primary and secondary conductors, and a core of soft-iron plates and an enclosing case of soft iron. 7th. The combination, with the primary and secondary coils, of a converter and a core of soft iron to which they are applied, of a soft iron enclosing case for the same.

## No. 27.966. Volt Meter. (Voltomêtre.)

The Westinghouse Electric Company, Pittsburgh (assignee of Philip Lange, Pittsburgh, Oliver B. Shallenberger, Rochester), Penn., U.S., 10th November, 1887; 5 years.

Lange, Pittsburgh, Oliver B. Shallenberger, Rochester), Penn., U.S. 10th November, 1887; 5 years. *Claim.*—1st. In an electric meter, the combination, with the coil of the meter having a comparatively low resistance, of a series of in-candescent electric lamps having a relatively high resistance, and connected in series therewith and reducing the error due to the change in the resistance of the coil. 2nd. The combination, in an electric meter, of the indicating device, the coil for actuating the same, connected in multiple arc with the translating devices, and one or more incandescent electric lamps of relatively high resistance con-nected in series therewith, reducing the error due to the change in the resistance of the coil. 3rd. The combination of a conductor, two branch circuits, two coils respectively included therein, an indicator acted upon by said coils in opposite directions, a carbon resistance in one of said branches, varied as to its value by the current travers-ing the same, and an incandescent electric lamp in the conductor. th. The combination, with a main line and translating devices in-cluded in the main line varying the amount of ourrent traversing the same, of an electrical indicator included in multiple are-circuit with the translating devices, consisting of opposing coils, an index acted upon thereby, branch circuits, of a volt meter consisting of an indicator, two coils respectively included in the branch circuits of said conductor, ores therefor carried by the support of said indi-cator, and means for counterbalancing the weight of said cores, 6th. The combination, with a conductor, having two branch circuits of said conductor, cores therefor carried by the support of said indi-cator, and means for counterbalancing the weight of said cores, 6th. The combination, with a conductor, having two branch circuits of said conductor, cores therefor carried by the support of said indi-actor, and means for counterbalancing the weight of said cores, 6th. The combination, with a combunction, su said core.

## No. 27,967. Ammeter. (Compteur électrique.)

The Westinghouse Electric Company (assignee of Philip Lange), Pittsburgh, Penn., U.S., 10th November, 1887; 5 years.

The Westinghouse Electric Company (assignce of Philip Lange), Pittsburgh, Penn., U.S. 10th November, 1887; 5 years. Claim.—Ist. An electric meter consisting of a movable core or armature, a coil included in the main line, into which said core is drawn a greater or less distance, according to the attraction exerted upon the core, a support for said core, a toothed segment moved by said support, an index hand geared to said segment, and an adjust-able counterpoise for balancing the weight of said core supported from the axis of said segment. 2nd. The combination of an indicat-ing arm, a scale for the same, a movable core, a toothed segment moved by said core, an adjustable counterpoise for the same supported from the axis of said segment. and near a coil included in the main linetcircuit and acting upon said core, a toothed segment moved by said core, an adjustable counterpoise for the same supported from the axis of said segment, an index geared to said segment, and a notch spring applied to the axis of said index for taking up the lost motion, substantially as described. 3rd. An electric meter for alternate electric currents, consisting of a magnetizing coil, a core movable therein, composed of magnetically separated soft iron wire, and an indicator operated by the movements of the core. 4th. In an electric meter for alternating ourrents, the combination of a magnetizing coil, a core moving therein, consisting of a convolute of non-conduct-ing material, covered by wires of soft iron, and an indicator operated by the movements of the core. 5th. A core, for electric magnetic apparatus, consisting of a sheet of paper, or other non-magnetic ma-terial, covered with soft iron wires and wrapped upon itself, sub-stantially as described. 7th. As an article of manufacture, a sheet of non-magnetic, non-conducting material, covered upon one side by wires of soft iron, substantially as described. 8th. The hereinbefore described method of forming cores for electro-magnets, which con-sists in winding wire upon a non-con as set forth.

## No. 27,968. Electrical Pressure Indicator. (Indicateur de la pression électrique.)

The Westinghouse Electric Company, Pittsburgh (assignee of Oliver B. Shallenberger, Rochester), Penn., U. S., 10th November, 1887; 5 years.

5 years. Claim.—lst. The combination, with a source of electricity, of two opposing coils, one connected in a shunt, and the other in a series with the work circuit, and an indicator affected by the currents traversing the coils, substantially as described. 2nd. An indicator for electric circuits, consisting of two coils, one connected in shunt upon, and the other in series with the work-circuit, one of said coils being adjusted to secure a predetermined percent greater effect than the other. 3rd. An electric indicator, consisting of two coils oppos-ing each other, an indicator acted upon thereby, an electric circuit-receiving currents by induction, having a difference of potential de-pendent upon the difference of potential at the terminals of the source of electricity, and a second circuit-receiving currents depend-ent upon the current in the work-circuit, substantially as described. 4th. The combination, with an electric converter, having its primary coil connected in circuit with the main line, and its secondary circuit adjustable with reference to its length, of a coil of insulated wire

connected in the secondary circuit, a second coil opposed thereto, means for supplying said second coil with currents proportional to the difference of potential at the terminals of the source, and means actuated by said opposed coils for indicating the electromotive force on the work circuit. 5th. The combination, with the source of elec-tricity, and a work-circuit supplied therefrom, of a converter, having its primary coil connected with said source, a solenoid adjustable with reference to its length, connected in the circuit of the secondary coil, a second selenoid acting in opposition thereto, a converter, the secondary coil of which includes said second solenoid in its circuit, and conductors connecting the primary coil of the converter, with the respective terminals of the source of electricity. Gh. An elec-tric indicator, consisting of a converter, the primary coil of which is designed to be connected in an electric circuit, means for adjusting the length of the secondary coils, a solenoid, adjustable with refer-ence to its length included in the secondary circuit, second solenoid acting in opposition to the first-named solenoid, a converter, includ the length of the secondary coils, a solenoid, adjustable with refer-ence to its length included in the secondary circuit, as econd solenoid acting in opposition to the first-named solenoid, a converter, includ-ing the second solenoid in its secondary circuit, and an indicator affected by currents traversing said solenoids. 7th. An electric in-dicator, consisting of a converter, the primary coil of which its de-signed to be connected in an electric circuit, means for adjusting the length of the secondary coil, a solenoid included in the secondary circuit, a second solenoid acting in opposition to the first-named solenoid, and an indicator affected by currents traversing said sole-noids. 8th. The combination, with a source of electricity, and con-ductors conveying currents therefrom, of converters reducing the potential of the currents, a secondary circuit receiving the currents of reduced potential translating devices included in said secondary circuit, a converter increasing the potential received from the said second circuit, conductors extending therefrom to a distant point, and an indicator operated by the electrical distribution, em-ploying alternating, undulatory or pulsatory currents, of a pressure-reducing device connected with the translating circuit, and an electric connection from distant therefrom, a pressure-increas-ing device connected with the translating circuit, and an electric connection from said pressure-increasing device to said indicating device. device.

## No. 27,969. Regulating System for Electric Circuits. (Système régulateur des circuits électriques.)

The Westinghouse Electric Company, Pittsburgh, Penn. (assignee of William Stanley, Jr., Great Barrington, Mass.), U. S., 10th No-vember, 1887; 5 years.

The Westinghouse Electric (Company, Pittsburgh, Penn. (assignee of William Stanley, Jr., Great Barrington, Mass.), U. S., 10th No-vember, 1887; 5 years. Claim—lat. The combination, substantially as hereinbefore set forth, of a source of electricity. translating devices operated by elec-tric energy derived from said source, and an electromagnetic device, onsisting of a mass of inductive material, and coils of wire applied thereto, included in said circuit'rayring, the sounter electromagnetic de-vice, consisting of a mass of inductive material, and coils of in-sulated wire applied thereto, included in said circuit, and establish-ing a variable conter electro-motive force therein, an inductorium, having its primary coil connected with said sources and translating devices included in its secondary circuit. Srd. The combination, substantially as hereinbefore set forth, of a source of electricity, a circuit supplied by said source of electricity, an inductorium having its primary coil connected with said sources and translating devices included in said source of a source of electricity, a circuit, and plus devices for the or a source of electricity, a circuit, and thereto, included in said source, a secondary circuit for the same, having a variable resistance, and an inductive device for establishing a counter electro-motive force in said circuit, and there-by modifying the strength of current traversing the primary coil in an inverse proportion to the changes in the resistance of the second-ary circuit. 4th. The combination, substantially as hereinbefore set forth, of a source of electricity, a circuit supplied by said source of electricity, two opposing coils included in said shuut. 5th. The combination, substantially as hereinbefore set forth, of a source of said coils, a shuut circuit around one of set deposing coils, an inductorium, having its primary circuit in-folded in said shuut, and translating devices included in circuit with the secondary coils. 6th. The combination, substantially as herein-pelou