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For Steam Fire Engines, address R. J. Gould, Newark, N. J.

Old Furniture Factory for Sale. A. B., care Jones Scale Works, Binghamton, N. Y.

Notes & Queries.

[We present herewith a series of inquiries embracing a variety of topics of greater or less general interest. The questions are simple, it is true, but we prefer to elicit practical answers from our readers.]

1.—PITCH OF A PROPELLER.—Will you please explain the meaning of the term "pitch" used in describing a screw propeller?—J. D. E.

2.—SAPONIFICATION OF LINSEED OIL.—What will cause linseed oil to turn to soap after absorption by a piece of woolen goods?—J. D. E.

3.—REDUCING VALVE.—If I wish to drive my engine with a pressure of 50 lbs. on the square inch, the gage on my boiler showing 100 lbs. on the inch, can I do so by using an intermediate boiler and a reducing valve? What is a reducing valve?—A. H.

4.—BRICK BURNING QUERIES.—How shall I remedy a kiln of brick in which the fires have been allowed to go out during the burning, leaving the bricks too soft? If I take down, soak in water, reset and burn over, can anything be put in the water to improve the quality of the brick?—S.

5.—SAW MILL HANDS.—Please tell me why it is next to impossible to find a man who thoroughly understands the management of a circular saw mill? Such is the case in this State (Tenn.) Is it because a saws harder to run than any other tool?—G. V. V.

6.—MECHANICAL DRAWING.—What is required of a young man in addition to a thorough knowledge of mechanical drawing, to fit him for a position as draftsman in a first class machine shop? Is a practical education in the principles and construction of machinery, or a course in mechanical engineering, essential?—S. J. L.

7.—ATTRACTION.—Two leaden spheres, each one foot in diameter, are placed with their centers four feet apart. What is the force with which they attract each other? What is the force that unites two pith balls, when floating near each other upon the surface of water?—A. F. M.

8.—REVOLUTION OF THE EARTH.—Would the earth's velocity upon its axis be increased by moving matter from the equator to the poles?—A. F. M.

9.—RADIATION OF HEAT.—Does the radiation of heat depend upon air, and would heat radiate in a room or vessel from which the air was exhausted? If air be essential in the case of heating a house, would not the register supply sufficient air to the air chamber and so dispense with a draft through the chamber? The particular question is: Can I heat a house by a furnace with the air draft closed?—H. P.

Answers to Correspondents.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries however, when paid for as advertisements at \$1 00 a line, under the head of "Business and Personal."

ALL reference to back numbers must be by volume and page.

TARNISH ON BRASS.—To A. P.—We have given many directions for cleaning polished brass. See pages 281, 298, 314, and 329, of volume XXV. of the SCIENTIFIC AMERICAN.

CEMENTING RUBBER TO SHEET IRON.—D. P. W. should try either or both of the methods described on page 42 of volume XXV. and page 42 of volume XXVI. of the SCIENTIFIC AMERICAN. If he paints his sheet iron with a thick metallic paint, he can fasten his rubber on with glue or any cement he chooses.

POWER OF ENGINE.—By a slip of the pen, there is an error in my answer, on page 170, to this query. The horse power, theoretically, is 1 856, which is subject to variation as I mentioned.—D. B., of N. Y.

ELIMINATION OF MERCURY.—To I. H. M., query 9, page 138.—Place the tin amalgam in a retort, and distill at a low red heat, conducting the mercury into a receiver of water. If the quantity to be operated upon is small, you may use a hard glass retort.—E. H. H., of Mass.

CEMENT FOR MEERSCHAUM.—To E. S. T., query 10, page 138.—Dissolve carbonate of magnesia in strong hydrochloric acid till saturated. With this solution, make a paste by adding fresh calcined magnesia, and rapidly use the cement so formed for building up the fractured pipe. If a piece is to be cemented in, moisten each edge with the solution, apply a little of the thinnest cement, and bring the pieces into correct apposition. In an hour or less it will have hardened sufficiently to clean off, and the pipe will be quite serviceable.—E. H. H., of Mass.

DRILLING HOLES IN GLASS.—To W. V. B., query 11, page 138.—Use chrome steel for drills, and make the points very obtuse angled. Use a slow motion, with firm and moderate pressure. Moisten continually with a saturated solution of camphor in turpentine.—E. H. H., of Mass.

BOILING OIL.—To V. L., query 12, page 138.—Steam can be used for the purpose, but to obtain the necessary heat, a very high pressure would be required, and would be attended with no advantage over coal where ordinary care is observed.—E. H. H., of Mass.

INDIA RUBBER FOR STEAM JOINTS.—To N. L., query 13, page 138.—India rubber washers exposed to the heat of steam pressure at four pounds and upwards will soon become hard and brittle, but if the joint has been carefully made at first, this will not affect its integrity.—E. H. H., of Mass.

NITRO-GLYCERIN.—To P. G. S., query 20, page 138.—Take nitrate of potash in powder 1 part, sulphuric acid 3 1/2 parts. Mix thoroughly, and cool to zero, then pour off the strong fuming nitric acid, draining thoroughly the mass of sulphate of potash left behind. To this acid and four fifths of a part of glycerin very gradually, taking care to maintain the whole at as near zero as possible. In an hour's time add a considerable quantity of water; the nitro-glycerin will separate and fall to the bottom. Wash it thoroughly with fresh water, and whatever else you do, be careful in all your manipulations with this powerful agent.—E. H. H., of Mass.

CEMENT TO RESIST WATER AND ALCOHOL.—To F. S., query 24, page 31.—You do not say what material is to be cemented. The peeling off depends on an affinity between the cement and the object it is placed on, and what will answer in some cases will not in others.—E. H. H., of Mass.

DRILLING HOLES IN GLASS.—To W. V. B., query 11, page 138.—Holes can be drilled in glass by the use of turpentine constantly applied to the drill.—C. O. I., of Pa.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

FLOW. Charles C. Lewis, Gainesville, Ala.—This invention has for its object to furnish an improved wooden mold board plow. The upper forked end of the standard is attached to the middle part of the plow beam, and the forward branch of the former supports the plow share. The land side is attached by its forward end to the share, to the outer part of which is fastened a brace, which, passing through the lower end of the standard, is secured to the land side. The space at the land side of the plow is closed by a metallic plate. The foot of a solid wooden mold board is fitted and secured in the cavity of the share, by which it is claimed the device is rendered light, cheap, and suitable for furrowing or for use in light soil.

GRAIN CEILING FOR VESSELS.—Constantin Lazarevitch, New York city.—When grain is shipped in bulk from one port to another, and especially to European ports, it is necessary to ceil the part of the vessel which contains such cargo to protect it from dampness. Such ceiling is required by the insurance companies. Boards are therefore placed between the bottom of the vessel and the grain, thus making a second bottom with boards, which overlap each other in that part of the hold. These boards are firmly nailed down to the bottom of the vessel, which renders it impossible to remove them without splitting, breaking, and effectually destroying them. This lumber, consisting of many thousand feet, is consequently sold for fire wood after the grain has been discharged. The object in this invention is to so put in and secure this ceiling that the lumber or boards of which it is composed shall not be injured, but may be removed intact and sold as perfect lumber, thus effecting a very material saving to ship owners, while reducing the cost of freight. The invention therefore consists in securing the ceiling with hooks, which do not penetrate or injure the lumber.

WINDLASS.—Melancton Bryant, Northport, N. Y.—This invention consists of the attachment of the pawl lever for turning the drum of a windlass or winch to the ratchet wheel or disk by a kind of yoke or frame, embracing both sides of the wheel, and confined upon it by sectional annular flanges fitting in annular grooves in the disk, and sliding around the disks in said grooves, for raising the pawl, but binding therein when the pawl is forced against the teeth, and moving with the disk when the latter is turned. When the pawl lever has the end of its short arm pivoted at the axis of the drum, it is capable of being worked much faster than the detachable bar arrangement, wherein two or more hand bars are placed in radial mortises arranged at intervals around the drum.

MUSIC STAND.—Lewis V. Brown, Salisbury, N. C.—This invention relates to an improved music stand whose rack can be extended for large or contracted for smaller sheets of music. The invention consists in making the rack proper on the principle of lazy tongs, of jointed rods, and in combining it with a bar or plate at the back, whereby it is locked in its expanded position. When the stand is not in use it is folded together and can be packed into a narrow space.

FANNING MILL.—James M. Kendall and James Peel, Madelia, Minn.—This invention consists of a simple and efficient arrangement of the shaking shoe and a revolving screen, whereby the grain is first subjected to the blast in the shoe, and then passed through the screen, which is revolved by gearing connected with the fan driving shaft, the said screen being protected from the blast of the fan by a hood. It also comprises a novel arrangement for shaking the shoe, whereby a horizontal and a vertical motion are imparted to the shoe. The shoe is constructed with perforated sides.

SAND-PAPERING MACHINE.—Orra I. Foster, Salem, N. H.—This invention consists of an arrangement of the fan blower for carrying the dust away, the fan blades being applied to a prolongation of the sand paper cylinder or its shaft instead of to the hood of the machine, as heretofore.

CULTIVATOR.—Totten Poling, Guthrie, Iowa.—This invention relates to an improved iron cultivator, which shall be so constructed that it may conform to irregularities in the surface of the ground, and may be readily adjusted to run deeper or shallower in the ground, as may be desired. Suitable appliances enable one of the plows to rise above or drop below the level of the other, thus adapting the cultivator to work upon an uneven surface, and enabling one of the plows to be raised to pass an obstruction without disturbing the other. This construction also forms an arch or rise in the connecting bar so that the cultivator may cultivate both sides of a row of plants at the same time without injuring or breaking the plants. The plow beams may be moved farther apart or closer together, as may be desired, their rear ends having a free lateral but no vertical movement. The plowman, while guiding the plows, walks at the side of the row of plants being cultivated. Bars bent downward and curved rearward to rest upon the ground serve as drag bars to support the plows away from the ground when passing from place to place.

CARRIAGE WHEEL HUB.—Jesse B. Bauman, Shepherdstown, Pa.—This invention relates to an improvement in carriage wheel hubs, the construction of which is such that the spokes, tire and felloe can be readily and easily tightened by means of movable collars, when it is necessary to take the dish out of the wheel.

CARRIAGE WHEEL.—Samuel R. Bryant, Waterford, Pa.—This invention relates to the mode of locking the spokes by means of grooves and wedges, and the mode of fitting the spokes and pipe box together. To lock together the spoke tenons so that lateral movement of one upon the other shall be prevented, longitudinal grooves in their contiguous surfaces are formed, and to prevent longitudinal movement of the spokes one upon another, transverse perforations may be formed to receive locking pins of any suitable material.

WAGON BRAKE.—Joseph Pavey and Marshall Martin, Walla Walla, Washington Territory.—This invention relates to improvement in a class of wagon brakes, wherein the brake bar is suspended below the reach of the wagon. This brake can be used with or without the wagon box, by reason of the employment of the bar for suspending the brake bar when the box is removed, and the attachment of the supports for the brake levers and to the axle.

APPARATUS FOR DRYING FLOCK OR VELVET PAPER.—Theodore A. Blanchard, New York city.—Flock paper after being flocked has heretofore been dried by looping or festooning the paper over poles, which were usually arranged so that they could be moved closer together or further apart, as circumstances required. This mode of drying the paper, though allowing the air to circulate freely about the paper, always permanently creased or marked it where it passed over the poles. This invention consists in supporting the paper in a horizontal or nearly horizontal position during the drying operation upon drying frames prepared for the purpose.

IMPROVED MANUFACTURE OF BITARTRATE OF POTASSA.—Gustave Bourgade, Jersey City, N. J.—The object of this invention is to simplify the means of producing cream of tartar or bitartrate of potash, so that the same may be economically manufactured in large quantities. The apparatus consists of a double jacket steam kettle, made of copper or equivalent material, with its lower part hollow, for the admission of steam. In the bottom of the kettle is a discharge pipe, having a valve and covered with a filter. The inventor fills the kettle with water, and when it is boiling with the heat of steam admitted into the jacket, adds a quantity of crude argols, well ground, which are left to boil until perfectly dissolved. In order to prevent the formation of tartrate of lime, he adds a quantity of diluted sulphuric or muriatic acid. Bone black is then poured in and the mixture left to boil. After dissolution, a quantity of prime American clay well dissolved in water is added; after which the preparation is allowed to flow into crystallizing tanks.

METHOD OF MAKING BLANKS FOR PLOW ATTACHMENTS.—Orren A. Anthony, Mayfield, N. Y.—This invention consists in a method of making a blank for an attachment for plows of a single plate of steel, which is fitted on to the worn out point of a plow and secured by rivets or bolts through the share and collar.

RAILROAD TANK VALVE.—Charles W. Chappell, Watertown, Wis.—This invention has for its object to furnish an improved device for operating a railroad water tank valve, enabling the valve to be conveniently opened, whatever may be the weight of the water pressing upon the valve. This is effected by means of a lever attached to the valve stem being raised by the revolution of an eccentric on the end of a shaft which enters the side of the tank. This shaft is rotated from the outside by means of a hand wheel.