

**New Mechanical Inventions.**

Mr. William H. Pierce, of Tolono, Ill., has patented a new Valve Gear, in which a rod from the hub of the balance wheel of the engine connects with an upright arm having a handle and also two pins arranged equidistant from the shaft, which are used for reversing the engine. Attached to the shaft is an arm, which receives a movable slide, to which last the cut-off connecting rod is pivoted. By adjusting this slide the strokes of the piston can be lengthened or shortened, and the steam supply to the cylinder regulated.

Mr. Paul S. Forbes, of New York city, has patented a new Rotary Condenser, made of a tube coiled into wheel form, and having its ends projecting at the centers of its opposite sides. It is placed in the well of a vessel and constantly revolved in the cold water therein, thus serving to condense the exhaust steam from an engine connected with it.

In order to avoid the work of cutting the screws in a lathe and turning the head and stand, Mr. William Guthrie, of Galva, Ill., has devised a new Jack, both the male and female screws of which are cut in ordinary bolt and nut cutting machines, and both the head of the male screw and the case or stand of the female screw are accurately cast upon the screws after the latter are cut.

Mr. Benjamin W. Hoyt, of Manchester, N. H., has invented a Lath Holder for temporarily supporting laths at any height on the wall. It is made of two hinged sections that turn on a swiveled top piece, with supporting hooks. The lower part has a cross-piece with curved or braced arms, like a basket, for holding the laths, and the middle part additional pointed arms or hooks for being supported on the studding of the wall.

An improved combined Wrench and Vise has been patented by Mr. Homer T. Gates, of Hartford, Ohio, in the jaws of which an object may be securely clamped by turning a nut. The vise may be completed by simply inserting the handle of the wrench in a socket made for the purpose. The construction of the wrench is also such that it may be used in places where wrenches ordinarily cannot be used.

In a new Machine for Cutting Wooden Cogs, invented by Mr. Warren L. Morris, of Victory, Ga., the cutting head, formed of the rotary shaft and its attached knives, has three cutting edges formed in different planes, and respectively used for cutting the working end of the cog, the tenon that fits in the mortise of the cog wheel, and the shank of a cog for receiving a key for securing the former in the wheel rim.

Mr. Ira Winn, of Falmouth, Me., has patented a machine for Removing Bark from Wood. There are a fixed and a revolving spindle for supporting and rotating the stick to be denuded, a centering device for holding the stick until it is engaged by the spindles, a yielding knife for removing the bark, and a stop for shifting the feed.

A new Bit Clamp for Boring Machines has been devised by Mr. Frederick Dezenorf, of Cornwall-on-Hudson, N. Y. It may be adjusted to different sized shanks of bits to firmly hold the same, and consists of two pins that are fulcrumed to the ends of a rigid T piece of a threaded center piece, and are adjusted by a conical nut turning on the latter.

A new Windlass Water Elevator, patented by Mr. Thurston B. Barber, of Baltic, Conn., has an improved construction of chain wheel which prevents the chain from slipping or being wound thereon, and improved devices for tilting the buckets, and a generally new arrangement of mechanism for lowering and raising the latter.

Mr. Edward G. Hall, of Healdsburg, Cal., has patented a new Ore Roasting Furnace for the reduction of cinnabar ores. The ore is placed in a hopper, whence it passes to a drying chamber, being carried along by a coned and tapered screw conveyer. During the passage it is heated sufficiently to drive off the volatile matter. It then goes to a wasting chamber in which is a conveyer which carries it ultimately to another chamber provided to receive it. The quantity of ore carried through the furnace is regulated by sliding the hopper. If the latter is placed over the smaller portion of the conveyer, a less quantity of ore is taken away by the screw than when the hopper is adjusted over the larger portion.

A new Self-Oiling Axle Box for coal cars,

devised by Mr. James Dawber, of Braidwood, Ill., is so constructed that when the car is dumped a quantity of oil flows from an oil chamber to cotton waste, from which it is supplied to the axle.

Mr. Michael Waters, of New York city, has invented an exceedingly ingenious apparatus for automatically replacing a car the wheels of which have run off the track. We cannot explain the mechanism of the device without the aid of drawings. Its operation, however, is briefly as follows: As soon as the car wheels leave the track, broad flanged auxiliary wheels take their place upon it. These are rotated by the forward motion of the car. Mechanism is thus set in operation which carries these wheels outward until they are of the same gauge as the truck wheels, and the car being also raised, the truck wheels are brought over the track. It only remains to lower the car by automatically acting devices to replace it on the rails.

A new Windmill, devised by Mr. John J. Kimball, of Napierville, Ill., embodies two wheels which are geared together and so constructed and arranged that the wind which escapes through one wheel will reach on the blades of the other one. The speed of the wheels may be regulated, and they are caused to edge more or less to the wind as the force of the same increases or diminishes.

Messrs. George and Thomas Shaw, of Dukinfield, England, have patented a Machine for Polishing Vegetable Fibers, such as are used for brush making. The material is heated with a dressing of sizing mixture and then submitted to the action of brushes, whereby they are rendered lustrous and in a measure waterproof.

Mr. George J. Kautz, of Emporium, Pa., has devised a new Sawing Machine, which is an improvement on the apparatus patented by him April 17, 1877. The invention consists of feed mechanism for the lumber, constructed of a weighted top roller and lower spiked roller, in connection with an intermittently-revolving spiked feed roller. There is also a revolving circular saw, turning in a swinging frame. A lever arrangement throws the feed mechanism and saw in or out of gear by a suitable clutch device with the driving shaft, and regulates the cutting off of the lumber.

Mr. W. H. Whitely, of Joslin, Mo., has invented a new Double Acting Pump, in which there is a double valved piston with two valved suction pipes and a discharge pipe. The advantage claimed for the double suction is that twice as much water is taken up at a stroke as is the case with ordinary pumps, and that the discharge by short strokes is as great as when long ones are made.

Mr. George W. Hooper, of Greene, Me., has also devised a Double Acting Force Pump. A double valve box is located at the foot of a cylinder in which works a valveless piston. There is a water way on one side of the cylinder which communicates therewith at its upper end, and also with one of the compartments of the double valve box. A new packing is used on the piston rod.

An improved Propelling and Dry Dock Attachment for Vessels, devised by Mr. James Curtis, of Middletown, Mo., consists essentially of balanced propelling wheels at the end of a lateral revolving shaft, in connection with water induction and eduction trunks. The latter are arranged with tightly closing, hinged or sliding gates that may be closed, forming a chamber or dry dock, from which the water is pumped for repairing the wheels.

Mr. Edmund Golucke, of Crawfordville, Ga., has devised a new Horse Power for ginning cotton, threshing grain, sawing wood, etc. The improvement consists chiefly in the construction of the gear wheels, which are made of wood with the cogs formed in the shape of tapering plugs inserted between fixed partitions and held by pins which are imbedded partly in the tapering plug and partly in the fixed partition, the plugs being held in place laterally by a removable disk or plate. The improvement also consists in the means of attaching the draft levers to the post of the king wheel, whereby they are more securely held in place.

Mr. Stephen M. Redfield, of Maryville, Mo., is the inventor of an improved Tenoning Machine, in which adjustable planes are pressed upon the board by strong band springs, so that they cut equally at both sides when reciprocated by a hand lever.

**Business and Personal.**

The Charge for Insertion under this head is One Dollar a line for each insertion.

Removal.—Keuffel & Esser, Manufacturers and Importers of Mathematical Instruments and Drawing Materials, have removed to 127 Fulton and 42 Ann Sts., New York city.

Alcott, Mt. Holly, N. J., pledges power to equal any Turbine.

Carpenters.—Your Saws will cut straight by using my Joiner: the teeth will all be of an equal length. Sample by mail, 25 cts.; \$2 per doz. E. Roth, New Oxford, Pa. I want agents.

Plows.—Two good practical Plow Patents for sale, or to make on Royalty. Terms to suit. Equally adapted for Steel or Iron mould boards; many thousands sold in New England in past few years; correspondence solicited. Address Solomon Mead, New Haven, Conn.

Want Iron and Steel Drop Forgings; Brass, Mall Iron, and Cast Steel Castings—small. Jas. A. Field, Milton, Mass.

For the best and most practicable Brick Making Machine, address Chambers Bros. & Co., Philadelphia, Pa.

For Sale.—One Putnam Gear Cutter, Brown & Sharpe Universal Milling Machine, one No. 2 Pratt & Whitney Screw Machine Wire Feed, one New York Steam Engine Co.'s Shaper, 8 in. stroke. Bullard Machine Co., 14 Dey St., New York.

Wanted.—2d hand modern Planer in good order, 24 to 30 in. x 6 to 8 ft. long; power cross, down and angle feed. Address O. Canuteson, Lock Box 108, Waco, Texas.

For Sale.—A well established Engine business; small capital; large profits; plenty of orders; new patterns; good style. Will take part pay in Engines. A good opening for a party with large shop and no work. Address Engine, Worcester, Mass.

Monkey Wrench, U. S. Patent, for sale, for \$500 net. Address Chas. A. Corman, Cochituate, Mass.

For best Sulky Plow made, apply to E. C. Eaton, Pinckneyville, Ill.

Silver Plater's Sets for Amateur, \$5. Batteries, Baths, Silver Solution, and Connections. Union Silver Plating Co., Princeton, Ill.

Wanted.—A Second-hand Engine and Boiler, about three horse power. W. W. Oliver, Buffalo, N. Y.

Sci. Am.—Last 22 vols. at 50 cts. Box 135, Ipswich, Mass.

Self-Feeding Upright Drilling Machine, of superior construction; drills holes from 1/8 to 3/4 inches in diameter. Pratt & Whitney Company, Hartford, Conn.

Hand Fire Engines, Lift and Force Pumps for fire and all other purposes. Address Rumsey & Co., Seneca Falls, N. Y., U. S. A.

North's Patent Universal Lathe Dog; folds all shapes; always in balance; stands up square with the work, and will not "skew." S. G. North, 440 N. 12th St., Phila., Pa.

For power and durability, Alcott's Water Wheel, Mt. Holly, N. J.

Electrical Goods of every description, Annunciators, Bells, Batteries, Wire, Electro-plating Apparatus, etc. Finger, Risteen & Co., Melrose, Mass.

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Silver Solder and small Tubing, John Holland, Cincinnati, Manufacturer of Gold Pens and Pencil Cases.

Chester Steel Castings Co. make castings for heavy gearing, and Hydraulic Cylinders where great strength is required. See their advertisement, page 62.

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For Bolt's Paneling, Moulding, and Dovetailing Machine, and other wood-working machinery, address B. C. Machinery Co., Battle Creek, Mich.

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The Turbine Wheel made by Risdon & Co., Mt. Holly N. J., gave the best results at Centennial test.

2d Hand Iron Planer built by Smith of Salem. Plane 13 ft. x 30 in.; price \$375. A. C. Stebbins, Worcester, Mass.

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John T. Noye & Son, Buffalo, N. Y., are Manufacturers of Burr Mill Stones and Flour Mill Machinery of all kinds, and dealers in Dufour & Co.'s Bolting Cloth. Send for large illustrated catalogue.

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Hydraulic Presses and Jacks, new and second hand. Lathes and Machinery for Polishing and Buffing metals. E. Lyon & Co., 470 Grand St., N. Y.

Corliss Engine Builders, with Wetherill's improvements, Engineers, Machinists, Iron Founders, and Boiler Makers. Robt. Wetherill & Co., Chester, Pa.

C. C. Phillips, 4,048 Girard Ave., West Phila., manufactures Vertical and other Burr Mills adapted to all kinds of grinding; also Portable Flouring Mills.

Shaw's Mercury Gauges, U. S. Standard of Pressure. 915 Ridge Ave., Philadelphia, Pa.

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New Machinery at Second-hand Prices.—Two Brown & Sharp's No. 3 Screw Machines; Five Prentice Hand and Foot Lathes; Six Boiler Feed Pumps; detailed list free. E. I. N. Howell, 720 Filbert St., Philadelphia, Pa.

Friction Clutches warranted to save Rolling Mill Machinery from breaking. Also Hoisting Machines and Safety Elevators. D. Frisbie & Co., New Haven, Conn.

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Felt of every description for Manufacturers' purposes, especially adapted for Polishing, can be furnished in any thickness, size, or shape. Tingle, House & Co., Manufacturers. Salesroom, 69 Duane St., N. Y. Factory at Glenville, Conn.

Bound Volumes of the Scientific American.—I have on hand about 200 bound volumes of the Scientific American, which I will sell (singly or together) at \$1 each, to be sent by express. See advertisement on page 29. John Edwards, P. O. Box 773, N. Y.

Ice Machines. Clayton & Cook, Daretown, N. J.



(1) R. R. R. asks for a recipe for mending china? A. Make a paste of powdered quicklime and white of egg and apply it to the parts to be united.

How is the first span or wire made in building a suspension bridge, where it is impossible for a boat to cross? A. A kite can be used to carry a string across, and by means of the string a rope is pulled over.

(2) C. M. says: I have a cellar floor cemented with ordinary Newark cement. A fine dust sweeps from it every time it is swept. Is there any preparation of silicate of soda or water glass that will cover this cement so as to glaze it, and prevent the surface cement from such abrasion? A. No: none that would serve practically as a remedy. A cheap earthen or cement tile would afford the relief sought. There is a tile made of cement concrete, having a cement face hardened by a patented process, that promises to be very useful in situations like those that you refer to, but it is not yet put upon the market by a manufacture sufficient to supply the demand that will arise for it.

1. Is a wire rope of galvanized iron wire, say of the size of one's forefinger, a suitable electrical conductor? A. Yes. 2. Would such rope answer as well as an ordinary iron rod of 3/4 inch iron? A. No.

(3) F. J. T. asks: 1. What is the nature of soluble glass or silicate of soda? A. It is simply a soda glass having a large excess of soda. It is completely dissolved by continued boiling in water, forming a clear sirupy liquid, used as a varnish for making artificial stone, etc. 2. Can it be mixed with white lead without detriment? A. White lead (lead carbonate) may be mixed with it to form a brilliant white paint; but not the oil lead. 3. Can it be used as a sizing for plastered walls before painting without causing the paint to peel or crack? A. No, not very well.

(4) J. M. H. wishes a recipe for making oiled walnut for furniture? A. There are different processes; one is to partially fill the pores of the wood with a coat of shellac varnish first, and then to finish with a coat of boiled linseed oil. The finest surface is given by applying a preparation called "wood-filler," and then finishing with the oil. This preparation can be obtained ready for use from the large paint and varnish dealers in this city.

(5) M. M. G. writes: A church in this city has a motor operated by the water in the city pipes for the purpose of blowing their organ. The engine is an oscillating one. The water enters through a 2 1/2 inch pipe under a pressure, say, of 25 lbs. After doing its work it is discharged through a 2 1/2 inch pipe into a cistern, the outlet being submerged to save atmospheric pressure, and then into a street sewer, say 30 feet from the engine. Is this discharge pipe large enough, it being the same size as the inlet pipe, to carry away the water after it has been relieved of its pressure? The engine does not work satisfactorily. The fall in the discharge pipe to the cistern is, say, 8 to 10 feet, the fall occurring 20 feet from the engine. A. The areas of the pipes should be inversely as the square root of the head of water in feet. In this case the outlet pipe should be 3 times the diameter of the inlet pipe; the former discharging into the open air. To get the full benefit of the fall of 8 or 10 feet, the water should be discharged above the water in the cistern, and the pipe not submerged into it. You do not avoid the atmospheric pressure by submerging the pipe.

(6) W. N. B. asks for a simple formula for artificial or cement stone for paving purposes? A. Almost all the successful processes are patented. What will prove probably to be the most successful is the carbonizing process, which consists in subjecting the pure cement surface to a bath of carbonic acid gas under pressure. This gives a surface as hard as the hardest marble.

(7) B. R. writes: It is well known that much of the soap in use contains impure elements and is liable to breed disease. Cannot science give us a substitute which shall be free from these objections? A. The use of soap is simply to furnish an alkali which with water will combine with the natural oily exudation of the skin. A little ammonia or borax may be used instead.

How can a feverish condition of the eyeballs and eyelids be removed without medicine? A. Bathe the eyes in cold water freely, do not use them to read either by gas or lamplight or near a window, avoid rich and greasy food, and keep the blood cool with any mild aperient.

(8) F. J. S. wants to know if rain water will become hard in a cement cistern? A. Yes, so long as there is any lime in the cement to be absorbed by the water.

(9) T. F. F. asks how to clean carpets simply and cheaply? A. Use ox gall, 1 pint to a pailful of water, with scrubbing brush and floor cloth, after-