

RECENTLY PATENTED INVENTIONS.

Railway Appliances.

LOCOMOTIVE SAND BOX.—John McDonald, Tokio, Japan. A steam chest made preferably in the form of a hollow disk is, by this invention, arranged on the under side of the sand receptacle, a pipe passing through the steam chest connecting at its lower end with the sand pipe leading to the rails, while a valve slides on the top of the steam chest to establish communication between the sand box and the pipe, an agitator secured on the valve extending into the sand receptacle. The construction is simple and durable, and the arrangement is such as to perfectly dry the sand, preventing its caking and insuring a continuous flow, at the same time permitting of placing the sand receptacle below or at the side of the boiler, instead of on top, as is now done.

TRAIN ORDER HOLDER.—Clarence E. Biddison, Goodland, Kansas. This is an improvement on a former patented invention of the same inventor, whereby the holder is rendered more simple and durable, and providing for them ore expeditious and convenient inserting of the order and holding it in place, the device also displaying train orders or notices of any description. Combined with a receiving frame, from side to side of which a pintle extends, is a door frame holding a glass pane and having outward projecting loops sliding and turning on the pintle, around which are coiled springs bearing on the receiving and door frames, the door being normally held closed by the springs, which are compressed when the door is lifted up.

Mechanical Appliances.

TUBE SEAMING MACHINE.—Albert D. Prentice, New York City. This is a device for forming a secure double-folded locked seam on the adjacent edges of a blank of sheet metal as it is being formed into a cylindrical or other shaped tube. It consists of a composite die having a base piece on which is a converging channel die to commence the bending, a contracting die in which is a tongue shaping and flanging the tube, two flanging dies and a finishing die, all arranged to receive the blank consecutively, while a mandrel is longitudinally extended through the several dies.

PUMP.—Joseph Darling, Karns City, Pa. This pump is intended especially for use in deep wells, whether oil or water. Connection is provided with a trap valve at the bottom of the well, whereby the valve may be positively opened when the standing valve of the pump is inserted, being held open so long as such valve support remains in operative position, and closed on the removal of the standing valve. As such insertion and removal of the standing valve only occurs in some instances at intervals of about thirty days, there is practically no wear on the trap valve, which, when once inserted, will wear a long time without needing repairs.

SUCKER ROD LIFTER.—Lewis Vaughan, Summit City, Pa. The block or base plate of this device has a seat for the rod, a slot leading thereto, while a hanger is pivoted to the plate, and a latch having its shaft portion journaled to the base plate has a crank arm at its front end extending across the slot, a handle extending from a crank arm at its opposite end, whereby the latch may be released by the hand grasping the hanger. The device is especially intended for lifting the sucker rods of deep wells, and in practice two of the implements are used, one being engaged with the head of one sucker rod section, and the whole being lifted by suitable hoisting devices, to bring the head of the next lower section above the well tube, when the next lifter is applied.

PLIERS.—Walter J. Monteith, Albany, Oregon. This tool is composed of pivoted jaw levers having shanks curved inwardly in opposite directions and pivoted lever handles whose shorter arms are curved outwardly and oppositely and pivoted to the shanks of the jaw levers, the implement working on the principle of a toggle lever, the power becoming greater and the grip of the jaws more powerful as the jaws are brought together.

BEVEL.—Peter J. Mabye, Brooklyn, N. Y. This is a simple and inexpensive tool that may be used either as a square or a bevel. It has a bifurcated handle, with a transverse screw provided with a thumb nut at its outer end, and a segmental groove concentric with the screw, while a blade in the handle has a projection to enter the groove, the screw passing through a small aperture to permit the blade to swing, but prevent longitudinal movement, it being clamped in the desired position for a square or bevel by the screw and nut.

Agricultural.

PLANTER.—William W. Jones, Granada, Col. An auxiliary beam is pivoted at one end to the plow beam and has at its other end a drive wheel, the auxiliary beam carrying a seed box in which is a spring-pressed slide, there being a flexible connection between the slide and the axle of the drive wheel. The implement is designed to be simple, durable and inexpensive in construction, and adapted for quick and easy attachment to the beam of a double or a single plow, the construction of the seed box being such that any kind of seed may be dropped therefrom without portions of the seed adhering to the drop slide.

PLANTER.—John A. Handeland, Palouse City, Washington. Combined with a main frame having an axle on which revolves a supporting wheel journaled in its forward end, is an auxiliary frame pivoted in the main frame and carrying a seed-dropping mechanism. The implement is designed to be especially adapted for garden use, and is so constructed that it may be utilized for planting seed or for cultivating young plants, and when the planting mechanism is removed, the implement may be used as a wheelbarrow.

Miscellaneous.

ARTIFICIAL STONE.—Walter Niff, New York City. This invention relates to what are known

as "doublets," composed partly of strass or other artificial material and partly of genuine stone, the design being to minimize the color effects of the genuine stone and better preserve the color of the artificial body, while protecting it. Garnet is most largely employed for the facing, as it readily fuses with the artificial stones, and by this invention the genuine facing is made to cover the stone above the girdle, the major part of the covering being of uniform thickness and corresponding with the contour of the artificial body above the girdle.

ILLUMINATING TILE.—Charles W. Mark, New York City. Two patents have been granted this inventor for improvements in vault lights such as are used in sidewalks, roofs, etc., the inventions providing lenses for the tile which will not become easily obscured by dirt, which will be capable of diffusing a great amount of light, and by means of which the light may be thrown to one side as well as immediately beneath the lens. The lenses are secured in a frame in any of the common ways, and, according to one patent, a bull's eye is produced centrally on the under portion of the lens, while depending lips or lugs with inclined inner sides and vertical outer sides are arranged at right angles to the bull's eye, the lugs being cut away at the corners to provide for a greater diffusion of light. According to the other patent the lugs are of dissimilar lengths, and depend from a flat under surface, the lugs being arranged in rows according to the direction in which the light is to be reflected.

HAND STAMP TYPE HOLDER.—Taylor S. Buck, Brooklyn, N. Y. This holder is designed principally for India rubber type of a flat form with edge flanges, the holder consisting of a casing of tin or other suitable material open at the bottom and having side edge flanges. Within the casing is a spring-pressed follower to which the handle is centrally attached, the spring clamping the follower on the flanges of the type. The follower is readily moved back with one hand, for putting in or removing type from the holder, leaving the other hand free to handle the type.

SPIRIT LEVEL.—Reginald Forwood, New York City. This level consists of a four-armed casing having a cruciform slot, a four-armed or cruciform spirit glass being held in the casing, and having rounded corners at the points of intersection of the arms. True level indicators are provided above the center of the glass, the indicator consisting of wires or threads extending across the center of the opening of the casing, or the indicator may be formed of marks or lines made directly upon the center of the spirit glass. This device is designed to indicate the true level in every direction of a camera box or other object to which it may be applied.

BANJO.—Frederick Gretsch, Brooklyn, N. Y. This invention provides a means whereby the brackets usually employed on a banjo head may be dispensed with and the neck may be secured to the head in such a manner as not to weaken but to strengthen the head, with the object of lessening the cost and improving the quality of the tone. A sounding plate with a central opening constitutes the bottom of the head, to the under surface of which the neck is secured, while a clamping band encircles the body band, resting on the sounding plate, the clips engaging the clamping band being passed through the sounding plate and being provided with adjusting or locking devices.

BERTH SAFE.—John A. Brittain, New York City. This is a safe or locker especially adapted for use in connection with sleeping car berths or steamer or ship berths, and is adapted to be quickly and conveniently attached in any desirable position to virtually constitute a portion of the berth. The casing is preferably cylindrical, and a drawer properly partitioned to receive money, valuables, etc., is held to slide in it, a stop device limiting longitudinal movement, while guides prevent transverse movement, while means are provided for securely locking the drawer in the casing.

SWEAT PAD.—Harry Ryburn, Bloomington, Ill. This is a combined sweat and collar pad, which may be a stuffed cushion pad, or made of felt or other suitable material, but having at its center, or portion which rests on top of the neck, an opening, leaving narrow side strips connecting the pad sections on opposite sides. The opening is of a size to fit over an ordinary sore, allowing the ready application of a medicament, and is closed by flaps extending from opposite sides, the flaps being made tapering and held to close the opening by means of strings.

DOOR LATCH.—Ambrose H. Applegate, Phillipsburg, N. J. Combined with a casing provided with studs is a reversible frame engaged by the studs, a reversible latch having trunnions fulcrumed in the reversible frame, and a bar pivotally connected with the latch and actuated from the knob spindle. The device is simple and durable, and permits of an easy closing of the door, while it can be used on right and left hand doors without turning the lock upside down.

FENCE.—George P. Ruhle, Swengel, Pa. This fence is composed of a series of independent panels, constructed in the form of trestles, each separately anchored. Each panel is composed of three pairs of crossed posts having a rider rail in the top crotches and a lower crotch rail, both secured to the posts, two rails being secured to the posts near the ground parallel with the lower crotch rail, diagonal braces and base poles being provided, while an anchor stake driven into the ground is connected by a detachable wire link with the lower crotch rail.

WORK HORSE DRIVER.—Oscar M. Bryan, Wilson County, near Chanute, Kansas. A spring-pressed crank rod having its outer end bent at a right angle is provided with a cross bar carrying prods, a sliding rod mounted in a support being connected with the crank of the crank rod, a lever mechanism being provided for moving the sliding rod, forming a device applicable to all kinds of horse powers on which work horses are used. By its means the horses may be urged without a special driver, and the device may be adjusted so that, as applied to a pair of horses, if one horse is slow or lazy and the other quick and irritable, the slow horse may be urged without exciting the other.

CHIMNEY CONSTRUCTION.—Adolph Boettcher, South Stillwater, Minn. An inner tubular plate is adapted to fixedly encircle a chimney and has an annular outwardly and downwardly extending flange in combination with an outer tubular roof plate disconnected therefrom and extending under the flange, so that when the plates are secured in place the inner plate may move downward on the setting of a chimney without affecting the outer or roof plate. These attachments are designed to protect the adjacent wood-work, and permit the chimney to settle without breaking or cracking, thus maintaining it in a fireproof condition.

PNEUMATIC TIRE.—William R. Foster, London, England. This invention relates to tires of bicycles, etc., in which air is forced into the hollow rubber tire, under sufficient pressure to form a cushion that is more or less elastic, the invention providing therefor a novel form of valve to effectually close the orifice at which the air is forced in, in combination with a circumferential re-enforcing or constricting elastic band, the valve being such as to admit of being slightly opened to relieve the internal pressure, to suit the requirements or fancy of the rider, should the inflation be deemed excessive.

THRILL COUPLING.—John Cook, No. 1008 South Clinton Avenue, Trenton, N. J. The coupling piece provided by this invention consists of a plate having a rib at one end and a projecting flange at the other, the coupling bolt extending from the flange parallel with the axle and terminating in a laterally projecting lug. The thrills have transverse holes in the ends to fit the coupling plates, the holes having recesses in one side to fit the lugs of the bolts, which are engaged by cams on the thrills. The coupling is designed to be strong, durable and inexpensive, and easily attached or removed, while it also prevents the thrills from rattling, and may be so used as to hold the thrills in elevated position when the vehicle to which it is applied is to be stored.

ROAD CART.—States D. Palmer, Marshalltown, Iowa. A pair of bars connected at their rear ends to the axle and at their front ends to the body of a vehicle have at an intermediate point a spring connection with the shafts, made adjustable along the length of the bars. A plate attached to the vehicle body has a long bearing, and a bolt or rod extends through the plate and also through the ends of the bars, elastic washers or cushions being arranged about the bolt on each side of the bars. The improvement is more especially designed to relieve the body of a two-wheeled cart from horse motion, but may also be applied on four-wheeled vehicles.

TONGUE SUPPORT.—Thomas C. Churchman, Sacramento, Cal. A rod, the ends of which are secured to the hounds, is located above the pivot pin of the tongue, while a spring rod is bent upon itself to form two coils extending around the pivot pin of the tongue and the rod above the pivot, an upwardly inclined forward U-shaped member of the spring rod engaging with the lower face of the tongue while a forked rear member engages with the lower face of the axle. The device may be applied to any vehicle, and is designed to cushion the tongue, rendering its movement easy to the horses when the vehicle is passing over rough ground, while also practically relieving them of the direct weight of the tongue.

MOVING LIVE STOCK FROM BARN.—William Jones, Osceola, Neb. This invention provides an apparatus designed to facilitate the removal of live stock, especially horses, from barns, in case of fire or other emergency. The improvement consists mainly in hinging the stall partitions at their rear ends, so that their front ends can move laterally, latch devices being provided to hold them in normal position, while a chain or wire rope or cable is supported to move longitudinally in guides, the chain having rings or loops to which the horses are secured and being also connected with the latches of the stall partitions. At the ends of the barn are locks to prevent the endwise movement of the chain until it is designedly released, when it may be drawn upon to lead the string of horses out of the barn.

TEACHING ADDITION.—Arthur L. Gillis, Mount Pleasant, Iowa. This invention provides a casing with upper and lower shutters and vertically adjustable strips, with numbers of greater value alternated by numbers of less value for exposure through openings, to facilitate the work of an instructor in teaching mathematics. The device is designed to afford answers to every combination of numbers, the answers to be concealed from the pupils by a transverse slide until after the work is done, when, to test their correctness, the slide is moved and the answer exposed to view. The device saves the annoyance and unhealthfulness attending the use of chalk, and is calculated to interest and command the attention of young learners.

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(3191) J. B. asks: Does a lightning rod attract lightning? "A" says it attracts first and then conducts. "B" says it does not attract, but only conducts? A. It is supposed that the main function of a pointed lightning rod is to diffuse the earth's charge and thus prevent the violent union of the electricity of the clouds and the earth. The rod when struck conducts the charge to the earth.

(3192) C. M. N. asks for a receipt for making solution of copper that will, with a battery, make a deposit on iron sufficient for a base for a silver plate. A. To a solution of pure copper sulphate add slowly a solution of potassium cyanide until no more precipitate is formed. Wash the precipitate and collect. Dissolve two pounds of potassium cyanide in a gallon of water, then add as much of the cyanide of copper as the cyanide solution will dissolve. Finally, add about four ounces of potassium cyanide. The solution should be used warm. Care should be taken in handling the solution, and the fumes from it should be avoided.

(3193) D. W. asks (1) for the best way to cover a canoe. I would prefer using canvas, but do not know how to make it water tight. A. The following is recommended for waterproofing canvas: Boil 1 1/4 lb. of castile soap (shaved up) in 15 gallons of water. In another vessel dissolve 1 1/4 lb. of alum in 15 gallons of water. Have both solutions nearly boiling. Immerse the canvas in the soap solution until it is completely saturated. Allow it to drain off, then run it several times through the alum solution. Then the canvas to dry in the open air. Also you may use paraffine wax melted in with a hot iron. 2. Can I keep a gravity battery in a closed circuit continually with a burglar alarm? A. You can keep a gravity battery on a closed circuit, provided the resistance of the circuit is the same as that of the battery.

(3194) P. K. asks: 1. Can you tell me what kind of battery is best for a closed circuit or which kind is least apt to polarize? Is the cause of polarization faulty construction or bad management? Is the Minotto and its modification suited for a closed circuit? A. The gravity or Daniell's battery is best. Polarization is generally due to the collection of hydrogen on the negative element. It may be due to either con-

struction or management. The Minotto battery is practically the same as Daniell's. 2. Which is the positive pole—the earth or the cloud? A. The earth is always negative. The clouds are sometimes positive and sometimes negative. 3. Why is it that a 10 cell battery used in galvanic belt will not operate a sander? Although the positive pole when set on the forehead and the other on the tongue will burn the skin, the current is not felt in other, even if silver is laid between the skin and the pole. A galvanic belt generates a very weak current, which is insufficient for operating a sander. 4. Can I use old newspaper in dry battery instead of sawdust? A. We think old newspapers packed tightly would lack porosity. 5. Can you give me the address of any who could give me description of the writing telegraph now tried or used in Chicago? A. Write the inventor, Professor Elisha Gray, of Chicago.

(3195) C. L. asks (1) how to reverse a small electric motor? A. Reverse the current in the field magnet or armature, but not in both. 2. What is the formula for dry battery paste? A. Dr. Gassner's formula is as follows: Zinc oxide 1 part by weight, sal ammoniac 1 part, plaster of Paris 3 parts, zinc chloride 1 part, water 2 parts. 3. Is there anything that can be used instead of alum in the hypo bath in photography? Alum leaves a white sediment on the plate. A. You will have no trouble of the kind mentioned if you will use the alum in a separate solution by itself, after the hypo has been washed out. 4. Please give formula for bichromate of potash solution for batteries. A. Make a saturated solution of bichromate of potash in water. Add slowly one-fifth its bulk commercial sulphuric acid. 5. Is there any way of preventing a Leclanche battery from running down when used on a motor? A. No. This battery is not adapted to running motors.

(3196) W. B. H. asks: I contend with a friend of mine that the changes going on in a cell of battery are by virtue of the current, that they are caused by the current, while he claims that the changes are causing the current. Which is correct? A. Chemical action starts the current, and the current increases the chemical action.

(3197) C. W. writes: I have a cell of chromic acid battery with 2 carbons and 1 zinc plate, each 3x6 inches, separated 1/4 inch, and immersed in the solution to a height of 5 inches. Please let me know what is the resistance, the electromotive force, and the current of this battery at its terminals, the solution being kept in circulation? A. A working battery acts as an electrolytic conductor and is in practice of higher resistance than the measurement. The ohmic resistance would be but a small fraction of an ohm if measured when not in action. When in use it would quickly increase as the acid became exhausted. How great this increase would be may be estimated from the fact that zinc sulphate solutions have from 24 times and upward the resistance of sulphuric acid and water. Assuming the battery to be charged with sulphuric acid of 1.080 sp. gr., the resistance would be but 0.004 ohms. Polarization and exhaustion would quickly deteriorate this constant. The E. M. F. of such a battery is nearly 2 volts. 2. How many 25 volt 30 candle power lamps could be lighted with a battery of 12 such cells, the lamps being connected in parallel on a circuit having one ohm resistance? A. The resistance of the battery might be taken in practice at 0.05 ohm. For a single lamp 14 cells would be required, arranged in series. 3. What is the rule for computing the resistance and current of a battery cell of this description? A. Multiply the specific resistance of the solution to be used in the battery by the distance from zinc plate to carbon, and divide the product by the facing area of the plates. All dimensions must be reduced to centimeters. 4. In SCIENTIFIC AMERICAN SUPPLEMENT, No. 792, you state that the large plunge battery described furnishes 4 amperes of current, is this correct? A. Yes; under the limitations indicated in the first answer. 5. Please give numbers (if any) of SUPPLEMENTS containing articles on domestic electric lighting? A. See SCIENTIFIC AMERICAN, No. 18, vol. 61, No. 19, vol. 62, SUPPLEMENT, Nos. 603, 699. For general electrical calculations we refer you to "The Arithmetic of Electricity," which we can supply by mail for \$1. The general idea of supplying a lamp from a battery is this. The voltage of the battery must exceed to some extent that of the lamp. Its resistance should be equal to that of the lamp for the minimum number of cells. With this resistance it must deliver four times the watts required by the lamp. With less resistance less watts are required and a higher efficiency will be attained, but more cells will be required.

(3198) Reader asks: Can you tell me where I can find a description of the process of preparing canvas or cotton cloth so that it is soft and pliable, and after being decorated can be applied to the wall by means of paste or white lead? I have known of several ceilings which have been treated and decorated abroad, rolled up, and sent over here to be put up, but so far have been unable to find out by what process the canvas retains its flexibility after being decorated. A. According to one method the canvas is dyed in imitation of tapestry. This is accomplished by rubbing the dye into the fabric by means of brushes. Effects secured in this way are said to rival those of real tapestry. According to another method the work is done on canvas or some other fabric in oil colors thinned with turpentine. The painting is also done on the canvas by oil colors in the regular way, with the exception of the use of an oil that does not dry hard, such as poppy oil or some of the drying oils with a very slight admixture of fixed oil.

(3199) W. H. B. asks: What is the difference between a modified choke shot gun and a straight bored, also what is the difference between a modified and full choke, also what difference would there be in their shooting qualities? A. Straight bore is what its name means, a perfectly straight and cylindrical gauge in the bore. A modified choke bore has the muzzle slightly drawn in on a taper to prevent scattering of the shot. A full choke is only a little more so, or the extreme amount of choke that is allowable. Choke boring of any degree is made to control the scattering of the shot by impacting it at the moment of leaving the gun.

(3200) G. W. R. asks: 1. What can I mix with powdered black oxide of copper (commercial) to form it into cakes for battery purposes, and how is it solidified? A. Powdered black oxide of copper is usually solidified by heavy pressure. 2. How can I make a good conducting cement for electrical purposes? A. Electrical soldering. Lead, soft solder, and carbon are used as conducting electrical cements. 3. I saw a Bunting receiver, and the helix on the outside was wound with bare copper wire. What advantage is this? A. The copper wire referred to is insulated by colloid or some kind of varnish. 4. What is the Gower-Bell telephone, and how constructed? How are receivers constructed to bring out sound for audiences on long distance? What is the Edison megaphone and how constructed? A. The loud-speaking and Gower-Bell telephones are described in Prescott's work on the telephone. Edison's megaphone is simply a combination of large speaking trumpets and ear trumpets.

(3201) F. C. M. asks: 1. Which is the best material with which to construct a 6 foot sewer 1 1/4 miles long, tunneled under a hill 200 feet from the surface, cement, concrete, or brick, and which is used the most? Cement is worth \$4 per barrel, here in Seattle, and sand and gravel in abundance. Sewer brick are worth \$10 per M delivered on the work. Which is considered by men of experience in that business to be the most practical, a cement or brick sewer? A. For a sewer of dimensions you state, brick set with cement mortar is best. 2. Can you refer me to any cities which have constructed cement sewers? A. New York, Brooklyn, and nearly all the large cities. If the tunnel you mention is to go through earth, the work might be easily executed by means of the Beach pneumatic shield.

(3202) N. N. asks: Will an auxiliary magneto-electric or extension bell work on a line 1 1/2 miles long, having perfect connections all around, without the aid of the regular magneto? I desire to use one if I can, on account of their less cost. What is difference in the winding of the cores of a 5 ohm and a 40 ohm? How can I tell them apart? A. By the use of a relay and battery you can ring your auxiliary bell. A 5 ohm magnet is wound with coarse wire, while a 40 ohm magnet is wound with fine wire. The safest way to distinguish the magnets is by the maker's mark or by actual measurement.

(3203) E. B. N. asks (1) if it will hurt geological specimens to wash them in soap and water to take off the dirt. I didn't know whether the soap would affect their color or not. A. As a rule it will not. 2. Will you tell me of some inexpensive but good solution to erase writing ink, and which will not hurt the paper? A. Equal parts oxalic and tartaric acids dissolved in water. Javelle water may be used also.

(3204) R. F. writes: I desire to ask a few questions relative to the tang, galvanometer and set of coils described in "Experimental Science." 1. Would it be at all advisable to use a 2 inch needle with a 5 inch pointer? A. The length of the needle depends upon the diameter of the galvanometer coil. It should not be longer than one-twelfth the diameter of the coil. 2. What sizes of German silver wire should be used for coils? I desire to make a set running from one-half to one thousand ohms. If you have not the data, where can I get it? A. German silver wire has a resistance ten times greater than that of copper. You can readily determine its approximate resistance by comparing it with copper.

(3205) D. M. D. writes: Will you tell me if there is any such serpent as a hoop snake? We have had quite an argument about it, but I can find no such snake in my dictionary. Also please tell me the motion it has in propelling itself forward. A. The hoop snake is a myth. The common milk snake progresses by forming a series of long loops which sometimes bear some resemblance to a hoop. It never takes its tail in its mouth and rolls, as some believe. See Col. Pike's article on "Hoop Snakes," SCIENTIFIC AMERICAN, vol. 61, page 344.

(3206) H. D. A. writes: I have constructed an electric motor as described in SUPPLEMENT, No. 767, but find instructions do not say how wires should be connected, and I am unable on that account to complete. How should the connections be made between poles of field magnet and to armature and commutator? A. Connect one terminal of the field magnet with the battery, connect the other with one of the commutator brushes, and connect the remaining commutator brush with the battery. If the field magnet is wound with fine wire it may be placed in a shunt, i. e., its terminals may be connected with the brushes and the brushes with the battery.

(3207) E. B. H. asks: How are bricks enameled, and what kind of enameling is used? What coloring matter is used to variegate the colors? A. Enamel for bricks is composed of powdered flint glass 260 parts, carbonate of soda 41 parts, boracic acid 12 parts. The face of the brick is sized with glue size, the enamel is then applied in solution, and fused in an oven. The enamel is colored with the metallic oxides. We refer you for further information to "Bricks, Tiles, and Terra Cotta," by C. T. Davis, which we can mail you for \$5.

(3208) F. B. asks: I would like to build a vehicle of some kind, and I would like to put some power to it. Can a motor about one horse power or a little more be run by a storage battery? If so, how much room would it take up, and what would it cost to run? A. It requires about 8 cells of storage battery for a horse power, and this power is hardly sufficient for running a vehicle on an ordinary road. Such vehicles have been used experimentally, but none, so far as we know, have been in practical use. Better use steam. It is cheaper and better in every way.

(3209) W. M. writes: I would like very much to know if there is a way of finding the voltage and amperage of a battery, without using the expensive instrument called the voltmeter, etc.? A. You can ascertain the voltage by comparing one of your cells with a cell of gravity or Daniell using a high resistance galvanometer. The amperage is determined by dividing the electro motive force by the resistance.

(3210) H. M. S. writes: In your number of July 11, 1891, in Notes and Queries, No. 3135, M. S. S. wants to know what will prevent the trouble of lime being deposited in a copper tea kettle, when lime water is used. Tell him to put an oyster or a mussel shell into the clean kettle, and the lime will prefer the shell to the copper. When the shell is loaded, take it out and break off the lime, or put in a fresh one. That is an easy way.

NEW BOOKS AND PUBLICATIONS.

Hay Fever and Rose Colds.—The July number of "Wood's Medical and Surgical Monographs," price \$1 a number, published by William Wood & Co., of New York City, has an interesting treatise of eighty pages by Sir Morell Mackenzie on hay fever and its treatment, with a chapter on rose colds, from which it appears that the cause of this disease is the entrance into the eyes and air channels of those predisposed to the ailment of minute particles of vegetable matter from grasses and plants in flower. Some of the grasses the pollen of which is most productive of hay fever are illustrated in the article. Although, it is said, hay fever too often excites ridicule rather than sympathy, the distress it occasions is declared to be very real, although the sufferers are "almost exclusively persons of cultivation, the male sex being more liable than the female, in the ratio of about three to one." Two other elaborate papers are included in this number of the Monographs, one on "Tuberculosis of the Bones and Joints," by Dr. Fedor Krause, of the University of Halle, and "A Study of Malignant Disease of the Upper Air Tract," by Dr. F. H. Bosworth, of the New York Bellevue Hospital Medical College.

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INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

July 21, 1891,

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Table listing inventions with names and patent numbers. Includes items like Adding machine, Air brake, Air cooling apparatus, etc.

Table listing inventions with names and patent numbers. Includes items like Collar fastener, Colors, manufacture of, Crane, hydraulic, etc.