

arrangement of levers for opening the suction valves, to permit the water contained in the cylinder and discharge pipe to escape, so as to prevent freezing and stagnation in the pump.

IMPROVED TRICYCLE.

The tricycle is a machine that is likely to meet with a ready reception from those who desire to avoid the risks of a bicycle, and also from ladies who would wish to share in healthy out-of-door exercise. The specimen we now illustrate is that built by Messrs. Singer & Co., of Coventry, England, and has several special features of value. In the arrangement of the wheels, the driving wheel is central with the weight, and the two forward carrying wheels are equally spaced on either side of the rider. Where a side driving wheel is used, the weight cannot be employed with advantage, and the other side carrying wheel acts rather as a drag upon the tricycle.

The frame, light but strong, is formed by a fork in front, carrying the pivots and forks for the two forward wheels. After uniting, it arches over the main driving wheel, where it carries the fork for that wheel, which fork is also stayed to the main fore carriage fork. The seat may be either a saddle or a cushioned seat, shifted at will by unscrewing bolts and nuts in the end of the bent spring. The other end of the bent spring is attached to a vertical spindle passing through a socket in the forward forging. The height of the spindle may be adjusted by a set screw, so that the seat or saddle may be fixed to suit the rider's convenience in each case, so as to give the freest and most comfortable play to the legs. The position is arranged for the saddle, to resemble, as far as possible, that of a bicycle rider. The driving gear is given by two treadles on the end of two levers, which are made into bell cranks by a stayed arm at right angles to the treadle arms. These bell cranks give an effective pull upon the cranks of the main driving wheel. A splash board is fixed to the main rib passing round the main driving wheel, so as to protect the rider. The steering gear is a powerful and effective arrangement on the two forward wheels; the spindles are carried up through the sockets, and fitted with handles at the upper ends. The two forks of the two leading wheels have arms riveted to them, and these are connected by a rod, so that the pair of wheels must turn together and may be moved by either handle. A powerful foot brake is added to press upon the tire of the back wheel.

The special advantages of this tricycle may be summed up as follows: (1.) Safety; the position of the rider is exactly between the three wheels, and therefore in the most stable position to resist overturn. (2.) Direct action; that is, the driving is centrally with the position of the rider, and also centrally with the driven wheel. (3.) Power; the arrangement of levers is most effective for mechanical advantage. (4.) Efficient steering gear. (5.) Adjustable seat for any size of rider. (6.) A good powerful foot brake upon the large wheel. (7.) The alternative use of either a cushioned seat or saddle, for a lady or gentleman. This is certainly a formidable list of advantages, but they are confirmed by the construction of the machine, which, at the same time, is light and elegant. —Iron.

SEA BEANS.

Quite an important industry has lately sprung up in Florida in the preparation and mounting, as watch charms, sleeve buttons, ear drops, etc., what are commonly known as Florida sea beans. At St. Augustine the United States Government has a sea bean factory, where a large number of Indian prisoners are employed polishing these pretty and curious products—of the sea, it is popularly supposed.

"I can get no clew to their origin," said an intelligent Florida tourist the other day. "They are said to come from the sea. Do they grow there?" Another gentleman, who had been connected with a popular winter resort in Nassau, was quite positive that they were a marine product. The encyclopedias are silent with regard to them. Tourists and tourists' books, guide books, and similar sources of information fail to explain their origin. They are for sale in all the fancy stores and notion shops, and at all the street corners by curbstone dealers in cheap jewelry. Everybody knows what they are; but all that is popularly known about their origin is that they are picked up along the Florida beaches after storms, and that large quantities of them are brought from the Bahamas, where they are likewise washed up from the sea.

On splitting one open it was at once apparent that it could not have grown in the sea; no marine plant bears dicotyledonous seeds. It was clearly a bean of some sort, and if they did not grow along the beaches where or near where they are picked up, they must have grown elsewhere, and possibly may have been floated by the Gulf Stream from the South. Thither we sought for them; and to save other inquirers the labor of identifying them we will say that after much research we were able to trace them to their native soil.

They are well known in the West Indies, where they are variously called from their appearance ox eyes and ass's eyes. The earliest description of them and the tree which bears them appears in the second volume of the "Natural History of Jamaica," by Hans Sloane. The tree was found by him

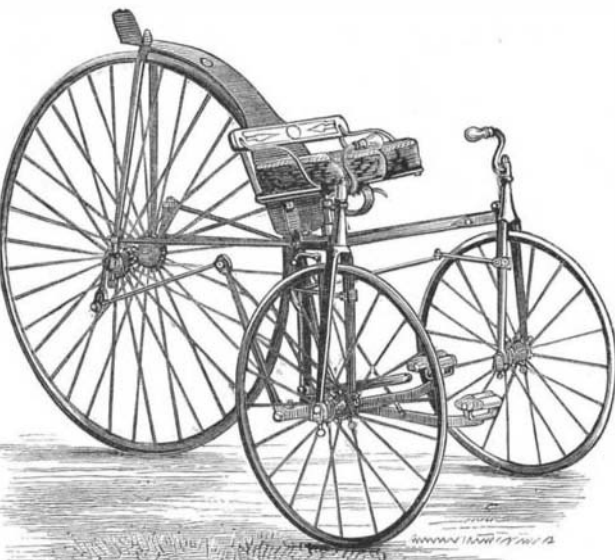
abundantly on low ground "by the river's side under the town and on the Red Hills very plentifully." His description of the tree, which he calls *Cytissus arboreus*, is quaint enough: "This tree has several trunks, each as big as one's leg, rising together, covered with smooth cinnamon colored bark, straight, eight or nine feet high, the branches rising upright, all round about beset with leaves coming out at an inch's interval, three always together, all taking their origin at the end of an inch-long, green, common footstalk," and so on to the end without a stop.

There appear to be several allied trees bearing the different beans sold under the common name. Linnæus describes the ox eye tree as *Dolichos urens*. De Candolle's name is *Mucena urens*. In his splendid "Flora des Antilles," De Tussé figures life size and beautifully colored the stem, leaf, flower, and fruit pod of the tree which yields the larger and handsomer beans, and describes the tree as *Negretia urens*. In many parts of the West Indies the superstitious carry ox eyes in their pockets, as like classes here carry buck eyes or horse chestnuts, and for the same purpose.

New Inventions.

An improved Picket Pin, which the inventor, Mr. P. J. Tweed, of Blair, Neb., claims cannot be pulled from the ground, and around which the tender rope cannot be wound or twisted, has recently been patented. A corkscrew shank gives a firm bearing in the ground, and the rope is swiveled to a washer in a hollow head having a central aperture in its top.

Mr. M. H. Smith, of Ithaca, N. Y., has invented an improved Device for Attaching Harness to the Shafts of horse trucks, buggies, and other vehicles drawn by one horse, the



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operation being accomplished by simply dropping the thills. The apparatus consists of a flanged and spring cushioned socket plate, which is pivoted to a plate clamped to the shaft, and carried, by the lowering of the shaft, over a recessed button on a side plate of the harness, so that a spring catch on the socket plate locks to the button of the side plate.

An improved Temporary Binder, or file for magazines, letters, papers, etc., has been patented by Mr. H. E. Thompson, Jr., of Pittsfield, Mass. To the back is secured a semi-tubular plate having semi-circular end plates. The edges of the long plate are bent over to form tubes, one of which serves as a hinge for two needle arms, and the other is intended as a receptacle for the binding rod when the file is full. The binding rod is adjustable in tubes formed upon the inner side of the end plates. This file may be made right-handed, so that the paper last filed may appear first, or left-handed, so that the papers follow each other in the order of filing.

A new Carpet Fastening, invented by Mr. Warren Aldrich, of Lowell, Mass., consists of a toothed strip, which is guided vertically below the mop board of a room or along the risers of stairs, and raised or lowered by suitable lever mechanism, so as to release or take hold of the carpet.

In an improved Side Bar Wagon, invented by Mr. D. F. Cooper, of New York city, the essential features are two parallel rubber-cushioned springs, which extend from the side bars to blocks on the under side of the body, to which each spring is fastened at two points, being cushioned at the intermediate points.

Mr. E. B. Beer, of Sussex, Canada, has made certain improvements in Targets, which consist, first, in attaching the target rigidly to a lever pivoted to a fixed frame in such a manner that it may be operated to swing the target out of its normal position, to enable it to be conveniently patched; and secondly, in constructing the supporting frame and lever arms or standards of beveled or tapering pieces, so that they may oppose as small a surface to the balls as possible.

An improvement in Wagon Gear and Brakes has been made by Mr. J. J. Pennington, of Henryville, Tenn. This invention is designed to furnish an arrangement by which wheels of equal size may be used, following each other in the same track, and the brakes be automatically applied to the hind wheels, or all the wheels, on descending ground.

A Book Rack for Church Pews has been invented by Mr. A. R. Sherman, of Natick, R. I. It is so constructed as to hold the books pressed shut, and at the same time allow them to be readily put into or taken out of the rack.

Mr. Albert Gemünder, of Columbus, O., has invented an Organ Pipe provided at the side and above its mouth with one or more openings, and having a corresponding valve or valves, arranged to be operated by suitable mechanism, so that one or a series of tones differing from the natural tone or pitch of the pipe may be produced at the option of the performer.

Mr. C. N. Buzzell, of Monroe, Me., has improved upon common Oven Shelves by pivoting them, making the free ends arc-shaped, and extending the latter as an arm, which serves as a partial support for dishes too large to be supported by the shelf alone. When the oven opens only on one side a single shelf is used; and when it has two doors two shelves are employed, swinging in opposite directions.

In a Ruling Pen, invented by Mr. J. C. Moss, of New York city, a graduated index is added, so that the blades of the pen may be quickly set to correspond with the width of any line which it is desired to rule.

In a new Car Coupling, the draw head has horizontal side slots, with end recesses or seats for the pivots of an adjustable guide frame, so as to extend the coupling link beyond the mouth of the draw head or withdraw it. This is an improvement upon a former patent issued to Mr. D. R. Halter, of Lee's Cross Roads, Pa.

An improved Rain Gauge has been patented by Messrs. Lawrence Dunne and E. T. Richmond, of Morgantown, W. Va. The object is to provide a gauge which will automatically fill and discharge, and will continuously and accurately record, both at the instrument and at a distant point if desired, the amount of rain fall. This gauge has two cylinders containing floats, which are connected by chains running over a chain wheel controlling a spring-actuated train of gearing that operates the supply and discharge valves of the cylinders, and also controls electrical recording apparatus. There is also a device for warming the apparatus, for melting snow or hail.

Mr. C. D. Hyde, of Pitcher, N. Y., has invented an improved Folding Chair, formed by the combination of two pairs of legs, pivoted side bars, seat and back, in such manner that the back may be turned down upon the seat, so that the chair may be slipped beneath a table, or all the pivoted parts may be folded together compactly.

Mr. M. J. Duffee, of Mobile, Ala., has invented an improved Envelope, which he claims cannot be opened after it is once sealed, and be reclosed and sealed again, without being torn or so much injured as to exhibit evidence of such opening. This is effected by subdividing the flaps into a number of overlapping and underlapping parts, which interlock.

A Self-tamping Oil Well Torpedo has been invented by Mr. G. S. Vaughn, of Franklin, Pa. It consists of a cylindrical shell, the upper portion of which is made of an outer and inner cylinder, and filled with plaster of Paris, sand, or other tamping material. A small central tube passes through the shell, and extends downward into the lower part, or torpedo proper, which contains nitro-glycerin. At the bottom of the central tube is an anvil, and side perforations admit the nitro-glycerin. A weighted drop rod having percussion caps at both ends is attached by a ferrule, is guided in the central tube, and explodes the shell by being dropped down upon the anvil.

A Life Boat, lately patented by Mr. G. F. Sievern, of Brooklyn, N. Y., is designed especially for use in a high surf. A double cone buoy, pivoted at one end to the bottom of the boat, projects forward, so as to take the water first and cause the boat to ride easily, and also to divide the wave and prevent breakers from falling on the body of the boat. The buoy is supported by a boom and braced laterally by stays.

Mr. J. M. Lasater, of Manchester, Tenn., has made an improvement in Hames and Sectional Rocking Collars, relating to the construction and arrangement of the parts by which the bearing pads are attached to the hames.

Messrs. J. D. Fahnestock and L. A. Powell, of Aurora, Ill., have patented a process of forming a Dental Plate and Teeth in one homogeneous piece of porcelain, by first taking a pattern of plate and teeth directly from the mouth, and from this forming a sectional mould; then packing this mould with plastic porcelain and subjecting it to pressure, the product being finished in the usual manner.

Mr. T. J. Connell, of Merrimac, Mass., has invented an improved Paint Brush Bridle, composed of sections pivoted at the lower end and held at the upper end by a cup ferrule. The lower end of the bridle is contracted and flattened into an elliptical shape. To the ferrule is attached a long clasp tube, which receives the handle.

A Safety Window-Cleaning Chair has been invented by Mrs. Henry Dormitzer, of New York city. It may be temporarily attached to any window, furnishes a secure support, and may be compactly folded when not in use. It consists of a combination of a platform, folding guards, and supports, suitably arranged.

THE Bethell system of preserving railway ties by creosoting, used in England, is said to increase the life of the ties to 20 or 30 years.