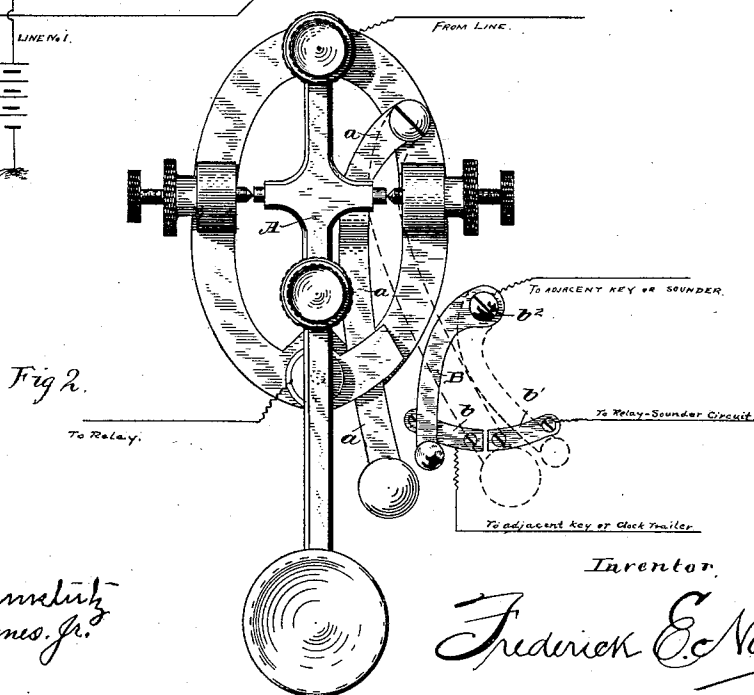
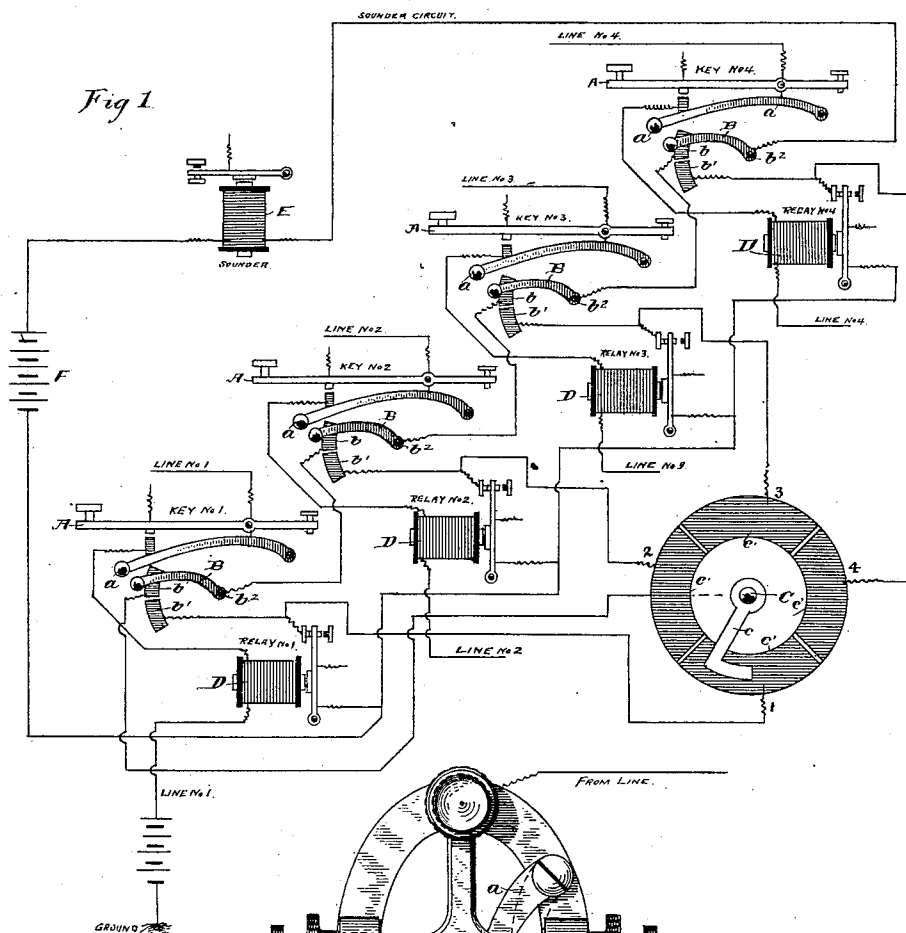


(No Model.)

F. E. NOW.
ELECTRICAL TRANSMITTING SYSTEM.

No. 475,468.

Patented May 24, 1892.



Witnesses

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ELECTRICAL TRANSMITTING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 475,468, dated May 24, 1892.

Application filed December 4, 1891. Serial No. 413,988. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK E. NOW, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Electrical Transmitting Systems; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in electrical signaling apparatus; and it consists of such features as are herein described, and shown in the accompanying drawings, and more especially pointed out in the annexed claims.

The object of the device is to create greater efficiency in the manipulation by a single operator of a number of distinct and separate telegraph-circuits, so as to facilitate the more ready dispatch of daily business and make such an office more readily accessible from the general offices or dispatcher's headquarters as well as local offices, an attainment at times most difficult to perform under the present system of working telegraph or similar lines.

With these ends in view I show in the accompanying drawings, in Figure 1, a diagrammatic view of a local station or office with four separate lines, three being through lines and one a terminal line, with the keys, relays, and a single sounder and a clock-work in connection, so as to deliver the sounder periodically to each of said lines in succession. The key-lever is shown in elevation, while its circuit-controller is shown in plan view side by side, so as to more clearly show the different circuits. Fig. 2 is an enlarged plan view of a key and my auxiliary circuit-switch in its relation thereto.

In the detail description I shall refer to the circuits as "closed" ones, since in telegraphing these are universally used. However, it will be understood that I do not in any manner limit myself to this kind of a circuit, as the device is equally adapted to a "closed" or "open" circuit system.

I use keys A of the ordinary construction, having circuit-closers *a*. Adjacent the circuit-closer *a* is located the auxiliary switch-lever B, its location being such that when the

lever *a* is moved sidewise to open the line-circuit preparatory to using the key A it will engage with B and move it sidewise also upon its pivot *b*², carrying it off from the segment *b* upon the segment *b*¹.

A suitable clock or other driving mechanism is provided to rotate a spindle or shaft C, which carries a trailer *c*. This trailer moves in contact with a series of concentric segments *c*¹, the segments, as shown, corresponding in number to the lines centering at any one office or that are desired to be connected in a system of this kind. Of course the number of segments could be increased twice or three times, as desired, thus connecting the segments belonging to the one relay two or three times to the sounder-circuit during one revolution of the trailer, instead of once, as shown in the drawings. This is optional, and would be arranged to suit the exigencies of the circumstances under which the system would be installed. The relays are all of the ordinary form and construction, as well as the single sounder, which serves all of the relays in the system. The mechanism deals more especially with the local or sounder circuit, since the line-circuit comes to key and passes to relay, and thence to line again or ground, as the case may be.

In ordinary practice each relay is supplied with a separate sounder with its own local battery, while with my device I use only one sounder for a large number of relays and only one local battery, thus economizing very materially in battery supplies and making the duties of the operator in charge easier, besides securing greater efficiency of service, because the annoyance of trying to read from a line when half a dozen other lines through their sounders are clicking incessantly, thus making the reading of an individual line anything but an easy and assuring task to the ordinary operator, while with the mechanism herein described it is possible for an operator to take care of half a dozen or more lines with as much ease as only one line under the present methods of telegraphic service.

The circuit connections will be readily understood from the following description: Each line-wire of course passes to its respective key A, thence to the corresponding relay D, and thence to line again. The clock

through its trailer *c* receives a circuit from the sounder *E*, which first leads to U^2 of the first switch *B*, thence by the switch-lever to segment *b*, thence similarly through the successive auxiliary circuit-controllers *B*, and from the last segment *b*, the clock-trailer *c*, and then through the different clock-segments *c'* to the armature connections of the respective relays *D*, corresponding to one or the other of the segments *c'*. From one terminal of the relay sounder-circuit, a line leads to the battery *F*, and thence to the sounder *E*. From the other relay-sounder terminal leads a line to the clock, as described, and also one to the segment *b'* of the auxiliary circuit-controller *B*. Thus it will be seen that when line No. 1 is calling the sounder will not operate until the trailer *c* is upon the segment *c'*, which corresponds to the relay *D*, located upon the line doing the calling. Then when the trailer is so located the sounder will respond; but only for about five seconds, more or less. Then the sounder is connected to another relay, so as to give this other line a five-second opportunity to call. Thus each line has, say, a five-second chance to call the station or office in question for each revolution of the trailer, or until the trailer connects with another segment which is connected with that particular relay.

Under the order of things as they now exist an operator having six lines (more or less) to serve will repeatedly "plug" or "turn down" all the relays but the one on the line being used. This would not be a disadvantage if they were immediately thrown into operation again as soon as the operator completed his message on the line on which he had been working; but unfortunately this does not follow, and sometimes hours elapse before the operator can be raised over any of the other lines, because most usually a penholder is resting complacently behind the relay-armature, thus plugging the sounder-circuit, and hence the inability of a distant office to raise him. The practice of turning down relays is also carried on very extensively where an operator has a "train-wire" in his office, very frequently making it impossible for the station to be reached over any other line, and generally recourse must be had over the train-wire in a roundabout manner, while with my system all these annoyances are overcome, and it is impossible for the operator to deprive any office from an opportunity of calling him. Should an office fail to reach him at first, then it is at once known that after a certain interval another opportunity will be given without any chance of failure by reason of his relays being turned down.

It frequently is the case that one operator at a station, besides being employed as a telegraph-operator, also fills the position of freight-agent, express-agent, and in some cases postmaster, and with these multitudinous duties, with the ordinary sounder-for-each-line ar-

range, it is almost impossible to raise the station, because of these diversified duties and the incessant clatter of all the sounders, which are liable to be in operation at the same time. With my device, wherein one sounder serves all the lines, the operator can more readily distinguish a call. Of course the one sounder will most likely be in almost continuous operation, but is the only instrument to which the operator needs pay any attention as far as calls are concerned. Again, the consciousness of the operator, as far as he himself is concerned, that there can be no dereliction of duty—such as turning down or plugging the relays, &c.—will work and perform his duties with greater ease and equanimity, because every line has an unhindered opportunity at short intervals to call him, and the maintenance of this opportunity does not depend upon any special observation on his part, such as seeing that no relays are turned down or plugged when he has completed the use of any one line and by reason of this immunity greater accuracy and efficiency of service can be attained.

Now in order that the device may be better understood in its entirety a brief résumé will be made of its operation. As stated, any one line is given a periodic opportunity for calling by reason of the clock movement, successively switching the different relay sounder-circuits from one to the other of the lines to have the use of the sounder for calling purposes to the entire exclusion of all the others for a short period of time, this opportunity recurring again at stated intervals, being also accorded in like degree to all the other lines. As the operator hears a call or a number of calls he selects the most important one and proceeds to the key corresponding to the line from which the important call was received. As he opens "the circuit-closer," as it is commonly called, he at the same time moves the auxiliary switch to its second segment, which instantly cuts the clock out of circuit and delivers the sounder to the relay which corresponds to the key being worked. The sounder may have been on some other relay-circuit when the key was reached; but the first movement of the operator at the key instantly delivers the sounder where it is needed and also makes inactive the clock-switch by cutting it out of circuit entirely for the time being. This auxiliary switch must, however, remain in the position to which it was first moved until the operator is through with the line entirely, and the last movement he makes is to grasp the auxiliary switch and move it toward the unoccupied segment, and in so doing he instantly operates the main-line circuit-closer and delivers the sounder to the clock, and also throws the clock in circuit again to successively deliver the sounder to the relays again, as before.

The device obviates many vexatious situations of dispatchers, as well as avoiding delays to the prompt movement of trains, be-

cause it is known that the office being called has but one sounder, which will within a few seconds be automatically placed on the train-wire, and if the operator is at his post of duty or even within hearing of the instrument he will respond promptly.

The economy of my device certainly is a very important item, since I enable railroad or telegraph companies to dispense with a large local-battery equipment, and thus effect a material commercial saving per year in the maintenance of their equipment, as has already been pointed out. Two cells of battery serve half a dozen (more or less) lines for sounder purposes, while under the old régime two cells are required for each line. Thus in case of a six-line system a saving of ten cells for each station is had not alone of first cost, but the subsequent maintenance of this large part of an unnecessary equipment, which consists of a multiplicity of battery-cells, &c.

Having described my device, what I desire to cover by Letters Patent of the United States is—

1. In an electrical transmitting system, separate lines, sending and receiving devices in circuit with each of said lines, a distinctly separate and single local translating device, means in circuit with said receiving devices adapted to automatically connect said local mechanism with the several receivers in periodic succession, and other means auxiliary to said sending devices adapted to automatically connect the local device with the receiving mechanism corresponding to the sending device actuated, substantially as set forth.

2. In an electrical transmitting system, separate communicating lines, a key and relay in each of said lines at a home station, a separate local device, and means auxiliary to said key adapted to automatically connect the local device with a home relay corresponding to any home key to be operated, substantially as set forth.

3. In an electrical transmitting system, separate communicating lines, a sending or signaling device and relay in circuit with each of said lines at a home station, a separate local device, and means actuated by said home sending devices at or about the moment a signal is sent to line, said means adapted to connect said local device to any of said relays

corresponding to the home sending device being operated, substantially as set forth. 55

4. In an electrical transmitting system, separate lines, sending and receiving devices in each of said lines, a regulating mechanism in common for all of said lines, and a local sounder or the like, with suitable connections whereby the regulating mechanism periodically connects said sounder to the several receivers in succession during the receiving of signals, and other means adapted to connect the sounder to a receiving-instrument corresponding to a sending device being operated in sending out signals and also disconnect said regulating mechanism therefrom, substantially as set forth. 60

5. In an electrical transmitting system, separate lines, sending and receiving devices in circuit with each of said lines, a local interpreting device serving for all the separate lines, and a regulating mechanism adapted to automatically connect in periodic succession said local device to the separate receivers, substantially as set forth. 70

6. In an electrical transmitting system, separate lines, a key and relay in circuit with each of said lines, a sounder, and a clock mechanism adapted to automatically switch said sounder periodically into circuit with the different relays, substantially as set forth. 80

7. In an electrical transmitting system, separate lines, a key and relay in each of said lines, a sounder, a clock to periodically connect said sounder to the different relays, and auxiliary key connections whereby when signals are to be sent said sounder is automatically connected to the relay corresponding to the key being operated and the clock mechanism during such operation to be out of circuit, and upon the completion of the signaling the clock is again connected in circuit by the key mechanism, substantially as set forth. 90

8. In an electrical transmitting system, a signaling-key, a circuit-controller thereon, an auxiliary circuit-controlling device adjacent thereto and adapted to be moved by the first of said controllers, substantially as set forth. 100

Witness my hand to the foregoing specification this 30th day of November, 1891.

FREDERICK E. NOW.

Witnesses:

C. E. SNYDER,
WM. B. TYLER.