

at 25 tons to the square inch. When drawn, the breaking weight is often as great as 40 or 50 tons to the square inch. These figures are to be regarded as approximate only, since differences in the physical conditions of metals, as well as slight variations in their chemical composition, often produce marked differences in their breaking weights.

**Bridge, Magnetic.**—An apparatus invented by Edison for measuring magnetic resistance, similar in principle to Wheatstone's Electric Bridge.

The magnetic bridge is based on the fact that two points at the same magnetic potential fail, when connected, to produce any action on a magnetic needle. The magnetic bridge may be arranged as shown in Fig. 70, of four sides made of pure,

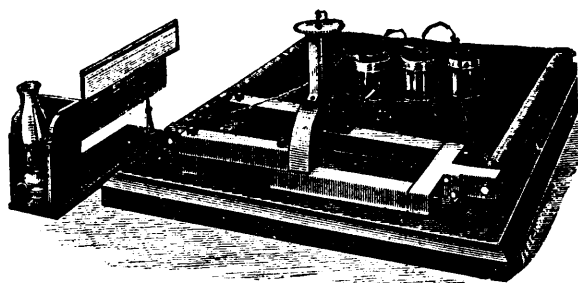


FIG. 70.

soft iron. The poles of an electro-magnet are connected, as shown, to projections at the middle of the short side of the rectangle. By this means a difference of magnetic potential is maintained at these points. The two long sides are formed of two halves each, which form the four arms of the balance. Two of these only are movable.

Two curved bars of soft iron, of the same area of cross-section as the arms of the bridge, rest on the middle of the long arms, in the arched shape shown. Their ends approach near the top of the arch within about a half inch. A space is hollowed out between these ends, for the reception of a short needle of well-magnetized hardened steel, suspended by a wire from a torsion head.

The movements of the needle are measured on a scale by a spot of light reflected from a mirror.

The electro-magnet maintains a constant difference of magnetic potential at the two shorter ends of the rectangle. If, therefore, the four bars, or arms of the bridge, are magnetically identical, there will be no deflection, since no difference of potential will exist at the ends of the bars between which the needle is suspended. If one of the bars or arms, however, be moved even a trifle, the needle is at once deflected, the motion becoming a maximum when the bar is entirely removed. If replaced by another bar, differing in cross-section, constitution, or molecular structure, the balance is likewise disturbed.

The magnetic bridge is very sensitive. It was designed by its inventor for testing the magnetic qualities of the iron used in the construction of dynamo-electric machines.

**Broken Circuit.**—An open circuit.

A circuit, the electrical continuity of which has been broken, and through which the current has therefore ceased to pass.

**Brush Discharge.**—The faintly luminous discharge that occurs from a pointed positive conductor.

**Brush, Faradic.**—An electrode in the form of a brush employed in the medical application of electricity.

The bristles are generally made of nickelized copper wire.

**Brush Holders for Dynamo-Electric Machines.**—Devices for supporting the collecting brushes of dynamo-electric machines.

As the brushes require to be set or placed on the commutator in a position which often varies with the speed of the machine, and with changes in the external circuit, all brush holders are provided with some device for moving them concentrically with the commutator cylinder.

**Brushes, Adjustment of the—of Dynamo-Electric Machines.**—Shifting the brushes into the required position on the commutator cylinder, either non-automatically by hand, or automatically by the current itself.

**Brushes for Dynamo-Electric Machines.**—Strips of metal, bundles of wire, or slit plates of metal, or carbon, that bear on the commutator cylinder and carry off the current generated.

Rotating brushes consisting of metal discs are sometimes employed. Copper is almost universally used for the brushes of dynamo-electric machines.

The brush shown at E, Fig. 71, is formed of copper wires, soldered together at the non-bearing end. A copper plate,

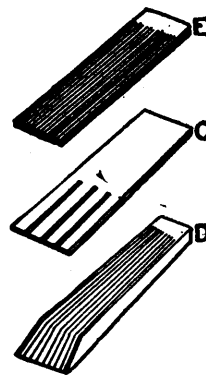


FIG. 71.

slit at the bearing end, is shown at C, and bundles of copper plates, soldered together at the non-bearing end, are shown at D.

The brushes should bear against the commutator cylinder with sufficient force to prevent jumping, and consequent burning, and yet not so hard as to cause excessive wear.

**Buoy, Electric.**—A buoy, on which luminous electric signals are displayed.

**Burner, Electric.**—A gas-burner whose gas-jet is electrically ignited.

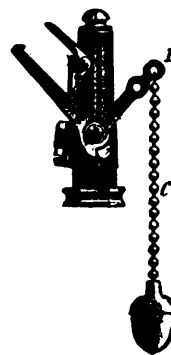


FIG. 72.

On pulling the pendant C, Fig. 72, a spark from a spark coil ignites the gas. On pulling the slide the gas is turned off.