hinged together. In use the bars are passed over the ridge of the roof, with the sections resting against opposite sides, as shown by Fig. II. in the accompanying engraving. The sections, it will be noticed, are provided with under-cut or T-shaped notches, which are adapted for engaging links or loops used in supporting brackets. The upper or horizontal member of each bracket consists of a bar with perforations in its under side, and the vertical member of the bracket carries a pin at its upper end, which is adapted to engage one or other of these perforations, according to the pitch of the roof. The method of linking the bracket bars to the notched bars is clearly illustrated in Fig. III. When the brackets are in position, a scaffolding plank is supported on them. In some instances it may be necessary to use the bars at their full length on one side of a roof; that is, to reach from the peak of the roof to the gutter. In such a case hooks are used, which are connected to the bar by a loop, and these hooks are adapted to engage the peak of the roof, as indicated in Fig. I. As the notches in the bars are of T-form, it is obvious that the bars may be used either end up. Mr. John Emberson, 43 North Lexington Avenue, White Plains, N. Y., is the inventor of this improved scaffolding.

AN IMPROVED NON-SKIDDING TIRE.

Motorists all know that the greater percentage of automobile accidents are due to side slipping or

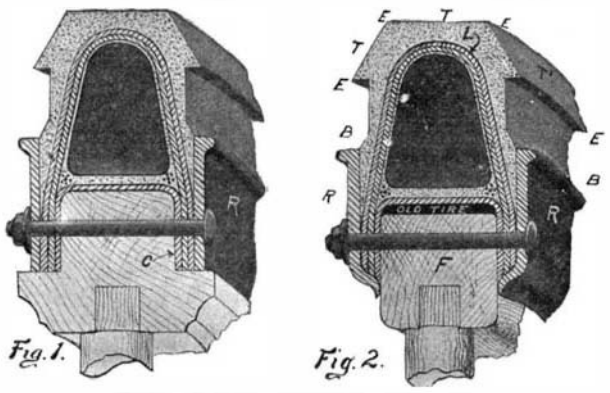
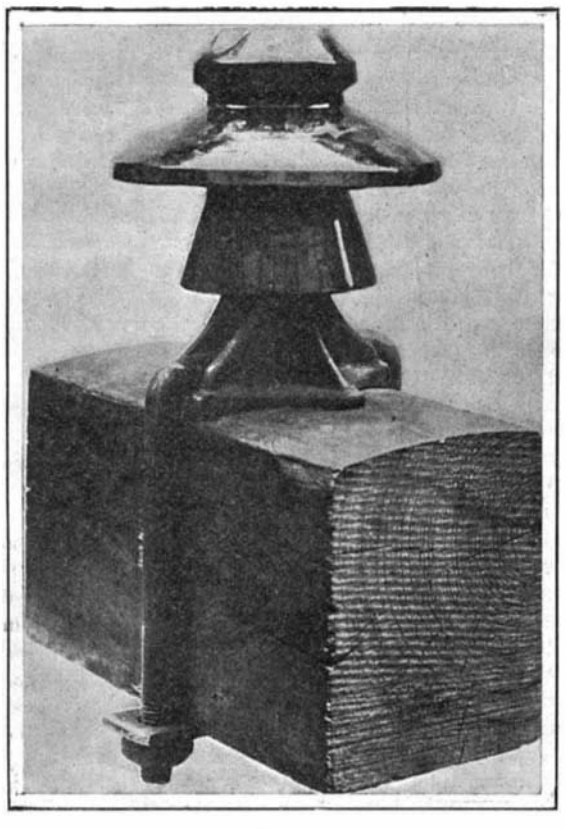


Fig. 1. Fig. 2.

AN IMPROVED NON-SKIDDING TIRE.

skidding. It is to eliminate as far as possible this dangerous feature that the tire herewith illustrated is designed. The tire depends for its action on the fact that a square-edged piece of rubber cannot be made to slip on a smooth or wet surface. Fig. 2 shows a tire as fitted to an ordinary wagon wheel, it being necessary only to bore a few holes through the felloe for the bolts which serve to hold the rings. The illustration shows the original iron tire still in place, which allows of using the vehicle with or without rubber tires as desired. This type of tire is particularly adaptable to ambulances, undertakers' wagons, and delivery vehicles. The surface *T* represents the normal tread surface. Upon rounding a curve the tendency would be to bring the secondary tread surface *T'* in contact with the roadbed. This interposes the edge *E*, which under ordinary conditions is calculated to prevent skidding. Should the speed be unusually great, or the curve very short, there is still a secondary edge *E'* to be called into play. The foundation layers of supporting fabric are designated by *L*. They serve to resist the force exerted at *E* when said edge is brought into commission. The rubber buttresses reinforce the walls and protect the tube from the rings. The tire is bolted to the felloe *F* by means of metal rings *R*. These rings also give support to the walls of the tire. In Fig. 1 the tire is shown as adapted to a specially-designed rim for automobile use. A metal cap *C* may be fitted over the felloe, so as to permit riding home on the rim without injury to the same in the event of serious accident to the tire. The positive mode of attaching the tires is an important feature of the invention. Owing to the unusually heavy construction about the air space, the tire is less liable to be punctured. The flat tread is an ideal one, because it presents a maximum friction surface for the roadbed. As a matter of fact, the so-called round tread is really flattened out as it bears the weight of the car, and this constant bending soon tells on the tire. The improved tire may be as easily repaired in case of puncture as other types; for the rings may be removed without jacking up the axle. Dr. John K. Broderick, of 805 North Main Street, St. Louis, Mo., is the inventor of this improved tire.



A NEW INSULATOR PIN.

A NEW INSULATOR PIN.

In the description of the transmission line and third-rail system of the Long Island Railroad published in our issue of June 9, mention was made of a new type of iron insulator pin employed. This pin, which is a radical departure from previous practice in pin design, is the invention of Mr. W. N. Smith, of Westinghouse, Church, Kerr & Co., who has applied for a patent on the device. The new pin combines several important advantages, as follows: It does away with the necessity of boring holes in the crossarms, thereby conserving the whole strength of the arm and lengthening its life; the metal composing it is distributed in the most effective manner possible, as its cross section is greatest next to the arm where the greatest resistance to bending is required; and finally, the shrinkage of the arm can more effectively be taken care of by the U-bolt and strap than by any of the other forms of pin fastening in common use, as there is no tendency to distort the bolt, and consequently, there is no possibility of the pin standing crooked upon the arm after the shrinkage has been taken up. Furthermore, it is practically indestructible, and instead of being one of the weakest factors in line construction, this pin is expected to be the strongest.

More than 8,000 of the pins, as originally designed and shown in the accompanying illustration, were used in the transmission line construction of the Long Island Railroad, carrying 250,000 circular mil cables in spans averaging 150 feet in length, and no failures have yet been reported after over a year of service. A dozen or more standard sizes of the improved design are being worked up to fit several sizes of crossarms and pole tops, and to carry insulators of varying sizes up to the highest voltages in practical use. The pins will be made of either cast or malleable iron to suit different conditions, and will it is believed fill a long-felt want for a pin which combines at a reasonable cost the maximum of strength and durability both in itself and in the crossarm to which it is fastened. While it is designed particularly for use with wooden crossarms, it can readily be adapted to steel crossarms, and to such special fixtures as are often necessary in heavy transmission line construction. On account of its superior mechanical design, it will also without doubt find a place in heavy catenary trolley construction, which is now being actively developed for the electrification of railways by the single-phase system.

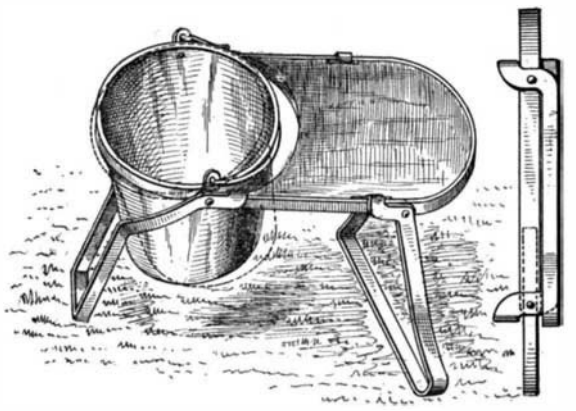
A New Trolley Car Headlight.

Ora E. Mitchell, the conductor of a Los Angeles street car, has devised a very successful headlight for trolley cars, which is under entire control of the motorman. There has been a demand for a light of this kind for use on suburban lines and those which have many curves. The headlight of the ordinary type, which is rigidly fixed to the dashboard, projects its light off at an angle when rounding a curve, and the track in front of the car is without any illumination whatever. The light invented by Mr. Mitchell is mounted in such a manner that it may easily swing from one side to the other, and is controlled by pneumatic pressure. The means of control is under the motorman's foot, and by a mere pressure of the toe he can direct the beam just where it is desired. The apparatus has been given a severe test in practice, and has been found to be a great improvement on the old form of light. This headlight will be adapted for use on automobiles as well as street cars.

A great improvement has been recently made in the machinery for making seamless hosiery. Under the old system, the rib or upper portion of the hosiery was made on one machine, the circular leg work on another, and finished on a third, but by the new machine the work is performed from start to finish in one operation. The new machine begins on the rib work, and automatically changes to the circular leg portion, then it makes the heel, foot, and toe, and starts on another piece without any intermission.

ODDITIES IN INVENTION.

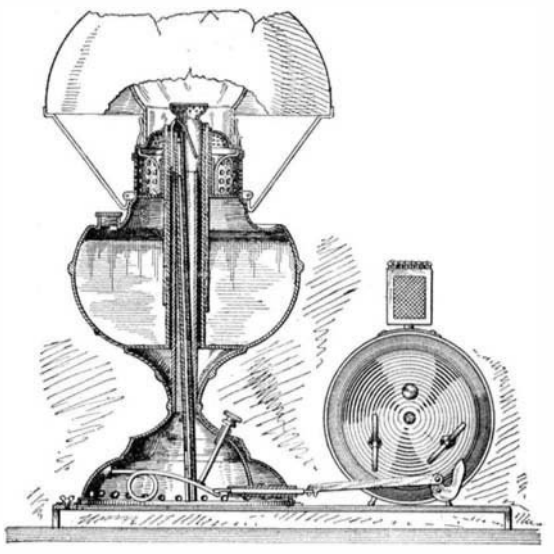
FOLDABLE MILKING STOOL AND PAIL HOLDER.—A very convenient device for the farm has recently been invented by a resident of Iowa. It consists of a milking stool which can be folded when not in use, and a pail holder attached to the stool, which can be adjusted to suit the convenience of the user. The frame for the



FOLDING MILKING STOOL AND SEAT HOLDER.

pail consists of a spring clasp, which permits the pail to be inclined toward the cow, if desired, or moved to an upright position to prevent spilling the milk. The pail is held in the position at which it is set by the frictional contact of the clasp.

TIME-CONTROLLED LAMP.—A resident of Georgia has invented a combined lamp and alarm clock, which is so arranged that the lamp will be automatically lighted when the alarm goes off. The lamp is of the center-draft type, and in the central sleeve is a tube which carries a plunger with a match in its upper end. The plunger rests on a strong spring, which is held under tension by a trigger connected with the alarm mech-



TIME-CONTROLLED LAMP.

anism. When the alarm is sounded the trigger is sprung, and the match is forced up against the wick of the lamp. In its course the match is ignited by friction, and the lamp is thus lighted. The value of this device when the alarm is set for some hour of the night or early morning will be appreciated. It is often desirable in the sickroom that the attendant be awakened to administer medicine at certain hours of the night without disturbing the patient. In such case the bell of the alarm may be muffled, and the trained attendant can then depend on the sudden flash of light to awaken him at the proper hour.

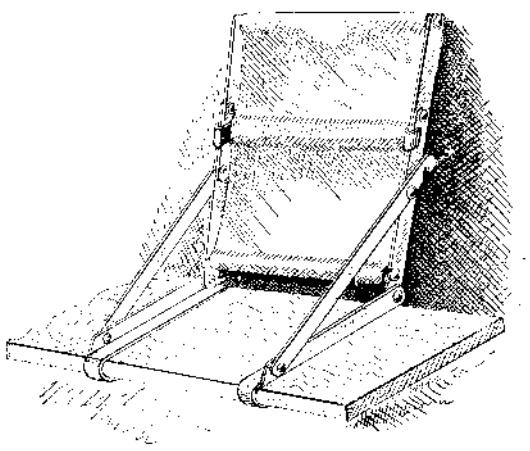
ROLLER BRIDGE FOR PERAMBULATORS.—The long-felt need of something to assist in moving baby carriages

ROLLER BRIDGE FOR PERAMBULATORS.

up and down stairs or steps has at last been met by the roller bridge which we illustrate herewith. As the name implies, the device consists of two bars

mounted on rollers, and to which the wheels of a perambulator can be readily attached. The perambulator thus mounted can then be rolled smoothly downstairs with no bumping or jarring of the infant occupant, as the bars are long enough to always bridge or span at least two steps. To make the bridge noiseless, the rollers are preferably rubber-tired, as indicated in the small detail view.

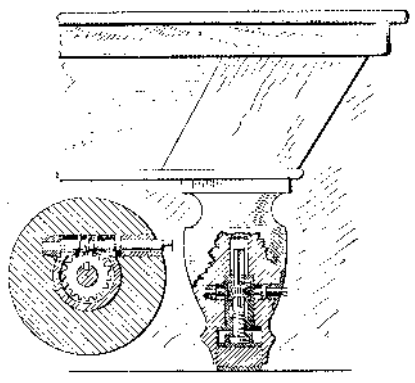
FOLDING SEAT BACK.—In these days of vacation trips,



FOLDING SEAT BACK.

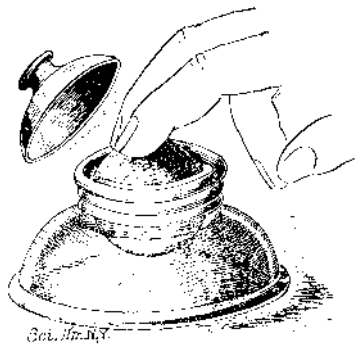
the advantages of a simple seat back for use in the camp or in a boat will be appreciated. Such a device is illustrated herewith. It consists of two seat bars and two back bars hinged together, and adjustably connected by a diagonal brace. A canvas back is arranged to be hooked into slots in the back bars. The seat bars are formed with hooks at their forward ends, which can be slipped over the edge of the seat to hold the seat back in position. When not in use the device can be folded into a very compact bundle. It will be found particularly useful on the bleachers at the baseball park or the plank seats of a country circus.

BILLIARD TABLE ADJUSTMENT.—It is essential for good playing that the top of a billiard table should be perfectly level, but owing to the vibration and settling of buildings, and to the changes of the temperature which are constantly going on, the required condition of the table top is maintained with great difficulty. A means by which the billiard or other table may be easily regulated is shown in the accompanying illustration. It consists of an apparatus for raising and lowering the corners of the table, the mechanism being buried in the legs of the table. A large chamber is provided at the bottom of the table leg into which a block is fitted. This block is moved vertically by a worm gearing turned by a shaft, which protrudes from the sides of the table leg. The shaft is the only part of the device which is visible. The construction of the apparatus is clearly shown in the accompanying illustration.



BILLIARD TABLE ADJUSTMENT.

FINGER MOISTENER.—An exceedingly simple and convenient finger moistener, for use when handling paper money or counting and arranging papers, is illustrated in the accompanying engraving. The ordinary moistener consists of a wet sponge in a cup, but the objection to this type is that it soon becomes dry from evaporation, also that it will collect dust and soil the fingers. The present invention avoids these objectionable features. It consists of a receptacle or reservoir with a wide mouth in which a ball is loosely fitted. The ball floats on the water of the reservoir. In use the fingers are placed lightly on the ball, and moved in any direction to turn up a moistened surface. Owing to the fact that the mouth of the reservoir is nearly closed, evaporation will be very slow indeed, and a single filling of water will last for a long time.



FINGER MOISTENER.

Brief Notes Concerning Patents.

An association of inventors which has adopted the name of the International Congress of Inventors has been formed, with Rochester, N. Y., as its headquarters. George H. Gallagher, of that city, who was one of the most active spirits in the organization of the body, has been elected president. Its object is the protection and advancement of the interests of the inventors of this country, and an effort will be made to effect similar organizations in the other principal cities of the country. When a firm footing has been secured, it is proposed to bring about certain changes in the patent laws, which are not regarded as satisfactory to the interests of the inventors.

A new kind of carpet has recently made its appearance on the market, and from the standpoint of the consumer at least, it has a number of excellent qualities to recommend it. It has many of the characteristics which have heretofore been the sole property of the very high-grade carpet, whereas this new article is sold at a very reasonable price. The new material is known as Cushion-Wilton, and is made by the introduction of a quantity of material between the back of the carpet and the pile. This, of course, increases the thickness of the carpet, and imparts an elastic tread which has heretofore been attainable only in the finest grades of floor covering. At present it is made only in the shape of rugs of the standard carpet sizes.

A shadow of questionability was thrown over the process of enriching the soil through inoculation by nitrogen cultures, by the scandal attending its introduction and distribution by the Agricultural Department, and this was increased by the fact that an unfortunate error was made in the manner of packing the material for shipment. Raw cotton was used, and was allowed to come in contact with the fertilizer, and this is said to be responsible for a grave deterioration. The results were not at all satisfactory. An improvement has been recently made in the manner of packing the nitrogen cultures for transportation which will, it is said, improve the keeping qualities, and guarantee better results to those who make use of the fertilizer. The new package costs a trifle more than the old one, but the superior results will justify the increased expenditure.

The citizens of Brantford, Canada, recently tendered a dinner to Alexander Graham Bell, who lived at that place at the time when he perfected the telephone, and a movement is on foot to purchase the old Bell homestead, which it is proposed to turn into a public institution. It is also proposed to erect a monument in the city of Brantford, the whole to cost about $35,000 or $40,000. This is done with the view of securing authoritative recognition of the fact that the birth and development of this invaluable instrument took place at Brantford. It is claimed that the telephone was invented there in 1874, and that the first transmission of speech over a telegraph line took place in 1876 over the lines of the Dominion Telegraph Company. The first experiment took place over a distance of about five miles between Brantford and Mount Pleasant. The Prince of Wales is one of the patrons of the movement.

A curb conduit system, by which the inventor says the accumulations of dirt and snow which are one of the problems of a great city will be disposed of almost automatically, has been worked out by James C. Marriot, a resident of Brooklyn, N. Y., who has been awarded a patent on the same. It contemplates the use of a large surface drain, such as have not been in use for many years, but the inventor provides for a covering of metal, which will remove the objection of unsightliness. At regular intervals a connection is made with the water supply, so that this drain may be flushed as desired. It is proposed to employ sweepers as at present, but instead of sweeping the dirt in piles for removal by cart, the men will simply direct the sweepings to this drain, and raising one of the plates, dispose of the dirt and replace the lid. The stream of water may be in operation all the time, and in this event the dirt will be carried away at once; but where it is not possible to be so lavish with the water, it may be turned on at stated intervals, which will have the same effect in conducting the accumulations away.

A great deal of attention has been attracted recently to the process of extracting the precious metals from their ores which has been discovered by Dr. John A. Just, of Syracuse, N. Y. A company with a capitalization of one million dollars has been formed for the purpose of exploiting the invention. The process is said to be entirely revolutionary in its character, and has not been anticipated in any particular by any other processes, and the great advantage claimed for it is that the operation of recovering the precious metals is greatly simplified, and the necessity of roasting the ores is wholly obviated. Instead of this a much shorter method of arriving at the same result is made use of, the mass being dissolved in chemicals and the metal recovered from the precipitate. The chemicals are capable of being recovered and made use of over and over again, so that the process is economical as well as rapid. A big reduction plant will be erected at Tonapah, Nev., the center of one of the western gold fields. Dr. Just is an inventor of wide repute and a scientist. He is said to be the holder of 170 patents, of which he is the originator, and about 100 of these are said to be practical successes. One of the new processes for which he is responsible is a method of reducing milk to a powder, and there are a number of establishments in different parts of the country at the present time making use of this discovery.

The big sight-seeing automobile designed to facilitate the inspection of a city by visitors proved a success from the start, and at the present time these cars are to be seen lumbering through the streets of all the principal cities of the world. But a spell of inclement weather has a very serious effect on the profits derived from the machine, while the item of maintenance goes on just the same as if the vehicle were making regular trips with full loads. A patent was recently secured by Timothy C. Hurst, of New York, N. Y., covering an interesting and somewhat amusing system, by which the profits and possibilities of such tours are greatly increased. Neither the weather nor any other conditions should interfere with the big auto, for the reason that the tours are made without moving from under a protecting roof. But notwithstanding this, the passengers will find that few of the thrills and sensations of a real trip around the city are missing. The scheme consists of a combination of an anchored automobile and a projection lantern, which enables the tourist to enjoy all the delights of a ride without any of the uncomfortable features sometimes attending a real experience of this character. The automobile body is suspended from the ceiling, and is without wheels or running gear of any kind. The only bit of machinery present is a motor, which imparts a series of vibrations resembling the bumps that would be encountered by a passage over the rough streets of a city. This delusion is heightened by a side tilt, which is given to the car to simulate the rounding of a street corner. As the car does not move, it is necessary to have the landscape pass in review, and to the tourists reposing in their comfortable seats, there is an ever-changing picture in front of them. This consists of a series of rapidly-made views, secured by covering the route of the alleged trip with a camera mounted on a car. These are subsequently projected on the screen in front of the big auto. It is thus possible not only to make a tour of the city in which the new amusement feature is located, but it is proposed to present a varied programme, so that it will be possible to make similar tours of other cities and localities of interest.

Among the recent occasional attempts at utilizing the heat of the sun for power purposes is the recent invention of a Frenchman for a thermo apparatus for raising fluids. It is founded on the principle of expansion and contraction of gases according to variations of temperature and makes use of the difference in temperature during night and day to effect its purpose. In a well, cistern, or the like, containing the fluid to be raised, a closed vessel provided with an inward opening valve, is entirely submerged. Another closed vessel of greater capacity is placed where temperature is subject to variation, e. g., in front of a wall exposed to the sun. This vessel may be partially surrounded by a curved reflector to increase temperature by radiation. In the interior of this exposed vessel is a small reservoir over which is fitted a rubber bag, and the reservoir is provided with a cock through which any volatile fluid such as liquid ammonia can be introduced. A pipe connects the two vessels, and another pipe, projecting down to the bottom of the submerged vessel, is conducted to the reservoir to which the water is to be supplied and acts as a delivery-pipe. The operation of the apparatus is as follows: The reservoir-cock is first opened, permitting the water to enter through the valve in the submerged vessel and ascend until it is at the same level as the water in the well, pressure being the same in both vessels. Liquid ammonia is then sent into the reservoir through the cock (such an amount that it cannot volatilize and that its vapor is kept in a state of saturation) after which the cock is shut. As the day temperature rises the pressure of ammonia-gas increases, the bag expands and fills the interior of the exposed vessel, and the air in this latter is thus forced down into the submerged vessel, the water rising in and escaping out of the delivery-pipe. A floating-valve device is so mounted on the inner end of the delivery-pipe that it closes when the level of the water in the submerged vessel sinks to its lowest point, and prevents it from quite emptying itself. At night with falling temperature, the ammonia-gas pressure sinks and the gas liquefies, the bag takes its initial form, and in consequence of the pressure in the submerged vessel the water in the well finds its own level into the submerged vessel, and the next day the operation is repeated. This takes place daily or any time that the heat of the exposed vessel varies.

RECENTLY PATENTED INVENTIONS.

Pertaining to Apparel.

COMBINED BUTTON AND PIN FASTENER.—R. ELLIS, Niagara Falls, N. Y. The object had in view in this case is to provide an attachable button which shall be specially adapted for use as a skirt-supporter and fastening means for the skirt-placket, the device to be equally adapted for affording ready replacement of a detached suspender-button and for other obvious uses.

BELT.—J. ASKEW, West Point, Miss. The invention has reference to wearing-apparel, and its object is to provide a new and improved belt arranged to properly support the trousers or other garments without exerting undue pressure on the stomach of the wearer. The ends are connected in a manner to maintain the usual appearance of an ordinary belt and to serve as ornaments.

Of Interest to Farmers.

COMBINED HARROW AND CULTIVATOR. M. TRUE, Watervalley, Miss. This improvement comprises the combination, with two like triangular frames provided with teeth and spaced apart and flexibly connected and provided with pendent bars, of wheels having axles provided with sockets adapted to receive and slide upon the bars, and clamp-screws applied for securing the sockets in any required adjustment, the wheels being arranged parallel in the inner sides of the frames.

MACHINE FOR LOADING SHOCKS.—W. O. CRAWFORD, Beaver Creek, Minn. A purpose of this invention is to provide a portable and readily-operated machine for loading shocks of corn or cornfodder onto wagons or for stacking the shocks or for moving them from the stack to the wagon, which machine may be used with equally good results for loading and stacking manure, hay, straw, and all kinds of fodder.

Of General Interest.

EMBROIDERY-SILK HOLDER.—J. J. LAWLER, Winsted, Conn. In this case the object is to provide a new and improved embroidery-silk holder arranged to securely hold a skein of embroidery-silk and to allow convenient removal of a single thread from the skein without danger of tangling the threads forming the skein.

HOLDER.—J. P. MERLINE, Oconto, Wis. This holder is particularly adapted for the support of paper bags. The objects of the inventor are to provide a simple and convenient device. In use the bags are drawn from the bar and when all have been used the device may be conveniently removed by means of its center loop projection and another supply placed upon it.

SURGICAL APPLIANCE.—W. L. WOODRUFF, Troy, Arizona Ter. The purpose of the improvement is the provision of a hood or cover for the part, especially designed to be used as an aid in the cure of venereal diseases, and to so construct the device that it can be readily applied and removed and worn with comparatively little discomfort.

UNDERTAKER'S MITTEN.—F. J. PIKIEL, JR., Appleton City, and J. N. UTTERSON, Montrose, Mo. The invention is a mitten for use to facilitate the dressing of corpses. In drawing a coat on a corpse the cuffs and shirt-sleeves slip back on the arms and are hence not in proper position when the operation is completed. By the aid of the mitten this result is avoided and the operation of dressing is more quickly performed.

KILN.—A. P. BROOMELL, York, Pa. The arrangement of the furnaces with respect to the stack provides for the efficient utilization of all the heat and for application thereof evenly throughout the extent of the interior of the stack, thus securing a uniform burning of the rock and consequently superior quality in the product. Means are provided to permit application of heat to the rock near the outer part thereof, and to avoid overburning of the central portion of the rock. At the same time, however, enough heat is directed upon the center to prevent formation of an unburned core.

Hardware.

COMBINED RATCHET WRENCH AND DRILL.—J. R. NEILSON, Union City, Tenn. The principal object in this case is to provide a device which affords a very positive grip upon the tool or other member gripped thereby, and which is provided with a reversible ratchet operating mechanism by means of which the wrench and drill may be positively rotated in either direction about its axis of rotation.

HOOK-LOCK.—F. LILIGER, St. Joseph, Mo. The invention relates to a device intended for locking or closing hooks, so that an article engaged therewith cannot be accidentally disengaged. The invention is particularly intended for use in connection with tackle-hooks, although it may be employed for other purposes.

CALIPERS AND DIVIDERS.—G. C. SMITH, St. Kilda, near Melbourne, Victoria, Australia. Mr. Smith has devised this invention in order to provide simple and inexpensive means for locking calipers and dividers in position and incidentally for enabling calipers to be used to measure accurately in positions from whence it is not possible to remove them in order to transfer the measurement without slacking them back.

Household Utilities.

SHADE AND CURTAIN BRACKET.—W. J. CONNELL and L. C. LOWE, Huntington, W. Va. The invention pertains to improvements in shade and curtain brackets, and has for its object to produce a simple, cheap, and efficient bracket that can be readily and quickly applied to and removed from a window-casing and one from which a short ventilating-shade in addition to a lace curtain and window-shade may be suspended.

BED-RAIL JOINT.—J. MURPHY, Kenosha, Wis. In this instance the invention refers to improvements in corner joints or fastenings for the rails of metal beds, the object being the provision of a joint that will be comparatively cheap to manufacture because of the small amount of metal required for the desired strength. The rails readily engage without employing screws or bolts, forging, bending the rail, or without a casting on the rail.

Machines and Mechanical Devices.

WASHING-MACHINE. — G. H. WISNER, Pioneer, Mont. In this patent the invention relates to improvements in washing-machines, the inventor's object being to provide a machine by means of which garments may be rapidly and thoroughly cleansed. In operation the water is kept in practically constant agitation. Means are provided to relieve the turn-table from undue shock when it is moved by means of the springs.

CLUTCH AND TRANSMISSION-GEAR.—J. W. WALTERS, New York, N. Y. One object in view of Mr. Walters is to combine in one structure a two-speed or differential transmission-gear and a clutch device adapted to control the starting and stopping of the machine to which the new device is applied. A further object is to compactly arrange the several parts to make them take up a very small amount of space on a motor-vehicle or any other form of machine or apparatus.

FIBER-CLEANING MACHINE. — A. G. PONS, Mexico, Mexico. In this patent the purpose of the invention is to construct a machine for decorticating plants, especially sisal hemp, and to provide a machine which will expeditiously remove the pulp from the fiber in a thorough and cleanly manner and without detriment to the fiber. After material is fed thereto the machine is practically automatic in its action.

MEASURING-MACHINE. — S. O. MYERS, Mount Vernon, N. Y. The invention of Mr. Myers has reference to measuring-machines, and his more particular object is the provision of a coin-controlled machine for measuring the heights and for indicating the normal weights of persons. Repeated use upon payment of a single coin by a number of persons successively stepping upon the platform without allowing the movable parts to resume normal position, is prevented.

BALL-BEARING.—R. CONRAD, 248 Kurfurstondamm, Berlin, Germany. Provision is made in this invention for a ball-bearing having concentric-grooved rings, the sides of the grooves being uninterrupted throughout their circumference and the parts being so proportioned and designed that the balls may be admitted to grooved space by displacing the rings relatively to each other. The term ball-bearing is to be understood as including various other known equivalent devices rolling between the rings.

Prime Movers and Their Accessories.

CARBURETER FOR GASOLENE-ENGINES. R. A. MIDDLETON, Rexburg, Idaho. The essential object of the improvement is to provide devices for furnishing an auxiliary air-supply, so that when the engine runs at excessive speeds an increased quantity of air will be permitted to pass through the carbureter, thus maintaining the correct proportions of air and fuel. It is designed for use especially in connection with internal-combustion engines, but may be used for other purposes.

Railways and Their Accessories.

AIR-BRAKE SYSTEM.—A. I. PERRY, New York, N. Y. More particularly the invention relates to those systems in which the braking action is to be effective throughout a train consisting of a plurality of cars. Its principal objects are to provide means for simultaneously applying the brakes with a definite and controllable pressure and for securing an automatic application if the train parts.

METALLIC TRUCK FOR RAILROAD-CARS.—F. GEBHARDT, Alliance, Ohio. In this patent the object of the invention is to provide a new and improved metallic truck for railroad-cars formed of comparatively few parts, readily assembled, and arranged to insure an easy riding of the car-body of an exceedingly strong and durable truck.

FOLDING AND EXTENSION CAR-STEP.—J. S. COXEY, Aberdeen, Wash. One purpose of the invention is to provide a simple and readily-applied means whereby to simultaneously operate a folding extension car-step from the platform of a car and raise and lower the temporary platform which normally covers the steps and open or close the gate at the platform when a gate is employed.

Pertaining to Recreation.

MERRY SKATING-RINK. — H. LOISELEUR, New York, N. Y. This invention has reference to amusement devices such as used at pleasure resorts; and the object of the inventor is to produce an amusement device of simple construction which will have the general characteristics of a merry-go-round or carousel, but which will be used by persons upon skates.

PARLOR GAME. — J. A. S. CHEVOLLEAU, Kingston, Jamaica, West Indies. In this instance the invention pertains to parlor games and resembles the games of billiards and pool. The intention of Mr. Chevolleau is to produce a table upon which an amusing and interesting game may be played, the rules of the game being designed to put a premium upon accuracy and judgment.

Pertaining to Vehicles.

MEANS FOR UNITING A PAIR OF BICYCLES TO FORM A QUADRICYCLE.—C. H. NICHOLAS, 34 Stroud Green road, Finsbury Park, London, England. The object here is to provide means for connecting together a pair of bicycles (of any usual construction and motor or pedal or otherwise driven) side by side in such manner that the combination may constitute a single vehicle capable of carrying more than two persons, the device so provided being designed to enable the cycles to be quickly and easily united to form a quadricycle and to be as readily detached from one another, so as to permit of the ordinary use of either machine alone when desired.

COUPLING.—G. LLOYD, Gananoque, Leeds, Ontario, Canada. In the present patent the invention has reference to a coupling useful in various connections, particularly as a means for joining the parts of vehicle-springs and for connecting the thills of a vehicle to the axle-clips. With this coupling the thills are free to swing vertically; but the parts are prevented from side play, and wear may be taken up quickly by tightening a bolt.

Designs.

DESIGN FOR A BADGE.—F. BUSSE, New York, N. Y. This ornamental design for a badge shows an outspread "base ball fan," with the ball in the center of the fan, the whole mounted on a stick-pin.

DESIGN FOR EIDER-DOWN CLOTH.—C. H. FRENCH, Canton, Mass. This ornamental design for eider-down cloth consists of rows of squares of confused texture against a plain field of cloth. These blocks are separated one from another at regular distances of half the width of each.

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(10016) O. M. S. asks: 1. How may opaque objects be seen under the microscope? A. By the use of the bull's-eye condenser. A lens which will focus the light of a lamp upon the upper surface of the object. One of these usually accompanies a microscope. 2. How can the glimmering of artificial light be overcome? A. If the light is too strong, turn the reflecting mirror till the field is illuminated to suit your eye. Shaded glasses can be had from dealers in microscopes which cut down and also color the light agreeably. These may be blue or gray. They are also made so that they are deeper in color in one portion than in another, and a nicer adjustment may be made of the illumination. 3. Will the best window or plate glass do for glass slips to use with a microscope of sixty-five diameters? If not, why? A. Any sort of glass will answer if it is smooth. It is better to buy the regular slips. These are 3 × 1 inch and are polished on the edges. They present a much better appearance than pieces of glass cut and left rough. 4. What proportion should the liquid, zinc and carbon be for a bichromate cell? A. A good bichromate mixture is composed of water 100 parts, potassium bichromate 17 parts, and sulphuric acid 10 parts, all by weight. The zinc and the carbon may be of any size which the battery jar will hold. It is better to have a carbon on each side of the zinc, two carbons to each zinc. This gives a larger current and utilizes the action on both sides of the zinc. 5. How to make an induction coil which will not induce a current strong enough to kill a person. A. A good induction coil is described in SUPPLEMENT, No. 160, price 10 cents. It is not necessary to injure one's self with a large coil. A simple rule for safety is to put the left hand in your pocket or behind your back when doing anything to the coil with the right hand, if the coil is running. 6. What are the preserving fluids used in the museums and laboratories? A. Alcohol is the fluid ordinarily used in museums for preserving specimens in jars and bottles.

(10017) L. F. S. writes to us as follows: I wish to know what horse power would be developed by a stream of water, which, if dammed would give a head of 130 feet or more. The amount of water flowing over a 4-foot weir is 8 inches, weir being rectangular 4 feet equals breadth, 8 inches equals depth. What size steel pipe or iron pipe would this water fill if it were to be carried to a turbine at distance of 1,200 feet? What is the cost of such pipe a running foot? Also, what would be the cost of a dynamo to utilize power thus developed by turbine? Suppose it were necessary to transmit power to a manufacturing plant at a distance of 4½ miles from power house. What would be loss of power in transmitting and what approximate cost of motor and wiring for such a plant? Kindly tell me where price list of motors and dynamos may be obtained. A. The capacity of your weir is 432 cubic feet of water per minute. This with 130 feet fall will give a theoretical power of nearly 3½ million foot-pounds or 112 horse-power. From this must be deducted the loss by friction and the water wheel which, if of the Pelton type, should net you 80 horse-power. The size of steel pipe for conveying this amount of water 1,200 feet with a loss of less than 2 feet head will be 24 inches in diameter and will cost about $1 per foot. A Pelton wheel and connections will cost about $400. The dynamo will cost about $2,400. A motor on a 4½-mile line will cost about $2,000, and should net 60 horse-power at 4½ miles distance. We refer you to the water wheel companies for estimates of a complete power plant.

(10018) Y. N. W. writes: As it is your aim to disseminate useful information we make the following statement which will interest all photographers: We recently purchased one of the new aluminium trays and lately undertook to intensify a negative in it, using a three-solution intensifier: Bromide of potassium, bichloride of mercury, and sulphite of soda, in the order named. Upon applying the mercury solution the chemical growth (which we had forgotten all about) of which a detailed description was given in the SCIEN-