RECENTLY PATENTED INVENTIONS.

Heating.

SMOKE-CONSUMING FURNACE.—J. B. HARRIS, Nashville, Tenn. The invention relates to smoke-consuming furnaces such as shown and described in the prior Letters Patent granted to Mr. Harris. The object of this invention is to provide a furnace arranged to insure a complete combustion of the fuel in the fire-box and combustion-chamber by the introduction of heated air into the front top portion of the fire-box and into the combustion-chamber at the bridge-wall.

Machines and Mechanical Devices.

CENTRIFUGAL MACHINE.—J. H. OSTRANDER, Ticonderoga, N. Y. This machine is designed for use in sulfite, pulp, paper, and chemical fiber mills. The invention relates to improvements in centrifugals particularly adapted for use in pulp or chemical fiber mills for separating liquor from pulp, an object being to provide a centrifugal of simple construction and by means of which the work may be quickly and thoroughly done.

BENDING-MACHINE.—W. VANDERLINDEN, Lansing, Ill. The intention in this case is to provide a hand-machine for bending iron rods or bars to form eyes or angles of any degree in a very simple and effective manner, the machine being durable in construction, easily adjusted for different work, and adapted for hand use on an anvil or other support.

MACHINE FOR STAMPING SOAP, ETC.—L. L. CONWAY, Louisville, Ky. In this patent the improvement relates to an apparatus for stamping a name or device on soap simultaneously or practically simultaneously with the operation of cutting the soap into cakes or bars. The soap may be stamped at any desired interval on the same table and by practically the same apparatus that cuts the soap into bars.

HAT-SHAPING MACHINE.—M. A. CUMING, New York, N. Y. In the present instance the invention relates to improvements in machines for shaping or forming hats of felt, straw, or other fabric, the object claimed by the inventor being the provision of a machine by means of which bell-crown hats may be rapidly and uniformly shaped.

GUIDE FOR SEWING-MACHINE HEMMERS.—H. BLASKOPF, New York, N. Y. Mr. Blaskopf's invention relates to an improved means for guiding and simultaneously curling a piece of fabric as it is drawn into a hemmer or feller so that after the fabric is once inserted into the machine the services of an attendant are not required, the device being to this extent automatic.

MACHINE FOR REPAIRING DRILLS.—J. J. BROSSOIT, Granite, Mont. Briefly stated, this invention comprises means for cutting and shaping the bit of the drill so as to repair any break therein and to sharpen the dulled cutting edges. By means of the apparatus involved these operations may be performed on the drill accurately and quickly by machine-power, and thus a decided advantage over hand-work is attained.

Of Interest to Farmers.

CORN-CUTTER.—T. J. LOVE, Lincoln, Ill. Mr. Love's aim is to provide a construction adapted to operate between two standing rows of corn and provided with means for cutting the corn, for holding it as cut, and constructed to admit the adjustment of the cutting devices out of position for use when it is desired to pass by the shock of corn without cutting the gallas-hill, by which is meant the four hills not cut, but are tied together to set the shock against.

COTTON-CHOPPER. — C. H. WALTERS, Springfield, Mo. In this case the object is to provide a machine that can be driven along a field having rows of cotton-plants or the like and which will have one or more rotary choppers that are rotated from the wheels of the machine and which will effectually sever the plants along the row or rows at or below the surface of the ground either at regular intervals in the rows, leaving the desired number of plants standing, or remove the plants entirely along the row or rows.

Railways and Their Accessories.

RAIL.—L. STEINBERGER, New York, N. Y. Mr. Steinberger's invention relates to improvements in rails, and more particularly to third rails employed for the purpose of distributing electric currents to moving vehicles of various kinds. It relates to several distinct means, and more particularly to certain features whereby the rail is made free to move relatively to its supports.

TRACK STRUCTURE. — L. STEINBERGER, New York, N. Y. This structure is particularly adapted for use for distributing electric current in the capacity of a so-called "third rail." The more special object is to produce a rocker to be applied upon a rail-section, so as to allow the section to rock in a lateral direction and to reduce to a minimum the bearing surface upon the rail rests, lessening the friction of the rail on its supports, and in consequence providing a means for the easy movement of the rail longitudinally and transversely during expansion and contraction of the rails.

Steam Engineering.

STRAINER.—F. G. BROWN, Sheffield, Ala. The object of the present invention is to provide a strainer, more especially designed for use on vertical water-feed pipes for locomotives and other machines and devices and arranged to properly strain the water or other liquid flowing through the feed-pipe and to allow of readily cleaning the strainer of accumulated trash or other impurities. The invention relates to strainers such as shown and described in a former application for Letters Patent of the United States, by this inventor.

Of General Interest.

FOLDABLE CONVEYER.—J. H. TORNEY, Buffalo, N. Y. This conveyer is designed to expedite the handling of freight and reduce the manual labor of handling; to enable the cargo of a vessel to be loaded or unloaded through the upper-deck hatches, thus saving in transporting freight through gangways; to minimize the liability of damage to the freight, particularly frail packages; to compensate for the draft of the vessel during loading and unloading, and to provide for folding the apparatus in compact relation to a warehouse when not in service.

DRILL-CHUCK.—E. R. SMITH, Oneida, N. Y. This invention relates to chucks in which a pair of jaws are mounted to slide toward or from each other on the operator turning a screw-rod having a right and left hand thread in mesh with the jaws. The object is to provide a chuck having a supplementary device for engaging the gripping-jaws to insure an exceedingly strong and firm grip of the jaws on the drill or other tool to be held in the chuck.

GAS-ENGINE COOLER.—C. E. SHAMBAUGH, Lafayette, Indiana. Mr. Shambaugh's invention relates to gas-engine coolers, more definitely stated, improved means whereby increased radiation of heat is effected. The construction comprises radially-disposed plates seated in longitudinally-arranged grooves in the cylinder, the said plates being grooved lengthwise thereof on opposite sides, the ribs between the grooves having series of transverse projections formed by struck-up portions.

BOTTLE-SEAL.—A. R. ROBERTSON, Pass Christian, Miss. To prevent tampering with the contents of a bottle, the device embodies the combination, with the neck which is adapted to receive a cork and formed with two annular beads on its outer surface, of a frangible cap, and a corrugated locking-spring adapted to lie between the beads on the neck and within the cap, so as to contact, thus holding the cap in place. Once seated, the cap can only be removed by breaking it away, and it is purposed forming the cap with an annular weakened portion to facilitate its fracture.

MANUFACTURING ORE BRICKS.—J. KOENIGER, 25 Aachenerstrasse, Cologne, Germany. The process in this invention comprises manufacturing weather-proof bricks for smelting purposes from sandy ores or ore-dust, ore residues, tunnel-dust, burnt iron and copper pyrite residues and from similar material, which consists in mixing materials which are to be submitted to the process in a dry condition with lime, magnesia, and borax and intimately mixing the resultant mass with dilute crude sulfuric acid, then pressing and molding the mixture and drying the resultant bricks. A smelting-brick consisting of ore material, lime, magnesia, borax, and diluted sulfuric acid, is a new article of manufacture.

MANUFACTURE OF DEXTRIN.—G. REYNAUD, 5 Rue Salneuve, Paris, France. Mr. Reynaud's process consists, essentially, in diluting the material to be treated in twice its weight of water and in heating the resultant mass under pressure in a digester at a temperature of 160 deg. to 220 deg. centigrade for an hour and a half. In this heat the cellulose and the amylaceous matters of the peat treated become converted into dextrin or achroodextrin, which is capable of advantageously replacing ordinary dextrin in its industrial applications by reason of its lower density.

BINDER.—J. MONTGOMERY, Fort Worth, Texas. One of the principal objects of the present invention is to provide a device which will securely bind and retain a number of loose leaves, the structure of such a binder enabling it to be readily attached to and removed from the packet of leaves. It appertains particularly to a temporary binder for order-books, cash-books, diaries, etc., capable of being rolled or folded and carried in the pocket.

ELEVATOR.—D. E. CONDON, San Francisco, Cal. The invention relates to spiral elevators as shown and described in the former Letters Patent granted to Mr. Condon. The object is to provide an elevator for use in all classes of modern business buildings in which large crowds of people (and freight, etc.) have to be carried to, from, and between floors in the safest and most expeditious manner, the elevator being arranged for continuous travel of the cars from one floor to another, and enabling the passengers to readily leave or enter cars at any floor.

BEARING FOR ELEVATOR-CARRIAGE ROLLERS.—J. BARRETT, New York, N. Y. The object in view in this instance is to provide a construction which minimizes friction on the engaging surfaces, thus preventing bending and cutting of parts. A further object is to so construct the parts as to produce a strong and light structure, owing to the fact that it is not necessary to cut away the stiles of the elevator-carriage to any material extent in order to mount the rollers thereon.

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.

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American inventions negotiated in Europe. Wenzel & Hamburger. Equitable Building, Berlin, Germany.

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We manufacture anything in metal. Patented articles, metal stamping, dies, screw mach. work, etc., Metal Novelty Works, 43 Canal Street, Chicago.

Inquiry No. 5355.—For makers of machinery for a milk sterilizing plant.

The celebrated "Hornsby-Akroyd" Patent Safety Oil Engine is built by the De La Vergne Refrigerating Machine Company. Foot of East 138th Street, New York.

Inquiry No. 5356.—For makers of time detectors with 6 keys, also with 12 keys.

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

Inquiry No. 5357.—For makers of cutlery or parties doing such job work.

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"The Household Sewing Machine Co., Providence, R. I., is prepared to take on contracts for the manufacture of high grade mechanical apparatus, requiring accurate workmanship, in either machine shop, cabinet work, or foundry lines. Expert mechanics, designers and tool makers. Facilities unexcelled. Estimates furnished on application."

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Inquiry No. 5360.—For parties engaged in raising skunks.

Inquiry No. 5361.—For makers of small papier maché articles.

Inquiry No. 5362.—For a new or second-hand small gas balloon, capable of lifting about ten pounds.

Inquiry No. 5363.—For makers of fans, buzz fans operated by water power.

Inquiry No. 5364.—For makers of pleasure launches (gasoline) 17 or 20 feet.

Inquiry No. 5365.—For makers of tin toys.

Inquiry No. 5366.—For makers of advertising novelties of every description, of celluloid, enamelled iron, stamped tin, founded brass name plates, etc.

Inquiry No. 5367.—For makers of or dealers in siphon pumps.

Inquiry No. 5368.—For a small family ice machine which makes 100 pounds of ice.

Inquiry No. 5369.—For small castings for boat engines and motors, of 2 to 5 h. p.

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Inquiry No. 5372.—For an outfit of archery court.

Inquiry No. 5373.—For makers of small articles suitable for canvassing.

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Inquiry No. 5376.—For makers of gas engine castings.

Inquiry No. 5377.—For makers of headless steel hat pins.

Inquiry No. 5378.—For makers of castings of every description.

Inquiry No. 5379.—For the maker of a machine for producing quartered figures on plain oak lumber.

Inquiry No. 5380.—For makers of gasoline or hot air engines of about ½ h. p.

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.

Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same.

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Scientific American Supplements referred to may be had at the office. Price 10 cents each.

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Minerals sent for examination should be distinctly marked or labeled.

(9353) A. T. J. says: 1. We say: "The man is *up* in a tree." "The boy is *down* in a well." Does this not mean to say (and is it not really positively correct), "The man is outwardly, in a tree"? "The boy is inwardly, in a well"? I mean there are no such terms as "up" and "down," only as we use the terms to express away from the earth's center and toward it. Am I correct? If "up" and "down" are correct, then to one on the equator at noon the sun would be directly "up" ("above;" and there is no such thing, likewise, as "above") and then at midnight the sun would be "down" ("below;" and there is no such thing, likewise, as "below"); and this would mean to say that the earth passed over and around the sun each 24 hours, or thereabouts. A. The words "up" and "down" refer strictly to the horizon about us, and to nothing else. Up is along a line drawn through the center of the earth and the point on the surface of the earth to which the matter refers. Up and down as you use the words referring to a tree and a well are used correctly. The sun at noon, to a person on the equator, is directly up from the surface of the earth above the head of a man standing at that point, and at midnight the sun is directly down beneath the man's feet. We see nothing wrong in this use of words, nor is the use of them necessary, since other words can be used to express the fact. 2. Is there any proof that the earth travels around the sun as a man would walk around a tree, or that it passes around the sun as a rider "loops-the-loop"? Is not the sun simply "away" from the earth, or the two "separated," without respect to "up" or "down"? A. The earth revolves around the sun in a year; that is, it occupies every point on the plane of its orbit in that time. 3. Can this and similar problems be worked out by any rule? Given a section of a circle, say 13 feet from point to point along the curved line, and the curvature such that a straight line from point to point would measure 10 feet 9¾ inches: required, the diameter of the circle if completed. A. We do not have at hand the solution of the problem concerning the chord and arc of a circle which you request. It can no doubt be solved, but it is not the policy of this paper to devote space to mathematical problems, unless they present some unusual features or are novel. 4. What proof have we that the reason the seas are salty is the emptying of streams into the oceans and seas from inland and no outlet, and not that there are vast salt mines whose uppermost (or outermost) surfaces as washed by the seas' and oceans' bottoms supply the saltiness? A. The proof that the salt of the ocean came from the land is briefly that the land contains large beds of salt, and that bodies of water which have no outlet are salt. There may be beds of salt under the ocean as you suggest, but it is not necessary to suppose them to be there. The saltness of the sea water can be accounted for without this supposition, and if not necessary why make it a part of the hypothesis anyway? No larger suppositions should be made than are necessary in any argument.

(9354) P. S. asks: Will you kindly inform me whether a fish when put into a tub of water will increase the weight of the water as much as the fish weighs or not, and if not, what fraction of the weight of the fish will it increase the weight of the water? A. If a fish is put into a tub containing water, and no water runs over, the weight of the whole is increased as much as the weight of the fish. The water takes the weight of the fish and carries it. The water rests on the bottom of the tub, and the weight of the fish is thus transferred to the bottom of the tub, and the scales, on which the tub may rest. If the tub is brimfull of water, and water overflows as the fish is put in, the weight is not changed by putting the fish into the water. The fish weighs the same as the water it displaces, as may be seen by the fish lying at rest in the water at any depth.

(9355) E. S. L. asks: Why does ice occupy more space than the same amount of water? What is the explanation of globular lightning? Why is the internal resistance of several cells diminished by joining them in parallel? Why is not the E.M.F. increased? A. It is not known why water expands in

freezing. There are very few substances which do so. Cast iron and type metal are two others which have the same peculiarity, and which are very important to man. The cause of globular lightning is not understood. The resistance of batteries is diminished by connecting them in parallel, because by this mode of connection the battery is reduced to a single cell of size equal to all the cells combined. The current generated by each set of plates is sent out directly into the line, and joins the current of the other plates without passing from cell to cell. The E.M.F. is that of one cell, because there is but one cell. The resistance is that of one cell with plates as large as all the plates combined. The larger the plates, the less the resistance of a cell.

(9356) W. L. G. writes: 1. Will you kindly answer the following question through the columns of your valuable paper? Does the weight of the atmosphere make any difference in the advantage to be derived from a condenser applied to a steam engine? In other words, is the advantage of a condenser greater at the sea level, where the air pressure is about 15 pounds, than it is on a mountain, where the pressure is only 10 pounds? The question does not involve the efficiency of the engine in the different locations, but simply the advantage to be derived from a condenser. A. The efficiency of a condenser is independent of atmospheric conditions, and depends only on the quantity and temperature of the condensing water. 2. Will a non-condensing engine give the same efficiency in a 10-pound atmosphere at 75 pounds boiler pressure as it would in a 15-pound atmosphere at 80 pounds boiler pressure? A. The terminal pressure in a steam engine cylinder is not influenced by differences in atmospheric pressure. Hence the efficiency of the engine depends upon the form of the indicator card alone, save the matter of engine friction, for the actual horse-power. The boiler efficiency may vary slightly with the atmospheric pressure, as water boils under 10 pounds absolute gage pressure, at 193 deg. Fahr. Hence the actual pressure will be greater than indicated by the ordinary gage, and may thus contribute to the apparent engine efficiency.

(9357) F. A. E. asks: 1. Will common wrought-iron pipe 2½ inches in diameter be suitable for a gas or kerosene engine cylinder if machined to suit? I mean, will it stand the pressure at the moment of combustion for a small power engine, and if not would steel tubing (drawn) be suitable? A. The iron pipe if *extra strong* grade will make a fair motor cylinder, but is not as good as steel tubing. It should be *extra strong* to allow for boring out, and amply strong for the explosive pressure. 2. Could you give me a formula for making five pounds of good bookbinder's paste that will keep for an indefinite time, say about one month? A. A good paste to keep may be made by mixing with rye flour paste 10 per cent good thin glue, hot, and then add 15 drops of carbolic acid. 3. Would a steam motor cycle be practical if built compact enough to be portable on two wheels? I think by using a flash boiler and a four-cylinder engine of about 2 inches or 2½ inches, single-acting, with about 2 inches or 2½ inches stroke. A. We do not think a steam motor bicycle practicable. There are too many things to look after and keep your balance; yet there are possibilities in that line. A steam motor bicycle somewhat similar to your idea for one has already been made and is in use in France. A description of it was published recently in the Motor Age.

(9358) H. S. P. asks: Will you kindly give a satisfactory explanation of the well-known fact that small amounts of water aid combustion, for example a forest fire burning green timber, steam injected into a fire-box to increase combustion, or the pouring of water on a great conflagration such as the Baltimore fire? In all of these cases we know or understand that the amount of water present increases the intensity of the fire.

It has been explained that water containing the elements of combustion is decomposed by the heat and the oxygen and hydrogen reunite to produce the hottest flame known. This would be trying to burn the products of combustion and there would be no increase of heat. Others say that the oxygen of the water unites with the carbon to form carbon monoxide and hydrogen, both very combustible with air or oxygen. But in this case the products of combustion are carbon dioxide and water and there is just as much water in the end as in the beginning, per formula:

$$C + H_2O = CO + H_2.$$
$$CO + H_2 + 2O\ (air) = CO_2 + H_2O$$

—it taking as much heat and more to vaporize and decompose the water than is given off when its elements combine.

As steam will not begin to decompose under a temperature of 1,000 deg. C., is it not a question whether any amount of water will actually decompose under such heat as in an ordinary fire-box, or a conflagration? If such was the case, the aid to combustion, by water, would be of a mechanical nature rather than a chemical. What mechanical aid could it possibly give? It seems that small amounts of water would only lower the temperature of the flame by subtracting the heat necessary to vaporize the water. A. We are aware that there is a popular impression that water sprayed into a fire increases the combustion; but we have our doubts as to the correctness of the belief. The doubt you express whether any open fire is hot enough to dissociate water is shared by other chemists. Until it is demonstrated that water can be separated into its constituent gases by an ordinary fire we should consider it very doubtful if water can be an aid to combustion.

(9359) E. H. L. asks: 1. I use water from an irrigation ditch for household purposes, and filter same through a 4-inch wall built of common building brick laid in lime mortar. Will such a filter arrest disease germs, and especially the germs of typhoid fever? A. Filtering the water of an irrigation ditch through a 4-inch brick wall is not reliable for arresting typhoid bacilli. If such are suspected, the water should be boiled after filtering. 2. Two soldiers, using rifles with elevated sights, shoot at a target across a river, say 500 yards distant. A stands at the water's edge, while B stands on a bluff 200 feet higher, but the same distance from target. Should both adjust their gun sights for the same range? A. The rifle fired from the higher elevation should have a slightly lower rear sight than the rifle firing horizontally. The force of gravity is less on an angular trajectory than on a horizontal one; varying as the cosine of the angle from the horizontal range.

(9360) W. J. writes: Will you kindly advise through the columns of the Scientific American what are the reasons given to prove that perpetual motion or any mechanism to develop perpetual motion is an impossibility? Are mechanics and scientists satisfied that such a machine will never be made? A. The most potent of the practical reasons as to why perpetual motion in a mechanical sense cannot be obtained, is derived from the fact that during the past three hundred years the genius of the mechanical world has been directed more or less to the solution of this problem, with many hundred failures and not a single success. Theoretically there is no reason that motion of a body can be sustained without the total elimination of friction and resistance, much less to give out power under any condition, beyond the power originally contributed to start it in motion. The origin of the perpetual motion idea dates back to the dawn of mechanical invention, when in the ignorance and misconception of true mechanical principles, mechanical experimenters, like the alchemists, imbibed the idea of getting something from nothing. Out of these feeble beginnings, a world of truthful facts have had a gradual development in the whole range of mechanical and chemical science, yet perpetual motion and the transmutation of metals are just where they started, three centuries since. Theories are floating conceptions that are only realized by facts, which are truthful and stubborn things.

(9361) H. V. L. writes: Will you kindly answer the following questions through the columns of your paper? 1. In internal combustion motors, what is the ratio of the volume of the gasoline mixture before and after combustion? A. The volume of an explosive mixture of gasoline vapor and air is somewhat less after explosion than the original volume at the same temperature and pressure. The union of the hydrogen in the vapor and the oxygen in the air forms a water vapor, which with the great heat of explosion is largely contributive to the pressure in explosive motors. When the exploded gases cool to normal temperature, the water vapor condenses and so lessens the initial volume. 2. About what is the temperature of the burnt gases at atmospheric pressure? A. The temperature of the exhaust gases at atmospheric pressure varies to a considerable extent by the condition of the primary charge and the explosive temperature; probably 300 deg. F. is an average temperature. 3. What compression is necessary for jump-spark ignition? A. Jump-spark ignition takes place at all compressive pressures, but is more positive with the higher compressions. 4. Will the gases ignite at a lower compression from a hot tube or wire? A. Hot-tube ignition requires compression sufficient to force the charge to the hot part of the tube, generally from 30 pounds and upward. A hot wire will ignite a charge at any pressure. 5. Can you give a formula for computing the safe bearing load of hardened steel balls as used in the caps of ball bearing jacks? A. An approximate safe load for hard steel balls is 20,000 pounds divided by the area of rolling contact in parts of a square inch.

(9362) G. G. G. asks: Please tell us in "Query" column of Scientific American whether the primary purpose of a lightning rod is to prevent a building's being struck by allowing the induced charge to escape from its point, or to quickly ground the current after it has reached the house. While several rods might materially lessen the attraction in the manner above stated, would they be at all adequate to conduct a heavy bolt to the ground? A. The primary purpose of a lightning rod is to act as a conductor for electricity, if the building is struck by lightning. The authorities are not disposed at present to consider that the action of a rod in discharging induced electricity into the air and thus preventing a stroke in the building is important. Too many rods would be required to produce much effect in this way.

(9363) E. M. F. writes: I would be very much pleased if you would answer me in your "Notes and Queries" column of the Scientific American, why it is that the

sharpest blades are very quickly dulled in cutting cork? A. The elastic nature of cork makes it necessary to *draw cut* in cutting cork, which is not usual in cutting wood. The draw cut tends to dull the edge of sharp cutting tools very quickly when cutting any kind of material.

NEW BOOKS ETC.,

GAS AND OIL ENGINE MANAGEMENT. By M. Powis Bale, M. I. Mech. E., A. M.I.C.E. New York: J. B. Lippincott Company. 1903. Pp. 110. Price $1.50.

The author of this handbook has previously published two similar books for steam engine users, which have been very successful; and, what counts for more, he has had fifteen years' experience with gas engines. The handbook gives a good many practical points regarding the care and operation of stationary gas and oil engines, and it also contains useful tables giving the calorific value of the various fuels ordinarily employed.

L'INDUSTRIA FRIGORIFERA. By Pasquale Ulivi. Milan: Ulrico Hoepli. 1904. 18mo. Pp. 168. Illustrated. Price 40 cents.

This small volume describes in detail the various methods used in producing cold and artificial ice for refrigerating purposes. The liquefaction of air and various gases is also treated quite thoroughly, and the different processes are described. The book also contains sixteen tables of value bearing on the subject treated.

EASY LESSONS IN ARCHITECTURE. By Thomas Mitchell. New York: The Industrial Publication Company. 1904. 12mo. Pp. 92. Numerous illustrations. Price 50 cents.

This little volume is intended to give rudimentary instruction in architecture to all interested in studying that most fascinating art. Each chapter consists of a number of questions and answers on some particular style or branch of architecture from the earliest times down to the present. The arrangement of the text in classified questions and answers puts it in very concise form, and makes the contents of the book easy to grasp and to remember. The present, or second, edition has been especially arranged for American readers. It will be found most useful to all who wish to know something of the main principles of architecture.

MARY OF MAGDALA. An Historical and Romantic Drama in Five Acts. The Original in German Prose by Paul Heyse. The Translation freely adapted and written in English Verse by William Winter. New York: The Macmillan Company. 1903.

We shall not quarrel with Mr. Winter for having done Heyse's religious drama into English blank verse. His rendering undoubtedly gains in dignity thereby. But we do seriously object to his having presented us with an expurgated version, when no expurgation was necessary. Winter's Mary is not Heyse's Mary. The German dramatist painted a strong picture of a woman exultantly sinful at first, bitterly penitent at the last. The American translator robs her of every trait of wickedness, and allows her to weep through four acts, with nothing to weep for. Confessedly ignorant of any knowledge of German, Mr. Winter presumptuously proclaims Heyse's text devoid of poetical or spiritual merit. Those who are blessed with a more intimate acquaintance with Heyse's splendid prose than is Mr. Winter, and who have not based their views on a "rough, literal translation," will find the original a more virile play, with stronger dramatic contrasts, than Mr. Winter would have us believe.

PUBLICATIONS OF THE MISSISSIPPI HISTORICAL SOCIETY. Edited by Franklin L. Riley, Secretary. Vol. VII. Oxford, Miss.: The Mississippi Historical Society. 1903. 8vo. Pp. 531.

The present volume is composed of a number of papers dealing with different phases of State history, and will certainly prove of interest to the historian and to residents of the State of Mississippi. There is an excellent chapter on the Mississippi floods by Dr. John W. Monette, and another chapter is on "The Progress of Navigation and Commerce on the Waters of the Mississippi River and the Great Lakes from 1700 to 1846."

LUFTVERUNREINIGUNG UND VENTILATION. Mit besonderer Rücksicht auf Industrie und Gewerbe. Von Dr. Josef Rambousek. With 48 illustrations and a table. Vienna and Leipzig: A. Hartleben. 1904. 8vo. Pp. 260.

The author starts out with an elementary discussion of ventilation principles, presenting a theory of ventilation and something of the technology of ventilation. In this particular part of the work the chief sources of impurity discussed are the exhalations of the human body. For this reason the earlier divisions of the book are confined to a discussion of the ventilation of dwellings, schools, churches, theatres, and the like. The second division, on the other hand, is devoted to a treatment of the ventilation of industrial buildings, such as factories impregnated with gases and dust. It is here that the author has given striking evidence of original investigation, for which reason these chapters constitute the most valuable portion of this treatise.

DIE PRAXIS UND BETRIEBSKONTROLLE DER SCHWEFELSAEURE-FABRIKATION. Fuer den Chemiker, Meister, Kammerfuehrer, etc. Von Dr. S. Meirzinski. With 19 illustrations. Vienna and Leipzig: A. Hartleben. 1904. 16mo. Pp. 256. Price $1.50.

This work may be considered a practical text-book on the manufacture of sulphuric acid. Under the heading "Chemical Control of Manufacture" only such processes are discussed which are actually in use in laboratories. These processes are so thoroughly and clearly described that even the unpracticed chemist may follow the steps described.

EVAPORATING, CONDENSING, AND COOLING APPARATUS. By E. Hausbrand. Translated by A. C. Wright, M.A., B.Sc. London: Scott, Greenwood & Co. New York: D. Van Nostrand Company. 1903. 8vo. Pp. 400. Price $5 net.

It would be difficult to find a subject where the literature is as inadequate as that relating to evaporating and condensing apparatus, and the author has done a signal service to mechanical engineering in the production of the present book, which is an excellent one. That this book was needed is shown by the fact that the first German edition was exhausted in a very short time. The whole treatment of the subject is most scholarly. We regret that lack of space prevents our publishing at least an abstract of contents.

INDEX OF INVENTIONS

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AND EACH BEARING THAT DATE

[See note at end of list about copies of these patents.]

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