

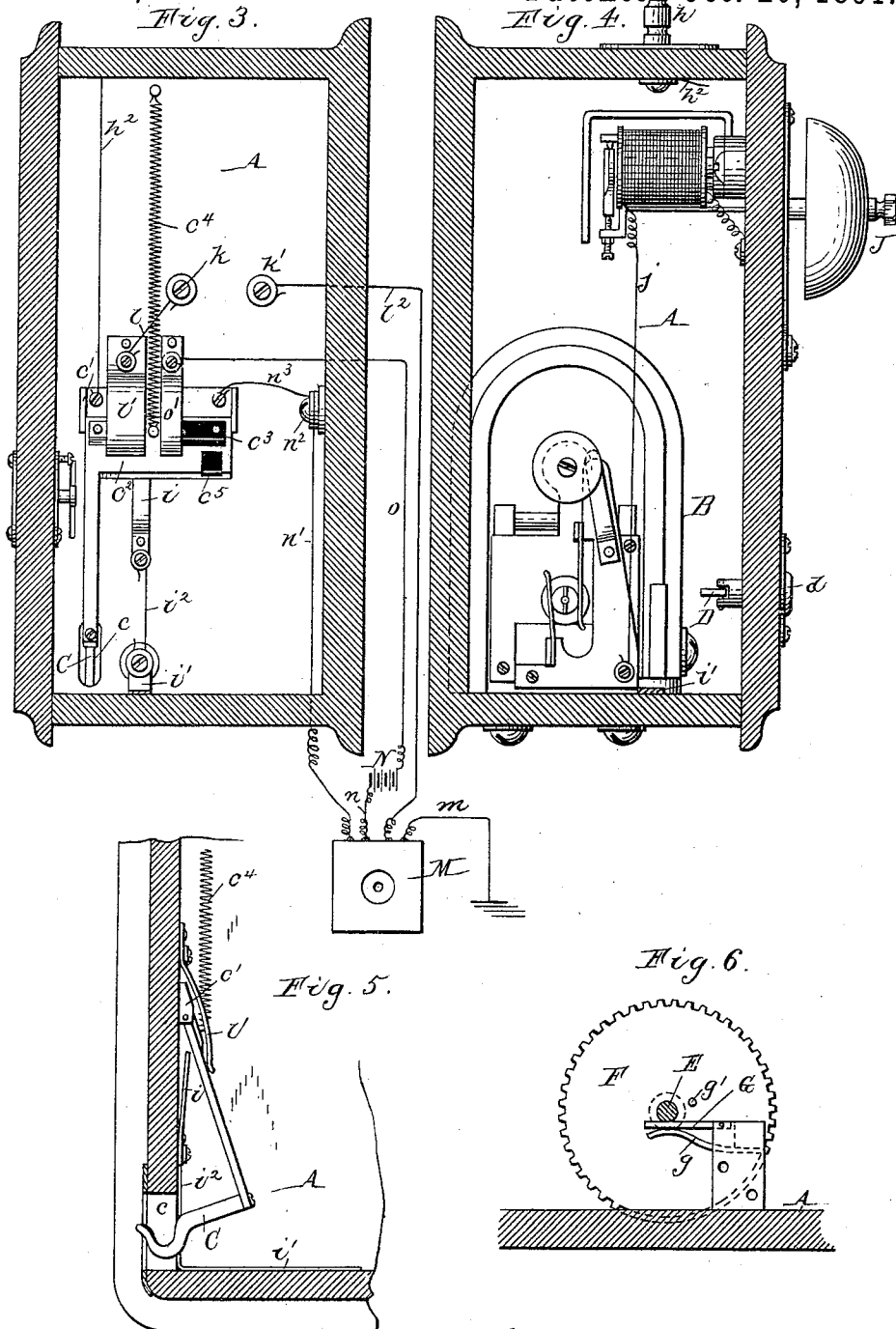
(No Model.)

2 Sheets—Sheet 2.

C. C. GOULD.
TELEPHONE SYSTEM.

No. 461,573.

Patented Oct. 20, 1891.



Witnesses:
Emil Neuhaert
Fred. C. Geyer.

Claude Gould Inventor.
By Wilhelm Bonnet.
Attorneys.

UNITED STATES PATENT OFFICE.

CLAUDE C. GOULD, OF BUFFALO, ASSIGNOR TO THE EASTERN ELECTRICAL MANUFACTURING COMPANY, OF WHEATFIELD, NEW YORK.

TELEPHONE SYSTEM.

SPECIFICATION forming part of Letters Patent No. 461,573, dated October 20, 1891.

Application filed May 28, 1891. Serial No. 394,401. (No model.)

To all whom it may concern:

Be it known that I, CLAUDE C. GOULD, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Telephone Systems, of which the following is a specification.

This invention relates to an improved telephone system. In the systems now commonly employed the receiver is supported upon a vertically-movable hook which connects the ringing-circuit with the telephone-exchange when the receiver is attached to the hook and which cuts out the ringing-circuit and establishes the talking-circuit when the receiver is removed from the hook. In this system the subscriber upon receiving a call removes the receiver from its hook and after finishing the conversation replaces the receiver. He should then ring off to notify the telephone-exchange that the conversation has been terminated. This is, however, frequently neglected, leaving the operator at the exchange in ignorance as to whether or not the subscribers have finished. For want of a signal from the subscribers the operator is left to conjecture whether the subscribers have ended their conversation, and in endeavoring to keep his switch-board cleared in order to render prompt and efficient service the operator is apt to disconnect such subscribers before they have finished, causing annoyance and confusion and impairing the efficiency of the service.

The object of my invention is to so organize the telephone system as to render it impossible for the subscribers to replace the receiver when through talking without first ringing off to notify the telephone-exchange that they have finished.

In the accompanying drawings, Figure 1 is a vertical section of a magneto case or box containing my improvement, in connection with a diagram of the other parts of the system. Fig. 2 is a horizontal section of the box in line *x x*, Fig. 1. Fig. 3 is a vertical longitudinal section of the box in line *y y*, Fig. 1, looking toward the left. Fig. 4 is a similar section on the same line, looking toward the right. Fig. 5 is a fragmentary vertical sec-

tion of the magneto-case, showing the supporting-hook of the receiver in a retracted position. Fig. 6 is a sectional elevation of the locking mechanism of the crank-shaft.

Like letters of reference refer to like parts in the several figures.

A represents the telephone-case or magneto-box, and B is the generator arranged in the lower part of the box or case, and which may be of any approved construction. In the drawings the type of generator is shown, in which the crank-shaft is capable of sliding lengthwise in its bearings.

C is a movable hook or support for the receiver, projecting horizontally through a vertical slot *c*, formed in one side of the case A, near the lower end thereof. The supporting-hook is hinged at the upper end of its shank to a metallic plate or bracket *c'*, secured to the inner side of the magneto box or case, so as to be capable of swinging outwardly through the slot *c* into the position indicated in Figs. 1 and 2 or to recede into the case in the position shown in Fig. 5. As represented in Fig. 3, the supporting-hook is provided below its hinge with a lateral contact-plate *c²*, across the upper portion of which extends a strip *c³* of insulating material.

c⁴ is a spiral spring attached at its upper end to the inner side of the case A and at its lower end to the upper portion of the supporting-hook, and which tends to draw the hook into the case.

Referring to Fig. 2, D is a catch arranged in the case behind the lower portion of the supporting-hook, and whereby the latter is held in its projected position. This catch consists of a horizontal lever pivoted between its ends to a support secured to the inner side of the door of the case and bearing with its free end against the lower portion of the hook. This lever is operated by a push-button *d*, connected to the opposite arm of the lever and arranged to slide in a socket or opening in the door or front wall of the case, the push-button being moved outward by a spiral spring *d'*, surrounding the shank of the button between the latter and the inner end of the socket in which the button slides. Upon pressing the push-button *d* the lever D is

swung on its pivot and its free arm is released from the lever, allowing the spring c^4 to retract the hook into the case, in which position the receiver cannot be hung upon the hook.

E represents the horizontal crank-shaft of the generator, which is capable of sliding lengthwise in its bearings, and e is a spiral spring surrounding the crank-shaft and tending to retain the shaft in its outermost position. This spring is secured at one end to the crank-shaft and bears with its opposite end against the adjacent bearing of the shaft. The inner end of the crank-shaft stands opposite the vertical shank of the supporting-hook C, so that upon pressing the shaft inwardly its inner end strikes the hook and swings the same outwardly against the tension of its retracting-spring c^4 . The contact-plate c^2 of the hook is provided opposite the inner end of the crank-shaft with a piece of insulating material c^5 , against which the shaft strikes, and whereby metallic contact between the crank-shaft and the hook is avoided. The crank-shaft of the generator is held against backward movement by a ratchet-wheel e' , secured to the shaft, and a pawl e^2 , engaging with the ratchet-wheel.

F is the gear-wheel mounted on the crank-shaft and meshing with the driving-pinion f of the generator.

G is a latch or locking bar pivoted at its inner end to a bracket secured to the inner wall of the case and bearing against the inner side of the ratchet-wheel of the crank-shaft E. This latch is held against the shaft by a spring g bearing against the rear side of the latch.

g' is a trip-pin or projection arranged on the side of the gear-wheel F adjacent to the latch, and which is designed to move the latch outwardly beyond the ratchet-wheel e' upon turning the crank-shaft, so as to permit the latter to be shifted inwardly. By this device the subscriber is compelled to partly rotate the crank-shaft in pushing the shaft inwardly to project the supporting-hook into its normal position.

h is a binding-post, to which the main line h' is connected, and h^2 is a wire connecting said binding-post with the metallic bracket or plate c' , to which the supporting-hook C is hinged.

Referring to Figs. 3 and 5, i is a contact-spring secured to the case on the inner side of the contact-plate c^2 of the hook, and with which said plate forms contact when the hook is in its normal projected position.

i' , Figs. 1 and 3, is a conducting-strip connected through the metallic base of the generator with one side of the generator-coil, and i^2 is a fusible wire extending from said conducting-strip to the contact-spring i .

J represents the call-bell of the telephone, j a wire extending from the opposite side of the generator-coil to one end of the coil of the

call-bell, and j' is a wire leading from the opposite end of the coil of the call-bell to a binding-post j^2 , which latter is connected with the ground by a wire j^3 . When the supporting-hook is in its normal projected position, the ringing-circuit is established through the main line h' , binding-post h , wire h^2 , metallic bracket or plate c' , contact-plate c^2 , contact-spring i , fuse-wire i^2 , conducting-strip i' , generator B, wire j , call-bell J, wire j' , binding-post j^2 , and ground-wire j^3 .

Referring to Figs. 1 and 3, k k' are the binding-posts, with which the wires of the receiver K are respectively connected. The binding-post k' is connected by a wire l with a contact-spring l' , secured to the case adjacent to the contact-plate c^2 of the supporting-hook. When the hook is in its projected position, the spring l' bears with its free end against the insulating-strip c^3 of the hook and forms no contact with the latter, while when the hook is retracted said contact-spring clears the insulating-strip and establishes contact with the plate c^2 of the hook. l^2 is a wire connecting the other binding-post k' of the receiver with one end of the induction-coil of the transmitter M, and m is a wire connecting the line side of the transmitter with the ground.

It will be understood that when the supporting-hook is in its retracted position the ringing-circuit is cut out and the talking-circuit is established through the main line h' , binding-post h , wire h^2 , metallic bracket or plate c' , contact-plate c^2 , contact-spring l' , wire l^2 , receiver K, wire l^2 , transmitter M, and wire m to the ground.

N, Figs. 1 and 3, is the battery. n is a wire leading from one pole of the battery to the transmitter M. n' is a wire leading from the transmitter to a binding-screw n^2 , secured within the magneto-box, and n^3 is a fuse-wire connecting said binding-screw with the bracket-plate c' . o is a wire connecting the opposite pole of the battery with a contact-spring o' , secured within the magneto-box, with its free end adjacent to the contact-plate c^2 of the supporting-hook, so that when the hook is in its retracted position its contact-plate bears against said contact-spring and closes the battery-circuit, while when the hook is projected the connection between the contact-spring and the hook is broken and the battery-circuit is cut out.

The operation of my improved telephone system is as follows: When the supporting-hook is in its normal position, in which it supports the receiver, it closes the ringing-circuit, comprising the call-bell and the generator, and cuts out the talking-circuit, comprising the receiver, the transmitter, and the battery. Upon receiving a call the subscriber first removes the receiver from the supporting-hook and then presses the push-button d . This action releases the catch D from the hook and allows the spring c^4 to draw the hook into the case, in which position the receiver cannot be

replaced thereon. This inward movement of the supporting-hook breaks the connection between the contact-plate c^2 of the hook and the contact-spring i and establishes a connection between said contact-plate and the contact-springs $l' o'$, forming terminals of the talking and battery circuits, thereby cutting out the ringing-circuit and switching in the talking-circuit. After having finished the subscriber rings off to notify the telephone-exchange by turning the crank-shaft E and at the same time pressing the same inwardly, so that its inner end strikes the supporting-hook and pushes the latter outward through the opening in the case, in which position the receiver may be replaced thereon. In swinging outward the hook deflects the lever of the catch D aside until the hook has cleared the lever, when the free end of the latter engages against the rear side of the hook and locks it in its projected position until the lever is again released by pressing the push-button. It will thus be observed that the supporting-hook of the receiver is caused to recede into the case as soon as the ringing-circuit is cut out and the talking-circuit is established, so that in order to replace the receiver after having finished the conversation the subscriber is compelled to first project the hook by means of the crank-shaft, and as the latter cannot be turned without operating the generator and giving a signal at the telephone-exchange it is practically impossible for the subscriber to neglect to ring off. The operator, therefore, has no occasion to prematurely disconnect subscribers, thereby avoiding annoyance to subscribers, facilitating the work of the operator, and enabling him to render more efficient service.

By providing a locking device for holding the crank-shaft against longitudinal movement until it has been partially turned the continued rotation of the crank-shaft after the latter has been moved inwardly to project the supporting-hook and cut in the ringing-circuit is assured, so that the subscriber cannot project the hook without at the same time ringing off.

In operating the crank-shaft the subscriber is not required to make any effort to push the shaft inward, as the ordinary pressure against the crank-arm in turning the shaft is sufficient to shift the shaft.

In calling the central office the subscriber turns the crank-shaft, removes the receiver from the hook, and at the same time presses the push-button to cut out the ringing-circuit and switch in the talking-circuit. After finishing the subscriber must first ring off before he can replace the receiver upon the hook, as above described.

The special parts and connections of the ringing and talking circuits form no essential feature of my invention, as the same may obviously be varied without departing from my invention; and I do not, therefore,

wish to limit myself to the particular organization of the system herein shown and described.

I claim as my invention—

1. In a telephone system, the combination, with a talking-circuit and a ringing or signaling circuit, of a movable switch-hook or support for the receiver capable of assuming an abnormal position in which it forms no support for the receiver, a catch or retaining device whereby the hook is held in its normal position, and means controlled by the ringing mechanism whereby the hook is returned to its normal position after being released by said catch, substantially as set forth.

2. In a telephone system, the combination, with a talking-circuit and a ringing or signaling circuit, of a movable switch-hook or support for the receiver capable of assuming an abnormal position in which it forms no support for the receiver, a catch or retaining device whereby the hook is held in its normal position, a spring which moves the hook into its abnormal position when released by said catch, and a shifting device controlled by the ringing mechanism, whereby the hook is returned to its normal position, substantially as set forth.

3. In a telephone system, the combination, with a talking-circuit, a ringing or signaling circuit, and a box or case containing terminals of said circuits, of a movable switch-hook or support for the receiver attached to the case and capable of receding into the case, a catch whereby the hook is retained in its normal position and which permits the hook to recede into the case when disengaged from the hook, and a generator having a longitudinally-movable actuating-shaft whereby the hook is projected out of the case, substantially as set forth.

4. In a telephone system, the combination, with a box or case, of talking and ringing or signaling circuits terminating in said case, a switch-hook or support for the receiver pivoted in the case and capable of swinging outside of the case and receding into the same, a catch whereby said hook is held in its normal projected position, and a push-button whereby said catch is disengaged from the hook, substantially as set forth.

5. In a telephone system, the combination, with a talking-circuit, a ringing or signaling circuit, and a box or case containing terminals of said circuits, of a movable switch-hook or support for the receiver attached to the case and capable of receding into the case, a generator having a lengthwise-movable actuating-shaft whereby the hook is projected out of the case, and a latch or stop which holds the actuating-shaft against longitudinal movement during a portion of its rotation, substantially as set forth.

6. In a telephone system, the combination, with a talking-circuit, a ringing or signaling

circuit, and a box or case containing terminals
of said circuits, of a movable switch-hook or
support for the receiver attached to the case
and capable of receding into the case, a gen-
5 erator having a lengthwise-movable actuat-
ing-shaft whereby the hook is projected out
of the case, a latch or stop bar engaging with
the shaft and holding the same against lon-
gitudinal movement, and a trip-pin or pro-

jection arranged on the shaft, whereby said
latch is disengaged from the shaft, substan-
tially as set forth.

Witness my hand this 19th day of May,
1891.

CLAUDE C. GOULD.

Witnesses:

FRED. C. GEYER,
C. F. GEYER.