

# An Interesting Small Fire Engine

## The "Invincible" Trailer Unit

**F**ACTORIES that consist mainly of a single building can usually be reached in case of fire by the ordinary type of fire engine familiar in the fire stations of all large towns and cities. Many factories are not of this type, however, but comprise a number of comparatively small buildings near together, making it difficult for a large fire engine to approach sufficiently close to deal effectively with a serious fire. In such cases a smaller engine is more efficient, its lower pumping capacity being outweighed by its ability to come to close quarters. An interesting example of this type of fire engine is the "Invincible" trailer fire unit built by Gwynnes Pumps Ltd., to whom we are indebted for our photograph and information. It is interesting to note that this firm has been building centrifugal pumps since 1849.

This pump is available in two sizes, the smaller having a nominal capacity of 100 gallons per minute, and the larger of 250 gallons per minute. Each unit consists of a highly efficient two-stage gunmetal pump driven by a petrol engine of ample power, complete with petrol and cooling-water tanks and priming exhaustor-pump. These sets have been specially designed with a view to limiting the weight as much as possible, so that they may either be drawn by hand or trailed behind a suitable vehicle. In addition to their use for fire fighting these units are very useful in agricultural districts, where they can be effectively employed at low running costs for spraying, irrigation, or drainage purposes. When a unit is used in this manner the pump will be operating against a much lower head, and a considerably larger amount of water will be delivered than when operating on fire service.

The 100-gallon outfit has a pump capable of discharging 100 gallons of water per minute through one or two jets at a pressure of 110 lb. per sq. in. when running at a speed of 3,000 r.p.m. It is of the two-stage type with impellers arranged back to back to minimise end thrust. Any small thrust that might arise is provided for by a double ball thrust washer that serves also to locate the impellers. The pump is entirely of gunmetal, with a stainless steel spindle, so that any possibility of rust is eliminated. The tail end of the spindle runs in a grease-lubricated bearing of ample length formed in the suction passage.

Priming is accomplished by a rotary exhaustor driven

from the pump spindle through a friction drive, brought into action when required by a hand lever. An interceptor tank is interposed between the pump and the exhaustor to prevent water from entering the exhaustor when the pump is primed. This interceptor comprises a ball float and mitre valve, and acts automatically. The tail end bearing and the main roller and ball bearings are lubricated by grease cups. The bearing housing is cooled by water tapped off from the pump casing through a strainer easily removable for cleaning, and the cooling water then passes to the engine cylinder jacket, the

quantity being regulated by a cock at the pump. Gauges are fitted to show the pressure of delivery, the vacuum or pressure at the suction, and the pressure of the oiling system of the engine.

Two 10-ft. lengths of 3 in. suction hose are provided, together with a gunmetal footvalve

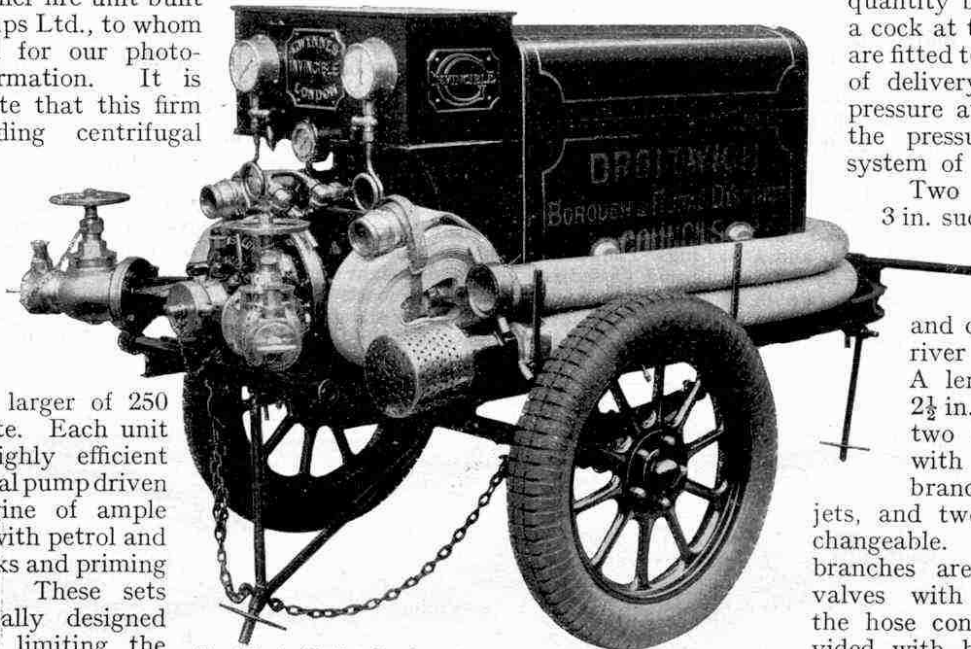
and copper strainer for river or pond supply. A length of 100 ft. of 2½ in. delivery hose in two coils is included, with two 18 in. copper branch pipes, two ½ in.

jets, and two ¾ in. jets interchangeable. On the delivery branches are 2½ in. gunmetal valves with outlets to suit the hose connectors, and provided with blank caps.

The pump is driven by a four-cylinder monobloc engine of 66 mm. bore by 100 mm. stroke, developing 17.5 b.h.p. at 2,000 r.p.m. The crankcase is of aluminium with a sump capacity of six pints of oil. The cylinder block is water-cooled by thermosyphon from the header tank at starting, with an adjustable supply from the pump when this is working.

The drive from the engine is taken through a gear-box giving a pump speed of 1.5 times the engine speed. The gears are totally enclosed, and run in an oil bath. The frame is constructed of steel channel, and the units are independently mounted on cross members. A suitable draw-bar attachment is provided for trailing and hand haulage.

The specification of the 250-gallon unit is generally in accordance with that of the 100-gallon unit just described, but with various modifications necessitated by the increased size. The pump of this larger unit discharges 250 gallons of water per min. through one or two jets at a pressure of 140 lb. per sq. in. when running at a speed of 2,400 r.p.m.



The "Invincible" trailer fire unit, a small but powerful engine specially designed for use in situations where it would be difficult or impossible for a large fire engine to approach sufficiently close.