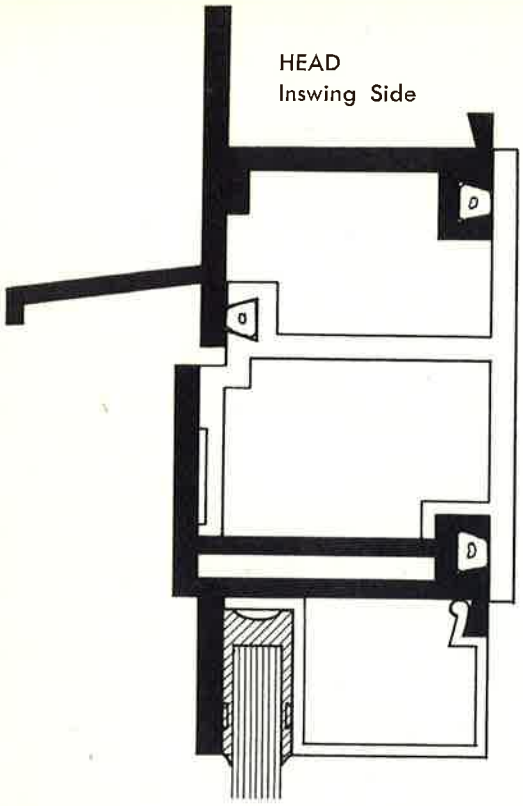
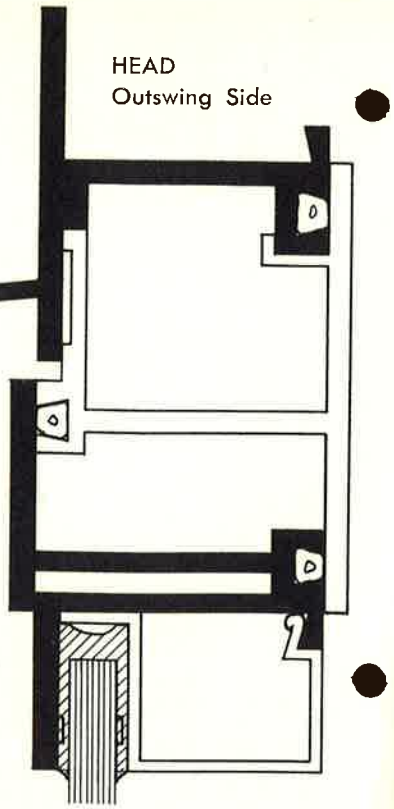
REVERSIBLE WINDOW

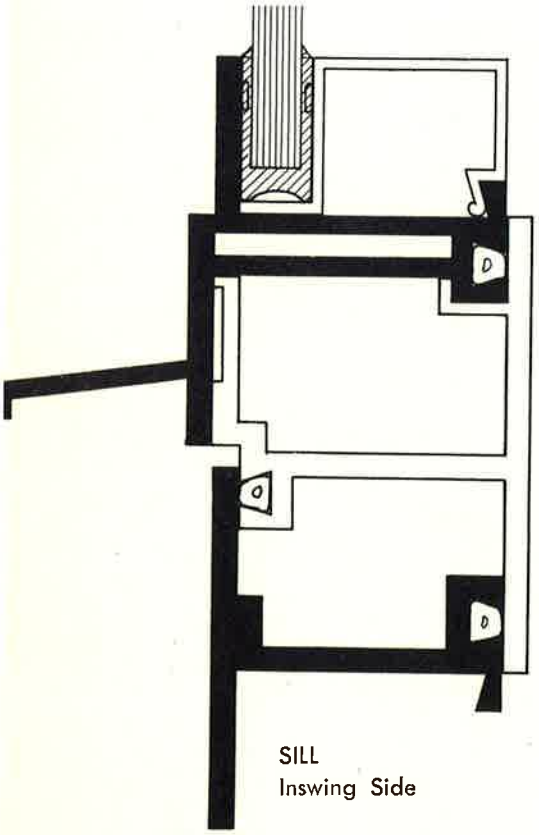
Research and analysis determined that the window function for the building pictured opposite should be of the reversible type. However, due to the extreme thermal changes and possible hurricane conditions at the locale, it was obvious that the Reversible window units available on today's market would not meet the requirements.

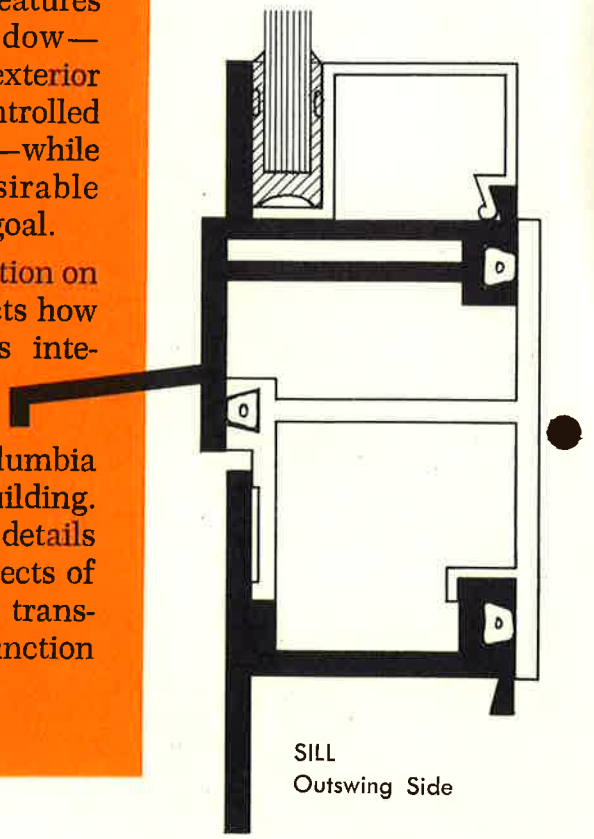
New design concepts affording overlap of ⅜″ metal to metal contact on both exterior and interior sides of the window perimeter and retaining the most desirable features of the Reversible window—economy — safety of exterior surface cleaning — controlled emergency ventilation—while eliminating the undesirable features—became the goal.

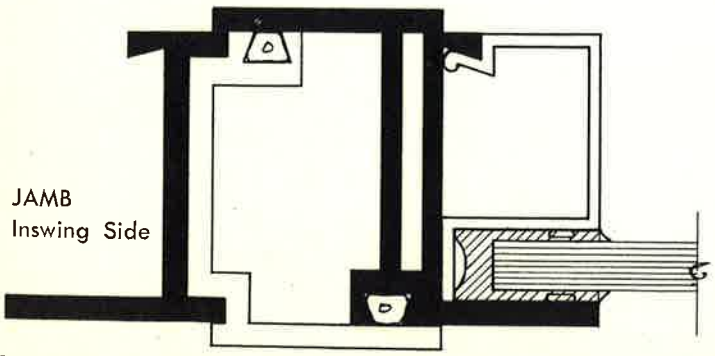
The detailed wall section on the opposite page reflects how this new window was integrated into a component unit of the curtain wall system of the Columbia Gulf Transmission Building. Study of the full size details reveal the practical aspects of a window designed to translate basic needs into function and beauty.

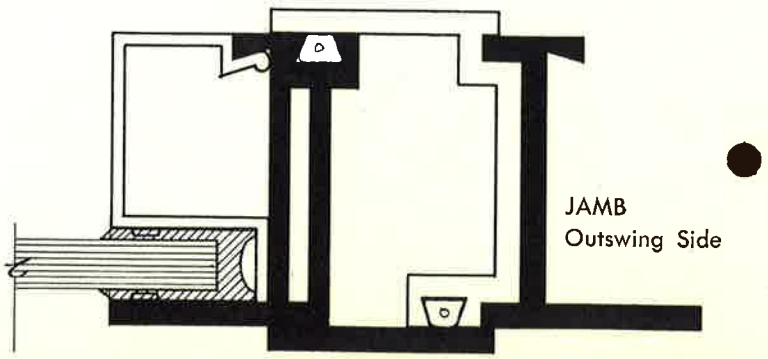








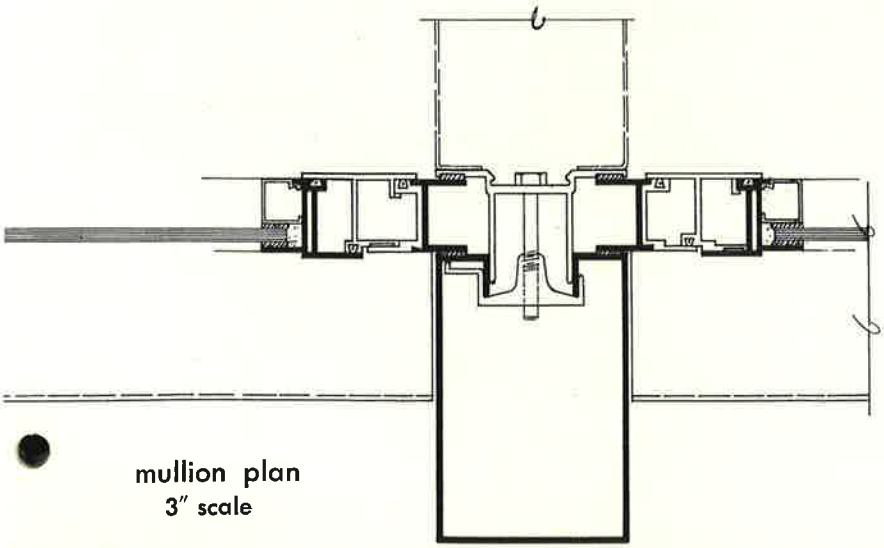




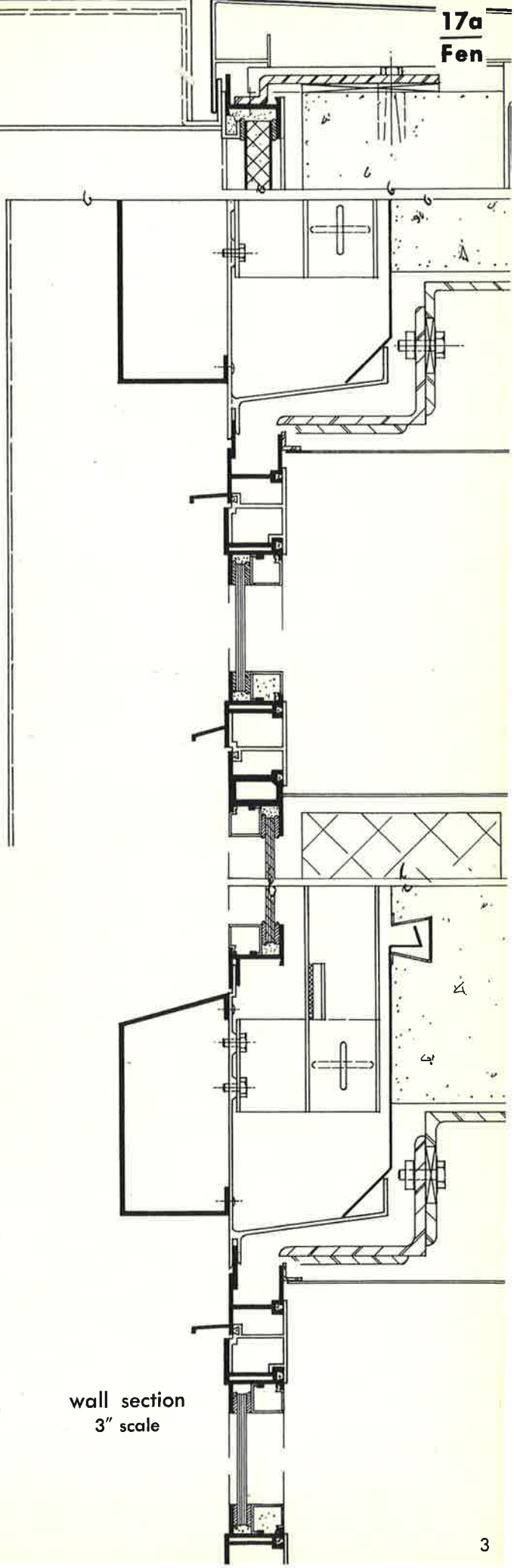
scale: full size

building	Columbia Gulf Transmission Company Office Building
location	Houston, Texas
architect	Douglas Orr
associate architect	Pierce and Pierce
contractor	Linbeck Construction Company

Ventilators are fully reversible yet afford metal to metal overlap of 3/8″ plus double contact weatherstripping. When ventilators are fully reversed parallel to frame a 2″ ventilation is gained.



mullion plan
3″ scale

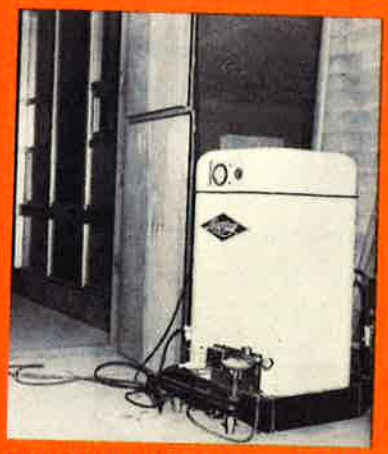


wall section
3″ scale

THERMAL BARRIER

Aluminum—the wonder product of man's 20th century vision—while faithfully defying the destructive forces of the elements, falls short of perfection in its quick response to environmental temperature through thermal conduction. The thermal barrier theory to halt thermal conduction created a need for realistic evaluation by extreme testing procedures to prove its effectiveness. Clinical data reported herein is the actual result of thermal barrier testing as developed by Fentron Industries. Data reflects test procedure specified by the architects of the Alaska Mental Hospital and the subsequent constructive action by Fentron to conclude successfully that Aluminum thermal conductivity can be controlled.

TEST CHAMBER CONSTRUCTED by Fentron. It is equivalent to (2) floors of the building, accommodating an actual job size unit for testing.



TEMPERATURE CONTROL UNIT—Inside the test chamber the exterior side temperature was controlled at —30° to +165°F. The interior side was maintained at 70°, for 78 hours.

WINDOW UNIT. 11'-3" x 18'-0". The window unit tested was complete in every detail to that proposed for the Alaska Mental Hospital.

ALASKA MENTAL HOSPITAL under construction. An insulated panel unit being guided into place by Fentron's skilled field men.

TEST REPORT:

A full size window manufactured and assembled by Fentron Industries, Inc., as per specification drawings, was erected as a divider wall in a test building, having insulated walls, at the Fentron factory. The divider wall included a vertical concrete beam to which one edge of the window was anchored, simulating a building wall.

The "inside" test room was kept at 70°F. by thermostatic control of continuously circulating air over a 20,000 watt electric heater. Thermo-couples located at the bottom and top of the room, 6" from the window, registered temperatures during the test. This room also contained lower and upper level platforms for observers and to facilitate measurement.

The test room simulating outside conditions was cycled 12 times through the range of —30° to +165°F. by means of a thermostatically controlled furnace, a 30 lb. cake, dry ice, preliminary cooler with a 1½ H.P. blower system; roll-in trays for crushed ice used in secondary cooling; and a 1,000 lb. tank of liquid carbon dioxide (CO_2) for the subzero stages. Dampers and duct work were arranged to give control of rate of change of temperature.

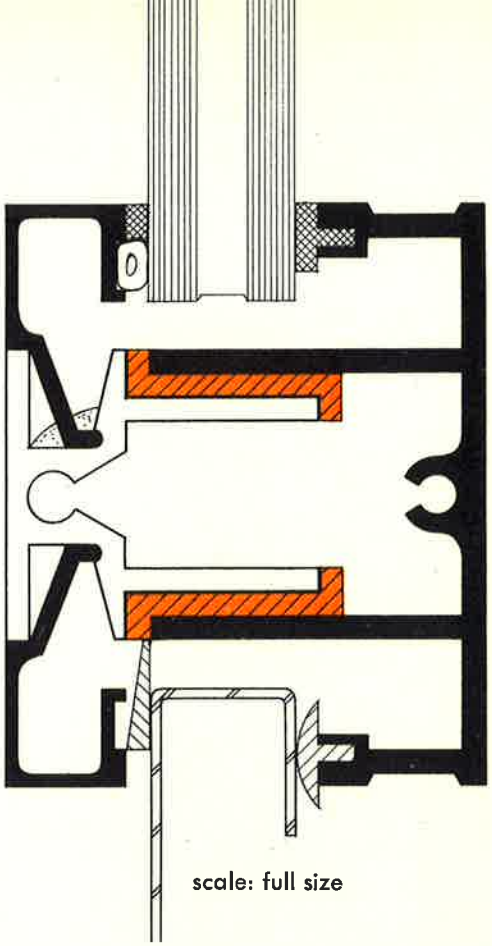
Dimensional changes of certain critical spans were determined at temperature extremes with 2" x 2" wooden gauges of pre-cut length. The ends were drilled, slotted, and fitted with spring loaded plugs whch permitted easy and uniform positioning at marked positions on the window. After settling into place, the plugs were clamped. The gauge sticks were then carried out to gauge table and read to the nearest .010". Mullion width dimension changes were measured with a micrometer and clearance changes at the "concrete wall" were measured by calipering a wedge.

Prior to erecting the wall, the 3 center panels were loaded pneumatically by evacuating a 2" x 8" chamber, to which they were sealed, to 4.8" water pressure differential or 25 P.S.F. (Equivalent to 100 MPH Wind).

After the temperature cycling was completed, the structure joints and seals were tested for leaks by blasting air and water from a high-pressure blower at the joints from a 4" flexible hose. During this time, the window was flexed .2" every 10 seconds by a hand operated rigging tied to the vertical mullions and main building wall.

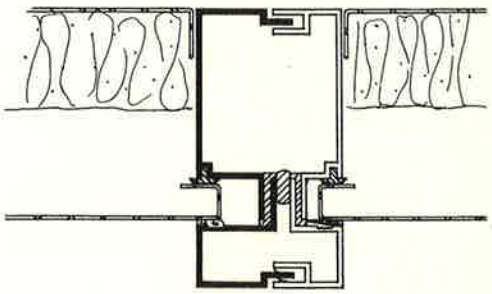
Visual observations were made of the window during test for sweating and fogging. Surface temperatures were taken at extreme conditions.

fentron

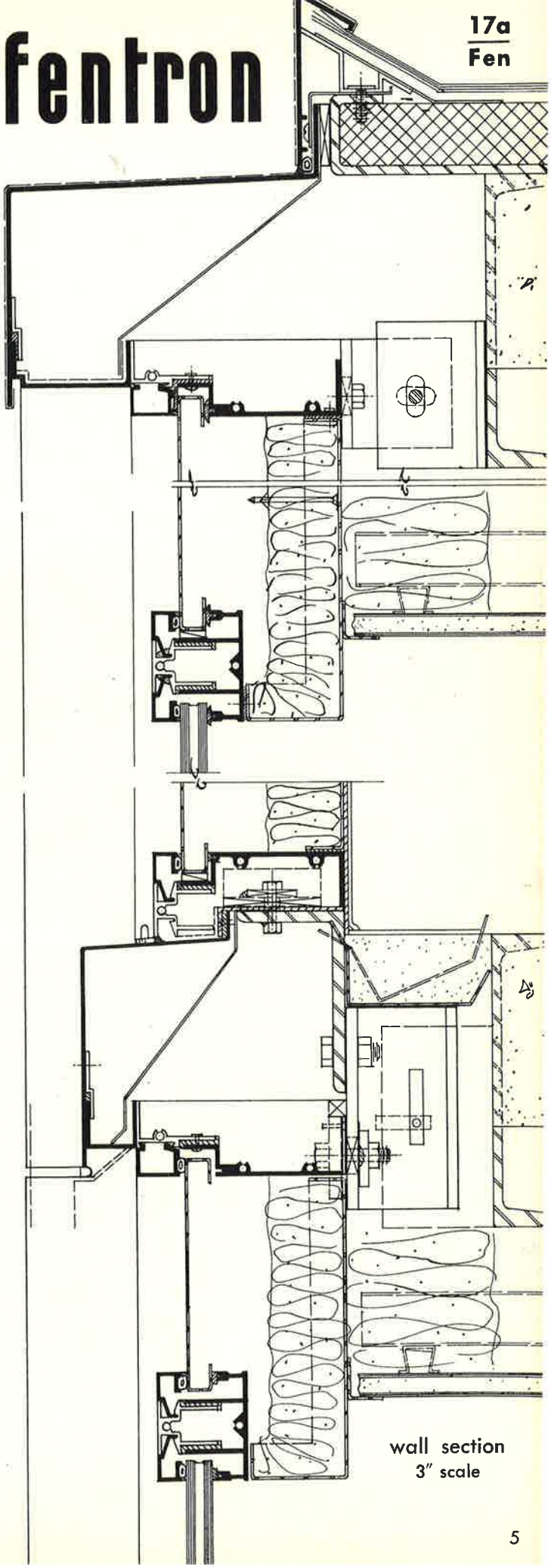


scale: full size

Section of typical insulated curtain wall member. The colored area is the thermal insulator, serving as the barrier which separates temperature conducting exterior metal from interior metal. The vinyl weatherstripping at strategic points seals the section against possible moisture infiltration.



mullion plan
3″ scale



wall section
3″ scale

building	Alaska Mental Hospital
location	Anchorage, Alaska
architect	Stone, Marraccini and Patterson
associate architect	Foss, Olsen and Sands
contractor	Lease Company, Incorporated

RECLAD BUILDING

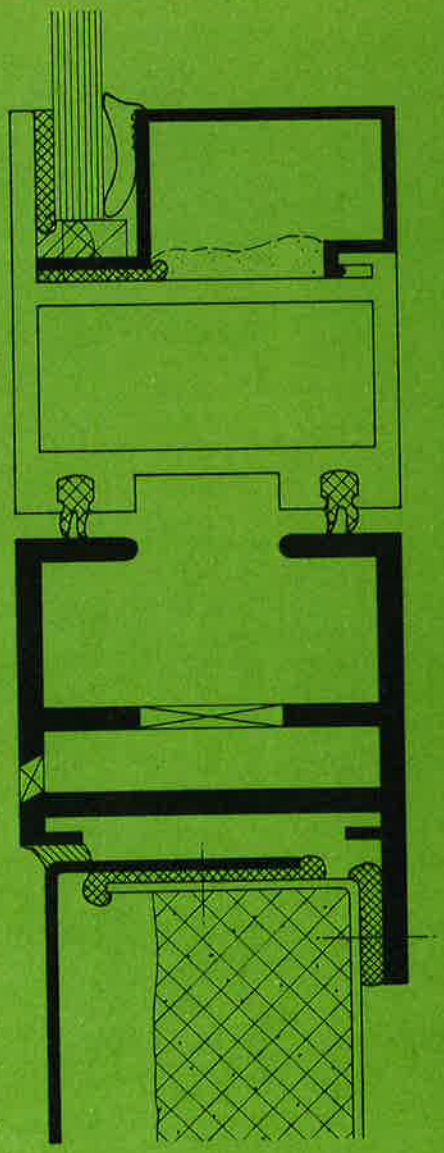
building | San Antonio Savings Association
location | San Antonio, Texas
architect | Benjamin Kenneth Wyatt
contractor | Forgy Construction Company

fentron

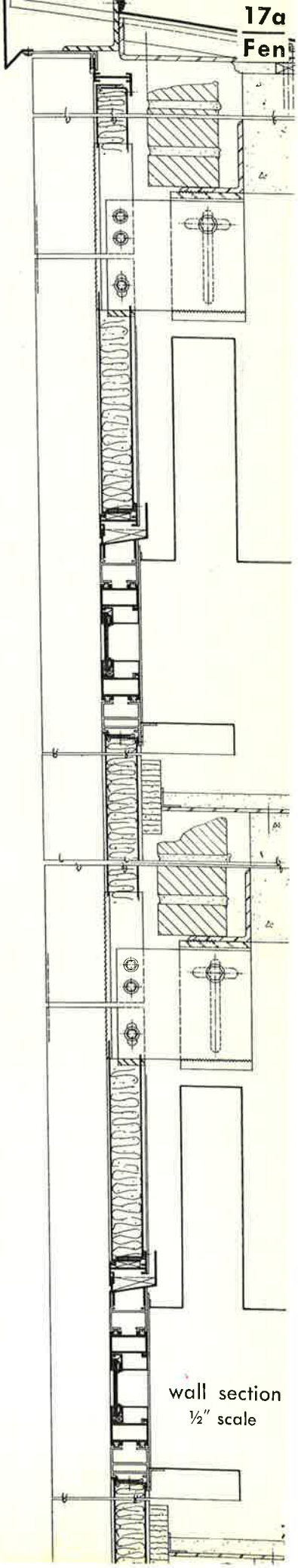
Recladding of exterior facades of older buildings has proven itself an important factor in prolonging their economic life.

This transition from old to new is accomplished by a combination of the well defined, simplified beauty of contemporary architecture and lightweight, quickly installed curtain wall units.

Remodeling techniques developed by Fentron to reclad existing buildings are unique in that occupants can conduct business as usual. Fentron curtain walls are erected without inside demolition. The component curtain wall units are shop fabricated and delivered to the building site ready to set in place.

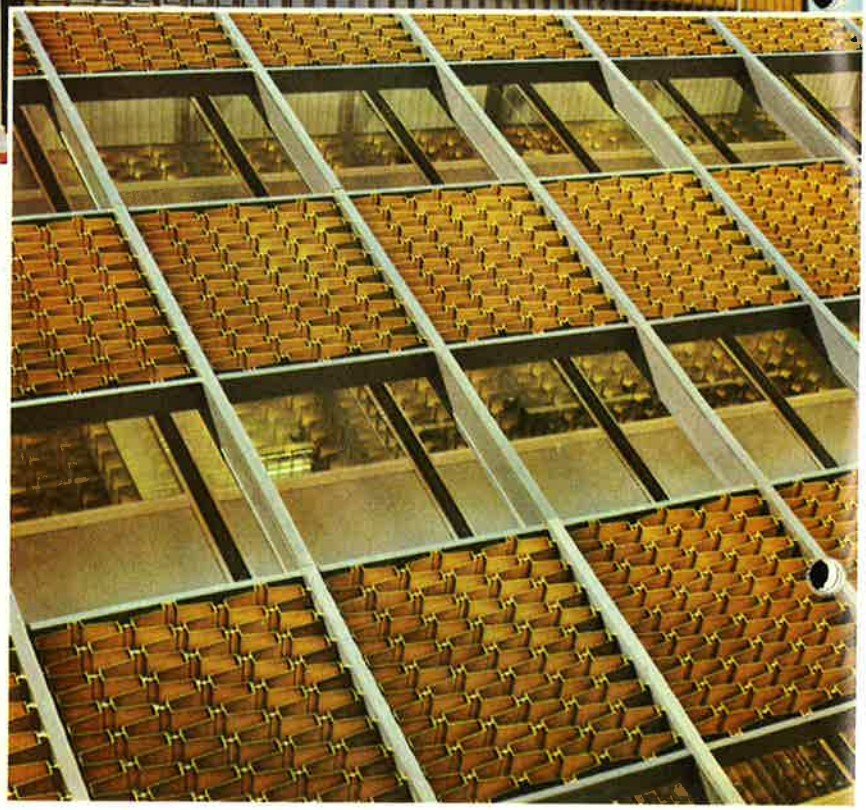


Frame and ventilator section of the Reversible window integrated into the curtain wall units for the San Antonio Savings Building.



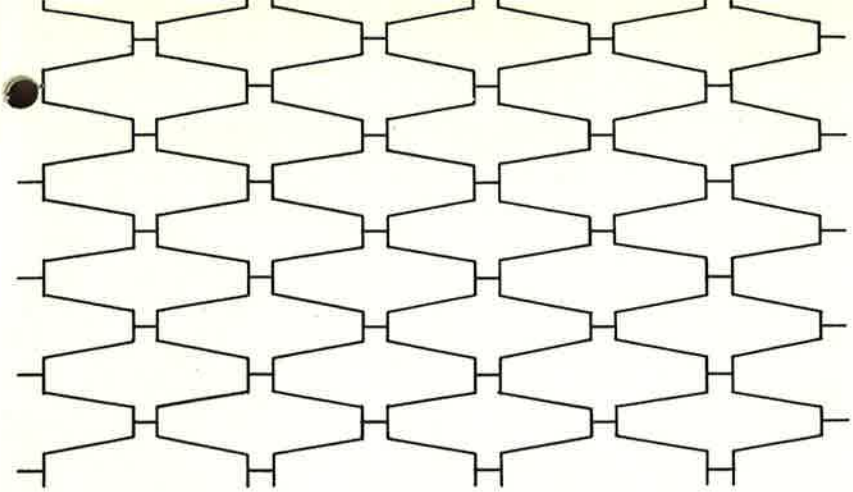
wall section
½" scale

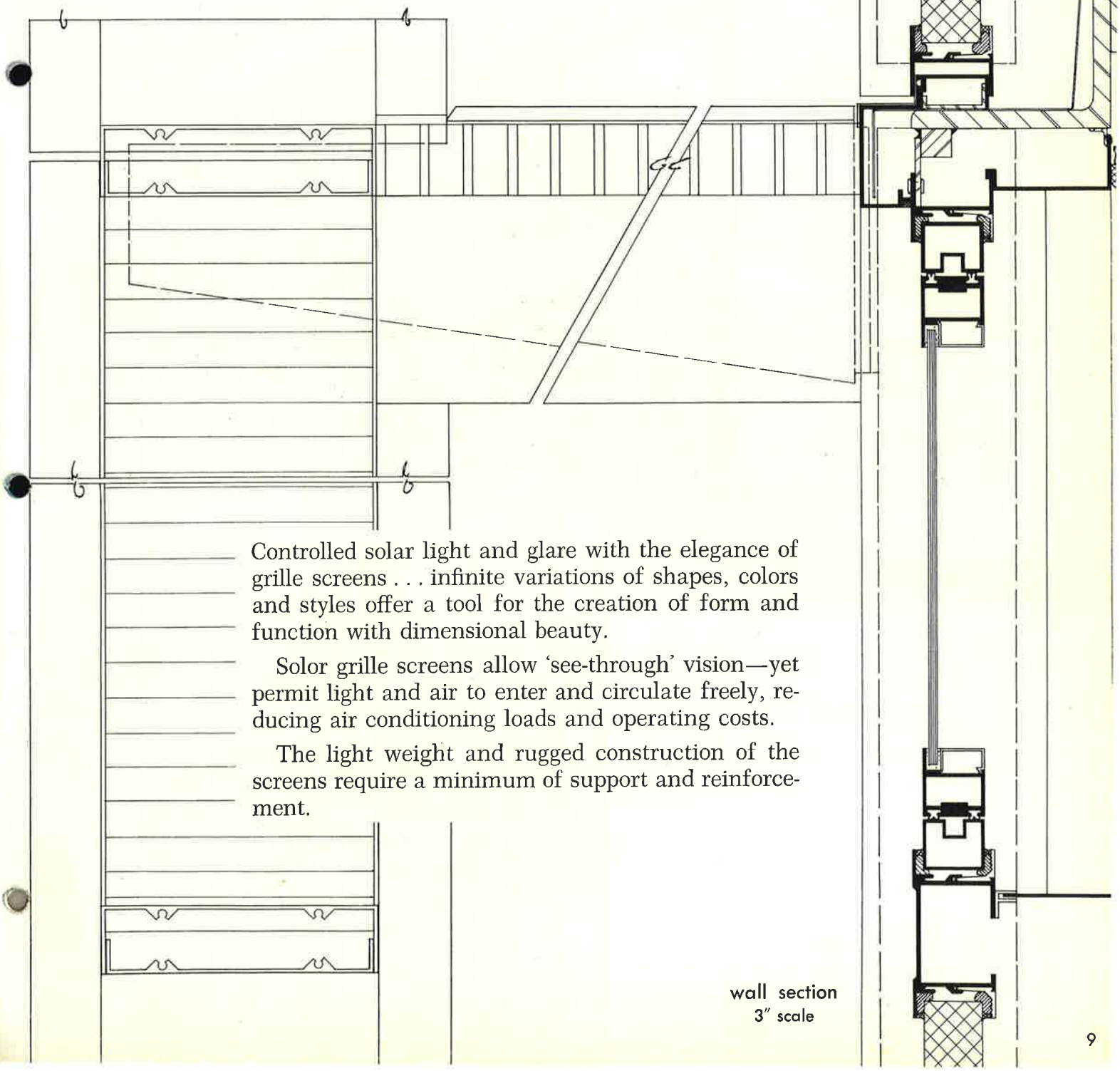
SOLAR SCREENS



building	United States Courthouse and Federal Office Building
location	Phoenix, Arizona
architect	General Services Administration Public Building Service
contractor	Robert E. McKee

fentron





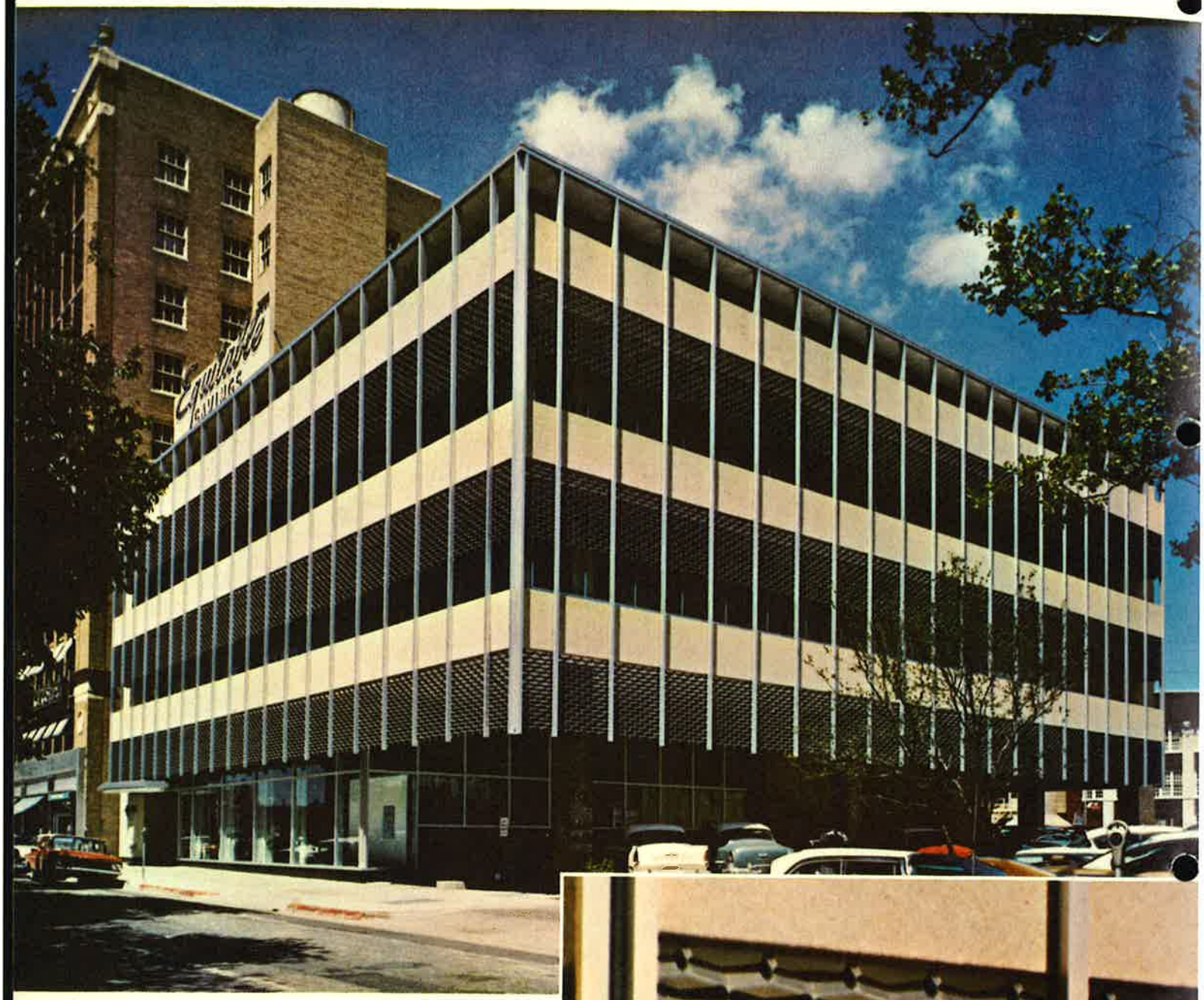
Controlled solar light and glare with the elegance of grille screens . . . infinite variations of shapes, colors and styles offer a tool for the creation of form and function with dimensional beauty.

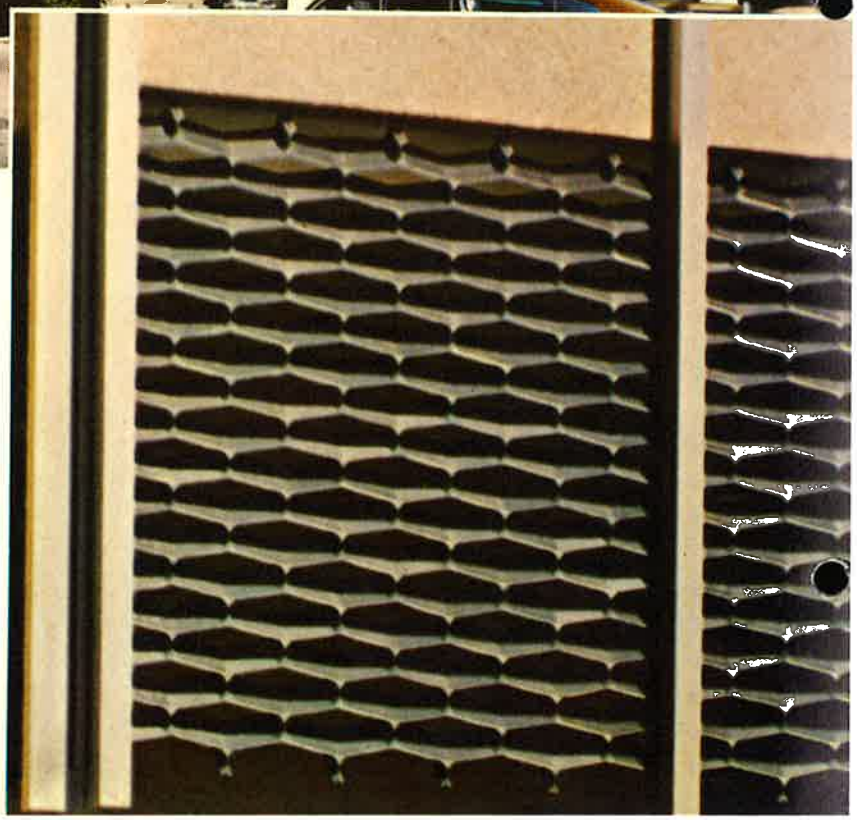
Solor grille screens allow 'see-through' vision—yet permit light and air to enter and circulate freely, reducing air conditioning loads and operating costs.

The light weight and rugged construction of the screens require a minimum of support and reinforcement.

wall section
3″ scale

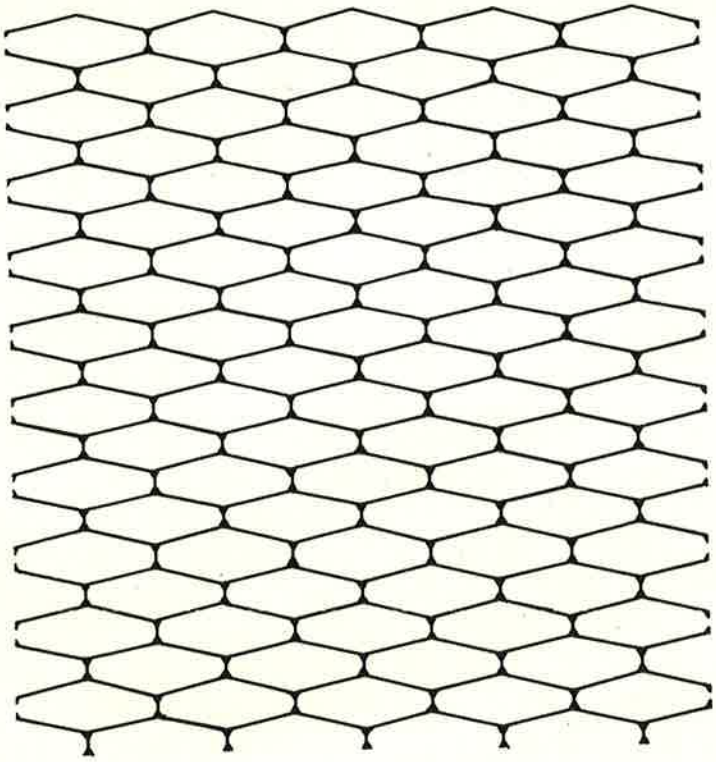
SOLAR SCREENS





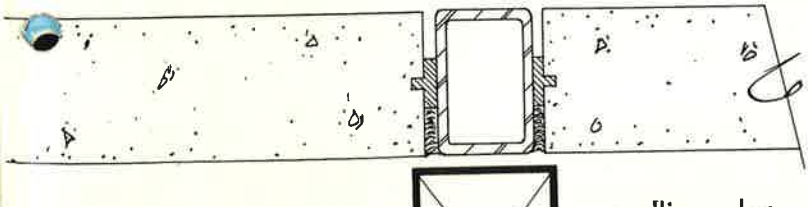
building	Equitable Savings Association
location	Fort Worth, Texas
architect and engineer	Preston M. Geren
contractor	Butcher and Sweeney Construction Company

fentron

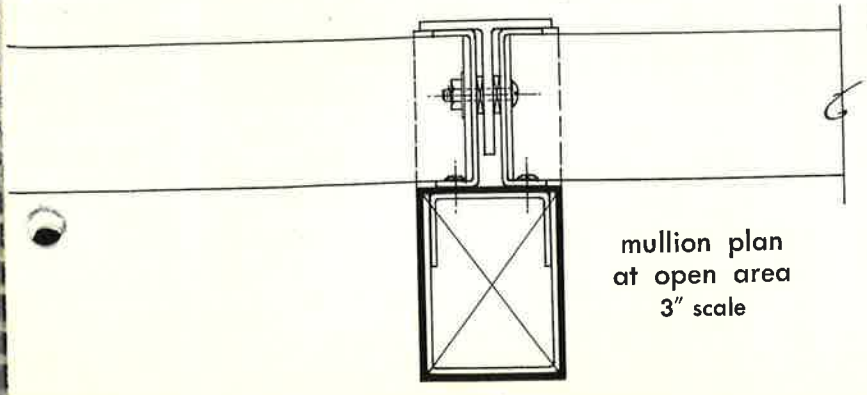


Subtle color accents can be obtained through the wide choice of contrasting finishes possible with Fentron's Electro/color and Kalcolor processes.

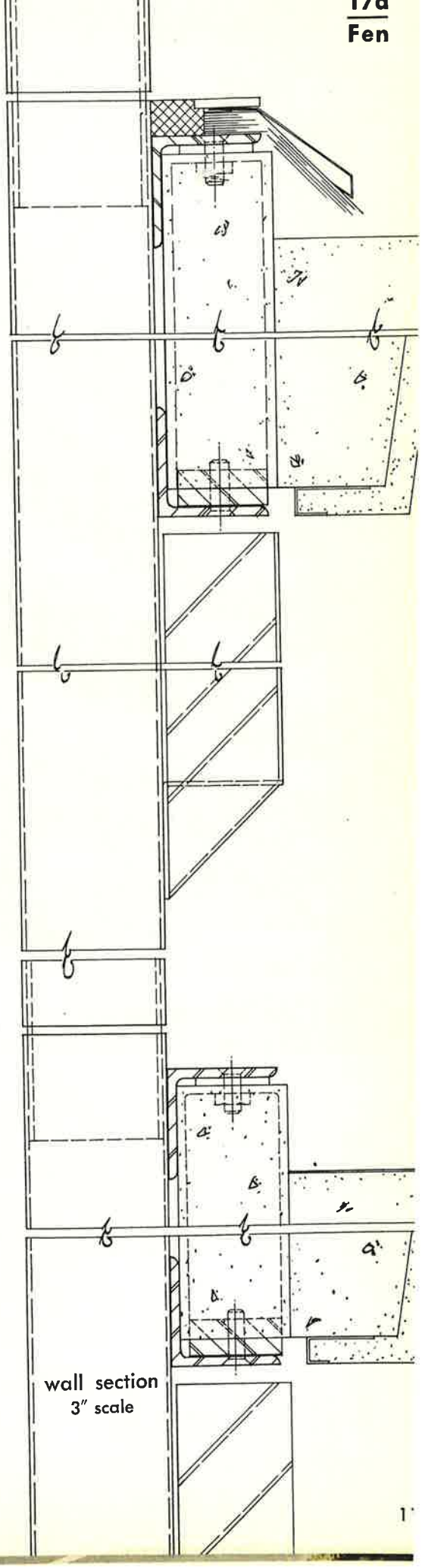
The solar screen pictured in this section was imaginatively enhanced by cutting the grill shapes at 45° and exposing the silver profile edges. The depth area was Electro/colored dark grey, adding greatly to its dimensional appearance.



mullion plan
at spandrel
3" scale



mullion plan
at open area
3" scale



wall section
3" scale

ALUMINUM IN COLOR

*Kalcolor** By Fentron

Tones of classic Kalcolor have no equal among architectural anodic treatments in combining durability of color, color match and resistance to abrasion and corrosive atmospheres.

Kalcolor is more than a new type of anodic finish for aluminum. It is a complete system of anodic finishing with rigid control measures practiced from production of basic metal to the anodic coating on the finished product. The anodic color achieved through this system is a function of the alloy composition, the reagents used in the anodizing bath and the special controls exercised in processing.

The dramatic new Kalcolor finishes offer a wide choice of exciting color-match and color contrast possibilities that promise new, enduring beauty in any architectural application, interior or exterior. In curtain wall assemblies, for example, components made of aluminum extrusions or sheet may be in the same color or contrasting colors.

The Kalcolor approach to color permits Fentron to offer the architect outstanding creative assistance that truly sparks design inspiration.

*Produced by Fentron under Kaiser Aluminum and Chemical Corporation License.

building	Labor and Industries Building
location	Salem, Oregon
architect	Skidmore, Owings and Merrill
contractor	Henry Mason Company

building	Columbia Gulf Transmission Company Office Building
location	Houston, Texas
architect	Douglas Orr
associate architect	Pierce and Pierce
contractor	Linbeck Construction Company

Fentron

ALUMINUM IN COLOR

building | United States Courthouse and Federal Office Building
location | Phoenix, Arizona
architect | General Services Administration Public Building Service
contractor | Robert E. McKee

Electro/COLOR

By Fentron

Delicate, glowing golds of sun colors and dark greys of sophisticated artistry... This is the essence of elegant Electro/color, the enduring colors that speak of poetry and permanence through color anodizing. Electro/color is Fentron's special process of applying color deep down in the aluminum, and is a part of many major buildings throughout America.

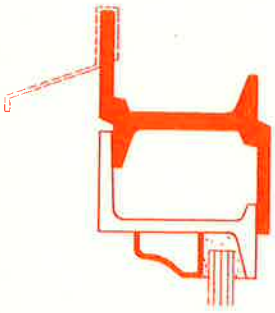
In architecture's never ending search for greater expressions of beauty, Fentron's Electro/color can be specified with confidence.

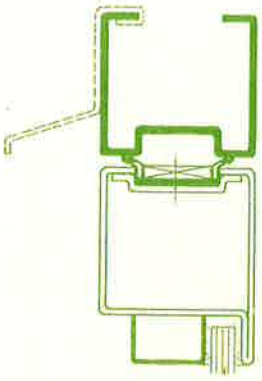
building | El Paso County Office Building
location | Colorado Springs, Colorado
architect | Earle A. Deits
contractor | Lembke Construction Company

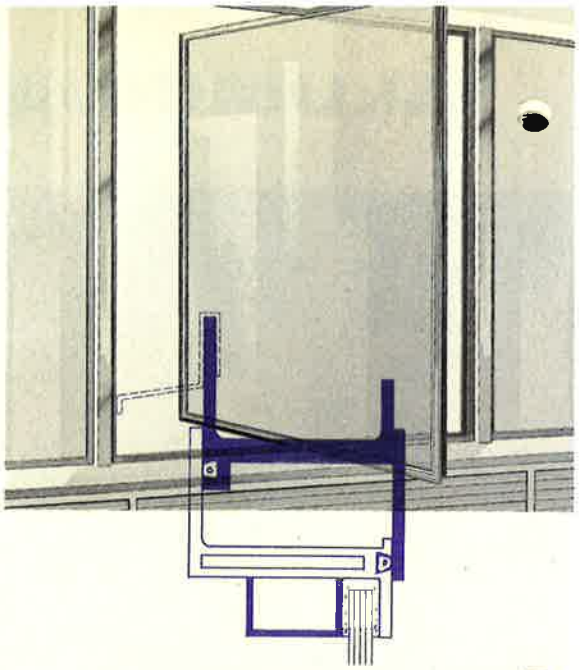
building | University of Washington Women's Residence Hall, Unit 1
location | Seattle, Washington
architect | Young, Richardson, Carleton
contractor | Wick Construction Co.

VERTICAL PIVOT

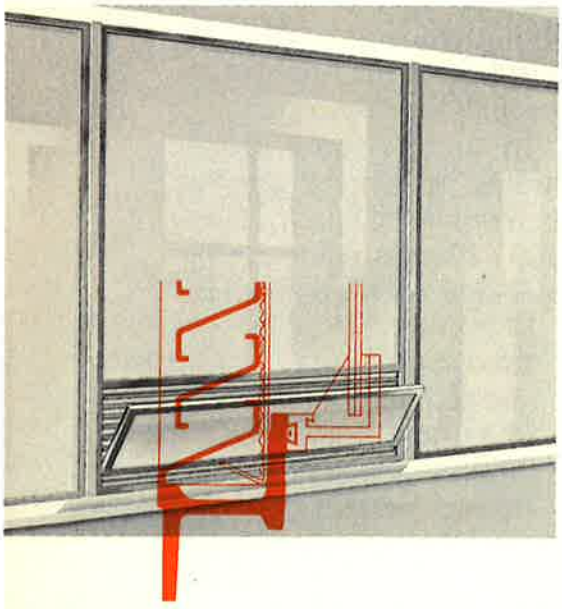
Exterior glass surface easily cleaned by rotating window. Ventilators shall have stainless steel pivots concealed in top and bottom rails with two (2) key controlled cam action locking devices at each jamb operable by authorized personnel only. Ventilators may be locked at a 4" open position for ventilation. Windows may be inside or outside glazed prepared for single or insulating glass.





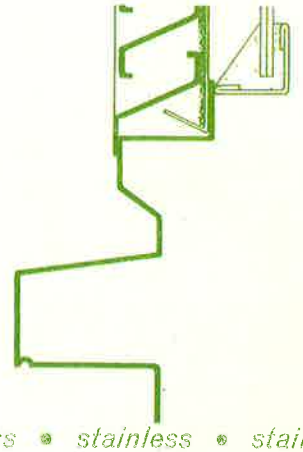


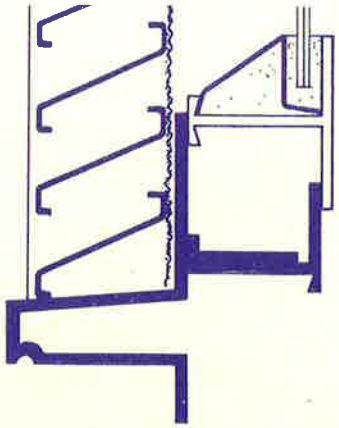
steel • steel • steel • steel • stainless • stainless • stainless • aluminum • aluminum • aluminum •



LOUVRE

Windows are furnished complete with louvre vanes, fly screen and cover frame. Louvre style provides picture frame vision with ideal screened ventilation. Windows may be prepared for single or insulating glass.





steel • steel • steel • steel • stainless • stainless • stainless • aluminum • aluminum • aluminum •

PIVOMATIC 3 POSITION WINDOW

Pivomatic as a fixed window. All mechanism concealed in sash.

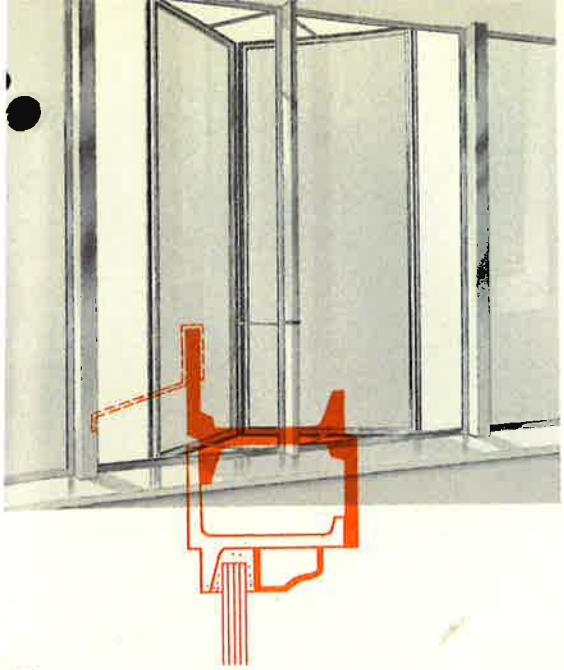
Pivomatic as a side inswing window. Easy to clean.

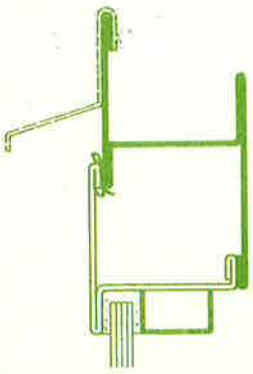
Pivomatic as a bottom inswing window. Controlled ventilation.

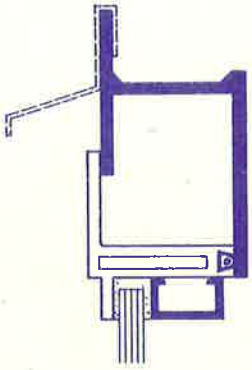
Fentron's new Pivomatic 3-in-1 window operates through an ingenious control mechanism which is completely hidden in the sash. The only exposed controls are a small shift-lever for instantly converting it from one type of window to the other and a conventional handle for opening and closing the window when it is in the side-hinged or bottom-hinged positions. The operator merely throws the small shift-lever and the window is released from its bottom hinges and automatically becomes securely hinged at the side. When it is closed the Pivomatic window presents the crisp and refined lines of a handsome picture window.

FOLDING

Each window shall have two ventilators which open outward simultaneously on concealed supporting arms, roller hangers, and guides. Ventilators are connected with a continuous piano hinge and may be operated mechanically or manually with restricted openings for ventilation or to maximum for cleaning. Windows may be inside or outside glazed prepared for single or insulating glass. Screens optional.



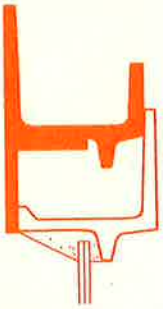


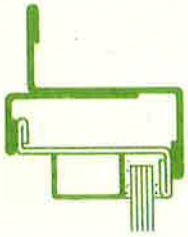


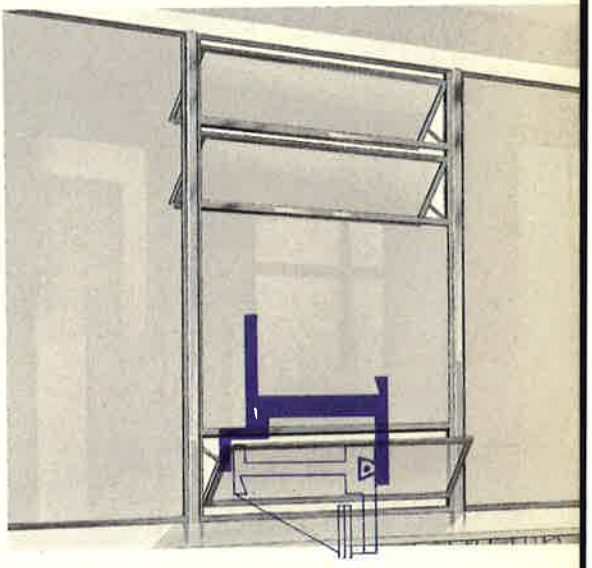
steel • steel • steel • steel • stainless • stainless • stainless • aluminum • aluminum • aluminum •

SYNCHROVENT

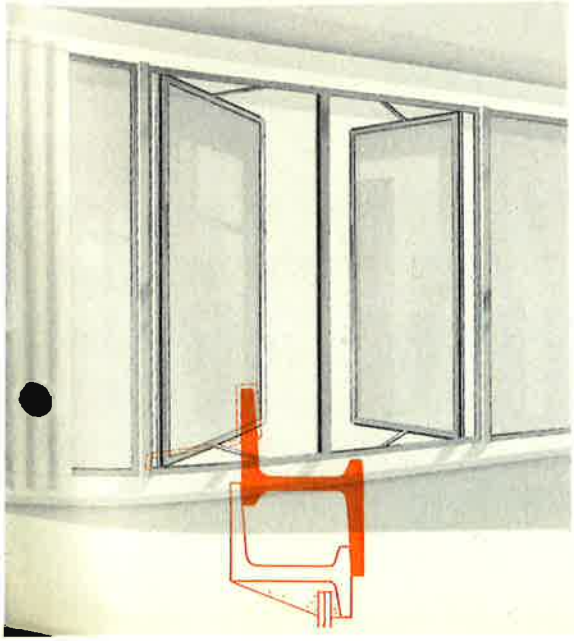
All ventilators shall be provided with concealed operating mechanism at each jamb which actuates control of all ventilators in a window unit by mechanical or manual operation of the control vent. The control vent may project outward or inward as desired. Windows may be inside or outside glazed.





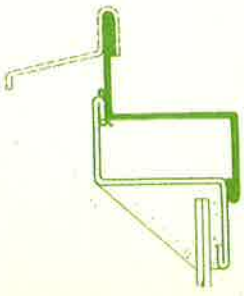


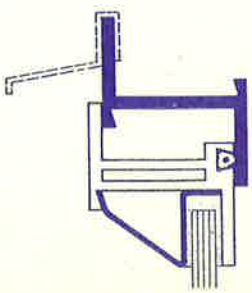
steel • steel • steel • steel • stainless • stainless • stainless • aluminum • aluminum • aluminum •



PROJECTED

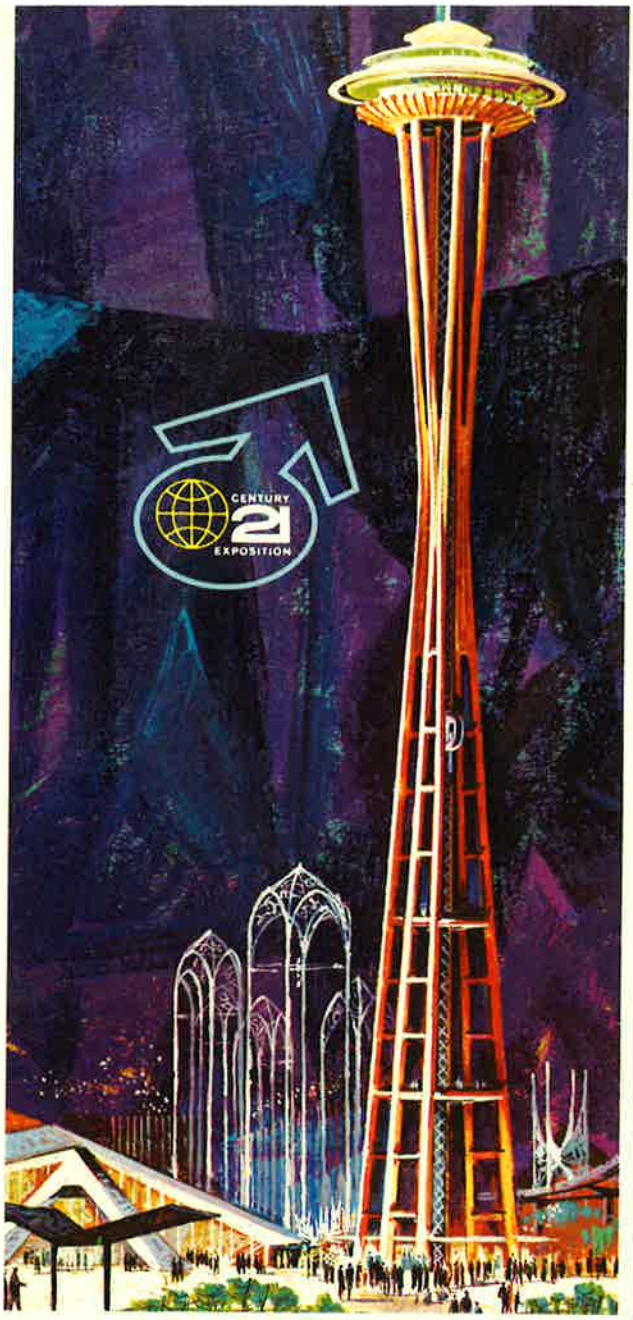
Designed to eliminate the use of exposed hinges for casement windows. Ventilators shall project outward from the jambs supported on sliding arms attached to ventilator and frame. Friction shoes shall be interlocked to channel guide tracks at head and sill. All operating hardware concealed when window is in closed position. Windows may be inside or outside glazed.





SEATTLE WORLD'S FAIR

To be held in Seattle, Washington from April 21 to October 21, 1962. A glittering preview of the Twenty-First Century.



SPACE NEEDLE—
John Graham Co. Architects and Engineers
John Minasian, Consulting Structural Engineer

MONORAIL FROM DOWNTOWN SEATTLE

UNITED STATES SCIENCE PAVILION—
Minoto Yamasaki and Associates, Architects
Naramore, Bain, Brady & Johanson, Associated Architects—Engineers

ON THE COVER:
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Paul Thiry, Architect
Howard S. Wright and Company, Inc., Contractor

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