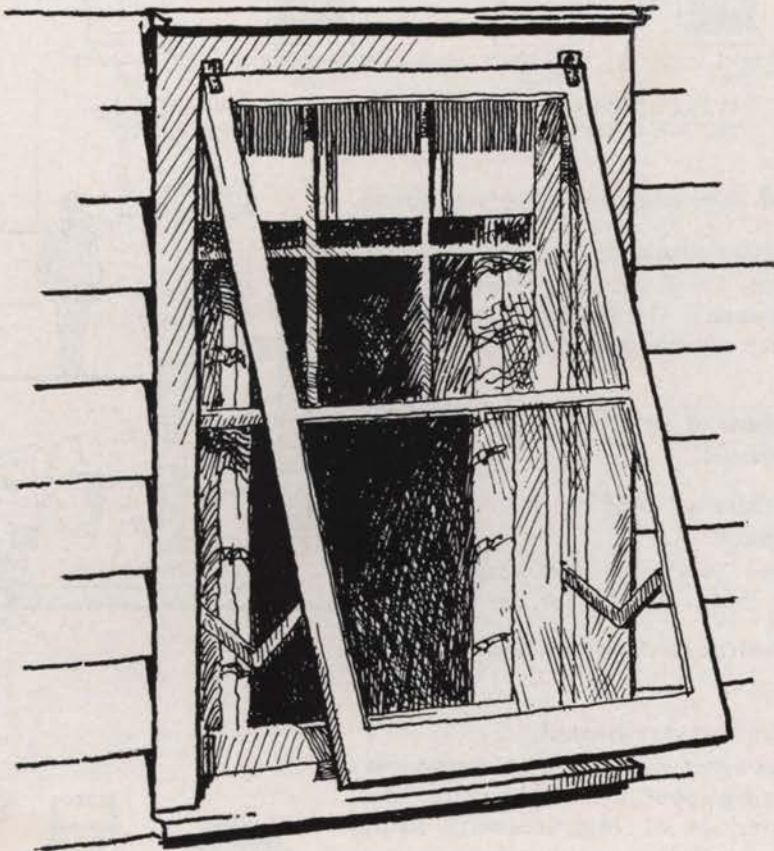


CIRCULAR SERIES

INDEX NUMBER **F11.2**

STORM SASH

FOR DOUBLE-HUNG WINDOWS



What Are They?

Why Use Them?

On Which Windows?

How Much Fuel Do They Save?

How Are They Made?

How Are They Fitted?

What Hardware Is Needed?

How Are They Stored?

How Much Do They Cost?

When Do You Buy Them?

ISSUED BY THE SMALL HOMES COUNCIL

UNIVERSITY OF ILLINOIS BULLETIN

VOLUME 43, NUMBER 2, AUGUST 20, 1945. Published every five days by the University of Illinois. Entered as second-class matter at the post office at Urbana, Illinois, under the Act of August 24, 1912. Office of Publication, 358 Administration Building, Urbana, Illinois. Acceptance for mailing at the special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 31, 1918.

Material in This Circular Prepared by A. P. KRATZ, S. KONZO, W. S. HARRIS, W. H. SCHEICK

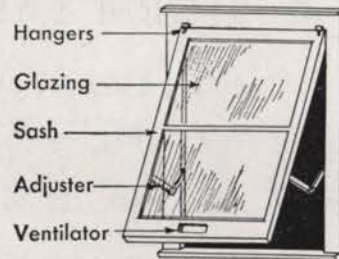
For copies of this Circular (F11.2) or additional information address
Small Homes Council, Mumford House, University of Illinois, Urbana



CIRCULAR SERIES
SMALL HOMES COUNCIL
F11.2

1. WHAT IS A STORM SASH?

A storm sash is an extra sash (sometimes called a storm window) that is placed usually on the outside of an existing window.



2. WHY USE STORM SASH?

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

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

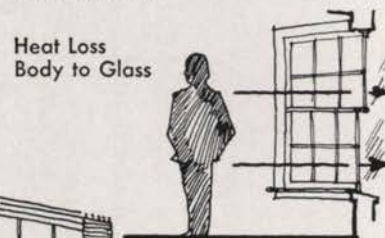
Figures on Windows Indicate Cubic Feet of Air Leakage per Hour for Every Foot Length of Crack Around Sash



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

c. They increase temperature of glass.²

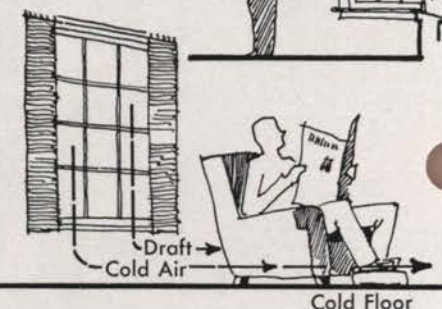
Ordinary single windows: 18° F. for zero weather.
Same with tight storm sash: 41° F. for zero weather.
A warmer window surface reduces heat loss from body to the glass.



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 sash: 62° F. for zero weather.



f. They increase the temperature near the floor 1° to 2°.
Resulting in warmer floors.⁵

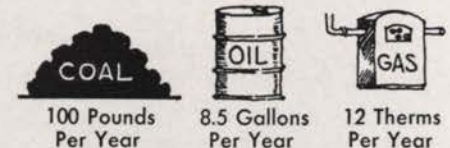
g. They increase life of heating equipment.⁵

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



h. They save fuel.⁵

Tests at the University of Illinois indicate fuel savings of 20% when all windows are fitted with storm sash. The percent of savings will vary with the climate and the area of glass.



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

3. WHICH WINDOWS SHOULD BE PROTECTED?



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

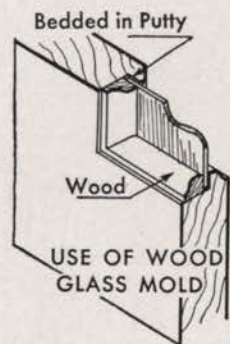
- In rooms hard to heat.
- Rooms exposed to west and north.
- Rooms used most.

4. STORM SASH OR WEATHERSTRIPPING?

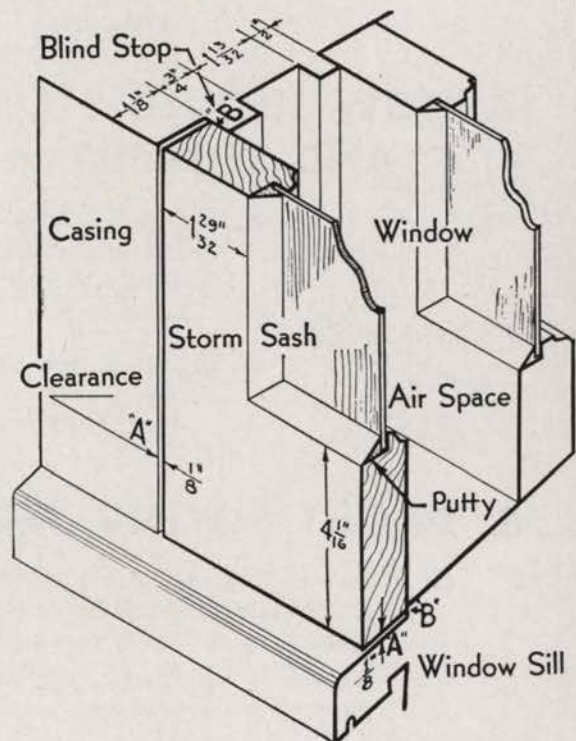
- a. **Air Leakage and Heat Loss.**—Weatherstripping controls air leakage better than storm sash, but storm sash reduce air leakage and heat loss through the glass.
- b. **Old Houses.**—It is usually cheaper to install storm sash than to weatherstrip old windows.
- c. **New Houses.**—Use windows which are furnished weatherstripped. It is more economical to install storm sash at the time you build, but they can be installed later.



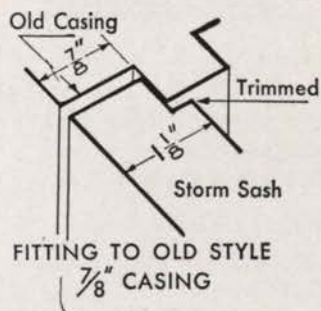
5. HOW SHOULD STORM SASH BE MADE AND FITTED?



- a. **Materials Used.**—Better grades of storm sash are made of naturally durable woods, or of material which has been toxic treated to resist decay. Glass most frequently used is known as SSB (single strength B), and is held in place by zinc points and putty. Storm sash are also available with the glass bedded in putty and held in place by a wood mold or bead.



- b. **Dimensions of Storm Sash.**—New windows should conform to "Modular standards" (National Door Mfgs. Ass'n). Standard storm sash will fit such windows without cutting or trimming on the job. For existing windows (either those that are not square and true, as in old houses, or those that do not conform to the standards), the storm sash must be ordered oversize and will require trimming at the job. The sketch at the right shows the standard dimensions for storm sash.



- c. **Ordering Non-Standard Sash.**—Give the glass size of the window with which the storm sash will be used, and the dimensions of the casing opening.
- d. **Thickness of Wood Sash.**—Factory-made wood storm sash are usually $1\frac{1}{8}$ " thick and fit into the $1\frac{1}{8}$ " depth between the casings of the window frame.
- e. **Old-Type Casings.**—In some older houses the thickness of frame casings is sometimes only $\frac{7}{8}$ ". In such cases the sash must be trimmed or rabbeted to make outer surface flush with window casing.

- f. **Proper Clearance for Fitting.**—Storm sash should have a definite clearance between sash and window frame of about $\frac{1}{8}$ ". If no clearance is provided they are more difficult to install, and if any swelling of the sash occurs it will bind them in the frames and may cause them to warp and permit leakage.

The seal is not along the edges at top, side, and bottom (see A in figure), but is along the surface where the sash comes in contact with the blind stop (see B in figure). If a tight seal cannot be obtained otherwise, the use of a felt strip securely attached along the contact edges of the sash is advisable.

6. WHAT HARDWARE IS USED ON STORM SASH?



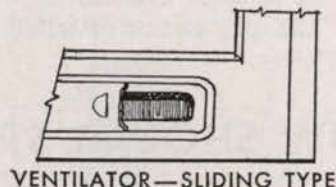
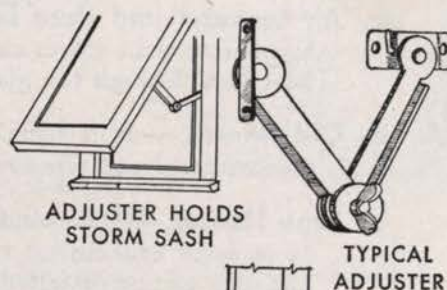
RESULT OF WARPAGE
IN STORM SASH

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

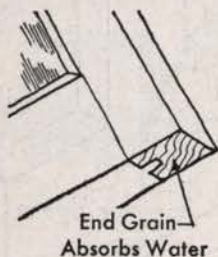
b. Adjusters.—These are attached to the storm sash and the side of the frame and permit opening of storm sash, and also serve to draw it tight and lock it.

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

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

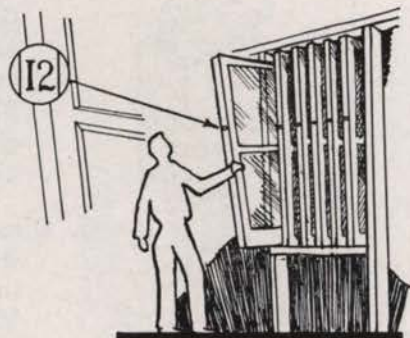


7. HOW SHOULD STORM SASH BE PAINTED AND STORED?



a. Painting.—After fitting, trimming, and installing the storm sash, 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 sash with corresponding numbers. Most convenient storage is in vertical racks.



8. ABOUT BUYING STORM SASH

a. Where to Buy.—Factory-made storm sash 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 sash 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 a wide range of 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 of storm sash 2'4" x 5'2" is about \$3.70 without vents and adjusters.

When sash must be cut and trimmed at the job, labor for fitting, hanging, and prime coat of paint is about \$1.00 or \$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.