RECENTLY PATENTED INVENTIONS.

Electrical Devices.

ELECTRICAL ROSETTE.—J. A. MEBANE, South Boston, Va. The present invention is a further improvement in the same line as that for which Mr. Mebane filed a former application for a patent. He has provided improved means for detachably connecting the base and cap of the rosette proper, also for insulating and protecting the fuse-wires and for attachment of conducting-wires. The improvement enables him to employ a fuse-wire of due length and to thoroughly protect and insulate the same from adjacent electrical connections.

SIGNAL SYSTEM. W. B. BRUCE, Gallatin, Tenn. Many serious collisions have occurred on railroads because no means are provided for signaling trains between telegraph-stations. The main object of this invention is to provide such a signal system—one that will be absolutely certain to operate and one which will be simple and practical in every respect, and inexpensive to manufacture and maintain.

Of Interest to Farmers.

MILKING-MACHINE.—O. B. BRYANT, Ravenna, Neb. The object of this inventor is to provide novel details of construction for a machine that adapt it for convenient application to the teats of a cow, effect a painless milking operation that simulates hand-milking, and afford support for the machine on the animal while in use.

GATE.—G. W. FOX and D. E. SARVER, Laramie, Wyo. This is an improvement in gates, especially farm and ranch gates. One purpose is to provide a simple, economic, and effective gate, capable of being expeditiously and conveniently operated by a person either riding or walking—which gate is practically a self-opening and gravity-closing gate. Another is to provide an automatically-acting latch for the gate and to construct suitable guides, and friction-rollers on the guides, facilitating the action of the said gate.

HARROW-TOOTH.—J. W. SMITH, Troupe, Texas. Among the advantages of this improvement may be mentioned a more thorough cultivation and pulverization of the soil. A closer cultivation of crops may be also obtained. When used in a cultivator, a much more thorough eradication of weeds is secured than by the use of the ordinary cultivator-point, since the weeds are cut off beneath the surface of the ground and are turned under the dirt instead of being merely scratched, as with the ordinary construction.

Of General Interest.

BLADE-CLAMP FOR SAW-FRAMES.—J. GRIEVE, Dodge City, Kan. The object of the invention is to furnish an inexpensive clamping attachment for each of the ordinary blade-clamps on a saw-frame which affords convenient means for reliably securing the ends of the saw-blade in clamped condition thereon and that may be quickly and readily adjusted for clamping or releasing the saw-blade without requiring the use of pliers or any other implement to effect such an adjustment of the improved attachment.

HANGER FOR CABLE-HEADS.—F. M. WINN, Des Moines, Iowa. The hanger is particularly adapted for use in connection with the heads or portions of aerial conducting-cables which are made into distributing-boxes and the like. In use the bars may be secured at each side of the pole at a distance below the cable-head and the vertical portion thereof introduced between the curved ends. The stay is then brought into coaction with the pole and fastened to it and the bolt finally tightened to draw the ends of the bars into coaction with the cable and thus support it.

STEREOTYPE-MATRIX. — F. SCHREINER, Plainfield, N. J. This invention includes the process of making the matrices, as well as the parts of the matrix. The object is to simplify the production of matrices and to provide a process which may be carried out quickly by means of dried sheets which can be kept in stock ready for use at a moment's notice. It dispenses with the necessity of mixing paste as used in the ordinary matrix processes and provides a matrix which may be quickly dried and made ready for instant use.

DRILL-SOCKET. G. A. SAGER, Albany, N. Y. The purpose of the improvement is to provide a socket in which a drill may be expeditiously and conveniently clamped and securely held whether the tang of the drill be intact or broken and to provide means whereby any size of drill may be positively held in the socket without danger of displacement even under the most severe strain.

CUTTING IMPLEMENT. H. F. NEHR, New York, N. Y. This device cuts what is known in religious services as the "host." The cutting element is in the form of a ring, and can be produced at a minimum cost to enable it being entirely dispensed with when dulled and substituted by others. It is simple, durable, and can be quickly and conveniently introduced and held in position for use and when not needed can be placed in a holder with the cutting edge innermost, thereby protecting the edge and maintaining it in a clean condition.

STOVEPIPE-PROTECTOR.—S. B. GRAHAM, Corsicana, Texas. This improvement refers to stovepipe connections, and its object is to prevent the descent of products of condensation on the outside of a stovepipe. It is especially applicable where the stovepipe is vertical and is more necessary under these circumstances. It also operates beneficially to prevent rain-water from passing down the pipe.

TROUSERS-STRETCHER.—W. J. WARDWELL, Redondo, Cal. In this patent the invention has reference to trousers-stretchers; and its object is the provision of a simple device which may be easily applied to a pair of trousers in order to crease them at the lower extremities and enable them to be suspended as from a hook.

MUSICAL-INSTRUMENT BEATER.—J. P. STANTON, San Francisco, Cal. The invention relates to improvements in devices for beating bass drums and cymbals, the object being to provide a beater so constructed that it may be operated with great rapidity and lightness of action, that may be easily cleaned of dust that may gather thereon, and so arranged as to be compactly folded for transportation or storage.

BEARING FOR HANDLE-CAPS.—L. B. PRAHAR, New York, N. Y. The inventor provides a construction of bearing for handle-caps for bags and like articles, which construction is an improvement upon that shown in his former application for a similar device, the improvement being such as to simplify the bearing, providing a construction in one piece including a base, one or more posts, and attaching-lugs which extend down from the lugs.

BUCKET-DUMPING DEVICE.—J. C. KIRSCH and J. J. HARTMAN, Granite, Colo. This invention refers to a device for dumping a mining-bucket which has been elevated through a mine-shaft. The object of the improvement is to produce a device of this class which will operate easily and simply to effect dumping of the bucket, the operation being effected without necessitating the seizing of the bucket.

PROCESS OF MAKING MALTED COCOA OR CHOCOLATE.—W. B. KERR, Medford, Mass. Among the several objects of this improvement are the following: first, to render the cocoa or chocolate more easily digestible; second, to render the same more palatable, and, third, to make a combinational article of food suitable for many culinary purposes for which neither of the ingredients could be used separately.

SHOE AND PANTS DUSTER.—M. M. HITT, Luray, Va. This apparatus is adapted for removing dust and dirt from boots and shoes and the lower portions of pants-legs without the use of a hand-brush or other manually-operated device. The inventor arranges the brushes horizontally and opposite each other and supports them upon a suitable frame, their free ends being in contact, or nearly so, and thus adapted for contact with shoes and the lower portions of pants-legs when a person walks or otherwise passes his feet between the brushes.

POWDER-CARTRIDGE FILLER.—W. H. HAYES, Philadelphia, Pa. In this case the invention pertains to powder handling; and the object is to facilitate the removal of powder or similar explosive from canisters. It is expected to be especially valuable in connection with the filling of cartridges to be used for blasting. The primary object has been to prevent dangerous explosions.

UNDERWAIST.—E. H. HORWOOD, Hoboken, N. J. The purpose of the invention is to provide a construction wherein the armhole-section is double in its entirety and likewise a portion of the sides, thus rendering the waist much more durable, particularly at points subjected to most wear and strain, and, further, to provide means whereby such construction may be carried out in the initial operation in manufacturing garments, enabling the garment to be made with the same facility and no greater expenditure of time than in the ordinary single-ply garment, thus enabling it to be marketable, as the cost of manufacture is practically no more than that of the ordinary garment.

PHOTOGRAPHIC SOLUTION-BOX.—G. C. GENNERT, New York, N. Y. This device is for use in developing, fixing and washing photographic plates, comprising a receptacle and a tray having free movement in the receptacle, which tray holds plates in a standing position. The tray is supplied with handles so applied that they may be used for reciprocating the tray in the receptacle and for supporting and holding the tray partially out of the receptacle and entirely out of the fluid employed, enabling ready access to the plates.

DRUM-BEATER.—A. D. CONVERSE, Winchendon, Mass. The purpose in this instance is to provide simple mechanism for controlling the operation of drumsticks relative to the head of a drum or other surface to be beaten upon, which mechanism can be conveniently operated to produce taps of all descriptions given to a drum and which are usually produced by a drummer holding the sticks in the hand.

PHOTOSTEREOSCOPIC APPARATUS. — J. S. A. TOURNIER, Bourges, Cher, France. In appliances ordinarily used two identical objectives are parallelly arranged. They give either upon a single plate of sufficient length or upon two separate parallel plates two images individually inverted, and in each the right-hand portions of the object are seen upon the left-hand side and inversely left-hand portions on the right; besides, centers of the two images are always at the same distance apart as the centers of the two objectives. The result is, whenever obtaining a stereoscopic base larger than the distance apart of the eyes with small negatives the apparatus presents a large volume on account of space lost in its center. Capt. Tournier reduces the volume by utilizing the whole space between the two objectives.

Household Utilities.

ATTACHABLE SEAT FOR WATER-CLOSETS.—H. PARKER, Asheville, N. C. A small portable seat-board is provided by this inventor having an opening of reduced diameter which may be instantly placed in position upon the seat proper, be firmly held in place automatically, avoid the least injury to the closet, and be readily removable when not in service. It can be carried in a case when traveling and when applied renders any closet having an ordinary seat-board available for the safe and convenient accommodation of small children.

DOOR-FASTENER.—G. W. NILES, Vanwert, Ohio. The invention is an improvement in that class of door-securers which are adapted for use independently of the ordinary latch or bolt forming an attachment of a door, the same having a member provided with a claw that engages the door-jamb and another member which is adjustable on the first-named one and adapted to abut the adjacent edge of the door, and thus prevent the latter being opened from without.

WINDOW-SCREEN. — W. C. HILDEBRAND, Glenrock, Pa. By this invention an improvement is made in window-screens, especially in adjustable window-screens which can be extended and contracted to fit windows of different sizes as well as to facilitate their insertion and removal from windows. The object is to provide certain improvements in the devices for connecting the sliding sections of the screen.

Machines and Mechanical Devices.

MACHINE FOR TREATING CREAM.—O. H. NEBEL and J. H. PETERSON, Worthington, Minn. The invention has reference to improvements in machines for cooling or heating and tempering cream, the object being to provide a machine of this character that will be simple in construction, easily operated, and having no parts liable to get out of order. Means are provided for observing the condition of the cream in the machine.

MACHINE FOR FORMING AND ASSEMBLING CAN-SECTIONS.—L. C. SHARP, Omaha, Neb. This machine is designed for use in connection with the two-piece or one-seam can forming the subject-matter of Mr. Sharp's copending application formerly filed. The invention relates to an apparatus for forming and assembling drawn can-sections, and it comprises automatic mechanism for fully performing this work with the exception of the dies or other mechanism for giving the can-sections their primary shape.

HORSE-WHIPPING MECHANISM. — A. NEUDECKER, Clements, Minn. The object of the invention is the provision of a simple means in connection with the mill whereby should the animal slack up or travel at a gait below a desired speed a whip would be automatically released to strike and continue to strike the horse until the proper speed is gained, when the operation of the whip is automatically stopped, obviating the attention of a driver and thus resulting in an economical operation of a horse-power mill.

TYPE-MOLD FOR TYPE-CASTING MACHINES.—J. MAYER and C. ALBRECHT, Berlin, Germany. The invention relates to a type-mold to be used in type-casting machines of any known kind and by which it is rendered possible to cast a plurality of types, logotypes, or wordtypes at a time, whereby the production thereof is in proportion increased. The new type-mold can be used in place of the linotype-mold in linotype casting and composing machines, so that by this type-mold it is rendered possible to produce at pleasure various types.

CIGARETTE-MAKING MACHINE.—A. BENÔIT, J. GUÉNIFFET, J. NICAULT, and E. DANGER, 7 Rue Deparcieux, Paris, France. In this machine a core or cord of tobacco is formed and fed along continuously, while the paper tubes are carried by a drum moved intermittently along and around its axis. Each tube successively is moved backward and comes in a direction contrary to that of the core of tobacco over the end of the latter. Immediately it is filled with tobacco it is moved forward. During this latter movement the core is cut without being stopped by a blade moved at the same speed of translation as the core itself. When the cut is completed the drum is turned and presents a fresh paper tube in front of the cut end of the core, which tube is immediately moved back to be filled by this core. By a special arrangement the drum receives very rapid intermittent rotary motion.

Prime Movers and Their Accessories.

FLY-WHEEL AND CRANK-SHAFT STRUCTURE. S. W. SHAW, Galesburg, Kan. The invention relates particularly to improvements in the construction of the crank-case, crank-shaft and fly-wheel of internal combustion-engines. The underlying object is to increase the compactness of the engine at the point of the crank-shaft and crank-case and at the same time to provide long bearing-surfaces, thus decreasing the friction and giving the moving parts greater and more support.

TURBINE.—C. RHOADES, Tilbury, Ontario, Canada. Steam or other motive fluid under pressure being supplied to the steam chamber will pervade the same, and the valves carried on stems being open it will pass through the nozzles, acting on the buckets at the periphery of the turbine-wheel to impart continuous rotary movement to the wheel, the speed proportionate to pressure of the fluid. Any or all nozzles may be cut out of action by operating the valves, which provide means for controlling the speed of rotation of the wheel. Means are provided so that during heavy loads steam jets will be forced through one or more buckets, exerting a part of the power on each succeeding bucket and avoiding choking the jets by the steam rebounding during slow speeds.

Railways and Their Accessories.

LANTERN.—A. C. DUDLEY, Kansas City, Mo. Mr. Dudley's invention relates particularly to improvements in signal-lanterns for railway use, the object being to provide an ordinary white-globe lantern with an auxiliary colored signal-globe so arranged as to be readily adjusted around a lamp-flame when required for signal purposes or raised above the flame, so that the white light will show, thus practically forming two lanterns in one structure.

RAIL-SANDING DEVICE.—W. T. WATSON, Vancouver, British Columbia, Canada. Provision is made in this invention for a simple and strong device for sanding rails and means for insuring a free flow of sand at all times. The device is intended to be attached to a railway-car and has a discharge-spout leading to the rails on which the car runs, the flow of sand being controlled by the motorman, conductor, or other person.

SIGN.—W. T. WATSON, Vancouver, British Columbia, Canada. The sign is intended especially for street-railway cars; but is useful for other purposes. The object of the invention is to provide a sign which will be uniformly visible in night and day and not subject to weather conditions. The light employed may be of any sort, but preferably an electric light, the rays of which are emitted at night, so as to make a luminous sign, and at day the lettering or other device produced on a plate will be plainly visible. Among the advantages, are means that prevent snow, sleet, and the like from obscuring the sign.

CAR-VENTILATOR.—T. H. GARLAND, Chicago, Ill. There is provision of means in this instance for securing efficient ventilation irrespective of the direction of motion of the car and at the same time to prevent the possibility of the entrance of snow, rain, cinders, etc., through the ventilator. Having no moving parts, it cannot easily become inoperative.

RAIL-CHAIR.—R. H. FRAY, Traver, Cal. In this patent the object of the inventor is to provide a new and improved rail-chair arranged to prevent spreading of the rails, especially along sharp curves, to securely join adjacent rails without the use of fish-plates and the like, and to permit convenient removal of a worn-out rail to be replaced by a new one.

Pertaining to Recreation.

PLEASURE-WHEEL.—C. J. JONES, Imperial, Neb. The principal object of the invention, which refers to pleasure apparatus in the form of a rotating wheel, is to provide a rotating wheel or platform which will be capable of holding a considerable number of persons and which will, when rotated, automatically rise and fall upon a mast or other support.

PUZZLE.—E. C. HOWLAND, New Milford, Conn. The purpose in this case is to provide a puzzle in which rolling objects differently colored are by shaking the receptacle containing them brought simultaneously to certain positions over correspondingly-colored spots and to provide barriers so grouped and arranged as to offer the greatest possible obstacle to the accomplishment of the desired purpose.

AMUSEMENT DEVICE.—A. DEBATTISTA, New York, N. Y. This device is especially adapted for out of door use, wherein inclined, straight, or undulating tracks are employed, and cars are mounted to travel by gravity on said tracks, each car being provided with a platform and an object thereon, grotesque, illustrative or plain and adapted to serve as a seat for one or more individuals. Means are provided whereby through the motion of the car an up-and-down and a forward-and-rearward motion is imparted to the platform and object carried thereby.

SEESAW AND IRONING-BOARD.—G. W. FAIRBANKS, Blue Rapids, Kan. The aim in this invention is to produce a seesaw of simple construction having attachments which will readily adapt the same for use as an ironing-board. The invention concerns itself especially with the means for supporting the board, for adjusting the height thereof, and for securing the same against movement when used as an ironing-board.

Pertaining to Vehicles.

LAP-RING.—W. T. FIELD, Bond, Tenn. Mr. Field's invention is in the nature of a new lap-ring designed to couple up a singletree to any draft attachment or to connect two sections of chain or for any analogous purpose;

and it consists in a ring composed of two separate U-shaped sections, one part provided with longitudinal grooves and the other with inwardly-facing locking-lugs adapted to enter the grooves of the first named section and to be locked thereto by a half-turn.

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.

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I sell patents. To buy, or having one to sell, write Thas. A. Scott, 719 Mutual Life Building, Buffalo, N. Y.

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

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Persons interested to promote or buy patented lacing hook for women's shoes. Chas. F. Collins, Jr., 6358 Penn Ave., Pittsburg, Pa.

Inquiry No. 7353.—For dealers in tobacco and fixtures for cigar factory.

WANTED.—Ideas regarding patentable device for water well paste or mucilage bottle. Address Adhesive, P. O. Box 773, New York.

Inquiry No. 7354.—For manufacturers of fittings for hermetically sealed water closet pans.

LATEST ADVERTISING NOVELTIES.—High-grade Illustrating, Designing and Printing. Catalogues a Specialty. Smith & Berkley, Holland Bldg., St. Louis, Mo.

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Inquiry No. 7356.—For dealers in Stewart's embossing board.

Mechanical devices of brass, aluminum, and kindred metals manufactured for inventors and patentees, and marketed on royalty, when desired. Imperial Brass Mfg. Co., 241 So. Jefferson St., Chicago, Ill.

Inquiry No. 7357.—For manufacturers of machinery for making carpet brooms.

Manufacturers of patent articles, dies, metal stamping, screw machine work, hardware specialties, wood fiber machinery and tools. Quadriga Manufacturing Company, 18 South Canal Street, Chicago.

Inquiry No. 7358.—For manufacturers of goods made from vulcanized or vulcanizable fiber.

Absolute privacy for inventors and experimenting. A well-equipped private laboratory can be rented on moderate terms from the Electrical Testing Laboratories, 548 East 80th St., New York. Write to-day.

Inquiry No. 7359.—For manufacturers of machinery for gumming paper.

WANTED.—The patents or sole agency for Britain and France, of new machines and articles used in the Brewing and Allied Trades. Highest references given and required. State best terms with full particulars to "Wideawake," care of Street's Agency, 30 Cornhill, London, England.

Inquiry No. 7360.—For firms who manufacture detail parts of furniture, such as various parts of roll top desk and parts of sectional bookcase.

WANTED.—Old, curious and defaulted bonds and stocks. Unsalable and inactive remainders of estates bought. Valuable book on this subject sent to any lawyer or banker on receipt of $1.00.
R. M. SMYTHE
Room 452, Produce Exchange, New York

Inquiry No. 7361.—For manufacturers of stoves, cooking utensils, etc.

Inquiry No. 7362.—For manufacturers of puzzles.

Inquiry No. 7363.—For manufacturers of small, 3-wheeled, rubber-tired delivery wagon.

Inquiry No. 7364.—For manufacturers of vacuum hand pumps.

Inquiry No. 7365.—For manufacturers of steel chimneys.

Inquiry No. 7366.—For manufacturers of diving suits.

Inquiry No. 7367.—For manufacturers of machinery for making wood alcohol.

Inquiry No. 7368.—For parties who make a business of laying out plots, that is for building, viz.: houses, stables, etc.

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters or no attention will be paid thereto. This is for our information and not for publication.

References to former articles or answers should give date of paper and page or number of question.

Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.

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

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Minerals sent for examination should be distinctly marked or labeled.

(9806) R. L. I. says: Please answer the following question through your Notes and Queries. This is probably an old question in one form or another, but it is new to me. A watch spring is coiled up tightly. It will then possess a certain amount of potential energy which will become kinetic when the spring uncoils. According to the doctrine of the conservation of energy, this energy which is stored up in the spring cannot be destroyed but will either be given back in the form of mechanical energy or transformed into some other form of energy. Suppose now that this coiled-up spring is slipped into a test tube of such a size that it will not allow the spring to uncoil, and the spring is dissolved in some acid. What becomes of the energy that was stored up in it? I suppose that it is transformed into heat. Would the heat produced by the reaction be greater when the metal is in this strained condition than when it is in a normal condition? A. We are frank to say that we do not know what becomes of the potential energy of a coiled spring should the spring be dissolved in acid and never get a chance to uncoil itself at all. This is an old conundrum, as difficult to answer as that other comrade of its own—"What becomes of the pins?" An answer to either would be about equally useful to the human race. We have many times answered this question, and always in the same way. The question has no practical value, and does not in any way interfere with the great law of the equality of cause and effect, which is in reality what is meant by the conservation of energy.

(9807) W. F. F. asks: I have been using a mercurial contact on a relay operating electric clock circuit, the mercury being held in a small cup forming one electrode and the other a plunger made of copper wire. After using for some few weeks the wire became entirely honey-combed and there was a carbon deposit on top of the mercury and on the sides of the cup. Can you advise what should be used as a plunger in the mercury? A. The copper wire used for the electrical contact becomes weak and fragile because of its amalgamation with mercury. This takes place slowly in the case of copper, but before long the copper is destroyed. A heavy platinum wire should be used, since platinum is not affected by mercury. We cannot account for a carbon deposit on the mercury. A deposit of oxide of copper in the form of a black powder is to be expected from the action of the oxygen of the air upon the heated end of the copper wire when the circuit is broken. If the black powder is carbon, it may be set on fire in a flame; if it is copper oxide, it will dissolve in nitric acid, giving the blue solution of copper nitrate.

(9808) G. B. asks: In projecting a lantern slide upon a screen with a single double-convex lens, the lines of the picture, when viewed close to the screen, within a foot or two: give the colors of the rainbow. If, however, the observer goes back ten or twenty feet more from the screen, all this color effect immediately disappears. Will you please explain why the color effect is not equally visible at this distance? I understand, of course, if a chromatic lens is used, there will be no such color effect. What I do not understand is why, when you can see it so plainly at a foot away you cannot see it equally plainly at ten feet, although all the other parts of the picture are equally visible at either distance. A. The colors which appear in a lantern slide shown by a single convex lens are not seen at a distance because the eye cannot see lines of the width of these lines of color at so great a distance. The fact is that a line one-tenth inch wide will be just visible at a distance of a little less than thirty feet. From this the distances at which other widths can be seen may easily be determined. Beyond the distance of visibility the separate colors cannot be seen, but the picture as a whole will be seen equally well at all distances. At the greater distances the eye accepts the larger features and does not seek finer details. For that reason a picture on a screen looks better viewed at a distance from the screen.

(9809) S. H. asks: Please explain to me, through your Query Column, why a file used to file a steel cylinder, that is revolving in a lathe, becomes a permanent magnet. A. We do not see any special connection between the use of a file in filing a revolving cylinder and its magnetism. Probably all files become magnets very soon. Being of hard steel the earth will soon magnetize them. All fixed iron or steel on the earth is magnetic with the lower end a north pole. We have noticed that files frequently hold the iron filings stuck on their ends, which shows that they had become magnetized. It is a very common occurrence, and doubtless due to the inductive effect of the earth upon them.

(9810) E. L. says: Does the wheel on the outside rail revolve oftener than the wheel on the inside rail? If not, why not, recognizing that the outside rail is longer than inside rail? A. We would say that the wheels on a steam railroad car or locomotive are rigidly attached to the axle, and therefore have to revolve together at exactly the same rate of speed. The outside rail, however, on a curve, is longer than the inside rail. This makes a certain amount of slippage between the wheels and the rails unavoidable when going around curves. The wheels, however, are somewhat larger in diameter near the flange than they are a few inches away from the flange, and the tendency is for the flange to hug the outer rail of the curves. Therefore, the outer wheel as it is rounding the curve is rolling on a somewhat longer diameter than the inner wheel. This tends to decrease somewhat the amount of slippage there would otherwise be.

(9811) E. N. writes: I have noticed recently in your correspondence column articles on lunar rainbows. I do not know what caused the discussion, but will say I have seen rainbows at night twice. In the early part of the spring of 1904 my attention was called to one of these. The time was about 8:30 P. M. A light rain had been falling, and the full moon shone from the east at an angle of about forty degrees. The arch of the rainbow was almost perfect, and I do not believe I ever saw a brighter-colored one. I do not know how long it lasted. About a month later I saw another one of these occurrences. The time and conditions were about the same, but the bow was not nearly so bright as the first. A. Many of our correspondents have reported lunar rainbows since the matter was first mentioned in our paper. Some have, however, been mistaken in calling what they saw a rainbow. A rainbow is always on the opposite side of the horizon from the sun or moon at the time. If seen in the morning, the solar rainbow is in the west; and if seen in the evening, it is in the east. So, too, the lunar rainbow is always opposite the place of the moon. As you say the moon was in the east, you saw the bow in the west. An arch of color seen on the same side of the sky as the sun or moon is not a rainbow, but a halo, and it is formed not from drops of falling rain, but from crystals of ice suspended high in the atmosphere. The colors of halos are often as bright as those of rainbows.

(9812) H. A. S. asks: Will you kindly enlighten me through your columns on the following discussion: A claims that a body in motion in going around a curve, such as an automobile for instance, the outside wheels leave the track; for this reason railroad tracks are superelevated or banked. B claims that the inside wheels leave the track; for this reason in all automobile races the turns are from right to left and the steering wheel at the right side of the car, and the machinist sits on the left side, more to act as ballast than anything else. If the inside wheels leave the track first, please explain. A. A vehicle turning a corner too rapidly will overturn outward. This is because centrifugal force is developed, and acts from the center of motion or toward the outside of the track. This has been fully discussed in this column several times lately, and we refer you to Queries 9110, Vol. 89, No. 6; 9488, Vol. 91, No. 23; 9576, Vol. 92, No. 12. We send the three papers for ten cents each.

(9813) E. P. C. asks: 1. I have made a small induction coil, the secondary of which is in two sections; 1½ pounds of No. 34 wire to the section. These two sections differ considerably in power, owing I think to the one made first being partially broken down; e. g. where section No. 1 is working alone, excited by two large bichromate cells, it yields sparks 1½ inches long. Section No. 2 under the same conditions gives sparks nearly 3 inches in length. The sparks from either section, however, are white, large, and of uniform size throughout their length. Now, when both sections are in place and working as one coil, the appearance of the spark undergoes a marked change. It is then about 4 inches in length (same battery power), but the full, white appearance only extends for about one-third of the distance from one pole, the remainder being much smaller, and of a reddish color. What is the cause of this? A. The short sparks given by the separate section of your coil are what are called "fat" sparks. They have greater intensity. When the two sections are joined in series, the long spark given when the terminals are wide apart are those which are characteristic of sparks that are near the limit of the ability of the coil. These show the dark space at the negative pole, and are bright only at or near the positive pole. What we have said is descriptive of the sparks, and does not give a cause or reason for these marks or characteristics. These causes are not known. 2. I see in Norrie's work on induc-