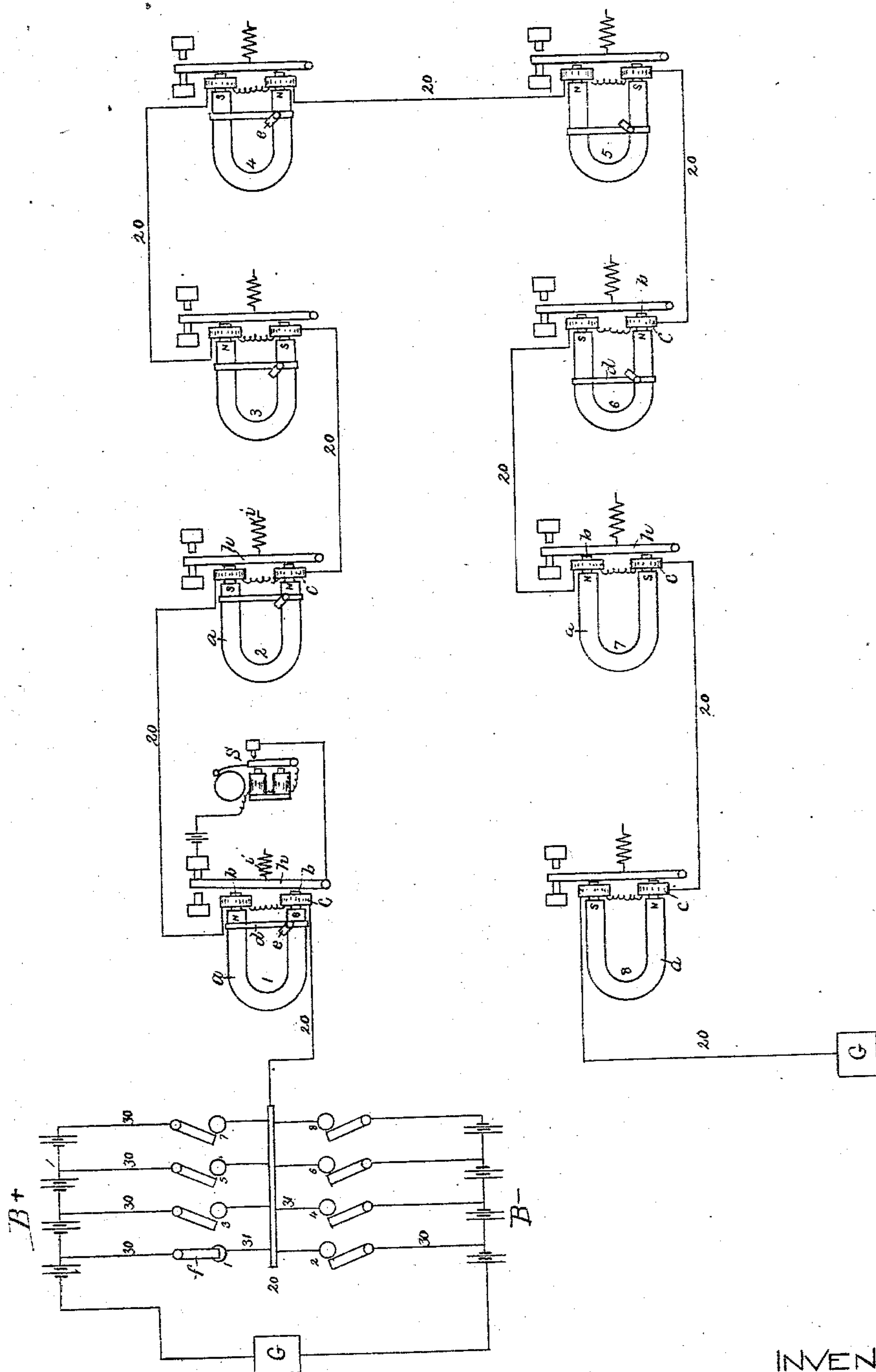


(No Model.)

J. C. WILSON.  
INDIVIDUAL CALL.

No. 283,448.

Patented Aug. 21, 1883.



WITNESSES

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# UNITED STATES PATENT OFFICE.

JOHN CORNELIUS WILSON, OF BOSTON, MASSACHUSETTS.

## INDIVIDUAL CALL.

SPECIFICATION forming part of Letters Patent No. 283,448, dated August 21, 1883.

Application filed January 11, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN C. WILSON, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Electrical Apparatus, of which the following description, in connection with the accompanying drawing, is a specification, like letters on the drawing representing like parts.

My invention, relating to an individual signal electric apparatus, has for its object to produce a series of electro-magnetic signaling-instruments, each of which, when all are placed in a single electric circuit, will respond to a current of certain definite character that will produce no practical effect upon the other instruments.

My invention consists in a central or main station and line or circuit leading therefrom through a number or series of different stations containing signaling-instruments, the controlling electro-magnet of each of which has its cores charged with magnetism of a different amount or character from that of any other of the instruments, the said charge of magnetism being permanent or independent of that induced by currents in the main circuit, and its amount in the different instruments being proportioned, as hereinafter described. The magnets are each provided with armatures, which are held up to the poles by the attraction due to the said permanent magnetism, and are provided with retractors, by which they are withdrawn from the poles in case the said permanent magnetism is neutralized. By this construction and arrangement it will be seen that a current in the main circuit passing through the coils of all the instruments, and of such strength and polarity as to produce in the cores of one of the instruments magnetism of the same amount and opposite polarity to the permanent charge, (which it has independent of the said current,) will just neutralize the said independent or permanent magnetism of the said instrument, and thus permit its armature to be retracted, while in the other instruments, having permanent magnetism of the same polarity but of greater amount, the current will not be sufficient to wholly neutralize their magnetism, so that their armatures will still remain attracted, and in those instruments having magnetism of the same polarity but less amount the said current will be sufficient to more than neutralize them, giving them a charge of mag-

netism of different polarity from that permanently or normally invested in their cores, and of sufficient amount to prevent the armature from being retracted, the said reversal in polarity taking place more quickly than the armature can move, so that there will be no appreciable effect upon the armature. In those instruments which have the opposite polarity to the one in question, the armature of which is released by the current, the said current will merely increase their magnetic attraction, causing them to hold their armatures with greater than their normal force. The permanent or normal charge of magnetism independent of that produced by the current in the main circuit passing through all the instruments may be derived from the permanent magnetism of steel, or, if desired, from a current in a local circuit passing through coils on the cores of the magnets. I do not broadly claim two electro-magnets in the same circuit having charges of permanent magnetism of different amount. The drawing shows in diagram a central station and a series of eight stations having instruments included in the same circuit, each adapted to be operated independently of the others, in accordance with this invention.

The instruments are shown as consisting of a magnet and movable armature and retractor, the magnet being of the class known as the "Hughes," consisting of a permanent steel horseshoe-magnet, *a*, having fastened upon its poles soft-iron cores *b*, upon which are wound the coils *c* of insulated wire included in the main circuit 20, common to all the instruments. The iron cores *b* are permanently charged with magnetism of the same polarity and strength as that of the poles of the permanent magnet to which they are attached, and the amount of magnetism imparted to the soft-iron cores may be regulated by a soft-iron bar or keeper, *d*, adapted to be clamped in contact with both branches or legs of the magnet at a greater or less distance from the cores *b*. The nearer the said bar *d* is to the cores *b* the less the amount of magnetism induced in the said cores by the magnets, so that the amount of the magnetism in the said cores may be regulated to a nicety by fastening the said bars at the proper points, as by the clamps *e*. The instruments are numbered from 1 to 8, in accordance with their position in the main circuit 20, and in the first two the cores *b* are charged with



an amount of magnetism equal to that which will be induced by a current of the strength that may be taken as a unit, the instrument No. 1 having its permanent polarity the same as would be produced by a negative current of unit strength, and instrument No. 2 having its polarity such as produced by positive current of unit strength in the circuit 20. The cores of instrument No. 3 have magnetism equal to what would be produced by a negative current of two units strength, while the cores of instrument No. 4 have their magnetism such as would be produced by a positive current of two units strength. Instrument Nos. 5 and 6 have magnetism of equal amount, but opposite polarity, such as would be produced by currents, for example, of three units strength, while instruments Nos. 7 and 8 have magnetism of equal amount, but opposite polarity, such as would be produced by currents of four units strength.

For convenience in illustration, two batteries are shown, marked B+ and B—, the former being adapted to have its positive and the latter its negative pole connected with the circuit, the said batteries being divided into sections, each of which may be assumed as capable of producing a current of unit strength. The batteries between the different sections are connected by wires 30 with a series of circuit-closers, *f*, the co-operating portions of which are connected by wires 31 with the main circuit 20, so that by closing any one of the instruments *f*, which are numbered to correspond with the electro-magnetic instrument before described, a definite number of units of battery will be connected with the line, so as to send a current of corresponding strength and either desired polarity through the coils *c* of the different instruments. As shown in the drawing, the circuit-closer *f* (marked 1) is closed, and one section of the battery consequently connected with the positive pole to the line. A current of unit strength is thus sent through the coils of the different instruments, such a current being, as before described, of proper strength and polarity to induce magnetism the same in amount but opposite in character to that permanently invested in the cores *b* of instrument No. 1, so that the magnetism of the said cores is exactly neutralized, and the armature *h* of the instrument released and withdrawn by its retracting-spring *i* from the said cores. The said current of the unit strength and positive polarity would produce magnetism in instrument No. 2 of the same character as that already invested in it, so that its armature would be attracted more strongly than before. The same current would produce in the cores of instrument No. 3 an effect opposite to that of the magnetism permanently invested therein; but as the said permanent magnetism is of the strength derived from two units and the current is of only one unit strength, it will be seen that magnetism of the strength of a unit will remain, which will be sufficient to prevent the arma-

ture from being attracted. If the circuit-closer *f*, No. 4, should be closed, a negative current of a strength of two units would be sent over the line, which would, in the manner just described, neutralize the permanent magnetism of the instrument No. 4, permitting its armature to be retracted. This current, in acting on instruments 1, 3, 5, and 7, will increase their magnetism and holding-power on their armatures, while on the instruments 6 and 8 it will diminish the said magnetism, but not wholly neutralize it, leaving a sufficient amount to retain the armatures attracted. In instrument No. 2, which has a permanent magnetism equal to that developed by a current of unit strength and positive polarity, the said current of two unit strength and negative polarity will wholly neutralize its permanent magnetism, but will produce in it a charge equal to that produced by a current of one unit strength of negative polarity.

It will be seen that a current of proper strength to neutralize any one of the electro-magnets will either produce or leave in all the the others sufficient magnetism to retain their armatures attracted.

The movement of the armatures may be made to operate the signal in any suitable manner, either carrying a bell-hammer to strike a bell, or, as in the case of instrument No. 1, controlling a local circuit including a signal, *S*, such an arrangement being adapted for individual signaling for telephone-lines.

It will be seen that the armatures all fall back undersubstantially the same conditions—namely, as near as possible to absolute neutrality of the cores—and they are all to be retained attracted by the same amount of magnetism—namely, that due to one section of the battery—and consequently the retractive force employed in all should be the same, and may be the weight of the armature-lever.

I claim—

An electric circuit connecting a main or central station and a series of out-stations, each containing a signal-instrument controlled by electro-magnets having coils in the said circuit, and having the cores of the said coils permanently charged with magnetism of different amount or polarity in the different instruments, combined with batteries at the said central station divided into a number of sections, and a series of circuit-closers corresponding with the said out-stations, and each adapted to connect a definite number of sections of battery of the requisite amount and polarity to neutralize the magnetism of the controlling-magnet of the signaling-instrument at the corresponding station, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN CORNELIUS WILSON.

Witnesses:

JOS. P. LIVERMORE,  
BERNICE J. NOYES.