

## ENGINEERING INVENTION.

A fish plate has been patented by Mr. Camille Licardie, of Clermont, De San Marcos, Guatemala. It is designed for use with railway rails, to be fastened longitudinally by the fish plates, each of which has on each end a downwardly projecting tooth fitting loosely into a corresponding aperture in the base of the rail.

## AGRICULTURAL INVENTIONS.

A horse hay rake has been patented by Mr. Julius H. Bally, of Paradise Hill, Ohio. It is designed to gather the hay and discharge it in a line parallel with the line of travel of the machine, and at right angles to its axle, the invention covering various novel features of combination and arrangement of parts.

A planter has been patented by Mr. Alfred W. Black, of Traverse City, Mich. It is for use with potatoes or other sets, and is made with two jaws to be forced in the ground a regulated depth, the jaws being separated at the bottom to allow the contents of the planter to drop therefrom, the device also serving to gauge the distance for the next hill.

## MISCELLANEOUS INVENTIONS.

A whip has been patented by Mr. Patrick S. Harrington, of Cheyenne, Wyoming Ter. This invention covers an improvement in the process of manufacture, consisting in wrapping an elastic stock with raw hide, together with a method of treating the hide before applying to the stock.

A wagon brake has been patented by Mr. Fred Rice, of Shopiere, Wis. It is constructed and arranged to be operated by the neck yoke, and so that the brake blocks will not interfere with the free backing of the wagon, the invention covering novel features of construction, combination, and arrangement of parts.

A clasp has been patented by Mr. James H. Conaty, of West Haven, Conn. The "cast off" finger or tongue of the clasp is formed from a part of the body of one of the jaws or members of the clasp, whereby the clasp can be produced with less labor than those of the usual construction.

A glass cutting table has been patented by Mr. Alonzo Hughes, of Orlando, Fla. One end of the table is provided with feeding and gauging devices, and the other end has a plain surface and straight-edged end upon which the glass may be broken, with other novel features, for facilitating the work of the cutter.

A dumping grate has been patented by Messrs. Peter Rensland and Charles Fisher, of Port Jervis, N. Y. The construction is such that by rotating a longitudinal shaft the grates may be turned at any angle to the frame, or they may be turned completely over and the faces used alternately, while the parts are interchangeable.

A fruit jar fastening has been patented by Mr. William Brace, of Washingtonville, Ohio. This invention covers a peculiar construction of cover and fastening ball, the ball being swung over the cover in locking the latter down by a roller riding in a groove, and forcing the cover down with an elastic pressure until the locking position has been attained.

Dental foil forms the subject of a patent issued to Mr. Thomas J. Henry, of New York City. This invention covers a sheet of dental foil having depressions causing breaks or punctures in the continuity of its fiber, and not mere superficial indentations for purposes of ornamentation, the punctures forming an important element in softening the foil.

A shoe heel has been patented by Mr. Antoninus Farina, of New York City. It is designed to have the appearance of being made, except for the heel tap, of a single thickness of leather, while wearing as the ordinary built-up leather heel, the construction being such that the tap may be readily removed when worn and another substituted without removing the heel from the shoe.

A spoke drawer has been patented by Mr. John M. Germann, of New York City. It has a main bar adapted to bear on and grip one edge or face of a spoke, with a stirrup for gripping the opposite edge, and a thrust bar adapted to bear on the wheel hub, making a simple and inexpensive device for quickly and easily drawing the spokes from light or heavy wheels.

A street and station indicator for cars and stages has been patented by Mary J. Watson, of Sacramento, Cal. It consists in a series of cards arranged to turn on a common pivotal wire, each card having two sets of names oppositely arranged with respect to each other near opposite edges of the card, the cards being of suitable size to admit of being inverted.

A wagon axle has been patented by Mr. Nathan W. Blevens, of Aurora, Tex. The invention covers an axle combined with a spindle whose shank has a threaded inner end, with nuts turned thereon on opposite sides of the inner seat, by which the spindle may be adjusted to and held in any desired position, and the wagon set to standard or narrow gauge as desired.

An oven has been patented by Mr. Levi Coke, of Elmira, N. Y. It is for bakers' use, and has three lower compartments, an upper compartment, a central fire in the top, and other novel features, affording means for uniform heating and keeping the shelves free from dust and smut, and wherein the shelves are arranged handily, while the oven will be free from gas and smoke.

An apparatus for coloring or bleaching cured or dried tobacco has been patented by Messrs. James K. Hardwicke and James J. Redmon, of Marshall, N. C. It consists of a structure with transparent or translucent outer wall, an inner light-reflecting wall, with plant or leaf supports or racks, whereby the

tobacco will receive both direct and reflected light to give it a uniform color.

A nut lock has been patented by Mr. Marshman H. Phillips, of Verschoyle, Ontario, Canada. Its body is substantially rectangular in form, and constructed of malleable iron, being designed as a simple and cheap construction of nut lock for railroad rails, to effectually secure the heads or ends of the bolts securing the fish plate, and forming a device which may be conveniently removed when a rail is to be replaced.

A pneumatic annunciator has been patented by Mr. William R. Ostrander, of Brooklyn, N. Y. It has an alarm train provided with a toothed wheel, a toothed bar arranged to engage with the toothed wheel and formed with an elongated slot through which is passed a supporting pin, an operating bar, and connections, the parts being so arranged that the resetting of the drops will rewind the alarm attachment.

An apparatus for steaming cloth and other fabrics has been patented by Mr. Voorhees T. Van Fleet, of Somerville, N. J. It has perforated steaming beams constructed with a series of longitudinal compartments arranged one above the other and provided with steam inlets and outlets at different heights, with other novel features, the apparatus being adapted to readily work on different kinds and thicknesses of goods.

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MAY NUMBER.—(No. 31.)

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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.

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(1) E. K. asks: 1. Is there anything I can use besides borax for soldering gold jewelry, for when you heat that it pushes the work away, or could I put anything in it to keep it from moving the work away? I use one kind of gum, but it is of not much use. Is there a substance which will stick the work to sheet iron, so when it is heated it will become hard, and thereby hold the work, so the borax in evaporating its water will not move the work away when soldering it? A. Use borax glass finely powdered and mixed with water, to form a thin cream. Borax glass is prepared by fusing borax. 2. What can I put in an alloy of gold and copper so as to make it hard? A. Try a small percentage of tin.

(2) M. S. asks: 1. Is it absolutely necessary that the winding of the coil on armature of simple electric motor should be in even and parallel lines? A. It will not be fatal to the working of the machine if the coils are not absolutely perfect. High efficiency in the working of the motor can only be secured by careful attention to all details. The coils should be made compact, and the winding should be even and parallel. 2. Could the motor be used as a dynamo by making changes, and what change would be necessary? A. To make a dynamo upon this principle, it is only necessary to use finer wire on the armature, and make the field magnet of cast iron. 3. Would it then furnish electromotive force sufficient to run a 16 candle power lamp? A. We think it is hardly sufficient to run such a lamp.

(3) L. R. M. asks: 1. Can the simple electric motor described in the above paper for March 17, 1888, be run by Grenet storage batteries, or if not, how can it be made to, also by what other ones besides the one mentioned in the article, can it be run? A. The motor referred to can be operated by any battery or arrangement of batteries that will yield a current of 12 volts and 6 amperes. 2. Also can the said motor be made into a dynamo, and if so, how? Also how many one candle power lamps would it supply, and how much power would it require? A. See reply to M. S.

(4) G. L. D. asks: Will you kindly inform me through your paper if simple electric motor, if connected with an Edison dynamo, will run a 9 inch swing iron lathe? If not, would it increase the power by doubling the width of armature, also that of magnet, and winding it the same with No. 16 A. W. G. cotton-covered magnet wire? A. The motor, if properly wound, is of sufficient size to run such a lathe, doing light work, but the armature should be wound with finer wire.

(5) J. A. V. writes: 1. I have just completed an induction coil having about 2,400 feet of wire, No. 36. How many quart bichromate potash cells can be used? A. If your secondary wire is properly insulated, you can probably use about 6 cells of plunging bichromate battery, with zinc and carbon plates 3x6 inches. 2. The coil is constructed with a draw tube. Must the primary coil fit exactly in the draw tube or not? A. The distance between the primary coil and the core and the primary coil and the secondary wire should be only enough to admit of proper insulation. 3. Is there any difference in currents, if there are four layers of wire on primary coil? A. There will probably be no advantage in using four layers of wire.

(6) G. D. writes: I have tried the magnetizing influence on my watch, and can say that my watch will not run, and am at sea to know what to do in order to demagnetize it. Would you please be so kind as to tell me what to do? A. Place your watch in a coil of 2 or 3 ohms resistance, connect the coil with a plunging battery, reverse the current rapidly as the battery is plunged, and also while the elements are being withdrawn from the solution. Test your watch by bringing it near a compass needle. If you find that any part of the watch repels the compass needle, you will know that magnetism still remains in the watch, and you will be obliged to repeat the operation just described. If, after treating it several times in this manner, you find that it still retains magnetism, you can remove the last trace by the judicious application of a permanent magnet to the edges of the watch.

(7) G. E. S.—The only successful way of burning petroleum under boiler is the jet burner, using the steam as a blow pipe. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 455, "Petroleum as Fuel;" No. 592, "Petroleum Burners;" No. 623, "Burners for Boilers;" No. 615, "Petroleum Fuel;" No. 618, "Le-noir's Petroleum Engine." There are several patents on devices for burning petroleum. You can turn a screw easier with a long screw driver because you have a better hold or grip. Salt liquefies ice by its chemical affinity for water, forming a liquid (salt water) that is fluid at a very low temperature.

(8) J. W. K., Jr.—Red shortness in iron is caused by excess of sulphur, amounting probably to four-tenths to six-tenths of 1 per cent. This causes the iron to be brittle at a red heat. Cold shortness or brittleness, when cold, is caused by phosphorus and silicon, the proportions varying from one to two tenths of 1 per cent. You will find description of crucible steel plant