

**SECURING TIRES ON THE WHEELS OF VEHICLES.**—Andrew C. Barnes, Albia, Iowa.—This invention relates to an improved manner of securing tires on wheels without the aid of the bolts usually employed for that purpose.

**CHURN DASH.**—A. B. Hutchins, Patchogue, N. Y.—This invention consists in constructing a churn dash in such a manner that it will be rotated by an up and down movement in the operation of churning and the cream thereby subjected to a violent agitation which will cause the butter to be produced within a very short period of time.

**COTTON CULTIVATOR.**—W. McCracken, Bainbridge, Ind.—The object of this invention is to obtain a cotton cultivator which will dispense with much labor hitherto required, and it consists in the use of a plow and scraper arranged in a novel way, and also in a hoe arranged and applied in such a manner as to operate automatically under the draft movement of the device, and in a direction transversely with the row of plants for the purpose of thinning out the latter at regular and proper intervals.

**SELF-OILING AND SELF-ADJUSTING BEARING FOR MACHINERY.**—Thomas S. Brown, Poughkeepsie, N. Y.—The object of this invention is to obtain a bearing for the shafting of machinery which will be self-lubricating and self-adjusting, and also be capable of adjusting itself in line with the shafting, in case the bearings be not set perfectly in line with the shafting in adjusting machinery together.

**WATER FILTER.**—George Waite and John Watts, New Orleans, La.—This invention consists in forming the filter and cooler in such a manner that the weight of the water shall be exerted to force the lower portion upward after it has passed through the filtering material.

**PISTON PACKING.**—John Askwith, Chicago, Ill.—This invention consists in the formation of the joint of the packing ring, and in the provisions made for keeping it expanded to the cylinder steam tight, and in a central position.

**REVOLVING WAIST BLOCK.**—William T. Adams, Baltimore, Md.—The sheave around which the sheet or other rope is passed is journaled in a disk which is permitted to rotate to keep the axis of the sheave at right angles to the direction of the rope. The sheave is journaled within the rotating disk and projects from each of its faces so as to deliver a rope which passes around it without impeding, both ends in the same direction or near it.

**SELF-CLOSING AND SELF-LOCKING RAILROAD SWITCH.**—Judson F. Jones, Washington, D. C.—The switch lock holds the switch upon the main track except while forcibly and temporarily held upon the return out. When the switch lever is released the spring returns the switch to the main track, the locking bar automatically engaging with a tooth of the switch bar; the locking bar cannot be disengaged except by the key which elevates it, and is released for subsequent engagement by the descending switch lever.

**STEAM ENGINE.**—George F. Washburn, Worcester, Mass.—This engine has two double acting pistons, each operating by itself in its steam cylinder and attached to a piston rod which carries a valve of any suitable construction operating in its own chamber. Each valve controls the action of the steam upon the double acting piston in the opposite cylinder and not that piston to which it is attached. A valve upon the exhaust port or in the exhaust pipe, opening outwardly, closes the aperture against the reflux of exhaust steam.

**TWEED.**—Daniel S. Loy, Graceham, Md.—The air from the bellows entering the blast chamber acts upon a wing and actuates the valve which closes the lower aperture of the chamber. When the blast ceases, the valve opens, discharges the cinders and admits the passage of air to the fire. Different forms of blast plates are used as caps fitting upon the rim which bounds the upper end of the blast chamber and the cinders are conducted by an adjustable pipe in such direction as may be suitable for their discharge.

**SASH-CORD ATTACHMENT.**—Carlos Swift, Mount, Carroll, Ill.—This invention relates to an ingenious, simple and effective device for attaching cords to window sashes.

**WASHING MACHINE.**—Mark Newland, Dayton, Ohio.—This invention consists especially in the combination of the double spring connecting rod, by which the rubber is operated with the rubber frame and with the crank shaft.

**CORN-CAKE MACHINE.**—C. C. Harriman, Warner, N. H.—This invention has for its object to furnish a neat and convenient machine for cutting out cakes of uniform size and thickness in batches of one hundred, two hundred, or more, as may be desired.

**SEED PLANTER.**—A. Bennett, Rockford, Ill.—This invention relates to an improvement in the construction of corn planters, whereby one man or boy with a double team may drop the grain at regular intervals in two rows, opening the furrow, and rolling the seed after they are dropped at the same time, thus completing the planting in one operation by a self-acting apparatus.

**CLOTHES FRAME OR RACK.**—Benjamin Britten, Galena, Ill.—This invention consists in so constructing a clothes rack or frame, that it can be folded up into a compact shape, suitable for being encased within a hollow tube or cylinder, that when the said rack is drawn out serves as its standard and support.

**MANUFACTURE OF IRON AND STEEL.**—Charles Usher, Iowa Falls, Iowa.—This invention consists in a novel manner of plating wrought iron or steel with malleable iron.

**CUTTER FOR TRIMMING WALL PAPER, ETC.**—Henry C. Snow, Princeton, Ill.—This invention relates to a cutter or implement for the trimming of wall paper more especially, whereby it can be trimmed with the utmost facility, accuracy, and rapidity.

**LOCK.**—James S. Porter and Russel Porter, Watford, N. Y.—This invention consists in the combination with a lock of a pistol, in such a manner that when a key is placed in the lock and turned for the purpose of unlocking it, the pistol will be discharged, thus operating as an alarm.

**FRUIT JARS, ETC.**—G. W. Buffington, Mechanicsburg, Ohio.—This invention consists in a novel manner of securing an elastic web or band to the jar cover, in connection with a peculiar form of the neck of the jar, whereby many advantages are obtained.

**BOOT AND SHOE.**—Joseph C. Adams, New London, N. H.—This invention relates principally to the heel of a boot or shoe, and consists in making the heel of metal and hollow, with its under plate constituting the treading surface, secured to the main portion of the heel in such a manner as to be easily removed therefrom.

**LOCK.**—Zeno Kelly, New Bedford, Mass.—This invention consists principally in the application to the link or shackle bar of a padlock of a seal or seals in such a manner and in combination with any suitable arrangement of devices for locking or holding such link or shackle bar in the lock casing, that before the lock can be unlocked, said seal or seals must be broken, or, in other words, punctured by the insertion of the key or of any other implement into the lock for opening or unlocking the same.

**BED SPRING FASTENING.**—D. Manuel, Boston, Mass.—This invention relates to an improved device for fastening the lower end of spiral wire bed springs to the slats, and also for securing their upper ends to the frame bars in such a manner that the springs will keep their vertical position, and the whole frame may be raised without deranging or moving the springs.

**GATE LATCH.**—W. H. Kellogg, Du Quoin, Ill.—This invention relates to a device for a self-closing latch to a gate, which will open either way, and may be opened very readily, being more especially adapted to small gates that are often passed, and require a convenient as well as sure fastening.

**WOOL PRESS.**—Spencer C. Bond, Farmersville, N. Y.—This invention relates to a wool press, the press box of which is composed of two hinged wings and two sliding heads. The hinged wings compose the sides of the press box, and they connect by cords or chains with a lever, in such a manner that by depressing said lever the wings are turned up simultaneously. The movable heads are attached to rods which slide in a suitable recess in the platform or bottom of the press box, and said rods are connected to the bolts (threads of which are secured to a windlass or drum), in such a manner that by turning said windlass the heads are drawn together, and the operation of pressing is effected. By adjusting the cords or ropes in a proper position previous to putting the fleece in the press box, the operation of tying the packs after they have been pressed is materially facilitated.

**FRUIT GATHERER.**—John Frantz, of Joseph, Shellsport, Md.—This invention relates to a machine constructed to gather apples, potatoes, or other fruit, from and off the ground.

**SHAKING TABLES FOR CONCENTRATING ORES.**—P. S. Buckminster, Gold Hill, Nevada.—This invention relates to an improvement in shaking tables for concentrating sulphurets and other heavier mineral portions of gold and other ores, and consists in a novel plan for constructing and arranging the grooves or riffles in the bed of the table, by which the operation of separation of the heavier mineral from the lighter earthy matters in the ore is rapidly and thoroughly performed.

**LIFTING JACK.**—Daniel Diver, Boone, Iowa.—This invention has for its object to furnish an improved lifting jack, designed especially for raising or leveling railroad tracks, but equally adapted to other uses.

**MEDICAL COMPOUND.**—Wm. B. Foster, Ridgeville, Ohio.—This medical compound is specially intended for the relief and cure of cholera morbus, cholera, diarrhoea, heart disease, rheumatism, white swelling, etc.

**COMBINED BRIDLE AND HALTER.**—J. McKibben, Lima, Ohio.—This bridle and halter is simple, convenient, and durable.

**INVALID CHAIR.**—John N. McMullen, West Liberty, Ohio.—This invention consists in the employment of a shaft arranged transversely under the seat of the chair, to which is connected a belt or belts whose ends, not being connected to the roller, are secured respectively to the back of the chair and to the bottom of the foot rest. Said roller being also provided with a toothed wheel having a crank, which, in connection with a pawl, enables the person occupying the chair to give both the back and foot rest the desired inclination.

**DRAFT PIPE FOR LOCOMOTIVE ENGINE.**—A. Pearsall, Atlanta, Ga.—The object of this invention is to equalize the draft through the boiler flues, thereby improving the effective operation of the engine.

**BALE TIE.**—Barry Coleman, Louisville, Ky.—This invention relates to an improved device for fastening the hoops of cotton or other bales, and consists in a single iron plate slotted in such a manner that the ends of a bale hoop may be readily passed through it, and secured so that they shall not slip.

Business and Personal.

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

**Wanted.**—Best wool carding and spinning machines and power looms. Manufacturers send circular and price list to C. Picard & Co., Nebraska City, Nebraska Territory.

**Manufacturers of House-furnishing Goods (Hardware)** will please send their address and circulars to S. W. Johnson & Co., Detroit, Mich.

**Photographer,** Box 5,830, New York Post-office, wishes to obtain the address of the person who has applied for a patent for discerning the presence of ghosts or spirits in a room.

**N. Evinger, of Sandford, Vigo county, Ind.,** wishes to engage with scientific parties as inventor. Also to sell his foreign claim on a very useful machine, patent pending.

**Wanted.**—An agency for some desirable and salable patented article that will work well with the retail hat and cap trade. Address W., Lock Box 122, Erie, Pa.

**E. Roth, New Oxford, Pa.,** wishes to know where he can get malleable casting done. Patterns furnished.

**Evans's Patent Graduating Circular Hand Plane** for finishing curved surfaces. Send for circular to F. H. Webb, Hudson, N. Y.

**Wanted.**—A situation as foreman or to work by the contract by a practical machinist with good reference. Should like to go West. Address Machinist, Box 665, Worcester, Mass.

**Manufacturers of wood-turning machines of any kind** other than the ordinary laths will please send cut and price to Geo. W. Sweet, Flint, Mich.

**Rouse & Dean, Dubuque, Iowa,** wish to correspond with manufacturers of lead-pipe machinery.

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

**O. J. F., of Mich., asks:**—Of two portable engines having the same amount of fire surface, one having 20 three-inch tubes 58 inches long and the other 16 three-inch tubes 72 inches long, which is the most efficient, or is there any appreciable difference in their efficiency? Ans: The 20 tubes present 24 inches surface more than the 16 tubes, and as the engines are portable, depending upon natural draft, we should prefer, in selecting an engine, the one with the shorter tubes, and think it would be more efficient.

**D. S. McD., of Ill.—**Water when frozen expands. As the sap, etc. in green wood is largely composed of water, freezing green timber will expand or burst it. Trees in exposed situations sometimes crack by intense cold. Freezing green wood is not analogous to seasoning it.

**A. P. R., of N. Y.—**A fly wheel acts as a fly wheel whether it is used as a pulley or not. See reply to W. K. of Ind., in No. 11 SCIENTIFIC AMERICAN.

**C. B., of Conn.—**We have seen the hammer you speak of in use and like it. If you wish for particulars see SCIENTIFIC AMERICAN Vol. XV pages 134 and 383.

**W. A. W., of L. I.—**We think better results will accrue if you use salt rather than brackish water in your boiler. The latter is apt to induce foaming. Why not distill your salt water and use it fresh? Your communication appeared in No. 10.

**P. G., of Ill.—**Round twisted belts of leather are manufactured so that they will not stretch more than flat belts. They have a solid longitudinal core of leather, untwisted and stitched to the outer envelope. They are very superior. Belts of only one quarter of an inch or less in diameter are cut from the solid leather. Gut belts of this size are better.

**G. W. T., of R. I.—**Rollers on shuttles for weaving were used to our recollection twenty-five years or more ago, but were rejected for the simpler form of smooth bottoms. We do not think rollers are an advantage.

**J. G. S., of Minn.—**We do not advocate the indiscriminate use of oil on taps. Sometimes a clean tap will work better in cast iron than one with oil. Much, however, depends upon the way in which the tap is made. If it has a good clearance it may work better without any lubricator. You may be sure that a tap with too much thread will not cut a screw thread but only jam the thread.

**M. R., of Conn.—**For making black lead crucibles, mix two to four parts of black lead with one part of clay. The ingredients should be finely powdered, thoroughly mixed, and after being got into the desired form by molding and pressure, must be thoroughly dried. The crucible is finally baked in a close oven. The quality of the crucible depends mainly on the freedom of the back lead and the clay from iron and lime.

**W. E. B., of Ill.—**The average boiling point of petroleum burning oil is about 350 deg. Fah.

**C. B., of Mich.—**If you take a sheet of raw rubber and soften it with naphtha till it becomes softened, you may succeed in getting it into the form you desire. After being thus molded it may require some days for the solvent to evaporate and the rubber to become hard.

**M. B. L., of Ill.—**Hydrogen in most of its chemical relations is like the metals. But it lacks the physical and sensible properties which

are commonly considered to be characteristic of metals. We have never seen a definition of a metal which could include hydrogen.

**H. W. H., of N. Y.,** has a new silver watch. He says "spots of yellow rust begin to show themselves on the inside of the case. What is the cause?" We suggest that this watch like the celebrated razors, was made to sell. If we knew that it was a relic of some gift enterprise or mock auction, we should test those yellow spots for brass. Silver and gold now-a-days like some other virtues are only skin deep. The vitality of jewelry is generally due to galvanism.

**J. S., of Ill.—**The mineral you send is very fine sand and is sometimes used under the name of tripoli for polishing metals. Genuine tripoli, however, is composed of infusorial siliceous shells.

**J. G. N., of Vt.—**Small articles of steel generally receive their final finish by tumbling with small scraps of leather.

**J. L., of Ill.—**The pasting up of millstones may be due to the grain being too moist, or to the stone being too fine. The remedy in each case seems evident.

**J. V., of Ala.—**The optometer is an instrument for determining the focal length of spectacles suitable to those who are to use them. An object of any convenient size as a line drawing or a paragraph of printed matter is set up, and the person whose eyes are to be tested places himself where the object can be distinctly seen. The distance from the eyes to the object will determine the focal length of the spectacles. But as this distance will vary with the size of the object, the person who is to use the device must determine by a few preliminary experiments on different persons, the relation between the distance and the focal length. The simplest form of the instrument is one tube sliding within another. The outer tube is stationary and has an object on its end. The inner tube slides in the outer and is graduated in inches. To operate it, look into the inner tube and slide it forward or back till the object is seen most distinctly. The focal length of the required spectacles may now be read off from the graduation. When the graduation is properly made, the instrument is quite useful for those who make it a business to fit people with spectacles.

**J. C., of Conn.—**A solution of rubber in turpentine or naphtha is called rubber cement and is sometimes useful in mending rubber goods but it does not adhere very well to vulcanized rubber, and the joint is always weak.

**O. C., of Mass.—**Ice is crystallized water. In the act of crystallizing, the particles are rearranged or polarized so as to occupy more space. This is all the explanation which is given of the fact that water expands in freezing. Water will not be expanded any the less when frozen in a vacuum, and your bottle of water tightly corked, and frozen under the exhausted receiver of an air pump will burst.

**H. B. S., of R. I.—**"1. What do we understand by the essence of matter? 2. What is the limit of our knowledge of the nature of matter?" (1.) The essence of matter may be defined as that which remains of matter after abstracting its properties; or as that to which the properties of matter are attached. This is a very excellent definition, but who understands the essence of matter? (2.) In the present condition of science we know nothing of matter or the nature of matter beyond or behind its essential properties. Is a knowledge of what is behind the properties so very desirable? There is abundance of knowledge which is both desirable and attainable.

**A. W., of Ky.—**Messrs. Hoe & Co. make a press that prints on both sides of the sheet at the same time, but the lightning press so known only prints one side at a time.

**D. O., of Ill.,** sends us a long and somewhat ingenious essay with the intent to prove that electricity is the explanation of gravitation, heat, light, chemical action, and in short of almost everything. Such speculations are not new. They seem to be based upon an imperfect notion of what electricity really is.

**A. C. R., of N. Y.—**You will probably succeed in removing the smell of the gas from your gutta percha and other tubes by immersing them in a weak solution of per manganate of potash.

**G. T. M. L., of N. Y.** says:—"A little roasted pure coffee eaten without further preparation, will immediately relieve that species of indigestion which causes sourness, or broiling of the stomach."

**E. C. G., of Ind.—**A galvanized telegraph wire will last longer than a plain wire, whether above or under ground. The time that the buried wire will endure, depends upon the nature of the soil. An acid or salt soil might use it up in a few weeks while in loam or sand it would last for years.

**D. M., of N. Y.—**When steam is let on to the engine, the pressure being relieved, the water begins to boil violently. In such circumstances an extraordinary amount of steam is generated, and the steam gage for a moment indicates increased pressure. The case may be illustrated by a simple experiment. Provide a glass flask with a good cork. Boil water in the flask, press in the cork, and after the heat has continued for a moment, slightly loosen the cork, and it will be evident that at the instant of loosening, the pressure is increased. If the experiment be dexterously performed, the flask may be burst by this paradoxical pressure.

**W. F. D., of Mass.—**You may easily distinguish vulcanized from raw rubber. Raw rubber is softened and dissolved by benzole, gets stiff and hard by cooling to 32°, and the finger nail when pressed on it leaves a permanent impression. Per contra, none of these things happen with good vulcanized rubber. Moreover, vulcanized rubber when burned gives a sulphurous odor.

**J. N. H., of Mich.—**No exact position has been fixed for the meridian from which the day should start. If it is ever established by statute (which is probable) it is likely that the same meridian will be continued from year to year, and thus the beginning of the year will be reckoned from it also.

PATENT OFFICE DECISIONS

BEFORE THE BOARD OF EXAMINERS-IN-CHIEF OF APPEAL.

ELISHA FOOTE for the Board.

**The claim must cover the precise novelty of the invention.**—Application for a patent for improvement in breech-loading fire-arms. The rear part of the applicant's breech block is composed of two arms. The upper one extends back to a socket that forms the joint on which it turns. The lower one is shorter and fits when the block is in position to close the bore against a fixed shoulder on the breech. The block is thus supported at both the top and bottom against the force of the explosion, and at the same time it can be dropped down, turning in the socket before mentioned, until the upper arm strikes against the fixed block and that unlooses the bore for the insertion of another charge.

This arrangement gives solidity to the structure and much simplicity and apparent practicability, and we do not find it in any of the references given. The first claim is liable to a construction that would render it entirely too broad. It is for the breech, G, constructed as described, etc. This is about the language which would have been used by the person who first invented a breech adapted to a movable block and who did not intend to confine himself to a particular form. And in this broad sense the claim seems to have been understood by the Examiner in charge. Had it been specified for the peculiar construction of the breech, G, having the shoulder, M, as described, a different conclusion might have been arrived at by the Examiner.

His decision in reference to this claim is affirmed, with the recommendation that the applicant be allowed to amend and present it for re-examination. Application for a patent for an improvement in engraving. The applicant claims his process of engraving substantially as described. In his argument he admits that a part of the process is old, and consequently he has omitted to comply with those provisions of the statute which require the applicant to particularly specify and point out the part, improvement or combination which he claims as his own invention or discovery. Curtis, in his treatise on patents (see 131), says in reference to this provision:—"This involves the necessity in all cases where the patentee makes use of what is old, of distinguishing between what is old and what is new. He is required to point out in what his invention or discovery consists; and if he includes in his description what has been invented before without showing that he does not claim to have invented that, his patent will be broader than his invention, and therefore void."

The Examiner was therefore right in rejecting the application as it was presented. The applicant has submitted to us an amendment intended to remedy the defects alluded to. This we have no power to receive. Our powers are those of review only—to determine upon the validity of decisions made.

The application must go back to the Examiner for him to investigate the new questions presented, before we can have anything to do with it. The Examiner's decision is affirmed, with the recommendation that an amendment be allowed.