Business and Personal.

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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 This is for our information and not for publication. References to former articles or answers should

give date of paper and page or number of question. be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.

or in this aepartment, each must take his turn.

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

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

Books referred to promptly supplied on receipt of price.

Plinerals sent for examination should be distinctly marked or labeled.

(7689) J. W. B. asks for the composition of the materials used in making the electro-polishing cloth; it is a cloth filled with something, and is used to polish all kinds of metal, silverware and glass. Also the composition of the magical sponge used for the same purpose. A. Dissolve in 20 ounces of water 4 ounces of soap and gradually add 2 ounces of pumice stone or finely powdered emery. Work this well into coarse cloth with the aid of a sponge. For silverware and glass use jeweler's rouge instead of pumice stone and emery. We are unable to give you any information regarding polish-

(7690) L. E. T. asks: Why is lightning always visible around the horizon, never being seen directly overhead? A. In answering this question, we should, in the first place, express a doubt of the statement that lightning is never seen directly overhead. It is true that people very rarely look directly overhead; but if they did, we think they would sometimes see the lightning flash across the zenith from one part of a cloud to another part. By far the greater number of lightning flashes are from one cloud to another, and but few from the cloud to the earth. Now to answer the question: It is a fact that most of the lightning flashes are toward the horizon. This is due in general to the fact that the earth around us seems to be a plane and the sky seems to be a dome. A storm cloud moves over the surface of the earth at the same distance above it, disregarding inequalities. When first seen, it is perhaps twenty miles away from the observer in a straight line. It is then seen on the horizon. When the cloud has moved twenty miles, it is directly overhead. It has seemed to rise from the horizon to the zenith, but its actual motion has been along the earth's surface. Its apparent rising is optical, only, and not real. The lightning which plays over the face of the cloud during this time shares the same optical change, and many of the flashes seem to go toward the ground. This appearance of downward motion of the lightning is also an illusion. The passage of a lightning flash is instantaneous, and we in our minds assign a direction to it. It is possible to train one's self to Snell, of Amherst, used to say to his students that he always saw the lightning flash up from the earth to the cloud. Another effect of projecting the motion of the cloud, which is nearly hostowers? See any text book of physics. cloud, which is nearly horizontal, against the concave dome of the sky is to cause the apparent velocity of the the magnifying power of a telescope, field and opera storm to increase very rapidly as it comes near us. The glass, and, so doing, your kindness will be thoroughly cloud seems to rise very slowly at first and to move much more rapidly as it comes over our heads. A gathering divide the focal length of the object glass in inches by the storm may increase its velocity of progression, but a thunderstorm which may travel several hundred miles before it uses up its force, is visible above any one horimethod of obtaining the magnifying power is illustrated, zon for a small portion of its course. Its actual motion, therefore, is quite uniform. Its acceleration is due to the fact that it is much nearer to the observer when it is nearly, or quite, over his head.

(7691) W. S. L. writes: 1. Have read your description of the Jeanty battery. 1, What voltage will each cell give and what amperage on short circuit? How many cells will be required to charge storage battranslated from the French journal Cosmos. It is howtween them. This cell can be used for any purpose for directions in Supplement. No. 641.

which the gravity cell can be used. In charging storage cells, five of these cells will be required for each two storage cells. We do not know whether these cells have been introduced into the United States or not. 2. How many cells of storage battery and what size for one two, and three ten candle power lamps? A. Ten candle power lamps are made for a great many different voltages. To light any lamp by a storage battery, take half as many cells as the voltage of the lamp. The size of the cell determines the ampere hours it will give, that is, the length of time it will light the lamps. Without knowing what current the lamps use, we cannot tell the number of cells required.

(7692) F. A. W. writes: I would like to ask a few questions in regard to the primary battery Jeanty that you illustrate in issue of June 24, 1899. What is the E. M. F. of battery? Are they made in different sizes? If so, what is the size and weight of cells of different capacity? I am looking for a primary that I can operate a lamp for a stereopticon outfit. Can this cell be used successfully to charge storage battery A See answer to last query. You will require about fifty of these cells to light an arc lamp for a stereopticon. It is of course possible to use a battery for astereopticon, but it is an expensive mode of getting light, both in labor and materials. Where the current for incandescent lighting cannot be had, there is no better light for a stereopticon than the calcium light. Many prefer Send for new and complete catalogue of Scientific it for its softness, even when the electric light can be

> (7693) C. B. M. writes: In experimenting with electric detonators for blasting, etc., I wish to procure some data regarding same, such as resistance of platinum wire, heat generated, amount of current required, etc. A. The construction of an exploder with which to set gunpowder on fire is not difficult. 'Take two pieces of rather coarse copper wire, No. 14 or 16 will answer, and join the ends with a piece of rather fine platinum wire, No. 26 or 28 will answer. The platinum and copper wires should be joined by twisting rather than by soldering, and not more than a quarter of an inch of free platinum wire is needed between the copper wires. The other ends of the copper wires are to be joined to the battery. The platinum wire is buried in the powder to be ignited. When the circuit is closed the electric current heats the platinum wire to redness and this sets the powder on fire. A couple of cells of dry battery should be sufficient. The resistance of platinum, is nearly 5¾ times that of copper, size for size.

> (7694) W. F. D. asks: 1. Is there any known substance (or substances) through which elec tricity cannot pass? If so, please name them? A. Any insulator fulfills the requirement of this question. There are many of these. Those in common use are glass mica porcelain, slate. India rubber. gutta percha, vul canized fiber, paraffine, paraffine oil, and various other oils, both of animal and vegetable origin. These are all high insulators. 2. What is the most economical method of producing it for experimental purposes? A. There is no single substance of the character referred to. Each of the substances we have named above has its own process of manufacture. 3. What is the latest theory concerning the above? A. A substance which offers so high a resistance to the passage of an electric current that practically no electricity can pass through it, is called a non-conductor, and may be used for insulation

> (7695) W. P. C. asks: What length of spark must an induction coil give to successfully operate an X-ray tube? A. Coils giving a spark of an inch or even less in length have been used to produce X-ray pictures. This is due to the fact that the effect of the rays upon the plate is cumulative, and by prolonging the exposure a picture can be made with a small tube and small coil. A small coil will not operate a large tube to advantage. For successful work in penetrating the thicker portions of the body, a coil giving a spark of even fourteen inches

> (7696) J. T. M. asks: Will you oblige me by giving me the address of some house which can furnish all necessary material for making the electric motor which is described in Scientific American SUPPLEMENT, No. 641? How can this machine be made to produce an electric light, if at all ? A. The machine described in SUPPLEMENT, No. 641, was designed for a motor. If power is applied to it and it is turned at full speed, it may produce current as a dynamo, and it may not. Many little machines will not excite their own fields. You can use a battery to excite the field. It then will generate a current and will probably light a miniature lamp. For dealers in materials see our advertising columns.

> (7697) G. B. O. asks: Will two equal waves of light or sound, coming from opposite directions and meeting each other, cause darkness, or stillness, respectively? A. If two waves of any sort meet each other in opposite phases, as, for instance, the crest of one falling into the trough of the other, these waves will destroy

> (7698) M. R. M. asks: The way to find appreciated. A. For the magnifying power of telescope focal length of the eye piece in inches, if a single lens. With Huygenian, Ramsden, or terrestrial eye piees, the with the forms and combination of the lenses, with the rules, in Scientific American Supplement, No. 399, 10 cents mailed. The magnifying power of an opera glass is best obtained by comparison of one of the pairs of glasses by directvision of the other eye on a well defined object.

(7699) G. M. asks: Will you kindly inform me whether the armature can be wrapped with tery? A. We have no knowledge of the Jeanty cell eleven coils instead of twelve in the simple electric motor beyond what is contained in the SUPPLEMENT, No. 1225, described in SUPPLEMENT, 641? A. You need not rewind your armature because you have room for but ever a gravity cell, and will give an E. M. F. of a little eleven coils instead of twelve as designed. Make a comover one volt. Its amperes will vary with the total area mutator with eleven bars, the same as the number of of the zinc and copper plates used and the distance be- coils, and proceed in other respects according to the

TO INVENTORS.

An experience of fifty years, and the preparation more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess inequaled facilities for procuring patents everywhere A synopsis of the patent laws of the United States and all foreign countries may be had 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 Address MUNN & CO., office Scientific American 631Br oadway, New York.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending

AND EACH BEARING THAT DATE. [See note at end of list about copies of these patents.] Accumulators, forming, C. Pollak
Accumulators, forming, C. Pollak. Acids of aliphatic creosotesters, making sulfo, Wendt & Lehmann. Addressing machine, F. H. Koehler. Agricultural implement, R. Javitch. Alir coupling hanger, J. C. Look. Alarm. See Elevator alarm. Telephone time alarm. Amalgamator, ore, J. E. Sutphen. Anesthetic, local, G. Pertsch. Anesthetic, local, G. Pertsch. Anesthetic, device for administering, R. E. Mercer. Mercer
Acids of aliphatic creosotesters, making sulfo, Wendt & Lehmann
Air coupling banger, J. C. Look. Alarm. See Elevator alarm. Telephone time alarm. Amalgamator. ore, J. E. Sutphen
Alarm.
Anestactics, device for Administring, R. E. Mercer. Me
Beitche, See Vashoeinen. Bicycle, M. Pedersen. Bicycle, M. Pedersen. G28,849 Bicycle etc., H. A. Lamplugh. G28,832 Bicycle gearing, J. N. Newsom. G28,839 Bicycle shandle bar, F. Schrader. G28,839 Bicycle shandle bar, F. Schrader. G28,839 Bicycle support, B. Phelan. G28,839 Bicycle support, B. Phelan. G28,839 Bicycles, etc., frame for, J. A. McKee. G28,748 Bicycles, etc., frame for, J. A. McKee. G28,748 Bicycles, etc., frame for, J. A. McKee. Bicycles, etc., frame for, J. A. McKee. G28,748 Bicycles, etc., frame for, J. A. McKee. Bicycles, etc., frame for, J. A. McKee. G28,748 Bicycles, etc., frame for, J. A. McKee. G28,749 Book, account, J. Frudenfeld. G28,748 Book, account, J. Frudenfeld. G28,748 Book, account, J. Frudenfeld. G28,749 Book, account, J. Frudenfeld. G28,740 Book, account, J. Frudenfel
Beitche, See Vashoeinen. Bicycle, M. Pedersen. Bicycle, M. Pedersen. G28,849 Bicycle etc., H. A. Lamplugh. G28,832 Bicycle gearing, J. N. Newsom. G28,839 Bicycle shandle bar, F. Schrader. G28,839 Bicycle shandle bar, F. Schrader. G28,839 Bicycle support, B. Phelan. G28,839 Bicycle support, B. Phelan. G28,839 Bicycles, etc., frame for, J. A. McKee. G28,748 Bicycles, etc., frame for, J. A. McKee. G28,748 Bicycles, etc., frame for, J. A. McKee. Bicycles, etc., frame for, J. A. McKee. G28,748 Bicycles, etc., frame for, J. A. McKee. Bicycles, etc., frame for, J. A. McKee. G28,748 Bicycles, etc., frame for, J. A. McKee. G28,749 Book, account, J. Frudenfeld. G28,748 Book, account, J. Frudenfeld. G28,748 Book, account, J. Frudenfeld. G28,749 Book, account, J. Frudenfeld. G28,740 Book, account, J. Frudenfel
Beitche, See Vashoeinen. Bicycle, M. Pedersen. Bicycle, M. Pedersen. G28,849 Bicycle etc., H. A. Lamplugh. G28,832 Bicycle gearing, J. N. Newsom. G28,839 Bicycle shandle bar, F. Schrader. G28,839 Bicycle shandle bar, F. Schrader. G28,839 Bicycle support, B. Phelan. G28,839 Bicycle support, B. Phelan. G28,839 Bicycles, etc., frame for, J. A. McKee. G28,748 Bicycles, etc., frame for, J. A. McKee. G28,748 Bicycles, etc., frame for, J. A. McKee. Bicycles, etc., frame for, J. A. McKee. G28,748 Bicycles, etc., frame for, J. A. McKee. Bicycles, etc., frame for, J. A. McKee. G28,748 Bicycles, etc., frame for, J. A. McKee. G28,749 Book, account, J. Frudenfeld. G28,748 Book, account, J. Frudenfeld. G28,748 Book, account, J. Frudenfeld. G28,749 Book, account, J. Frudenfeld. G28,740 Book, account, J. Frudenfel
Beitche, See Vashoeinen. Bicycle, M. Pedersen. Bicycle, M. Pedersen. G28,849 Bicycle etc., H. A. Lamplugh. G28,832 Bicycle gearing, J. N. Newsom. G28,839 Bicycle shandle bar, F. Schrader. G28,839 Bicycle shandle bar, F. Schrader. G28,839 Bicycle support, B. Phelan. G28,839 Bicycle support, B. Phelan. G28,839 Bicycles, etc., frame for, J. A. McKee. G28,748 Bicycles, etc., frame for, J. A. McKee. G28,748 Bicycles, etc., frame for, J. A. McKee. Bicycles, etc., frame for, J. A. McKee. G28,748 Bicycles, etc., frame for, J. A. McKee. Bicycles, etc., frame for, J. A. McKee. G28,748 Bicycles, etc., frame for, J. A. McKee. G28,749 Book, account, J. Frudenfeld. G28,748 Book, account, J. Frudenfeld. G28,748 Book, account, J. Frudenfeld. G28,749 Book, account, J. Frudenfeld. G28,740 Book, account, J. Frudenfel
Bicycle cussion attachment, W. B. Spencer. 628,839 Bicycle sparing, J. N. Newsom. 628,839 Bicycle saddle, W. C. Gates. 628,704 Bicycle support, B. Phelan. 622,548 Bicycle support, B. Phelan. 622,548 Bicycles stee. frame for, J. A. McKee. 622,723 Binding machines, shifting device for self. W. B. Brown. 628,723 Binding machines, shifting device for self. W. B. Brown. 628,646 Biscuits, manufacturing, W. T. Carr. 628,646 Biscuits, manufacturing boiler. 628,736 Bottle, non-refillable, F. W. King. 628,718 Boot or shoe, M. McMahon. 628,836 Bottle, non-refillable, F. W. King. 628,716 Box. See Folding box. Folding or collapsible box. Hat box. Packing box. Brake. See Car brake. Sleigh brake. 628,531 Brake. See Car brake. Sleigh brake. 628,531 Brake. See Car brake. Sleigh brake. 628,648 Bread making machine, W. Watson. 628,568 Bread, preserving, H. A. Sevigne. 628,799 Brick, W. M. Hazel. 628,799 Brick sanding and forming machine, Converse & Underwood. 87,000 Broom, push, J. Knecht. 628,640 Buckle, harness, E. Manes 628,714 Buoy, C. B. Wetterbergh. 628,714 Buoy, C. B. Wetterbergh. 628,716 Burner. See Gas burner. Hydrocarbon burner. Cabinet, bill or envelop, F. Scbilz. 628,714 Buoy, C. B. Wetterbergh. 628,717 Canc knife, H. Disston. 628,871 Canc harier and feeder, D. H. Walsh. 628,871 Car brake, Rodgers & Scott. 628,831 Car brake, L. L. Logan. 628,832 Car brake, R. L. L. Logan. 628,832 Car brake, Rodgers & Scott. 628,832 Car brake, Rodgers & Scott. 628,833 Car brake, Rodgers & Scott. 628,834 Cars, electric lighting apparatus for, C. A. Gould 628,658 Card and fact and cip, Mills & Hunton. 628,837 Car dead, R. C. Keeler. 628,833 Car brake, Rodgers & Scott. 628,834 Cars, electric lighting apparatus for, C. A. Gould 628,658 Card deck rod, D. E. Hunter. 628,831 Card fact and cip, Mills & Hunton. 628,836 Card punching machine punch selector, M. W. Lacker, Card and cok rod, D. E. Hunter. 628,831 Ca
Bicycle shadle bar, F. Schrader. 628.837 Bicycle saddle, W. C. Gates. 628.537 Bicycles, etc., frame for, J. A. McKee. 628.548 Bicycles, etc., frame for, J. A. McKee. 628.568 Bicycles, etc., frame for, J. A. McKee. 628.568 Bicycles, etc., frame for, J. A. McKee. 628.568 Bicycles, etc., frame for, J. A. McKee. 628.566 Bicycles, etc., frame for, J. A. McKee. 628.666 Bicycles, etc., frame for, J. A. McKee. 628.666 Bicycles, etc., frame for, J. A. McKee. 628.666 Bicycles, etc., frame for, J. A. McKee. 628.788 Boot, account, J. Frudenfeld. 628.788, 628.789 Boot, account, J. Frudenfeld. 628.788, 628.789 Boot, account, J. Frudenfeld. 628.788, 628.789 Boot, account, J. Frudenfeld. 628.788 Boot, account, J. Frudenfeld. 628.788, 628.789 Bottle, non-redilable, F. W. King. 628.788 Brake. See Car brake. Sleigh brake. 628.531 Brake. See Car brake. Sleigh brake. 628.531 Brake. See Car brake. Sleigh brake. 628.538 Brake. See Car brake. Sleigh brake. 628.538 Brake. See Car brake. Sleigh brake. 628.538 Brick sanding and forming machine, Converse & 628.538 Brick sanding and forming machine, Converse & 628.718 Bung, C. B. Wetterbergh. 628.718 Buoy, C. B. Wetterbergh. 628.718 Buoy, C. B. Waterbergh. 628.718 Buoy, C. B. Waterbergh. 628.718 Cabient, bill or envelop, F. Schilz. 628.718
Boiler. See Range boiler. Book, account, J. Frudenfeld. 628,788, 628,789 Boot or shoe, M. McMahon 628,888 Boot or shoe, M. McMahon 628,718 Box. See Folding box. Folding or collapsible box. Hat box. Packing box. Box. J. H. dreenstreet. 628,718 Brake. See Car brake. Sleigh brake. Bread making machine, W. Watson. 628,568 Bread, preserving, H. A. Sevigne. 628,359 Brick, W. M. Hazel. 628,718 Brick sanding and forming machine, Converse & Underwood. 628,568 Brick wathing machine, W. Watson. 628,568 Brick J. H. A. Sevigne. 628,359 Brick sanding and forming machine, Converse & Underwood. 628,568 Buckle, harness, H. C. Keeler. 628,568 Buckle, harness, H. C. Keeler. 628,568 Buckle, harness, H. C. Keeler. 628,718 Bung, G. F. Bokel. 628,718 Bung, G. F. Bokel. 628,718 Bung, G. F. Bokel. 628,719 Cable roads, automatic grip for J. Heenan 628,711 Cable in arbid, producing, W. S. Horry. 628,806 Can carrier and feeder, D. H. Walsh. 628,877 Cap. I. Pachner. 628,801 Car brake, L. L. Logan. 628,803 Car brake, E. Canda. 628,603 Cars, electric lighting apparatus for, C. A. Gould 628,653 Cars, electric lighting system for, J. L. Creveling 628,650 Card diacter, W. F. Steele. 628,803 Card flat end clip. Mills & Hunton. 628,803 Card punching machine punch selector, M. W. Lee. 628,803 Carpet sweeper, pneumatic, G. L. Westman. 628,803 Carpet sweeper, pneumatic, G. L. Westman. 628,801 Carpet deaning apparatus, E. E. Hill. 628,801 Carpet deaning apparatus, E. E. Hill. 628,803 Carpet deaning apparatus, E. E. L. Westman. 628,803
Boiler. See Range boiler. Book, account, J. Frudenfeld. 628,788, 628,789 Boot or shoe, M. McMahon 628,888 Boot or shoe, M. McMahon 628,718 Box. See Folding box. Folding or collapsible box. Hat box. Packing box. Box. J. H. dreenstreet. 628,718 Brake. See Car brake. Sleigh brake. Bread making machine, W. Watson. 628,568 Bread, preserving, H. A. Sevigne. 628,359 Brick, W. M. Hazel. 628,718 Brick sanding and forming machine, Converse & Underwood. 628,568 Brick wathing machine, W. Watson. 628,568 Brick J. H. A. Sevigne. 628,359 Brick sanding and forming machine, Converse & Underwood. 628,568 Buckle, harness, H. C. Keeler. 628,568 Buckle, harness, H. C. Keeler. 628,568 Buckle, harness, H. C. Keeler. 628,718 Bung, G. F. Bokel. 628,718 Bung, G. F. Bokel. 628,718 Bung, G. F. Bokel. 628,719 Cable roads, automatic grip for J. Heenan 628,711 Cable in arbid, producing, W. S. Horry. 628,806 Can carrier and feeder, D. H. Walsh. 628,877 Cap. I. Pachner. 628,801 Car brake, L. L. Logan. 628,803 Car brake, E. Canda. 628,603 Cars, electric lighting apparatus for, C. A. Gould 628,653 Cars, electric lighting system for, J. L. Creveling 628,650 Card diacter, W. F. Steele. 628,803 Card flat end clip. Mills & Hunton. 628,803 Card punching machine punch selector, M. W. Lee. 628,803 Carpet sweeper, pneumatic, G. L. Westman. 628,803 Carpet sweeper, pneumatic, G. L. Westman. 628,801 Carpet deaning apparatus, E. E. Hill. 628,801 Carpet deaning apparatus, E. E. Hill. 628,803 Carpet deaning apparatus, E. E. L. Westman. 628,803
Boiler. See Range boiler. Book, account, J. Frudenfeld. 628,788, 628,789 Boot or shoe, M. McMahon 628,888 Boot or shoe, M. McMahon 628,718 Box. See Folding box. Folding or collapsible box. Hat box. Packing box. Box. J. H. dreenstreet. 628,718 Brake. See Car brake. Sleigh brake. Bread making machine, W. Watson. 628,568 Bread, preserving, H. A. Sevigne. 628,359 Brick, W. M. Hazel. 628,718 Brick sanding and forming machine, Converse & Underwood. 628,568 Brick wathing machine, W. Watson. 628,568 Brick J. H. A. Sevigne. 628,359 Brick sanding and forming machine, Converse & Underwood. 628,568 Buckle, harness, H. C. Keeler. 628,568 Buckle, harness, H. C. Keeler. 628,568 Buckle, harness, H. C. Keeler. 628,718 Bung, G. F. Bokel. 628,718 Bung, G. F. Bokel. 628,718 Bung, G. F. Bokel. 628,719 Cable roads, automatic grip for J. Heenan 628,711 Cable in arbid, producing, W. S. Horry. 628,806 Can carrier and feeder, D. H. Walsh. 628,877 Cap. I. Pachner. 628,801 Car brake, L. L. Logan. 628,803 Car brake, E. Canda. 628,603 Cars, electric lighting apparatus for, C. A. Gould 628,653 Cars, electric lighting system for, J. L. Creveling 628,650 Card diacter, W. F. Steele. 628,803 Card flat end clip. Mills & Hunton. 628,803 Card punching machine punch selector, M. W. Lee. 628,803 Carpet sweeper, pneumatic, G. L. Westman. 628,803 Carpet sweeper, pneumatic, G. L. Westman. 628,801 Carpet deaning apparatus, E. E. Hill. 628,801 Carpet deaning apparatus, E. E. Hill. 628,803 Carpet deaning apparatus, E. E. L. Westman. 628,803
Brake. See Car brake. Sleigh brake. Bread making machine, W. Watson
Brake. See Car brake. Sleigh brake. Bread making machine, W. Watson
Broom, push, J. Knecht
Broom, push, J. Knecht
Surner
Surner
Car brake, Rodgers & Scott. 628,630 Car coupling, J. E. Cunningham 628,621 Car frame, F. E. Canda 628,635 Cars wheel, F. E. Canda 628,636 Cars, electric lighting apparatus for, C. A. Gould 628,658 628,636 Cars, electric lighting system for, J. L. Creveling 628,630 628,630 Card fatend clip, Mills & Hunton 628,630 Card flat end clip, Mills & Hunton 628,836 Card punching machine punch selector, M. W. Lee. 628,836 Card punching machine punch selector, M. W. Lee. 628,433 Carpet cleaner, B. A. Correll 628,433 Carpet cleaner, B. A. Correll 628,535 Carpet cleaning apparatus, E. E. Hill 628,535 Carpet raweeper, pneumatic, G. L. Westman 628,631 Cartidge belt for fuse in automatic or machine guis, E. Probabin 628,671
Car brake, Rodgers & Scott. 628,630 Car coupling, J. E. Cunningham 628,621 Car frame, F. E. Canda 628,635 Cars wheel, F. E. Canda 628,636 Cars, electric lighting apparatus for, C. A. Gould 628,658 628,636 Cars, electric lighting system for, J. L. Creveling 628,630 628,630 Card fatend clip, Mills & Hunton 628,630 Card flat end clip, Mills & Hunton 628,836 Card punching machine punch selector, M. W. Lee. 628,836 Card punching machine punch selector, M. W. Lee. 628,433 Carpet cleaner, B. A. Correll 628,433 Carpet cleaner, B. A. Correll 628,535 Carpet cleaning apparatus, E. E. Hill 628,535 Carpet raweeper, pneumatic, G. L. Westman 628,631 Cartidge belt for fuse in automatic or machine guis, E. Probabin 628,671
Car brake, Rodgers & Scott. 628,630 Car coupling, J. E. Cunningham 628,621 Car frame, F. E. Canda 628,635 Cars wheel, F. E. Canda 628,636 Cars, electric lighting apparatus for, C. A. Gould 628,658 628,636 Cars, electric lighting system for, J. L. Creveling 628,630 628,630 Card fatend clip, Mills & Hunton 628,630 Card flat end clip, Mills & Hunton 628,836 Card punching machine punch selector, M. W. Lee. 628,836 Card punching machine punch selector, M. W. Lee. 628,433 Carpet cleaner, B. A. Correll 628,433 Carpet cleaner, B. A. Correll 628,535 Carpet cleaning apparatus, E. E. Hill 628,535 Carpet raweeper, pneumatic, G. L. Westman 628,631 Cartidge belt for fuse in automatic or machine guis, E. Probabin 628,671
Carding engine alarm apparatus, P. H. Russell. 628,493 Carpet cleaner, B. A. Correll
Carding engine alarm apparatus, P. H. Russell. 628,493 Carpet cleaner, B. A. Correll
Carding engine alarm apparatus, P. H. Russell. 628,493 Carpet cleaning apparatus, E. E. Hill. 628,538 Carpet sweeper. pneumatic, G. L. Westman. 628,505 Cartridge belt for fuse in automatic or machine guns, E. Trochain. 628,871 Cass Sea Show augus
Carding engine alarm apparatus, P. H. Russell. 628,493 Carpet cleaning apparatus, E. E. Hill. 628,538 Carpet cleaning apparatus, E. E. Hill. 628,538 Carpet sweeper. pneumatic, G. L. Westman. 628,505 Cartridge belt for fuse in automatic or machine guns, E. Trochain. 628,871 Cass. Sac Show uses
Cartridge belt for fuse in automatic or machine guns, E. Trochain
Cartridge belt for fuse in automatic or machine guns, E. Trochain
Casket pedestal, J. Ort. 628.633 Casting metallic wheels, apparatus for. C. Bush. 628,446 Ceiling and side wall plate, metal, G. H. Ennis 623.579
Centing and side wan plate, metal, G. H. Emils 025.519
Chain, Camelinat & Taillandier
Chopper. See Cotton or beet chopper. Chronometer escapement, A. V. Chardon 628,758
Cigar bunch rolling machine. R. M. Russell
Clamp, W. H. Sheeley
Chair. See Reclining chair. Chair and cane combined, Kutz & Kelchner
Clothes wringer, G. A. Paddock. 628 545 Coal handling apparatus, W. H. Wall. 628,636 Cock, compression, J. H. Calaban. 628,631 Coffee pot. Goldsmith & Martyn. 628,705
Brandt. 628,688 Collodion mixture, Helbing & Pertsch. 628,483 Column, wooden, Schwerd & Emrick. 628,898 Compass and course corrector, J. M. Fields. 628,600 Compressed air mechanism for vehicles, F. Schu-
Computing device and weighing scale, combined, J. H. Stephens
& Dohlgreen 628.697 Conveyer slide block, J. M. Dodge 628.776 Cooking apparatus, electrical, J. B. Cary 628.635
Cooking apparatus, electrical, J. B. Cary. 628.695 Copies, making press, L. D. Craig. 628.698 Copying press, F. L. Dyer. 628.701
Corn knife, E. D. Woods
Copies, making press, L. D. Craig. 628,638 Copying press, F. L. Dyer. 628,701 Corn knife, E. D. Woods. 628,534 Corrugating machine, C. Traxler 628,564 Cotton elevator, C. McIntosh 628,451 Coupling. See Car coupling. Hose coupling. Spring coupling. Stovening coupling. Thill
coupling. Crane overhead traveling T R & W H Mor-
gan
Cucumber picker, W. W. Robinson. 628.854 Culinary utensil, Longfield & Kline. 628,717 Culivator, D. S. Blue. 628.745
Cultivator, M. & A. Sattley 628,857 Cultivator, corn, E. Nordstrom 628,588 Cultivator draught compaction, wheeled F. Chil
Cuphoard and dumbwaiter combined cellar G
W. Mentzer
Lating fluid, R. Goll
Cutter bar, M. Viskochil. 628.873 Cutter head, C. F. Overmyer. 628.841
Cutting stick and retaining device therefor, A. Houghtlin
Cutting stick and retaining device therefor, A. 4698,466 Cycle, chainless, A. W. Delane. 628,453 Cycle driving mechanism, Lane & Doney. 628,555 Cycle, motor car, or other frames, etc., junction of, Kirk & Jeffs. 628,476 Dental dam attachment, M. O. Nelson 628,476 Dental plugger, Case & Shaw. 628,524 Dentist's or jeweler's drawer and tray, T. C. 628,467 Howleroft. 628,467 Derrick, C. W. Kearns. 628,815
Dential dam attachment, M. O. Nelson 628,487 Dential plugger, Case & Shaw 628,524 Dentials on jewaler's daywar and tree 77
Howlcroft. 628,467 Derrick, C. W. Kearns. 628,815

	
Derrick, E. F. Terry	628,592 528,850
Die press, W. E. Hewit	628,626 628 642
Display cabinet, ribbon or braid, W. H. Wyman. Door check, C. B. Harkness. Door fastener, O. E. Wold	528,795 528,735 528,735
Doors in partially open positions, device for securing, S. K. Humphrey. Douche mat, M. M. Hawley	528,808
Doughe mat, M. M. Hawley	
Draught attachment, J. M. Carter. Drill. See Rock drill. Drill. Farrington & Copeland. Drilling, boring, or shapping machine, W. Fletcher Dye and making same. blue black, C. O. Muller. Dye, black, Priebs & Kaltwasser. Dye, bluish black, Priebs & Kaltwasser. Dye, brown azo, P. Julius. Eleggs, device for beating, C. Julier. Electric conductors, manufacture of, S. O. Cowper.	628,781 628,703 628,721
Dye, black, Priebs & Kaltwasser	628,608 628,609 628.814
Eggs, device for beating, C. Julier. Electric conductors, manufacture of, S. O. Cowper-Coles	628,471 628,770
Electric current regulator, F. E. Ramsay	628.849 628,807
device for producing, M. Gebre	628,457 628,782 628,661
Electric furnace, J. J. Faulkner. Electrode, battery, J. C. Howell Elevator, Sec Cotton elevator. Elevator alarm, electric, H. R. Brubns. Embossing die for burnishing rolls, E. H. Wilk.	628,597
Engine. See Gas engine. Rotary engine. Steam	628,593
Engine cut off, locomotive, M. Wilkes	628,569 628,448 628,615
Extractor. See Ingot extractor.	628,587
Fan attachment, W. R. Bievins	628,744 628,618
Faucet, C. S. Frishmuth. Feed bag, E. Dawson. Feeding and weighing machine, P. C. Waring	628,786 628,451 628,879
Fasteners, stud member for separable, G. E. Adams Faucet, C. S. Frishmuth Feed bag, E. Dawson. Feeding and weighing machine, P. C. Waring Feence, wire, G. H. Chandlee (reissue) Fence, wire, G. H. Chandlee Fencing machine reeling mechanism, J. A. Jewell Filter, W. M. Deutsch, Dichard	11,758 628,450
Fencing machine reeling mechanism, J. A. Jewell. Jewell. Filter, W. M. Deutsch	628,809 628,884 628,517
Filtering beer, etc., apparatus for, C. Haefner Fire escape, H. J. Maier	628,534 628,824 628,736
Fire escape and truck ladder, J. F. Mack Fire kindler, J. F. Murphy Fireplace, C. B. Nay.	628,629 628,833 628,837
Fishing reel, D. M. Quarles, Jr Flexible joint, A. Campbell. Flexible material machine for making articles	628.847 628,692
of, Shedlock & Hudson Flexible material or articles formed therefrom, apparatus for setting or curling Shedlock &	628,728
Hudson. Flue cleaner, H. A. Ruggles. Fluid actuated motor for actuating fluid, T. O.	628,729 628,611
Perry. Fly paper holder, J. W. Schriever. Flyding how P. A. Wreeland	628,547 628,494 628,549
Perry. Fly paper holder, J. W. Schriever. Folding box, R. A. Kneeland. Folding machine, N. Haywood Folding or collapsible box, J. H. Chenoweth. Folding table, J. W. Hoshour. Formaldehyde solution, J. J. A. Tribat. Full orader dinner and spreader, K. M. Star. First orader dinner and spreader, K. M. Star.	628.798 628.760
Formaldehyde solution, J. J. A. TriMat	628,502
rett. Furnace. See Blectric furnace. Furnace feeder and grate, C. J. Bell. Furnace spark arrester and draught producer, A. Brechot.	628,740
Furnace wall cooling device, Gaines & Gustaf-	0.00,100
son Furnaces, air feeding apparatus for boiler, W. Kneen	
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Glove fastener, A. F. & E. F. Hall	628.821 628.589 628,660
Governor, steam engine. L. Skinner	
ing, T. H. Macdonald. Grinding machine, J. Gilson. Grindstone, G. W. Jones.	628,544 628,623 628,715
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Hair fastener, A. L. Bates. Hair pin, D. W. Irvin. Hair trimming device, M. McCarter. Hammer, steam, J. F. Doolittle. Handle for toilet articles, E. Oldenbusch Harmonica, F. Strauss.	628,664 628,722 628,599
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Handle for toilet articles, E. Oldenbusch Harmonica. F. Strauss Harness attachment, G. E. Pooler Harness collar supporter, W. N. Houghtaling Harrow, R. J. Chenoweth Harrow, L. I. Fowle Harrow, P. A. Schumacher Hat box, pyramidal, M. L. Horning Hat bolding attachment for chairs, F. R. Ottenheimer.	628,713 628,761 628,785 628,553
Harrow, P. A. Schumacher Hat box, pyramidal, M. L. Horning Hat holding attachment for chairs F. R. Otten.	628.553 628,465
heimer. Hat making machine, P. C. Waring. Hat making machine, P. C. Waring.	628,605 628,878 628,533
Heater. See Hot air heater. Steam heater. Heel compressing machine, W. J. Young. 628,512,	628,513
Hominy mill, J. Beall. Hook and eye, D. L. M. McIntyre.	628.516 628,604
Hook and eye, W. W. Pierce. Horseshoe, W. E. Sbaw	628.684 628.590 628.765
Hose nozzle, M. H. Hart. Hot air heater, electrical, J. A. Elliott. Lyb for wheele of velocineds etc. W. Cor.	628,907 628,702
Hat box pyramidal M. L. Horning. Hat holding attachment for chairs, F. R. Ottenheimer. Hat making machine, P. C. Waring. Hat support for theater seats, E. J. Guenzel. Heater. See Hot air heater. Steam heater. Heel compressing machine. W. J. Young. 628.512, Hoisting apparatus, T. Shipley. Hominy mill, J. Beall. Hook and eye, B. F. Orewiler. Hook and eye, B. F. Orewiler. Hook and eye, W. W. Pierce. Horseshoe, W. E. Sbaw. Hose coupling, J. Collette. Hose nozzle, M. H. Hart. Hot air heater. electrical, J. A. Elliott. Hub for wheels of velocipedes, etc., E. Germaine. Hydrocarbon burner, C. M. Gray. Hydrocarbon burner, C. M. Gray.	628,791 628,823 628,650
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Welsbach or other, G. S. Barrows	628,595 628,90 0 628,473
Injector, A. Fuller. Injector, E. J. Young.	628,456 628,684 628,672
Inner sole, J. S. Damrell. Insulated rail support, King & Mead. Insulation of electric wires, J. A. Poche (reissue).	628,699 628,667
issue)	11,759
Joint. See Flexible joint. Rail joint. Journal box, B. S. Lawson.	623,480
Knob heading machine, H. K. Jones Lacing hook setting machine, G. W. Allen	628,666 628,738
Lamp, miner's, W. A. Dunlap. Lantern, J. H. Hill.	628,653 628,804
Jack See Lifting jack. Jar cover or closure, W. S. Shaw. Joint. See Flexible joint. Rail joint. Journal box, B. S. Lawson. Knife. See Cane knife. Corn knife. Knob heading machine, H. K. Jones Lacing hook setting machine, G. W. Allen. Ladder, step, J. P. Grace Lamp, miner's, W. A. Dunlap. Lantern, J. H. Hill. Lantern, tubular. C. T. Ham. Lasting shoes, fastener for use in, E. S. Durkee. Lath or sheathing, metal, G. A. Turnbull. Lathe spindle work holder, Whitney & Harrington.	628,777 628,565
Lathe tool holder, J. Gregory	628,730 628,707 628,470
Liquids, apparatus for regulating the level of, K.	628,803
	628,581 628,460
Locomotive driving wheel, I. N. Wissinger Loom, J. H. Northrop	628,733 628,893
Grosswyler. Liquids, closing device for vessels for containing volatile, L. Goybet. Locomotive boiler cleaning device, T. J. Rossell Locomotive driving wheel, I. N. Wissinger. Loom J. H. Northrop. Loom shuttle filling carrier, J. V. & E. Cunniff. Loom warp stop motion, A. Wilkinson. Lubricator, W. S. Pierce. Lubricator choke valve feed, Weldon & Egger. Mail distributing boxes, partition for, Myers & Rinebart.	628,772 628,731 628,675
Mail distributing boxes, partition for, Myers & Rinebart	628,890 628,892
Mail distributing boxes, partition for, Myers & Rinehart. Manure loader, automatic, W. Bell. Mask, base ball, B. T. Rogers. Mat. See Douche mat. Measure, C. L. Fulton.	628,741
Measure, tape, B. H. Kirk	628,475
Kuhné	628,478 628,546 628,784
(Continued on page 62)	

(Continued on page 62)

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MUNN & CO., 361 Broadway, New York.

	Stientitit	6
	Mercerizing apparatus, G. W. Miller	
-	Mercerizing apparatus, G. W. Miller. 628.669 Merry-go-round, marine, L. Simmons. 628.679 Metal bars, apparatus for bandling, Edwards & Morgan. 628.528	٩
ine ine	Morgan 628,528 Mill. See Hominy mill. Windmill. 628,657 Moisture chamber for blotter baths. H. E. Gifford 628,657 Mould, T. F. Keller 628,816 Mould and mould apparatus. O. Eisele. 628,578 Mould cooling device, J. E. Luppincott. 628,543 Moulding for electric wires. etc., M. & D. W. Chase. 628,696	
and gbt	Mould cooling device, J. E. Lippincott	Pr
ine, ver-	Chase	•
be day	Newspaper folding and wrapping machine. T. Wolfe	ſ
DO	Nut lock, G. D. Wing. 028,732 Ordnance, breech loading, C. H. Tompkins. 628,732 Organs, self-playing device for, F. W. Hedgeland 628,353 Oven, baker' W. Neubs. 628,478 Packing box, M. N. Edwards. 628,738 Packing, metallic, J. T. N. Angell. 628,531 Packing, rod, J. S. McDonald. 628,835 Paint agitator, C. A. Brown. 628,731 Papeling and genering composite embossed. 8.	
BS •	Oven, baker', W. Neubs 628,488 Packing box, M. N. Edwards 628,778 Packing, metallic, J. T', N. Angell 628,515	
r Ty		-
	Paper, apparatus for imparting water finish to,	F
۳,	Paper cutter, W. H. Lewis	
	Paper, machine for threading piles of, G. A. W. Ebrhardt	
0.	Perfecting press, flat bed, H. Stamm. 622,53 Photographic plate holder. W. H. Lewis	ı
ıd	107, T. Herbst. 628,536 Picker. See Cucumber picker. Pin. See Harrpin. Safety pin.	L
uces	Pin. See Harrpin. Safety pin. Pipe joining apparatus. J. W. Abrahams. 628,643 Pipe wrench, W. A. Bradford 628,749 Pipes, tubes, etc., cap and coupling for, G. F. Griffin. 628,793	A
and J. S. lan-	Pleting mechine U P Poissier 690 696	
rels, val.	Plow E. Bruesewitz	
, A.	Boyles 628.748 Pneumatic wheel, E. E. Powers 628.845 Pneumatic wheel, Thornton & Lea 628.562	~
T	Pot. See Coffee pot. Potato digger, P. Brown. 628,444 Potato digger, J. Skinner. 628,495	-
_	Plow clevis and wheel adjusting device, J. T. Boyles	Ţ
E	Printing machine. cylinder, C. Potter 628,490	1 9
rice	Printing machine, polychrome, H. de Montin. 628,719 Prints, removing, superfluous powder or dust from bronze, G. G. Torlina. 628,563 Pump or motor, rotary. J. Grindrod. 628,636 Punch making machine, A. J. Bradley. 628,637 Puzzle or toy, marine, J. F. Butz. 628,639 Radiator. beat. M. M. Brophy. 628,639 Radi joint, J. E. Suith. 628,555 Railway switch, electric, F. A. Ruff. 628,555 Railway switch, electric, F. A. Ruff. 628,630 Rechining chair, I. N. Dann. 628,700 Rechining chair, I. N. Dann. 628,700 Refrigerator, H. M. Kirby. 628,888 Rexister, A. C. Spofford. 628,556 Rein holder, J. Trantom. 628,501	
lies,	Punch making machine, A. J. Bradley 628.687 Puzzle or toy, marine, J. F. Butz 628.520 Radiator, beat, M. M. Brophy 628.689	ce
II.	Raily switch 628,856 Raily switch 628,856 Raily switch 621,856 Range boiler, J. H. Stone 628,850 Racing chair I. N. Dann 628,870	F/
	Refrigerator H. M. Kirby 625,888 Register, A. C. Spofford 628,556 Rein holder, J. Trantom 628,501	
led the	Rein holder, J. Trantom	
rill	Saddle clamping attachment, T. J. Biggs. 628,743 Safety pin, F. T. Clark. 628,598 Sasb, window, E. M. Squire. 628,865 Sausages, etc., machine for slicing German, W.	1
	A Van Berkel. 628,742	-
A	Scale, C. L. Bell. 628.572 Scale, G. W. Chandler. 628.525 Scale, G. W. Chandler. 628,525	
	Scale, G. W. Chandler 628,525 Scale, combined multiple weight and pendulum, J. H. Stephens 628,558 Screen. See Well sand screen. 628,558 Screen seed changing mechanism. C. L.	
	Grobmann	
hine	Screw machine speed coarging mechanism. L. C. Woerner. 628,734 Screws, etc., machine for separating chips or shavings from, H. K. Jones. 628,665 Sealing device, package, J. T. Craw 628,731 Secondary battery, C. Ridsdale. 628,492 Separator. See Cream separator. Sewing machine spooling device. C. C. M. Wag.	17
R. H.	Separator. See Cream separator. Sewing machine spooling device, C. C. M. Wagner.	
ES. ies o oump	Shade cutter, E. Litten. 628.903 Shaker attachment for tumblers, etc., VV. Edson. 628.904 Sharpening rotary cutters, machine for, N. K.	
raw- s of d in	Skow 628,488 Shears, F. Macri. 628,488 Ship, G. A. Chaddock 628,757	
cents	Show case, M. Vold	
ork i our Cut-	Signaling device, train, W. A. & B. S. H. Harris., 628,796	F
ntral	Sleigh brake, A. D. Polleys	c a G
lears pre- asers	Sound recording and reproducing machine. H.	3 0
oved, stop- logue.	Spigot, multiple way, D. Fisher	f b
110.	spinning frame yarn protector attachment, Wall & Schedlbauer	
Y	& Schedlbauer 628,875 Spinning ring bolder E. P. Mason 628,825 Spout and spouted vessel W. A. Dunlap 628,655 Spring coupling H. C. Swan 628,656 Square bevel Brown & Beauchene 628,755 Square steel J. B. Robichan 628,855	3
	1 63 0,500 0, 1000 0,000	· 1 .

spring coupling. H. C. Swan

square, bevel. Brown & Beauchene. 628,753

square, steel, J. B. Robichan 628,853

stamp, hand, J. Cooke 628,753

stamp, hand, J. Cooke 628,753

stamp mill journal box, T. W. Capen 628,476

stam p mill journal box, T. W. Capen 628,476

stand pipe and fire escape, combined, H. Vieregr 828,872

staple, screw. W. F. Schall 628,616

steam mengine, C. C. Worthington 628,511

steam generator, J. C. Parker 628,696

steam heater, F. M. Radke W. Cummings 628,644

stendiling machine, rotary, G. W. Cummings 628,644

sterdiling canned goods, apparatus for, F. W.

Smith 628,554

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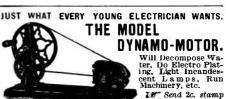
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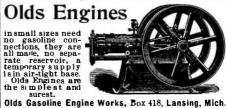
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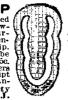
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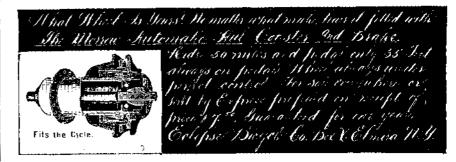
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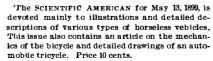
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