RECENTLY PATENTED INVENTIONS.

Engineering Improvements.

ROTARY ENGINE.—THOMAS R. BELLAS, Joplin, Mo. The invention provides a construction in which a number of cylinders or working-chambers are located within a small space so as to secure a powerful engine of small dimensions. The construction is furthermore such that a compound action is obtained and that the periods of operation by live steam and by expansion may be varied in their relative length.

Mechanical Devices.

STONE AND DIRT LOADING MACHINE.—CHARLES C. TROXELL, Caldwell-on-the-Hudson, N. Y. Mr. Troxell has devised a light, economical machine for picking up stones or for elevating dirt and delivering the gathered material to a cart or other receptacle connected with the machine. Endless carriers are mounted to travel on the vehicle-frame. Pockets are formed on the carriers; and fingers form part of the pockets. These fingers are adapted to pick up material. At the rear of the frame guard-fingers are provided which co-act with guard-plates. An adjusting mechanism is provided for the fingers and guard-plates.

OAR-MAKING MACHINE. — WILLIAM T. JONES, New Westminster, British Columbia, Canada. The inventor has devised a very ingenious machine for making oars and similar irregularly shaped work. The machine is simple in its construction and performs its work with an efficiency that leaves nothing to be desired.

RUG-STRAIGHTENER.—GEORGE T. WEEKS, Edon, Ohio. Mr. Weeks has provided a light, extensible frame on the lazy-tongs principle for the purpose of straightening a rug and preventing the ends or corners from turning up. The frame is readily attached to or removed from the rug.

GAS AND AIR MIXER.—GUSTAV RAAP, Berlin, Germany. The object of the invention is to provide a device for producing compressed air and for conducting it to the air-suction apparatus which serves as an air-meter. A device regulates the work of this compressed air mechanism, which device is controlled by the pressure of the gas and air mixture within the service-pipe.

FAUCET.—JOSEPH NAGENGAST, Bayonne, and JOHN HÜLSS, Elizabeth, N. J. The faucet is constructed principally of wood and nickel in such a manner that the liquid (a chemical or dyeing solution) will not come in contact with a metallic surface and so that a plunger-valve will be operated by an external lever. This lever may be locked in various positions and the plunger held seated or at such distance from its seat that the flow of liquid may be regulated.

MACHINE FOR MAKING COMMUNION-WAFERS.—JOHANN J. EUGSTER, New Riegel, Ohio. This machine consists of two boxes or sections pivotally connected, the one larger than the other. The smaller box has its bottom at a higher level than the larger box. A die plate is located at the top of the smaller box; and a heating-plate is adapted to be brought on top of the die-plate. The machine is operated very readily and is provided with effective devices for keeping the operating parts clean.

WASHING-MACHINE.—EDWARD CAMPBELL, Winnipeg, Manitoba, Canada. A series of partitions are so arranged as to form compartments for the reception of clothes, one compartment being independent of another so that fine material may not be brought in contact with heavier goods. Water is delivered to the various compartments. A rubber in each compartment has a rotary or a rotary-reciprocating movement whereby the clothes in the various compartments are rubbed clean.

FIRE-EXTINGUISHER. — GEORGE W. THOMPSON, Cole Building, Nashville, Tenn. The device is of that character in which the sprinkler-head is located in a water-supply pipe in a convenient position. The valve is held closed by a fastening, the separate sections of which are bound together by a fusible substance. This invention is an automatic fire-sprinkler of this character which will hold the valve securely to its seat at normal temperature without being disturbed by variations in the pressure of the water in the service-pipe, and which is yet very sensitive to abnormally high or dangerous temperature.

AUTOMATIC FIRE-EXTINGUISHER. — GEORGE W. THOMPSON, Cole Building, Nashville, Tenn. This invention is an improvement in stationary fire-extinguishers and alarms in which air and water pipes are distributed throughout a building and provided with sprinklers to be manually or automatically operated. The invention relates more particularly to the automatic valve mechanism which controls admission of water to the pipes, the latter being normally filled with air under a predetermined pressure. This pressure being lowered by opening one or more sprinklers, the mechanism opens the water-supply valve and allows water to flow into and fill the air-pipes and discharge from the sprinklers.

Vehicles and Their Appliances.

AIR-PUMP FOR PNEUMATIC TIRES. GEORGE B. STACY, Boston, Mass. The object of the invention is to provide a pump which is arranged to avoid leakage and to force a sufficient quantity of air into the tire to keep the tire inflated in case of a puncture or other leakage. The pump is attached to the tire and is so arranged that when the tire is deflated the pump-plunger will come into contact with the interior of the tire and will be actuated to force air into the tire as the wheel is turned.

AUTOMATIC TANK-PUMP FOR AUTOMOBILES.—GEORGE B. STACY, Boston, Mass. Mr. Stacy has in this patent described a pump actuated while the automobile is in motion by one of the wheels, the pump being designed to fill the air-tank to insure the proper working of the motor employed for propelling the vehicle. The pump is operated by a cam on the hub of the wheel.

AUTOMATIC TIRE-INFLATER.—GEORGE B. STACY, Boston, Mass. In this invention the main object has been to provide a tire-inflater locked by the tire against movement while the tire is being inflated, and arranged to be automatically actuated upon deflation of the tire by the device's coming in contact with the ground at every revolution of the wheel.

VEHICLE-BRAKE.—JOSEPH N. CALLAHAN and JEFFERSON D. SHORT, Henrietta, N. C. The invention relates to a type of vehicle-brake which effects a positive lock between a vehicle axle and the wheels. On the rear axle is a guide-block in which two locking-bars are held to slide. Springs press the locking-bars out. By means of a lazy-tongs the locking-bars are retracted and the springs compressed. The lazy-tongs device is operated from the front of the vehicle. The locking-bars are held back against the stress of the springs, but are releasable from the front of the vehicle.

Miscellaneous Inventions.

LIFE-BOAT.—BENVENUTO GIANESE, Genoa, Italy. The inventor has devised an apparatus to be used on board ships in place of the usual life-boats. The principal feature of the apparatus lies in the fact that it can be readily and automatically thrown overboard in any case of emergency without danger of its being submerged.

LANCET. — ROBERT CALDWELL, Auckland, New Zealand. The instrument is designed to cut through the obstruction that sometimes forms inside of the lower end of the cow's teat, so that the milk may thereby be made to flow more freely.

FRUIT-JAR HOLDER. — SIMEON L. BRAY, Evansville, Ind. The jar-holder comprises a base on which a post is mounted. A clamping-lever has swinging connection with the post and is provided with an opening to receive the neck of a jar. The device will tightly hold a jar during the sealing thereof, and will obviate the touching of the hot jar with the hands.

TOY.—CHARLES W. WALTERS, Richmond, Va. The improved toy is an amusing novelty designed to represent a child bathing. The child suddenly emerges from the water when the cover of the tank is quickly raised.

BASIC FIREBRICK COMPOUND.—SPENCER B. NEWBERRY, Sandusky, Ohio. The refractory compound forming the subject of this invention has for its principal ingredients tricalcium silicate and free magnesia, but contains no free lime. The compound is basic and permanent and non-slaking on exposure to air.

BOX-LID OPENER OR CLOSER.—NORMAN P. HICKS, Brooklyn, New York city. The invention relates to improvements in devices for opening the lids of inking-pad boxes and comprises a lever fulcrumed on the side of the box and provided with an inwardly-extending lug which projects through a notch in the lid and with an upwardly-turned arm to receive the lid in open position. Upon depressing the end of the lever, the lug raises the lid and forces it back against the arm.

CLOSET-SEAT. — MARTINA T. ROBINSON, Bloomsburg, Penn. The seat is adapted for the use of children, and is so constructed that it can be compactly folded. Hence it may be conveniently carried when traveling. The seat can be securely fastened to an ordinary closet-seat without injury thereto.

ADJUSTABLE SHELF AND SUPPORT THEREFOR.—DEAN A. BECKWITH, Manhattan, New York city. The shelf is arranged to permit the placing of a desired number of shelves in a cabinet and to permit the shelves to be readily adjusted to form spaces of the desired height, according to the room needed for books, merchandise, or other articles.

BEACH-PROTECTOR. — CHARLES H. VAN ORDEN, Catskill, N. Y., and EDWARD B. COOMBS, Manhattan, New York city. The object of the invention is to protect beaches by the use of mattresses so that the surf is prevented from washing away the sand from the beach and destroying valuable property. At the same time the mattresses form a barrier to break the force of the surf and a means for the deposition of the sand carried by the water for reclaiming the land.

PROCESS OF STORING AND AVERAGING ORE IN BULK.—EDWIN H. MESSITER, Apartado Postal 132, San Luis Potosi, Mexico. The usual procedure of lead-smelting is to "bed" the ores by forming each kind of ore into a horizontal layer in a rectangular bin. The ores are removed from the beds by entering through doors in the sides of the bins and attempting to cut the beds down vertically. The caving of the ores causes irregularity in the resulting mixture. The leading feature of this process consists in bringing in the ore by means of an elevated conveyer which discharges the material, not from a fixed and definite point, but from a traveling point, uniformly along a certain portion of its length by a kind of sowing action caused by the travel of the discharge devices.

SPRING ATTACHMENT FOR FISH-HOOKS.—ALBERT D. GARY, Lavonia, Ga. The invention is an improvement in the class of spring attachments for fish-hooks which are adapted to be set by pressing a spring and to be released by a pull on the hook, whereby a fish seizing the bait is impaled and caught. The invention is distinguished by simplicity, cheapness and portability. The device is composed of two members, one of which is connected with a hook and the other with the fishing-line.

FORMATION OF COLORED FABRICS.—PAUL B. WORTHINGTON, Manhattan, New York city. The colors are to be applied to the fabric by the use of brushes and by the aid of stencil-plates. The fabrics are to be subsequently embroidered to form pillow-tops and the like. Part of the fabric is given a firm support or backing, and the remainder is left unsupported or unbacked. A part of the fabric is covered so as to leave only a section exposed. To this exposed portion color is applied to cause the absorption of more color on the back portions of the exposed sections than on the unbacked portion.

Designs.

THILL-COUPLING PLATE. — JAMES L. KEHL and JOHN GARTHE, Northport, Mich. The thill-coupling plate is so formed that the coupling may be held so that it cannot fall out of its own accord.

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.

STEAM BOILER ECONOMY. By William Kent, A.M., M.E. New York: John Wiley & Sons. 1901. 8vo. Pp. 472, 126 illustrations. Price $4.

A treatise on the theory and practice of fuel economy in the operation of steam boilers. This is one of the most important subjects which interest mechanical engineers to-day. The author has been conducting tests since 1875, so that he is thoroughly familiar with his subject. It is an eminently practical and useful book.

A MANUAL OF PRACTICAL HYGIENE FOR PHYSICIANS AND MEDICAL OFFICERS. By Charles Harrington, M.D. Philadelphia and New York. 1901. 8vo. Pp. 729. Price $4.25.

A most comprehensive book, dealing with the subject in a masterly way. It is the best book on hygiene we have seen in many years. We have not the space to give even the chapter headings, but it is safe to say it contains everything within the purview of the subject.

TWELFTH BIENNIAL REPORT OF THE STATE BOARD OF AGRICULTURE OF KANSAS. Vol. XVII. 1899-1900. F. D. Coburn, Secretary. 8vo. Pp. 957.

Kansas is enjoying well-merited prosperity, and this report gives most valuable particulars as to the agriculture of that State. It is a model book which many State boards might well copy.

THE CEMENT INDUSTRY. Descriptions of Portland and Natural Cement Plants in the United States and Europe With Notes of the Materials and Processes in Portland Cement Manufacture. New York: The Engineering Record. 1900. 8vo. Pp. 235. Price $3.

Several years ago The Engineering Record began the publication of a series of articles upon the European and Portland cement industry. The articles were prepared for that journal by Frederick H. Lewis, M.A.S.C.E., who undertook in the interest of this inquiry a personal inspection of the important European plants, and who, on account of his familiarity with the subject, was well qualified to compare foreign with American plants. These articles form the basis of the present volume, but other plants are described by other writers. The book is most excellent, and deals with the subject in a most thorough manner.

CABBAGE, CAULIFLOWER AND ALLIED VEGETABLES, FROM SEED TO HARVEST. By C. L. Allen. New York: Orange Judd Company. 1901. 12mo. Pp. 100. Price 50 cents.

The author of this book has devoted a lifetime to this study; and, living in the very heart of the most favorable cabbage-growing section of the United States, and being himself largely and practically interested in this industry, is probably more familiar with its various details than any other man. There is a convincing and practical tone about the entire work which at once assures the reader of the safety of following the instructions given in its pages.

CHEMICAL LECTURE EXPERIMENTS. By Francis Gano Benedict, Ph.D. New York: The Macmillan Company. 1901. 12mo. Pp. 436. Price, $2.

The experiments are numerous and are well described, although the illustrations are merely diagrams. The object of the book is primarily to furnish teachers with a large number of reliable lecture experiments. The author does away, as far as possible, with elaborate and costly apparatus. This has resulted in the omission of some familiar experiments, but it has been possible in many cases to substitute an equivalent experiment.

CENTRAL ELECTRICAL STATIONS. Their Design, Organization and Management. By C. H. Wordingham, A.K.C. London: Charles Griffin & Co., Ltd. Philadelphia: J. B. Lippincott Company. 8vo. Pp. 496. Price, $7.50.

The literature dealing with central station practice is, at the present time, exceedingly limited, but that relating to many of its branches is very complete. The author recognizes the fact that there is no special need of additional books on the boiler, engine and dynamo, so he has concentrated his attention on the problems which arise in the practical operation of central stations, whether of a scientific engineering or a commercial nature, and to indicate the solution which his own experience and that of other engineers, similarly placed, has dictated. In this age of voluminous and indiscriminate publication it is refreshing to see the odds and ends of an important subject like the supply of electricity for light and power gathered together and tied in such an orderly fashion. Special attention is given to the general features of the station, mains, storage batteries, street lighting, costs, and methods of conducting the financial side of the station.

CENTRAL STATION EXPERIENCES FROM POWER. New York: The Power Publishing Company. 1901. 12mo. Pp. 106.

A humorous series of narratives on the trials and tribulations of a steam engineer while learning to run an electric station.

BAMBOO WORK. Edited by Paul N. Hasluck. London and New York. 1901. 18mo. Pp. 160. Price, 40 cents.

Bamboo work opens a new field to the amateur. With the instructions given in this eminently practical little book, it will be possible to make satisfactory bamboo articles. It is profusely illustrated.

ELECTRIC SPARKS. By Prof. James A. Beaton, A.M. Chicago: Laird & Lee. 1901. Vest-pocket form. Pp. 272. Price, leather gilt, 75 cents; cloth, 50 cents.

Considerable information on electricity is conveyed by this little book. The diagrams are excellent, and the work will prove useful to many readers who desire some acquaintance with the subject.

EXPERIMENTS ARRANGED FOR STUDENTS IN GENERAL CHEMISTRY. By Profs. Edgar F. Smith and Harry F. Keller. Philadelphia: P. Blakiston's Son & Co. 1900. 16mo. Pp. 88. Price, 60 cents.

A practical course which has been tested makes an excellent textbook. The authors have produced one of the best works on the subject we remember to have seen. It is interleaved.

A PRACTICAL TEXTBOOK OF PLANT PHYSIOLOGY. By D. T. Macdougal, Ph.D. New York: Longmans, Green & Co. 1901. 8vo. Pp. 352. Price, $3.

The author is Director of Laboratories at the New York Botanical Garden. He has produced a book which will be of great value to all students of botany. The experiments are numerous, interesting, and well explained. It is a thoroughly satisfactory scientific book. There are 159 illustrations.

NATURE BIOGRAPHIES. The Lives of Some Every-day Butterflies; Moths; Grasshoppers and Flies. By Clarence Moores Weed. New York: Doubleday, Page & Co. 1901. 8vo. Pp. 164. Price, $1.50 net.

This volume, by a well-known professor of entomology, is a sort of personal acquaintance with the lives of the more common butterflies, grasshoppers, moths, etc. Many photographic illustrations help to give reality and charm to the author's descriptions. It is a handsome example of the bookmaker's art.

TUNNELING. A Practical Treatise. By Charles Prelini, C.E. With additions by Charles S. Hill, C.E. New York: D. Van Nostrand Company. 1901. 8vo. Pp. 311. Price, $3.

Strange as it may appear, there are but two books on tunneling in the English language; the present makes the third. The older books were not adapted for textbooks, so the author has done a real service to engineering literature by preparing a work which will be of special value to students. The question of tunneling-shields is admirably treated, although the late Alfred Ely Beach, of the SCIENTIFIC AMERICAN, does not seem to have received adequate credit for his system of using hydraulic jacks, which was superior to the Greathead system.

SAW FILING AND MANAGEMENT OF SAWS. By Robert Grimshaw, M.E. New York: Norman W. Henley & Co. 1901. 16mo. Pp. 93. Price, $1.

A thoroughly practical treatise on filing, gumming, swaging, hammering and brazing of patent saws; the speed, work and power to run circular saws, etc. The book has been well received in former editions, and it has now been thoroughly revised and brought up to date.