

RECENTLY PATENTED INVENTIONS.

Agricultural Implements.

DRAFT-EQUALIZER.—JOHN RUSK, Cheneyville, Ill. A U-shaped frame is adapted to be attached to the gang-plow; and on each longitudinal member of the frame an equalizing-lever is fulcrumed. A sheave is mounted on the transverse member of the frame; and a flexible connection between the ends of the levers passes over the sheave. The equalizer, since it is made in sections, can be very closely hitched and prevents all undue side draft when in use on gang-plows for three or more horses.

HARROW.—WILLIAM M. BAKER, Fortville, Ind. The invention is an improvement on a harrow patented by the same inventor, the improvement enabling the machine to be adapted for work in trashy ground. The inventor employs rollers, the teeth of which are intercurrent with the hooked forward ends of rigid blades. These blades are to be substituted for a plain roller when the harrow is to be used in trashy ground; and their action is such that, as the toothed rollers revolve, the hook-ends of the blades catch the refuse material and deliver it at the rear of the harrow, and also pulverize the earth taken up by the roller-teeth.

COMBINED HARVESTER, THRESHER, AND BAGGER.—THOMAS P. MORAN, Nelson, British Columbia, Canada. The invention provides a combined header, thresher, and bagger which will work as well on hilly as on level ground. The header is placed in front and the thresher behind the header, with its long axis at right angles to the line of draft, so that the thresher moves practically side-wise. Behind the thresher comes the team, while the driver's seat and bagging devices are run out to a point in the rear of the team. Special provision is made for leveling and adjusting the various parts of the machine. The team being placed in the rear is thrown away from the standing grain (instead of into it) in steering the front of the machine at a slight angle uphill in counteracting the drift or natural tendency of the machine to slide downhill.

Bicycle Appliances.

BRAKE.—JOHN F. MOEN, Brooklyn, New York city. The brake comprises a plate or shoe from which a shank extends forwardly, adapted to engage with the crown portion of the front fork of the bicycle. A band, elastic in the direction of its length, detachably secures the brake to the fork. The brake can be applied to a bicycle without the use of clamps or screws.

Electrical Apparatus.

CABLE-TERMINAL.—WILLIAM CALLAHAN, Sidney, Ohio. The cable-terminal is to be used in making connections with aerial telephone-wires where it is necessary to place the wires on a pole or at any other place where a cable terminates. A neat and convenient means is furnished for making connections, with provision for receiving and conducting away the accidental heavy charges due to lightning or the crossing of the lines with high-tension electric-light wires. Moisture is prevented from creeping into the strands of the cable at its terminal.

Mechanical Devices.

AUTOMATIC ADJUSTABLE DIE.—FRANK H. STAHL, Charlestown, W. Va. The invention provides several die-blades so supported that they may be adjusted to proper relation to cut the thread upon the end of a pipe-section. When the thread has been cut on a lathe, the blades can be automatically released and spread apart so the die can be quickly moved back for another operation, thereby effecting a very considerable saving in time. The die can be adjusted to different sizes of rods or pipes as well as to take up wear on the cutting surfaces of the blades. Thus the device combines a number of dies in one, whereby its usefulness is increased. By reason of the automatic release, the die can not run too far and jam against a shoulder, as so frequently happens in the ordinary construction.

Miscellaneous Inventions.

DISTANCE-FINDER.—ROBERT L. MARSHALL, Elizabethtown, Ky. The purpose of the invention is to provide a practical and accurate instrument for finding the distance or range of any remote object by a simple adjustment, without any calculation whatever. The finder has a base-line at right angles to which is a stationary telescope jointed to a movable hypotenuse-bar provided with a second telescope. The hypotenuse-bar has a laterally-adjusting device with a variable throw or range of deflection. Mechanism between an index-hand and the hypotenuse-bar also has a variable throw or range of movement, the variable throw of one of these parts being reverse to that of the other in respect to the relation of speed and power, so that the dial of the index-hand can be spaced off with equal graduations, a feature of great importance in securing accurate results.

PLOTTING INSTRUMENT.—LUTHER M. CARMICAL, Jonesville, Va. This plotting instrument comprises an arm and a base-plate, provided with different graduations on each edge. A guide-bar is fixed on the base-plate; and at right angles to the guide-bar is the base-bar of a protractor. A sleeve adapted to slide on the guide-bar, is rigidly attached, and has a flange serving as an index for the adjacent graduated edge. The sleeve has a clamping-section by means of which the protractor may be held in any adjustment. The instrument is used in drafting in poles or feet the field-notes of a survey as usually obtained by compass and chain, and ascertaining the area therefrom.

ACETYLENE-GAS APPARATUS.—ALPHONSE F. GALENNIE, Thibodeaux, La. The acetylene apparatus comprises a generating-tank, into which a carbide-hopper has a gravity-discharge. A valve controls the discharge-opening, the stem of the valve extending vertically through and above the carbide-holder and being joined with a lever connected with the gasometer-bell. As the gasometer-bell falls, the lever is caused to open the valve in order that carbide may drop into the generating-tank; as the bell rises, the valve is closed.

TAPE-NEEDLE.—WALTER S. HUTTON, Pocatello, Idaho. By means of this tape-needle, a string can be

quickly passed through hams, shoulders, and other meat. The pointed head of a shank terminates in shoulders at its inner ends. A locking-arm is pivoted on the shank and comprises two connected side members respectively lying on the sides of the shank. The locking-arm has its front end arranged to engage the shoulders of the shank-head to limit the movement of the locking-arm. The front end of the locking-arm is formed with a recess to receive a thread, the recess being closed at the head of the shank when the locking-arm is engaged therewith. A spring serves to throw the locking-arm into closed position.

ACETYLENE-GAS GENERATOR.—OLIVER H. HAMPTON, Williamsburg, Ind. The apparatus is arranged to generate gas in proportion to the amount needed and consumed by the burners, to withdraw the carbide-ashes with the carbide-holder upon removing the latter for recharging, and in case of excess pressure of gas to prevent the water from being forced out of the generator-tank. The generator comprises a carbide-casing, a gasometer having a tank and bell, a gas-conducting pipe leading from the carbide-casing to the gasometer, and a valve on the pipe within the gasometer and normally held to its seat by a spring. A weight is loosely carried by the gasometer-bell and is adapted to move the valve into an open position against the tension of its spring upon the descent of the bell.

LAMP-BURNER.—HARTWELL A. CROSBY, Calais, Me. The invention comprises a wick-tube and a wick-elevating device. The wick-elevating device consists of a toothed wheel outside of the wick-tube and adapted to engage the wick. A frame is pivoted upon the wick-tube and has an extinguishing member adapted to swing over and cover the tube. A triangular bar is journaled in the lower end of the frame and is engaged by the toothed wheel, so that the frame is swung and the end of the wick-tube is uncovered when the wheel is turned in one direction; and the wheel is prevented from turning in the opposite direction as soon as the frame is permitted to swing back by the dropping of the wick.

UMBILICAL FORCEPS.—ERNEST V. ACHESON, Salt Lake City, Utah. The forceps are so constructed that the umbilical cord may be cut in two at one operation of the instrument. The ends of the cord will be automatically fastened or sealed by the instant application of insulated aluminium, gold, silver, or wire bands. The instrument is so constructed that the various parts can be readily separated for the purpose of cleaning or sterilizing and as readily assembled and adjusted.

COOKING-UTENSIL.—WILLIAM A. VAN DEUSEN, Brooklyn, New York city. The cooking-utensil consists of a number of vessels capable of use either singly or collectively and employing but a single cover. The utensil is particularly adapted for steaming cereals, vegetables, custards, and puddings, and is so constructed that the steam will have access to the sides of the vessel in which the food is placed, from top to bottom, insuring a rapid and uniform cooking.

OIL-PRESS MAT.—ROBERT F. WERE, New Orleans, La. This new oil-press cloth consists of a fabric composed of long hair. The hairs forming the warp threads of the fabric are hard, stiff, or coarse, and have a hard twist. The hairs for the weft threads are soft and pliable and have a soft twist. The mat is designed for use in cotton-seed and other presses, and is not liable to lose its shape when subjected to heavy pressure, or to adhere to the meal-cake.

BLACKBOARD-SUPPORT.—JAMES S. McCLUNG, Pueblo, Colo. The support is so constructed that a teacher can face his class and at the same time write on the board while it is in a horizontal position, turn the board so that the pupils can see the work right side up and quickly remove the work from the pupils' sight. The arrangement is especially adapted to train children to see quickly and accurately.

CARBURETER.—ELIJAH D. PARROTT, Portland, Ore. The object of the invention is to provide a carbureter arranged to prevent frost from forming on the inside of the evaporating-coil or in the gas-main leading from the apparatus. The apparatus is provided with a water-tank and with an evaporating-pan connected with a gasoline-supply and an air-supply. An evaporating-coil leads from the pan, the pan and the coil being submerged in the tank-water. A heater is connected with the water-tank to heat the water; and a pump is connected with the coil.

ACETYLENE-GAS APPARATUS.—LEWIS J. RUTH, Leamington, Canada. The invention belongs to a class of acetylene apparatus in which the generator and gasometer are separated and the carbide is placed within a perforated or grated cylinder which may be revolved, the water being supplied by a perforated pipe or spray over the cylinder. The lime formed by the decomposition of the calcium carbide will be sifted out of the carbide by the rotary movement given to the cylinder when the gasometer-bell rises. This lime falls upon the inclined bottom of the generator and is then removed. When the gasometer falls, water is admitted to the perforated pipe and sprayed on the carbide. The gas generated will cause the gasometer-bell to rise and the water is cut off.

ARTIFICIAL TOOTH-CROWN.—CHARLES A. FONES, Manhattan, New York city. The device comprises three parts—the crown, a connecting-sleeve, and a locking member or lock-screw. The construction allows the parts to be accurately adjusted and forms an artificial tooth-crown of exceptional strength. No longitudinal strain can separate the crown from the sleeve or from the lock-screw. Since no platinum is required, the device is comparatively cheap.

PROCESS OF FORMING CONCRETE WALLS.—CHARLES GUY, Box 242, Topeka, Kans. This cheap process of forming a concrete wall consists in erecting a crib having a face corresponding with the desired form of the concrete surface to be produced; next applying a thin layer of plaster upon the face; then laying a coarse or open-grained fabric upon the stratum of plaster; applying concrete in contact with the fabric and allowing it to set; and finally removing the crib and stripping the fabric with the adhering plaster from the concrete surface. No surfacing or matching of lumber is necessary.

Designs.

WALL-PAPER.—HARRY WEARNE, Rixheim, Germany. The leading feature of the design is a lattice

scroll having reverse curves located between borders of irregular outline made up of conventionalized flowers and leaves. Bouquets of flowers, leaves, and buds are located at the convex portions of the scroll.

BUSTLE AND HIP-FORM.—FRANCIS B. GRANGER, Manhattan, New York city. The bustle and hip-form comprises a crescent-shaped body portion within which is arranged a pad-like portion of a contour substantially that of the body portion, but having its edges spaced from the edges of the body portion.

TEAPOT.—AUSTIN F. JACKSON, Taunton, Mass. The teapot is decorated with raised ornamental work applied on the cover and neck in the form of a foliated, flowered spray.

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.

MAGNETISM AND ELECTRICITY. An Elementary Treatise for Junior Students, Descriptive and Experimental. By J. Paley Torke. London: Edwin Arnold. 1899. 16mo. Pp. 264. Price \$1.40.

The author notes clearly the fundamental facts and laws of magnetism and electricity. The explanations are lucid, and the illustrations have a freshness not usually seen in text books. It will probably be largely adopted in schools.

NATURE STUDY FOR GRAMMAR GRADES. A Manual for Teachers and Pupils Below the High School in the Study of Nature. By Wilbur S. Jackman, A.B. New York: The Macmillan Company. 1899. 12mo. Pp. 407. Price \$1.

Nature study is one of the most interesting developments of modern education, and the volume before us is admirably adapted to assist teachers in preparing experiments and questions. That pupils need some rational and definite direction in nature studies is now agreed, but to prepare outlines in suggested directions necessary so as to place them within the reach of each pupil is more than the ordinary teacher has time to do, but the volume before us has admirably filled this gap in the literature of the subject. Such subjects as botany, mineralogy, astronomy, natural philosophy, etc., are taken up.

ELECTRIC POWER TRANSMISSION. By Louis Bell, Ph.D. New York: Electric World and Engineer, Inc. 1899. 8vo. Pp. 505. Price \$2.50.

A thoroughly practical treatise for practical men and is adequately illustrated. It is the best book on the subject we have seen and fills a field which has not been adequately covered before. Modern electrical practice moves so quickly that treatises on the subject are rapidly rendered useless, and for this reason an up-to-date book has been needed.

INDUCTIVE GEOMETRY. By Col. C. W. Fowler. Published by the author at Louisville, Ky. 1899. 18mo. Pp. 55.

THE SUCCESSFUL MAN OF BUSINESS. By Benjamin Wood. New York: Brentano. 1899. 16mo. Pp. 208.

There can never be too many books of the present nature, dealing with success in business life, though in the majority of cases it will be found that those who have actually achieved success do not write books of this kind, but the author's intention is undoubtedly good, and they are worthy of considerable circulation. It is true that business men frequently write books, but they are nearly always upon some subject far removed from their immediate source of livelihood. The author deals with the subject from an eminently practical standpoint.

A DIVIDEND TO LABOR. A Study of Employers' Welfare Institutions. By Nicholas Paine Gilman. Boston: Houghton, Mifflin & Company. 1899. 12mo. Pp. 400. Price \$1.50.

This volume deals with a subject which in the near future is certainly destined to be one of the most important of economic problems. A thorough understanding of the principles outlined in this book would tend to cause capital and labor to unite on a substantial basis and to prevent those most unfortunate of economic revolutions—strikes. The author discusses the modern employer, welfare institutions in Germany, patronal institutions in France, patronages in Holland and Belgium, profit sharing, etc. It contains abundant food for thought.

AMERICAN SOAPS. A Complete Treatise on the Manufacture of Soaps, with Special Reference to American Conditions and Practice. Dr. Henry Gathman, Editor of the American Soap Journal. New York: Published by the author. 1899. 8vo. Pp. 461. Price \$15.

The first edition of "American Soaps" appeared in print seven years ago and was well received, and since that time the author has continually collected all the available new information that could assist in making a later edition of the book more complete, and the author has had the benefit of the experience of many of the original purchasers of the book. There is an extensive literature upon soap making, but most of them are adapted from foreign practice or deal with antiquated methods. The present book cannot be placed in this category. It is an excellent contribution to technical literature by a man who thoroughly understands modern American soap making and it is in no sense a compilation. To those who are looking for a thoroughly practical book on soap making of all kinds, with special reference to modern practice, we can heartily recommend this book. It is freely illustrated, and the number of formulas for soaps of various kinds is large. The section devoted to the actual processes used in the manufacture of soaps of all kinds occupies three-quarters of the volume. It is an admirable book.

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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.

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(7801) P. C. W. asks: Is there any known process by which I can send a current of electricity through a paper in a dry form by having subjected it to a process so it will conduct electricity? A. You cannot send an electric current through a dry paper. There is no substance which will render dry paper a conductor. Only the spark of a high tension discharge will pass through dry paper.

(7802) S. H. D. says: Will you tell me the horse power of the ten wheel or mogul railroad engine, also the horse power of the hog and jack, or consolidators? What is meant by the term horse power? Please tell me how to calculate the horse power of any engine. Give the simplest way. A. The horse power of any locomotive can be found by multiplying the area of the piston in square inches by the mean effective steam pressure in the cylinder; multiply the product by 2, which will give the total average pressure on both pistons; multiply this sum by the number of feet the piston travels in 1 revolution of the driving wheel, then multiply this product by the number of revolutions the driving wheel makes per minute, and divide by 33,000. Example: What is the horse power developed by an engine having cylinders 19 inches diameter by 24 inches stroke, having an average cylinder pressure of 53.7 pounds per square inch? The driving wheels being 78 inches diameter and making 260 revolutions per minute (about 60 miles per hour)?

283-5294 square inches piston area.
53.7 pounds mean effective (average) pressure.
15,225.5 pressure on one piston.
2 pistons.
30,450 pressure transmitted from both cylinders.
4 feet piston travel in each revolution.
121,804
260 revolutions per minute.
31,669,040 ÷ 33,000 = 959 horse power.

One horse power is a power that will lift 33,000 pounds one foot high in a minute. The horse power of any engine is computed on the same principle as shown above, considering the multiplier 2 as referring to 2 cylinders, and not used with 1 cylinder.

(7803) B. F. S. asks: 1. Would a field of wrought iron $\frac{1}{2} \times \frac{3}{4}$ inches square do for a field of motor described in SUPPLEMENT, No. 641? I wish to use it as a generator. A. A field of wrought iron, forged of the same size as that of strap iron, may be used in place of the strap iron. The reason for using the strap iron was to enable those to build the motor who had no means of forging a piece of wrought iron. 2. Would the field be equally serviceable if brazed instead of welded? A. Yes, if the brazing is put exactly opposite the middle of the armature. 3. Compare such a field with a laminate one. A. The brazing is no better than an air space for transmitting the lines of force, and should be placed where the lines of force leave the poles and pass through the armature. 4. In making plunge battery (see SCIENTIFIC AMERICAN SUPPLEMENT, No. 792), the upper ends of the carbon plates are permeated with paraffine. Will this have any effect on the making of electrical connections made by strips of copper, i. e., is paraffine a conductor of electricity? A. Paraffine is not a conductor, and should be scraped off where the contact is made with the copper strips. 5. If you take a bicycle wheel and place one end of the axle on some support such as your finger, it will fall over, but if you first cause it to rotate rapidly it will maintain its perpendicular and pass around its point of support. Please explain. A. The principle involved in this is that of the gyroscopic. All rotating bodies tend to remain in the plane of rotation.