

## ENGINEERING INVENTIONS.

A stuffing box has been patented by Messrs. William Dingle and William Jenkins, of Lake Mahopac, N. Y. It is made in two parts, with a smooth inner surface, its bolt-receiving lugs being perforated to receive the perforated heads of the gland fastening bolts, and having a gland made in two parts with smooth outer surface, and overlapping lugs perforated to receive the fastening bolts, so the gland can be secured in the stuffing box by exterior bolts and nuts, and can be readily applied and removed.

## MECHANICAL INVENTIONS.

A bench stop has been patented by Mr. John Adams, of Hancock, N. Y. The casing has a post with a lateral stop or arm capable of rotary movement and carrying a clamp, with its jaw adapted with said stop or arm to effect the clamping operation, making a bench stop adapted for universal use.

A screw driver has been patented by Mr. Willis B. Gilmore, of Minneapolis, Minn. The bit has an annular recess to contain a loose spring, with one end entering an aperture or connected with a surrounding sleeve fitted upon the bit of the driver, making an improved device for holding the screw on the end of the bit, with other novel features.

An apparatus for striking moulds for hand rails has been patented by Mr. Frederick R. Bodley, of Denver, Colo. This is a mould striker of novel construction to produce moulds for rails of any required pitch, size, and shape, without requiring special skill for its operation, and so the most difficult mould can be struck out on the mould board as easily as simple forms.

A power transmitting pulley has been patented by Mr. John T. La Turno, of Armstrong, Mo. It is made in two sections placed loosely on a driving shaft, with interior lugs and springs between them, one of the pulley sections carrying the pulley rim or face, and the other section a clutch device, in combination with a clutch splined to the driving shaft, giving a gradual strain between driving and transmitting power gears in starting.

## AGRICULTURAL INVENTIONS.

A sorghum and corn cutter has been patented by Mr. Charles E. Coe, of Leesburg, Kansas. It consists of a shearing mechanism, with means for advancing it upon the ground to cut the stalks, laying them to form a bunch, holding the bunch till it is large enough, and dropping it at the will of the operator.

A baling box has been patented by Mr. Oliver Bulkeley, of Dexter, Texas. Fixed standards reach above the end board, and there are hinged side boards, so the bale cords can be placed in the box with their ends reaching over the upper edges, when the bale cloth can be put in, and the cotton or other material to be baled packed therein, and the whole tied by the cords. It is particularly intended for the cotton field, as it only weighs 100 pounds, or it may be of use to small farmers in baling hay.

## MISCELLANEOUS INVENTIONS.

An axle skein has been patented by Mr. Edmund N. Hatcher, of Columbus, O. Combined with an axle and its skein, the hood, band, and bolts are all formed in one piece, thus strengthening the parts at the points usually the weakest.

A spool holder has been patented by Mr. Amos W. Judd, of Chattanooga, Tenn. It consists of a spiral spring of small diameter for holding the spool, and in a fastener fixed to the ends of the spring and capable of being attached to the clothing of the user.

A pump has been patented by Mr. James E. Sinclair, of Waverly, Md. The water cylinder is combined with a hood arranged on the outside of the casing for collecting escaping gases, whereby they may be destroyed to prevent the spreading of noxious vapors.

A beehive has been patented by Mr. Martin Van Ensley, of McMinnville, O. The bottom is made double, with passage and ventilating openings, and there are other novel features, covering improvements on a former patented invention of the same inventor.

An elevator has been patented by Mr. Chas. W. Hays, of Orange, N. J. It is constructed with an arm attached to the well door to engage with the carriage when the door is open, and prevent the carriage from moving up or down before the door is closed, thus locking the carriage in place when the door is open.

A draught equalizer has been patented by Mr. Oliver C. Beck, of Rickreall, Oregon. The invention covers a combination of single trees, a double tree, and a treble tree, so as to equalize the draught of one horse drawing at one end of a tree or cross bar by two horses drawing at the other end of the same tree.

A hydraulic dredge has been patented by Mr. John H. Anderson, of Shelby, Neb. It is a sectional dredging vessel comprising a main boat and supplementary boats, with dredge tubes for cutting either a narrow or wide channel, the invention being an improvement on a former patented invention of the same inventor.

An apparatus for working electric bells has been patented by Mr. Wilbur F. Horn, of Carlisle, Pa. The bell is rung or other electrical effects produced by the immersion of one of the battery plates into the exciting fluid, by a novel device, one plate being permanently immersed and the other normally out of contact with the exciting fluid.

A scraper and elevator has been patented by Mr. Titus H. Apple, of Meadville, Pa. It is for loading snow, earth, sand, sawdust, stones, or such materials into carts, wagons, or other vehicles, for which the parts are novel in detail of combination, and the apparatus can be thrown into and out of operation very easily and rapidly.

An electric lock has been patented by Mr. Hilborne L. Roosevelt, of New York city. The armature of the magnet is combined with a swinging plate, spring, and bolt, and a trip plate is interposed between the armature and swinging plate, with other novel features, the invention being an improvement on a former patented invention of the same patentee.

A machine for making horseshoes has been patented by Messrs. Joseph Rigby and John W. Gorsuch, of Ottawa, Kansas. A former is fixed on an iron casting fastened on a block, and around it the shoe blank is bent by hand levers, the invention affording an improved device for bending straight blanks into the form of horseshoes by hand.

A saw jointer and set has been patented by Mr. James K. Bridges, of Woodstock, Ill. This invention covers a simple device to joint the teeth of crown-saws or straight ones, to joint the raking teeth and set the teeth of thick or thin saws, and to gauge the set of the teeth to ascertain any irregularities of the set and enable them to be corrected.

A windmill has been patented by Mr. Joshua G. Benster, of Duncan, Neb. This invention covers improvements in the construction and arrangement of the supporting apparatus for the wheel supporting frame, the frame itself, the wheel, and transmitting apparatus, and the apparatus for mounting and operating the tail vane, all intended to provide a simple, substantial, and durable mill.

A machine for spinning and winding yarn, thread, etc., has been patented by Messrs. Oscar Hanna and Hiram W. T. Earnshaw, of Dover, Ky. This is a device which may be attached direct to the condenser card, to the jack frame, or to the twister frame, when used as a doubler and twister, and is particularly adapted to the spinning of roving as it comes from the condenser.

A wagon end gate has been patented by Mr. Charles P. Krenson, of Munster, Ill. The end gate is fastened in place in the wagon box by hinged rods and levers, the rods being hinged to one side of the box and adapted to be engaged with levers pivoted to the other side of the box, the levers being held and locked by suitable devices, and the lock bars engaging with the hinged rods to hold the gate from working up.

A copy case has been patented by Mr. Myron A. Sherman, of Grant Fork, Ill. It is made with a sheet metal body with the upper parts of its sides bent outward, upward, and inward, forming grooves, and having a cover with a glass plate in a sheet metal frame to slide in said grooves, the cover sliding on and off at either end of the case, and so the edges will not tear or scratch the copy.

A device for holding photographic plates in developing trays has been patented by Mr. Samuel B. Pratt, of Boston, Mass. In combination with a developing tray is a sliding plate arranged to hold one end of a photographic plate, and adapted to be raised for lifting one end thereof out of the liquid, so the photographic plates may be easily held in and removed from the liquid without immersing the fingers.

A hay press has been patented by Mr. Herman L. Whitehead, of Island City, Oregon. There are improved contrivances for working two followers from opposite directions toward each other in a horizontal case by means of a single or double lever arrangement with power applied by a windlass by horse power, making a simple device for applying great force in a low down case, while the pressed bales may also be lifted out by one of the levers.

## NEW BOOKS AND PUBLICATIONS.

**MAGNETO-ELECTRIC AND DYNAMO-ELECTRIC MACHINES.** By Dr. H. Schellen. Translated and enlarged by Nathaniel S. Keith. Vol. I. D. Van Nostrand, New York.

The work of Dr. Schellen, who had previously been a publicist of considerable mark in several departments of physics, was deservedly popular in Germany, and had reached its third edition before the close of last year. Taking this book as a foundation, Mr. Keith proceeds to add descriptions of dynamos and allied apparatus made and used in this country, the plan of the work being designed to cover everything of practical value or special interest experimentally which has been done in this field up to the present time. Mr. Keith has heretofore written much, and made many valuable original investigations on applications of electricity to practical ends, so that he comes to this task amply equipped with all the qualifications necessary to present the public with a work of standard value in the two volumes of which the first is just issued.

**ILLUSTRAZIONI DELLA FERROVIA METROPOLITANA E CAMPI FLEGREI, Naples, Italy.**

This is a book of illustrations showing an elaborate scheme for the improvement of the city of Naples, to which Mr. Lamont Young has devoted the last ten years. He has also had the assistance, in this task, of Mr. A. Caprani, founder of the Royal Hotel in that city. This wonderfully beautiful city of southern Italy seems now fairly in the way of having our modern street railways, spacious boulevards, etc.

**STEAM BOILER INCORUSTATION.** By Charles T. Davis. Industrial Publishing Company, Washington, D. C.

This treatise is largely devoted to methods for preventing corrosion and the forming of scale, determining the constituents of water and their effects on boilers, compounds and apparatus for purifying it, apparatus for feeding chemicals with the water, etc.

## Business and Personal.

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Woodwork's Mach'y. Rollstone Mach. Co. Adv., p. 222.

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Knurling Tool, self-centering, for lathe use. Pratt & Whitney Co., Hartford, Conn.

## Notes &amp; Queries

## HINTS TO CORRESPONDENTS.

Name 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 mail, 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) Reader desires to know which of the following contains the most nutriment—rice, beans, peas, or oats? A. Peas contain 98 per cent of nutriment; rice, 88 per cent; beans, 87 per cent; oatmeal, 74 per cent.

(2) C. E. B. asks: What amount of salicylic acid per gallon will prevent the fermentation of cider, or other liquid of similar nature? A. Add one oz. salicylic acid to each forty gallons immediately after the cider has left the press, and no fermentation will take place.

(3) C. B. S. asks how to make a glue suitable for gluing sea shells together, one that will set quick, and be stiff after set, and yet not crackle or break easily. A. Use the following:

Starch.....2 drachms.  
White sugar.....1 ounce.  
Gum arabic.....2 drachms.  
Water.....q. s.

Dissolve the gum, add the sugar, and boil until the starch is cooked.

(4) C. S. R. asks: What material will mix with anthracite coal ashes, to make a walk that will be firm and smooth both in wet and dry weather? A. Mix with Portland cement one part, ashes two parts; make into a mortar quickly, spread on path and smooth with shovel or trowel.

(5) B. T. S. writes: It is said that about one-twentieth of water is air; now if I convert the water into steam and then condense it back to water, and take that water direct out of a vacuum back into the boiler, and use it over and over without its coming in contact with the air, what proportion of air will there be, if any, still left in that water? A. Practically no air; but any fresh water that may be pumped into the boiler contains air, which will mix with the steam and enter the condenser.

(6) E. P. M. asks: 1. Is it practicable, by any known plan, to manufacture, in glass, frusta of hollow cones about four inches high, whose shells shall be about a quarter of an inch thick, tapering in interior diameters from 4 1/2 inches to 3 1/2 inches; the interior section to be circular to within 1/8 of an inch, it being allowable to strengthen or stiffen the shell by exterior flanges as desired? A. Yes, make a model of your cone in wood or any other material. Send it to a glass house and have cones blown, or if they are to be exact have them pressed in a mould, which the glass blower can have made to suit your pattern. 2. In the conversion of rectilinear reciprocal to rotary motion, what per cent of power is lost by the imperfections of the ordinary crank in the varying force exerted at different points in the circle described by the pin? A. The crank value is 0.65 of the direct pressure.

(7) Upsilon desires to know recipe for acid compound that will restore worn or blunt files to utility. A. Clean the files by brushing them clean of dirt and grease as well as any foreign metal sticking in the teeth; then dip in a strong alkali for a few minutes to remove all traces of grease from the bottom of the teeth; rinse in clean water, then dip a solution of 1 part nitric acid, 3 parts sulphuric acid, to 7 parts water. Time 5 seconds to 5 minutes, according to cut and wear. Rinse in warm lime water, dry, and oil slightly. Finally brush with powdered charcoal to take off excess of oil and give them the peculiar look of new files.

(8) H. B. asks the process for making counter dies for the ordinary seal press and metal used, to give the best result. A. Cast the counter die upon the face of the die in type metal, and solder it to the brass backing piece while in the press in order to get a good register. 2. Formula for making ink to print on tin with a rubber stamp? A. Use a little varnish rubbed up with the ordinary printing inks.

(9) Brazoria asks if there is any device for measuring distance, close or far, without the use of rods or chains. How is distance measured? A. You cannot measure a distance without a measure of some kind to begin with. Long distances are obtained by triangulation, for which an accurately measured base is necessary. See any book on trigonometry.

(10) G. R. H. writes: Can you explain how it is that although water expands in freezing, a piece of wet board when frozen is smaller than at any other time? That it is so I have proved repeatedly, although I have heard the fact disputed. A. The expansion of water ceases at the moment of congelation. Ice contracts by cold more than wood.

(11) J. N. asks the most extensive place in the manufacture of cutlery—Sheffield, England, or Turner's Falls, Mass.? A. Sheffield, England.

(12) G. A. D. writes: Will you please inform me what kind of shoe blacking that is which some private valets use for blacking their masters' shoes and where it can be bought? It is said to keep the leather soft and give a good polish. A. All blacking which gives a good polish on shoes is in its nature non-beneficial to the leather, and many of the best polishes contain acids which are injurious. The leather, however, may be kept in fairly good condition by using the blacking sparingly and occasionally sponging off, when a slight application of neatfoot oil and tallow will help restore the life to the leather. There are too many good blackings in the market for us to particularize here, but more depends upon their use and the care taken of the leather than in the differences in their quality.

(13) J. F. M., of Ohio.—The signing of the patents by the Acting Secretary is lawful, and such patents are perfectly valid. This has been so held by decision of the United States Court.

(14) E. L. I. asks: What substance loosens printer's ink so that newspaper pictures can be transferred to other paper? A. The liquid to be used is made by dissolving 1 1/2 drachms common yellow soap in 1 pint hot water, adding when nearly cold 3/4 fl. oz. spirit of turpentine, and shaking thoroughly together. This fluid is applied liberally to the surface of the printed matter with a soft brush or sponge (being careful not to smear the ink, which soon becomes softened), and allow it to soak for a few minutes; then well damp the plain paper on which the transfer is to be made, place it upon the engraving, and subject the whole to moderate pressure for about one minute. On separating them a reversed transfer will be found on the paper. This transfer will not be equal to the