Magnetic Field Observation Box

I. Precautions
1. Handle the acrylic observation box with much care. If dropped or given a strong shock, it may be damaged causing a leak of solution.
2. Avoid wiping the box with benzene or thinner.

![Fig. 1]

II. Purpose
This apparatus enabled the stereoscopic observation of magnetic field (magnetic lines of force) which has been seen only on a plane by inserting a bar magnet in the box.

The fine iron powder and silicone oil solution are enclosed in the transparent box. Handling is so easy that anyone can understand what magnetic lines of force are.

III. Specifications
- Observation box: Transparent acrylic resin with transparent screw
- O.D.: 100 × 56 × 56 mm
- Magnet hole: 8 φ × 75 mm
- Enclosed material: Silicone oil solution, needle iron powder
- Weight: 370 g
- Accessories: Alnico magnet 7 φ × 50 mm

IV. Operation
1. Before experiment, scatter the iron powder by rotating the box as the figure shows.

![Fig. 2]

- Good
- Bad
2. When the iron powder is scattered uniformly, insert the supplied bar magnet slowly. Do not insert it with force, otherwise the box may be damaged.

3. Lay the box down at the insertion of bar magnet, the iron powder is magnetized to form magnetic lines of force. When the bar magnet is drawn out, the iron powder drops slowly. Scatter the iron powder again.

4. Bring another magnet close to the box and insert the bar magnet in the hole. The iron powder is magnetized in two areas showing attraction and repulsion of magnetic forces.

(Reference)
1. In the step 4, try to put some spacer such as iron screw, iron nail wooden chip, etc before inserting the bar magnet. Different kinds of magnetic fields can be observed.
2. As this box is made of transparent plastic an overhead projector can be used for two dimensional observation.

Nakamura SCIENTIFIC CO., LTD.
Magnetic Field Projectual

By Fred Northcutt

The Magnetic Field Projectual is a self-contained unit designed for projecting magnetic fields with an overhead projector. The projectual is filled with a special viscous fluid acting as a supporting medium for the metal filings. To facilitate the even distribution of the metal filings, the projectual contains a glass rod that will fall through the fluid medium when the projectual is agitated by tipping it from side to side.

Any size or shape magnets can be used singly or in combination with the projectual. Place the magnet(s) on the overhead projector in any desired position. Then place the projectual, with the filings evenly distributed, directly on top of the magnet(s). The projector can now be focused to show the magnetic field pattern surrounding the single magnet or combination of magnets.

One cautionary note: To avoid scoring and damaging the projectual surfaces, care should be taken not to move the projectual roughly over the magnets placed beneath it.