

**RECENTLY PATENTED INVENTIONS.**

**Electrical Devices.**

**COMBINED SOUNDER AND RESONATOR.**—S. F. COX, Sallisaw, Ind. Ter. This invention relates to telegraphic apparatus, the more particular object being to produce a combinational instrument adapted to do the work of a relay, a sounder, and a resonator. Further it relates to details of construction, the purpose of which is to improve the general efficiency of the same in the matter of producing a clear tone and of rendering certain parts readily accessible.

**TROLLEY HARP.**—C. HIBBARD and W. HIBBARD, Sandy Hill, N. Y. In this case the invention refers to trolley-harps, the more particular purpose being to provide means for mounting the trolley-wheel upon the harp and for removing it therefrom, and also for maintaining the wheel mountings firmly in position while the wheel is in place.

**ELECTRICAL SIGNAL CONTROL.**—M. ABT, New York, N. Y. In the present patent the invention has reference to electric signal controls, and more particularly to a system for use in connection with elevators for the purpose of enabling passengers to hail cars and for apprising passengers of the approach of the said cars.

**ELECTRIC MOTOR.**—D. MENDELSON, Brooklyn, N. Y. The invention is in the nature of a motor of the vibratory type designed, chiefly, to be used in small installations for advertising purposes, but applicable also to other uses; and it consists in the construction and arrangement of the motor parts with special reference to securing a large effective power in a relatively small motor.

**Of Interest to Farmers.**

**CONVERTIBLE FORK AND RAKE.**—C. C. TYLER, Anneta, N. C. Mr. Tyler's improvement relates to a tool adapted to serve as a fork or rake and to be readily converted from one form to the other, and has for its object to provide a tool so constructed as to enable straight prongs to be used and adapted to hold straw or hay when used as a fork as readily as if the prongs were curved, and thereby dispense with disadvantages arising from the use of curved prongs on a tool of this character when used as a rake.

**STALK-PULLER.**—C. R. SMITH, Fentress, Texas. One purpose of the invention is to provide a machine by means of which a pull may be exerted on stalks for extracting them and their roots and to improve upon the pulling-machines for which Letters Patent were formerly granted to Mr. Smith, to the extent that the machine is made lighter, and wherein the grippers constitute links of endless chains having guided movement in independent casings, the opposing chains being in close and automatically-adjusted relations to each other throughout the length of their inner leads.

**CORN-HARVESTER.**—J. HETTRICH, Grand Island, Neb. The machine is guided by a grain-wheel on the tongue so that three rows of corn are engaged by the front thereof, dividing boards straightening the leaning stalks. Teeth receive the stalks between them, distance between the teeth allowing the stalk to pass, but not the ear, the latter being snapped off and carried upward by the teeth which deliver onto the carrier. The carrier elevates the ears and drops them onto husking-rollers. Husk is torn from the corn by the rollers and dropped upon the husk-conveyor which delivers it to the rear of the machine, means then provide for dropping the corn into the wagon.

**Of General Interest.**

**MUSIC-SHEET.**—J. B. WALKER, New York, N. Y., and A. R. BOND, Plainfield, N. J. A music-sheet used on piano players consists of a length of paper provided with perforations variously arranged according to the notes to be sounded and which is adapted to be moved over a series of pneumatic ducts in a so-called "tracker-board," to progressively uncover, by means of the perforations, certain of said ducts thereby pneumatically selecting the notes which are to be struck by the mechanism. As heretofore made such sheets expand and contract with hygroscopic changes and do not properly "track" with the tracker board. The present invention provides a sheet which will properly track regardless of atmospheric changes.

**ERASER.**—G. W. PARK, Denver, Col. One of the principal objects of the improvement is to provide an eraser combined with or forming part of the tubular member ordinarily employed with fountain-pens for protecting the pen or writing-point thereof. The device may be conveniently associated with a fountain-pen and carried in the pocket with the latter to be available for use.

**ROLL-PAPER HOLDER AND CUTTER.**—J. F. FINAN, Cumberland, Md. The improvement pertains to that form of a roll-paper holder having a stand with a vertical spindle on which the roll of paper is held, and it is designed to apply to this form of roll-paper holder a feature heretofore employed in horizontal roll-paper holders for facilitating the seizure of the edge of the paper between the thumb and forefinger preparatory to pulling it out and tearing off the sheet.

**ROPE-GRAB FOR OIL OR OTHER DRILLED WELLS.**—L. STEPHENS, Macksburg, Ohio. The invention is an improvement in

devices employed for fishing out or recovering ropes lost in oil wells. It is more particularly an improvement in that class of grabs consisting of opposing jaws, which are provided interiorly with teeth and movably connected in such manner that they will close upon a rope and hold it firmly gripped so that it may be drawn out of the well.

**SHAFT-PACKING.**—F. T. NOLAN, Crystal River, Fla. The object of the invention is to provide a packing for rotatable shafts which is air and water tight and in which there is the minimum amount of friction. The improved packing may be used in connection with rotatable shafts which are already provided with packing-glands.

**GRADER.**—J. BAGLEY, Tacoma, Wash. The invention is especially useful in connection with devices intended for operation in hard ground, such as shale. The object is to provide a grader which presents a plurality of blade edges. A further object is to provide removable teeth for a device peculiarly adapted for use in hard or stony ground.

**SPRINKLER.**—C. C. RHODES, Honolulu, Ter. Hawaii, and H. G. RHODES, San Francisco, Cal. In this instance the invention refers to sprinkling apparatus, and more particularly to that adapted for use in watering lawns and the like. It has for its principal object the provision of a movable sprinkler in which the direction of rotation is automatically reversed and in which the range of this movement may be varied.

**LABEL SPREADER.**—G. N. BYL and J. KOEHLER, Jersey City, N. J. One purpose of the invention is to provide an economic device for spreading labels on a surface coated with an adhesive material, which device can be adjusted to receive labels of varying width and length, and wherein the labels will be held in separate groups or packages, and wherein also the feed of the labels will be automatic and reliable.

**SHAFT-PACKING.**—C. H. COOK, Louisville, Ky. This invention refers to improvements in packings particularly designed for automobile piston-shafts, an object being to provide a packing that will permit the slight vibratory motion incident to piston-shafts, but will effectually prevent leakage along the shaft of gas or other motive agent employed.

**COMPOSITION OF MATTER.**—E. VOLLER, Jersey City, and M. F. THALBERG, Hoboken, N. J. The composition is adapted for any purpose for which a hard waterproof and fireproof material is desired; but it is particularly adaptable for use as a lining for ceilings, walls, and the like. While the material is being formed any suitable coloring matter may be introduced to produce the color or tint desired for the resulting product.

**SIGN-PAINTING PROCESS.**—T. MUNNECKE, New York, N. Y. The invention has reference to a process for painting signs or fixing characters upon a surface. The improvement is especially applicable in placing signs or letters upon glass, as in show-windows or glass doors, the object being to facilitate the object.

**METHOD OF TREATING ORES.**—W. KEMP, Tucson, Arizona Ter. Mr. Kemp's invention relates to an improved method for smelting ores, especially ores of copper and iron. This inventor does not limit himself to the use of any particular apparatus for carrying out his process. Certain particular forms of apparatus are especially suited for this purpose. While feeding fuel to the ore continuously he also prevents premature combustion from taking place in the fuel supplied.

**HAWSE-PIPE.**—C. PETRIE, St. Johns, Newfoundland. The principal objects of the invention are to provide means whereby a cable will be absolutely protected from coming into contact with any sharp edges and to provide rollers for reducing friction and assisting in the above-named objects with means whereby if the spindles are broken or displaced they will still remain in position and perform their services in a similar manner to that in which they operate normally.

**Hardware.**

**LOCK.**—T. S. MORTON, Quincy, Ill. The improved lock comprises a casing, a sliding latch, and a gravity member made approximately T shape and pivoted in the middle of its head and below the pivotal connection of the same with the latch, its pendent portion extending below the pivot and below the plane of the lateral arm.

**COMBINED TURNING-TOOL AND CALIPERS.**—R. S. WHIPPLE and J. A. OLESSAK, Philadelphia, Pa. The object of the invention is the provision of novel details of construction for a wood-turning tool and for a caliper attachment thereon that are adapted for co-operative use, affording a gage as well as a turning-tool, whereby a piece of material may be rapidly turned to a desired diameter at one operation.

**Household Utilities.**

**WINDOW-JACK.**—J. S. HAWLEY, New York, N. Y. The jack is designed for prying up windows which become stuck by reason of the swelling of the sash or other causes. The invention consists of a lever with a reduced end adapted to work in a recess in the lower frame of the window-sash and carrying fulcrum-blocks of different heights at opposite sides

thereof, adapted to be brought alternately in action.

**COFFEE AND TEA FLASK.**—J. GARRIGAN, New York, N. Y.—The aim in this invention is to provide a heating device with means for removably holding it in position; also to provide the flask with a center draft-tube down which air is drawn to cause the lamp-flame to spread over the bottom of the flask, thus causing quick heating of the liquid. The term flask is designed to also cover dinner-pails or other vessels.

**DISH-DRAINER.**—J. P. TIBBITS, New York, N. Y. This device is used for holding plates, saucers, and other dishes in such position as to allow the same to drain thoroughly and makes an excellent dish-warmer. The invention also relates to a type of rack in which dishes are as far as practicable supported edge upward, yet rest easily in position without any pressure except that due to their own weight, and suspended clear of the bottom of the drip-tray in such manner that the entire edge of each dish is free.

**Machines and Mechanical Devices.**

**ATTACHMENT FOR GRINDING CENTERS.**—C. L. PERIKIN, Muncy, Pa. The grinder is especially designed to be applied to lathes. One embodiment of the invention consists of a frame substantially U-shaped supported in horizontal diagonal position from the tail-stock spindle when applied to the lathe, a form of clamp being employed adapting the frame to be readily attached and detached. Journalled in the frame extremities is a shaft frictionally driven from the lathe face-plate and itself acting to frictionally drive a second shaft, journalled parallel thereto in the frame, the second shaft carrying a grinding-wheel at its inner extremity and slidingly mounted in its bearings, whereby the wheel may be reciprocated over the lathe-center as both revolve in opposite directions.

**REWINDING MECHANISM FOR SELF-PLAYING PIANOS.**—H. MEYER, New York, N. Y. The object of this invention is to provide a mechanism arranged to allow the use of a single note-sheet containing a number of pieces of music, only one of which is played upon the introduction of a coin, the note-sheet being automatically rewound at the end of the last piece of music to start playing the first piece of music upon the introduction of another coin. It is a division of the application for Letters Patent of the United States, formerly filed by Mr. Meyer.

**NAIL AND RIVET MACHINE.**—J. BUCKLEY, Waterbury, Conn. The chief objects of the inventor are to provide a multiplex machine which can be used for simultaneously making a plurality of rivets, nails, and the like, and in which portions can be readily thrown out of gear by a simple manipulation of the parts, so as to provide for making any smaller number of articles. In this way the machine can be used for making a single rivet at a time or for simultaneously making a nail and a rivet or a plurality of either.

**BAND-CUTTER FOR THRESHING MACHINES.**—M. G. ALBERTSON, Oakes, N. D. One object of the invention is to provide automatically-acting friction-brakes which operate upon shafts to prevent them from turning during the time the knives are in normal operation, said brakes being so applied that should rapidity of the feed of the bundles tend to choke the machine, the brakes will permit the knife-carrying shafts to revolve and their knives to roll over the bundles, thus obviating throwing off the drive-belt and preventing possible breakage of knives.

**MACHINE FOR CLEANING AND SEPARATING COTTON FROM ITS IMPURITIES.**—J. S. LYLE, McLoud, Oklahoma Ter. A special object in this instance is to provide a machine which will act upon cracked and unopened bolls, and so work upon machine-picked material, as well as hand-picked, thereby reducing the cost of gathering the cotton and increasing the yield by utilizing immature and unopened bolls. Such bolls are opened without cutting or tearing the same, thereby saving the staple and avoiding the difficulty of cleaning out mashed or finely-broken pieces of hulls.

**MOLDING-MACHINE.**—H. BANNON, Elwood, Indiana. This machine is especially adapted for molding chimney-blocks having smoke and ventilating passages. It is capable of general use. A hand-press made of cast-steel provides great strength without clumsiness, and can be operated by an attendant to mold articles of complicated shape and leave them so as to be readily removed from the mold and set aside for drying. The invention also provides an efficient and easily-operable core-manipulating device, a simple means for opening the mold, a novel press-head, and a pallet.

**VIOLIN-PIANO.**—F. H. WATSON, Huntingdon, Tenn. In this patent the object of the invention is to provide a violin-piano which is simple and durable in construction and arranged to insure the proper sounding of the treble and bass strings and to allow of conveniently placing the resinous band in position.

**INTESTINE-CLEANER.**—W. F. DUNCKER, Wrightsville, Pa. Mr. Duncker's invention consists in an improvement in machines for cleaning intestines of hogs, beef, and sheep for casing of sausage, etc. Injury to the casings or

tearing thereof by the revolution of scrapers is avoided in the operation. The feed-rollers and scrapers are kept clean and water is supplied to wash the casings as they are passing through the machine.

**Prime Movers and Their Accessories.**

**MOTOR.**—S. J. EVANS, Bluefield, W. Va. In this case the invention has reference to motors, and has for its object the provision of a motor which is simple, cheap, and efficient in operation, and one in which the water of condensation is drained off without the use of cocks. Air may be employed as a motive fluid instead of steam, if desired.

**LUBRICATOR.**—C. G. GLASRUUD, Sheyenne, N. D. This force-feed lubricator is adapted to be applied to connecting-rods and other moving parts of engines or other machinery. It insures certain and reliable action, at the same time provides means by which the feed may be regulated with great exactness. The driving part is simple and certain in action, and provides for complete regulation of its movement.

**Railways and Their Accessories.**

**BRAKE MECHANISM FOR INCLINED RAILWAYS.**—S. E. JACKMAN, New York, N. Y. The object of this invention, which relates to mechanisms for inclined railways, such as shown and described in Letters Patent of the United States, formerly granted to Mr. Jackman, is to provide a mechanism, arranged to allow the controlling of a car on the down-track or homestretch independent of the occupants and with a view to check the speed of the car and bring it finally to a stop at the station.

**RAILWAY.**—S. E. JACKMAN, New York, N. Y. The invention relates to switch-back or inclined gravity railways—such as are used in pleasure-resorts, exhibitions, and the like. The object is to provide a railway arranged to afford exciting and interesting rides over a continuous track. Very little time is consumed in passengers entering and leaving the cars. Mr. Jackman has secured two more patents in railways. In one, the invention refers to switch-back or inclined gravity-railways, and is for use in pleasure resorts, exhibition-grounds, etc. The arrangement provides for cars continually traveling over a continuous track, with little loss of time in handling passengers, and hence many cars can be run simultaneously on the track, spaced suitable distances apart, and a revenue can be derived from the running in a comparatively short time. Mr. Jackman's next invention of a railway relates to switch-back or gravity railways, such as used in pleasure-resorts, exhibition-grounds, and the like places. The object is to provide a railway having a continuous track for cars to travel on, the track being provided with deep dips in the several courses to render the ride exceedingly interesting and exciting to the passengers.

**COMBINED TRAIN SIGNAL AND INDICATING APPARATUS.**—W. A. HARRIS and B. A. HARRIS, Greenville, S. C. The apparatus is especially designed for use on passenger-trains and adapted through the aid of an independent train-pipe to communicate an audible and a visual signal to the engineer, the visual corresponding to the audible and remaining in position to indicate the latter signal which has been given until the indicating devices have been released by the engineer. The Messrs. Harris have invented another combined train signal and indicating apparatus designed for use on freight trains, the present invention relating to means whereby the engineer may signal back to the conductor or other train man in the caboose the signals which have been received by the engineer or any other signal desired, the objects being to establish signaling communication by which signals may be reliably sent back and forth between the caboose and engine-cab.

**CAR-REPLACER.**—W. A. HUTSON, Orlando, Fla. The replacer is of the class which consists of a portable device, commonly called a "frog" or "shoe," which is adapted to be placed over or beside a track rail and has a grooved and sloping guideway in which a truck-wheel of a railroad-car may run and be at the same time guided into due normal position upon the rail. It includes two frogs or shoes, which are used together, but differ in construction, the same coacting in such a way as to replace a car-truck in a novel and expeditious manner.

**Pertaining to Recreation.**

**GUN-SIGHT.**—D. W. KING, JR., San Francisco, Cal. The purpose here is to provide a sight in which are means whereby to enable a marksman to use any one of the four notches with either side of the diaphragm at any desired elevation, providing for eight combinations, and giving him a rear sight to suit the eyes and to conform to the size and shape of the front sight used and also to render the sight adaptable to various conditions of weather, light, or background.

**GAME DEVICE.**—H. D. DARLINGTON, Norwood, Ohio. One purpose of the inventor is to provide a device which embodies a game-board provided with numerically-designated counting-spaces having electrical connection with a signaling device and a co-operating expelling device adapted for throwing a ball, projectile, or

other object onto a table from a point remote therefrom, the object thrown having a contact portion to complete the electric circuits employed.

#### Pertaining to Vehicles.

**HORSE-DETACHER.**—H. G. SIMPSON, Elkhorn, W. Va. This is an attachment for the front axles of carriages and wagons for releasing poles and shafts in case of danger from a horse or team running away. More particularly it is an improvement in detachers which include sliding bolts adapted to secure pole or shaft irons, and a vertical oscillating lever with which such sliding bolts are connected by links or rods.

**CARRIAGE-TOP ATTACHMENT.**—W. C. WILLIAMS, Eckford, Mich. This inventor's improvement is in that class of buggy or carriage top attachments which are removable from the carriage or buggy seat. The object is to provide an attachment which may be more easily and quickly applied and detached than heretofore and which will be held securely when so applied. It is applicable for many forms of vehicles.

**CHECK ATTACHMENT TO VEHICLES.**—S. L. DUCKETT, Goldfield, Colorado. Of the purposes in this instance one is to provide an attachment adapted for use in checking horses should they attempt to run away while being driven or when left standing and to provide a device for such purposes which will be simple and which can be brought into action while the driver still holds the reins.

**CRANK-HANGER.**—F. M. OSBORNE, Anaconda, Mont. This invention is an improvement in crank-hangers for bicycles. In carrying out the invention the sprocket wheel pulls between the bearings, and the cranks can be conveniently removed when desired without disturbing all of the parts of the hanger. The construction forms a very simple crank-hanger from which dust will be excluded and in which the cranks can be readily removed by simply turning off a nut and pulling the shaft-sections of the cranks apart.

**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.



#### HINTS TO CORRESPONDENTS.

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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.

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Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(10440) Mr. C. D. W. asks: Is John Tyndall dead? If so, when did he die? A. John Tyndall died December 4, 1893.

(10441) S. K. S. says: Is the nebular hypothesis of Laplace still the accepted scientific theory of the cosmogony of our castle? If not, what theory, if any, has supplemented it? A. It cannot be said that the nebular hypothesis of Laplace is held in its entirety by astronomers at the present time. The phenomena which cannot be accounted for by their conditions are too numerous. Darwin's tidal evolution hypothesis has by many been adopted as an addition or supplement to the nebular hypothesis. The large number of spiral nebulae seem to demand a modification of the hypothesis. You will find a very recent exposition of the whole question in Moulton's "Astronomy," pp. 440-448. We can send the book for \$1.25. It is the latest text book of astronomy.

(10442) W. B. K. asks for the government formula for whitewash. The following coating for rough brick walls is used by the United States government for painting light-houses, and it effectually prevents moisture from striking through: Take of fresh Rosendale cement, 3 parts, and of clean, fine sand, 1 part; mix with fresh water thoroughly. This gives a gray or granite color, dark or light, according to the color of the cement. If brick color is desired, add enough Venetian red to the mixture to produce the color. If a very light color is desired, lime may be used with the cement and sand. Care must be taken to have all the ingredients well mixed together. In applying the wash, the wall must be wet with clean fresh water; then follow immediately with the cement wash. This prevents the bricks from absorbing the water from the wash too rapidly, and gives time for the cement to set. The wash must be well stirred during the application. The mixture is to be made as thick as can be applied conveniently with a

whitewash brush. It is admirably suited for brickwork, fences, etc., but it cannot be used to advantage over paint or whitewash.

(10443) A. A. H. asks how to make javelle water. A. Javelle water proper is prepared by passing gaseous chlorine—derived from the action of hot sulphuric acid on a mixture of common salt and oxide of manganese—into a 10 per cent aqueous solution of carbonate of potash until the latter will absorb no more. It may also be made by adding a solution of carbonate of potash to a solution of chlorinated lime (bleaching powder) as long as a precipitate continues to form, the liquid being afterward decanted or filtered. Ordinarily, however, the liquid called javelle water is chlorinated soda, and not potassa.

(10444) J. K. E. asks how to make gravel and tar walks. A. Take 2 parts very dry lime rubbish and 1 part coal ashes, also very dry, and both sifted fine. In a dry place, on a dry day, mix them, and leave a hole in the middle of the heap as bricklayers do when making mortar. Into this pour boiling hot coal tar, mix, and when as stiff as mortar put in 3 inches thick where the walk is to be; the ground should be dry and beaten smooth; sprinkle over it coarse sand. When cold, pass a light roller over it; in a few days the walk will be solid and waterproof.

(10445) B. L. W. asks how to make Pharaoh's serpents. A. These are little cones of sulphocyanide of mercury which, when lighted, give forth a long, serpent-like, yellowish brown body. Prepare nitrate of mercury by dissolving mercury dioxide in strong nitric acid as long as it is taken up. Prepare also sulphocyanide of ammonium by mixing 1 volume sulphide of carbon, 4 strong solution of ammonia, and 4 alcohol. This mixture is to be frequently shaken. In the course of about two hours, the bisulphide will have been dissolved, forming a deep red solution. Boil this until the red color disappears and the solution becomes of a light yellow color. This is to be evaporated at about 80 deg. F., until it crystallizes. Add little by little the sulphocyanide to the mercury solution. The sulphocyanide of mercury will precipitate; the supernatant liquid may be poured off, and the mass made into cones of about 1/2 inch in height. The powder of the sulphocyanide is very irritating to the air passages, and the vapor from the burning cones should be avoided as much as possible. To ignite them set them on a plate or the like, and light them at the apex of the cone.

(10446) H. N. M. asks how to prepare skins for fur. A. Mix bran and soft water sufficient to cover the skins. Immerse the latter and keep them covered for twenty-four hours; then remove, wash clean, and carefully scrape off all flesh. To 1 gallon of water (hot) add 1 pound of alum and 1/4 pound of salt. When dissolved and cool enough to admit entrance of the hand, immerse the skins for twenty-four hours, dry in the shade, and rub. Stir the liquor again, immerse the skins for twenty-four hours, dry, and rub as before; immerse for twenty-four hours in oatmeal and warm water, partially dry in the shade, and finally rub until entirely dry. This leaves the skin like white leather, and fit for immediate use.

(10447) A. C. N. asks how to lay sheet lead. A. In laying sheet lead for a flat roof, the joints between the sheets are made either by rolls, overlaps or soldering. In joining by rolls, a long strip of wood two inches square, flat at the base and rounding above, is placed at each seam; the edge of one sheet is folded round the rod and beaten down close, and then the corresponding edge of the next sheet is folded over the other. In overlapping, the adjacent edges of the two sheets are turned up side by side, folded over each other and closely beaten down. Soldering is not adopted when the other plans can be carried out.

(10448) H. J. N. asks how putz pomade is made. A. 1. In 100 pounds common yellow vaseline, melted, stir 20 pounds of fine colcothar. 2. Same as above, only using lard instead of vaseline. 3. Twenty pounds of Am. mineral oil and 5 pounds of lard are melted and 25 pounds of fine colcothar are stirred in. 4. The following is given as the formula for genuine putz pomade: Oxalic acid, 1 part; oxide of iron, 25 parts; rottenstone, 20 parts; palm oil, 60 parts; vaseline, 4 parts. The oxide of iron may be Venetian red. Both it and the rottenstone must be absolutely free from grit. Oxalic acid is poisonous.

(10449) M. B. W. asks how to make dextrine paste. A. In hot water dissolve a sufficient quantity of dextrine to bring it to the consistency of honey. This forms a strong adhesive paste that will keep a long time unchanged, if the water is not allowed to evaporate. Sheets of paper may be prepared for extempore labels coating one side with the paste and allowing it to dry; when to be used, by slightly wetting the gummed side, it will adhere to glass. This paste is very useful in the office or laboratory.

(10450) H. P. W. asks how to join rubber. A. Rubber is easily joined and made as strong as an original fabric, by softening before a fire, laying the edges carefully together, without dust, dirt, or moisture between. The edges so joined must be freshly cut in the beginning. Tubing can be united by joining the edges around a glass cylinder, which has previ-

ously been rolled with paper. After the glass is withdrawn the paper is easily removed. Sift flour or powdered soapstone through the tube to prevent the sides from adhering from accidental contact.

(10451) C. N. asks for a formula for ground glass. A. Sandarac, 90 grains; mastic, 20 grains; ether, 2 ounces; benzole, 1/2 to 1 1/2 ounce. The proportion of the benzole added determines the nature of the matt obtained.

(10452) A. M. C. asks: I have a system of wires which I use for receiving wireless messages. They are horizontal, and run nearly parallel to the elevated structure of the Long Island Railroad, which is equipped with the third-rail system. I have noticed that unless the weather is damp, whenever a steam engine passes on the structure, I get sparks about 1/4 inch long from the wires. There are four wires, each 180 feet long. They run at an angle of about 15 deg. to the tracks, and are about 40 feet off ground. Between the wires and parallel to the tracks is a two-phase 2200-volt alternating line, about the same height as the wires. The least distance from the wires to tracks is about 125 feet. No smoke or steam from engine reaches the wires. The sparks are very heavy, and apparently of an oscillatory nature, not the ordinary static sparks obtained from high wires. At no other times except during thunderstorms can I get sparks from the wires which amount to anything. A. There would seem to be no doubt that the sparks from the receiving wires of the wireless station are due to the induction of the great mass of metal in the steam engine, passing through a field in which heavy currents are already flowing, that of the alternating current. We have not met with just this case before, but it would seem that this cause would be sufficient to account for the effect produced.

(10453) K. S. B. writes: In regard to the recent wreck of the electric train on the New York Central, I see by your paper that the spikes holding the outer rail were sheared, showing a much greater stress on the outer rail at a given speed than for a steam locomotive of the same weight. As for the reasons for this: Besides the concentration and the low height of the load, would not the gyroscopic effect of the rotating parts of the motors play an important part? As the wheels (drivers) are comparatively small, the speed of rotation is large. Then to change the direction of the axis of revolution of these heavy, rapidly-revolving parts would take a considerable force, which was probably not taken into account by the engineers, who elevated the outer rail to counteract the inertia of the train only. This so-called "gyroscopic action" enters as a large factor in other problems of a similar nature, and it seems to me that it would in this particular case also. It also seems to me that this action of the motors would have to be taken into account on heavy motors at high speeds. I presume that lighter parts, also lower speeds in general, is what has kept electric trains from experiencing this difficulty heretofore. A. Your suggestion of a gyroscopic action in the rapidly rotating wheels of an electric train is doubtless correct. Just how great a force is produced we have not calculated. It would be variable, and would increase very rapidly with the increase of speed.

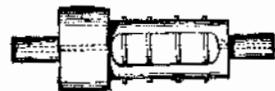
(10454) E. S. D. writes: Will you kindly answer me through your Notes and Queries what would be the normal height of the barometer at an elevation of 5548 feet above the level of the sea? A. Normal barometer at an altitude of 5,548 feet will be about 24 1/2 inches.

(10455) J. B. W. asks how to color brass a deep blue. A. A cold method of coloring brass a deep blue is as follows: 100 grammes of carbonate of copper and 750 grammes of ammonia are introduced in a decanter, well corked, and shaken until dissolution is effected. There are then added 150 cubic centimeters of distilled water. The mixture is shaken once more, shortly after which it is ready for use. The liquid should be kept in a cool place, in firmly closed bottles or in glass vessels, with a large opening, the edges of which have been subjected to emery friction and covered by plates of greased glass. When the liquid has lost its strength it can be recuperated by the addition of a little ammonia. The articles to be colored should be perfectly clean; especial care should be taken to clear them of all trace of grease. They are then suspended by a brass wire in the liquid, in which they are entirely immersed, and a to-and-fro movement is communicated to them. After the expiration of two or three minutes, they are taken from the bath, washed in clean water, and dried in sawdust. It is necessary that the operation be conducted with as little exposure to the air as possible. Handsome shades are only obtained in the case of brass and tombac—that is to say, copper and zinc alloys. The bath cannot be utilized for coloring bronze (copper-tin), argentine, and other metallic alloys.

(10456) A. D. M. asks for a dressing for linoleum. A. A weak solution of beeswax in spirits of turpentine has been recommended for brightening the appearance of linoleum. Here are some other formulas: 1. Palm oil, 1 ounce; paraffine, 18 ounces; kerosene, 4

ounces. Melt the paraffine and oil, remove from the fire and incorporate the kerosene. Polish.—2. Yellow wax, 1 ounce; carnauba wax, 2 ounces; oil turpentine, 10 ounces; benzine, 10 ounces. Melt the waxes carefully, add the oil and benzine, and stir until cold. 3. Yellow wax, 5 ounces; oil turpentine, 11 ounces; amber varnish, 5 ounces. Melt the wax, add the oil, and then the varnish. Apply with a rag.

(10457) J. W. H. asks for a tool for straightening wire. A. Such a tool is shown in the accompanying cut. It consists of a casting about 10 inches in length, having



on each end a bearing which may be supported in suitable boxes. The pulley is a part of the casting, and is 3 inches in diameter and 2 inches wide. Four steel pins are inserted 1 inch apart and a little to one side of a central longitudinal line. A hole a little larger than the wire to be straightened is drilled axially through the bearing. The wire passes through the tool over and under the steel pins. It is well lubricated and is pulled through as the tool revolves rapidly.

(10458) C. N. asks how to do annealing. A. For a small quantity, heat the steel a cherry red in a charcoal fire, then bury it in sawdust, in an iron box, covering the sawdust with ashes. Let it stay until cold. For a larger quantity, and when it is required to be very soft, pack the steel with cast iron (lathe or planer) chips in an iron box as follows: Having at least half or three-quarters of an inch in depth of chips in the bottom of the box put in a layer of steel, then more chips to fill spaces between the steel and also the half or three-quarters of an inch space between the sides of the box and steel, then more steel; and lastly, at least one inch in depth of chips, well rammed down on top of the steel. Heat the whole to and keep at a red heat for from two to four hours. Do not disturb the box until cold.

(10459) B. W. F. asks how to clean paint. A. To clean paint, provide a plate with some of the best whiting to be had; have ready some clean warm water and a piece of flannel, which dip into the water and squeeze nearly dry; then take as much whiting as will adhere to it, and apply it to the painted surface, when a little rubbing will instantly remove any dirt or grease. After which, wash the part well with clean water, rubbing it dry with a soft chamois. Paint thus cleaned looks as well as when first laid on, without any injury to the most delicate colors. It is far better than using soap, and does not require more than half the time and labor.

(10460) C. D. asks how to make grape syrup. A. 1. Half pint brandy, 1 ounce tincture of lemon, 1 gallon simple syrup, tincture red sanders, 1 quart. 2. Brandy, 1/2 pint; spirits of lemon, 1/4 ounce; tincture of red sanders, 2 ounces; simple syrup, 1 gallon. 3. A grape syrup, not an artificial syrup, or one for fountain use, but a syrup from the fruit, for domestic or table use, etc. Take 20 pounds ripe freshly picked and selected tame grapes, put them into a stone jar, and pour over them 6 quarts of boiling soft water; when sufficiently cool to allow it, well squeeze them thoroughly with the hand, after which allow them to stand 3 days on the furnace with a cloth thrown over the jar, then squeeze out the juice and add 10 pounds of crushed sugar; let it remain a week longer in the jar; then take off the scum, strain and bottle, leaving a vent until done fermenting, when strain again and bottle tight, and lay the bottles on the side in a cool place.

(10461) B. J. asks how to waterproof canvas. A. A solution containing equal parts by weight of gelatine and chrome alum. It is not advisable to mix more of the solution at once than is sufficient to give the canvas one coat, as, if the mixture once sets, it cannot be reliquified like a plain solution of gelatine, and hence, if the quantity of canvas to be waterproofed is but small, it would, perhaps, be preferable to coat with plain gelatine solution until quite impervious to cold water, and then to thoroughly soak for, say, twenty-four hours in a strong solution of chrome alum.

#### NEW BOOKS, ETC.

**THE NAVAL POCKET-BOOK.** Founded by Sir W. Laird Clowes. Edited by Geoffrey S. Laird Clowes. London: W. Thacker & Co., 1906. Pocket size; pp. 965. Price, \$3.

The present edition of this well-known, compact, and very convenient little work is fully up to the high quality of its predecessors. It opens with a calendar in which the leading events of naval history on each particular date are recorded; and this is followed by a comparative summary of the fighting fleets of the world arranged under a new system of notation. Then in tabular form is given the statement of the various world's navies, tables and descriptions of the naval guns and small arms, a list of drydocks, giving dimensions and capacities, and at the close of the book are diagrams of the leading types of ship of each navy, showing the disposition of guns and armor with the sizes and thicknesses of each.