

again when the western edge of the moon moves forward just enough to allow the solar rays to glint round at us through the valleys among the lunar mountains.

But when warned by our director, every eye must be turned to the west, for whatever else we succeed in doing, we must not fail to see the lunar shadow as it approaches. We may not live long enough to witness another eclipse under such auspices. Let us make the most of this. Forbes, who observed at Turin, the total eclipse of 1842, said that he was so confounded by the awful velocity of the shadow, which swept toward him from the Alps, that he felt as if the great building on which he was standing swayed beneath him and began to fall over in the direction of the coming gloom. The rapidity of its motion and its black intensity produced the sensation that something material was flying over the earth at a speed "perfectly frightful," and he involuntarily listened for the rushing noise of a mighty wind. Airy describes as "very awful" a shadow retreating away among the hills of Northern Spain. Other writers are no less dramatic in their accounts of these phenomena, and the tremendous impression they create. But when the shadow has come, and after we have recovered to some degree from the effects of shock, and of the sudden darkness into which we have been plunged, we must rivet our attention upon the sun, or rather upon the moon, around whose black disk by this time will have appeared the splendid phenomena associated with a total solar eclipse, seen in all its majesty. Striking indeed is the almost instantaneous substitution, as in a dissolving lantern, of one picture for another, the one showing the sky with the blackened sun like a blot upon it, the other showing the sky suddenly draped in the mantle of night, upon whose sable bosom glow planet, star, and coronal halo, and also roseate jets of incandescent gaseous matter leaping upward from and falling back upon the sun.

Now we photograph, sketch and color most assiduously, not losing a single second. We lay down the positions of planets, comets, if any, and of bright stars. The eclipse is taking place in the constellation of Taurus, between the fine red star Aldebaran and the Pleiades. We look to see whether Aldebaran is able to make its presence known by shining through

the gauzy structure of the corona, and how many of the bright stars in Orion and other constellations can be detected. We glance about the horizon and note the rich color-tones, ranging from black, in the zenith, through browns, purples, crimsons, and reds, to yellow lying along the rough sky-line thirty miles away, where the sun is still shining, though with a partially hidden disk. We notice the ashy tints around us, reflected in our own faces. But a sudden glow along the western edge of the moon warns us that totality has gone like a flash, and that we have time only for a quickly exposed photographic plate or two, and for watching another lovely dissolving view, the fading out of night before the returning glow of all-conquering day. Almost instantly the landscape brightens and becomes familiar. Not until now, as we feel the warmth of the solar rays, did we suspect a passing chill. New life throbs everywhere. The black lunar shadow has swept majestically by us and is already out on the Atlantic, rushing toward Europe. Its vast track behind us is sprinkled with thousands of people, spell-bound by the wondrous vision vouchsafed them by Nature, who, for a moment, as it were, has lifted but a corner of her robe and allowed them to gaze upon glories, the impressions of which will never fade from memory.

A New Railway for Hawaii.

The construction will soon begun on a new railway on the Island of Hawaii. The contracts will be awarded in a few days and the road will be in operation very soon. It will be known as the Kohala and Hilo railway and will connect the port of Hilo, the principal city on the Island and the eastern coast, with Mahukona on the northwestern coast. According to The Railway Age it will have a total trackage, including branch lines, of 130 miles and will open to cultivation a large fertile territory originally inaccessible on account of lack of transportation facilities. The road will be operated by electricity, which will be generated by water power. Three power plants will be built each of sufficient size to furnish sufficient power to run the entire road should necessity call for it. One will be located near Hilo, another at Hakalau, which

is near the center of the road and a third at Kuhuaele, which is at the northern end of the Island. The track will be off standard gage with 60 pound rails. The company will start with one hundred 20-ton cars and 6 electrical locomotives, 2 for passenger service and 4 for freight. Three hundred employes will operate the road and the cost of construction will be about \$2,500,000. It is believed that the wood will be of incalculable advantage to the planters of the Island. With the new road the time from Honolulu to Hilo will be only 13, instead of 36 to 39 hours.

The Current Supplement.

The current SUPPLEMENT, No. 1242, has a number of important papers. "The Evolution of Technical Education in Economics, Politics and Statecraft" is an address by Dr. R. H. Thurston delivered on the occasion of the anniversary meeting of the Franklin Institute at the National Export Exposition. "The Uganda Railway" is accompanied by a map. "Boats and Sails," by Walter Burnham, is one of the most interesting articles which we have ever published relating to shipping. It is an amplification of the article which is published in this issue of the SCIENTIFIC AMERICAN, and is accompanied by eleven illustrations. "Electric Auxiliary Machinery in the United States Navy" is by Alton D. Adams. "The Observatory at Pulkowa" is an interesting illustrated article. "Proper Forms for Cross Sections of Moving Bodies" is an article by M. F. Mithoff. "The Progress of Science and Its Results" is the Presidential address of the British Association.

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RECENTLY PATENTED INVENTIONS.

Agricultural Implements.

SHEEP-HOOK.—PHILIP I. MOULE, Bercail, Mont. The hook is so constructed that the leg of a sheep may be readily caught thereby and held as long as desirable, it being practically impossible for the animal to free itself. The leg of the sheep is automatically locked without injury by a peculiar form of spring loop, so that the operator can release the animal when necessary.

VINE-CUTTING ATTACHMENT FOR PLOWS.—GEORGE H. NUNGEZER, Pooler, Ga. The purpose of this invention is to provide an attachment for plows especially adapted for cutting sweet-potato vines in advance of the plow in order that the vines may be readily cut and plowed under, and that the beds may be simultaneously sided or hilled and made ready for digging or plowing out. The attachment consists of a support, by the ends of which knives are carried, the support being adapted for attachment to a plow-beam.

Engineering Improvements.

METHOD OF AND APPARATUS FOR GENERATING POWER.—GUSTAF M. WESTMAN, 1144 Broadway, Manhattan, New York city. The operation of the motor involves the free expansion of the motive fluid. Free expansion is the condition of the fluid in which it can expand to the surrounding pressure without doing any work or putting other bodies in motion. In such condition the velocity of the fluid is increased; but when putting other bodies in motion, the fluid necessarily loses velocity proportionate to that acquired by the body set in motion; consequently, the fluid loses power or ability to expand; and its temperature can not sink as low as it would have done if no body had been put in motion. This may be regarded as the application of a new physical principle to engineering.

AUTOMATIC WATER-FEEDER FOR STEAM-BOILERS.—CLAUDE B. HANTHORN and ALVADORE WELCH, Astoria, Ore. This invention relates to a type of water-feeding devices employed to supply water to steam-boilers, while they are in service and also capable of use in connection with oil, gas, or fluid boilers. An efficient device of this character is provided, which is readily connected with any steam-generator and which automatically feeds water from a source of supply into the boiler by force of gravity, the apparatus being adapted for adjustment to maintain the water in the boiler at a desired height.

BOILER-FURNACE.—SAMUEL W. BUTTERFIELD, Three Rivers, Canada. The furnace is designed to burn mill refuse and coal and is arranged to insure a complete combustion of the fuel and quick generation of steam in the boiler. The boiler is provided with a fire-box under its front end and with a second fire-box located in front of the first box and having communication with the inner box over a bridge-wall. The grate of the inner box is above that of the outer box. By having two fire-boxes located one in front of the other, a complete combustion is obtained, so that the heat-units are all utilized in the generation of steam.

Mechanical Devices.

COMBINED DOOR LATCH AND LOCK.—EDWARD E. NELSON, Fillmore, Ill. The latch and lock are devoid of springs and provide means for the locking of both the latch-bolt and lock-bolt at the same time, thus affording double security. The working parts comprise a slide-bolt, a slidable locking-bolt, and a shackle-bar having

two lateral projections and slidably disposed between and parallel with the bolts. The shackle-bar is adapted by adjustment to engage the lateral projections with the latch-bolt and locking-bolt, thereby securing them against retraction.

WRAPPING-MACHINE.—GEORGE L. GAY, Spokane, Wash. This invention provides a wrapping-machine for newspapers, pamphlets, circulars or the like, which is arranged to deliver the material for forming the wrappers from an endless roll, then to place the wrapper securely and firmly around the newspaper, circular or other paper to be wrapped, and at the same time to fold both the wrapper and paper, finally to cut the wrapper from the endless roll and to seal the end and deliver the paper completely wrapped ready for mailing.

Railway Appliances.

CAR-COUPLING.—ALFRED R. HEATH, Covington, Ind. The coupling is of the hook-and-catch type, and comprises a body having a hook-member at one end and a slotted draw-bar at the opposite end. At the forward end of the slot a rock-shaft is supported, the rear side of which is engaged by a fulcrum-box. A buffer-spring in the slot has its ends respectively pressing upon the draw-bar and fulcrum-box. The great range of rocking adjustment enables two cars of different heights to be coupled together so that there will be no cramping strain on either car-coupling.

SEAT.—JOHN JAMES, Polo, Ill. This inventor has devised a simple seat which is especially adapted for the use of locomotive-firemen, which is removably applied to the locomotive-tender, and which can be compactly folded. When the seat is not to be used, its back may be thrown down over the seat, and the seat and back and connected parts so folded together that there will be but little space occupied.

MAIL-CRANE.—FRANCIS M. EDWARDS, Greigsville, N. Y. Most mail-cranes in use must be mounted at or beyond a switch or upon the outer sides of double tracks. This necessity often involves the location of the mail-crane at a considerable distance from the station. The present device can be placed upon either side of a track, between double tracks and near a station, so that it may be watched. The crane has a receiving-arm pivoted upon a horizontal pivot and provided with a locking extension at its inner end and with a bag catching and holding device at its outer end. A spring-held catch engages the locking extension of the arm, and a pivoted bag-delivering arm is adapted to be engaged by the delivering-arm in its drop. Connections to the catch are provided for releasing the receiving-arm.

CAR-REPLACER.—ISAAC H. WISE, Huntsville, Ala. The car-replacer is a device for replacing cars and wheeled vehicles upon a track. The car-replacer has a toothed rib or track and a toothed segment-disk has flanges at each side of the teeth, engaging the rack. A notch at one edge of the segment-disk is adapted to receive the car-axle. A similarly-curved segment-disk secured to the toothed segment is adapted to bear upon the base. The car-axle will be lifted as the segments roll upon the base. The angular position of the device will determine the amount of side movement given to the car. Hence the car can be raised and transferred sidewise as many times as necessary.

Miscellaneous Inventions.

FASTENER FOR BUTTONS.—ARTHUR H. LOHSE, Manhattan, New York city. Connected with a button having eyes is a plate through which and through the

eyes a rivet passes. A pin extends through another eye of the button and through the plate. The pin and rivet serve to hold the button and plate together. A tongue on the plate is adapted to be turned against the pin. A button once fastened cannot very readily be loosened or torn off.

SURVEYOR'S COMPASS.—RUDOLPH J. GORPINGER, St. Francis, Ark. The compass comprises a casing having a graduation over which a needle plays. A retaining device or stop projects into the path of the needle and is movably mounted on the casing, so that it may be brought into registry with different points of the graduation. The vibrations and oscillations of the needle are hence confined, and the needle comes to rest in a comparatively short time, thereby enabling the surveyor to run lines quickly.

IRONING-BOARD.—WILLIAM HARGROVE and JAMES J. WYLDE, Montreal, Canada. This invention provides a simple and ingenious ironing-board which can be readily attached to a table and which can be folded into a small space when not in use. The board is provided with a head, which is placed on top of the table, and with bearings in which a leg is fulcrumed, resting with its free end upon the floor. A clamping extension on the leg engages the under side of the table-top to hold the board. The board is held in extended position by a brace on the leg, which brace engages one of a number of teeth on the under surface of the board.

BUTTONHOLE-MOISTENER.—DANIEL F. BAGLEY, Brooklyn, New York city. This device for moistening the buttonholes of collars, cuffs, shirts, and the like, consists of pivotally connected handles, to one end of each of which a jaw is pivoted. The jaws contain absorbent pads for the water. By applying the jaws to opposite sides of a buttonhole, the starch is extracted and the buttonhole portion rendered pliable, while the adjacent portions still retain their stiffness.

PROCESS OF MAKING SOLUBLE ALKALINE SILICATES.—FRITZ HENKEL, Düsseldorf, Germany. The inventor has discovered that, by intimately mixing solid silicic alkalis or alkaline silicates with a little water, in the proportion of six to one, and strongly heating the mixture, or by mixing the solid silicic alkali or alkaline silicate with a hot, concentrated solution of the silicate, a substance is obtained which cakes to form a solid mass which can be pulverized and is easily soluble in cold water.

PROCESS OF DECOLORIZING VEGETABLE JUICES.—JOHANNES C. BOOT, Klatten, Java. The object of the invention is to render the iron salts of decolorized sirups and juices innocuous, so that a permanent decolorization is obtained. To this end the inventor heats the juices (concentrated below 50° Brix) to about 50° C.; and, under constant stirring, sulphurous acid alone or zinc and sulphurous acid are added. So far the process is that usually employed. The liquid is then heated to 80° C. and a soluble ferrocyanid is added until the iron (or iron and zinc) is precipitated. The liquor is then filtered or decanted.

HOSE-CLAMPING DEVICE.—ALBERT M. BURGHER, Clay City, Ky. This device for attaching clamps to hose consists of opposing jaws arranged to receive the clamp and provided with handles. A device is provided for adjusting the jaws; and a fulcrum is furnished for the handles. A bearing-block is carried by the movable fulcrum and is arranged for engagement with the clamp to be secured. The device is adjustable to hose-clamps of different diameters.

PNEUMATICAL APPARATUS FOR APPLYING TOOLS TO SURFACES OF ANY SOLID BODIES.—LOUIS J. MOISSENET, Cherbourg, France. The appar-

atus applies or affixes tools to the surface of any solid body and employs a vacuum created by one or more suckers of proper size placed on the surface and in the interior of which a more or less complete vacuum is produced, so as to establish on the surface of the body fastening-points which permit any machine-tool to be fixed in place, such as a drill, mortising machine, and the like. The suckers serve firmly to fix a brush or stay on the surface to be operated upon; and the tool is fitted to the bench, which serves as its fixed point of support during the work.

PRESS.—GEORGE F. CROSS, San Antonio, Tex. This improved press for holding down sauerkraut, pickles, and the like, in barrels or tubs, comprises a presser or follower-plate on which a guideway is vertically mounted. A presser-foot slides in the guideway; and on the presser-foot arms are mounted on horizontal axes. The arms extend over and engage the follower or presser plate to rock thereon, and serve to hold the follower or presser plate in position.

CALCINING-FURNACE.—CHARLES M. ALLEN, Basin, Mont. The furnace has a number of hearths located one above the other, the uppermost hearth being shorter than the hearth beneath it, leaving one end of the roof of the lower hearth exposed to form a drying-floor leading to the entrance of the upper hearth. The drying-floor is capable of freely taking up the high heat the lower hearth and of imparting that heat to the material discharged upon the drying-floor to expel the moisture from the material during its travel over the floor and before its entrance into the upper hearth. Inlets are provided for the products of combustion to the hearths at the extreme ends; and an outlet for the products of combustion at the discharge end of the lowermost hearth. Very little sulfuric acid being generated, it follows that the life of the hearth is greatly lengthened.

SACK-HOLDER.—FRANK H. GILBERT, Ridgefield, Wash. The sack-holder comprises a hopper with straps secured to the outer sides of its rear wall and terminating in hooks at the upper end. A bracket is attached to the rear wall, and a locking and releasing bar is mounted to rock in a channel formed in the rear wall and is held in place by the straps. Holding-bars are mounted to rock on the opposite side walls of the hopper. Lugs extend inward from the holding-bars and are adapted to be engaged by the locking and releasing bar. A spring moves the locking and releasing bar to its normal position. The sack-holder can be easily attached to a bin or other support.

METHOD OF PRESERVING AND TAWING SKINS.—URY DE GÜNZBURG, Boulevard Lamouroux 52, Vitry-sur-Seine, (Seine), France. In the method to which the present invention relates, the cohesion of the fibers of the hide or skin is destroyed, and putrefaction is prevented without the help or the formation during the operation of any crystallizable salt, which would have the effect of diminishing the strength of the skin. Consequently, skins thus treated contain no crystallizable salts, remain perfectly flexible, and lose none of the strength they possessed before being treated. Water, be it cold or hot, has no effect whatever on a skin thus prepared.

PIPE-COUPLING.—WILLIAM J. HENNING, Key West, Fla. The coupling comprises two sleeves respectively adapted to embrace pipe-sections. The first of these sleeves has interior threads to engage one of the pipe-sections. A collar embraces both sleeves and serves to draw them together. A gland-like collar threaded on the second sleeve is adapted to carry a packing whereby the second sleeve is hermetically connected with the adjacent pipe-section. The pipes can

thus be hermetically coupled, even though they be of different diameters.

PACKAGE FOR PERCOLATING COFFEE.—HENRY M. HUMPHREY, Plainfield, N. J. This invention provides an improvement upon the Humphrey percolator-package which has been described in our columns. The improvements embody a metallic seal for the mouth of the coffee-containing bag, which seal can be partially bent over so as to open the mouth and provide a hook for suspending the bag from the edge of the coffee-pot. Hot water is then poured into the bag and permitted to percolate through the coffee and into the pot.

GATE.—OLAUS B. JACOBS, Roland, Iowa. The invention provides a barrier for gateways in stock-fences or other inclosures that will permit the larger stock to pass through, but will effectually retain hogs, sheep, and other short-legged animals. The gate or barrier comprises a frame and palings in series in the frame, the frame having passage-ways between them and spaced and arranged to permit the passage of animals having long legs and to constitute a barrier for animals having short legs.

MEDICAMENT-CARRIER.—CHARLES M. JONES and ALEXANDER LE ROY HARVEY, Baxter Springs, Kan. This surgical appliance consists of a flexible band between the ends of which a connecting elastic strip extends. Cover-straps are secured over the outer faces of the ends of the band and over the flexible strip to secure the flexible strip to the band.

CHURN.—WILLIAM F. FRIBLEY, Bourbon, Ind. The cover portion of the churn is provided with a funnel portion having a top comprising two segmental frames pivotally connected at one side to swing relatively to each other. Each of the sections has a strainer; and through openings formed in the sections a dasher rod is movable, having connection with a mechanism, the operation of which requires but little muscular power.

CHURN-DASHER.—WILLIAM H. SWAN, Kankakee, Ill. The churn-handle is provided with a set of rotary dashers so constructed that in churning, the dashers will rotate in opposite directions and their motion will be automatically reversed by the up-and-down movement of the handle. The churn can be filled nearly to the top since the dasher does not splash the cream.

SKIRT AND BELT SUPPORTER.—ALICE M. TULLY, Manhattan, New York city. The supporter consists of a safety-pin adapted for engagement with a waist and provided with a hook, and a second safety-pin adapted for engagement with a skirt-band and having an eye arranged for insertion over the hook whereby to hold the waist and skirt detachably connected. The point of the hook is adapted to enter the inside of a belt whereby the belt is held in place and the eye is prevented from coming off the hook so long as the belt is in place.

SHOE-DISPLAYING DEVICE.—DONALD S. BET-COME, Indianapolis, Ind. The device is particularly adapted for the use of traveling salesmen and is inclosed in a trunk for shipment. The invention consists of a wheel having shelves to which shoes may be fastened and which may be secured to the wheel either in tangential or radial positions, according as it is desired to display the shoes or prepare the device for shipment.

BUNG.—JACOB CONRAD, Chicago, Ill. This improved barrel-bung can be readily applied and used with or without a bushing, and is designed to prevent the opening of the barrel during transit. The bung has a cylindrical casing loosely fitting in the hole and having internal threads receiving a hollow screw with inwardly-extended ribs running longitudinally therewith and adapted to be engaged by a key. Beyond the casing the inner end of a screw projects, which end loosely receives a rivet carrying a presser-plate. A yielding gasket loosely surrounds the inner portion of the screw and casing and is engaged by the presser-plate, so that as the screw is drawn into the casing the gasket is expanded to close the bung-hole. The bung-hole can be opened only by the key.

WATER-HEATER.—MICHAEL E. HERBERT, Jr., 240 to 252 Root Street, Chicago, Ill. The device is a water-heater for baths and domestic purposes. It employs a water-jacketed feeding-magazine and comprises a boiler made in two main parts, the upper of which has a pendant annular water-chamber and the lower of which incloses or forms the fire-box. These two parts are connected by a series of vertical pipes.

WAGON-BODY LIFTER.—HON. ORLO H. DRINK-WATER, Cottonwood Falls, Kan. The wagon-body lifter comprises sills and a toggle-arm having its side bars pivoted at their upper ends to the pivoted toggle-arm. Rollers operate on the sills. Great power can be exerted to lift the body from the running gear, the running-gear itself being caused to transmit the power. The lifter is adapted for bodies of different sizes.

CALCULATOR.—WILLIAM D. CONKLIN, Rutherford, N. J. The calculator is designed to reckon wages, the wage per hour, day, or week, and the number of hours of service given. The calculator comprises a base-plate provided with sets of guideways arranged one above the other and at right angles to each other. Imperforate plates slide in the lower set of the guideways; and each bears numbers representing the amounts of pay due for a certain number of hours and indexed to indicate the hours served. Perforated plates slide in the upper set of guideways, each indicating the amount of wages for a given time. A perforated face-plate is placed above the sliding plates.

Designs.

BOX.—LEOPOLD AUERBACH, Manhattan, New York city. The box is designed to contain candy, is cylindrical in shape, and is covered by a medallion on which the head of Columbus is produced.

HINGE FOR DOOR-HANGERS.—JOHN C. GABEL, Jr., Onarga, Ill. The hinge is of novel construction and provides a means for suspending the carriages of sliding-doors, especially freight car doors. The hanger is designed to be used in connection with a sliding-door devised by the same inventor.

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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(7734) H. E. B. asks for a list of the twenty-four inventions and discoveries of highest rank made during this century, alluded to in Horace C. Hovey's article on the American Association for the Advancement of Science, in our issue of September 2. A. The list, as enumerated by Prof. Edward Orton, in his address before the association, is stated to be as follows:

- 1.—Railroads, 15.—Molecular Theory of Gases, 2.—Steamships, 16.—, 3.—The Telegraph, 17.—, 4.—The Telephone, 18.—The Periodic Law in Chemistry, 5.—, 19.—, 6.—, 20.—The Glacial Epoch, 7.—, 21.—The Antiquity of Man, 8.—, 22.—Organic Evolution, 9.—The Phonograph, 23.—Cell Theory and Embryology, 10.—The Roentgen Rays, 24.—Germ Theory of Disease, 11.—The Spectroscope, 12.—Anesthetics, 13.—Antiseptic Surgery, 14.—Conservation of Force, ease.

He remarked that he had quoted from Alfred R. Wallace's classification. Wallace's numbers 5, 6, 7 and 8 are thus filled:

- 5.—Lucifer Matches, 7.—Electric Lighting, 6.—Gas Illumination, 8.—Photography.

Prof. Orton added Lord Kelvin's "Vortex Theory of Matter" and the "Nebular Theory." The latter, as in the same range with Wallace's No. 19, "The Meteoritic Theory." His No. 16 is the "Velocity of Light Directly Measured," and his No. 17 is "The Uses of Dust." He called attention to the obvious fact that the personal equation of the author of such a list would appear in the selection of the great advances.

(7735) J. K. L. asks: If a person wishes to become an electrician and knows nothing of the subject, what book should he start with? A. If a person knows nothing of electricity, the best book to study first is probably Thompson's "Elementary Lessons in Electricity and Magnetism," price \$1.40 by mail. This book employs no mathematics beyond algebra. We are inclined to think that the best course for one who wishes to gain a working knowledge of electricity in order to be an electrician is to take the course in one of the best correspondence schools. He will there be taught practically rather than theoretically. This is almost the only course open to one living remote from colleges, or one so situated that he cannot stop working and earning while he is learning his new subject.

(7736) J. S. writes: I wish to get a chemical in powder or liquid form, that will absorb heat quickly, and when heated, to retain a high temperature for say twenty-four hours or so when confined. Will you kindly send me the best formula? A. We do not know any substance which will heat quickly and also retain heat for a very long time. The two requirements are antagonistic to each other. Sodium nitrate fused will give off a great deal of heat in cooling, but it will corrode the vessel in which it is contained. Air slaked lime may be raised to a very high temperature.

(7737) H. B. asks: Which is the best iron to use on transformers and alternating current motors? A. Any good soft wrought iron is suitable for the core of a transformer.

NEW BOOKS, ETC.

CHRISTIAN SCIENCE AND OTHER SUPERSTITIONS. Being selected from "Faith-Healing, Christian Science, and Kindred Phenomena." By J. M. Buckley, LL.D. New York: The Century Company. 1899. Pp. 128.

METRIC TABLES. By Sir Guilford L. Molesworth. London and New York: Spies & Chamberlain. 1899. 24mo. Pp. 86. Price 80 cents.

This is the third edition of a handy little book on metric tables. The equivalents are arranged so that they can be readily handled by those who have to convert measures.

THE TEACHING BOTANIST. A Manual of Information upon Botanical Instruction. By William F. Ganong, Ph.D. New York: The Macmillan Company. 1899. 12mo. Pp. 270. Price \$1.10.

As its title implies this work is addressed to the teaching botanist and serves as a manual of information upon botanical instruction and deals with its elementary presentation as a science. The work will certainly prove of great value to all teachers of botany, giving as it does clear instruction as to scientific drawing and description, laboratories and their equipment, botanical collections, botanical books and their use and many other interesting things which it would be difficult for the teacher to find in convenient form.

PHYSICAL NATURE OF CHILDREN AND HOW TO STUDY IT. By Stuart H. Rowe, Ph.D. New York: The Macmillan Company. 1899. 12mo. Pp. 206. Price \$1.

The tests which the author outlines may be made in a comparatively short time and will be a great help in solving some of the individual problems which present themselves to every teacher. The book deals with sight, hearing, manner, ability, enunciation, nervousness, fatigue, diseases, habits of posture, movement, etc. When we examine a modern book on pedagogy like the present volume, it is a revelation of modern methods of instruction, and we can but feel that the older methods must have had a great deal of cruelty connected with them, because the teachers themselves were unfamiliar with the physical nature of children. The book is a most admirable contribution to the literature of teaching.

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An experience of fifty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequalled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending

OCTOBER 10, 1899.

AND EACH BEARING THAT DATE.

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

Table listing inventions with patent numbers and names of inventors. Includes items like Accumulator plates, Air brake, Alarm, Animal trap, Animal trap, Ash can, Asphalt from petroleum residue, Axle and bearing, Axle lubricator, Back pedaling brake, Basket, Bathing appliance, Bayonet, Bearing, Bed bottom tightening device, Bell alarm, Bench, Berry picking machine, Bicycle, Bicycle frame, Bicycle guard, Bicycle pedal attachment, Bicycle stand lock, Bicycle support, Bicycle wheel, Binder, Bit, Bolt, Blotter holding device, Bobbin latch, Boiler cleaner, Boiler burner heater, Boiler furnace, Bolt, Book leaf, Book manufacturing sales, Books, reference or page marker for, Boot or shoe, Bottle filling apparatus, Bottle stopper attachment, Bottles, Bouquet holder, Box, Brake, Brake appliance, Brick, Broom handle, Brush, Brush, Brush, Brush, Brush, Brush, Burglar alarm, Burner, Cab. harness, Cabinet for faces, Cam or pulley fastening, Can.

Table listing inventions with patent numbers and names of inventors. Includes items like Car coupling, Car dumping, Car dust guard, Car fender, Car life guard, Car, railway, Car step, supplemental, Car window dust guard, Cars, electric lighting apparatus for railway, Carpet stretcher, Carriage for multiple cannon, Case, Case or box for matches, Cash register, Caster, adjustable, Cheese curd aerator, Churn, Churn, F. V. Koulik, Churn and butter worker, combined, Churn gate valve, Clear ash receptor, Clear rolling machine cutting device, Clamp, Clamp, See Pole or column clamp, Tooth clamp, Cleaner, See Roller cleaner, Cloth shearing machine cloth rest, Amback & Hollingworth, Cloth shearing machine rest, Amback & Hollingworth, Clothes line and clothes pin holder, combined, S. Burdick, Coaster, gravity, H. O. & A. W. Moritz, Cock, blow off, L. E. Butler, Coin assorting and counting apparatus, F. S. D. Scott, Comb, See Currycomb, Computer brush holder, W. Cooper et al., Confectionery coating machine, W. H. Weeks, Cooling beer, etc., apparatus for, W. Bachner, Corset clasp, A. Herr, Cot, k. rockdown, D. Holke, Cotton press filling box, Thorsen & Shutt, Coupling, See Car coupling, Pipe coupling, Thill coupling, Crate, folding, G. A. Jones, Cross tie, metallic, J. D. Wilson, Culinary vessel, C. Halstead, Cultivator, J. Mallon, Cultivator spring rip, C. R. Farless, Cupric sulfate solutions, refining, O. Hofmann, Currycomb, O. S. Hopkins et al., Cutter, See Vegetable cutter, Cycle, M. Pedersen, Cyclometer, G. T. Brown, Decorations, device for making free hand relief, W. A. Willower, Dental instrument fastener, J. W. Ivory, Dental mirror attachment, W. I. Brigham, Detonator composition, G. P. Bickford-Smith, Developing tray rocker, J. H. Clarke, Disinfectant for water closets, cisterns, etc., apparatus for, automatically feeding, A. C. Monfort, Disinfecting apparatus, R. S. West, Disinfectant for automatically delivering disinfectant to charges of flush water, J. L. Wade, Display and receiving appliance, D. E. Henning, Display cabinet for window shades, H. McGinnis, Display rack, revolving, M. F. Xander, Door attachment, G. J. Winter, Door check, G. W. Warner, Dock, dry, W. H. Gartz, Draining outfit, mechanical, G. K. Ryck, Drawer pull, D. W. Tower, Drier, Bishop & Jerguson, Drill, See Ratchet drill, Drill, M. M. Moore, Driving mechanism, S. P. Pierson, Dumping apparatus, G. M. Kenned, Dyeing wool fast black, Julius & Iablin, Egg holder, B. Keys, Electric brake, G. H. B. Hooper, Electric meter, F. Ebbig, Electrical binding post, W. Roche, Electrical conductors, crossing for underground conduits for, V. Koch, Electrical indicator, M. Waddell, Electrical indicator, Waddell & Lextrand, Electrical influence machine, K. S. Lemstrom, Electromagnetic cylinder engine, G. H. B. Hooper, Elevator, See Revolving elevator, Elevator, H. R. Tracy, End gate, wagon, W. F. Gatewood, Engine, See Electromagnetic cylinder engine, Gas engine, Gasolene engine, Rotary engine, Engines, electric starting device for gas, J. W. Raymond, Entrenching tool, J. C. Michie, Evaporator, T. Kuzel, Eyeglass guard, R. K. Kasus, Eyelet, E. L. Sibley, Fence post base, W. Perry, Fender, See Car fender, Figure, jointed, C. B. Morrow, File, letter, Stable & Mills, Films, apparatus for developing roll, Smithers & Kelly, Filter, N. Lanser, Filter, water, Armstrong & Mulconroy, Filter, water, W. G. Toussay, Filtering device, portable, A. Marks, Fire extinguisher, automatic, O. Hoffmann, Fire resisting construction, interior, A. T. Stearns, Fish globe or tank, A. J. Park, Flask top, F. De Gordy, Flax breaking and reducing machine, J. T. Smith, Flood gate, W. Cloude, Floor setting tool, L. A. Manwarink, Foot rest, adjustable, J. A. Moore, Fortune telling device, Long & Capron, Fountain, E. D. Brainard, Fuel preparing and feeding apparatus, A. A. Day, Furnace, See Furnace for retorting, Furnaces, charging device for heating, J. Hundley, Garbage can, C. J. Vaughn, Gas apparatus, acetylene, G. Harden, Gas burner, acetylene, H. E. Shaffer, Gas engine, O. F. Good, Gas engine, A. Lee, Gas engine, T. J. Sturtevant, Gas engine, G. A. Whitcomb, Gas fixture safety connection, McDermott & Bennett, Gas generator, acetylene, G. F. Dillon, Gas leak indicator, P. Hartenfels, Gas lighting or extinguishing mechanism, time, A. B. Shaw, Gas machine, acetylene, J. E. Landrum et al., Gas machine pump, gasolene, E. J. Crawford, Gasolene engine, C. O. White, Gate, See Bridge gate, End gate, Flood gate, Gate, N. Early, Jr., Gelatin tubes, apparatus for forming, P. J. Foulton, Gelatinous substances, apparatus for manufacturing, G. H. Hart, Gem setting, Ballou & Burdett, Generator, See Gas generator, Steam pressure generator, Gin driving mechanism, C. W. Brown, Glass articles, machine for grinding, E. F. Genert, Glove, J. Comrie, Governor, engine, C. 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