ENGINEERING INVENTION.

A locomotive truck has been patented by Mr. Alonzo C. Packer, of Pittsburg, Pa. This invention provides a center plate supported by springs, the latter held by hangers movably mounted on the main truck frame, the range of movement of the hangers being defined by adjustably mounted stop blocks, the construction being adapted to afford the freedom of movement necessary in car trucks in passing curves.

AGRICULTURAL INVENTIONS.

A hand planter has been patented by Mr. Seth Hackett, of Bronson, Mich. Combined with a handle and ground penetrating and opening points, with a spring-pressed pivoted jaw, is a hopper and seed-dropping disk, with other novel features, whereby the requisite quantity of seed may be deposited in each hill.

A grain or hay stacker has been patented by Mr. Donald McRae, of Umatilla County, Oregon (P. O. address, Walla Walla, Washington Ter.) It is a portable stacker whose main feature is a lever pivoted on an upright, and adapted to be swung both vertically and laterally for the purpose of transferring grain, hay, or straw, etc., from a wagon to a stack.

MISCELLANEOUS INVENTIONS.

A folding paper box has been patented by Mr. David J. Rex, of Pittsburg, Pa. It is formed of a single piece of paper of the requisite thickness, the intention being to reduce the waste to a minimum in the making of a class of boxes which are sold by weight, and especially designed to hold tacks.

A horse detacher has been patented by Mr. George T. Parker, of Glasgow, Ky. Combined with the ferrule having the trace stud is a double-armed stud for forcing the trace off the trace stud, there being a retracting spring operating between the arms of the slide, and a tripper, with other novel features.

A horse detacher has been patented by Mr. William B. Walker, of Nevada, Mo. The bolts to secure the traces and breeching straps are normally held by springs, which are connected to draw lines adapted to be operated by the driver to retract the bolts and release the traces and breeching in case horse or horses attached to a vehicle should run away.

A folding hat and coat rack has been patented by Mr. Gayger D. Tolman, of Shawano, Wis. It has a shelf formed of wire, upon which hats may be placed, side frames hinged thereto, with loops to attach them to nails or other supports, and hooks pivoted to the rear and sides of the shelf, the several parts being made of wire and adapted to be folded up together.

A faucet has been patented by Mr. Edwin P. J. Freeman, of Roslyn, N. Y. It is a hollow metal tap screw-threaded on its outer and inner surfaces, to be screwed permanently into a barrel, with a screw-threaded stopper or plug screwed into the inner end of the tap, and an outer faucet to be screwed in provided with a rod or blade for screwing back the plug.

A lightning escape for wire fences has been patented by Mr. Allin Cockrell, of Lamar, Mo. The fence is constructed with a number of sections, in each of which a single strand of wire is extended back and forward between posts, and has its terminals grounded, so that a stroke of lightning will only affect a portion of the fence.

An auger handle has been patented by Mr. Harry Naylor, of Oil City, Pa. It is formed with a cylinder having openings, in the line of which project a fixed notched cross piece and a rocker clamp adapted to move lengthwise of the handle, thereby holding any sized bit in a straight position, while the shank does not touch the cylinder.

A candy machine has been patented by Mr. George Tschinkel, of Brooklyn, N. Y. It has an endless apron with form plates, in connection with a funnel having apertures in its bottom, a bar sliding in ways, with adjustable rods and plungers, and other novel features, whereby candy may be rapidly and conveniently formed into any desired shape.

A wrench has been patented by Mr. Richard L. Mabrey, of Doniphan, Mo. The head ends of the wrench bars have V-shaped transverse notches on their inner faces, to gripe the nut or other object to be turned, and to the lower wrench bar is pivoted a pawl to overlap and engage the upper arm, and hold the bars in any desired adjustment to properly gripe the nut or bolt.

A windmill has been patented by Mr. Joseph S. Marshall, of Clear Water, Kansas. This invention covers a novel construction and combination of parts designed to afford a windmill which may be manufactured at a low cost, and wherein the parts are so connected that the bolts will not be apt to become loose when the woodwork of the mill is exposed to the action of the elements.

A waterproof composition for floors, walls, etc., has been patented by Mr. Charles V. Mittge, of Brooklyn, N. Y. It is made of cement, cream of tartar, pulverized ivory, quicksilver, pulverized isinglass, marble dust, and other materials, in specified proportions and manner described, and designed to make a hard surface capable of receiving a very high polish.

A sawing machine has been patented by Mr. George McCormick, of Washington, D. C. It has a rectangular frame, carried on rollers at its four bottom corners, in which is a sliding frame to support and carry the saw either in horizontal or vertical position, the machine to be operated by two or four men, and being designed for sawing down trees and cutting the felled timber into pieces.

A boot or shoe stretcher has been patented by Mr. John Donovan, of Boston, Mass. This invention covers an improvement on a former patented invention of the same inventor, and provides for a more convenient adjustment of the toe pieces laterally and of the heel piece longitudinally when the stretcher is in place in the boot or shoe, and for the ready interchangeability of toe pieces of various sizes.

A nut machine has been patented by Mr. Alfred Marland, of Pittsburg, Pa. This invention covers a novel construction of machine that first hammers the iron or steel to the desired shape, then slightly presses the blank, to remedy any defects left by the hammering, and punches the eye of the nut while under pressure, without waste of the material other than that in the core.

A pump attachment has been patented by Mr. Thomas Diffley, of Rosemount, Minn. It is to prevent the water in pumps from freezing, a vent tube being secured in the pump tube, about eight feet below the curb, and a valve being arranged in a simple and firm manner in connection therewith, with other novel features, by means of which the escape of water from the pump tube may be easily regulated at the top of the well.

Business and Personal.

The charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

NEW BOOKS AND PUBLICATIONS.

PRINCIPLES OF THE ECONOMIC PHILOSOPHY OF SOCIETY, GOVERNMENT, AND INDUSTRY. Van Buren Denslow, LL.D. Cassell & Co.: New York. 1888. Pp. xxx, 782. Price $3.50.

Within the limits of our space we cannot attempt to review this exhaustive work. Wealth, values and prices, poverty, capital, profit and loss, the land and labor questions, money, and the relations of the State to all these, are considered and treated in great detail. The work is written by a protectionist, who devotes one chapter more directly to free trade, and shows with great clearness the basis for his belief in the doctrine of protecting home industry. The last chapter on state action in relation to special industries is of peculiar interest. In it various leading industries, their progress and development, are considered, both with reference to England and America. This chapter is a complete *resume* of the author's doctrines, and in it the illustrations of the same are presented with much force. In addition to a very full table of contents and general index, a "personal index" is given, in which the references are restricted to proper names alone.

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Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information, and not for publication.
References to former articles or answers should give date of paper and page or number of question.
Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all, either by letter or in this department, each must take his turn.
Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.
Scientific American Supplements referred to may be had at the office. Price 10 cents each.
Books referred to promptly supplied on receipt of price.
Minerals sent for examination should be distinctly marked or labeled.

(1) B. B. A. writes: Having a horned toad in our possession (from California), and not knowing its diet, we are at a loss to know what to give it to eat. A. Its natural food is insects. In captivity it eats very little, and can subsist a long time without any nourishment.

(2) W. E. M. asks if the electromotive force generated by an armature moving in a constant magnetic field will be doubled if the speed of armature be doubled. A. Every dynamo has what is known as its critical speed. Below this it develops very little electrical energy, above it the development increases very rapidly with increase of speed. We can supply you by mail with Silvanus Thompson's "Dynamo-Electric Machinery," price $5, also Carl Herring's "Dynamo-Electric Machinery," price $2.50. These are both excellent works, and are fully up to date.

(3) S. A. S. asks: Does the use of link motion affect the lead of a slide valve or change it to any extent in shifting the link? A. The lead is and is not affected by the movement of the link. Much controversy would be saved by disputants by a positive definition of the subject of dispute. There are two kinds of link motion. One in which the link is stationary with a moving slide or block, carrying the end of the valve rod with it. This makes an unvarying lead. The other form has the valve rod and link block in a fixed line, the link being attached to the shifting bar. This is called the shifting link, and its operation causes a variable lead. This you will find fully illustrated and demonstrated in Edwards' "American Locomotive Engines," $2.00, which we can mail for the price.

(4) E. J. L.—The magnesium light is not adapted for use in enlarging, as the smoke given off obscures the light. If you use the improved gelatino-bromide paper, you can produce an enlargement in a few seconds by the aid of an ordinary kerosene light.

(5) A. T. asks for the formula for vanilla extract. A. Cut 2½ oz. vanilla beans; pour 1¼ quarts 90 per cent spirit over them, digest for some time and filter. Keep in hermetically sealed bottles. This gives the essence of vanilla. The residue may be treated with water, afterward to be decanted, which gives vanilla water.

(6) G. E. S. asks if the friction between steel and rhodium would be great enough to be objectionable, if used in a watch? A. The frictional relation of rhodium as asked is probably unknown, as it has only been made in small quantities and is more expensive than iridium. It is very difficult to manage, and is hard to cut and drill. Rhodium, like iridium, can be highly polished. For experimental purposes in the line of your inquiry, we recommend iridium, because it is a commercial metal largely used in pen making, takes a high polish, and is extremely hard.

(7) G. J. K. asks: 1. Will the power of the motor described in No. 11, March 17, be diminished by wrapping the armature with No. 20 wire, and can I then run it as a motor or dynamo at will? A. Not if the driving current is of proper character for such winding. 2. How is a spark coil made with power enough to light two or three burners? A. Wind four or five pounds of No. 22 wire around a bundle of iron wires, the bundle may be made of No. 16–20 wire, ¾ inch diameter and 7 inches long. We refer you for water motors to our SUPPLEMENTS, in which several are described.

(8) R. F. A. asks: 1. What will remove iron rust from a marble gravestone, caused by some preparation used to clean it? A. Use a solution of 1 part of nitric acid in 25 of water, and carefully applied to spots only, then rinse with water and ammonia. 2. What preparation (a liquid) is used in instruments employed to cure a cold by inhalation? A. Carbolic acid and iodine. 3. Will an electric battery run an induction coil to good advantage? A. Yes.

(9) A. C. McG. asks: 1. What force will a plunge battery of six cells, each cell containing two carbons and one zinc, 4½ x 6, give? A. It would give about 12 watts in an external circuit of resistance equal to its own. This resistance would vary according to the arrangement of the cells. 2. How long would it run two three candle incandescent lamps? A. It would not run them very brightly—with large cups it