BOTTLE STOPPER.—Robert F. Boocmsdes, Wallingford, Ct.—The object of this invention is to provide a convenient and perfect stopper for bottles, or decanters, and consists in an india rubber cylinder, of proper shape to fit the mouth and neck of the bottle or decanter, which is fitted around a metal tube for receiving a screw fastened in the head of the stopper. The stopper is inserted in the bottle when the screw is partly withdrawn, and the india-rubber cylinder is elongated by its elasticity, so that it enters easily, and the screw is then turned for the purpose of compressing the india rubber, and expanding it laterally, so that it shall fit in the neck of the bottle tightly, and fill the sides completely, effectually preventing the admission of air or the loss of the contents.

DEVICE FOR SUPPORTING HOP POLES.—Norman C. Roberts, and Ezra W. Badger, Fly Creek, N. Y.—This invention consists in providing for hop poles a chain and ring formed of wire or any other suitable material; the rings being placed over the tops of the poles, and forming a part of the chain which is drawn over each row of hills to support the tops of the poles, to prevent them from surging in the wind, as well as to keep them separated, and in their proper positions.

METHOD OF MAKING ILLUMINATING GAS.—A. C. Rand, Union Mills, Pa.—The object of this invention is to make illuminating gas from benzine and other hydro carbon liquids, by a very simple and compact apparatus, and in such a manner that no fire or other expensive process is employed.

MACHINE FOR FURROWING MILL STONES.—J. J. Zinn, Albion, Pa.—The object of this invention is to furnish millers with a machine for picking the cross furrows or channels of mill stones with perfect regularity and accuracy, and great facility, without laying off the furrows by measurement.

GRADUATING LEVEL.—N. Hollingsworth, Rosetta, Ill.—This invention relates to a leveling instrument, which is provided with a telescope, a needle box and adjusting springs, in such a manner that by means of the needle in the needle box the inclination of the telescope, or its position towards the horizon, can be determined at a glance; and furthermore, the telescope, when adjusted in a horizontal position, can be leveled so that it can be made to swivel in a horizontal plane without being permitted to deviate from its horizontal position. If the telescope is released, it can be readily adjusted to any desired inclination, and an instrument is obtained which can be used with advantage in cross-leveling and in surveying operations of any description.

CORN PLANTER.—Soloman G. Dentler, Orangeville, Ill.—This invention has for its object to furnish an improved machine by means of which the furrow may be opened and the corn dropped and covered easily and accurately.

GATE.—Hiram Turner, Ripon, Wis.—This invention has for its object to furnish an improved gate, strong and simple in construction, and which may be easily adjusted to swing at any hight, to pass over mud, snow, or other obstructions.

STEAM GENERATOR.—William Young, Easton, Pa.—This improvement relates to a new portable arrangement and combination of parts for the purpose of generating steam for various purposes, and the invention consists in arranging a boiler or generator over a fire box and connecting it with a steam drum (which stands above it) by pipes, and also in a device for heating the water before it is pumped into the generator.

GATE.—Cornelius Trexler, La Grange, Ind.—This invention has for its object to furnish an improved gate so constructed and arranged that it may be opened to its full extent without its being necessary to slide the gate back its entire length or swing the entire gate upon its hinges.

HAY LOADER.—George W. Swartz, Newburgh, Pa.—This invention relates to a machine which is attached to and travels with the wagon for the purpose of raising the hay from the ground and depositing the same into the wagon.

BEEHIVE.—S. Hutchinson, North Lewisburg, Ohio.—This invention relates to a new and improved beehive of that class which are constructed in sections. The invention consists in a novel and improved manner of clamping the sections together whereby close joints are obtained, closer or tighter an usual, so that no crevices are allowed in which moth eggs may be deposited. The invention also consists in providing the hive with a bottom composed of an endless space having moth traps and cleats attached and arranged whereby the hive may be kept in a perfectly clean state and the propagation of moth within the hive avoided.

COTTON PRESS.—Samuel D. Roberts, Washington, La.—This invention relates to an improvement in the construction of a cotton press and it consists in an arrangement of double levers operated by a capstan connected with drums, ropes and pullies which work a single vertical follower block for compressing cotton in an ordinary packing box or chest.

SIRUP PITCHER.—John Hyslop and Charles E. Phillips, Abington, Mass.—This invention relates to the cover or lid of the sirup pitcher, and it consists principally in so constructing that portion of the cover which covers the nose of the pitcher that it will enter the said nose and thus as it were cut off the flow of liquid therefrom, consequently not only causing and forcing the liquid to flow back in the pitcher, but also serving to wipe off the liquid from the nose.

REGISTER.—John McLauchlin, Brooklyn, N. Y.—This invention relates to hot-air registers. It consists in the use of a sheet of wire gauze or netting within the body of the register for the purpose of preventing papers or other articles dropping or passing through the register to the fire below, while no hindrance is given to the passage of the heated air.

EXPLOSIVE POWDER.—Gustav Adolph Neumeyer, Duchy of Saxe-Altenburg, Germany.—This invention relates to an explosive powder which is intended to be more safe, but as powerful, as the ordinary powder now in use.

POST.—A. W. Gore, Manhattan, Kansas.—This invention relates to a post for fences and other purposes, which post is made of sheet metal and provided with cross wires having eyes or loops at its ends for securing the ends of the sections of a wire or other fence thereto, or for convenience in hitching a horse, if used as a hitching post.

INDICATOR.—David P. Davis, Jersey City, N. J.—This invention relates to an indicator more particularly intended for use in connection with steam boilers although it can be applied to other purposes. The invention consists in the application to or the combination with any ordinarily constructed or other suitable pressure gage, of a dial or disk of any suitable material for receiving and retaining marks or indentations, which disk is arranged to revolve with a regular and continuous motion and in such a manner as to be marked by a pencil or any other suitable marking device arranged to operate in connection with the said pressure gage and to be thus moved according to the pressure therein over the surface of the said disk either in a straight or a curved line as may be found necessary.

PAPER FABRIC FOR THE MANUFACTURE OF WATER-PROOF INSOLES AND OTHER ARTICLES.—L. M. Crane, Ballston Spa, N. Y.—The invention consists in constructing the fabric of two or more layers of paper with a sheet or sheets of gutta-percha interposed between them.

SCAFFOLD.—Benjamin Best, Dayton, Ohio.—This scaffold consists of a series of upright posts, which are anchored to the ground by means of braces, and on which sliding braces for supporting the platform are arranged in such a manner that the latter can be raised or lowered at will by the parties on the platform. The length of the scaffold can be regulated by the number of uprights employed.

BALING PRESS.—A. J. Purviance, Mount Zion, Iowa.—The nature of this invention consists in combining gearing with windlass and shackle rigging power for compressing and baling hay or cotton.

BALING PRESS.—Wm. B. Smith, Aberdeen, Ind.—This invention relates to a hay press of that class in which the hay, cotton or other article to be baled is held in place by a follower while it is being operated upon by a beater, both the follower and beater moving in a horizontal direction.

PUNCHES.—Lorenz Wolf, St. Jacob, Ill.—The object of this invention is to provide a standard for guiding a sliding punch in such a manner, that the socket in the standard may be enlarged or diminished at pleasure, according to the diameter or size of the tool, which is to slide therein.

THROTTLE VALVE LEVER.—Norman King, Etna, Pa.—This invention relates to a method of operating the throttle valve of a steam engine, and it consists in the arrangement of two levers, which have arms attached and which have their fulcrums upon a stationary standard, and which operate in such a manner that the valve is moved with the greatest ease and can be set or locked in any desired position.

HAMMERS.—Henry Cheney, Little Falls, N. Y.—This invention relates to a new manner of forming the sockets of wrought iron hammers, and consists in making the same of malleable iron and brazing, soldering or otherwise securing it to the head.

DRAY.—F. Van Doren, Adrian, Mich.—This invention relates to a new manner of arranging and constructing the bottom or the bearing surface of dray carts, the same being so arranged as to be removable from the frame of the dray. To one side of the said bottom are secured a series of rollers which when on top, facilitate the loading and unloading of the cart, while, when the bottom is turned around, so that the rollers are on this underside, the dray has an ordinary flat bottom which can be removed with its load and rolled to any desired place within a building.

WATER WHEEL.—Thomas Pattinson, Little Rock, Nevada Co., Cal.—This invention relates to a new and improved water wheel, in which the water is applied to the wheel in such a manner as to ensure the most favorable results as regards the per centage of power obtained, economy in the consumption of water, and in the construction of the wheel.

OXYGEN.—Henri Adolphe Archereau, Paris, France.—This invention consists in a new process for producing Oxygen, industrially on a large scale, by the decomposition of sulphur acid through heat, and in the compression of Oxygen gas, and its utilization to various purposes, chiefly metallurgic.

BAG HOLDER.—Lafayette Turner, Cedar Rapids, Iowa.—This invention relates to a device for holding bags during the process of filling and for closing them when filled. It consists in an adjustable frame set on pins on the ground; the mouth of the bag is folded over the ends and the bag hangs down within the frame, which is then stretched by means of a hinged adjustable cross-piece or bar. A clutch closes the bag when filled, beneath which the string is passed and tied.

CIGAR POINT PERFORATING MACHINE.—Oliver Quinand, Vicksburg, Miss.—This invention relates to a machine for perforating the points of cigars and consists of a block of wood or other suitable material seated on a spring in a hollow block having spikes hinged in its walls, and passing through slots or mortices in the shape of right angled triangles in the walls of the inner block.

GRAIN SCREENS.—Reason Hawkins, Philadelphia, Indiana.—This invention relates to an improvement in the construction of screens for separating the trash and foul seeds of cockle and cheat from wheat and other small grain, and dividing the grain into first and second qualities.

HORSE POWER MACHINE.—John Schley, Savannah, Ga.—This invention relates to an improvement in the construction and arrangement of a machine to be used as a horse power, and is especially designed for plantation use, to be applied to mills and all other purposes.

MANUFACTURE OF SUGAR.—Ursin Naquin and Theodale Morrillson, Parish of La Fourche, Louisiana.—This invention relates to new and useful improvements in the manufacture of Sugar, and consists in a new mode of saturating cane juice and bleaching it with sulphurous acid, for the purpose of making it white bright sugar.

BENDING SCYTHE SNATHS.—O. W. Stearns, Lebanon, N. H.—The nature of this invention consists in machinery for bending scythe snaths, whereby the work is more rapidly and economically performed than by the ordinary method of bending them by hand.

EXTENSION FRUIT LADDER.—John E. Treat, Oxford, Mich.—This invention relates to a new and improved extension step ladder, designed more especially for picking fruit and for general household purposes. The extension feature admitting of the device being used in many cases where the ordinary step ladders cannot be employed.

SCHOOL SETTEE AND DESK.—John Peard, New York, N. Y.—This invention relates to a new and improved combination of a School Settee and Desk, whereby a very cheap and durable article of the kind specified is obtained, and one which will admit of being compactly folded when not required for use, and contain both a book and a slate rack.

HAY RAKE.—Sylvester Johnson, New Harmony, Indiana.—This invention relates to the frame from which the rake is pivoted, made with curved side timbers; to the sash for holding the rake head in proper position while raking; to the combination of a lever, chain or rod, arm and pawls with the rake head; to the formation of notches in the rake teeth, so that the sash may have an inclined position; and to the combination of an arm and link with the sash and arm of the rake head.

MACHINE FOR CUTTING STRAW, &C.—S. Pettinode, Corunna, Mich.—This invention consists in the application of feed rollers to the lever straw cutter; in operating the feed rollers by means of a toothed arm and cogs formed upon the hub of the knife lever, in the combination of ratchet wheels, pawls, connecting rod and lever with the feed rollers and with the toothed arm, in the combination of metallic side pieces with the box frame and upper roller of the cutter, and in the combination of adjustable guide arms, guide rods, and springs, with the metallic side pieces and with the upper feed roller.

MACHINERY FOR MAKING HOT PRESSED NUTS.—Lewis Thierry and Geo. B. Hill, Detroit, Mich.—This invention relates to improvements in machinery for the manufacture of hot pressed screw taps or nuts, and consists of devices for cutting the nuts from the heated iron bar with hexagonal, octagonal or quadrilateral sides, and by an automatic slide moving the blanks over a die and under a punch, which punches out the center hole for the screw, the whole operation of cutting off the blanks and punching the holes being continuous and simultaneous and performed with great rapidity, allowing a whole bar of heated iron to be fed into the machine and converted into blank nuts without intermission or a second heating and without waste of material, except the core from the hole.

COMPOSITION FOR TANNING LEATHER.—A. Westbrook and —— Campbell, Leona, Pa.—This invention relates to a composition for tanning fur skins and glove leather, by the application of which the process of tanning will be facilitated and hastened, and whereby the leather will be made more tough, softer, and more pliable than it can be made with the methods now in use, and whereby stretching and working while drying the leather is made unnecessary, thus saving a great amount of labor, besides producing a superior article.

SUSPENSION BRIDGE.—A. S. Hallidie, San Francisco, Cal.—This invention relates to a suspension bridge which is suspended from strong cables or ropes that are attached to substantial posts or pillars, and which is strengthened by means of suspension rods, which connect the aforesaid cables with the girders, upon which the planking rests, and by braces which connect the cables on each side of the bridge with each other, so that thereby the bridge is made very strong and durable, and capable of sustaining heavy weights, and of withstanding the force of strong gales.

CAR COUPLING.—John Pettengill, Jr., Lisbon, N. H.—This invention relates to a self-acting car coupling, which is so arranged that the link will be held between the elastic sides of the coupling box, so as not to rattle, and is always held firmly in any desired position. Provision is also made that high and low cars can be coupled.

HOLDER FOR BROOMS, ETC.—H. W. Warner, Watertown, Conn.—This invention relates to a holder by means of which brooms, brushes, and other similar articles can be suspended to and upon the walls or sides of a room or other apartment with the utmost ease and readiness, and in such a manner as to offer no obstruction to their being removed when desired for use.

DEVICE FOR TETHERING ANIMALS.—James P. Thorp, Southingfon, Conn.—This invention relates to a new and improved device for tethering animals, designed more especially for horses, whereby said animals may be allowed a length of rope to admit of them grazing over a considerable area without danger of having their feet entangled in the rope.

MOLDING AND PRESSING BRICKS.—A. J. Sprague, Toledo, Ohio.—This invention relates to a new and improved machine for molding and pressing bricks, and it consists in a novel means for pressing the clay into the molds with a feeding and discharging device, and a guard grating, whereby clay may be molded and pressed into proper form very expeditiously and in a perfect manner.

SKATE.—John Forbes, Halifax, Nova Scotia.—This invention relates to a new and improved fastening for securing skates to the feet, whereby skates may, with the greatest facility, be firmly secured to the boot or shoe, and very readily detached from it when required. The fastening is of that kind in which straps are dispensed with, and the skate clamped to the sole of the boot or shoe.

CLAMP FOR SUSPENDING WHIPS.—Alvin C. Mason, Boston, Mass.—This invention relates to a new and improved clamp for suspending whips when not in use, in order that the same may be kept straight and in proper shape.

SETTEE FOR SCHOOLS AND OTHER PURPOSES.—John Peard, New York City.—This invention relates to a new and improved settee for schools and other purposes, but more especially designed for class rooms in our public schools. The invention consists in a novel construction of the settee, whereby a very strong and durable seat is obtained, and one which may be manufactured at a small cost, and be capable of being adjusted and secured in any position required either against a wall or against a raised platform.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

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 advertisemets at 50 cents a line, under the head of "Business and Personal."

A. M. R., of Mo.—The amount of heat evolved by compressing air, and of cold by rarifying it, have not been carefully determined by experiment. But there are good reasons for supposing that when 2 cubic feet of air are compressed into the space of one cubic foot sufficient heat is evolved to raise 9½ lbs. of water 1°. If this heat be allowed to escape, the expansion of the air to the original bulk might be able to cool 9½ lbs. of water 1°. The freezing machines constructed on this principle, however have not been successful. The best freezing machine appears to be Carre's which depends for its action on the rapid volatilization of ammonia. Ice is now practically manufactured in all parts of the world; in the frigid and temperate zones by nature, and in the tropics by Carre's machines.

G. R. D., of Mass.—The cast iron to be tinned should be well cleaned by an acid pickle and rinsing in water. It is then dipped in a strong solution of chloride of zinc, and finally in the bath of melted tin. You will find an answer to your other question above.

D. S. H., of Pa.—"I notice that you do not always spell correctly. In spelling a word of three letters, you used two wrong letters and placed the only correct one at the beginning of the word instead of at the end. H. M. T. (page 347 Vol. XVI) enquires: How many revolutions on its own axis will a wheel make in rolling once around a fixed wheel of the same size?" You spelled your answer o-n-e. You should have spelled it t-w-o." Very good! Also E. W. D., of Conn., H. N. S., of Ohio, and T. J. W. of Minn., are not content with our answer. Whether the proper answer be one, or two, depends upon the understanding of the question. A wagon wheel is a reasonable example of a rolling wheel, and we think the question very easily suggests it. Now in a rolling wagon wheel the axis or axle always maintain the same position with reference to the point of contact with the ground. A line drawn on the end of the axle towards the point of contact will always keep its relative position; in rolling around a fixed wheel the line will be directed to the center of the fixed wheel. Now no one will doubt that under such an explanation of the question our answer is the only one admissable. The case which permits the other solution requires that a line drawn on the end of the axle shall be kept parallel with a fixed line, a case which is not so easy to conceive or to put in practice. Now we do not offer this as a complete discussion of the question, for that might fill a whole page of this paper, but rather to show how difficult it is to satisfy all with a short answer. We still think our original answer is the best which can be expressed by three letters.

J. L. W., of Ohio believes that telegraph wires are less liable to oxidation on account of the current of electricity passing through them. He has no faith in the electro-anti-incrustators heretofore alluded to in this paper, but thinks that a current from a battery made to pass through a boiler would be a perfect preventive of incrustation.

E. J. W., of Ill.—A tin vessel will not be suitable for holding your plating solution. If you were to put your solution into an ordinary tin kettle, the silver would speedily be precipitated, and the solution would in time work its way through the metal.

P. J., of N. Y.—A solution of phosphorus in sweet oil or ether, seems to be what you want. The solution shines in the dark when it is exposed to the air. An ounce of it in a two ounce vial would be sufficient to illuminate the dial of a watch or a compass so that it could be read. When the solution is used in a vial, the cork is to be removed for a moment, then replaced, and the liquid shaken. . . . P. J. quotes from an old French book of 1681, a description of a concave mirror two and a half feet in diameter, with which a silver coin was melted, wood set on fire candle light reflected several hundred feet, etc.

D. S. McD., of Ill.—If your shafts are perfectly in line one with the other there can be no question about the running of your belt, if that itself, is straight. Level and line one shaft to the other, which cannot be a very difficult job and you will have no trouble with a belt running on the edge of the pulley. Of course the pulleys must be true and in line with each other.

J. Q. C., of Mass.—Almost any ordinary kitchen utensil, as a quart tin pail with the cover made tight and proper connecting pipes, will be found sufficient to generate steam for your toy engine of 2 inch by half inch cylinder,

C. C. W., of Pa.—The details of the process of producing an artificial skating surface, we suppose have not been made public. Probably some of the artificial stone compounds would be found suitable for the purpose. It is not likely that any imitation of ice can be made so perfect that the ordinary skates can be used on it. All that is required for the roller skates is a smooth hard floor.

J. H. L., of Pa.—The brown powder which you send and which you say is deposited in large quantities from the water of a spring, is mainly oxide of iron. If you heat it to a bright red heat it will turn a permanent red and become merchantable red ochre. The hardened deposit in the neighborhood of the spring, if there is enough of it may prove valuable to you as an iron ore.

J. H. G., of Ky., has a mill at the bottom of a cave 150 feet from the surface. He drives the mill by water of 150 feet head, and wishes to know how much of the water he can return to the surface by means of the mill. The proportion of water that may be returned to hight of the head will vary within wide limits according to the machine employed and the size of pipes. A good turbine might return 80 per cent of the water which drives it.

A. W. G., of Conn., wants a cement insoluble in water to be used with a mass-like paper pulp for the purpose of solidifying it. Shellac or gutta percha have been found useful for such compositions. They become adhesive by heat, or they may be used in solution.

M. B. S., of N. Y., suggests that horse radish may be distilled and used for medical purposes in the room for mustard, etc." The oil of horse radish is isomeric with oil of mustard, and a drop of either applied to the skin will produce a blister. Each contains more than a third of its weight of sulphur.

Business and Personal.

The charge for insertion under this head is 50 cents a line.