Horse-Power in France.

In a recent issue *L'Auto* gives the number of cars and their h.p. registered in each department of France for 1907 and 1908. Although deploring the decrease of export business, *L'Auto* speaks hopefully of the home industry, pointing out that as against 31,286 cars, equalling 337,016 h.p. registered in France in 1907, 37,586 equalling 443,521 h.p., are registered for 1908. One-fourth of the cars so registered are found in the Department of the Seine, the total of which has increased by no less than 1,300 fresh cars. It is indicated with satisfaction that the maximum increases are mostly found in the departments where hitherto automobilism has been somewhat in abeyance, and this is regarded as a good sign. In the matter of h.p. the mean for each car in 1902 was 5 h.p., rising to 6 h.p. in 1903, 7 h.p. in 1904, 9 h.p. in 1905, 10 h.p. in 1906, 11 h.p. in 1907, and 12 h.p. in 1908. In the Department of the Seine, however, the average is 17 h.p.. Evidently the high powered cars turned out by French manufacturers are not made for use in France.

Clean Lamps.

While it is common knowledge that acetylene lamps must be kept scrupulously clean, motorists often imagine that an oil lamp ought to run a whole year without an internal clean. One of the commonest reasons for oil lamps going out is the choking of the draught holes in the cap of the lamp by heavy deposits of carbon. These should be looked for and removed before any lengthy drive by night. The other essentials are a good lamp, a good oil, and a clean, dry wick.

Recovering Parts from Inaccessible Places.

A lately published suggestion for using an electro-magnet to recover a bit of metal from an inaccessible place is quite a useful one, though not new, but I think a whalebone or cane handle would be found to be an improvement, as the flexibility allows of its being pushed into corners which a stiff wire does not. This also makes a very useful "tool" in a workshop to retrieve small screws, springs, etc., which have fallen into shavings or sawdust on the floor and cannot be seen. Some have also seen one used in deep or muddy water, but then the cable must be "under water wire," and strong enough to drag the magnet along the bottom. Dry cells with a switch in circuit are better than accumulators to provide the current, and much cheaper and handier to move about. Nothing makes a better core for an electro-magnet than a lot of ladies' hair pins bound together, and enough for a big magnet can be found on the pavement any day.—Retriever.

The Motor and the Tariff.

The Tariff Reformers recently dug out the fact that up to the end of September, 1908, Britain had imported no less than £3,768,000 worth of foreign motor cars. They argue that had those cars been made in Britain there would have been a big hole in the list of the unemployed.—*Bulletin.*

Electricity and Engineering

New Reflector for Searchlights.

(Written specially for PROGRESS.)

The Honourable Charles Algernon Parsons, C.B., George Gerald Stoney, and Ebenezer Bennett, all of Heaton Works, Newcastle-on-Tyne, have recently produced some greatly improved reflectors for use in searchlights where the reflectors are subjected to shocks and concussions, or to the expansion of the glass under heat, all of which may result in the breakage of the glass. Such breakage has hitherto in most reflectors rendered the entire reflector useless, because the reflector no longer retains its proper figure or shape, or the broken piece or pieces fall away from the remainder.

The new searchlight reflector is so constructed that if it becomes fractured by heat or concussion the broken portions thereof shall be retained in proper reflecting position, and thus the figure of the reflector shall not be substantially altered.

In some cases the glass plate is made with wire netting, cross rod, expanded metal or the like embedded in it, or is provided with a circular clamping ring whereby an initial compressive strain may be put on the glass to strengthen the same, so that displacement or dispersion of the glass in the event of fracture occurring is prevented.

In other cases, the reflector is made in one or a multiplicity of pieces secured by mounting it or the pieces on a highly viscous cement on a backing; or by securing the various pieces in frames held on a backing; or by providing the piece or pieces with a multiplicity of bolts, screws, rivets or the like; or by clipping the pieces with or without springs, whereby, in the event of concussion or fracture, displacement or dispersion of the pieces is prevented.

Some different forms of the device are illustrated.

In figures 1 and 2 there is incorporated in the glass (a) wire netting, (b), and thus even although the glass (a) may be cracked or fractured, still the wire netting (b) will hold it together so as to prevent serious alteration of figure or falling away of the pieces. Instead of wire netting, strips or rods of metal interlaced or otherwise may be used, or expanded metal may be employed; in fact, any suitable arrangement having metal incorporated in the glass of the reflector may be used, so that in the case of breakage, the whole glass does not fall to pieces. The strips, rods, or the like, may either be incorporated in the body of the glass, or arranged on the surface of the same.

In another form, as shown in figures 3 and 4, the glass (a) of the reflector is drilled at intervals with holes (e), screws or rivets (d) are passed and fixed to a suitable backing (e). These screws or rivets (d) may in some cases be provided with springs (f), and in some cases the surface of the glass may be cut by means of a diamond or the like, as shown at (g), so that any fracture which takes place will do so along certain lines where the damage will be least. It will be seen that with this form also the holding or binding means for the glass reflector are distributed over the surface of the reflector and thereby prevent the separate parts in case of a fracture, falling away and thus rendering the reflector useless.

In some cases, the reflector is cemented to a suitable backing, and this cement may be used in conjunction with wire netting, or the screws or rivets such as mentioned above, also diamond or the like cuts may be provided. Cement may also be used alone, or in conjunction with other means if desired. Also the cement may be somewhat yielding, i.e., not hard, but highly viscous, so as to allow some expansion by slipping between the glass reflector and the backing.

Further, a reflector, whether of ordinary glass or reinforced as above described, may be backed or surrounded by a ring, and backing in tension so as to put a considerable initial compressive stress on the glass, and as glass is much stronger in compression than in tension, its strength will thereby be greatly augmented.

In another development, the reinforcing and backing means may consist of wire netting drawn tightly over the back of the reflector by means of a straining ring and set screws, or by means of channel rings over the edge of the glass, their points on the edge of the ring encircling the edge of the plate, to which it may be cemented if desired.

Another method is to stretch tightly a sheet of thin, flexible metal in contact with the back of the reflector and retained in position by the ring, over which the edge of the metal is turned.

In these modifications, diamond cuts may be provided in the face of the reflector, and suitable means may be provided for contracting the ring to adjust the tension of the thin metal backing sheet.

In some cases the glass may be put under initial compressive strain by pressing it