RECENTLY PATENTED INVENTIONS.

Engineering.

LOCOMOTIVE EXHAUST NOZZLE.—John O'Neill, Plainview, Ill. This nozzle is adapted for ready application on all kinds of locomotives, is always under the full control of the engineer, and is designed to relieve the working parts of the locomotive of any back pressure. The nozzle casing is held on a stand pipe, and has a contracted outlet in which is a revoluble cutoff secured to a shaft, the cutoff being actuated from the reversing shaft of the engine, so that no back pressure will take place in the cylinders, and at the same time the necessary draught will be given in the boiler flues.

Railway Appliances.

SIGNAL AND SWITCHING APPARATUS.—John D. Taylor, Chillicothe, Ohio. This invention provides an electrically controlled and operated mechanism to serve as a block signal system, a switch operator and crossing signal, all controlled by the current, but so arranged as to give the danger signal in case of failure of the current. The improvement consists in the combination of electric motors, semaphore-operating mechanism, controlling magnets, and switch-operating mechanism. The switch mechanism can be applied to transfer switches as well as to derailing switches, and the improvement is applicable at the junction or crossing of any number of roads, it being impossible, with this improvement, to give the right of way to trains on two roads at the same time through carelessness.

SWITCH AND SWITCH OPERATING MECHANISM.—Joseph E. Downer, Allenport, Pa. This is a simple device, applicable to any kind of a train, and providing means whereby a switch may be set from the train, either for the main line or for a siding, while the train is moving, even at a high speed. Centrally of the switch rails is pivoted a shifting block with concave side faces, and there is an operative connection between the rails and the block, while the trip mechanism on the engine or other part of the train has projections adapted to engage the shifting blocks on either of their sides, such mechanism being conveniently operated by one on the train.

Mechanical.

BELT TIGHTENER.—George H. Hanson, Ellsworth, Iowa. According to this improvement a tightening pulley is located at one side of and beyond the adjusting mechanism, so that the pulley may be applied to either the outer or inner face of the belt. The pulley is held on an axle fitted in a socket of the adjusting bar, the axle standing at right angles to the bar, and the latter extending outward some distance beyond the plane of the standards projecting from a base plate. The tightener may be placed at any desired angle to a support.

Agricultural.

HARVESTER.—Bennett Osgood, Pender, Nebraska (Martha J. Osgood, administratrix). This is an improvement in machines which cut, gather, and bind grain, forming it into a shock before discharging it from the machine, the invention providing for the simple construction and automatic operation of the cutting, binding, and bundle carrier devices. The cut grain falls onto a carrier and is taken under a presser hood whose projecting arms gather a sufficient quantity to form a bundle, which is tied by a binder mechanism, when the bundle is moved by sweeps to a bundle carrier and thrown into a shock frame, which, when sufficiently filled to form a shock, is lowered, and the shock passed out in an upright position.

THRASHER AND SEPARATOR.—Daniel S. Geiser, Waynesborough, Pa. This invention relates to machines in which the straw and grain are discharged into revolving screening drums, the construction being simplified and cheapened by dispensing with complicated mechanisms, the improved machine effectively and economically separating the grain and straw. In a revolving inclined drum are internal spiral-edged ribs, while fingers or combs are so arranged and connected with the cylinder of the thrasher that when fed internally with mixed straw and grain the revolving action of the drum moves the straw forward and on the spiral rings, while the grain settles and passes off through the open faces between the ribs to the winnowing devices, which have carrying fingers and separating combs.

SEED PLANTER OR GUANO DISTRIBUTER.—John P. Allen, Sr., Dawson, Ga. This machine delivers cotton seed, corn, peas, etc., and guano or other fine fertilizers, uniformly in drills, and in greater or less quantities, as desired. It is an improvement on a former invention of the same inventor, providing means for the convenient control of the distribution of seed and fertilizer, and for such construction of the covering plows that they will surmount an obstacle met with and automatically return to their normal or covering position. These plows may also be readily thrown out of contact with the ground when desired.

HOG STY AND FEED TROUGH.—Albert Auchly, Montgomery City, Mo. This sty is a walled structure with intermediate partition, there being double folding pendent doors at one side of the partition on the rear wall of the sty, with swinging and folding doors on the other side of the partition, means to retain the doors upwardly folded, and a runway below the doors along the rear of the sty, while connected with the floor is a trough adapted to receive rocking adjustment, affording means for the safe feeding from the same trough of a litter of small pigs at the side of the parent sow, preventing waste of food or the entrance of the pigs within the trough.

COW STALL.—Joseph Ardron, Mandan, North Dakota. This invention provides simple means designed to prevent the fouling of the bedding in cow stalls, a presser piece being arranged to contact with the backbone of the cow when it arches its spine, causing the cow at such times to step backward, thereby preventing the floor or bedding or the animal from becoming fouled.

FEED BOX.—John H. Denison, Maquon, Ill. This box is preferably made of metal, and is divided by a partition into a feeding and a storage compartment, the partition having a gated opening near its bottom, while a lid covers the storage compartment. Within the storage compartment is a screen for automatically screening the grain or feed when necessary.

SPRAY NOZZLE.—Charles Hood, Puyallup, Washington. This nozzle is adapted to spray plants, trees, etc., with liquid poison, the device affording an exceedingly fine spray or fog, having more force than the ordinary spray, while the cleaning of the nozzle when stopped up is readily effected. The nozzle has no outside attachments likely to catch on vines or shrubbery, and may readily be converted into a sprinkler.

CHICKEN BROODER.—John C. Nicholls, Blue Mound, Ill. In this brooder fresh air only is supplied to the brood chamber, and the bottom is gently warmed, while a greater portion of the heat comes from above. The brood chamber has a removable bottom covered with sand, so that it may be readily cleaned, and there are runs at each side of the chamber.

Miscellaneous.

FIRE EXTINGUISHER AND ALARM.—James C. Morton, Washington, N. C., and Edward B. Freeman, Norfolk, Va. This is a combination apparatus more particularly adapted for use in connection with lumber driers or kilns, which are, according to this invention, equipped with flood pipes connected with a suitable source of water or steam supply, or both, and with mechanism adapted to open the proper valves in case of fire. The draught or stack flues will be at the same time automatically closed, and an alarm sounded by a whistle or gong.

WINDMILL.—Myron H. Richardson, Windom, Kansas. This is a strong, simple and light machine, designed to afford a great deal of power in proportion to its size. It is readily thrown into and out of gear, in the latter case affording very little resistance to the wind. A governor actuated by the centrifugal force of the main shaft and wheel operates to make the wheel turn at a uniform rate of speed without regard to the force of the wind.

SPIRIT LEVEL.—Erik Olson, Neihart, Montana. According to this invention a disk or wheel is secured to the stock, and around the hub of the disk on opposite sides of the web are cylindrical tubes containing spirit or mercury, and having a bubble to indicate on a graduation on a ring held against the corresponding face of the web. The graduation on each of the rings is formed on concentric circles, the lower half indicating degrees and subdivisions, and the upper half bevels, cuts, and pitches, corresponding to the degree indicated by the bubble on changing the position of the stock.

HOOK FOR MINER'S BUCKETS, ETC.—George W. McMillan, Hurleton, Cal. The shank of this hook has a spring-controlled tongue adapted for locking engagement with the hook, while a latch pivoted to and pendent from the tongue is in constant engagement with the hook, serving to maintain the tongue in locked or closed position, and protecting the spring of the tongue. Should a bucket carried by the hook strike an obstruction, the bail would only be forced into better locking engagement with the hook. The device is very simple, strong and inexpensive.

WIRE REEL.—John A. List, Bartelso, Ill. This is a simple form of reel for mounting on a wagon or other vehicle, for winding or unreeling wire in the construction of a fence, and its construction is such that the wire may, by means of a guide arm, and without possible injury to the operator, be directed across the face of the reel to cause it to wind at either end or at the center of the reel, as required.

ACCOUNT KEEPING APPARATUS.—Samuel H. Boylan, Armour, South Dakota. This apparatus is designed to obviate the necessity of keeping the ordinary account books, as day-book, ledger, etc., providing instead a convenient method of keeping original entries upon tickets in envelopes, and summarized on the envelopes, to be filed for ready reference. The apparatus provides a two-part case, with removable cover and body portion open at one end, spring catches securing the parts together, and there being in the body portion guide rails, on which slides a follower having flanges or guides, by means of which the envelopes and tickets may be readily kept in order, but be always accessible.

EASEL.—Hattie F. Beecher, Port Townsend, Washington. This device may be used as a drawing table, but is especially adapted for workers in water colors. The table proper may be adjusted at any desired angle, so that the colors applied will flow with greater or less rapidity, and the table is also adjustable vertically, while the pallets and brush holders are so connected with it as to be simultaneously adjusted, as required for the convenience of the artist, whether sitting or standing. The pallets and brush holders are so mounted on the table supports as to be adapted to revolve, thus being always in convenient proximity to the table and the artist.

CURTAIN.—Joseph Darling, Baldwin, Pa. Combined with the roller, operating cords and guides, is a bracket having a main plate at the inner ends of which are upwardly and downwardly projecting arms to which the operating cord is connected, and having at its outward end a lug with a seat for the roller stud, and devices for locking the stud in the seat. The construction and arrangement of parts permits of the extension of the curtain outwardly beyond the operating cords, to fully cover the window, a double crank lever also enabling the operating cord to exert leverage to sustain the bracket and curtain in position.

PORTABLE FOLDING SEAT.—James R. R. Morford, La Harpe, Ill. This is a device which, when not needed, may be slid as an envelope upon a folded umbrella, in which way it may be carried about, affording a temporary seat for one desiring to rest for a time in the open air. It consists of a tapered hollow standard, to the top edge of which are hinged seat bars adapted to fold across each other and project beyond the standard, there being a spring catch adapted to interlock with one seat bar.

LAMP.—Franz Gedies and Carl Schunke, Berlin, Germany. This is an adjustable lamp adapted to be readily brought into any desired convenient position to facilitate working or reading. The lamp-carrying tubular arm of a vertical standard adapted to be readily clamped to a table or other support has a longitudinal projecting rod, on the outer end of which is a vertically adjustable arm to which is secured the base of the lamp, whereby the several adjustments are readily effected.

ICE CREAM FREEZER.—James S. Stidham, Floyd, Texas. According to this improvement the refrigerating box, arranged to be revolved by a crank, has in its several sides openings to receive elongated cream cups, the latter being so arranged as to form a lining within the ice box, and so that every cup will be exposed throughout its length to the action of the ice. After the cream or ices are frozen they may be preserved for quite a time without replenishing the ice.

SASH BALANCE.—Valentine Schirmer, New York City. This improvement is adapted for window frames of different dimensions, being capable of convenient adjustment for increase in tensional force of its spring, and adapted to receive a locking adjustment to retain the coiled spring from relaxing when the balance is prepared to receive and sustain a window sash. A novel mechanism is provided to permit the free introduction and removal of the sash, and effect a working connection between the sash and counterbalancing devices. With this attachment no chains, pulleys, or weights are needed, and a sash fastener is not required, as the sash may be readily locked in any desired position. The sash may also be arranged to swing inwardly, to facilitate cleaning.

SURGICAL CHAIR.—Oskar Baruch, Berlin, Germany. The seat of this chair has an articulated connection with the frame, to be capable of up and down movement, while the back is supported on the upper part of the frame and slides longitudinally, being capable of assuming various angular positions in relation to the seat. The several parts are conveniently adjustable, so that the patient may be placed in any required position for the surgical operation.

FOOT REST FOR BICYCLES.—Milton W. Smith, Long Island City, N. Y. A toothed plate is, according to this invention, fastened to a clamp which is vertically adjustable on the bicycle fork, while a swinging arm having a hub journaled on the face of the toothed plate is provided with teeth to engage the teeth of the plate, there being means for fastening the hub to the toothed plate and a foot rest on the outer end of the arm. The rest may be adjusted vertically in the usual way, and may also be adjusted to and from the rider, to bring it into desired position for an easy rest.

DESIGN FOR DOOR PULL, ETC.—Charles Sotscheck, New York City. A stem-like figure simulating an oak leaf projects from each end of this plate, and the stem-like figures are also entwined with coils, the flat plate of the pull having at its side edges scroll-like figures.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention, and date of this paper.

NEW BOOKS AND PUBLICATIONS.

A HISTORY OF MATHEMATICS. By Florian Cajori. New York and London: Macmillan & Co. 1894. Pp. xiv, 422. Price $3.50.

We have nothing but commendation to bestow upon Professor Cajori's history. On the title page he gives a quotation from Professor Glaisher to the effect that no subject loses more than mathematics by any attempt to disassociate it from its history. The science in itself often seems dry, but when its history is brought together and put into the excellent shape in which we find it in the present work, what seems to the layman a dry skeleton is clothed with a most attractive form. The work is naturally largely biographical, telling of the work of each investigator in turn, and of their various disputes and counter theories.

A POCKET BOOK OF MARINE ENGINEERING RULES AND TABLES. By A. E. Seaton and H. M. Rounthwaite. London: Charles Griffin & Company. New York: D. Van Nostrand Company. 1894. Price $3.

The title of this book, which we have given somewhat fully, explains sufficiently its scope. When we state that it is very attractively printed, illustrated as required, contains an index and excellent table of contents, and is elucidated by 127 separate tables, we think enough has been said to show how valuable it will be found by the working engineer. It is bound in flexible leather with rounded corners, so as to present a very workmanlike appearance, suggesting utility to the practical marine engineer.

THE WORLD'S CONGRESS OF RELIGIONS. Edited by C. M. Stevens, with an introduction and review by Rev. H. W. Thomas. Chicago: Laird & Lee. 1894. Pp. 363. Price 50 cents.

This book claims to be a complete and concise history of the world's congress of religions held at Chicago. It contains extracts from the various addresses delivered there and contains portraits of some of the participants.

ELEMENTS OF SYNTHETIC SOLID GEOMETRY. By N. F. Dupuis. New York and London: Macmillan & Co. 1893. Pp. xii, 239. Price $1.60.

This exceedingly well treated and well made book is intended by the author as a continuation or sequel to his work on plane geometry.

GUIDE TO THE STUDY OF COMMON PLANTS: AN INTRODUCTION TO BOTANY. By Volney M. Spalding. Boston: D. C. Heath & Co. 1894. Pp. xxiii, 246. Price 85 cents.

This excellent and interesting work is designed for the use of advanced schools. It treats of modern botany by modern methods, so that a peculiar life and aspect of reality is given to the subjects, the work reading not at all like the old type, dry botanies, but by suggestion and the use of the induction method awakening the interest of the students. It covers very interesting ground and is so written that it can be read almost as a literary work, while it may also be employed as a text book pure and simple.

A TREATISE ON THE KINETIC THEORY OF GASES. By Henry William Watson. Oxford: Clarendon Press. 1893. Pp. xiv, 87. Price $1. No index.

The author states that his object in his treatise is to make the existing state of the theory more widely known, in the hope that mathematicians may be induced to turn their attention to the theory, and thus remove, if possible, the obstructions remaining in the way of its completed establishment. The work is very mathematical in treatment and will prove a valuable contribution to this branch of physics.

HELICAL GEARS: A PRACTICAL TREATISE. By a Foreman Pattern Maker. New York: Macmillan & Co. 1894. Pp. xv, 127. Price $2.

The author believes that this is the first work on the subject which has ever yet appeared written by one who claims to be a pattern maker. It is fully illustrated by clear and demonstrative cuts, so that an exceedingly practical aspect is given to the treatise. It forms a valuable addition to the literature of foundry and machine work, which has received so much attention during the last few years.

PRACTICAL WORK IN HEAT. By W. G. Woollcombe, M.A. Oxford: Clarendon Press. New York: Macmillan & Co. 1893. 12mo. Pp. 61. Illustrated. Cloth. Price $1.

A college text book using mathematics freely. The description of experiments, to which the entire work is devoted, is very clear, and doubtless the book will prove of value for use in connection with any standard work on physics.

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