ground connection to the branch of the charged wire. 5th. The combination, of a constant source of electricity having one terminal normally grounded, the said source being common alike to the central station and to each substation, normally open, main and branch wires extending from the said source of electricity to each sub-station and to the signalling key or circuit closer, at the central station, and means as indicated for transferring the current from the open branch wires to either end of the subscriber's lines. 6th. The combination, in a telephone exchange system, with a series or subscriber's lines, of a separate signalling circuit, a continuous current dynamo or magneto-electric machine in a branch of said circuit, a battery in another branch, and a switch for conecting at will in said circuit said electric machine or said battery. 7th. In a telephone exchange system, a continuously operating dynamo or magneto-electric machine, or equivalent source of electricity, located at any suitable point and adapted, by means of main and branch conducting wires, to supply all the necessary currents for signalling purposes to the central station, and to each substation connected with the said exchange system. 8th. The combination, in an electrical system, with a series of lines, of a branch containing a dynamo-electric machine having its field excited in said branch, and switches or connectors for joining said branch to said lines individually for the purpose of signalling. 9th. The combination of a series of subscriber's lines, signalling devices in the several lines at the central office, a distinct signallling circuit, or circuits, a battery or other generator of electricity, such as a dynamo or magneto-electric machine, electrically connected with said signalling circuit or circuits, and also with the central office terminals of the subscriber's lines, and switches or circuit changes at the substations, for altering thereat the circuit connections of the aforesaid generator, so as to operate for each station the signal device in the line, whereon said station is placed. 10th. The combination of the subscriber's lines, the signal devices or call bells at the substations, the signalling devices, or annunciators at the central office, one or more generators of electricity, a signalling circuit or circuit switches, or circuit changes at the substations for altering the circuit connections of a generator, so as to operate for each station the signal device or annunciator in its own line at the central office, and switches or circuit changers, at the central office, for altering the circuit connections of a generator so as to operate the signal devices, or call bells at the substations, the generator circuit as well in the case of a subscriber calling the central office, as of the latter calling the former, being composed in part of the signalling circuit, and in part of the direct line of the subscriber calling or called. 11th. The combination, with the movable telephone support and switch, the spring for shifting the same when the telephone is removed, and a line wire or conductor connected with said switch, of the contact piece connected with the signal or call bell, the contact piece connected with the telephone, and the intermediate contact piece connected with a generator of electricity or means for operating a signal device, said switch being adapted to make contact with all said pieces, so that, when the telephone is on the support, the call bell is connected in with the line wire or conductor aforesaid, and when the telephone is removed, the switch is shifted, cutting out the call bell and connecting in the telephones, and its movement temporarily connecting in the generator or signalling means.

No. 15,826. Improvements on Electric Lamps.

(*Perfectionnements aux lampes électriques*).

William Crookes, London, Eng., 21st November, 1882; for 15 years.

Claim.—1st. The use of hydrofluoric acid, with or without other acids, in the manufacture of carbons for electric lamps, and more especially the carbon filaments, of incandescent lamps by exposing cellulose to the action of the acid or acids, and then carbonizing the same. 2nd. The use of hydrofluoric acid, with or without other acids, in the manufacture of the various forms of carbon disks, sticks, or rods, employed in electric lamps by exposing carbon after carbonization to the action of the acid or acids, such carbon being in the shape of thin sheets, or filaments, or fine powder. 3rd. The use of free chlorine, or hydrochloric acid gas in the manufacture of the various forms of carbon employed in electric lamps to purify the carbon. 4th. The preparation of a superior kind of carbon for use in electric lamps and otherwise, especially for the filaments used in incandescent lamps, by carbonizing cellulose that has has been dissolved in, or acted on, by a solution of oxide of copper in ammonia. 5th. The application of a solution of oxide of copper in ammonia to paper, thread, or other form of cellulose, and afterwards carbonizing the same for the purpose of rendering the carbon produced therefrom, closer in texture, denser and more elastic and homogeneous. 6th. The preparation of carbon, either in a pure state or containing copper, from cellulose dissolved in a solution of oxide of copper in ammonia, and subsequently reduced to a solid and structureless form. 7th. The manufacture of filaments for use in incandescent lamps out of a film or skin, prepared from cellulose dissolved in a solution of oxide of copper in ammonia and then reduced to a solid and structureless form. 8th. The method of making a strong and electrically perfect junction between the ends of the filament in an incandescent lamp and the conducting wires, by electro-plating with copper, nickel, platinum or other suitable metal. 9th. The method of making a strong and electrically perfect junction between the ends of the filament in an incandescent lamp and the conducting wires, by painting the junction with a solution of cellulose in a solution of oxide of copper in ammonia and subsequent carbonization. 10th. The method of diminishing the resistance of carbon filaments for use in incandescent lamps, by electrically heating them in an atmosphere of chloroform vapour. 11th. The method of diminishing the resistance of carbon filaments for use in incandescent lamps, by electrically heating them in a vessel exhausted of air, which is in connection with a vessel containing a solid or liquid hydro-carbon, whose boiling or volatilizing point is high and whose vapour density, at ordinary temperature, is low. 12th. The use of cored wires with an external platinum surface, for conducting wires at the points where they pass through the glass of the bulbs of incandescent lamps. 13th. The method of forming the glass enclosures for the filaments of incandescent lamps. 14th. The introduction into the bulbs of incandescent electric lamps, or into chambers in connection therewith and forming part of the lamps, of substances having a general power of absorbing gases for the purpose of getting rid of the residual gas after the exhaustion by the pump is completed. 15th. The method of obtaining a good exhaustion by the introduction into the bulbs of incandescent electric lamps, or into chambers connected therewith, forming part of the lamps, of substance having a selective power of absorbing gases, whilst ensuring, by the means herein above described, or equivalent means, that the residual gas, after the exhaustion by the pump is completed, is of a nature to be readily absorbed by such substances. 16th. The method of getting rid of the residual gas by the use of substances having a generator selective power of absorbing gases, the absorbing substances being placed in a chamber permanently connected with the pump used for exhausting the bulbs and not in the bulbs themselves, or in chambers connected therewith forming part of the lamps, and thus getting rid of the residual gas before the sealing of the bulb of the lamp. 17th. The introduction of mercury vapour in a highly rarefied state into the bulbs of incandescent lamps, as a protective atmosphere.

No. 15,827. Apparatus for filtering liquids.

(*Appareil pour filtrer les liquides.*)

The Sinclair Rectifying Machine Company, (assignee of Thomas R. Sinclair,) New York, U. S., 21st November, 1882; (Extension of Patent No. 1850.)

No. 15,828. A Gang Plough.

(*Charrue à plusieurs socs.*)

Lewis F. Bungay and Thomas Merritt, Norwich, (Assignees of Brooks W. Walton, of Fergus,) Ont., 21st November, 1882; Extension of Patent No. 1843)

No. 15,829. Improvements in Harrows.

(*Perfectionnements aux herses.*)

Peter Patterson and Alfred S. Patterson. Patterson, Ont., (Assignees of D. C. and H. C. Reed & Co., of Kalamazoo, Mich., U.S.,) 21st November, 1882; (Extension of Patent No. 8266.)

No. 15,830. Improvements on Underground Conductors. (*Perfectionnements aux conducteurs souterrains.*)

Thomas A. Edison, Menlo Park, N. J., U.S., 22nd November, 1882; for 15 years.

Claim.—1st. The combination, with an inclosing tube and electrical conductors contained therein, of washers made of manilla, or paste board, supporting the conductors and separating them from the tubes and from each other, and notched upon their exterior edges to permit the flow throughout the tube of liquid insulating material. 2nd. A compound electric conductor in which the individual conductors are solid metallic bars formed each as a segment of a circle, and both separated from each other and supported, within an inclosing tube, by disks or washers of insulating material. 3rd. A circuit for electric currents in which one conductor is a hollow tube, and the other a solid circular rod passing through the said tube, and insulated therefrom and supported therein, and separated therefrom by insulating disks or washers. 4th. A metallic circuit for electric lights consisting of two semi-circular rods supported by, and separated from each other, in a metallic pipe, by a series of insulating washers, the pipe being filled with a suitable insulating material. 5th. In a metallic circuit composed of semi-circular rods secured within, but insulated from a metallic containing tube, the arcs of the conductors and the tube being concentric.

No. 15,831. Improvements on Electrical Distribution Systems. (*Perfectionnements aux systèmes de distribution électrique.*)

Thomas A. Edison, Menlo Park, N. J., U.S., 22nd November, 1882; for 5 years.

Claim.—1st. In a system of electrical distribution employing complete metallic circuits, the combination of the positive conductors and the negative conductors crossing each other at the corner of the blocks, like conductors being connected together at the points of crossing and service or junction boxes, wherein such connection is made. 2nd. The combination, with the intersecting positive and the intersecting negative conductors connected together in pairs, of the safety catches between the points of intersection. 3rd. The combination, with the main conductors arranged in pairs, intersecting each other, and properly connected together at corners, or branching points, of safety catches placed at the points of intersection, in boxes adapted to protect them and receive the ends of the conductors for union thereto. 4th. The combination, with the conductors and the junction boxes, wherein the appropriate conductors are united to each other, of the bow-shaped connecting pieces.

No. 15,832. Improvements on Electrical Distribution Systems. (*Perfectionnements aux systèmes de distribution électrique.*)

Thomas A. Edison, Menlo Park, N. J., U.S., 22nd November, 1882; for 15 years.

Claim.—1st. The conductors A B forming a complete metallic circuit inclosed in separate pipes C D. 2nd. The conductors A B form a complete metallic circuit, in combination with separate inclosing pipes C D, and notched pasteboard washers *a*. 3rd. The corner junction box, wherein the main conductors of like kind are coupled together in pairs, in combination with the feeding conductors entering such box, and connected with the positive and negative main conductors.