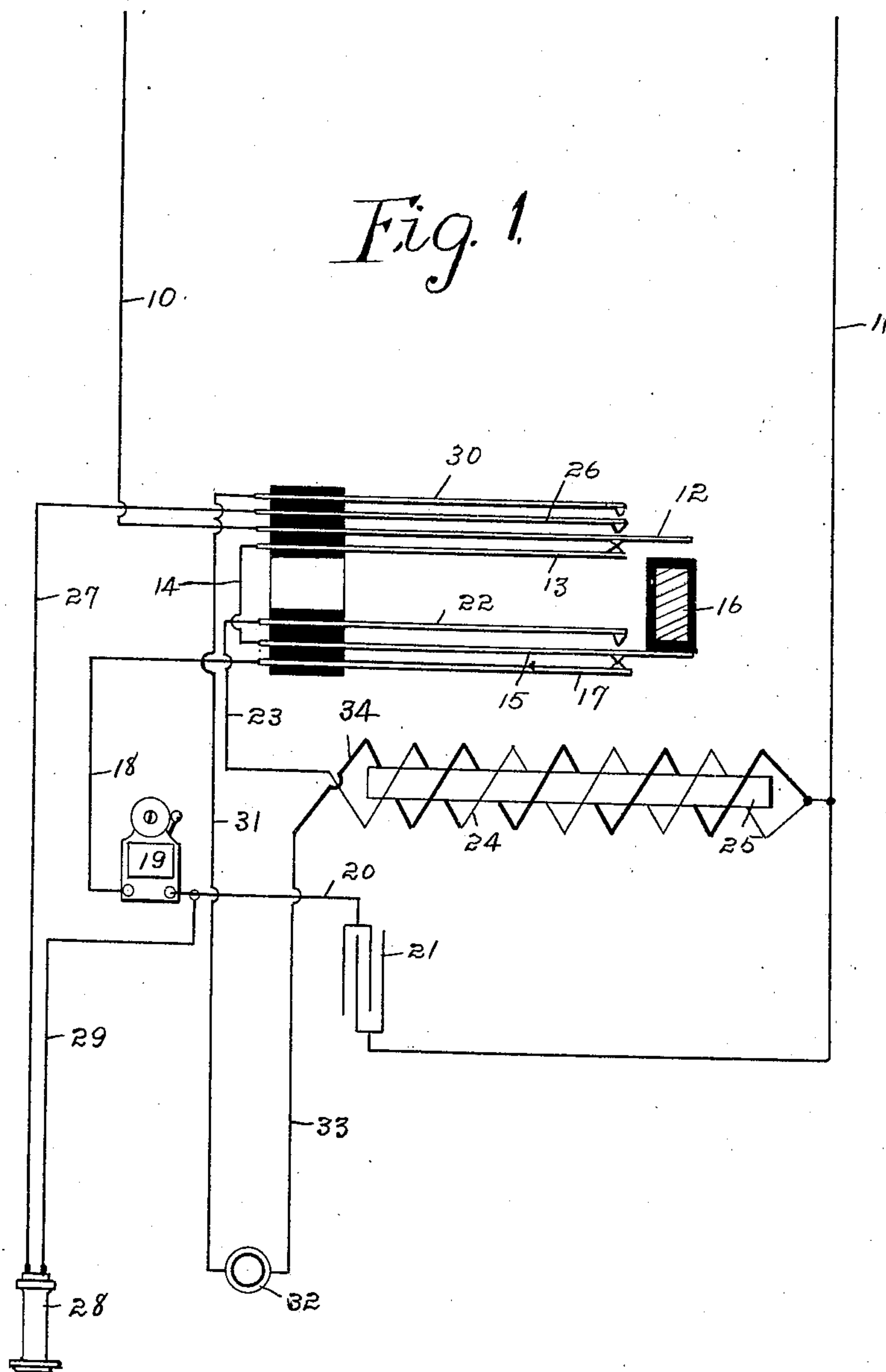


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 LOCK-OUT DEVICE FOR COMMON BATTERY TELEPHONES.  
 APPLICATION FILED JUNE 1, 1908.

925,098.

Patented June 15, 1909.  
 2 SHEETS—SHEET 1.



Witnesses  
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 F. C. Dahlberg.

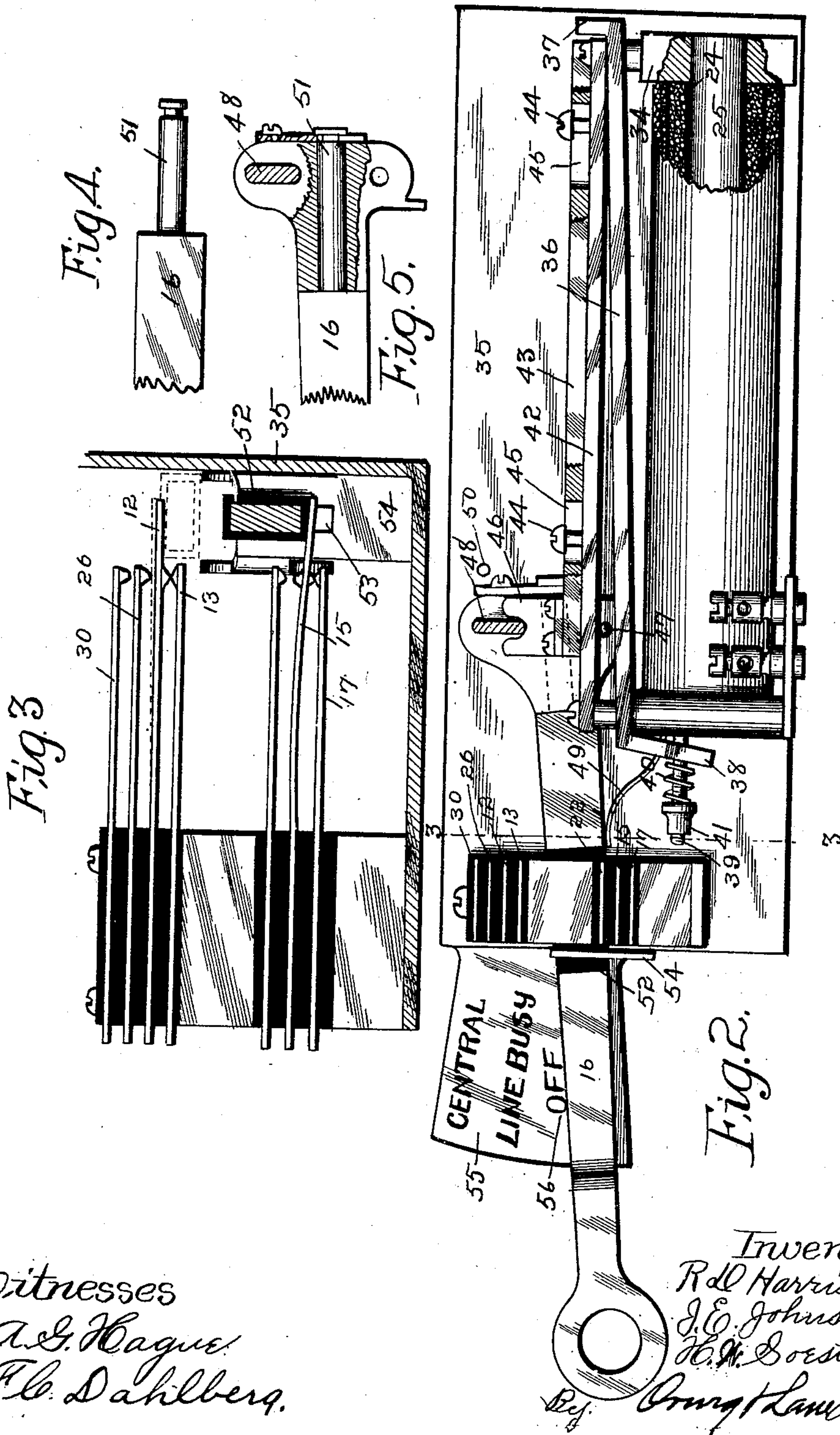
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# UNITED STATES PATENT OFFICE.

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## LOCK-OUT DEVICE FOR COMMON-BATTERY TELEPHONES.

No. 925,098.

Specification of Letters Patent.

Patented June 15, 1909.

Application filed June 1, 1908. Serial No. 435,905.

*To all whom it may concern:*

Be it known that we, RALPH D. HARRIS, JOHN E. JOHNSON, and HENRY W. SOEST, citizens of the United States, residing at Fort Wayne, in the county of Allen and State of Indiana, have invented a new and useful Lock-Out Device for Common-Battery Telephones, of which the following is a specification.

10 The object of our invention is to provide a lock-out device for telephones of the class in which a number of telephones are operated by current from a common battery, which lock-out device is so arranged that  
15 when the receiver is in position on the receiver hook, a central operator may, by using an alternating current, ring the telephone bell, and then when the person at the telephone removes the receiver from the hook it  
20 will move to a first position only if the party line on which the telephone is located is being used by a person at one of the other telephones on the same party line, or if none of the telephones on the party line are being  
25 used, the receiver hook will automatically move to its upper position, whereupon the person at the telephone will be placed in communication with the central operator, who may then connect the telephone with  
30 another telephone on the same system.

A further object is to provide a device of this kind, in which a person at any telephone on a party line may, after placing his telephone in communication with central and  
35 after having central ring the bell of the desired second party on the same party line, then the first person may, by turning the receiver hook to a certain position, so operate the lock-out device on the telephone of said  
40 second person that the receiver hook of the telephone belonging to the second person may raise to proper position for connecting two telephones, and then, when such a connection is made, the first person may return  
45 the receiver hook to its original position, whereupon no other telephone on the same line may be used.

A further object is to provide a device of this kind in which the current is not depended upon to energize a magnet for the purpose of holding any of the operative parts in place while talking, hence a comparatively small amount of electric current is all that is necessary for operating the lock-

out device, because the current used for 55 energizing the magnet is used for an instant only and not during the time that the telephone is in use.

A further object is to provide a device of this kind of simple, durable, and inexpensive 60 construction, that will occupy a minimum of space and may be contained wholly within the ordinary telephone box, and in which all of the operations are made by movements of the receiver hook, and without the use of additional push buttons, switches, etc. 65

Our invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more 70 fully set forth, pointed out in our claims, and illustrated in the accompanying drawings, in which—

Figure 1 shows a diagram illustrating the relative arrangement of the various parts of 75 our improved device. Fig. 2 shows a side elevation of a telephone receiver hook, and the various parts of our improved attachment arranged in position relative thereto. Fig. 3 shows a sectional view on the line 3—3 80 of Fig. 2. Fig. 4 shows a top or plan view of the inner end of the receiver hook, and— Fig. 5 shows a side elevation of same, partly in section.

Referring to the diagram shown in Fig. 1, 85 we have used the reference numeral 10 to indicate the line wire, and 11, the return wire, of a party line running to a central exchange.

The line wire is connected to a spring contact arm 12, normally in engagement with a 90 second spring arm 13. The spring arm 13 is connected by means of a wire 14 with a spring arm 15.

The spring arms 12 and 15 are positioned respectively above and below the receiver 95 hook 16. When the receiver hook is at its lower limit, it rests upon the arm 15 and holds it in engagement in a spring arm 17, which latter is connected, by means of a wire 18, with a telephone bell 19. The telephone 100 bell is in turn connected by means of a wire 20 with a condenser 21, and the condenser is connected with the return wire 11. When the receiver hook 16 is in its position midway between the arms 12 and 15, then the 105 spring arm 15 is normally in engagement with a spring arm 22, which latter is connected, by means of a wire 23, with a coil of



wire 24 arranged around a magnet core 25, and connected to the return wire 11. This coil around the magnet core 25 is of comparatively high resistance, say for instance about  
 5 five hundred ohms. This wire 24 is preferably wound around the magnet core in such a manner that when a current passes through it it will energize the magnet core and cause it to act in a manner to be hereinafter described. When the receiver hook is in an  
 10 elevated position it engages the arm 12 and forces it upwardly in contact with a spring arm 26, which latter is connected with a wire 27 leading to the telephone receiver 28, and  
 15 from the receiver a wire 29 leads to the condenser 21. The spring arm 26 is also held by the arm 12 in engagement with a spring arm 30, which latter has a wire 31 connected with it and leading to the telephone transmitter  
 20 32, and a wire 33 leads from the transmitter 32 to a coil 34 which surrounds the core 25 and which has comparatively low resistance, say for instance about fifty ohms, and which is wound around the core 25 in such a man-  
 25 ner that a current passing through it will not energize the magnet to any appreciable extent. This wire 34 is connected to the return wire 11.

The operation of the elements before de-  
 30 scribed under various conditions is as follows: Assuming that the arms 12 and 13 are in engagement with each other and that the receiver hook is resting upon the arm 15 to hold it in engagement with the arm 17, then  
 35 the current from the line wire may pass to the bell 19 and through the condenser 21 to the return wire. It is to be understood in this connection that the current employed for the ringing of the bell is an alternating current  
 40 which may pass through the condenser. After the bell has been rung, the operator removes the receiver from the telephone hook thus permitting the hook to move upwardly. Assuming that the hook moves up only far  
 45 enough to be out of engagement with the arm 11, as will be hereinafter described, then the arms 15 and 22 will be in engagement and the current will pass through the coil 24, thus energizing the magnet core 25 and setting  
 50 in motion mechanism that will permit the hook to rise farther if the full current is passing through the coil 24, as would be the case if the line was not in use. If, however, the line is in use then the full current does  
 55 not pass over the coil 24 and, hence, the coil will not be energized and the mechanism for releasing the receiver hook will not be operated, and the receiver hook can not rise farther. Assuming, however, that the receiver  
 60 hook is permitted to move to its upper limit, then the arms 12, 26, and 30 will be placed in engagement with each other and the current may flow through both the receiver and the transmitter as required in use. Further, if  
 65 the receiver hook should be placed in posi-

tion where it will force the arm 12 into engagement with the arm 26, but will not force the arm 26 into engagement with the arm 30, then the current will pass only through the receiver and not through the transmitter. 70

Referring to Sheet 2 of the accompanying drawings, the mechanism that is attached to the telephone, and that constitutes our invention, comprises a support 35 having the coils 24 and 34 mounted thereon surrounding 75 the magnet core 25.

Pivoted adjacent to one end of the magnet core 25 is an armature arm 36 having an upwardly projecting lug 37 at one end and a downwardly projecting arm 38 at its other 80 end. This arm 38 has a stationary rod 39 passed through it and a spring 40 is mounted on the rod 39 to engage the arm 38, said spring being made adjustable by means of a nut 41, thus normally leaving the end of the 85 armature arm upon the lug 37. When the magnet core 25 is energized the end of the arm 36 will be drawn downwardly.

Above the armature arm 36 is a stationary plate 42 having slidingly mounted upon it a 90 bar 43 held in place by means of the screws 44 in the slots 45. On this bar 43 is a lug 46 having a notch in its upper end. The inner end of the receiver hook is pivotally supported at 47 and is provided above its piv- 95 otal point with a lug 48 to enter the notch in the lug 46. By this means the bar 43 is connected to the receiver hook in such a manner that when the receiver hook is elevated the lug 48 thereof, resting in the notched lug 46 100 of the bar 43, will cause the bar 43 to move longitudinally. Therefore, before the receiver hook can be elevated to its upper limit, the bar 43 must be moved in a direction away from the outer end of the receiver hook, 105 and this, obviously, cannot be done until the lug 37 is lowered. These parts are so arranged and proportioned that when the lug 37 is in its elevated position as shown in Fig. 2, then the receiver hook cannot be elevated 110 because the lug 48 will rest in the notch of the lug 46 and the bar 43 will be held against sliding movement by said lug 37, however, when the lug 37 is moved downwardly, the receiver hook may be elevated because the 115 bar 43 will then be free to slide.

We have provided a spring 49 for normally elevating the receiver hook, and a stop 50 for limiting the upward movement of same. The outer end of the receiver hook is pivotally 120 connected with the inner end by means of the rod 51 so that the outer end of the hook is capable of being turned relative to the inner end. The central portion of the receiver hook is provided with an insulating cover 52, 125 and this part normally rests in the slot 53 of a plate 54, so that the outer end of the receiver hook will be held against turning movements so long as the hook is in this slot and can only be turned when the hook is 130



above the upper end of the plate 54 and out of the slot, as shown in Fig. 3, in which figure the position of the receiver hook, when elevated above the plate 54 and turned, is shown by dotted lines. In said figure we also show by dotted lines the position of the spring arm 12 when the receiver hook is turned after being elevated above the plate 54.

Adjacent to the receiver hook is a plate 55 having marked upon it, near its lower portion, the word "Off", and near its central portion the words "Line busy", and near its upper portion the word "Central". These words are so arranged with respect to the receiver hook that when the receiver hook is in its normal position the word "Off" will appear directly above it, and when it is elevated, so far as it can go when the slide bar 43 is limited by the lug 37, the words "Line busy" will be directly above it, and when it is elevated to its upper limit the word "Central" will appear directly above it, thus indicating to the person who is using the telephone just what the condition of the telephone is as regards connections that are made.

When the receiver hook is above the plate 54 and out of the slot 53, then it may be turned to position at right angles to its normal position as shown by dotted lines in Fig. 3 and when in this position the only connection that will be made is that by the spring arm 12 engaging the spring arm 26, whereby the receiver only is connected with the line.

In practical use, and assuming that our improved telephone is used on a party line with a battery common to all of the telephones on the line, then when the operator removes the receiver, the spring 49 will force the receiver hook upwardly. The first effect of the upward movement of the receiver hook will be to cause the arms 15 and 22 to contact with each other, whereupon the battery current is run through the coil 24 and the magnet core 25 is energized to move the armature 36, bearing the lug 37, downwardly far enough to permit the slide bar 43 to move upwardly and allow the receiver hook to be moved to its upper limit.

Obviously, if part of the current is being used by another party on the same line, then the current will not be sufficient to energize the magnet core 25, and hence the receiver hook can only move up to position where the words "Line busy" appear above it. This will indicate to the operator that the party line current is already in use. If, however, the full current on the line wire is available, the magnet core will be energized and the receiver hook will be permitted to move upwardly to its upper limit where the word "Central" will appear above it. When in this position, the spring arm 12 is in contact with both of the arms 26 and 30, and both

the receiver and transmitter are in the circuit, and the telephone is then ready for use in the ordinary way.

Assuming that it is desired by the operator of one of the telephones on a party line to have communication with a person at another telephone on the same party line to the exclusion of all of the other telephones on the same party line, then the operation is as follows: The operator at the first telephone removes the receiver from the hook and requests the central operator to ring the bell of the desired other telephone on the same party line. Then, after this is done, the operator at the first telephone turns the receiver hook to the position shown by dotted lines in Fig. 3, thus preventing the current from going through the transmitter on his telephone and through the coil 34. This will then give a sufficient amount of the current to the second telephone so that the magnet core 25 may be energized sufficiently to permit the receiver hook of the second telephone to be elevated and then the person at the second telephone may call the person at the first telephone and as soon as this is done the receiver hook of the first telephone is returned to its first position thus throwing into communication both the receiver and transmitter, whereupon the two telephones on the same party line are connected. None of the other telephones on the same line can be connected during this time, because substantially all of the current is being used and there would not be sufficient current passing through any of the other telephones on the same line to energize the magnet core 25.

One of the important advantages of our invention is that when the current is flowing through the transmitter of the telephone, this current must flow through the coil 34, which offers just sufficient resistance to the current so that none of the other telephones on the same line can be used, for the reason that it requires the full current to energize the magnet core 25, and obviously, if the resistance offered by the coil 34 is such that the full current can not be turned into the coil 24 of any of the other telephones on the same line, said telephones can not be used.

Another important advantage in connection with our improved device, is that the instrument does not depend upon the current for holding the circuit closed, because after the circuit is once closed through the telephone, all of the current will flow through the receiver and transmitter and not through the coils surrounding the magnet core so that the full current is used for the purpose of transmitting sound waves and not for the purpose of energizing the magnet for holding the circuit closed.

The entire device is of very simple and inexpensive construction and not liable to get out of order.



One of the important advantages of our invention is that so long as any telephone on the party line is being used, all of the current will be used by said telephone and on account of the fact that the current thus being used on the telephone passes only through the coil that has comparatively low resistance, then, obviously, if the receiver of any other telephone was taken down, the current would not pass through it because it would have to pass through the coil on the other telephone that is of high resistance before the lock out device of the other telephone could be operated to permit the receiver to be elevated to its upper limit, and as the current always selects the path of least resistance, the removal of any other receiver on the party line would not affect the telephone being used.

In the following claims, we have used the term receiver hook to indicate a lever on which the receiver is detachably placed, or a lever on which any other sort of a weight may be detachably placed. It is readily understood that the receiver could easily be placed on a stationary hook, and a weight placed on the lever instead of the receiver and the same results accomplished.

We claim as our invention.

1. In a telephone, the combination of a receiver, a transmitter, and an electro magnet, all included in the telephone circuit, a receiver hook pivotally mounted, means for raising the hook, a locking device for the receiver hook designed to be released by the electro magnet, and contact arms also included in the circuit, and so arranged that when the receiver hook moves upwardly the circuit will be completed through the electro magnet and the locking device released to permit the receiver hook to move to its upper limit and also so arranged that when the receiver hook moves to its upper limit the circuit will be completed through the receiver and the transmitter, the coil surrounding a core of said electro magnet being of comparatively high resistance so that when the current is being used on another telephone on the same party line, the current will not be sufficient to operate the electro magnet as required to release the locking device, and a second resistance coil having comparatively low resistance connected with the transmitter for purposes stated.

2. In a telephone, the combination of a receiver, a transmitter, and an electro magnet, all included in the circuit, said electro magnet being wound with a coil of comparatively high resistance, a coil of comparatively low resistance connected with the transmitter circuit, a lock-out device released by the electro magnet, a receiver hook normally held against upward movement by said lock-out device, and a series of contact devices so arranged that when the receiver hook is first

elevated, the current will pass to the coil of high resistance on the electro magnet and the electro magnet will be operated thereby to release the lock out device and to permit the receiver hook to move to its upper limit and to cause the contact device to complete the circuit through the receiver and transmitter.

3. In a telephone, the combination of a receiver hook, an electro magnet wound with a coil of comparatively high resistance, a lock-out device arranged to be released by the electro magnet to permit the receiver hook to move to its upper limit, a transmitter, a coil of comparatively low resistance included in the transmitter circuit, said electro magnet being so arranged that it can be actuated to release the locking device only by approximately the full current, so that when the transmitter of any telephone in the same circuit is in use and the current is flowing through the low resistance coil thereof, the high resistance coil of the electro magnet will not be affected.

4. In a telephone, the combination of a receiver, a transmitter, and an electro magnet, all included in the telephone circuit, said magnet being wound with a coil of comparatively high resistance, a coil of comparatively low resistance included in the transmitter circuit, a receiver hook, a locking device interposed between the receiver hook and the electro magnet to be automatically actuated by the magnet to permit the receiver hook to move to its upper limit, and a series of contact devices included in the circuit and so arranged that when the receiver hook first moves upwardly, the current will pass through both the receiver and the transmitter circuits, and then when the receiver hook is moved to another position the current will pass only through the receiver, whereby a current may pass through the telephone without going through either of the resistance coils, so that the full current may be used on another telephone on the same party line to thereby operate the lock-out device of said other telephone.

5. In a telephone, the combination of a receiver, a transmitter, and an electro magnet, all included in the telephone circuit, said magnet being wound with a coil of comparatively high resistance, a coil of comparatively low resistance included in the transmitter circuit, a receiver hook, a locking device interposed between the receiver hook and the electro magnet to be automatically actuated by the magnet to permit the receiver hook to move to its upper limit, and a series of contact devices included in the circuit and so arranged that when the receiver hook first moves upwardly, the current will pass through both the receiver and the transmitter circuits, and then when the receiver hook is moved to another position the current will pass only through the receiver,



whereby a current may pass through the telephone without going through either of the resistance coils, so that the full current may be used on another telephone on the same party line to thereby operate the lock-out device of said other telephone, said receiver hook having its outer end pivotally connected to its inner end and being so shaped that when in its elevated position, its outer end may be turned to position at right angles to its first position to thereby actuate the contact device as required to include in the circuit only the receiver.

6. In a telephone, the combination of an electro magnet included in the telephone circuit, a spring actuated armature in position to be acted on by the magnet, a lug on the armature, a receiver hook, means for normally elevating the receiver hook, a slide bar operatively connected with the receiver hook and arranged to move longitudinally when the receiver hook is elevated, said slide bar being so arranged with relation to the lug on the armature that when the armature is in its position away from the magnet, the lug will prevent such movement of the slide bar as to release the receiver hook.

7. An improved telephone, comprising a receiver, a transmitter, and an electro magnet wound with a coil of comparatively high resistance, all included in the telephone circuit, a coil of comparatively low resistance included in the circuit with the transmitter, a telephone bell, a condenser included in the circuit with the bell, an armature arranged to be operated by the electro magnet and having a lug thereon, an adjustable spring connected with the armature, a receiver hook having its outer end pivotally

connected with its inner end, and its inner end fulcrumed to a suitable support, a slide bar adjacent to said armature and means connected with the inner end of the receiver hook, said parts being so arranged that when the armature is not attracted by the electro magnet, the upper movement of the receiver hook will be limited by the slide device engaging the lug on the armature, a slotted plate arranged to engage the outer portion of the receiver hook to prevent its turning movement until the receiver hook passes above said slotted plate, and a series of contact arms arranged in the circuit in such a manner that when the receiver hook is at its lower limit, the bell only may be operated, then when the receiver hook is elevated, a current will be passed through the electro magnet, then when the receiver hook is elevated to its upper limit, the current will pass through the receiver and transmitter, and then when the outer end of the receiver hook is turned the current will pass through the receiver only, the two coils being so arranged with relation to each other as regards to resistance that when the circuit is passing through the coil that is connected with the transmitter, the same current will not pass through the electro magnet of another telephone on the same party line.

Des Moines, Iowa, April 20, 1908.

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