

(No Model.)

H. H. CUTLER.
CALL BOX.

3 Sheets—Sheet 1.

No. 504,488.

Patented Sept. 5, 1893.

FIG.1.

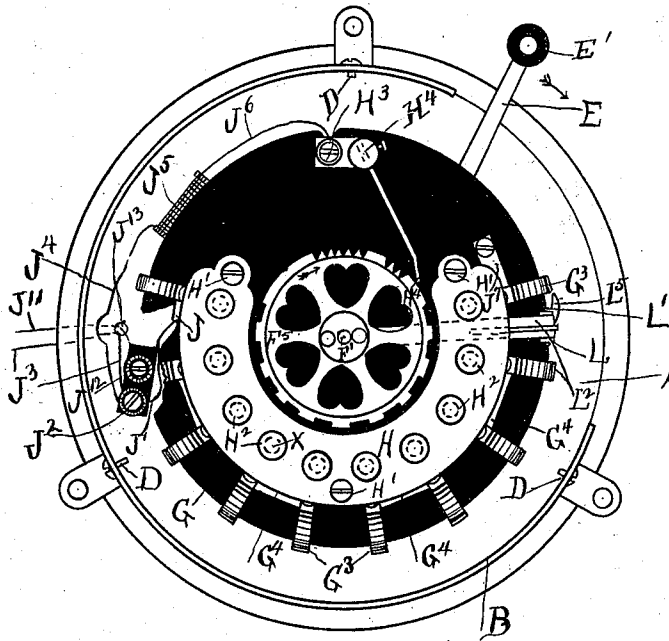
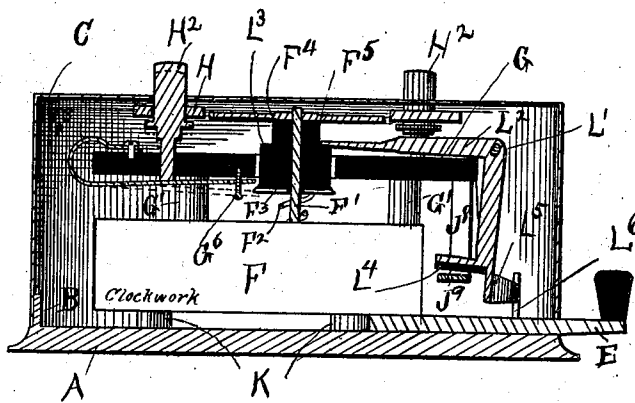


FIG.2.



WITNESSES

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(No Model.)

3 Sheets—Sheet 2.

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FIG. 3.

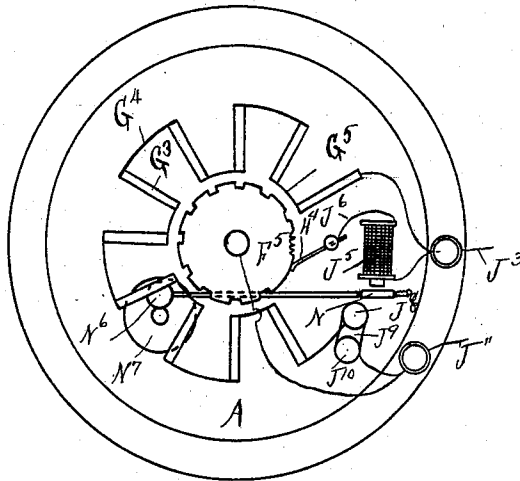


FIG. 4.

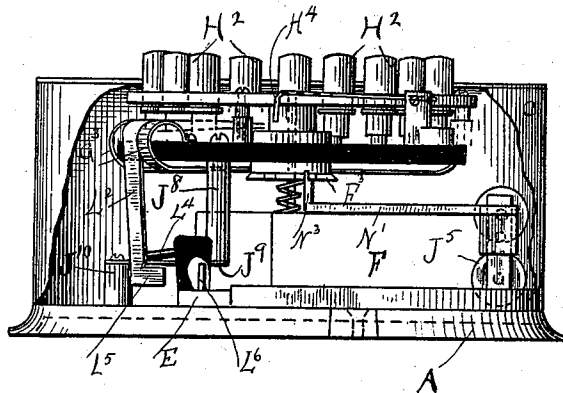
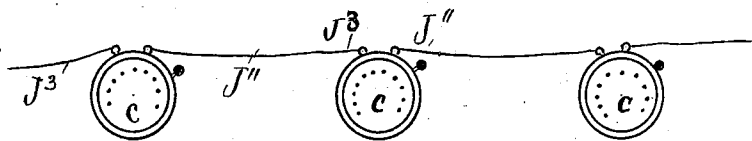


FIG. 5.



WITNESSES

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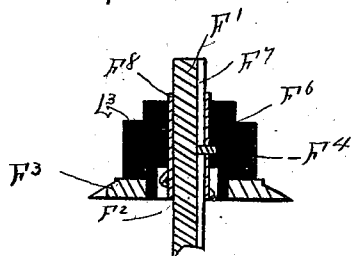


FIG 6

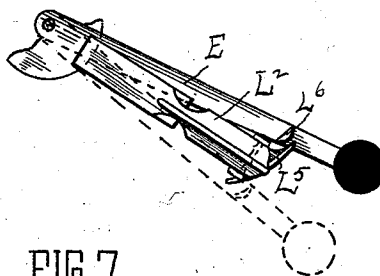


FIG 7

FIG 8

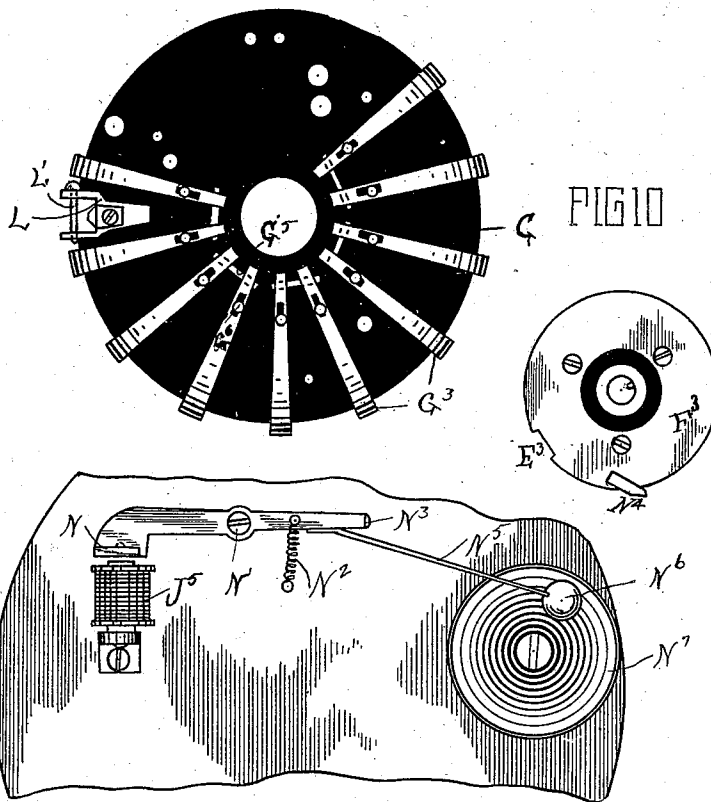


FIG 9

WITNESSES

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UNITED STATES PATENT OFFICE.

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CALL-BOX.

SPECIFICATION forming part of Letters Patent No. 504,488, dated September 5, 1893.

Application filed January 13, 1892. Serial No. 417,990. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. CUTLER, a citizen of the United States, residing at Waltham, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Call-Boxes, of which the following is a specification.

My invention relates to call boxes for district telegraph work and has for its object to provide a simple, cheap and convenient box.

My invention is illustrated in the accompanying drawings wherein—

Figure 1 is a plan view of my box with cover removed; Fig. 2 a vertical cross section with certain parts omitted; Fig. 3 a diagrammatic view showing the circuits through the box; Fig. 4 a side view with certain parts removed; Fig. 5 a diagrammatic view of the line with the boxes in circuit; Fig. 6 an enlarged detail section of driving shaft; Fig. 7 a detail of handle and elbow crank lever; Fig. 8 a reverse view of insulation disk; Fig. 9 a detail of alarm bell. Fig. 10 is a detail of the plate on the lower side of the insulation piece.

Like parts are indicated by the same letters in all figures.

A is the base about which rises the flange B whereon the cover C is retained in position by means of the screws D. This flange is cut away at one portion to give room for the motion of the handle E which has the hand piece E'.

F is a motor or clock mechanism which is not here shown in detail as not being part of the invention, and also because it is capable of large variation.

F' is the shaft driven by such clock mechanism and about it is coiled the spring F² upwardly bearing against the plate F³ on the lower end of the insulation piece F⁴ which is rigid with the break wheel F⁵ or upon the insulation as shown in Fig. 6. The insulation piece F⁴, plate F³ and break wheel F⁵ are rigidly secured together and are secured upon the shaft so as to move vertically therealong but to rotate therewith. This is preferably accomplished as indicated in Fig. 6 by means of the pin F⁶, slot F⁷ and an exterior tubular part F⁸ which surrounds the shaft and on which the other parts are secured.

G is a plate of vulcanite or other insulation rigidly supported upon the base by means of

pillars, as for example, G' G' and provided with the central aperture through which the insulation piece F⁴ is free to vertically reciprocate. Radially disposed about this plate and secured thereto are the springs G³ curved as shown and connected together in pairs on the upper side of the plate by the strips G⁴ G⁴ and adapted to be connected together on the lower part of the plate in pairs by the strips G⁵. Each of these spring pieces G³ extends over the lower projecting plate on the insulation piece and each is slotted to receive the guide and stop pin G⁶.

H is a crescent shaped piece supported rigidly upon the insulation disk by the posts H' H' and provided with a series of keys H² H² which may be numbered or lettered as desired. Each key has a flange which limits its upward motion toward the crescent and a shoulder which limits its downward motion toward the insulation plate and a lower extremity which passes freely through an aperture in the insulation plate and bears upon the spring piece G³. Fixed upon the insulation disk is the binding block H³ to which is adjustably secured the finger H⁴ adapted to bear upon the break wheel F⁵. The spring pieces G³ G³ are connected by the strips G⁴ and G⁵ so as normally to make a continuous circuit from the first to the last of such strips. In electrical contact with the first strip is a block J from which leads the conductor J' to the binding post J² whence leads the conductor J³ to the main line. From this same binding post leads a conductor J⁴ to the magnet J⁵ whence leads the conductor J⁶ to the binding block H³. The clock mechanism is in electrical contact with the base of the box.

J⁷ is a block in electrical contact with the last of the spring pieces G³. To this block J⁷ is secured the depending pillar J⁸ against which bears the spring J⁹ which is secured upon the post J¹⁰ and in electrical contact with the base of the box.

J¹¹ is the second line wire and it leads to the binding post J¹² and is in electrical contact with the base of the box. The two main wires may be led in through the aperture J¹³. The clock mechanism is supported on the base by the short posts K K. The handle E is pivoted and connected with the spring driven shaft of the clock mechanism so that

when the handle is moved its proper distance it will sufficiently wind the spring to cause it to drive the mechanism, when allowed to operate, a sufficient length of time to give the call from the box. On the side of the insulation disk is secured the support L on which by means of the pivot pin L' is pivotally secured the elbow crank lever L², one end of which normally rests upon a shoulder L³ of the insulation piece F⁴, and the other end of which is provided with the insulation tip L⁴ which is adapted to bear upon the upper side of the spring J⁹ and break its contact with the post J⁸. The elbow crank lever is further provided with the cam shaped piece L⁵ adapted to be engaged by the pin L⁶ on the handle E. Fig. 7 illustrates this construction in detail.

The magnet J⁵ is provided with the armature N pivoted at N⁷ and normally redirected by the spring N². This armature is provided at its inner end with an upwardly turned catch N³ adapted to engage the tooth N⁴ on the plate F³ and thus to normally lock the clock mechanism from rotation. To this armature is also secured the rod N⁵ with the bell clapper N⁶ adapted to strike the bell N⁷ and thus give the alarm.

The use and operation of my invention are as follows: A series of boxes of my invention are coupled in series in the main circuit and a box is placed at each point where one is desired. A continuous current flows over such circuit and enters the box at, for example, the binding post. Here the circuit is divided within the box, one branch passing to the first spring piece G³ and thence through the circuit of such pieces to the base of the box through the cut out at J⁸ J⁹ J¹⁰ and out upon the line. The other branch of the circuit includes the magnet, the break wheel and the base of the box where it also connects with the main line. Normally therefore the current will flow through the box through such divided circuit, but the current passing through the magnet will be insufficient to actuate it. If now, an operator desires to use one of the boxes he will move the handle in the direction indicated by the arrow and since the pin L⁶ will engage the inner side of the cam L⁵ the elbow crank lever will be moved on its pivot so as to cause the end L⁴ to depress the spring J⁹ and move it away from the end of the post J⁸, thus momentarily breaking the circuit through the spring pieces G³. This action will shunt the total current through the magnet and cause it to draw up its armature and give one tap upon the bell which will indicate that the line is in order and current flowing. The excursion of the handle is then continued to the limit of its stroke at which time the spring will be sufficiently wound and when the handle is released the parts will be locked in position by the engagement of the armature rod with the tooth on the plate associated with the break

wheel. By this movement of the handle and elbow crank lever the break wheel and its associated part will be moved downwardly so that all of the spring parts G³ which might have been by accident or otherwise depressed will be permitted to slip over the edge of the plate F³ and pass to the upper side thereof, so that when the elbow crank lever is released from the handle all of the spring pieces G³ will be in their normal positions with their free ends above the plate F³. Now the apparatus is ready to be set for the particular call desired and the proper key is pushed inwardly by the operator into the position shown in dotted lines in Fig. 2. This carries the associated spring G³ below the plate F³ and therefore disengages the spring piece G³ from its strip G⁵ and since the keys H² are made of insulating material, breaks that branch of the circuit which includes the spring piece G³, and it will remain broken until the spring piece G³ is again restored to its normal position in contact with the strip G⁵. If now the key depressed were the one marked X a call will be given in the following manner: The circuit through one path being broken the current will traverse the other path or the path including the break wheel. The first action resulting from this shunting of the current to that path will energize the magnet and cause its armature and rod to move and will thus release the plate F³ and hence the clock mechanism shaft, whereupon the spring will cause the break wheel to rotate in the direction of the arrow. The circuit being completed through the finger H⁴ will be from time to time broken as this finger passes the notches in the wheel and this making and breaking of circuit will continue giving first the number of the box and then the successive call numbers until the spring G³ which has been depressed is freed by the coincidence of its free end with the slot in the plate F³ whereupon it rises through such slot and engages the strip G⁵ and closes the circuit so as to shunt the current out of the magnet and break wheel and discontinue the making and breaking of circuit. By this means it is evident that the depression of any given key determines the number of breaks in the circuit and hence the number of signals at the central station. After the call has been given and the mechanism has ceased to operate the operator may take the handle and move it part way toward the limit of its excursion or far enough to again break the circuit through the spring piece J⁹, whereupon he will receive a signal, as for example three taps on the bell, which signal will indicate that the central station has received his call. By releasing the handle the parts will be restored to their normal positions. When the operator desires to use the box if he moves the handle far enough to break the circuit through the springs G³ he will receive a single tap on his bell to indicate the good order of the line if

the circuit is out of use and free for his employment. If however somebody else is using the line at that moment, or some other box is sending in a call, he will hear more than one tap on his bell resulting from the making and breaking of the circuit incident to the rotation of the break wheel in some other box and this will notify him that the line is busy whereupon he will free the handle and wait a reasonable length of time when he will again try his box.

It is evident that many features shown in the box might be varied and altered or substitutions might be made for them without departing from the spirit of my invention and that some of these features might be employed without the others and yet be employed in the manner indicated in my description. I do not wish therefore to be limited to the form of construction or arrangement of parts shown.

The return call device is that portion of the apparatus which is adapted to give back on the box the signal from the receiving office which states or indicates to the person at the box that the call has been received. This is accomplished by the magnet J⁵, armature N, spring N² and associated bell and hammer.

I claim—

1. In a call box having a winding handle, or the like the combination of the main line with a divided circuit within the box, containing two branches, one having the signal wheel and the other a circuit breaker adapted to be automatically opened, to shunt the whole current through the signal wheel, by the motion of the winding handle.

2. In a call box having a winding handle, or the like the combination of the main line with a divided circuit within the box containing two branches, one of said branches having a signal wheel and a starting magnet therein, and the other a circuit breaker automatically opened by the motion of the winding handle.

3. In a call box the combination of the main line with a divided circuit within the box containing two branches, one of said branches having a signal wheel and a starting magnet therein, and the other a circuit breaker automatically opened by the motion of the winding handle, and a series of circuit breaking keys adapted each to be manually operated and thus to determine how long such branch of the circuit shall be broken.

4. In a call box having a winding handle, or the like the combination of the main circuit with two branches thereto within the box, one containing a starting magnet adapted also to give an alarm and embracing the signal wheel and finger, and the other containing a circuit breaker whereby the current will normally pass through the latter circuit but when it is broken will be shunted to the former and thus give an alarm to show whether or not the line is busy.

5. In a call box having a winding handle, or the like the combination of the main line with two branches in the box, one of said branches containing a signal wheel and finger and a magnet adapted to control the release for the driving mechanism, the other containing a circuit breaker adapted to be momentarily operated to break the circuit by the motion of the winding handle so as to cause the magnet in the other branch to give a signal that the box is ready for use.

6. In a call box the combination of the main line with two branches in the box, one of said branches containing a signal wheel and finger and a magnet adapted to control the release for the driving mechanism, the other containing a circuit breaker adapted to be momentarily operated to break the circuit by the motion of the winding handle so as to cause the magnet in the other branch to give a signal that the box is ready for use, and circuit breaking keys connected with the second branch whereby the same is broken manually and the mechanism thus freed by shunting the current to the other branch.

7. In a call box the combination of the following elements: a winding handle, a signaling wheel, a motor mechanism adapted to be wound up by the handle and when released to operate the signal wheel, and a series of starting keys which when depressed start the box or release its mechanism and at the same time determine what call will be given.

8. In a call box the combination of the following elements: a winding handle to energize the driving motor and a series of circuit breaking and signaling keys and means whereby all of such keys are automatically re-set in normal position by the same motion of the handle which energizes the driving motor.

9. In a call box the combination of a driving motor, a signal wheel and finger and a handle to energize such motor with a series of starting and signaling keys adapted each when operated, after the mechanism has been set, to start the mechanism and determine the call.

10. In a call box the combination of a driving motor, a signal wheel and finger and a handle to energize such motor with a series of starting and signaling keys adapted each when operated, after the mechanism has been set, to start the mechanism and determine the call, and devices whereby all of such keys are normally re-set by the same action which energizes the motor.

11. In a call box the combination of the main line with two branches thereto in the box, one containing a signaling wheel and arm and a return call device, the other provided with the circuit breaker whereby the current may be shunted at will to the first mentioned branch so as to cause its mechanism to operate.

12. In a call box the combination of the main line with two branches thereto in the box,

one containing a signaling wheel and arm and a return call device, the other provided with the circuit breaker whereby the current may be shunted at will to the first mentioned
 5 branch so as to cause its mechanism to operate, said circuit breaker adapted to be automatically operated by the operation of the box handle before it has reached the limit of its motion so that a return signal can be received without re-winding or re-setting the
 10 mechanism.

13. In a call box the combination of a motor mechanism, a handle for energizing the same, a return call device and means for energizing
 15 such device upon a slight motion of the handle and before the motor mechanism is energized, and manually operated release and signal keys adapted to set the box in operation after the handle has been moved to its extreme position.

14. In a call box the combination of the main line upon which a number of boxes are placed in series, with two branches in each
 25 box, one of said branches of normally low resistance and the other containing the signaling wheel and arm and a magnet with a return signal mechanism operated thereby.

15. In a call box the combination of the main line upon which a number of boxes are placed in series, with two branches in each
 30 box, one of said branches of normally low resistance and the other containing the signaling wheel and arm and a magnet with a return signal mechanism operated thereby, and
 35 a motor mechanism to drive the signal wheel.

16. In a call box the combination of the main line upon which a number of boxes are placed in series, with two branches in each
 40 box, one of said branches of normally low resistance and the other containing the signaling wheel and arm and a magnet with a return signal mechanism operated thereby and a motor mechanism to drive the signal wheel,
 45 and a handle to energize the motor mechanism.

17. In a call box the combination of the main line upon which a number of boxes are placed in series, with two branches in each
 50 box, one of said branches of normally low resistance and the other containing the signaling wheel and arm and a magnet with a return signal mechanism operated thereby and a motor mechanism to drive the signal wheel,
 55 and a handle to energize the motor mechanism, and said handle adapted when moved partially through its excursion to shunt the whole current through the box into the magnet and thus place the magnet and its return call in series with the whole line so as to receive any signal passing over the line.
 60

18. In a call box the combination of the main line upon which a number of boxes are placed in series, with two branches in each
 65 box, one of said branches of normally low resistance and the other containing the signaling wheel and arm and a magnet with a re-

turn signal mechanism operated thereby and a motor mechanism to drive the signal wheel, and a handle to energize the motor mechanism, and said handle adapted when moved
 70 partially through its excursion to shunt the whole current through the box into the magnet and thus place the magnet and its return call in series with the whole line so as to receive any signal passing over the line and
 75 adapted further when moved on to release such shunting mechanism and energize the motor.

19. In a call box the combination of the main line upon which a number of boxes are placed in series, with two branches in each
 80 box, one of said branches of normally low resistance and the other containing the signaling wheel and arm and a magnet with a return signal mechanism operated thereby and
 85 a motor mechanism to drive the signal wheel, and a handle to energize the motor mechanism, and said handle adapted when moved partially through its excursion to shunt the whole current through the box into the magnet
 90 and thus place the magnet and its return call in series with the whole line so as to receive any signal passing over the line and adapted further when moved on to release such shunting mechanism and energize the
 95 motor, and a series of manually operated circuit breakers whereby the current may be shunted to the magnet and the mechanism be started at will.

20. In a call box the combination of two circuits within the box, one containing a series
 100 of circuit breakers along its length, the other containing the signal wheel and finger and a motor mechanism for driving the signal wheel, and a circuit closing device traveling with the
 105 signal wheel and operating against such circuit breakers so as to restore the circuit broken by any one of them and thus divert the current from the signal wheel at a period determined by the position of such circuit
 110 breaker.

21. In a call box the combination of two circuits within the box, one containing a series
 115 of circuit breakers along its length, the other containing the signal wheel and finger and a motor mechanism for driving the signal wheel, and a circuit closing device traveling with the signal wheel and operating against such circuit breakers so as to restore the circuit broken by any one of them and thus divert
 120 the current from the signal wheel at a period determined by the position of such circuit breaker, and a manually operated circuit closer adapted to re-set all of such circuit breakers and restore the circuit by single action.
 125

22. In a call box the combination of two circuits within the box, one containing a series
 130 of circuit breakers along its length, the other containing the signal wheel and finger and a motor mechanism for driving the signal wheel, and a circuit closing device traveling with the

signal wheel and operating against such circuit breakers so as to restore the circuit broken by any one of them and thus divert the current from the signal wheel at a period
5 determined by the position of such circuit breaker, and a manually operated circuit closer adapted to re-set all of such circuit breakers and restore the circuit by single action, said manually operated circuit closer being the same device which energizes the motor so that the main circuit is established whenever the driving mechanism is re-energized.

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Witnesses:

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