

RECENTLY PATENTED INVENTIONS.

Agricultural Implements.

DOUBLE PLOW.—R. V. E. RASMUSSEN, Emdrup, Copenhagen, Denmark. This new improvement relates to double plows designed especially for plowing on inclined surfaces, as the sides of hills, and is constructed to be used in either direction, having the beam mounted to turn to coact with either share. The plow works easily, and the position of the beam can be quickly changed.

PLOW.—S. V. JEFFORDS, Waycross, Ga. In working young plants, the furrows should be formed as near as possible to the roots. Working close up to the plants with a shovel or half-shovel cultivator is objectionable, as the dirt is thrown beyond the plants or upon them, with mashing-down or bending-over results. To overcome such objections, Mr. Jeffords has invented an attachment adapted to be used with any type of plow or shovel cultivator whereby sliding action of the sod up the plow is obstructed, with effect to break and loosen it, the better adapting it for hilling up young plants.

Engineering Improvements.

ENGINE.—G. COLOMBO, North Bergen, N. J. In the present case the improvement has reference to an engine adapted particularly for use in connection with steam as a motive force, the engine being provided with a new and novel form of continuously-turning valve and a cut-off working therewith.

ATTACHMENT FOR AIR-BRAKE SYSTEMS.—J. W. ALEXANDER, Bridgeport, Ohio. The particular object in view in Mr. Alexander's invention is to provide a drum or reservoir with a blow-off attachment which may be operated from a locomotive-cab and which subserves two purposes—first, to remove the water accumulated in the drum, and, second, to suddenly relieve air-pressure in the train-pipe as required for an emergency-brake.

VALVE MECHANISM.—J. T. FENTON, Philadelphia, Pa. This device belongs to the class employed in multiple-cylinder engines, and the object of the invention is to provide a valve mechanism arranged to control the admission and exhaust of the motive agent to and from the cylinders in proper succession, to allow of using the motive agent expansively, to permit of varying the cut-off, quickly reversing the engine, and shutting off the motive agent when desired.

Hardware.

ROPE-CLAMP.—J. S. HERMANSON, West Superior, Wis. In the operation of this device, the rope in the clamp is free to move downward and to the left, but not in the opposite direction. The least movement upward and to the right causes the rope to bear upon a channeled surface, thus forcing the teeth of a movable jaw toward the teeth of a stationary jaw and firmly securing the rope. By means of a handle the rotund portion of a cam can be forced into engagement with the upper end of the movable jaw, thereby causing the teeth to move asunder, thus releasing the rope. The teeth grip the rope as soon as the handle is released.

IMPLEMENT FOR APPLYING AND CLINCHING FENCE-WIRE CLAMPS.—G. H. WRIGHT, Spokane, Wash. In this implement, one object is to bend the fastener around the wires and to bend the wires themselves at the point of intersection; another, to so construct the parts of the tool that the clamp may be placed in the tool, and by a slight movement of the bending-jaws the clamp is seized by the jaws so as to be held in the implement; another, the provision of bending-jaws to seize the clamp, and to bend parts of the latter around the wire; and another, to provide means for holding the tool against displacement on the wires, and being operable with the jaws, so as to open for the application of the tool to a line-wire.

CLAMP.—R. H. MAKOWSKY, New Haven, Conn. This case relates to improvements in clamps for the use of cabinet-makers and other woodworkers, the object being to furnish a clamp of simple construction that may be used as an ordinary clamping device and also may be employed as a vise adjustably connected to a bench.

COLUMN-CLAMP.—A. A. LOEFISCHER, Dubuque, Iowa. A means for clamping together masses of material is provided by this device. In use, a chain is thrown loosely around the object to be clamped, and a screw is rotated in the proper direction to move the blocks apart to a maximum distance. The chain is next drawn as taut as convenient by inserting a hook in some one of the links intermediate of the end of the chain. Then grasp the handle, turn the screw, and tighten the chain around the structure.

SASH-LOCK.—J. MAC VANE, Riverside, R. I. This construction locks both sashes in closed positions or when either or both are opened for ventilating. The lock is carried by one sash and equipped to move the bolts simultaneously to their retracted positions, the bolts being projected to their operating positions by springs and adapted to separately engage with a pulley-stile and the other sash stile. A lever carries a dog which engages with the bolt for the upper sash, and in the path of the lever drops a detent for holding the lever against operation, the detent being placed in an inaccessible position from an

implement inserted between the meeting-rails of the sashes.

Mechanical Devices.

CUTTING ATTACHMENT FOR CORNICE-BREAKS.—G. R. BYDE, Fresno, Cal. Mr. Byde's invention relates to certain novel and useful improvements in slitting or cutting attachments for cornice-breaks, and has particular application to a mechanism of the type employed for cutting sheet metal or the like of various widths. The machine is constructed so that it is easily attached to ordinary cornice-breaks.

MOVING-PICTURE APPARATUS.—G. M. HIGGINS, Cleveland, Ohio. The prime feature of the invention is the arrangement of lenses mounted to move continuously in an endless path parallel with and at a speed proportional to that of the moving film, these parts moving past the light-admitting orifice, so that the lenses operate successively upon the film, and the parts moving in exact time with each other insures accurate impressions and avoids that objectionable appearance of vibration common to apparatus of this sort. The operation is reversible, and there is an arrangement facilitating the reproduction of the colors of the subjects taken.

CUTTING DEVICE FOR BUTTER, LARD, ETC.—B. HAMBLET, New York, N. Y. It is the purpose of this invention to provide a new and improved cutting device more especially intended for the use of grocers and other retail merchants selling butter and the like by the pound and arranged to enable the grocer to mechanically and accurately cut the product in the tub or like receptacle into parts of a predetermined weight without the use of scales or other weighing devices.

CRANE.—L. S. FLECKENSTEIN, Easton, Md. This mechanism may be classified as an improvement in cranes whose principal parts are a vertically-rotatable post, a horizontal arm or jib permanently attached to the post, and a winch or drum for winding up the hoisting chain. The crane has many advantages in respect to simple construction and the application of power.

VENDING-APPARATUS.—R. C. KELLY, Davenport, R. STROPPEL, Cedar Valley, and P. F. WYJACK, Iowa City, Iowa. These inventors have secured patent rights on a machine adapted especially for vending cigars from the boxes in which they are packed, and the vending apparatus is associated with certain peculiar coin-controlled devices, so that upon the insertion of a coin into the machine a cigar will be delivered.

Railway Improvements.

RAILWAY-TIE.—J. S. MILLER, Clinton, Neb. This invention relates to improvements in railway-ties, the object in view being to provide a tie, consisting partly of wood and partly of metal, so constructed that the rails may be prevented from spreading and will rest on the wood portions, thus obtaining the requisite elasticity.

RAILWAY-RAIL.—G. A. CASE, Joplin, Mo. This sectional rail constitutes an improvement over the construction covered in a prior patent of Mr. Case. The present invention is directly concerned with the base or main section of the rail; and the object is to construct this section tubular so that compressed air or fluids of any sort may be transmitted through the rail without interfering with the use of the rail in its ordinary capacity.

MAIL-CRANE.—T. J. CONWAY, Blanchester, Ohio. Certain useful improvements in automatic mail-cranes or mail-delivery devices are provided by this invention, the object of which is to provide a mechanism of this character capable of being readily placed in position for immediate use. After a mail-bag has been taken away from the automatic mail-crane by devices on a passing train, the crane automatically swings away from or into a position parallel with the track.

FOLDING CAR-STEP.—N. GRAY, Louisville, Ky. In this contrivance the improvement has for its object a novel construction and combination of parts whereby the folding car-step may, together with the vestibule-door, entirely close the outer side of the vestibule when the folding step-section is closed and by which this section may be closed through the aid of a trap-door forming an extension of the car-platform when properly adjusted.

CAR-AXLE BOX.—J. MALTRY, Omaha, Neb. The principal object of this improvement is to provide for a constant supply of lubricant to the journals of the axle and to prevent the entrance of dust into the oil or lubricant chamber. Another object is to so construct and arrange the parts that the chamber may be readily removed or detached from the journal.

Vehicles and Their Accessories.

BICYCLE.—B. F. MODISSETT, Helena, Ark. The parts in this construction are organized in a new way, so as to bring the carrying-wheels into parallel relation and to suspend the weight of the load close down to the ground. An improved steering device insures the control of the wheels separately by levers within reach of the hands and these levers may be shifted so as to steer on any course or to simultaneously move the wheels to positions for arresting without a brake. The machine is equipped with a mechanism adapted to use the power of the hands and feet to secure high

speed. The frame is so mounted on the axles as to reduce the shock when a wheel drops into a rut or depression.

RUBBER TIRE.—R. AUSTIN, Brooklyn, N. Y. This tire comprises an endless member of resilient material, provided with bearing-plates spaced apart and buried therein, each plate being provided with central perforations and mutilations upon its edges, for anchoring the central portions and the edges firmly within the resilient material, and a wire within the material and encircling all of the bearing-plates. This wire is totally disconnected from the plates and spaced asunder, so that the material forms a cushion as between the bearing-plates and the wire.

Miscellaneous.

STOVE OR RANGE.—B. F. ALLEN, St. Louis, Mo. Improvements in stoves and ranges are provided by this invention whereby the heat generated in the firebox can be utilized either for cooking or quick baking by shifting dampers, so as to cause the heat to traverse around the oven before reaching the chimney or to direct the heat into the heating-chamber under the top plate without causing the heat to pass around the oven.

NON-REFILLABLE BOTTLE.—J. C. GUSTAVSON, Providence, Utah. This bottle has for its object the provision of a construction which will permit the contents to be dispensed, but will prevent its refilling and will include means whereby to prevent the insertion of wires or other instruments to displace the valves arranged to prevent refilling.

FIRE-ESCAPE.—J. TRIPLETT, Campbells-ville, Ky. The particular object in this improvement is to provide a simple construction readily applicable to a door, window, or other support in or adjacent to a room, and by which safe descent can be made by means of a rope or cable and in so doing will elevate another rope, so a second person can descend, who in turn will raise the first rope, so that an unlimited number can escape by alternately using the two cables supplied to the apparatus.

TOOTH-BRUSH.—C. A. TORRANCE and G. S. STONE, Talmage, Neb. The purpose of these inventors is to provide a tooth-brush so made as to feed an antiseptic solution to the bristles for the prevention of disease. The brush is furnished with a hollow member having an inclosed measuring-chamber and suitable valves and connections for regulating the admission and discharge of an antiseptic liquid from the chamber to the bristles of the brush-head.

SUBMARINE CONSTRUCTION.—L. L. RINALDI, Somerville, Mass. This invention relates to the construction of piers, sea-walls, lighthouses, and the like; and the object is to provide a submarine construction arranged to permit of placing the building-blocks in proper position below the water-level to securely fasten the lowermost layer of blocks in place on the bed of the waterway and form a secure, durable and accurate foundation in quiet waters as well as in strong currents.

SELF-FEEDING MATCH HOLDER AND IGNITER.—C. H. SCALES, Toronto, Canada. Provision is made in this holder for the safe storage of matches in a manner to expose them for ready access, so that they can be withdrawn individually for use, thus saving the quantity used, which is an item where matches are offered gratis. A striker is associated with the magazine to facilitate ignition of the match on the withdrawal thereof from the magazine, thus avoiding striking matches against a wall. Means are supplied for receiving burned matches, and also to enable the holder to be used in connection with matches of different lengths.

JAR.—J. A. MAXSON, Cogar, Oklahoma Ter. The purpose in this invention is to provide a new and improved jar for containing fruits, preserves, meats, and other fruit products and arranged to insure hermetic sealing of the mouth of the jar to protect the contents against air, moisture, and other influences tending to spoil the goods.

ANIMAL-YOKE.—W. M. LANDERS, Lawn, Texas. Mr. Landers' invention has reference to improvements in animal-yokes, particularly for cattle, the object being to provide a simple and comparatively cheap construction that will prevent an animal wearing the yoke from passing through a wire or other fence. It may also be applied to horses or mules.

CAMEO GLASS.—A. H. FREEMAN, Mount Vernon, N. Y. The intention in this improvement is to provide a new cameo glass designed for use in colored-glass windows or other articles utilized for ornamental purposes or for glassware and arranged to represent in relief any pattern or predetermined design in the desired colors to produce a highly artistic effect and enhance the appearance of the article.

PRINTER'S GALLEY.—W. A. FAUCETT, Raleigh, N. C. In this case the aim is to provide a galley which will hold in proper condition type-set matter that is subsequently transferred to the bed or "stone" for "make-up" into "form" by keying such matter in columns within a chase. Measuring scales for the galley show the length of a "slug" of type-set matter at a glance, and facilitate the making up of a column of predetermined length by avoiding the application of a rule thereto.

HYPODERMIC SYRINGE.—T. A. CHAPPELL, Bronwood, Ga. This syringe has an

expandible plunger-head and means for expanding the head and relieving it from pressure. It is so constructed that it may be charged from the side, and when a tablet is introduced it will be pressed by the plunger-head at its inward movement against an anvil-surface within the body of the syringe, crushing the tablet and dissolving it quickly. This invention relates to one previously patented by Mr. Chappell.

DEVICE FOR TEACHING PENMANSHIP.—W. W. FRY, Philadelphia, Penn. That class of devices for teaching penmanship in which a slotted sheet or backing is associated with a guide-copy, is represented by this invention. The object of the invention is the provision of means whereby a series of guide-copies may be interchangeably placed in position before the pupil and in which each copy is held in place and flat by devices adapted to permit the easy and quick introduction and removal of the copy.

FARM-GATE.—J. T. YAGER, Brownsboro, Ky. The purpose of this improvement is to provide a farm-gate adapted to open from either side and so to hinge the gate to a swing-post and an operating-lever mounted on the post that when the lever is moved upon its pivot the first action of the gate will be to raise itself at its outer or free end, thus disconnecting the gate-latch from its keeper, the next action of the lever swinging the gate and opening it in the desired direction. The operating-lever carries means for preventing the gate when swung closed from passing beyond the closed position and when the gate arrives at this position to carry the checking means out of checking action.

COPY-HOLDER.—S. C. HOYLE, Bryan, Texas. The purpose of the inventor is to provide a holder which will keep the place during the task of copying and will turn the leaves of the shorthand-book, thus obviating the removal of the book from the holder until all the copying is completed; and, further, to provide means for automatically operating the device through the medium of the carriage of a typewriting machine or manually, as may be convenient.

LAMP.—B. NADEAU, Boston, Mass. This lamp is of that class intended to be used with gas as a fuel and to carry an incandescent mantle. The aim of the invention is to improve the lighting efficiency of the lamp, which end is attained by certain features and parts serving to confine the heat to the immediate vicinity of the burner, thus facilitating the combustion of gas.

RECORD ATTACHMENT FOR WAITERS' OR MERCHANTS CHECKS.—A. WYSE, New York, N. Y. This recorder's purpose is to provide a device for use of waiters' and merchandise checks to carry a duplicate of the amounts of individual checks used during a given period or a duplicate of the totals of individual checks, and means enabling a checker to as readily make the entry on a tally sheet as on the check. Another purpose is to place the record in an endless form upon a support, and to provide means to enable each waiter, checker, or salesman to have at hand during the service a complete duplication of prices of articles sold during such time and enabling persons comparing accounts to have before them a record of sales made by each one employed during specified periods of time.

HEATER.—O. F. ROGGENKAMP, Seneca, Kan. In operation the drum of this heater is to be filled with fuel such as corn-cobs or long sticks of wood standing upright. The combustion will take place in the base or fire-box, and the products of combustion will pass through the drum and the pipe. This self-feeding heater may be made of comparatively light metal.

COMBINED WATER HEATER AND CONDENSER.—W. TATE and M. L. CABLE, Greensboro, N. C. The inventors have for their object improved means whereby feed-water for steam-boilers and heating plants generally may be more effectually heated by exhaust-steam or return water from radiator heating systems. Means are adapted to condense exhaust-steam and the water thereof be mingled with the feed-water as it passes through to a hot-water pump operating to force the heated feed-water into the boiler.

PICTURE-HOLDER.—EMMA C. ETHERTON and G. E. POWELL, Atlantic, Iowa. The intention of the inventors is to provide an improved holder manufactured from spring-wire in such a way that it may be expeditiously applied to pictures, plaques, photographs, mats and other flat objects, so as to securely engage therewith. The device may be equipped with a leg member adapted to support the holder and the article engaged therewith in a standing position.

DRESSER.—J. L. LARSON, Butte, Mont. The invention relates particularly to improvements in the arrangement of mirrors for dressers, the object being to so mount a plurality of mirrors that their angle may be adjusted one independently of another for such relative adjustment that a person may at one time receive the reflection from the front and sides or from the front, sides and back.

Designs.

DESIGN FOR MATCH-SCRAPER.—A. B. RISLEY, Hoboken, N. J. The design consists in a background which represents a barn, a match-receptacle which is in the form of a feed-box and represented as supported in close relation to the barn, and in the exhibition

of a donkey in relief waiting for the feed supposed to be in the feed-box.

DESIGN FOR A BOX-COVER.—H. L. CROLL, New York, N. Y. The design is produced on the top of a box cover and consists in a major wreath, inclosing two minor wreaths, and these minor wreaths respectively inclosing portraits.

NOTE.—Copies of any of these patents will be furnished by Munn & Co. for ten cents each. Please state the name of the patentee, title of the invention, and date of this paper.

Business and Personal Wants.

READ THIS COLUMN CAREFULLY.—You will find inquiries for certain classes of articles numbered in consecutive order. If you manufacture these goods write us at once and we will send you the name and address of the party desiring the information. **In every case it is necessary to give the number of the inquiry.**

MUNN & CO.

Marine Iron Works. Chicago. Catalogue free.
Inquiry No. 4231.—For manufacturers of aluminum bones for sharpening knives.

AUTOS.—Duryea Power Co., Reading, Pa.

Inquiry No. 4232.—For makers of Ferris wheels for use at fairs and summer resorts.

Morgan Emery wheels. Box 517, Stroudsburg, Pa.

Inquiry No. 4233.—For makers of fans driven by spring motors.

"U. S." Metal Polish. Indianapolis. Samples free.

Inquiry No. 4234.—For catalogues, prices and descriptions of automobiles suitable for a livery.

Blowers and exhausters. Exeter Machine Works, Exeter, N. H.

Inquiry No. 4235.—For makers of light, portable bandsawmills.

Handle & Spoke Mch. Ober Mfg. Co., 10 Bell St., Chargin Falls, O.

Inquiry No. 4236.—For makers of plows with an elevator attachment for placing dirt into wagons.

Mechanics' Tools and materials. Net price catalogue. Geo. S. Comstock, Mechanicsburg, Pa.

Inquiry No. 4237.—For domestic and foreign manufacturers of inflatable rubber toys, such as balloons, etc.

Sawmill machinery and outfits manufactured by the Lane Mfg. Co. Box 13, Montpelier, Vt.

Inquiry No. 4238.—For a machine for cutting wire into lengths and winding it around a small package.

Let me sell your patent. I have buyers waiting. Charles A. Scott, Granite Building, Rochester, N. Y.

Inquiry No. 4239.—For a steam jacketed vulcanizer for making artificial rubber limbs, etc.

MANUFACTURERS! Want any parts made of any metal? Write us. Metal Stamping Company, Niagara Falls, N. Y.

Inquiry No. 4240.—For makers of wire cushions for invalid chairs.

Inventions developed and perfected. Designing and machine work. Garvin Machine Co., 149 Varick, cor. Spring Sts., N. Y.

Inquiry No. 4241.—For dealers in second-hand pool and billiard tables.

Manufacturers of patent articles, dies, stamping tools, light machinery. Quadriga Manufacturing Company, 18 South Canal Street, Chicago.

Inquiry No. 4242.—For a mechanical lawn grass (not leaf) rake.

FOR SALE.—Patent No. 670,432. Hat fastener clasp head as did old elastic, but is applied under hair. Address Emma T. Miller, Urumia, Persia.

Inquiry No. 4243.—For makers of apron springs for use of sporting men, etc.

Crude oil burners for heating and cooking. Simple, efficient and cheap. Fully guaranteed. C. F. Jenkins Co., 1103 Harvard Street, Washington, D. C.

Inquiry No. 4244.—For makers of shot guns, hammer and hammerless guns, etc.

The largest manufacturer in the world of merry-go-rounds, shooting galleries and band organs. For prices and terms write to C. W. Parker, Abilene, Kan.

Inquiry No. 4245.—For makers of hose, hose reels, cut-off nozzles, spanners, hydrant wrenches, axes, etc.

We manufacture anything in metal. Patented articles, metal stamping, dies, screw mach. work, etc. Metal Novelty Works, 43 Canal Street, Chicago.

Inquiry No. 4246.—For makers of small steel castings or small steel pressed work.

The celebrated "Hornsbly-Akroyd" Patent Safety Oil Engine is built by the De La Vergne Refrigerating Machine Company. Foot of East 138th Street, New York.

Inquiry No. 4247.—For dealers in "Wheatstones Dial Telegraph Instruments."

Contract manufacturers of hardware specialties, machinery, stampings, dies, tools, etc. Excellent marketing connections. Edmonds-Metzel Mfg. Co., Chicago.

Inquiry No. 4248.—For dealers in phosphorescent sulphide of calcium.

WANTED.—A competent and energetic foreman for brass manufacturer making brass fittings. One who is a good manager of men and systematic in the handling of work, also practical in designing tools. A growing opportunity for the right man. Address with references "Brass Manufacturer," Box 773, New York.

Inquiry No. 4249.—For machinery for grinding bones for fertilizing purposes.

FOR SALE.—Patent desk calendar (No. 722,705, March 17, 1903) accepted by four San Francisco wholesale stationery houses for regular drummers' line for Pacific coast. A money maker for party who has means to introduce extensively. F. H. Smith, 2019 Broadway, San Francisco, Cal.

Inquiry No. 4250.—For makers of adding machines.

Manufacturers desired for the manufacture under royalty of valuable U. S. air compressor patents. Invention great success and growing rapidly into large use abroad. Principals only dealt with. Full particulars on application to Box 722, c. o. Judd's, 5 Queen Victoria Street, London, England.

Inquiry No. 4251.—For information as to the new telephone system lately devised.

WANTED.—A factory superintendent for progressive manufacturer of brass and iron fittings. A man versed in general machinery and tool practice and thoroughly systematic in management of work and output. Must be qualified in the handling of men and perfectly reliable for taking charge of factory. Give references and address "Manufacturer," Box 773, New York.

Notes and Queries.

HINTS TO CORRESPONDENTS.

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.

Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(9035) J. T. K. asks: 1. I want to magnetize a needle to saturation, steel $\frac{1}{4}$ x 1-16 inch, 3, 6 or 12 inches long (but I suppose the length would not make any difference, so it was long enough for the winding). How many ampere-turns should I use? How long should the current be kept in the circuit? A. To magnetize a bar of steel by a battery, wind a coil of a few turns of wire of such a size that the bar will slip easily through it. Connect it to the current, and pass the bar back and forth a few times from the middle to the end and then to the other end, etc., stopping at the middle before cutting off the current. If you have an electromagnet with an iron core such as a telegraph sounder, you can magnetize a small bar by drawing it from end to end along one of the ends of the core of the electromagnet. It is well to draw it in the opposite direction along the other core, also, the same number of strokes to each core. If you would use a dynamo current for the magnetizing, you may connect the coil or electromagnet for the purpose in series with a lamp, arc or incandescent, and use the current which lights the lamp to do the work. 2. Have you a SUPPLEMENT that explains how to wind a transformer for a certain output, both step-up and step-down? That is, how many primary turns to how many secondary turns? If not, where can I get a book at low cost that will tell? A. We have not published any plans for transformers. You will find some in the book "Electrical Designs," which will take 200, 400, or 1,000 volts, and deliver 15, 32, 50 or 100 volts, or the reverse.

(9036) A. W. writes: During a late residence of five months on the highland of Bolivia at 13,000 feet above sea-level, I noticed that all colorless transparent glass assumed a deep violet hue after a short time. The neighborhood is flat and sandy, forming the bed of a dried-up lake. The district is subject to violent electrical disturbances. Borax, magnesia and niter are present. Can you tell me the cause of the violet color of the glass? A. We should look for the cause of the discoloration of the glass to some substance in the region rather than to the altitude. But we are not able to explain the case satisfactorily to ourselves. Some reader may have knowledge on the matter.

(9037) A recent note gave figures for the pressure used in organ bellows in pounds per square inch. It is the custom of builders to rate the pressure to be used in the organ in inches of water, determined by the difference of level in the two arms of a "U" tube, one arm of which is connected to the bellows. In our statement the error was made to give as pounds per square inch figures which should have been given as inches of water. A firm of builders has given us the following data: "Pressures of air usually employed are 3 to 3½ inches on the manual pipes, and 3½ to 4 inches on the pedals. In very large organs this is very often increased as high as 8 inches on the pedals and from 8 to 15 inches where there is a solo organ."

(9038) W. L. W. asks: Requiring to gild the first surface of a glass mirror whose surface must remain optically true, we have tried the formula furnished by Prof. Schwarzenbach. The experiment has failed entirely, although conducted with care. Can you say also whether any particular method for making the marsh gas is required to insure purity? A. The following process, devised by Wernicke and improved by Böttger, will undoubtedly give thorough satisfaction. Three solutions are prepared. a. Dissolve 1 gramme pure gold in aqua regia, evaporate to dryness in the water bath to expel excess of acids, take up with water and dilute to 120 cubic centimeters. b. Dissolve 6 grammes pure caustic soda in 100 c.c. of water. c. Reducing solution: Dissolve 2 grammes dextrose in 24 c.c. water and add 24 c.c. alcohol and 24 c.c. acetaldehyde of 0.870 spec. grav. This solution should always be freshly prepared, as it deteriorates on standing. For gilding, mix in the ratio of 64 c.c. of solution a, 16 c.c. of solution b, and 1 c.c. of solution c. The glass surface to be gilded should be cleaned thoroughly with caustic soda solution, but not with acid. Marsh gas is obtained in pure form by mixing 2 parts sodium acetate, 2 parts caustic potash and 3 parts quicklime, and heating the mixture.

(9039) M. K. McQ. says: 1. What amount of electricity is used in decomposing a given amount of water? A. One coulomb of electricity will decompose water so as to give 0.00010384 gramme of hydrogen and 0.0008256 gramme of oxygen. This is an amount of current given by one ampere flowing at a pressure of one volt for one second. Any other amounts are calculated easily from this. 2. Give a formula or recipe for a cement that will firmly unite meerschaum and silver. As a subscriber of the SCIENTIFIC AMERICAN I cannot say enough in its praise as an up-to-date scientific publication. a. Dissolve good glue in water and add half as much linseed oil varnish and one-quarter as much Venice turpentine as the amount of glue used. b. Mix 3 parts copal varnish, 1 part linseed oil and varnish, 1 part oil of turpentine and 1 part glue. c. Mix Canada balsam with carpenters' glue 2 ounces and Venice turpentine ¼ ounce.

(9040) O. R. B. asks how to lag pulleys. A. Cast-iron pulleys may be lagged with leather without the use of rivets, by first brushing over the surface with acetic acid, which will quickly rust it and give a rough surface; then attach the leather to the face of the pulley with cement composed of 1 pound of fish glue and ½ pound of common glue. To Cover Pulleys with Paper.—Scratch the face of the pulley with a rough file thoroughly, so that there are no bright or smooth places. Then swab the surface with a solution of nitric acid, 1 part; water, 4 parts; for 15 minutes; then wash with boiling hot water. Having prepared a pot of the best tough glue that you can get, stir into the glue a half ounce of strong solution tannic acid, oak bark, or gallnuts, as convenient to obtain, to a quart of thick glue; stir quickly while hot and apply to the paper or pulley as convenient, and draw the paper as tightly as possible to the pulley, overlapping as many folds as may be required. By a little management and moistening of the paper, it will bind very hard on the pulley when dry, and will not come off or get loose until it is worn out. Use strong hardware wrapping paper.

(9041) G. F. M. says: 1. Do you know of a process to remove iron rust, fats or acid stains from marble, without cutting it down? A. Grease spots can often be removed by applying over the spot some fuller's earth or powdered chalk, saturated with benzine; let lie for a few hours, then remove and scour. Acid stains cannot be removed, as they eat into the marble. Iron stains can sometimes be removed by the use of hot strong caustic soda solution. Oxalic acid is much more likely, however, to remove the stain, but will more or less attack the marble. 2. What substance will produce the greatest volume of gas when brought in contact with fresh or salt water? A. Metallic lithium will probably yield the greatest volume of gas when brought in contact with water. Theoretically, 7 pounds of lithium will yield 1 pound of hydrogen gas, equivalent to over 5,000 liters, or about 180 cubic feet.

(9042) G. W. says: Would you please send me a receipt for making a good library paste, one that will keep for an indefinite length of time and one that would answer the purpose of a photo-mounter? A. Dextrine forms the base of nearly all library pastes. The dextrine is treated chemically, and the manufacture is entirely unlike that of ordinary pastes. Many of these pastes are patented. We have no definite formula. For \$1 we will look up and send two or three copies of patents which will give you an idea of the composition and methods of manufacturing such pastes.

(9043) J. J. McV. says: Can you inform me where I can obtain the following information in regard to wood pulp? 1. About what is its weight per cubic foot when in the pulp? Also its weight per cubic foot after it has been compressed into the solid form? A. Wood pulp is always put on the market in the form of a coarse board; the specific gravity in this form will vary, being dependent on the nature of the wood, the method in which the pulp has been made, and its relative dryness. We cannot find any figures published, and doubt whether any determinations have been made of its specific gravity. 2. Can it be made impervious to moisture, and reasonably free from decay, if placed in the earth? And does the process of making it so materially increase the cost? A. The treatment to which pulp is subjected in the manufacture of indurated ware, fiber pipe or papier mache makes it quite impervious to water. The cost of such treatment is considerable, relative to the cost of the wood pulp itself. 3. When compressed into the solid form what is its tensile and shearing stress per square inch? A. We know of no records of these tests. 4. What is the approximate cost per cubic foot or pound of the compressed product when made from the coarsest, cheapest kinds of timber, in large quantities? A. We have no information on this subject. 5. What is the process of making the pulp from the coarsest timber? And also how is it made waterproof? A. There are two general methods, mechanical and chemical. The mechanical is simply a grinding operation. The chemical method is subdivided into two, the soda method and the sulphite method. Descriptions of the methods of making wood pulp are beyond our limit of space, but the details can be found in all chemical technologies. It is waterproofed with rosin dissolved in boiled linseed oil.

NEW BOOKS, ETC.

INDIA RUBBER AND GUTTA PERCHA. By T. Seeligmann, G. L. Torrilhon and H. Falconnel. London: Scott Greenwood & Co. New York: D. Van Nostrand Company. 1903. 8vo. Pp. 402. Price \$7.50.

A complete practical treatise on these two gums, dealing with the historical, botanical, arboricultural, mechanical, chemical, and electrical aspects is this work, translated from the French by John Geddes McIntosh. The literature of rubber is extensive, as is shown by the excellent bibliography. It is rather surprising that the invention of vulcanization is credited to Nelson Goodyear instead of Charles Goodyear. It is to be hoped that the error will be corrected. The book is an excellent one, but some views of American rubber plants might have profitably been included, also rubber-tire making. Foreign authors are apt to forget that the rubber industry was brought to perfection by American inventors. Thomas Hancock does not deserve much credit for what he did, and the story is not given in the volume before us.

LE NAVIRE POUR PASSAGERS. Essai sur un Type Nouveau de Navires sans Tangage et sans Roulis Evitant Ainsi le Mal de Mer aux Passagers Inchaivrables et Insuissibles après Abordage. Par C. Turc, Lieutenant de vaisseau, Ancien élève de l'Ecole polytechnique. Paris: E. Bernhard et Cie. 1903. Pp. 88.

INDEX OF INVENTIONS

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