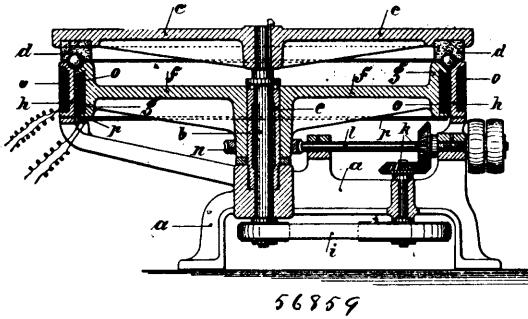
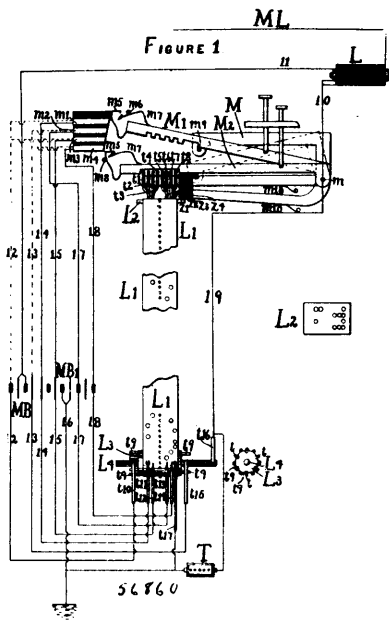


grinding ring or disc are employed, forming the guiding groove of a metal capable of being magnetized and magnetizing it in a suitable



manner permanently or intermittently to such a degree that it ensures the balls in the guiding groove revolving at a constant or nearly constant velocity during their passage round the guiding groove, substantially as and for the purpose hereinbefore described.

No. 56,860. Electric Telegraph. (Télégraphe électrique.)



William Henry Cooley, Brockport, New York, U.S.A., 3rd August, 1897; 6 years. (Filed 23rd December, 1895.)

Claim.—1st. In combination, in a telegraphic circuit, the following elements, namely, at any one station in such circuit a distributor and means for sending to line, alternating at the successive contacts made by such distributor, direct and inverse induced impulses and means for balancing upon the home relay at such station the effect of such outgoing induced impulses. 2nd. In combination, in a telegraphic circuit, the following elements, namely, at any one station in such circuit, a home relay, a distributor, and means for sending to line, alternating at the successive contacts made thereby, direct and inverse induced impulses or currents, and means for maintaining such home relay neutral to such outgoing impulses or currents. 3rd. In combination with a system of simultaneous dual transmission between any two stations, and means for sending to line alternating direct and inverse impulses at points of time synchronous with the contacts made by a distributor at one of such stations, a synchronizing distributor at the other one of such stations having its contacts each in a separate electric circuit or branch circuit, together with a receiving instrument, each of such circuits or branch circuits also containing therein the contacts of a main line relay common to two or more of such circuits or branch circuits and contained in such above mentioned system of simultaneous dual transmission. 4th. A transmitting distributor and source of direct and inverse induced impulses or currents, and a home relay having a balancing coil thereon in circuit with a source of electric energy. 5th. A receiving relay in a main line and a receiving instrument at the same station, and a distributor between such relay and such receiving instrument. 6th. In combination with means for charging a main line at regular intervals of time, a

distributor at a receiving station on such line, making contacts synchronously with the charges on such main line, such distributor located between a relay in the main line and any suitable receiving instrument or instruments. 7th. In combination with means for charging a main line at regular intervals of time and a distributor capable of imparting or supplying impulses to any suitable receiving instrument or instruments at points of time synchronous with the charges on the main line, a relay in such main line at any station and a receiving instrument or instruments at the same station, such distributor located between such relay and such receiving instrument or instruments. 8th. In combination with means for charging a main line at regular intervals of time, a receiving relay located in such main line, the contacts of such relay placed in circuit with a source of electric energy, together with a distributor making contacts synchronously with the charges on the main line, and a special local relay or receiving magnet for each contact made by such distributor, each of such local relays or receiving magnets and corresponding contact in such distributor located in a separate branch of such above named source of electric energy. 9th. Two stations connected by a main line, at one station a distributor and means for charging the main line at intervals of time synchronously with the contacts made by the distributor at that station, at the other station a relay permanently located in the main line and having its contacts, by the operation of a distributor also at such other station, placed successively in each of several local circuits or branch circuits, each of such local circuits or branch circuits also containing a receiving instrument. 10th. A series of receiving or relay magnets and means for energizing the same in different combinations thereof taken a certain fixed number, less than the whole thereof, at a time, all of such receiving or relay magnets in each combination being energized together in common during some portion of the period of time set off for the energizing of each combination, in combination with a source of electric energy having a series of branch circuits, and in each branch circuit a registering or printing magnet and such a certain fixed number of relay contacts as shall correspond to and be actuated by the energizing of some one of such above named combinations of such receiving or relay magnets. 11th. A series of receiving or relay magnets and means for energizing the same in different combinations thereof taken a certain fixed number less than the whole thereof, at a time, all of such receiving or relay magnets in each combination being energized together in common during some portion of the period of time set off for the energizing of each combination, in combination with a series of printing or registering magnets, each one located in circuit with a source of electric energy together with such a certain fixed number of relay contacts as shall correspond to and be actuated by the energizing of some one of such above named combinations of such receiving or relay magnets. 12th. A series of receiving or relay magnets and means for energizing the same in different combinations thereof taken a certain fixed number, less than the whole thereof, at a time, in combination with a series of printing or registering magnets, each one located in circuit with a source of electric energy together with such a certain fixed number of relay contacts as shall correspond to and be actuated by the energizing of some one of such above named combinations of such receiving or relay magnets. 13th. In combination with means for sending to line alternating induced impulses, means for sending to line or not, as desired, at each such induced impulse, a battery impulse synchronizing and harmonizing therewith. 14th. In combination with means for sending to line alternating induced impulses, means for sending to line or not as desired battery impulses of different strength at each such induced impulse and synchronizing and harmonizing therewith. 15th. A series of electric circuits or branch circuits, each containing a pair of relay contacts, means for causing a first impulse, traversing such first circuit, to open the contacts in such first circuit and close the contact in such second circuit, and means for causing the second impulse thus transversing such second circuit to open the contacts in such second circuit and close the contacts in such third circuit, and so on, the impulse thus traversing the last circuit in the series, causing the contacts in such last circuit to open and the contacts in such first circuit to close, whereby in each succession of impulses, corresponding impulses are caused to traverse the same circuit or branch circuit. 16th. A series of electric circuits or branch circuits, each containing a pair of relay contacts, means for causing a first impulse, traversing such first circuit, at its cessation, to open the contacts in such first circuit and close the contacts in such second circuit, and means for causing the second impulse thus transversing such second circuit, at its cessation, to open the contacts in such second circuit and close the contacts in such third circuit, and so on, the impulse thus traversing the last circuit in the series, causing, at its cessation, the contacts in such last circuit to open and the contacts in such first circuits to close, whereby in each succession of impulses, corresponding impulses are caused to traverse the same circuit or branch circuit. 17th. Three relay armatures having their actuating coils arranged to be synchronously traversed by energizing impulses, the first armature having working contacts on each side thereof and responding to impulses of one kind or character, the second armature also having working contacts on each side thereof and responding to those same impulses and also to impulses of a different kind or character not affecting such first named armature, the third armature responding to impulses actuating either of the other armatures and also to impulses affecting neither of the other armatures, such second named armature con-