gravel, tacks, or the like, to break up the liquid. It is covered by a frusto-conical tube at the smaller end of which, and in line with the pointed end of the chamber, is a needle valve connected by a pipe with the top of the chamber. Another pipe connects the bottom of the chamber with the bottom of a cylindrical gasoline holder, and there is a valve near the latter. A short tube projects from the top of the tank and terminates in a bulb for forcing air into it. The gasoline is first forced through the needle valve and fills a small cup below the latter. The cupful is ignited, and, in burning, heats the vaporizer, which then produces vapor. The burning vapor passing between the vaporizer and sheath, draws in air to aid the combustion.

SHOOTING GALLERY.—CHARLES B. JEFFERS, Logansport, Ind. The target consists of a framework on which are mounted a number of endless chains carrying figures of animals, so constructed that when hit by a bullet, the smaller ones will fall over and the larger ones will signify the fact by dropping the head or in some similar way. A round target on each side has a hole in the center through which a bullet can pass and ring a bell. The bullet causes a lever to put in gear a mechanical piano, and cause it to play. The target and piano are connected with a shaft driven by a gas engine or other motive power.

HEAD-GATE LOCKING DEVICE.—BENJAMIN F. POWELL. Manzanola, Col. This locking device has for its object the limitation of the distance the gate can be raised. A threaded rod having a keyway running along it passes through the cross-bar of the framework and is raised by screwing down a nut above the cross-bar. A collar split at one side and having a pin across the split is locked in place by a padlock, the bar of which passes around the pin and in the keyway; and this collar limits the upward movement of the rod and gate.

GAME APPARATUS. — CHARLES E. PATTERSON, Hornellsville, N. Y. This game is a number game played with small square checkers, each one of which has a number stamped near each of its four corners. The board is divided into four squares by double lines the width apart of the checkers and divided by transverse lines into squares the size of the checkers. The game consists in choosing some number and placing a checker on one of the squares. The player scores as many points as he can make multiples of the number chosen by adding together the numbers on one side of his checker and his opponent's checkers. The game is completed when all the squares are filled.

TRUSS.—ZEBULON OLIVER, Tesla, Texas. This truss pad is made of beeswax fastened to a wood backing. It is a round button with an annular channel around the center, from which, upon passing the pad to the body, a sufficient amount of air will be exhausted to hold the pad sufficiently tight to prevent its slipping. The pad is adjustably mounted on a U-shaped spring which passes around one side of the body and carries two adjustable pads on its other end.

WINDLASS.—GEORGE W. MORGAN, Dawson, Canada. The crank is so connected with the drum that if the windlass suddenly revolve backward, the crank is released from the drum. This is accomplished by attaching a boss with sloping teeth to the shaft and providing the hub of the crank arm with similar teeth to turn the windlass. Outside the crank and like it loose on the shaft is a wheel with two set-screws. The outer end of the crank-hub has several long sloping teeth and when the set-screws are tightened against the outermost end of these, the crank hub is clutched to the shaft. If the windlass suddenly start backward, the inertia of the wheel causes it to lag behind, and the set-screws will slide to the inner end of the teeth, whereupon the spring will separate the crank-hub from the boss. The windlass is also furnished with a band-brake and a pawl and ratchet to keep it from unwinding.

HOLDER FOR PENCILS.—ADOLF KLEIN, Manhattan, New York city. This holder consists of a nut with screw thread to be fitted in the back of a note or memoranda-book at the top end. The pencil is provided with a cap having a screw thread to fit the nut and a shoulder to prevent the pencil from screwing in too far.

SUSPENDERS AND WAIST-HOLDER. — MINNA JANSEN, Astoria, Queens, New York city. The invention consists of a belt of fabric the ends of which are buckled together in front. The belt is provided with ordinary suspenders, the back ends of which are sewed to the upper edge of the belt and project a short distance below it, forming tabs adapted to project through holes in the waistband of a shirt-waist and thus keep it in place. On the back of each tab is a hook which engages an eye on the skirt band after the tab has been inserted in the shirt-waist band. The latter is therefore securely held in place. Suitable straps depend from the belt for supporting hose and holding up the dress-skirt in wet weather.

AWNING-FIXTURE.—JAMES SULLIVAN, Manhattan, New York city. This fixture is a pear-shaped plate with a narrow slot near the neck end and a hole containing a round metal ring in the body part. The neck part is bent at an obtuse angle and the swivel eye in the top of the awning pulley block is passed through the slot. The rope passes through the hole in the shield thus formed and thence over the pulley; while the metal plate furnishes a smooth surface for the awning to fold upon and effectually protects it from catching in the pulley.

SUSPENSION-CABLEWAY AND ROPE CARRIER. —GUSTAF P. WERN, Manhattan, New York city. The invention provides a series of support brackets travelling on the main cable and constructed to carry on small wheels a carriage or traversing rope and a hoisting rope between the carriage and the towers. The brackets are properly distributed by means of a two-stranded rope attached to the carriage and carrying clamps of several sizes at the proper distances apart. These clamps pass between two small wheels on each bracket but the one they are intended to move, and each moves one bracket to its position on the line.

HAMMOCK SUPPORT. — HOMER R. WOOD and GEORGE R. TAITT, Prescott, Arizona. The support consists of two tripods, the legs of which are fastened together at their top ends by a pin which passes through clevises, one pointing downward and the other upward, adapted to support a hammock and awning. The tripods are connected by a rod in two telescoping sections, so that it occupies but little space when not in use.

EGG-BEATER.—THOMAS HOLT, Tarrytown, N. Y. This beater is an improvement of the usual form in which two rotating beater-bows are arranged side by side on different axes eccentric to each other, so that they rotate one within the other. The improvement consists in so twisting the circular parts of the beater arms that they will in describing a circle be always at an angle to the circumference and thus tend to throw the material inward so as to beat it thoroughly. The upper shank part of the arms is curved to conform with the circle it describes so that it passes edgewise through the material with the least possible friction.

HAME-FASTENER.—FRANK N. RANKIN, Gainesville, Texas. The fastener consists of a flat plate with two ears extending upward from the sides at one end and containing three transverse slots at the other. This latter end is bent downward and under, so that one slot is just under the actual end of the plate. A cam locking-lever is pivotally supported in small holes in the tops of the ears. The fastener will securely hold the hame-strap to the loop or eye on the hame-frame when the hames are unfastened and not in use, and yet will allow it to be readily detached from the eye when desired.

Designs.

WHEEL-SPOKE.—CLARENCE E. SPICER, Titusville, Pa. The body of the spoke is threaded at its inner end, the thread terminating in an hexagonal nut a short distance from the end of the spoke. From here the spoke tapers to its outer end, where it is provided with flattened prongs or tines forming a U.

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.

NEW BOOKS, ETC.

VON LOEBELL'S JAHRESBERICHTE UEBER DIE VERÄNDERUNGEN UND FORTSCHRITTE IN MILITÄRWESEN. XXV. Jahrgang. Zweiter Theil. Berichte über die einzelnen Zweige der Kriegswissenschaften und des Heerwesens. Berlin: Ernst S. Mittler und Sohn. 1899. Large octavo. Price, paper $3.30.

The second volume of the jubilee number of von Loebell's Jahresberichte is devoted entirely to the progress made by the various countries in the past twenty-five years in the various branches of military science. Our own recent war has not been neglected; and the way in which it was fought, the lessons which it taught, and the results obtained, have in various articles been discussed with a most gratifying impartiality. The two volumes of the Jahresberichte will be made the basis of all future v. Loebell reports.

THE INTERNAL WIRING OF BUILDINGS. By H. M. Leaf, Westminster, England. Philadelphia: J. B. Lippincott Company. 1899. 16mo. Pp. 198. Price $1.50.

Electric energy is now so universally adopted for lighting, heating, and transmission of power and other purposes, that insulated wires or cables for conveying the current are now fixed in most buildings of any importance. The conditions under which these conductors have to perform their work in carrying the current vary greatly. It is the object of the treatise before us to describe the various means of fixing the wires to suit the different conditions under which the current is likely to be employed. English practice is, of course, described, but the book is certainly likely to prove useful to American electricians.

LEXIKON DER METALL-TECHNIK. Redigirt von Dr. Josef Bersch. Vienna: A. Hartleben. 1899. 2d, 3d, 4th and 5th parts. Price 30 cents each.

DIE MODERNE CHEMIE. Eine Schilderung der Chemischen Grossindustrie. Von Dr. Wilhelm Bersch. Vienna: A. Hartleben. 1899. 2d, 3d, 4th and 5th parts. Price 30 cents each.

When the first parts of these two works were published, we gave a brief description of them in these columns. The later installments, it must be confessed, have not deviated from the general excellence of the first parts, and the promises made have been fully kept.

PRACTICAL COURSE IN MECHANICAL DRAWING. By William Fox, M.E., and Charles W. Thomas, M.E. New York: D. Van Nostrand Company. 1899. 16mo. Pp. 98. 87 illustrations. Price $1.25.

Manuals and text books of mechanical drawing are legion, but the little book before us is a substantial addition to the literature on the subject. We particularly commend the half-tone illustrations, taken from life, showing the actual position which a draughtsman should use in drawing lines, etc. This is a feature which we have never seen in any other book, and it cannot but prove of great assistance to the beginner. The examples for practice are numerous and well executed, although some of them are reproduced on too small a scale; doubtless this cannot be avoided in a book that is sold at such a remarkably low price.

FIGHTING IN THE PHILIPPINES. Authentic Original Photographs. Chicago and New York: F. Tennyson Neely. 1899. Price 25 cents.

This is the most complete picture book of the Philippine Islands that we have seen. The photographs are well selected and are well executed. Their size is 4×7, which is plenty large enough to show detail. Actual scenes of the war including the fighting are given. The photographs show more conclusively than any that we have ever seen that war at best is a great horror. Some of the illustrations of the dead men are fairly sickening. This is practically the first war where the camera has played a really important part. The collection of pictures is unique and we do not know of any one who would not care to have this pretty little book.

MODERN PHOTOGRAPHY IN THEORY AND PRACTICE. By Henry G. Abbott. Chicago: George K. Hazlitt & Company. 1898. Pp. 234. 12mo. Photographs. Price $1.

This volume has been printed for the benefit of amateur photographers. The preface aptly remarks that there are two kinds of amateurs, one who presses the button and leaves the professional to do the rest, and the other, the earnest student, who has ambition to become in every sense of the word a photographer. The volume before us was certainly compiled for the latter individual. It is filled with practical information regarding cameras, plates, fitting up a dark room, exposure, etc., and the number of formulas published is large. A number of photographs are inserted which add considerable to the interest of the book. Excellent engravings of lighting and electric light decorations taken at night are given.

DIE AETHERISCHEN OELE. Von E. Gildmeister und Fr. Hoffmann. Berlin: Julius Springer. 1899. Pp. 919. Large octavo.

The need of a work which would discuss exhaustively and critically the entire field of etherial oils induced the well-known Leipzic firm of Schimmel & Company to commission Drs. Gildmeister and Hoffmann to prepare a book which would meet all requirements. To assist them in their labors, the firm placed at their disposal the data collected during the long period of its business career. The result has been a work which for scholarly and exhaustive treatment leaves nothing to be desired. Particularly valuable are the descriptions of commercially important oils, and the methods by which imitations and adulterated oils can be distinguished from the pure product. The work although inspired by Schimmel & Company is not to be considered as a trade publication, but as a scientific treatise which fills a long-felt want.

LIVING PICTURES. THEIR HISTORY, PHOTO PRODUCTION AND PRACTICAL WORKING. By Henry V. Hopwood. London: The Optician and Photographic Press Review. 1899. Pp. 275. 12mo.

A really satisfactory and adequate book upon moving pictures and moving picture photography has been needed for a long time, and Mr. Hopwood has succeeded admirably in his task. The devices are well illustrated and are marvels of ingenuity. Many of the diagrams are clear and helpful. We think that the author might have been more free in giving credit to the papers from which illustrations were obtained. We notice five illustrations from the SCIENTIFIC AMERICAN that, so far as we can see, no acknowledgment is given for their use. There is a bibliography of 145 titles.

DAS PERPETUUM MOBILE. Von A. Daul. Vienna: A. Hartleben. Pp. 133. With 33 illustrations. Price, paper, 60 cents.

Although like the alchemist of old the inventor of perpetual motion machines has labored to no purpose, his efforts are not without a certain interest to the modern mechanic. For this reason the author of the present work has collected from the principal scientific periodicals published in France, England, and the United States, accounts of the most notable perpetual motion machines. We observe that the SCIENTIFIC AMERICAN has provided Herr Daul with no small amount of material.

GEOLOGICAL SURVEY OF NEW JERSEY. Annual Report of the State Geologist for the Year 1898. Trenton, N. J. 1899. Pp. 344, plates and maps.

The geological survey of the State of New Jersey has been noted for many years as being a model State geological survey and its reports and maps are most creditable. The present volume does not fall below its predecessors in interest. Special attention is given to the pine belt and forest fires. The book is freely illustrated with half-tone engravings and diagrams.

DESCRIPCION Y MOVIMIENTO COMERCIAL DEL PUERTO DE BUENOS AIRES EN EL AÑO 1897. Por Enrique Carmona. Buenos Aires: Imprenta de Juan a Alsina. Calle Mexico, 1422. 1898. Pp. 98.

INDEX TO THE LITERATURE OF THALLIUM. 1861–1896. By Martha Doan. Forms part of Smithsonian Miscellaneous Collections. Vol. XLI. Washington: Smithsonian Institution. 1899. Pp. 26. 8vo.

We have received the last edition of the catalogue of stereopticon apparatus and lantern slides of T. H. McAllister, the optician, of 40 Nassau Street, New York city. As might be expected, the new catalogue deals with the latest forms of lanterns, including the Welsbach electric and acetylene burners. The collection of slides is unrivaled, and a large majority of them are unique. The negatives have been taken specially for lantern slide work. In purchasing slides, it must be remembered that the ordinary photograph does not always blend itself to the adequate lantern slide, but where points of view are selected with special reference for use as slides, the results are highly satisfactory. Mr. McAllister's views of Rome, for instance, occupy many pages in the catalogue, and were made especially by a staff artist. The possession of a lantern and a few hundred slides is a most enjoyable and economical method of entertaining friends.

We have received a number of the Acetylene Gas Journal. It is published at Buffalo, New York, and the cost is 50 cents per year. We like the appearance of the new paper very much. It is filled with information relative to the new industry and it is the official organ of the International Association. An acetylene gas installation may be put into houses by many who are unfamiliar with the proper way of doing this work, and even the average gas fitter is at fault when it comes to acetylene. For this reason the back numbers of the Journal are particularly valuable.

Business and Personal.

The charge for insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in the following week's issue.

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The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, $4. Munn & Co., publishers, 361 Broadway, N. Y.

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Notes & Queries

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.
Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.
Scientific American Supplements referred to may be had at the office. Price 10 cents each.
Books referred to promptly supplied on receipt of price.
Minerals sent for examination should be distinctly marked or labeled.

(7718) C. W. asks: Will you be so good as to name the best conductor for the electric current? A. The best conductor for the electric current, meaning by best that which offers the least resistance to the current, is silver. After silver come in order copper, gold, aluminum, zinc, platinum, iron, nickel, tin.

(7719) D. A. S. asks: Can you furnish me directions to recharge dry batteries? A. Dry cells may be recharged by sending a current through them in the opposite direction. They are not worth recharging, but are thrown away when they are run down.

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AUGUST 29, 1899.

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