ENGINEERING INVENTION.

A changeable gauge truck has been patented by Mr. Samuel R. Wilson, of Adelaide, South Australia. It is to effect the automatic transfer of railway cars from tracks of one gauge to another, for which the axle ends and wheels are threaded, and midway upon the axle is a square block, which, on coming in contact with an elevated ridge or rail in the center of the track, locks the axle, causing the wheels as they revolve to approach or recede from each other as they pass into a changed gauge.

AGRICULTURAL INVENTIONS.

A corn planter has been patented by Mr. Charles C. Du Cray, of Iowa County, Wis. It is designed to provide for the smoothing of the ground in advance of the wheels, for the marking off of the adjacent rows as the planter advances, and for improving the corn-delivering mechanism, the invention covering various novel details and combinations of parts.

A planter and fertilizer distributer has been patented by Messrs. Lewis and John Charles, of Clear Spring, Md. Its construction is such that the dropping devices can be readily thrown into or out of gear with the drive wheel, and the fertilizers agitated and forced outward as desired, the invention covering various novel features and combinations of parts.

MISCELLANEOUS INVENTIONS.

A reversing gear for saw mills has been patented by Mr. Europe N. Collett, of Whelen Springs, Ark. This invention covers a novel construction and combination of parts and details for a simple and durable device to impart a forward and backward motion to the saw mill carriage.

A saw jointer has been patented by Mr. Charles R. Black, of Topeka, Kansas. It has two plates recessed on their inner adjacent faces to form saw and file receiving spaces, with a slot and a locking projection engaging them, to facilitate the jointing or leveling the teeth of saws prior to filing them.

A leak stopper for vessels has been patented by Mr. Louis Weihe, of Connellsville, Pa. It consists of a canvas sheet with horizontal stay rods at suitable distances apart, ropes for suspending the canvas sheet, and means for releasing the rolled-up sheet to cover a leak in the side of a vessel.

A vegetable cutter has been patented by Mr. Anthony Lethert, of Jordan, Minn. It is a machine whereby vegetables of all kinds may be cut in slices and the slices cross-cut if desired, in a convenient, speedy, and efficient manner, the machine being simple and durable in construction.

A bulletin board has been patented by Mr. Levi J. De Land, of Fairport, N. Y. This invention provides a simple construction by which to hold a number of tablets or cards which may be differently inscribed, and changed as often as desired, for exhibiting different signs from time to time.

A bag fastener has been patented by Mr. Henry A. Martens, of St. Joseph, Dakota Ter. It consists of two clamps hinged together, one formed with a toothed arm and the other having a spring bolt adapted to engage the toothed arm, making a simple metallic fastener especially designed for use on grain bags.

A brace for bedsteads has been patented by Mr. Charles P. Lewis, of Sweet Springs, West Va. From hooks on the inner corners of the posts, below the rails, bands extend to a central head, in which a bolt is held to be turned by a wrench or other suitable tool, for strengthening bedsteads and holding the posts firmly in place.

A slate for telephone desks has been patented by Mr. Emil T. Mueller, of La Crosse, Wis. It consists of a sheet of suitable material covered with a slate composition, and having retaining clips adapted to clamp the edges of a desk, and hooks to hold a slate or lead pencil, to be constructed of various sizes to fit different desks, for conveniently recording messages.

The manufacture of thimble skeins for axles forms the subject of a patent issued to Mr. Joseph F. Davidson, of Columbus, Ohio. The method consists in bending the metal blank until the longitudinal edges meet, or nearly so, and then uniting them by a separate strip, by bringing all to a welding heat and welding the parts together to make a double seam.

A hydraulic shaping press has been patented by Mr. Arthur E. Hobson, of Hartford, Conn. It provides means for clamping a flange formed at the edge of a blank directly to the upper edge of the die, the press having means for raising the die from its holder or case, and means for drawing the blank whereby embossed faced articles may be produced.

A portable fence has been patented by Mr. Albert Wheat, of Reading, N. Y. It is made of sections of posts and rails mounted in an inclined position against inclined braces, the inclined braces and fence sections resting against pegs driven into the ground, flexible strips extending over the braces and sections and being fastened to the pegs.

A heating furnace has been patented by Mr. James White, of Brooklyn, N. Y. It has separate air ducts through the combustion chamber, in combination with an air chamber surrounding the furnace, and other novel features, for heating a number of rooms independently and uniformly without regard to the length of pipe necessary, supplying also the requisite amount of moisture to the air.

An automatic fire extinguisher for car heaters has been patented by Mr. Louis A. Lyon, of Shorter's Depot, Ala. With a pipe extending into the fire box of a car heater are connected a funnel, hammers, and glass vessels holding a fire-extinguishing liquid, so held relatively that the vessels are broken by the hammers and the liquid runs into the fire box when the heater is upset in any direction.

A saw filing machine has been patented by Mr. David W. Johns, of Allegheny City, Pa. It has a rotary file having a segment removed and replaced by an adjustable cam for automatically feeding the teeth of the saw forward, with mechanism for holding and guiding saws, and other features, being adapted for filing all varieties of saws, including circular, cross cut and rip saws, long saws, and band saws.

A frame for use in the manufacture of oil press mats has been patented by Messrs. Marcus T. and Junius A. Murphy, of New Orleans, La. This invention covers auxiliary pusher bars, used in connection with the regular mat plates, making a machine to stand a great hydraulic or other pressure for pressing the warps into a compact form without breaking the mat plates or injuring the warps.

A hot air furnace has been patented by Mr. Philip H. Scheurer, of Nashville, Ill. There are side flues between the fire box and casing, opening at their lower ends below the fire box, and down flues for the passage of the heat to the side flues, in connection with various novel features of construction and combinations of parts.

A telephone transmitter has been patented by Mr. John M. Graham, of Pittsburg, Pa. Two pairs of contact springs are arranged to press opposite ends of electrodes carried by springs bearing on the diaphragm, one contact spring of each pair being connected with one terminal of the induction coil, the electrodes operated by the diaphragm being connected with the terminals of the local battery, whereby the current in the local circuit is reversed during each vibration of the diaphragm.

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(1) P. D. asks: How ought the word dynamo be pronounced? Should it be pronounced "dy-nam'-o," with the accent on the second syllable, like the word "dynamics," or should it be pronounced "dyn'-a-mo," with the accent on the first syllable? A. Analogy favors the pronunciation "din-a'-mo." It is of course an incomplete word—the first component of dynamo-electric.

(2) H. D.—Violin strings are made of the coatings of the entrails of sheep.

(3) P. B. asks: 1. Are magnetism and electricity the same substance? Does an electric light dynamo make the electricity, or simply collect it from the elements? If an electric light dynamo were placed in a perfect glass vacuum, insulated and run as intended, would it produce any or more or less electricity than as now run? A. Neither magnetism nor electricity can be called a substance. Magnetism is a force supposed to be due to magnetic energy; magnetism is a manifestation or phenomenon of electricity, according to the most recent theories. An electric light dynamo converts mechanical energy into electric energy, and would work equally well in a vacuum.

(4) W. F. P. asks: 1. Will a bichromate battery with half as much surface of zinc and carbon as another, have half as much power? A. Practically speaking, yes. The smaller battery will give the same difference of potential, but will have double the resistance, if the plates are at the same distance. 2. Is the carbon obtained from gas retorts the kind used for these batteries? A. Battery carbons are generally made from a carbon composition paste, which is baked and ignited. 3. How many cells of the simple plunge battery described in vol. lvii., page 116, of the SCIENTIFIC AMERICAN will it take to run the simple electric motor, with sufficient power to operate a sewing machine? A. This battery is too small for the purpose. 4. Also how many will it take to run a three candle power electric light? A. For a three candle incandescent lamp, use four to six cells.

(5) M. O. G. asks: 1. Could the armature core be made of cast iron, or is it better to have it of soft iron wire, and why so? A. The armature core is subjected to rapidly recurring changes of polarity. To enable these to take place and to prevent the formation of Foucault currents, wire is used. 2. Would a battery comprising 12 cells, having 2 carbons each 2 inches by 3 inches, and 1 zinc of the same size in each cell, give enough power to run one sewing machine? A. The plates of your battery are rather small. It would probably drive a light sewing machine. Your plates should be of double the area given.

(6) E. A. writes: I have built a dynamo electrical machine, combining some of the features of the machine described in SUPPLEMENT, No. 161, with the one in No. 600. I made my patterns after the one in No. 161, but made them three times as large as drawings instead of twice as large. Shuttle armature wrapped with No. 18 double covered wire; magnet wound same as the 8 light dynamo in SUPPLEMENT No. 600, but with No. 16 wire. I have 72 convolutions on each limb, and eight wires deep. Dimensions of magnet as follows: Height 9 inches, width 6 inches, thickness 4 inches, magnetic field opening is 2¼ inches diameter, magnet and armature weigh about 30 pounds, that is of iron. I started it with one cell of gravity battery, and it works splendidly, gives very powerful shocks. Now, from these data, would you inform me what the probable power of the machine would be, that is E.M.F. and quantity of current produced, running at a speed of say 1,500 revolutions per minute? And what would be its lighting capacity, if any? Is there not some simple way in which to measure its power, say by heating a given amount of platinum wire of a given size, say No. 36? What is the power in volts of the machine described in SUPPLEMENT, No. 161? A. You can measure the power of your machine by comparing it with 6 or 8 cells of gravity battery, by the aid of a tangent galvanometer. The machine described in SUPPLEMENT, No. 161, yields a current of 6 volts and 3 amperes.

(7) G. A. writes: I wish to run an incandescent lamp, one now, may be later on lighting the whole house, but of course a dynamo is too expensive for this, so I am going to use a storage battery, charging it during the day with cells. Will you please tell me what is the cheapest, best storage battery I can use, and how it is made? Also, what cell had I better use? A. For information on storage batteries, consult SUPPLEMENT, Nos. 304, 370, 332, 354, and 215.

(8) W. J. B., referring to the 8 light dynamo, asks: 1. What size wire should be used for main circuit? A. It depends upon the length of the circuit. If the circuit is short, No. 16 copper wire will do; if long, the size should be increased to No. 14 or even No. 12. 2. Must not the current pass through each lamp in succession? As I understand the diagram in SUPPLEMENT, No. 600, it seems not. Will you explain or refer me to some paper on the subject? A. The dynamo is unable to produce a current of sufficient voltage to run through eight lamps in series. The dynamo referred to, in which the lamps are arranged in parallel, is cor-