(No Model.)

C. J. KINTNER.

ELECTRICAL SIGNALING DEVICE.

No. 452,026. Patented May 12, 1891.

Fig. 1.

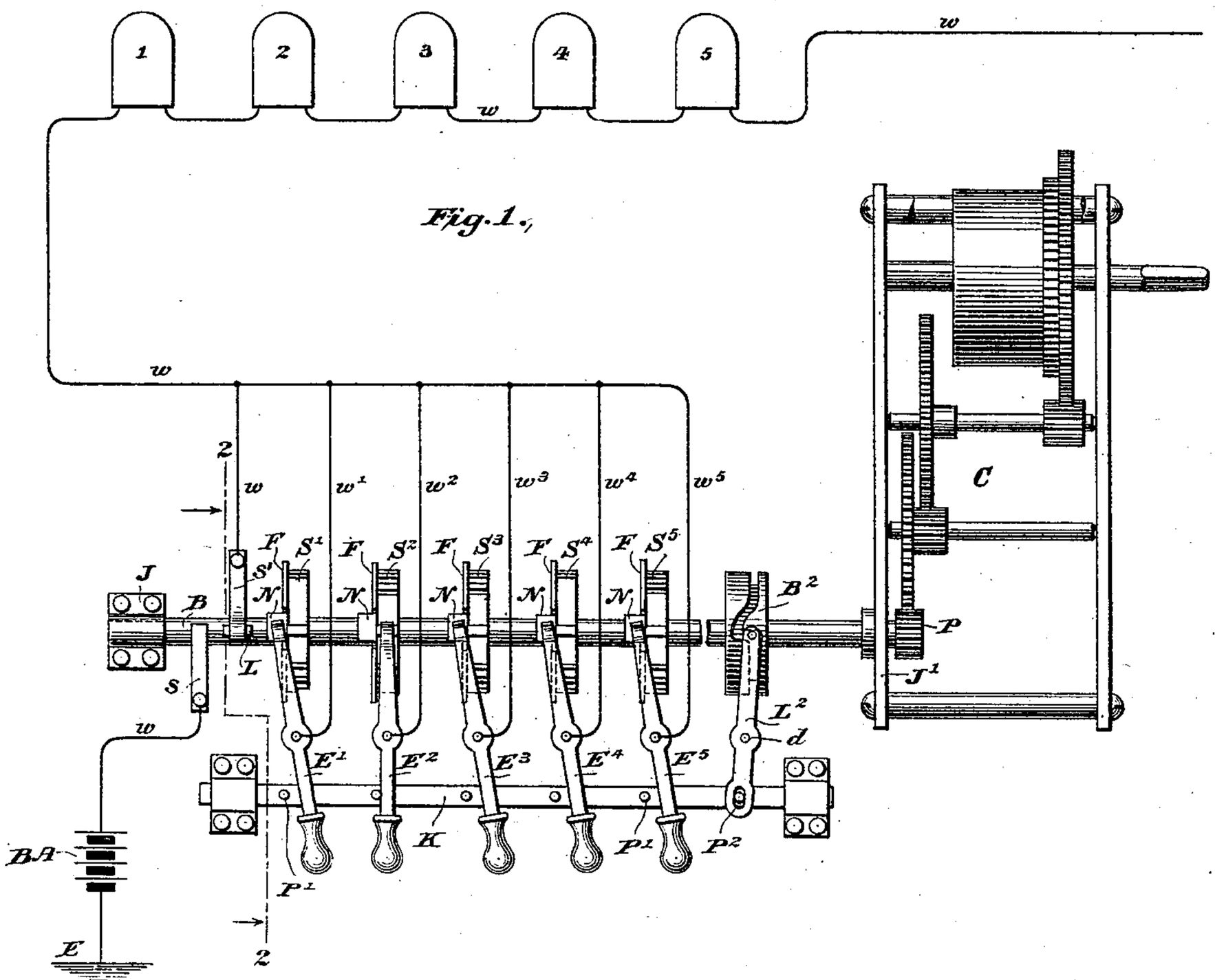


Fig. 2.

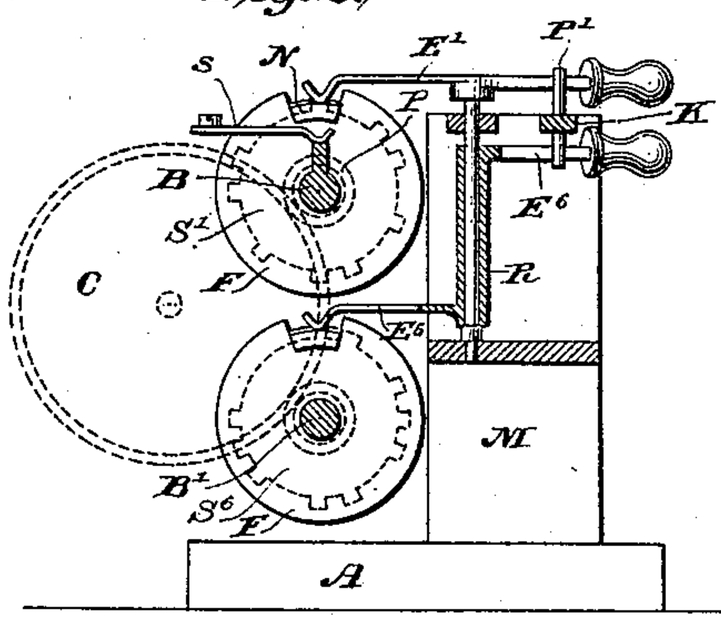
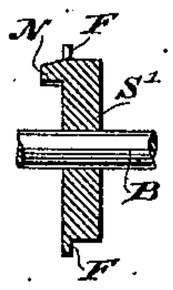


Fig. 3.



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ELECTRICAL SIGNALING DEVICE.

SPECIFICATION forming part of Letters Patent No. 452,026, dated May 12, 1891.

Application filed July 15, 1890. Serial No. 358,860. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. KINTNER, a citizen of the United States, residing at New York, in the county and State of New York, have made a new and useful Invention in Electrical Signaling Devices, of which the following specification, taken in connection with the drawings, is a full, complete, and exact description.

My invention relates particularly to electrical signal-transmitters; and its objects are, first, to devise a transmitter adapted for central-station use and to automatically transmit any one of a series of prearranged signals; second, to prevent the interruption of a signal during the time it is being transmitted; third, to allow one signal, and one signal only, to be transmitted at a time and to restore the signal mechanism to its normal condition after this transmission has been completed; fourth, to accomplish the several features hereinafter indicated. I accomplish these several objects by the use of the mechanism hereinafter described, but particularly pointed out in the claims which follow this specification.

My invention is especially designed and adapted for use in connection with the automatic individual signaling apparatus invented by Adin A. Hatch and disclosed in his patent, No. 435,983, granted by the United States Patent Office on the 2d day of September, 1890, and with analogous signal-receiving apparatus. In the invention disclosed in said patent to Adin A. Hatch individual signal-receiving apparatus is actuated at outlying stations and caused each to respond to its own particular transmitter, in which characters of the Morse code are utilized and combinations of varying orders of intermittent current impulses are transmitted for the purpose of operating such individual receivers to the exclusion of those not wanted.

My invention is particularly designed for use on a main-line circuit wherein there is located a signaling-battery and a series of such individual automatic receivers, and it will be clearly understood by referring to the accompanying drawings, in which—

Figure 1 is a plan view showing the circuit-connections in diagram. Fig. 2 is a sectional view of Fig. 1, taken on line 2 2, as seen looking from left to right in the direction of the arrows. Fig. 3 is a detail sectional view of one of the signal-disks.

Referring now to the drawings in detail, *w* is the main line running from the earth E through a series of outlying individual signaling apparatus indicated by signal-boxes 1, 2, 3, 4, and 5.

B A is the signaling-battery located at a central or signaling station from which it is desired to call any of the outlying operators through the agency of my improved apparatus, which I will now describe in detail.

C is a clock mechanism impelled by spring or weight power, or any preferred type of energy, the last gear-wheel thereof meshing with a pinion P on a shaft B, journaled at J J′.

S′ S^2 S^3 S^4 S^5 are signal-transmitting disks, each of which has upon its surface a prearranged signal in the nature of conducting-teeth adapted to contact, respectively, with the conducting signaling-arms E′ to E^5. These signaling-disks are arranged, as shown, at the desired distances apart on the axles B B′, and are electrically in contact therewith. On the right-hand end of the shaft B is a cam-wheel B^2, having an irregular cam on its surface, which is adapted to give lateral motion to a bar or connecting-link K, having sliding bearings in the frame of the apparatus, this motion being imparted by a lever L^2, pivoted at *d*, and having a pin which plays in the cam-groove at one end and a corresponding pin P^2 on the bar or connecting-link K, as clearly shown.

P′ P′ are pins arranged on the upper and lower sides of the sliding bar or connecting-link K, said pins lying in the paths of the signal-arms E′ to E^5 and E^6, &c. These signal-arms are connected at their pivot-points with the main-line *w* by wires *w′* w^2 w^3 w^4 w^5, &c., respectively, and the contacting ends of said arms rest normally on or near the exterior ends of beveled contacting segments N, the interior or horizontal portions of which constitute part of the signal-disks proper.

F F F, &c., are non-conducting disks or

guards, each having a notch in that portion of its periphery which rests normally near the free ends of the arms E′ to E⁵.

s is a conducting-spring which bears on the shaft B, and connects the battery B A electrically with said shaft, and *s′* is a similar conducting-spring connected at one end to the main line *w*, with its other end resting normally on a conducting-lug L, so that the current from the battery B A passes directly to line by wire *w*, spring *s*, shaft B, lug L, spring *s′*, and through the signal-boxes 1, 2, 3, 4, and 5. In Fig. 2 I have shown two sets of these transmitters arranged upon parallel shafts B B′, the shafts being geared together through the agency of a common driving-wheel and pinions P, and adapted, therefore, to rotate both in the same direction and at the same speed. Of course any number of such shafts may be geared to the mechanism C. The axles B B′ are both in metallic contact with the frame of the machine, while the signaling-arms E′ to E⁶ are insulated therefrom. The lower arms E⁶ are journaled around the bearings of the upper set of signaling-arms by long journal-bearings R, and are adapted to bear against pins on the lower side of the bar or connecting-link K. (See Fig. 2.)

The operation of the apparatus is as follows: Under normal conditions the battery-current from B A passes directly to line through the wire *w*, as already indicated, or if the ends of the arms E′ to E⁵ rest normally against the beveled bearings N it will pass to line *w* through the branch wires *w′* *w*² to *w*⁵. Suppose now it is desired to transmit a signal from some one of these transmitting-disks, as S². The signal-arm E² is pushed to the left through the agency of its handle, and the free end thereof is brought into alignment with the signal-teeth on the disk S², while the other end of the arm E² is forced against one of the pins P′, thereby causing the bar or connecting-link K to be thrust to the left, and with it the lever L², so that the pin on the free end of said lever is released from its bearings on the shoulder in the cam of the wheel B² and the clock mechanism is allowed to impart an advance motion to the shaft B. As this shaft rotates, therefore, the circuit is broken, first through the branch *w*, its spring *s′*, and lug L, and the current is transmitted from the battery through the shaft to the disk S² and through the teeth thereof in succession as it revolves to the arm E², branch wire *w*², line-wire *w*, through the several outlying signal-boxes 1, 2, 3, 4, and 5, actuating the apparatus in box 2 to the completion of its phase and warning the operator at that station that he has been called. When the shaft B has made one complete revolution, the cam-wheel B² causes the pin in the end of the lever L² to be forced to the left, and hence imparts to the bar or connecting-link K a motion to the right, thereby causing the pin P′ on the left-hand side of the lever L² to restore said lever to its original position parallel with levers L′, L³, L⁴, or L⁵. At the same time the shaft is again checked in its rotation, and the apparatus is ready for the transmission of the same or any one of the signals, as before. It will be seen that after the apparatus has once been started the signal-lever cannot be removed from the signal-disk, nor can any other signal-lever be placed in operative relation with its signal-disk until the shaft B has made a complete revolution and is restored to its normal condition, so that the contacting ends of all the levers are in the paths of the notches of the disks F. When it is desired to transmit any signal from one of the signal-disks on the shaft B′, the operator actuates one of the lower set of signal-levers E⁶, as seen in Fig. 2, said signal-levers being the duplicates of those shown in Fig. 1 and being operatively connected with the bar or connecting-link K by pins on the lower side of said bar, in the same manner as the arms E′, &c., were connected to that bar by pins P′.

It is of course obvious that when the free ends of the signal-arms E′ to E⁵ rest normally on the shoulders N, when said shoulders are of conducting material and connected with the signal-disks, the spring *s′*, shunt-wire *w*, and lug L may be done away with. I prefer, however, the arrangement shown, and that the free ends of the arms E′ to E⁵ be absolutely out of contact with the shoulders N, thereby diminishing the friction as much as possible at starting.

I do not limit myself to the use of this apparatus with the special form of signaling-receiver above referred to, as it is obvious it may be utilized in any place where any one of a series of signals is to be sent to one or more outlying stations, as in telephonic, telegraphic, fire-signaling and analogous apparatus. Nor do I limit myself to the specific mechanism herein shown and described for causing any one of a series of signals to be transmitted from a single multiplex signal-transmitter to the exclusion of any other individual signal from the same transmitter during the time that the first signal is being turned in, as I believe it is broadly new with me to so devise a multiple signal-transmitter that during the time any one signal is being transmitted no other signal can be turned in from the same transmitter.

I am aware that it is old in the art of fire-telegraphy to cause a given signal-transmitter to so act upon the other transmitters located at outlying signal-boxes as to lock them out during the time that a signal is being sent in from the first-named box, and my claims hereinafter made are limited to a multiplex transmitter, in which all of the signals are sent from a common instrument located at a single signaling-station.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A signaling-instrument having one or more transmitting-disks secured to a power-impelled shaft, and one or more circuit making and breaking arms adapted to make and break circuit through said transmitting-disks, in combination with a stop device carried by the shaft, and mechanical connections operatively connecting the circuit-breaking devices with the power-impelled shaft, whereby the signal is first automatically transmitted and the application of the power then checked, substantially as described.

2. In a signal-transmitter, a signal disk or wheel carrying a disk or guard and having a circuit making and breaking device adapted to automatically transmit a prearranged code or signal, said disk or wheel being fixedly secured to mechanism for driving it, in combination with a stop device connected to the driving mechanism, and mechanical connections between the signal-contacting lever and the stop device, substantially as described.

3. In a signal-transmitter, two or more signal-disks having each a prearranged order of electrical contacts, in combination with a contacting device, one for each disk, adapted to rest operatively in contact with said contacts, and guards or disks for holding said contacting devices one in operative relation with its signal-disk during the transmission of a signal and the others out of operative relation with their signal-disks during such time, substantially as described.

4. In a signal-transmitter, a series of circuit-interrupting disks having each a prearranged code or signal, a series of pivoted circuit-controlling levers, one for each disk, a protecting disk or guard, one for each circuit-interrupting disk, power-impelled mechanism for rotating the disks, a stop device operatively connected to the power-impelled mechanism, and mechanical connections between the pivoted circuit-controlling levers and the power-impelled mechanism, whereby the latter is held or released at the will of an attendant and a particular signal is transmitted to the exclusion of all other signals in in the same apparatus, substantially as described.

5. In a multiple signal-transmitter, a series of signal-disks having each a prearranged order of contacts and all connected to a rotary shaft, a series of pivoted contact-levers, one for each disk, a stop device carried by the rotary shaft for holding the impelling mechanism in check, a sliding bar or link operatively connected to all of the contact-levers and to the stop device, whereby on operating any contact-lever its signal-disk is operatively connected in circuit and the impelling mechanism is simultaneously released, so that a signal will be automatically transmitted, substantially as described.

6. In a signal-transmitter, a rotary shaft carrying a signal-disk fixedly secured thereto, having a prearranged order of electrical contacts, impelling mechanism geared to said shaft for automatically rotating it, a protecting disk or guard connected to the lateral face of the signal-disk, a pivoted contact-lever normally out of operative relation with the signal-disk, a stop device carried by the rotary shaft for holding the impelling mechanism in check, mechanical connections between the contact-lever and the stop device, whereby the contact-lever is placed in operative relation with the signal-disk and the impelling mechanism is simultaneously released, so that a signal will be automatically transmitted, substantially as described.

7. In a signal-transmitter, a signal-disk having a prearranged order of electrical contacts, in combination with a pivoted contacting lever normally out of circuit with said disk, and a stop device carried by a rotary shaft and having a lever-and-link connection with the pivoted contacting lever, as described, whereby the contacting lever is held in operative relation with the disk during its rotation, but prevented from being so placed if the disk is rotated before the lever is turned, substantially as described.

8. A multiple signal-transmitter having individual transmitting-disks fixedly secured to a common shaft geared to an impelling mechanism, a series of pivoted signal-levers, one for each disk, a stop device for holding the impelling mechanism in check, and lever-and-link connections between the signal-levers and the stop device, whereby any signal may be sent on actuating its lever and the latter restored to normal condition after the signal is sent, substantially as described.

9. Two or more rotary shafts geared to a common actuating mechanism and each provided with one or more individual signal-transmitters, in combination with a stop device carried by one of the shafts for normally holding the actuating mechanism in check, and lever-and-link connections between the signal transmitters and said stop device, whereby the actuating mechanism is released and any signal transmitted and the mechanism automatically restored to normal condition, substantially as described.

10. In an electrical system of automatic signaling, a main line, a signaling-battery, a multiple signaling transmitter having two or more signal-disks fixedly secured to a rotary shaft geared to an impelling mechanism, and a stop device having lever-and-link connections with the transmitters for restoring them to normal condition after they have once been set and the proper signal transmitted, in combination with notched protecting guards or disks, one for each signal-disk, and a series of individual signaling receivers, one for each individual transmitter, substantially as described.

11. A multiple signal-transmitter having a series of transmitting-disks fixed to a rotary shaft, each disk having a notched protecting

disk or guard, in combination with a series of pivoted signal or contact levers having their contacting ends in the path of the notches of said disks, substantially as described.

12. In a signal-transmitter, a signal-transmitting disk having a prearranged signal on its face, and a notched protecting disk or guard, in combination with a pivoted transmitting-lever having its contacting end located in the path of the notch, substantially as described.

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