New Coin Level Detector for Coin Telephones

News of Public Telephone Development

A new coin level detector, compatible with all existing and planned coin telephone stations, has been developed by Bell Laboratories' Public Telephone Department at Indianapolis. The device incorporates a sensing unit that makes use of the conductivity of the coins to indicate electrically when the coin receptacle is 68 percent full.

The need for coin level detection is greatest at those stations where use is highly variable and where, consequently, it is virtually impossible for the telephone company to predict accurately when the coin receptacle is approaching "full." If the coin receptacle is allowed to overfill, a jammed coin chute causes a service failure, resulting in a loss, not only of revenue, but also of customer good will. The alternative is to schedule coin collection rounds frequently enough to assure a low average coin level, and accept the increased costs of administering the station. To help solve this problem, Bell Laboratories engineers R. R. Stokes and T. E. Redick have put together the new device which enables a more accurate prediction of "full" and promotes more efficient use of the coin receptacle's capacity.

Compared to previous devices, the new detector offers substantially improved accuracy, stability, and reliability. These improvements are attributable to the design of the sensor, which consists of a signal strip and a ground strip, separated by a plastic insulator. The sensor's planar laminated construction provides a large surface area for contact with the coins without reducing the effective capacity of the receptacle.

Installation of the sensor requires no modification of existing receptacles. It simply clips into place. One element of the sensor is grounded against the receptacle cover. The other element is connected to an external monitoring circuit by means of an insulated contact stud mounted in the cover, a spring contact, and a terminal board mounted within the telephone housing.

In conjunction with the sensor, a new cover, which incorporates the contact stud, has been provided. When the cover is closed, the stud engages the contact arm on the sensor, thus creating an electrical path between the signal strip and the exterior of the receptacle.

As the receptacle is inserted into the cash compartment of the telephone, the head of the stud rides against the rail-mounted spring contact to connect the sensor through the terminal board to the monitoring circuit. The terminal board mounts onto the base of the housing. The spring contact mounting screw, which passes through a ¼-inch hole in the rail and base, secures both the spring contact and the terminal board in place, along with an insulation strip, and provides electrical continuity between them.

If desired, the coin level signal can be monitored at a central office by connecting the detector in series through a high-resistive load. This connection can be made very easily, since the required lead and resistor are already supplied with the terminal board. When the telephone is not in use and the coin level exceeds the triggering level, this high resistance condition can be detected at the central office with modified line insulation test equipment.

Since the resistor would not be required for local indication of the coin level signal, an alternate terminal is provided so that the detector can be connected directly to a local monitoring circuit if desired. This type of system may be preferred in high usage areas, such as airports or railroad and bus depots, where operating company personnel may be available to monitor the status of the detector. One possible arrangement would be to connect the detector from each telephone station in the area to a conveniently located monitor panel where the triggering of any detector would be indicated by an associated lamp on the panel.

A field conversion kit, available to the Bell System from the Western Electric Company, consists of the spring contact, insulation strip, terminal board, lead, and nut for installation in the base of existing coin-operated telephones. The clip-on sensor, which mounts within the coin receptacle, is available separately, as is the new receptacle cover. Since the new cover can be used even if the telephone is not equipped for using the new detector, the earlier cover will no longer be manufactured.

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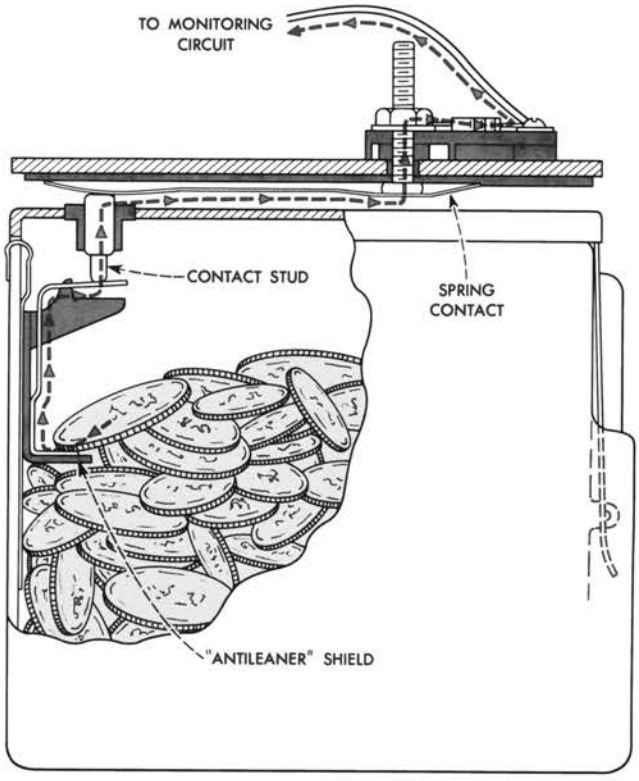
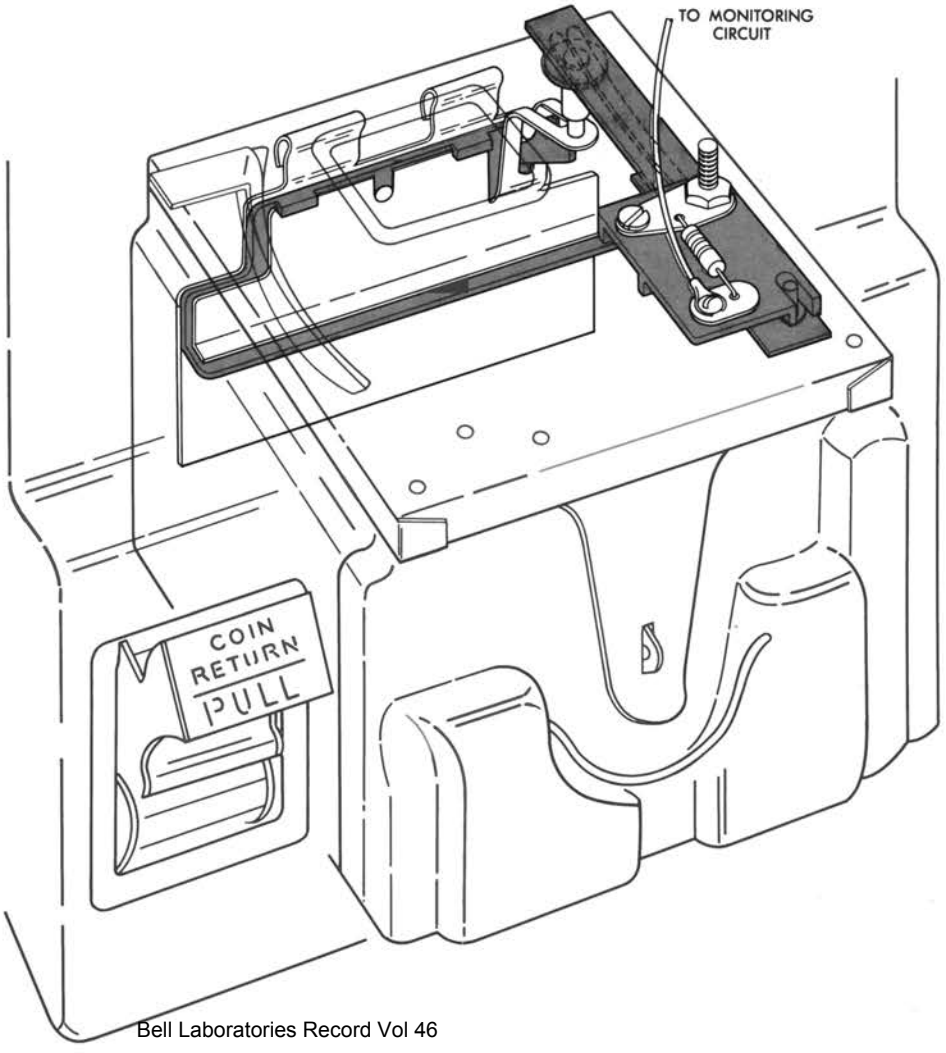


The lower edge of the signal strip is turned outward to provide a horizontal ledge for the coins to rest upon. This assures reliable contact forces between the coins and the sensor and reduces the probability of signal instability caused by coins being jarred out of contact with the sensor by subsequent deposits. A plastic "antileaner" shield extends out from beneath the ledge to prevent premature triggering by coins falling on edge and leaning against the sensor.



The coin level sensor clips into place inside the coin receptacle. When the receptacle is 68 percent full, the coins contact the sensor, sending an electrical indication through the contact stud in the receptacle cover to the terminal board mounted separately in the base of the telephone housing.