RECENTLY PATENTED INVENTIONS. Engineering.

GAS OR VAPOR ENGINE.-Eugene P. Woillard, Sugden, Fla. According to this invention an pivoted projecting levers are connected to the adjacent explosive engine is provided having high pressure cylinders with reciprocating pistons, a low pressure cylinder with a piston rigidly connected to one of the high pressare pistons, the working chambers of the low pressure cylinder and the corresponding high pressure cylinder being between the respective pistons, and the exhaust from the high pressure cylinders discharging into the low pressure cylinder. It is designed to utilize the motive agent expansively to the fullest advantage in a double acting tandem engine having a high pressure impulse in one direction and a low pressure or compound expansion impulse in the other direction. so that every stroke is a working stroke.

STEAM BOILER. - John B. Fleming, Frisco, Utah. Two horizontal shells, with a furnace beneath each, according to this invention, are supplied with feed water from a feed water heating and purifying shell located above and between the boiler shells, there P. Ryder, Westfield, N. J. This invention provides a being fire tubes in the heating and purifying shell, and the water being thrown from a pump into this shell in an incandescent lamp by a novel current collector, the the form of a spray to cause the separation of its impurities. Blow-out pipes are provided for removing sediment or scum from the heating and purifying shell, and, when it is not necessary to heat and purify the feed water, the shell may be conveniently cut out of operation by valves provided for such purpose.

DRIVE WHEEL BRAKE RELEASE. Walter O. Pelham, Denison, Texas. This is an improvement on a former invention of the same inventor, and provides an automatic valve mechanism arranged in the brake pipe and connected with a pipe leading to the loco motive steam chest, the mechanism having a valve adapted to establish communication between the brake pipe and the outer air. The improvement is applicable to air, steam, or vacuum brake systems, the brakes being instantly released at the time the train is in motion and before the braked drive wheels are on the point of sliding on the rails, or before the triple valve acts to release the brakes.

VALVE. - George W. Graffin, Allentown, Pa. A valve adapted to make a tight closure, and it carries may be withdrawn from the valve casing, so constructed as to permit of conveniently repairing the The machine is of simple, durable and inexpensive conworking parts without dispensing with the services of struction, and is designed to automatically and thorthe valve, has been devised by this inventor. The improvement comprises a valve casing having inlet and the machine all coarse material. outlet and valve seat at the inlet, two valves proper movably mounted in the casing and adapted to be seated on the valve seat, guideways in which the valves loosely slide, extending from one end of the casing to the other, a slidable stem for each valve and a ball and socket joint Manigold. Dexter, N. Y. A movable stool and a swingfor connecting each valve with its valve stem, while a movable abutment in the casing is adapted to be engaged by either of the valves.

Railway Appliances.

Patten, Baltimore, Md. This is a device adapted for ready insertion in a car axle box and removable therefrom, and comprises a plate spring of novel construction adapted to support at its rear end a dust guard at the rear end of the box and a wiper bearing on the under side of the axle, the spring also supporting on its central portion a roller which bears upon the axle while its lower edge is always immersed in the oil. The spring is of nearly the same width as the oil chamber, and its front end is bent up to form a hood, preventing oil from reaching the axle box lid. The spring in position normaliy serves as an oil baffie, in addition to its other functions, but is sufficiently flexible to be readily removed with its attachments, from the axle box.

RAILWAY TRACK SLEEPER THREAD CUTTER.-Albert Collet, Paris, France. A boring tool the rake head, spring teeth being rearwardly and downdevised by this inventor is more particularly intended for screw cutting the holes already made in railway sleepers for fastening screws, although it may be em- head. A substantially straight and rigid tooth is located ployed for screw cutting cylindrical holes in wood gener- at the forward end of the shield. ally. The tool has a cylindrical cavity and an exterior thread, and a removable cutting part is dovetailed into its body and held in place by a metal strap. The tool has a longitudinal hole opening at both ends and a transverse hole for the escape of the chips.

Electrical.

WATER REGISTERING DEVICE. Samuel J. Evans, Elkhorn, West Va. For indicating the cones and forced through the perforations of the and registering the height of water in a tank or similar dasher as so many streams or currents, causing the quick receptacle, this inventor has constructed a device wherein an electric circuit is closed by means of a float controlled by the water in the tank, a registering mechanism being also operated accordingly at any convenient point. The mechanism is also designed to sound a high and low water alarm, the pointer of the registering deon a dial the raising and

the motor car travels, an inclined slotted rail forming the open at its bottom. Track boxes are inserted at suitable intervals between the ends of the slot rail sections, and ends of the respective contact rail sections.

Bicycles, Etc.

MECHANICAL MOTOR FOR BICYCLES, ETC .-- Charles P. Labatt, Los Angeles, Cal. A novel foot power device has been devised by this inventor, according to which the driving gear comprises sliding pedal levers in connection with a guide box having a longitudinally extending partition forming two raceways there being a pivoted spring-pressed tongue at each end of the partition and a stud projecting from the levers and alternately moving through the raceways. The levers have geared connection with the rear traction wheel, and the improvement is also designed to facilitate the driving of small stationary machines of different kinds.

ELECTRIC BICYCLE LAMP.- Malcolm peculiarly constructed electric generator connected with generator being actuated from the tire of the wheel, and being supported to rock on projections from the frame The current transmitter comprises an elastic-limbed brush held in an insulating holder block by a central screw and a nut held from turning by the flanges of the holder block, the brush having enforced contact with a current collector ring forming part of the generator. The improvement is also adapted for use on vehicles other than bicycles.

Mining, Etc.

CONCENTRATOR AND AMALGAMATOR. -Angus McKellar, Salt Lake City, Utah. To sift fine flour or flake gold from placer gravel, a contracted pan or basin, according to this invention, receives the mate- the harness rial from a screening surface, and a hopper beneath takes the material from the pan, while a cylinder with mercury in its bottom is connected by a pipe with the hopper. A valve in the lower portion of the cylinder is connected with a pipe through which the mercury and the material oughly remove from the screen and deliver outside of

Mechanical,

MECHANICAL MOVEMENT.-Julius ing hand lever are, according to this invention, both mounted on certain means by which the motion from the stool and lever are synchronized and regularly transmitted from the apparatus to a rotary crank shaft or other device to which motion is to be imparted. One seated on the stool grasps a hand pin passing through a CAR AXLE LUBRICATOR. - James S. | lever, and, bearing on the pedals, rocks back and forth, causing the stem on which the seat is mounted to reciprocate vertically and horizontal levers to rock. The power is applied at three points-at the stool, at the pin, and on the pedals, and these several movements act on a lever and link.

Agricultural.

HAY RAKE.-Benjamin Mellinger, Topeka, Kansas. In a horse hay rake this invention provides guards for the ends of the rake to prevent the hay gathered from being spilled at the ends of the row of teeth, a cleaning device being also provided for the teeth, operating in connection with a lever to raise the teeth. The guard comprises a shield formed of adjustable sections attached to and projecting rearwardly from wardly curved from the shield over the space between the end rake teeth and the forward portion of the rake

CHURN. - Jakob Widder, New York Within the cylindrical casing or body of this City. churn is a fixed hollow cone at the top, between which and another similar cone at the bottom of the casing the dasher is reciprocated, the dasher also being conical and perforated. The dasher rod is surrounded at its upper end by a helical spring, so that the dasher is normally held up within the upper cone. As the dasher is reciprocated, the cream is violently compressed hetween formation of butter.

Miscellaneous.

BRICK DIE. - Clarence M. Steele, Statesville, N. C. A die designed to form the greatest variety engine efficiency so gratifying to the eye is made a least friction is afforded by this inve tion, the die having polished metal surfaces through and the full working chart of volume and temperature which the clay is forced, forming it into bars for making curves accompanying the work. A schedule blank is brick. The die is composed of two die sections, a partition and a cylindrical shell or casing, the latter having a steam inlet and an outlet, with valves controlling the supply of lubricant. The circular shell bears all the outward strain upon the dies, and the several parts may be easily dressed out and polished, and securely put together with only two bolts and cap screws.

standing in the fancet, has been devised by this in- partments has now a well defined point of vantage which other side of the conduit, which is slotted at its top and ventor. 'Inefaucet barrel is made with a cap inclosing its outer end, the cap having an inwardly extending cupshaped bearing through which the piston rod extends to so as to thoroughly understand the results reached, the inner end of the faucet barrel. A collar near the Among the interesting articles in the present number are outer end of the rod rests against the cup-shaped bearing when the piston is flush with the inner end of the harrel, the barrel of the fancet being then completely emptied when the faucet is closed.

> POCKET KNIFE.-Alexander Normand, Klerksdorp, South African Republic. This knife has interchangeable blades to permit the user to readily and quickly remove one blade and substitute another, or to place in the handle a tool particularly adapted for the work in hand. The handle has two pivots especially adapted to facilitate making changes of blades or the in sertion of a tool, one of the small tools provided for use with the knife having an adjustable wrench head.

> BOOK SUPPORTER.-Henry L. Pinney and Franklin Leuzner, Cass City, Mich. A device for supporting books which may be attached to arm chairs without marring them, and adjusted to different heights, positions or angles, consists, according to this invention, of an adjustable pivoted arm which carries a board for the support of a book, with means for adjusting it to any angle, and a leaf holder consisting of wires pivoted near the upper edge of the board. The device may be conveniently swung in or out, closer to or further away

> from the reader, and will hold the book from an almost flat to a nearly vertical position. HARNESS SHAFT TUG.-William Fawcett, Brooklyn, N. Y. The frame of this tug is formed of a single piece of metal, curved at its lower portion to form a shaft support and bent over with a loop and pin, there being an adjacent loop to engage the belly band. The inner portion of the frame forms a buckle, with two pins, one above the other, one of which engages a movable tongue. The tng can be very cheaply manufactured and is quickly attached to the saddle strap of

> DRESS SKIRT LIFTER.-Esther Manning, No. 2273 Seventh Avenue, New York City. This simple device enables a woman to elevate the bottom of her dress skirt at all points, where others have been made to lift the rear portion only of the skirt. The device consists of tapes extended one from each breadth seam of the skirt and extended through guide rings along the seams and terminating in two tapes which are projected through the placket, whereby the several tapes may be simultaneously drawn to lift the bottom of the skirt. The device has met with ready sale—a fact which proves its utility.

> MEAT SHAVER. - Caleb R. Turner, Brooklyn, N. Y. To facilitate the shaving or slicing of meat in a neat and expeditious manner, this inventor has perfected a device of simple and durable construction, arranged to properly feed the meat to the slicing or shaving knife, and permit the operator to regulate the feed for thinner or thicker slices. It has an L-shaped trough to receive the meat, and a standard at the front end carrying a pivot for a knife frame to be swung by a handle to draw the catting edge of a segmental knife across the meat, a longitudinal carrier or pusher moving the meat forward bodily or pushing it in the trough toward the knife. By the shifting of a nut, less or more feed may be given to the carrier, and a gate at the front end of the trough protects the operator from getting his fingers under the knife.

> COVER FOR WASHTUBS, ETC. - Mark Delaney, Union Hill, N. J. This cover is preferably made of five parts, two cleats or side bars, two leaves having each a longitudinal groove in its inner side edge these grooves receiving, when the leaves are brought to gether, a central lag screw or connecting bar for the side bars or cleats. Tongues on the end portions of the leaves fit in grooves on the inner side edges of the cleats or side bars, and a cover is thus made which is adapted to withstand to a maximum degree the effects of steam dampness and water without warping.

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.

THE ENTROPY TEMPERATURE ANALYSIS OF STEAM ENGINE EFFICIENCIES. With a blank diagram arranged for easy application to any concrete case. Prepared by Sidney A. Reeve. 1897. New York: Progressive Age Publishing Company. Pp. 20. Price \$1.

A work of twenty octavo pages devoted to an explanation and mathematical analysis of engine efficiency on the lines of heat energy as representative in the Carnot cycle. The diagrammatic display of the details of nrincinal object illustrations าไรได

is accessible to every intelligent experimenter who is inclined to carefully study the ground already traversed, "The Aerodrome in Flight," "Recent Experiments in Gliding Flight," "The Best Ship for Wings," "The Way of an Eagle in the Air." "Screw Propellers Working in Air," "Blue Hill Measurements of the Velocity of Flying Ducks," etc., and biographical notices of Samuel Pierpont Langley, Ph.D., LL.D., D.C.L., and Otto Llienthal,

THE STEAM ENGINE CATECHISM. A series of direct practical answers to direct practical questions, mainly intended for young engineers and for examination questions. By Robert Grinshaw. Eleventh edition. New York: Norman W. Henley & Com-pany. 1897. Pp. 194, 219. Price \$2.

This work is now in its eleventh edition, which is a satisfactory indication of the value with which the book is held. The popular question and answerform is retained, and the questions are answered in a remarkably lucid manner. The tables of calculations are very clear. The work is provided with an excellent index.

ARCHITECTURAL DRAWING FOR ME-CHANICS. By I. P. Hicks. A couprehensive treatise on architectural drawing for building mechanics, showing the learner how to proceed step by step in every detail of the work. New York : David Williams. 1897. Pp. 94. Price \$1.

This is a comprehensive treatise on architectural drawing for building mechanics, showing the learner how to proceed step by step in every detail of the work. Even a superficial examination of this work will satisfy the reader that it is written by one who thoroughly understands the needs of the beginner in architectural drawing, and especially the building mechanic. It is not intended for architects proper, but it is for the use of builders and those who execute the designs of architects. The popularity with which the author's other work, entitled "Builders' Guide," has been received has brought many letters of inquiry, which have been convincing proofs of the wants and needs of the mechanic for a work of the kind on architectural drawing. It can be commended most warmly.

THE INDUCTION COIL IN PRACTICAL WORK, INCLUDING ROENTGEN X RAYS. By Lewis Wright. London: Macmillan & Company, Limited. New York: The Macmillan Company. 1907 Dr. 1720 Price 41 05 1897. Pp. 172. Price \$1.25.

A work by such an eminent physicist as the author of Light " and " Optical Projection " will certainly command attention. It is written simply and solely as a practical help to the efficient and safe use of an induction coil, with especial reference to the extensive use in surgical and physiological work with Roentgen rays. This new field of experiment has brought many into personal contact with coils who have never had any acquaintance with such instruments before. Not a few of such have actually stated their need of such information as it is here attempted to supply, and it is thought that some will like to have an outline of the many experiments in which the induction coil bears a part. The vork is illustrated with well selected engravings

- EIGHTEENTH ANNUAL REPORT OF THE MANAGERS OF THE BINGHAMTON STATE HOSPITAL, AT BINGHAMTON, N. Y. For the year ending Septem-ber 30, 1896. Transmitted to the State Commisson in Lunacy. Albany, N. Y. 1897. Pp. 190.
- HOUSE PLANTS AND HOW TO SUCCEED WITH THEM. By Lizzie Page Hill-house. New York : A. T. De la Mure Printing and Publishing Company. Pp. 220. Price \$1.

For dwellers in cities, and especially those who live in flats or apartments, this little book affords a good deal of practical information which will enable the house keeper to raise and care for many beautiful plants, and give one, even in such limited space, some of the delights of the country and of out of door life. The text is fully illustrated.

EUROPEAN ARCHITECTURE : A HISTORI-CAL STUDY. By Russell Sturgis. New York : The Macmillan Company. Pp. 578. Price \$4.

Of books on architecture there are many, but of treatises which a reader of good intelligence, not himself an architect, can consult with profit and satisfaction. there are comparatively few, and of these we know of no one so comprehensive, so free from prejudice and row ideas, and which discloses such a and sound judgment, as this volume of Mr. Sturgis. Historians as careful and learned as Mr. Freeman examine as closely into all distinguishable details of the earliest structures, many of them prehistoric, as they do into the roots of words in all languages, in endeavoring to throw light upon those far-back times in which were planted all over Europe, and particularly in all regions near the Mediterranean, the evidences of races antecedent to, but powerfully affecting, those which came later upon the stage, of whom we have more or less complete authentic data. But it is not every author who has the qualifications to correctly read the ancient landmarks, as they mark the history of the races of the earth; and when the architect seeks to piece them into studies of the origin of different orders of architecture. and thence trace out their later development, one does not have far to go, in most cases, before feeling that he has left the solid ground of established fact and is in an atmosphere of doubt and conjecture. In this work of Mr. Sturgis, however, the prefatory pages on archaic and prehistoric building, and the succeeding chapters on Grecian and Roman architecture, show us, as a connected whole, and more clearly than we have elsewhere seen it set forth, how it is that "somewhere in Grecian lands, about seven hundred years before our era, a beginning of ar-

water in the tank or reservoir by successive steps,

IGNITER FOR GAS ENGINES.-Harry S. Dosh, Baltimore, Md. An igniter designed to operate successfully and with certainty and uniformity with a single battery cell has been devised by this inventor. It comprises two electrodes having their ends formed as extended plates, and means for suddenly separating the plates, which lie sufficiently close together to cause by their separation a rarefaction of the gaseous medium between them. The invention thus affords a means of creating in the gas cylinder a partial vacuum or reduced pressure between the spark electrodes and simultaneously transmits through this more tenuous medium of gas and air the electric spark, which permits the use of a very weak battery of a single cell.

ELECTRIC RAILWAY SYSTEM. - Law rence K. Devlin, Havre, Montana. This invention is for an improvement in systems where the trolley is adapted to run on a sectional contact rail, in a slotted conduit. and normally out of electrical communication with the feed wire, the sections of the contact rail being put in communication with the feed wire by contact devices actuated by the movement of the car. One of the track rails forms one side of the conduit wherein the trolley of

BRISTLE WASHING MACHINE. - Charles E. Tyler and James Dempster, Halifax, Canada To clean a large number of bundles of bristles simultane onsly and to permit of removing a washed bundle of bristles and replacing it by an unwashed bundle durin, the washing operation, this machine is made with a reciprocating comb and a disk capable of movement over

the comb, and adapted to carry the bristles and bring them into the path of the comb teeth. The comb is mounted to slide on the bottom of a liquid receptacle. and the comb teeth pass in every direction through the bristles in each bundle.

PISTON FAUCET.-Edwin R. Greene, Providence, R. I. A faucet for drawing beer, ale, etc., and arranged to prevent a large amount of liquid from third, the development of the motor. Each of these de-

also detailed on the diagram sheet in the order of observation and as a guide to uniformity in the work of engine testing. An excellent study sheet for expert work.

THE AERONAUTICAL ANNUAL, 1897. Devoted to the encouragement of experiment with aerial machines, and to the advancement of the science of Means. Boston. Mass.: W. B. Clarke & Company. Pp. 178. 8vo. Paper. Price \$1.

The Aeronautical Annual is always a welcome visitor, and the third volume of this really important publication surpasses in interest those which have preceded it. It is got up in the same handsome style and is profusely illustrated. The contributors include Dr. S. P. Langley. Octave Chanute, Otto Lilienthal, Hiram S. Maxim and others. The progress in aeronautics in 1896 was very marked, the development being chiefly along three lines: First, the development of the self-propelled aerodrome; second the development of the motorless air sailer;

chitecture was made; two centuries and a half later this had grown into the architecture which we admire; from this it came to pass that Roman building was what it was, and from Roman building has come all that of later Europe." The history of architecture in Europe from 350 A.D. up to recent times is covered by nine chapters in which is crowded a vast deal of valuable information and most interesting comment. The book is embellished with ten plates and 256 other illustrations.

A TREATISE ON ARCHES. By Malverd A. Howe, C.E. New York : John Wiley & Sons. Pp. 371. Price \$4.

This is a book particularly designed to facilitate the work of the practicing engineer, saving his time in the making of many essential mathematical demonstrations and furnishing formulæ and tables adapted to his wants for a wide variety of work. The author is professorod civil engineering in Rose Polytechnic Institute, and the demonstrations are designed to be such as may be readily followed by senior students in technical schools.

The large and valuable catalogue of manufacturers' and machinists' hardware, issued by Charles H. Besly & Company, of Chicago, presents an extent and variety of tools and supplies which one seldom finds in a single volume. It comprises 300 closely printed pages in fine type, with profuse illustrations and ample index, the articles catalogued including almost everything from an engine lathe to calipers or from a differential pulley to a scratch awl.

SCIENTIFIC AMERICAN BUILDING EDITION

JULY, 1807. - (No. 141.)

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- No. 1. Perspective elevation, in colors, and floor plans of a Colonial residence at Overbrook, Pa. A unique design. Mr. Thomas P. Lonsdale, architect, Philadelphia, Pa.
- No. 2. Colorial house at Richmond Hill, N. Y., recently erected at a cost of \$4,200. Perspective view and floor plans. An attractive and pleasing de sign. Architects, Messrs. Haugaard Brothers Richmond Hill, N. Y.
- No. 3. A residence, iu the Colonial style, recently erected at Larchmont, N. Y., for Mr. William Murray, at a cost of \$7,700 complete. Two perspective elevations and floor plans. A pleasing design with excellent interior arrangement. Mr. Frank A. Moore, architect, New York City.
- No. 4. A cottage at Prohibition Park, Staten Island, re cently erected for Mr. August Mayer at a cost of \$2.250 complete. A very attractive design for a modern cottage of small dimensions. Perspective elevation and floor plans. Mr. John Winans, architect, Prohibition Park, Staten Island.
- No. 5. "Wyandauk." the country residence of Lieut Morton at Southampton, Long Island. A most excellent design in the Colonial style. Two perspective elevations and floor plans. Mr. James B. Lord, architect, New York City.
- No. 6. A modern dwelling at Binghamton, N. Y., cently erected for Mr. William Mannis at a cost of \$3,000 complete. A good example of a suburban house. Two perspective elevations and floor plans. Messrs. T. Q. Lacey & Son, Binghamton, N. Y., architects.
- No. 7. A Colonial residence at Ardmore, Pa., recently erected for Dr. Louis O. Lusson. Perspective elevation and floor plans. Messrs, Boyd & Boyd, architecte, Philadelphia, Pa.
- No. 8. A Colonial residence at Bensonhurst, Long Island, recently erected for Mr. Thomas A. Ritson. Two perspective elevations and floor plans, A handsome design. Architects, Messrs. Parfitt Brothers, Brooklyn, N. Y.
- No. 9. A residence at West Chester, Pa., recently erected for Dr. S. Hagerty. Perspective elevation and floor plans. A design with many excellent features. Mr. Edward S. Paxson, architect, Philadelphia,
- No. 10. A residence at Attleboro, Mass., erected for E P. Clafin, Esq., at a cost of \$5,500 complete. An artistic and pleasing design. Messrs. George F. Barber & Company, architects, Knoxville Tenn.
- No. 11. Perspective and interior view of the Walhalla of Ratisbon on the Danube. A costly reproduction of the Parthenon at Athens. This temple was erected at a cost of about \$6,000,000, and is devoted entirely to the display of busts of distinguished Germans. No. 12. Design for a "cozy corner."
- No. 13. View of the library of Mr. Henry L. Hotchkiss, MENT, Nos. 1063, 1073, 1078, ten cents each. New Haven, Conn.

Business and Personal.

The charge for insertion under this head is One Dollar a line for each insertion : about eight words to a line Advertisements must be received at publication office as early as Thursday morning to appear in the following week's issue.

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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.
Ref erences to former articles or answers should give date of paper and page or number of question.
Inquiries not answered in reasonable time should is repeated: correspondents will be ari m mindth at 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 renumeration.
Books referred to promptly supplied on receipt of price.

price. Minerals sent for examination should be distinctly marked or labeled.

(7179) W. D. M. says: Is shellar considered a good bicycle wood rım cement ? If so, how is it prepared for that purpose ? Also, how should it be ap-A. Cements for Tires.-1. Shellac..... 2 oz. av. Gutta percha...... 2

Red lead	 	90 g	г.
Sulphur	 · · • • • · · · · ·	90	"
Malt the shallos and	 		

Melt the shells ac and gutta percha, and add, with stant stirring, the red lead and sulphur melted. Use while hot.

2. Isinglass	
Gutta percha	
Caoutchouc	
Carbon bisulphide Mix and dissolve.	4 fl. oz.
3. Caoutchouc	2 oz. av.
Resin	140 gr.
(IL - 1)	100 11

Carbon disulphide, a sufficient quantity to dissolve

the other ingredients.	
4. Crude rubber	16 oz.
Carbon disulphide	4 "
Macerate twenty-four hours, and then add	a solutio

materate twenty-four nours, and then add	a solumon
of—	
Resin	1 oz.
Beeswax.	1/4 "
Carbon disulphide	4 "
(7180) G. R. S. says: Will you	kindly
nform me through your Notes and Queries of	f a cleaner

and polish for tan shoes that will not injure the leather ? A. We have published directions for making preparations for cleaning and polishing shoes, in our SUPPLE-

(7181) J. C. McK. writes: I have been

ton covered in two layers of primary, but additional current can be used toovercome your larger resistance. In doing so more heat will of course be developed, and the coil cannot be run as long at a time. With an odd number of sections in secondary, one end of the wire will come out on inside of spool. An even number of spools should have been used. The larger the number of sections, the less the risk of breaking down the insulation between the turns of secondary, because there is less difference of potential between adjacent parts of the coil.

(7182) R. E. R. writes: I have made the caustic potash battery you describe in "Experimental Science." I used a cast iron kettle for the cell after heating the water. I added the potash (1/2 pound), which was in stick form, and after this was thoroughly dissolved I put in a pound of black oxide. The sheet zinc is three feet long and six inches wide, rolled in spiral shape, The inside of kettle seemed to corrode to a consider able thickness. Can you account for it? Would not a copper pail be a good substitute for the kettle? A. The cell with oxide of copper in an iron dish, and a solution of caustic potash or soda, must have a thin layer of heavy petroleum oil on the top of the liquid to prevent the action of the carbonic acid of the air upon the potash or soda. You do not mention using this. In the action of the cell a dark brown or nearly black mud is formed from the black oxide. This may be what you have thought to be the corrosion of the kettle. If the kettle corrodes, it will be seen by the formation of holes or pits in the iron. This should not take place. The zinc of this battery, for best effect, should be amalgamated. This is difficult with ordinary sheet zinc; probably impossible with so large a piece as you use. This battery is properly to be used on closed circuit; that is, it should be left with current flowing through a large resistance when yon are not at work with it. From your description it is difficult to see why you have had a complete failure. The suggestions above may lead you to better success. A copper pail would be more expensive. If you would use copper, we would advise a dish bent up from sheet copper to hold the black oxide. This set into a glass jar would form a good negative plate. Rivet an insulated copper wire to the copper dish, so that neither the liquid nor the zinc can touch the wire on its way out. Then, if you can get a plate of zinc such as is used in the gravity battery and amalgamate it, the result will be much better.

TO INVENTORS.

An experience of nearly fifty years, and the prepara tion of more than one hundred thousand applications for natents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequaled facilities for procuring patents everywhere. A synonsis of the natent laws of the United States and all foreign countries may be bad on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

INDEX OF INVENTIONS For which Letters Patent of the United States were Granted JULY 20, 1897, AND EACH BEARING THAT DATE. [See note at end of list about copies of these patents.]

586,627 586,769 586,921 586,749 586,749 586,550

	Bridle, M. Wilson Brush and mop holder, combined scrubbing, F.	280,048
e. In nd the	E. Matthews Buckle I. D. Bank	586,857 586,746
num-	Buckle, martingale, G. 'I. Wolff.	586,649
e will	Burner. See Gas burner.	586,991
spools	Cable mechanism, secondary, J. T. & W. J. Hun-	586,821
f sec-	ter Cable strand, E. P. Frederick	586,901 586,706
lation	Can. See Oil can. Can opener W. A. Simond	586.874
66 ali-	Canister, combination, A. E. Carter.	586,758
	E. Sterne.	586,633
the	Car draw bar, railway, W. T. Van Dorn	586,701
bost-	Car, hand, I. N. Glover Car loading apparatus, C. W. Underwood	586,601 586,641
ch was	Car sign, street, G. E. Weis Car ventilation, H. F. Stanley	586.583 586.939
lved I	Cars, air brake for railway, J. F. Coffin	586,836 586,577
three	Cardboard box, H. Schmeer.	586,827
shape.	Carriage and wheel chair, combined baby, J. A.	EUR 700
ld not	Case. See Paper case. Spectacle case.	500.054
P A.	Casein, making ammoniacai, w. Majert Cement sidewalk, W. P. Beckwith	586,540
la so-	Chair. See Reclining chair. Rocking chair.	380,912
layer	Chair and fo otrest, combination, C. A. Lee Churn, A. Mearns	586,610 586,908
to pre-	Churn, C. L. Monroe Churn dasher, P. C. Barlow	586,731 586,754
In the	Cigarette machine, F. Girard Cistern cover lock, H. Oberjohann	586,599 586,800
ud is	Cithern attachment, F. Zimmerly	586,651
at you	Clothes from boiling water, device for removing,	586 607
If the	Clutch, friction, Bardons & Oliver	586,832
holes	Clutch mechanism, traction engine, E. Huber	586,664
nated.	Cotton elevator and cleaner, seed, G. Lemoine	586,906
ly im-	Cotton, printing and mercerizing, J. Weiss	586,778 586,750
attery	Crate, egg, J. H. Hammer Crate. folding egg, T. Ellenbecker	586,846 586,725
is, it	Crate, folding egg, J. J. Goldbaum Crate machine, F. B. Sites	586,843 586,671
ge re-	Cultivator, F. Benfield. Current recorder, excessive, J. R. Cravath	586,655 586,723
had a	Curtain fixture, A. J. Roth.	586,935
d you	Cutout, fusible, Perkins & Tregoning	586,565
expen-	Cycle chains, adjustingmeans for, Roberts & Mor-	
a dish	ton. Cycle gear cases, apparatus for manufacturing, H.	586,624
This plate	W. Dover Cycle w beel, D.N. Gleason	586,840 586,600
sh. so	Damper, J. É. Sentz Deborning implement. G. Webster	586,571 586,806
e wire	Dental instrument, J. W. Hard Die. See Glove cutting die.	586,727
of zinc	Dilator, uterine, T. A. Lewis.	586,776 586,626
amate	Dust collector, D. W. Marmon	586,742
	Dyeing black, E. Von Portheim	586,865
	Electric furnace, R. F. S. Heath	566,687
ens ra	Electric furnace, F. J. Patten	586,615
ations	Electric motor, F. A. Perret	586,825
rstand	Electric switch, J. F. McElroy Electric switch connection, H. A. Bullard	586,933 586,543
where.	Electrical conducting wires, connector for, Hull & Du Bois	586.665
es and	Electrical conductor, C. N. Dutton Electrical meter, W. D. Marks	586,811 586,559
nd per-	Electrodepositing device, J. Bossard Electrolysis, method of and apparatus for effect-	586,894
ice for	ing, C. Kellner Electromagnetic motor, F. J. Patten	586,729 586,823
es and	Elevator. See Cotton elevator. Elevator clutch and brake. W. Weismantel	586,885
BINESS. RICAN.	Ellipticspring, T. G. Mandt	586,777
	Engine. See Explosive engine. Pumping engine. Botary steam engine. Steam engine. Trac-	000,000
_	tion engine.	
NS	Engine center, traction, 1. Schmitt	596 971
. 0	Engines, cuton apparatus for marine, r. Bitther.	586,871 586,893
	Envelope, P. A. Roberts. Explosive engine, F. A. Redmon.	586,871 586,893 586,625 586,828 586,828
e	Envelope, P. A. Roberts. Explosive engine, F. A. Redmon. Expressing press, F. Stitzel. Extract, a himal, E. Reinert.	586,871 586,893 586,625 586,826 586,673 586,673 586,623
C	Envelope, P. A. Roberts. Explosive engine, F. A. Redmon. Expressing press, F. Stitzel. Extract, animal, E. Reinert. Extractor. See Pen extractor. Eyelet, E. Kempshall.	586,871 586,893 566,625 586,826 586,673 586,673 586,623 586,770
C	Expressing press, F. Stitzel. Expressing press, F. Stitzel. Extract, animal, E. Reinert. Extractor. See Pen extractor. Eyelet, E. Kempshall. Feed water feeding and heating apparatus, boiler, E. P. Holly.	586,871 586,893 586,625 586,625 586,673 586,623 586,623 586,770 586,972
e	Envelope, P. A. Roberts. Expressing press, F. Stitzel. Extract, animal, E. Reinert. Extractor. See Pen extractor. Eyrlet, E. Kempshall. Feed water feeding and heating apparatus, boiler, E. P. Holly. Fence stay fastening tongs, G. B. Sechrist. Fence stay, wire, W. Robbins	586,871 586,893 586,625 586,625 586,623 586,673 586,623 586,770 586,952 586,952 586,077 586,915
TE.	Envelope, P. A. Roberts. Expressing press, F. Stitzel. Extract, animal, E. Reinert. Extractor. See Pen extractor. Eyelet, E. Kempshall. Feed water feeding and heating apparatus, boiler, E. P. Holly. Fence stay fastening tongs, G. B. Sechrist. Fence stay, wire, W. Robbins. Pence stretcher, wire, C. H. Salisbury. Fences tay, wire, W. Robbins.	586,871 586,893 586,625 586,625 586,623 586,623 586,623 586,970 586,952 586,952 586,715 586,715 586,202 586,914
TE. ents.]	Envelope, P. A. Roberts Expressing press, F. Stitzel. Expressing press, F. Stitzel. Extract, animal, E. Reinert. Extractor. See Pen extractor. Eyelet, E. Kempshall. Freed water feeding and heating apparatus, boiler, E. P. Holly Fence stay fastening tongs, G. B. Sechrist Fence stay, wire, W. Robbins Fence stay, wire, W. Robbins Fence stay, wire, W. Robbins Fence stay, wire, S. Garles Fifth wheel, vehicle, J. McLaughlin. Fifth wheel wagon, M. M. Sherwood.	586,871 586,893 586,625 586,828 586,623 586,623 586,673 586,623 586,952 586,952 586,952 586,115 586,902 586,809 586,809 586,902 586,809
TE.	Engines, cuton apparatus for marine, r. httner. Envelope, P. A. Roberts Expressing press, F. Stitzel Extract, animal, E. Reinert. Extractor. See Pen extractor. Eyelet, E. Kempshall. Feed water feeding and heating apparatus, boiler, E. P. Holly Fence stay, wire, W. Robbins Fence stay, wire, W. Robbins Fence stay, wire, C. H. Salisbury. Fence, Wire, B. Scarles Fifth wheel, vehicle, J. McLaughlin. Fifth wheel wagon, M. M. Sherwood. File for deposit slive, J. H. Rand.	586,871 586,893 586,625 596,828 586,673 586,623 586,623 586,770 586,952 586,807 586,807 586,807 586,807 586,808 586,801 586,809 586,801 586,600 586,609 586,601
TE. ents.]	Engines, cuton apparatus for marine, r. hittier. Envelope, P. A. Roberts Expressing press, F. Stitzel Extract, animal, E. Reinert Extractor. See Pen extractor. Eyelet, E. Kempshall Freed water feeding and heating apparatus, boiler, E. P. Holly Fence stay fastening tongs, G. B. Sechrist Fence stay fastening tongs, G. B. Sechrist Fence stay, wire, W. Robbins Fence stay, wire, W. Robbins Fence stay, wire, B. Scarles Fifth wheel, vehicle, J. McLaughlin Fifth wheel wagon, M. M. Sherwood File for deposit slips, J. H. Rand. Filter, C. A. Kunzel, Jr.	586,871 586,823 586,625 586,625 586,623 586,673 586,623 586,673 586,952 586,870 586,911 586,902 586,804 586,911 586,670 586,709 586,709 586,709
TE. ents.] 586,551 586,645 586,645 586,645 586,645	Engines, Cuton apparatus for marine, F. Bitcher, Envelope, P. A. Roberts Expressing press, F. Stitzel Extract, animal, E. Reinert Extractor. See Pen extractor. Eyelet, E. Kempshall Freed water feeding and heating apparatus, boiler, E. P. Holly Fence stay fastening tongs, G. B. Sechrist Fence stay wire, W. Robbins Fence stay, wire, B. Scarles Fifth wheel, vehicle, J. McLaughlin Fifth wheel, wehicle, J. McLaughlin Fifth wheel wagon, M. M. Sherwood File for deposit alips, J. H. Rand Filter, C. A. Kunzel, Jr Filter press plate, H. P. Chamberlain Files trap and boat, combined, G. W. Nelson	586,871 586,893 586,625 586,623 586,623 586,623 586,623 586,770 586,952 586,615 586,615 586,615 586,670 586,570 586,581 586,570 586,581 586,570 586,581 586,570 586,581 586,570 586,581 586,570
TE. ents.] 586,651 586,650 586,669 586,669 586,766	Envelope, P. A. Roberts Expressing press, F. Sutzel. Expressing press, F. Sutzel. Extract, animal, E. Reinert Extractor. See Pen extractor. Eyelet, E. Kempshall. Feed water feeding and heating apparatus, boiler, E. P. Holly fence star wire W. RODERS, G. B. Sechrist Pence starter wire, C. H. Salisbury. Pences, Wire, B. Scalles, Pifth wheel, vehicle, J. McLaughlin. Fifth wheel wagon, M. M. Sherwood. File and handle, A. Weed. File for deposit slips, J. H. Rand. Filter, C. A. Kunzel, Jr. H. Rand Filst trap and boat, combined, G. W. Nelson Float trap, J. F. McElroy	586,871 586,893 586,625 586,625 586,623 586,623 586,623 586,770 586,952 586,670 586,801 586,670 586,801 586,670 586,801 586,570 586,593 586,593 586,593 586,593 586,593 586,593 586,593
T E. ents.] 586,551 586,645 586,669 586,669 586,665 586,665	Envelope, P. A. Roberts Envelope, P. A. Roberts Expressing press, F. Sutzel. Extracts, animal, E. Reinert Extractor. See Pen extractor. Eyelet, E. Kempshall. Feed water feeding and heating apparatus, boiler, Feed water feeding and heating apparatus, boiler, E. P. Hollytoning tongs, G. B. Sechrist Pence stay fastening tongs, G. B. Sechrist Pence stay fastening tongs, G. B. Sechrist Pence stay, where, W. Robins Pence stay, where, W. Robins Pence stay, where the state state state state state Pence stay, where the state state state state state state Pence stay, where the state st	586,871 586,625 586,625 586,623 586,623 586,623 586,623 586,6770 586,597 586,597 586,597 586,597 586,690 586,690 586,691 586,691 586,691 586,691 586,693 586,6
T E. ents.] 586,551 586,689 586,689 586,786 586,786 586,786 586,718 586,835	Employee, P. A. Roberts Expressing press, F. Sutzel. Expressing press, F. Sutzel. Extractor. See Fen extractor. Eyelest, E. Kempshall. Feed water feeding and heating apparatus, boiler, Feed water feeding and heating apparatus, boiler, E. P. Holly Fence stay fastening tongs, G. B. Sechrist. Fence stay and the start of the start of the start fence stay wire, W. Robins. Fence stay wire, W. Robins. Fence stay wire, W. Robins. Fence stay wire, W. Robins. Fence stay wire, W. Robins. Fifth wheel weaker, M. Gharghlin Fifth wheel weaker, M. Gharghlin Fifth wheel weaker, M. Gharghlin Fifth wheel weaker, M. Sherwood. Fifth wheel weaker, M. Sherwood. Filter of deposit alins, J. H. Rand Filter, C. A. Kunzel, Jr. H. Rollow, M. Kollow, Flooting, M. T. Hersee. Fromting and the disc. C. Fisher. Fold trap, J. F. McElroy. Frame. See Bioycleframe. Frame. See Bioycleframe. Fumigator, J. W. Cock.	586,671 586,623 586,623 586,673 586,773 586,673 586,779 586,799 586,799 586,799 586,799 586,799 586,799 586,799 586
T E. ents.] 586,551 586,559 586,649 586,649 586,769 586,718 586,718 586,850 586,718 586,850	Employer, P. A. Roberts Expressing press, F. Sutzel. Expressing press, F. Sutzel. Extract, animal, E. Reinert. Extractor. See Pen extractor. Eyelet, E. Kempshall. Feed water feeding and heating apparatus, boiler, E. P. Holly Fence stay fasten ing tongs, G. B. Sechrist. Fence stay wire, B. Scales Fith wheel, vehicle. McLaughlin. Fith wheel, vehicle. McLaughlin. Fith wheel, vehicle. McLaughlin. Fith wheel wagen, M. M. Sherwood. Fith wheel wagen, M. M. Sherwood. Fits press plate, M. Yed Filter, press plate, M. Yed Filter, press plate, M. P. Chamberlain Fish trap and box combined, G. W. Nelson. Fostrap, J. F. Meslery Fouching and, J. Fisher. Fouching and, J. Fisher. Folding bax, S. Klein. Frame. See Bioryleframe. Frame. See Biorgleframe. Frame. See Annealing furnaca. Electric fur- nace. Swelting furnaca. Electric fur-	586,671 586,225 586,225 586,225 586,223 586,673 586,672 586,672 586,672 586,672 586,672 586,672 586,672 586,611 586,672 586,611 586,672 586,673 586,675 586,778 586,768
T E. ents.] 586,551 586,563 586,563 586,563 586,563 586,563 586,765 586,581 586,581	Employer, P. A. Roberts Expressing press, F. Sutzel. Expressing press, F. Sutzel. Extractor. See Pen extractor. Eyelet, E. Kempshall. Feed water feeding and heating apparatus, boiler, E. P. Holly Fence stay wire, W. Robbins. Fence stay wire, B. Scales Fifth wheel, vehick, J. McLaughlin. Fifth wheel wagon, M. M. Sherwood. Fifth andle, A. Weed. File and handle, A. Weed. File for deposit slips, J. H. Rand Flooring, A. T. Hersee. Footing box, S. Klein Frame. See Bicycle frame. Founigator, J. W. Colk. Fumigator, J. W. Hill, Fumigator, J. W. Hill, Fumace. See Anneeling furnaca. Electric fur- mace. Smelting furnace.	586,571 586,223 580,223 580,223 580,773 580,623 586,770 586,623 586,677 586,602 586,602 586,602 586,603 586,605 586,60
T E. ents.] 586,551 586,645 586,560 586,689 586,765 586,581 586,581 586,581 586,581 586,581	Employer P. A. Roberts Expressing press. F. Stitzel. Expressing press. F. Stitzel. Extract. a nimal, E. Reinert. Extractor. See Pen extractor. Eyelet, E. Kempshall. Feed water feeding and heating apparatus, boiler, E. P. Holly Fence stay wire, W. Robbins. Fence stay wire, B. Scales Fifth wheel, vehick. J. McLaughlin. Fifth andle, A. Weed. File for deposit slips. J. H. Rand Filer, C. A. Kunzel, J. C. Kisher. Footing, J. F. McElroy. Flooring, A. T. Hersee. Foushing tank, J. C. Fisher. Folding box, S. Klein Frame. See Bicycle frame. Fomigator L. W. Cock. Fumigator J. W. Cock. Furnace. See Anneeling furnace. Furnace. See Saw table gage. Gas alarm. electrical. J. Erikson.	586,871 586,253 580,223 580,277 580,27
T E. ents.] 586,551 586,645 586,645 586,645 586,645 586,645 586,870 586,870 586,581 586,581 586,581 586,581 586,581 586,581	Empines, cucon apparatus for manne, r. Bitther, Envelope, P. A. Roberts Expressing press, F Suitzel. Extract. animal, E. Reinert. Extractor. See Pen extractor. Eyelet, E. Kempshall. Fende star feeding and heating apparatus, boiler, E. P. Holly Fence stay wire, W. Robbins. Fence stay wire, W. Robbins. Fence stay wire, B. Scales Fifth wheel, vehicle, J. McLaughlin. Fifth and Andle, A. Weed. File for deposit slips, J. H. Rand Filter, C. K. Kunzel, J. Filter press plate, H. P. Chamberlain. Fiesh trap and boat, combined, G. W. Nelson. Flooring, A. T. Hersee. Flooting, Dox, S. Klein. Frame. See Bicycle frame. Frumigator, L. W. Cock. Fumigator, J. W. Hill. Furnace. See Annealing furnace. Furnace. See Saw table gage. Gas alaruner, J. Stubbers	586,571 586,253 580,223 580,273 580,273 580,273 580,273 580,273 580,275 580,275 580,275 580,215 580,215 580,215 580,210 580,21
T E. ents.] 586,551 586,645 586,645 586,645 586,680 586,680 586,581 586,585 58	Employed P. A. Roberts Expressing press. F. Skitzel. Expressing press. F. Skitzel. Extract. a nimal, E. Reinert. Extractor. See Pen extractor. Eyelet, E. Kempshall. Feed water feeding and heating apparatus, boiler, Feed water feeding and heating apparatus, boiler, Fence stay wire, W. Robbins. Fence stay wire, B. Scales Fifth wheel, vehicle, J. McLaughlin. Fifth and K. M. Weed. File for deposit slips, J. H. Rand Filer, C. K. Kunzel, J. H. Rand Filer press plate, H. P. Chamberlain. Fish trap and boat, combined, G. W. Nelson. Flooring, A. T. Hersee. Floughing, A. T. Hersee. Floughing, A. T. Hersee. Flough and boat, S. Klein. Frame. See Bicycle frame. Frumigator, J. W. Hill. Frame. See Saw table gag e. Gas alarung, J. Stubbers Gas manafacturing apparatus, A. E. Aldrich. Gase. Ree Railway crossing gate.	546, 671 546, 625 540, 625 540, 625 540, 625 540, 627 540, 623 540, 673 540, 673 540, 673 540, 673 540, 673 540, 673 540, 673 540, 675 540, 775 540, 7
T E. ents.] 586,551 586,645 586,645 586,590 586,590 586,590 586,591 586,593 586,593 586,593 586,593 586,574	Emplanes, Cucon apparatus for manne, F. Bittler, Envelope, P. A. Roberts Expressing press, F Suitzel Extract. animal, E. Reinert Extractor. See Pen extractor. Eyelet, E. Kempshall. Fende star feeding and heating apparatus, boiler, Fende star fastening tongs, G. B. Sechrist Fence stary wire, W. Robbins. Fence stary wire, W. Robbins. Fence stary wire, B. Scalles Fifth wheel, vehicle, J. McLaughlin. Fifth and handle, A. Weed. File for deposit slips, J. H. Rand Filter, C. K. Kunzel, J. Filter press plate, H. P. Chamberlain. Fiesh trap and boat, combined, G. W. Nelson. Flooring, A. T. Hersee. Flooting, Dox, S. Klein Frame. See Bicycle frame. Fumigator, J. W. Hill. Furnace. See Annealing furnace. Furnace door, R. B. Hobson. Gas laruner, J. Stubbers. Gas manafacturing apparatus, A. E. Aldrich. Gate. See Railway crossing gate. Georing, W. A. McCollough.	546,671 546,625 546,625 546,625 546,623 546,673 546,673 546,673 546,673 546,673 546,673 546,673 546,673 546,675 546,615 546,615 546,617 546,643 546,617 546,543 546,617 546,552 546,617 546,552 546,513 546,552 546,513 546,514 546,513 546,51
T E. ents.] 586,551 586,645 586,560 586,766 586,766 586,766 586,564 586,564 586,564 586,564 586,574	Emplanes, Cucon apparatus for manne, F. Bittler, Envelope, P. A. Roberts Expressing press, F. Stitzel Extract., animal, E. Reinert Extractor. See Pen extractor. Eyelet, E. Kempshall. Feed water feeding and heating apparatus, boiler, E. P. Holly Fence stay wire, W. Robbins Fence stay wire, W. Robbins Fence stay wire, B. Scarles Fifth wheel, vehicle, J. McLaughlin. Fifth andle, A. Weed. File for deposit slips, J. H. Rand Filter, C. Kunzel, J. H. Rand Filter, C. Kunzel, J. Bisher. Foloring, A. T. Hersee. Fish trap and boat, combined, G. W. Nelson. Flooring, A. T. Hersee. Fushing tank, J. C. Fisher. Folding box, S. Klein Frame. See Bicycleframe. Fungator, L. W. Cock. Funigator, J. W. Hill. Furnace. See Annealing furnaca. Electric fur- nace. Smelting furnace. Gas furner, J. Stubbers Gas furner, J. Stubbers Gas furner, Surg joint for, H. P. Drew. Gas manafacturing apparatus, A. E. Aldrich Gate. See Railway crossing gate. Glove fast ener, W. B. Page	546, 671 546, 623 546, 625 546, 625 546, 625 546, 623 546, 673 546, 673 546, 673 546, 673 546, 677 546, 643 546, 543 546, 543 546, 643 546, 543 546, 544 546, 545545 546, 545 546, 545555 546, 545 546, 54555555556555555555655555555555555555
T E. ents.] 586,551 586,645 586,645 586,645 586,950 586,764 586,564 586,564 586,564 586,564 586,564 586,571 586,571	Employed P. A. Roberts Expressing press. F. Stitzel. Expressing press. F. Stitzel. Extract. a nimal, E. Reinert. Extractor. See Pen extractor. Eyelet, E. Kempshall. Feed water feeding and heating apparatus, boiler, E. P. Holly. Fence stay fastening tongs, G. B. Sechrist. Fence stay wire, W. Robbins. Fence stay wire, W. Robbins. Fence stay wire, B. Scarles. Fifth wheel, vehicle, J. McLaughlin. Fifth wheel wagon, M. M. Sherwood. File for deposit slips, J. H. Rand Filter of a constitution of the state	546, 671 586, 673 580, 603 580, 603 580, 603 580, 603 580, 603 580, 603 580, 603 580, 617 580, 603 580, 617 580, 617 580, 603 580, 617 580, 618 580, 618 580, 618 580, 614 580, 614 580, 614 580, 614
T E. ents.] 586,551 586,645 586,645 586,645 586,645 586,645 586,645 586,645 586,645 586,645 586,564 586,564 586,564 586,574 586,574	Employee P. A. Roberts Expressing press. F. Stitzel. Expressing press. F. Stitzel. Extractor. See Pen extractor. Eyeles, E. Kempshall. Feed water feeding and heating apparatus, boiler, E. P. Holly. Fence stay fastening tongs, G. B. Sechrist. Fence stay wire, W. Robbins. Fence stay wire, W. Robbins. Fence stay, wire, B. Scarles. Fifth wheel, vehicle, J. McLaughlin. Fifth wheel vehicle, J. McLaughlin. Fifth wheel wagon, M. M. Sherwood. File for deposit slips, J. H. Rand Filter, C. Kunzel, J. Filter press plate, H. P. Chamberlain. Frash trap and boat, combined, G. W. Nelson. Flooting, J. T. Hersee. Flushing tank, J. C. Fisher. Folding box, S. Klein. Frame. See Bicycleframe. Fumigator, L. W. Cock. Fumigator, J. W, Hill. Gas alarm, electrical, J. Erikson. Gas larner, J. Stubbers. Gas manafacturing apparatus, A. E. Aldrich Gate. See Anlway crossing gate. Glove, E. L. Blun. Glove fastener, W. B. Page. Glove fastener, F. F. Raymond, 2d. Grain binder buit aluster, B. F. Stewart. Grain diedro was maching machine heedle orman. Guard. See Seing machine heedle orman. Guard. See Seing machine heedle orman. Guard. See Seing machine heedle orman. Guard. See Seand mather and separator, J. C. Benson. Guard. See Seing machine heedle orman. Guard. See Seing machine heedle orman. Guard. See Seing machine heedle orman. Guard. See Seand mather and separator, J. C. Benson. Guard. See Seand mather mather aluster, B. F. Stewart. Guard. See Seand mather mather aluster, B. F. Stewart. Guard. See Seand mather mather aluster, B. F. Stewart. Guard. See Seand mather but aluster, B. F. Stewart. Guard. See Seand mather but aluster, B. F. Stewart. Guard. See Seand mather but aluster, B. F. Stewart.	546, 671 546, 623 546, 623 546, 623 546, 623 546, 623 546, 623 546, 627 546, 627 546, 627 546, 627 546, 627 546, 627 546, 627 546, 627 546, 621 546, 641 546, 641 546, 543 546, 617 546, 617 546
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onstructing an induction coil along the following lines and would be pleased to have your opinion as to the spark we might reasonably expect from the same. Length of coil inside heads will be a little over 13 inches. Three Blot Boa sections of 4 inches each. Size of coil when finished, 7 inches. Size of core, 1% inch. Wire on primary, No. 16, Boil Boil Boil two layers. Wire on secondary, No. 38, 100 layers approximately. Winding, 116 to inch. No. 200 thread (cot-Bol ton) between, making it a solid mass. Amount of wire on secondary, 5 pounds. Insulation between layers is Boo two thicknesses of finely paraffined paper. The winding is very nearly perfect. We have one pound of wire on Bo now, and a 10,000 ohm magnet, will not ring through it, although some current passes. As No. 38 wire has a re sistance of a little over 10,000 ohms to the pound, the insulating must be very near perfect. We get quite a good shock by using a 10 volt battery, but it would seem to us Bot that we ought to get more from No. 1 wire. We have no core, and no condenser, simply trying the coil in the winding apparatus. A. Your coil should give at the longest a 4 inch to 6 inch spark from its dimensions, though in a six inch coil as large a number of sections a Bra eightare used in the secondary. The induced current would be very weak without condenserand core. Should Bre say you would better have used No. 12 copper wire cot

ale automate T Ti Monoling for Chi		
cle support, J. E. Norellus	Horse starter, R. E. Sherman	586,929
cle support, folding, Hunter & Pendleton 586,902	Horseshoe, elastic, M. W. Lowes	586.558
cle support, pedal, W. J. Simonis 586,629	Horseshoe, soft tread, L. D. Saxton.	586,696
cle, water, C. L. Knepper 586,851	Hub, vebicle wheel, H.L. Eaton	586,548
k. See Printer's block.	Ice cream disher, J. E. & W. H. Crea	586,807
ter, revolving, G. S. Foster 586,815	Ice cream freezer, C. H. Ackerman	586.538
ts, device for launching life or other, G. W.	Index, C. C. Smith	586.875
Beebe 586,927	Indicator. See Scale indicator. Valve indicator.	
er. See Steam boiler.	Inkstand, W. L. Stewart.	586.878
er, W. Radcliff	Inkstand, self-closing, A. K. Sagen	586,668
ers, apparatus for removing sediment from	Insulated conductor, flexibly, J. H. Kelman	586.554
steam, J. Watt 586.805	Insulator, electric line, J. J. Tracy	586.700
lock for communicating doors. W. H. Tay br 586.675	Jack. See Pumping lack.	000,100
k and carbon sheet holder therefor, manifold	Japan, method of and apparatus for applying. J.	
memorandum, F. M. Turck 586.640	H Kelman	586 555
kbinding, T. C. Kenworthy	Ignton T F Sullivan	596 636
k. cashier's and salesman's check. C. L Lo-	Knockdown hox T E Wiedersheim .Ir	588 646
596 925	Lace fastener E D Heinemann	596 818
ing or drilling machine with means for driv.	Lacinghook E Kempshall	586 772
ng rods hars or tubes into holes drilled com-	Lacing tunned E Kompshall	596 771
bined multiple V & G Jetley 586 603	Ladder convertible step H & Williams	596 889
le filling machine T Roberts 586 747	Land roller 1 M Miller	596 010
telocker sutomatic J. J. Reifgraher 586 693	Lentern and illuminated sign for street cars W	000,000
tle non refiliable T E Worthington 586 719	I Larzoloro	596 775
the machine for feeding stonners sutomati-	Lother like substances producing R Lissaner	596 007
colle to N Muslar 596 613	Leave of light projectors protective device for	000,001
the or other vessels with geset by means of	disporsing F Norz	596 700
ansulas or containers a harged with lign offed	Lightning arrestor switchboard A M Taylor	566 575
apsures of contrainers charged with inqueneu	Lighting aresici, switchooard, A. M. Taylor	506 022
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See Cordboard how Folding how Fronk	Teah See Beeleah Bedatead leah Belt leah	000,100
town how Match how	LOCK. See Bag lock. Bedstead lock. Bolt lock.	
town box. Match box.	Loch Booth & Davisson	
abot A Tanbart 596 991	Lock, Booth & Davisson	000,101
Rec, A. Tauvert	LOCK, U. J. Petgen	000,780
to mochaniam fluid processo O P Mochan 596 561	LOCK, J. D. KOSS.	000,028
achievedem limiting and sete ining design for	Locomotive cab window, W. P. F. Carroll	000,690
eculoaders, nutring and retaining device for	LOOM, W. P. KIRKPAURICK	280,904

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