CIRCULAR SERIES
INDEX NUMBER F11.2

STORM WINDOWS

FOR DOUBLE-HUNG WINDOWS

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How Much Fuel Do They Save?

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ISSUED BY THE SMALL HOMES COUNCIL

UNIVERSITY OF ILLINOIS BULLETIN

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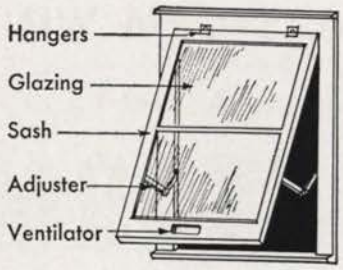
CIRCULAR SERIES
SMALL HOMES COUNCIL F11.2

1. WHAT IS A STORM WINDOW?

A storm window is an extra window that is placed usually on the outside of an existing window.

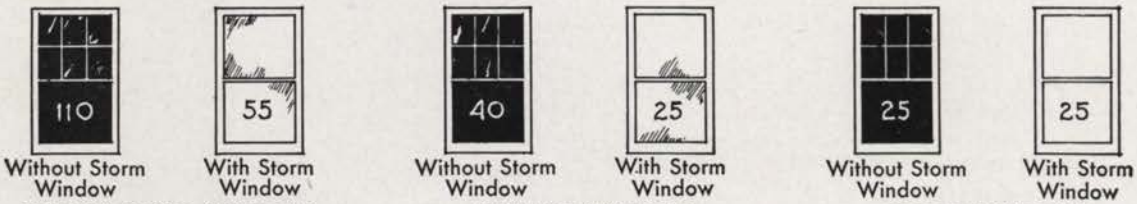


2. WHY USE STORM WINDOWS?

a. They reduce the amount of cold air leaking into a house.[1]

(1See correspondingly numbered References at end of last page.)

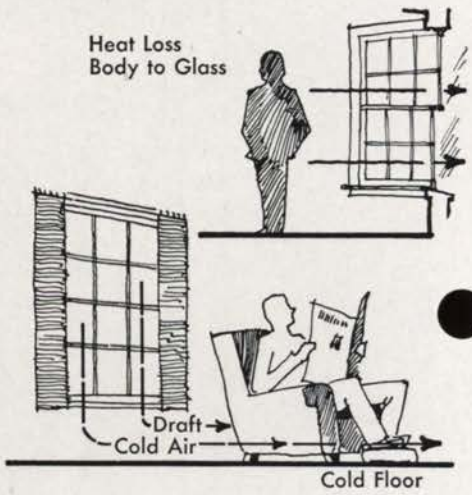
Figures on Windows Indicate Cubic Feet of Air Leakage per Hour for Every Foot Length of Crack Around Sash



b. They reduce amount of soot and dirt entering house.

c. They increase temperature of glass.[2]

Ordinary single windows: 18° F. for zero weather.
Same with tight storm windows: 41° F. for zero weather.
A warmer window surface reduces heat loss from body to the glass.



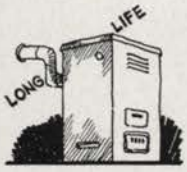
d. They reduce condensation of moisture and formation of frost on glass surfaces.[3]

e. They increase temperature of cool air moving down window surface to floor.[4]

Ordinary single windows: 56° F. for zero weather.
Same with tight storm windows: 62° F. for zero weather.

f. They increase the temperature near the floor 1° to 2°.

Resulting in warmer floors.[5]



g. They increase life of heating equipment.[5]

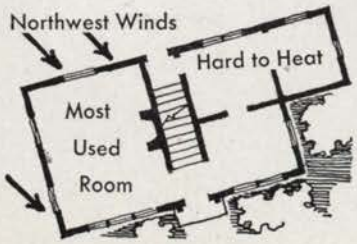
They reduce load on heating equipment 20% (actual test) when all windows are equipped with tight storm windows. They reduce long periods of high-intensity firing. They prolong life of equipment.

h. They save fuel.[5]

Actual field tests indicate fuel savings 20% when all windows are fitted with tight storm windows.

APPROXIMATE FUEL SAVINGS FOR ONE 2'-4" x 5'-2" WINDOW WITH TIGHT STORM WINDOW

3. WHICH WINDOWS SHOULD BE PROTECTED?



In Illinois, all windows should be protected if funds permit; if not, provide storm windows in this order:

a. In rooms hard to heat.
b. Rooms exposed to west and north.
c. Rooms used most.

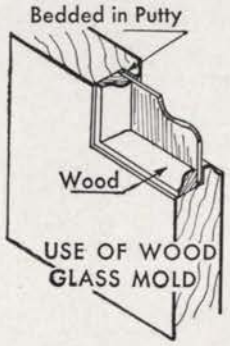
4. STORM WINDOWS OR WEATHERSTRIPPING?

a. Air Leakage and Heat Loss.—Weatherstripping controls air leakage better than storm windows, but storm windows reduce air leakage and heat loss through the glass.

b. Old Houses.—It is usually cheaper to fit storm windows than to weatherstrip old windows.

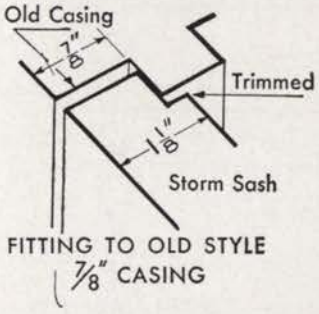
c. New Houses.—Use windows which are furnished weatherstripped. Storm windows may then be installed later.

5. HOW SHOULD STORM WINDOWS BE MADE AND FITTED?

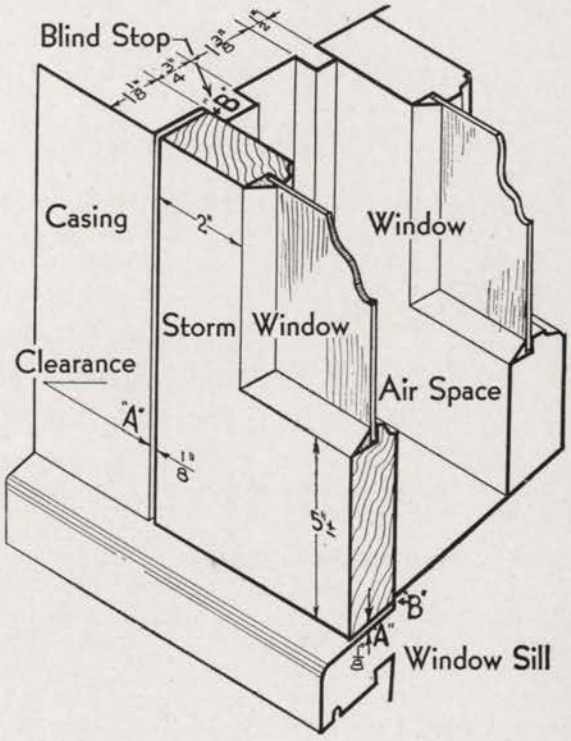


a. Construction of Sash.—Better grades are made of No. 1 White Pine, toxic treated to resist decay. Side rails are about 2" wide, bottom rail about 5". Glass may be held in place with putty or reinforced with wood mold around the pane. Latter type requires less maintenance than putty alone.

b. Thickness of Wood Sash.—Factory made wood storm windows are usually 1⅛" thick and fit into 1⅛" depth between blind stop and window casing of the window frame.



c. Old-Type Casings.—In some older houses, depth between blind stop and casing is sometimes only ⅞". In such cases, the sash must be trimmed or rabbetted to make outer surface flush with window casing.



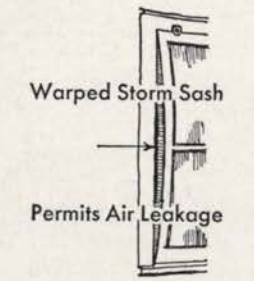
d. Requirements for Fitting.—Stock storm sash are made oversize, about ¼" wider and 2" longer than standard window openings, and will require trimming and fitting on the job. Side rails can be trimmed about ½". The bottom rail can be trimmed as much as 2" if necessary.

Window frames are not always squared and true, particularly in the cases of old houses. Storm sash are made oversize to allow for individual variations in the framing dimensions.

e. Proper Clearance for Fitting.—Storm windows should have a definite clearance between sash and window frame of about ⅛". If no clearance is provided, any swelling of the sash will bind it in the frame and may cause it to warp and become leaky.

The seal is not along narrow edges at top, sides, and bottom (See A in Figure), but is along the vertical surfaces where the sash comes in contact with the blind stop. (See B in Figure.)

6. WHAT HARDWARE IS USED ON STORM WINDOWS?



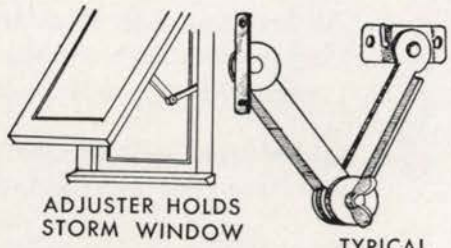
RESULT OF WARPAGE IN STORM SASH

a. Hangers and Hooks.—These are usually used to hang storm windows. Hangers are placed on window casing at head, and hooks at the sill. These alone do not prevent warping or insure tight fit.

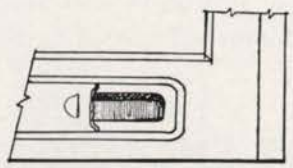
b. Adjusters.—These are attached to the storm sash and the side of the frame and permit opening of storm sash, and also serve to draw it tight and lock it.

c. Ventilators.—These permit ventilation without opening storm windows, and may prevent frost forming on storm windows.

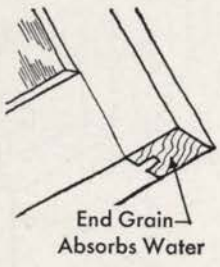
d. Where to Use Vent and Adjusters.—They are usually used on storm windows in bathrooms and bedrooms.


ADJUSTER HOLDS STORM WINDOW

TYPICAL ADJUSTER

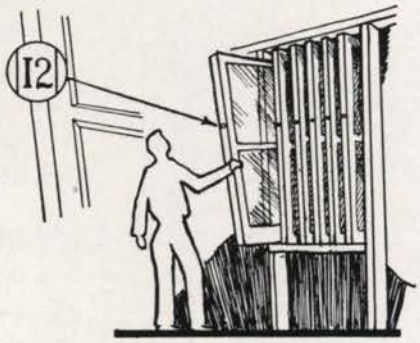

VENTILATOR—SLIDING TYPE

7. HOW SHOULD STORM WINDOWS BE PAINTED AND STORED?



a. Painting.—After fitting, trimming, and installing the storm window, the wood surfaces of the sash should be painted with a prime coat and with two coats of paint.

b. Marking and Storage.—Mark window jambs and storm window with corresponding numbers. Most convenient storage is in vertical racks.



8. ABOUT BUYING STORM WINDOWS

a. Where to Buy.—Factory-made storm windows and hardware can be obtained from lumber dealers, hardware stores, and building supply houses. In many cases carpenters and builders will give estimates.

b. When to Buy.—Storm windows can be fitted any time of the year, under favorable working conditions. Seasonal demand is greatest in fall and early winter. Buy in summer for ample time for painting and installing.

c. What Size to Buy.—Stock sizes to fit almost any size of wood windows are available. Catalogue listings of manufacturers show as many as 300 stock sizes. Nonstock sizes cost more.

d. How Much Do They Cost?—

(1) Cost of wood sash glazed—about $.30 per sq. ft. as received from dealer.
(2) Cost of hangers and hooks—about $.10 per set.
(3) Cost of adjusters—about $.50 to $.75 per set.
(4) Cost of ventilators—about $.25 to $.65 per set.

Total cost for window 2′4″ x 5′2″ is about $3.70 without vents and adjusters.

Labor for fitting, hanging, prime coat of paint is about $1.00-$1.50.

9. DOUBLE-HUNG STEEL SASH WINDOWS

The material in this bulletin applies equally well to both double-hung wood and steel sash windows.

10. REFERENCES

1. American Society of Heating and Ventilating Engineers Guide, 1944, Chapter 5.
2. University of Illinois Engineering Experiment Station Bulletin No. 223, p. 79.
3. University of Illinois Engineering Experiment Station Bulletin No. 230.
4. University of Illinois Engineering Experiment Station Bulletin No. 266, p. 120.
5. University of Illinois Engineering Experiment Station Bulletin No. 355.

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