

The Hyacinth Pest in Florida.

The hyacinth pest in Florida is of alarming proportions, especially on the St. John's River, and its tributaries. For several years residents have strenuously battled against the plague of the hyacinth plant which has invaded their waterways, hindering not only commerce, but various industries and inflicting severe pecuniary loss on many. At last the plague has reached so serious a stage that the War Department investigated the matter and bills were introduced into Congress with a view of remedying the difficulty. The Windsor Magazine recently had an interesting article on the subject entitled, "A River Choked with Hyacinths," written by Walter Akroydd, from which we obtain our information. The particular species of hyacinth which chokes the St. John's River thrives only in water or in places where the soil is very marshy. As a rule it simply floats upon the surface of the water without any attachment whatever of its roots to the soil, and under these conditions it flourishes more luxuriantly. The flower is not of the pretty bell-shape which characterizes the bloom of the flower which we ordinarily know by the name of hyacinth, nor is the range of color so varied. The flowers are invariably of either a light blue or violet. In the springtime the vast expanse of flowers upon the surface of the water presents a very striking picture; the leaves grow to considerable size, a bunch of stems frequently averaging from one to two feet in height. The roots also grow, in many cases, to a length of three feet, and in exceptional cases, even longer.

A pond at Edgewater, four miles above the town of Palatka, was first infested with the hyacinth plant. In 1890 the sheet of water was cleaned out and the plants were thrown in the river. They immediately grew luxuriantly and travelers and tourists were much struck by the pretty sight, and being ignorant of their multiplying propensities, they carried away specimens to grow in the rivers near their homes. In four years the fishermen began to be alarmed at the hyacinth which entangled their nets, steamers also found that their progress was retarded by huge clumps of the hyacinth. The evil has grown until at the present time the hyacinth invests the St. John's River for a distance of over 200 miles, the banks on either side of the water being fringed with a border of plants from 25 to 200 feet in width. The stream is so sluggish that the hyacinth is able to hold its own and multiply rapidly. At places the entire river is covered with a dense mat of plants so that there is a vast expanse of flowers a mile wide during the period when it blooms. Small boats with screw propellers find it almost impossible to make any headway, as the plants become entangled in the screws.

Side-wheel paddle steamers fare better, but the plants are apt to collect in the paddle box, making an impenetrable blanket, so that the steamers are entirely blocked and cannot move in either direction. Steamers with low-pressure engines have their injection pipes blocked by the plants. Pieces of wood and other debris are often concealed by plants. The timber industry has been brought almost to a standstill by the hyacinths, and the loss to fishermen is most severe. In addition the towns along the river are menaced by another evil which is even more serious. When heavy rainfalls or floods occur, small drifting islands of hyacinths are carried along by them until they strike a bridge; here they clog and form a dam. The pressure of water is very great, and if the barrier does not succumb, the surrounding country is flooded. In 1894, 65 feet of trestle work that spanned the river at Rice Creek was carried away. At another bridge men had to be specially employed to push the plants through the space under the piers.

Various schemes have been devised for exterminating the plants, but it is not believed that they can be permanently banished, although it is thought that they can be kept under control. The War Department recommends the construction of a light draft stern-wheel steamer, having a double bow or outrigger, which, on being forced into a mass of plants, will cause them to gather toward the middle of the boat, where the inclined carrier will pick them up and deposit them in front of rollers driven by machinery. These rollers in turn will force the water from them, thus greatly reducing their bulk. The crushed material would then be thrown into barges and would be taken where no damage could be done. The process would be very expensive and a steamer would have to be constantly employed. It is believed that the plant cannot be entirely extirpated. Other suggestions have been the use of booms, which will catch the plants traveling with the current and bring them to a standstill. They can then be taken out and destroyed. So far, however, none of the schemes have been carried into effect. This is a splendid example of the trouble which comes from destroying nature's balance and the whole difficulty could have been prevented if the weeds had not been thoughtlessly taken from the pond in which they were and thrown into the river.

One of the things with which our Department of Agriculture charges itself is the determination of questions of this kind. Any citizen can obtain expert information in matters of this kind by writing to the Department, and if their advice was more often sought and accepted vast sums would be saved. Now, however, when it is too late, the inhabitants have invoked the

aid of the Division of Vegetable Physiology and Pathology of the Department of Agriculture, and Mr. Webber has been detailed to investigate the matter. After a prolonged and careful search, Mr. Webber has discovered a disease which he considers would do widespread damage among the hyacinth plants. This is a parasite fungus which attacks the leaves in spots and in time completely kills it. It is hoped that considerable quantities of this fungus may be obtained for introduction among the hyacinths. If it does not entirely kill off the plants it will, at any rate, keep their growth in check.

On the Burlington and Missouri River Railroad, discarded locomotive flues are being utilized as fence posts. About half of the wooden fence posts are destroyed by fire, so that the new iron posts present great advantages. It is said that two workmen can turn out fifty posts per day. The total cost of the new posts is about 15 cents each, counting only labor and the value of the tubes for scrap iron.

The Current Supplement.

The current SUPPLEMENT, No. 1230, has many articles of sterling value. "Incandescent Mantles" is an article by Vivian B. Lewes and gives exactly the kind of information which our readers are always desirous of knowing regarding incandescent mantles. "Rules for Conducting Boiler Trials" gives the recommendations of the American Society of Mechanical Engineers on this important question. "The Preservation of the Dune of Helgoland" describes an important engineering work on the North Sea. "Winged Carriers of Disease" is a most interesting article by Eliza Priestley. "The Wear of Modern Guns" illustrates the erosion caused by smokeless powders. "Magnetism" is a lecture by Prof. J. A. Ewing. "Miscellaneous Notes and Receipts" is published for the first time in this issue.

Contents.

(Illustrated articles are marked with an asterisk.)

Air brake decision.....	74	Inventions, recently patented.....	79
Air resistance problem.....	66	Japanese navy.....	72
Air resistance to moving bodies.....	70	Paris Exposition medal.....	70
Artichoke poisoning.....	74	Patents and annual report of the	
Automobile news.....	70	commissioner.....	66, 67
Automobile vehicle, transcontinental*.....	75	Plaster of Paris hardening.....	68
Books, new.....	75	Polar expedition, Italian*.....	75
Cerium.....	75	Railway bridges, Japanese.....	74
Coral, coloring matter of.....	65	Safety pins, antique.....	75
Electrical notes.....	71	Science notes.....	71
Engineering notes.....	71	Scientific American, new features	
Engine, hydraulic.....	69	of.....	67
Exploring party, Wyoming.....	75	Smokestack lowering device*.....	69
Exposition, Southern.....	68	Spines, origin of.....	74
Flour, exportation of wheat.....	66	Stovepipe coupling*.....	69
Gun, navy, 4-inch.....	70	Supplement, current.....	76
Heavens in August.....	67	Traction engine, overland*.....	68
Hyacinth pest in Florida*.....	76	Volta centenary.....	76
Invention, index of.....	77	Washington monument, lightning strikes.....	69

RECENTLY PATENTED INVENTIONS.

Agricultural Implements.

HARROW.—LEONARD F. FOWLE, Rudd, Iowa. The present invention provides a simple riding attachment for harrows to which any form of drag may be quickly applied. The beam has at its forward end a depending portion fastened to the drag-bar, and on opposite sides of the beam side braces are arranged, which are secured at their forward ends to the drag-bar at points laterally to the point of connection of the beam therewith, converging thence to the beam, and secured at their rear ends to the beam. The drags can be connected with the drag-bar, so that they may play freely between the beam and the side braces.

CANE-CARRIER AND FEEDER.—DANIEL H. WALSH, Plaquemine, La. The cane-carrier and feeder is designed to remove cane from cars or other vehicles and to deliver it to carriers. The invention comprises a supporting guide-frame along which the rake-frame is fitted to slide. The guide-frame is mounted upon supports in such a manner that it may be laterally moved to accommodate the rake to the width of the cane-pile and swing in a vertical plane about one end, so as to enable the rake-proper to be lifted, if need be, over the cane in its reverse movement.

Electrical Apparatus.

CURRENT TRANSFORMER.—SETH K. HUMPHREY, Boston, Mass. This invention is an improved device for transforming a multiphase current from one voltage to another and also from an alternating to a direct current without the employment of a rotary transformer. The device comprises a core consisting of a disk having a series of openings through and over which a number of primaries are reeved, arranged in sets placed opposite one another and connected, one set with the opposite set. The secondary winding consists of a series of coils, each having connection with segments of a stationary commutator. Auxiliary windings are extended across the center of the disk and connected in parallel with the primaries.

AUTOMATIC CIRCUIT-BRAKER.—CHARLES M. CLARK, Brooklyn, New York city. The circuit-breaker has a spring-pressed rotary disk normally in position to render the circuit continuous. An electromagnet in the circuit is arranged for action on an overload of current. To lock the disk against the tension of its spring, a spring-pressed latch is employed, connected with the electromagnet to be actuated thereby and to unlock the disk upon an overload of current. An electromagnet for the latch, likewise in the circuit, movably holds the latch in a locking position relatively to the disk, and permits the spring of the latch to actuate the latter and unlock the disk upon the passing of an overload of current.

PRIMARY BATTERY.—EDWARD BAINES, Brooklyn, New York city. To the ordinary gravity battery the inventor adds a perforated plate or grid located between the

electrodes. Upon this grid crystals of copper sulphate are placed so as completely to cover the upper side of the grid. The current can then pass from the positive to the negative electrode by way of the interstices between the crystals. The negative electrode is, hence, in a clear solution and out of contact with the crystals.

Railway Appliances.

TRAIN-SIGNALING DEVICE.—WILLIAM A. and BENJAMIN S. H. HARRIS, Greenville, S. C. The invention provides a simple construction whereby a sound-signal can be given to the engineer by a slight reduction of pressure in the train-pipe without necessitating the use of a separate signal-pipe parallel with the brake-pipe, by placing a signaling device in direct connection with the train-pipe between the engineer's valve and the train-line. This signaling device forms part of the train-pipe and permits the transmission of signals from any car by a slight reduction of pressure in the train-pipe by the operation of the conductor's discharge-valve, the reduction being too slight to set the brakes.

CHOKE-VALVE FEED FOR LUBRICATORS.—WILLIAM G. WELDON and EDWARD L. EGGER, Centralia, Ill. This attachment facilitates the feeding of oil to the chest and locomotive cylinder when the engine is working steam, and when not working steam, or when the automatic lubricator is out of order and fails to feed oil. Connected with a casing adapted for communication with a steam chest and lubricator-pipe, is an automatic reciprocating valve provided with an oil-passage adapted to permit the feed of oil in all positions of the valve, and having its recessed or cup-shaped lower end accessible or exposed to the action of steam from the steam-chest.

Miscellaneous Inventions.

COMBINED STAND-PIPE AND FIRE-ESCAPE.—HENRY VIEREGG, Grand Island, Neb. In this combined stand-pipe and fire-escape, the stand-pipe is mounted on a hanger arranged to roll on a track in front of a building, so that the stand-pipe may be placed in any position with regard to the building. The stand-pipe is provided with rungs, forming a ladder on which persons may ascend and descend.

FRUIT GRADER, DIPPER, AND SPREADER.—FERDINAND M. STARRETT, Silverton, Ore. The fruit grader, dipper, and spreader comprises a grading cylinder which separates the fruit into desired sizes. The separated fruit drops into a dipping cylinder of lye-water, whence it is passed into a second tank containing clear water, the object being to check the skin of the fruit, so that it will dry more quickly, and also to clean the fruit. After being dipped for the second time the fruit is passed to the drying trays, in such a manner that it is dried in a single layer.

WINDOW-SASH.—ETTIE M. SQUIRE, Peckville, Penn. The window-sash has a main portion to which a

swinging portion is hinged. The main portion is rabbeted to receive the swinging portion, and the bottom rail of the swinging portion is formed of two parts fastened together, between which the glass is clamped. One section of the rail is rabbeted to form a ledge overhanging the adjacent parts of the main portion of the sash. The vertical rails of the main portion are notched to receive the ends of the ledges. The swinging sections open without movement of the main parts of the sash, and when closed, form an absolutely air-tight connection.

CORNER-SHIELD FOR WAGON-BOXES.—DANIEL W. McCLAUGHERY, Fox Lake, Wis. The object of the invention is to provide a simple device capable of attachment to any wagon-box and adapted to protect the faces and ends of the side boards, so that they will not be injured. The device consists of a shield formed with flanges and sides, the spaces between the sides being such that the shield may snugly fit the side faces of the wagon-box, so that when the shield is placed in position, the lower edge of the inner face of the shield may rest upon the bed of the wagon-box.

STEAM-HEATER.—FREDERICK M. RADKE, Manhattan, New York city. The heater comprises a novel arrangement of mud-drum, steam-drum, stand-pipes, circulating-pipes, and feeder. Because of the arrangement of tubes in which steam is generated, the steam is forced directly into service when at its driest and hottest point. Owing to the small amount of fuel required and the use of a self-feeder, the heater requires less attention than similar devices.

COMBINED CELLAR-CUPBOARD AND DUMB-WAITER.—GEORGE W. MENTZER, Elgin, Ill. The combined cellar-cupboard and dumb-waiter consists of a counterpoised cupboard raised and lowered by a rope and pulley, and adapted to be arranged in a room immediately above a cellar or dry pit. When in its lowermost position the top of the cupboard is flush with the floor. The device possesses the merit of being portable. No nails are used in hanging. The cupboard dumb-waiter, it is said, takes the place of a refrigerator, requires but little room, and is so constructed that it can be very readily put into any house.

SLEIGH-BRAKE.—ABNER D. POLLEYS, Melrose, Wis. The brake is designed to retard a sleigh when ascending a hill and to prevent the sleigh's slipping back in ascending the hill. The device consists of a bifurcated lever provided with a spur adapted to enter the ground in response to a pull from a link connected with a handle in reach of the driver's hand. In backing the sleigh, the spur is automatically driven further into the ground, thus preventing the sleigh from slipping down an incline.

BARREL-CLOSURE.—FRANZ KÖHN, Ploen, Prussia, Germany. Barrels used in transporting fish are provided with large openings closed by covers during transit. The present invention provides a cover of this kind, consisting of two hinged lids which cover the opening and which are furnished with hasps engaging the inner

edges of the opening. The lids are held in place by a lever, pushed under a hasp.

HUB FOR WHEELS OF VELOCIPEDS, ETC.—EUGÈNE GERMAINE, Paris, France. On a spindle an adjusting bearing member is screw-threaded, which is provided with an engaging portion. A locking-device longitudinally movable with relation to the spindle has an engaging portion to co-operate with that of the bearing member. A spring maintains the locking device normally in engagement with the adjusting member, the spindle and locking member being prevented from relative rotation.

CASE FOR SACERDOTAL ARTICLES.—JOHANN J. EUGSTER, New Riegel, Ohio. The case is adapted to contain in such a manner that each of them will be readily accessible, articles such as are required by clergymen for sacerdotal use. These articles are used particularly in the visitation of the sick. The invention hence provides a convenient case constructed to contain within a comparatively small space all the articles required by a priest for administering the extreme unction and for like purposes.

BALL CHECK-VALVE.—JAMES ESSEX, London, Ontario, Canada. The check-valve comprises a body having a straightway passage in one end of which is an inwardly-facing valve-seat. From an upwardly-extending connected chamber a curved ball-ways leads to the valve-seat. Within the chamber is a ball adapted to fit the valve-seat and to be forced up the raceway into the connected chamber to clear the raceway. The inventor states that the valve is trustworthy in operation, that it can be used with a brass, rubber, and even a glass ball. The chief merits claimed are cheapness of construction and efficiency of operation.

PACKAGE-SEALING DEVICE.—JOSEPH T. CRAW, Jersey City, N. J. The present invention seeks to provide a simple device whereby the end flaps or wings of empty paper boxes or cartons, usually packed flat, may be quickly and securely sealed at one end. The device consists of a surface over which the portion of the box to be closed is passed. The surface has an opening adapted successively to receive the sealing-flaps of a box. The walls of the opening are arranged to direct the flaps to a closed position; and a cement is applied to the surface. Guides define the path in which the box is to be moved.

HAND-STAMP.—JAMES COOKE, Omaha, Neb. The stamp consists of a handle on which is fitted a screw turned by a fixed nut. An impression disk is fixedly secured to the screw to move therewith. A second impression disk is mounted upon the first impression-disk and is movable independently. By means of a rubber or elastic sleeve, the impression portion of the stamp has a connection with the handle that is in a measure yielding, enabling the stamp to adapt itself to inequalities of the surface to be marked.

GAME-APPARATUS.—AMSEY N. COSNER and GILBERT L. MATTHEWS, Newton, N. J. It is the purpose of this invention to provide an amusing game through

the medium of which a game of shooting matches may be played. A tilting chute is provided, adapted to hold a ball which is to be delivered upon a tray. A gun is provided for the tray, the charge of which gun is to be fired at the ball while it is traversing the board.

WINDOW-CLEANER.—LEWIS COCHRANE and FRIDRICH THIELEMANN, Brooklyn, New York city. This device consists essentially of a tubular arm, which is slotted throughout the greater portion of its length and contains a slide provided with an arm passing through the slot and carrying outside the tube a device adapted to hold a sponge or rag by which the window-pane is cleaned. This slide is connected with the end of a spring band or bar which projects from the inner lower ends of the arm, where it may be engaged to move the slide up and down in the arm. The device can be used to clean the outside of a window from the inside of a room.

CHRONOMETER-ESCAPEMENT.—ARTHUR V. CHARDON, Rue de Bretagne 23, Paris, France. In detent-escapements as now used, the flank of the tooth of the escapement-wheel which drives the balance-wheel is straight and radially inclined. The result is that between the moments when the tooth meets and leaves the driving stud, there is a sliding movement of the stud on the tooth, which results in bad driving. To obviate this, the inventor has devised an escapement-wheel of which the tooth has a curve formed so as to reduce friction at the part where it acts on the stud.

BEVEL SQUARE.—SPENCER F. BROWN and CHARLES BEAUCHENE, Lake Linden, Mich. This invention provides a try and miter square, by means of which a miter may be delineated and a straight cut indicated at the top or bottom and at the side of an object, and marked with a single stroke of a marking-tool. Two square sections are rigidly joined together, one of the sections having a slot in which portions of a miter-plate fit. The miter plate is mounted on a bolt fitted in the square, whereby movement of the miter-plate is permitted. Means are provided for locking the miter-plate on the square.

TYPE-CASE.—CHARLES J. BOTZ, Sedalia, Mo. The type-case has a number of obliquely-arranged boxes adapted to hold type. When a box is full, a storage-box is slid in the frame of the type-case to receive the type from the full box. The storage-box, after having been filled, is removed, and the empty box is ready to receive another charge. The manipulation of the apparatus is simple, its capacity unlimited owing to the use of storage-boxes, and type may be distributed with great ease and rapidity.

CLAMP.—WILLIAM H. SHEELEY, 156 Fifth Avenue, Manhattan, New York city. It is the common practice to attach temporary blocks to mitered casings that are to be glued together, so as to give a bearing surface for the hand screws used to hold the parts together while being glued. It is the object of the present invention to correct the faults of this method. This end is attained by means of a miter-clamp, the frame of which has flanges projecting from one side and extending at an angle with each other corresponding with the angle of the miter-joint. One of the flanges is a skeleton-flange; and in this skeleton-flange a block is moved toward and from the other flange by means of a cam. A friction-roller is journaled upon the sliding-block and is engaged by the eccentric. A projecting arm upon the block engages the opposite side of the cam to withdraw the block.

SPOOLING DEVICE FOR SEWING-MACHINES.—CAROLINE C. M. WAGNER, Hamburg, Germany. By this attachment a separate spooling-device, such as is used in lace-making, is rendered unnecessary and the spooling is greatly accelerated by reason of the greater number of revolutions obtainable with the sewing-machine. The attachment consists of a bobbin which is held in an adjustable sleeve driven by a friction-wheel engaging the hand-wheel of the machine.

FIREPLACE.—CASSIUS B. NAY, Fairmont, W. Va. To provide a simple construction by which to prevent the escape of fire or smoke at the top or sides of the front, is the purpose of this invention. With this end in view, a fire-front is used comprising a front plate provided with inwardly-projected side flanges and with benches projecting beyond the adjacent faces of the side flanges and adapted to receive the side linings of brick.

APPARATUS FOR HANDLING COAL.—WILLIAM H. WALL, Nanaimo, Canada. The apparatus comprises a frame or platform with supply and dumping tracks at intervals of which are openings. The platform has a series of chutes lying below the dumping-tracks. To transfer the coal-cars from the supply-track to the dumping-track, a carriage is used. Tilting gripping-dogs move the cars along the tracks and are operated by cylinders and pistons; and valves and operating means control the passage of pressure to the cylinders. The apparatus is designed for loading vessels and transfer-cars with coal.

RUDDER-FRAME AND GEAR FOR SHIPS.—FRANK S. CORMIER, Moncton, New Brunswick, Canada. This invention is designed for temporary use on ships, and is attached to a vessel when the rudder has been broken away or injured. The temporary steering device comprises a cage-like rudder frame to the front of which a strut-brace is hinged, having a forked forward end fitted on each side of the stern-post. A rudder is hinged to the rudder-frame; and a series of guys hold the rudder-frame and brace in place and turn the rudder.

Designs.

PAPER-BOX BLANK.—EDWARD E. PINKERTON, Sioux City, Iowa. The leading feature of the design consists of a center-piece, slotted sides, and ends having divided tongues.

TELEPHONE-RECEIVER CAP.—HENRY R. COOL, Urbana, Ohio. The design provides a novel arrangement of earpiece whereby it is said the holding of the telephone is rendered less fatiguing than usual, and the sound is improved.

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

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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.

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(7700) H. Y. N. asks: Are buildings covered with iron or steel roofs more or less liable to be struck by lightning? Are instances on record of buildings so protected being struck? A. We suppose that an iron roof upon a building would render it more liable to be struck by lightning. We have no instances to cite in support of our opinion.

(7701) W. A. M. writes: 1. Suppose I compress air with an ordinary air pump direct into storage tank, maintaining a constant pressure of 80 pounds. What power would that air generate if used at once in a cylinder 7 inches by 18 inches? A. About 50 per cent of the power used in compressing air may be returned by immediate use of the compressed air. 2. What would be the minimum sized tank that would insure full power for one stroke of cylinder piston full length? A. The size of the tank is of little value, except as an equalizer for the strokes of the compressor piston, to catch condensed moisture and as storage for special uses. It may be from five to ten times the capacity of the compressor cylinder. 3. Would it be advisable to use a water jacketed air pump or air compressor, or would not the air heated by compression be more powerful when used at once, and less expensive to install the plant? A. For 80 pounds pressure, the temperature of the air will rise from 60° to 433° Fah., which is too high for economy in operating the compressor. The high temperature will not conduce to the best conditions in the press. 4. It is proposed to compress air with an ordinary air pump 2 1/2 inches by 6 inches cylinder, running at 30 strokes per minute, into a tank 16 inches by 60 inches. The air compressed to 80 pounds would be used in the cylinder above mentioned, 7 inches by 18 inches, for one stroke only, one in every two minutes. Would this proposition be feasible? And would the power exerted be quick or slow? For the full length of the stroke, 18 inches? A. Your compressor or air pump should be three times larger in capacity or run three times faster than stated, in order to fill the press every two minutes at 80 pounds pressure. Six and one-third volumes of free air is required to make one volume at 80 pounds pressure. The transfer of air power is quick, and your arrangement is feasible.

(7702) P. C. T. asks: Can you give me a formula or formulae for producing cold by the mixing of chemicals? A. There are many substances which produce a fall of temperature when they are dissolved. We give several formulae. All parts are by weight.

- 1. Snow..... 3 parts. Crystallized chloride of calcium ... 4 " This will freeze mercury.
2. Water..... 1 " Nitrate of ammonia..... 1 "
3. Sal ammoniac..... 5 " Nitrate of potash..... 5 " Sulphate of soda..... 8 " Water..... 16 "
4. Sulphate of soda..... 8 " Hydrochloric acid..... 5 "

The nitrate of ammonia and water as above are the chemicals used by the makers of portable freezing machines. In the liquefaction of nitrate of ammonia a large amount of the heat of the water becomes latent when the temperature falls to near zero Fah. The machine may be simply a large pail or can with a cover, a smaller can sitting inside containing water or other material to be frozen or cooled. Water as cold as can be obtained is poured into the outer chamber and an equal quantity of nitrate of ammonia put into the water in the outer chamber in several portions with a small scoop

NEW BOOKS, ETC.

ELECTROTYPING. A Practical Treatise on the Art of Electrotyping by the Latest Well Known Methods. By C. S. Partridge. Chicago: The Inland Printer Company. 1899. Pp. 149. 16mo. Price \$1.50.

The literature of electrotyping, though quite considerable, is not up to date, and for this reason electrotypers will undoubtedly warmly welcome Mr. Partridge's book. It is a thoroughly scientific treatise on electrotyping as conducted in modern foundries, and the illustrations of the apparatus and machinery show that the latest methods are described. There is considerable field for a book of this kind at the present time.

HINTS ON AMALGAMATION AND THE GENERAL CARE OF GOLD MILLS. By W. J. Adams. Chicago: Modern Machinery Publishing Company. 1899. Illustrated. Pp. 111. Price \$1.50.

CHIMNEY DESIGN AND THEORY. A Book for Engineers and Architects. By William Wallace Christie. New York: D. Van Nostrand Company. 1899. Pp. 164. 8vo. Price \$3.

The literature upon chimneys has been mostly scattered through periodical literature, so that a really comprehensive and up-to-date work upon the subject has long been needed. The author has performed his task admirably, and the tables, formulas, and illustrations are most excellent. We do not admire the abbreviation "illus." for illustrations. There is no authority for it, but this is, however, a detail. It is a substantial addition to engineering literature, and the author has performed a signal service to the engineering profession in giving such valuable data in condensed form.

ENERGY AND HEAT. By John Roger. New York: Spon & Chamberlain. 1899. Pp. 36. 16mo. Price 50 cents. Supplement to the same, 25 cents.

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INDEX OF INVENTIONS

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JULY 18, 1899.

AND EACH BEARING THAT DATE.

(See note at end of list about copies of these patents.)

Table listing various inventions and their patent numbers, including items like Acetophenonetetracid, Addressing machine, Adhesive compound, Adjusting washer, Alloy of aluminum, Animal trap, Back pedaling brake, Band cutter and feeder, Barber's cut-throat shaver, Barrel header, Battery, Bean shooter, Bearing, Car axle, Bearing roller, Bed, Bedstead, Bicycle brake, Bicycle parcel carrier, Bicycle speeder, Billiard cue tip, Billiard cue tip, Blower, C. H. Bicaly, Bobbins in shuttles, Boiler, Boiler attachment, Boiler tube cleaner, Boilers, automatic alarm for steam, Boilers, pipes, etc., from corrosion, means for protecting, Bolt, Bolt, Boring and turning mill, Boring machine, Bottle, non-refillable, G. W. Skanks, Box, See Cigarette box, Journal box, Jug packing box, Box machine, Broney, C. Mondeng, Brake, See Back pedaling brake, Bicycle brake, Car brake, Wagon brake, Brush, rotary, P. K. Westergard, Buckle, Wagner & Dailey, Burial casket, E. O. Peoples, Burner, See Gas burner, Vapor burner, Burner, H. F. Smith, Vapor burner, Button, collar, J. Goldsmith, Jr., Button lathe, automatic, G. Griffin, Butt on, separable, D. W. Sealf, Cable reel, E. Turney, Camera, kinetographic, H. Casler, Camera assembling and cooling device, Fulton & Cook, Can filling machine, E. Metzner, Capsule, J. Weyland, Car brake, street, W. F. Knell, Car brakes, pump for street, W. F. Knell, Car coupling, W. Reese, Car coupling locking device, G. P. Stewart, Car dust guard, passenger, J. E. Scott, Car seat, ball bearing, J. S. Johnston, Car wheel, automatically adjustable roller, J. J. A. Miller, Car wheel, E. M. Biss, Card, Jacquard or dobbie, H. Polican, Carding engine, traveling flat, R. Taylor, Jr., Carrier, See Bicycle parcel carrier, Cash carrier, Carrier, J. M. Dodge, Cartridge loading machine, J. H. Barlow, Cartridge loading machine, T. P. Flynn, Case, See Dressing case, Cash carrier, M. C. Swezey, Cash register and recorder, J. Pfeifer, Caster, furniture, A. B. Biss, Catapult for throwing projectiles, C. F. McGlashan, Cattle guard, J. W. Ross, Chain, drive, T. Holt, Chair, See Hydraulic chair, Revolving and reclining chair, Chapel, chain pump, or similar apparatus, H. Check holder, conductor's magnetic, J. Flinger, Check row wire, J. W. Parker, Chimney stack draught device, J. G. Thomas, Chimney top or ventilator, J. A. Hodel, Churn, J. B. Christie, Churn and butter worker combined, W. E. Penn, Cigar lighter, A. C. Grubike,

Table listing various inventions and their patent numbers, including items like Cigars, coin controlled machine for selling, J. V. Hoere, Cigarette box, M. Marcuse, Cistern, W. J. Slack, Clevis, plow, S. D. Poole, Clothes pin, E. F. Reser, Conveying apparatus, T. J. Vollkommer, Cooker, steam, C. Ball, Cord or rope machines, automatic stopper for, J. Holden, Corking machine, A. A. Pindstoffe, Corn sheller, C. M. McLaughlin, Electric shaver, H. W. Packard, Couch and chair, combined, H. H. Patten, Couch, box, J. Hoey, Counterbalance for tools, liquid, C. W. Bolsinger, Coupling, See Car coupling, Thill coupling, Crate, bicycle, H. G. Street, Cream pasteurizing machine, W. J. Stewart, Crusher, See Ore crusher, Cultivator, E. Children, Cultivator, J. C. Hastings, Curtain rod, J. Berbecker, Cushion, See Billiard cushion, Spring cushion, Cutter, See Band cutter, Weed cutter, Cutter head, S. Schimer, Weed cutter, Cycle driving mechanism, A. P. Stephens, Cycle steering mechanism, A. P. Stephens, Dam, G. L. Cudner, Dish washing means, W. I. Law, Distilling metals, etc., apparatus for, O. Frolich, Door attaching, swinging, J. H. Whitaker, Door bolt, A. G. Bayles, Door check, C. F. Hanington, Door check and spring, H. Bitner, Door check, liquid, C. O. Case, Door hanger, J. Larson, Double action lock, E. Trefelner, Dough for bread, making, W. S. & C. I. Corby, Drawing instrument, A. Holz, Dressing case, telescoping, D. S. McIntyre, Drying kiln, W. B. McHenry, Dye and making same, cresol sulfur, H. R. Vidal, Educational apparatus, J. O. Gamble, Egg tester, H. L. Tower, Elastic fabric, woven, Green & Astill, Electric circuits, means for preventing sparking when making and breaking, A. Muller, Electric heater, M. W. Dewey, Electric transformer, J. W. Packard, Electric wires, automatic carrier for, Schottle & Willitz, Electrode, storage battery, C. W. Kennedy, Electrolysis apparatus, J. T. Morrow, Elevator gate, F. W. Maubie, Elevator, apparatus for operating electric signals for, H. Pedersen, Embroidering machine shuttle, J. J. Sonderegger, Emulsions, separating, F. W. Arvine, Engine, See Carding engine, Rotary cylinder engine, Rotary engine, Steam engine, Engraving machine, H. M. Reiser, Exhibiting or displaying appliance, Brown & Burpee, Eyeglass holder, W. C. Kantner, Eyeglasses, E. F. Elwood, Fabric, See Elastic fabric, Woven fabric, Faucet, J. Larson, Faucet or tap, G. Rawlins, Felt mat, W. G. Faatz, Fence, wire, F. Canfield, Fiber lapping machine attachment, W. T. Hurley, Fibrous stock marking same, F. Hickman, Filter, J. A. Maigen, Filter, water, R. Barrie, Filtering device, C. O. Grube, Filtering organ, J. A. Maigen, Fire escape, J. Delgado, N. Aguilera, Fire extinguisher, J. W. White, Firearm, breech loading, N. G. Whitmore, Flask, See Sprinkling flask, Floor cloth, apparatus for manufacturing mosaic, F. Walton, Floor surfacing machine, H. McLaughlin, Plug stopper, W. Fleming, Fly catcher, E. F. Trowbridge, Frost protector, J. H. Stevens, Frying fish, rack for, M. R. Geer, Furnace, See Roasting furnace, Rotary furnace, Steam superheating furnace, Furnace hot air pipe, I. Stearns, Fuse, time, O. Hartmann, Gage, See Plow land gage, Game, W. A. Wissemann, Garment supporter, G. McKnight, Gas burner, acetylene, G. & J. W. Bray, Gas burner, acetylene, A. Bachner, Gas generator, acetylene, Eldridge & Blum, Gas generator, acetylene, R. A. Wheelock et al., Gas jet igniting apparatus, A. Bachner, Gate, See Elevator gate, Spout gate, Gate, E. Helton, Gate, A. Forster, Gate opening or closing device, swinging, G. B. Morton, Generator, See Gas generator, Gold waste from jewelers' washings, trap for recovering, B. L. Byers, Governor, J. E. Bachhausen, Grinder, mower knife, G. H. Fowler, Gun, M. C. Roquin, Guns, horizontal wedge breech closing mechanism for, C. Pohlit, Hair trimmer, M. Fischhaber, Hair, G. B. Boole, Handle, See Tool handle, Handle securing device, W. L. H. Pape, Hanger, See Door hanger, Hat hanger, Harrow, W. Richards, Harrow, pulverizer, and crusher, combined, J. Harvester and shaker, corn, O. A. Wolf, Hat fastener, W. N. Brewer, Hat hanger, C. Easton, Hat pounding machine, W. H. Jackson, Hay press, H. Gray, Hay raking, manufacturing, of, Boro, Rowe & Lumley, Heater, See Electric heater, Water heater, Heels, device for securing rands to, C. A. Bliss, Hinge, W. B. Arnold, Hinge, box couch, J. Keely, Hitch, J. W. S. Ayres, Hog trap, J. J. Ehmert, Hook, See Snap hook, Horse dater, J. Orteig, Horseshoe, W. Cahill, Horseshoe, soft tread, J. C. Higgins, Hose, J. W. Simpson, Hub, vehicle wheel, C. C. Ballin, Huller, See Seed huller, Humidifier, R. C. Ulbrich, Hydraulic chair, F. Koenigkramer, Hydrogen, apparatus for producing carbureted, J. F. King, Index, W. W. Simpson, Ink well stand, E. Oldenbusch, Insect screen, A. C. Gulick, Ironing device for smoothing edges of laundered shirt neckbands, H. A. Drummond, Jack, See Double action, Joint, See Rail joint, Railway rail joint, Journal box, H. C. Swan, Journal box, T. B. Taylor, Journal lubricator, E. B. Brown, Jug packing box, J. L. Canale, Key ring, G. W. Silbert, Key sock, C. G. Perkins, Kilm, See Drying kiln, Knitting machine, circular, F. Wilcomb, Knitting machine latch opener attachment, Elliott & Miller, Knob attachment, H. W. Bawley, Lamp, acetylene gas, G. W. Bawley, Lamp, acetylene gas, Snyder & West, Lamp, acetylene gas, M. Strakosch, Lamp, acetylene gas generating, H. Stearns et al., Lamp, electric arc, Hall & Burdick, Lamp, incandescent, A. H. Miller, Lamp, incandescent vapor, P. J. Fitzgerald, Lamp lighting attachment, vapor, J. A. Yarton, Lamp or burner, gas, A. T. M. Johnson, Lamp raising device, signal, T. J. Walsh, Lamps, manufacture of incandescent, A. Wierre, Last, binding, N. W. Arnold, Latch, W. E. Lott, Lathe, F. C. Huse, Lead sulfate, making, G. Kassner, Leather splitting machine, J. Bustfield, Lift safety gear, Halket & Kennedy, Lock, See Sash lock, Lock lever, G. J. Riblet, Sr., Locomotion, electric, H. Van Hovenbergh, Loom, A. W. Beardsell, Loom attachment, J. Begins, Loom, circular, J. & C. Herold, Loom, horizontal, W. W. Uhlinger, Lubricating device, W. P. Phillips, Lubricator, See Journal lubricator, Lubricator, J. F. Lewis, Manger, feed, C. H. Hain, Mat, See Felt mat, Measure, tailor's, H. C. Bluthenthal, Measure, tape, H. Steinmetz,

(Continued on page 78)