



**An Exclusive Account of Visits to the Body-building Works and to Some of the L.G.O.C.'s Most Modern Garages.**

In our last issue, we concluded the first portion of our article on the L.G.O.C. engineering organization with an illustration showing the manner in which the B-type motorbus chassis are put through the works. A composite photograph, showing the additions made day by day for six days to a chassis on its way through the assembling shops, served admirably to illustrate the procedure.

Finally, we may here record the existence of all the other usual departments of an up-to-date motor-vehicle factory, and these include a very capacious coppersmith's shop, in which tanks, radiators, etc., are constructed in accordance with the latest methods of that craftsman's art, a smith's shop, which, however, has not a large share of work to do, a very complete hardening shop with gas muffles by well-known makers, a test shop, in which every engine has to develop a pre-determined b.h.p. before it is delivered to the assemblers, and last but not least, a Mathewson's patent sand-blast equipment, in which all the many hardened parts are scoured after being received from the hardening shop.

In our last issue, we reproduced a photograph of the sand-blast operator, clad in mask and leather suiting (an old soldier, by the way), who is an appropriate symbol of the fact that this company is sparing no expense in the matter of plant installation, or in the securing of the best available knowledge for the design and construction of chassis.

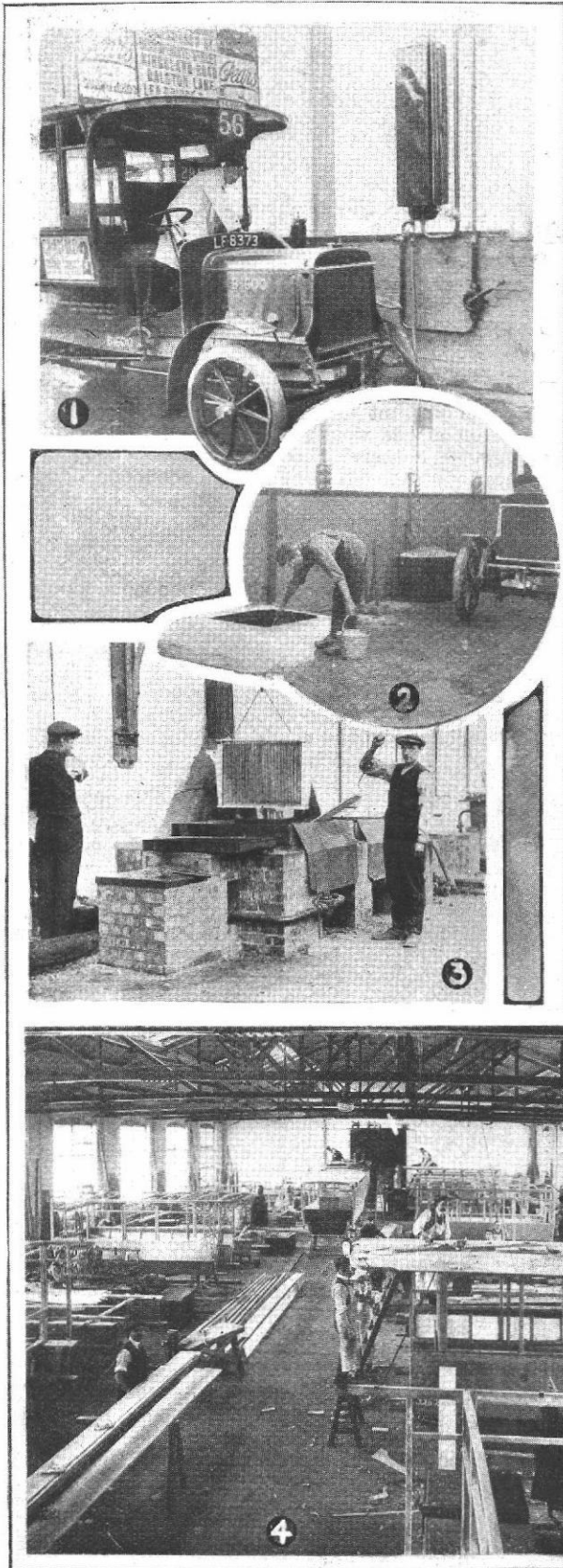
In these present articles, we are engaged with a description of the works and garage facilities of the company. We therefore do not propose to deal in any detail with the design of the chassis itself. Nevertheless, we may usefully point to the design of four-cylinder engines with trough lubrication, enclosed magneto, and chain cam drive, to the gearbox with its unique form of chain transmission and dog clutches, and to the back axle with its light but capacious cast-steel casing and its easily-detachable worm housing, as exemplifications of the extraordinary strides which have been made by this company with regard to the design of a modern chassis suitable for road-passenger traffic. The provision of self-contained oil trays on engine, gearbox and back axle is a constructional feature which will undoubtedly be embodied by many other makers in future.

**The Bodywork a Marvel of Lightness.**

We have so far endeavoured to give to our readers the result of a comprehensive survey of the engineering workshops at Walthamstow, which, as we have mentioned, are under the control of the Associated Equipments Co., Ltd. Next in sequence of production is obviously the bodywork—that all-important portion of the complete bus, which, to practical minds, is a marvel of light construction and of rigidity; the coachwork, in consequence of the demand for light axle-loads, has been greatly reduced in weight.



**A remarkable Sunday-morning view of part of the running sheds at the Leyton depot, where 130 B-type machines are housed.**



For many years the L.G.O.C. has possessed its own coach factory. It was in the shops at North Road, under the able direction of Mr. A. Crane, the coachworks manager, and of his predecessor, that the London horsed omnibus, a type unique in pattern, was evolved. Many have been the attempts to evolve something better, to give more accommodation and perhaps better facilities for ingress and egress, but they have invariably been doomed to failure. So satisfactory a compromise was the old L.G.O. pattern of horse-bus body, which prevailed for many years, that it very largely settled the pattern of its motor-borne counterpart. True, there is now a tendency to arrange the inside seats crosswise, and to use metal where wood has done service in the past, but the general contour and the distribution of seating remains much as it has been for the past 50 years.

#### We Visit the Coachworks and Garages.

The courteous permission of the company, which was afforded to THE COMMERCIAL MOTOR to visit the Walthamstow works, was extended in respect of the coachworks at Holloway, as well as to any of the latest garages from which information might usefully be obtained in order to render the present account of the company's activities complete.

The North Road coach factory, situated within five minutes walk of Holloway Station, employs 600 men, and mounts and turns out 30 complete buses every week at the present time, 17 of the bodies being wholly constructed on the premises.

The factory is a fine modern building, with spacious shops and adequate gangways throughout. It is capable of handling something like 130 bodies at one time. There are four main body-building shops in all—three on the upper floor, and one on the lower. The bodies themselves are erected by coachbuilders and their mates, and the construction is completed by them to such a stage that it can then be turned over to the fitters, who place in position the staircase, the rails, and the roof.

#### Building a Staircase.

On the upper floor, adjoining the erecting shops, is what is known as the vice shop, in which all the metal

#### A further selection of exclusive illustrations from the

(1) Drivers draw their own petrol from measuring tanks in the garages. (2) To save time washers dip their buckets into tanks which replace the usual water taps. (3) In the coppersmiths' shops at Walthamstow, dipping the ends of the radiator centres in solder baths. (4) A general view of one of the coachbuilders' erecting shops at North Road, Holloway. (5) The "B-type" four-cylinder engine, showing the encased magneto and the Solex carburetter. (6) The "B-type" chassis.

body fittings are bent, screwed, filed, polished, and generally finished off. An interesting feature of the up-to-date methods of construction which are employed is the manner in which bus staircases are built up. Staircases of any sort, as is well known, call for very skilled workmanship, but at North Road a particularly awkward job has been reduced to quite a simple task. We reproduce a photograph of the method that is adopted. Before removal from the large wooden former upon which the staircase is entirely built up, the steps are edged with the familiar non-slipping iron treads; it merely then remains for the fitters to bolt the complete staircase on to the bus body, and, thereafter, the rails, seats and similar parts are placed in position.

#### Ready for the Chassis.

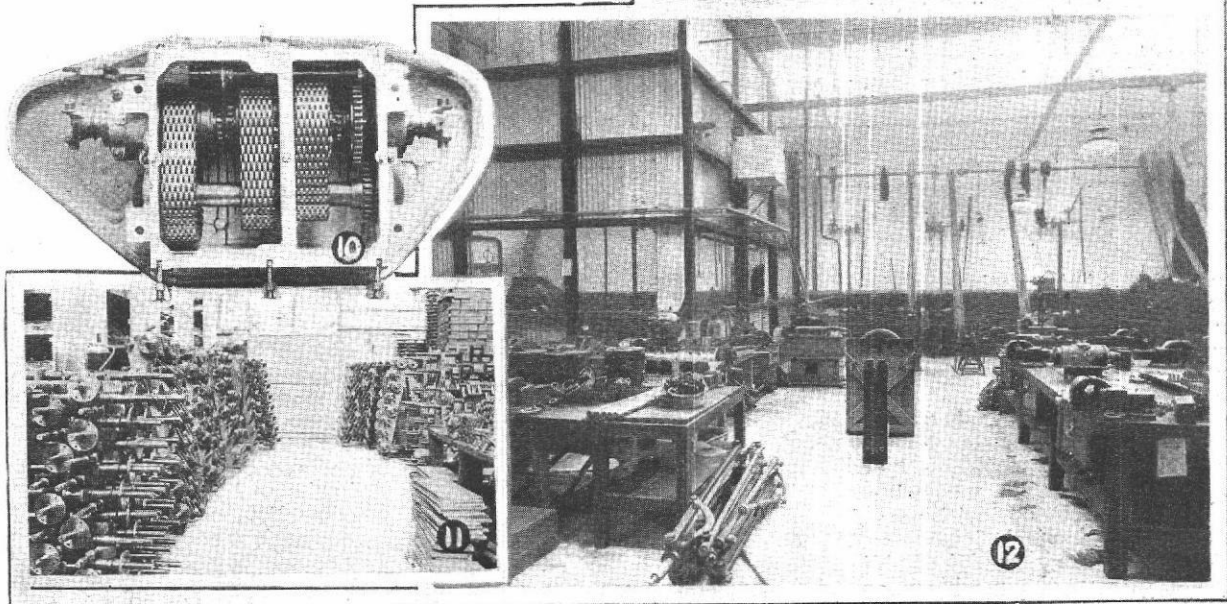
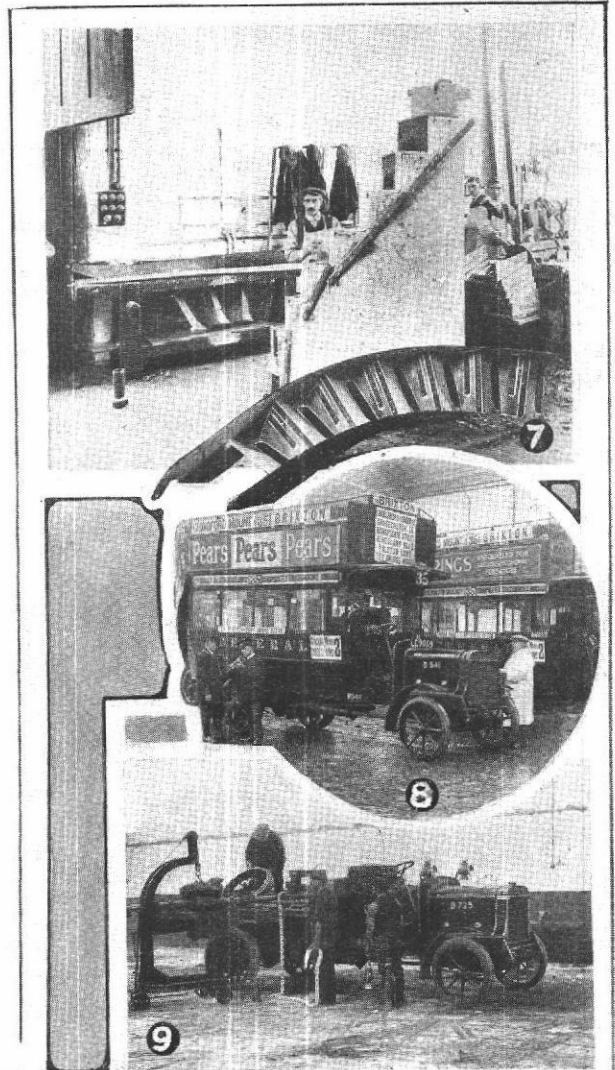
At one end of the upper erecting shops is the upholstery department, where the cushions are constructed in the customary way. When the finished body leaves the fitter's hands, it is complete in respect of windows, rails and other details. It is then lowered by means of a lift to the erecting shop on the ground floor, where the chassis to which it has been allotted is already waiting, having been sent over from the Walthamstow works after finally passing the testers there. The bodies are then placed on trestles and are jacked up so that the chassis may be run beneath them for the final bolting down process to take place.

An interesting department which is situated near to this big shop is that which is given over to the manufacture of inside fittings, such as ventilating frames, lined panels, seat and back valances, etc.

#### Wood-working Plant.

There are, of course, many other departments in this well-equipped works, and these render the establishment a remarkably self-contained one. Pride of place must be given to the wood-working departments, which are equipped with the latest types of special wood-working tools manufactured by J. Sager and Co., of Halifax. These include under and overhand planers, band and circular saws, morticing and tenoning tools, spindle machines, and travelling planers.

We are informed that the accuracy of machining in this department is now so reliable, that it is quite an



#### L.G.O.C. engineering shops, coachworks and garages.

(7) Building a bus-body staircase in the Holloway works. (8) Ready for service. Booking the driver and conductor out on the first morning "time." (9) Even the breakdown wagons are "B-types," so far has standardization gone. Each wagon is equipped with towing chains, jacks, timber baulks, lamps and other emergency tackle. (10) The much-discussed and frequently-copied chain-drive gearbox of L.G.O.C. design. (11) Stacks of great numbers of crankshafts in the finished stores at Walthamstow. (12) A typical machine-shop equipment in one of the latest garages.

exceptional thing for any of the parts there produced to require further treatment with plane or chisel in the erecting shops.

When orders are placed for bodies, the man in charge of the batch has issued to him from stores complete sets of ready-machined parts, and these, we are told, fit together almost with the simplicity and accuracy of the wooden bricks with which most of us were familiar in earlier days. A greater part of the woodwork is machined to templates, which themselves are, for the most part, made of hard mahogany strengthened at the edges in most instances by strips of lignum vitæ.

#### Diesel Engine Power Plant.

Close at hand to the machine shops is a well-equipped smithy, where all the necessary coach-smith's work is effected. Sixteen forges, supplied with induced draught by means of a powerful electric motor, occupy the centre of this department. Power for the whole works is derived from the generating station, where two large Diesel engines, which, by the way, it is interesting to recall were amongst the first of this type to be installed in this country, are direct coupled to electric generators. This plant supplies power and light for the whole of the factory.

#### Perambulating Advertisements.

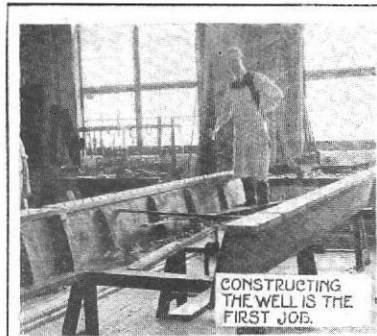
By no means the least interesting feature of the work which is carried on at the North Road factory is that which has to do with the large number of display advertisements which are carried by the company's machines. A special advertising department is responsible for the appearance of the announcements in question. Posters are being constantly changed, and a very accurate and systematic account is kept of the bills which are shown.

#### Ready for Scotland Yard.

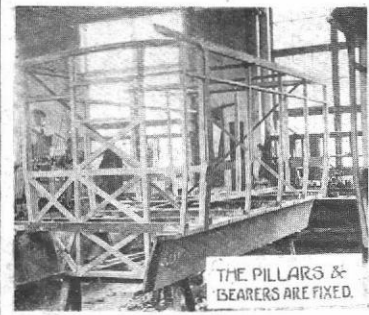
The final procedure at North Road, before the complete machine in all the glory of its paint and lettering—the latter a very big department of the works organization—consists of the fixing of lighting equipment, lamps, horns, aprons, destination boards, and route number plates. The vehicles are then handed over to a special department, which looks after the formalities which have to be observed in order to secure Scotland Yard's seal of approval on each machine. Passed with regard to noise, mechanical fitness, and the other requirements of the Public Carriage Office, the machines are driven direct to the garages to which they have been previously allotted.

#### The All-B Routes.

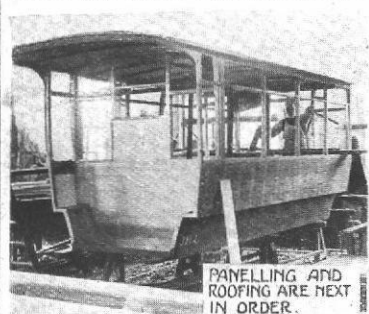
Practically the whole of the company's old types have now been removed from the streets, and the wonderful fleet which now so well



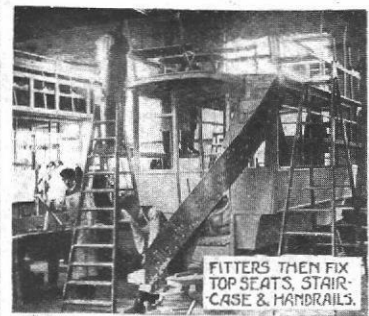
CONSTRUCTING THE WELL IS THE FIRST JOB.



THE PILLARS & BEARERS ARE FIXED.



PANELLING AND ROOFING ARE NEXT IN ORDER.



FITTERS THEN FIX TOP SEATS, STAIRCASE & HANDRAILS.



GLAZED & STOPPED READY FOR THE PAINTERS.

A series illustration showing the building of a modern motorbus body, which represents a remarkable combination of lightness and strength.

serves London, and which, incidentally, is giving the tramway authorities so much to think about, consists of the latest B-type machines, identical in design throughout. Even the breakdown wagons and the stores lorries are of this latest pattern. Standardization and simplification have thus been achieved to a remarkable extent by this company.

#### The Last Word in Garage Equipment.

We may conclude our account of the L.G.O.C. works organization by giving our readers some idea of the latest type of garage which this company is now putting up in many parts of London. It is only natural to suppose that this company has actually learned as much in respect of garage accommodation and maintenance organization as it has concerning the desirable structural features of a successful machine. At our request Mr. Iden suggested the garages which would give us the best idea of this part of the organization. With this in view, we were sent down to Leyton and Forest Gate, the former only opened this year, the latter depot being the one which was not so long ago occupied by the Great Eastern Motor Omnibus Co., Ltd., and which has been entirely rebuilt.

The company possesses 26 garages at present. At the time of going to press, the motorbuses which are stored therein serve no fewer than 67 separate routes. On weekdays, these extend from Romford in the east to Windsor in the west, and to corresponding distances on the north of the river, whilst, on Sundays, special services run out as far as St. Albans, Whyteleafe, and other distant termini. At Forest Gate there are at present housed 110 machines—all B-types, whilst at Leyton there are 130.

One of our illustrations is remarkable evidence of the manner in which, by careful organization, a large number of machines can be housed in very close quarters. It must be remembered that provision has to be made for occasional laggards on the road, and that, nevertheless, the whole of the machines have to proceed out of the depots in their correct order in the morning. When the drivers and conductors hand over their buses at night to the depot staff, they report fully as to the behaviour of the machines on the road during the day, and, so far has the organization proceeded, that it is possible to effect almost all the usual replacements or repairs before each vehicle takes to the road again in the morning.

#### One Night's Work.

A word must be said for the very thorough way in which each vehicle is cleaned from the top of its rail to the tread of its tire; washers and cleaners soon get to work after the

motorbus is at rest in its allotted place in the garage, and the well-drained floor is quickly aflood with water from their buckets, which, by the way, are filled from conveniently-placed pits, and not, as is so often the case, from slow-running taps. Meanwhile engine and chassis cleaners scour the whole of the mechanism with paraffin, the final polish is given to windows and to paintwork, and the cushions are brushed, until the machine looks like a new one, when it is ready to start another day's work in the morning.

In the meantime, allotted gangs of adjusters and repairers have attended to any reports which have been made overnight as the result of the machines' running on the road. Petrol filling is effected by means of flexible hose through

measuring tanks, each driver taking his own supply, whilst one checker looks after the gauges as the machines run up to the fillers.

#### Garage Repair Plant.

Each large modern garage has a well-equipped dock and machine shop, so that it may effect with dispatch everything, with the exception of unusual breakdowns, under its own roof. We reproduce a photograph of a typical garage machine shop, and other illustrations in this issue exemplify the general arrangements which are adopted in the company's modern garages, all well lighted, widely spaced, and well ventilated.

#### Palmarum Qui Meruit Ferat.

We may conclude by complimenting the present staff of the com-

pany on the share which they have had in evolving so well conceived and so complete an organization as that at the present time possessed by the L.G.O.C. Over and above those big departments which we have described, and which are under the control of the chief engineer, there are, of course, many other branches of the company's activity, notably the traffic department, to whose energies the company nowadays owes so much of its successful operation.

At the present time, when the motorbus exploitation of London and the surrounding districts is being pursued so relentlessly, it will, we feel sure, have proved exceptionally interesting to our readers to learn how the principal company concerned is achieving its ends.



## Fire-Brigade . . . . . . Matters.



Elland U.D.C. has decided to obtain prices for a motor tender with fire escape.

Liverpool's latest addition to its motor fire equipment, a 50 h.p. John Morris turbine motor pump, of 500 gallons capacity, has just been delivered and tested.

Hull has decided to buy another horse for its fire brigade, in preference to a new motor fire-engine, for which the Watch Committee is of opinion that the outlay would be too heavy, especially as the present has been an extraordinarily heavy year in the matter of expenditure.

Dennis Bros., Ltd., has delivered the first of a repeat order for two more machines for Nottingham. It arrived in that town on Tuesday of last week, and was immediately put through its tests. A speed of 38 m.p.h. was registered on the road, and it attended its first fire on the following Friday.

The Albion Motor Car Co., Ltd., has just received an order—through Messrs. Fyfe Motor Co., Dunfermline—for a rescue wagon for the Fyfe Coal Co., Ltd. This vehicle is to have a special type of body, fitted to a 32 h.p. Albion chassis, and will be the first vehicle of its kind in Scotland.

The vehicle will have accommodation for 11 men, including the driver, and will also carry 10 sets of rescue apparatus, four smoke helmets for use in the mine, also oxygen cylinders, ambulance boxes, a hand pump, etc. It is for use in the case of accidents due to fire, explosion or falls in the mines.

The superintendent of Fleetwood Fire Brigade is to report to the Highways and Market Committee with regard to prices and particulars of steam and motor fire-engines suitable for the town.

Burnley's new motor fire-engine, which cost £1200, was put through a series of tests last week in the presence of members of the Corporation and adjoining municipalities. The machine was christened "Caleb," which is the christian name of the chairman of the Watch Committee.

Manchester Watch Committee is prepared to receive tenders for the supply of two four-cylinder, petrol-driven fire pumps of 350-gallon capacity, also one four-cylinder, petrol-driven motor hose carriage. Tenders should be sent to the Chief Fire Station, London Road, on or before the 1st November.

The fire brigade at Driffild has for some while past earned the name of "horseless," owing to the difficulty of getting horses to take its engine to an outbreak. It was this circumstance which suggested the purchase of a motor jointly by the urban and rural councils. The old engine is to be offered to Shoeburyness for £30.

Malden and Coombe U.D.C., which is considering the improvement of its local fire service, has a recommendation before it to purchase a first-aid motor fire-engine carrying an escape and it is hoped that this machine will be able to pull the ordinary steam fire-engine as well. An alternative proposal for the purchase of a complete motor pump is also under discussion.

Barnoldswick D.C. has in mind the purchase of a fire-engine; a motor appliance is suggested.

Lancaster Town Council has received sanction to borrow £1130 for the purchase of a motor fire-engine.

The municipal authorities of Moscow have placed an order with the Daimler Co., of Marienfelde for two motor fire-engines.

It has been decided to invite tenders for a new motor or horse-drawn fire-engine for Darwen, and the borough surveyor is to get out plans and estimates for consideration by the General Purposes Committee.

In our last issue, we recorded the recommendation of the Plans and Works Committee of Edinburgh Town Council with regard to the acceptance of Merryweather's tender for three plunger-pump motor fire-engines, and of Halley's tender for two motor tenders. Considerable discussion arose at the Town Council meeting during which the recommendations were considered, Mr. Bruce Lindsay criticising the committee's proposal very severely. He suggested that too much money was being paid for the machines, and that this was due to the fact that there was little competition. He criticised the choice of a Merryweather on the basis of price. Mr. Bailie Lyon said that the Corporation had agreed to have a plunger pump, and he thought that, if Mr. Moscrip would be content to take one engine and one tender only, they would have ample proof whether or not Mr. Bruce Lindsay were right. His motion, that they should accept the tender for one of each, was adopted by a majority of 15.