gen in the amount given above not affecting the break on the pressure-temperature curve to any noticeable amount.

The critical temperatures of two-component systems may be determined by the same procedure.

This apparatus can be used for other studies such as the investigation of equilibria in heterogeneous systems.

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A SAFETY SWITCH FOR WATER-COOLED X-RAY TUBES

SINCE water-cooled x-ray tubes may be damaged if the flow of water is interrupted during operation, it is a common practice in physics laboratories to insert in the control circuits of x-ray machines so-called bucket switches which are held closed by the weight of the water that leaves the cooling system of the tube but which open automatically if for any reason this flow ceases. Such switches are satisfactory where the waste water can be dumped into a sink and where bulk is not a disadvantage. However, because they take up considerable space and can not be connected into a closed water system, it may be inconvenient or impossible to employ bucket switches in connection with medical x-ray apparatus.

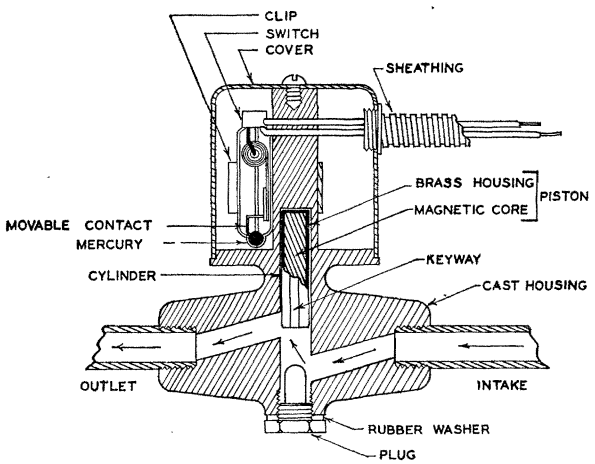

FIG. 1. Flow switch.

There is described here a simple, small, dependable flow switch which can be connected into a closed water-cooling system. The switch is normally open, closing when water flows through it and opening again when the flow stops, either because of pressure failure or a clogged waste line. The switch itself (a commercial product, Mercoid Magnetic Switch, No. 9-81R) consists of a glass capsule containing a pool of mercury and two electrodes. One electrode is permanently bathed in the mercury; the second is held away by means of a coil spring but makes contact with the mercury whenever a permanent magnet is brought up to the side of the capsule.

The mercury switch is mounted against the outside of a vertical brass cylinder within which lies a piston made up of a brass housing surrounding a magnetic core. The fit between piston and cylinder is purposely loose and to further facilitate leakage between the two a longitudinal keyway is cut in the piston.

The magnetic core of the piston consists of a cylindrical, cobalt-alloy steel, permanent magnet having a diameter of approximately 9 mm, a length of approximately 3 cm (one third of a commercial cylindrical magnet, Central Scientific Company of Chicago, No. 78295-B).

Operation: When no water is flowing through the switch, the piston under the action of gravity moves down until it strikes a mechanical stop, in which position direct communication between intake and outlet ports is cut off and the magnet is below the level at which it will operate the magnetic switch. The latter, therefore, is open and the x-ray machine can not be operated.

When water flows through the device, the piston moves upward until a free communication is established between intake port and outlet port in which position the armature of the magnetic switch is attracted, the second electrode makes contact with the mercury, the control circuit of the x-ray machine is completed and the x-ray tube can be operated.

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