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A LOW-COST WINDOW -- WITHOUT JAMBS

Abstract

Experimental low-cost windows were designed and prototypes built. The windows, fixed and ventilating, differ from conventional ones because jambs have been eliminated. The cost of fabricating, packaging, shipping, installing, and maintaining this window should be less than that of conventional windows. The experimental window is designed to fit into 24-inch on-center stud spacing, but can also be used with other stud spacings.

A LOW-COST WINDOW--WITHOUT JAMBS

By

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Introduction

Walls constructed with studs spaced 24 inches on center and combination sheathing-siding are likely to be extensively used in housing. Windows, illustrated in figures 1 to 5 and described here, have been designed for this type of spacing. The design eliminates the labor involved in framing. The thick (1-3/8 in.) members for constructing the outside frame can be used with combination sheathing-siding or with conventional separate sheathing and siding. The unit may be fixed, opening (ventilating), or a combination of the two. Quality has not been sacrificed for low cost.

Maintenance is reduced by exposing less wood to weathering by positioning the glass as close as possible to the exterior surface[2] (figs. 1 and 2). All exposed joints are vertical to minimize trapping water (figs. 3 and 4). Storm panels (fig. 2) or screens (fig. 4) are easily removed for cleaning, repairing, or replacing. The yearly maintenance tasks of removing storm sash and installing screens or removing screens and installing storm sash are eliminated because the storm sash and screen are fixed. Thus, space for storage of storm sash or screens is not needed.

Compared to conventional double-hung windows, heat loss should be less with the experimental windows. In these windows, the glass panes are a sufficient distance apart to reduce conduction heat transfer, but sufficiently close to minimize convection currents.

Fabrication Details

The design permits machining with relatively simple woodworking equipment. Either mortise and tenon or dowel joints may be used to join vertical to horizontal members. Kiln-dried shop-grade lumber, preferably ponderosa pine (Pinus ponderosa Laws.), Sitka spruce (Picea sitchensis (Bong.) Carr.), basswood (Tilia L.), yellow-poplar (Liriodendron L.), or any white pine (Pinus sp.) is recommended. Almost any other spruce or aspen or cottonwood (both Populus sp.)--without tension wood--would also be satisfactory. After the wood components have been machined to size, they may be dipped in a pentachlorophenol and mineral spirits solution to minimize staining and decay.

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[1] *Maintained at Madison, Wis., in cooperation with the University of Wisconsin.*

[2] *Heebink, B. G. Proposed Low-Cost Window Unit. USDA Forest Serv. Res. Note FPL-0212. Forest Prod. Lab., Madison, Wis. Jan. 1972.*

The glass is 20 inches wide (figs. 3 and 4), a commercially standard size. Because the edges of the storm panes are not covered with a strip of wood or metal, the edges should be rounded for safety in handling. When installing the inner glass pane, glazing compound can be used alone or under wood moldings to fasten the glass in position and to seal against outward water vapor movement. The outer panes are set in a flexible plastic gasket to prevent water leaking between the outer and inner glass panes and to allow for easy removal of the outer pane for cleaning. To provide for the escape of any water vapor that may accumulate between the inner and the outer panes, the gasket on the lower edge is noncontinuous. Three 1/16-inch-wide openings in the gasket should suffice. A suitable plastic gasket is not available, but could be produced if demand were sufficient.[3]

The hardware (fig. 5) is simple, and could be produced by almost any small machine shop, but, like the plastic gaskets, is not now available.

Installation Details

The windows may be installed without special framing members, such as headers or supporting members, but nailing members above and beneath each unit are required. The fixed or the ventilating units may be used independently or they can be grouped. When placing window units one above the other, a spline should be inserted into the grooves of each unit. A bead of calking should be spread on both sides of the spline, and the units compressed until there is "squeezeout" of the calking material. Thewindows are installed using a level to plumb them and by nailing them to the sheathing and studs with tenpenny casing nails. A drip cap is required (figs. 1 and 3).

When finishing the interior surface, the studs may be covered with gypsum board or plywood. This results in a clean, trim appearance.

Cost Considerations

The design, production, and installation of the proposed windows should reduce costs by the following:

1. Eliminate jambs, which, in turn, will reduce machining, packaging, and shipping costs, and the quantity of lumber required.

2. Eliminate cost of framing window openings in the wall.

3. Eliminate insulation between studs and casing, thus eliminating the need for narrow pieces of insulation blankets.

4. Reduce maintenance.

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[3] *Bordner, J. Extruded Window Components. Woodworking and Furniture Digest. Pp. 41-43. April 1971.*

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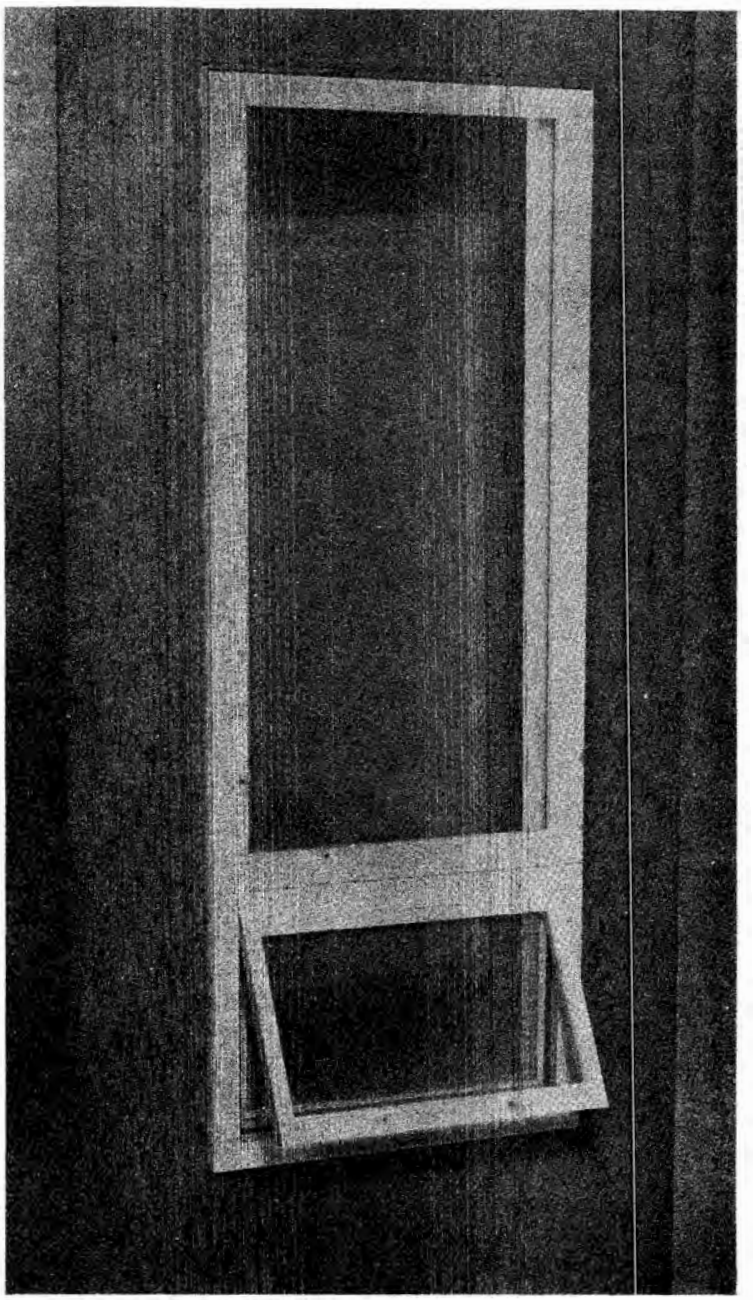


Figure 1.--Installed unit shows both fixed window with drip cap and ventilating window. M 140 761

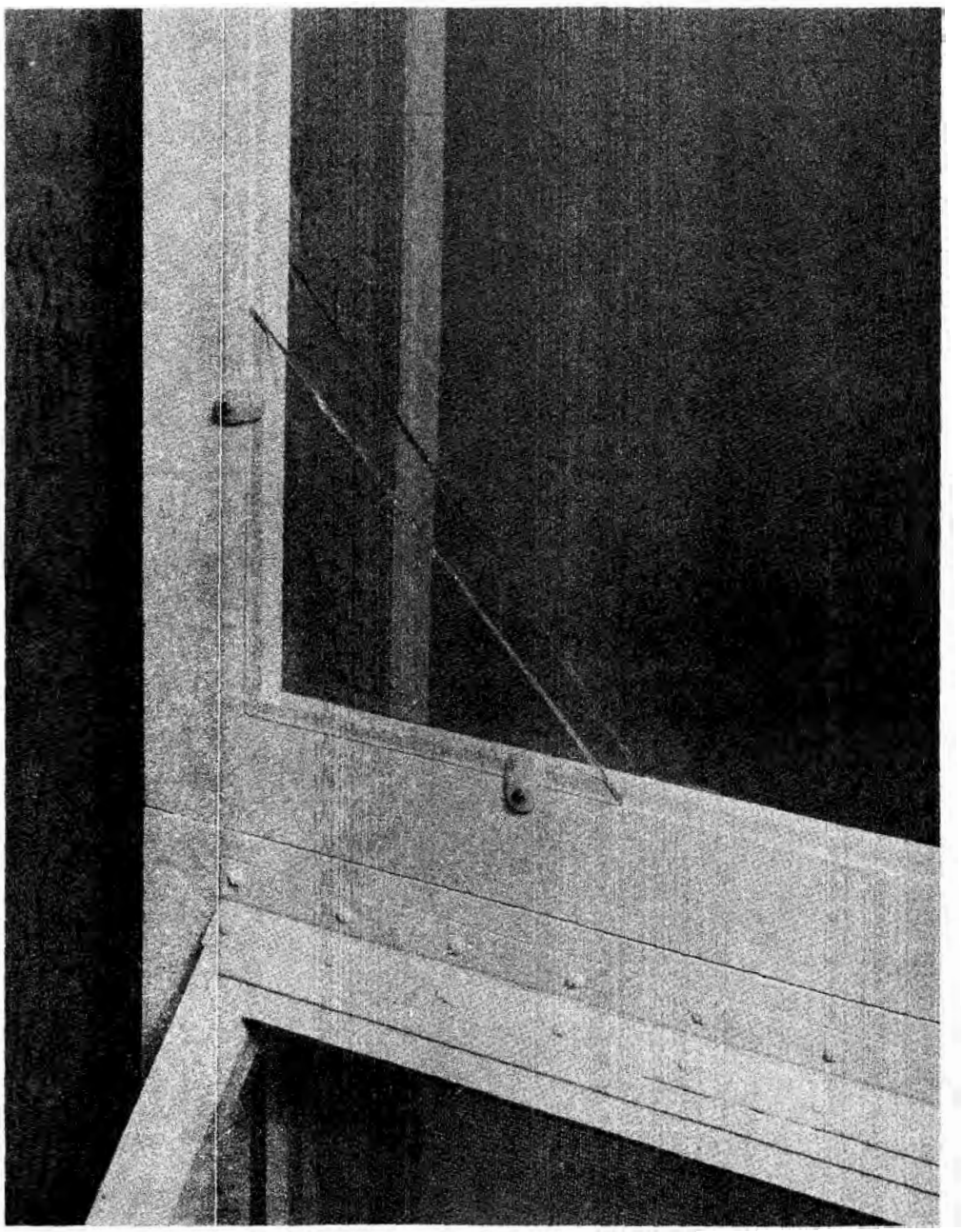


Figure 2.--Window unit from exterior showing screened opening and interior finishing of plywood with corner trim. Positioning of glass is shown at left midsection. M 140 763

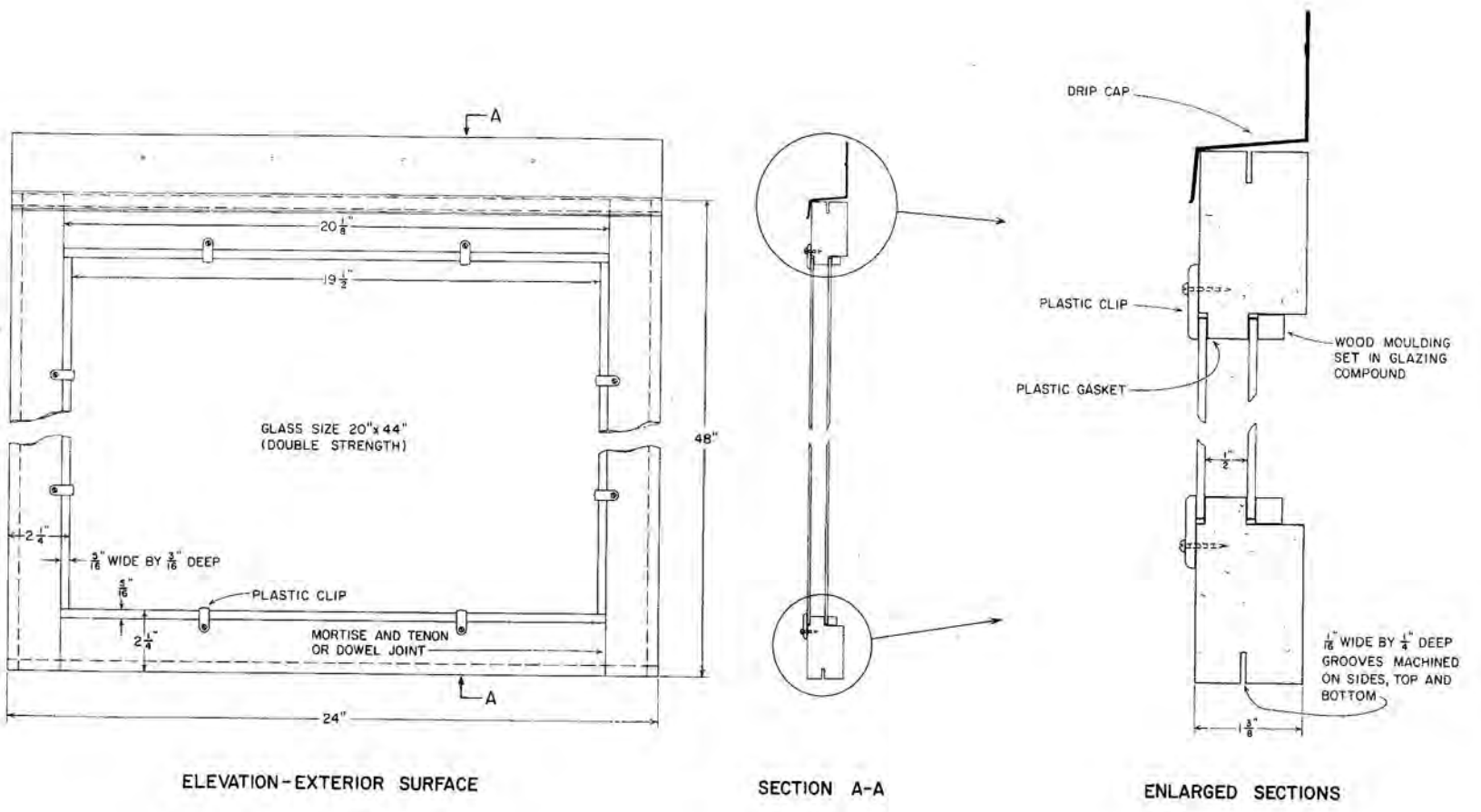
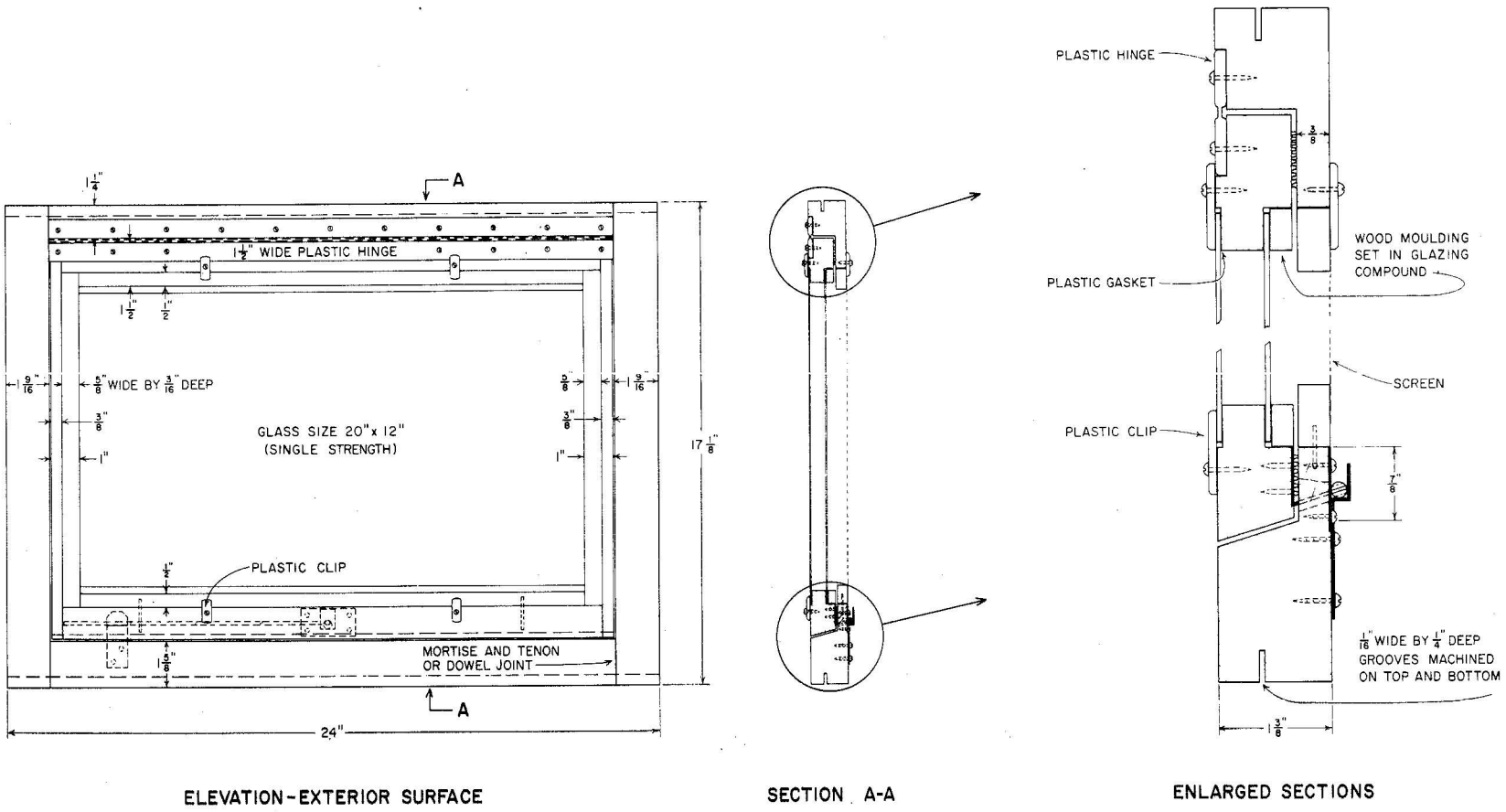


Figure 3.--Front (outside) of fixed window unit (left), cross section (center), and detailed cross section (right). M 141 357



ELEVATION - EXTERIOR SURFACE

SECTION A-A

ENLARGED SECTIONS

Figure 4. --Front (outside) of ventilating unit (left), cross section (center), and detailed cross section, (right).

M 141 358

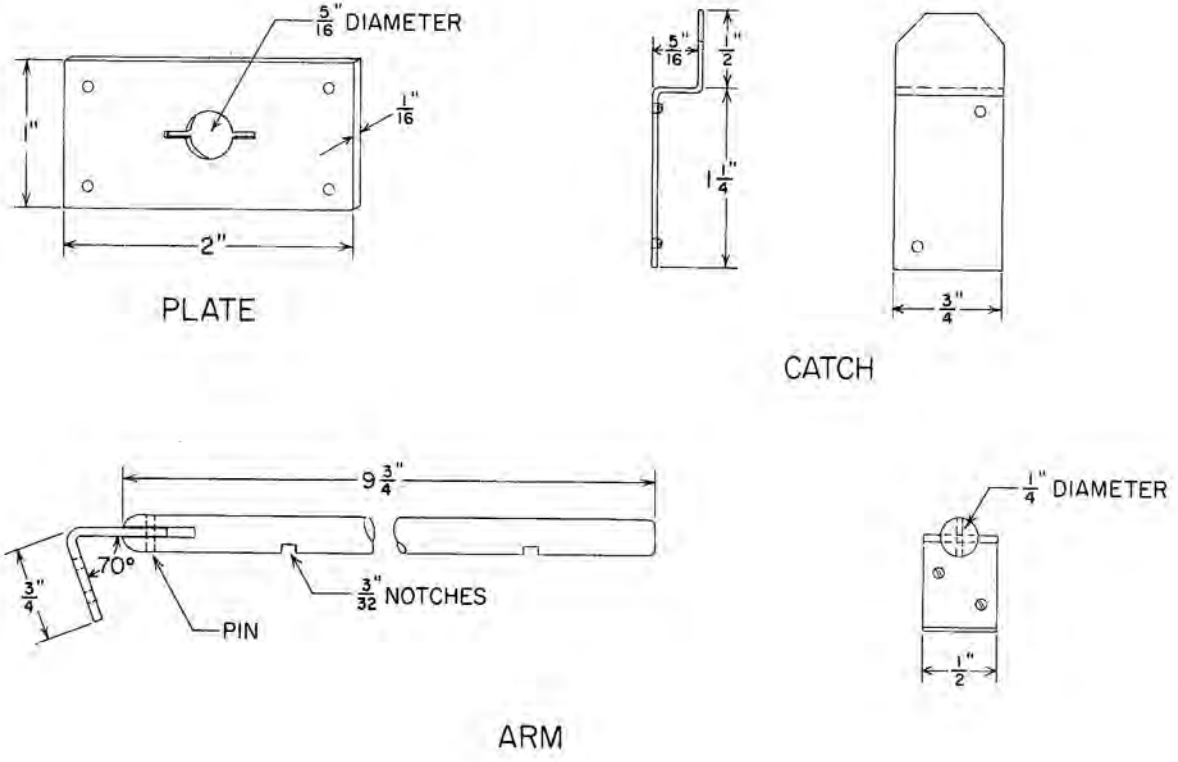


Figure 5.--Closure hardware for ventilating unit.
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