

## ENGINEERING INVENTIONS.

A fish plate fastening machine has been patented by Mr. Joseph H. N. Guilford, of Whigham, Ga. This invention covers a peculiar construction and arrangement of parts for a machine which can be readily clamped to either side of the rail, and affords a simple and convenient means of screwing up the nuts more rapidly and powerfully than can be done by hand.

A car coupling has been patented by Messrs. Clement Leidy and Charles E. Green, of Angus, Ohio. Combined with a drawhead having a sliding block is a downwardly swinging piece hinged on the block; a tripping pin is pivoted in a slot in the free end of the hinged part, and the lower end of this pin is connected by a link with the front end of the bottom of the drawhead.

A car coupling has been patented by Mr. John T. Sustaie, of Matthews, N. C. This invention covers a special construction to so hold a removable link on the drawbar of one car that it shall engage the drawbar of an approaching car without attention, and yet provide means so an attendant may guide the link with his hand in case it becomes necessary to couple with a car having a common drawbar.

A railroad tie has been patented by Messrs. Lee O. Vanderbilt and Milton E. Campany, of Muskegon, Mich. It is formed of two inverted bowls having plain upper surfaces, two fastening clips secured to the plain surface of each bowl by bolts, and a bar connecting the two bowls and secured by the fastening bolts of the inner clips; the concave side of the bowl is filled with earth well tamped or with concrete, the object being to furnish a tie which shall be practically indestructible.

## AGRICULTURAL INVENTIONS.

A seed drill has been patented by Messrs. James J. Sweatt, George H. Sweatt, and Francis V. Sweatt, of Conyersville, Tenn. This invention consists of special combinations of parts and their construction in machines for planting seeds in drills, so they shall be simple in construction, convenient to use, and reliable in operation, planting theseeds regularly and in uniform quantities.

A combined hay and stock rack has been patented by Messrs. Jonas H. Hittle and Aurin D. Davis, of Mackinaw, Ill. This invention relates to racks adapted to be used on wagons for carrying hay, and also for penning hogs and other animals, and the patent covers improvements on a former patented invention of the same inventors, the construction of the rack having some new features which render it more convenient and reliable.

## MISCELLANEOUS INVENTIONS.

A leather working machine has been patented by Mr. John A. Panton, of Quincy, Mass. This invention relates to improvements on the Holmes-Fitzhenry scouring machine, with the object of preventing the stones striking the table while the stock is being scoured, set, or worked.

A soldering pan has been patented by Mr. Thomas Leslie, of Brooklyn, N. Y. It is made with compartments to receive the resin, waste solder, wiping cloth, acid, and ammonia, and moulds for making the waste solder into bars, the pan being so constructed as to promote convenience and economize time.

A portable fire escape has been patented by Mr. Hermann Wettstein, of Harvard, Ill. It can be folded compactly to occupy small space, and is intended to be opened upon the ground so persons in burning buildings may jump upon it, it being of such size, strength, and elasticity that it will hold up without injuring those jumping from a great height.

A nut lock has been patented by Mr. Aaron C. Vaughan, of Shane's Crossing, Ohio. It is in the nature of a washer or thin plate acting somewhat after the manner of a jam nut, and so made that when turned up to the nut its inner peripheral edge binds the thread of the bolt with a friction that holds the plate and nut firmly against turning off.

A gate has been patented by Mr. Chas. L. Burden, of Gun City, Mo. The gate works by a loose hinging connection with cleats, so that expensive metallic hinges and fittings are dispensed with, and the gate works without the noise common to metal hinges, its construction being simple, the cost low, while the gate is a durable one for use on farms, etc.

An automatic stove damper has been patented by Mr. Daniel J. Dunn, of West Fitchburg, Mass. The damper is adapted to close by gravity to cut off the draught from a fire in a stove, heater, or furnace, and has fusible pins connected to its pivot, with a detent to act on the fusible pins to hold the damper open more or less, and to allow it to close when the pins melt.

A fork forming machine has been patented by Mr. Philippe Denery Dupont, of Summerville, Vt. This invention provides a mechanism for forming or shaping forks with suitably prepared blanks, the prongs being pressed and formed into shape at the same time without hammering, the same machine answering for different kinds and sizes of forks, so the work can be done better and quicker than by hand.

A fire escape ladder has been patented by Mr. Joseph Barnett, of New York city. It is made with a base frame provided with a turntable carrying standards and a hinged ladder, the standards and ladder being connected by a windlass, guide pulleys, and rope or chain, so the ladders can be easily raised for use and lowered for transportation, and be securely held when raised, and readily adjusted at different inclinations.

Improvements in the walls of buildings and other structures form the subject of a patent issued to Mr. William H. Orr, of Carlisle, Ind. The invention consists in building up such walls of hay, straw, or other loose, fibrous, balable material, and holding and compacting the bales together by bolts and plates, to give them sufficient hardness to admit of their being faced inside and out with cement or plaster.

A drum cover has been patented by Mr. George W. Brown, of New York city. It is made preferably of India rubber cloth, in the shape of a bag

adapted to be drawn over the drum, and is more especially designed to protect the drum in stormy weather, there being a ring for holding the cover close to the drum head, so the cover will not interfere with the beating of the drum.

A coupling device for sand points in drive wells has been patented by Messrs. Charley F. Lang and Orlando C. Stafford, of Rising City, Neb. This invention covers a special device of coupling for use between a pump and sand point in driven wells, to allow the disconnection of the sand point from the pump, and save the time and labor required for withdrawing the sand points used in driving wells,

A lock has been patented by Messrs. Thomas Donahue, James Roche, Willard T. Goodwin, and William W. Cone, of Terryville, Conn. This invention consists in a mortise cabinet lock with a removable key guide, and an escutcheon plate in which the key guide is held, with various other novel parts and details, making a lock which automatically adjusts itself so the key can pass in without binding.

A lamp attachment has been patented by Messrs. Charles P. Bynon and James Stewart, Jr., of Yonkers, N. Y. It consists of a bar with a lip at one end for securing it to a lamp, and a burner support at its other end to be so attached to the lamp as to hold the burner, or burner and globe combined, and obviating the necessity of removing the burner and wick from the lamp while the lamp is being filled.

A darning attachment for sewing machines has been patented by Mr. Frederick W. Stewart, of Oswego, N. Y. This invention is an improvement in the class of stocking darning attachments for sewing machines in which a spiral spring and a sleeve encircling the needle are employed in connection with a ring that rests on the bed plate, and to which the stockings are secured.

A windmill has been patented by Mr. Joseph Benoit, of New Braunfels, Tex. The sectional spiral vanes of the windwheel have a flange on the outer edge, widest at the end of the vane on which the wind first takes effect, and inclined to the plane of the vane for deflecting the wind thereon, so as to more effectually hold the wind and be more effective, with other novel features of construction and arrangement.

An attachment for pants has been patented by Mr. John J. Neubert, of Rochester, N. Y. This invention provides an extensible band, with button holes, and held on the waist by elastic bands secured to the extensible band and to the seat of the pants, the attachment being more especially calculated for use on boys' pants, so the strain on buttons and button holes is materially decreased.

A die for fifth wheel heads has been patented by Mr. Nicholas Eccles, of Auburn, N. Y. This is a die of novel construction, to forge the members into form, after which the operation is completed by bending the forging, the head being formed square and the clip part twisted so as to lie flat on the axle, the object being to produce a strong and better head than can be made by the methods heretofore employed.

A breeching attachment for vehicles has been patented by Mr. John C. Williams, of Auroraville, Wis. Instead of making the breeching strap as a part of the harness, it is, according to this invention, made separate from the harness, and the breeching is so connected to the thills of the vehicle as to make it adjustable backward and forward, and as to height, to accommodate the size of the draught animal.

A chimney cap has been patented by Mr. Theodore J. Steen, of Oakland, Neb. The cap has four upright corner bars, their lower ends tapered and bent outward, and their upper ends bent to fit against the under side of a peaked hood, to which the upper bent ends of the bars are riveted, making a chimney cap which is very effective, is held securely on the chimney, and can be fastened readily and easily.

A burial apparatus has been patented by Mr. Marshal Chastain, of Moulton, Iowa. It consists of a movable frame with a tilting earth box having a removable or hinged side, a windlass and operating ropes adapted to support the coffin, the apparatus to be used in opening and filling graves, for which it can be operated by a single person if required, and without scattering the loose fresh earth over the grass or lawn around the grave.

A portable dark room for photographers has been patented by Mr. William W. Walker, of Williamsport, Pa. It is formed of a flat box and a top to which two sides are hinged, the sides being adapted to be held in an upright position on the flat box when the dark room or box is erected, but when it is folded the top and sides are placed in the flat box, sleeves are secured to the ends of the top and hinged sides, and plates of colored glass are held in the sides and top.

A gluing table has been patented by Messrs. James H. Clemons, of Dolgeville, and Joseph W. Bower, of Stratford, N. Y. It has a bed frame to receive the work, a clamp frame held above the bed frame and provided with one or more rods or bars carrying presser plates or washers, adapted to be swung to one side as each successive glued strip or piece is to be clamped to place, and means for pressing the plates to work.

A cherry pitting machine has been patented by Mr. James McVicker, of Caldwell, N. J. A circular table, centrally pivoted, has a series of apertures near its edge, a reciprocating arm so acting as to puncture the cherries and force the pits out of them and down through the openings, the machine being adapted for very rapid operation, while the pits are removed with less mutilation and waste than is usual in doing the work by hand.

An apparatus for rectifying spirits and spirituous liquors by electricity has been patented by Mr. Thomas E. Atkinson, of San Francisco, Cal. This invention consists of an electrode of hard wood with one or more carbon conductors perforated transversely with a number of holes, charred over its exterior surface and in the transverse holes, and having a covering of canvas provided with apertures corresponding with the holes in the electrode, so the electric current will precipitate impurities, and impart to the liquor the flavor of the wood of which the electrodes are made.

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## Notes &amp; Queries

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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 Information requests on matters of personal rather than general interest, and requests for Prompt Answers by Letter, should be accompanied with remittance of \$1 to \$5, according to the subject, as we cannot be expected to perform such service without remuneration. Scientific American Supplements referred to may be had at the office. Price 10 cents each. Minerals sent for examination should be distinctly marked or labeled.

(1) M. J. B.—The metric system is not the standard in the United States. You will not become a machinist by reading books. The best way to commence, aside from necessary shop practice, is to try and first learn something of mathematics.

(2) E. F. W.—SUPPLEMENT No. 160 will give you an idea of the construction of an induction coil such as you want, but the one there described would be too strong for ordinary medical use. Make the secondary coil of about 10 or 12 layers of No. 28 wire instead of using No. 36. You should administer strong shocks with great care. They are sometimes dangerous.

(3) W. H. C. asks: What is the cheapest and simplest method of measuring resistances up to say 100 ohms? A. There is nothing cheaper than a rheostat and galvanometer. The "bridge" method is best, but a Wheatstone bridge is expensive.

(4) H. C. C. asks a simple recipe for preparing hop bitters.

A. Hops.....	2	oz.
Dandelion.....	2	"
Gentian.....	2	"
Chamomiles.....	2	"
Stillingia.....	2	"
Orange peel.....	2	"
Alcohol.....	77	fl. oz.
Water.....	77	"
Simple sirup.....	12	"

Exhaust the drugs with the alcohol and water, and add the simple sirup. The cordial is a pleasant preparation, which is said to resemble the patented Hop Bitters.

(5) H. H. W.—Thunder is the sound resulting from an atmospheric electric discharge known as lightning. The duration of a flash of lightning is altogether too small to be determined by mere visual observation, though the sound is often prolonged for several seconds.

(6) G. F. J. writes: I have got a buggy that I keep in a barn where I have got three horses also. The varnish on the buggy becomes of a sulphur color. Can you tell me what does it? A. The ammonia arising from the decomposition of the animal refuse.

(7) J. V. S. asks: 1. Is the attraction of a magnet increased by the number of coils of wire that surround the magnet? A. Yes, up to a certain limit; but the current must be adapted to the winding to secure a maximum result. 2. How large are the largest magnets made in spool shape? A. We do not know that there is any fixed limit. Probably the largest in existence are in some of the large dynamos. 3. What can they be bought for apiece, and where can they be had? A. Any of our prominent dealers in electrical or philosophical instruments could supply you with a large electro magnet. 4. Where can I get reliable information in regard to the nature of electricity, with a view of applying it as a motive power? A. Purchase Du Moncel's Electric Motors.

(8) M. B. asks: What is the best thing to do with a seasoned round piece of hickory about 3 inches in diameter, 1 foot long, to make it keep its round, true shape year after year? A. Boil in linseed oil.