

RECENTLY PATENTED INVENTIONS.

Engineering.

**SMELTING FURNACE.**—Charles Bishop, Tacoma, Washington. For fusing all kinds of ore, using oil as the fuel, and with or without charcoal mixed in the ore, this inventor has devised a furnace whose combustion chamber has its bottom formed into a chamber to receive the molten metal, the grate being at the lower end of the stack and in an inclined position over the combustion chamber, into which discharge a number of fire boxes connected with an oil supply. The lower end of the grate projects into a slag discharge which leads to the outside of the furnace.

Railway Appliances.

**SWITCH.**—D. Fred Carver, Brooklyn, N. Y. This invention relates to switches in which the main line rails have a continuous and uninterrupted tread through the switch, and the invention prevents the wheels from cutting into the rails. The main rails are spread wider than the normal gage and a riser is placed between the normal and widened gage lines for receiving the wheel flanges, a second riser being provided for the tread of the wheel. The second riser, which leads to the siding, overlaps the main rail tread. Various novel details are also provided. The risers and auxiliary devices are designed for the inside of the curve, the switch tongue, which is the only movable part of the switch, being at the outside curve.

**SWITCH OPERATING DEVICE.**—Wilson A. Clapp, Pittsfield, Mass. This is a simple and inexpensive device, applicable to any form of sliding switch, whereby the switch may be opened or closed from a moving train, and at a distance in advance of the train entering the switch. The mechanism for operating the shifting or trip devices may be readily applied to an engine or car without interfering with any of its working parts. The switch is adapted to be set automatically by means of a trip bar held in a hanger below the engine, or the device may be operated by means of a hand lever.

**CAR BRAKE.**—John W. Buford, Jr., Jackson, Tenn. This brake is designed to remain automatically applied while the car is at rest or while the engine is not pulling, but will be released the moment the car is started ahead. In descending an incline the brakes may be applied only partially, and when it is necessary to back a car the brake pressure may be taken off entirely. A shifting lever is furnished beneath the car in connection with a longitudinally slidable shaft, there being two brake beams between which is located a spring pressing the beams apart to normally apply the brakes, there being means for drawing the brake beams apart against the tension of the spring and a connection between the beams and a shifting lever.

**PARLOR AND SLEEPING CAR.**—James M. Osgood, Boston, Mass. This inventor has devised an improved car in which the chairs or seats employed for day use may be readily converted into sleeping berths so arranged that the berths of a section will overlap each other to a certain extent. The several sections of the car are also provided with separating partitions that may be compactly folded in the side framing of the car in the day time and extended transversely in connection with the berths at night. An intermediate partition divides a section into two compartments for night use, and the seats or chairs are so attached to the floor that they may be all moved to one end, thus making a reception room of the body of the car. Further details relative to this invention may be had by application to the Osgood Car Company, 37 Tremont Street, Boston, Mass.

Electrical.

**TELEGRAPH REPEATER.**—Charles W. Leiser, Carlisle, Ill. A cheap and efficient instrument is provided by this inventor, one that needs but little care after being once adjusted to the circuits over which it is to be worked. It comprises two relays provided with armature levers, each having two spring contacts furnished with limiting pieces, two stationary contact points for each armature lever, two batteries connected with the main lines and with the forward stationary contacts of the relays, while the electrical connections, the relays and their armatures, are oppositely arranged with respect to each other. The instrument may be constructed of common telegraph relays at small cost, obviating the necessity of building special new instruments.

Mechanical.

**PIPE WRENCH.**—William H. Furbee and Thomas Barrett, Manning, West Va. This is an improvement in what are known as chain wrenches, the chain being held at one end to the handle and having at its other end a gripping link, a portion of the handle being arranged to engage and operate the gripping link. When once adjusted it may be used on a considerable range of sizes of pipes, the nose or projection of the handle tilting the gripping link to properly engage the pipe, while a bail holds the link to the head of the wrench without interfering with the link by the swinging of the handle.

**EXHAUST FAN.**—Samuel Rembert, Memphis, Tenn. This is an improvement in fans designed to facilitate the conveyance through piping of seed cotton, cotton seed, etc., and the construction is such as to avoid injury to the conveyed material by contact with the blades of the fan. The fan casing has a lateral inlet, and held to and revolving with the fan is a perforated guard, which is arranged between the blades and the side of the case having the inlet opening, thus forming a passage for the cotton along the guard and between it and the case, while the turning of the guard plate facilitates the flow of the material.

**CIGARETTE BOX MACHINE.**—Domingo Perez y Bunol, Havana, Cuba. This machine not only makes the boxes but packs the cigarettes. It comprises a series of mechanisms acting together to form a sheet of paper into the shape of a box, then introduces the articles to be packed in the boxes and closes the latter. A paper or cardboard feed device supplies periodically the necessary material for each box, a cutter dividing the

material into pieces of the right size and shape, when a conveyor carries the cut pieces to a former which makes the shape of the box, which is then carried to a position to receive the articles to be packed. The cigars, cigarettes, or other articles to be packed are mechanically arranged in regular lines or rows before being conveyed to the unfinished box.

**OPERATING JIG PLUNGERS.**—Adren L. Heaston, Bingham Canon, Utah. In ore concentrating jigs this invention provides a device for operating the plungers in such manner that a quick drop is given to the plunger to cause the water to be dashed upward with great force through the screen to readily separate the valuable particles from the tailings. The plunger is secured to a lever pivoted on the tank, and near its pivoted end, the long arm of the lever being slowly raised by a cam, and quickly returned by a spring, thus throwing the water upward against the material contained in a sieve.

**PIPE COUPLING AND FITTING.**—William H. Le Chard and John A. Best, Atlantic City, N. J. In long screw pipe couplings and fittings intended to withstand high pressure, this invention provides the threaded portions with plain surfaces whereon are compressed soft metal collars for packing and making tight joints, such packing collar being kept always at hand when the sections are coupled or uncoupled. The sockets, locks or jamb nuts employed, and also the mouth portions of the fittings, are so shaped that the soft metal collars will be effectually compressed between such opposing surfaces, the collars being wider at their inner than their outer peripheral surfaces.

Agricultural.

**FARM GATE.**—George W. and John E. Lilly, Seafalia, Mo. This invention is for an improvement in horizontally swinging gates adapted to close automatically by gravity, and whose free ends may be adjusted as required to swing over stones or other obstructions, such adjustment also facilitating the separating of small domestic animals, as sheep and swine, from larger ones, as horses and horned cattle. The gate is formed of horizontal slats and pivoted vertical connecting bars, and hinged alongside is a triangular device formed of a right angular rod and a tension rod, while a toothed plate secured vertically to the gate proper engages the pointed end of the device.

Miscellaneous.

**AERIAL PHOTOGRAPHIC APPARATUS.**—William A. Edley, Bayonne, N. J. In apparatus to be carried by a kite string to properly support photographic cameras for taking negatives of the surroundings from a great altitude, this inventor has devised a novel form of hanger, which, with a boom extended from its lower end, are connected with the kite string, the hanger supporting a platform to which the camera holder is hinged, there being means for elevating the rear end of the holder, over which also extends a hinged arm adapted to engage the shutter operating button, and a string extending downward from this arm to the ground. By drawing on this string the shutter of the camera is operated to make the exposure at the desired time. The platform may carry several cameras, the strings being connected and all simultaneously operated in the same way.

**SEWING MACHINE HEMMER.**—Mary R. K. Fowkes and Mary E. J. Bennett, Selma, Ala. The improved hemmer devised by these inventors is designed to produce hems of any width, from one-fourth of an inch to eight inches, and it may be applied with very slight changes to either lock stitch or chain stitch machines. The improvement comprises a base plate with front slot and parallel graduations, in combination with a slotted gage bar with foot, a cross bar with clamp bolt secured in the slot of the base plate and a separate hem turner.

**TYPEWRITING ATTACHMENT FOR ADDING MACHINES.**—George W. Dudley, Charleston, West Va. Two patents under the foregoing title have been granted this inventor for improvements upon an invention formerly patented by him, according to one of which it is intended to extend the scope of the machine by providing it with a fully equipped alphabet, with numerals and characters, adapting the machine for making statements of accounts and doing all kinds of clerical work involving the use of letters or figures. The object of the invention covered by the other patent is to enable the combined adding and printing machine to operate upon and print directly on blank books, such as bank books, pass books, etc., and to this end the printing carriage and its associated parts are reorganized to enable the blank book to be readily placed in the machine and the extensions, and the totals to be printed directly on the pages.

**ICE CREAM FREEZER.**—George S. W. Brown, Athens, Pa. This is a household appliance comprising the freezer, a tank for storing the cream when frozen, an ice water tank or refrigerator, all built in cheap and compact form, and designed to be of great utility. Within the frame of the freezer is a revolving freezing cylinder, and the mixture that is to be frozen is held in a receptacle that is vertically adjustable in relation to the cylinder, a scraper being suspended from the frame so as to bear against the cylinder, scraping off the frozen cream and allowing it to drop into a receptacle below.

**FILTER.**—Edon A. Brashear, Western Port, Md. This filter has a central inlet at its bottom and a central filtered water chamber opening at the bottom into a surrounding sand space, there being two vertically adjustable concentric tubes forming an upward passageway for water and sand, and both tubes being open at their lower ends and forming a compound valve with the bottom of the filter to cut off the sand by their successive action, while forming a tight joint. The filter is designed for household purposes or larger uses, and the sand used as the filtering medium may be agitated and cleansed from time to time by the admission of water under pressure.

**LAMP.**—William H. Kincaid, Santa Barbara, Cal. According to this invention, a series of inwardly converging reflectors is grouped around a cen-

tral light, while transparent panes are located exteriorly of the reflectors and extending from the back of one reflector toward the reflecting face of the adjacent reflector. The lamp frame consists of two sections connected by a vertical hinge joint, and a series of light reflectors secured to the frame is grouped around the central light, whereby the rays are first concentrated and then directed to properly light the streets, instead of diffusing the light all around, and unnecessarily lighting objects in the immediate neighborhood of the lamp.

**BASKET.**—William R. Yerby, Athens, Ga. This invention is for a cheap and durable basket designed especially for farm use in the gathering of products, the basket being readily made without the use of skilled labor. It is composed of an open rectangular framework, held together by brace wires, while a bag having pockets at its upper edges receives the four upper bars of the frame, the bottom of the bag being engaged by penetrating points and supported on the wires.

**BELT FASTENER.**—Jonathan Hill, Jersey City, N. J. This is a fastener for machine driving belts, consisting of a locking bar terminating in heads, washers passing over the heads of the bar and a key passing through the washers and engaging the straight side face of the locking bar. The fastener is readily applied to connect the ends of a belt, the locking bars and keys being given a curved form when the belt is placed on a pulley, and the point of a junction forming a ridge extending away from the pulley.

**DOOR SPRING AND CHECK.**—Christian Bayer, New York City. A swinging arm is mounted on the door casing, according to this invention, there being a barrel on the free end of the arm and in the barrel a rotating block through which extends a rod connected with a shaft designed to rotate on the door, there being a spring connected at one end to the shaft, and a chain extending from the other end of the spring around the barrel on the arm. The construction is simple, and the device is not liable to get out of order, while it operates effectively to close doors without slamming them.

**TRACE CARRIER.**—Edward A. Cotham and George Wells, Monticello, Ark. This invention is for a buckle especially adapted for use on the backband of a harness, there being on the buckle a safety snap or its equivalent adapted to be attached to the trace, such snap or other device having a swivel connection with the buckle to prevent chafing or rubbing the sides of the horse.

**HORSE DETACHER.**—James H. Dunington, Washington, Pa. This is an attachment for the front axle of the vehicle, and also the thills, the portion connected with the thills being readily disconnected from the portion attached to the axle to permit the forward or thill carrying section to be quickly disengaged, and thus admit of the instant release of an unruly or runaway horse. The device is very simple and inexpensive, the disengagement of the animal being effected by pulling on a cord extending to convenient reach of an occupant of the vehicle.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co. for 10 cents each. Please send name of the patentee, title of invention, and date of this paper.

NEW BOOKS, ETC.

**THEORY AND CALCULATION OF ALTER-NATING CURRENT PHENOMENA.** By Charles Proteus Steinmetz, with the assistance of Ernst J. Berg. New York: The W. J. Johnston Company, 253 Broadway. 1897. Pp. xvii, 431. Price \$2.50.

In this work we have a very valuable contribution to what may be properly termed the greatest development of the new electricity. The title discloses its subject, which is treated by a high authority. Dr. Steinmetz has long been known as one of our best electrical mathematicians, and in this work at last we have his contribution to the world's work issued in really good shape. The time has gone by when electricity can be treated entirely from the practical aspect. Theory is absolutely required, and the mathematical treatment given to the different theoretical studies is imperative. Formerly the higher mathematics were kept out of electrical books as far as possible, but the new school of educated electricians, well versed in analytical mechanics and in the calculus, will hope to find in such works as that of Dr. Steinmetz a precursor of many others.

**DIE KRAFTUEBERTRAGUNGS-WERKE RHEINFELDEN.** Technische und Wirtschaftliche Darstellung der Ausnutzung der Wasserkraft des Rheins bei Rheinfelden. Herausgegeben von der Allgemeinen Elektrizitäts-Gesellschaft. Berlin: Druck von H. S. Hermann. 1896. Pp. 173.

Transmission of power has received great attention in Europe, and electricity has lent itself to the work with great effect. This monograph is devoted to the river Rhine as a source of power and to the development of the power depending upon its flow. It treats of a most important enterprise in the use of water power and electrical energy. It is profusely illustrated and well printed, and gives the details of the work in several general divisions, such as water power, the generation of electric energy, its transmission and utilization.

**BERLIN UND SEINE BAUTEN.** Berlin: Wilhelm Ernst & Sohn. 1896. Three parts in two volumes, 1,550 pages, 2150 illustrations in the text, 18 plates and 5 maps. 4to. Price stitched, \$15 exclusive of importation expenses.

This work is very comprehensive in its scope and deals with every department of architecture and all kinds of public works in the city of Berlin and its chief suburb, Charlottenburg. Owing to the fact that Berlin is the seat of county and provincial authorities as well as of those of the Prussian kingdom and of the German empire, the number of public buildings is very large. The municipality also is world famed for the thoroughness and effectiveness of its work. The publication above re-

ferred to gives us an excellent review of the various public buildings, such as the new parliament building and the cathedral, which is being constructed, the various institutions of learning and office buildings as well as residences. Special chapters are devoted to descriptions of the parks, the streets and squares, canals, bridges, street railways and other means of communication. The systems of water supply and of sewerage, the lighting of the city, the fire brigade and the street cleaning department are fully treated. The book also gives an account of the industries represented in Berlin, as well as of the markets and other buildings provided by the municipality for the convenience of the public. The illustrations are excellent and numerous, and the work is highly creditable to the publishers as well as to the editors.

**THE A B C OF THE X RAYS.** By William H. Meadowcroft. New York: The American Technical Book Company. Pp. 189. Price in paper 50 cents, cloth 75 cents.

The present work by the author of another well known book bearing in part the same title will, we are convinced, be very acceptable to many. The book is excellently illustrated, well printed and has a very satisfactory index. The radiograph, with accompanying photograph of a mummy's hand, that of an Egyptian princess, may be cited as an example of the illustrations, some of which in half tone work are of unusual clearness.

**TABLES FOR THE QUANTITATIVE ESTIMATION OF THE SUGARS.** With explanatory notes. By Dr. Ernst Wein. Translated, with additions, by William Frew. London: E. & F. N. Spon. New York: Spon & Chamberlain. 1896. Pp. xiv, 128. Price \$2.40.

This work in the original German has been very widely used both in Germany and America by sugar chemists, and is regarded by them as a standard work on this subject. It is largely made up of tables, only enough text being introduced to explain them, so that it amounts in great part to a reprint of an important set of tables for practical use, the text and headings being translated and the whole put into English dress.

**THE COMMERCIAL ORGANIZATION OF FACTORIES.** A handbook for the use of manufacturers, directors, auditors, engineers, managers, secretaries, accountants, cashiers, estimate clerks, prime cost clerks, bookkeepers, draughtsmen, students, pupils, etc. By J. Slater Lewis. London: E. & F. N. Spon, 125 Strand. New York: Spon & Chamberlain, 12 Cortlandt Street. 1896. Pp. xxxvi, 540. Price \$12.

We have to rely upon the title of this book to tell to some extent the ground it covers. It treats of the management of the force of a factory and of the use of the different kinds of time registering systems. In some places it affords somewhat curious reading, the English system of personal interference being quite strongly brought out in some of the provisions. In it is elucidated at great length many systems of conducting the different departments of an establishment. As an example we would refer to the portion devoted to the ticket system of keeping exact account of the work done by each man, of the time wasted by him, of his late comings, etc. The illustrations of the book are numerous—including the shape and inscriptions of checks for time, of paper slips, of tickets and bill heads. Certainly it is curious to see the workings of a factory brought down to so scientific a basis as that indicated.

**DIE SIEDESALZ-ERZEUGUNG VON IHREN ANFAENGEN BIS AUF IHREN GEGENWAERTIGEN STAND NEBST EINEM ANHANGE UEBER SEESALINEN.** Von Carl Baltz, Elder von Balzberg. Berlin: Wilhelm Ernst & Sohn. 1896. Pp. 159. Also an atlas of 19 plates. Price \$8.

This is a very exhaustive work on the methods and apparatus for the production of salt from salines. The subject is treated in a very interesting manner, the chronological order being followed in most of the chapters of the book. Although continental European procedures are described with most detail, still improvements due to Englishmen and Americans are not omitted, so that the author may rightly claim to have produced a thoroughly complete work. So far as we know, no similarly exhaustive work has been published hitherto, and the fact that the book received the highest award in a prize competition is further evidence as to its thoroughness. All improvements made since 1860 are described very fully, the apparatus for boiling, drying, and purifying the salt being treated with considerable minuteness. A separate chapter is devoted to methods introduced at a comparatively recent time, such as the hot air method, the cooling method, the vacuum method, the Rittenger-Piccard method, also the production of salt by utilizing the heat of the sun's rays. Another chapter treats of the various uses to which salt is put in the household and in different industries and arts. This chapter is particularly interesting. The production of salt from sea water forms the subject of the last part of the book, and there is appended a catalogue of works bearing on the matter treated in the book, so that reference to the original works utilized is made very easy.

**Education by Correspondence.**—We have received the 1897 catalogue of the International Correspondence Schools, Scranton, Pa. The catalogue contains a description of the courses of instruction in the schools and states the methods by which the work is conducted and a history of the institution. Correspondence schools are not intended to take the place of regular institutions of learning, but in many cases the correspondence school admirably meets the requirements of those who for the want of time and means cannot attend regular schools where scientific and technical subjects are taught. The instruction papers are sent out and questions are furnished which the student must answer. When a set of answers is received by the school it is examined, corrected, and returned with such suggestions and criticisms as will enable the student to understand the subject thoroughly.