RECENTLY PATENTED INVENTIONS.

Agricultural Implements.

TEDDER ATTACHMENT FOR HARVESTERS.—WILLIAM H. MCELREE, Dunkirk, Ohio. The attachment is so made that, although the tedder is free to perform all its functions, it does not interfere with the action of reaping or mowing. The forks can be instantly raised by the driver when an obstruction is encountered, and dropped when the obstruction has been passed. The fork-carrying frame is pivoted on the main frame; and the main frame is readily attachable to portions of the harvester. The driving mechanism of the shaft upon which the forks are mounted can be automatically thrown in and out of gear as the adjustable frame is raised or lowered.

HARROW.—WILLIAM M. BAKER, Fortville, Ind. The frame of the harrow contains pivoted tooth-carrying sections independently adjustable. The runners can be attached to the main frame so that the harrow can be taken to and from the field without bringing the teeth into action. The outer ends of the toothed sections can be adjusted either up or down. The rows of teeth are so mounted that they receive different inclinations. The various rows of teeth can be adjusted and held as adjusted.

ROTARY ENGINE.—MARTIN A. GREEN, Land Title Building, Philadelphia, Pa. The rotary engine is designed to be operated by steam, air, or vapor of any kind and can also be used as a water-meter or as a pump or blower when forcibly driven in an opposite direction. The engine has an eccentrically-arranged hub, rotating within a casing. Sliding piston-faces are carried by the hub and slide in and out across the space lying between the hub and the interior of the casing.

SPEED-REGULATOR FOR EXPLOSIVE-ENGINES.—ALBERT L. ZIMMERMAN, Valparaiso, Ind. A chest communicates with the cylinder of the engine. An inlet-valve connects the chest with a mixing-chamber. Gas or oil are supplied to the mixing-chamber by a pump. Graduating devices are provided for the inlet-valve and for the pump to limit the opening movement of the inlet-valve and the stroke of the pump. The graduating device for the valve consists of a sleeve turned by the action of the governor and provided with a spiral groove into which a fixed pin extends. A collar on the valve-stem abuts against the sleeve. The graduating device for the pump consits of a screw-rod against which the pump-plunger abuts, turned by the action of the governor, and a fixed nut in which the screw-rod turns. The charge is rarefied according to the speed of the engine, from which it follows that the explosions take place regularly, but with more or less force according to the speed.

Mechanical Devices.

EXHIBITOR.—CHARLES H. WRIGHT, Eureka, Cal. This invention provides a novel means for exhibiting goods, by which a single article is placed in view and held for a short time, after which it is removed and a second article similarly displayed, this end being automatically attained by the mechanism carrying the articles. Specifically, this mechanism comprises a carrier having a step-by-step rotary movement, and an elevator working in conjunction with the carrier to take the articles individually therefrom and move them upward into exposed position. The elevator exposes the article for a short time, then drops it out of view, and subsequently returns with a second article.

COMPUTING-SCALE.—JOHN J. SEARS, Dayton, Ohio, and GEORGE FISHBURN, Sydney, New South Wales. The object of this invention is to produce a machine which will print on a card or slip of paper the computed value and indicate the weight simultaneously. Type is carried on a revolving drum connected with a weighing-platform. Means are provided for carrying paper adjacent to the type. A printing-lever is employed to press the paper against the type; and an impression-hammer is arranged to strike the printing-lever. The goods are placed on the platform, thereby causing the drums to revolve. The lever corresponding with the rate at which the goods are to be sold are depressed, whereby a regulating-stop is made to enter between two teeth on the drum, thus ensuring that the type indicating the value of the goods at the ascertained weight is held immovably in the right position while the impression is being taken.

LOCK.—ALEXANDER L. DIFFENDAFFER, Canton, Mo. Gravity-locks usually have a latch portion which impinges against the keeper on the door-jamb, connected with the weight by which it is actuated. In closing the door the latch must ordinarily move a relatively large mass of metal, thus opposing the quick-closing action and creating much friction. The invention provides a very light and reversible latch-bolt, and combines with it a separate weight operated by the knob-shaft, so that the action of the latch-bolt in closing the door is independent of the weight. A night-latch may be applied to lock the latch-bolt if it be so desired.

DERRICK AND DUMPING DEVICE.—WINFIELD S. RYNEARSON, Boise, Idaho. The purpose of this invention is to improve the construction of derricks which are provided with a mast mounted to turn on a base and with a boom carried by the mast. The inventor has devised a locking device capable of holding the scoop in position to carry a load and to enable the scoop to be manipulated to receive a load. The fastening device is so operated that the scoop may be quickly brought to a dumping position.

VOTING-MACHINE.—ANDREW H. HART, Winchester, Ky. Mr. Hart's invention is an improvement on a voting-machine for which he has already received letters patent. The primary purpose of the improvement is to make the machine more complete in its details and to extend its usefulness. Indeed, so far-seeing has the inventor been that he has even devised means for registering votes in those sections of the country in which a person, in order to become qualified to vote, must show that he has paid a poll-tax before election day.

Vehicles and Their Accessories.

CARRIAGE-IRON.—FRED J. WAGNER, Dallas, Ore. This fitting or corner-iron is designed to join the parts of the body or bed of a carriage. The invention embodies a peculiar construction by which the sills are held rigidly at their joints, and by which the side and end walls of the body are connected securely at their vertical beams.

LUBRICATING-JOURNAL.—SIDNEY WOOLF and JAMES C. IRWIN, Lynch, Neb. The journal has a cavity opening at its outer end and openings leading to the side of the journal to lubricate the wheel. On the end of the journal a hollow nut is fitted to hold the wheel in place. A cap is adjustably fitted on the nut and contains a lubricant. To hold the cap at the desired adjustment a spring-dog is carried by the nut. The journal, by these novel means, can be lubricated without necessitating the removal of the wheel or even adjustment of the axle-nut.

NECK-YOKE CENTER.—CHARLES W. MCDONALD, Gallatin, Mo. The pole-ring has an integral arm. A plate-spring is secured by one end so as to project its body through the pole-ring and thus be adapted to come in contact with a vehicle-pole on which the ring is placed. This neck-yoke center affords lateral and vertical movement to the neck-yoke for a limited distance, checks the neck-yoke from rocking, and prevents rattling.

TIRE.—CHARLES F. ALLEN, Hueneme, Cal. The invention provides an improved construction of pneumatic tires for motor-carriages and other conveyances. An outer metallic or non-puncturable sectional tire engages the ground and serves as a guard or protector for the pneumatic section. The device is readily applied, and may be as conveniently removed.

Railway Appliances.

CAR-VENTILATOR.—LEWIS H. BOWMAN, Walla Walla, Wash. The ventilator is in the form of a fan adapted by its rotation to cool the atmosphere and to drive floating dust from the car. In connection with the ventilating-fan a motor is employed, which is operated by the current of wind produced by the motion of the car.

TRAIN SIGNALING APPARATUS.—WILLIAM A. and BENJAMIN S. H. HARRIS, Greenville, S. C. This invention is an improvement in signaling devices for railway-trains employing automatic air-brakes. In the present invention while the signaling devices are in direct communication with the train-pipe, they do not form a part of that pipe or of the direct conduit for the air, so that the volume of the air as it passes back and forth does not pass through the signaling apparatus. This is important: for the signaling apparatus is not fouled by the deposit of dirt and dust. In the signaling apparatus means for trapping the dust and air are provided. By means of this invention signals can be transmitted to the engineer by slightly reducing the pressure in the train-pipe without necessitating the use of a separate signal-pipe.

Miscellaneous Inventions.

HEAD-GATE.—HORACE W. ELDER, Dawkins, Colo. The object of the invention is to provide a new gate designed for use in irrigating-ditches to control the water flowing upon the land, and arranged to permit a convenient insertion in a ditch without requiring the formation of a dam. The head-gate comprises a body having an opening and a gate therefor. Side wings are movable on the body, and are adapted to cut into the side walls of the ditch. The wings are hung on links pivoted on the body.

FUSE-HOLDER.—WARREN R. COOK, Pittsburg, Pa. The fuse-wire holder is particularly adapted for use in electrically-operated street cars. The holder contains a number of fuse-wires, so that should one be burned out another may be quickly turned into place to complete the circuit. The fuse-carrier comprises a cylinder which is mounted to rotate. In the carrier a number of fuse-wires are supported, between which separating plates are arranged. Contact devices are employed to give the necessary rotary motion to the carrier in order to bring a fuse-wire into the circuit when its predecessor has been burned.

MEDICAL BED.—DR. ADOLFO LURIA, 291 West Division Street, Chicago, Ill. The bedstead supports a cooling-tank containing ice and water, and provided with a downwardly-extending pipe. The tank is supported directly over and parallel to the bed. Its function is to regulate the temperature of pyretic of febrile patients, as, for instance, in cases of spinal meningitis, pneumonia, typhoid fever, and all forms of diseases where bodily temperature plays an important part.

TEMPORARY COVER OR TOP FOR COUNTERS, SALOON-BARS, ETC.—JOHN J. KOETZNER, 1208 Delaware Avenue, Washington, S. W., D. C. The counters of shops and stores must be resurfaced at intervals; and since considerable time is necessary for a varnish to dry sufficiently, serious inconvenience and perhaps loss is involved. Mr. Koetzner has devised a temporary cover or top for counters which protects them while the varnish is drying. This cover is supported above and is parallel to the fixed counter or bar, and is adapted for use in the same manner as the regular counter, so that there need be no interruption of business.

FLUE.—EDWIN H. MESSITER, San Luis Potosi, Mex. This dust-flue for furnaces comprises arched bars; base-walls in which the ends of the bars are seated; metallic devices co-operating with the arched bars in forming a metallic skeleton or frame-work; and a concrete filling. The flue requires a smaller amount of material than the usual form and finds its principal application where the ordinary round smoke-flue is rarely used, namely, for flues of 60 to 300 or more square feet area, and where pipes of such great size could not be possibly employed on account of structural difficulties, or on account of the injurious action of acids or heat in the gases on materials of which pipes are made.

INDEX-TAB.—CHARLES V. HENKEL, Manhattan, New York city, N. Y. The invention provides a novel and simple tab which can be removably attached to the pages of books in order to indicate at what portion of the book words beginning with a certain letter may be found. The location of the tabs can be readily changed.

COMPOSITE PRINTING-PLATE OR BLOCK.—LORENZO D. CLARK, Red Bluff, Cal. Mr. Clark has devised a simple means whereby a printing-plate can be detachably secured on a base-block so as to enable the clamping furniture used in the lock-up of a form, when suitably adjusted, to draw the printing-plate forcibly on the base-block and hold the plate firmly clamped on a base-block. The device can be produced in flat or curved form and can be used on rotary or other printing presses, run at a high speed. In service an indefinite number of impressions may be secured, fully equaling in appearance the best work executed on form wherein a type-set composition is held.

Designs.

WATCH-CHARM AND CIGAR-CUTTER.—JOHN F. RAWLINGS, Bloomfield, Iowa. The watch-charm and cigar-cutter comprises two semi-bell shaped side members of concave-convex cross sectional form, connected at their upper ends by a bridge-piece surmounted by an eye for attachment to the chain.

WALL PAPERS.—HARRY WEARNE, Rixheim, Alsace, Germany. Eight design patents have been granted to Mr. Wearne for wall-papers, all noteworthy for their artistic merit. One of the designs represents an Egyptian lotus rising from the water. The second design pictures a bunch of hyacinths tied with ribbons. In a third design trellis figures are shown, combined with stalks of a running rose. The fourth design represents a circlet of stems, foliage, and pinks, including a bow, all inclosing a panel. The fifth design has for its leading features a lozenge-shaped panel upon which is a bouquet, and a network surrounding the panel. Floral scrolls are arranged in the sixth design to represent a lyre; and between the scrolls is a group of asters. A garland of passion flowers and roses, and a basket of roses suspended by the garland are to be found in the seventh design. In the eighth design stucco-like, concentric, decorated scroll bars are shown, all merging at their ends in broad leaf scrolls; while a mass of flowers covers the space between the upper leaf scrolls and extends across a medallion.

BELTS.—LOUIS SANDERS, Manhattan, N. Y. Of the three design patents issued to this inventor, the first covers a belt having downwardly-curved, overlapping front terminals at the intersection of which is an ornament. The leading feature of the second design is found in surface decoration in which two lines extend longitudinally, one above the other, the lower line conforming with the contour of the lower edge of the belt, and the upper line conforming with the lower line except at the back central portion of the belt, where it is arched. The belt shown in the third design has a transverse plating on its outer face.

PIPE-HANGER.—SAMUEL F. STEPHENS, Charlotte, N. C. The hanger is so constructed that it can receive several pipes. The leading feature is a body portion recessed to receive the pipes.

BROOM-SHIELD.—HORNER W. HODGES, Atlanta, Ga. The shield serves the purpose of firmly connecting the broom-body and handle.

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.

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.

(8031) G. E. M. asks: 1. Would you kindly advise me how to melt rubber, and add the necessary chemicals which it requires to mold it into a certain shape or form? A. The rubber is not melted, but vulcanizable rubber is pressed in heated molds at a relatively low heat, which results in vulcanizing it, or causing it to stay in a fixed position. 2. What is the best kind of a mold to be used (is plaster paris sufficient) for the said purpose? A. Plaster of paris molds answer for vulcanizing. 3. Should there be a special ingredient used in the rubber to make it soft and pliable? A. Sulphur is the material which is thoroughly mixed with rubber to make it vulcanize. It is first softened by steaming, then masticated in a machine made for the purpose. The rubber comes ready prepared for use. Articles on the preparation and manipulation of India rubber are contained in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 249, 251, 252 and 1204; price 10 cents each, by mail.

(8032) E. S. B. writes: 1. I have been endeavoring to collect some data regarding the properties of some elementary gases at low temperatures from files of your paper and other sources, but find so many vague and contradictory statements that I have decided to ask you to give me some information. A. Your perplexity is very natural. A periodical simply announces results, reports the news, with the name of the authority who is responsible for the result, and leaves the matter there. The facts change, or rather, the determinations of various investigators change from time to time, presumably becoming more exact. Even then different investigators reach dissimilar conclusions. Any conclusion published must rest upon the reputation of the man whose name accompanies it. It is not the function of a scientific journal to decide what figures or facts are correct. We should advise you to obtain one or all of the following books, and base your work upon their statements, correcting their figures from time to time by the papers published by the men engaged in these researches. Barker's "Physics," price $3.50, or Ganot's "Physics," $6. Both are desirable if you would have the whole story. Hardin's "Liquefaction of Gases," $1.50; Sloane's "Liquid Air," $2.50; "New Researches on Liquid Air," Dewar. After these would follow the principal scientific journals. No one journal can chronicle all that has been done in any particular field. Progress is constantly being made, and one paper does not always learn the entire story. The data you seek are given in the pages of the books listed, so far as they were known when those books were published. The figures for hydrogen were given in the SCIENTIFIC AMERICAN for October 7, 1899, from Prof. Dewar. 2. If the critical temperature of hydrogen is 35 deg. C. absolute and its critical pressure is 15 atmospheres, does it follow that with a given mass of hydrogen under critical conditions, the least increase or decrease of pressure will cause it all to become liquid if it was a gas or gaseous if it was a liquid? Will the least subtraction or addition of heat cause it all to become liquid or gaseous? A. The reading of the "Physics" to which we have referred you will fully inform you on this point. We may answer the question in the negative. No gas can turn liquid instantaneously; no liquid can freeze instantaneously. The critical temperature is simply the temperature below which a substance must be cooled before any liquefaction of it can take

place. Further removal of heat will cause as much of the gas to liquefy as the heat removed would cause to evaporate were that number of calories to be added to the liquid. The critical pressure is a pressure which is associated with the critical temperature as a minimum of pressure for the temperature. As the gas is cooled below the critical temperature, the necessary pressure to hold it a liquid also diminishes, until we may come to a temperature at which the liquid will remain in a "static" or fixed condition in the open air. This is, of course, what is called its "boiling point." Its vapor pressure is then equal to atmospheric pressure. 3. Has any gas under critical conditions any latent heat? A. Yes. The answer to the last question implies this. The term "latent heat" is disappearing from our books. It is not necessary and conveys an erroneous impression, or rather, it is based upon a former theory which is false and abandoned. The heat of evaporation is the energy which is used in changing the condition of the substance from the liquid to the gaseous form, and this energy is still active in the gas maintaining it in the gaseous form. When the heat is removed the substance returns to the liquid form. So long as the substance is a gas, the heat necessary to change its form from a liquid to a gas must be in the substance, and as soon as this heat is removed, the substance will return to its liquid form.

NEW BOOKS, ETC.

American Trade Index. Descriptive and Classified Membership Directory of the National Association of Manufacturers of the United States, Arranged for the Convenience of Foreign Houses. Philadelphia: National Association of Manufacturers. 1900. 12mo. Pp. 67. Price $5.

The index is printed in English and French, and 7,500 copies are now being distributed gratuitously among the principal business houses of the world, and will prove an agency for the foreign distribution of information concerning American manufactures. The arrangement is admirable, and the alphabetical list of articles produced by members of the National Association of Manufacturers will certainly prove of the utmost value, as this index is printed in both English and French. The registered cable addresses are also given.

Commercial Organic Analysis. By Alfred H. Allen. Vol. II., Part 2. Hydrocarbons, Petroleum and Coal Tar Products, Asphalt, Phenol and Creosotes. Philadelphia: P. Blakiston's Sons & Company. 1900. 8vo. Pp. 330. Price $3.50.

It seems almost unnecessary to do more than give the title of this book, which forms, with its companion volumes, one of the most important contributions ever made to the literature of chemistry. The present volume deals with subjects which interest a large number of manufacturers.

School Chemistry. By John Waddell. New York: The Macmillan Company. 1900. 12mo. Pp. 278. Price 90 cents.

The author has produced an excellent book, and the only criticism we have to make is that many of the old classic illustrations which make their appearance with such refreshing regularity are in evidence. An endeavor is made in this text-book to help the pupil in the discovery of new facts which enables them to see their connections, and to show how facts lead to theory and theory aids in investigation in the discovery of further facts.

Petroleum in California. A Precise and Reliable History of the Oil Industry of the State. Compiled and published by Lieut. Redpath. Los Angeles, Cal. 8vo. Pp. 134. Price $1.

Nature has certainly been lavish with her gifts in California. Its gold and fruit have been one of the wonders of the world, and the production of oil is the third great industry. The pamphlet before us gives in convenient form reliable information regarding almost everything that the reader is desirous of knowing about the discovery, exploitation and prospects of oil in California.

Modern Perspective. A Treatise Upon the Species and Practice of Plane and Cylindrical Perspective. By William R. Ware. New York: The Macmillan Company. 1900. 12mo. Pp. 336. Price $4.

The present work was first issued in 1882, and since that time it has been recognized as one of the standard works on perspective. The author has taken advantage of the opportunity offered by the issue of a new edition to revise the text and to add in an appendix some matters of interest. The reputation of the Professor of Architecture in Columbia University is so great that any book which bears his name is sure to be an excellent production.

Our Country. What It Is and What Has Made It What It Is. By W. C. Dodge. Washington: Government Printing Office. 1900. Senate Document. 8vo. Pp. 98.

The object of the present pamphlet is to present in a condensed and simple form those facts relating to the growth, prosperity and future prospects of our country with which every intelligent and patriotic citizen ought to be familiar. The idea is an admirable one, and the amount of information which is given is very considerable.

Cassell's Cyclopedia of Mechanics. Edited by Paul M. Hasluck. London and New York: Cassell & Company. 1900. Quarto. Pp. 384. Price $2.50.

This volume presents in a form convenient for ready reference and every-day use receipts, processes and memoranda selected from the rich store of choice information contributed by a staff of skillful and talented technicians, upon whose practical experience and expert knowledge the information is based. The matter in the volume has been carefully digested, freely illustrated and made plain to those inexperienced. It will prove useful to all amateurs.

The Principles of Mechanics. An elementary Exposition for Students of Physics. By Fred. Slate. Part I. New York: The Macmillan Company. 1900. 12mo. Pp. 299. Price $1.90.

The author's aim has been to select the subject matter with close reference to the need of college students. The second, to bring the instruction into adjustment with the actual speed of their training; and third, to aim continually at treating mechanics as a system of organized thought, having a clearly recognizable culture value. The author is Professor of Physics in the University of California.

Elements of Mineralogy, Crystallography and Blowpipe Analysis from a Practical Standpoint. By Alfred J. Moses, E.M., Ph.D., and Charles Lathrop Parsons, B.S. New York: D. Van Nostrand Company. 1900. 8vo. Pp. 414. Price $2.

In this edition of the authors' text-book they have adhered to the design of the edition of 1895, to present the facts leading to a useful knowledge of mineralogy in such a manner that the student in the technical school and the professional man in the field may readily learn to recognize, or at least to determine all important minerals. Their original book has been largely rewritten, and the result is a handsome contribution to the literature of mineralogy. The larger part of the illustrations do not appear in other works. In all, there are 664 illustrations and diagrams and several tables.

Sanity of Mind. A Study of Its Conditions and of Means to its Development and Preservation. By David F. Lincoln, M.D. New York: G. P. Putnam's Sons. 1900. 12mo. Pp. 177.

The author deals in his opening chapters with the attitude of public men; care and education which is favorable to sanity of mind, nature of mental derangement, degeneracy, education, self-education and our social and civic duties. It is a most interesting discussion of the subject.

INDEX OF INVENTIONS

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