is the Edison socket considered a better s et than the T. H. socket? A. We cannot say nat we think one of these sockets is better than the other. Both have their friends. One uses a screw, the other holds the lamp by springs. 3. How is it that lightning goes from earth to cloud, as well as from cloud to earth? Electricity does not flow from negative to positive, and the earth being considered as negative, how does the lightning go from earth to cloud? A. We have many times stated in these columns that the direction of the flow of electricity is entirely conventional. We agree to the ordinary flow from what we call positive to what we call negative. An alternating current is considered to flow both ways alternately. The fact is that light-ning frequently surges to and fro between the cloud and the earth a dozen times or more in what we call a flash, and it is all over in a very small fraction of a second, so that no one can say that he saw it go either way. It is as easy to see the flash go up as it is to see it come down. 4. A short time ago I was in a telegraph office, and there was a thunder storm going on around us; every lightning stroke would cause the telegraph instrument to tick, as if the key has been opened and closed. Why should the lightning affect the instrument in such a way? A. Induction charges a telegraph line when a lightning storm is near, and the current sparks across the instruments and the lightning arresters with the snapping sound which you heard. It is a common occurrence. 5. What kind of a conductor of electricity does liquid air make? A. Liquid air is an insulator. just as gaseous air is. It is not a conductor of electricity at all.

(9085) G. A. S. asks: In order to settle a controversy, will you kindly give a solution of the following problem in the next issue of your paper: A claims that if a gun be fired from the rear of a rapidly moving train, at a given point, in the opposite direction, and the velocity of the bullet is exactly the same as that of the train, when the train has traveled one mile distant from the point of discharge, the bullet will be one mile from the train, or at the point of discharge. B claims that the bullet will be beyond the point naissance, and embodies the information colof discharge, when the train has traveled the distance of one mile. Who is correct? A. For a full answer to your inquiry regarding a gun discharged from a train in the direction opposite to the motion of the train, see the SCIENTIFIC AMERICAN, Vol. 88, No. 19, Query 8997. A is right.

(9086) A. M. W. says: In your paper of June 6, Notes and Queries, 9036, in regard to clear glass assuming a violet color: A number of years ago I resided in various mining towns of Colorado, and often found pieces of glass of an amethyst color. On one occasion I found a broken table goblet, but the portion that lay upon the ground was not as perfectly colored as other parts. I do not remember ever finding any of this colored glass only on very dry, rocky slopes and where it was exposed to direct hot sun rays. Occasion ally I would find a piece that was blotched as though rain drops had dried so quickly that the outer edges of the spots had a seared appearance, but it was color only and a little darker on these edges. At that time my impression was that it was necessary for the glass to be in a very dry, rocky place, fully exposed to the sun, and after little showers and spattering drops from surrounding rocks in drying quickly from the hot sun that it caused some chemical action that formed the coloring.

(9087) J. H. writes: Will you please in form me who manufactures the gas ignition pellet for sale? Also what the ingredients are and in what proportion they are mixed, and how fastened to the mantles which render them self-igniting mantles? A. There is only one substance within our knowledge which can be heated by a stream of gas striking it, so that it will ignite the gas. That substance is spongy platinum. It is used in the Döbereiner lamp, where a stream of hydrogen impinges on a platinum sponge. Platinum in this form is capable of absorbing 800 times its volume of oxygen, which does not enter into combination with it, but is simply condensed into its pores, and is available for combination with

(9088) C. M. Z. asks: Please tell me what is the voltage of a good dry cell 1½ x The third part deals with the reaction between inches. Will a battery of this size light a small lamp of 2 c. p. and $4\frac{1}{2}$ or $5\frac{1}{2}$ volts? Is one battery 8 inches long and $1\frac{1}{2}$ inches diameter as good as two batteries $1\frac{1}{2}$ x 4 inches long? A. The voltage of a dry cell is about 1.5 volt. To light a lamp of $5\frac{1}{2}$ volts will require four cells in series. The size of a cell does not affect the voltage. This is determined by the materials employed. The size of a cell determines the current it will give and the time it will last.

NEW BOOKS, ETC.

THE LOCOMOTIVE. New Series. Vol. 23. Hartford, Conn. 1902. 8vo. Pp. 191. Price \$1.

Through the courtesy of J. M. Allen, A.M. M.E., the editor of the Locomotive, we received the last volume. This interesting publication is issued by the Hartford Steam Boiler Inspection and Insurance Company, and deals with matters germane to steam boilers, power, etc.,

scientific articles on various subjects. The ed in reviewing the volumes previously issued, periodical is well illustrated by half-tone and line drawings. Among the features of the Locomotive is a list of boiler explosions with details.

ELEMENTS OF STEAM ENGINEERING. By H. W. Spangler, Arthur M. Greene, Jr., and S. M. Marshall, B. S. in E. E. New York: John Wiley & Sons. London: Chapman & Hall, Ltd. 8vo. Pp. v, 275; 273 figures. Price

This book is intended to bring before the beginner examples of the various forms of steam apparatus used in modern steam power plants; to explain simply and briefly the construction, use and reasons for using these various parts in this branch of engineering. Although the institutes.

HEREDITY AND SOCIAL PROGRESS. By Simon Ltd. 1903. 12mo. Pp. vii, 214. Price \$1.35.

Prof. Patten has presented here what may well be considered a thorough and clear discussion of a subject which, thanks to Herbert Spencer, has become of constantly increasing importance within recent years.

PROBLEMS IN ASTROPHYSICS. By Agnes M. Clerke. Containing 81 illustrations. London: Adam & Charles Black. 1903. Pp. xvi., 567. Price \$6.

The present work deserves more than usual attention by reason of the scholarly standing of its author as a writer on astronomical subjects. The book which lies before us is characterized by the same excellence which it was our privilege to note in the author's recently published "History of Astronomy During the Nineteenth Century." It is the purpose of the present work not so much to instruct as to sug-The volume represents a kind of reconlected by astrophysical scouts and skirmishers regarding the practical lines of advance and accessible points of attack. The book is divided into two parts, the first of which discusses solar physics, and the second, problems in sidereal physics.

LEAD AND ITS COMPOUNDS. By Thomas Lambert. Illustrated by 40 plans and diagrams. London: Scott, Greenwood & Co. New York: D. Van Nostrand Company. 1902. Pp. xiv, 228. 8vo. Price \$3.50.

The author shows in this volume the great strides which have been made in the metallurgy of lead and zinc. He has incorporated the latest applications of electrical science, not only in cleaning the ores, but also in their aftertreatment. The work contains a description of the pigments of both metals, their mixture and properties. The value of the book is enhanced by a chapter devoted to the assaying and analysis of lead and zinc ores, and the quantitative test of paints and oils.

Siderology. The Science of Iron. By Hanns Freiherr v. Jüptner. Trans-lated from the German by Charles Salter. The Constitution of Iron Alloys and Slags. With 11 plates and 10 illustrations. London: Scott, Greenwood & Co. New York: D. Van Nostrand Company. 1902. 8vo. Pp. viii, 344. Price \$5.

of our present knowledge of iron as it is to be and Means of Communication, "A Guide to the found in the widely-scattered literature on subject. The work furthermore gives to the student an account of the researches which have been already carried out and explains to the consumer of iron and steel the connection between the various properties of iron and steel, their constituents, and the methods of working the raw material. The work is divided into three portions, the first of which, after describing the theory of solution deals with the microscopical and chemical constituents of iron and slags. The second part treats of the connection between the chemical composition, the working, the microscopical structure, and properties of iron and steel. the metal slags, and other reagents

Monogram Engraving. Specially parisons for estimating each constitution. Compiled as a Text-Book for Students and Reference Book and Guide Physico-Chemical Tables for the Use for Engravers. With 200 original illost Analysts, Physicists, Chemical Chemical Chemical Compiled by Physico-Chemical Tables for the Use for Engravers. lustrations. Philadelphia, Pa.: Keystone Publishing Co. 1903. 8vo. Pp. 199. Price \$1.50.

This seems to be a thoroughly practical book of utility to the skilled engraver as well as to

THE NEW INTERNATIONAL ENCYCLOPÆDIA Editors Daniel Coit Gilman, LL.D., Harry Thurston Peck, Ph.D., L. H. D., and Frank Moore Colby, M. A. Volume VII. New York: Dodd, Mead & Co. 1903. 8vo. Pp. 888.

This new volume of the International Encyclopædia takes us from "Ethics" to "Fuller-

we have confined our attention only to the scientific portions. The article "Evolution" is a most excellent review of the development of Herbert Spencer's theory from the modern, scientific standpoint. A good bibliography is appended to the article. The discussion of "Explosives" may well be considered the best to be found in any of the cyclopedias. Treat 1903, ing as it does of the latest brown and smoke less powder, the article may be considered perhaps the most modern on the subject to be found in any reference book. The article on "Fire Engines" presents all that is worth knowing of modern American fire engines. It is well illustrated by excellent pictures of a chemical fire engine, a hand chemical fire engine, and of machines, and to give a working vocabulary an American model of 1902. We are glad to note that the subject of modern steel-frame book is primarily prepared for first year students in engineering schools, it will probably be on "Fireproof Construction." For the purpose For the purpose of use to the general reader and to many of of illustration, the "Flatiron" building in course the young men in manual training schools and of construction has been selected; a better selection could hardly have been made, for the picture illustrates the modern method of con-N. Patten. New York: The Macmillan structing the interior steel work first, and then Company. London: Macmillan & Co., of applying the outer masonry in sections. The scientific biographies are well written. That on Faraday, although brief, is quite adequate. The biography of Benjamin Franklin should have discussed more fully Franklin's scientific achievements. Of the scientific articles in this volume, perhaps the most technical and the most thorough in treatment is the one on "Freezing Point." The discussion of fuel is also good.

TASCHENBUCH DER KRIEGSFLOTTEN. IV.
Jahrgang. 1903. Mit teilweiser Jangang. 1903. Mit teriweiser Benutzung amtlichen Materials. Herausgegeben von B. Weyer, Kapi-tänleutnant a. D. Mit 277 Schiffs-bildern und Skizzen. München: Verlag von J. F. Lehman. 1903. 16mo. Pp. 321. Price \$1.

Capt. Weyer's book comes to us this year in a form that is even better than that of the work which he published last year. The information which he gives is fully as trustworthy as that which is contained in some of the more pretentious naval annuals. His tables, so far as we have been able to discover, seem accurate and comprehensive. The publishers are to be congratulated on the manner in which they have issued this work. The printing and the character of the illustrations are much better than those of the previous volumes.

THE STORY OF THE TRAPPER. By A. C. Laut. Illustrated by Arthur Heming and others. New York: D. Appleton & Co. 1902. Pp. xi, 284. Price \$1.25.

In the "Story of the Trapper" is presented a vivid picture of an adventurous figure painted with a singleness of purpose and a distinctness impossible of realization in the large and detailed histories of the American fur trade and the Hudson's Bay and Northwest Companies, or the various special journals and narratives. The author's wilderness lore and knowledge of the life, added to an acquaintance with its literature, has borne fruit in the personification of the western and northern trappers who live in these pages.

THE GREAT SIBERIAN RAILWAY FROM ST. PETERSBURG TO PEKIN. By Michael Myers Shoemaker. New York and London: G. P. Putnam's Sons. 1903 12mo. Pp. viii, 243. Price \$2.

In these pages will be found a record of a journey over the Siberian Railway from St. Petersburg to Pekin, with a detour to Corea. The author bases his statistical information This book may be regarded as a compilation on the work published by the Minister of Ways Great Siberian Railway."

> THE ANALYSIS OF OILS AND ALLIED SUB-STANCES. By A. C. Wright. New York: D. Van Nostrand Company. London: Crosby, Lockwood & 1903. 8vo. Pp. xi, 241. Price \$3.50.

The author tells us that this brief account of the methods used in the analysis of oils. fats, and waxes has been written with the definite aim of presenting the subject in a form suited to the needs of the student and beginner, and that it includes all recent developments likely to be found of value in practical work. In accordance with this purpose, the chemistry of the various processes is explained in some detail, and methods which doubled by the addition of several chapters on have been recently proposed are fully explained. THE ART OF ENGRAVING. A Practical An estimate has been made to indicate the Treatise on the Engraver's Art. With extent to which reliance may be placed upon Special Reference to Letter and methods for detecting adulteration. Stock com-Monogram Engraving. Specially parisons for estimating each constant have Specially parisons for estimating each constant have

> MANUFACTURERS, AND SCIENTIFIC CHEMISTS. In two volumes, each complete in itself. By John Castell-Evans, F.I.C., F.C.S. Vol. I. Chemical Engineering and Physical Chemistry. London: Charles Griffin & Co., Ltd. Philadelphia: J. B. Lippincott Company. 1902. 8vo. Pp. xxxii, 548.

Mr. Castell-Evans has reason to be proud of his work. He has been a most painstaking compiler, so painstaking, indeed, that his work must at times have seemed little short of scientific drudgery. His task must have involved but occasionally there are published excellent Maitland." Following the plan which we adopt | years of labor. The work has been designed to fications under each problem, work can be read-

be of use to all engaged in any branch of chemistry and metallurgy. The volumes will be the means of saving a great deal of time that can be more profitably and pleasantly employed in true scientific work.

ANALYSES OF PIG IRON. Vol. II. Collected and published by Seymour R. Church. San Francisco. Pp. 197. Price \$5.

The contents of this volume are in no sense a repetition of Vol. I, but are made up entirely of new and additional analyses, data and leading articles. The analyses published in this volume, as well as in the first, are taken directly from reports furnished by the respective furnaces or their agents. These reports are to be kept on file for the inspection and convenience of subscribers. The book presents authoritative analyses which should be of great service to the ironmonger. The publisher is to be congratulated upon the very handsome manner in which he has issued this book. Its full leather binding, heavy coated paper, fine printing and admirable illustrations are not often found in technical works.

STEAM POWER PLANTS: THEIR DESIGN AND Construction. By Henry C. Meyer, Jr., M.E. New York: McGraw Publishing Co. 1903. Pp. 159.

Mr. Meyer has presented us with a very carefully prepared work on a subject with which many engineers are familiar, but of which they by no means know all that they ought to know. The most noteworthy features of the book are sixteen folding plates of ground plans, sectional elevations, and the like. These will be of especial service to the power

CONDUCTORS FOR ELECTRICAL DISTRIBUTION. THEIR MATERIALS AND MANUFACTURE. THE CALCULATION OF CIRCUITS, POLE-LINE CONSTRUCTION, UNDERGROUND WORKING AND OTHER USES. By F. A. C. Perrine, A.M., D.Sc. New York: D. Van Nostrand Company. London: Crosby, Lockwood & Son. 1903. 8vo. Pp. vii, 287. Price \$3.50.

Dr. Perrine's experience as a manufacturer of insulated wires and cables, as a consulting engineer on their installation, and as a teacher of electrical engineering at Leland Stanford, Jr., University, renders him peculiarly well fitted to prepare a book on electrical conductors. The fourteen chapters of which this work is comprised discuss inductive materials, alloyed conductors, the manufacture of wire, wire finishing, wire insulation, cables and their use, classification of cables, calculation of circuits. Kelvin's law of economy in conductors. multiple arc distribution, alternating current calculation, overhead lines, pole line, line insulators, and underground conductors

WALLPAPERS AND WALL COVERINGS. Practical Handbook for Decorators, Paperhangers, Architects, Builders, and House-owners. With many Half-Tone and other Illustrations Showing the Latest Designs. By Arthur Seymour Jennings. New York: William T. Comstock. 1903. 8vo. Pp. 161. Price \$2.

The present work may be regarded as an enlarged republication of "Practical Paper Hanging," brought out by the author several years ago. The volume covers the field more fully than the previous work and is furthermore more elaborately illustrated with half-tones of the latest designs of a large number of manufacturers in America, England, and France. Among the chapters which deserve special mention are those on the "Selection of Wall Papers," and "Different Varieties of Wall Papers and their Characteristics." Rules are given showing how difficult or unusual obstacles should be met.

RAILROAD CONSTRUCTION. THEORY AND PRACTICE. A Text-Book for the use of Students in Colleges and Technical Schools. By Walter Loring Webb, C. E. New York: John Wiley & Sons. London: Chapman & Hall, Ltd. 1903. Pp. xvii, 675. 232 figures. 16mo.

Since the issue of the first edition the author has conferred with many noted educators in civil engineering. As a result, it was decided to recast the whole work and to reduce the size of the book from octavo to pocketbook dimensions. The original text has been almost structures, train resistance, rolling stock, etc., and also several chapters giving the fundamental principles of the economies of railroad location. The author's primary aim has been to produce a textbook for students.

DESCRIPTIVE GEOMETRY. With Numerous Problems and Practical Applications. By William S. Hall, C.E., E.M., M.S. With a 4to Atlas of 18 Plates. New York: D. Van Nostrand Company. 8vo. Pp. iv, 76.

Textbooks of descriptive geometry, with very few exceptions, deal only with first angle projection, but in the best recent practice in mechanical drawing the third angle is used. Moreover, the third angle is commonly employed in perspective. In this book all four angles are used. The problems therefore become general and a large variety of constructions can be introduced under each problem, By inserting the problems for construction in a separate volume and by having several modiily assigned to members of a class in recita- YUCCEAE. By William Trelease, from the tion; no two students need be given the same work. A large number of carefully arranged problems and some practical applications are

A PLAN FOR THE STUDY OF MAN. With reference to Bills to Establish a Laboratory for the Study of the Criminal, Pauper, and Defective Classes. With a Bibliography of Child Study. By Arthur MacDonald. Washington: Arthur MacDonald. Washin Government Printing Office.

It is difficult to say what Mr. MacDonald has accomplished in this book. He has collected a mass of information which is apparently not applied to any practical purpose. The pamphlet before us outlines the methods which are to be pursued in a laboratory which Mr. MacDonald would like to establish. The only thing for which we have to be thankful in the publication of this book at the government's expense, is a very good bibliography of child

CURVILINEAR MOTION. A Supplementary Reading in Physics. Prepared by J. A. Culler. Columbus, Ohio: O. T. Corson. Pp. 14.

Machines. A Supplementary Reading in Physics. Prepared by J. A. Culler. Columbus, Ohio: O. T. Corson. Pp.

THE KINDLING POINT. A Supplementary Reading in Physics. Prepared by J. A. Culler. Columbus, Ohio: O. T. Corson. Pp. 14.

A STROKE OF LIGHTNING. A Supplementary Reading in Physics. Prepared by J A. Culler. Columbus, Ohio: O. T. Corson. Pp. 16.

INERTIA. A Supplementary Reading in Physics. Prepared by J. A. Culler-Columbus, Ohio: O. T. Corson. Pp.

Weight. A Supplementary Reading in Physics. Prepared by J. A. Culler. Columbus, Ohio: O. T. Corson. 1902. Pp. 16.

THE MOLECULE. A Supplementary Reading in Physics. Prepared by J. A. Culler. Columbus, Ohio: O. T. Corson. Pp. 13.

ENERGY: A CONSTANT QUANTITY. A Supplementary Reading in Physics. Prepared by J. A. Culler. Columbus, Ohio: O. T. Corson. 1901. Pp. 15.

THE AIR. A Supplementary Reading in Physics. Prepared by J. A. Culler. Columbus, Ohio. O. T. Corson. 1901. Pp. 15.

A BENT RAY OF LIGHT. A Supplementary Reading in Physics. Prepared by J. A. Culler. Columbus, Ohio: O. T. Corson. Pp. 15.

Hot Ice. A Supplementary Reading in Physics. Prepared by J. A. Culler. Columbus, Ohio: O. T. Corson. Pp.

These are excellent little pamphlets describing the principles of physics in a way that is clear and easily understood as well as thororghly scientific.

THE INDUCTION MOTOR. Its Theory and Design. Set Forth by a Practical Method of Calculation by Henri Boy de la Tour. Translated from the French by C. O. Mailloux, M.A.I.E.E., M.I.E.E. New York: McGraw Publishing Company. 1903 xxvii, 200. Price \$2,50. 1903. 8vo. Pp.

To American electricians this should be a welcome book, for it can hardly be denied that the induction motor has found its greatest development in Europe. Mr. de la Tour presents a complete study of the polyphase induction motor, and explains at length all the peculiarities of its operation without resorting to more than elementary mathematics. The reader will find a few new deductions and formulæ, such as, for instance, those which enable one to estimate the magnetizing action of wave windings and those for determining the dimensions of the short-circuiting rings for rotors of the squirrel-cage type. Not the least valuable features of the book are the practical examples showing the material effect of the thickness of the air-gap on the value of the magnetic leakage factor.

COSMETICS. A Handbook of the Manufacture. Employment, and Testing of All Cosmetic Materials and Cosmetic Specialties. By Dr. Theodor Koller. Translated from the German by Charles Salter. London: Scott, Greenwood & Co. New York: D. Van Nostrand Company. 1902. Pp.

vii., 262. Price \$2.50. It has been the author's purpose to establish cosmetic technology on a rational basis. Since the cosmetic industry is mainly indebted to the researches of chemists for the advance it has made, it follows, as a matter of course, that the author has drawn upon their work largely for the information he has presented. The author has endeavored to give his reader an accurate knowledge of the materials of which cosmetics are to be made, as well as to point out the best and simplest methods of

RICHERCHE D'AERONAUTICA. Estratto dalla publicazione in corso di stampa II volo mecanico per A. Bertelli.

Thirteenth Annual Report of the Missouri Botanical Garden. plates. 8vo. Pp. 133.

SMITHSONIAN PHYSICAL TABLES. Second Revised Edition. Prepared by Thomas Gray. Washington: Pub-lished by the Smithsonian Institu-tion. 1903. 8vo. Pp. 301.

GEOLOGICAL AND AGRICULTURAL REPORT ON THE GEOLOGY OF LOUISIANA. Containing Special Papers by Different Authors Based on the Work of Three Field Seasons, 1900, 1901, and 1902. Gilbert D. Harris, Geologist in Charge; Arthur C. Veatch, Asst. Geologist, and Jov. A. A. Pacheco, Asst. Geologist. Made under the direction of the State Experiment Station, William Stubbs, Director. 1902. Baton Rouge, La. 8vo. Pp. 288.

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Cigar box or similar receptacie, E. C. Thurnau Cigar pipe, W. Assman Cigarette cutting mechanism, J. Wojciech- cowski	782,664 732,252	G
Cigarette cutting mechanism, J. Wojciech- owski Circuit breaker. H. P. Ball	732,330 732,254	Ğ
Cisterns, etc., form for, G. G. F. Boswell.	732,509	G

Clamp, J. Black	732,160	Gas
Clip, L. Steinberger	732,598	Gas Gas
Clutch, G. A. Ede	732,402 732,398	Gas Gas
Clamp, J. Black. Clamp, J. W. Marshall. Clamp, J. W. Marshall. Clip, L. St.inberger. Clothes line clamp, O. H. Grosland. Clutch, G. A. Ede. Clutch device, P. Diehl Coaster brake, F. Schmitz. Cock, time controlled gas, H. H. Ward. Coffer dam, T. A. Dungan. Coin controlled apparatus, J. C. A. Riecke Coke conveyor, hot, M. Graham. Coking kiln, C. W. A. & J. Mettler. Column and beam, composite, W. N. Wight Comb, J. L. Gillum. Compasses, locking, F. J. McCabe Composite material, A. Leisel Concrete structure, A. A. Firestone. Condiment holder, pulverlzing, C. B. Overbaugh Corn husking machine, L. D. Swart. Corn husking machine, L. D. Swart Corn sheller, A. H. Patch. Corset, J. Schufflay	732,121 732,243	Gat Gea
Coffer dam, T. A. Dungan	732,401 732,115	Ger
Coke conveyor, hot, M. Graham Coking kiln, C. W. A. & J. Mettler	732,545 732,097	Gol
Column and beam, composite, W. N. Wight Comb, J. L. Gillum	732,485 732,543	Gol Gol
Composite material, A. Leisel	732,106 732,569	Gov
Concrete making machine, G. S. Tiffany Concrete structure, A. A. Firestone	732,471 732,535	Gov
baugh	732,214 732,468	Gra Gra
Corn husking machine roller, L. D. Swart Corn sheller, A. H. Patch	732,469 732,217	Gra Gra Gra
Corset, J. Schufflay	732,591 732,378	Gra Gra Gra
Cotton handling machinery, J. R. Fordyce Cotton picker, J. Griffin	732,625 732,546	Gra Gri
Corn sheller, A. H. Patch. Cornset, J. Schufflay. Corset, abdominal, C. H. Schopbach. Cotton handling machinery, J. R. Fordyce. Cotton picker, J. Griffin. Cotton picker, H. Wiswall, Jr. Crab shell cleansing apparatus, J. W. P. Insley	732,681	Gri
sley Crate, folding egg, S. M. Hunt. Crayon molding machine, W. F. Hanson Crib, folding, M. C. Collier. Cuff holder, C. H. Leach. Cultivator and harrow, combined, H. C. Farris	732,637 732,412	Gur
Crib, folding, M. C. Collier	732,618	Hai Hai
Cultivator and harrow, combined, H. C. Farris	732,624	Hai
Curtain and shade support, adjustable, G.	732,104	Hai Hai Hai
		Hai
Curtain pole bracket, adjustable, G. Quackenbush curtain stretcher lock and hinge, R. S. Corlett Cutting out press, F. B. Morris. Damper, fireplace, M. E. Stokes. Dental proceps, F. B. Wantz. Dental engine, J. B. Wantz. Dental engine, J. B. Wantz. Dental forceps, K. Felsch. Dental medicine receptacle, G. B. Smith. Deplactor and making it, A. H. Stone. Defector. See Bottle detector. Detector See Bottle detector. Detector bar, J. T. Hambay. Dials, device for protecting combination, H. Lietz Dials, device for protecting combination, H. Store wash, treating, Sudre & Thierry Door check, liquid, C. H. Ocumpaugh. Door lock and alarm device, W. N. Greer Door, screen and storm, M. F. Byrne. Door waster shed, cellar, T. K. Clark. Draft equalizer, F. B. Stout. Dredger, W. U. Fulcher. Drier, Schoellhorn & Albrecht. Drum, heating. A. C. Selleck	732,652	Hai
Cutting out press, F. B. Morris	732,277 732,101	Hat
Decorative device, J. Braun	732,513	Hat Hat
Dental forceps, K. Felsch	732,288	Hai Hai Hea
Dental plugger, A. Bush	732,044 732,323	Hed
Detector. See Bottle detector. Detector bar, J. T. Hambay	732,296	Hin
Dials, device for protecting combination, H.	732,197	Hos Ho
Distillers' wash, treating, Sudre & Thierry	732,184 732,234	Hoi Hoi
Door lock and alarm device, W. N. Greer	732,369	Hoo
Door water shed, cellar, T. K. Clark Draft equalizer, F. R. Stout	732,275	Hos Hos Hos
Dredger, W. II. Fulcher	732,538 732,451	Hos Ice
Drum, heating, A. C. Selleck	732,454 732,445	Ign Ign
Dye and making same, blue sulfur, I. and H. Levinstein	732.090	Ign Ign
Dredger, W. II. Fulcher. Drier, Schoellborn & Albrecht. Drum, heating, A. C. Selleck. Dust pan, M. Rice. Dye and making same, blue sulfur, I. and H. Levinstein. Earth breaking apparatus, W. Cole. Eccentric, M. Topliff. Egg case, R. W. Hurd. Electric controller, J. A. Little Electric generators, automatic regulator for, W. A. Turbayne. Electric generators, automatic regulator for.	732,173 732,606	Illu Ind
Electric controller, J. A. Little	732,413 732,201	Ind
W. A. Turbayne. Electric generators, automatic regulator for, Turbayne & Hubbard	732,238	Ins
Turbayne & Hubbard Electric heater, G. C. Hawkins	732,239 732,349	Ins
Electric generators, automatic regulator for, Turbayne & Hubbard. Electric heater, G. C. Hawkins Electric light shade and reflector, O. A. Mygatt Electric machines, maintaining synchronous	732,211	Inte
Electric machines, maintaining synchronous rotation of dynamo, Rice & Berg	732,114	Iron Jac
Mygatt	700 CF 4	Jar Jou
Electric meters, compensating friction in,	739 176	Kni
Electric motor, P. Swan Electric motor controller, E. R. Whitney	732,235 732,247	Kno Lad Lar
Electric motor friction gear, J. B. Wantz Electric signal, G. F. Hilton	732,386 732,559	Lar
synchronous rotation of dynamo, kiee & Berg Electric meters, compensating friction in, F. P. Cox Electric motor, P. Swan Electric motor controller, E. R. Whitney. Electric motor friction gear, J. B. Wantz Electric signal, G. F. Hilton Electric switch, T. O. Chouinard. Electric switch, I. G. Waterman. Electric switch, I. H. P. Ball.	732,170 732,477 732,672	Lan
Electric motor, H. Rowntree	732,377	Lar
device for, D. C. Conkling Electrode, W. R. Chipman	732,174 732,047	Lar
Electric switch, T. O. Chouinard Electric switch, I. G. Waterman Electric switch, H. P. Ball Electric motor, H. Rowntree Electrical transformers, automatic cut-out device for, D. C. Conkling Electrode, W. R. Chipman Electrolytes, applying heat to, Burgess & Hambuechen Electronagnet. C. A. Brust	732,616	Lat
Hambuechen Elevator mechanism, A. Cowperthwait Elevator safety device, electric, G. T. Rennerfelt Engine igniter, internal combustion, Mears & Aylward Engraying, mechane M. Berr	732,273 732,522	Lat Lat
nerfelt	732,586	Laz Lea Lea
& Aylward Engraving, machine, M. Barr Engraving machine, R. Trentzsch Eraser, rubber, F. A. Schultz Excavating mechanism, W. Cole. Exhibit frame for lace draperies, G. J. Bicknell Extension table, H. Johnson	732,365 732,154	Lea
Eraser, rubber, F. A. Schultz	732,472 732,658	Lif
Excavating mechanism, W. Cole Exhibit frame for lace draperies, G. J. Bick-	732,172 732,158	Lin Liq
nell Extension table, H. Johnson Eyeglasses, W. A. Vescelius Eyeglasses, pendent lens, G. F. Applegate Fan, foot power, F. Marak Fans, electric motor for ceiling, P. Swan. Fans or other objects, oscillatory support for, J. Devine	732,354 732,473	Liq Liq
Eyeglasses, pendent lens, G. F. Applegate Fan, foot power, F. Marak	732,251 732,363	Liq
Fans, electric motor for ceiling, P. Swan Fans or other objects, oscillatory support for,	732,602	List
J. Devine	732,341 732,077	Loc
Feed water system, D. W. Patterson	732,436 732,630	Loo
Fence machine, wire, Bates & Cocker	732,155	Loc
Fence post, S. F. Webb	732,244 732,447	Loc
Fence, postless wire, M. H. Starling Fence stay fastener, wire, C. Kanavel	732,231 732,190	Loo
Fence wire staple, R. A. Winters Fiber cutting machine, wood, G. L. Weller	732,486 732,246	Lub
Fans or other objects, oscillatory support for, J. Devine J. Devine Feed water heater, R. H. Hornbrook. Feed water system, D. W. Patterson. Feeder, caft, I. H. Hall, Jr Feeding mechanism, F. B. Pease. Fence machine, wire, Bates & Cocker. Fence post, J. G. Wait. Fence post, S. F. Webb. Fence post, cement, A. P. Robertson. Fence, postless wire, M. H. Starling. Fence stay fastener, wire, C. Kanavel. Fence wire staple, R. A. Winters. Fence wire staple, R. A. Winters. Fiber cutting machine, wood, G. L. Weller Fifth wbeel, C. A. Hennicke. Fille and binder, paper, M. D. Kenyon. Filter, J. F. Wittemann. Filter, oil, B. L. Scott. Fire escape, W. H. Logan. Fitte ordinguisher automatic F. M. Allen	732,192	Lut Lur
Filter, oil, B. L. Scott	732,659 732,645	Mas
Fines extinguishing Van Dinon & Cuthria	7 9 142	Mas
Firearm, M. Goss. Firearm ejector, G. E. Humpreys. Firearm sight, L. L. Hepburn Firearm, sight etrigger, J. A. R. Elliott. Firearm, subcaliber, G. H. Garrison Fireproof construction, W. N. Wight Fireproof floor, W. N. Wight Wight Fireproof floor construction with the wight Fireproof floor construction, W. C. Lewis.	732,187	Mat Med Met
Firearm sight, L. L. Hepburn Firearm, single trigger, J. A. R. Elliott	732,075 732.531	Met Met
Fireproof construction, W. N. Wight	732,540 732,483 732,482	Met Met
Fireproof floor and constructing same, W. N. Wight		Ϋ́e
Wight Fireproof floor construction, W. C. Lewis Fish cutting and cleaning apparatus, A. R. Rogers Flax stock and preparing same, B. C. Mudge	732,484 732,091	Mil
Rogers		Mix
Flax stock and preparing same, B. C. Mudge	732,376 732,103	Mol
Float, electrical contact controlling, I. G. Wa erman	732,103 732,608	Mol
Float, electrical contact controlling, I. G. Wa erman	732,103 732,608	Moi Moi Moi
Float, electrical contact controlling, I. G. Wa erman	732,103 732,608	Mod Mod Mod Mus
Float, electrical contact controlling, I. G. Wa erman	732,103 732,608	Mol Mol Mus Mus Mus Nec
Float, electrical contact controlling, I. G. Wa & trman Flour and lard rubbing machine, T. Westerman Flue expander and cutter, A. Nault Flusbing apparatus, C. N. Marcellus. flushing apparatus, R. P. Jones. Fly escape, window screen, E. L. Hereford Folding box, Z. B. Webb Folding carrier, W. J. Best. Foot cleaner or door mat. mechanical. Preuss	732,103 732,608 732,478 3 ,2313 732,095 73,41 (732,634 732,329 732,037	Mod Mod Mus Mus Neo Nes Nut
Float, electrical contact controlling, I. G. Wa & trman Flour and lard rubbing machine, T. Westerman Flue expander and cutter, A. Nault Flusbing apparatus, C. N. Marcellus. Hishing apparatus, R. P. Jones. Fly escape, window screen, E. L. Hereford Folding box, Z. B. Webb. Folding carrier, W. J. Best For cleaner or door mat, mechanical, Preuss & Jansson Fork, J. O. Cochran. Formaldebyde generating apparatus. E. F.	732,103 732,608	Mod Mod Mus Mus Neo Nes Nut Nut Nut
Float, electrical contact controlling, I. G. Wa & trman Flour and lard rubbing machine, T. Westerman Flue expander and cutter, A. Nault Flusbing apparatus, C. N. Marcellus. Hishing apparatus, R. P. Jones. Fly escape, window screen, E. L. Hereford Folding box, Z. B. Webb. Folding carrier, W. J. Best For cleaner or door mat, mechanical, Preuss & Jansson Fork, J. O. Cochran. Formaldebyde generating apparatus. E. F.	732,103 732,608 732,478 3 2313 732,095 732,634 732,329 732,037 732,373	Mod Mod Mus Mus Mus Nes Nut Nut Nut Nut Oil
Float, electrical contact controlling, I. G. Wa & trman	732,103 732,608 732,478 3 2313 732,095 73,41 (732,634 732,329 732,037 732,373 732,675 732,159	Mod Mod Mus Mus Nus Nus Nus Nus Nus Nus Nus Nus Oil Oil
Float, electrical contact controlling, I. G. Wa & Frman Flour and lard rubbing machine, T. Westerman Flue expander and cutter, A. Nault. Flusbing apparatus, C. N. Marcellus. flusbing apparatus, R. P. Jones. Fly escape, window screen, E. L. Hereford Folding box, Z. B. Webb. Folding carrier, W. J. Best. Foot cleaner or door mat, mechanical, Preuss & Jansson Fork, J. O. Cochran. Formaldehyde generating apparatus, E. F. Billings Fuit, dessicating, W. S. Keyes. Fuel and making same, artificial, E. C. May Furnace. See Boiler furnace. Furnace. G. T. Wyatt.	732,103 732,608 732,478 73,213 73,41 732,634 732,634 732,329 732,373 732,675 732,563 732,574 732,610	Mod Mod Mus Mus Nec Nus Nut Nut Nut Oil Oil Ord
Float, electrical contact controlling, I. G. Wa & Frman Flour and lard rubbing machine, T. Westerman Flue expander and cutter, A. Nault. Flusbing apparatus, C. N. Marcellus. flusbing apparatus, R. P. Jones. Fly escape, window screen, E. L. Hereford Folding box, Z. B. Webb. Folding carrier, W. J. Best. Foot cleaner or door mat, mechanical, Preuss & Jansson Fork, J. O. Cochran. Formaldehyde generating apparatus, E. F. Billings Fuit, dessicating, W. S. Keyes. Fuel and making same, artificial, E. C. May Furnace. See Boiler furnace. Furnace. G. T. Wyatt.	732,103 732,608 732,478 73,213 73,41 732,634 732,634 732,329 732,373 732,675 732,563 732,574 732,610	Mol Mot Must Must Must Nec Nes Nut Nut Nut Oil Oil Ord
Float, electrical contact controlling, I. G. Wa & Frman Flour and lard rubbing machine, T. Westerman Flue expander and cutter, A. Nault. Flusbing apparatus, C. N. Marcellus. flusbing apparatus, R. P. Jones. Fly escape, window screen, E. L. Hereford Folding box, Z. B. Webb. Folding carrier, W. J. Best. Foot cleaner or door mat, mechanical, Preuss & Jansson Fork, J. O. Cochran. Formaldehyde generating apparatus, E. F. Billings Fuit, dessicating, W. S. Keyes. Fuel and making same, artificial, E. C. May Furnace. See Boiler furnace. Furnace. G. T. Wyatt.	732,103 732,608 732,478 73,213 73,41 732,634 732,634 732,329 732,373 732,675 732,563 732,574 732,610	Mol Mot Mus Mus Mus Nec Nes Nut Nut Nut Oil Oil Ord
Float, electrical contact controlling, I. G. Wa & Frman Flour and lard rubbing machine, T. Westerman Flue expander and cutter, A. Nault. Flusbing apparatus, C. N. Marcellus. flusbing apparatus, R. P. Jones. Fly escape, window screen, E. L. Hereford Folding box, Z. B. Webb. Folding carrier, W. J. Best. Foot cleaner or door mat, mechanical, Preuss & Jansson Fork, J. O. Cochran. Formaldehyde generating apparatus, E. F. Billings Fuit, dessicating, W. S. Keyes. Fuel and making same, artificial, E. C. May Furnace. See Boiler furnace. Furnace. G. T. Wyatt.	732,103 732,608 732,478 73,213 73,41 732,634 732,634 732,329 732,373 732,675 732,563 732,574 732,610	Mol Mot Must Must Nut Nut Nut Nut Oil Ord Ord Ord Pag
Float, electrical contact controlling, I. G. Wa & Frman Flour and lard rubbing machine, T. Westerman Flue expander and cutter, A. Nault. Flusbing apparatus, C. N. Marcellus. flusbing apparatus, R. P. Jones. Fly escape, window screen, E. L. Hereford Folding box, Z. B. Webb. Folding carrier, W. J. Best. Foot cleaner or door mat, mechanical, Preuss & Jansson Fork, J. O. Cochran. Formaldehyde generating apparatus, E. F. Billings Fuit, dessicating, W. S. Keyes. Fuel and making same, artificial, E. C. May Furnace. See Boiler furnace. Furnace. G. T. Wyatt.	732,103 732,608 732,478 73,213 73,41 732,634 732,634 732,329 732,373 732,675 732,563 732,574 732,610	Mol Mol Must Must Nut Nut Nut Nut Oil Oil Ord Ord Ore Pac Pac
Float, electrical contact controlling, I. G. Wa & Frman Flour and lard rubbing machine, T. Westerman Flusbing apparatus, C. N. Marcellus. Hisbing apparatus, R. P. Jones. Fly escape, window screen, E. L. Hereford Folding box, Z. B. Webb. Folding carrier, W. J. Best. Foot cleaner or door mat, mechanical, Preuss & Jansson Fork, J. O. Cochran. Formaldehyde generating apparatus, E. F. Billings Fruit, dessicating, W. S. Keyes. Fuel and making same, artificial, E. C. May Furnace. See Boller furnace.	732,103 732,608 732,478 73,213 73,41 732,634 732,634 732,329 732,373 732,675 732,563 732,574 732,610	Mol Mot Must Must Nut Nut Nut Nut Oil Ord Ord Ord Pag

)	Gas burner, automatic, C. A. Haas	732,068
3	Gas burner heating attachment, W. A. Kone- man Gas cut off automatic J. E. Seymour	732,085 732,124
Ś	Gas cut off, automatic, J. E. Seymour Gas engine, W. J. Wright Gas meter, interential, T. Thorp	732,683
3	Gas meter, inferential, T. Thorp	732,128 732,327
5	Germicide generator, F. MacFarland Girders or beams, cambering or straightening	732,572
7	device for, W. M. Burdon	732,164 732,639
	Gate, G. H. Smith Gearing, compensating, H. L. Warner Germicide generator, F. MacFarland Girders or beams, cambering or straightening device for, W. M. Burdon Gold extracting, T. B. Joseph Gold separator, B. Westhaver. Golf club, F. W. Taylor	732,149 732,137
9	doverning and reversing mechanism, gas en	732,202 732,567
5	gine, E. Loker. Governor, marine engine, G. F. Lasher Grain bin, Moulton & Witherspoon Grain binder breastplate stripping device, E.	732,102
3	A. Johnston Grain cleaner and distributer, J. Wilhelm	732,355 732,248
,	Grain drier and cooler, rotary, A. Johnson	732,561 732,633 732,335
3	Grain drill, C. A. Hardy	732,577
;	Grinding machines, steady rest for, C. H.	732,132 732,314
7	Grinding or polishing machinery, D. L. Bis-	732,505
2	Grinding or polishing machinery, D. L. Bls- set Gun, breakdown, C. F. Lefever Hair clamp, W. J. Koenig Hammer, automatic, A. Stromdahl Hammer feeding device, forge, P. R. Peise-	732.420
3	Hammer, automatic, A. Stromdahl Hammer feeding device, forge, P. R. Peise-	732,566 732,466
Į	Harrow, A. W. England	732,110 732,061
1	Harrow, J. O. Avery	732,331 732,219
2		732,222
,	justing mechanism for I Machail	732,093
)	Hat bodies, machine for forming napped bats for, A. B. Waring. Hat body felting machine, J. Leonard. Hat fastener, A. F. Malmstead. Hat forming block, J. W. Brown. Hay rake cleaner, wheeled, J. Macphail. Heater. See Electric heater.	732,475 72,4 1
3	Hat fastener, A. F. Malmstead	72,4 2 732,362 732,163
2	Hay rake cleaner, wheeled, J. Macphail Heater. See Electric heater.	732,094
3	her	732,033
3	Hinge, spring, W. L. Evans, Jr	732,063 732,029
1	Hoist apparatus scraper attachment, S. E. Leonard	732,571 732,619
ì	Hoisting and conveying apparatus, L. S.	732,499
1	Hoop, N. K. Bowman.	732,270
5	Hose attachment, W. G. McKay	732,582 732,209 732,487 732,497
l	ice box or reirigerator. F. C. Pershing	732,440
5	igniter, electric, mears & Aylward132,354,	732,346 732,366
3	Igniter generator, L. J. Le Pontois Igniter generator, electric, L. J. Le Pontois Illuminating canopy, F. L. O. Wadsworth	732,372 732,371 732,474
3	Index, W. H. Gilman732.580.	732,581
	Induction motor, A. E. Averrett	732,153 732,595
3	Insulating system for electric transmission circuits, A. W. Underwood Insulator, high tension current, K. S. Lem-	732,665
,		732,088
ı	Internal combustion engine, A. F. Evans Ironing board, L. W. Cyphers Ironing table, G. W. Clapp	732,343 732,525 732,394
1	Jack, Tuggie & Doering	732,142
1	Knitting machine warn and weft G T	732,650 732,318
3	Nicholls	732,434 732,491
7	Nicholis	732,295 732,141
9	tale and T T Ward	
2		732,488 732,686 732,334
7	Lamp, incandescent vapor, G. Bohner Lamp rheostat, arc, J. J. Wood Lamps, switch for double filament electric,	732,334 732,489
1	Lamps, switch for double filament electric, Lobenthal & McCullough Lantern frame and blank for making same,	732,644
3	A. L. Edwards. Latch, H. W. Schiermeyer.	732,529 732,450
è	Lathe, T. Craig	732,050 732,558 732,418
3	Lazy tongs construction, F. King Leaf holder for directories, etc., C. E. Napp Leather, making patent, W. R. Smith Leather snipping machine, N. Hayward Leveling instrument, automatic, J. W. Bel-	732,429 732,129
1	Leather snipping machine, N. Hayward Leveling instrument, automatic, J. W. Bel-	732,185
3	Lifting jack, W. H. Cox	732,258 732,523
2	Liquid level indicator. L. Murphy	732,383 732,578 732,208
1	Liquid separator, centrifugal, Collins &	
	Hartmann Liquid temperature regulator, H. A. R. Diet-	732,520 732,054
2	rich Lister, S. H. Tinsman. Lock, L. Neischl.	732,140 732,431
[Lock, L. Neischl Locknorther sanding device, J. C. Hooper Log conveyer, S. F. Claypool Loom, J. C. Brooks Loom for weaving tuffed fabrics, J. A.	732,076 732,519
)		732,043
2	Loom, pile carpet weaving, Panitschek &	732,518
1	Ahorn Loom shuttle checking mechanism, G. H.	732,216
1	Parker Loom take up motion, O. L. Owen Loom thread parting mechanism, E. S. Stimpson	732,437 732,436
3	Lubricator, See Journal lubricator,	732,460
2	Lunch box. L. Louis	732,146 732,423
9	Magh annaratus for decomposing brewers'.	732,195
3	V. Lapp Massage machine, T. D. Ingram. Massaging instrument, B. E. Joseph. Match safe, J. De Bruin. Match dyoner F. A. Liftchild	732,414 732,356 732,177
7	Medicine dropper, F. A. Liftchild Metal bars, severing, Pearson & Roberts	732,689 732,218 732,260 732,641
ĺ	Metal bending machine, W. Block Metal, leaching, T. B. Joseph	732,260 732,641
3	Metal working machine, L. F. & R. Schulze. Metallic tie and rail fastener, V. C. Wash-	102,400
	abaugh	732,476 732,269
l	Mill, H. C. Groves.	732,613 732,294 732,661
3	Mixing device, L. E. Sbinn	732,576
3	Mills	732,276 732,351
3		732.627
ć	Music leaf turner, E. Allison Music leaf turner, H. H. Hill	732,496 732,554
ì	Muzzle, grazing, H. G. Banks	732,502 732,537
	Necktie sbield, reinforced, G. Flaskamp Nest, trap, G. & W. Brand Nut lock, G. J. Callahan Nut lock I. Esser	732,106 732,166 732,178
5	Nut lock, L. Esser	700:406
3	Nut, lock, A. Scholer	732,411 732,181
1	Oil can, druggist's dispensing, J. A. Dinkler Oil switch, H. P. Ball	732,181 732,620 732,255
)	Ordnance, gas check pad for breechloading, G. Gerdom	732,541
9	Urdnance, semi-automatic breechloading, W. H. Bevans	732,259 732,319
5	Ores leaching G. E. Thede	732,319 732,605
l	Dealege R D Doett-	7777 200
	Package, R. P. Beatty Package tie, Jacobson & Trede Packing, stuffing hov. I McCallum	732,332 732,081 732,579
2	Package, R. P. Beatty Package tie, Jacobson & Trede. Packing, stuffing box, J. McCallum Paper bags, or the like, holder for piled slips or sbeets of. W. Hudson.	732,332 732,081 732,579 732,359
	Nut. lock, A. Scholer. Nut. lock, A. Scholer. Nut. locking, A. T. Hugbes. Oil burner, fuel, T. E. Flaberty. Oil can, druggist's dispensing, J. A. Dinkler Oil switcb, H. P. Ball. Ordnance, gas check pad for breechloading, G. Gerdom Ordnance, semi-automatic breechloading, W. H. Bevans. Ore concentrator, Rogers & Hanson. Ores, leaching, G. E. Tbede. Package, R. P. Beatty. Package tie, Jacobson & Trede. Package tie, Jacobson & Trede. Packing, stuffing box, J. McCallum Paper bags, or the like, holder for piled slips or sbeets of. W. Hudson. Paper box, folding, G. A. Hartrampf. Paper box gluing mechanism, W. S. Scales.	732,332 732,081 732,579 732,352 732,071 732,225