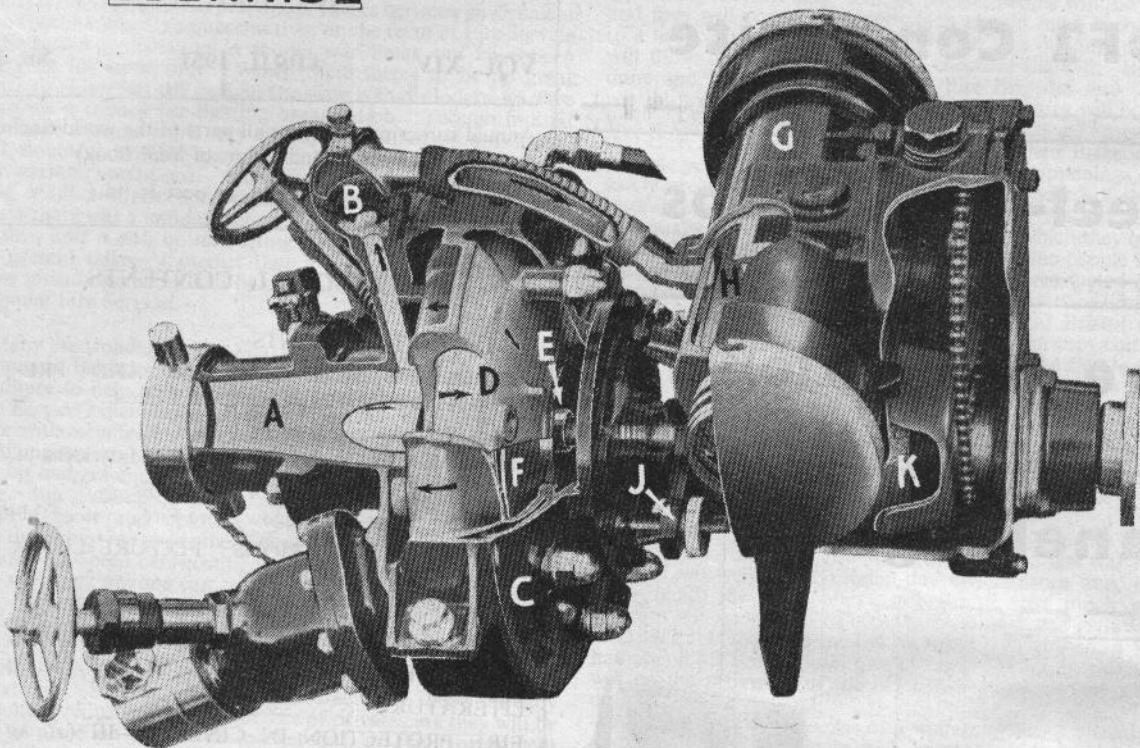


DENNIS



THE MAIN PUMP

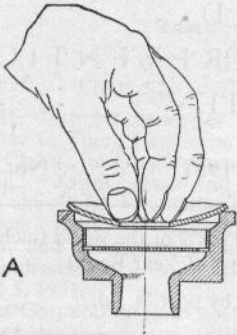
- A Suction Inlet
- B Automatic Valve
- C Cover
- D Way to Second Stage
- E Second Impeller Eye
- F Second Impeller
- G Priming Pump
- H Priming Piston
- J Stuffing Gland Adjuster
- K Clutch (Priming)

When clutch "K" is engaged, the priming pump "G" extracts air from the suction hose and main pump. The depression thus created permits atmospheric pressure to drive water into the spaces and to enter the eye of the first impeller. It is then forced by the speed of the impeller over the diffuser casing "D" into the second impeller. At this second stage water is returned under increased pressure to the annular space in the casing and from here directed to the delivery outlets.

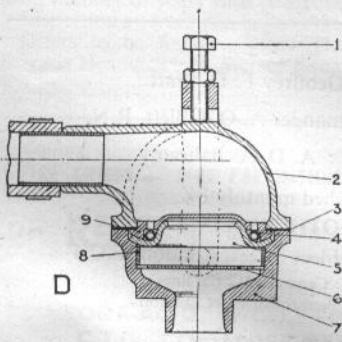
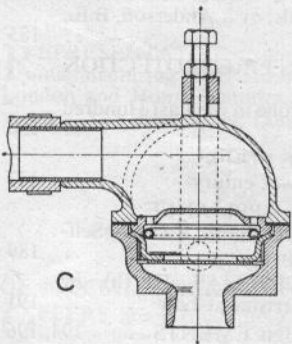
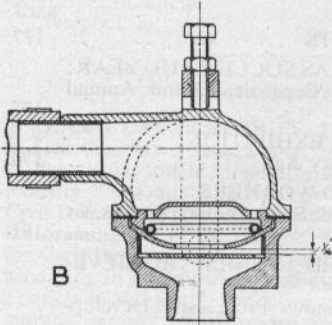
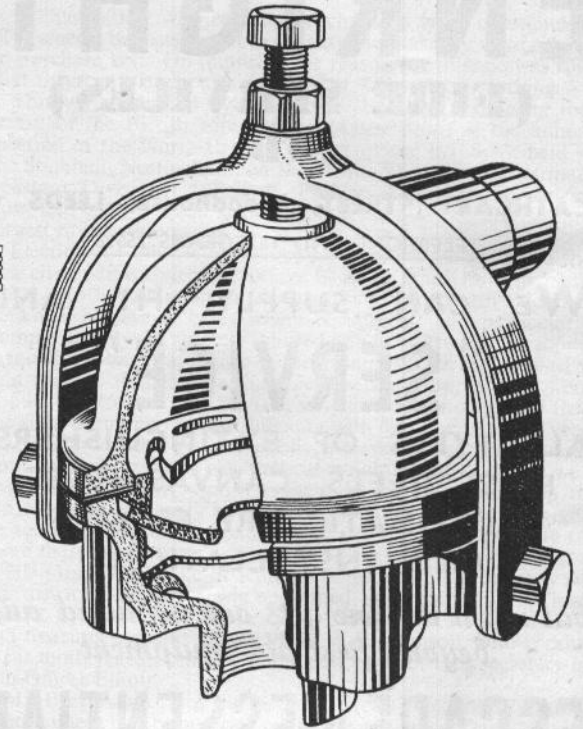
By using this two-stage arrangement the forces are opposed, mechanical thrust on the impeller is more or less balanced and high efficiency is achieved with small dimensions and low weight.

Wearing parts are reduced to a minimum and the onset of corrosion is arrested by the use of gunmetal and alloy steels in construction.

D E N N I S B R O S L T D G U I L D F O R D



DENNIS



- 1 Clamping Screw
- 2 Cover
- 3 Fibre Washer
- 4 Top Ring
- 5 Diaphragm
- 6 Lower Seating
- 7 Bottom Casing
- 8 Securing Ring
- 9 Upper Seating

The Air Valve automatically takes care of varying pressures in the primer inlet and its efficiency is easily maintained.

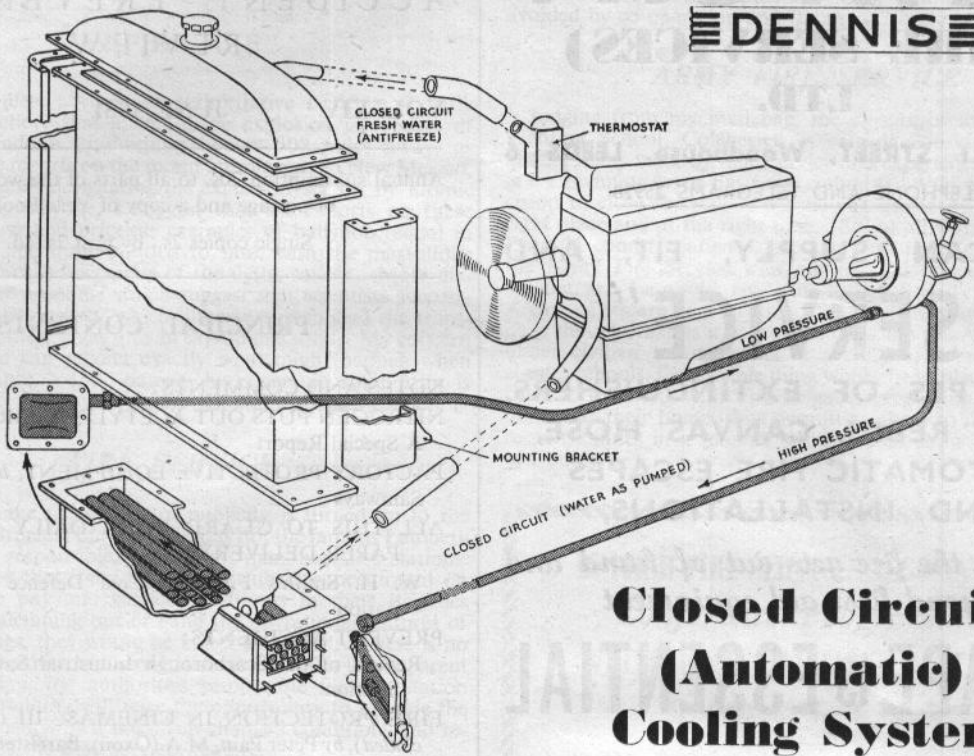
The method of replacing a diaphragm is illustrated at "A" whilst "B" shows the correct position of the components when the valve is at rest.

After priming from open water the diaphragm is pressed down by the atmosphere on to the lower seating, preventing air from entering the pump as at "C." Under the influence of hydrant pressure the diaphragm assumes the position shown in "D" sealing the main pump inlet off from the primer.

The Automatic Valve is exclusive to the Dennis Pump.

DENNIS BROS LTD GUILDFORD

Know Your Dennis = N° 3



Closed Circuit (Automatic) Cooling System

It will be readily seen from the diagram that when the main pump is in action a supplementary engine cooling system automatically enters into operation. Water is piped from the high pressure side of the main pump via a tube stack in the lower tank of the radiator to the low pressure side. By this means, heat is extracted from the engine coolant by its contact with the tubes.

In effect, therefore, the engine cooling system is a closed circuit—not subject to main pump pressure or to contamination—with the two-fold advantage, respectively, that a thermostat for rapid warming can be incorporated and anti-freeze solutions may be used.

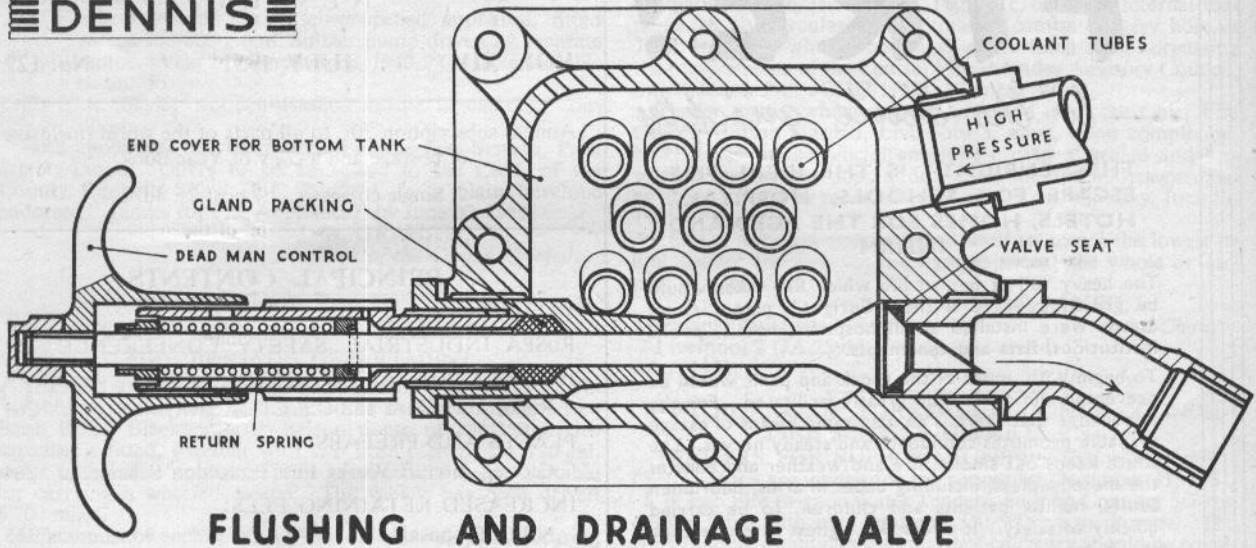
The cooling water is eventually delivered at the hose nozzles to be used on the fire and not allowed to leak on to the ground to become a further embarrassment when working on soft ground or during freezing conditions.

Closed circuit cooling is standard equipment on Dennis Fire Engines Type F.2, F.7, F.8 and F.12.

D E N N I S B R O S L T D G U I L D F O R D

Know Your Dennis = N° 4

DENNIS



FLUSHING VALVE

(Closed circuit cooling system)

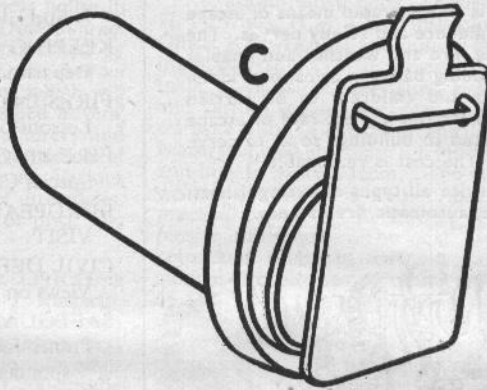
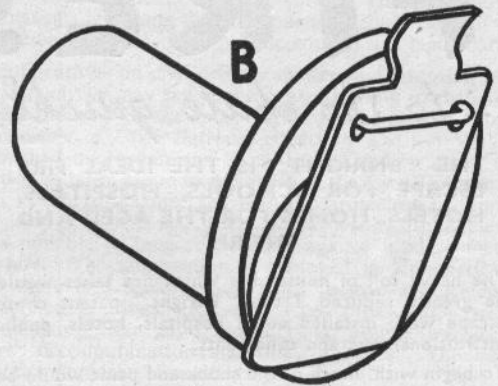
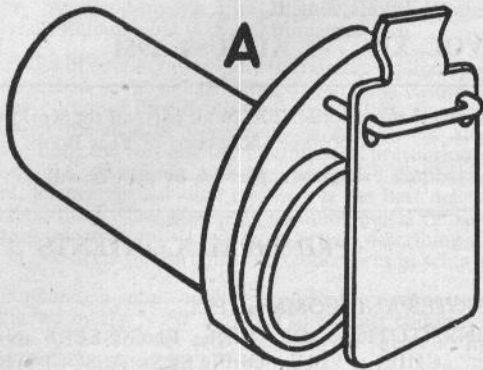
When the main pump is in operation cooling water is diverted from the high to the low pressure stage of the pump via the heat exchanger, and the purpose of the flushing valve is to provide foolproof means of occasionally clearing the system of foreign matter whilst pumping is in progress. In addition, the valve provides for draining the cooling tubes (which are inclined towards the near side) and is a useful means of breaking the vacuum before uncoupling hoses.

The valve is closed by spring pressure and must be held open for flushing—accidental opening is therefore impossible. Advantage is taken of two-stage pumping to provide for efficient flushing, as it will be realised that the moment the valve is opened to the atmosphere water in the low pressure side reverses its direction of flow as the influence of high pressure upon it ceases.

The flushing valve is another exclusive Dennis feature.

DENNIS BROS LTD GUILDFORD

Know your Dennis No. 5



PRIMER DRAINING VALVE

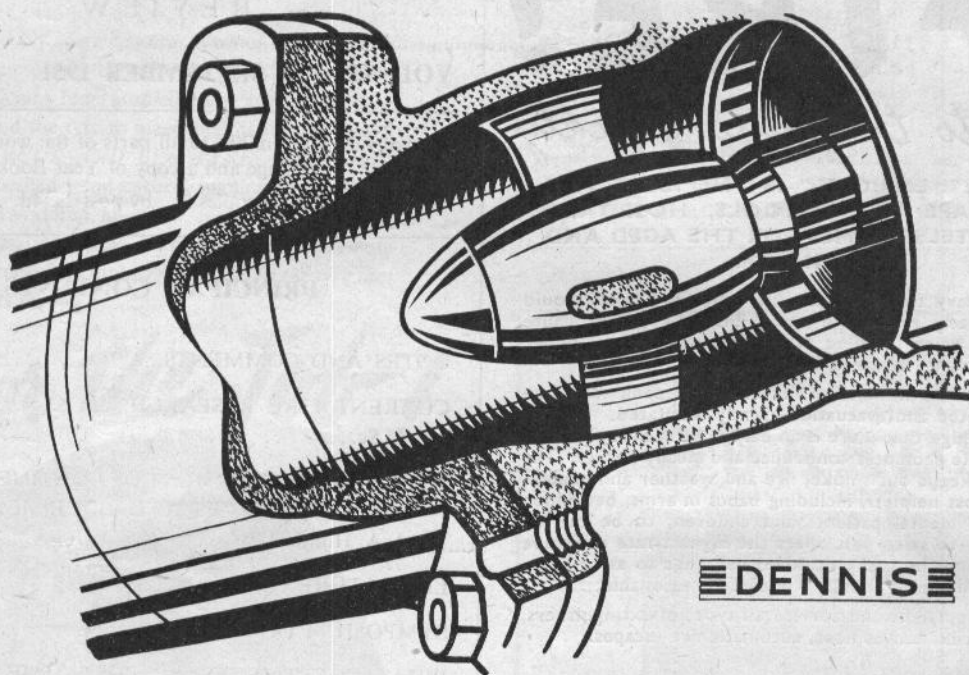
DENNIS

The simplicity and reliability of the Primer Draining Valve tends to obscure its existence. Nevertheless, this vital component replaces yet another manual control, improving efficiency and eliminating possible error. When at rest the clack hangs by gravity clear of the valve seat (A)—as soon as a depression occurs in the primer cylinder the clack is drawn by the ingoing air to a closed position (B), where it remains until the completion of priming and water has entered the cylinder.

Since the pump is now at rest the vacuum cannot be maintained and with the restoration of atmospheric pressure in the cylinder the clack opens (C) and water drains away.

DENNIS BROS LTD GUILDFORD

Know your Dennis No. 6



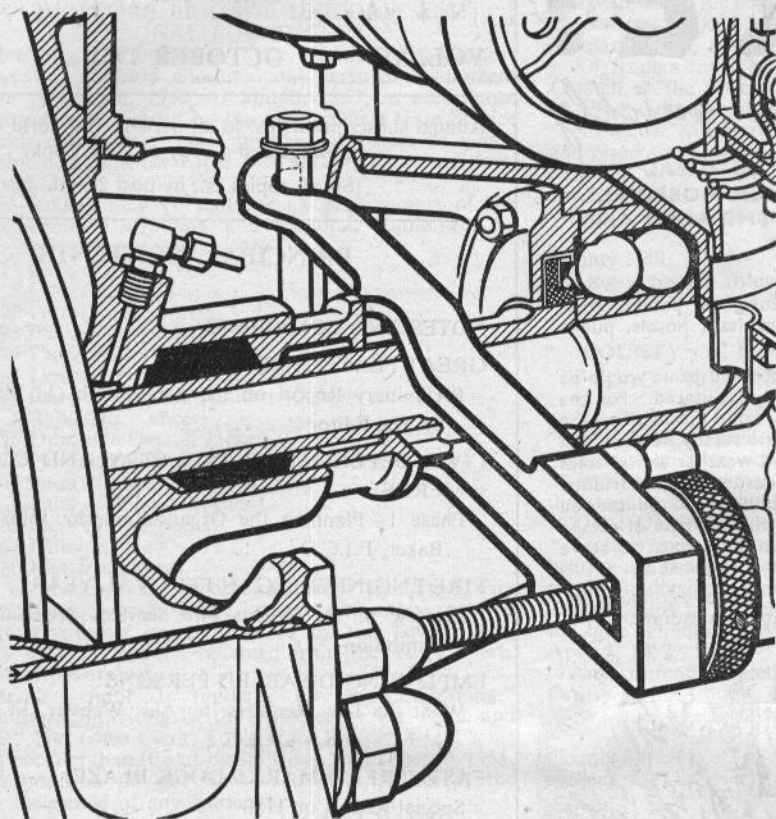
End Bearing

The advantages of mounting a bearing in the eye of the pump are, clearly, that a smaller diameter shaft can be adopted, thereby reducing the weight of the rotating mass and, by the elimination of shaft whip, the pump is sustained in peak working condition over extremely long periods.

It can be demonstrated that the bearing in no way reduces the flow of water to the pump.

The steel shaft is encased by a bronze sleeve nut which runs in a blind white metal bearing. This bearing is lubricated by grease gun through a drilling in the web. During overhaul the bearing can be replaced at very small cost.

DENNIS BROS LTD GUILDFORD



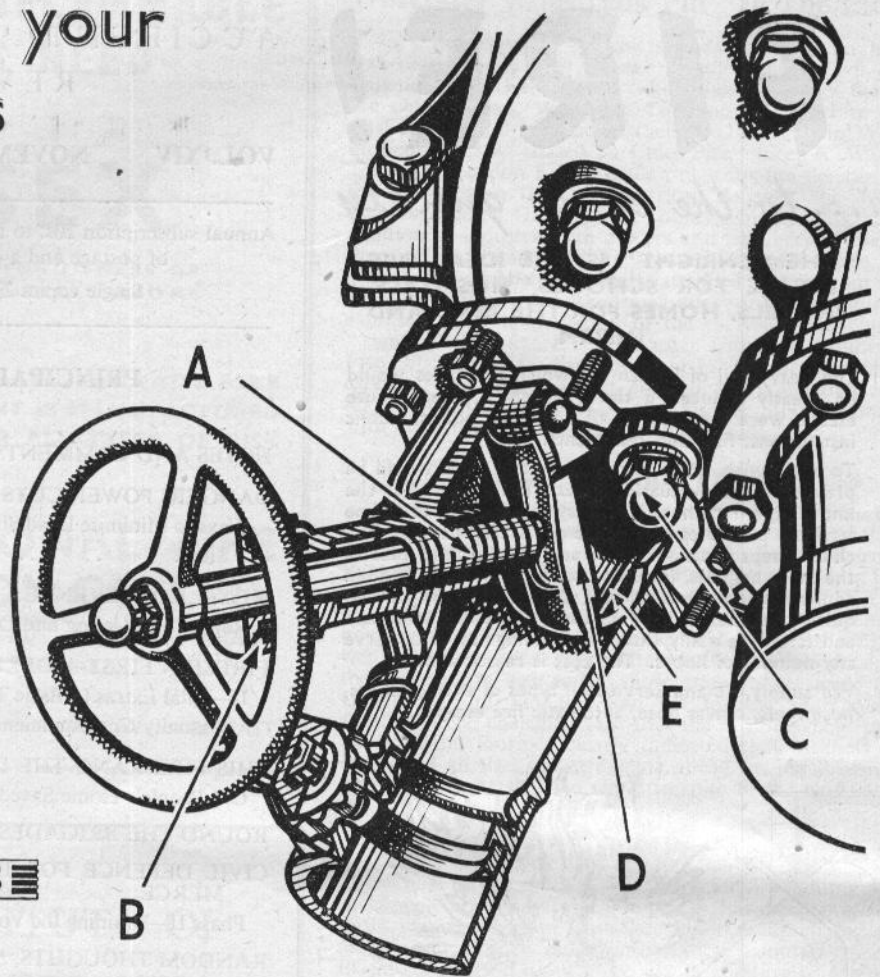
★
DENNIS
 ★

Gland Adjustment Lever

The periodic adjustment and maintenance of the main pump shaft gland has been so simplified that the use of tools of any kind is unnecessary. As will be noted from the illustration, the packing sleeve is retained by a lever working on a fulcrum pin and operated by knurled head screw. Correct adjustment should permit a slight escape of water. For repacking the gland, the lever is designed to swing clear without the removal of the fulcrum pin. It is worthy of note that the high grade steel shaft used in the pump is shrouded in bronze and is immune from the effects of salt or brackish water.

DENNIS BROS LTD GUILDFORD

Know your Dennis No. 8



DENNIS

Delivery Valve

This is semi-automatic in action. The clack (D) closes on to the seating (E) by gravity, and may be tightened down by the delivery valve spindle (A). The spindle is made watertight by the gland (B), which should be adjusted to withstand pressure and yet give ease of operation. (A little oil on the spindle at this point helps considerably.)

It is essential, when removing the pump cover, that the nut (C) inside the delivery port be removed first.

DENNIS BROS LTD GUILDFORD

Introducing The NEW

F8



WRITE FOR
PUBLICATION 240C

NARROW TRACK

- ☆ This new appliance needs little more than 6ft. 6in. for clearance—it is slimmer by 12in. than standard

LOW HEADROOM

- ☆ The maximum headroom required when equipped with an extension ladder is under 9ft. 6in.

LOW IN WEIGHT

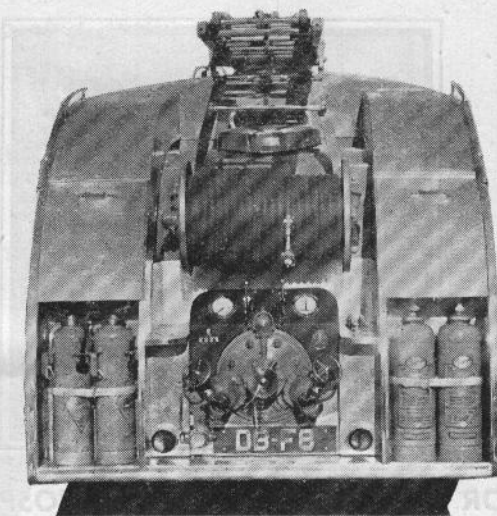
- ☆ With a full crew and 250 gallons of first-aid water the all-up weight of the F8 is under 5 tons

SMALL TURN AREA

- ☆ Work close in—a really short wheelbase of only 10ft. gives an approximate turning circle of 36ft.

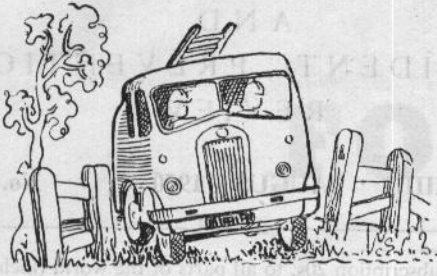
4 CYLINDER O·H·V PETROL ENGINE

4 SPEED GEARBOX · NEW 500 G·P·M PUMP



DENNIS

DENNIS BROS LTD GUILDFORD ENGLAND

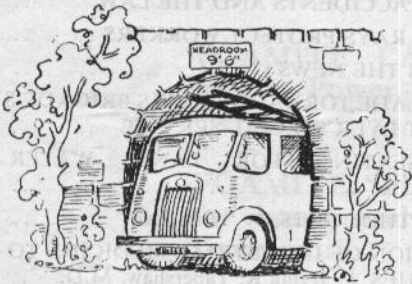


SQUEEZE IT THROUGH

With an overall width of only 6 ft. 6 in. this new appliance is 12 in. slimmer than standard

TURN IT ROUND

A really short wheelbase of 10 ft. gives a turning circle of approximately 36 ft.

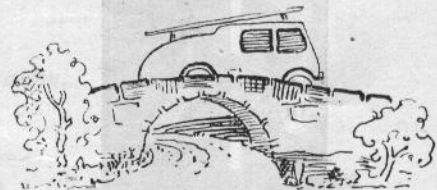


TAKE IT UNDER

Maximum head room required with an extension ladder is only 9 ft. 6 in.

TAKE IT OVER

With a full crew and 250 gallons of water, the appliance weighs under 5 tons



DENNIS *first again!*

SEE THIS NEW APPLIANCE ON STAND 68 EARLS COURT SEPT. 22 to 30

THE NEW F8 FOR RURAL SERVICE

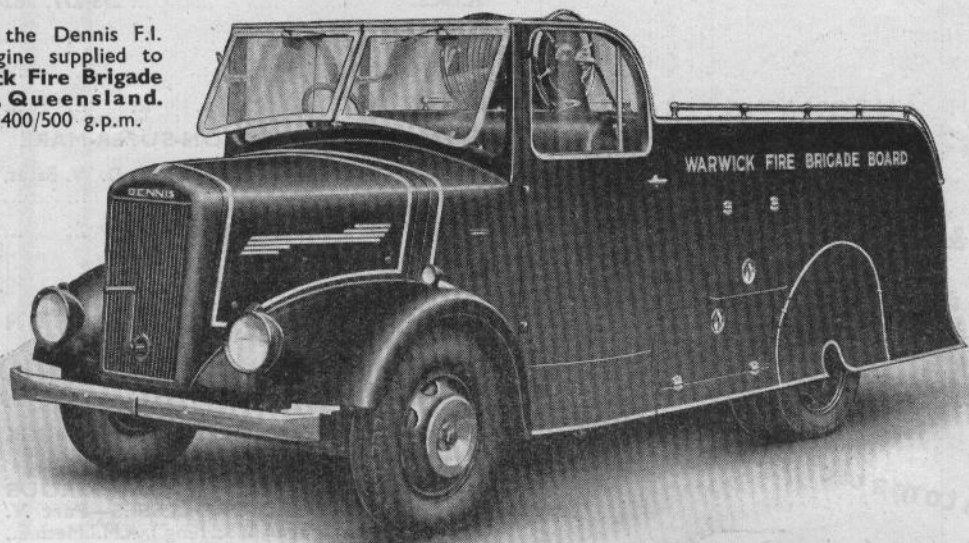
DENNIS BROS LTD . GUILDFORD

The Total Number of Dennis Fire Engines

delivered to Australian Fire
Brigades up to the end of 1946 is **254**



This is the Dennis F.I.
Fire Engine supplied to
**Warwick Fire Brigade
Board, Queensland.**
Output 400/500 g.p.m.



180 of these have been supplied
to the New South Wales Fire
Brigade Board, Sydney. There
are many more on order!

Factory representatives in Australia :—
Messrs. W. A. Crowle Ltd., Crowle House,
105, York Street, Sydney.

DENNIS

BROS., LTD., GUILDFORD

This appliance is equipped with:—
An 11 in. searchlight, a detachable
draw-bar, first-aid apparatus com-
prising 150 ft. hose and a 40-gallon
tank, used in conjunction with the
main pump.



When Chocolate is off the ration Fire will still be controlled . . .

by Dennis Fire Appliances. The
Dennis F.1 Fire Engine, seen above, has been supplied
to protect Messrs. Rowntree's precious stocks and plant.
A New World Body is provided for the comfort and the
safety of the crew, with the 400/500 gallon turbine pump
skilfully accommodated so that access is not obstructed
by the ladder support.

DENNIS

BROS., LTD., GUILDFORD

New Fire Engine for Chocolate Factory



This F.I. Dennis Fire Engine recently supplied to Messrs. Rowntree & Co., Ltd., York, incorporates a New World body with specially designed front for weather protection. The rear mounted main pump has a normal output of 350/500 g.p.m. and also feeds the hose reel equipment, for which a 40 gallon supply tank is carried. Special fittings include an 11 inch searchlight and detachable draw bar for towing a trailer.

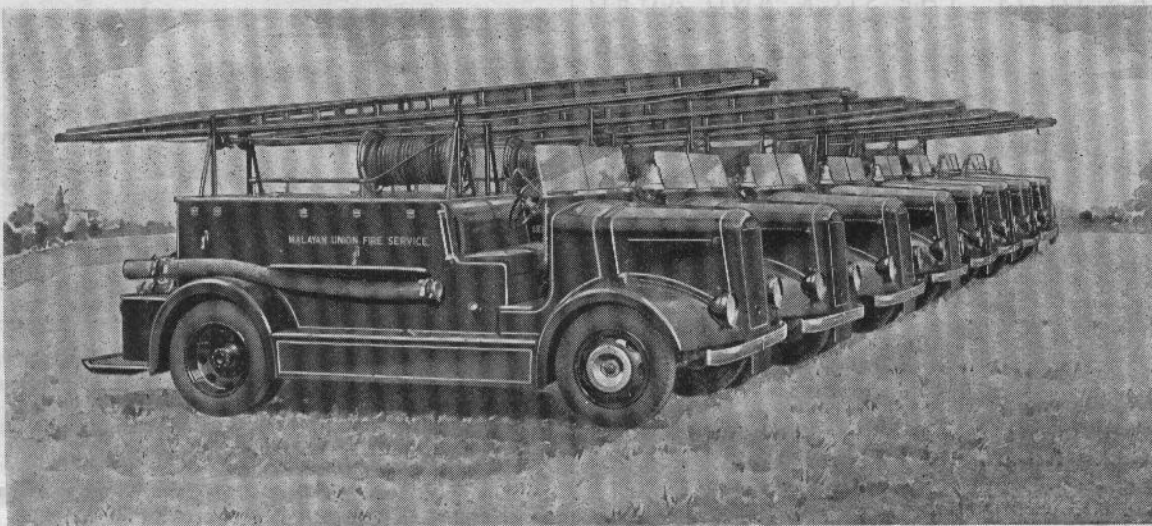
more for **MALAYA**

DENNIS

**400-500 g.p.m.
FIRE ENGINES**

The F.1. Fire Engine is designed, with a variety of body-types, to provide a high degree of accessibility and easy manipulation of pump controls.

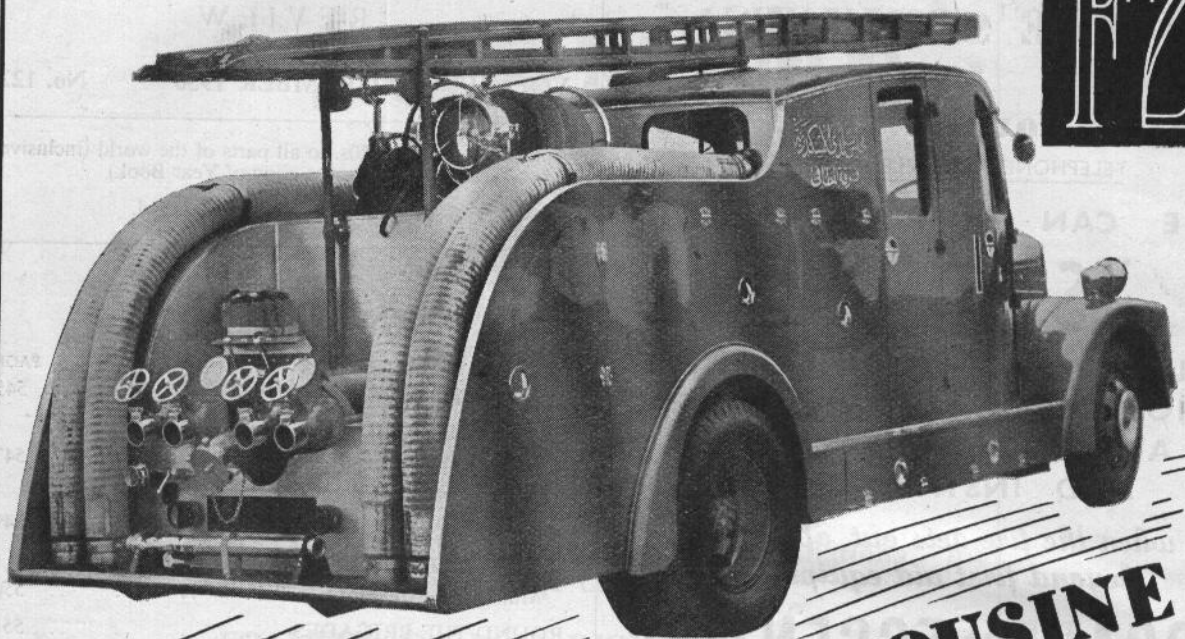
These machines carry 1,800 feet of delivery hose, a 40-gallon tank with 120 feet of First-Aid hose, and a 35-ft. Ajax ladder



DENNIS BROS., LTD.
GUILDFORD
ENGLAND



BY APPOINTMENT
MOTOR VEHICLE
MANUFACTURERS
TO THE LATE
KING GEORGE V



and now SEMI LIMOUSINE

We have been making limousine and semi-limousine fire engines for upwards of a quarter of a century for service with the leading brigades throughout the World. In the latest addition to the fire engine range of appliances we have excelled ourselves.

Here is a machine of character, with graceful lines, ample accommodation and a performance which is truly remarkable.

With over 25 h.p. per ton, handling can be likened to that of a big car with easy manoeuvrability and a very high factor of safety.

The same power unit drives the famous Dennis 1000 g.p.m. main pump and horizontal primer by power takeoff from the gearbox and a closed circuit system automatically takes care of engine cooling requirements throughout the longest pumping operation.

Why not write for publication number 239C?



DENNIS BROS LTD GUILDFORD



SERVING THE COMMUNITY

DENNIS F12 APPLIANCES DELIVERED OR ON ORDER

IN ENGLAND

BATH	1
BEDFORDSHIRE	2
BIRMINGHAM	1
BLACKPOOL	1
BOOTLE	1
BOURNEMOUTH	1
BRADFORD	1
BRISTOL	2
BRIGHTON	1
BUCKINGHAMSHIRE	1
BURTON-ON-TRENT	1
CAMBRIDGESHIRE	1
CARLISLE	1
CHESHIRE	7
COVENTRY	2
CROYDON	3
CUMBERLAND	1
DERBYSHIRE	6
DEVON	1
DONCASTER	1
DORSET	1
DURHAM	1
EASTBOURNE	1
EAST HAM	2
ESSEX	8
GLOUCESTER	2
GLOUCESTERSHIRE	1
GRIMSBY	1
HAMPSHIRE	2
HEREFORDSHIRE	1
HERTFORDSHIRE	2
HUDDERSFIELD	1
HULL	1
LANCASHIRE	3
LEICESTERSHIRE	1
LIVERPOOL	5

LONDON COUNTY C.	8
MANCHESTER	4
MIDDLESBROUGH	1
MIDDLESEX	21
NORFOLK	1
NORTHAMPTONSHIRE	2
NOTTINGHAM	1
NOTTINGHAMSHIRE	2
OLDHAM	1
PETERBOROUGH	1
PLYMOUTH	1
PORTSMOUTH	2
READING	1
ROCHDALE	2
ROTHERHAM	2
ST. HELENS	1
SALFORD	1
SHEFFIELD	3
SHROPSHIRE	1
SMETHWICK	1
SOMERSET	9
SOUTHAMPTON	1
STAFFORDSHIRE	6
STOCKPORT	2
STOKE-ON-TRENT	1
SUFFOLK & IPSWICH	2
SUNDERLAND	2
SURREY	6
TYNEMOUTH	1
WALLASEY	1
WALSALL	2
WARWICK	1
WEST HAM	2
WIGAN	1
WILTSHIRE	1
WOLVERHAMPTON	1
WORCESTER	1
YORKS E. RIDING	3
YORKS W. RIDING	16

IN SCOTLAND

ANGUS	2
GLASGOW	1
LANARKSHIRE	4
SCOTLAND WEST	3
SCOTLAND STH. WEST	5
SCOTLAND STH. EAST	3
SCOTLAND NTH. EAST	2

IN WALES

CARDIGANSHIRE	1
CARMARTHEN	1
FLINTSHIRE	1
GLAMORGAN	3
SWANSEA	2

IN NORTHERN

IRELAND

NORTHERN IRELAND	8
BELFAST	7

IN EIRE

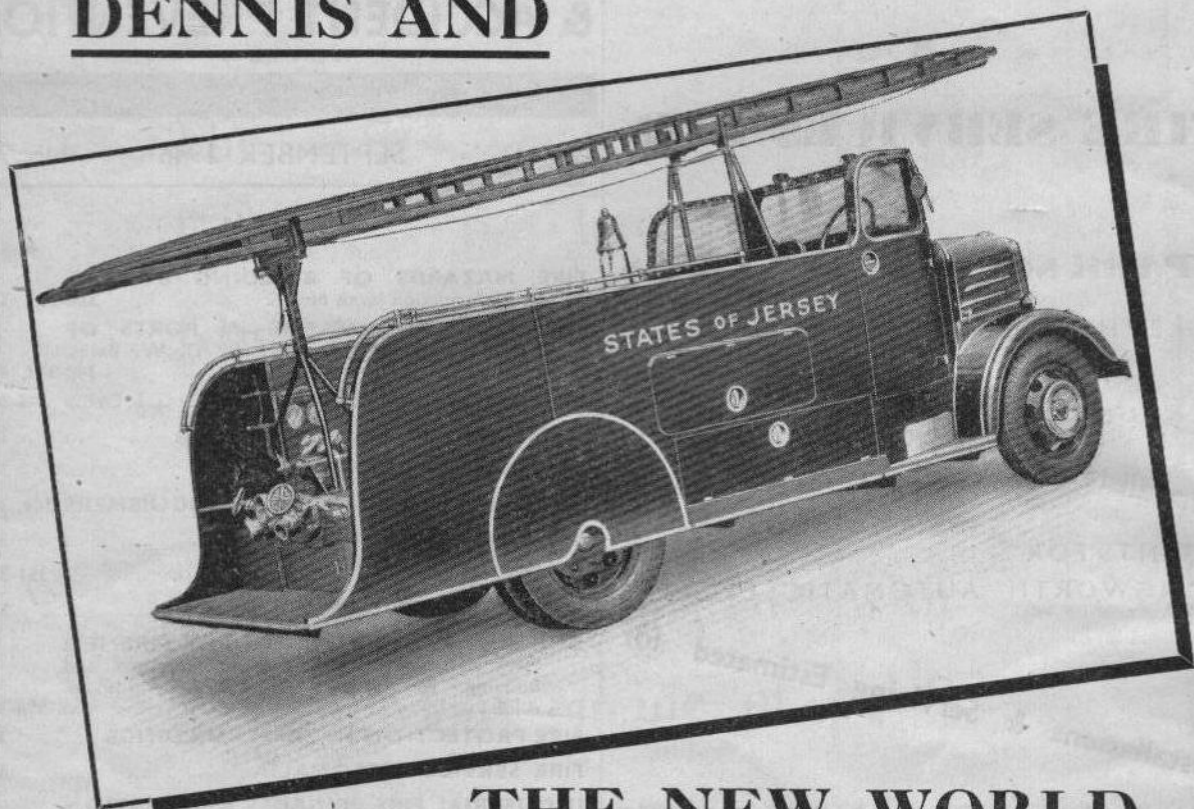
DUBLIN	1
GALWAY	1

OVERSEAS

CHRISTCHURCH	1
GEORGETOWN	1
HONG-KONG	1
SINGAPORE	4
SUDAN	1

THE DENNIS F12 *dual purpose* FIRE ENGINE
DENNIS BROS LTD GUILDFORD ENGLAND

DENNIS AND



THE NEW WORLD

THIS 350/500 gallon appliance incorporates a New World body with seats facing inwards—the essence of safety and weather protection. Note, too, the valuable additional windshielding at the front.

THE pump controls are disposed so that they are instantly ready to hand, and masterly design has provided easy entry and exit, unobstructed by the ladder support.

DENNIS

BROS., LTD., GUILDFORD



BY APPOINTMENT
TO H.M. THE KING

IMPRESSIONS OF THE NEW DENNIS FIRE ENGINES

The Post-War F1 and F3 Models

The Dennis F1 chassis fitted with a "New World" type enclosed body and rear mounted pump. The crew enter and leave from the rear. Note the side lockers with flush doors.



DURING the war years Dennis Bros., Ltd., of Guildford produced commercial vehicles in very large numbers, and their well equipped fire engine division made over 7,000 trailer pumps. At peak periods these pumps were leaving the assembly lines at the rate of over 60 a week, but now Government contracts have been completed, production is being switched to

peace-time needs in the shape of a completely new range of fire engines, designated the F1 and F3 models.

A *Fire Protection Staff Reporter*, who recently visited the Guildford works, was privileged to make an inspection of these appliances in process of erection for fire services in Turkey, the Bombay Fire Brigade, several industrial brigades in this country and brigades in the Far East.

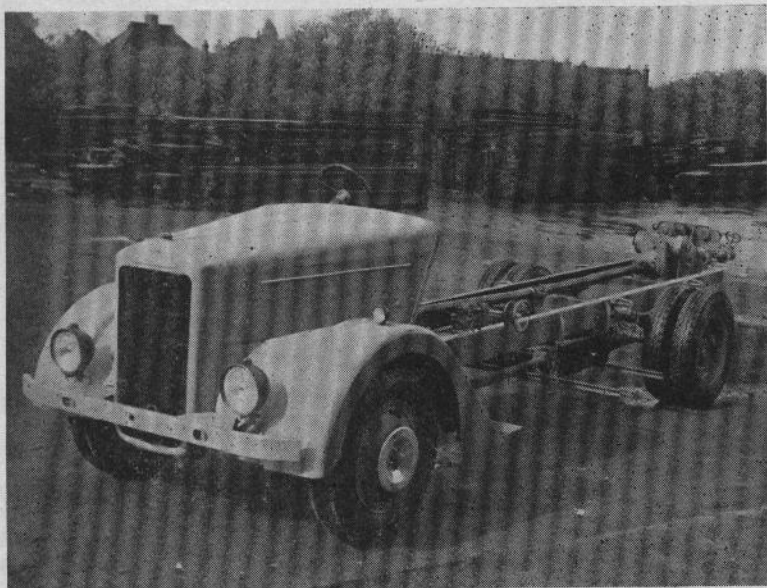
Incorporated in the new F models are numerous improvements, many of which are based on war-time experience, and it is evident that Dennis appliances will continue to uphold the good name of British engineering practice throughout the world. These improvements constitute important developments in fire engine construction, and are likely to have considerable effect on future trends.

The designers have paid particular attention to driver comfort and control, the layout being based on motor car lines, adapted for special requirements. A member of the staff told our reporter that in view of the increased strain placed on vehicle drivers under present-day road conditions, it was essential that the driver of a fire engine should receive more consideration than in the past. Undoubtedly much thought has been given to the arrangement of driving seat and controls. In fact, our reporter found his view of the road and the seating position superior to what is experienced in many private cars.

The new models give a favourable impression of speed and stability, due to the clean bonnet sweep which continues to the scuttle. By the adoption of a new chassis frame and rearrangement of the petrol tank and exhaust groups a height of only 5 ft. 3 in. to the top of the scuttle dash has been achieved on the F3s, yet the minimum ground clearance when fully loaded is 10 ins. A notable improvement is made by re-designing the chassis instrument panel, and placing it in the centre of the scuttle, all the gauges and controls being now neatly grouped within easy reach of the driver. This arrangement has also enabled two scuttle lockers to be provided for stowage of small gear and



This illustration shows the unit-constructed hose-reel pump suction and deliveries. The power take-off and main pump driving shaft is on the right-hand side of the picture immediately above the propeller shaft.



This general view of the new Dennis F3 fire engine chassis clearly illustrates its sturdy construction and low overall height. The minimum ground clearance is 10 inches. The pump can be rear or centre mounted to suit customers' requirements.

tools. Provision is also made for adding to the instrument panel such equipment as may be required by individual customers.

Engine and Chassis

The F1 chassis is powered by a Dennis 4-cylinder petrol engine having cylinders 100×120 mm., developing 70 b.h.p. at 2,500 r.p.m. and dual magneto and coil ignition. The drive is through a single-plate clutch to a ball and gate 4-speed gear box. The larger (F3) model has a 6-cylinder 120×140 mm. o.h.v. petrol engine developing 125 b.h.p. at 2,400 r.p.m.

Transmission

In both models of this range transmission is by a two-portion propeller shaft united near the centre by a universal joint and provided with vibration-damper. It is supported by a ball-bearing. Power is transmitted through a spiral bevel pinion and crown wheel in the rear axle, which has roller bearings throughout. At the inner end of the hub is fitted a special type of oil-seal, which prevents leakage on to the brake-shoes.

Front Axle, Steering Gear and Brakes

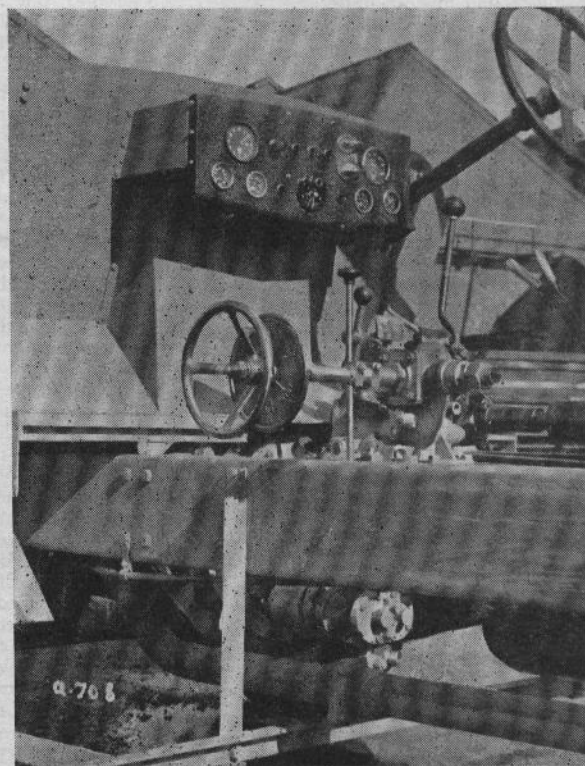
The front axle is designed for heavy duty, having hardened steel bush bearings to take the journal loads, while the hubs are fitted with taper roller bearings and special oil seals. The steering is designed on the worm-and-nut principle, and in both the F1 and F3 models, the position of the column has been re-aligned to give greater driving comfort. The brake system comprises the well-known Lockheed hydraulic equipment provided with automatic compensation for atmospheric changes, a master cylinder, reserve supply tank, and individual brake-shoe cylinders and expanders. The 20 gall. fuel tank is slung close beneath the off-side chassis member, and a filler extension, adjustable to

suit various body types, is fitted. It is interesting to note that the manufacturers insist upon each chassis performing its road tests with standard fuel tank and accessories, thus ensuring the immediate location and correction of any defects. Such a system is obviously more satisfactory than testing vehicles without their own fuel systems and accessories.

The Pump

The pump is the well-known Dennis two-stage back-to-back high-pressure turbine, made entirely of gunmetal and fitted with twin air pumps for priming. In models fitted with a rear pump, the drive is taken from a power take-off on the gear box by means of a flexible coupling and shaft, whilst those with a centrally mounted pump are driven through a flexible coupling only. Duplicate suction and delivery fittings and controls are provided in the latter instance. The pump fitted on the model F1 has an output of 600 g.p.m., and is tested to 200 lbs.

(Contd. on p. 395)



This illustration shows the position of the unit-constructed hose reel pump and 5-way control valve. The gear levers including the power take-off and pump control are conveniently grouped to the left hand. Note the new centre mounted instrument panel, on which dials and switches are concentrated. Throughout, the object has been to place all controls in the most advantageous position in relation to driving position.

IMPRESSIONS OF THE NEW DENNIS FIRE ENGINES—(Contd. from p. 387)

per sq. in. before leaving the works. On the large (F3) chassis, the maximum rating is 1,000 g.p.m., and either two or four deliveries may be fitted according to customers' requirements.

Hose Reel Equipment

This equipment incorporates a Wynn pump of unit construction, bolted to the gear box for direct-gear drive, and controlled by means of a hand lever in the driving compartment. Water is drawn from a copper tank placed in the body and delivered under pressure to a hose reel carrying 120 ft. of rubber hose with shut-off branch. The tank has a large filler cap, so that it can be replenished by buckets of water if desired. A special 5-way valve enables any of the following connections to be made instantly:—

- (1) Tank to pump and then to hose reel.
- (2) Hydrant to pump and then to hose reel.
- (3) Hydrant direct to hose reel.
- (4) Hydrant direct to tank.
- (5) "Off" position.

The wheel control is located in the lower near side of the driver's seat.

The main pump can be used to supply the hose reel equipment where it is not considered necessary to have a separate unit construction pump. In this case, a supply pipe taken from the tank enters the suction inlet of the main pump, being controlled by a cock. A second pipe takes the discharge water from the diffuser casing through a control cock direct to the hose reel. A hydrant connection is also fitted, so that water can be supplied from a stand-pipe.

Electrical Equipment

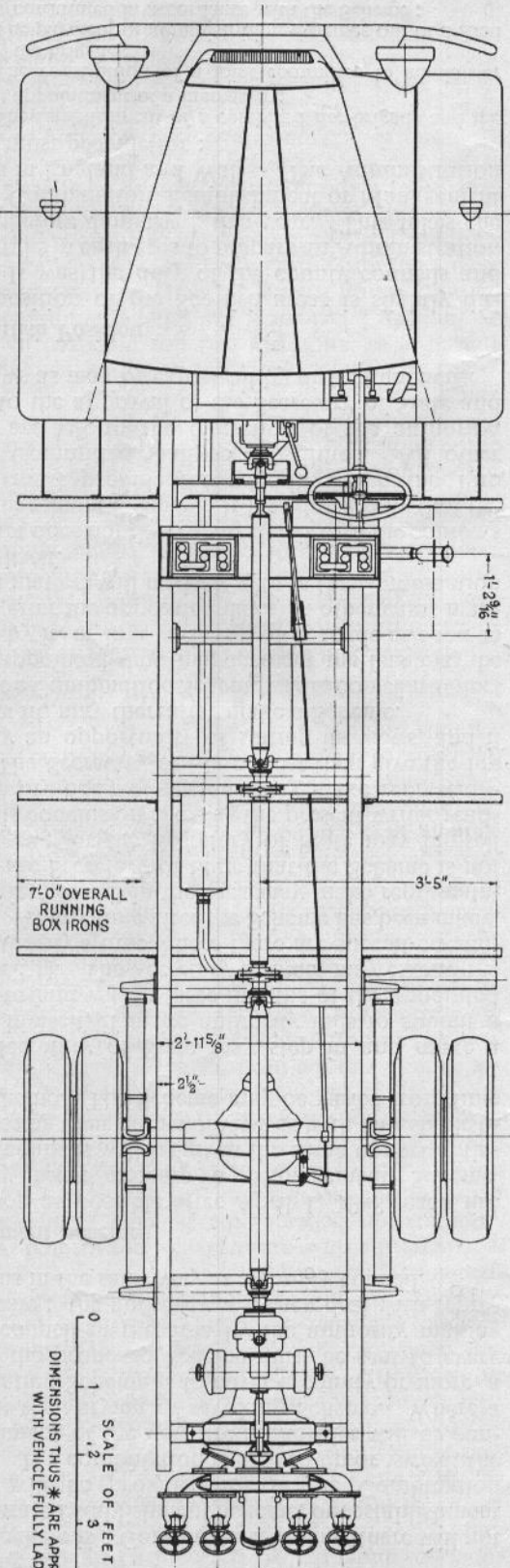
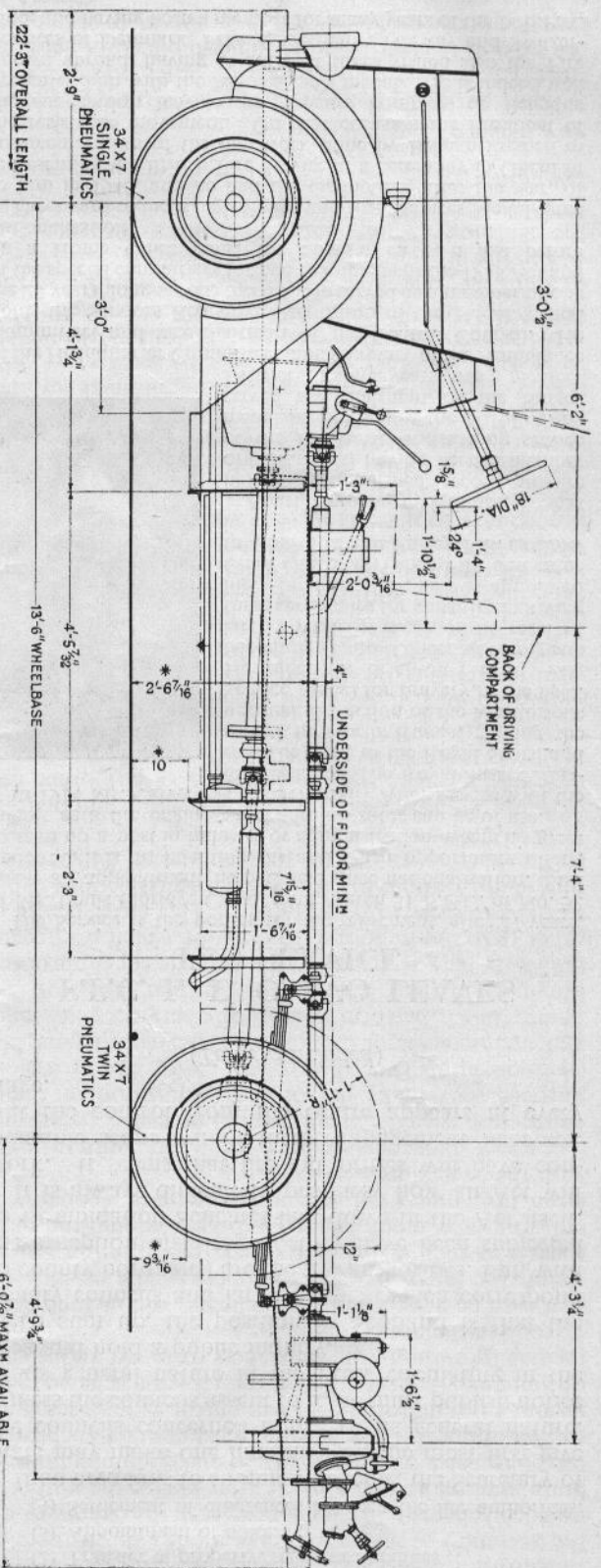
The electrical equipment is a self-contained system, having an engine-driven dynamo supplying current to the battery for the ignition coil, the lamps, starter motor and accessories. The dynamo is regulated to maintain a steady output, irrespective of the speed at which it is running. Anti-dazzle devices are fitted to the head lamps, being operated by a switch on the instrument panel.

In producing the F1 and F3 models, Dennis engineers have made a valuable contribution to post-war fire appliance design. These new machines are indeed worthy descendants of the long line of fire engines for which the Guildford works have been famous for more than 30 years.

DENNIS FIRE ENGINES

New F Models

F.1	F.3
Wheelbase 10 ft. 6½ in.	13 ft. 11 in.
Engine—4 cylinder: 70 b.h.p. at 2,500 r.p.m.	6 cylinder: 125 b.h.p. at 2,400 r.p.m.
Pump capacity:	
540 g.p.m. at 80 lbs. sq. in.	960 g.p.m. at 80 lbs. sq. in.
480 " 100 " "	920 " 100 " "
420 " 120 " "	670 " 160 " "
360 " 140 " "	840 " 120 " "
340 " 160 " "	765 " 140 " "
Maximum speeds 54.5 m.p.h.	58 m.p.h.
Tyres—Low pressure:	
32 × 6, twin rear.	34 × 7, twin rear.



SCALE OF FEET

0 1 2 3 4 5

DIMENSIONS THUS * ARE APPROXIMATE WITH VEHICLE FULLY LADEN

General arrangement of the Dennis Type F2, 8 cyl. fire engine chassis, with pump in rear position

WEAPONS AGAINST FIRE

II.—The Dennis F2

SEVERAL interesting features are embodied in the new 800/900 g.p.m. fire engine now in production by Dennis Bros., Ltd., Guildford. A representative of FIRE PROTECTION was enabled recently to see the appliance under road and pumping tests, which were carried through in the neighbourhood of Guildford with a gross weight of nearly 6 tons (over 6,000 kg.).

The engine is a Rolls-Royce straight 8, having overhead inlet and side exhaust valves. Its h.p. rating is 39.2, developing 150 b.h.p. at 3,000 r.p.m. The chassis, pump, scuttle dash and windscreen, as used on the test day, weigh 2 tons 16 cwt. (2,835 kg.), and with the test equipment and a 3-ton test load gave the gross weight above, approximately that of an equipped and manned pump-escape, distributed as to slightly over 4 tons 8 cwt. (4,489.5 kg.) over the rear, and 1 ton 11 cwt. (1,581 kg.) over the front axles.

The effort made by the designers to give the new F2 a clean appearance, and adaptability to take any of the varied bodies that the Service customer may want, has been successfully achieved. There can be no two opinions about the pleasing lines and attractive look of the machine, and quite apart from this the requisite care, which one would expect from makers with so long and fine a tradition of fire engine building, has been lavished on producing an appliance which conforms not only to the standards of an automobile engineer but to the practical needs of the fireman.

Examples of this can readily be seen in the high power-to-weight ratio, the specially arranged close gear ratios (with a gate designed to suit the driver who has to handle at very short notice different types of vehicles which are not always the latest and best) and, a most noteworthy and pleasing innovation, a flow meter in the centre of the pump panel calibrated to show the g.p.m. passing into the pump at any time. The value of this instrument to the pump operator, either in single unit use or series, or relay pumping, or for training purposes, will readily be appreciated.

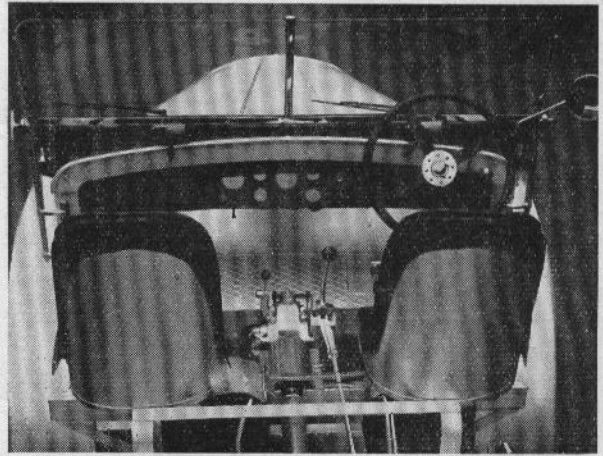
As to measurements, the chassis has an overall length of 22 ft. 3 in. (6,781.8 mm.) and an overall width of 7 ft. (2,133.6 mm.). The wheelbase is 13 ft. 6 in. (4,114.8 mm.), the track, 5 ft. 11 in. 5/32 in. (1,807.4 mm.). A 10 in. ground clearance is provided; Dennis's are satisfied that it gives the fireman all he needs over quite rough ground. The turning circle is 50 ft. 6 in. (15.39 m.), right or left.

Tyres are 34 x 7 in., twin rear, single front; a 20-gall. (91 litres) fuel tank is provided. The Dennis closed circuit automatic cooling system is incorporated. The clutch is a two plate dry, 237 sq. in. (1,529 sq. cm.). Four wheel hydraulic brakes are fitted. There is a stainless steel jacketed silencer.

The pump is a high pressure turbine pump (back to back), with a horizontal reciprocating priming pump, coupled through an automatic air valve. The first aid pump, not fitted to the chassis under test, is a gear-type unit at the side of the main gear box, coupled

through a 5-way control valve to the tank and hose reel.

So much for general dimensions and equipment. Before going on to the test results, a few additional details on the features listed above will be of interest. The use of the closed circuit cooling system permits the use of anti-freeze, and salt-water pumping can be done if necessary. The tubes in the heat exchanger are large, to allow for the possible entry of foreign bodies, and a spring-loaded flushing valve entirely overcomes the possibility of the valve being left open by accident. There is no waste water from the priming or cooling systems and the pump thus goes far to eliminate the "bogging down" snag encountered from this cause when working on soft ground. Again, instead of



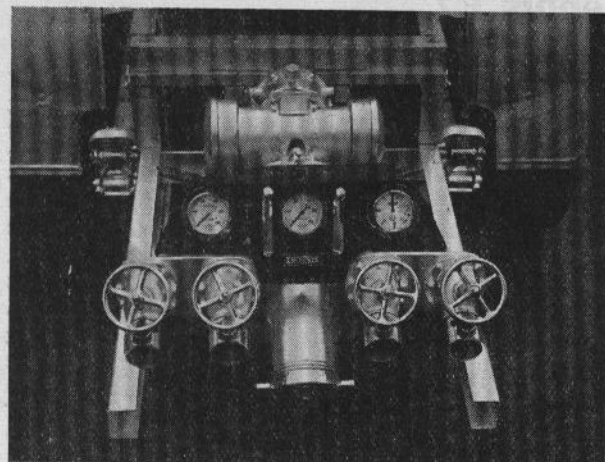
The driver's seat of the F2; bucket seats are mounted for test purposes only

opening cocks to connect the primer to the main pump, the two are connected by an automatic valve permanently open until the control lever is depressed. There are automatic clacks, and the 2-stage steel shaft is encased in bronze with specially designed keyways to provide a complete seal.

Tests began with a cold start, which was extremely interesting. The date was March 23, and the night before there had been a noticeable hoar frost. The F2 had stood in the cold without any heating all night but the engine picked up instantly and the start certainly bore out the contention of the Dennis engineers that heaters—especially in the normal conditions of warmth in a fire station—are unnecessary additions to equipment and expense. It is a vexed question, but on Tuesday, March 23, with the frost still on the ground in the shade, they were undeniably unnecessary for the F2.

So out of the yard in the sharp March air to the Hog's Back and Wanborough. Here acceleration tests gave readings of zero to 20 m.p.h., all gears, 7.2 secs.; to 30 m.p.h., 15.1 secs.; to 50 m.p.h., 41.4 secs. From 10 to 30 m.p.h. was done in 19.6 secs. in top gear, and to 40 in 32.1 secs., again in top. Foot

braking, on a concrete road surface, in two tests from 30 m.p.h. to zero, read 85 and 76 per cent. on two separate runs, with measured distances of 48 ft. and 50 ft. The hand brake gave 28 per cent. from 30



Rear end of the Dennis F2, showing flow meter in centre of instrument panel

to zero. Radiator (bottom vessel) temperature at the top of Hindhead, approximately half-way through the tests, was 130 deg. F. On a hill climb test (Nutcombe Hill, Hindhead, 1 in 4) the F2 got its whole six tons up one-fifth of a mile in 49.6 secs., and on subsequent runs was stopped and restarted without difficulty in the middle of the hill.

The pumping test readings were no less interesting. The following are the tabulated results :

Pump Pressure, lb. sq. in.	Vacuum, in. of mercury	Output, G.P.M.	Speed, R.P.M.
40	15	1005	1675
80	12	910	1700
100	10.25	808	1750
120	8.5	710	1850
140	7.25	630	1925
160	5.75	550	2025
180	5.0	455	2150
200	4.0	370	2225

The lift was 3 ft. 9 in. using 8 ft. of 5½ in. British Standard suction hose. Priming took 1.6 secs.

Two deep lift tests were taken from 28 ft. (8.6 m.), with priming times of 17.2 and 15.8 secs., using 32 ft. of standard suction. With 40 ft. of suction over a swanneck bend on a 24 ft. (7.1 m.) lift, the priming time was 17 secs.

Pump output with a 10 ft. (3.06 m.) lift, using 24 ft. of standard suction, was :

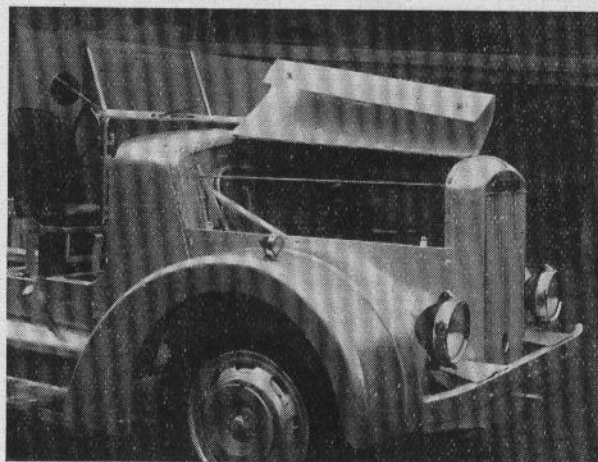
Pump Pressure, lb. sq. in.	Vacuum, in. of mercury	Output, G.P.M.	Speed, R.P.M.
100	19	765	1810
160	15	505	2050

At the time of the tests, the barometric pressure was 30 in. and the shade temperature 54 deg. F.

As a footnote to the foregoing, it may be mentioned that the pump had been run for 100 hours at 200 lb. in an earlier works test.

It will readily be seen that in the F2 the makers have produced a striking new appliance of high performance for Fire Service work. The fact that the tests were performed under exceptionally good conditions in no way invalidates the fine results.

The F2 embodies the results of considerable experiment at the Dennis works during the war. It can, of course, be supplied with any of the popular bodies to choice—Braidwood, New World, or limousine and with the pump fitted amidships to allow for the carriage of a wheeled escape. Every piece of accessory equipment is tested complete after fitting to the chassis. Cost necessarily varies with the type of body selected ; besides, the makers pride themselves on the individual treatment given to each fire authority's special requirements. These can be numerous and varied. Allowing for factors of this kind, the price of the chassis, complete with instruments and pump, is broadly in the neighbourhood of £1,800. The body and equipment would step this figure up approximately to £2,500, or over £3,000 where the specifica-



The F2 chassis ; the spring-loaded flushing valve is at the right below bumper

tion is on the lines of the Home Office machine. It is interesting to note that the Ministry of Works have recently ordered 20 F2's on Home Office account.

CORRESPONDENCE

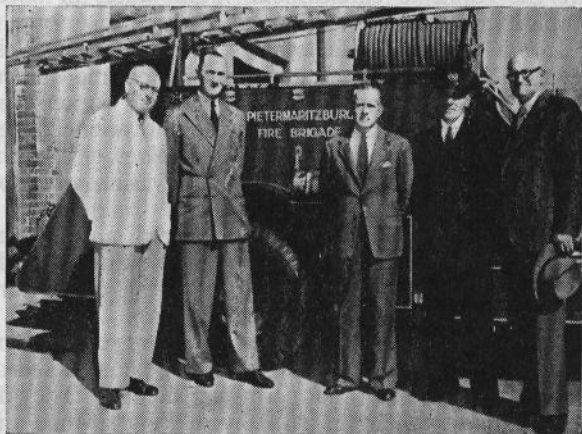
THE BENEVOLENT FUND

SIR,—I write as Chairman of the National Council of the National Fire Service Benevolent Fund to express a word of appreciation for the excellent report of the proceedings at the recent special general meeting of the Fund at County Hall, London, included in the April edition of FIRE PROTECTION. It is of considerable importance to the Fund that these proceedings should be as widely and accurately reported as possible and I am sure that the Executive Committee of the Fund would wish me to express their thanks for the extent of space given to this important meeting.—Yours, etc.,

A. H. JOHNSTONE.

South Lodge,
South Side,
Wimbledon Common, S.W.19.
April 2, 1948.

IN SOUTH AFRICA



During a recent visit to South Africa, Mr. William Fish, J.P., Managing Director of Dennis Bros., Ltd., arrived in Pietermaritzburg in time for the handing over ceremony of the municipality's new Dennis F.3 appliance. The machine has a capacity of 900/1000 g.p.m. and carries CO₂ foam equipment. Mr. William Fish (extreme right) is here seen with officials of the Council and Fire Department

FIRST STANDARD APPLIANCE COMMISSIONED

THE first of the 70 Dennis F 7 pump escapes to be built in accordance with the Home Office standard specification was accepted by Chief Officer E. Thomas, K.P.M., East Ham Fire Brigade, on May 27. The Mayor of East Ham (Councillor Mrs. E. M. Brace), who was accompanied by the Mayoress (Mrs. Grinder), the deputy Mayor and Mrs. W. I. Jackson, the chairman of the Fire Brigade Committee (Alderman W. E. Hurford), Councillor A. G. M. Oakes, Superintendent Hickinbotham and the Town Clerk, handed over the log book of the appliance to Chief Officer Thomas. The Mayor said it was her first public engagement and she was glad the Borough had been chosen to accept the newest type of pump in the country.

After the Mayor and her party had inspected the machine, it took them on a tour of the Borough. Among those who accepted invitations to be present at this pleasant ceremony were Chief Officers W. H. J. Benton, O.B.E., K.P.M. (Essex), C. T. Demarne, A.M.I.Fire E. (West Ham), deputy Chief Officers D. D. Barwick (East Ham) and C. G. Tobias, B.E.M. (Essex), and Mrs. R. Marshall (FIRE PROTECTION).



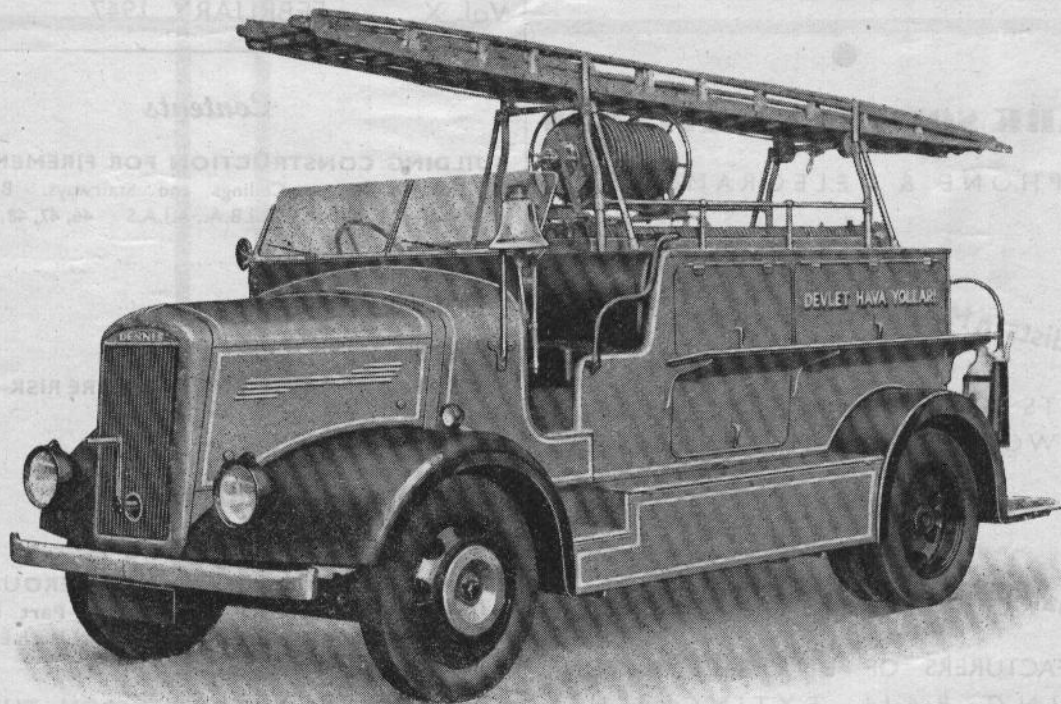
[Central Press photograph]

The new Dennis F 7 pump escape placed on the run by East Ham Fire Brigade has been described in previous issues of FIRE PROTECTION. When fully equipped with gear and crew, it will attain speeds of approximately 60 miles per hour, and from a standing start will accelerate to 40 miles per hour in 30 seconds. It has a Rolls Royce 8-cylinder, 150-b.h.p. petrol engine, anti-radio interference apparatus and many other special features. In working order the appliance weighs about 8 tons

FIRE PROTECTION February, 1934

DENNIS

BROS., LTD., GUILDFORD

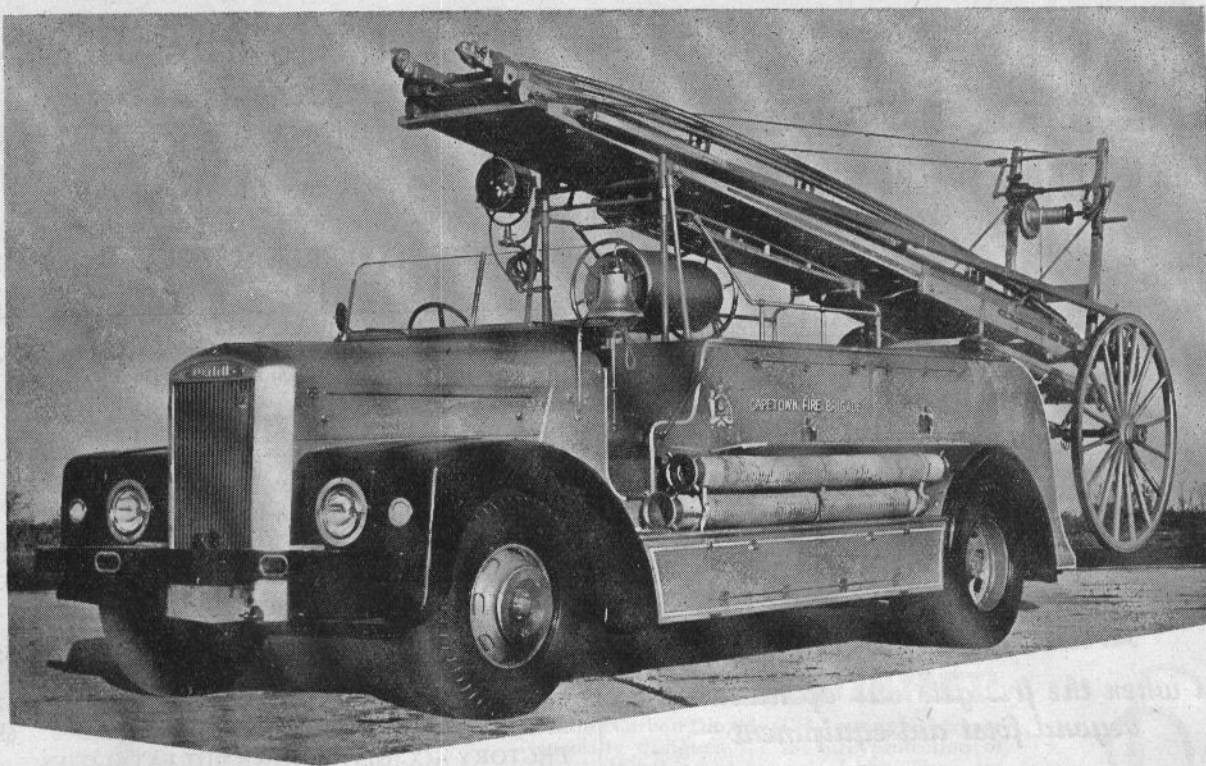


This Dennis F.1 Fire Engine (Output 400-500 g.p.m.) is one of 7 recently ordered by The United Africa Co. Ltd. for Turkish Airways

FASHION OR FUNCTION ?

If streamlining conflicts with efficiency, our decision is ruthless. The sleek limousine and the New-World bodies are admirably suited for service in many areas, but for the requirements of Turkish Airways, the traditional Braidwood type is unexcelled.

How would you more conveniently accommodate personnel, ample delivery hose, two large CO₂ extinguishers, foam branches, a plentiful supply of Saponine, a 30-ft. ladder, First-Aid hose AND A 200-GALLON TANK ?



CAPETOWN *continues!*

Capetown is another famous brigade whose associations with Dennis are entering the third decade of staunch relationship.

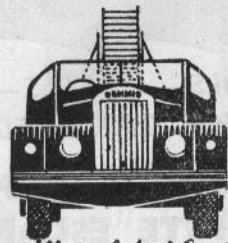
With close on eighty square miles of territory to cover, the Capetown Authorities know the importance of fast, high efficiency appliances and that the Dennis F.2 is a leader in this field.

from the specification

The engine is of Straight-8-cylinder design, governed to provide a maximum of 150 b.h.p. and employs the Dennis closed circuit cooling system.

The Dennis two-stage pump is a back-to-back turbine which delivers 900—1,000 g.p.m., and can be fitted at the rear or amidships, as required.

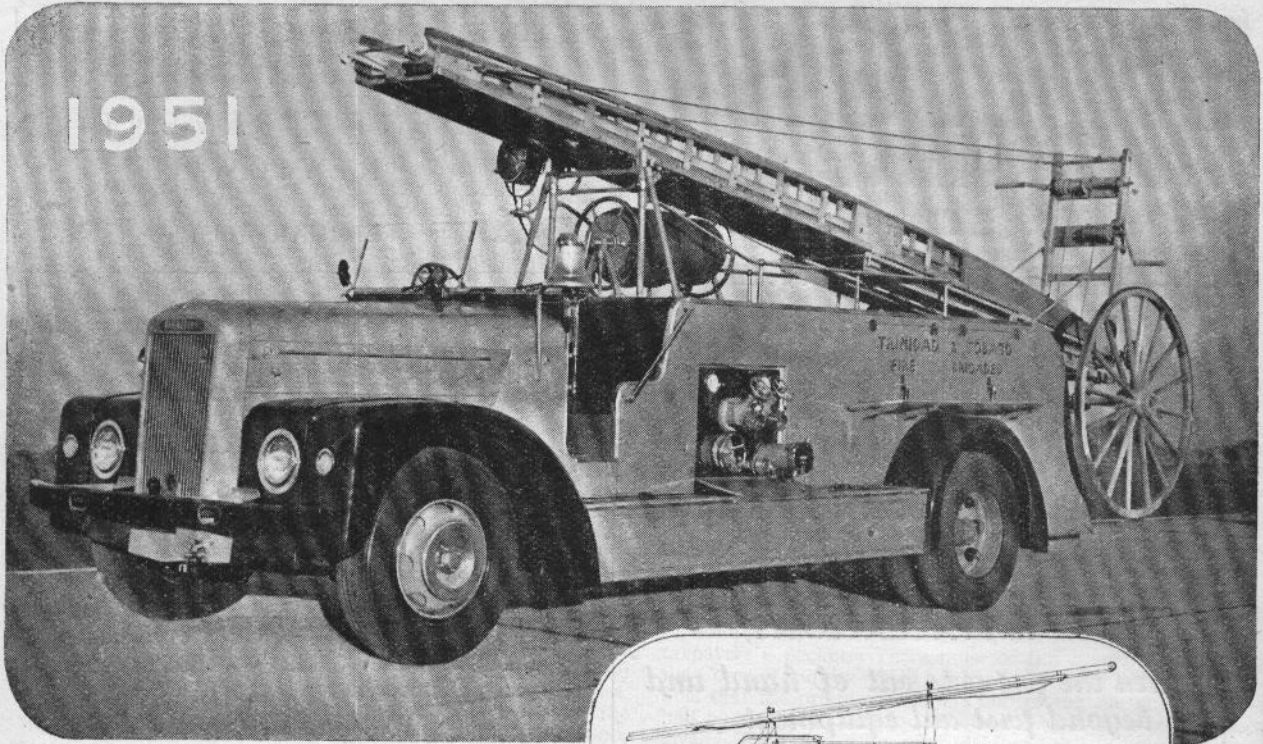
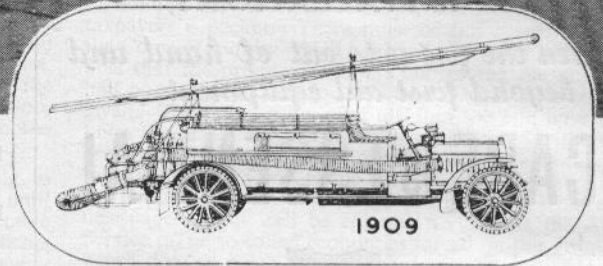
Likewise, the style of body and equipment can be the subject of personal choice, and Dennis engineers are willing to co-operate to the fullest extent in matters of design.



with restyled front

D E N N I S B R O S . L T D . G U I L D F O R D

1951


DENNIS


Progress...

Dennis fire engines are constructed individually and each specification is drawn and detailed with one objective in view—that of progressing towards better and more efficient fire appliances.

Nearly half a century of fire engine manufacture is an assurance in itself that behind every machine, each development of significance to date has been incorporated in the design.

DENNIS BROS LTD GUILDFORD



Equipment includes a 50-ft. Ajax wheeled escape, 150-ft. first-aid hose mounted on an Ajax turntable reel and supplied from a 40-gallon tank, working in conjunction with the main pump. The body is of the Double Transverse seating type.

“ . . . and never the twain
shall meet ” ?

BUT the manufacturing genius of the West meets the needs of the East.

For many years, the Bombay Fire Brigade has favoured the Dennis appliance and now takes delivery of the newly introduced F.3 model, output 800-900 g.p.m.

Like many other knowledgeable Authorities, this Brigade approves the amidships pump for ease and speed of operation.

DENNIS

BROS., LTD., GUILDFORD



SHOWING THE 500 G.P.M PUMP

two faced!

A distinct virtue of the Dennis F.6 appliance!

Equipped with a 600 gallon galvanised steel water tank the F.6 is always ready to serve two masters, performing duty as either a fire engine or as a street washing machine.

For both duties the Dennis 500 g.p.m. two-stage turbine pump is employed and controls are provided in the cab for road work and at the rear for fire service.

Provision is made for hydrant or open water (including sea water) operation and ample locker space accommodates the lengths of hose.

Truly a useful vehicle, which in spite of its hypocrisy has lost nothing in outward appearance, presenting as it does very smart clean lines.



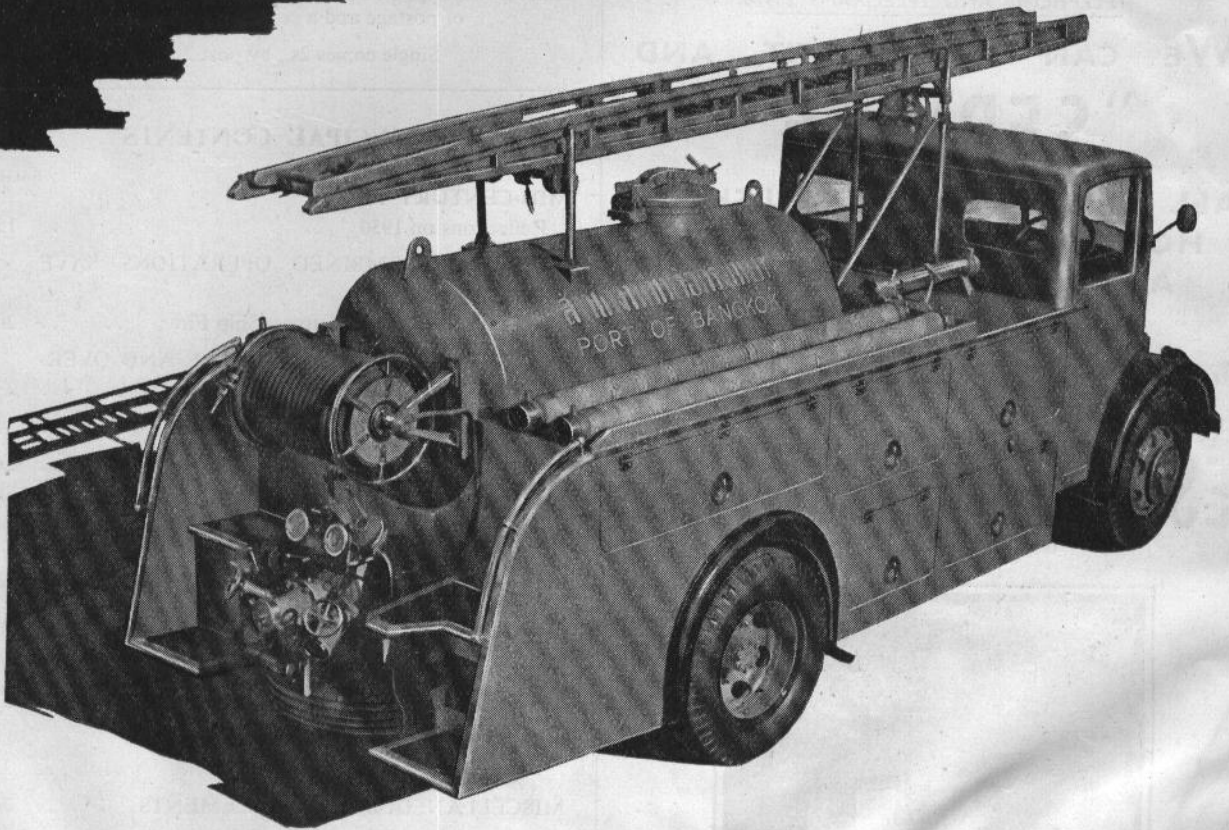
SHOWING THE STREET WASHING HEADS

AT PRESENT THE F.6 IS FOR EXPORT ONLY

DENNIS BROS LTD GUILDFORD

สำนักงานท่าเรือกรุงเทพ

PORT OF BANGKOK



With a population of roughly 50,000 per square mile Bangkok, Siam's greatest port, finds the need for a special fire appliance. As is the Dennis custom, a vehicle has been built to meet the specification, a tank type appliance with rather less water carrying capacity than standard and more locker accommodation. This new appliance has, as always with Dennis, the inherent advantage of being produced throughout under one roof. In spite of an individual specification the degree of standardization of vital components maintains the ease of spares replacements in any part of the world

F6

DENNIS BROS LTD GUILDFORD



No. 5 pumping set for Trinidad Harbour Board

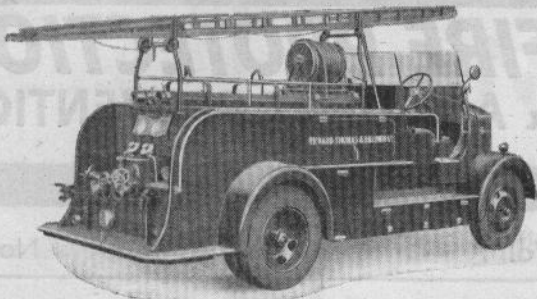
The No. 5 pumping set introduces another addition to the range of Dennis appliances. At present construction is limited to special requirements only, but the general specification includes the new features established in the Dennis F.2 and F.7 range. The 150 h.p. straight eight engine is direct coupled to the Dennis turbine pump giving approximately 800/900 g.p.m. at 80 lbs. sq. inch, and 400 g.p.m. at 200 lbs. sq. inch.

Closed circuit water cooling, self starting at temperatures below zero, and a rapid full power characteristic, are worthwhile inclusions in the design.

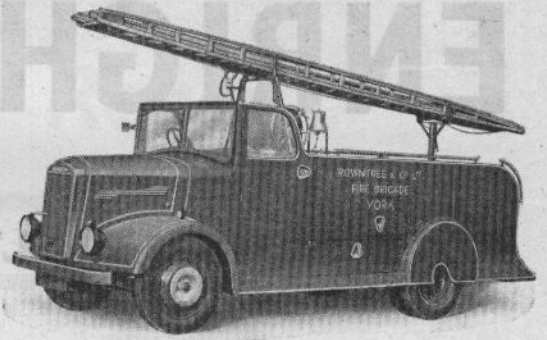
Between the twin cylinder priming pump and the main pump is fitted a self-operating valve which takes care of varying pressure conditions and obviates the use of manual control. The engine is automatically set for correct priming speed at the touch of a single lever.

Our engineers are at present willing to co-operate in the design of stationary, hand- or power-trailed units to special requirements.

DENNIS BROS LTD GUILDFORD



Richard Thomas & Baldwin Ltd.

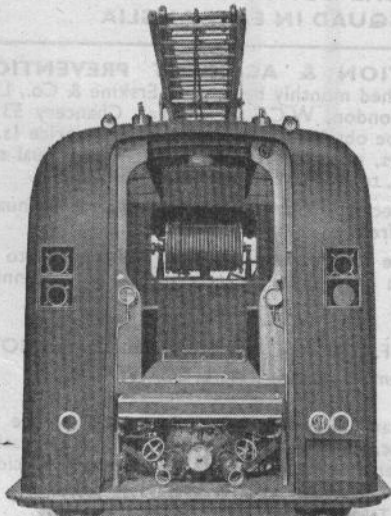


Rowntree & Co., Ltd., York

DENNIS

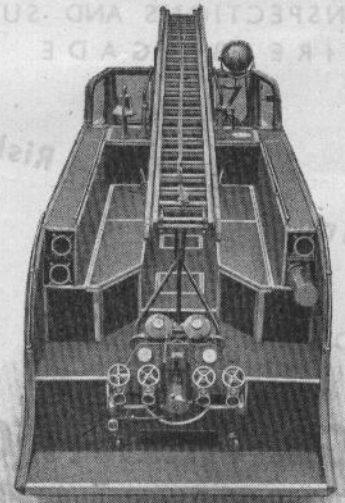
BROS., LTD., GUILDFORD

Manufacturers of Fire Engines for INDUSTRIAL FIRE BRIGADES



Boots Pure Drug Co., Ltd.

Cadbury Bros., Ltd.

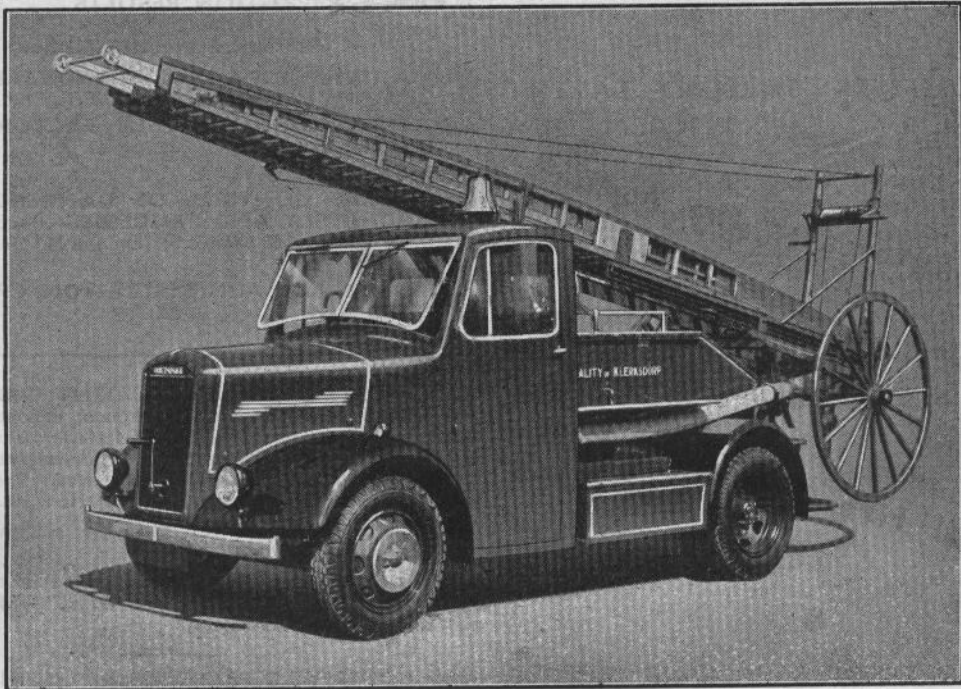


**Another Emigrant
to
South Africa
from**

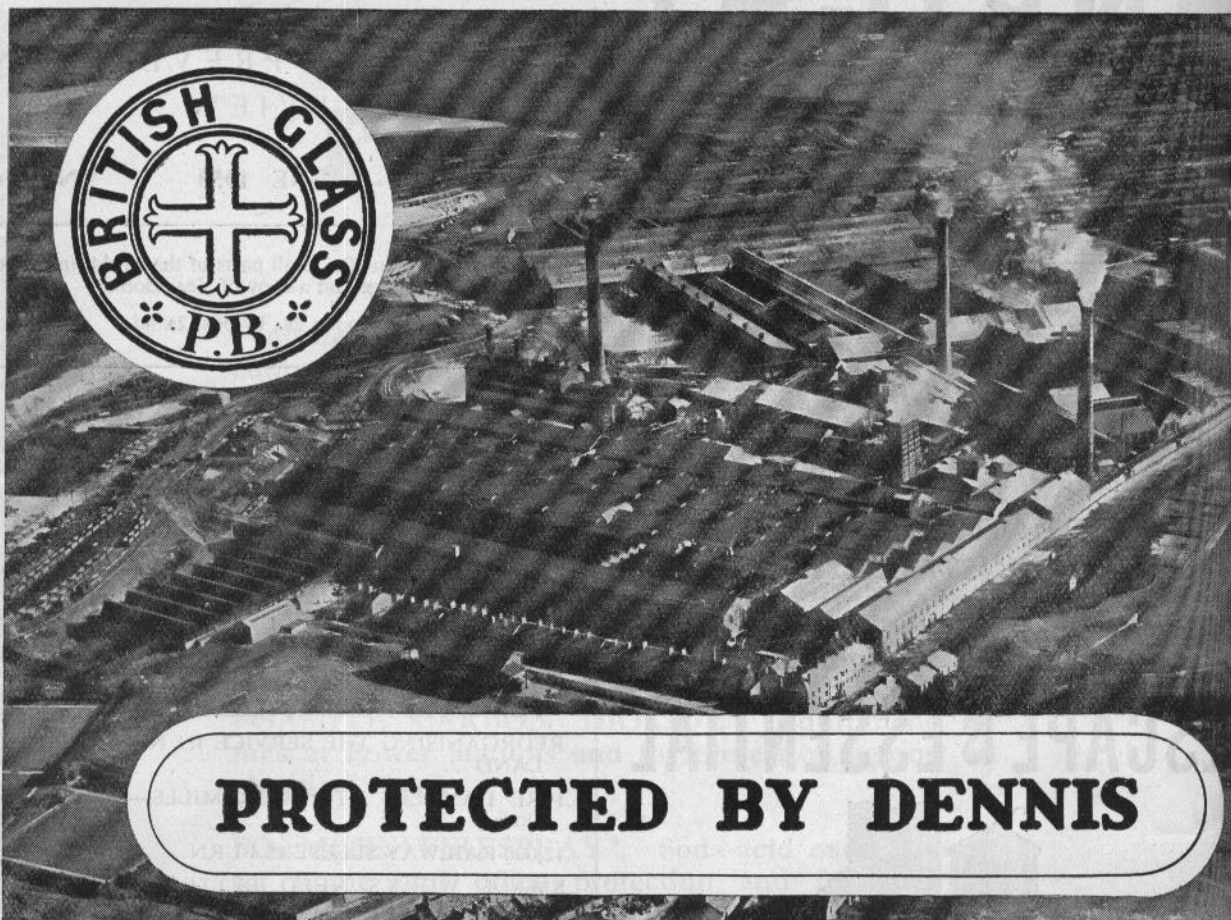
DENNIS

BROS., LTD., GUILDFORD

**who have recently shipped a number
of Fire Engines to this Dominion.**



Supplied to the MUNICIPALITY OF KLERKSDORP, this F.I. machine (output 400/500 g.p.m.) is provided with a cab for the driver and officer. The Braidwood-type body carries 1,500 ft. of delivery hose as well as ample first-aid equipment and a 50-ft. Telescala escape.

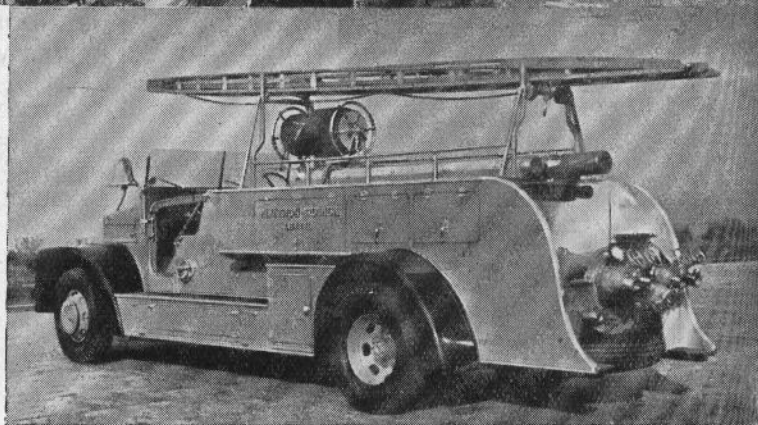


PROTECTED BY DENNIS

Absolute reliability and advanced design once again influence the choice of a Dennis F.2 by a famous industrial brigade.

Messrs. Pilkington Bros., Ltd., have increased their brigade strength by the addition of a Dennis 150 h.p. F.2 at one of their three St. Helens Glass Works.

Amongst the special features of the F.2 are: below zero starting—immediate full power—controlled engine temperature—no-waste cooling system and unequalled road performance.



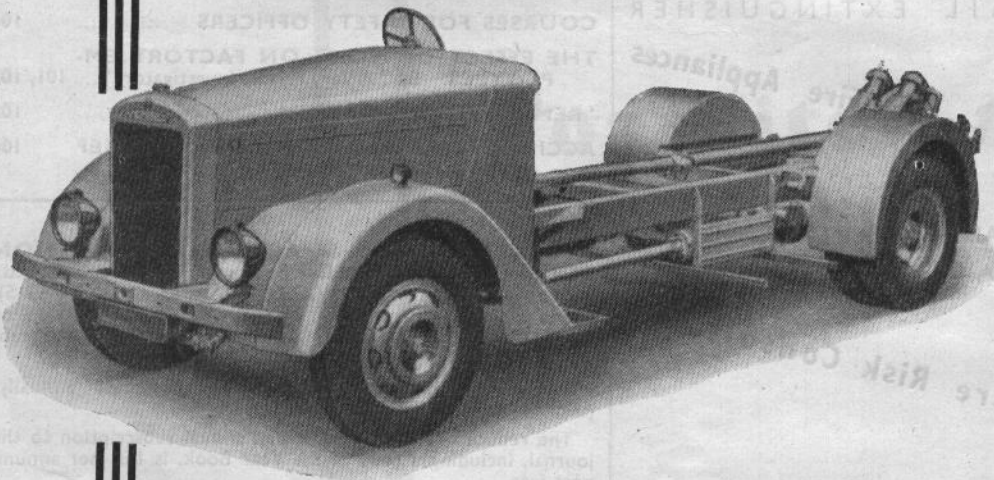
DENNIS BROS LTD GUILDFORD

Quality of the First Order

has evoked this, the third (repeat) order from the

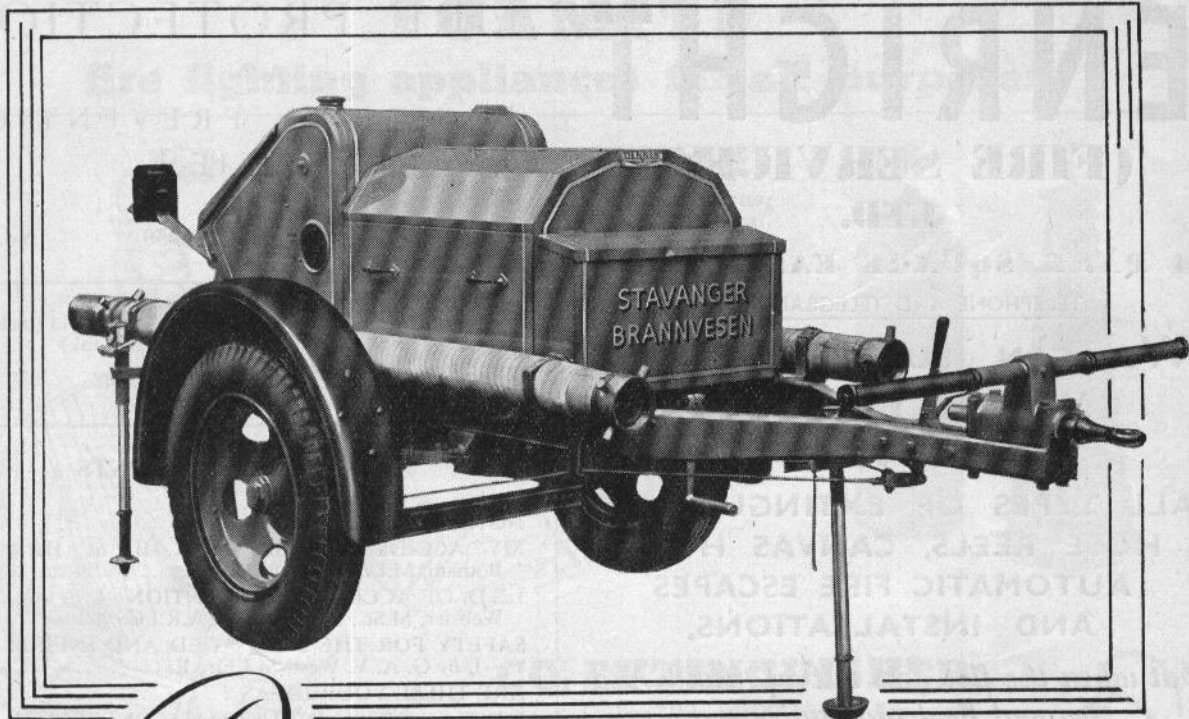
CITY of GHENT

This is the 800-900 gallon model of our newly-introduced range, acclaimed by so many Authorities for its qualities of dependability, manoevrability, efficiency and full-throated POWER.



DENNIS

BROS., LTD., GUILDFORD



Portrait of a **T.P**

The backbone of the brigade—maid of all work—call the humble trailer pump what you will, but name it Dennis and it's a friend of firemen.

No glamour is attached to trailer pump duty, but in the crisis of a drought, a flood, or just a fire, the trailer is up early and the last to retire, and given fuel and oil, cares little for the hours in between.

The Dennis 350/500 g.p.m. pump is a leader in its class with a reputation, earned in active service, for downright dependability.

Nowadays, with the war years behind, the trailer pump is serving in all manner of ways, from fire extinguishing to fruit growing, and in almost every part of the world.

DENNIS BROS LTD GUILDFORD

MARCH 1950

Fire Protection and Accident Prevention Review



H.M. Dockyard --- --- Singapore

Shortly the new Dennis F.12 illustrated above will commence over 8,000 miles of sea journey to Singapore. Moreover, on arrival it will be in good company. Dennis appliances have been operating in Singapore for many years and amongst the latest additions to their strength are two F.7 appliances.

Each of these machines is capable of 1,000 g.p.m. and road speeds approaching 70 m.p.h. carrying a full crew in limousine comfort.

DENNIS BROS LTD GUILDFORD



Royal Palace Cairo



DENNIS

To the long list of distinguished people whose property is protected by Dennis Appliances, we have the honour to add the name of the Egyptian Royal Household. The Royal Palace at Cairo will shortly take delivery of a Dennis F.I. Machine, equipped with New World Body and extension ladder. Twin searchlights are mounted immediately behind the cab, together with the first-aid hose reel. The machine carries both siren and bell.



DENNIS BROS LTD GUILDFORD

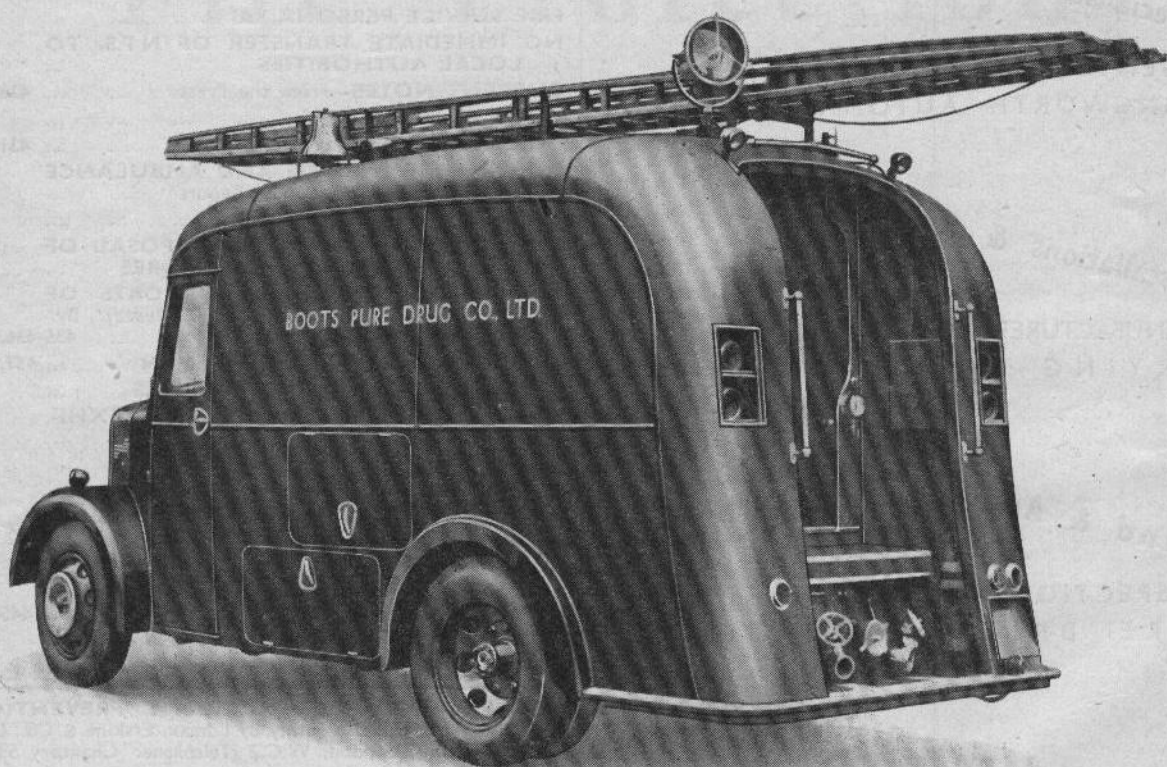
The Exceptional Efficiency

of Messrs. Boots' firemen may be partly due to their taking our medicine in preference to their own.

The prescription for these "patients" was :—

New-type Dennis F1. fire engine with enclosed body and rear pump giving 350/500 gallons per minute. First-aid hose-reel. Special tunnels housing the suction hose. Unimpeded rear opening, with latest-pattern pump snugly housed under floor-extension without loss of accessibility to unions or controls.

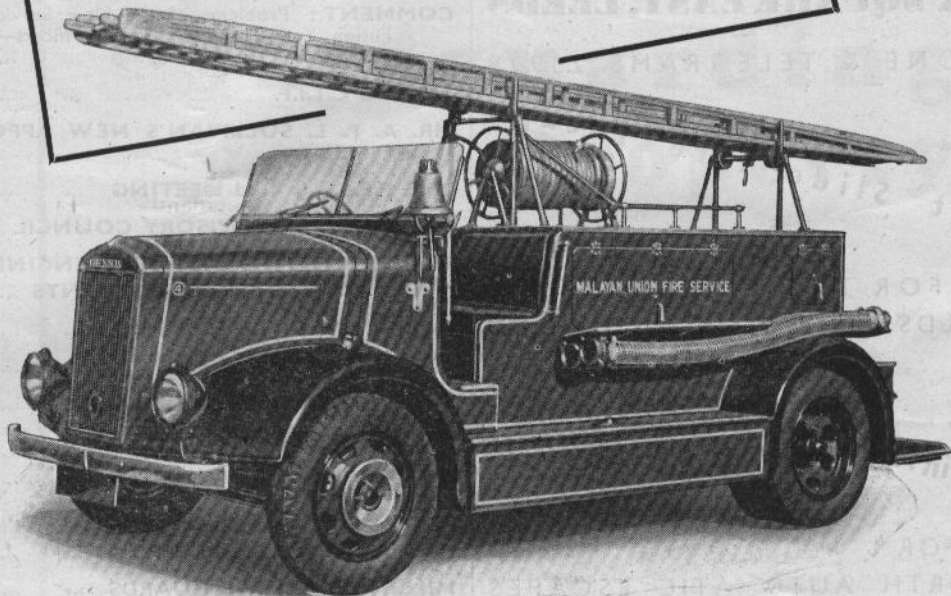
Supplementary ingredients include :—35ft. telescopic ladder, search light, electrically-operated bell, draw-bar, portable CO₂ and foam equipment, nozzles, and accommodation for breathing apparatus.



DENNIS

BROS., LTD.,
GUILDFORD

**FROM:—DENNIS
TO:—MALAY**



The Braidwood-type body carries a 40-gallon tank used, in conjunction with the main pump, to supply 120 ft. of First-Aid hose. There is accommodation for 1,800 ft. of delivery hose and equipment includes a 35-ft. Ajax ladder.

This F1. 400/500 g.p.m. Fire Engine is one of 10 similar Dennis machines ordered for the Malayan Union.

Powered by a 4-cylinder engine of proved worth, this essentially up-to-date machine is of a solidity of construction that promises faithful service for many years ahead.

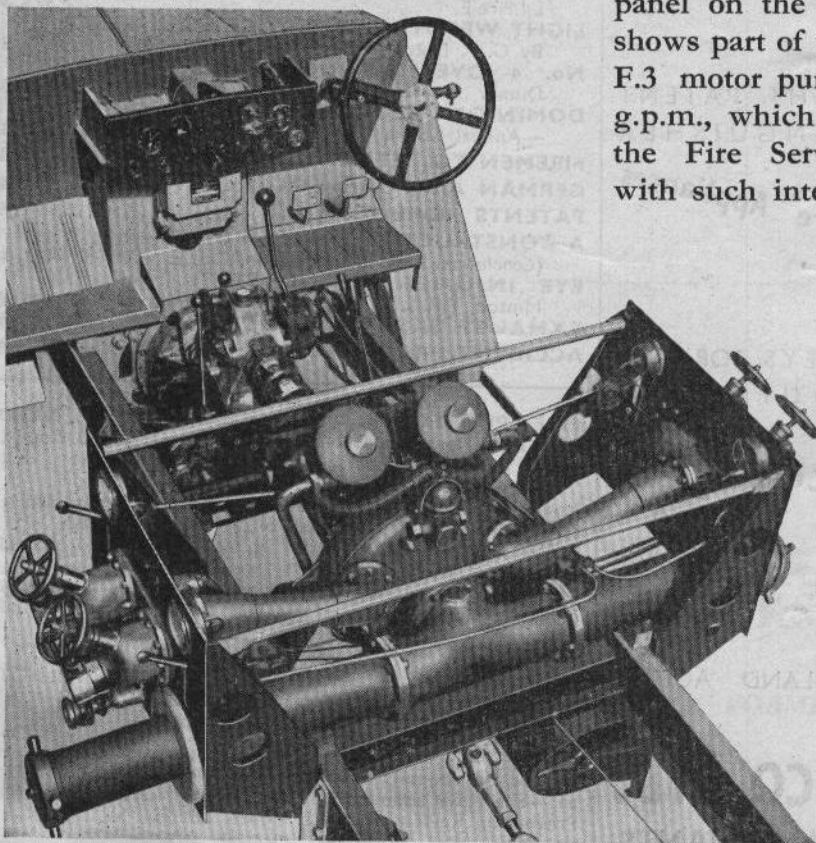
DENNIS

**BROS., LTD.,
GUILDFORD**

You don't often get a chance like this, so make the most of it!

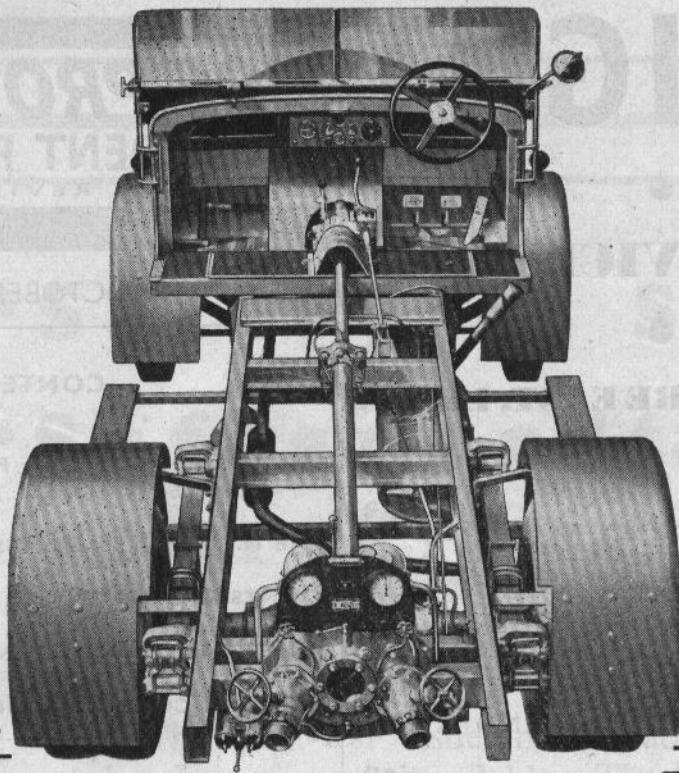
Here is the arrangement of the Dennis pump in the amidships position, preferred by many expert Authorities. You can see how the duplication of couplings, controls and gauges is arranged, the lay-out giving compactness without sacrifice of accessibility even when the body is fitted.

NOTE, too, the comprehensive instrument panel on the dash. This picture shows part of the newly-introduced F.3 motor pump, capacity 800-900 g.p.m., which the "High-Ups" of the Fire Services are discussing with such interest.



DENNIS

BROS., LTD.,
GUILDFORD



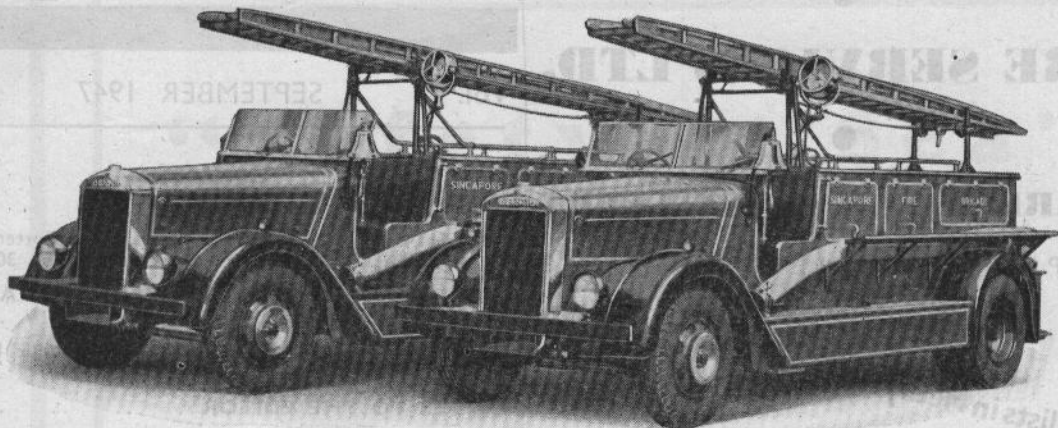
ATTENTION —

both to the minutest detail and to the specialised needs of Fire Authorities all over the world—this is what has inspired and achieved the progressive design of Dennis Fire Engines for a matter of 40 years.

DENNIS

BROS., LTD., GUILDFORD

This F.1, 400/500 g.p.m., chassis, which is one of five being supplied to the N.S.W. Fire Board, Sydney, is no exception.



SINGAPORE welcomes

Old Favourites — new

DENNIS

Fire Engines

These machines are examples of the F.3. 800-900 g.p.m. model. Provided with Braidwood-type bodies, they have stowage capacity for approx. 3,000 ft. of delivery hose! Accessories include : 11 in. searchlight, automatic hose-locker lights and a 35-ft. Ajax ladder. As an alternative to the latter, a wheeled escape may be carried.

DENNIS BROS., LTD., GUILDFORD



choose
HIGH POWER
and
LOW WEIGHT

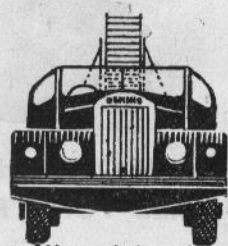
DENNIS BROS LTD GUILDFORD

We are proud to announce the adoption, by Messrs. British Thomson-Houston Co., Ltd., of Rugby, of the first of a number of F.2 appliances for industrial Brigades in England.

Three years of successful duty overseas have thoroughly proved the F.2 and justified Dennis High-Power-to-weight ratio design.

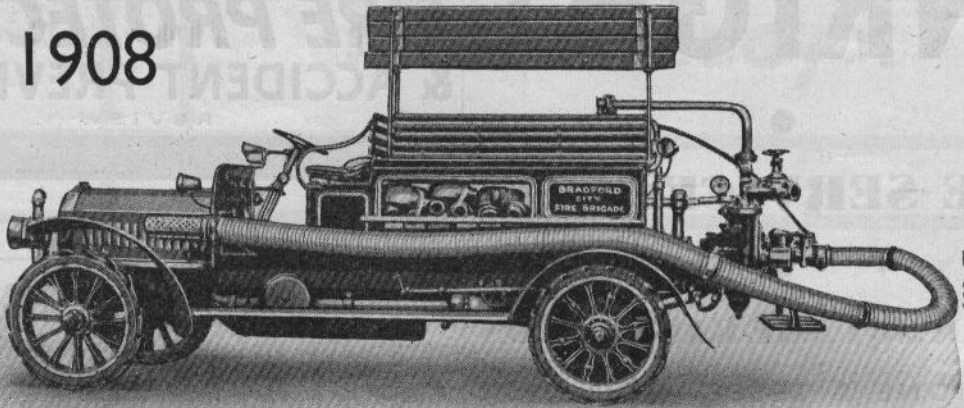
With close on 25 b.h.p. per gross ton, available, this appliance is capable of extremely high road performance, whilst the two-stage turbine pump delivers outputs up to 900/1,000 g.p.m.

Under maximum gross load conditions the F.2 remains a light, easily handled appliance, incorporating all the features demanded by modern fire fighting technique.



with restyled front

1908



PATERFAMILIAS

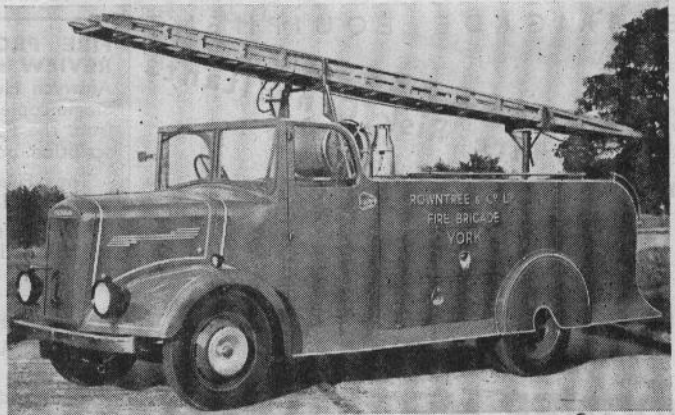
of all Dennis Fire Engines, who made his first public appearance over 40 years ago. Bradford was the fortunate city. Since then, succeeding generations have marked our progress in design and constructional methods, but the quality of workmanship—the best that skilled craftsmen can offer—is a family likeness that has been clearly recognisable throughout the years. No wonder the Dennis Fire Engine of to-day is renowned—as it is used—the world over!

1947

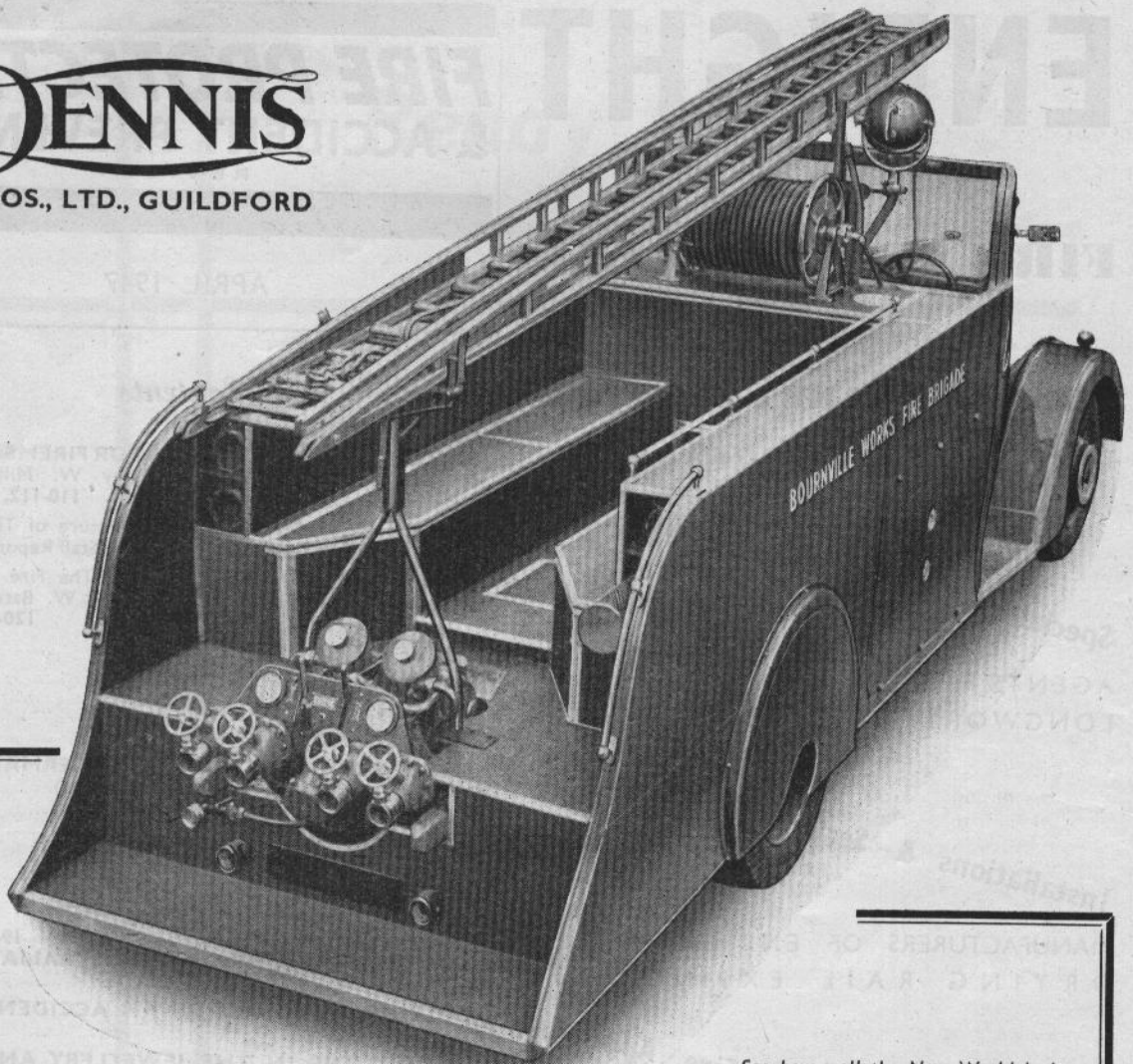
DENNIS

BROS., LTD., GUILDFORD

This Dennis F.I. Fire Engine, recently supplied to Messrs. Rowntree and Co., Ltd., York, is an example of our post-war range. The new World body is specially designed to afford a high degree of accessibility, combined with safety and a measure of weather protection. Output 400/500 g.p.m.



DENNIS
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See how well the New World body affords a high degree of accessibility, combined with safety and a measure of weather-protection. The 800/900 gallon pump is skilfully accommodated so that its controls are ready-to-hand, unobstructed by the ladder support.

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have chosen the Dennis F.3. Fire Engine
for the protection of their plant at
THE BOURNVILLE WORKS