**520.49 Smoke Ventilator Control.** Where stage smoke ventilators are released by an electrical device, the circuit operating the device shall be normally closed and shall be controlled by at least two externally operable switches, one switch being placed at a readily accessible location on stage and the other where designated by the authority having jurisdiction. The device shall be designed for the full voltage of the circuit to which it is connected, no resistance being inserted. The device shall be enclosed in a metal box having a door that shall remain closed except during service to the equipment.

In addition to the two externally operable switches at different locations, the design of a normally closed circuit ensures that smoke ventilators operate when the circuit opens for any reason, such as a circuit breaker tripping or a fuse blowing.

## Part IV. Portable Switchboards on Stage

**520.50 Road Show Connection Panel (A Type of Patch Panel).** A panel designed to allow for road show connection of portable stage switchboards to fixed lighting outlets by means of permanently installed supplementary circuits. The panel, supplementary circuits, and outlets shall comply with 520.50(A) through (D).

Also known as a road show interconnect or intercept panel, this panel is designed to connect the load side of a portable switchboard to the fixed building branch circuits and associated outlets. It may also provide for the fixed branch circuits to be connected to a fixed switchboard when the portable switchboard is not installed.

**(A) Load Circuits.** Circuits shall originate from grounding-type polarized inlets of current and voltage rating that match the fixed-load receptacle.

The required grounding-type polarized inlets may be flush or pendant. The fixed-load receptacle is where the portable switchboard connects to the house circuits to control the theater lights.

**(B) Circuit Transfer.** Circuits that are transferred between fixed and portable switchboards shall have all circuit conductors transferred simultaneously.

**(C) Overcurrent Protection.** The supply devices of these supplementary circuits shall be protected by branch-circuit overcurrent protective devices. Each supplementary circuit, within the road show connection panel and theater, shall be protected by branch-circuit overcurrent protective devices installed within the road show connection panel.

Because inlets feeding permanent circuits are cord-and-plug-connected to a portable switchboard, there is no guarantee that the branch circuit overcurrent protective devices (OCPDs) in the switchboard will be rated correctly for the ampacity of the permanent circuit conductors fed by the panel. That is why supplemental overcurrent protection is provided for every inlet in a road show connection panel.

**(D) Enclosure.** Panel construction shall be in accordance with Article 408.

**520.51 Supply.** Portable switchboards shall be supplied only from power outlets of sufficient voltage and ampere rating. Such power outlets shall include only externally operable, enclosed fused switches or circuit breakers mounted on stage or at the permanent switchboard in locations readily accessible from the stage floor. Provisions for connection of an equipment grounding conductor shall be provided. For the purposes of ampacity adjustment, the requirements of 520.27(B) shall apply.

Power outlets, known in the entertainment industry as company switches or bull switches, are the point in the wiring system where portable feeder cables connect to the fixed building wiring. They can be as simple as an overcurrent-protected multipole receptacle designed to accept the supply cable described in 520.54(K), Exception, or they can be multiple sets of parallel single-conductor feeder cables. These single-conductor feeder cables, as described in 520.54(C), can be terminated via single-pole separable connectors, as described in 520.53(C), or directly to busbars, fused disconnect switches, or circuit breakers with wire connectors (lugs).

**520.52 Overcurrent Protection for Branch Circuits.** Portable switchboards shall contain overcurrent protection for branch circuits. The requirements of 210.23 shall not apply.

**520.53 Construction.** Portable stage switchboards shall be listed and shall comply with 520.53(A) through (E). The load

EXHIBIT 520.7 A large, portable SCR dimmer switchboard (rolling rack). *(Courtesy of Electronic Theatre Controls, Inc.)*