

by simplicity of design, durability and inexpensiveness of construction, and by means of which perfect stereotype-matrices may be simultaneously impressed or embossed and dried, thereby effecting a material saving of time and expense in the production of such matrices.

AUTOMATIC DUMPING ORE-ELEVATOR.—D. B. McTAGGART, Butte, Mont. In carrying out the present improvement the inventor has particularly in view providing an automatic side-dumping elevator or skip for hoisting, lowering, and automatically discharging coal, ore, or other materials in mines, which skip shall embody the essential features of simplicity, durability, and economy in installation. The safety-clutch mechanism prevents the car being dashed to pieces at the bottom of the shaft in case the cable parts.

MOLDING-PRESS.—C. H. DARLING and H. RHEAD, Trenton, N. J. The invention refers to a molding-press capable of use for molding all plastic substances, but especially applicable for the manufacture of tiles from clay. The object of the inventors is the provision of a power-operated molding-press with means whereby the operations ordinarily performed in hand-presses may take place automatically and without the intervention of any manual control.

SHIP'S WINDLASS.—C. W. BLAKE, Norfolk, Va. The principal object in this case is to provide means for overcoming the effects of pulls upon the anchor chains or cables, hawser chains or cables or other chains or cables of the vessel caused by undue surging of the vessel produced by motion of the sea, more especially when the vessel is at anchor, or being weighed, or when the vessel is being towed in a heavy sea or swell. The invention refers more especially to windlasses, hoisting-drums, winches, capstans, towing-machines, steering-gears, etc.

Prime Movers and Their Accessories.

SANDER FOR LOCOMOTIVES.—G. W. FRAZIER, Alamogordo, New Mexico. In this patent the invention has reference to sanding devices for use on locomotives to prevent slipping action of the drivers upon the rails. The invention has for its object to simplify and improve certain details of construction, more particularly the sand feed or cut-off valve devices.

ENGINE FOR OPERATING CLAM-SHELL BUCKETS.—J. G. DELANEY, Newark, N. J. This invention relates to an engine for operating clam-shell buckets, the same being equipped with a traversing and a non-traversing drum and applicable to machinery for dredging and for excavating purposes generally, although the invention in whole or in part may be used at will in the arts.

BACK-PRESSURE RELIEF-VALVE.—C. A. CUNNINGHAM, Brainerd, Minn. The object of the inventor is to provide a valve arranged to completely relieve the piston on the steam-cylinder of all pressure over and above steam-chest pressure, thus insuring a steady running of the engine and utilization of the motive agent to the fullest advantage and relieving the piston of all pressure when the engine is drifting.

ROTARY INTERNAL-COMBUSTION ENGINE.—T. WRIGHT, Jersey City, N. J. Mr. Wright's improvement relates to that class of internal combustion engines in which one or a plurality of cylinders and pistons are arranged to turn around a stationary crank-shaft, the piston-rods being connected to the crank and power being taken from the outer ends of the cylinders or from some part in connection with the cylinders.

BOILER-FURNACE. G. WOLF, New York, N. Y. This invention relates to improvements in attachments to tubular steam-boilers for supplying air in a heated condition to the boiler-furnace for promoting combustion and the burning of the gases. In certain devices air is so admitted as to pass off with the draft through the combustion-chamber, and does not effect the purpose designed. The object here is to provide a boiler attachment so arranged as to practically direct hot air into a portion of the combustion-chamber, causing a thorough mixture with and complete burning of the gases, resulting in intense heat, and economy in fuel.

FEED-WATER HEATER AND PURIFIER.—T. O. ORGAN, Philadelphia, Pa. In the present patent the invention has reference to an apparatus for heating boiler feed-water by the aid of exhaust steam, for filtering the feed-water, extracting the oil from the exhaust-steam, and also for receiving the drip from the heating system.

Railways and Their Accessories.

CABOOSE-LIGHT.—R. L. MASSEY, Grand Island, Neb. Mr. Massey's invention relates to lights adapted for indicating "safety" or "danger," and has for its objects ready and simplified means adapting the light to be set from within the caboose and which means shall operate automatically, restoring the light from "safety" to "danger" upon withdrawing the safety-signal and vice versa when the danger signal is withdrawn.

RAPID-TRANSPORTATION SYSTEM.—E. W. CURTISS, New York, N. Y. Broadly stated this invention comprises two platforms constantly rotating in contact with an endless tram of cars, the object being to have plat-

forms large enough so that while they travel at the same rate as a train of cars at their circumference—say fifteen miles an hour—their rate of motion near the center will be much smaller—say two an hour—so that people can board platforms near the center and proceed to the circumference, where they can board cars without any difficulty due to change in speed between any two moving parts.

RAIL-JOINT.—T. E. LAROC, Ehrmandale, Ind. The object had in view by this inventor is to provide means in the make-up of joints for railway rails whereby improved fastening of the rails may be effected by means which shall also brace the rails against spreading action. The rail-joint has advantage over similar joints in the means employed for locking the chair and braces to the rail and in the special construction, arrangement, and combination of parts forming the joint.

RAIL-JOINT.—W. J. FORSYTH, New Iberia, La. The aim of the invention is to provide a rail joint or union which will form a very substantial and secure connection between the abutting extremities of adjacent rails for the purpose of increasing rigidity and preventing the undesirable jars or shocks which may occur at rail-joints as the wheels pass over them.

BRAKE-RIGGING.—J. M. DAVIES, JR., Plattsburg, N. Y. In its preferred embodiment this invention comprises a combination with connections for transmitting the braking force, said connections including a shiftable part and devices for operating the part, the operating devices being themselves actuated by the relative movement of the car-body and trucks due to the absence or pressure of a lead on the body. The present is a combination of a co-pending application filed by this inventor.

CAR-COUPLING.—J. ANSON, Cooper, Canada. The object of the inventor is to provide features of construction for a car-coupling of the Janney type, which enable the use of the car-coupling when the knuckle-jaw is broken and, furthermore, which permits the improved knuckle to be employed as a coupling-link in case the car-coupling is to be coupled with the draw-head of an ordinary link-and-pin car-coupling or a Janney coupling having a broken knuckle.

RAILWAY-SWITCH.—W. K. SMITH, Denver, Col. Mr. Smith's invention refers to improvements in switches for street-railways, his object being to provide a switch mechanism of novel construction adapted to be operated by a motorman on a car while the car is moving. Among the many advantages are those in relation to weather conditions. The opposite edges of a shifting-plate are sharpened so that when sliding on the cover any ice or snow thereon will be readily cut by the sliding plate. This cover is provided with an opening through which the tapered rail may be passed into position. This opening, however, is normally closed by another cover seated on a gasket of rubber or the like, to prevent the entrance of water.

Pertaining to Vehicles.

VEHICLE-BRAKE.—A. J. JACOBS, 33 Salisbury road, Redland, Bristol, England. The object in this instance is to provide perambulators, mail-carts, and other three or four-wheeled vehicles propelled by hand with means whereby on the release of the handle-bar or shafts a brake will be automatically applied to the wheels, the construction being such that the brake will be automatically held off whether the vehicle is propelled by means of handles either in the forward or backward direction or is tilted backward as in mounting a step or curb in the forward direction, or is tilted forward, as in mounting a step or curb in the rearward direction.

AUTOMOBILE.—ARBA HOLMES and ALBERT HOLMES, Carroll, Iowa. The invention of the Messrs. Holmes relates particularly to a knuckle-joint construction designed especially for use in connection with wheels of automobiles. The inventors have improved a joint of this character in certain particulars largely with a view of incasing the same and protecting it from dust and moisture and incidentally to provide an oil cup within the casing.

WHEEL.—J. C. RAYMOND, New York, N. Y. The invention is an improvement in wheels, and particularly in the means for securing the tire in place, and has for an object the provision of a simple novel construction by which the tire may be securely held and may be readily removed and replaced whenever desired. When the tire is inflated the parts are arranged to operate to prevent any displacement of the tire and yet permit the same to be quickly removed and repaired and replaced or another substituted, thus avoiding delays in use of the invention.

CHILD'S CONVERTIBLE CARRIAGE.—J. A. CRANFALL, New York, N. Y. In this instance the improvement has reference to a child's carriage; and the particular objects of the invention are to provide means for converting such carriage at will into a go-cart or a crib and the provision of means for permitting such changes to be made readily and without complicated adjustment of the parts or the use of instruments of any kind.

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The SCIENTIFIC AMERICAN SUPPLEMENT is publishing a practical series of illustrated articles on experimental electro-chemistry by N. Monroe Hopkins.

Inquiry No. 6533.—For a machine for removing chaff from the inside of the coffee bean, while the coffee is being ground in an ordinary mill.

U. S. Patent No. 779 301 on a pipe wrench, good investment, sale rights to purchaser.

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Any metal, sheet, band, rod, bar, wire; cut, bent, crimped, punched, stamped, shaped, embossed, lettered. Dies made. Metal Stamping Co., Niagara Falls, N. Y.

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We manufacture gasoline motor and high-grade machinery, castings best quality gray iron. Select patterns, and let us quote prices. Frontier Iron Works, Buffalo, N. Y.

Inquiry No. 6536.—For manufacturers of bicycle pumps.

Manufacturers of patent articles, dies, metal stamping, screw machine work, hardware specialties, machinery and tools. Quadriga Manufacturing Company, 18 South Canal Street, Chicago.

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Inquiry No. 6545.—For makers of leather-carving machines.

Inquiry No. 6546.—For makers of stationary engines and elevators.

Inquiry No. 6547.—For makers of briquetting machinery.

Inquiry No. 6548.—For makers of carpet-cleaning and rug-weaving machinery.

Inquiry No. 6549.—For a machine for gumming envelopes when manufacturing them; also for machines for making envelopes, complete.

Inquiry No. 6550.—For makers of marine engines, such as used in battleships and ocean vessels; also for firms who build large vessels.



Notes and 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.

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(9536) X. Z. says: 1. Is there any system in use where electricity is used under hot water or steam boilers for heating purposes? How much more expensive would it be than egg coal at \$6 per ton of 2,000 pounds? In the case I have reference to, it could not be applied direct, as there would be too much danger from fire, and besides it is too dry a heat. A. In reply to your questions, we would say that it would never be feasible to use electricity under hot-water or steam boilers for heating purposes unless the quantity of heat desired was very small indeed, or the cost of the electricity almost nothing. As a rule, steam is required to generate electricity, and only from 1-6 to 1-10, or in some cases 1-20, of the heat required to generate electricity could be again utilized for heating purposes. It would also be difficult to obtain electrically a temperature hot enough to generate steam. 2. Which is the most economical for heating—hot water under 2 pounds pressure or under 40 pounds pressure? A. There is no difference in the economy of hot-water systems between those which operate under high pressure and those which operate under low pressure. With a high-pressure system there is slightly less heating surface required. 3. Which is the most economical from a fuel standpoint (for heating a building say 10 x 50, even span, sides 4 feet, ridge 10 feet) steam or hot water? Are there any records of experiments carried on in a first-class, practical way regarding steam versus hot water? A. There is no difference in economy between hot-water and steam systems, both giving the same results when properly installed.

(9537) H. A. Wright says: Will you kindly advise as much in detail as possible, what is known about the tempering of bronze and copper? A. Bronze and copper cannot be tempered in the ordinary sense of the word. Suddenly cooling them in water does not produce the same character of change that is produced in tool steel when subjected to the same treatment. Both copper and bronze, however, can be hardened to a considerable degree by hammering or by rolling them when cold, but the character of this change is similar to the change that is produced by cold-rolling steel shafting or wire, excepting that perhaps it is somewhat more pronounced. Bronze is a composition of copper, tin, and zinc, and varies very much in hardness according to its composition. By using just the proper portion of copper and tin, an extremely hard metal may be obtained; but such a metal cannot be obtained by any process of tempering or hardening from the soft varieties of bronze without remelting and changing the composition.

(9538) U. M. C. says: Can you furnish me with a rule for finding approximately the M. E. P. of a steam engine, without the use of an indicator? A. The M. E. P. of a steam engine can be estimated only very roughly without the use of an indicator. If the point of cut-off is known, and the point of compression is known, it is possible to draw to any convenient scale an indicator diagram which will very roughly approximate the true indicator diagram. This can best be done by comparison with the indicator diagrams of similar engines. By measuring the area of such an assumed diagram, dividing this area by its length, and multiplying this result by the proper scale, the M. E. P. may be approximately obtained.

(9539) M. & L. say: Some time since we purchased of you at your suggestion a work entitled "The Brass and Iron Founder's Guide." We cannot find therein the formula and particulars of a certain bearing metal entitled "French automobile bronze," the peculiarities of which are hardness in the extreme with good working qualities, nevertheless, and also a certain resistance to friction heat. Could you oblige us by giving us this formula? If you do not know it, could you furnish us with a formula for a metal of this character? A. There is no special peculiarity in the bronze bearing metal used in French automobiles over any other first-class bearing metal; the composition is just the same. A good formula to use for such a bearing is: 88 per cent pure copper, 10 per cent tin, 2 per cent zinc. A very slight variation in the proportion of any of the above percentages

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will cause a considerable change in the character of the metal. To obtain exactly the degree of hardness and toughness that is desired, requires considerable skill in mixing. Sometimes one per cent or one per cent and a half of lead is added to the above mixture, in order to make metal more easily worked in the machine shop.

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CYCLOPEDIA OF APPLIED ELECTRICITY. Five volumes. Prepared by the American School of Correspondence at Armour Institute of Technology. Chicago, 1905. Large 8vo; 2,500 pages; 3,000 illustrations. Price, \$30.

This is a very comprehensive work on electricity, dealing particularly with its practical applications and avoiding all unnecessary digressions into theory. Well-known specialists in the different branches covered have aided in the collaboration of this work, contributing specially-prepared articles, and all the standard works on electrical subjects have been consulted and freely drawn upon. Primarily, this cyclopedia is intended for the use of students, the matter being arranged in the progressive order in which it is usually taught, instead of being alphabetically arranged. Examples are used throughout, in order to give a practical understanding of the various subjects, and at the end of each volume are a series of review questions, which permit the reader to examine himself and test the knowledge he has acquired. But though the work is thus particularly adapted for students, it is none the less of value to electricians, engineers, telephone and telegraph operators, and all who are interested in the practical side of electricity. Higher mathematics is avoided, and only the simplest equations are used. All the explanations and descriptions are extremely simple and clear, and at the same time they are very thorough and complete. A common fault with most general works on electricity is the free use of technical terms without explicit definitions of their meanings. In the present work the simplest language is used, and technical terms, while not avoided, are fully explained before being introduced.

The first volume deals with the elements of electricity, electrical measurements, electric wiring, insulators for transmission lines, and telegraphy, including a comprehensive chapter on wireless telegraphy, and one on the teleautograph. Electric welding is also described in this volume. The second volume describes direct-current dynamos and motors, with a valuable chapter on electric motors in machine-shop practice, and another on storage batteries. Volume III covers the subjects of electric lighting and electric railways, dealing also with power stations and management of dynamo-electric machinery. The volume contains in addition a chapter on boiler trials. The fourth volume takes up alternating-current machinery and power transmission, describing all the principal types of alternators, synchronous motors, induction motors, etc., also converters, including a chapter on the mercury-vapor converter. In the fifth volume telephones and telephone practice are dealt with. This is a complete and very practical book on the subject, written by William C. Boyer, who is a telephone engineer of wide experience. The volume ends with a chapter on wireless telephony and a complete index of the entire cyclopedia.

MODERN INDUSTRIAL PROGRESS. By C. H. Cochrane. Philadelphia: J. B. Lippincott Company, 1905. 12mo.; pp. 647; over 400 illustrations. Price, \$3.

Mr. Cochrane's book, although not an original work, must be considered a most successful attempt to popularize modern engineering. He has described tersely, though vividly, the foremost technical achievements in civil engineering, steel-making, photography, wireless telegraphy, farming, glass-making, and most of the important American industries. The illustrations in the book vary in excellence. Some are extremely good and some nothing more nor less than catalogue cuts, which ought to have no place in a volume of this character. Apart from this defect, the book is one that can certainly be recommended to the non-technical reader.

RADIUM. And All About It. By S. R. Bottono. New York: Whittaker & Co., 1904. 12mo.; pp. 96. Price, 50 cents.

One of the latest of the popular manuals on recent scientific discoveries and inventions, which Mr. Bottono has been publishing in London. "Radium" is entertainingly written and well illustrated.

FRICITION AND LUBRICATION. A Handbook for Engineers, Mechanics, Superintendents, and Managers. By William M. Davis. Pittsburg: The Lubrication Publishing Company, 1904. 12mo.; pp. 265. Price, \$2.

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