

## COMMERCIAL VEHICLES AND MOTOR-BOATS AT OLYMPIA.—No. II.

STEEL motor-boats were shown by two firms. The Seamless-Steel Boat Company, Limited, of Calder Vale-road, Wakefield, exhibited a very handsome twin-screw cruising-launch propelled by independent sets of 15 horse-power paraffin-engines. The hull, which is 40 ft. long by 8 ft. 6 in. beam and 4 ft. deep, is composed of two pressed plates, one forming each side, riveted to a T-bulk head-bar. The engines are supported on levers formed of angles and plates, and the engine-room floor is of chequered steel plate. The steel launch exhibited by Messrs. Boulton and Paul, Limited, of Norwich, is 30 ft. in length, and driven by a six-cylinder engine of 32 brake horse-power, using either petrol or paraffin. The boats of this firm are built after the manner of a steamship, with steel plates riveted to a

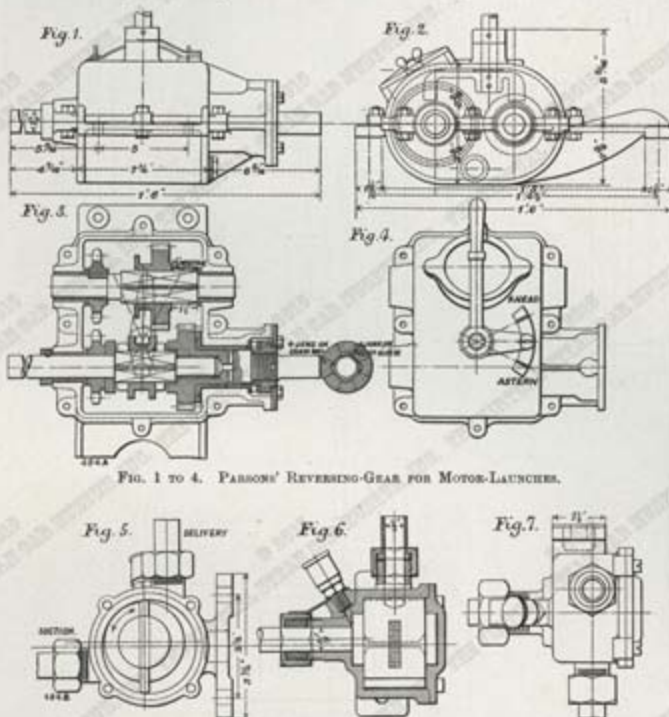
have recently brought out for marine motors. The construction will be clear from Figs. 1 to 4, subjoined, and the figures also show that a very small room or depth is required to contain the apparatus. It will also be seen that friction-clutches and small epicycloid and other pinions are avoided in the design, which is straightforward and mechanical throughout. The gear is operated by a lever shown in Fig. 4, which has ahead, neutral, and astern positions. On the inside of the cover, and fixed to the lever spindle, is another lever, shown dotted in Fig. 3, one end of which actuates a double dog-clutch on the driving-shaft, and the other simultaneously moves the countershaft pinion in or out of gear. The engine is coupled to the left-hand side of the box in Fig. 3, and when the lever is in the neutral position merely drives the dog-clutch which is on the squared end of the shaft. For going ahead this clutch is engaged

One of the most unusual engines in the Show was exhibited by Williamson's Patents, of Koolunga, Gorleston-on-Sea. It was an oscillating two-cycle paraffin-engine, to be used as auxiliary power on a yacht, and had a cylinder 6½ in. bore by 8 in. stroke, developing 14 brake horse-power at 350 revolutions. In general appearance it was like an open-type double-acting vertical engine, but the under side of the piston was used as a compressor for the charge. The crank was fully visible, and the shaft ran in ball bearings. The inventor claimed that the design eliminated the side thrust on the cylinder-walls due to the obliquity of the connecting-rod in the ordinary type. The fact seemed to have been overlooked that to stop and start the oscillation of a heavy cylinder 700 times a minute requires a very considerable side thrust, which is much more awkward to provide for than that which it is sought to avoid. However, the design was undoubtedly original, and that is something nowadays.

We referred briefly last week to the exhibit of the Darracq-Serpellet Omnibus Company, Limited, of 15a, Amelia-street, Walworth-road, S.E., and are now able to illustrate one of the vehicles shown by the firm. The chassis illustrated in Figs. 1 and 2, page 464, is that of a 30 to 40-horse-power steam-omnibus of the type in use by the Metropolitan Steam-Omnibus Company for London service. It would, of course, serve equally well for a lorry or van, carrying loads up to about 4 tons, and smaller sizes are constructed for lighter work. The chassis is of channel steel, and the engine, which is shown separately in Fig. 3, page 465, is placed horizontally, and a little ahead of the rear axle. There is a spur-reduction gear housed in the crank-casing, from which the second-motion shaft projects on each side and terminates in sprockets, whence a chain-drive transmits motion to the rear wheels. The differential gear is on the second-motion shaft within the crank-case. The engine has two double-acting cylinders, 92 millimetres (3½ in.) bore, and a 125 millimetre (4½ in.) stroke, with the cranks at right angles. The spur and chain gearing is such that the engine runs at five times the speed of the road-wheels. The valves are of the mushroom type, worked by a cam-shaft, and all four of them are placed at the back end of the cylinder, and on its upper side, the steam-valves being nearest the cylinder. Leakage down the valve-stems is prevented by a large number of grooves turned in the stems. The pistons are packed by means of ordinary stuffing-boxes, and any leakage through these is kept from the crank-chamber by the crossheads, which completely fit the cylindrical guides. By sliding the cam-shaft endwise, cut-off can be varied from three-quarter stroke down to zero, and a further movement reverses the engine.

The boiler, or, rather, steam-generator, illustrated in Figs. 4, 5, and 6 on page 465, is situated over the front axle, and consists of ten weldless-steel coils, each composed of a tube about 33 ft. long, bent into grid-iron form, and connected in series by end-connections outside the casing. The coils are arranged horizontally, one above the other, and the unions, which are not exposed to heat, can be inspected or tightened while steam is up. The joints are made with soft-copper washers. In the hands of a careful driver, boilers of this type have been in daily use for over a year without replacements. They are absolutely free from danger, and should a coil go, comparatively little trouble and time are required to insert a new one, which is a job within the capabilities of an unskilled man. We understand that no case of a tube being choked by scale has ever been known. A safety-valve is fitted which is set to lift at about 800 lb., the usual working pressure being about 450 lb., though, of course, this fluctuates greatly, and may be almost anything the driver desires. The steam normally leaves the boiler at a temperature of about 1000 deg. Fahr.

The paraffin fuel is pumped through a vaporising coil, winding to and fro in three nickel troughs, and then, after passing through a gauze filter, escapes in the form of vapour from sixteen steel nipples of ½ in. diameter beneath the troughs. The vapour rises through holes in the bottom of the channels and draws in air with it, burning with a Bunsen flame above the channels and around the vaporiser tubes. By undoing a single union the whole of this apparatus can be withdrawn, complete with the casing in which it is contained. This only takes a minute or two. The life of all parts of the burner, except the vaporiser tube, is indefinitely long. The latter, however, should generally be renewed after



FIGS. 1 TO 4. PARSONS' REVERSING-GEAR FOR MOTOR-LAUNCHES.

FIGS. 5 TO 7. PARSONS' OIL-PUMP.

framing of steel sections. The plating varies from 18 B.W.G. to ½ in. in thickness, and the frames from ½ in. to 2 in. equal angles. Messrs. Boulton and Paul build and engine boats of this type up to 60 ft. in length, and provide them with airtight compartments, which will keep them afloat even when full of water. On their stand were shown several engines—one a new design specially built for racing. It has six cylinders, 4-in. bore by 6-in. stroke, giving 32 brake horse-power at 800 revolutions. It weighs, with aluminium crank-casing, 2½ cwt., and has been designed to give over the rating of the M.M.A. formula of last year. To actually attain the power at which the new formula rates them, most engines would have to be run at a speed so high that the propellers would be very inefficient; and for this reason the engine in question has been designed to meet the altered conditions. The cylinders are cast separately, with valves on opposite sides, both of which are well water-jacketed, and of large size.

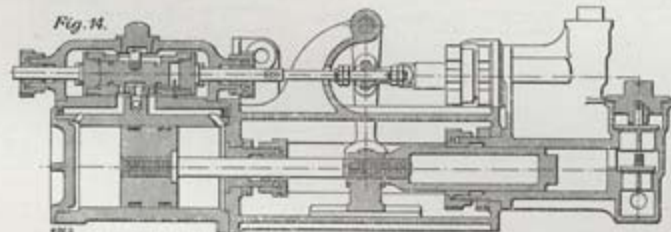
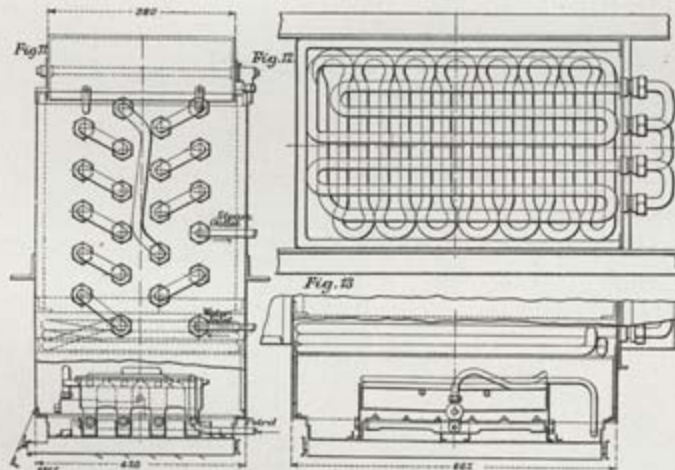
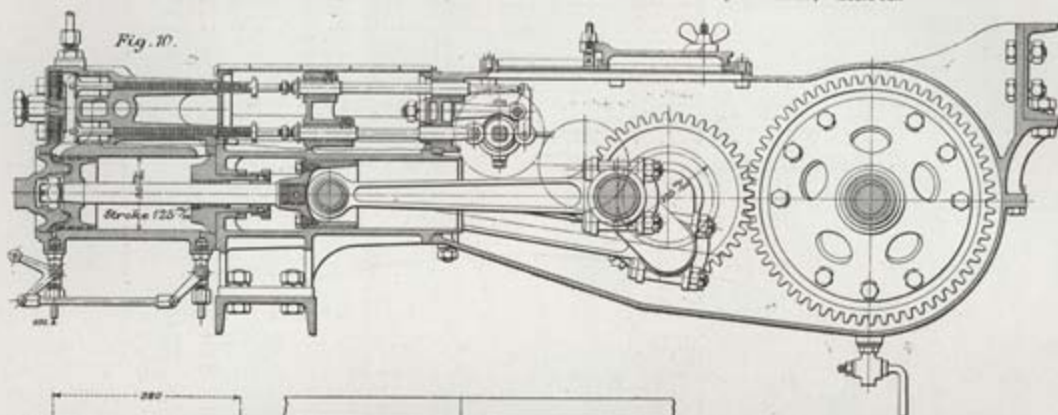
The Parsons Motor Company, Limited, of Southampton, were showing, besides a number of paraffin-engines, a new type of reversing-gear which they

with the boss of the adjacent spur-wheel, and a direct drive is obtained. For going astern the clutch is engaged with the sprocket-wheel, and the gears are in mesh, so that the drive is to the counter-shaft by a heavy roller-chain and back through the gear. The shaft thrust is taken by a ball-bearing, and the astern thrust by a substantial surface.

The same makers also showed an extremely simple pump for the circulating water of a marine motor, or for pumping out the bilges. It is illustrated in Figs. 5, 6, and 7, and is of gun-metal throughout, including the screws, so that corrosion is impossible. It can be run either way, according to which is required to be the outlet branch, and will suck from a considerable depth. A good feature about it is that a bearing is provided at both ends, the slot for the slides being cut right through the outboard end, and the nipple at this end being afterwards made solid again by sweating in a bar of gun-metal. The lubricator shown feeds grease between the slides and to the outboard bearing. The pump can be run at 350 or 400 revolutions per minute, and is usually driven direct from the engine cam-shaft.

## THE DARRACQ-SERPOLLET STEAM MOTOR-OMNIBUS.

CONSTRUCTED BY THE DARRACQ-SERPOLLET OMNIBUS COMPANY, LIMITED, LONDON.



the vehicle has done about 2500 miles, as it becomes coated internally with a hard carbon deposit. There are no moving parts whatever about the burner, which is of an extremely simple type, and devoid of any automatic apparatus. The heated gases pass up through the generator and down on each side, and the draught is assisted by the exhaust from a small donkey-pump, which supplies both oil and water. The draught is thus proportional to the work being done by the boiler.

A section through the donkey pump is given in Fig. 7. There is a double-acting steam-cylinder shown on the left-hand side, which drives a water-pump direct, and an oil-pump through a rocking

lever worked from the cross-head. The vertical continuation of this lever gives a drive for a positive lubricator on the dashboard, which feeds oil to the engine, &c. The oil-pump has a capacity of one-tenth that of the water-pump, and normally works against an air pressure of 30 lb. which is maintained in the tank from which oil is supplied to the burners. The water-pump, of course, delivers against the generator pressure. The pump makes never more than 60 strokes per minute. Twenty-four gallons of water are carried, this quantity sufficing for a run of 50 miles. The fuel tank, which is of equal size, will last for about 80 miles without replenishing. The feed-water after

leaving the donkey-pump passes first through a recuperator, or exhaust-steam feed-water heater. This consists of three tubes on each side of the engine, jacketed by exhaust steam. Thence it goes to a second heater, beneath the generator, but not directly in the flame. It then goes through the generator and engine, through the recuperator, to an air-condenser in front of the chassis, and thence to a second condenser placed horizontally at the back.

The control of the vehicle is simple and smooth. The throttle-valve is a loose mushroom piece, which, by means of a crank-arm, is moved over a hole in the throttle-chest. It is worked by the pedal. The donkey-pump is started and stopped by a small lever on the steering-column, and its correct control is important for economical and satisfactory running. As regards brakes, the Darracq-Serpellet chassis is most thoroughly equipped, for besides the powerful effect got by reversing the engine (without steam) which will stop the vehicle on almost any hill, there are pedal brakes acting on each rear wheel, and lever brakes on the counter-shaft. The four mechanical brakes are all of the internal-expanding type, and either set will cause a dead stoppage if applied suddenly in an emergency.

Besides the exhibits with which we have dealt at greater or less length there were many others which we have not been able to touch upon. The petrol-electric vehicles of Messrs. J. and E. Hall, of Dartford, and Messrs. Greenwood and Batley, of Leeds, have recently been dealt with in these columns, as also has the Royal delivery van, of the Victoria-street Garage, Westminster, a vehicle in which no machinery or gear of any kind is beneath the body. The Steel Barrel Company, Limited, of Uxbridge, showed tanks, barrels, and drums of sheet steel for oil, petrol, and other liquid. The exhibit included some excellent specimens of electric and gas welding in sheet metal. Messrs. Lodge Brothers and Co., of 14, New-street, Birmingham, showed Sir Oliver Lodge's ignition system, in which, by a suitable arrangement of condensers a most powerful oscillating discharge fires the mixture. This was shown sparking when smothered with oil and water. The Simms Manufacturing Company, Limited, of Kilburn, N.W., showed the new Simms magnetos of British manufacture. Messrs. Hans Renault, Limited, of Manchester, exhibited a large selection of chain-gears in motion, and other firms showed tyres and accessories in stands occupying nearly the whole of the gallery.

RAILWAYS OF DENMARK.—It is reported that the Danish Folketing has passed a Bill referring to the completion of the railway system in that State; 2,778,000*l.* will be devoted to the work, which includes the duplication of certain lines, the construction of new ones, while thirty-five private lines will receive subsidies. A number of electric lines are also authorised, which, however, are not to receive State aid.

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 CONSTRUCTED BY THE DARRACQ-SERPOLLET OMNIBUS COMPANY, LIMITED, LONDON.

(For Description, see Page 463.)

