Public Telephone Cabinets In Australia

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Summary: Two papers from the Telecommunications Journal of Australia in 1956 and 1960 respectively. The first provides an overview of public telephone cabinets in Australia and the second describes the state of the art, aluminium public telephone cabinet.

Introduction

It is hard to believe that public telephone cabinets have been around since the First World War in Australia. Before the ubiquitous mobile telephone, public telephone cabinets were situated in most popular city, metropolitan and country locations. They started as grand attachments to post offices and railway stations and transformed into practical enclosures sympathetic to climate, capital cost and maintenance.

Both papers are written by Mr H J Lewis, a Divisional Engineer attached the Telegraphs and Workshops Section of Central Administration of the Postmaster General's Department.

The first paper (TJA 1) provides a summary with photographs of the striking range of public telephone cabinets that were in operation in 1956 and summarises the desirable features of cabinets at that time.

The second paper (TJA 2) from 1960 describes the development of the aluminium public telephone cabinet which was state of the art and had many advantages over its predecessors.

Public telephones were deregulated in 1989 and are now supplied by Telstra and a number of other private companies.

Despite the penetration of mobile telephones, there is community concern over the reduction and location of public telephones in Australia, which form part of the Universal Service Obligations (USO). The social benefit of public telephones with respect to these USOs is monitored by the Australian Communications and Media Authority

References

TJA 1 - Lewis, H.J. 1956. 'Review of Public Telephone Cabinets in Australia', *Telecommunication Journal of Australia,* October 1956, Vol. 10, No. 5, pp. 155-157.

TJA 2 - Lewis, H.J. 1960. 'Review of Public Telephone Cabinets in Australia', *Telecommunication Journal of Australia,* October 1960, Vol. 12, No. 5, pp. 338-341.

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REVIEW OF PUBLIC TELEPHONE CABINETS IN AUSTRALIA

*H. J. LEWIS**

Introduction

The climatic conditions in Australia vary greatly. The northern areas are sub-tropical with heavy rainfall in the coastal regions while a small highly populated area, consisting of southern Victoria and Tasmania, has a temperate climate with moderate rainfall. Generally speaking, provision has to be made for the warm conditions, as even in the coolest populated parts summer temperatures are likely to reach 100° F, while it is unusual for winter temperatures to fall much below 40° F.

Public telephone cabinets have been used extensively to relieve the shortage of private services as well as provide a public telephone service at key points throughout the cities and suburbs. They are generally good revenue-earners and so warrant attention to their design so that they provide an adequate service to the public. The cabinets are usually installed on the pavement or nature strip associated with the footway, close to the gutter or road kerb. They are also installed in banks of two or three outside railway stations or suburban post-offices where the calling rate is high.

There have been many cabinet designs built from several different materials during the last 60 years. The following sections of this review outline the chief features of the main types of cabinets still in use.

A.P.O. Former Standard Type Cabinet

This type of cabinet was introduced in 1933 and is constructed in several forms, namely—

(a) Glazed half length, 2 sides and door
(b) Glazed full length, 2 sides and door
(c) Glazed full length, all sides and door
or (d) Glazed half length, all sides and door.

Fig. 1.—Former A.P.O. Standard Cabinet, mounted on "cast in situ" Concrete Base.

The material used is chiefly wood, with galvanised-iron for roofing. The floor is linoleum-covered wood and the glazing is provided by ¼-inch drawn or plate glass. The cabinet is bolted down to a "cast in situ" concrete base. The general construction is shown in Fig. 1.

Experience has shown the following deficiencies in this design as generally used in Australia:—

(a) The wood joinery is a point of weakness and it is difficult to exclude the weather and maintain satisfactory jointing.
(b) The wood tends to rot around the lower portion of the cabinet due to ingress or absorption of moisture.
(c) The ventilation is inadequate.
(d) The cabinet requires frequent repainting (approximately every 3 years).

Several modifications have been made to improve ventilation, but they have not been adopted as standards pending a redesign of the cabinet to overcome the troubles listed under (a), (b) and (d).

Fig. 2—Steel Cabinet with Domed Asbestos-Cement Roof, and all but one row of Glazing fitted with Non-Actinic Glass.

B.P.O. Type Steel Cabinet

This type of cabinet is a close copy of the design used by the British Post Office and called Kiosk No. 3. It is made of sheet steel instead of the cast iron or concrete used by the B.P.O. Small quantities were made during the war period, but, due to failure of the surface by rust, and poor ventilation; production has been discontinued. The most notable point of design in this cabinet is the introduction of a cast asbestos-cement roof. This material has proved satisfactory and is being used on some of the recent designs. The general construction is shown in Fig. 2.

Fig. 3.—Precast "Pipe-Type" Concrete Cabinet with Wooden Door, concrete Floor forming mounting Base and Concrete Roof.

Concrete Types of Cabinet

Two main types of concrete cabinet have been made in Australia. The first of these is illustrated in Fig. 3, and was introduced in 1927. It consisted of a body made from a cylindrical precast pipe with two small half length windows and a wooden door. These cabinets had precast concrete roofs, some of which were flat with a small conical metal ventilator in the centre of the roof whilst others were conical and ornamented to represent small roofing tiles. The cabinets were fitted into a precast base which as well as providing the mounting, served as a floor. 6 x 1½ inch openings were made at floor level around the walls to act as drainage ports for the interior, and also provided ventilation, which is considered inadequate. The other type of concrete cabinet, shown in Fig. 4, was a flat-roofed, square shaped, fully glazed one which was cast in situ.

Both of these cabinets have been satisfactory from a maintenance viewpoint, although if damaged by a heavy blow such as given by a vehicle, they are

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Fig. 4—Concrete Cabinet cast in situ—Metal Door and Window.

more or less a total loss. They also have the disadvantage of requiring much "on-site" work during their installation, and are not readily shifted to another location.

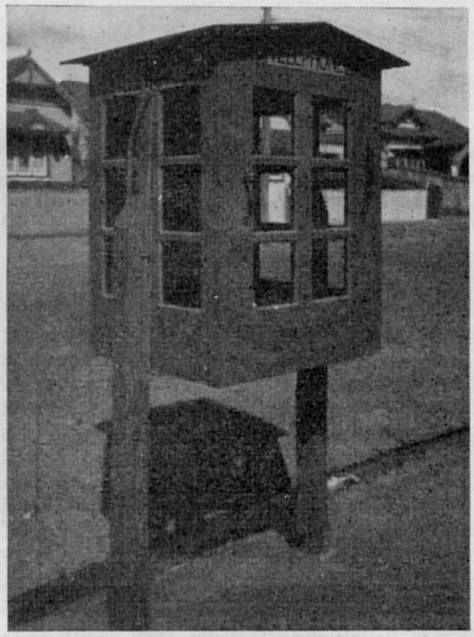

Fig. 5.—"Head-Box" Type of Cabinet Installed in New South Wales.

Head-Box Types of Cabinets

As a measure of economy and for speedy erection during the recent war period, head-box types of cabinet were introduced. As illustrated in Fig. 5, these provided protection for the equipment and shelter for the user above waist level only. They are not greatly favoured by the public, but have proved useful in locations where pavement space was not available for a full sized cabinet. These cabinets were also used in Military Camps where a temporary public telephone service was provided. Despite the usage disadvantages of this type of cabinet, its maintenance costs are very low, its ventilation reasonably good, and it can provide very satisfactory services in special locations.

Special Tropical Types of Cabinet

As well as the louvre-glazed type of cabinet described in a following section of this review, two types of wooden panel-glazed cabinets have been pro-

Fig. 6.—Tropical Type Cabinet Installed in Queensland.

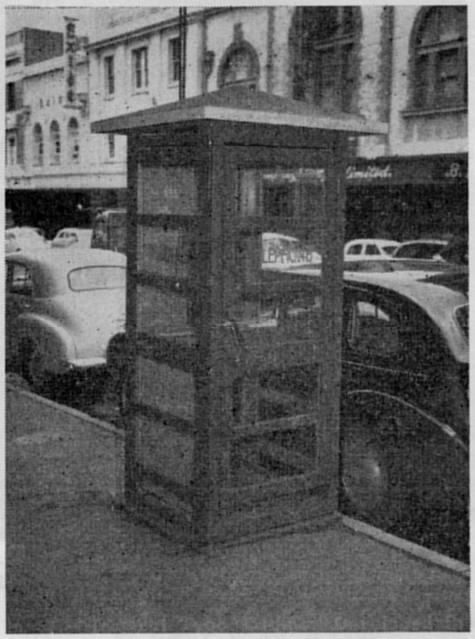

Fig. 7.—Tropical Type Cabinet Developed in Queensland in 1955.

duced in Queensland to suit the tropical climate. These cabinets are shown in Figs. 6 and 7. These cabinets have a somewhat similar appearance to the former standard cabinet. The roof ventilator has been deleted and additional ventilation introduced under the eaves. The lower glazing areas of the cabinet have been replaced with wooden louvres in one type, whilst in the later model a gap has been provided beneath the glazing areas to allow free ingress of air. The roof is galvanised iron and is unpainted. These cabinets suffer from the same faults of wood joinery exposed to the weather as the former standard type.

Recent Types of Cabinet

Two recent design changes have chiefly been related to appearance and ventilation. Domed roofs similar to those used on the B.P.O. cabinets were introduced in Victoria on the former standard type cabinet. Initially these were made with a wooden framework covered with lead sheeting. The same design was repeated with cast aluminium and also cast asbestos cement. In the latter types the ventilation area was increased in the roof by adding small cast aluminium ventilators to the gables. At the same time the ceiling and cabinet body ventilating areas were increased, which greatly improved the ventilation in the cabinet. This type of roof is shown in Fig. 8.

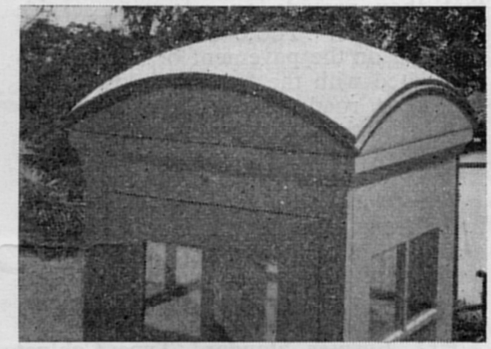

Fig. 8.—Domed Roof Used in Victoria on "Modified-Standard" Cabinets. Ventilators have been added to the Gables of recent models.

In 1951, following the manufacture of a steel cabinet of modernistic design, as shown in Fig. 9, in the Sydney Workshops, two new types of cabinet were

Fig. 9.—Experimental Louvre-Glazed Steel Cabinet Developed in New South Wales.

developed. The chief feature of these cabinets was the introduction of louvre glazing to provide excellent "cross" ventilation. Previous cabinets had been limited to a few square inches (except for the one described in the previous paragraph, which had 48 square inches) of "flue" ventilation whereas the louvres provided approximately 30 square inches on each side of the cabinet for "cross" ventilation as well as small "flue" ventilation in the roof to cool the roof cavity of the cabinet. Other features of this type of cabinet were an alternative roof

Fig. 10.—Recent Experimental Tropical Type Louvre-Glazed Wooden Cabinet.

with large eaves to provide more shade in tropical areas, improved door fittings, flush lighting, acoustic panelling around the upper portion of the walls and rubber flooring. This type is illustrated in Fig. 10.

Although this louvre-glazed cabinet appears to be satisfactory from a ventilation viewpoint, it still retains the same wood joinery principles which are a source of trouble in the former standard cabinet. It also requires frequent painting and is subject to deterioration due to wood rot around the lower portion of the cabinet.

Pending development of a cabinet of durable material, probably cast aluminium, the louvre-glazed cabinet with the domed roof shown in Fig. 11 has been adopted for present manufacture. Modifications have been incorporated in this cabinet which will limit some of the causes of deterioration previously experienced and enable all fittings to be made on a production basis. Previously the practice has been to purchase the basic cabinet shell and add the fittings at the time of installation. This is a costly practice which permits variations in methods of fitting the equipment and so spoils the appearance of the cabinet as well as developing unstandard arrangements. The chief modification introduced to the structure is the elimination of the wooden floor, one of the parts with the most wear and deterioration. In future this cabinet will be mounted directly on a concrete base with a durable surface, by four angle-iron pillars with a 1½ inch gap between the sides of the cabinet and the base. This method of mounting will isolate the wooden sides from the ground and reduce the failure on the lower rail due to capillary seepage of moisture, as well as provide a durable floor which can be readily cleaned.

Artificial lighting is provided by a flush panel fitting mounted in the ceiling, and the ceiling and upper portions of the wall are covered with an acoustic treatment which greatly reduces the "drumminess" of the cabinet and absorbs the external noise. The notice sign "Telephone" is provided on the top glass louvre by a sandwich joined with an epoxy resin adhesive. The lettering is a fused ceramic paint on the inner surface of the outer glass, with black characters on a yellow background. Provision is made for hidden light and communication cabling with two wooden corner strips rising up both the back interior corners of the cabinet. Cables can be brought in underground through these corner strips to the light and instrument, or where necessary, can also be brought in overhead, although the latter arrangement is not favoured.

Fig. 11.—Recently Adopted Louvre-Glazed Wooden Cabinet.

Summary of Desirable Features for Cabinets

The following points appear to be the desirable features for public telephone cabinets for the majority of the settled areas in Australia and for the greatest portion of year—

(a) Good ventilation is essential, with complete natural replacement of the air inside the cabinet at frequent intervals.
(b) Good natural lighting in the daytime and adequate artificial lighting after sunset which can be maintained by the street-lighting patrol.
(c) A complete view into the cabinet from all directions. This is necessary to limit vandalism and misuse of the cabinet.
(d) A floor surface which is durable and does not require repetitive protective treatment.
(e) An exterior surface which is durable and does not require repetitive protective treatment.
(f) Construction with materials which will withstand weather without deterioration, are readily available, repairable and can be fabricated without complex processes.
(g) Readily discernible by the public and yet aesthetically designed to harmonise with local buildings.
(h) Readily transported, erected or shifted.
(i) The fittings subject to damage such as windows, door fittings and lighting fixtures should be designed to facilitate quick replacement or repair in the field.
(j) Acoustic properties which limit the ingress of noise and the egress of conversation.
(k) Door to provide easy entry into the cabinet and easy access for cleaning.
(l) Shade, either by provision of eaves on the roof of the cabinet, or by placing the cabinet in a position where it is shaded by adjacent buildings or trees.
(m) Adequate designation signs either attached to the cabinets, or mounted on buildings or posts to direct callers to the public telephone.
(n) Provision for tidy and easy entry of lighting and transmission cables.
(o) Provision for interference-proof mounting of the equipment with fittings that are built into the cabinet.
(p) Easy access to the coin box for clearance purposes.
(q) Built-in notice frame and directory shelf.
(r) Interior of cabinet to be easily cleaned, finished in a hygienic manner and be not easily disfigured or damaged.

THE AUSTRALIAN ALUMINIUM PUBLIC TELEPHONE CABINET

*H. J. LEWIS**

INTRODUCTION

Public Telephone Cabinets are one of the three prominent structural facilities which the Postmaster-General's Department provides for public use. The other two are Post Offices and street Letter Receivers.

Not only is it essential that these facilities are efficient in their use and aesthetic in their appearance, but they must be durable and economical to provide and maintain.

This latter aspect has always presented a difficult engineering problem in regard to telephone cabinets, due to the number of variable influences such as climate, location, vandalism, and durability of materials.

In 1957, a committee was established to examine this problem and provide a cabinet suited to the Australian conditions. The original committee consisted of:—

Chairman: Mr. B. Edwards, Supervising Engineer, Telegraphs and Workshops.

Members: Mr. R. Lamb, Supervising Engineer, Melbourne Workshops; Mr. W. Murrell, Assistant Controller, Telecommunications Division; Mr. W. Waterworth, Senior Buildings Officer; Mr. A. McPherson, formerly Sectional Engineer, Telephone Equipment, now Superintending Engineer, Services, Victoria.

Mr. Edwards and Mr. Murrell have retired recently and Mr. McPherson transferred to other duties. These members have been replaced by:—

Mr. K. Smith, Sectional Engineer, Telephone Equipment.

Mr. L. Garrioch, Sectional Engineer, Workshops.

Mr. K. Richardson, Assistant Controller, Telecommunications Division.

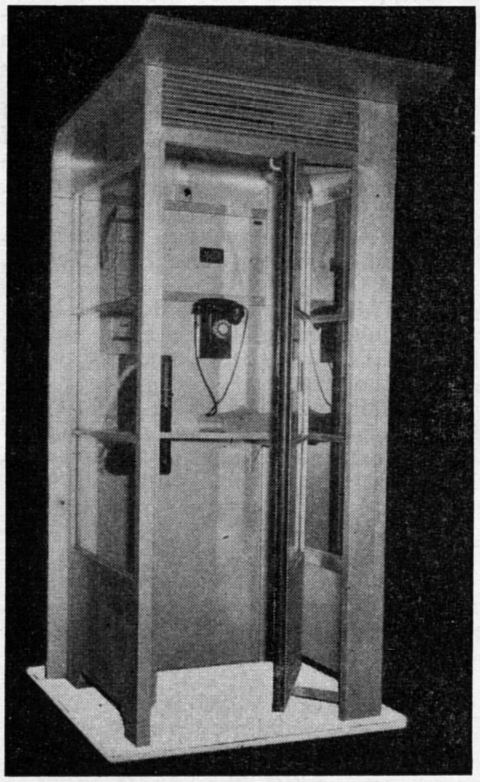

Fig. 1.—The Australian Aluminium P.T. Cabinet. This cabinet is at present installed at the corner of Spring and Collins Streets, Melbourne.

* See page 379.

PREVIOUS TYPES OF AUSTRALIAN CABINETS

Before describing the aluminium cabinet, a brief look at some of the previous designs and their weaknesses is of interest.

Early cabinets were usually built as attachments to post offices. They were made solidly with a small amount of glazing, poor lighting and ventilation, and, because of their bulk, were unsuitable for installation in residential streets. Fig. 2 shows a typical cabinet of this era.

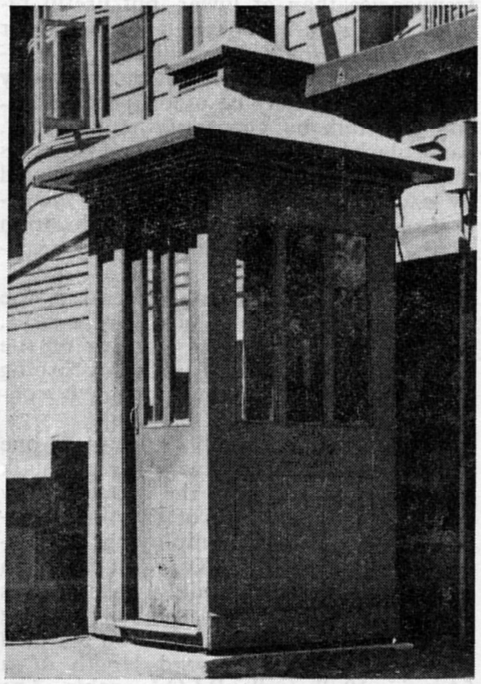

Fig. 2.—Early Wooden Half-Glazed Cabinet.

Subsequently, several designs of reinforced concrete were tried, some of which are still in existence (see Fig. 3). However, this material failed either due to corrosion of the reinforcing material, the weight of the cabinet causing subsidence of the footpath, the difficulty in repairing the concrete if damaged by a vehicle, or impossibility of moving it to a new site.

Pressed steel cabinets were also tried, but they cannot be considered successful due to the high cost of combating corrosion. In 1935, a wooden cabinet with fixed glazing in four styles was produced.

Style (a) Glazed all sides full length.

Style (b) Glazed three sides full length.

Style (c) Half-glazed all sides.

Style (d) Half-glazed three sides.

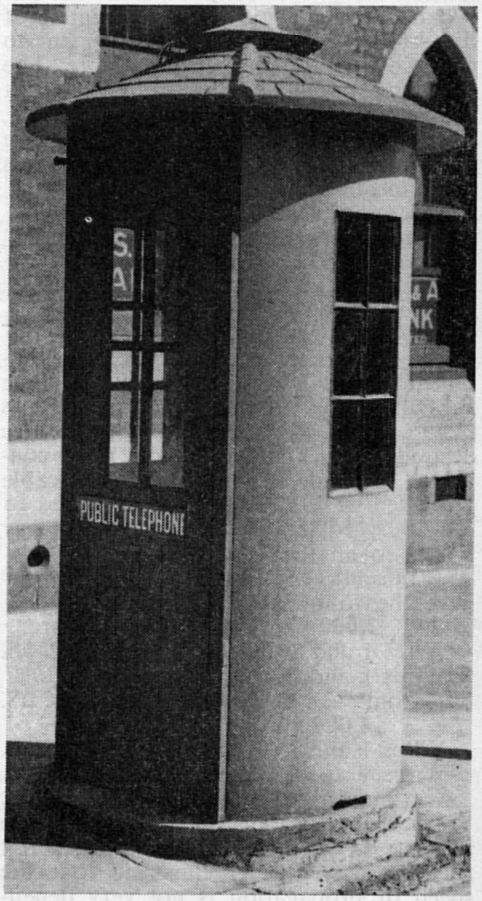

Fig. 3.—Reinforced Concrete Cabinet.

This type of cabinet originally had a hip-type roof with a lofted ventilator and wide eaves. Later models had a domed roof of either lead-covered timber, aluminium or asbestos-cement.

The cabinet was poorly ventilated, had a wooden floor which was subject to rot, particularly if the cabinet was mounted on wooden plinths and required frequent repainting to preserve it. Even so, the joinery in the lower portion of the sides and back failed due to capillary entry of ground moisture.

Many of the faults of the early wooden cabinets were reduced or eliminated in 1956, in the present wooden louvre-glazed cabinet. The wooden floor was omitted and the cabinet mounted on four metal angle brackets 1½″ above the concrete floor-base. Durable timber was specified, iron-work protected, and the lighting and acoustics improved with a flush-fitting and acoustic lining in the

ceiling. The louvre glazing provided most of the ventilation, and was assisted by ventilation through the ceiling and under the 1½″ gap between sides and floor.

However, it is still necessary to repaint these cabinets at regular intervals to preserve their appearance and ensure long life for the joinery.

Fig. 4.—Wooden Cabinet with Fixed Glazing, Style (a).

DEVELOPMENT OF THE ALUMINIUM CABINET

In the light of this experience, the committee examined many overseas designs of cabinets, new materials (including plastics), and methods of manufacture which would allow "packaging" of a cabinet for long-distance transport.

At the outset, the requirements of a cabinet were determined by the committee, and are listed hereunder:—

Economics.

(i) Low maintenance costs.
(ii) Long site life.
(iii) Low installation, transport and storage costs.
(iv) Minimised first cost.
(v) Restriction of types, preferably to one.

Design.

(i) Easy to use.
(ii) Good ventilation.
(iii) Effective lighting, natural and artificial.
(iv) Readily discernible to the public.
(v) As good acoustic properties as possible.
(vi) Door to provide protection and privacy.

Technical.

(i) View into cabinet from at least three directions.
(ii) Design to suit shaded locations.
(iii) Provision for tidy and easy cable entries.
(iv) Protection of equipment.
(v) Easy access for coin clearance.
(vi) Built-in notice and directory shelf.
(vii) Cabinet to be easily cleaned.

A range of designs was prepared to enable the committee to consider this technical information in relation to both the desirable features, previously listed, and aesthetic, manufacturing, installation and usage viewpoints.

The previous practice of colouring departmental cabinets red was, by permission, departed from in the design of the new cabinet. This removed one of the main restrictions which had previously limited the improvement of cabinets. After survey of available materials aluminium was chosen as the material which fulfilled most of the requirements. This material blends well with present-day architecture, is readily procurable and workable, and offered a durable finish at reasonable cost.

Fig. 5.—Louvre-Glazed Wooden Cabinet.

The committee's first design of cabinet had a curved roof, solid back, fixed glass panelled sides and door, the latter folding into the cabinet, and a concrete base forming the floor.

Fig. 6 is an architectural sketch first depicting the new design.

Trial folding doors were fitted to wooden cabinets in service and their operation studied. Due to the strains that are placed on this type of door, the fault incidence was high and the welded joints tended to fail. It was observed that if a user had collapsed in the cabinet it was a near impossibility to gain access without dismantling or damaging the cabinet. Also, extra floor space is required for this type of door.

However, one feature which proved its worth was the partial opening of the door in its normal position. This feature has been retained on the present door but folding action has been abandoned.

A major contribution was made to the design of new cabinet by the development of a special door by Mr. L. C. Gemmell, then Sectional Draftsman of the Melbourne Workshops. The body of the door is a single panel which is pivoted on cantilever arms in such a way as to allow the door to swing inside and along the right hand wall of the cabinet. The door is stabilised and its movement controlled by an arm fixed to it and sliding in a track above the door frame. Fig. 7 shows the various positions of the door. A spring in the upper door pivot returns the door to its normal position. The door may be closed completely by a gentle push from the inside. No lubrication is required for the mechanism as Nylon is used for the bearings and slipper.

A spring at the hinge end of the guide track absorbs the opening jar of the door. The spring at the other end of the guide track normally holds the door partly open, but when the door is fully closed it acts to locate it in that position.

The aluminium-sheathed plywood used on the back and roof consists of waterproof plywood with a heat-bonded aluminium sheath. An aluminium capping, applied with aluminium screws and epoxy resin, seals the edge of the plywood. The surface of the aluminium on the inside of the cabinet is embossed with

Fig. 6.—Sketch of the First Design of Australian Aluminium P.T. Cabinet.

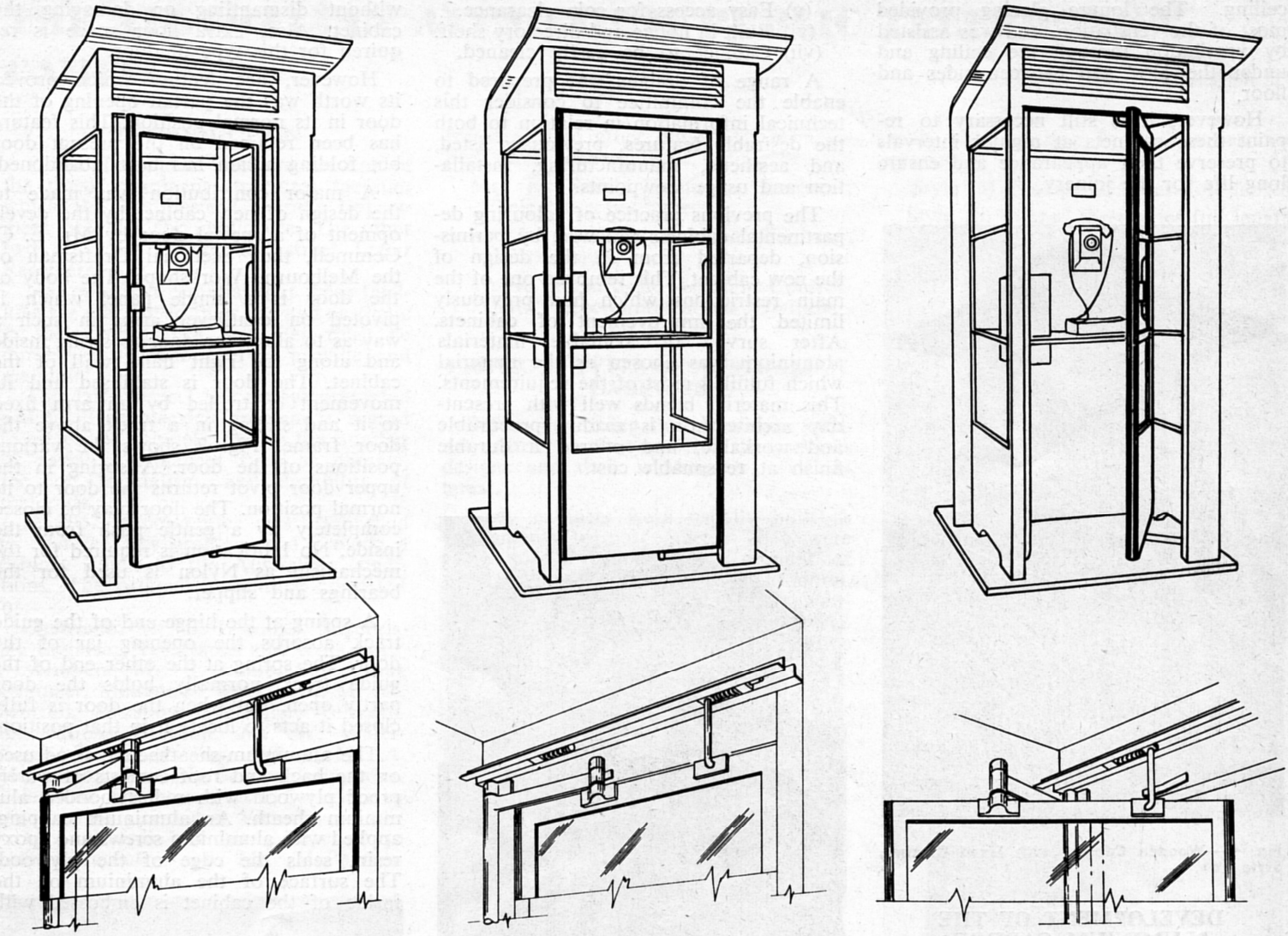

Fig. 7.—Various positions of the Gemmell Door.

(A)—Normal Position. (B)—Fully Closed Position. (C)—Fully Open Position.

a mesh pattern to restrict writing thereon, and the exterior is wire-brushed to give a satin finish.

The sides, floor, and door frame are constructed of special aluminium sections made of alloy AA 50S-T5, and ⅛″ sheet aluminium alloy AA 65S-T6. The first cabinet was made by welding these sections to form the desired framework. However, distortion was difficult to avoid and a fabricated assembly was designed, using the shapes of the sections to lock them together. The top and lower ⅛″ panels of the sides are respectively screwed and rivetted in position after the horizontal members have been fitted using self-tapping screws.

Glass in the sides and door is mounted and held in position by a "Neoprene" Strip designed for the purpose. This strip holds the ¼″ plate glass firmly but without pressure. The Neoprene strips and glass panels are held in position by aluminium strips which lock each other in turn, the final one being secured by one screw in the top strip of each panel.

The edges of the door are fitted with a rubber buffer strip. This eliminates any possibility of injury to fingers caught in between the door and the door frame. Also, it provides a weather seal when the door is closed.

The directory shelf is made of plywood with a mottled grey synthetic veneer covering on the face and edges. The shelf is mounted on right-angle brackets fixed to the back of the cabinet.

The coin attachment is mounted on a metal backplate previously screwed to the aluminium-sheathed plywood. One of the advantages of the latter material is that its wooden core provides a good medium for mounting the instrument, notice frame, ducting, etc.

Communication wiring is brought into the cabinet at ground level and runs in an aluminium duct up the right-hand back corner of the cabinet and across the back face to the wall-mounted telephone instrument and coin-attachment.

Lighting is provided, at present, by an incandescent lamp fitting centrally mounted on the ceiling. Supply wiring enters the cabinet at ground level passing up ducts in the left-hand corner of the cabinet, then across the back of the cabinet to a small switchboard, and then across to the light fitting. It is hoped to use fluorescent lighting when arrangements have been made regarding lamp replacement.

Ventilation is obtained in two ways. The door remains partly open when the cabinet is not in use and allows fresh air to continually enter the cabinet. When the door is closed, the 4″ gap between the sides and floor, and the louvre ventilator over the door, continue to provide ventilation to the user.

A fused ceramic symbol on the upper glass pane of each side provides an international notice for the public of the purpose of the structure.

Twelve of these cabinets have been made and are being field-tested throughout the Commonwealth. Six of the

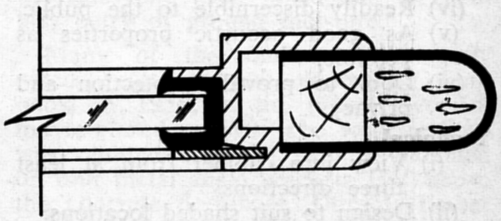

Fig. 8.—Section Through Door style showing "Neoprene" Glazing Strip Rubber and Buffer Strip.

twelve are finished with an anodised surface and the other six have a coating of Butyrate lacquer. Whilst the anodising process provides a very hard and durable surface, it is expensive and may not be justified, but the field tests will decide this matter.

PROPOSED MODIFIED DESIGN WITH FLAT ROOF

Examination of the costs of the present design of cabinet has led the committee to the development of a modified version with a flat roof without the overhanging back and roof. The louvre ventilator above the door has been omitted, and ventilation is provided by suspending the roof on angle brackets 1½" above the sides of the cabinet. Storm water is shed at the back of the cabinet.

Fig. 9 is a sketch of the proposed new model. The committee is continuing

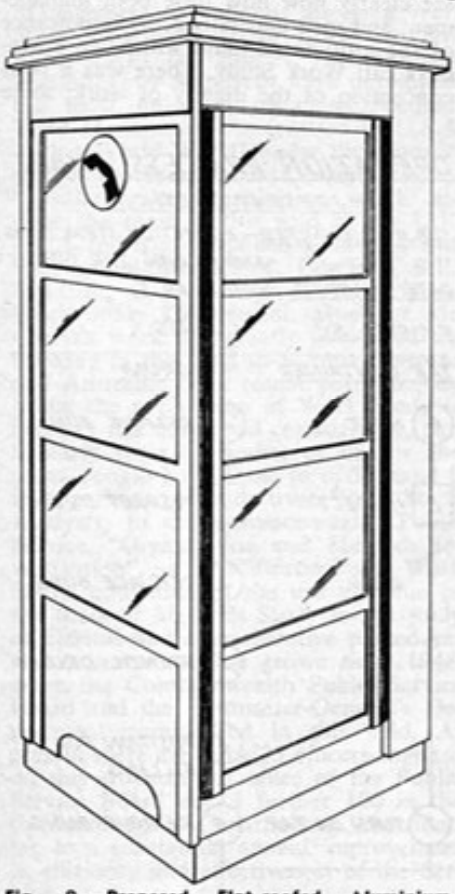

Fig. 9.—Proposed Flat-roofed Aluminium Cabinet.

development of this cabinet during the field trials of the other twelve. Reports and observations on the first cabinet have indicated that a big step has been taken towards the design of a cabinet which will meet the requirements of Australian conditions, be a serviceable cabinet, and have minimum maintenance requirements. No doubt further improvements will be made after the field trials, and another article will be published when design is finalised.

Acknowledgment

The author wishes to thank Mr. L. C. Gemmell for his assistance in preparing this article.

H. J. LEWIS, author of the article "The Australian Aluminium Public Telephone Cabinet" is a Divisional Engineer in the Workshops Section at Headquarters. He joined the Department as Radio Technician in 1939 and worked at the Melbourne Broadcast Studios and Lyndhurst Radio until qualifying as Engineer. Mr. Lewis then served in the Outer Metropolitan Lines Division during 1946-47, and in the Melbourne Workshops as Engineer and Divisional Engineer, Design and Plant, for the following four years. Subsequently he has been in the Workshops Section at Headquarters in various duties of Planning and Production work, and recently on Plant and Workshops Practices. Mr. Lewis had practical experience in the manufacture, installation, and maintenance of Telephone Cabinets, whilst at the Workshops and has since served on the Committee which designed the present louvre-glazed wooden cabinet. During the recent illness of Mr. Edwards he acted as Chairman of the Committee which designed the new aluminium cabinet.

H. J. LEWIS