

R. F. WILLIAMS.
 DETECTOR FOR WIRELESS TELEGRAPHY AND TELEPHONY.
 APPLICATION FILED AUG. 24, 1910.

1,048,117.

Patented Dec. 24, 1912.

3 SHEETS—SHEET 1.

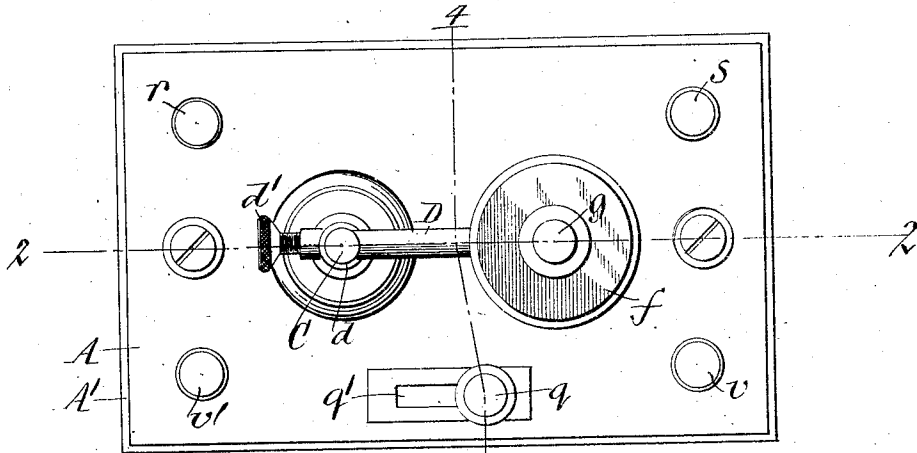


Fig. 1.

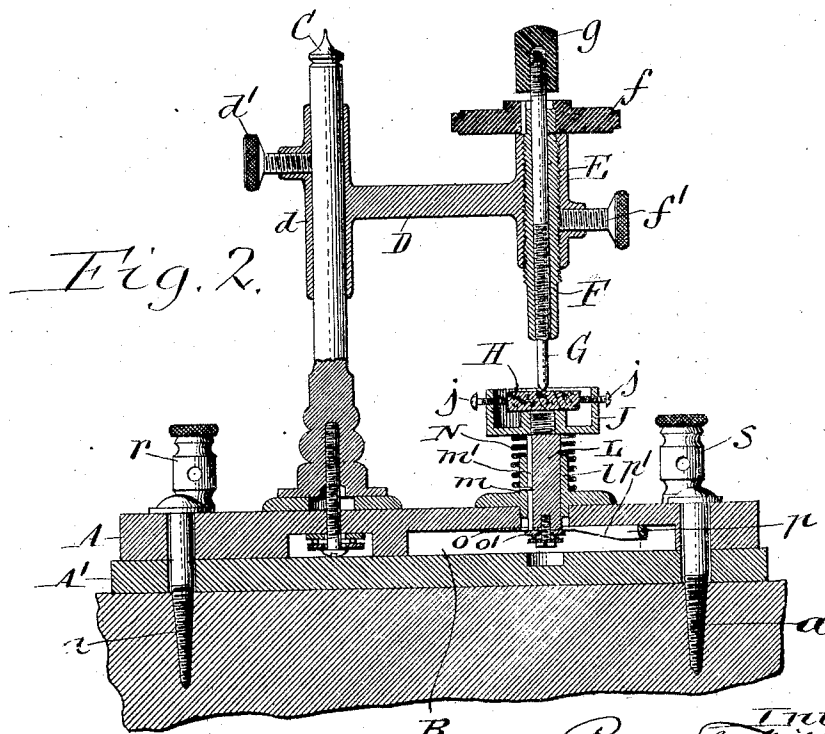


Fig. 2.

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Fig. 3.

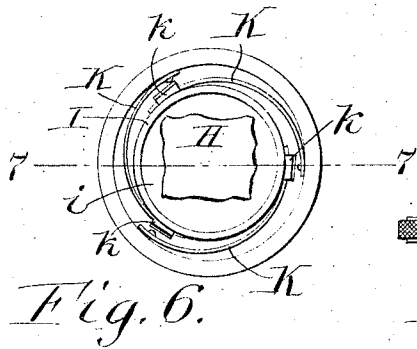
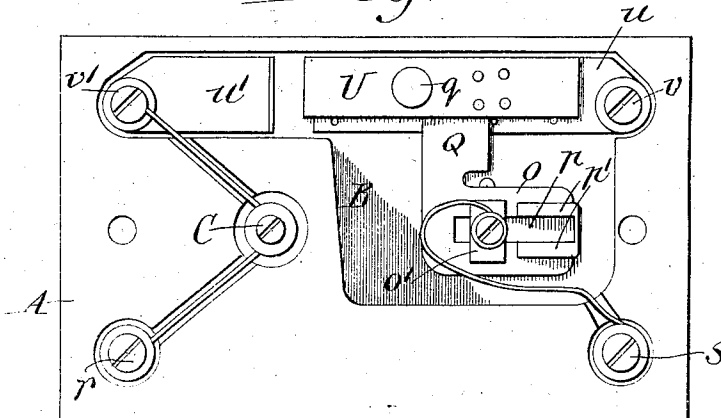


Fig. 6.

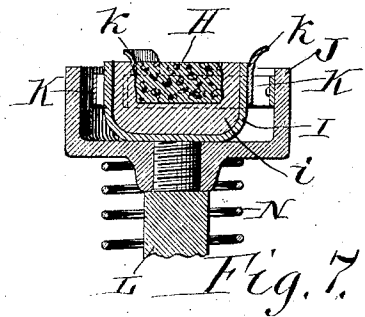


Fig. 7.

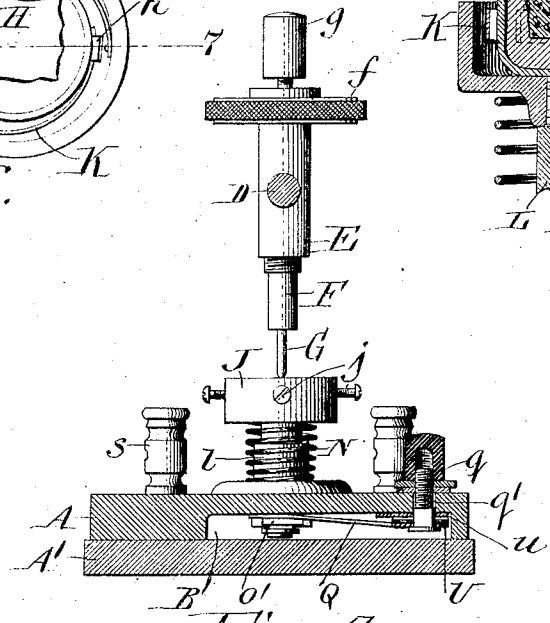


Fig. 4.

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3 SHEETS—SHEET 3.

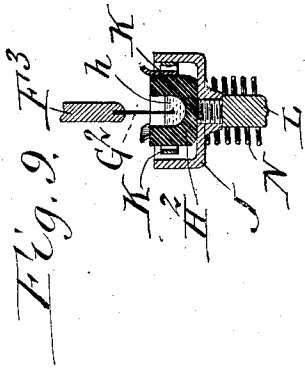
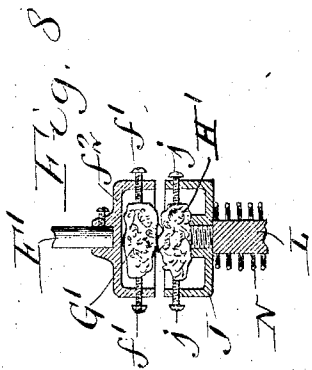
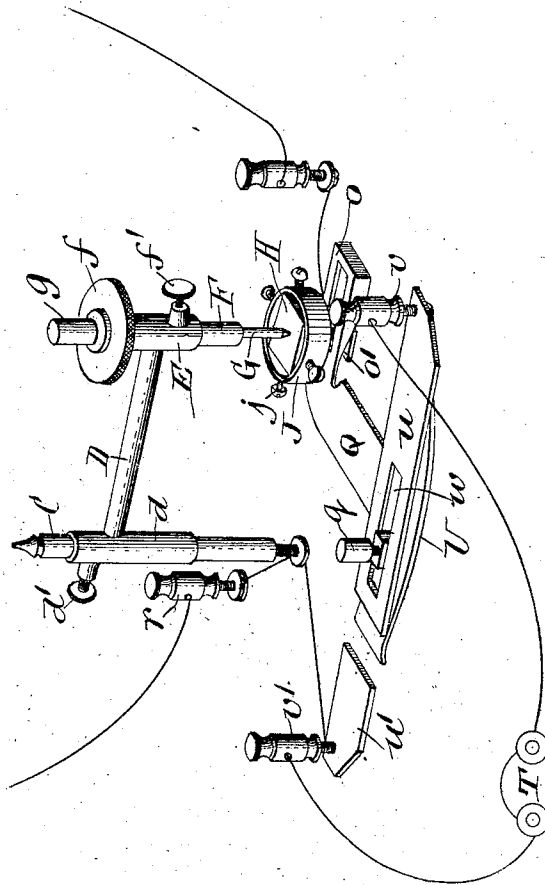


Fig. 5.



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UNITED STATES PATENT OFFICE.

ROGER F. WILLIAMS, OF BUFFALO, NEW YORK, ASSIGNOR OF ONE-HALF TO MARTIN L. FAILING, OF BUFFALO, NEW YORK.

DETECTOR FOR WIRELESS TELEGRAPHY AND TELEPHONY.

1,048,117.

Specification of Letters Patent.

Patented Dec. 24, 1912.

Application filed August 24, 1910. Serial No. 578,696.

To all whom it may concern:

Be it known that I, ROGER F. WILLIAMS, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Detectors for Wireless Telegraphy and Telephony, of which the following is a specification.

When operating a wireless telegraph or telephone apparatus the terminals of the detector are usually separated and the receivers are short-circuited or cut-out, so as to prevent burning out or injury of the detectors and receivers and also preventing shocking the person who may be listening at the time a message is being sent.

The detectors for wireless telegraphy or telephony heretofore in use have usually been so constructed that whenever the terminals were separated preparatory to sending a message the normal adjustment of the terminals relatively to each other was disturbed and required re-adjustment after each sending operation to produce the best results, thereby causing interruption and delay in the transmission of messages. Furthermore, in these prior detectors the means for moving the detector terminals and the means for cutting the receivers into or out of circuit were entirely independent from each other and necessitated separate operations for placing the same into one or another relation to the rest of the apparatus, thereby necessitating greater care in the proper manipulation of the apparatus.

The object of this invention is the production of simple, convenient and efficient means whereby the detector terminals may be quickly separated and the receivers cut out preparatory to sending a message and the terminals of the detector may be again brought together and the receivers again placed in operation after sending a message—preparatory to receiving a message without causing any disturbance in the adjustment of the detector terminals, thereby avoiding interruption and delay in wireless telegraphic or telephonic communication.

My invention has the further object to so construct the detector that the operation of moving the detector terminals toward and from each other and rendering the receivers operative or inoperative is effected simultaneously and by the same movement of the operator.

In the accompanying drawings consisting of 3 sheets: Figure 1 is a top plan view of a detector embodying my invention. Fig. 2 is a vertical longitudinal section thereof in line 2—2, Fig. 1. Fig. 3 is a bottom plan view of the upper base section and associated parts. Fig. 4 is a vertical transverse section in line 4—4, Fig. 1. Fig. 5 is a diagrammatic perspective view of the detector showing the electric connections. Fig. 6 is a top plan view, on an enlarged scale, showing a modification of the means for supporting the detector block. Fig. 7 is a vertical section of the same in line 7—7, Fig. 6. Figs. 8 and 9 are fragmentary sectional elevations showing other forms of terminals.

Similar letters of reference indicate corresponding parts throughout the several views.

The apparatus is provided with a base which may be of any suitable construction, but as shown in the drawings the same comprises upper and lower sections A, A¹ of insulating material, such as marble or rubber, these sections being secured to each other and to a support by means of screws a, as shown, or otherwise. The opposing surfaces of the base sections are constructed to form a chamber or cavity B between them for the reception of parts to be presently described.

C represents a post or standard secured at its lower end to the upper base section.

D represents a horizontal arm provided at its inner or rear end with a sleeve d which is capable of sliding vertically on the upper end of the standard C and is held in the desired position thereon by a set screw d¹. At its front or outer end the arm D is provided with an internally screw threaded socket E in which is arranged a vertically adjustable sleeve F having an external screw thread engaging with the thread of the socket and also provided with an internal screw thread. The adjusting sleeve F may be turned by means of a thumb piece, knob or disk f secured to the upper end of the same. After adjustment the sleeve F is held in place by a set screw f¹ arranged in the side of the socket and bearing against the side of the adjusting sleeve, as shown in Fig. 2. Within the adjusting sleeve F is arranged a detector point or needle G which has an external screw thread

engaging with the internal thread of the adjusting sleeve and a knob, button or finger piece *g* at its upper end for turning and adjusting the same.

5 H represents the detector block with which the lower end of the detector point engages and which may consist of silicon or other suitable material. The detector block may be supported in any suitable manner
10 so as to be capable of movement toward and from the detector point. The means for this purpose shown in Figs. 2, 4 and 5 comprise a holder having a socket or pocket J which receives the detector block, and a plurality
15 of set screws *j* arranged in the side of the pocket and bearing against different parts of the detector block. The detector block may also be detachably secured in the socket of the holder by the means which are shown
20 in Figs. 6 and 7, and which are constructed as follows:

I represents a metal cup which has a rounded bottom and in which the silicon detector block H is secured by a metallic filling *i*, so that the cup, filling and block form
25 practically one piece. The cup containing the detector block is like those now in common use and furnished by the trade ready for use. To permit this cup to be readily inserted in the socket of the holder or removed
30 therefrom, a plurality of curved spring clamping jaws K are provided which are arranged in an annular row and each of which is secured at its outer end to the inner side
35 of the cylindrical wall of the holder and curves from its attached end inwardly and circumferentially toward its free end in the form of a partial volute. At its inner end each spring jaw is provided with an upwardly and
40 outwardly projecting inclined or curved guide lug *k*. Normally the several clamping jaws when free are arranged with their inner ends close together, so that they form a contracted seat or nest. When it is desired to
45 apply a detector block supporting cup to the holder this cup is pressed with its convex underside downwardly between the guide lugs of the clamping jaws, whereby the latter are spread and permit the detector cup
50 to pass between the jaws after which the resilience of the jaws holds the cup in place. The detector block and its cup can be easily removed by simply lifting it out of frictional engagement with the jaws. By this
55 means the detector block can be quickly put in or removed from the apparatus and replaced by another, thereby avoiding prolonged interruption in the use of the apparatus which at times is exceedingly important.
60

The detector block holder is mounted on the upper end of an upright guide or slide rod L which projects at its lower end through an opening in the top section of the base into
65 the chamber or cavity thereof and which is

guided between its ends in a guide way *l* secured to the top of the base. The guide rod and way are preferably cylindrical and the rod is held against turning in the way, preferably, by means of a spline *m* arranged
70 on the way and projecting into a longitudinal groove *m*¹ in the slide or guide rod. The slide rod and the parts associated therewith are yieldingly held in an elevated position for engaging the detector block with the detector
75 point by means of a spring N which surrounds the guide way and bears at its upper and lower ends against the underside of the holder socket and the base of said guide way, as shown in Figs. 2 and 4.
80 By thus preventing turning of the holder the detector block is not displaced circumferentially relatively to the detector point when moving the block toward and from the point, thereby avoiding disturbance in the
85 adjustment of the detector after the same has been properly set.

The depression of the detector block is preferably effected by means of a horizontally movable wedge arranged in the chamber
90 or cavity of the base. This wedge is preferably constructed in the form of a plate *o* arranged between the underside of the upper base section and the upper side of a shoulder on the guide rod formed by a cross
95 piece *o*¹ thereon and provided with a longitudinal slot *p* through which said guide rod projects and also provided on its underside on opposite sides of the slot and guide rod with two inclined faces *p*¹, *p*² in line with
100 the ends of said cross piece. Upon moving the wedge backwardly its inclined faces clear the cross piece and permit the spring N to elevate the detector block into contact with the detector point but when the wedge
105 is pushed forwardly its inclined faces by engaging the cross piece depress the detector block out of engagement from the detector point. This forward and backward movement of the wedge is effected by means of
110 a slide Q reciprocating horizontally within the chamber of the base and provided with a finger piece or handle *q* which projects upwardly through a longitudinal slot *q*¹ in the upper section of the base.
115

The standard C is electrically connected with one side of the main circuit of the wireless telegraph system, so that the detector block forms the terminal of this side of said
120 circuit. This connection preferably includes a binding post *r* arranged on one corner of the base. The guide rod L is electrically connected with the opposite side of the wireless telegraph or telephone system, this connection preferably including a
125 binding post *s* arranged on another corner of the base.

When the detector block is engaged with the point the main circuit of this station is closed through the detector and the latter
130

responds to the electrical undulations produced in the main circuit by the sending of a message at another station. But when the detector block and point are separated the main circuit through these parts is broken, thereby preventing the same from being burnt or otherwise affected by the electric current upon sending a message at the local station, which burning would disturb the adjustment of these terminals relatively to each other and necessitate re-adjustment. When the detector block and point are in contact with each other, the message represented by the electrical undulations which influence said block and point are translated, so that they are audible by means of one or more telephonic receivers T which are arranged in a shunt circuit around the main circuit. A switch is provided whereby this shunt circuit may either be electrically connected or disconnected between the receivers and the detector, so as to either short circuit or cut out the receivers or leave this shunt circuit long and cut in the receivers. The preferred means for accomplishing this cutting in and out of the receivers is combined with the means which move the detector block and point toward and from each other, so that when the detector block and point are separated preparatory to sending a message the receivers will be cut out at the same time, while upon engaging the detector block and point with each other preparatory to receiving a message the receivers will be cut in circuit. This is preferably accomplished by constructing the slide Q and wedge of metal and providing this slide with a bridge contact U which engages at one end permanently with a shunt contact u on one side of the receivers while its opposite end is movable into and out of engagement with a shunt contact u^1 on the opposite side of the receivers. For convenience the connections of the shunt circuit include binding posts v, v^1 on opposite sides of the receivers which posts are preferably connected with the contacts u, u^1 , respectively, and arranged on the other corners of the base.

The finger piece or handle g preferably passes through a slot w formed in the shunt contact u in line with the slot g^1 in the base. When the slide Q is pushed backwardly to permit the detector block to engage the point, the bridge contact U is withdrawn from the contact u^1 and only engages the contact u , thereby cutting in the receivers. But when the slide Q is pushed forward so as to disengage the detector block from the detector point, then the bridge contact engages both of the contacts u, u^1 , whereby the receivers are cut out or short circuited and injury to the detector and receivers is prevented.

In adjusting the detector, the detector point is shifted approximately to the desired

position by raising and lowering the arm D on the post C or raising or lowering the sleeve F in the socket E. The fine adjustment of the detector is effected by raising or lowering the point G in the sleeve F for which purpose the screw threads between said point and sleeve are made finer than between the said sleeve and its socket. By raising and lowering the point the pressure of the same against the detector block may be varied inasmuch as the spring N is strained more or less, thereby enabling the detector to be adjusted to obtain the best results under different conditions.

When the detector block is lowered during the time of sending a message the same can be again restored exactly to its former position for resuming listening at the receivers and taking a message without necessitating re-adjustment of any parts of the detector.

Instead of employing a needle G and a block H as the detector terminals or elements the lower terminal may consist of a piece of ore H^1 which is secured in the holder J by means of the screws j and the upper terminal G^1 which engages with the lower terminal may also consist of a piece of ore which is held by screws f^1 in a cup-shaped holder f^2 on the lower end of an adjusting rod F^1 , as shown in Fig. 8. My invention is also applicable to an electrolytic detector in which the lower terminal consists of a carbon cup H^2 secured in the holder J by spring jaws K and containing a quantity of acid h , the upper terminal consists of a needle G^2 mounted on the rod F^3 and dipping at its lower end into the acid within the carbon cup.

In the construction shown in Figs. 8 and 9 the lower terminals are disengaged from the upper terminals when cutting out the receivers and engaged when cutting in the receivers.

I claim as my invention:

1. In a detector for wireless telegraphy or telephony, a detector terminal, and a holder for said terminal comprising a socket, and a plurality of springs each of which is attached at one end to said socket and engages its free end with said terminal and each of which has the form of a partial volute and extends circumferentially around said socket.

2. In a detector for wireless telegraphy or telephony, a detector terminal, and a holder for said terminal comprising a socket, and a plurality of springs each of which is attached at one end to said socket while its free end is provided with an outwardly projecting guide lug which engages the side of said terminal and each of said springs having the form of a partial volute and extending circumferentially around said socket.

3. A detector for wireless telegraphy or telephony comprising an upper terminal, a

lower terminal, and means for moving said lower terminal toward and from said upper terminal comprising a holder supporting said lower terminal and having a guide rod, 5 a guide way in which said rod moves, a spring operating to move said holder in the direction for engaging said terminals, and a wedge adapted to engage a shoulder on said rod and move the holder in the direc- 10 tion for disengaging said terminals.

4. A detector for wireless telegraphy or telephony, comprising two terminals connected with opposite sides of the detector circuit, a shunt circuit arranged around the 15 main circuit and adapted to include receivers, a spring device for moving one of said terminals against the other, a wedge device for separating said terminals, and a switch associated with said 20 wedge device and operating to bridge said shunt circuit and cut out said receivers when the detector terminals are in engagement and to cut in said receivers when the detector terminals are out of engagement.

25 5. A detector for wireless telegraphy or

telephony comprising two terminals connected with opposite sides of the detector circuit, a shunt circuit arranged around a main circuit and adapted to include receivers, a holder for supporting one of said 30 terminals and provided with a rod, a spring for moving said holder in the direction for engaging its terminal with the other terminal, a movable wedge adapted to engage a shoulder on said rod and move the holder in 35 the direction for disengaging the terminals, a slide connecting with the wedge and provided with a handle, shunt contacts arranged on opposite sides of said shunt circuit between the receivers and the main circuit, and 40 a bridge contact inovable with said slide and adapted to connect and disconnect said shunt contacts.

Witness my hand this 23rd day of August, 1910.

ROGER F. WILLIAMS.

Witnesses:

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ANNA HEIGIS.