APPLIANCES

MODIFICATION TO THE P.M.X. OPHTHALMIC MAGNET*

BY

C. R. KANAGASUNDARAM

Birmingham and Midland Eye Hospital

THE P.M.X. magnet is a very compact but extremely powerful ophthalmic magnet, designed on the principle that the power of a magnet depends on the current passing through it and not on its size, the limiting factor being the heat generated during a specified time (Blake, 1954).

While the compactness and power of this magnet are very great assets, it has a few disadvantages which the following modifications are meant to eliminate.

The P.M.X. magnet is termed a hand magnet and is meant to be at least partly supported by the surgeon's hands, but it weighs 15 lb., and it is impossible to perform delicate manipulations while supporting this considerable weight.

This problem of weight has been solved by suspending the magnet by two coil springs from a support clamped to the side of the operating table. The height and position of the support can be adjusted so that the magnet is suspended in mid-air about an inch or two above the patient's chin, and the instrument can then be drawn into position by the surgeon by the application of only a few oz. of effort to stretch the springs (Figure). When the magnet is released it swings away from the operating area back to its position over the patient's chin.

FIGURE.—The modified magnet poised over the patient's eye.

* Received for publication February 16, 1962.

The magnet is suspended from the springs by a hook on a swivel joint, which enables the curved magnet point to be rotated into any convenient position.

The great power of the magnet is a distinct advantage in removing small foreign bodies from the back of the globe but this power is an embarrassment with larger and more accessible fragments. The ideal is to remove the foreign body as gently as possible, and unnecessary trauma may be caused by slamming the fragment against the wall of the globe and dragging it too quickly along the retina to the scleral incision. To make it possible to remove a foreign body with the least effective attractive force, a transformer has been designed to vary the current and consequently the attractive force of the magnet. The addition of a curved magnet point twice as long as the longest standard one helps to weaken the pull of the magnet. This point has a tip so fine that it can be inserted through a keratome incision into the anterior chamber. The long stem also keeps the bulk of the magnet farther from the eye, so that it interferes less with the lighting of the eye and the surgeon's line of vision.

A great deal of heat is generated in a magnet during use and the standard magnet is protected from this heat by an automatic switch which disconnects the current after a period of 20 sec. This length of time may be sufficient in a simple case but is quite inadequate in dealing with an awkward foreign body which may be entangled in the iris or may present sideways in an incision. In the modified magnet a longer excitation time (more than $2\frac{1}{2}$ times the normal) can be obtained by reducing the power of the magnet by adjustment of the transformer.

Repeated applications may raise the temperature of the magnet to a dangerous degree, sufficient to char the sterile towels around it and even, on one occasion, to cause a burn on the patient's forehead. This hazard is reduced considerably by using the modified magnet with the transformer at its weakest effective setting.

I wish to express my thanks to the consultants of the Birmingham and Midland Eye Hospital, particularly Mr. Martin Walker, for their help in having these items made.

The transformer was designed and constructed by Associated Electrical Industries Ltd., and the rest of the equipment in a local metal-working establishment.

REFERENCE

BLAKE, L. R. (1954). *J. sci. Instrum.*, **31**, 237.