. Two interesting chapters, with some fine pictures, are given to the island of St. Helena, and one to the diamond mines of Kimberley.

## Business and Personal.

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## Notes &amp; 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 40 cents each. Books referred to promptly supplied on receipt of price. Minerals sent for examination should be distinctly marked or labeled.

(7118) C. J. C. writes: 1. Why is it that an alternating current of electricity will blow fuses in line if its two sides are crossed by anything except an incandescent lamp? In other words, if you connect sides by anything except an incandescent lamp, it will blow fuses, but you can cross it by lamp and it will not blow. A. Simply because the "anything" is of lower resistance than a lamp. If the connection is of adequate resistance, the fuses will not blow out. 2. Also can two or more T. H. or other direct current arc machines be connected together? If so, how? If not, why not? A. Yes; either in series or parallel, by connecting the leads from the binding posts. 3. Are there any books on alternating current for amateurs which you can recommend? A. We can supply the following books on alternating currents: "Alternating Electric Currents," by Houston & Kennelly, \$1; "Alternating Currents of Electricity," by Kapp, \$1; "Alternating Currents," by Bedell & Crehore, \$2.50; Tesla's "Experiments with Alternate Currents," \$1 by mail postpaid.

(7119) O. F. H. asks: An old sailor has told me that the needle of the mariner's compass points toward the south pole after the ship crosses the equator; please let me know through your query department whether this is a fact. A. No reversal takes place. The north pole points north and the south pole south approximately, the direction varying with the locality. It is a mere question of expression to say which end of the needle does the pointing.

(7120) A. L. M. writes: 1. How can I form storage battery plates quickly by Plante's process? What is the best oxidizing solution to form the plates electro-chemically in a short time, say 10 hours? A. There is no quick way of forming plates. Dilute nitric acid, 1 acid to 10 water, may be used for a preliminary immersion to corrode the surface. 2. How many amperes should be used per square foot of positive plate in forming? A. Allow 4 to 6 amperes. 3. How strong should the sulphuric acid solution be, and how much should the acid rise when a storage cell is charged? A. Before charging, sp. gr. 1.170; after charging, 1.195. 4. How can I use Baumé's hydrometer for testing the specific gravity of an acid solution? A. By floating it in the acid and comparing its readings with the table calculated for the purpose. It is much better to use a hydrometer graduated on some other basis, as much confusion exists in the matter of Baumé equivalents.

(7121) A. asks: 1. Will common tomato cans answer the purpose for jars in the caustic potash battery described in "Experimental Science"? A. They will do for a cheap battery. 2. What is a cheap way to make black copper oxide? A. Heat scrap copper to redness on a pan or slab of fire clay. After it cools pound off the oxide, reheat and repeat pounding. The process is not really cheap. The expense of the oxide is the great objection to this battery. 3. Please tell me where the energy goes in the following case: A common clock spring is wound up; it is then put in the fire and the temper taken out. The spring will now not unwind. Where does the energy go? A. The energy is represented by the heat due to the winding. This heat disappears from our recognition, as the air takes it up. The wound clock spring contains no energy due to its tension. It can on unwinding utilize the heat energy of the air and of itself and grow cool in so doing. 4. Is magnetism energy? If so, where does it go when you put a permanent magnet in the fire? A. No. It is force, and is destroyed by heating the magnet.