

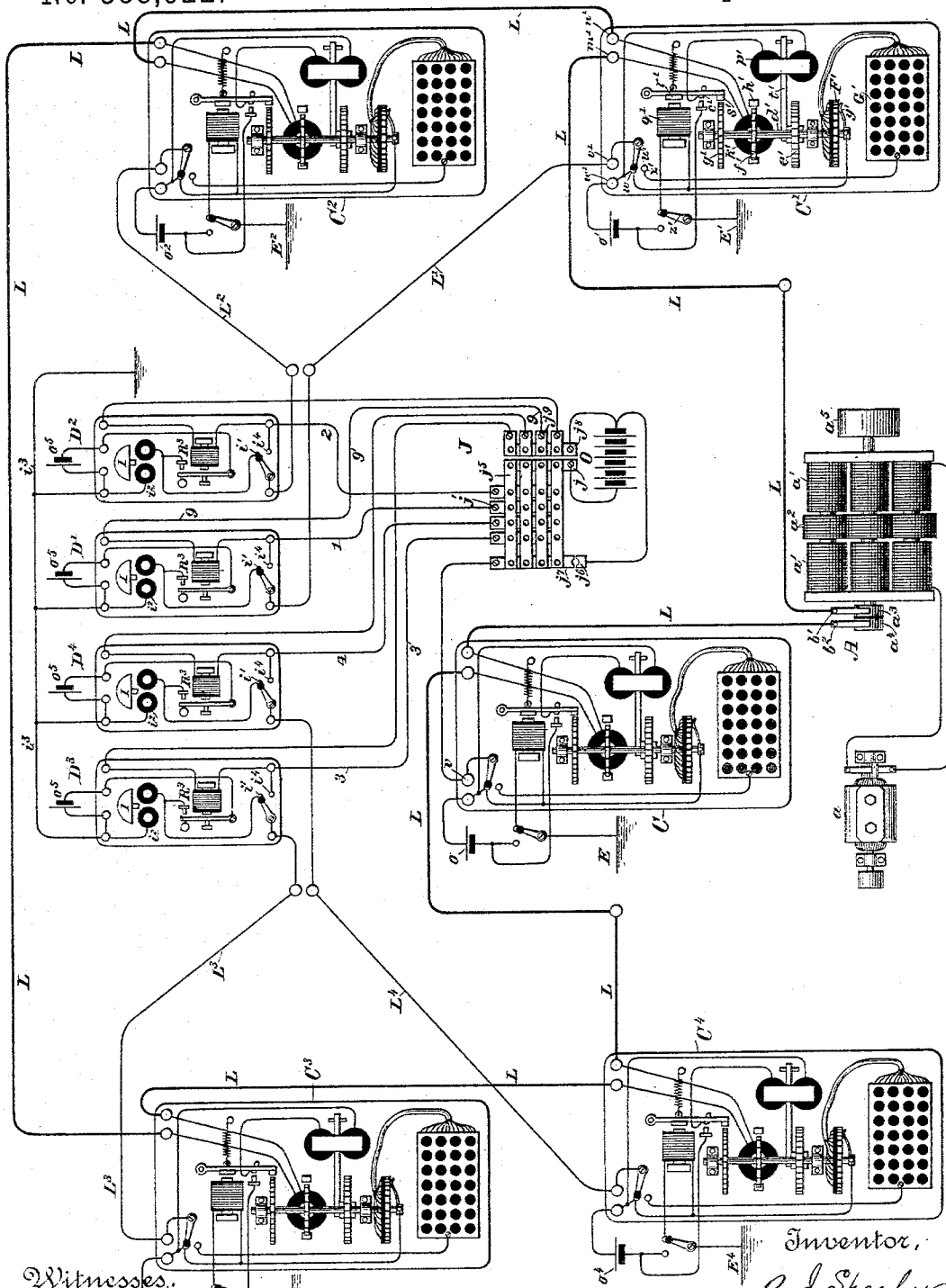
(No Model.)

R. J. SHEEHY.

TELEGRAPH EXCHANGE SYSTEM.

No. 388,922.

Patented Sept. 4, 1888.



Witnesses.
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TELEGRAPH-EXCHANGE SYSTEM.

SPECIFICATION forming part of Letters Patent No. 388,922, dated September 4, 1888.

Application filed December 9, 1887. Serial No. 257,393. (No model.)

To all whom it may concern:

Be it known that I, ROBERT J. SHEEHY, a citizen of the United States, residing in New York, in the county and State of New York, have invented certain new and useful Improvements in Telegraph-Exchange Systems, (Case A,) of which the following is a specification.

The invention relates to the class of electric-telegraph systems in which printing and various other forms of telegraph-instruments and electrical apparatus may be employed for intercommunication between subscribers located at different points.

The object of the invention is to provide convenient means whereby instruments located at different places may be readily connected with each other through a central station, so that the operation of either instrument may be controlled by that connected therewith, and the further object is to provide convenient means for insuring that the instruments so connected shall be actuated in unison with each other, while any other instruments of the system may be used in the manner of those already connected, but independently thereof. The instruments are driven or their movements controlled primarily by means of alternating, intermittent, or pulsatory electric impulses sent through a special conductor from a central station through all the instruments in the series, a single circuit being specially provided for this purpose. Any suitable form of motor or controlling device may be used for this purpose. The recording portions of the instrument are operated, however, by currents transmitted over independent conductors leading to the individual instruments. These individual conductors may be connected with each other at the central station in any desired manner. The alternating, intermittent, or pulsatory currents are transmitted continuously over the controlling-circuit, and therefore all the instruments tend to operate in unison with each other. When, however, two instruments are connected together through the central station, either instrument may be employed for arresting the instrument at a distant station, and also its own movements, independently of the other instruments of the system, and cause records to be effected thereby. The home instrument will operate in the same manner as

the distant instrument. These two instruments may thus be temporarily thrown out of unison with the other instruments of the system; but they will remain in unison with each other, and therefore may be operated for transmitting and receiving messages as long as they are connected with each other. When their special conductors are disconnected at the central station, each instrument will come to its unison point, and thus be in readiness for connection with other instruments when required. This case relates especially to the general organization of the system whereby the instruments are controlled from a central station and are capable of being individually connected and operated.

The accompanying drawing, which will serve to disclose the invention and the method of operating it, is a diagram illustrating the general organization of apparatus and circuits as employed in a printing-telegraph system; though it is applicable also to autographic, automatic, and various other systems.

Referring to the drawing, A represents an electric generator of any suitable character, delivering alternating, intermittent, or pulsatory currents. It is in this instance provided with an exciter or continuous current-generator, *a*, whose circuit is through the field-magnets *a'* *a'* of the generator A. The terminals of the armature-coils *a''* are connected with collecting-rings *a'''* and *a'''*, carried upon the shaft of the generator. The generator is driven by power applied to a belt-wheel, *a''*, or in any other convenient manner.

Against the two rings *a'''* and *a'''* there rest contact-brushes *b'* and *b''*. The brush *b'* is connected with a line, L, leading through the several instruments *C'*, *C''*, *C'''*, and *C''''*, which are supposed to be located at different points, and back to the central station, C, thence to the brush *b''*. This conductor L is thus traversed continuously by the electric impulses delivered by the generator. These impulses are employed in this instance for operating escapement devices of the several instruments. The instruments here shown are all of like construction. Thus the instrument *C'* is provided with a shaft, *d'*, carrying type-wheels *e'*, a scape-wheel or star-wheel, *f'*, and a stop-wheel, *g'*. The escapement-anchor *h'* is vibrated by

means of an electro-magnet, k' . This magnet is connected in the circuit of the conductor L between two binding-posts, m' and n' . The shaft may be driven either by the movement of the anchor or it may be impelled by a spring or weight and its rotation controlled by the anchor, or it may be driven by any suitable motor. In like manner the instruments C^2 , C^3 , and C^4 and the instrument C at the central station are organized.

The method of operating the instruments for effecting impressions therefrom is as follows: Each instrument is provided with a press-magnet, as shown in the instrument C' at p' , and also with a stop-magnet, q' . The latter magnet is designed to be included in a special line, L' , leading from the central station. The press-magnet p' is included in a local circuit, to be described. The line L' leads to a binding-post, v' , thence through a switch, u' , and switch-point w' to the magnet q' , and thence through the switch z' to the earth at E' . An impulse sent over the line L' to the instrument C' will thus traverse the magnet q' and reach the earth at E' . The armature r' of the magnet q' is provided with a contact-point, c' , for closing the circuit of a local battery, o' , through the magnet p' when it is drawn forward. When the magnet p' is thus vitalized, it will cause an impression to be effected; but usually it is desired to arrest the type-wheel. For this purpose the armature-lever r' of the magnet q' carries a stop, s' , which engages the teeth of the stop-wheel g' when it is drawn forward, and thus arrests the movement of the shaft d' and type-wheel e' . The lever t' of the press-magnet p' will be immediately operated and cause an impression to be taken from the type-wheel. For the purpose of employing the instrument C', for instance, for sending the proper impulses to effect impressions, the connections of the line L' through the instrument may be changed by means of the switch u' , which is inserted between the point w and the binding-post v' . By moving this switch to a point, x' , the connections may be changed so that the circuit may be completed from the switch u' and its point x' through the separate keys of a key-board, G' , to a circuit-controlling device or sunflower, F' . The sunflower consists of contact-strips over which a brush, y' carried upon the shaft d' , is revolved. The brush y' is connected with the switch-point w' , and the separate strips of the sunflower are connected with the respective keys of the key-board G' . By depressing any key the circuit will be closed the moment the brush y' strikes upon the corresponding contact-strip of the sunflower. For the purpose of obtaining the requisite battery-power a battery, O, at the central station is placed in circuit in a manner to be described. It is evident that when an impulse is sent over the line L' by the operation of a key upon the board G' the instrument C' will be arrested, an impression effected, and the type-wheel will remain at rest until the interruption of the

circuit by the releasing of the key and the consequent releasing of the stop-wheel from the stop s' . Moreover, whatever effects are produced upon the instrument C' will also be duplicated upon any instrument, C^2 , C^3 , C^4 , or C, which is connected therewith, and vice versa.

For conveniently notifying an operator at the central station when it is desired to communicate with a distant station, annunciators, as shown at D' , D^2 , D^3 , and D^4 , may be respectively connected in the circuits of the lines L' , L^2 , L^3 , and L^4 , leading to the respective stations. A current sent over the line L' , for instance, passes to the annunciator device D' , thence through a switch, i' , to a magnet, i^2 , employed for operating a vibrating or other call-bell, I, and thence to the earth by way of a conductor, i^3 . By moving the switch i' to a contact-point, i^4 , the operator at the central station will be able to cut the instrument D' out of circuit and place the line L' in connection with a corresponding strip, j' , of a switch-board, J. This strip may be placed in connection with a strip, j^5 , and through it with a strip, j , thence to one pole of the battery O, and from the other pole through strips j^6 and j^7 to the binding-post v of the instrument C, and thence through that instrument to the earth at E. In this manner the instrument at C will be placed in connection with the instrument at C' through the battery O, and whatever communication is desired may be sent from one instrument to the other.

In case it is desired by the subscriber at C' that his instrument shall be connected with the instrument C³, for instance, the operator at the central station first transmits a signal over the line L^3 to the station at C³. This may be accomplished by connecting the instrument C through the battery O with the conductor 3, leading to the device D^3 , and through an electro magnet, R^3 , and switch i' , which is placed in contact with the point i^4 . Any suitable form of signal may then be transmitted over the line L^3 to the instrument C³. The instrument C³ being then placed in connection with the instrument C', through the battery O by means of the strips j^8 and j^9 and conductor 9, the two subscribers will be in direct communication. The instrument C may be placed in circuit, if it is desired, by a split switch-plug in a manner well understood. The switch i' of the instrument D' may remain against its point i^4 , thus including the magnet R^3 in circuit. This will serve to give notice at the central station when the subscribers have ceased communication, for by drawing its armature-lever forward under the influence of a continuous current from the battery o^2 , for instance, it will close the circuit of a local battery, o^5 , through the call-bell.

I claim as my invention—

1. In a telegraph-exchange system, the combination of a central controlling device consisting of a source of alternating, intermittent, or pulsatory electric impulses connected

through all the several instruments of the system, and conductors leading from the recording devices of each instrument of the system to the central station.

5 2. In a telegraph-exchange system, a source of alternating, intermittent, or pulsatory electric currents, controlling devices for the several recording-instruments of the system operated by currents from the source, individual
10 conductors leading from the individual instruments to the central station, and switch devices at the central station for coupling any of the individual conductors.

15 3. The combination, with an electric generator delivering alternating, intermittent, or pulsatory currents, or equivalent source of currents, of a series of motor devices for telegraphic instruments operated by currents from the source, individual recording devices,
20 conductors leading thereto, devices for connecting any two of said conductors, and circuit-controlling devices for making and breaking circuit-connections through such connected conductors.

25 4. The combination, with an electric generator delivering alternating, intermittent, or pulsatory currents, of a number of controlling devices for telegraphic instruments connected in series with said source, radiating conductors
30 extending from a central station to the individual telegraphic instruments, recording apparatus for the respective instruments respectively connected in said radiating conductors, and circuit-connecting devices for coupling
35 said radiating conductors with each other.

5. In a telegraphic-exchange system, a source of alternating, intermittent, or pulsatory electric currents, controlling devices for the several recording-instruments of the system op-

erated by currents from the source, individual
40 conductors leading to the central station, switch devices at the central station for coupling any of the individual conductors, and a circuit-controlling device for each instrument for controlling the connections of its conductor
45 and that connected therewith.

6. The combination of a source of alternating, intermittent, or pulsatory electric currents located at a central station, recording-instruments located at different points operated or
50 controlled by such currents, individual conductors leading from the central station to the several instruments, and a circuit-controlling device at each instrument for making and breaking the connections of the corresponding
55 individual conductor, thereby operating the recording device of the instrument connected with the corresponding line.

7. In a telegraph-exchange system, the combination, with a series of independent tele-
60 graphic recording-instruments of like construction located at different points and an electrical governing, controlling, or actuating device for each, of an electric circuit in which the several devices are included, a transmitter for
65 governing, controlling, or actuating electric currents applied to said circuit tending to operate the devices in unison with each other, and a recording device in each instrument effecting the same record from each instrument
70 when they are in unison.

In testimony whereof I have hereunto subscribed my name this 8th day of December, A. D. 1887.

ROBERT J. SHEEHY.

Witnesses:

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