$$\text{Force in dynes} = \frac{B^2A}{8\pi}$$

where A = area of magnet pole face in cm^2
B = flux density at contact in gauss

It is sometimes necessary to know the forces that exist between magnetic components separated by an air gap. Specimen figures are shown in Fig. 11 illustrating the changes in mechanical force that occur when the magnet length is altered. Throughout these tests, the diameters of magnets, and of extensions when used, remained at 0.8 inch.

In general, forces produced by magnets operating near an iron plate increase steadily with increasing magnet length up to a length/diameter ratio of approximately three-quarters. Beyond this point, further increases in length produce only small changes. A similar trend is shown by magnets operating between iron extensions, but in this case the curves begin to level off at a smaller length/diameter ratio. This agrees generally with the changes observed in working point in Fig. 9, and illustrates that the effective length of the magnet is increased by the additional iron.

Attempts to increase holding power by attaching tapered iron pole pieces to the magnet have been unsuccessful, evidently because leakage is introduced which cancels the effect of possible flux concentration.

Economics

Platinax II contains 76.7 weight per cent platinum and naturally is of high intrinsic value. The magnetic characteristics as outlined above are, however, quite exceptional and if due attention is paid to careful design, economic circuits are feasible. Platinax II obviously has its major applications for miniaturised circuits where it is necessary to have high flux in restricted spaces and where a small magnet can be fabricated from strip or wire.

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Alternating Current Polarisation of Noble Metal Surfaces

THE FORMATION OF PLATINUM AND PALLADIUM BLACKS

It has been observed that the reproducibility of a platinum electrode can be improved by a pre-anodisation treatment. The explanation of this effect has been in some doubt, and a recent paper by Dr J. P. Hoare of the General Motors Research Laboratories (*Electrochimica Acta*, 1964, **9**, (5), 599–605), throws new light on the matter.

The effect of AC currents on small beads of noble metals was studied and it was noted that whereas black films were formed on the surface of platinum and palladium when treated in this way, no such films were observed on gold, iridium or rhodium. Some oxidation did occur on the gold and iridium and, if a DC current was superimposed on the AC so that the AC swing was not centred about a point more oxidising than that originally used, then the 'black' formation did not occur on platinum or palladium and oxides were formed here also.

Dr Hoare deduces from his study that the mechanism of the formation of these blacks is via the dissolution of hydrogen, since it is well known that platinum and palladium will react readily with hydrogen, whereas gold, iridium and rhodium will not. The break-up of the surface is attributed by the author to the successive absorption and desorption of this hydrogen.

Further, measurements of double layer capacity, a technique that can detect changes of surface area, confirmed that the platinum and palladium surfaces increased in area after polarisation whereas the rhodium surface did not. The increases of area noted for the gold and iridium are explained by the formation and reduction of oxide films. J. H.