

AN EARLY REAPING-MACHINE.

After having been hidden away for more than half a century in a barn near Spencertown, N. Y., Enoch Ambler's curious old mowing-machine has again seen the light of day at a county fair. Although it was patented as early as December 23, 1834, it was not the first apparatus of its kind; for Obed Hussey, on December 31, 1833, and Cyrus McCormick, on June 21, 1834, as well as others before them, had taken out patents on similar contrivances. And although it appears not to differ materially from the contemporaneous Hussey and McCormick reapers, the old Ambler machine, merely on account of its age, is of sufficient interest to warrant a brief description.

The frame of the machine is supported by a single, central driving-wheel, spiked to prevent its slipping and connected by gearing with a horizontal pulley. By means of a belt passing around the pulley a vertical shaft is driven, which, at its lower end, is provided with a crank to reciprocate a cutter-blade which, it will be observed, is straight and not serrated and is mounted between the upper and lower sections of double fingers carried by a finger-bar. The cutting implements extend seven feet from one side of the machine. As the horses pull the machine forward, the grain, without the assistance of a reel, is received in the spaces between adjacent stationary guards or fingers and is cut by the reciprocating blade. The double fingers which form part of the cutting apparatus were claimed both by Hussey and McCormick as an original invention, and were frequently mentioned in their bitter controversy for the honor of having devised the first successful automatic reaper.

The first trials of the Ambler machine are said to have been in every way successful. But like many another similar primitive contrivance, it possessed the disadvantage of necessitating a very frequent sharpening of the cutter-blade.

Phosphorescent Sulphide of Strontium.

M. José Mourelo has presented to the Académie des Sciences an account of his method of preparing a phosphorescent sulphide of strontium. The same experimenter has previously shown that certain substances, such as carbonate of manganese and sub-nitrate of bismuth, in small proportions, have the property of exciting the phosphorescence of strontium sulphide. In his recent experiments with sulphate of manganese, he has succeeded in obtaining a brilliant phosphorescence. The method of preparation is as follows: A mixture is made of 100 grammes carbonate of strontium, 30 grammes sulphur, and 0.2 gramme sulphate of manganese, pure and anhydrous; these are well mixed and put into an earthen crucible, well closed. The crucible is heated to a bright red for three hours. In this manner a sulphide of strontium is formed which is almost white, hard, and possessed of an intense yellow-green phosphorescence, which may be excited by the exposure of a few seconds to diffused light. The experimenter describes several other methods of preparation, by which he has progressively arrived at results even more satisfactory. He takes, for instance, 100 grammes carbonate of strontium, adding 50 c. c. of water in which has been dissolved 2 grammes of dry sodium carbonate and 0.5 gramme fused chloride of sodium. After desiccation, the mixture is calcined, and to the impure strontia resulting is added 30 grammes of sulphur and 0.2 gramme sulphate of manganese. By submitting this mixture to an intense heat, a sulphide of strontium is obtained whose phosphorescence is more brilliant than in the former case and it is excited with less exposure to light. The experiment which has given the best results is the following: With 100 grammes carbonate of strontium is mixed a solution of 0.2 gramme sulphate of manganese in 50 c. c. water; to the mixture is added 30 grammes of sulphur, 0.5 fused sodium chloride, and 2 grammes sodium carbonate. This mixture, heated in a crucible to bright redness for three hours, gives a sulphide which is rather white, hard, and granular, possessing a very great phosphorescent power, it being excited by the smallest exposure to diffused light.

THE Krupp works are to be extended at a cost of not far from a million dollars.

Utilizing New Fish for Food.

The waste of food products has always been characteristic of our national life, and in the economical preparation of food materials which Americans consider useless, most of the European countries are far ahead of us. But with the rapid growth of our population, and the increasing demand for new varieties of food, the application of scientific principles to the food problem is creating changes for the better. Owing to the progressive activity of an able scientific Fish Commission, American fish culture stands first in the world, and our food fish have been multiplied so enormously by artificial methods of propagation that the supply has always kept well abreast of the demand.

But no individual, or scientific body, is more ready to acknowledge our inferiority to most European countries in the matter of utilizing all fish products than the Fish Commission. It is the abundance of fish food in this country that has prevented Americans from adopting the economical devices found in Europe, and it will be the self-chosen duty of the United States Fish Commission to illustrate the value of the methods of some of the northern countries of Europe in utilizing fish products as food.

In Norway, Scotland, and the Scandinavian countries factories are established for making fish pastes,

eliminated. For flavoring soups, or for forming the foundation of soups, this fish extract is valuable, and is employed in the countries of Europe quite extensively in general cooking.

Both whale and shark meat is highly nutritious, but the excessive fat of the former makes it unpalatable to any except the inhabitants of the cold northern countries. To overcome this the fat and oil are first extracted in sufficient quantity to make the residue a good foundation for meat extract. The oil that is removed is used for other purposes, while the rich, nutritious liquor and juices are boiled down further and evaporated until they have the consistency of molasses. Then it is flavored in various ways for the market and put up in sealed jars.

The fishmeal made in the factories of Norway is another article of food that is practically made from waste or useless material. The flesh of fish that have no recognized standing in the markets in the fresh state is reduced to a fine powder, and by chemical treatment it is prepared so it will keep indefinitely. This fishmeal is highly nutritious, and is eaten extensively by the inhabitants of northern Europe. When properly flavored, it is not an unpleasant article of food. The statement is made by some authorities that this fishmeal contains four times as much nutriment as beef.

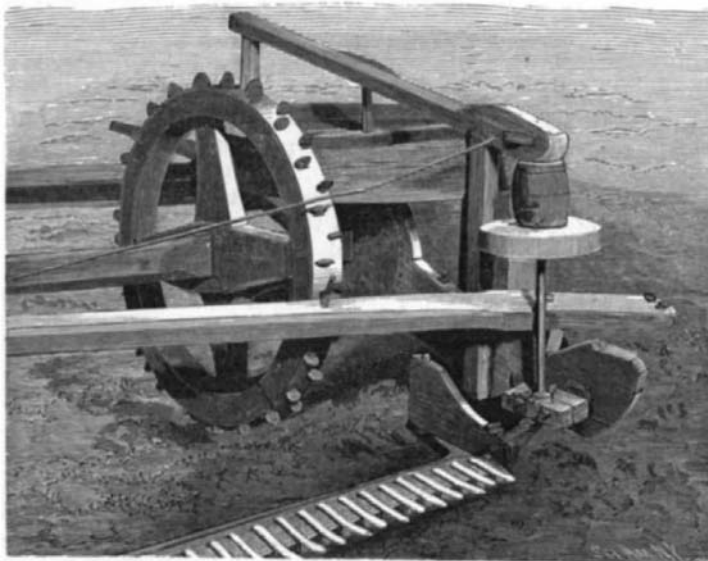
Fish paste is another product of these northern factories that has received the universal commendation of culinary experts abroad. The paste is made by reducing the flesh of the fish to a thick mass, with all the natural juices of the fish retained, but with disagreeable strong odors eliminated. This paste is highly seasoned, and is all prepared for making soups and similar delicacies. It is put up in cans and jars, and the French and German cooks depend to quite an extent upon these fish pastes for relieving the monotony of consomme and mock turtle soup at the beginning of each meal.

The question of establishing similar fish factories in this country of course depends upon the supply of available fish that to-day have little economic value. Whales we have not in sufficient abundance to supply the factories with material for their cheap products, but sharks of great variety abound in the waters along our Atlantic seaboard. They could be caught in enormous quantities, and besides supplying the factories with material they would relieve the seas of pirates that undoubtedly tend to keep down the supply of fresh food fish. The porpoises could also help to furnish the factories with raw material, for in the extraction of the oil and fat from these large fish there is a great waste of flesh and fish juices. Our moss-bunkers and menhaden, which are now used chiefly for bait for blue and other fish, might find a new use in the fish factories, while dogfish, skates, and similar inhabitants of the deep that are inimical to the fishing industry would inevitably be utilized for paste and extracts.

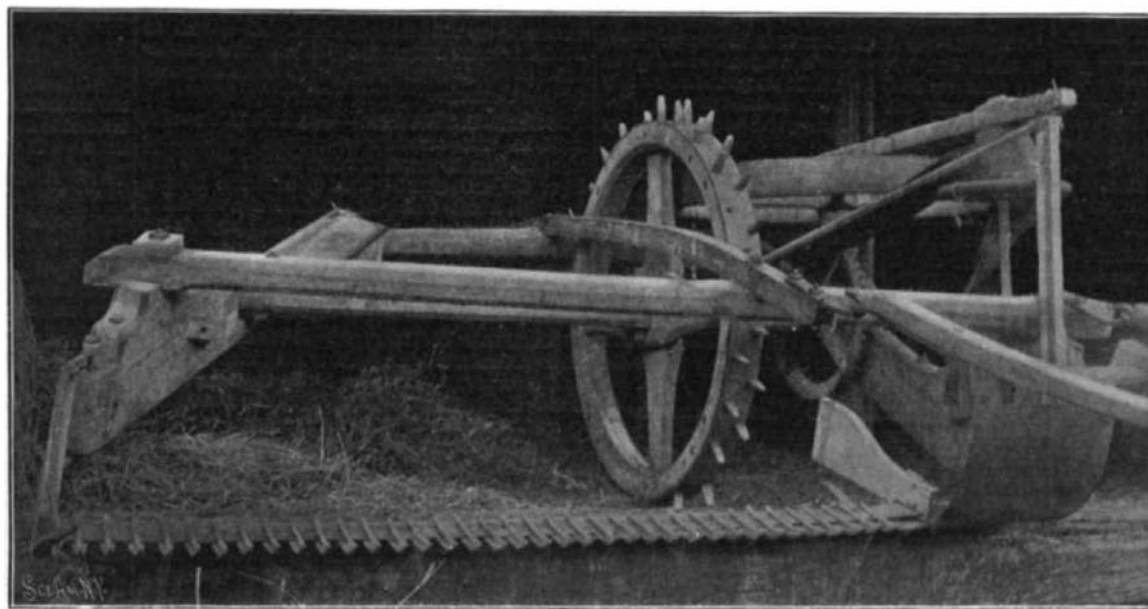
The swordfish has already become popular as an article of diet, although it was not many years ago

that the flesh of this fish was considered unfit to eat. Around Block Island to-day there are numerous swordfish hunters, who depend upon the industry for a living. The fish are sold in New York and Boston at paying prices, and most summer hotels have swordfish steaks on their bill of fare. The swords of the fish are sold as souvenirs. Swordfish steak is cut with the grain, and retails at 12 to 15 cents a pound, and the supply hardly equals the demand, especially in summer. The fish caught off the coast run from two to six hundred pounds in weight. Formerly all of these monsters were allowed to live in the ocean without thought of using them for food, but now both the fishermen and the consumers are benefited by the discovery of their really valuable qualities as fish diet. While it may not be possible ever to popularize the flesh of the blue, leopard, or shovel-nose sharks as fresh fish, the factories of the future will utilize them for making fish paste, fishmeal, or fish extract. G. E. W.

THE Rome correspondent of The London Lancet has made a suggestion that the salt which from the earliest ages has been mingled with the water for ceremonial church purposes should be modified so as to make it a true disinfectant.



ANOTHER FORM OF THE AMBLER REAPER.



THE AMBLER MOWING-MACHINE OF 1834.

powders, and extracts that are absolutely unknown in this country. These factories use to a large extent the fish that have little or no commercial value in the markets of the world as fresh or salted food. The nutriment of the fish used is fully as good as the fresh fish, and it is only lack of flavor and palatableness that prevents their general acceptance by our epicures. By converting them into pastes, powders, and fish extracts they obtain for them a position in the food economy of the world that is highly important.

In a forthcoming report the Fish Commission will give elaborate details about the workings of these fish factories in northern Europe, and will even recommend the establishment of similar ones on the Atlantic seaboard. This is especially interesting in view of a recent innovation made by the fish factories of Scotland and Sweden in successfully utilizing the flesh of the shark and whale as fish extract. The concentrated extract of these two gigantic sea inhabitants is put up in sealed cans, and resembles in some particulars the numerous meat extracts put up in this country. The fish extract made from the shark and whale is cheaper than any of our meat extracts, has fully as much nutriment as beef extract, and through chemical treatment all disagreeable fishy flavor is

Automobile News.

Automobiles have appeared at a number of hunts and shooting meets in England.

The Automobile Velo Club, of Nice, has arranged a week's meeting on the Riviera, and another club is doing the same for Pau.

The French army authorities have been conducting tests with the Scotte steam vehicles for heavy traction work. It does the work which was formerly performed by thirty-two horses. The speed of the Scotte road train is much faster than that of the traction engine, and as no stops are necessary to change horses, a long journey can be expeditiously made.

Mr. James T. Allen, Examiner, United States Patent Office, has been compiling a volume dealing with all patents on carriages propelled by electricity, gas, steam, or other power between 1789 and July 1, 1899. It will contain photographic reproductions of all the drawings, with text dealing with the matter of the essentials, of the specifications, the claims in full, and other matter.

The Italian general staff has ordered the construction of a few automobile caissons for field artillery, which will be made to demonstrate their practicability this spring. The War Office will make public the results of their experiments during the Exposition. Three models for ordinary field service will be shown. First is a strongly built vehicle of high power and of the racing pattern, provided with a motor which will produce a speed of 40 miles an hour. It is intended for the carrying of dispatches. The second will be a heavyweight traction car for carrying large field pieces. There will also be a very light petroleum motor tricycle armed with a Maxim gun. Motor ambulances, wagons for the use of the field telegraph service and motor cars for the use of the staff will also be exhibited.

The Automobile Cab Company, of Boston, will not use motormen as drivers, owing to the fact that the motorman's training bars him from being an efficient driver. On the cars, when any danger threatens, his first thought is to put on the brake with all his might with his right hand. On a cab, however, the right hand deals with the steering lever, which is a wholly different matter, and the driver who had been a motorman would probably forget in emergencies and try to stop the cab by pushing the steering lever just as he

used to manipulate the brake handle. This usually results in the cab running wild, and it is liable to do serious injury. An accident which occurred in Boston last summer was traceable to the fact that the man in charge was an ex-motorman, and the old instinct got the better of him.

An automobile with three occupants was run into by a trolley car in New York on June 21. The horseless vehicle was going at a pretty good rate on Fifty-ninth Street just west of Sixth Avenue, when the driver lost control of the steering apparatus. A Sixth Avenue trolley car came around the curve at Fifty-ninth Street also at a high rate of speed. The motorman thought that the automobile would get out of the way; the result was that the two vehicles came together and the light carriage was thrown against the wall of the Park, clear across the stone sidewalk. The three occupants were thrown against the wall and under the wreck of the vehicle. No one was seriously injured. The automobile was completely wrecked. This should be a lesson to all drivers of such vehicles, especially in cities, to take more precaution than they would with horse-drawn vehicles. Accidents of this kind injure the automobile industry, and the drivers cannot be too severely condemned.

In one of its recent meetings, the Automobile Club of France proceeded to choose the equipages which were to represent it in the contest to be held next year for the Gordon Bennett cup. The two equipages chosen were: 1st, Messrs. R. de Knyff, Charron and Girardot; 2d, Count de Chasseloup-Laubat, Hourgières, Lemaitre and Levegh. This choice has been the subject of some discussion on the part of the persons named and others, and it is not certain whether the choice will be final or not. Several of the automobile clubs of Europe have signified their intention to take part in the contest. The Duke of Ratibor, president of the Automobile Club of Germany, has just officially announced to the Paris Club that his club will take part in the contest. The Automobile Club of Belgium has also signified its intention to enter the competition, and has chosen three of its best conductors to contest the cup next spring. On the contrary, the Swiss and the Austrian clubs have announced that they cannot take part in the contest until 1901, as the automobile industry in these countries is not yet sufficiently developed.

The New Tomb of Fulton.

The special committee of the American Society of Mechanical Engineers now has \$1,200 toward the new monument, and the amount needed is about \$3,000. It is thought that the balance will be raised promptly in the next few months, so that the tomb can be prepared during the summer and the interment and dedication will take place during the annual meeting of the society in December. It will be a plain granite receptacle with probably nothing more than the name of Fulton on the side toward the street, and an inscription on the other side will recite the facts of the erection of the sarcophagus by the society. An illustrated monograph on Fulton is to be issued by the society, and it will be prepared by H. H. Suplee. It will include illustrations of all known memorials of Fulton, the richest collection of which is in the possession of the society. There is reason to believe that the transfer of Fulton's remains will be followed by a movement to erect a costly monument to the inventor.

The Current Supplement.

The current SUPPLEMENT, No. 1257, has many articles of importance. "The Present Status of the Caprifig Experiments in California" is by Dr. L. O. Howard, and it corrects erroneous notions which obtain regarding this curious subject. "The Problem of Honeycomb" is by Charles Dawson, and is an interesting paper. "The Insect Foes of Tobacco" is an elaborately illustrated article. "Recent Improvements in Rice Culture" is by Dr. Eugene Murray-Aaron, and is illustrated. "Animal Electricity" is by W. S. Hedley. "The Progress of Automobilmism in 1899" describes the principal advances of the year.

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RECENTLY PATENTED INVENTIONS.**Agricultural Implements.**

GRASS OR STUBBLE BURNER.—DANIEL MORRISON, Maple Creek, Northwest Territories, Canada. On the prairies of the United States and Canada the flames from burning stubble and grass often spread and cause no small damage to buildings. The inventor has devised a machine which burns the dried grass, but prevents the spreading of the flames by means of aprons of fire-proof material. The apparatus sets fire to the stubble and forces the flames in the right direction by a draft of air as it moves over the ground, thus burning a strip equal in width to the width of the machine.

HARROW AND PULVERIZER.—HENRY G. MOSHER, Fairmount, Neb. The harrow and pulverizer is constructed with crushing-plates and toothed bars, arranged so that both may be adjusted at the same time, or so that the plates may be adjusted independently of the toothed bars. The grouping of the plates and the toothed bars is such that the plates, when placed parallel with the ground, will insure the teeth's entering the soil the desired depth, thus enabling a field to be evenly harrowed, even when young plants are just sprouting from the ground.

Engineering Improvements.

ROTARY ENGINE.—HORACE FISHERING, Xenia, Ohio. The circular body of the engine has annular grooves in both ends leading to a central partition, with blades passing from end to end and through the partition. In these ways chambered blades operate to give passage for steam and to prevent the cushioning and pounding of steam as the blades play automatically in and out of the piston-slot or ways. Rods on the middle section of the ways extend out through the rim and have slides attached to their outer ends engaging a cam or track, the orbit of which is composed of arcs, the centers of which are diametrically opposite each other from the piston-shaft. The inner arc permits the blade to be in its innermost position to pass the abutment; the outer arc permits the blade to be in its outermost position covering the steam-space, the length of this arc being the distance between the inlet and exhaust-port. An arc on either side unites these two arcs, causing the automatic action of the blade and completing an orbit or track absolutely without an abrupt point.

Railway Appliances.

INTERCEPTING-VALVE FOR AIR-BRAKES.—GEORGE W. BUCKALEW, Memphis, Tenn. By the use of an intercepting-valve, devised by the inventor, one or more engines coupled to the rear end of the train as helping engines, are enabled to co-operate with the leading engine in supplying air from their main reservoirs, to the train-pipe, so as to assist in supplying the brakes in long trains. When the devices are applied, they are so adjusted on the leading engine as to be thrown out of action, so that the leading engine acts in the usual way to apply the brakes for the whole train by a reduction of pressure in the train-pipe through the engineer's valve of the front engine. But with the rear engine the devices, by proper adjustment, are brought into action for automatically supplying to the train-pipe air from its main reservoir and still permitting

pressure to be reduced in applying the brakes from the front engine.

Miscellaneous Inventions.

CORSET.—LAHVESIA PAXTON C. PACKWOOD, Lake Maitland, Fla. The corset is composed of front and rear parts connected by buckled straps and unprovided with the usual side portions. A strap thus made, besides fitting the figure properly, enables the body freely to perform physical exercises.

CONVERTIBLE BEDSTEAD.—ADRIAN DE PINIEC-MALLET, Bensonhurst, Brooklyn, New York city. To convert a bedstead from a double into a single bedstead or vice versa, the inventor employs two bedsteads having interlocking engagement and moving transversely one upon the other to form a bed of the form desired. One bedstead has a transverse connection between its posts on the outside and the other bedstead has a transverse connection between its posts on the inside of the posts of one bedstead being movable between the posts of the other bedstead.

COMBINED HOOK AND CLASP.—CHARLES V. RICHARDS, Skowhegan, Me. This device comprises essentially three parts—a body-plate, a clamping-plate and a connecting-link between the two—so combined that they are adapted to be attached to the waist-band of a skirt and to be supported from a belt of that type which is independent of the skirt.

ACETYLENE-GAS GENERATOR.—AUGUSTUS F. SHRIVER, Arbutle, Cal. The generator comprises the usual gasometer having a rising and falling bell and a generator connected by a pipe with a water supply. A lever operates a valve in the pipe and has a roller upon its free end adapted normally to engage the side of the gasometer-bell, thereby to be held in an inclined position, and also adapted to pass over the upper end of the bell when it falls sufficiently to open the water-supply valve to admit water to the carbid and generate a fresh quantity of gas.

FIRE-ESCAPE.—ALFRED HOLDEN, Manhattan, New York city. The fire-escape comprises a drum upon which a chain or rope ladder is wound. The drum is mounted at the top of a building and is connected with an electric motor, so that it may be turned either to wind or unwind the ladder. The motor is operated by means of a switch which is located on the ground or at any easily-accessible place at a distance from the motor.

NEGATIVE-HOLDER.—FRANK C. MEYER, 1310 Myrtle Avenue, Brooklyn, New York city. The object of this invention is to provide a convenient casing for packing, storing, and preserving photographic negatives. The holder provided for this purpose consists of a series of flexible, parallel leaves having their central portions cut out to allow the circulation of air. Strips are arranged between the base portions of the leaves, both leaves and strips being secured solidly together, so that the strips form a solid base-support for the negatives. The construction prevents contact of the negatives with one another when placed between the leaves, permits circulation of air, thereby preventing molding, excludes dust, and protects the plates during shipment and storage.

FOUNTAIN-PEN FILLING-DEVICE.—LYMAN FISK, Hackensack, N. J. Through the stopper of an

ink-bottle a suction-pipe extends carrying a piston at its outer end. The reservoir of the pen is pushed over the outer end of the suction-pipe, forcing out the air through a vent in the stopper. In drawing the reservoir back a vacuum is created, which causes the ink to rush up through the suction-pipe and fill the pen. The reservoir may thus be rapidly and easily filled without danger of staining the fingers.

CURTAIN-SUPPORTER.—MRS. A. T. K. HAWLEY, Delhi, La. This supporter for curtains, portières, and other hangings, by means of which the curtains are held in regular and graceful folds by automatic devices, comprises a tube having a longitudinal slot, one end of the tube being open. A head removably engages the end. A retractile coil spring is fitted in the tube and has one end secured to the removable head. Fastening devices for the curtain are engaged with the coils of the spring and project slidably through the slot in the tube.

FIREMAN'S LIFE-SAVING APPLIANCE.—WILLIAM H. CORNELL, Brooklyn, New York city. The invention provides a means for facilitating the saving of lives by firemen, an end which is attained by constructing an appliance to be strapped to the fireman and capable of being carried to the person to be rescued. The device is so constructed that it can also be used at the end of a line for lowering persons from the windows of a burning building, instead of carrying them down on the back of a fireman.

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

NEW BOOKS ETC.

ON THE THEORY AND PRACTICE OF ART ENAMELING UPON METALS. By Henry Cunyngham, M.A. London: Archibald Constable & Company. New York: The Macmillan Company. 1899. 12mo. Pp. 136. Price \$1.60.

Enameling is a most fascinating art, which is not properly understood to-day. So far as we remember, there is no practical treatise at all in English, and for this reason the present work will be warmly welcomed. Owing to the factory-system, art craftsmen find it difficult to earn a living, and the art of enameling bids fair to become a lost art as far as the best work is concerned. The present admirable book will do much to prevent the art from becoming forgotten. Many illustrations are made from actual photographs taken in the workshop.

STANDARD POLYPHASE APPARATUS AND SYSTEMS. By Maurice A. Ondin. M.S. New York: D. Van Nostrand Company. 1899. 12mo. Pp. 249. Price \$3.

The development of the polyphase apparatus and the application of the polyphase systems to the solution of engineering problems have been so rapid of late that there is no valuable literature on the subject that is at once practical and up-to-date. This in itself would be a satisfactory reason for the publication of the present work. Many who thought they were thoroughly familiar with electrical matters ten years ago find that they are

absolutely at sea when the two-phase, three-phase and monocyclic systems are concerned. The book is an admirable treatise.

THE IRONMONGER'S DIARY FOR 1900. London: The Ironmonger. 1899. Quarto. Pp. 568.

This annual volume is a complete diary for the year, and is interleaved with sheets of blotting paper. There is a certain amount of practical information in the front, and the bulk of advertising matter is impressive.

HOW TO RUN ENGINES AND BOILERS. With a New Section on Engines and Boilers. By Egbert P. Watson. New York: Spon & Chamberlain. 1899. 18mo. Pp. 160. Price \$1.

The author, who has contributed many articles on the same subject to the SCIENTIFIC AMERICAN, is amply qualified to deal with the subject, and he has succeeded well within the limits which have been laid down for him.

INTRODUCTION TO PHYSICAL CHEMISTRY. By James Walker, D.Sc., Ph.D. London and New York: The Macmillan Company. 1899. 8vo. Pp. 335. Price \$2.50.

The present work answers the majority of the questions which are sure to be asked by the beginner in chemistry. In no other work have we seen the broad facts relating to atomic weights, equations, specific heats, solubility, etc., so clearly described. The average work on chemistry usually begins with a page or two of preliminary matter, and then the elements are taken up in detail. Every teacher of chemistry can read this book with profit.

PHOTOGRAPHIC MOSAICS. By Edward L. Wilson. Thirty-sixth year. New York: E. L. Wilson. 1900. 16mo. Pp. 288. Price \$1.

An excellent annual; the literary contents appeal to all photographers. The most modern, up-to-date methods are described.

LEXICON DER METALL-TECHNIK. Redigiert von Dr. Josef Bersch. Parts 16 to 20. Vienna: A. Hartleben. 1899. Price per part, paper, 70 cents.

DIE MODERNE CHEMIE. Eine Schilderung der Chemischen Grossindustrie. Von Dr. Wilhelm Bersch. Parts 16 to 20. Vienna: A. Hartleben. 1899. Price per part, paper, 70 cents.

Monumental Records.—We have received the first two numbers of this interesting periodical, to which we have referred on another occasion. The new series has now been started and the periodical gives promise of being in the front rank of the archaeological periodicals of the world. Certainly we do not know of any which is so well illustrated, and the text is excellent. It is edited by Rev. Henry Mason Baum, D.C.L., and is published by the Monumental Records Association, 76 Fifth Avenue, New York city. Those who believe that archeology is a dull and uninteresting science need only examine the issues of this unique periodical to understand their error.