A Splash-Proof Dial for the Navy

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THE airplane carriers "Lexington" and "Saratoga" of the U. S. Navy have complete dial telephone systems which were engineered by these Laboratories*. While the ships' communicating systems are in general similar to comparable installations ashore, the service conditions which they encounter are more severe; and for this reason some modification of standard apparatus was required. The calling dials furnished the Navy for these ships offer an example of such modification.

Since the installations on the "Lexington" and "Saratoga" are full-automatic, each telephone station must be equipped with a dial, and obviously the proper functioning of the dial is an important factor in the operation of the ships' communicating systems. Several telephones are required on deck and in other exposed locations, where they may be used in severe weather. Telephones in such positions are mounted in water-tight boxes (Figure 1) ordinarily kept closed. The cover of the box must be opened to use the telephone, however, and while in use the dial may be exposed to driving rain or spray.

In order to maintain satisfactory dial operation under such conditions, water must be excluded from the interior of the dial. To accomplish this the standard design was modified to make the dial "splash-proof." In this it was desirable from the standpoints of both manufacture and cost to make a minimum number of changes, and obviously necessary to make them so as in no way to interfere with the functioning of the dial. Thus, while a stuffing box on the dial shaft would be effective in excluding water, it would introduce variable friction unfavorable to the maintenance of constant dialing speed. For this reason it was

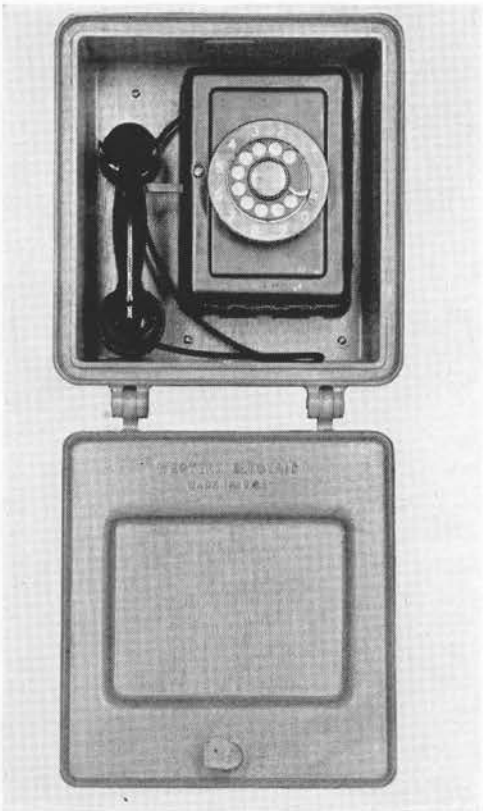

Fig. 1—Outdoor telephones aboard ship are mounted in water-tight boxes

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necessary to build shields and baffles around the dial to deflect water striking the outside.

A dial adapter (No. 56-A), developed previously for use on coin collectors at public telephones, was found well

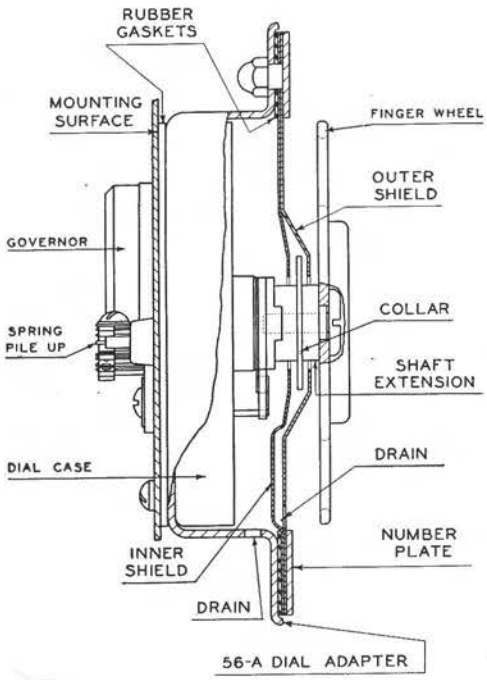

Fig. 2—The extent to which the construction of the standard dial has been modified by the introduction of special parts (larger print) for splash-proofing, is clear in sectional view

suited as the base of the splash-proofing construction and the mounting for the number plate. This adapter is a flanged cup-shaped receptacle in which the dial is mounted and bears an annular number plate, mounted on its flange outside the dial finger-wheel. The large figures possible on such a plate are an aid to visibility under poor lighting conditions.

The sectional view in Figure 2 shows how the splash-proofing construction is built around the dial. The standard dial, from which the finger wheel, finger stop and number plate have been removed, is placed in the cup of the dial adapter. A rubber gasket and a thin plate, the "inner shield," are then mounted on the flange of the cup. A short "shaft extension" is placed on the dial shaft; the outer shield and number plate are assembled on the flange. A collar machined on the shaft extension is located halfway between the inner and outer shields and overlaps the edges of the hole in each. The dial finger wheel is mounted on the end of the shaft extension, and a special finger stop is fastened to the number plate. So built, the dial may be operated in the usual manner.

In order to prevent water from entering the back of the dial, a rubber gasket is interposed between the dial adapter and the subset on which it is mounted. An unusually heavy finish was applied to many of the ferrous parts of the dial, to provide better protection against corrosion under the severe humidity found at sea.

If water is thrown against this dial, which is always mounted in a vertical plane, most of it will be deflected by the outer shield and will run off across the number plate. Some water may pass through the opening between the hole in the shield and the dial shaft, and this will be deflected by the collar on the shaft and will drain through a radial duct formed in the inner shield and ending in a hole in the outer shield. Finally, a small hole, drilled in the bottom of the adapter cup, permits the drainage of any small amount of water which might possibly enter the interior of the dial. Thus, while the modified dial is not water-tight, the shields make it as nearly splash-proof as practicable, and it has given two years of satisfactory service to the Navy.