RECENTLY PATENTED INVENTIONS.

Electrical Devices.

INSULATOR.—J. A. Hanson and A. F. Lambert, Davenport, Wash. This invention relates to insulators, more particularly of the type used upon wire fences where it is desirable to employ one or more of the fence-wires, for the purpose of telephoning, telegraphing, etc. The dielecric may be made of porcelain, clay, china, or other brittle materials, and the staples may be rapidly secured upon the same by any farm laborer.

CURRENT-REGULATOR. — E. Dysterud, Monterey, Nueva Leon, Mexico. The object of this invention, which relates to automatic current-regulators, is to produce a neat, simple, and efficient form of regulator which will require a minimum of attention and which is not liable to get out of order. The instrument works best where the variations in current strength are comparatively light; but it may be nevertheless used to advantage whether the variations are considerable or are abrupt. It also serves to render the potential of the current being generated substantially constant.

Hardware.

NUT-LOCK.—J. F. Rieman, Goshen, Ind. The aim of this invention is the provision of a simple nut-box that may be easily applied and removed, that effectively holds a loose nut, permits of convenient release for tightening the nut against an object, takes up no available room, is perfectly reliable in service, and that may be produced at low cost.

WIRE-ROPE CUTTER.—M. T. Wolf, Washington, Pa. Mr. Wolf's invention relates to means employed for drilling deep wells to obtain water, gas, or oil. The intention is to provide a cutting device that may be conveniently lowered in the well-bore and by its impact on the drill-holder be caused to cut the wire rope that has been connected with the drill, and thus permit the removal of the rope.

Machines and Mechanical Devices.

ROLLER-BEARING.—R. F. Bower, Lima, Ohio. The object in this improvement is to provide a construction of bearing which will be useful wherever a journal-bearing is desired and will be especially useful in such bearings as are designed to permit lateral motion by allowing the shaft or journal to slide laterally in the bearing. It may be used in car-axle boxes or line shafts, stationary machinery, propeller-shafts, and wherever a journal-bearing is employed.

MAGNIFYING ATTACHMENT FOR SEWING-MACHINES.—Sallie Jones, Glasgow, Ky. This device will facilitate the setting, threading, or adjustment of the needle, etc. Persons having defects of vision find it almost impossible to make adjustments and extremely difficult to even thread the needle. The purpose is to overcome these difficulties and permit any one to make the most delicate adjustment of the needle, thread it, and see that the sewing is properly executed.

CASH-REGISTER.—J. C. Vahjen, New York, N. Y. Mr. Vahjen's purpose is to provide a positively-acting construction whereby as each lever-key is depressed a corresponding tablet will be displayed and remain so until another key is operated, each key returning automatically to normal position on release. Also to provide means whereby a key must be fully depressed at each operation to discharge a printed check of amount, which check is cut from a roll of tape and drops from the machine with a display of the tablet. When a key is partially depressed it cannot be forced to normal position before pressed downward to the limit of its travel. Mr. Vahjen has invented another cash-register which relates to a printing mechanism for registers operated by key-levers, which mechanism is particularly designed to print in duplicate and when desired to operate in conjunction with a knife adapted to cut one of the printing tapes or ribbons into checks for delivery from the machine, while the other printed tape remains concealed within. The purpose is to provide a construction of printing attachment applicable to any key-lever-operated machine.

AUTOMATIC PIANO-PLAYER.—H. Meyer, New York, N. Y. The object of the invention is to provide an automatic player for a piano, organ, or like key-actuated musical instrument arranged to permit convenient varying of the speed of the note-sheet traveling over the tracker-board to actuate the key-strikers with more or less force, to keep the note-sheet in proper alinement with the tracker-board, and to quickly reroll the note-sheet.

SAWING-MACHINE.—E. H. Hoff, Mosinee, Wis. The invention relates to improvements in sawing-machines for felling trees, sawing stumps, or the like, an object being to provide a machine of simple construction that may be easily carried from place to place, that may be operated with comparatively little manual exertion, and in which the saw may be arranged for operation at any desired angle.

Pertaining to Vehicles.

STEAM-SLEIGH.—J. R. Tibbits, Delmar, N. Y. The invention consists in effective means whereby the sleigh may be guided. The propelling means and the guiding means are thrown into and out of engagement with the snow or ice by levers extending up within reach of a person sitting on the sleigh-seat. The guiding means has the further advantage in being adapted to be used as a brake.

Prime Movers and Their Accessories.

RELIEF-VALVE.—S. O. Brune, Mine Centre, Canada. In this patent, the object of the invention is to produce a simple, efficient, and reliable device adapted to be easily and quickly applied, capable of a quick action when pressure is admitted, so as to minimize leakage of steam, and susceptible of regulation to adjust itself to different steam-pressures.

HOT-WATER COOLER.—J. S. Scott, Brantford, Canada. In the present invention the aim is to provide a new and improved hot-water cooler, more especially designed for use in connection with the water-jacket of an explosive-engine or the like and arranged to insure a quick cooling of the water to keep the cylinder cool at an approximately uniform temperature.

Of General Interest.

ENVELOP-CLASP.—A. De Saint Chamas, Chicago, Ill. In carrying out this invention Mr. Chamas has particularly in view the provision of a clasp or fastener which will securely seal an envelop or similar receptacle in such manner that the latter may be quickly and rapidly opened by the postal authorities or other persons to permit the contents to be inspected and such envelop then to be readily closed and sealed again. The clasp or clip embodies features of simplicity, durability, lightness, and strength in addition to convenience in use—that is to say, the clasp may be readily adjusted and removed, while at the same time it will form a safe and reliable closure.

COMBINED HYDROMETER AND SYRINGE.—R. Van Benthuysen, New York, N. Y. The purpose here is to prevent hydrometer-tubes from touching the side walls of syringe-barrels and to provide means whereby to prevent rotary motion of the hydrometer in the barrels. And further the purpose is to so construct the scale section of the hydrometer-tube that it will be polygonal in cross-section, having a reading upon one face, for example, indicating density, upon another face degrees Baumé, and upon the third face a reading setting forth a required percentage of liquid to bring the solution tested to proper density.

CABINET.—W. B. Altick, Lancaster, Pa. Briefly stated, the invention comprises a rigid framing furnishing the top, bottom, and back wall of the cabinet and two arc-shaped sections which are arranged to slide between the top and bottom walls, so as to extend outward to meet at their front edges and close the cabinet or so that they may be folded back apart from each other, thus opening the cabinet completely. The invention relates to a cabinet designed so that a person using the telephone will not be annoyed by surrounding noises or his conversation heard by persons near.

COMBINED TABLE AND DESK.—J. McG. Wood, Court-House, Ohio. Mr. Wood's invention relates to improvements in combined tables and desks, an object being to provide a combined table and desk so arranged that when not in use the desk may be slid into the table, so that the complete device will occupy comparatively little space.

CAN.—C. B. Howell and A. C. De Yoe, Campbell Hall, N. Y. In this case the invention relates to cans used for the transportation and storage of milk and like fluids; and the object of the invention is to provide certain new and useful improvements in cans whereby the ears for the handles of the can are securely fastened in place to prevent the ears from becoming loose or detached and the handle lost.

HOSE-SUPPORTER.—A. M. Wilson, Cherokee, Iowa. Briefly stated, the object of this improvement is to provide a supporter arranged to give the desired comfort and ease to the wearer, especially when moving the limbs or bending the body, and to prevent undue strain on the hose or the parts of the supporter. The supporter may be attached to a corset without danger of accidental detachment when the corset and supporter are worn or when the corset is removed and with it the supporter.

SELF-CLEARING PROPELLER.—C. H. Lee, Southampton, N. Y. This improvement is more especially adapted for use on that class of vessels known as "launches," although the principle may be utilized in propellers adapted for service on other styles of marine vessels. The object is to provide means in co-operative relation to the propeller for removing seaweed and other vegetable matter from the blades, thus making the propeller self-clearing and overcoming the lodgment of matter that interferes with the efficiency of the propeller.

HAIR-PIN.—Louisa Ousey, Bellevue Villa, South Wimbledon, Surrey, England. In this patent the invention is in the nature of an improved hair-pin constructed in such a manner as to enter the hair easily, to glide smoothly over the scalp without pricking, abrading, or scratching the same, and at the same time to hold the pin in the hair against falling out.

BLOCK AND TACKLE.—J. O. Walton, Boston, Mass. The invention in this instance is in the nature of a novel block and tackle designed to provide a very compact construction of great power in which the blocks may be conveniently formed by casting and in which the various runs of the rope are sufficiently separated to avoid rubbing against each other, thereby reducing friction and increasing the efficiency of the device.

BOTTLE-CLOSURE.—B. Clemens, Moundsville, W. Va. The present invention refers to a cap or closure intended particularly for bar-bottles used in retailing liquid goods. It may be applied, however, to various other purposes. It comprises, broadly speaking, a body preferably of spring metal, so as to snap over and retain its position on the mouth of the bottle, a spout projecting from the body, and a peculiarly-arranged cover for the spout.

WRITING-TABLET.—D. F. Curtin, Butte, Mont. In this instance the invention relates to that class of tablets in which a continuous strip or supply of paper is held within a case and drawn out of the case and over the outside thereof which forms a base upon which the paper rests while being written on; and the object is to provide a tablet combined with a supplementary receptacle for holding pencils, matches, stamps, etc.

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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READ THIS COLUMN CAREFULLY.—You will find inquiries for certain classes of articles numbered in consecutive order. If you manufacture these goods write us at once and we will send you the name and address of the party desiring the information. **In every case it is necessary to give the number of the inquiry.**

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Handle & Spoke Mchy. Ober Mfg. Co., 10 Bell St., Chagrin Falls, O.

Inquiry No. 5421.—For machines to graduate linear measure in inches and their subdivisions.

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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. 5427.—For manufacturers of pocket match boxes and similar novelties.

The largest manufacturer in the world of merry-go-rounds, shooting galleries and hand organs. For prices and terms write to C. W. Parker, Abilene, Kan.

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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. 5429.—For manufacturers of transparent celluloid, in very thin sheets.

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Inquiry No. 5430.—For manufacturers of roller skates.

Wanted by a manufacturer owning his own plant with both wood and metal-working machinery, as a side line, some article or novelty that will have a ready sale during fall and winter months, located near Boston, Mass. Novelty, Box 773, New York.

Inquiry No. 5431.—For an outfit for cutting stencils in brass sheet.

"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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Patent and Export Company, Christiania, Norway. Specialty: Sale of patents and patented articles in Norway, Sweden and Denmark. Corresp. solicited.

Inquiry No. 5433.—For manufacturers of small circular cardboard boxes about ½ by 2 inches

Inquiry No. 5434.—For makers of small locomotives.

Inquiry No. 5435.—For manufacturers of rubber toys.

Inquiry No. 5436.—For a small family ice machine which makes 100 pounds of ice.

Inquiry No. 5437.—For handpower scroll punches and hand power corking machines, such as used in manufacturing iron fence.

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.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

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.

(9369) C. W. B. says: I do not wish to prolong any argument about how the ocean got its saltness, but in your letter in reply to my letter in which I suggested that the ocean became salty in primeval time when the water first settled on the surface of the globe, it brought down chlorine gas and was the medium for uniting that with sodium in such quantity that the whole ocean became salty, as at present. You say that you will not altogether disagree with my suggestion, but then you add: "The water of the ocean was once fresh water. It has received salt from the water that has come into the ocean. LeConte says that salt lakes received their salt from deposits left by the ocean. The ocean received its salt from the rocks." Now, if this last statement is true, how did the salt get into the rocks? Salt is not an original element. There must have been a time when its constituents were separate and independent. All of the seven geological text books that I have before me claim or assume that all salt deposits or brines are remnants of the ocean evaporated. The salt in the rocks that you refer to must have been deposited there by water, and that water was salt water. When I first wrote you my impressions as to the origin of the saltness of the ocean I could not find any authority for it. But now I find it in Prof. Alexander Winchell's "Sketches of Creation." After saying that the deposits of salt found everywhere are dried-up remnants of the ocean, he says, on page 296: "How the waters of the sea came into possession of their saltness is a question of primeval chemistry to which allusion has heretofore been made. It was the result of the chemical actions which took place between the fire-born rocks and the atmospheric acids washed down by the primeval rains, and gathered with the gathering together of the waters." In discussing the various chemical unions that probably took place when the primeval waters settled on the globe he says, on page 60; "Carbonate of lime refusing, for the greater part, to dissolve in sea water, would settle to the bottom and become limestone; while chloride of sodium—which is only the chemist's name for common salt—remained in solution, and thus gave its characteristic salinity to the sea." Unless you can find a better authority than this I think you will have to concede that the ocean got its saltness originally from the union of chlorine gas brought down by the primeval rains which constituted the medium for bringing that and sodium together to form salt; and that all the salt in the rocks, soil, mines, or wells was deposited from some evaporated part of the salty ocean. A. We now understand that we are thinking of the earth at one time and you at another in reference to the genesis of salt water in the ocean. At some time the earth was hot, too hot for water or salt either, to exist. When the cooling had proceeded far enough, the various substances began to combine, and chemical action became possible between the several elements as their various temperatures of association were reached. Thus water was formed. We did not suppose that any one would maintain that water was salt at first, and although you assert the original saltness of the ocean, we must think that you cannot intend this declaration to apply to the genesis of the water in the seas. The salt itself must have been formed at some time when the earth had cooled below the temperature of dissociation of sodium and chlorine. We confess we do not know when this was in the sequence of events under discussion, but suppose any one asserting positively regarding this matter must have definite knowledge on this important point. The quotation you make from Winchell is quite to the point that the water now in the sea was originally fresh. The salt "was the result of the chemical actions which took place between the fire-born rocks and the atmospheric acids washed down by the primeval rains, and gathered in by the gathering together of the waters." That is sufficient. The salt was formed after the water was formed and gathered in by the inflowing of the waters into the lower parts of the earth. It does not seem necessary to pursue the subject farther.

(9370) G. S. T. asks: 1. By what rule would you determine the size boiler to build to supply a cylinder of a given size? A. The cylinder size is usually made to represent a certain horse-power at some assumed pressure, cut-off, and speed of the piston, and for each horse-power an allowance of 12 square feet of heating surface and a half square foot of grate surface must be provided for in the boiler. 2. What chemical composition is it that when it comes in contact with water immediately burns and bubbles up like lava on the surface? A. Any dry mixture of an acid and an alkali, as for example tartaric acid and carbonate of soda, will make a rapid effervescence when water is dropped on the dry mixture. 3. What is the meaning of the word "phase"? I have several electrical volumes and sets, but one or two of them explain it in such a manner as to make it incomprehensible to a person not very far up in electrical knowledge. Really what I want to know is the difference between a two and a three-phase machine, and how you tell the difference? A. Phase is a current impulse which may be multiphase by alternating two, three, or more times in a multipolar generator of four, six or more poles for each revolution of the armature. The difference may be known by the different direction of the pole winding. See two and three phase system illustrated in SCIENTIFIC AMERICAN SUPPLEMENT Nos. 822, 831, 10 cents each mailed.

(9371) F. A. M. says: We are setting a new steam boiler 60 x 16 inches, and in bringing up the question of water supply, our local steam engineers all contend that with a given amount of fuel more steam can be generated by supplying the boiler with water from a nearby spring by means of an injector, or inspirator which will heat the water before entering the boiler, than can be had if we use the local gravity water system, which has sufficient pressure to force the water into the boiler directly against the steam pressure, but which would be cold as it entered. The writer contends in favor of the gravity system, inasmuch as the effort of lifting the spring water will be overcome. Will you please advise us as to the correctness or advisability of both methods? A. We advise the use of the gravity system to feed your boiler, if it can be trusted for full pressure at all times, but do not neglect other means of feeding your boiler to guard against accidents. The same heat power must be used from the boiler whether the water is fed cold or is heated by the injector. If the gravity supply can be supplemented by waste heat of the exhaust steam or chimney heat, the greatest economy may be obtained. If cold-water feed is adopted, the water should enter the boiler above the tubes and be distributed through a perforated pipe for best effect.

(9372) J. P. M. asks: With a heating apparatus for a residence, that seems to burn either anthracite or bituminous coal with equal facility, what will be the comparative heating value of the two of average market quality, weight for weight? A. The total heat units of combustion of the good marketable coals of the United States scarcely varies 1,000 heat units from the mean of 14,000 heat units per pound of the various kinds, as semi-bituminous, bituminous, and the various grades of anthracite. The available heat per pound of fuel depends much upon the method of firing and the kind of furnace used. In furnaces for heating dwellings, far the larger number are designed for anthracite coal and are not suitable or economical with bituminous coal. The excessive waste of smoke fouls the heating surfaces and the heat is lost through the chimney. In furnaces with underfeed appliances the economy in heating gives bituminous coal an equal quality with anthracite; but the care is somewhat greater.

(9373) E. H. A. writes: I was much interested in what you had to say about the reason for water hammer (Query 9329, page 239 of SCIENTIFIC AMERICAN for March 19, 1904). We are troubled with musical water pipes, always in the cold-water pipes. Will you kindly give the cause of it? Can it be stopped permanently? Turning on the cold water and then shutting it off stops it for the time being. Sometimes it stops for a long time. A. We have little experience with musical water pipes, except from the tremor of loose valves when drawing water, which may be heard all over the house when any bibb is running with a loose valve disk. The noise from the kitchen boiler by the condensation of the steam from the water back is quickly stopped by opening the hot-water bibb and drawing off a quantity of hot water. This noise is also heard all over the house by the reverberation of the pipe system. Sometimes leakage through the rubber disks of compression valves makes a musical sound by the vibration of the rubber lip of the valve disk. Its location is easily traced, when a new disk may be inserted. Your plumber should know all about this trouble and its correction.

(9374) S. G. A. asks: Would thank you to inform me in the next issue of your paper, whether the buoyant effect of water at the surface is greater in deep water than in shallow; that is, will deep water carry a greater weight in a boat than shallow water will? A. The buoyant effect of water on a boat is the weight of water the boat displaces. It is therefore not greater at one part of the sea than at another part. The depth of the water has no effect on buoyancy.

(9375) J. A. M. says: In rounding a curve on a railroad one rail is longer than the other; the wheels on a car that are on the longest rail must travel farther than the wheels on the short rail. As axle and wheel are one piece, both wheels must make the same number of revolutions. Please explain how this is done. A. It is very evident that with fixed car wheels on the axle, a considerable slipping must be done in rounding a curve. The taper tread on the wheels was designed to help the curve traverse by riding the high side of the tread on the outer rail and the low or smaller part of the tread on the inner rail from the centrifugal force of rounding the curve. This but slightly fills the requirement, and slipping of the wheels does the rest. By the centrifugal force of rounding a curve, the greatest pressure or load is thrown on the outer wheels and the inner ones do most of the slipping forward. By close observation of the rails on curves, it may be plainly seen that the wheels slip on both the rails, as shown by the wear.

(9376) M. G. D. writes: In a discussion I contended that steam from a boiler at say 100 pounds pressure, allowed to expand to atmospheric pressure in a system of heated tubes, will issue from this heating coil at or above the temperature of the steam in the boiler if the tubes are kept hot enough; in other words, that high-temperature steam can be obtained without high pressure by an arrangement as above described. The other party says that under no condition can steam be obtained above 212 deg. F. without increasing the pressure above that of the atmosphere. A. Steam circulating in heating coils cannot be kept as hot as the steam in the boiler without outside heat to counteract radiation; but by expansion to atmospheric pressure in a coil without receiving heat, pressure and temperature will both fall and temperature of the exhaust will be 212 deg. F. By superheating or adding heat in the coil, any desired temperature, even far above that of the boiler, may be had in the exhaust and far above the temperature due to the pressure in the pipe of the coil. The general principles of the use of superheated steam are discussed and illustrated in SCIENTIFIC AMERICAN SUPPLEMENT Nos. 1068 and 1069. We think that the articles on superheated steam in SCIENTIFIC AMERICAN No. 24, vol. 74, also SUPPLEMENT Nos. 1387 and 1408, would also be of interest to you; price 10 cents each mailed.

(9377) S. T. Co. writes: We note in a recent issue that you advise the use of alcohol to remove ink spots from typewriter keys. Allow us to state from experience that this is not effective, because as celluloid keys are referred to, the alcohol (particularly if wood alcohol) will dissolve the celluloid and ruin the appearance of the keys. Javelle water is the best substance to use.

NEW BOOKS, ETC.

THE FACTORY MANAGER AND ACCOUNTANT. Some Examples of the Latest American Factory Practice. Collected and Arranged by Horace Lucian Arnold. New York: The Engineering Magazine. 1903. 8vo. Pp. 431. Price $5.

The author deals with this subject in an admirable manner, and the forms or blanks which are illustrated would certainly tend to give the manager of any large plant most valuable points. The book is made up of several complete factory systems, both the costing and commercial blanks being accurately reproduced, each one having the actual size in inches given, together with its color and the material on which it is printed. The reader is thus enabled to reproduce any form and apply it in his own practice, and he may also trace its action and effects in relation to the entire accounting of the factory, and can compare his own practice with that of other managers, cost-keepers, or accountants. It is certainly to the credit of the various companies represented that they have allowed their forms to be reproduced. It is an excellent book.

SCHUTZ DER EISENBAHNEN GEGEN SCHNEEVERWEHUNGEN UND LAWINEN. Von E. Schubert. With 103 illustrations and an atlas of 38 plates. Leipzig: Wilhelm Engelmann. 1903. 8vo. Pp. 62. Price $1.25.

This monograph forms part of Schubert and Fink's "Handbook of Engineering Sciences," in which it appeared as the twelfth chapter under the title "Means for Securing the Safety of Railway Traffic." Beginning with the discussion of snowstorms, the author treats of snowdrifts and their effect upon railways. As a protection against snowdrifts he recommends various constructions, which consist either in modifications of the roadbed itself, or in cutting off the wind. A similar treatment is accorded to the subject of snow avalanches. One of the most striking parts of the book is an excellent series of illustrations, which clearly show how snowdrifts and avalanches originate, and how their course may be checked by walls, dams, fences, and the like.

FIRE AND EXPLOSION RISKS. By Dr. Von Schwartz. Translated from the German edition by Charles T. C. Salter. Philadelphia: J. B. Lippincott Company. 1904. 8vo. Pp. 357. Price, $5.

This work forms a complete handbook for fire insurance officials, members of the fire department, lawyers, factory inspectors and owners; in fact, anyone interested in fire risks and dangers and their prevention.

The book is divided into eleven parts, which treat of such subjects as the following: Fires and explosions of a general character; fireproofing; dangers caused by sources of light and heat, gases, agricultural products, various industrial materials, lighting and lighting materials; dangers in various establishments, such as drug stores, breweries, soap and sugar works, and the like; and danger from petroleum, oils, ethers, and other liquids, as well as from metals, oxides, acids, and salts. In completion of the general thoroughness with which the subject is treated, the book contains an appendix of eight tables giving the boiling, flashing, and fusing points of various liquids and substances, the working temperatures permissible in the various trades, together with an explanation of some of the principal processes and their risks, and dangerous substances that are liable to ignite and explode spontaneously, with their reactions. As a reference work for those having to do with fires and fire risks, the value of this volume is unquestionable.

ELEMENTS OF THEORETICAL MECHANICS. By Alexander Ziwet. New York: The Macmillan Company. 1904. 8vo. Pp. 494. Price, $5.

This work is a revised edition of "An Elementary Treatise on Theoretical Mechanics," which was published by Prof. Ziwet ten years ago. It contains practically the whole course in theoretical mechanics as taught at the University of Michigan; but, on account of the time limit of the course and the mathematical capabilities of the usual second-year student, the subject matter is confined largely to problems in one and two dimensions. Thus, although such problems as the motion of a rigid body around a fixed point had to be omitted, rectilinear motion and rotation about fixed axis have been more thoroughly treated than heretofore, and some illustrations of plane motion have been given. Fundamental subjects, such as simple and compound harmonic motion, motion under central forces, and the theory of moments of inertia, are treated very thoroughly. The book is theoretical in character, though numerous practical illustrations of the theories discussed are given. It is intended for use chiefly as a textbook, and the author's expressed desire is that it may tend to stimulate the study of theoretical mechanics in engineering schools.

ANTHRACITE COAL COMMUNITIES. By Peter Roberts, PhD. New York: The Macmillan Company. 1904. 8vo. Pp. 387. Price, $3.50.

This new work on the anthracite coal fields by Mr. Roberts will be welcomed by all who are familiar with his previous volume on "The Anthracite Coal Industry," published in 1901. While the facts relative to the economic life of the people of these regions were given in the former work, little or nothing was said concerning the social and moral life. In the present volume this is thoroughly dealt with; and the author, besides having a personal acquaintance with the people he describes, has had the benefit of much valuable testimony given before the Coal Strike Commission a year ago. The home life, different ways of living, the intellectual and religious life, the schools, the saloons, and the political system of these hard-working people are graphically and interestingly portrayed, while some 25 illustrations from photographs give one a good idea of the appearance of the people and of their homes.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending April 12, 1904.

AND EACH BEARING THAT DATE

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

Acid, 1-5 nitroanthraquinone sulfonic, R. E. Schmidt 757,057, 757,058
Adhesive supplying mechanism, A. Sheldock. 756,900
Adhesives, making, A. Nettl 757,337
Adjustable key, C. J. Caley 756,830
Advertising waste paper box, S. Leveen 757,403
Aerial vehicle, A. G. Bell 757,012
Air brake, J. H. Bleoo 757,015
Air heating system, C. A. Vaughn 757,074
Alkoxy-caffein and making same, F. Ach 757,330
Amusement apparatus, G. H. Du Clos 757,286
Animal trap, C. G. Hawkins 757,038
Animal trap M. C. Harlan 757,401
Artichoke trimmer, A. Roumiguiere 757,229
Assembling, forming, and setting mechanism, W. P. Devine 756,837
Atomizer, C. L. Turner 757,157
Atomizer, S. Kettle 757,200
Axle brasses, implement for replacing car, A. Case 757,266
Bag fastener, J. D. Wood 756,924
Bandage, suspensory, W. A. Tainsh 757,153
Barber's memorandum and cash drawer, L. A. Bucklin 756,825
Barometer, C. H. Stoelting 756,905
Barrel head securer, S. A. Hunter 757,309
Basket making machine, A. Pohorzeleck 757,344
Battery. See Dry battery.
Battery cell, E. Whitman 757,16
Battery, grid, storage, G. W. Frost 75,396
Battery plate grids, apparatus for making secondary, A. F. Madden 757,210
Bearing, convertible roller, J. C. Hoshor 757,115
Bed, G. L. Marple 757,327
Bed covering, E. W. Brown 757,256
Bed spring, Dixon & Ridgway 757,098
Belt stretcher, J. B. Conner 757,272
Bending machine, J. J. Wood 757,078
Bicycle handle bar support, R. H. Tate 757,154
Binder, loose leaf, J. L. McMillan 757,336
Binder, temporary, G. A. Shoemaker 756,901
Blind clip, Venetian window, F. Tenney 757,155
Blower, pressure, A. W. Case 757,267
Blue-red lake and making same. G. Gullbransson 757,109
Boiler and furnace, combined, W. W. Bonson. 756,822
Boiler purifier, steam, N. W. & S. Yantis 757,382
Bolt heading machine, H. O. Olson 757,409
Bolt holder, H. A. Parson 757,142
Bolting machine driving mechanism, sieve, Fraser & Mather 756,950
Bolting mill, Renault & Cusson 757,227
Bone holding device, K. Wintsch, Jr 757,166
Book holder, R. L. Kinman 757,202
Book, sample card, E. W. Bredemeier 757,389
Booster apparatus, L. Lyndon 757,405, 757,406
Bottle, W. Conard 756,939
Bottle, P. J. Germain 757,105
Bottle closure sprinkler cap, E. A. McIlhenny 757,216
Bottle, non-refillable, George & Norris 756,843
Bottle, non-refillable, W. A. Coke 757,391
Box fastener, C. W. Beebler 757,172
Brace balance weight, C. F. Keables 757,315
Braiding machine, J. P. Swift 757,423
Brake, M. A. Wodal 757,006
Brake rigging, W. G. Price 757,345
Bread and cake closet, H. W. Diers 757,282
Brick machine, H. A. Stouffer 756,906
Brick or building block, glass faced, J. H. Leighton 756,971
Brick pallet and truck, F. E. & E. A. Swift 757,068
Broom binding machine, S. P. Fraley 757,103
Brush, G. A. Vickery 756,998
Buggy top attachment, E. Walter 757,161
Building block, R. T. Frost 757,033
Bulkheads, construction of, J. Truax 757,368
Bung lock, H. Hubert 757,118
Burner igniting attachment, G. Oberlaender 757,219
Bustle, E. Vaughn 757,369
Button forming machine, collar, E. J. Yale 757,080
Button, lacing, A. L. Cole 757,025
Cabinet, C. F. Tholin 756,911
Cabinet, kitchen, E. Guelff 757,400
Can. See Powder can.
Can bodies, forming, F. D. Cleveland 756,832
Can valve attachment, oil, Young & Fuller. 757,170
Canopy, adjustable, E. G. Burland 757,175
Capstan, G. Hartweg 756,851
Car coupling, J. S. Henson 756,855
Car coupling, C. A. Tower 757,366
Car, derrick, M. Schmaltz 757,235
Car draft coupling, E. C. Washburn 756,918
Car, dump, J. C. Depew 757,279
Car hopper, dump, J. C. Depew 757,278
Car, railway, C. E. Stewart 757,427
Car replacer, H. Q. Hall 757,299
Car seat, emergency, M. H. Murch, Jr 757,334
Car, stock, J. L. Rouze 757,349
Car underframe, railway, J. M. Hansen 757,110
Cars, flexible metallic pipe coupling for railway, J. Joynt 757,313
Cars, mounting boppers for dump, J. C. Depew 757,277
Carbonator, F. B. West 757,375
Carbureter, gas engine, G. F. Swain 756,908
Carbureter, internal combustion engine, G. McCadden 756,879
Carpet fastener, R. Reininger 757,226
Carpet rod and fastener, stair, C. Michael. 756,875
Carriage top seat iron, H. C. Swan 757,363
Cart, dumping, S. Gantz 757,293
Carving machine, automatic, F. Streich 757,151
Carving machine, automatic, Streich & Ruebs 757,152
Carving machine, automatic, Ruebs & Streich 757,230
Carving machine, automatic, F. Streich 757,243
Cash register, W. G. Powell 757,223
Cement, apparatus for the manufacture of slag, C. Gramm 757,035
Cement composition, magnesia, E. Bietel 757,252
Cement mold, R. B. Coltrin 757,093
Cement molding apparatus, R. B. Coltrin 757,094
Chain, belt, E. Magaldi 756,866
Chain links, machine for cutting out sheet metal blanks for, F. Egge 757,028
Chain, machine for making sheet metal, F. Egge 757,029
Chair seat spider, J. M. Germanson 756,955
Check and release mechanism, automatic, J. D. Wright 757,381
Check book, Heilrath & Taber 757,304
Checkrein attachment, J. A. Clary 757,092
Cheese cutting apparatus, P. S. McCroskey. 757,335
Chemical compounds, producing, J. J. Griffin 757,036
Cigarette or cigar box, A. G. Psiaki 757,225
Cistern, G. W. Boyer 757,253
Clasp pin, H. W. Fishel 757,032
Clipper, hair, G. F. Stevens 757,359
Clutch, friction, C. Seybold 757,236
Coin counting and delivery machine, L. Sumner 757,362
Coke oven door hoist, C. S. Mason 757,134
Coke puller, A. J. Doss 757,283
Coke puller, J. E. Jones 757,312
Comb, N. D. Ingram 757,042
Concentrator, J. Ruedy 757,350
Converter system, rotary, E. M. Hewlett 756,960
Cooking vessel, H. M. De Sachet 757,281
Cord knotter, E. M. Kellogg 757,127
Corset, D. Fogliano 757,291
Corset stay, L. I. Cassidy 757,268
Couplings, lock mechanism for vertical plane, H. C. Buhoup 756,826
Cover, packing vessel, C. C. Woods 757,167
Crane, L. S. Fleckenstein 757,290
Crane and supporting structure therefor, V. R. Browning 756,932
Crate, folding, W. Pond 756,890
Crate, shipping, F. O. Miller 756,877
Creasing machine, C. R. Nelson 756,882
Cultivator, A. L. Samuelson 756,898
Cultivator, S. F. Vance 756,996
Cultivator, G. W. & C. E. Goss 757,398
Cultivator and harrow spring tooth, S. F. Vance 756,995
Cultivator attachment, A. Rodocker 756,883
Curler, hair, N. B. Stone 757,241
Current ventilator, double, H. I. M. Ross 757,348
Curtain pole, A. Miller 757,048
Cut-off and alarm, fluid pressure, R. M. Hughes 757,119
Cutter. See Linoleum, etc., cutter.
Cutting and trimming machine, A. E. Roenigk 757,228
Cutting shears, G. E. Benton 756,818
Cyanamid salts, manufacture of, G. Erlwein 757,185
Demand meter, R. S. White 757,000
Dental bite taker holder, E. B. Marshall 757,133
Diamonds for industrial purposes, apparatus for setting, F. Krause 757,318
Display cabinet, E. A. Wilcox 757,003
Ditching and grading machine, R. Russell. 757,417
Door fastening device, C. Cadwallader 756,829
Door stop, W. F. Nolan 757,051
Door, vertically moving, W. A. Cross, 757,178, 757,179
Doubletree, F. L. Wolverton 756,923
Draft equalizer, A. K. Waters 756,921
Draft equalizer, P. V. Schandoney 757,232, 757,233
Draft equalizer, W. S. Emert 757,288
Draft evener, C. T. Elliston 756,841
Draft rigging, E. C. Washburn 756,919
Drawing and designing apparatus, H. E. Ablett 757,246
Dredge, A. Boschke 757,173
Dress suit case, J. D. Wood 756,925
Dry battery, Swan & Rose 757,422
Drilling machine, G. Smith 757,239
Drum, beat radiating, E. J. & F. A. Langell 756,970
Drum snare brace, E. Boulanger 756,930
Dyeing machine, textile fabric, Rothwell-Jackson & Hunt 757,055
Dynamo brush holder, W. Slee 757,357
Egg drying apparatus, A. D. Robinson 757,347
Electric condenser, M. O. Troy 756,991
Electric current regulator, N. Harrison 757,302
Electric distribution, panel board for, G. H. Jones 756,966
Electric lock, J. Livingston 756,864
Electric motors, means for variably operating and controlling, R. Eickemeyer 757,394