(No Model.) 2 Sheets—Sheet 1.

S. S. BOGART.

ELECTRICAL SELECTOR.

No. 563,443. Patented July 7, 1896.

Fig. 1

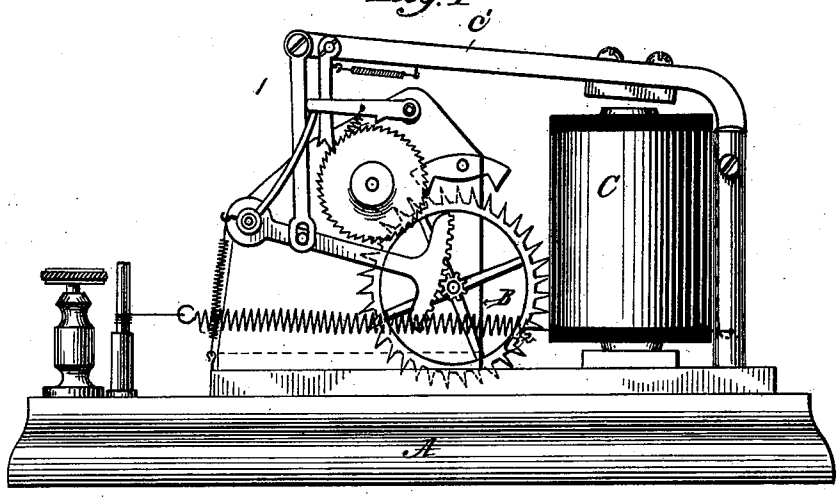


Fig. 2.

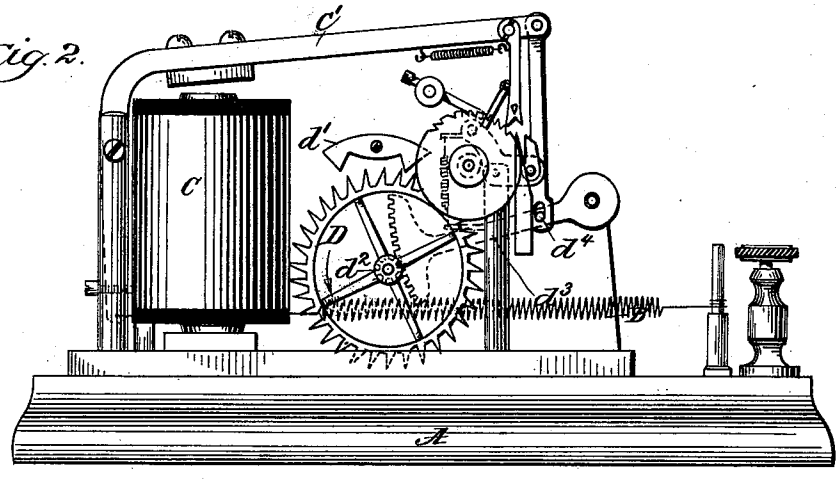


Fig. 3.

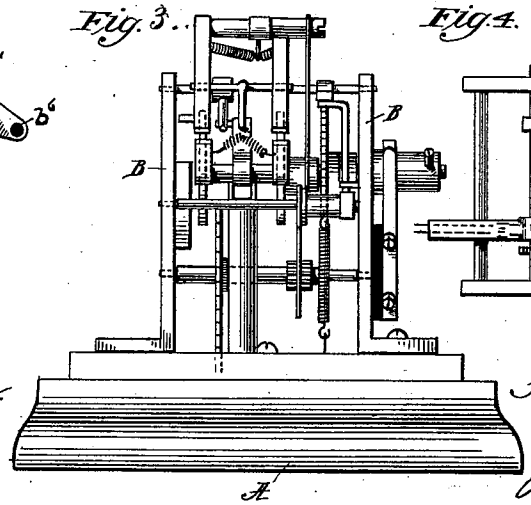


Fig. 4.

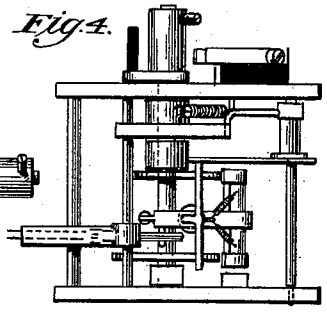
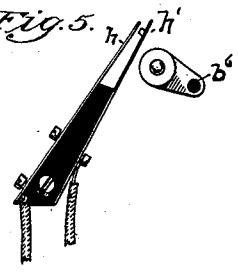


Fig. 5.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 6.

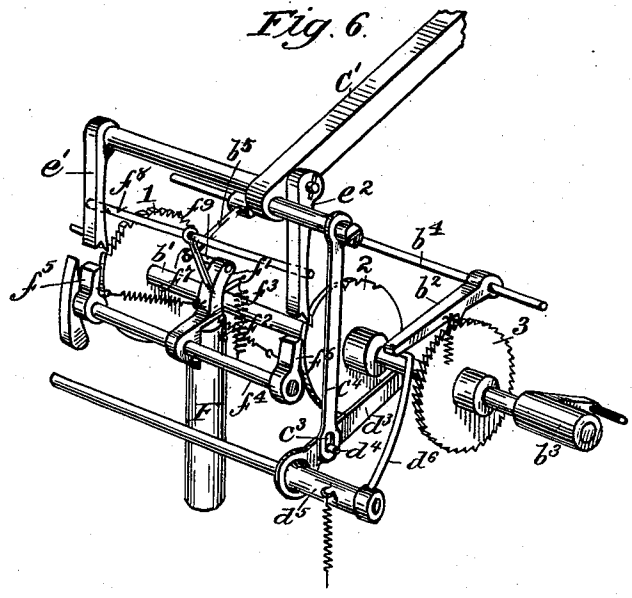
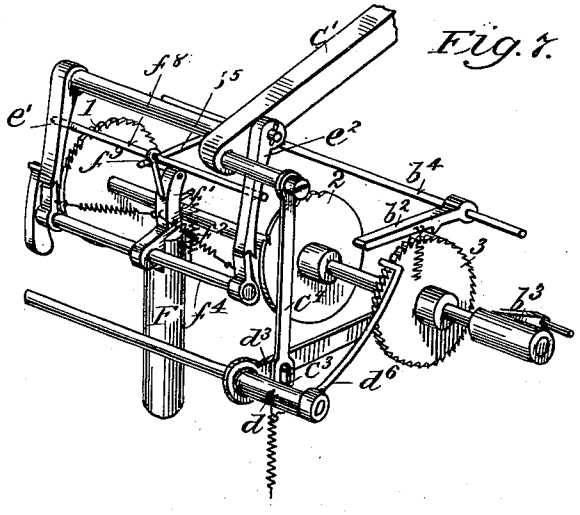


Fig. 7.



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UNITED STATES PATENT OFFICE.

SAMUEL S. BOGART, OF SCHRAALENBURG, NEW JERSEY, ASSIGNOR TO THE ELECTRIC SELECTOR AND SIGNAL COMPANY, OF WEST VIRGINIA.

ELECTRICAL SELECTOR.

SPECIFICATION forming part of Letters Patent No. 563,443, dated July 7, 1896.

Application filed January 5, 1895. Serial No. 533,908. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL S. BOGART, of Schraalenburg, Bergen county, New Jersey, have invented a new and useful Improvement in Electrical Selectors, of which the following is a full description.

The accompanying drawings illustrate the invention, of which—

Figure 1 is a side elevation of the device with a portion of side wall removed; Fig. 2, an elevation of the opposite side of Fig. 1, with upper part of side wall removed. Fig. 3 is a front elevation of the device; Fig. 4, a plan view of the front part of the instrument. Fig. 5 is a view of the brushes and the selector crank and pin which controls them. Figs. 6 and 7 are enlarged perspective views of the combination and spacing wheels and their operating mechanisms, showing different positions of the parts.

Upon a suitable base, as A, are erected the standards or side plates B, which constitute the frame and support the mechanisms of the apparatus. Journaled in the frame is the shaft b', which carries the wheels 1, 2, and 3. (See Figs. 6 and 7.) 1 may be called the "combination-wheel," as its teeth are cut thereon in members, separated by a raised space, and form a mechanical representation of a predetermined arrangement or fixed combination of electrical impulses received from a suitable transmitter. 2 may be called the "spacing-wheel," as its periphery is cut and arranged to represent spaces between its members which correspond with the teeth of the combination-wheel, that is to say, where the teeth occur on one of the wheels a raised space is placed upon the other, and both have a raised space in common at the end of each member of the combination. They are both rigidly secured to the shaft and are operated by a single magnet in the manner hereinafter described. 3 is a ratchet-wheel, also secured to the same shaft, and is provided with the check-pawl b^2, which drops into one of the teeth at each impulse and retains the shaft until it is thrown out by the operation of the devices. This wheel may therefore be called the "check-wheel." The wheels are impelled or thrust forward at each impulse against the tension of a coiled spring located within the drum b^3 on the shaft b'. This spring exerts its tension to restore the selector to zero when it has completed its phase, or when a false impulse is received from the transmitting instrument.

C is an electromagnet; c', a pivoted armature-lever, which responds to electrical impulses through the coils of the magnet and is provided with the usual retractile spring c^2.

In the drawings there is shown a retarding device, represented by the wheel D and the anchor d'. The wheel is suitably mounted on a shaft properly journaled in the frame. On the same shaft is placed a pinion d^2, which meshes with a pivoted rack d^3. Upon the arm of this rack there is a pin d^4, which enters and plays in a slot c^3 in the free end of the arm c^4. The other end of this arm is pivoted to the armature-lever c', as shown, so that the prompt movement of the parts is unaffected by the retarding device pending the lost motion of the slot and pin, but it is brought into action when either end of the slot contacts with the pin.

The impelling-pawls e' e^2 are pivoted to the end of the armature-lever and act upon the combination and spacing wheels 1 and 2. (See Figs. 6 and 7.) They are arranged with a spring which exerts its tension to retain the pawl in contact with the periphery of the wheels. As the wheels are impelled and turn the shaft b', it is checked and held by the checking-pawl b^2, acting upon the check-wheel 3, and I have provided means for throwing out this pawl when a false impulse is transmitted or when the impulses cease, and when this checking-pawl is thrown out the coiled spring in the drum b^3 will return the selector to zero or starting-point. Within a slot on the post F is pivoted the head-piece f', at f^2, whose spring f^3 retains the head-piece inwardly until thrown out. This head-piece carries the bar f^4, and the bar carries the projections f^5 f^6. The upper arm of the head-piece is provided with the pin f^7, which carries the cross-bar f^8, which projects behind the pawls e' e^2, and are so arranged with each other that when the pawl e' is dropped into a notch on the wheel 1 and descends with the armature-lever both pawls e' e^2 will pass inside the projections f^5 f^6; but when that pawl is riding upon a raised space on the wheel,

which occurs when a false impulse is transmitted, it will strike the projection f^5 when it descends, as shown in Fig. 7, throwing out the head f' and cross-bar f^8, which in turn throws out both pawls e' and e^2. This movement also throws out the pawl b^2 from the check-wheel 3 and allows the selector to be returned to normal position. Projecting from the head-piece f' is a pin f^9, and from the shaft b^4, which carries the pawl b^2, there is an arm b^5, which lies in the path of the pin f^9, and as the head-piece is thrown out when the false impulse occurs the pawl b^2 is lifted and the wheel 3 released. The wheel 1 is cut to represent a predetermined arrangement of impulses, for example, 4 2 1 3 2, and each of these requires a corresponding arrangement of impulses from the transmitter and may be called the "members" of the combination. Between each member and the next adjoining one there is a raised space on the wheel, which represents a distance of two impulses, if such were given, and then the next member of the combination begins, followed by the raised space. On the wheel 2 the spaces occur where the teeth are placed on No. 1, with an increase to represent the two impulses of space on the wheel 1, and teeth where the spaces occur on No. 1. The wheel 2 is a little smaller in diameter than the wheel 1, so that its pawl may descend upon one of its spaces and still pass inside of the projection f^6, and the two are arranged together, so that at the start from normal position and at the beginning of each member of the combination both of the pawls are in a notch upon the respective wheels.

The impulses from the transmitter must be given to correspond with the wheels, and vary in the amount of pause between the impulses, and in these pauses the armature-lever goes back different distances, according to the duration of the pauses, as will be illustrated by taking the first member of the combination, which is 4, or four impulses.

At the starting-point both pawls are in a notch. The armature descends four times in succession with sufficient rapidity to allow the pawl of wheel 1 to return and enter the notch behind, but not farther, and descend again, until the four impulses are given. Both pawls pass within the projections f^5 f^6. Pawl e' escapes f^5 because it is within its notch, and pawl e^2, though riding on a space, escapes the projection f^6 because of the smaller diameter of its wheel. When these four impulses are completed, a pause occurs in the impulses sufficient to allow the armature-lever to go back a distance of two notches and thus pass over the space between the members. At this point both pawls are in their notches and descend together, propelling the wheels. Two impulses are given, then a pause sufficient to pass the pawls over the space between the members, and so on. Now it will be seen that if this pause is too short and the pawl descends before its time, e' will descend upon the raised space on the wheel and throw out the check-pawl b^2, releasing the wheel 3, which allows the selector to be returned to zero. Again, if five impulses are given instead of four the same thing occurs, or if the pause is too long the pawl e' will rest upon the second or third notch of the next member of the combination, so that when the impulses are given to suit the combination the same thing will occur, or else if the armature be allowed to return too far it will of itself release the check-wheel in the manner I will now describe.

The rack d^3 is provided with a sleeve d^5, by which it is journaled on its shaft, and on this sleeve and moving with the rack is the arm d^6, whose path is beneath the extended arm of pawl b^2. When the armature-lever is down and engaged in propelling the wheels, the arm does not strike the pawls; but if the arm is allowed to go back too far, either by allowing a pause of too long duration between the impulses or when the impulses cease, the return of the armature-lever causes the arm to lift the check-pawl and return the selector to zero. In this way also the parts are restored to normal when the selector has completed its phase. When the selector has completed its phase, a crank-pin b^6 on the shaft b' closes the brushes h h' to control a circuit to perform such work as is common and usual with these devices, which need not be further described.

What I claim, and desire to secure by Letters Patent, is—

1. In an electric selecting instrument a movable device actuated by the armature of an electromagnet to the end of its phase in response to impulses from a transmitter, means for retarding the backward throw of the armature between the impulses thereby preventing it from completing its backward throw and means for returning the selector to zero actuated by the same armature in completing its backward throw when the actuating impulses cease.

2. In an electric selecting instrument a movable device actuated by an electromagnet responding to electrical impulses transmitted through its coils, an armature-lever having a downward movement of given distance from starting-point and two backward movements both within said given distance for working out the combination of the selector, one of said backward movements to return and catch the next succeeding tooth of the wheel and the other to return and catch the next but one of the teeth, said movements governed by duration of the pauses between the electric impulses.

3. In an electric selecting instrument a movable device actuated by an electromagnet, responding to electrical impulses transmitted through its coils, an armature-lever having a downward movement and three backward movements for working out the combination and restoring the instrument to zero at the

end of its phase, said movements regulated by the duration of the pauses between the impulses.

4. In an electric selecting instrument a movable device responding to a fixed combination of electrical impulses transmitted through the coils of an electromagnet; an armature-lever and mechanical connections whereby the phase of the selector is worked out, and means for restoring the instrument to zero actuated by the forward throw of the armature-lever and also by the backward throw of said lever.

5. In an electric selecting instrument a movable phase-completing device actuated by an armature-lever responding to impulses through the coils of its magnet to work out the combination, means for restoring the instrument to zero actuated by a false impulse, and means for restoring to zero at the end of its phase, actuated by the armature-lever in returning to starting-point.

Signed at New York city, in the county of New York and State of New York, this 15th day of December, A. D. 1894.

SAMUEL S. BOGART.

Witnesses:

WILLIAM SUTPHEN,

M. TURNER.