

AUSTRALIAN AND NEW ZEALAND TRAMWAYS CONFERENCE.ADELAIDE - SEPTEMBER 1931.ONE-MAN CARS IN GEELONG.

In September 1924 we placed in service at Geelong two Birney Safety Cars manufactured by the Brill Company of U.S.A.

This was our first experience with One-man cars and the results obtained under most service conditions have been both satisfactory and economical. At first, however, and until the public had become used to the cars and educated to the necessity for providing themselves with the correct fare, delays were caused, with the result that there was difficulty in keeping to the ordinary Two-men car running schedule. In fact, at peak load periods this was found impossible, especially as all cars pass through the main street of the city, this street constituting the tramway traffic centre, and following Two-men cars were there held up at such times. Once, however, the public had become used to the cars the work of the Driver-Conductor was greatly simplified, and the difficulty with regard to the maintenance of the running schedule mitigated to a very considerable extent.

From the experience gained with the two Birney cars we were able to definitely determine that, even with our existing fare system and time tables, it was practicable to operate One-man cars during slack periods of the day, and in view of the necessity for cutting down expenditure as far as possible it was therefore decided to convert a number of our combination cars to make them suitable for One-man operation.

The type of car selected for alteration is shown in the attached sketch plan and photographs. It is of the single truck 6'6" wheel base, drop sill type, is 31' overall, is fitted with two 45 h.p. 225N. Westinghouse motors and Air Brake equipment, and has seating accommodation for 36 passengers (16 in the saloon and 10 on the transverse seats at each end).

After giving due consideration to several alternative methods it was finally decided to rearrange the transverse seats at the open ends of the car as shown on the plan. This arrangement, whilst reducing the seating accommodation from 36 to 34 passengers, made it possible to effect the change, without altering the original position of the seats, by merely cutting back the seat adjacent to the Motorman's bulk-head, with the provision of an 18" opening in the centre of the other transverse seat to provide a gangway, the seating accommodation in the saloon being left untouched. That portion of the seat against the Motorman's bulk-head which had been cut away was then re-used to provide two single seats placed one at each side between the saloon bulk head and the first transverse seat. It will be observed that had the seats been placed longitudinally in a manner similar to that in which the seats are placed in the saloon, standing passengers would have occupied the vacant floor space, with a consequent blocking of the passage-way in and out of the car.

The next step was to move the stanchion at the left hand end of the Motorman's bulk-head back to the next adjacent roof rib. This, without weakening the coach work, provided a 2'5" doorway for passengers to enter or leave the car, and was considered desirable, as the original opening of only 1'7" wide had proved somewhat too narrow a space to be convenient.

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The open sides were then panelled to a height of 3'2" in line with the saloon window sills, as is shown in the photographs. After fixing in position a suitable top rail or sill, this panelling was carried out in $\frac{1}{2}$ " redwood covered with 22 gauge galvanised iron. The saloon rail was continued over this outside panelling, and three ply boarding was used on the inside to give a finished effect.

Weather blinds were provided to close in the space above the panelling at the ends of the car; these were constructed to run in grooves at each side in such a way that it would be impossible for them to be blown out by the wind. A flap is fitted at the bottom of each weather blind to act as a watershed over the outside of the sill at the top of the panelling. Necessary alterations have also been made to the spouts and grab rails.

To simplify cleaning, the transverse slats with which the floor in the open ends had previously been covered were removed and replaced by malthoid covering, such as used in the saloon.

Owing to the fact that centre poles are in use along portions of the track, it was essential that some special provision should be made in order that passengers could not enter or leave the car by the rear end or stand on the rear step. The original steps extending over the length of the open ends were accordingly removed and short steps about 3 ft. long installed in their place, these steps being hinged to allow of their swinging up when not in use.

To barricade the opening at each end an expanding metal grill was designed with a hook attachment, which, when the grill is extended across the opening, drops into a special locking device operated

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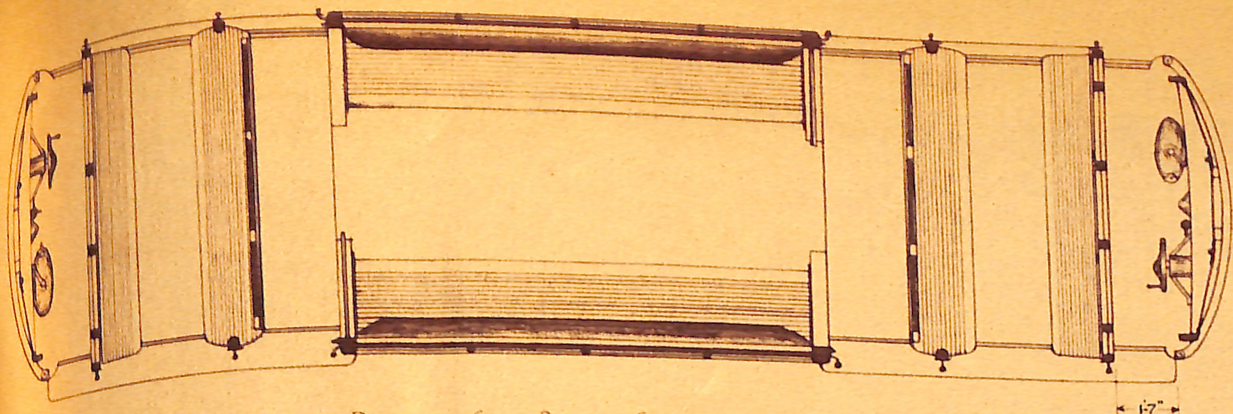
by the Motorman's controller reversing key. This locking device, which consists of a simple eccentric movement, serves two purposes; first of all to prevent passengers from opening the grill, and secondly to ensure that it is tightly against the stops provided, thus preventing any rattling. The grill is arranged to swing through about 90 degrees when fully contracted so as to lie against the dash of the car and not be in the way of passengers entering. By means of a lever system manufactured partly from Ford Model "T" steering gear parts and placed under the floor of the car, this swinging movement has been made use of to simultaneously operate the step so that when the grill is pulled across and closes the car entrance the step is accordingly swung out of use. The linking of the step with the door grill ensures that the Motorman cannot change ends without being certain that the steps and grills are in the correct position. A detailed sketch showing the arrangement is attached.

In accordance with the convention of equipping One-man cars with a "dead-man's" handle as part of the control, a complete set of equipment of the Westinghouse type was fitted to one of the cars. The question, however, arises as to whether the extra expense involved, viz. £72, is warranted, and comments from members regarding this point would be appreciated. Whilst the author has been associated with the use of One-man cars for seven years, there is no evidence up to date of any occasion on which the device in question can be deemed to have averted an accident. Generally speaking the converted One-man cars under review, which have been in service for several months, have not indicated that there is any necessity for the provision of the "dead-man's" handle. In fact, the absence of the

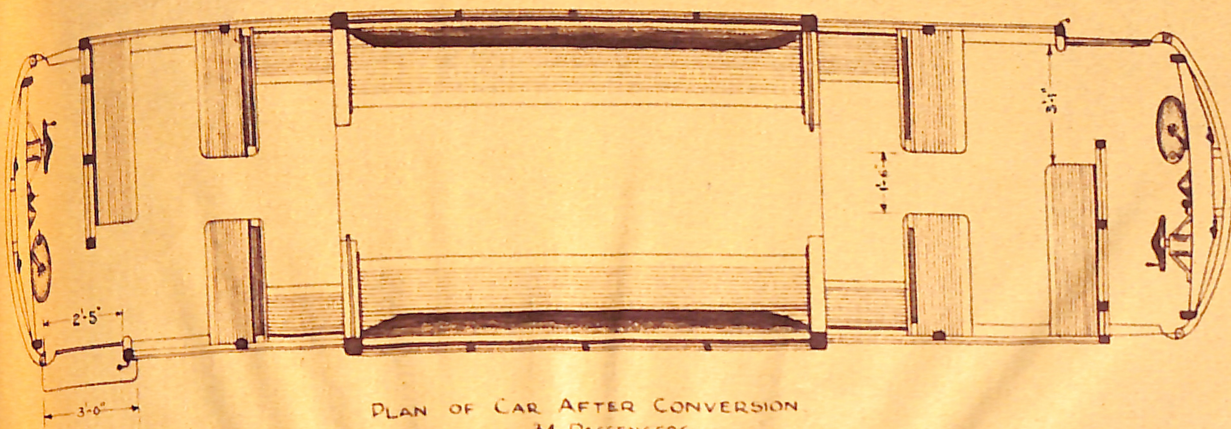
special safety devices which form an integral part of the Birney cars is more of an advantage than otherwise; and motorman-controlled doors do undoubtedly cause delays in traffic.

The total cost of altering the cars as described amounted to £135 per car, omitting the "dead-man's" equipment.

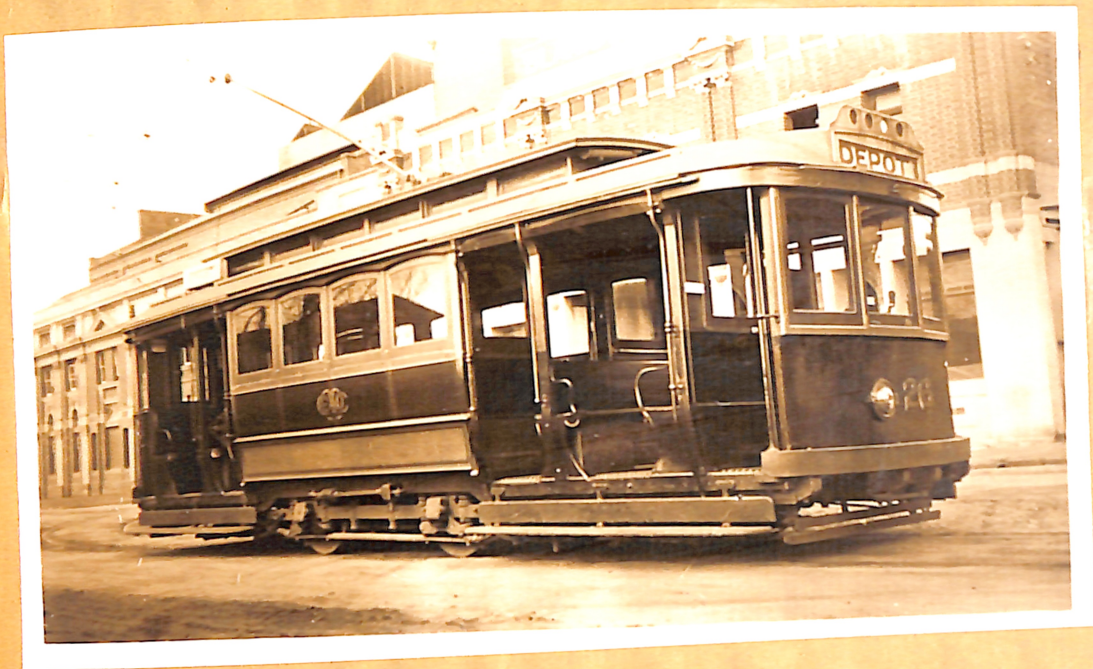
So far the results obtained by converting the ordinary type of combination car to such of the One-man type are, in the light of present economical considerations, sufficiently encouraging to justify the intention of extending the use of One-man cars wherever it is possible to do so. The question as to the limits of their use or as to whether or not they will be generally adopted throughout is governed by what the future will bring forth as regards increases or decreases in the tramways traffic. Whilst the cars as altered can be operated with one man, their efficiency as regards Two-men operation is not greatly impaired, it being possible to use them as One-man cars during the slack periods, and to send a Conductor out with them during busy times of the day. So far we have not had to dismiss any men in consequence of the adoption of the One-man system, but for some time past no vacancies have been filled, and it is hoped that the natural wastage will enable us to extend the One-man system without any large number of dismissals.



PLAN OF CAR BEFORE CONVERSION—
36 PASSENGERS.



PLAN OF CAR AFTER CONVERSION
34 PASSENGERS.

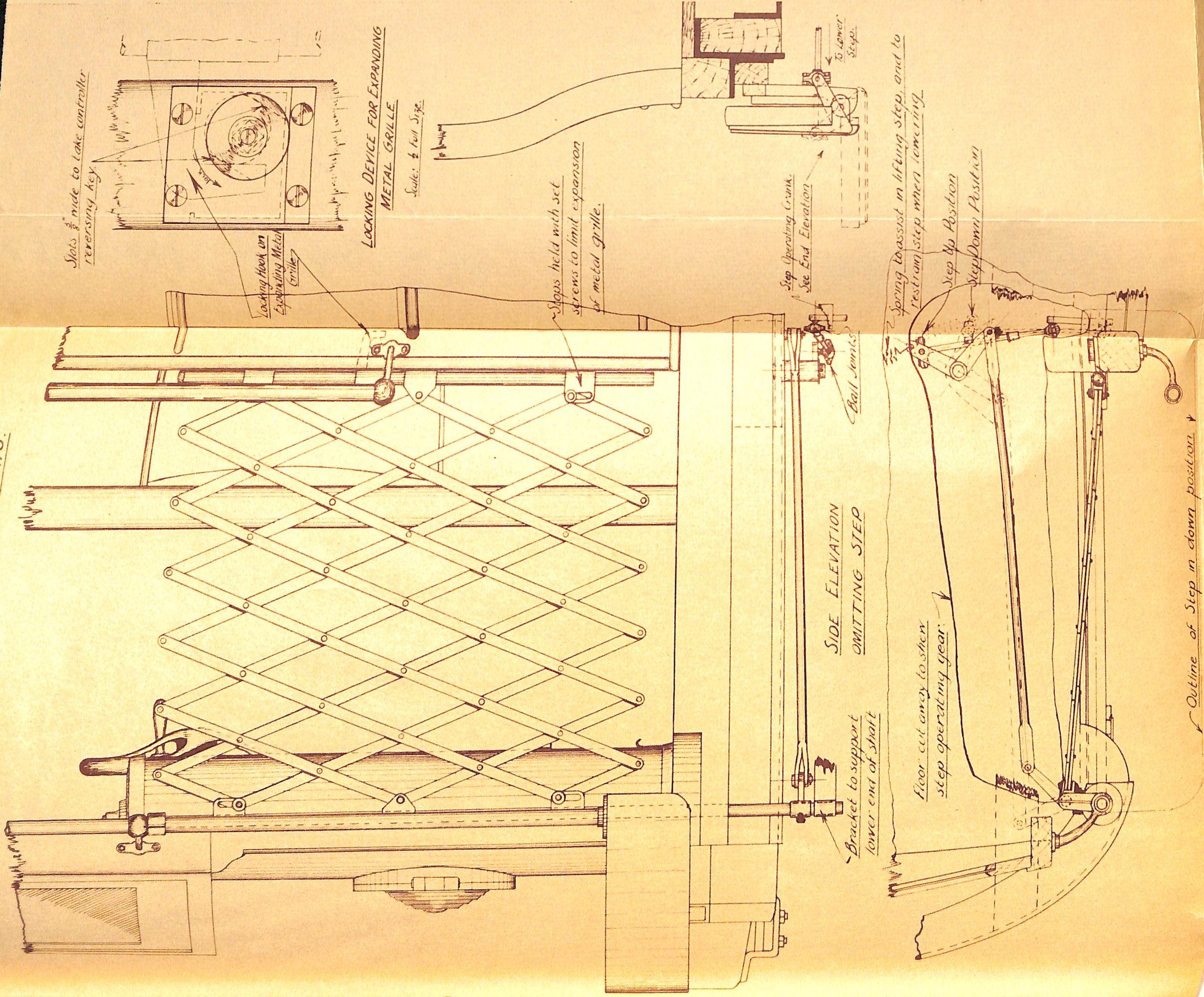


BEFORE CONVERSION

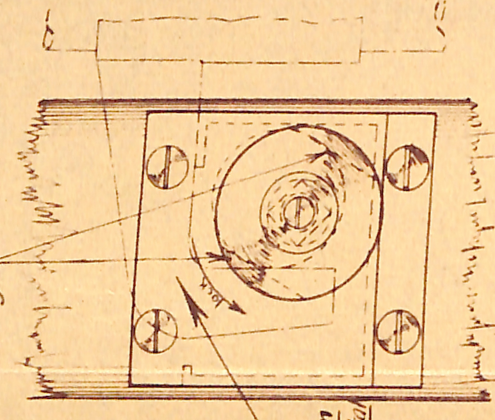


AFTER CONVERSION

GEELONG ELECTRIC TRAMWAYS.



Slots $\frac{3}{8}$ wide to take controller reversing key.



LOCKING DEVICE FOR EXPANDING METAL GRILLE.

Scale: $\frac{1}{2}$ full size.

Locking hook on Expanding Metal Grille.

Stops held with set screws to limit expansion of metal grille.

Step Operating Crank. See End Elevation.

SIDE ELEVATION OMITTING STEP

Bracket to support lower end of shaft.

Floor cut away to show step operating gear.

Spring to assist in lifting step, and to restrain step when lowering.

Step Up Position

Step Down Position

Outline of Step in down position.

PLAN

PORTION OF END OF CAR, SHOWING EXPANDING METAL GRILLE AND STEP OPERATING GEAR.

Scale: $\frac{1}{2}$ " = 1 Foot

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APPENDIX TO PAPER ON ONE-MAN CARS IN GEELONG.
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Read by R. H. Meakin, A.M.I.E. (Aust.)

ADELAIDE - SEPTEMBER 1932.
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Since this paper was prepared, the use of the one-man system has been extended. It was decided that, as there was no indication that traffic would increase at the beginning of the financial year commencing July 1931, in our relatively small and therefore restricted system, we would alter sufficient cars to provide for the whole of the tramway service being operated with one-man cars, from first thing in the morning until noon, and from 8 p.m. until the service was shut down each night at about 11.30 p.m., also during the whole of Sundays. From noon until 8 p.m. on week days the cars are operated with two men.

Owing to the fact that the same cars would need to be used throughout the day, we found it necessary in order to provide for peak loading to equip all the converted cars with an additional entrance for use only when the car was worked by two men. Two entrances were placed so that the one which needed to be open would be at the rear of the saloon between the transverse seat and the saloon bulk-head on what might be termed the "near" side of each car. An expanding metal grille was provided for each opening, similar in design to the ones used on the ends of the cars. This grille was also linked to the step, which was made the same length as the front one, by a lever and bell crank mechanism so that as the grille was expanded from the side post to the saloon bulk-head the step was simultaneously pulled

to the "up" position. To hold the grille in its expanded position, a simple spring plunger was provided which dropped into a hole in a plate fastened to the floor of the car, and which worked up and down in the $\frac{1}{2}$ " pipe used as the side member of the grille.

The installation of these additional openings in the cars made it necessary to do away with one of the two short longitudinal seats at each end of the cars where the openings are situated.

The system of using one-man cars throughout during the slack periods of the day, and the same cars operated by two men during the hours between noon and 8 p.m. when traffic is more brisk, has proved entirely satisfactory. Whilst the total number of passengers carried shews a slight decrease, this is not attributable to the use of one-man cars. Practically no alterations had to be made to the time tables or to the fare system, and whilst there were a few complaints from the public, on investigation we found that these were largely engendered by friends of some of the men whom we unfortunately found it necessary to dismiss.

Mr. Meakin: I would refer particularly to the necessity, or otherwise, for using the Dead Man's handle and would ask Members to discuss this. An appendix to this paper, which was originally written about 18 months ago, gives later information and is attached as part of the paper.

Mr. Maddocks: Do you charge a flat rate fare?

Mr. Meakin: No. One penny per section; pay as you enter. Check system. Passengers hold check whilst in car. There is no real objection from motormen as regards doing the combined work of driving and conducting. We do not make them nip the check when the one-man car is in use. The check shows both a number and a letter.

Colonel Hancox: We have operated one-man cars for eight years. The first cars were run on a route of two sections; we had a 2d. and 3d. section. It was a short 3d. section. There was a constant agitation for the section to be reduced to 2d. and we agreed that if the local Progress Association would assist the men in one-man car operation. The chief difficulty was in the collection of fares and the giving of change. The Progress Association helped considerably in that matter and no difficulty was experienced. We have since extended their use and the fare system consists of ordinary cash fare tickets with no punching. On the lines where there are three 2d. sections we have introduced colored tickets adapted from the system used in Sydney, i.e., different color for each section. This has greatly assisted in preventing over-riding and also the driver. The ticket numbers are entered up at the end of the trip in much the same way as the others; they are subject to inspection. All our one-man cars are operated to "Pay as you enter". These are not operated on particularly busy lines, otherwise we might have to change this system. I have had on trial a number of different registration and punch systems. One which the Paris Tramways devised, is a system of register and punch. They claim it is very successful, but I do not know how far it has been extended. All our one-man cars are fitted with the safety handles. Some cars are fitted with engine air operated doors, but as the public strongly objected to being enclosed, we leave the doors open at the driver's end and find this a great assistance. It removes the public's objection, and it eases the driver's duties. Maintenance would be reduced by doing away with the engine operated doors. We have not had any instance where the dead man's handle has been of assistance.

Mr. Steer: Have you had any collisions, Mr. Hancox, with cars with dead man's handles fitted? A collision with another car?

Colonel Hancox: No.

THIRD DAY - WEDNESDAY, 14TH SEPTEMBER, 1932.

ONE-MAN CARS IN GEELONG.

Paper submitted by Mr. Meakin on Tuesday, 13th September, 1932. Discussion resumed.

Chairman: We have four 'Birney' cars operating at Port Adelaide. The loading and unloading is somewhat slow. I consider doors unnecessary. We make too much of safety

doors. On cars such as those on the Glenelg route where we have high speeds it is essential that the doors be closed, in the interests of safety, but on one-man cars, under ordinary operating conditions, doors are unnecessary. I agree with the opinion expressed by Members regarding this matter.

Mr. Cole: Do you use fare collectors (boxes) or ticket systems on your one-man cars? We have used one-man cars for 18 years with fare boxes attached, and have overcome the difficulty of slowing down by adopting the system 'pay as you enter - pay as you leave'. The passenger places the money in the fare box. Passengers boarding cars in the City pay as they enter. Those boarding after the car has left the City pay as they leave the car.

Chairman: In Auckland they had one-man buses operating and used a ticket system. The driver had various tickets in front of him on a ledge and his cash on another ledge just underneath. I was much impressed with the issue of the tickets. They also adopted the principle of 'pay as you enter - pay as you leave'.

Mr. Cole: Our fare box cars have not interlocking doors. We have taken as much as £10 per shift on them.

Colonel Hancox: Our men collect fares very quickly. Some delay occurs at heavy loading points, but I think one-man cars are quicker at setting down passengers and restarting. They get well ahead of two-men cars when out of the City. Very few are used on heavy loading points though. One-man cars leave the termini punctually. We have fewer missed fares and less overloading on the one-man cars, and we find much use for them standing outside Theatres and Football and Sports Grounds. The great advantage to us is that we can undertake traffic with one-man cars which we could not do before without incurring a loss. We have 21 one-man cars in operation. The scheduled speed varies up to 9 miles per hour including lay-overs.

Mr. Strickland: We have 20 one-man cars, run mostly on the Footscray service, which consists entirely of one-man cars. We have adopted the 'pay as you enter - pay as you leave' system there, and it is very satisfactory from the traffic point of view. The main point Mr. Meakin is anxious about is Safety appliances. We have dead man's handles and the usual safety devices on the one-man cars. We consider that they are not essential, although we have had some cases on ordinary cars where the dead man's handle would have been of service.

With the electro-pneumatic brake gear as supplied, failure of current prevents a service application of the brake, although the emergency application can still be made. To provide against the effect of the trolley wheel leaving the wire, or of a power failure, we inserted a relay to apply the brake on loss of voltage. This brought a car to a standstill on a railway crossing on one occasion, when the railway signalman cut off power. We had therefore to provide a button to cut out the relay when coasting over these crossings, of which there are several in Melbourne. Thus one complication leads to another.

I do not favour the interlocked doors: the door engines and extra air piping add a great deal to the weight and cost of the car. It should be satisfactory on a small car in light traffic to have a door operated manually by the driver.

Chairman: We had a case of a man who started his car then climbed up to alter his roof destination sign. He slipped and fell off and the car came right through North Adelaide to the City without accident before it came to rest. The Conductor did not even know that the Motorman was off the car.

Mr. Cryle: I would like to ask Mr. Meakin what method they adopt in fixing fare boxes to cars.

Mr. Meakin: We do not have fare boxes on the cars.

Mr. Cryle: Do you issue any change to the Motorman?

Mr. Meakin: Yes - 10/- worth of change.

Mr. Cryle: What happens in wet weather as regards loading on the one-man cars under the 'pay as you enter' system?

Mr. Meakin: If there are passengers waiting to board the car in wet weather, we allow them to get on to the platform before collecting the fares.

Mr. Steer: We have found no difficulty in Brisbane regarding non-use of safety gadgets, although recently we came in for much criticism from Aldermen, (one of whom is an ex Motorman) because we did not have the dead-man handle on cars. The whole object of the criticism was an endeavour to get rid of the one-man cars. We have only 10 one-man cars and they are run on two comparatively slack lines. Our one-man cars save us about £3,000 per annum. We have fare boxes - they are locked to the end of the cars. Passengers pay as they enter coming into the City and pay as they leave going out of the City. We issue tokens on our system. They are issued by Motormen to passengers. When a passenger presents a token the Motorman knows what fare he has to collect. We are not able to extend the system to any extent in Brisbane. Most of our routes run right through the City, but if opportunity ever presents itself I shall not have the slightest hesitation in extending our system of one-man cars. We had plenty of opposition to the one-man cars in the beginning, even from the passengers, but when the people got used to them they were alright. They run right into the City and no doubt they do delay traffic slightly.

Mr. Cole: Do you open all gates when passengers are loading in the City?

Mr. Steer: No, we have exceptionally wide gateways.

Mr. Cole: We have four doorways in our one-man cars.

Mr. Steer: It is the Motorman's duty to see that the correct fare is put into the fare box. He only issues change. If the token presented does not fit the fare the passenger puts in the box, more is demanded. Like on all other systems there is the possibility of Motormen allowing friends to ride free, but he risks being caught. There is also that possibility on two-men cars, with Conductors. They do so at a risk. We have a distinctive token for each section travelled. We have had a certain amount of trouble by boys on the back platform scaling over the gates without paying their fares at all.

Mr. Meakin: Are the tokens metal or are they tickets?

Mr. Steer: I think Mr. Cryle has a sample which he will be pleased to show you. We imported from America some special Cash Fare Boxes. They were made by the Cleveland Fare Box Company but were unsatisfactory as they had so small a receptacle they would not hold one day's takings, and we returned them to America. They were good safe boxes in other respects.

Mr. Copsey: I would like to ask whether structural alteration has been necessary to bodies of one-man cars - especially on the near side entering platforms?

Mr. Strickland: We have not made any alterations at all.

Colonel Hancox: We did not import any one-man cars. We have some single deck cars similar to those described by Mr. Meakin. With our double-deck cars we had to make alterations to the stair-case.

Mr. Meakin: We have not found it necessary to alter the 'Birney' cars at all.

Mr. Copsey: Why I asked is because we found it necessary to strengthen up the under-frame, and I was wondering whether any of the Members had experienced the same trouble.

Mr. Hursthouse: Has it been found necessary to use the shield behind the driver? We have never used those installed on our one-man cars.

Chairman: It seems to me that the shields are unnecessary.

Mr. Strickland: By using the shields you lose the reflection from the lamps, but general light is provided sufficiently from the body of the car with the reflection of the nickel fittings, etc. We find it necessary to use the shields in Melbourne. We recently altered the Driver's seat in our cars, making it more comfortable. We have also provided a foot rest - similar to those you have in your cars in Adelaide. Regarding running through the City, we designed one-man/two-men cars with the idea that we should run one-man cars to the outer termini and pick up the Conductor on the inward journey to the City. The Conductor would leave the car at certain points and pick up the next tram in. These cars have a centre door. The door is left/open when the Conductor is on the car but is closed when the Conductor is off the car. I think the one-man car is a thing we have got to come to. It will not only enable us to give a better service on existing lines but will extend the sphere of tramway operation.

Mr. Hursthouse: In regard to the dead-man handle, I think it could be done without on 'Birney' cars. It is questionable whether it justifies the extra maintenance,

Chairman: The dead-man handle on the Type "H" cars were part of the designed equipment for master controllers. No consideration was given to the advisability of putting on the dead-man handles on Type "H" cars.

Mr. Strickland: The risks we impose on the travelling public are far less than those they impose upon themselves.

Colonel Hancox: With regard to sloping windows, we had some experience with them. We tried them and found them ineffective. We also had a blind behind the driver but

found it necessary to substitute a partition which keeps passengers away from the driver. One of the troubles met with was to supply the driver with sufficient light to collect his fares. We also had to overcome the glare of blue lamps, but we have not been able to get them made to suit traction conditions.

Mr. Meakin: The reason why we have not adopted a special fare system is because we have not seen fit so far to use one-man cars during busy periods of the day. Our cars are really one-man/two-men cars. That is why we have been able to adhere to the ordinary fare system.

Chairman: Are there any further questions?

Mr. Meakin was congratulated and thanked for his fine paper.

18. INDISCRIMINATE MOTOR COMPETITION AND RECENT ACTION TO COMBAT IT (BRISBANE).

Mr. Steer: We asked that this matter be brought up to see if you had any further suggestions to make. I would like with your permission to read an extract from the Minutes of the last Tramways Conference, held in Brisbane, as follows :

"The running of motor buses, or the licensing of other persons to do so, is wholly in the hands of the Brisbane City Council, the business being handled by the Tramways Department and the Transit, Electric Light and Power House Committee, subject to the Council's approval. At present 49 buses plying upon 30 suburban routes (up to 13 miles in length) terminate in the City, and 14 buses operating on 12 suburban routes run to various tram termini. There are also 22 buses running on three long-distance routes which terminate in the City. All the buses are privately owned. During the last 2½ years (now 4½ years) the policy of the Council has been not to grant additional licences or to authorise additional trips of suburban buses to the City, but to encourage buses where they consider "the revenue of the Department is suffering."

(Vide pages 26, 27 & 28 of Proceedings of Brisbane Conference - 1930).

We have recently had trouble with Taxi Companies. They are practically all in difficulties and have cut down their fares. Two, three and even four passengers are now able to ride in from the suburbs for half the original fare, and it is hitting us hard. We have drawn the attention of the Commissioner for Railways to the matter, in his capacity as Chairman of the State Transport Board. We also have competition from the Railways. A few years ago the Railway fare, from certain stations near the tram lines, was 6d. into the City and back - the same as the tram fare. The Railway fare is now 3d. return.

Mr. Cameron: In Melbourne we are about to have a Transport Bill introduced, mainly to deal with undue competition such as the carrying of picnic parties on lorries on Saturdays, Sundays and Holidays. We suffer from that class of competition very severely, and motor cars. Motor cars are,