

(No Model.)

3 Sheets—Sheet 1.

E. DAVIS.

ELECTRIC SIGNAL OR ALARM.

No. 386,772.

Patented July 24, 1888.

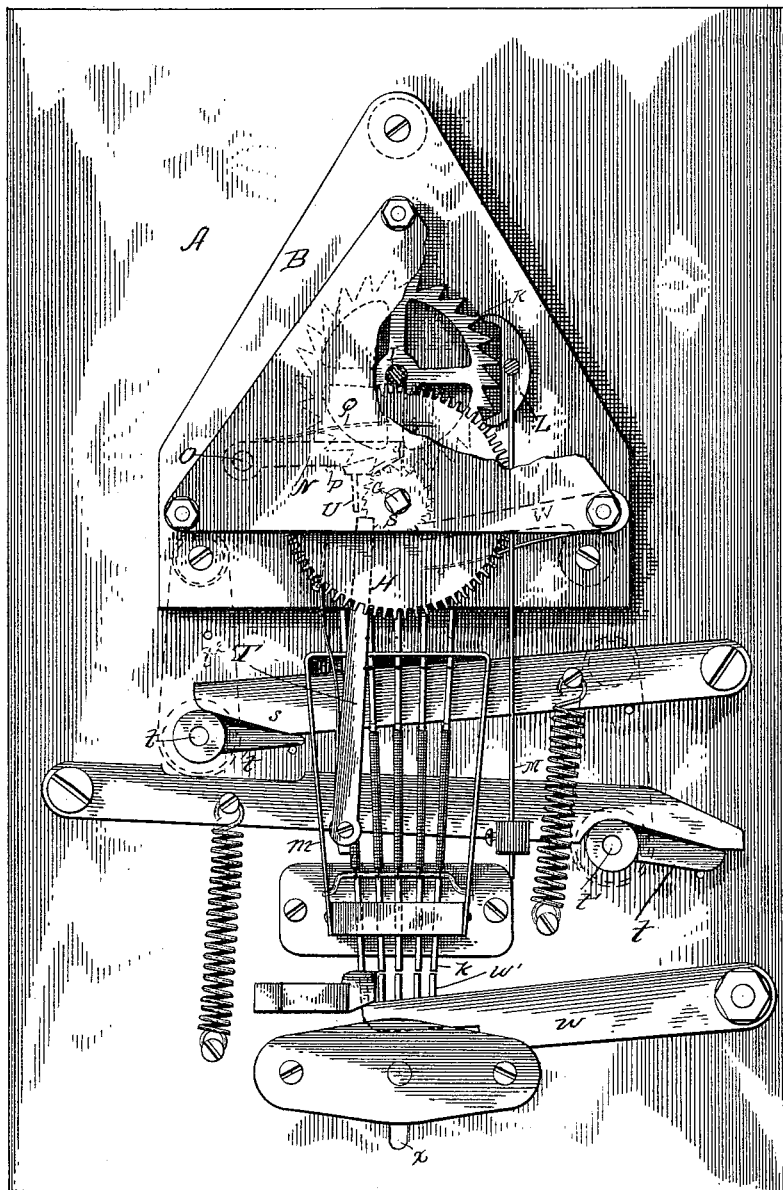


Fig. 1.

WITNESSES.

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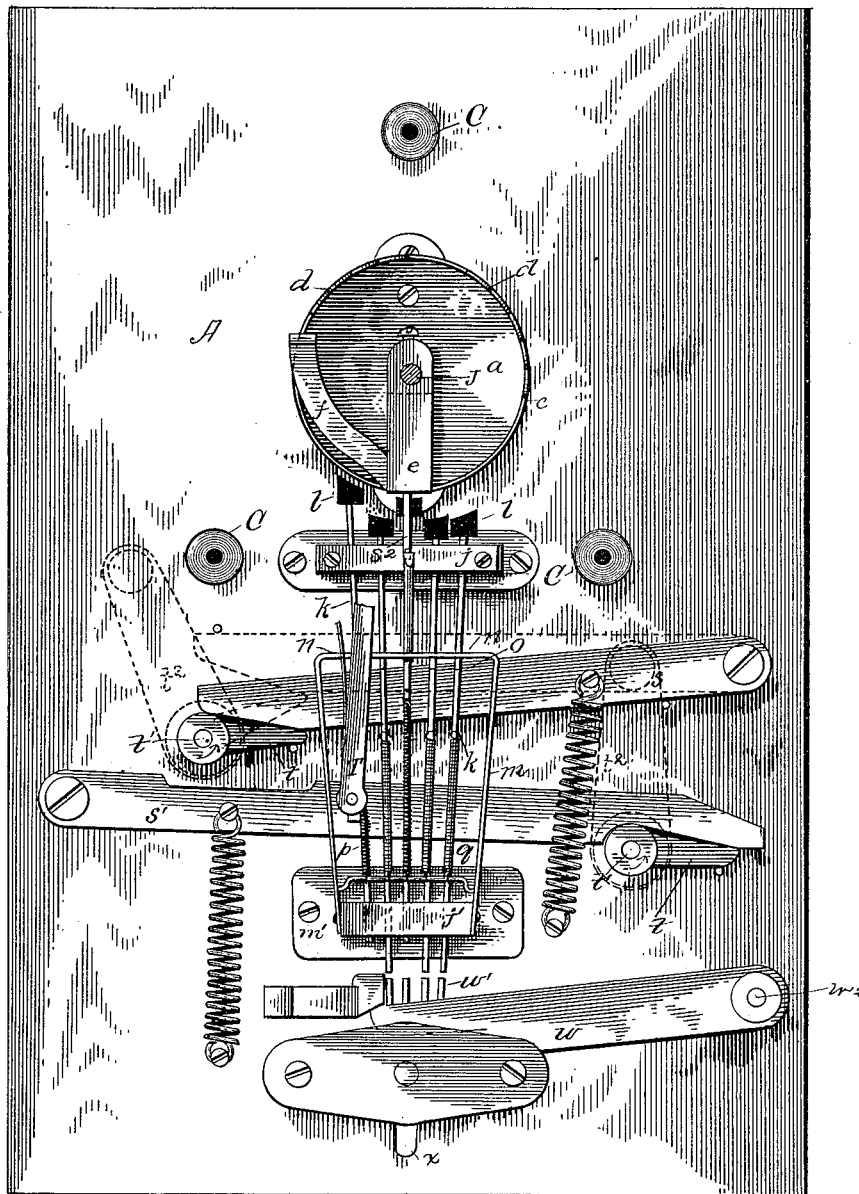


Fig. 2

WITNESSES.

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(No Model.)

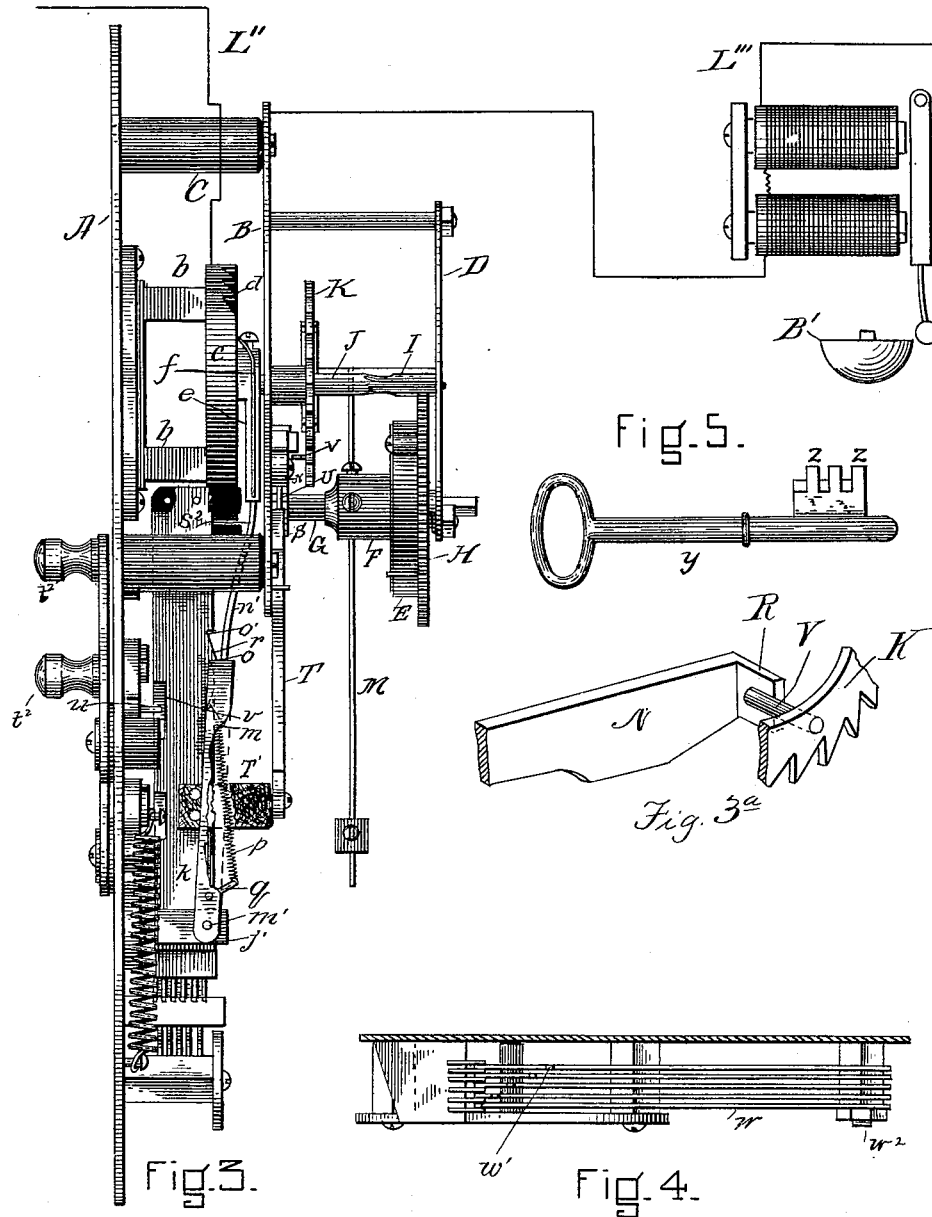
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WITNESSES.  
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# UNITED STATES PATENT OFFICE.

EDWARD DAVIS, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO E. B. WELCH, OF SAME PLACE.

## ELECTRIC SIGNAL OR ALARM.

SPECIFICATION forming part of Letters Patent No. 386,772, dated July 24, 1888.

Application filed May 13, 1887. Serial No. 238,024. (No model.)

### *To all whom it may concern:*

Be it known that I, EDWARD DAVIS, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Electric Signals and Alarms, of which the following is a specification.

My invention relates to electric signaling apparatus, and particularly to contrivances of that kind designed for use in police street signal-boxes and in similar places for the purpose of giving signals or alarms.

It is the object of my invention to provide an apparatus which shall be capable of giving certain common signals or alarms—such as a signal indicating the number of the box in which the operator may be, calling an ambulance, giving an alarm of fire, calling to the telephone, &c.—and also an individual or particular signal which shall indicate the particular officer, watchman, or person making the signal.

My invention involves the employment of a telegraph-register—that is, an instrument capable of recording signs or marks made by the making and breaking of an electric circuit—and a clock mechanism, which may be set in operation and automatically effect the giving of a predetermined signal or alarm.

My improvements reside in the construction of the transmitting-instrument, whereby I am enabled to employ keys or similar devices of different form or character, each of which, when used to set in operation the clock mechanism, will give and cause the receiving-instrument to record a different signal.

I will now proceed to describe my invention, so that others skilled in the art may be able to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, the same letters indicating the same parts wherever they occur.

Of the drawings, Figure 1 represents a rear elevation of a signal-transmitting apparatus embodying my invention, parts of the supporting-frame being pictured as broken out. Fig. 2 is a rear elevation of the parts attached directly to the base-plate, the clock mechanism proper being removed. Fig. 3 is a side elevation of the device complete as portrayed

in Fig. 1, a portion of one of the parts being represented as broken away. Fig. 3<sup>a</sup> is a detail hereinafter referred to. Fig. 4 is a top plan view of the pedals or levers for operating the special signal or pattern slides. Fig. 5 is a view of a key used in connection with my improvements and hereinafter referred to.

As the receiving instrument constitutes no part of my improvements, it is not herein represented, and may be of any suitable or known construction, supposed, for convenience of the present description, to be a "Morse" instrument adapted to record a telegraph alphabet of dots and dashes made by the making and breaking of an electric circuit, my invention having to do alone with the last-mentioned function of a signaling apparatus.

In the drawings, A represents the front or base plate, of any suitable material.

B indicates the center plate, supported on posts or pillars C, of hard or vulcanized rubber or other insulating material; and D is the back or rear plate, between which and the center plate, B, the time mechanism is supported, consisting of a mainspring, E, wound on the barrel F, secured to the main arbor G, to which is also secured the toothed wheel H, engaging with a pinion, I, attached to or forming an integral part of center arbor, J, with which is connected an escapement mechanism of common construction, consisting of a toothed wheel, K, on center arbor, J, an escapement-lever, L, pivoted to the center plate and engaging said toothed wheel K, and a pendulum, M, attached to the fulcrum or pivot of the escapement-lever.

N represents a lever, pivoted at O to the rear face of center plate, B, and resting at its free end on a pin or stud, P, upon which it is normally held by a light spring, Q. Said lever N is provided, on the rear side toward its inner end, with a lug or offset, R, which lug is adapted, in the normal position of the lever, to engage a forwardly-projecting pin, V, on toothed wheel K, and stop the rotation of said wheel, as seen in Fig. 3<sup>a</sup>.

S represents a ratchet-wheel secured to the inner end of main arbor G, the teeth of which ratchet-wheel are engaged by a pawl or lever, T, which, when lifted to turn the ratchet-wheel the distance of one tooth, will be brought

into contact with the lower end of a pin, U, projecting down from the inner end of lever N, and raise said lever, so as to permit pin V to escape from lug or offset R, and allow center arbor, J, to make one complete rotation, when pin V will again come in contact with lug R, and thus stop the operation of the time mechanism.

The turning of ratchet-wheel S the extent of one tooth is designed to be sufficient to wind up mainspring E far enough to effect one complete rotation of center arbor, J.

W is a holding-pawl for preventing the backward turning of ratchet-wheel S and main arbor G.

*a* represents a disk of hard or vulcanized rubber or other suitable non-conducting material, which disk is superincumbent on another disk of metal of good conducting properties, which latter disk is supported on posts *b b*, of material similar to the last-mentioned disk, which posts are attached to though insulated from the front plate, A. The last-mentioned disk is provided with a rim, *c*, extending up around the periphery of the disk *a*, which rim is notched at intervals, as indicated at *d d*, Figs. 2 and 3. The forward end of center arbor, J, rests upon disk *a*, and may have a journal-bearing in the same, so that rim *c*, its disk, and posts *b b* will be completely insulated from other parts of the device. The purpose of the disk *a* is to insulate the center arbor and its adjuncts from the metal disk or part on which the disk rests.

To the forward end of center arbor, J, is secured an arm, *e*, which extends out over rim *c*, so as to not directly be brought in contact therewith as the center arbor is rotated. Said arm is provided with a laterally-projecting spring contact-finger, *f*, resting lightly at its free end on the rear edge of rim *c*, so that if one pole of an electric circuit were connected with posts *b b* or rim *c*, as represented by the "line-in" wire L', and the other with parts of the device in electrical communication with center arbor, J, and its attached arm *e*, as represented by the "line-out" wire L'', when said center arbor is rotated once upon its axis the circuit would be made and broken by the finger *f* and notches in flange *c* five times at the point *g* and four times at the point *h*, with a short broken interval at the point *i*, thus causing the receiving-instrument to record, say, five dots, a space, and four dots, indicating fifty-four as the number or common signal of the box.

It now only remains for me to explain how special or individual signals may be given, in addition to this common signal, by the same device.

Suitably supported at their upper and lower ends in comb-bars *j j'*, insulated from front plate, A, are any suitable number of slide-bars *k*. In the present instance I have shown five such bars; but in practice I propose, ordinarily, to use a greater number. Said slide-bars *k* are provided at their upper ends with

small blocks or keys or teeth *l*, of any suitable insulating material, which blocks are adapted, when the slide-bars are raised, to be brought in juxtaposition to rim *c* and stand out slightly beyond the rear edge thereof, so that the free end of contact-finger *f*, when the latter is carried around by arm *e* and comes in contact with any of the blocks *l*, will be raised off of rim *c*, and so break the circuit the same as when the said finger fell in the notches of the rim at the points *g* and *h*, as hereinbefore explained. It is by the raising and releasing of the slides *k*, so as to form different combinations of the blocks or false teeth *l* around rim *c*, that I am enabled to make the contrivance capable of giving the special or individual signals mentioned.

*m* indicates an inverted-U-shaped arm or yoke, pivoted at its ends, as at *m'*, to the sides or ends of comb-bar *j'*, and adapted at its upper end, as at *n*, to rest against the rear edge or face of slide-bars *k*, which latter devices are notched, as represented at *o o'*. Cross bar or part *n* of yoke *m* is held against the rear edge of slide-bars *k* by means of springs *p*, attached at their lower ends to a bail-wire, *q*, secured to and extending outwardly from yoke *m*, and at their upper ends to slide-bars *k*, there being one such spring to each slide-bar. If now any slide-bar *k* should be raised so as to bring its block or false tooth *l* into juxtaposition with rim *c*, cross-bar *n* would ride from notch *o'* over tooth *r* and drop into notch *o*, holding such slide-bar locked in raised position by the engagement of tooth *r* with cross-bar *n* until trip-finger *s'*, extending downward or outward from the end of arm *e*, shall be brought in contact with finger *n'*, extending up from cross-bar *n* of yoke *m*, and press the upper end of said yoke outward, disengaging cross-bar *n* from tooth *r*, and permitting spring *p* to draw the slide-bar down to its normal position.

Various means may be provided for raising different slide-bars *k* for the purpose of forming various combinations of the false insulating-teeth *l* around rim *c*. In the present instance I have shown two levers, *s s'*, each pivoted at one end to the front plate, A, and resting at their free ends on dogs *t*, secured to crank pins or studs *t'*, adapted to turn in bearings in the front plate, and having cranks *t''* (shown in dotted lines in Fig. 2) secured to their forward ends, whereby said crank pins or studs may be rocked in the direction of the arrows, Fig. 2, and so cause dogs *t* to operate on levers *s s'* and raise the free ends of said levers, as represented by the dotted lines relating to lever *s* in Fig. 2.

Levers *s* and *s'* are provided with pins *u*, extending into elongated notches *v*, formed in the rear edges of slide-bars *k*, so that as lever *s* or *s'* is raised pins *u* of such lever will engage such slide-bars as may have pins *u* extending into notches *v* of the same and raise such slide-bars and their attached false teeth *l*, with the result before explained.

It will be noticed that pawl or lever T is con-

needed by means of an insulating block or link, T', with one of the slide-bars *k*, and that this slide-bar is adapted to be raised each time that the instrument is operated to give an alarm or signal, in order to trip lever N through the medium of lever T, as before explained. Though I have shown the slide-bar to which lever T is pivoted as provided with a false insulating-key, *l*, it need not be so equipped, but be without any means for affecting the electric circuit through the medium of spring-finger *f*.

Supposing, now, that the various parts are in their normal position, which is that represented in Fig. 1, and that an officer or watchman desires to call to the telephone an attendant at headquarters, and that lever *s* is designed to make the telephone-call, said lever will be raised, as represented in dotted lines in Fig. 2, raising certain of the slide-bars and their false keys, as represented, for example, in said figure, tripping lever N and setting the device in operation, so that spring-finger *f*, in passing over keys *l*, will first make and break the circuit, so as to record a telephone-call at the receiving-instrument, and then, in passing over notches or teeth *d d*, will, by the making and breaking of the circuit, record the number of the box from which the signal is given. Lever *s'* being adapted to raise different slide-bars and form a different combination of false keys *l* around rim *c*, said last-mentioned lever may be operated to call, for instance, an ambulance and give the number of the box, and so as many additional levers may be provided for other common calls as may be desired, or as the capacity of the contrivance may admit.

Each slide-bar is adapted to rest at its lower end on a pin or projection, *w'*, of a pedal-lever, W, pivoted at *w* to the front plate provided with a key-hole, *x*, and other means to receive a key, *y*, which may be inserted into the key-hole and turned so that its wards *z* will engage and raise certain pedal-levers and the slide-bars resting thereon, and in this way form still different combinations of the false keys *l* around rim *c*, and so set the device in operation and give a signal corresponding to the structure of the particular key employed, it being seen that keys can readily be formed to give a large number of different signals. This provision for operating the slide-bars by means of a key to give a signal is designed to enable special or particular signals to be given by an individual in possession of a key of particular structural character, so that, for example, a particular officer or watchman can in his rounds operate the different signals to give assurance that that particular person is or has been at a particular box, or that a particular person is at a particular box and is in want of a particular thing, as an ambulance or the presence of the attendant at headquarters at the telephone, or the like.

The invention may also be employed as a simple telephone call, since the common signal can be employed to signal "central office"

and the special signal to give the number of the telephone caller.

It is obvious that by increasing the number of slide-bars *k* and their insulating-keys *l* a practically endless number of combinations of such keys about rim *c* may be formed and the usefulness of the device extended.

The operation of the invention as a whole has been so fully explained in the description of the construction, relationship, and function of the several groups of devices as to make further explanation unnecessary.

The term circuit making and closing or breaking devices or mechanism, as herein employed, is meant to identify such means as spring contact-finger *f*, or equivalent means, and means for actuating the same.

Though I have set forth the particular form and arrangement of the parts comprising the invention, as herein represented, it is obvious that these may be varied without departing from the nature or spirit of the invention.

The apparatus may be used for telephone or other lines to indicate whether the line is or is not in use. To this end the disk *c* may be connected to line-in L', and the contact-arm to line-out L'', as shown in Fig. 3, so that when even the spring *f* is in contact with the disk *c* the circuit will be closed and a bell, B', will be sounded.

Having thus described my invention, what I claim is—

1. In an electrical signaling apparatus, the combination, with the conducting strip, the movable contact-arm, one or more projections adapted to be moved into position to cause changes in the relation of the contacts, a catch for holding the projections in position during the passage of the movable contact-arm over them, and a projection connected to the movable contact-arm, adapted to co-operate with and move the catch out of engagement with the projections when the contact-arm has passed by them, substantially as described.

2. In an electrical signaling apparatus, the combination, with an electrical contact having a determinate signal indicated thereon, a traveling contact, and a motor for moving it over the first-mentioned contact, of one or more teeth or projections arranged to be projected in the path of the traveling contact, a catch for holding said teeth in projected position, and connections between said catch and motor, whereby the former will be operated by the latter and the teeth or any of them allowed to return to normal position after the signal has been transmitted, substantially as described.

3. In an electrical signaling apparatus, the combination, with a circuit-breaker arranged to transmit a determinate signal, and a motor for operating the same, of one or more teeth or projections arranged to co-operate with the circuit-breaker to vary the signal sent, a catch for holding said teeth in operative position, and connections between said teeth and the motor for releasing the latter when the former are placed in operative position, and other

connections between said catch and motor for allowing the return of the teeth to normal position after the transmission of the signal, substantially as described.

5 4. In an electrical signaling device, the combination, with the circuit making and breaking contacts arranged for sending a determinate signal, of one or more teeth or blocks arranged to co-operate with the circuit making and breaking contacts to vary the signal  
10 sent, and a removable key having portions of its operating-surface arranged to operate one or more of said teeth, so as to vary the normal signal to correspond with the surface of the  
15 key employed, substantially as described.

5. In an electrical signaling apparatus, the combination, with the circuit making and breaking contacts, of a series of slide-bars provided with insulating teeth *l*, severally adjustable within the path of movement of the contacts, so as to vary the normal operation of the same, and a key, *y*, for moving said bars to adjust the same, substantially as described.

6. In an electrical signaling apparatus, the combination, with a stationary contact and a movable contact arranged to transmit a determinate signal, of a series of slide bars, *k*, provided with teeth *l*, adapted to be adjusted within the path of the movable contact, pedal levers *w*, provided with pins or projections *w'*,  
30 and key *y*, substantially as described.

7. In an electrical signaling apparatus, the combination, with the stationary contact and the movable contact arranged to transmit a determinate signal, of a series of slide-bars, *k*, having notches *v*, and provided with teeth *l*, adapted to be adjusted within the path of the movable contact, the levers *s s'*, provided with pins *u*, pedal *w*, provided with pins or projections *w'*, and key *y*, substantially as described.  
40

8. In a signaling apparatus, the combination, with the circuit-varying contacts ar-

ranged to transmit a predetermined signal, of one or more projections arranged to operate upon the contacts to cause them to vary the signal from the normal, and a removable key  
45 for co-operating with the said projections to place one or more of them in position to vary the signal in accordance with the particular key employed, substantially as described. 50

9. In a signaling apparatus, the combination, with the circuit-varying contacts arranged to transmit a predetermined signal, of one or more teeth or projections arranged to operate upon the contacts to cause them to  
55 vary the signal from the normal, a catch for holding said teeth in position to cause this variance, and a removable key for co-operating with said projections to place one or more of them in position to vary the signal in accordance with the particular key employed, substantially as described. 60

10. In a signaling apparatus, the combination, with the circuit-varying contacts arranged to transmit a predetermined signal and a motor, of one or more teeth or projections arranged to operate upon the contacts to cause them to vary the signal from the normal when projected, a catch for holding said teeth projected and a projection operated by the motor  
70 for releasing said catch when the signal has been sent, and a removable key for projecting one or more of the teeth and thus varying the signal in accordance with the particular key employed, substantially as described. 75

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses, this 4th day of May, A. D. 1887.

EDWARD DAVIS.

Witnesses:

C. F. BROWN,  
ARTHUR W. CROSSLEY.