RECENTLY PATENTED INVENTIONS.

Mechanical Devices.

LOCK.—EDWARD FACKNER, New York city. The purpose of this invention is to provide a lock which is simple in action and durable in construction. The lock has a casing in which a fixed partition is located. In the casing a spring-pressed bolt is arranged at the front side of the partition. This bolt comprises a rod movable through the partition, three brackets rigidly held in the casing at the rear side of the partition, and two independent tumblers, alternating with the brackets. Each tumbler is capable of engagmg the rod to hold it. In connection with each tumbler, a key-rod is used and operated respectively at the opposite sides of the casing. By the arrangement described, the door can be locked from the inside, so that it cannot be opened from the outside, one tumbler being merely left in its normal position.

APPARATUS FOR SHUFFLING CARDS.—JOSEPH BOOTH. New York city. The present invention provides an apparatus in which the intermixing of the cards is performed far more thoroughly and expeditiously than by hand. In the apparatus in question, the cards to be shuffled are introduced into the mouth of a casing containing the operative mechanism and fall through guide-passages upon a series of horizontally movable tapered fingers. These fingers are attached to a narrow strip having rounded notches in its upper edge. The fingers are inclined downwardly from base to point, and have a flat bottom and vertical side flanges, the upper edges of which are toothed. The cards falling through the passages are arrested by the strip, in the notches of which they temporarily rest. A separator being released, the cards slide off upon the fingers, whence they are discharged. The cards being supported evenly in the same plane and being restrained by the toothed flanges, they fall off one by one, so that they are delivered well shuffled in the receptacle at the base of the apparatus. Thus by a simple, highly efficient device, cards may be intermixed more thoroughly than is usually done in shuffling by hand.

AUTOMATIC PLAYING-CARD SHUFFLER.—JOSEPH BOOTH, New York city. The purpose of this invention is to provide an apparatus for shuffling cards whereby all players are placed on the same plane of equality, whereby any advantage gained by using marked cards is nullified, and whereby a more complete shuffling is attained than is usually accomplished manually. The cards introduced in the casing are divided into three equal parts. Each part is temporarily arrested and supported by one of the tapered fingers of a separator. A spring gear which has been placed in operation, acts to force the separator or shuffler slowly backward, in which operation the cards fall successively off on each side of the fingers and drop into a tapering condenser, slotted in its entire width to allow the cards to pass. In the present invention, as well as in the preceding, it will be observed that the cards are not intermixed by twos and threes, but one by one, attaining thus a more perfect shuffling than has been hitherto possible.

SPOUT-HOISTING APPARATUS.—HENRY F. KUSS, Escanaba, Mich. This invention provides an apparatus for raising and lowering spouts used for discharging material from a wharf into a boat. By means of this apparatus the pulling leverage will be changed with the changing positions of the spout in raising or lowering. The apparatus comprises a drum tapered in both directions, with the smaller diameter near its ends, these tapered portions being each provided with a spiral groove or channel. Cables engage in the grooves and have connection with the outer end of the spout or platform. A tapered and spirally-channeled equalizing drum is mounted on the shaft of the first named drum. The drums are rotated by cranks. A counterbalancing weight has a cable engaging with the equalizing drum. Means are provided for preventing the weight from swinging outward to strike a boat or the like.

GRADER AND SCRAPER.—CALVIN KARRAKER, Dongola, Ill. The object of this invention is to provide a machine of comparatively few parts, that will reduce the amount of labor required in grading or excavating. The machine is constructed so that it may be adjusted to different widths of road. The ditcher and grader comprises a carriage and a frame mounted to swing vertically with relation to the carriage, and consisting of side sections. Each section consists of two parts adjustable longitudinally, one part on the other. From the shafts to the side-pieces of the frame, braces extend, which are slotted at their inner ends. A bolt extends through the slots of the overlapped inner ends of pairs of braces. The ground-breaking devices are operated by the wheels, which in turn are operated by a series of sprocket wheels driven by a traction engine.

PLANTER.—JOHN S. EARHART and CHARLES MILLER, Millersville, Ill. This invention provides improvements upon the construction of a planter patented by the same inventors. The improvements in question relate particularly to the connection between the seed-drop mechanism of the three seed-boxes and to the means for adjusting the central seed-box so as to cause the seed to be planted more or less deeply. The seed-box is provided with a supporting frame and with a runner. Side-pieces on a frame are connected at their rear by a cross-piece, and have upwardly-extending forward ends pivotally attached to the supporting-frame of the seed-box. A wheel is journaled in the rear portion of the pivoted frame and a lift-lever is connected with the pivoted wheel-carrying frame. By operating the lever the frame will be raised or lowered, and the wheel will be carried toward or away from the ground, thus regulating the depth at which the runner shall enter the ground.

Railway Appliances.

CAR BRAKE AND FENDER.—OLIVER B. WHITNEY, Marlborough, N. Y. This car-brake and fender is designed to bring a car almost instantly to a standstill, either at the option of the driver or when an obstruction passes into the fender. The car-brake is provided with a shoe adapted to pass between a wheel and a rail. A link carries the shoe normally in the path of and out of contact with the wheel, and is arranged to allow the shoe to move down into a resting position on the track in advance of the wheel to permit the latter to run onto the shoe. A spring-arm extends forwardly from the shoe. Fixed stops on the car-frame hold the shoe in place, one of the stops being adapted for engagement by the arm to guide the shoe forward and upward to a normal, inactive position.

EMERGENCY-CROSSOVER.—FRANK R. COATES, Stamford, Conn., and ORRY M. SHEPARD, New York city. This emergency-crossover has a point-rail formed of T-rail, with the web and base cut away at one end at an angle so as to fit against the side of the track-rail. The head extends over the head of the track-rail and is beveled to form an incline for raising the wheels so that their flanges will clear the track-rail. A plate is fixed to the bottom of the point-rail, extends in the direction of its length, and is adapted to rest upon the tie and to support the point-rail at the proper elevation.

Miscellaneous Inventions.

TRIPLE VALVE.—JOHN V. WELLS, Wilmerding, Ill. The purpose of this invention is to provide a triple valve which does away with the necessity of releasing the brakes to recharge the auxiliary reservoir, the reservoir being at all times fully charged in case of an emergency. The triple valve has a valve-body with two ports independently connected with the brake-cylinder. A slide-valve is arranged to uncover one of these ports to connect with the auxiliary reservoir on an emergency application. The slide-valve is provided with a port having a spring-pressed valve near one end and opening at the other into a recess at all times in communication with the train-pipe pressure. The port in the slide-valve is adapted to connect the other port in the valve-body with the train-pipe pressure.

SYRINGE-NOZZLE.—FERDINAND KING, New York city. This syringe-nozzle consists of an approximately semispherical body having its outer or front end curved downwardly, forwardly, then inwardly, and extended within the body to form an inwardly extending projection. This projection is spaced from the body and forms therewith a longitudinally curved annular chamber. The inwardly-curved front portion of the body is perforated, whereby the spray delivered from the nozzle will converge toward the center of the nozzle and meet at a short distance in front of it.

FOLDING-BED.—CHARLIE E. YEAGER, Prairie Creek, Ind. The object of this invention is to provide a combined bed and bureau which may be quickly adjusted, and which, when not in use, will present the appearance of an ordinary article of furniture. The bed comprises a head-section, a foot-section, a bed pivoted to the foot-section and sliding into and out of the head-section and a spring secured to one of the sections. This spring is detachably interlocked with the other section, whereby it may be adjusted to assist in the folding operation or may be released to prevent such operation accidentally. By means of a drag-line extension, the spring may be connected and disconnected.

HOE-SLING.—ALLEN J. CARLEY, Belmont, La. To provide a device which is adapted for use on rakes, hoes, or long-handled shovels, and which is designed to save much labor, this inventor has arranged a sling comprising a shoulder-strap with elastic sections. A hanger-section is also provided, which has its upper end buckled to the elastic sections at the ends of the shoulder-strap. The hoe is attached to the lower end of the hanger-section by means of a strap.

CHART-TABLE.—SILAS N. GREENLEAF, Seattle, and HENRY BARKER, Hoquiam, Wash. The chart-table provided for by these inventors is designed to hold charts or maps in place for convenient inspection on board a vessel or other place, the table and map being constructed to be readily folded and stored when not in use. The table has a top consisting of slats arranged closely together and held in place by some flexible material secured to the upper surface of the slats. A smooth, unbroken top-surface is thus provided when the table is in use. One edge of the top is hinged to a support. Supporting-arms are hinged to the support. Flexible straps hold the chart on the table top. In rolled position the top is held by a strap.

COAL-CHUTE.—JAMES S. CHEW, What Cheer, Ia. This coal-chute is of peculiar construction and is arranged to divide the stream of coal and to direct it into any of a plurality of passages, so that two or more vehicles may be loaded simultaneously from one chute. The coal-chute has two branches, a post mounted at the meeting walls of these branches and a deflector having a jaw loosely embracing the post. The deflector is mounted to swing on the chute to command each branch thereof, and the jaw serves to shed the coal past the post.

BURGLAR-ALARM.—DANIEL L. WARTZENLUFT, Kutztown, Pa. The alarm devised by this inventor is an electrically actuated burglar-alarm. By jarring or breaking a window-pane, door-panel, transom, or the like, the circuit is closed and the alarm sounded. The wires of the circuit are extended across the window and are connected with the alarm. A circuit-closer is mounted to swing on one of the wires and adapted to close the circuit when swung out of its normal engagement with the window.

Designs.

GAME-BOARD.—FRANK B. WELLS, Masonville, N. Y. This design consists of a box-like body in which there is a horizontal partition above the bottom provided with pockets at diagonally-opposite corners of the box-body, each pocket having an opening. In each of the other two corners, and in the center of the partition, openings are also made. Balls are placed in the pockets and the board is to be tilted so as to roll the balls into the proper openings.

TIRE REPAIRING PLUG.—ARRAH J. WHISLER, Kokomo, Ind. The plug-stem in this design is provided at its lower end with an upwardly flaring rim, the outer side of which tapers at its lower end to a point. This rim extends upwardly to a point on a level with the upper end of the stem, the space within the rim being conical and extending from the lower end to about the level of the upper end of the stem.

NOTE.—Copies of any of these patents will be furnished by Munn & Co. for 10 cents each. Please send the name of the patentee, title of the invention, and date of this paper.

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.

(7485) **W. A. T.** writes: Will you kindly inform me as to the number of pounds of gun cotton or explosives used in the 13-inch shell? A. The 13-inch shell is charged with 70 pounds of brown powder.

(7486) **O. S. K.** writes: I believe I saw at one time in your publication the method of placing an egg in a bottle. Think some acid or something was used to soften the shell and then the egg was placed through the neck of the bottle. A. In order to make eggs enter a decanter or a bottle, it is necessary to soak an egg for about twenty-four hours in acetic acid or strong vinegar. The shell of the egg thus becomes soft, but must be handled with care. It will be an easy matter for the egg while in this state to enter the mouth of the bottle. It can be helped along greatly by the use of a funnel, as wide as possible as will just enter the bottle. If the egg is now placed in the funnel, it gradually finds its way and by its own weight drops into the bottle. The bottle should be about half full of water, both to check the fall of the egg and to prevent its breaking and at the same time it hardens the shell, which after the operation is very thin, more so than originally. An egg can also be passed half way through a finger ring, and in that condition placed in water, and it presents a very curious appearance—an egg with a ring around its center.

(7487) **C. E. G.** writes: Please inform me how much No. 10 wire for the primary and No. 36 for the secondary of an induction coil will be needed to give a four-inch spark, and how large a core, also how many square feet of tinfoil for the condenser, and what kind of a battery and how many cells will be needed. A. We cannot give you definite quantities for your 4-inch coils. Use two layers of No. 10 wire for primary. For secondary you will do well if you get 1 inch of spark for 1 pound of No. 36 wire. Some makers claim to do better than this. You may have to use 2 pounds per inch of spark. We cannot tell. For battery you can hardly do better than to use the bichromate plunge battery. If you wish to make it, follow pattern in SCIENTIFIC AMERICAN SUPPLEMENT, No. 792, price 10 cents. Six cells, perhaps four, will be enough for your coil. Your core may well be 1½ inches by 12 inches. The condenser requires about 75 square feet of tinfoil. Probably no two 4-inch coils are alike in all respects, and you may have to try more than once to get a coil giving that length of spark.

(7488) **H. M. J.** writes: A question was raised here in regard to the speed of the "Columbia" and "Minneapolis." Would like to have you answer it in your most valuable paper, which I take regularly. What is the standard official time each makes in knots? What is the greatest speed each has made? A. The greatest speed of both the "Minneapolis" and "Columbia" was made at their official government trials, when the "Minneapolis" made 23·073 knots per hour and the "Columbia" 22·8 knots.

(7489) **C. H. B.** writes: Kindly inform me how to construct a cheap balloon, one that may be used repeatedly, with a lifting power of about eight pounds. What is the size and pitch of the propeller wheels on the torpedo boat "Porter"? A curious fact has attracted my attention, and I have sought a plausible explanation in vain. At Pensacola, Florida, near the seashore are many flowing wells, usually less than one hundred feet in depth. The tide here rises about two feet once a day. When the tide is high these wells flow much more freely than when the tide is low. Some weak wells have been observed to flow only during high tide. If you can explain how the tide can affect water above its level I shall be pleased to have you do so. That it does do so is evidenced daily at this place by the flowing wells. A. An interesting illustrated description of the manufacture of balloons was published in SCIENTIFIC AMERICAN SUPPLEMENT, No. 413, and also a practical paper on balloon construction in No. 736, 10 cents each mailed. A balloon to lift 8 pounds should have a capacity of 125 cubic feet. We have no dimensions of the Porter's propellers. The subway waters near the sea flow into it and are influenced by the rise and fall of the tide in the same manner that sluggish rivers rise and fall with the tide, although their waters may constantly flow seaward. The rise in the tide increases the underground resistance to the constant flow of water toward the ocean. The waters of artesian wells near the sea have their natural outlet at various distances from the shore, according to the depth and formation of the water-bearing strata. Variations of pressure by tidal action over the outlets of such subterraneous waterways will react upon artesian well flow for a considerable distance from the ocean. Ordinary surface wells near the ocean are influenced by the same causes, and are found to vary their water level with the rise and fall of the tides.

(7490) **L. H. M.** writes: Will you please answer in your next issue of the SCIENTIFIC AMERICAN through the Notes and Queries column the following questions: 1. How many and what kind of storage batteries would it require to light 15 incandescent lights, 16 candle power? A. To light 15 16-candle power incandescent lamps, 52 volts, will require 28 cells of 7 plates, each 7¾ inches by 7¾ inches. These will discharge 8 hours at the rate of 15 amperes. This answer is based upon the tables issued by the Electrical Storage Battery Company, Drexel Building, Philadelphia, Pa. 2. Which would be more economical—52 or 110 volts for lights? A. There is no difference in electrical efficiency of 52 and 110 volts. If you adopt 110 volt lamps, you will require 58 cells of battery. The cost of battery will be more than twice as much. 3. What would be the smallest dynamo that would charge the batteries? I want to run the dynamo by water power. A. You will require a current with 70 volts pressure for charging the battery. For the best rate of charge the dynamo should give 30 amperes. This will charge the battery in 4 hours. 4. Would it be possible to make the batteries and dynamo myself, and where could I get information about making them? A. If you are a good machinist, you might make the dynamo; but cells which do not infringe some patent would not be worth much. 5. About what would be the first cost and the after operating expenses? A. We do not know what it would cost you to put in your plant. Probably twice as much to build it as to buy it. The cheapest way is to get a kilowatt machine and light your lamps directly with it. There does not seem to be any need of using a storage battery. You can obtain information about the storage cell from Treadwell's "Storage Cell," price $1.75 by mail.

NEW BOOKS, ETC.

ALTERNATING CURRENTS OF ELECTRICITY AND THE THEORY OF TRANSFORMERS. By Alfred Still. With numerous diagrams. London and New York: Whittaker & Company. 1898. Pp. 184. Price $1.50.

This book has been written, not only for engineering students, but also for those engineers who are but slightly acquainted with alternating current problems, or who, though their practical knowledge of the subject may be extensive, are yet anxious to get elementary but sufficiently accurate ideas of the leading principles involved, which will enable them to solve many if not the greater number of problems likely to arise in practice. The introduction of the higher mathematics has been to a large degree avoided. As this is a very important subject of electrical engineering, the present work will undoubtedly have a large sale.

EASY LESSONS IN MECHANICAL DRAWING AND MACHINE DESIGN. Arranged for self-instruction. By J. G. A. Meyer. Fully illustrated. Volume I. New York: Arnold Publishing House. 1898. Pp. 405. 4to. Price $7.50.

The present work is one of the best works we have seen on mechanical drawing. It is filled with excellent illustrations of the kind of drawings which the draughtsman would be compelled to make in a shop, such as full details of lathes, stuffing boxes, cranks, bolts, etc. Theoretical problems are far from being neglected, however, and a large number of them are scattered throughout the book. The volume with its 500 illustrations is specially adapted for the use of students who wish to acquire a competent knowledge of mechanical drawing at home. The large size of the pages enables the drawings to be reproduced on a large scale and also permits a handsome face of type being used. The book is most creditable in appearance.

A CATALOGUE OF THE SCIENTIFIC AND TECHNICAL PERIODICALS. 1665–1895. Together with chronological tables and a library check list. By Henry Carrington Bolton. Second edition. Washington. 1897. Pp. 1247.

The first edition of this catalogue was published in 1885. The value of Dr. Bolton's service to science is very great. We are indebted to him for the Bibliography of Chemistry and for the present catalogue. They both have been labors of love and have been executed with remarkable accuracy and zeal. It is difficult to know whom to congratulate most, Dr. Bolton for the valuable volume which he has compiled, or the Smithsonian Institution, which has published this work, which could never pay its expenses. It is gratifying to know that we have a branch of the government which is able to take up and publish manuscripts of this kind. The value of the Smithsonian Institution in the increase and diffusion of knowledge is recognized throughout the world.