

## RECENTLY PATENTED INVENTIONS.

## Railway Appliances.

**TRAIN MARKER AND SIGNAL LAMP.**—Marion P. Cook, Denison, Texas. This inventor has devised a lamp in which the light may be differently colored, and the change of color quickly and conveniently made without opening the lamp. A guard or slide is provided for the passage of the adjusting device to prevent wind interfering with the flame. The lamp has two or more lenses or bull's eyes, for showing lights of different colors from the front and rear of the lamp, and from one side, the change of lights being instantaneous.

**CAR DOOR.**—Heinrich W. F. Jaeger, Sandusky, Ohio. According to this improvement tracks are mounted above and below the door opening, and a roller at one edge of the door engages one track, while within a slotted stationary housing at the opposite edge of the door is a movable housing engaged by a spring, a roller mounted in the movable housing having its trunnions slidable in the slots of the stationary housing. Owing to the peculiar construction of the rollers or casters, loose movement or play of the movable parts is prevented, and the door rides easily on its bearings with a minimum of friction.

**TRACK BED SHAPER AND DITCHER.**—James E. McCormick, Port Jervis, N. Y. To properly shape the earth and stone filling on the sides of the track bed, cutting the weeds and facilitating drainage, this inventor has devised a frame adapted for pivotal connection with the side of a car, and normally standing at an angle to the car, a knife carrier at whose lower end is a knife being held vertically adjustable on the frame, and the bottom edge of the knife being of a shape corresponding to the cross section of the side of the track. As the machine is pulled or pushed along the knife cuts into the sides of the track and removes surplus material, directing it to one side, and giving the desired and proper shape.

## Mining, Etc.

**ORE CONCENTRATOR.**—Joseph O. Diumick and Edward K. Woods, Denver, Col. This invention consists in electric means for arresting and separating the metallic portions of granulated or pulverized pulp as it is forced by water over the concentrator bed. A bed of insulating material is placed over a pair of inclined metal tables, and rows of metallic pins extend from the metal bed through the bed of insulating material, while an electro-magnet has one pole connected to the metal bed plate of one table and the other pole to the metal bed plate of the other table. One table of a pair may be in concentrating operation while the other is being washed to clear it of concentrates.

**CONDENSING LEAD FUMES.**—Oliver R. Moffet, Joplin, Mo. To readily condense and collect the valuable particles in the fumes arising from the lead smelting process, this invention provides an apparatus comprising a mixing chamber connected with the smelting furnace and with an ordinary coal burning furnace, a fan drawing the mixed fumes from the mixing chamber to a settling chamber, where a strainer is movably held, each of the strainers being made of a perforated sheepskin, with the wool facing the inlet of the chamber. The occasional shaking of the strainers causes the solid matter adhering to the wool to drop into hoppers.

## Mechanical.

**WRENCH.**—Lewis P. Davidson, Denver, Col. This is a tool in which the movable jaw may be locked or released at any point in its travel on the shank by a slight movement of the thumb while the wrench is held in the hand. The invention is particularly applicable to that class of wrenches in which the handles are of two longitudinal parts between which the threaded shaft has a bearing. The wrench has but few parts, and is very simple, strong and inexpensive.

**STOVEPIPE TOOL.**—Albert B. Claffin, Staples, Minn. For those who have to set up stoves and stovepipes, this invention affords a convenient tool for cutting the pipes and crimping their edges where necessary to facilitate fitting their ends one within the other. At one end of the body or handle portion of the tool is a projecting knife, forming a novel and efficient pipe cutter, while at the other end intermeshing crimping wheels are journaled in forked arms, the edges of the pipe being crimped by being passed between the wheels.

## Agricultural.

**PLOW.**—Melvin M. Mullins, Monticello, Miss. This is a shovel plow, designed for use wherever a turning plow is ordinarily employed, and has a detachable point so fitted to the wing of the plow that the two will be virtually integral. Means are also provided whereby the wing and point may be adjusted to or from the ground, so that as the point wears out it may be carried downward and held in its adjusted position, enabling a point to be used until it is practically worn away, the wing and other portions of the plow being intact. A guided adjustment of the handles connected with the plow beam is also provided for.

## Miscellaneous.

**ADDING MACHINE.**—George W. Duale, Charleston, West Va. In this machine the addition may be quickly effected in the column of any denomination without reference to the usual order of progression of units to tens, tens to hundreds, etc., the addition being performed by beginning at the left hand column or one of the middle columns of figures as well as if begun at the right hand. The machine has numbered rotating disks for the units, tens, hundreds, etc., each moving its neighbor of higher denomination at every tenth space, the disks being operated by levers and keys, and there being an internal sliding adjusting device by which all

the keys may be made to operate on a disk of any desired denomination.

**ADDING AND PRINTING MACHINE.**—Two further patents have been granted the same inventor for an adding machine which, by the same manipulation of the keys, prints the figures on a sheet of paper in the order in which they are added, thus forming a proof sheet, the machine by special adjustments printing at the bottom of the column the sum total, doing the work by vertically ascending or descending progression, or in a horizontal order. With these features are combined, in the last patent, an improved mechanism for causing the keys to impart a variable throw to the adding wheels and type carrier, and for dispensing with the strain of turning at one time a number of the adding wheels. A novel organization of devices is also provided for spacing, adding and printing, or spacing without printing and printing without adding.

**PROTECTOR FOR PNEUMATIC TIRES.**—Zebulon Foster, Chicago, Ill. To prevent the puncture and damage of tires, this inventor provides a protective rim whose contiguous ends are enlarged and curved around the sides of the tire, being arranged one within the other and having their flat sides snugly engaged with each other. Each side of each end has an inwardly extending ear, the ears being longitudinally aligned, and being respectively engaged by threaded bolts and nuts to cause the rim to bind on the tire.

**PROCESS OF OBTAINING PHENOLS.**—Leonhard Lederer, Munich, Germany. To obtain pure phenols from substances containing them, such as crude cresols, xylenols, thymol, carvakrol, eugenol, guajakol, and creosol, this inventor has devised a process consisting in subjecting the substances to the action of chloroacetic acid in the presence of alkaline lye, then treating the alkaline salts produced with suitable mineral acids to produce separate phenoxacetic acids, which are also treated with mineral acids to produce phenol.

**FURNACE.**—Thomas H. Lucas, Minneapolis, Minn. This is a furnace which may be used on boilers or for cooking or heating, and has a primary combustion chamber communicating with and receiving the gases from the fire pot, while a second combustion chamber covers or surrounds the primary chamber and communicates with it at the top through a restricted opening, there being means of supplying air to the primary chamber at the restricted opening. The furnace is designed to insure complete combustion and utilize the fuel to the best advantage.

**BOILER.**—George H. Hersey, Clifton, N. J. This boiler and its casing are made in sections which may be assembled to form a boiler of any size by using a greater or smaller number of sections, and is designed to afford simple and efficient means for heating buildings by hot water or steam. The boiler is formed of one or more series of hollow oblong metal loops connected at the ends and connected with steam or water distributing pipes, and the sectional inclosing case has a grate, ash pit, smoke bonnet, perforated baffle plate, and a draught chamber.

**THREAD CABINET.**—William K. Shelton and Perry H. Stewart, Hopkins, Mo. This is a revolvable polygonal cabinet with several main compartments adapted to display a number of shades of the same color of silk or thread, the cabinet also having a central and commodious storage compartment in which to keep surplus stock. Novel distributing devices are also provided whereby a particular spool may be easily withdrawn from any cell in the cabinet or from any of its columns of spools.

**FOLDING LEG FOR FURNITURE.**—Dan E. Carter, Traverse City, Mich. Brackets secured to the under face of a table or other article of furniture, according to this invention, have recesses in which are pivoted the legs, which carry clamping rods, adapted to draw the brackets together and lock the legs in position. The construction is especially adapted for benches, tables, cot beds, chairs, etc., the legs being readily held in folded position or position for support, and the locking device being simple and inexpensive.

**DENTAL FORCEPS.**—Sheldon A. Stienbarger, Augusta, Ill. Pivoted to these forceps is a fulcrum plate on which a rotary cam is mounted to turn to rock the forceps relatively to the fulcrum plate. The forceps are designed to facilitate drawing a tooth directly out without moving it laterally, rendering the work less difficult for the dentist and less painful to the patient.

**BOX HINGE.**—Charles L. Feinberg, Brooklyn, N. Y. This is an inexpensive and durable hinge, particularly adapted to mounting the lids of cigar and other light boxes, and the hinge may be applied without the use of nails or screws. It consists of two pivotally connected sections, one of which is applied to the box by pinching a projection in position after passing it through a slot in the box, the other section having an edge bent so that it is adapted to embrace one edge of the lid.

## Designs.

**CUFF HOLDER.**—Louis P. Kleiderer, Henderson, Ky. In this design the body of the cuff holder has parallel wavy lines, at one end of which are loops presenting a leaf-like figure, while at the opposite end is a large central loop with eyes at the sides.

**GAME BOARD.**—Volney K. Coffill, Brooklyn, N. Y. This board has disk-like figures printed about centrally on its four straight edges, while in the center of the board is a salient point surrounded by four groups of salient points, those of one set differing in color from those of the other sets.

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## Notes &amp; Queries

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(6743) S. A. E. asks how to mount drawings on linen. A. The linen or calico is first stretched by tacking it tightly on a frame or stretcher. It is then thoroughly coated with strong size, and left until nearly dry. The sheet of paper to be mounted requires to be well covered with paste; this will be best if done twice, leaving the first coat about ten minutes to soak into the paper. After applying the second coat, place the paper on the linen and dab it all over with a clean cloth. Cut off when thoroughly dry.

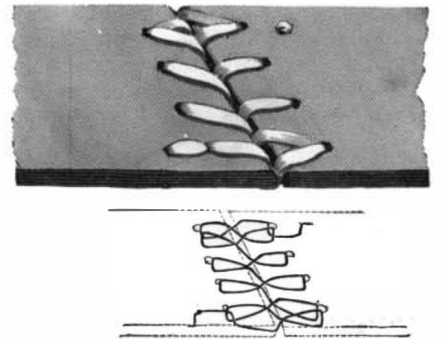
(6744) A. J. H. asks: 1. If you have a current of 100 volts and put a resistance of 100 ohms in this circuit, what would be the voltage of current after passing through resistance, or in other words how many volts would the 100 ohms resistance reduce the 100 volts? A. Voltage in the case named is treated not as something absolute, but as expressing a difference of potential. If 100 volts were expended in producing a current through the 100 ohm conductor, the potential difference between the terminals being 100, the potential difference for intermediate points would vary directly with the resistance between them. Thus between either end and the center there would be a potential difference of 50 volts. 2. Suppose you take a common telephone magneto and change it into a dynamo by putting in a commutator, take the fine wire off shuttle, now what number wire would you advise to put on shuttle so as to get best possible results and what size small lamp could you be able to light with it? A. For a small magneto we refer you to our SUPPLEMENT, No. 161, and for a drum armature for the same our SUPPLEMENT, No. 599. The winding of a magneto must be calculated for voltage and amperage desired, for "best results" is too indefinite. The armature of the magneto you allude to is not of good type for your purpose.

(6745) G. A. D. asks: 1. What is the smallest number of hydro-electric batteries of say 1 volt each that will cause a spark to pass over an air gap in a conductor, said air gap being one twenty-fifth of an inch wide, and the spark to play continuously (or as near to that as possible) between the two ends of the conductor? A. For sparking distance between ball electrodes the usual allowance is 10,000 volts for one-tenth inch. You will have to use a spark coil, as the battery on the above basis would be too large. 2. If same air gap were in a Geissler tube when it is at its best conducting condition, how many of the same cells would be required to cause said spark to pass? A. It depends on the size of the Geissler tube. A small one would show a one twenty-fifth inch spark. 3. How can I cause carbon (which has been made by carbonizing sugar) to dissolve in molten iron or silver. As soon as I put the carbon in the molten metal it rises to the top and burns away there, before it can be mixed enough to allow any of the carbon to dissolve in the molten metal. A. Try graphite or electric light carbons. You will not succeed in dissolving more than a trace, if that much, in silver. If you will have iron cast very hot in an iron mould, the piece cast being very thin, it will retain "dissolved" or combined carbon. 4. What is the greatest pressure we can exert on any substance, in pounds per square inch, and by what means that are available in practical application? A. It depends on the power of the press;—there is no limit assignable. The hydraulic press is usually available. 5. Please name a substance or two which I can practically introduce in a Geissler tube, to absorb the oxygen, so that, when I have exhausted the tube of air and the absorbent has got through absorbing the oxygen, there will

be only nitrogen gas left in said tube. A. Metallic sodium carefully freed from naphtha. It is dangerous to handle.

(6746) B. E. R. asks: 1. How could the simple electric motor described in SUPPLEMENT, No. 641, be modified so as to develop (full) one-sixth or one-fifth horse power? Would it be sufficient to increase the thickness of the magnet core two or three layers, put one or two extra layers of wire on magnet, and use a current of twenty volts; or would it be necessary to make all parts of larger size? A. You would need a cast iron core to give it good residual magnetism, so as to make it self-starting. We strongly advise you to go on other lines and make such a dynamo as is shown in our SUPPLEMENT, No. 600. 2. Why will not the above motor operate as a dynamo, especially if the field is excited by a battery? A. It has too long and thin a core; it will generate current if you use it as described in your question. 3. How many amperes of current will a Daniell's cell generate, the porous cup of which is a common drain tile (with one end stopped), the copper and copper sulphate solution being in this, and surrounded to full height by the zinc and solution of salt? A. About ½ ampere through a low external resistance. 4. How many volts is the Edison-Lalande battery? A. 0.5 to 0.75 volt. 5. How long should a chromic acid porous cup battery operate with one charge? A. It depends on how much current is taken from it. 6. Is the energy of the battery wasted when the circuit is left open for a month or two? A. Yes. The zincs are rapidly attacked, the solution thus becoming spoiled. 7. How many square inches of zinc must be exposed in the above battery to produce one ampere of current? A. Three or four square inches. 8. How can silver be removed from old plated ware? A. By dipping in a mixture of a little strong nitric acid and strong sulphuric acid for articles of brass, copper, or German silver. For zinc, iron, tin, lead, Britannia metal or pewter, use a 10 per cent solution of potassium cyanide and make the article the anode, with a platinum, copper, or brass cathode. Both processes require watching, especially the first. 9. Will you please give directions for making an inexpensive compound for coating wooden battery cells, to render them acid proof? A. Melt together 4 parts resin, 1 part gutta percha and a little boiled oil. Apply hot, using a hot iron to work it into the corners and cracks.

(6747) A. J. C. asks how to lace belts. A. A correspondent in the SCIENTIFIC AMERICAN says: I send you a sample of belt lacing which I am using in my factory. It is far superior to any other way of lacing. It runs smoother on small pulleys, as it bends to



fit them. To lace it, commence in middle or either side. If in middle, divide the string into equal lengths; if on edge, same as sketch, by fastening one end and running across and back. You will readily see its advantages. I suggest it so others may be benefited.

(6748) D. M. H. says: Please let me know through Notes and Queries how to make a mould to cast one-half sphere plaster figures in. A. A good gelatine mould may be made in the following manner: Soak the best white glue in cold water for 24 hours, then drain off all the water. Melt the soaked glue in a water jacketed kettle, then pour the glue upon the object, the latter being incased in a lead or pasteboard box. Let it cool for 12 hours, then separate the cast from the object. If the object be a statuette, a thread should be attached to the back, and extended out of the mould at both ends, so that it may be used for cutting open the mould after it is cooled, to permit of taking out the statuette. A good material for a mould is made in the following way: Dissolve 20 parts of fine gelatine in 100 parts of hot water, and add ¼ part of tannin and the same amount of rock candy. It is said that a mould made of gelatine or glue alone may be made more durable by pouring over it a solution of bichromate of potash in water, 1 part of bichromate to 10 parts of water, and afterward exposing it to sunlight. Most objects require oiling slightly before being covered with glue or gelatine.

(6749) A Subscriber writes: I wish to build an air motor to run small electric light plant. 1. How large a storage battery is necessary for 6 incandescent lights? A. A typical cell gives 35 amperes at 2 volts. By using 20 volt lamps you can get on with ten such cells and have still an excess. Allow 20 volts and 240 amperes per lamp. 2. How large a dynamo for same? A. See our SUPPLEMENT, No. 600, for full description. 3. About how large a wheel? Winds here in mountains are strong. A. One horse power wheel would be ample. 4. Will kerosene at 80 cents per gallon be economical or not? A. If you can handle the plant, it might be economical; the chance of its proving so will be greater as its size is greater. For size given, the personal attention required would militate against it.

(6750) I. W. T. writes: I am making a coil for demagnetizing watches, using a 120 volt alternating current, and would like to know the size and amount of wire for same. A. Use three or four pounds No. 20 wire. Wind around a core of the section suited for the largest size watch. There is no harm in giving plenty of room.

(6751) L. W. G. says: Would you kindly give me a recipe for coloring incandescent lamps red and blue that will not crack or blister? A. 1. Prepare the glass by thoroughly washing in soap and water and drying. Then dip in bath made by beating up the whites of two eggs in 1½ pound or pint of water and filtering, and