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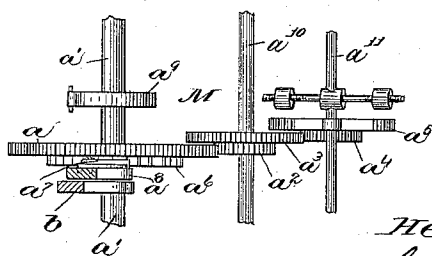
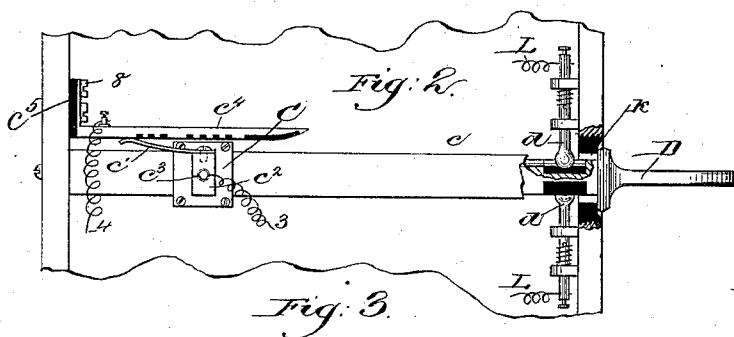
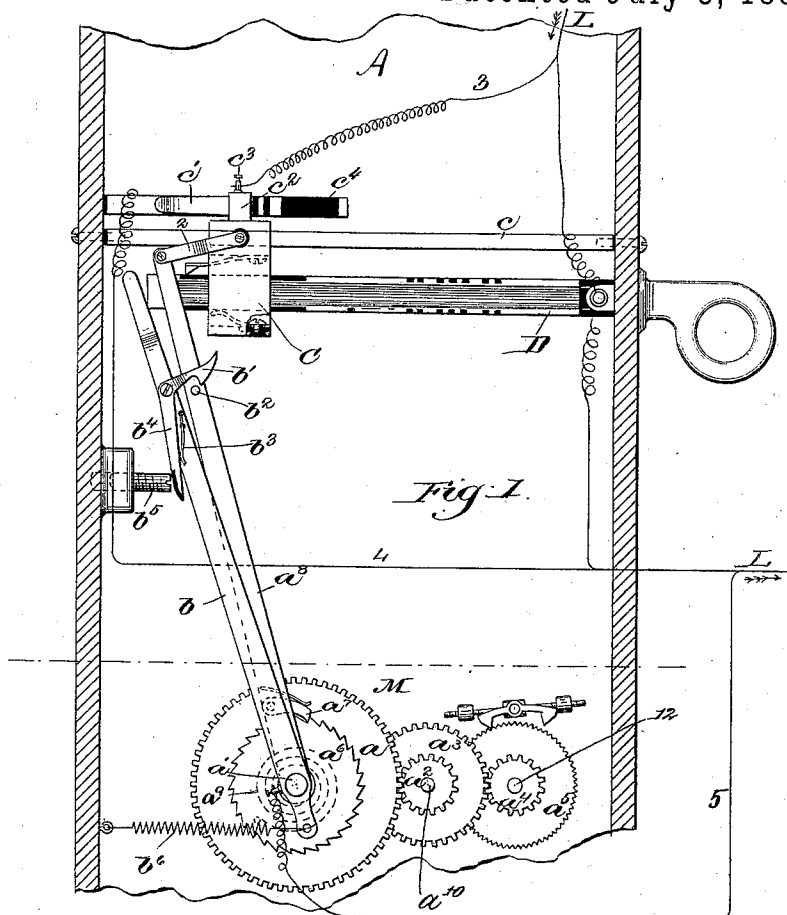
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H. A. CHASE.

SIGNAL BOX.

No. 366,154.

Patented July 5, 1887.



Witnesses  
John F. C. P. P. P.  
Arthur J. P. P.

Inventor  
Henry A. Chase.  
By Crosby & Gregory

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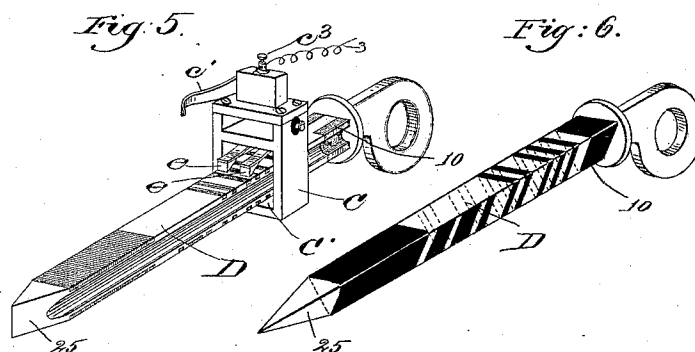
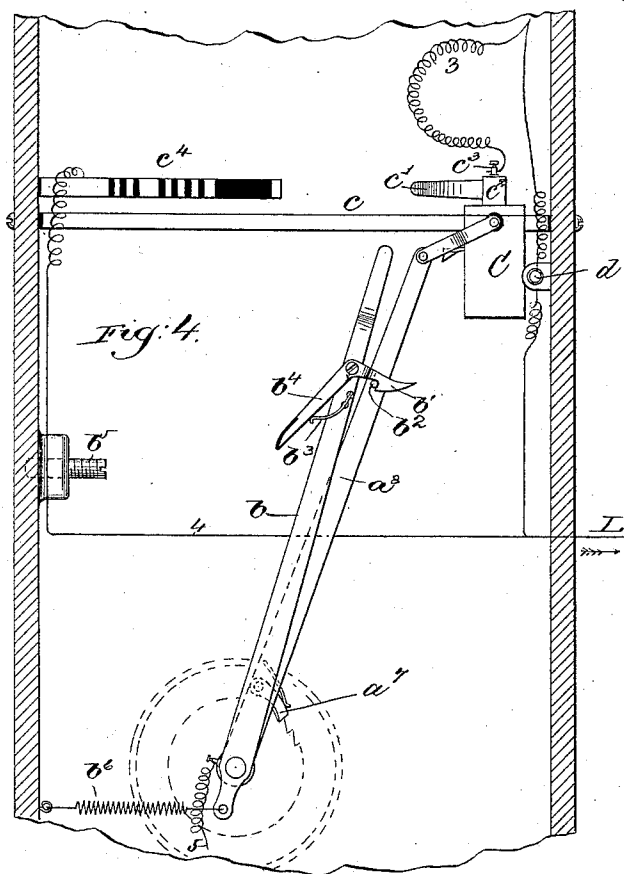
2 Sheets—Sheet 2.

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*Witnesses*

John H. Prentiss  
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Henry A. Chase,  
by Crosby & Sargent Attys.

by Crosby & Gregory Attys.

# UNITED STATES PATENT OFFICE.

HENRY A. CHASE, OF STONEHAM, MASSACHUSETTS, ASSIGNOR TO THE  
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## SIGNAL-BOX.

SPECIFICATION forming part of Letters Patent No. 366,154, dated July 5, 1887.

Application filed August 31, 1886. Serial No. 212,315. (No model.)

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

Be it known that I, HENRY A. CHASE, of Stoneham, county of Middlesex, and State of Massachusetts, have invented an Improvement in Signal-Boxes, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to construct a signal-box which may be employed for municipal signaling.

The signal-box herein shown as embodying my invention contains a permanent circuit-changing device to transmit the number of the box and a motor, the said permanent circuit-changing device being under the control of and co-operating with a key which may be introduced into the box, the said key being provided with one or more arbitrary signaling-surfaces, whereby other signal than that indicated by the permanent circuit-changing device may be transmitted to another station.

This invention is applicable, among other uses, to police-signals, in which instance a series of boxes are located in the rounds or beats made by the officers, each officer carrying what I herein term a "key," it consisting of a piece of metal having formed upon its surface a signal indicating the number of the officer carrying it, so that when introduced into the box containing the permanent circuit-changing device the box number, together with the number of the officer, is transmitted to a distant station, thereby giving notice at such latter place as to which box has been operated and who has operated it, each officer having, it will be understood, a key with a different signaling-surface. One of the keys herein shown is provided with two signaling-surfaces, one of which designates the number of the officer carrying such key, and the other a special signal, together with the officer's number, and if many special signals are desired the key will have as many sides or faces as there are special signals.

Figure 1 shows in side elevation a signal-box constructed to embody this invention, the side wall thereof being removed and the key inserted, the parts being in a position to transmit a signal; Fig. 2, a top view of Fig. 1, the motor being removed; Fig. 3, a top view of

the motor; Fig. 4, a similar view to Fig. 1, with the parts in their normal position; Fig. 5, a perspective view of the key and the carriage carrying the co-operating contact-piece, and Fig. 6 a perspective view of a key having three signaling-faces.

The box or case A is of any usual or suitable shape and constructed to contain the operative parts. A suitable motor, M, (see Figs. 1 and 3,) is contained within the box or case.

The motor shown consists of a toothed wheel,  $a$ , mounted loosely upon a shaft,  $a'$ , said toothed wheel  $a$  meshing with a pinion,  $a^2$ , fixed to the shaft  $a''$ , carrying the toothed wheel  $a^3$ , which in turn meshes with a pinion,  $a^4$ , fixed upon a shaft,  $a'''$ , carrying the escapement-wheel  $a^5$ . A ratchet-wheel,  $a^6$ , is also mounted loosely upon the shaft  $a'$ , but it is fixed to the toothed wheel  $a$  to move in unison therewith, and said wheel is engaged by a pawl,  $a^7$ , carried by a lever,  $a^8$ , secured to the shaft  $a'$ , and extended vertically for a short distance.

A mainspring,  $a^9$ , secured to and wound about the shaft  $a'$ , has one of its ends connected with the box or case A, or to some other stationary frame, so that as the lever  $a^8$  is moved, as will be described from its position shown in Fig. 4, into the position shown in Fig. 1, the shaft  $a'$  will be rotated and the main spring  $a^9$  wound up; but when said lever  $a^8$  is released, the recoil of the main spring rotates the shaft  $a'$  in the opposite direction, the pawl  $a^7$  at such time engaging the teeth of the ratchet-wheel  $a^6$ . The return movement of the lever  $a^8$  to its normal position is thus regulated by the escapement mechanism. Another lever,  $b$ , similar to the lever  $a^8$ , is mounted loosely upon the shaft  $a'$ , it being slightly bent at its upper end to lie in the path of and so as to be moved by a key, bar, or plug, D. The lever  $b$  has a pivoted latch,  $b'$ , which engages a stud,  $b^2$ , projecting from one side of the lever  $a^8$ , said latch being normally retained in such position by the spring  $b^3$  bearing against the arm  $b^4$  thereof, that as the said lever  $b$  is pushed rearwardly by the key the lever  $a^8$  will also be moved back with it.

The arm  $b^4$  of the pivoted latch  $b'$  at the extreme rearward position of the lever  $b$  strikes

a stud or adjustable pin,  $b^5$ , which disengages the said latch  $b'$  from the stud  $b^2$ , so that the lever  $a^8$  may be returned slowly into its normal position by means of the motor M, while the lever  $b$  is held in its rearward position by the said key. The lever  $b$  upon being released by the withdrawal or removal of the key will be returned to its normal position by a spring,  $b^6$ .

A carriage, C, mounted to slide freely upon a track,  $c$ , extended transversely of the box or case A, has a block,  $c^2$ , to which is attached a contact-pen,  $c'$ , and the said block having a binding-post,  $c^3$ , or other suitable connecting device, to which one terminal of the line or branch wire 3 will be secured. The contact-pen  $c'$  is arranged to wipe over a signaling-surface formed upon a bar,  $c^4$ , secured to the box or case A by screw 8, extended through the bar and into a suitable insulating-block,  $c^5$ , such bar and pen constituting a permanent circuit-changing device. The carriage C is joined with the lever  $a^8$  by a connecting-link, 2. Two other contact-pens,  $e e$ , are secured to the carriage C within the open lower portion C' thereof, through which open portion the key D, herein shown as a bar of metal, having a signaling-surface formed thereon, may be passed, the said contact-pens  $e e$  wiping over the said signaling-surface as the carriage is moved backward at a slow speed by the motor.

The key D, shown in Figs. 1 and 5, has two faces provided with a signaling-surface, one of which may indicate the officer's number, and the other any arbitrary signal, together with the officer's number.

In Fig. 6 I have shown a key, D, having three faces, so that two special arbitrary signaling-surfaces are presented.

By referring to Figs. 1 and 5, the signaling-surface at one face or side is represented as 232, which may correspond with the officer's number, and the arbitrary signal at the other face or side represents a dot and dash, followed in succession by the officer's number, 232.

Referring to Fig. 2, the bar  $c^4$  of the permanent circuit-changing device represents 34, which may characterize the box or its locality.

The main line L enters the box and passes through two spring-controlled locking devices,  $d$ , shown as sliding bolts, which normally bear against each other, but which may be spread apart by the wedge-point 25 of the key D as the latter is being inserted into the box. Three branch wires, 3 4 5, lead from the main line L within the box. The wire 3 leads to the binding-post  $c^3$ , and thence to the contact-pen  $c'$ . The wire 4 leads to the bar  $c^4$ , upon which the box number is represented, it forming part of the permanent circuit-changing device, the other wire, 5, leading to the lower end of the lever  $b$ . The operation is as follows when employed for police-signaling service and the like: Each box in the circuit is numbered, and such number is represented upon the bar  $c^4$ . Each officer has a key, by which he may operate the box, and the officer's key contains a number corre-

sponding with the number by which he is designated in the police service. As the officer goes from box to box he introduces his key through the key-hole  $k$ , the wedge-shaped end of the key first separating the locking device or bolts  $d d$  and then striking the upper end of the lever  $b$ , and thereafter the further inward movement of the key moves the lever  $b$  rearwardly, the latch  $b'$  thereon causing the lever  $a^8$  to be moved with it, the latter by the link 2 taking the carriage C from the position shown in Fig. 4 to its position shown in Fig. 1. As soon as the sharp point of the key D separates the two locking devices or spring-controlled bolts,  $d d$ , the current passes through said bolts and also the key D, the inner ends of the said bolts being kept pressed into grooves cut in the opposite sides of the said key. When the key D has been fully pushed in, said spring-bolts  $d d$  enter holes made in the insulated portions 10 of and hold the said key against such pressure as would tend to force it outward. In this condition of the parts the current will pass through the branch wire 3, contact-pen  $c'$ , bar  $c^4$ , and branch wire 4 to the main line. As the pivoted latch  $b$  is tripped, the lever  $a^8$  and the carriage C are slowly returned to their normal position by the motor, and the contact-pen  $c'$ , during the first part of its return movement, wipes over the signaling-surface formed upon the bar  $c^4$ , thereby successively changes the condition of the circuit to cause any suitable receiving-instrument—such, for instance, as an ordinary self-starting register—located at the main station to respond and announce the number of the box, and during the last part of the return movement of the said carriage C the contact-pen  $c'$  leaves the bar  $c^4$ , causing the current to pass through the branch wire 3, contact-pens  $e$ , key D, lever  $b$ , and branch wire 5 to the main line L, so that as the contact-pens  $e e$  pass over the signaling-surface formed upon the key D the number there represented, and any other character or signal thereon, will also be transmitted to the distant station and will be received upon the register which receives the box number. The key D is then withdrawn, permitting the two spring-controlled locking devices or bolts  $d d$  to make contact with each other and again complete the line and permit the lever  $b$  to return to its normal position.

If a special signal is desired to be transmitted, another side, or, in this instance, as shown in Fig. 5, the under side, of the key D, is turned uppermost.

It is obvious that the key D may have as many signaling-faces as desired according to the number of special signals; also, many of the operating parts within the box may be changed and yet subserve the purpose herein described, so I do not desire to limit my invention to the specific construction shown, the gist of the invention being to transmit a permanent signal and an arbitrary or variable signal through the medium of a key or equiva-

lent, which is temporarily introduced into the box.

I claim—

1. In a signal-box, the combination, substantially as described, of a circuit-changing device consisting of a signaling-surface and a contact-pen, each permanently located within the box, and another circuit-changing device consisting of a removable key having a signaling-surface formed thereon, which co-operates with a contact-pen also permanently located within the box, a movable carriage carrying the contact-pens, and a motor mechanism for controlling the movement of the carriage, substantially as described.

2. In a signal-box, the combination, substantially as described, of a circuit-changing device permanently located therein, consisting of a signaling-surface and a contact-pen, and an independent removable key having two signaling-surfaces thereon, which is introduced into the box, a contact-pen arranged to co-operate with the signaling-surface upon said independent key to form another circuit-changing device, and motor mechanism, substantially as described, to control the operation of the said circuit-changing devices, as set forth.

3. In a signal box, the combination, substantially as described, of a circuit-changing device permanently located therein, and an independent removable key having a signaling-surface thereon which is introduced into the box, and means, substantially as described, co-operating with the said key, to also change the condition of the circuit, whereby a permanent and an arbitrary signal may be transmitted to a distant station, substantially as described.

4. In a signal-box, the combination, substantially as described, of a contact-pen located within the box, motor mechanism, substantially as described, for moving it, and an independent removable key, D, having one or more signaling-surfaces thereon, whereby the key introduced into the box places the contact-pen into position to be actuated by the motor, the said pen being caused to travel over the key while the latter is retained in the box, as set forth.

5. A signal-box wherein are combined the following elements, viz: a circuit-changing device permanently located within the box which changes the condition of the circuit to transmit a signal characteristic of the locality of the box, and another circuit-changing device consisting of a contact-pen located within

the box, and an independent removable key having a signaling-surface formed thereon, which is introduced into the box in position to be acted upon by its contact-pen to change the condition of the current and transmit another signal, substantially as described.

6. In a municipal telegraph system wherein are combined a series of boxes each containing a circuit-changing device permanently located within the box, which when operated transmits the box number, a series of removable keys, one of which is carried by each officer, each of said keys having a different signaling-surface formed thereon, which indicates the number of the officer carrying it, and a contact-pen located within each box with which any one of the said keys may co-operate when introduced, thereby to transmit the number of the officer operating any one of the boxes.

7. In a municipal signal system, a central office, electrically connected sub-station signal-boxes located at the sub-stations and provided with a motor and with permanent circuit-changing devices to indicate the number or location of the said boxes, and a pen, c, combined with an independent key adapted to be inserted into a box at the sub-station, the said key having a signaling-surface to designate not only the officer using the said key but also an arbitrary signal, whereby not only the number of the box but also the officer and the arbitrary signal on the key may be designated or transmitted to the central office between the time of the insertion and removal of the said key.

8. An independent removable multiple transmitting key or device, which consists of a bar or plug having two or more faces, each face of which is provided with a different signaling surface, substantially as described.

9. In a signal system, the combination, substantially as described, of a series of signal-boxes, a permanent circuit-changing device for each box, and a second circuit-changing device for each box, a co-operative part of each latter circuit-changing device being removable and interchangeable among the several boxes.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY A. CHASE.

Witnesses:

BERNICE J. NOYES,  
FRED L. EMERY.