

the corrugations of the double corrugated sheet.

ELEVATOR.—E. C. PORTER, Telluride, Colo. The invention is an elevator for water, slimes, grain, and other fluid matter, and provides a machine which will do a large amount of work with comparatively small power and contains no valves or other parts apt to wear out or get out of order, and which is capable of use at any inclination from vertical to horizontal.

MACHINE FOR MAKING CARTONS.—S. M. LANGSTON, Camden, N. J. This invention pertains to certain improvements in machines for making cartons, and more particularly for making that type of carton in which a strip of sheet material is bent to form a tube and in which the meeting edges are secured together by a strip of tape or the like.

STEAM-HAMMER.—T. E. HOLMES, 8 Oakdale road, Sheffield, England. In this invention the object is to provide improved controlling gear whereby to render a self-acting hammer more perfectly amenable than heretofore to the will of the operator, so that the latter will be enabled to regulate, with greater certainty than hitherto, the frequency, intensity, and length of stroke of individual blows.

VARIABLE-SPEED GEARING.—J. DEIM, Winnipeg, Manitoba, Canada. The principal object in this invention is to provide a plurality of non-rotatable gear members, any one of which may be brought into engagement with a rotatable gear member to cause a rotation of the latter as it moves bodily along the face of the stationary member.

LOOM-TEMPLE.—A. FORTUNA, Manchester, N. H. This invention prevents unequal wearing of the slide bar and tipping even when the bar is already worn. When worn so that there is a tendency of the bar roll to tip downwardly at its outer end a bar is lowered toward a lateral lug to correct tipping after which it is secured by a set screw. Means assist in supporting the torsional pull; and making the leverage of resisting force more nearly equal to that of the opposing force.

DRILL AND CUTTING-MACHINE.—E. A. CUNNINGHAM, Oskaloosa, Iowa. This mechanism includes a rotating bit and is arranged so that the bit is normally free to travel forward slowly as it turns, but is stopped or checked automatically in its forward travel whenever it encounters an obstacle unusually hard to penetrate, yet the bit is free to travel rapidly forward when the boring through the unusually hard obstacle is complete.

AIR-SHIP.—C. J. BERTHEL, Pinetown, N. C. The wings of the aeroplane spread a greater distance transversely to the line of flight than the fore and aft distance. This follows the analogy of the wings of a bird and founded on the principle of physics essential to successful aeroplanes, which secures a short transverse impact of the wings upon the relatively still air whose inertia gives the resultant upward pressure to buoy up the aeroplane and allow quick clearance of the air in the rear.

Prime Movers and Their Accessories.

METHOD OF UTILIZING HEAT OF COMBUSTION AND STEAM-POWER IN PRIME MOVERS.—T. SCHTSCHERBAKOFF, Moscow, Russia. In this apparatus an internal combustion chamber is inclosed within a steam boiler so that steam is generated from heat developed in the combustion chamber and the products of direct combustion are conducted through certain controlled passages to the engine cylinder.

Railways and Their Accessories.

SPIKE.—C. D. WALCOTT, Washington, D. C. This spike is one that may be cheaply formed from rolled bars and one that avoids the splitting of the tie and which does not turn or rotate about its longitudinal axis in driving, and which withal possesses a much greater holding effect when sunk into the wooden tie than spikes of ordinary cross-section.

RAILROAD-TIE.—G. WHITAKER, Temple, Texas. This invention is an improvement in railroad ties and fastening and has for an object to provide a simple, novel tie that can be used in connection with the ordinary wooden ties, and can be used on any ordinary ballast, will form in itself a track gage and will facilitate the fastening and releasing of the rails as may be desired.

AUXILIARY COUPLING-HEAD.—P. W. HOGAN, Durand, Mich. The invention is an improvement in heads of the character shown and described in Letters Patent formerly granted to Mr. Hogan, the said coupler head having for its purpose to serve as a substitute for a broken coupler head of the "Master Car Builders" type and is connected to engage the draw-bar of the broken coupler at the rear of the head and project a slight distance in advance thereof.

AUTOMATIC RAILROAD-SWITCH.—I. A. CALL, Salt Lake City. The object here is to provide a switch which may be operated from the train or engine while the same is in motion, or by hand in the usual manner, and a switch of the stub rail type which will not be liable to clog from snow, dirt, or other causes, nor from contraction or expansion of the rails at the switch.

TURN-TABLE.—M. J. LEONARD, Long Branch, N. J. Mr. Leonard's invention comprehends a turntable the upper surface of which always remains at the same level, the

descent of the weight thus being independent of the upper level of the table—the weight being raised by the forward movement of the locomotive or other piece of rolling stock to be turned.

CAR-DOOR.—C. W. LEANING, Yankton, S. D. This invention has reference to car doors, and more particularly such as are formed of a number of independently movable sections arranged on guideways and adapted to be moved into operative positions away from the doorway of the car when not in use.

TRACK DEVICE FOR RAILWAY-SIGNALS.—M. M. KANE, Montgomery, Ala. The aim of this invention is to produce a device which can be operated by a train passing in either direction, and which is constructed in such a way that it can be readily actuated by a switch point so that a signal near a switch may be controlled from the switch through the device to indicate whether the switch is open or closed.

CAR-WHEEL.—I. P. TODD, Middlesboro, Ky. In the present patent the aim is to provide a wheel especially adapted for mining cars, and provided with a detachable hub, which may be removed when worn out, and replaced by a new one, or should the wheel proper be injured it may be replaced by a new one, using the old hub.

AUTOMATIC SIGNAL AND STOPPING DEVICE FOR RAILROAD-TRAINS.—F. J. MILLER, Cincinnati, Ohio. This inventor's purpose is to avoid collisions and his device comprehends the electro-magnetic devices in the road-bed, acting in connection with electro-magnetic devices on engine or car, whereby the entry of a train upon a section of track already occupied, will actuate in the on-coming train a signal and will cause automatic devices to be set into action by which the throttle valve is closed and the train is automatically stopped.

CAR-BRAKE.—H. HOFFMANN, New Rochelle, N. Y. The improvement is on a patent formerly issued to Mr. Hoffmann, and the present invention is particularly applicable where a brake drum is provided upon which a cable or chain is wrapped, the braking force being applied to the brake mechanism through the said chain.

RAIL-FASTENER.—J. ENGEL, Millersburg, Ohio. In operation, the rail can be fastened or loosened with a sledge, and the use of nuts and bolts is avoided. The fastener can be applied to a joint as well as any part of a rail between joints, and the gage of the track can be changed by removing the metal plate fasteners from one side of the rail and placing them on the opposite side. The tie and fastener are thus adapted for use on a curved and straight track.

NUT-LOCK.—W. R. GARNER, Palestine, Texas. The device is a combination nut lock and washer and is especially for use on railway rail joints. In application the nuts should be loosened sufficiently to permit the driving of the depending washer plates between the nuts and the back plate or angle bar. These plates are attached to a top plate and the shoulder springs are also attached at their upper ends to the top plate, but all are detached thence to their lower ends. Mr. Garner has also patented another nut-lock in which the nuts will not only be prevented from turning, but the plates and angle bars will be held tightly in position on the rail joints to prevent the rails from moving or spreading, and the rails going down or dropping in a soft road bed, and nuts prevented from rattling or turning back over the bolts and lost motion of nuts and angle bars will be followed up by the spring washers and spring arms.

Pertaining to Recreation.

DRUM.—A. D. CONVERSE, Winchendon, Mass. In this improved construction, the head is formed with a hoop section at one end of greater diameter than the body of the drum, and the head is also provided with a hoop section which engages with the hoop section of the body and is locked thereto to hold the drum in position.

Pertaining to Vehicles.

AUTOMOBILE FIFTH-WHEEL.—E. A. OLIVER, Richland, Mo. The objects of this invention are first, to provide means by which a cable running from a wheel on the hind axle will be guided onto a wheel on the front axle; second, to reduce the friction of the cable on the guides; third, to provide means by which the front end of the body or springs of the automobile will rest directly over the front axle.

VEHICLE-WHEEL.—W. L. HOWARD, Trenton, N. J. In a prior application Mr. Howard disclosed mechanism for detachably securing tire-carrying rims to wheels, including curved sections moving circumferentially away from each other and radially to grip the rim. The mechanism for spreading apart the gripping sections includes a worm wheel carried by a rotatable rod, the opposite ends of which are provided with threads of opposite pitch. The present invention utilizes substantially the same general features but provides mechanism for spreading the gripping sections and locking them in position.

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.

THE INTEGRALS OF MECHANICS. By Oliver Clarence Lester, Professor of Physics in the University of Colorado; formerly Instructor of Physics in the Sheffield Scientific School, Yale University. New York: Ginn & Co., 1909. 8vo.; 67 pages; with diagrams; cloth. Price, 80 cents.

The aim of this book is to furnish the conclusion to courses in the integral calculus such as are usually given in colleges and technical schools, and at the same time to provide for the beginning of theoretical mechanics, which usually follows the calculus. The subject-matter is concerned entirely with such applications of the calculus as the calculation of lengths, areas, volumes, densities, centers of mass, moments of inertia, and ellipsoids of inertia. These subjects are treated in great detail, all principles being fully illustrated by examples worked out in the text and by numerous problems set as exercises. Since the ground covered is common to both integral calculus and to theoretical mechanics, the author hopes in this way to save both time and energy; to save time by providing applications of the calculus useful in mechanics; to save energy by treating the purely mathematical parts of mechanics entirely apart from the ideas of force and motion. This method avoids breaks in the continuity of the mechanics course proper, and minimizes the liability of the student to such troublesome confusions as moment of inertia with the moment of a force, or center of gravity with the force of gravity. Whereas the book is intended strictly as a college textbook and has little interest for those unfamiliar with the calculus, it has the additional value of illustrating the practical applications of the latter to those who have commenced its study at college and considered it purely as mental gymnastics.

AZIMUTH. By George L. Hosmer. New York: John Wiley & Sons, 1909. 16mo.; 73 pp. Price, \$1.

The purpose of this volume is to present in compact form certain approximate methods of determining the true bearing of a line, together with the necessary rules and tables arranged in a simple manner so that they will be useful to the practical surveyor. It is a handbook rather than a text-book, hence many subjects have been wholly omitted which are ordinarily included in books on Practical Astronomy but which are not essential in learning to make the observations described in this book. In all of the methods here treated the object sought is to secure sufficient accuracy for the purpose of checking the measured angles of a survey with the least expenditure of time. For this reason many approximations have been made and many refinements omitted which simplify the calculations without introducing serious error into the results, and although such a treatment would scarcely be proper in a text-book the gain in simplicity and convenience would seem to justify its use in a book of this character. The methods which are here presented are not new, but have all appeared in one form or another in works on Navigation, Astronomy, and Surveying. Much valuable matter written on this subject is so scattered, however, that it is difficult to find in one small book all that would be needed by the surveyor in making azimuth observations.

SCIENCE AT HOME. Simple Experiments for Young People. By P. Baron Russell. New York: R. F. Fenno & Co., 1909. 16mo.; 183 pages. Price, 75 cents.

The present volume is an attempt to interest young people in simple physical and chemical experiments. The aim of the book is admirable, and the experiments are not beyond the powers of average children.

MISSION FURNITURE. How to Make It. Part I. Chicago: Popular Mechanics Company, 1909. 18mo.; 94 pages. Price, 25 cents.

This little book, which is neatly bound in cloth, belongs to the Popular Mechanics series of twenty-five cent books. It gives a number of illustrations showing how mission furniture can be constructed at home at a small cost. The price is so low the book should have a considerable sale.

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