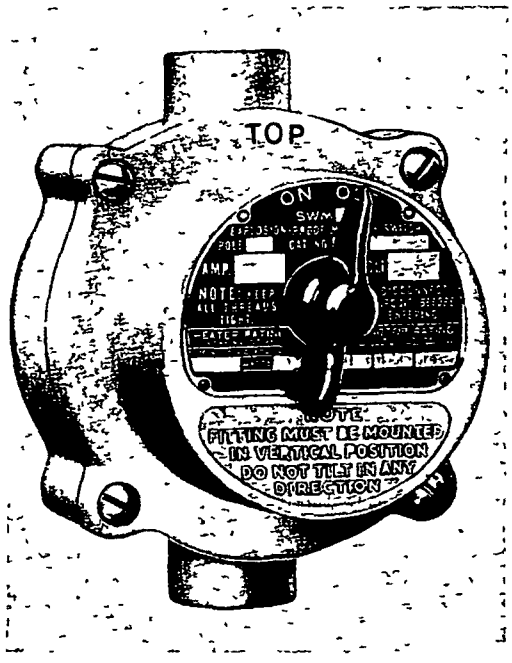


FIG 41–7 —An explosion-proof and dust-tight mercury switch, listed by Underwriters Laboratories, which makes and breaks the circuit when the switch tilts the tube inside the mechanism

Courtesy The Appleton Electric Co

many industrial users have, likewise, found them to be an effective means of reducing exposure to the hazards of electric current It should be noted that in plants which have instituted the strong safety program wherein the employee is admonished to look for the grounding pin on all attachment plugs, the double-insulated device now constitutes an exception to the rule The ensuing confusion may result in the loss of some degree of safety

Explosion-proof apparatus

Standard electrical apparatus considered safe for ordinary application is obviously unfit for installation in locations where flammable gases, vapors, dusts, and other easily ignitable materials are present Sparks and electric arcs originating in such fittings have been the igniting medium in costly fires and explosions

Explosion-proof Apparatus is defined in the *National Electrical Code*

Apparatus enclosed in a case which is capable of withstanding an explosion of a specified gas or vapor which may occur within it and of preventing the ignition of a specified gas or vapor surrounding the enclosure by sparks, flashes, or explosion of the gas or vapor within, and which operates at such an external temperature that a surrounding flammable atmosphere will not be ignited thereby

Before electrical equipment and its associated wiring is selected for a hazardous location, it is necessary to determine the exact nature of the flammable materials present For instance, an electrical fitting or device which is found by test to be safe for installation in an atmosphere of combustible dust may be unsafe for operation in an atmosphere containing flammable vapors or gases

The *National Electrical Code* should be checked for these types of hazardous materials, which are described in detail in Articles 500 through 503 A summary of the hazardous location classifications described in this code are given in Fig 41–6

A study should be made of the machines or devices to be used and of the processes involving liquids, gases, or solid substances, and their ratings should be checked When hazards have been determined and the layout of the building inspected, it can be decided whether one small section of the plant should be classified as hazardous or whether the hazardous conditions extend to all parts

The results of this study should be presented to a manufacturer of explosion-proof apparatus so that electrical equipment and wiring can be selected for safe installation

Leading manufacturers of electrical equipment often maintain staffs of engineers to guide buyers in the purchase of explosion-proof fittings Because of the highly technical nature of this field, competent engineers should always be consulted for these needs

Only fittings which have undergone exhaustive tests and meet the requirements of the Underwriters' Laboratories, Inc, for use in hazardous locations should be used (Fig 41–7) They must be of durable material, provide thorough protection, and be finished to be totally resistant to atmospheric conditions

Explosion-proof fittings should be installed