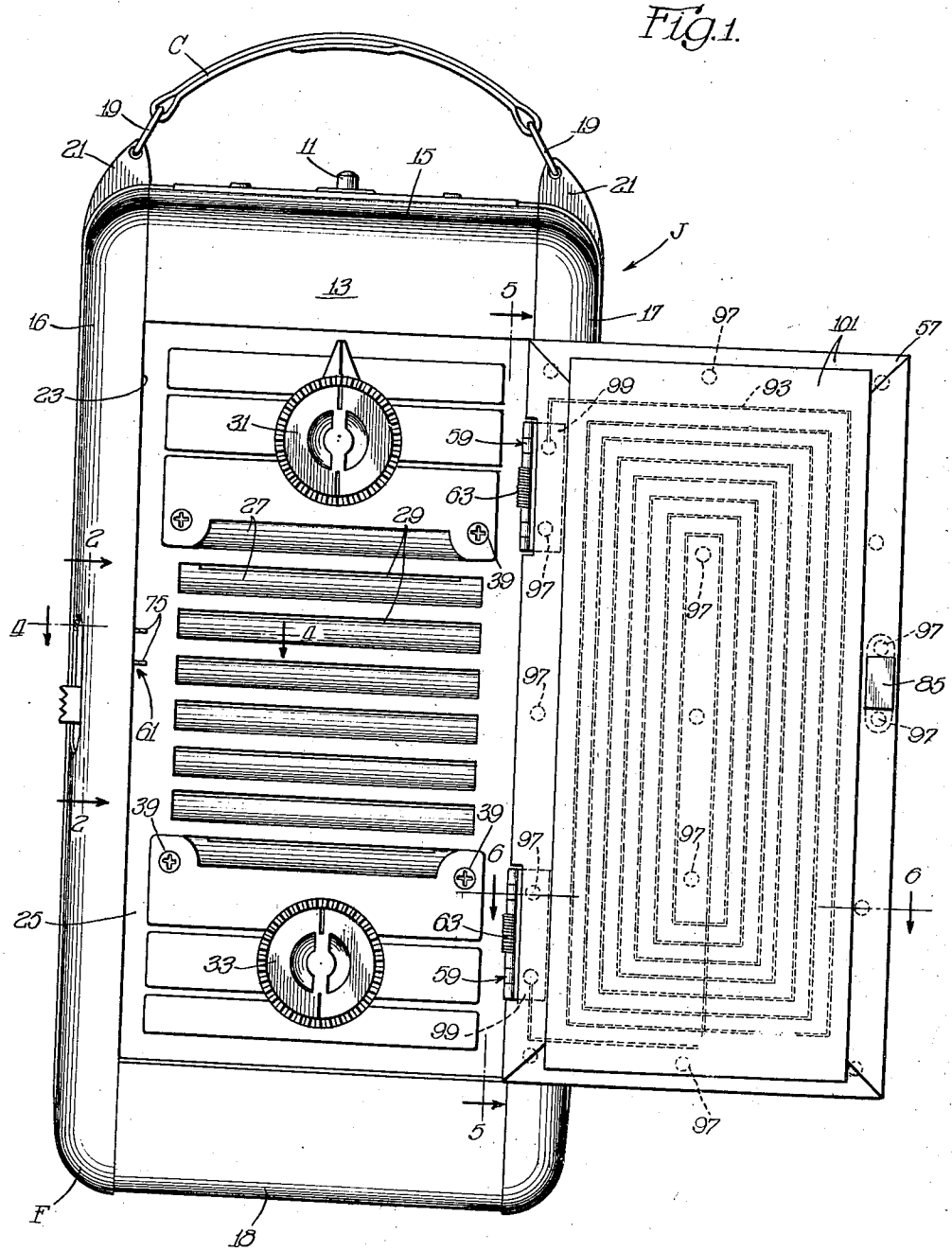
July 29, 1941. W. J. SCHNELL 2,250,936

RADIO RECEIVER

Filed March 8, 1941 2 Sheets-Sheet 1

Fig. 1.



INVENTOR.
William J. Schnell

BY Spencer, Marzall, Johnston & Cook
Attys.

July 29, 1941. W. J. SCHNELL 2,250,936

RADIO RECEIVER

Filed March 8, 1941 2 Sheets-Sheet 2

Fig. 2.

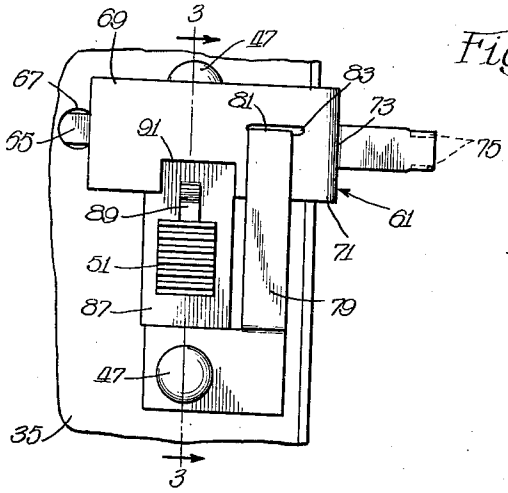


Fig. 5.

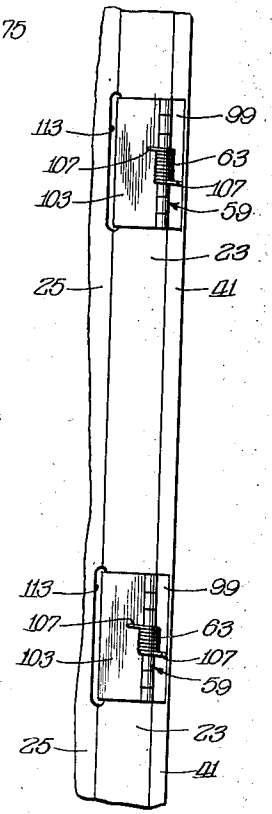


Fig. 6.

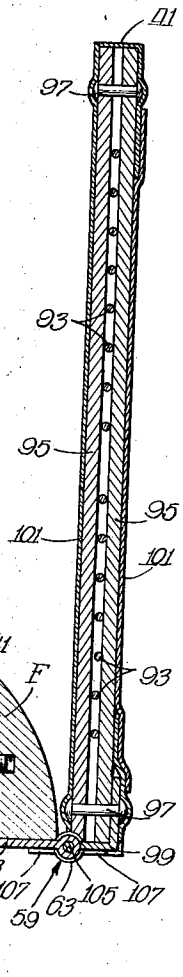


Fig. 3.

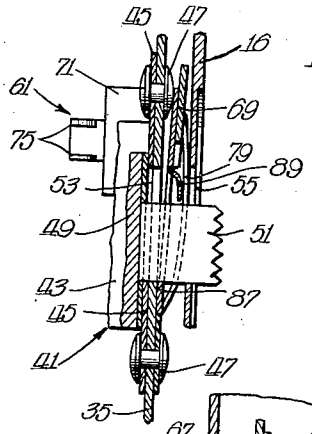
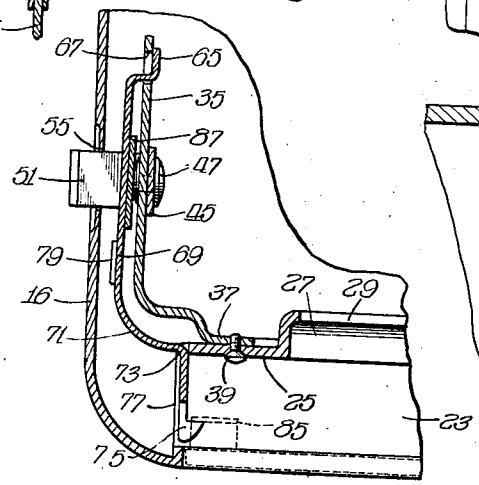
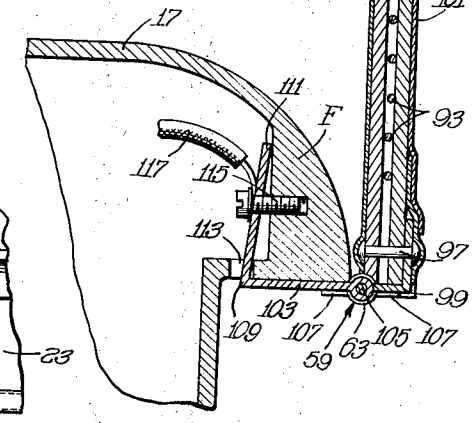


Fig. 4.





INVENTOR.
William J. Schnell

BY Spencer, Marzall, Johnston & Cook
Attys.

Patented July 29, 1941 2,250,936

UNITED STATES PATENT OFFICE

2,250,936

RADIO RECEIVER

William J. Schnell, Berwyn, Ill., assignor to Electrical Research Laboratories, Inc., Evanston, Ill., a corporation of Illinois

Application March 8, 1941, Serial No. 382,379

12 Claims. (Cl. 250—14)

The present invention relates in general to cabinets and has more particular reference to an improved cabinet for radio receiving equipment.

An important object of the invention is to provide a cabinet for radio receiving equipment having adjustable controls, including a cover normally enclosing the controls, which cover, when opened, permits access to the said controls; a further object being to provide a hinge cover having yielding means normally urging the same toward open position, in combination with a latch for maintaining the cover in closed position, whereby the cover is rendered self-opening upon release of the latch.

Another object is to provide a cabinet for radio receiving equipment, including a depressed panel for the display of manually operable receiver controls, and a cover normally enclosing the controls; a further object being to provide for latching the cover in closed position and for releasing the latch as an incident to the conditioning of the receiver for operation; a still further object being to provide an exposed switch for conditioning the receiver for operation and in connecting the switch with the cover latch.

Another important object is to provide aerial means positioned on the movable cover and electrically connected with the receiver mechanism within the casing; a further object being to utilize the cover mounting hinges as a means for accomplishing the electrical connection between the aerial and the receiver mechanism.

Other important objects and advantages reside in the construction of the cover with built-in aerial; the formation of the receiver case as a molded shell having a recess for housing the manually operable control knobs; the cover hinge structure and method of mounting the same on the molded case; and the structure and arrangement of the switch control cover latching mechanism.

These and numerous other important objects, advantages and inherent functions of the invention will become apparent as the invention is more fully understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment of the invention.

Referring to the drawings:

Figure 1 is a front view of the receiver, shown in perspective, with the cover in open position;

Figure 2 is a sectional view taken substantially along the line 2—2 in Figure 1;

Figure 3 is a sectional view taken substantially along the line 3—3 in Figure 2;

Figure 4 is a sectional view taken substantially along the line 4—4 in Figure 1;

Figure 5 is a sectional view taken substantially along the line 5—5 in Figure 1; and

Figure 6 is a sectional view taken substantially along the line 6—6 in Figure 1.

To illustrate the invention, the drawings show a radio receiver J comprising a casing F having a carrying handle C to facilitate transportation.

The casing F preferably comprises a suitable molded plastic and may conveniently be formed as a pair of co-operating sections hinged together as at the bottom of the case, latch means 11 being provided at the top of the case to secure the casing in closed position.

The present invention, of course, is not restricted to the form or construction of the casing, only the front portions of which are illustrated, said front portion comprising a front wall 13 and integral top, side and bottom walls 15, 16, 17 and 18. The handle C preferably comprises a strap attached at its opposite ends, as by means of preferably wire hinge clips 19, to handle lugs 21 formed to receive the clips 19, said lugs 21 being formed preferably as integral upstanding portions of the casing, the same preferably comprising portions of the front casing section and projecting at the junction of the top wall 15 with the opposed side walls 16 and 17.

The front wall 13 of the case is formed with a recess 23, which extends substantially throughout the area of the front wall, leaving front wall margins which merge into the top, side and bottom walls to afford a graceful and attractive appearance. The bottom of the recess 23 comprises a wall 25, the medial portions of which form an acoustical grille comprising depressions 27 and slots 29 in said depressions opening through the wall 25. The wall 25, on opposite upper and lower sides of the grille portion, forms panel means for the display of manually controlled knobs 31 and 33.

Within the casing F, radio receiving mechanism is mounted. This receiver mechanism is preferably fabricated as a unit, in accordance with current manufacturing practice, various parts being mounted on a frame or chassis 35, which includes mounting portions 37 extending at the edges of the grille in the wall 25, the chassis 35 and parts mounted thereon being secured in the casing preferably by holding screws 39 located preferably in spaced relationship at the edges of the grille, which screws extend

through the wall 25 and take into threaded sockets formed to receive them in the chassis frame 35, which is thus clampingly secured to the back of the wall 25 in position extending within the casing.

The invention is not, of course, limited to the structure of the radio receiving mechanism on the chassis frame 35, and it will be understood that the structure and arrangement of the receiver mechanism is to some extent, at least, dependent upon the size and shape of the casing, since the receiver mechanism is necessarily arranged compactly to fit within the casing. It will be understood, also, that the adjustable elements of the receiver, namely, the station selector or tuning device and the volume control device, comprise turnable shafts and are mounted on the chassis frame 35 in position to extend, respectively, through openings formed in the casing wall 25 adjacent the grille portion, so that the shafts may extend within the recess 23 in position to receive the control knobs 31 and 33, which may be press-fitted upon the ends of the shafts after the receiver mechanism has been mounted in the casing.

Operation of the receiving mechanism is controlled by suitable switch means 41, the switch mechanism being enclosed in a casing 43 forming a bracket 45 which is held on a portion of the chassis frame 35, as by the rivets 47. The switch, as shown, embodies a sliding member 49 having a manually operable control portion 51 which projects through aligned openings 53 in the switch casing and chassis frame, the switch being mounted in a frame portion extending immediately within a side wall 16 of the case F in position such that the switch control portion 51 may extend outwardly of the casing F through an opening 55 in the wall 16 in line with the openings 53.

A cover 57 is provided for covering the recess 23 when the receiver is not in use. This cover is mounted on the casing by hinges 59 disposed at a side edge of the recess 23. The casing is provided with latch means 61 at the opposite edge of the recess for holding the cover 57 in closed position. The hinges 59 embody spring means 63 normally urging the cover toward open position so that the same may open when the latch is released, thus uncovering the grille and revealing the control knobs 31 and 33.

The cover holding latch 61 is preferably connected with the control switch 41 so that the latch mechanism is in cover holding position when the switch is open and the receiver is in inoperative condition, the latch being released by switch closing movement so that the cover 57 may spring open as the receiver is conditioned for operation by closure of the switch 41. To this end, the latch means 61 comprises a detent member preferably formed as a sheet metal strip, having a lug 65 adapted for interlocking reception in an opening 67 in the chassis frame 35 adjacent the switch means 41. When inserted in the opening 67, the lug 65 pivotally secures the latch member 61 on the frame 35. The latch member has a portion 69 extending from the opening 67 transversely above the switch operating member 51, the end of the portion 69 remote from the lug 65 being curved as at 71, and bent as at 73 to form a pair of latch fingers 75 in position extending in an opening 77 in the re-entrant wall defining the recess 23.

A spring clip 79, having an end edge 81 latched in a notch 83, is mounted on the frame 35, preferably being secured on the frame by one of the rivets 47. The spring clip 79 thus secures the detent member and urges it on the frame 35 in a direction normally to resiliently project the latch fingers into the recess 23 in position to engage a latch lug 85 on the swinging edge of the cover 57.

The switch operating member 51 carries a cam plate 87 formed with a struck-out cam portion 89, said cam plate preferably comprising a flat metal sheet of rectangular configuration, having an opening for receiving the member 51 and a struck-out portion forming the cam 89 adjacent said opening. The plate 87 extends between the chassis frame 35 and the portion 69 of the latch member, the plate 87 preferably riding, at one end, on one of the rivets 47. The portion 69 of the latch member is preferably notched, as at 91, to provide an edge in position to be engaged by the cam portion 89 of the cam plate when the switch member 51 is moved to switch-closed position; but the cam 89 disengages the latch member 69 when the switch member 51 is in switch-open position. When the cam 89 engages the latch member, the latter is caused to rotate on its pivot in a direction to move the latch fingers 75 in the slot 77 in a direction to disengage the latch lug 85, thereby permitting the cover 57 to open under the influence of the spring means 63. The curved structure of the latch member provides resilience, in addition to that afforded by the spring clip 79, sufficient to permit closure of the cover 57 after the switch 41 has been opened. Upon closure of the cover, the lug 85 snaps past the detents 75, depressing the same and allowing the cover to become latched as it reaches closed position.

The cover 57, in addition to its recess closing function, is formed to provide a loop aerial for the receiver. To this end, the cover 57 comprises a support for an aerial conductor 93, preferably arranged in the form of a continuous loop mounted on the cover 57. In order to connect the aerial with the receiver mechanism within the casing F, the opposite ends of the conductor 93 are electrically connected with the cover connected portions of the hinges 59. The casing connected portions of said hinges, which extend within the casing F, are electrically connected within the casing with the receiver mechanism.

In the illustrated embodiment, the cover 57 comprises a pair of panel members 95 having the aerial conductor 93 arranged in spiral coils between the panels 95. These panels are formed of insulating material and are secured together upon the conductor coils in any suitable fashion, as by means of rivets 97, some of which also serve to anchor the latch lug 85 and the cover connected portions 99 of the hinges in place, the aerial conductor being connected on said hinge members 99 by means of the rivets. In order to afford an attractive finish, fabric pieces 101 may be applied to enclose the panels 95.

The hinges each comprise metallic plates 99 and 103 suitably connected together by means of a hinge pin 105, which also carries the hinge spring 63. The spring 63 has opposite ends 107 pressing, respectively, on the plates 99 and 103, thereby affording an electrical connection between the plates 99 and 103, in addition to the electrical connection between said plates through the hinge pin 105. The casing mounted portions 103 of the hinges extend in the recesses 23 at a side edge thereof and are open, as at 109, to provide lugs 111 which extend through slots 113

in the side walls of the recess adjacent the bottom wall 25 thereof. The lugs 111 of the hinges thus extend within the side wall 17 of the casing and are secured to the casing F by means of holding screws 115, thereby anchoring the hinges securely in place. The lugs 111 are electrically connected with suitable aerial conductors 117 connected with the receiver mechanism.

It is thought that the invention and its numerous attendant advantages will be fully understood from the foregoing description, and it is obvious that numerous changes may be made in the form, construction and arrangement of the several parts without departing from the spirit or scope of the invention, or sacrificing any of its attendant advantages, the form herein disclosed being a preferred embodiment for the purpose of illustrating the invention.

The invention is hereby claimed as follows:

1. A radio receiver comprising a casing, receiving apparatus mounted in the casing and having control elements exposed outwardly thereof, a cover movably mounted on the casing, a control switch for said apparatus, latch means actuated by said control switch, said latch means normally securing the cover in position enclosing the control elements and being operable, upon actuation of said switch, to release said cover, and yielding means normally urging said cover toward open position.

2. A radio receiver comprising a casing, receiving apparatus mounted in the casing and having control elements exposed outwardly thereof, a cover movably mounted on the casing, latch means for securing the cover in closed position enclosing the control elements, yielding means normally urging said cover toward open position, giving access to the control elements, a control switch for said apparatus, accessible outwardly of the casing when said cover is closed and movable from an inactive position to an active position, conditioning the apparatus for operation, and means actuated by said switch, when moved to active position, for releasing said latch.

3. A radio receiver comprising a casing, receiving apparatus mounted in the casing and having control elements exposed outwardly thereof, a cover movably mounted on the casing from closed position enclosing the control elements, yielding means normally urging said cover toward open position revealing said control elements, latch means for holding the cover in closed position, biasing means normally urging said latch means toward cover holding position, a control switch for said apparatus, and means operated by said switch for retracting the latch means against the influence of said biasing means.

4. A radio receiver comprising a casing formed with a recess, receiving apparatus mounted in the casing and having control elements extending in exposed position in the recess, a hinged cover movably mounted on the casing for tilting movement about an edge of said recess, spring means normally urging said cover toward open position, revealing said control elements in the recess, latch means for holding the cover in closed position enclosing the control elements in the recess, biasing means resiliently holding said latch means in cover holding position, a control switch for said apparatus, said control switch having a manually operable portion exposed outwardly of said casing when said cover is closed, and cam means actuated by said switch for retracting the latch means from cover holding position against the influence of said biasing means.

5. A radio receiver comprising a casing, receiving apparatus mounted in the casing and having control elements exposed outwardly thereof, a cover movably mounted on the casing, a control switch for said apparatus, and latch means actuated by said control switch, said latch means normally securing the cover in position enclosing the control elements and being operable, upon actuation of said switch, to release said cover.

6. A radio receiver comprising a casing, receiving apparatus mounted in the casing and having control elements exposed outwardly thereof, a cover movably mounted on the casing, a control switch for said apparatus movable between inactive and active positions, latch means for normally securing said cover in closed position, and means actuated by said switch for releasing said latch means upon movement of the switch to the active position and providing for engagement of the latch means only when said switch is moved to inactive position.

7. A radio receiver comprising a casing, receiving apparatus mounted in the casing and having control elements exposed outwardly thereof, a cover movably mounted on the casing, latch means for securing the cover in closed position enclosing the control elements, yielding means normally urging said cover toward open position, giving access to the control elements, a control switch for said apparatus accessible outwardly of the casing when said cover is closed and movable from an inactive position to an active position to condition the apparatus for operation, and means actuated by said switch for releasing said latch means when the switch is moved to active position and permitting engagement of the latch means only when said switch is moved to inactive position.

8. A radio receiver comprising a casing formed with a recess, receiving apparatus mounted in the casing and having control elements extending in exposed position in the recess, a hinged cover movably mounted on the casing for tilting movement about an edge of said recess, spring means normally urging said cover toward open position, revealing said control elements in the recess, and latch means for holding said cover in closed position comprising a lever pivotally mounted in said casing and having a latch portion adapted to extend into said recess, spring means normally biasing said lever into latching position, a control switch for said receiving apparatus having an operating portion movable in substantially a rectilinear path, a lever operatively connected with said operating portion of said control switch for substantially rectilinear movement therewith, and means cooperating between said last mentioned lever and said latching lever for moving the latching lever to un-latching position against the influence of said spring biasing means upon movement of said control switch to an active position.

9. In a radio receiving apparatus of the character described, a casing, receiving apparatus within said casing, a cover for said casing, switch means for said receiving apparatus, latching means for said cover, and means operable from the exterior of said casing and common to said switch means and said latching means for jointly controlling operation of the switch and latching means.

10. A radio receiver of the character described comprising a casing, receiving apparatus mounted in said casing and having control elements exposed outwardly thereof, a unitary cover member mounted on said casing for enclosing said control elements when the apparatus is inactive and

movable to an open position revealing said elements, conductor means forming an aerial mounted on said unitary cover member, a plurality of electrically conducting hinges pivotally connecting said cover member to said casing, latch means for securing said cover in closed position, spring means for moving said cover member to a predetermined open position upon release of said latch means, means electrically connecting said aerial to a pair of said hinges and said pair of hinges to said receiving apparatus, and switch means for controlling operation of said receiving apparatus actuated by said latch means.

11. A radio receiver of the character described comprising a casing, receiving apparatus mounted in said casing and having control elements exposed outwardly thereof, a unitary cover member mounted on said casing for enclosing said control elements when the apparatus is inactive and movable to an open position revealing said elements, conductor means forming an aerial mounted on said unitary cover member, a plurality of electrically conducting hinges pivotally connecting said cover member to said casing, latch means for securing said cover in closed position, a member operable from the exterior of said casing for controlling said latch means, spring means for moving said cover member to a predetermined open position upon release of said latch means, means electrically connecting said aerial to a pair of said hinges and said pair of hinges to said receiving apparatus, and switch means for controlling operation of said receiving apparatus actuated by said latch control member.

12. A radio receiver of the character described comprising a casing formed with a recess, receiving apparatus mounted in said casing and having control elements extending in exposed position in said recess, a unitary cover member for enclosing said control elements when the apparatus is inactive and movable to an open position revealing said elements, conductor means forming an aerial mounted in said unitary cover member, a hinge member comprising a plate of electrically conducting material having a portion extending along a side wall of said recess and an angularly related end portion extending through a slot provided in said side wall of the recess and receivable within the interior of said casing, fastening means passing through said angularly related end portion of said plate and engaging a wall of said casing for securing the hinge member to the casing, a second plate of electrically conducting material pivotally and electrically connected to said first plate, means securing said cover member to said second plate, means providing an electrical connection between said conductor means and said second hinge plate, means providing an electrical connection between said first mentioned hinge plate and said receiving apparatus, latching means for normally securing said cover member in closed position extending through a side wall of said recess opposite said hinge member, means extending exteriorly of said casing for controlling operation of said latching means, and spring means for moving said unitary cover member to a predetermined open position upon release of said latching means.

WILLIAM J. SCHNELL.