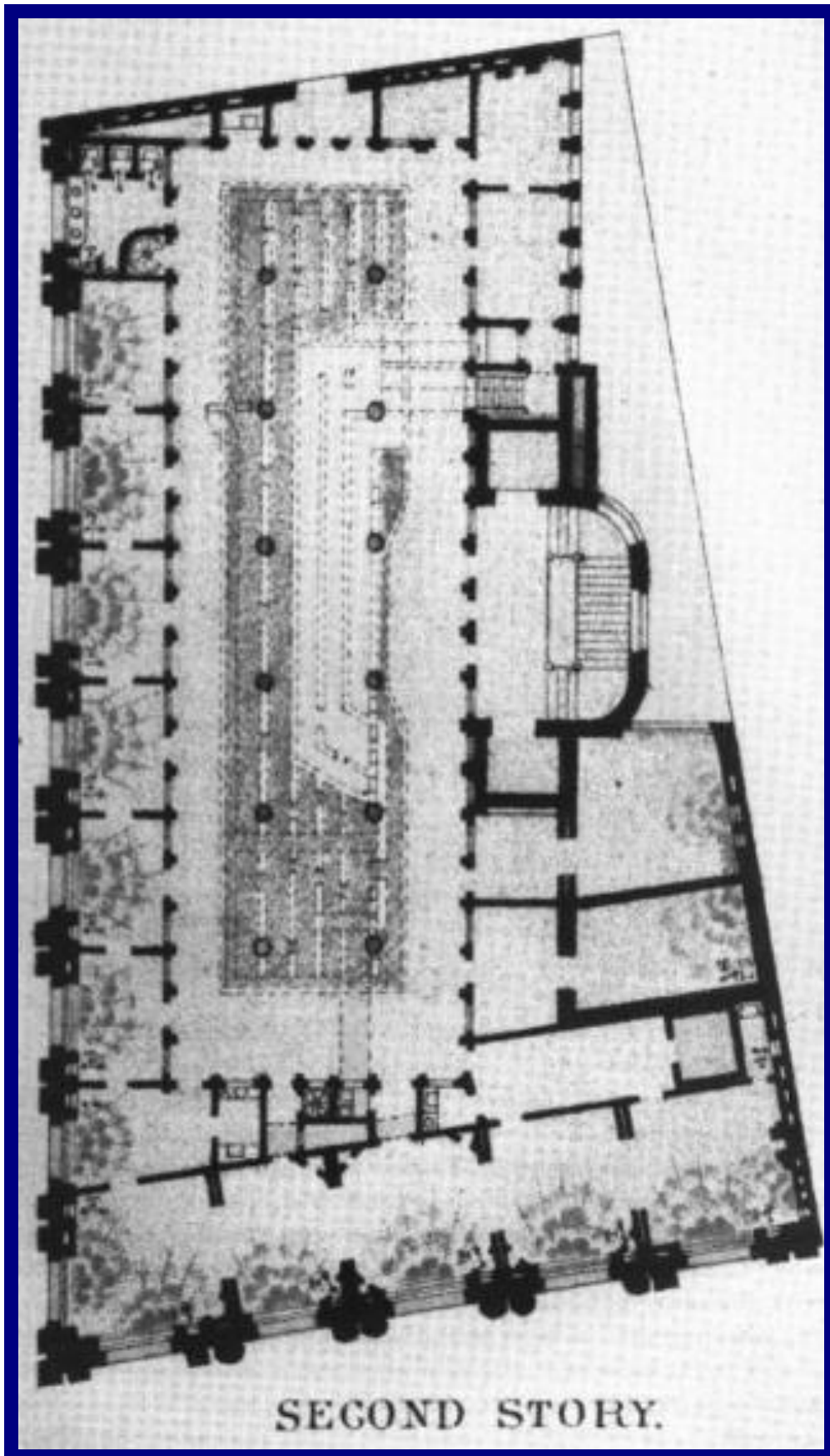


HVAC IN HISTORIC BUILDINGS OF USA

PART FOUR FROM THE EAST COAST, TO THE GULF AND TO CALIFORNIA

BRIAN ROBERTS

OFFICE BLOCK VENTILATION SCHEME 1898



Early system of hot air "chimney type" ventilation by Lewis Leeds which failed.

WINTER GARDENS NEW YORK



The Typhoon Fan Company 1920s.

CONTENTS: FEATURED BUILDINGS

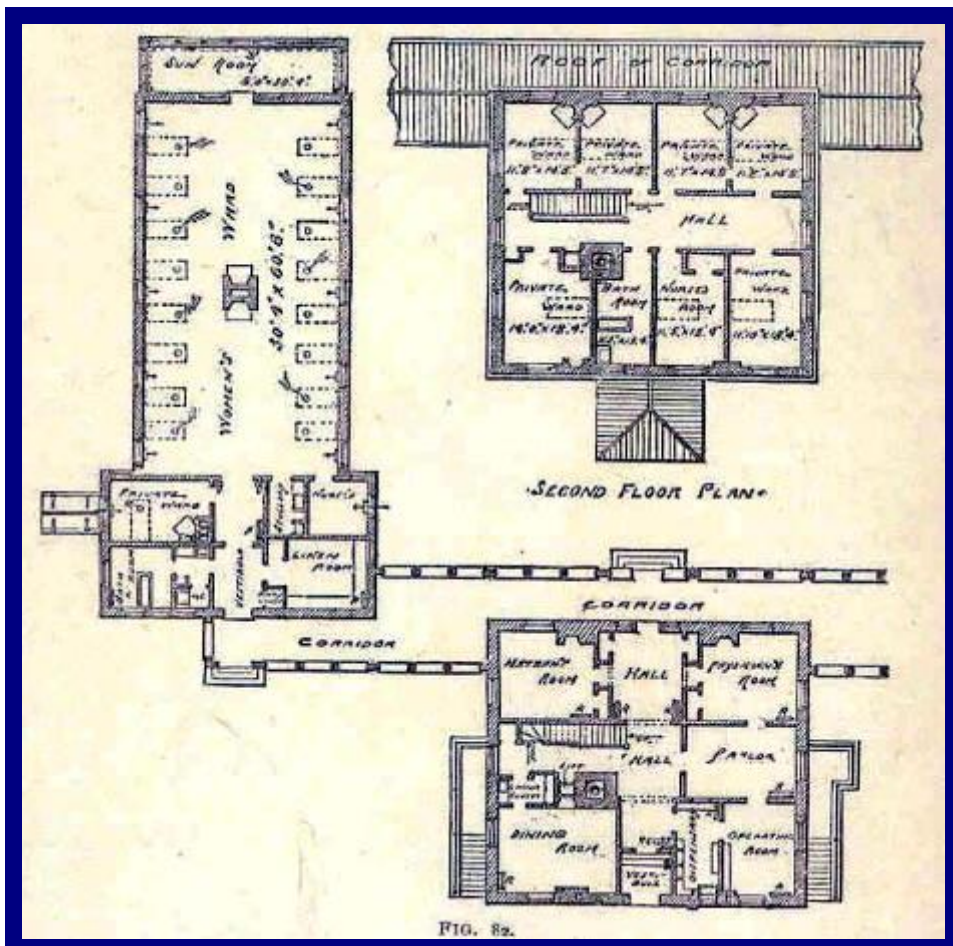
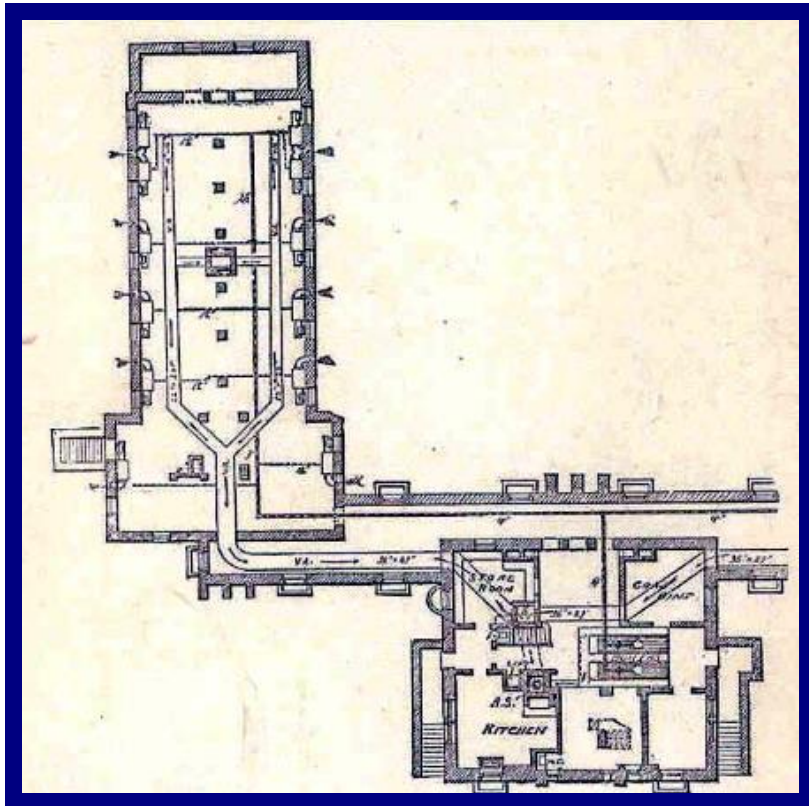
COVER: Johnson Wax, Racine: *front*, Kresge, Detroit: *inside front*,
Gwynne, Cincinnati: *inside back*, Southwestern Bell, St. Louis: *back*.

HOSPITALS: 1,4-9, OFFICES: 2,20-24
THEATRES: 3,10-19,25, HVAC EQUIPMENT: 31,41,42
TEXTILE MILLS: 32-33

US PATENTS: 25-30,34-40,43,44

REFERENCES AND FURTHER READING: 44

CAMBRIDGE HOSPITAL MASSACHUSETTS



CAMBRIDGE HOSPITAL MASSACHUSETTS

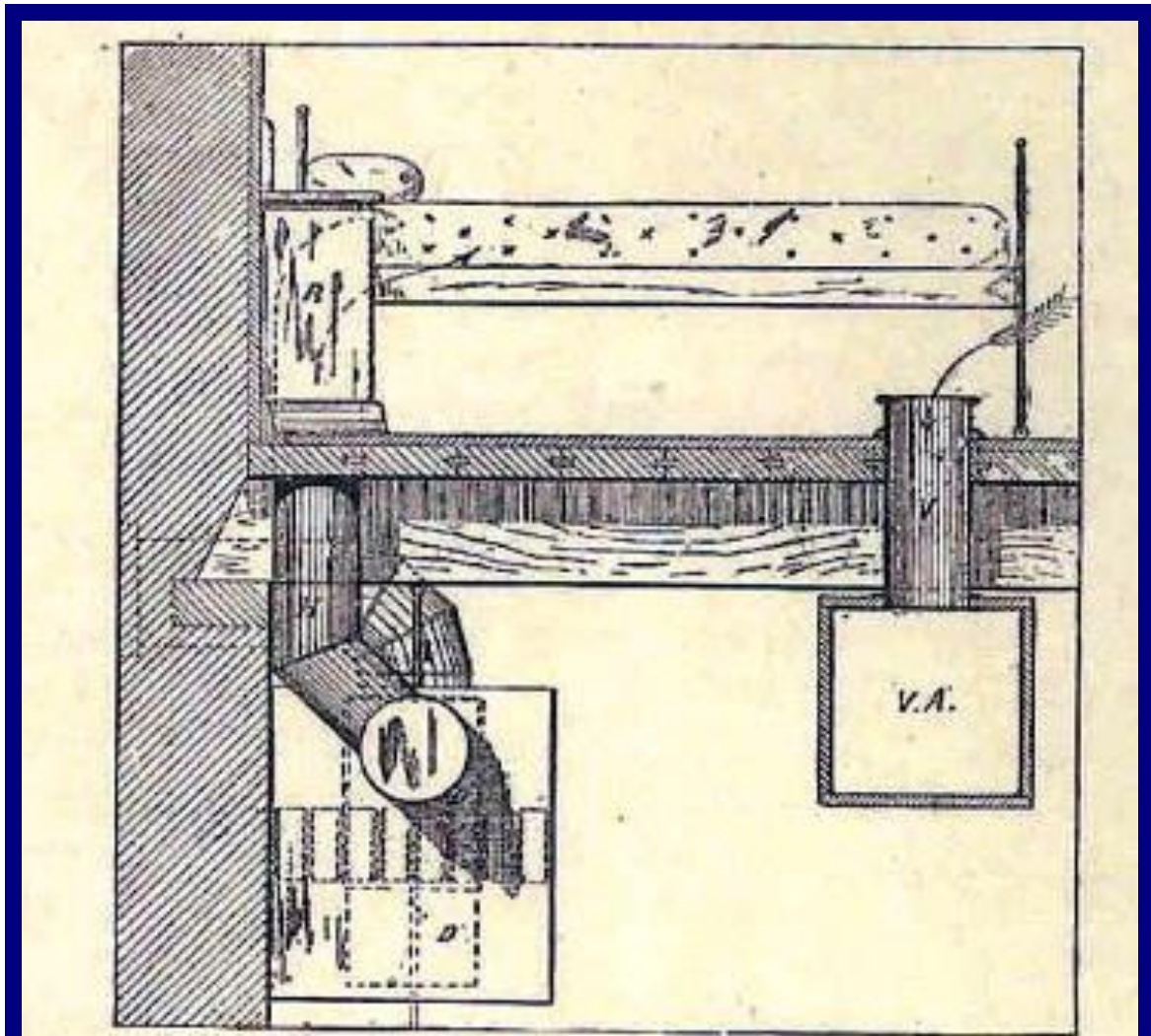


FIG. 83.

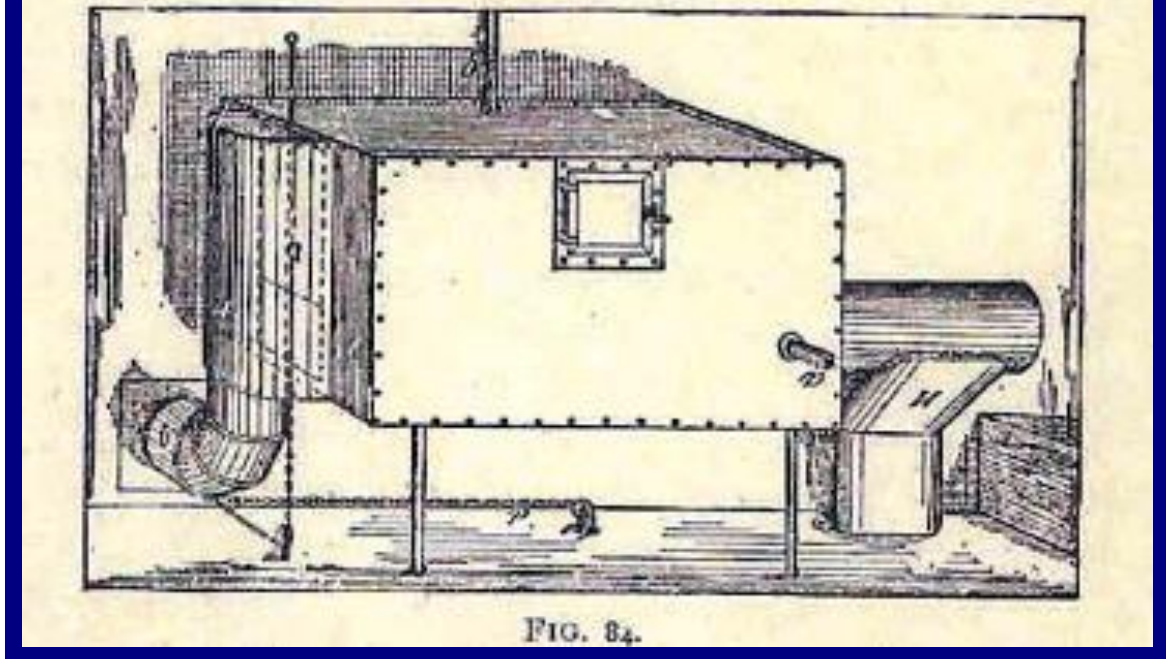


FIG. 84.

JOHN HOPKINS HOSPITAL BALTIMORE

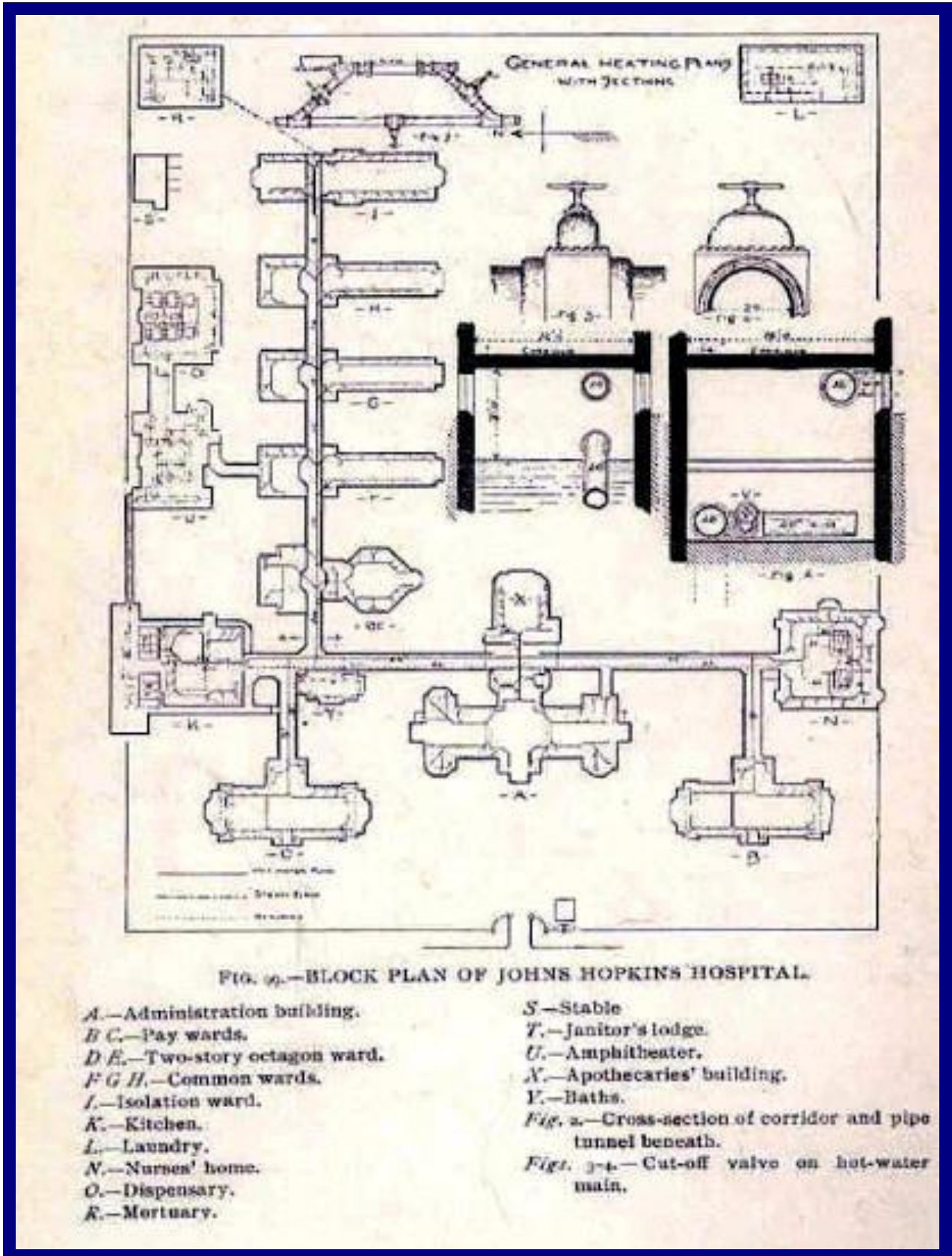
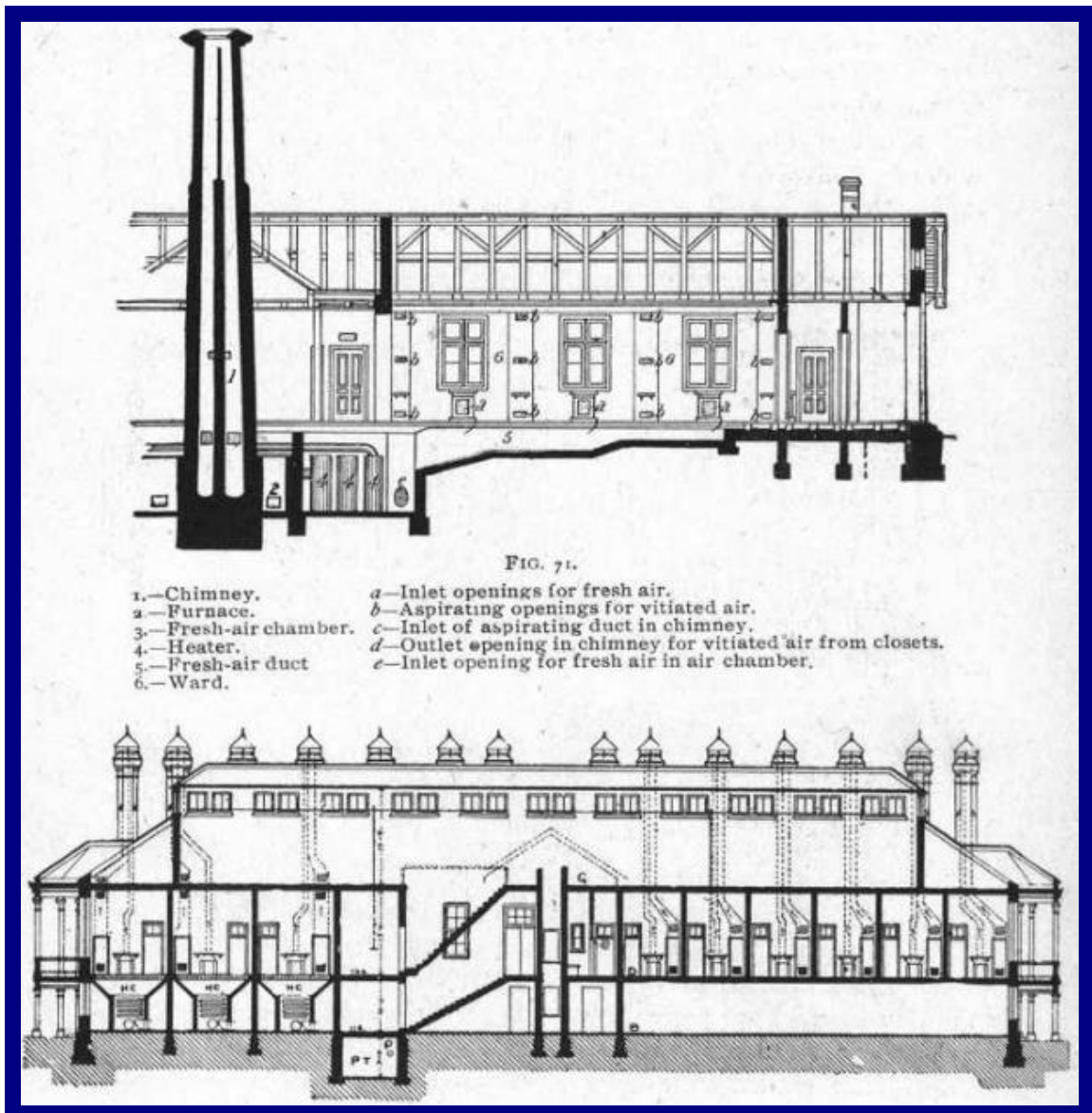
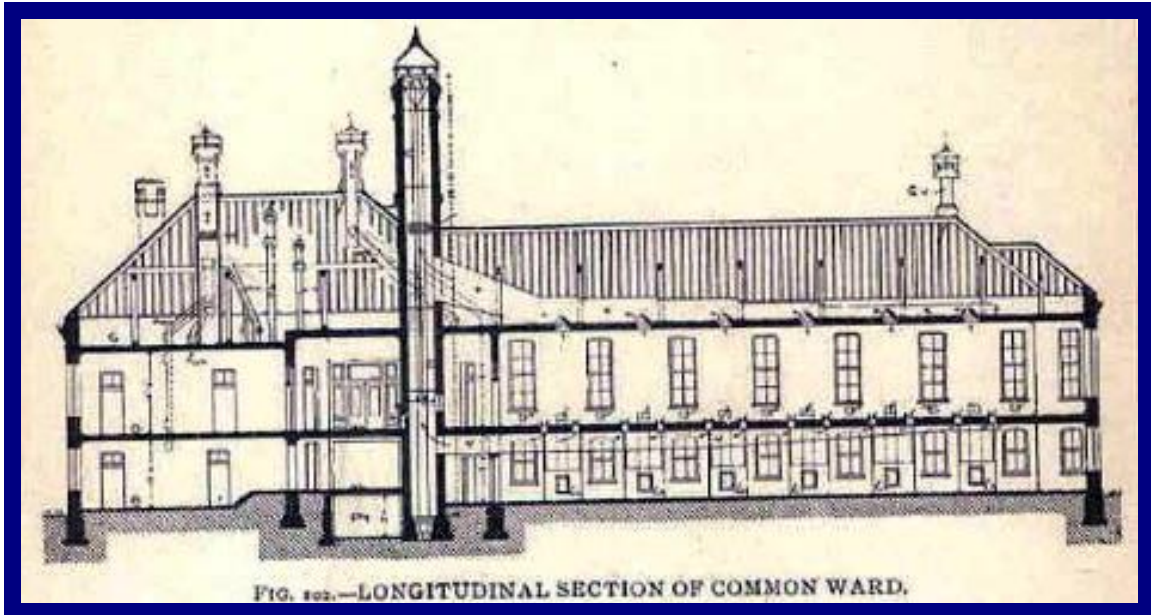


FIG. 99.—BLOCK PLAN OF JOHNS HOPKINS HOSPITAL.

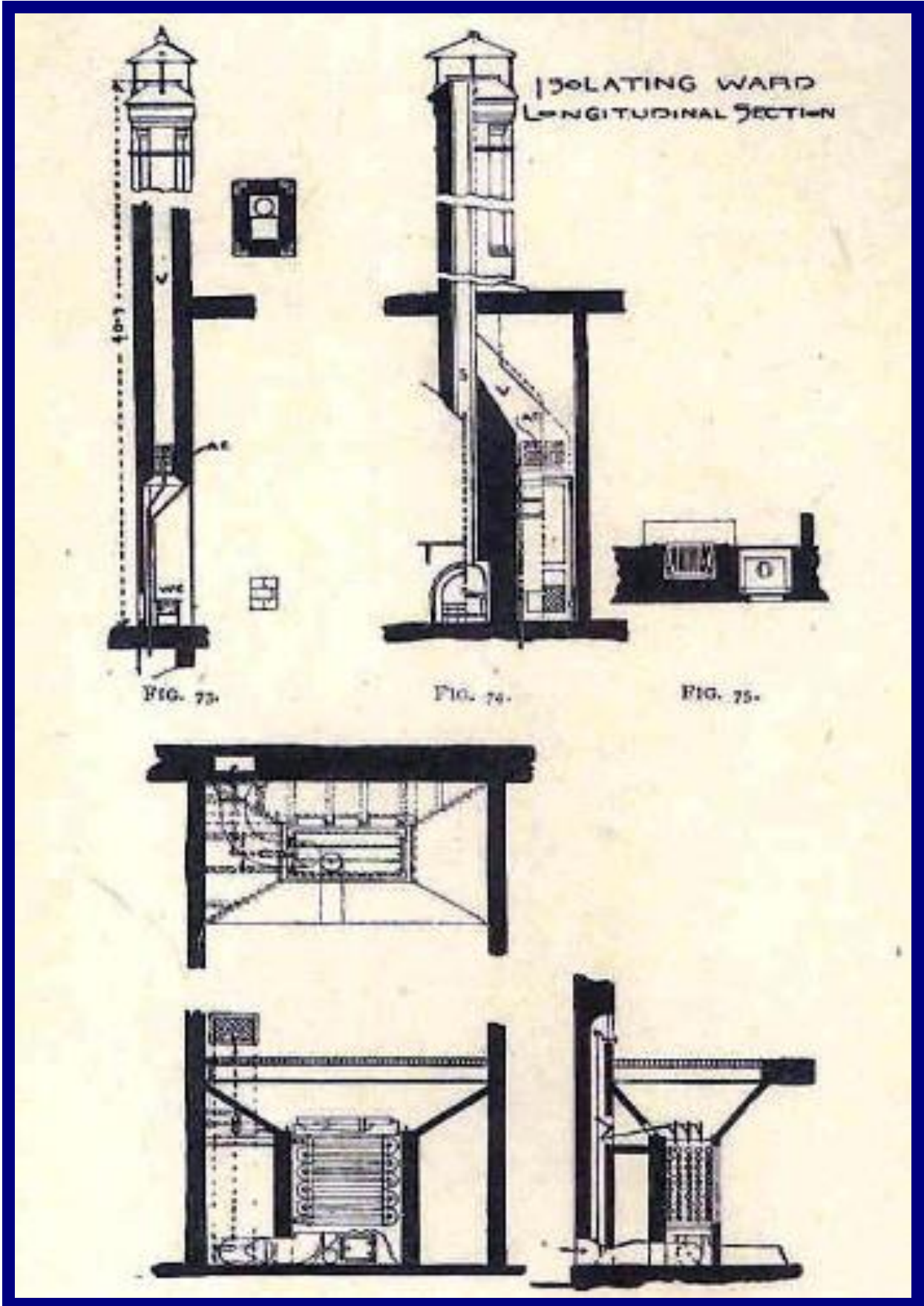
- A.—Administration building.
- B C.—Pay wards.
- D E.—Two-story octagon ward.
- F G H.—Common wards.
- I.—Isolation ward.
- K.—Kitchen.
- L.—Laundry.
- N.—Nurses' home.
- O.—Dispensary.
- R.—Mertuary.

- S.—Stable
- T.—Janitor's lodge.
- U.—Amphitheater.
- X.—Apothecaries' building.
- Y.—Baths.
- Fig. 2.—Cross-section of corridor and pipe tunnel beneath.
- Figs. 3-4.—Cut-off valve on hot-water main.

JOHN HOPKINS HOSPITAL BALTIMORE



JOHN HOPKINS HOSPITAL BALTIMORE



NEW YORK HOSPITAL

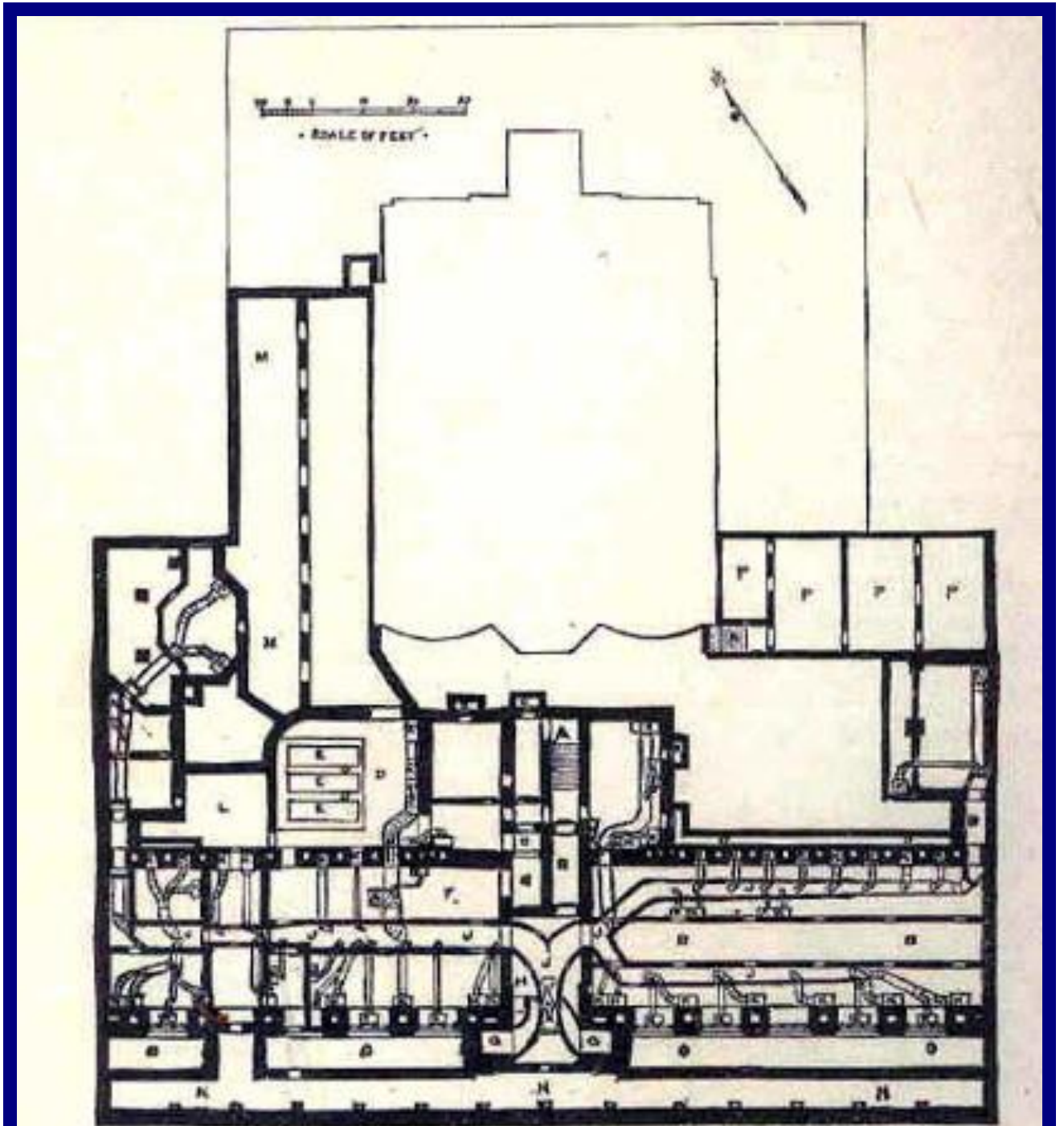


FIG. 7A.—NEW YORK HOSPITAL BUILDINGS.—PLAN OF CELLAR.

- | | | | |
|-------------------------|----------------------------|---------------------------|-----------------------------------|
| <i>A.</i> —Stairs. | <i>E.</i> —Boiler. | <i>I.</i> —Fan blower. | <i>M.</i> —Coal vaults. |
| <i>B.</i> —Corridor. | <i>F.</i> —Engine room. | <i>J.</i> —Cold-air duct. | <i>N.</i> —Vaults. |
| <i>C.</i> —Elevator. | <i>G.</i> —Fresh-air duct. | <i>K.</i> —Steam coils. | <i>O.</i> —Area. |
| <i>D.</i> —Boiler room. | <i>H.</i> —Engine. | <i>L.</i> —Ash vaults. | <i>P.</i> —Vegetable vaults, etc. |
| | | <i>Q.</i> —Ice house. | |

<10>

ORPHEUM MINNEAPOLIS

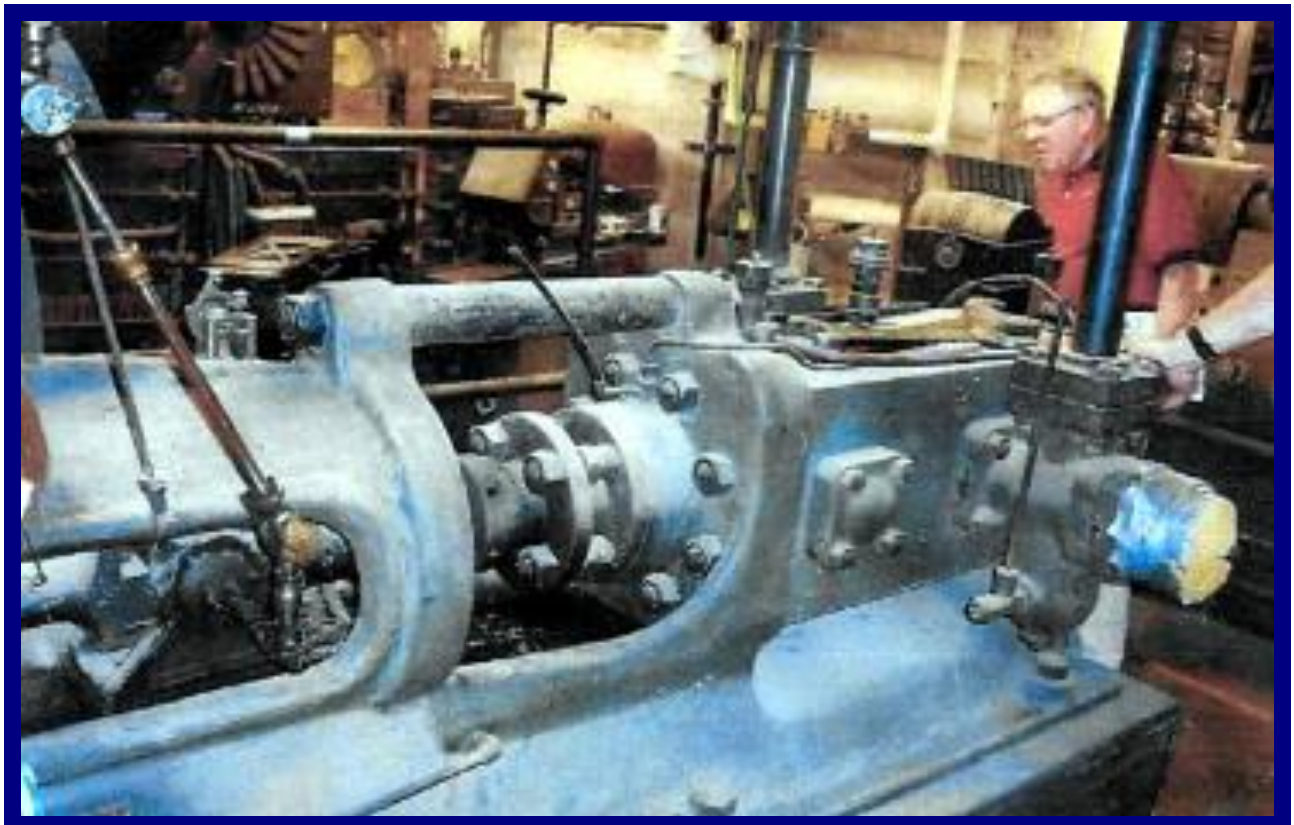


Opened 1921. Air conditioning by Wittenmeier, CO2 refrigeration.

ORPHEUM MINNEAPOLIS



Flywheel of CO₂ refrigeration compressor.

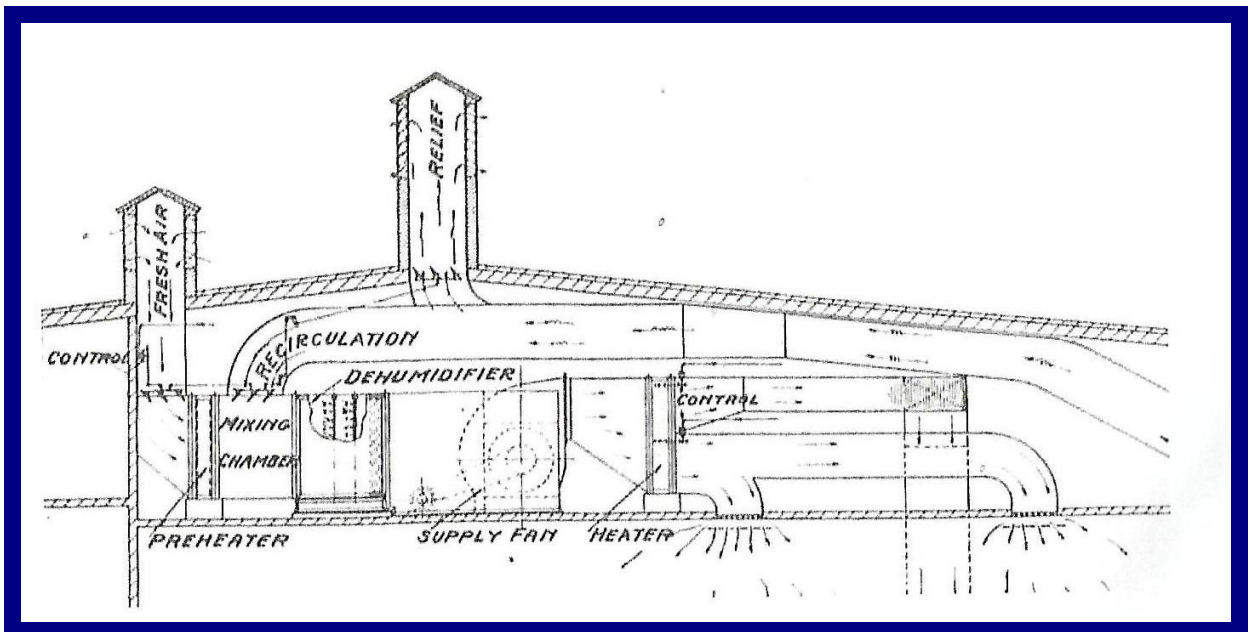


CO₂ refrigeration compressor.

METROPOLITAN THEATRE LOS ANGELES



Grauman's Metropolitan Theatre air conditioned by Carrier.



1924.

METROPOLITAN THEATRE LOS ANGELES

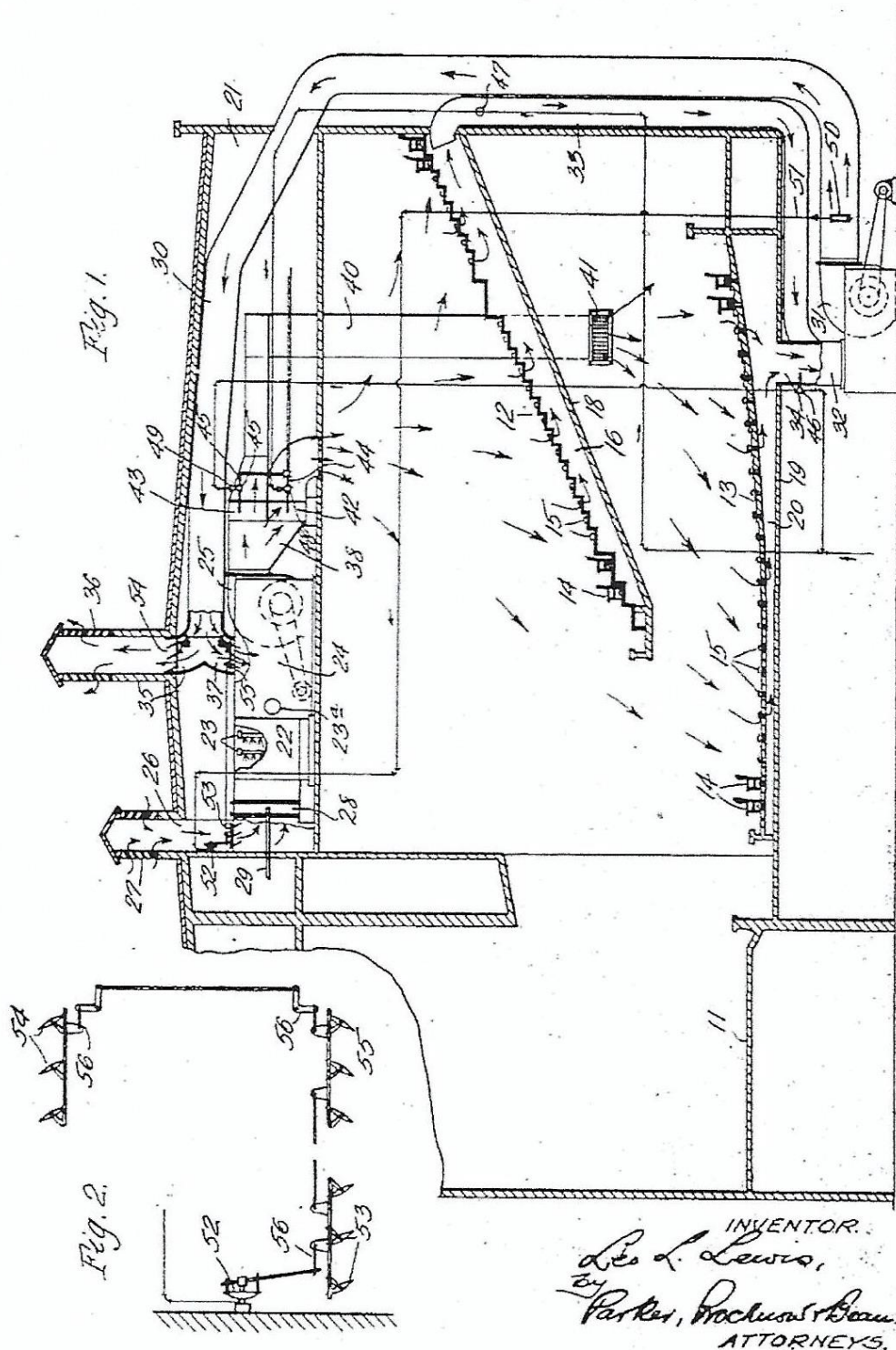
May 4, 1926.

1,583,060

L. L. LEWIS


METHOD OF AND APPARATUS FOR COOLING AND VENTILATING.

Filed Dec. 22, 1924



Overhead supply, floor return (opposite to Wittenmeier system)

RIVOLI THEATRE NEW YORK



Keep Cool
AT THE
Rivoli

We have invested over \$100,000 in a refrigerating cooling plant to keep you cool and comfortable when the world is sweltering. Unseen, unheard, resistless are the huge motors with a combined pulling power of 221 horses—representing but a small part of the marvellous equipment which absolutely assures a temperature that is just right. Delightfully refreshing days and evenings all summer at

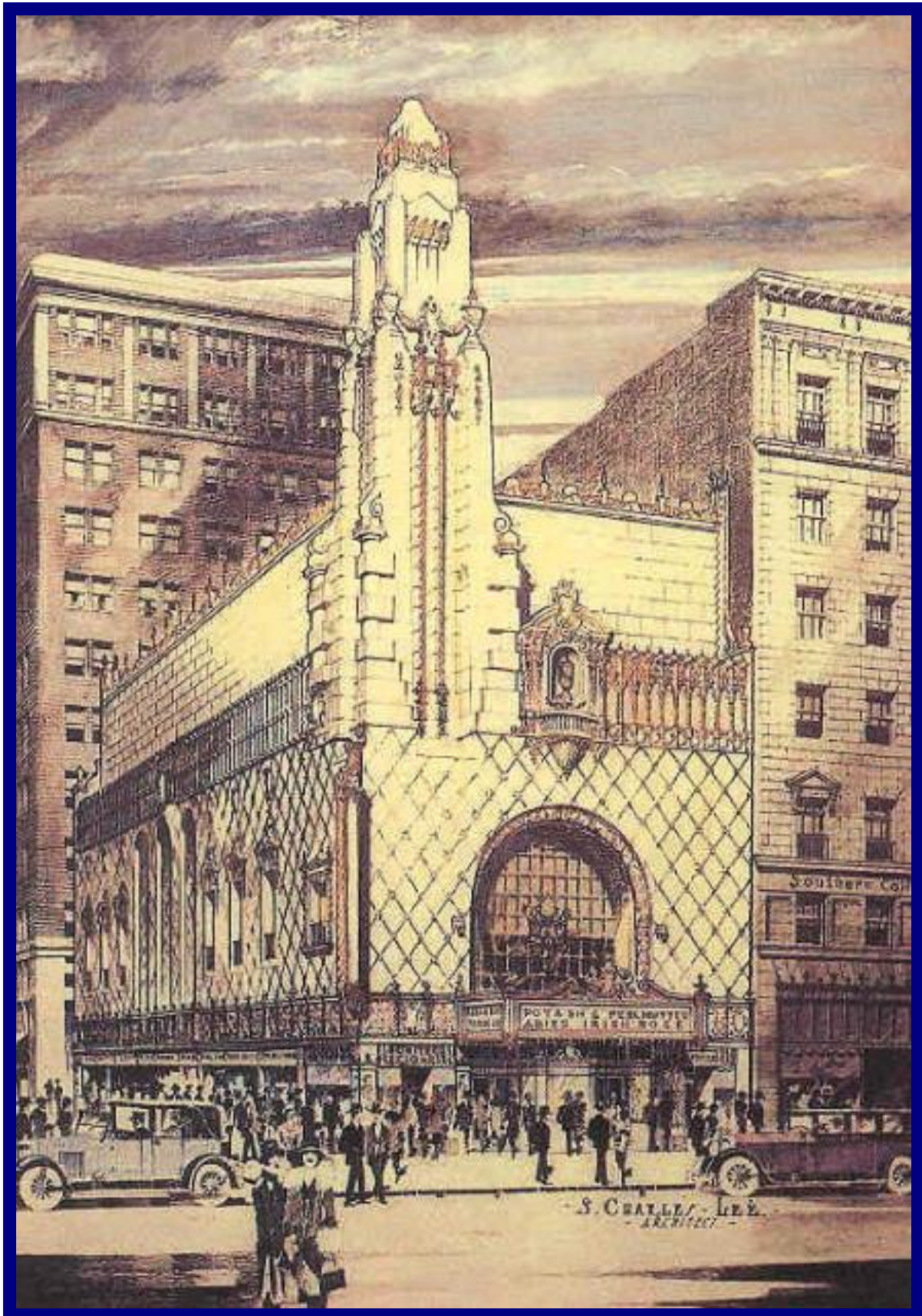
The **RIVOLI THEATRE**
BROADWAY at 49th STREET.
THE HOME OF *Paramount Pictures*

FOX THEATRE ATLANTA



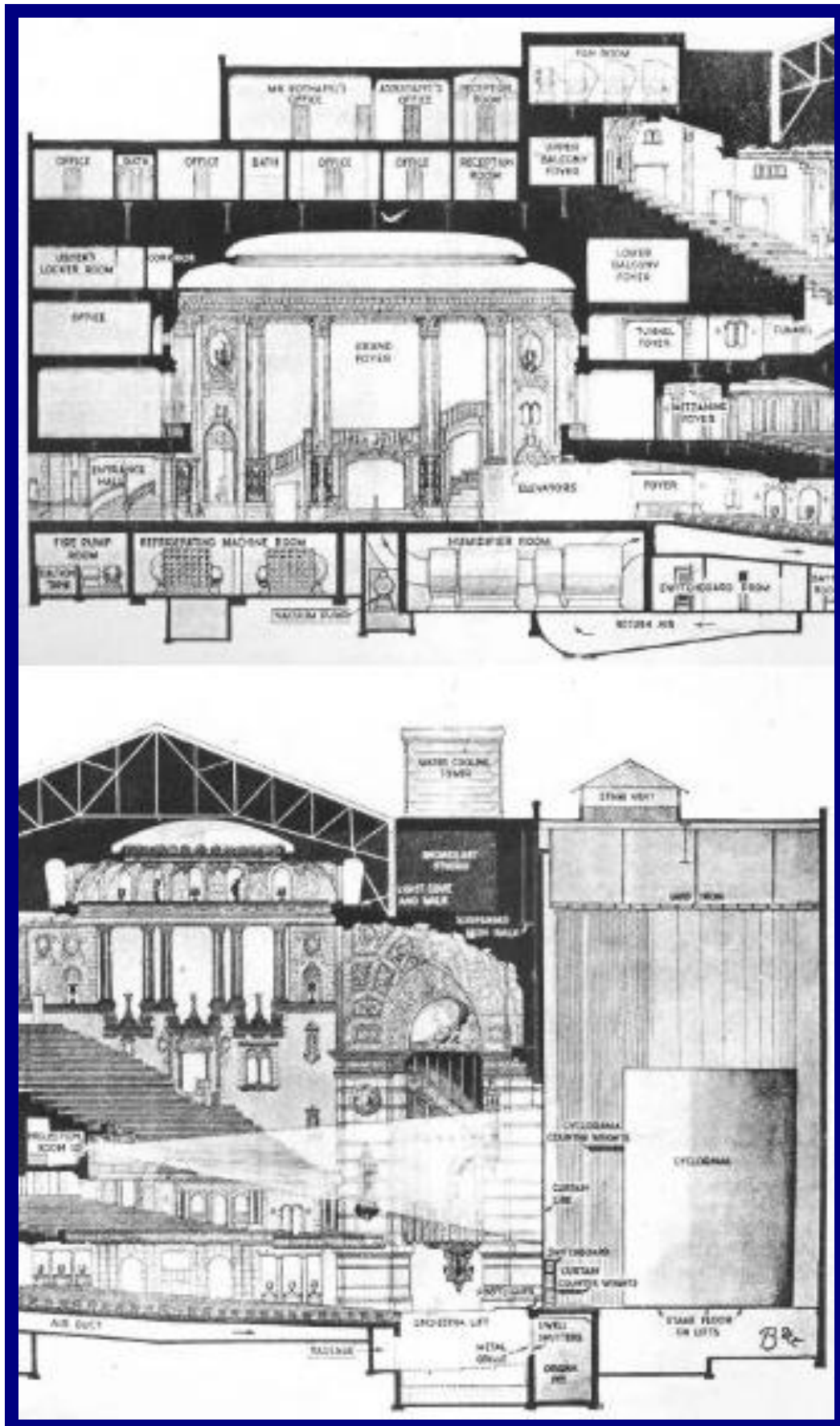
Air conditioned with NH₃ refrigeration 1926. Replaced with Carrier centrifugal 1946-64.

TOWER THEATRE LOS ANGELES



Opened 1926, air conditioned by Carrier.

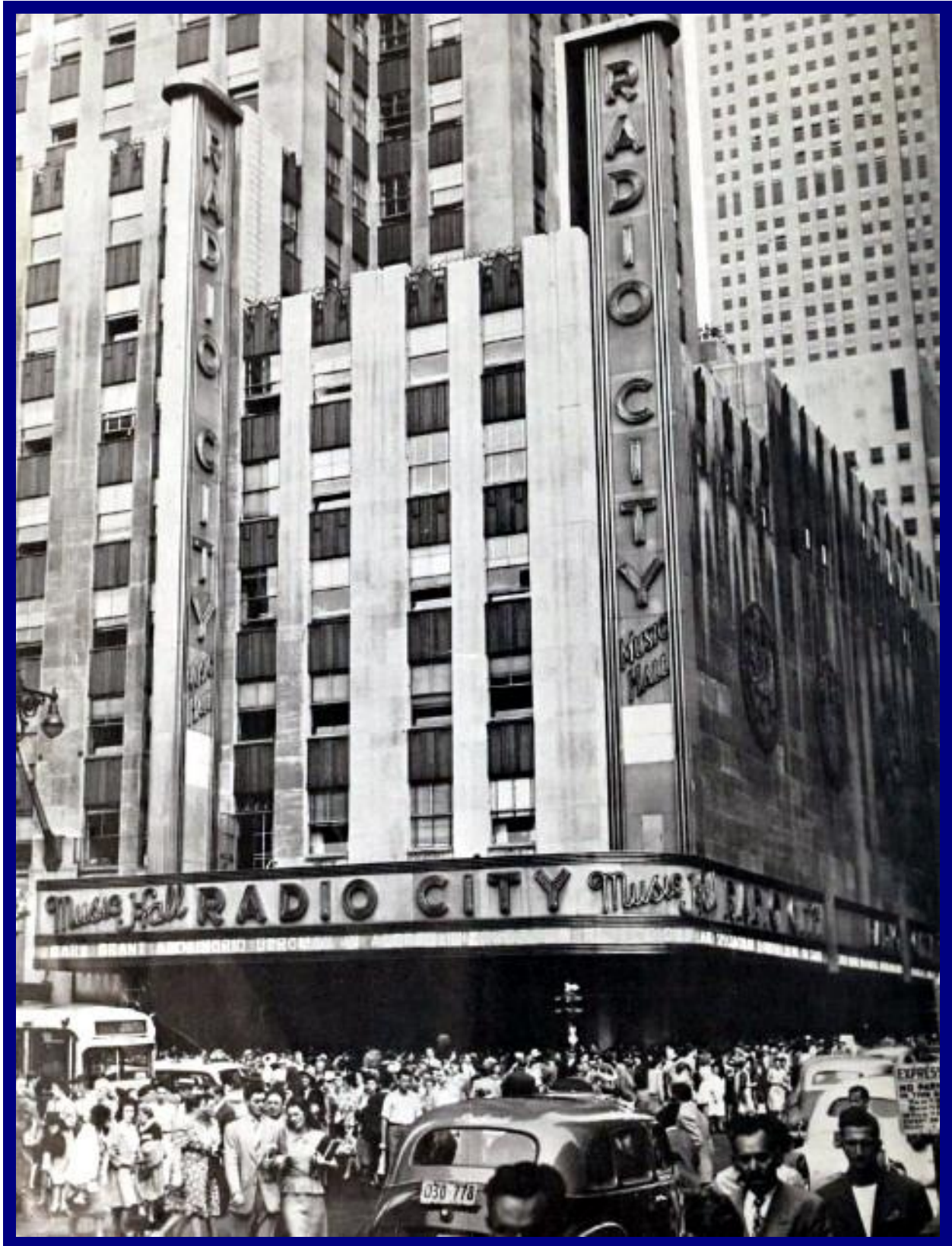
ROXY THEATRE NEW YORK



Opened 1927, 6214 seats, with air conditioning by Carrier.
Two centrifugal chillers, 420 TR total. Theatre demolished 1960

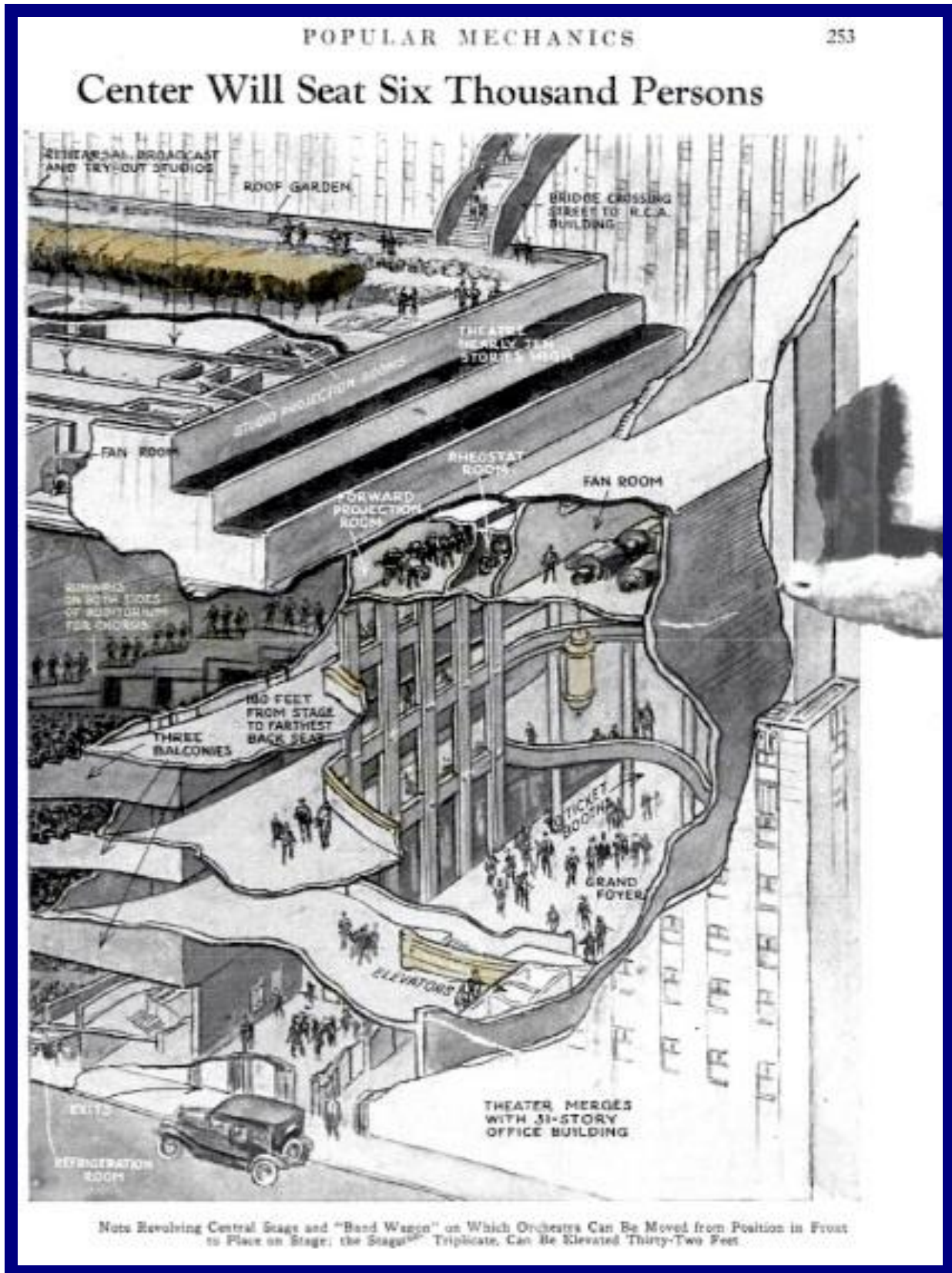
<18>

RADIO CITY MUSIC HALL NEW YORK



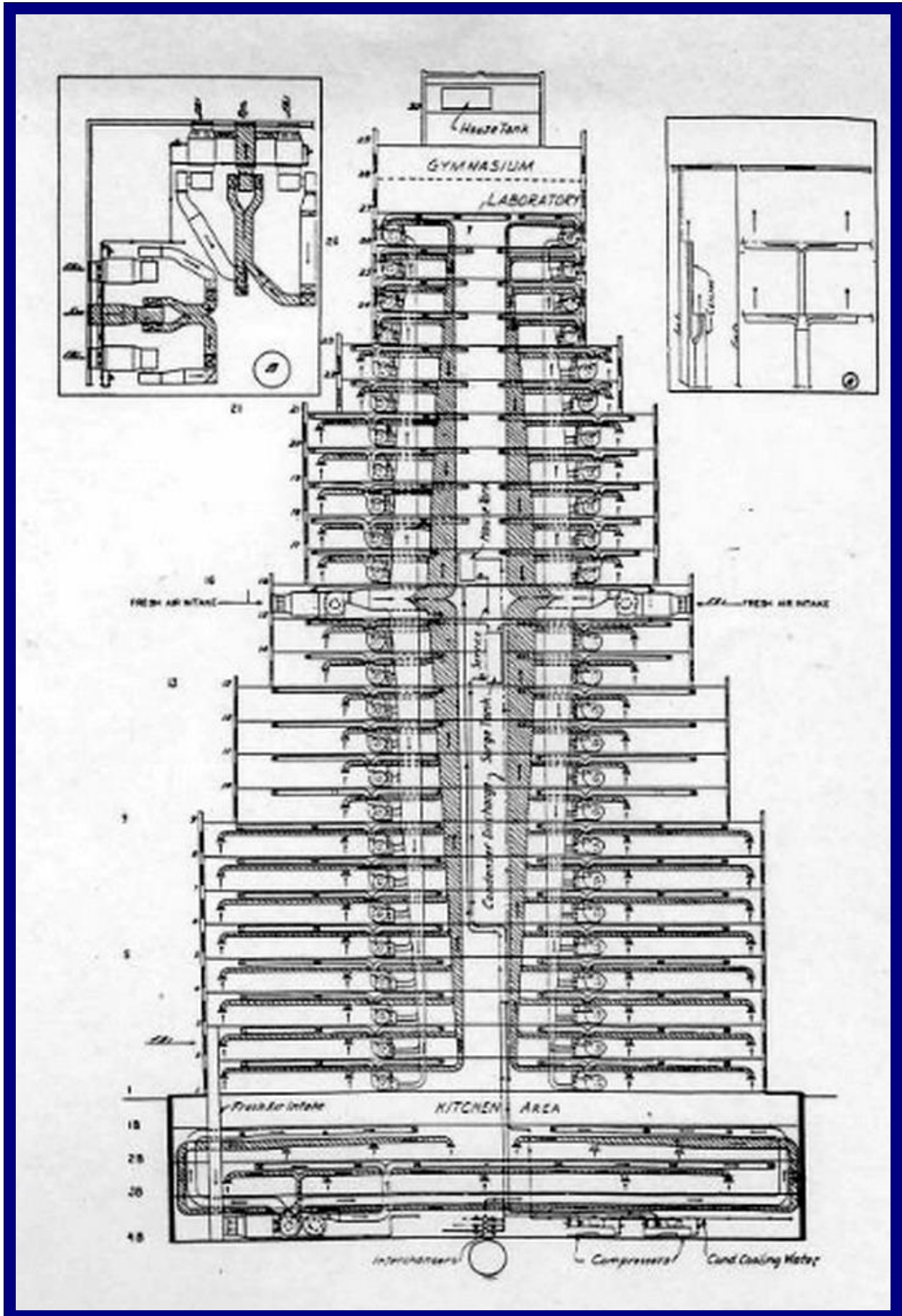
Opened 1932, 6000 seats. Air conditioning supply air 240,000 cfm, 600 TR.

RADIO CITY MUSIC HALL NEW YORK



Served from central chilled water refrigeration plant.

METROPOLITAN LIFE NEW YORK

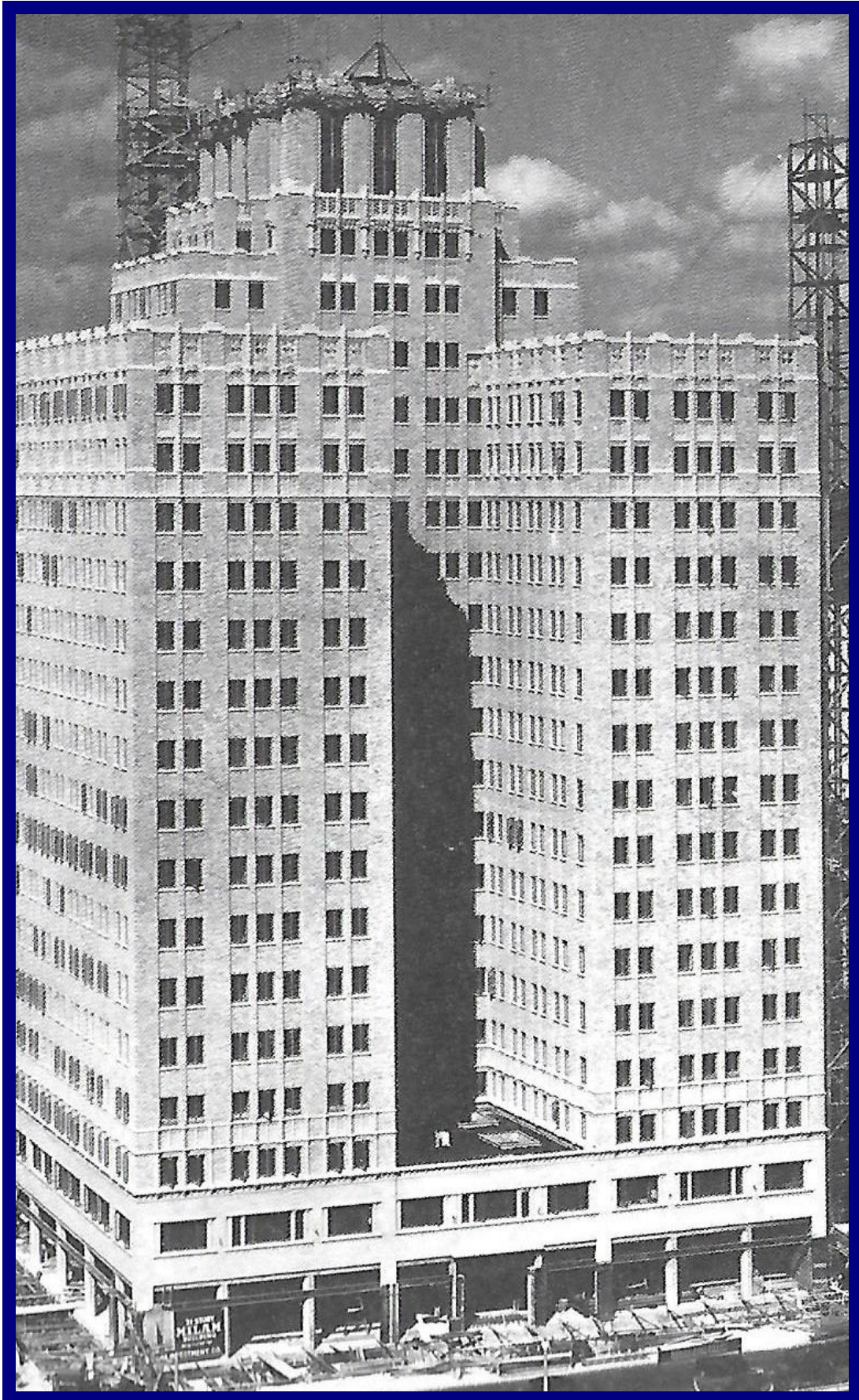


PATTERSON BUILDING FRESNO



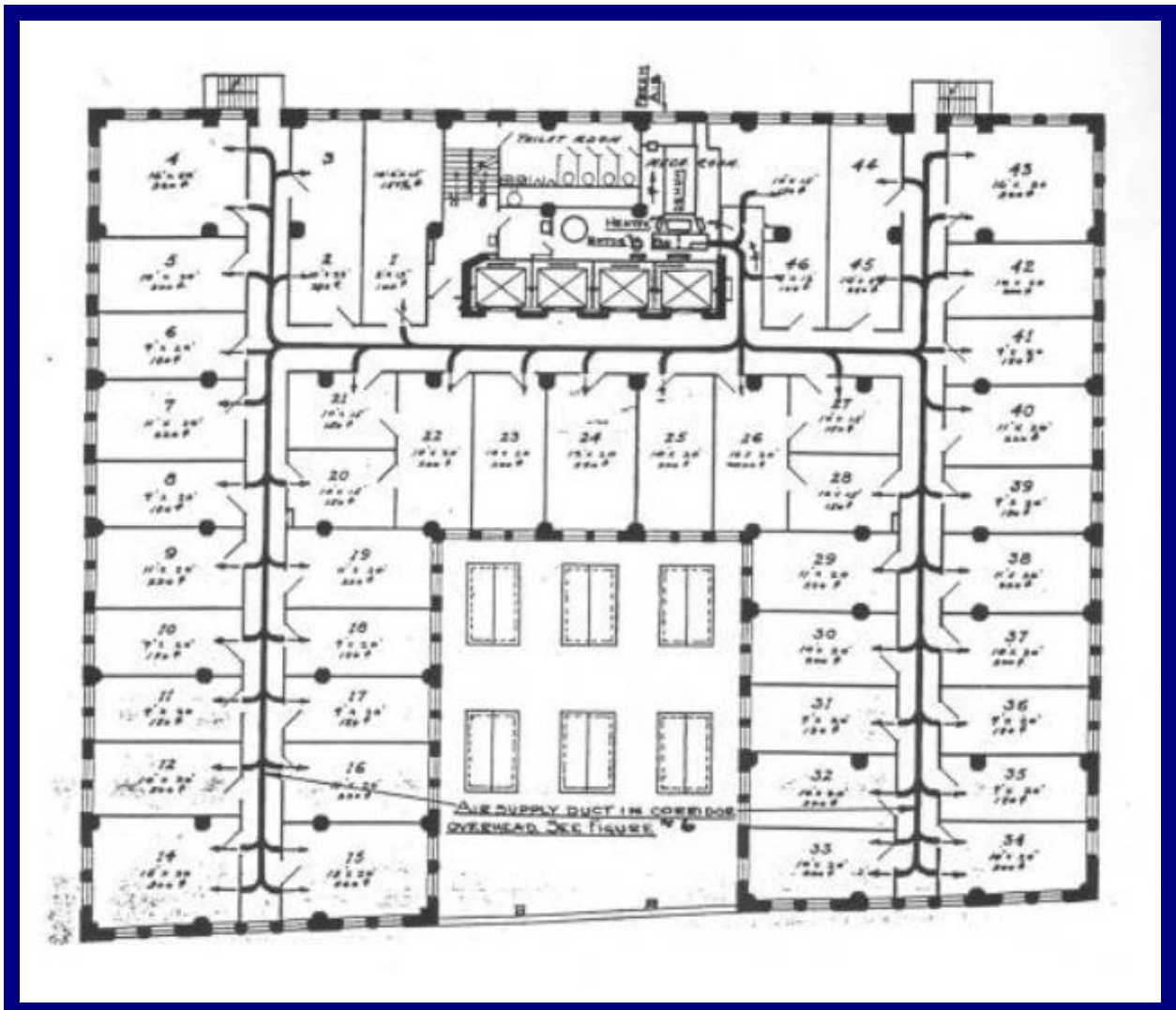
Existing building, air conditioned 1926, refrigeration Carrier centrifugal.

MILAM BUILDING SAN ANTONIO



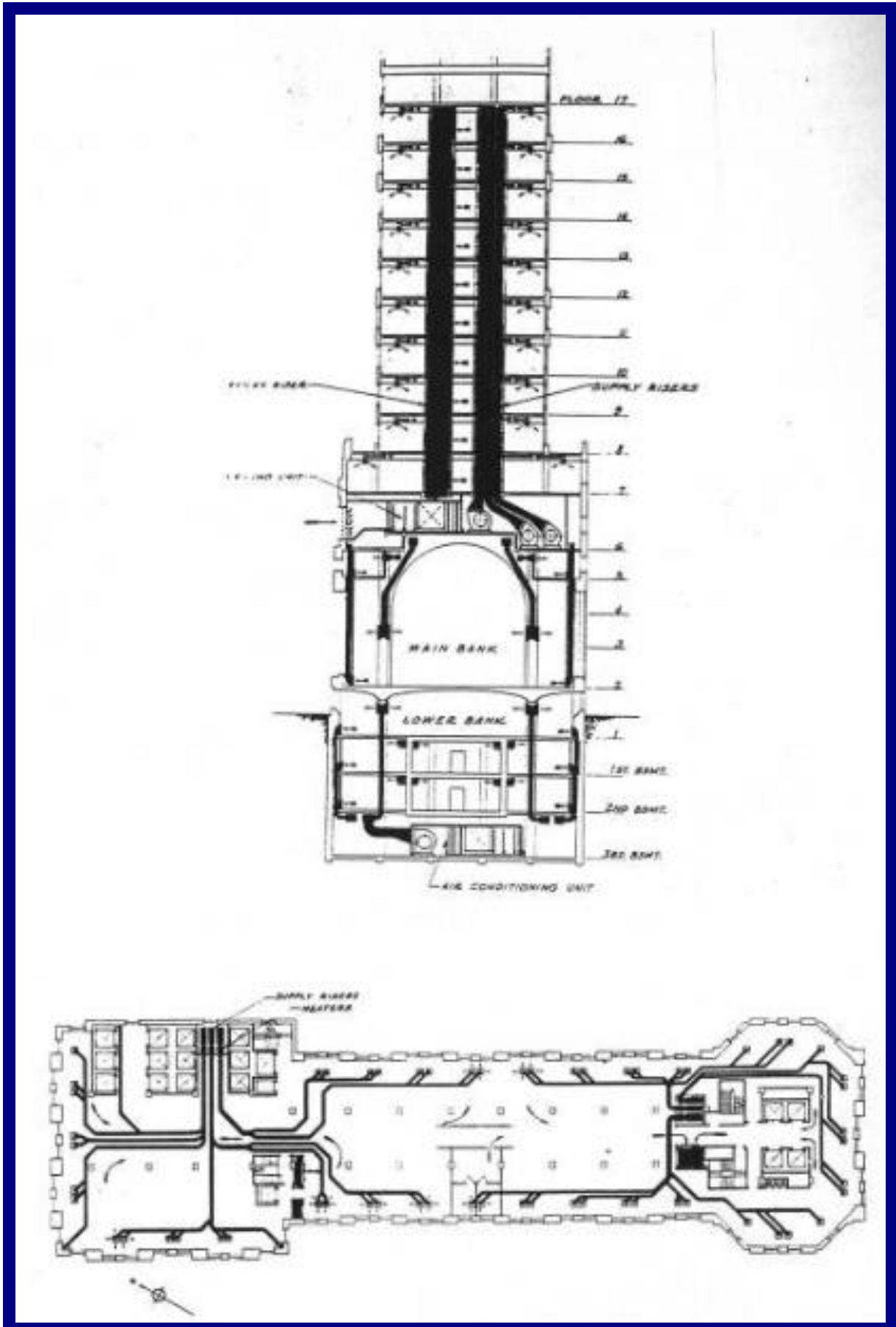
1928 21 floors, recognised as first building to be "Fully air conditioned."

MILAM BUILDING SAN ANTONIO



Typical floor, Carrier system with two centrifugal chillers, 375 TR total.

UNION TRUST BUILDING DETROIT



1929, 40 floors, the 10 floors above the Bank air conditioned by American Carbonic Machinery.

BUTTERFLY THEATRE MILWAUKEE 1916



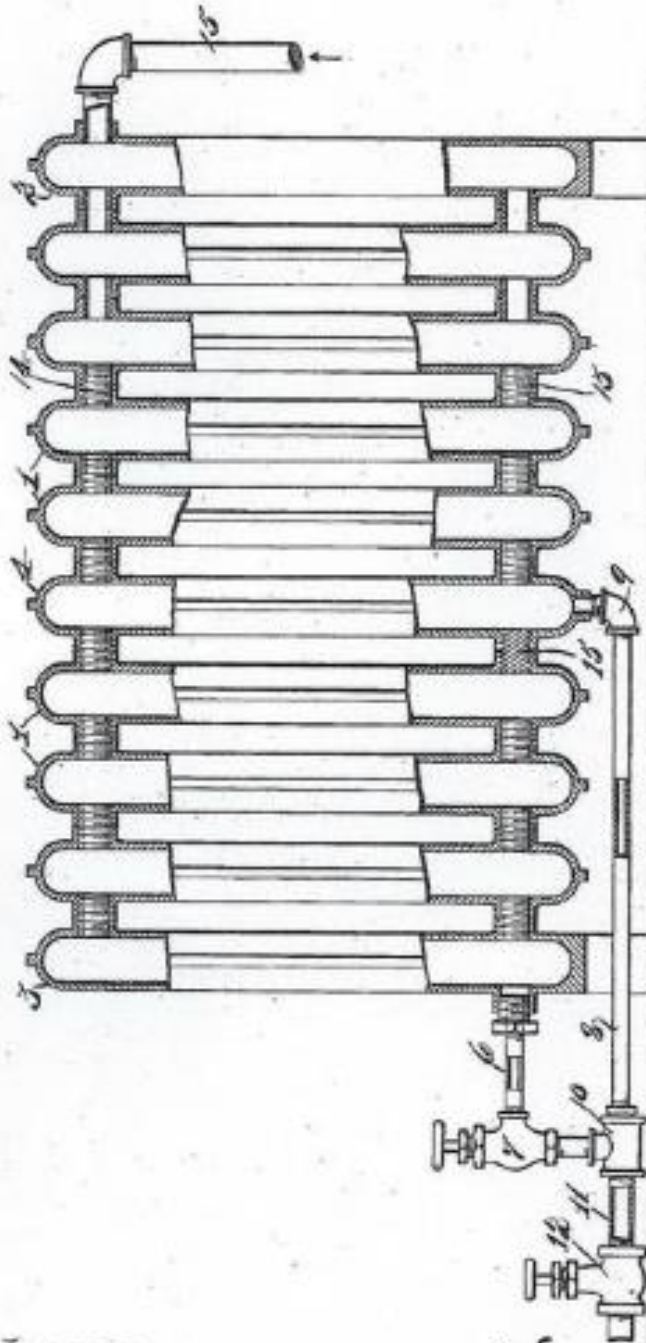
BUTTERFLY THEATRE, Milwaukee, Wis.
Most Luxurious, Exclusive, Refined
Photo-Play House in America.
Absolutely Fireproof—Perfect Ventilation.
Change of Program Daily.
Complete Change of Air Every 3 Minutes.

ANDREWS HOT WATER RADIATOR 1911

W. ANDREWS.
HOT WATER RADIATOR.
APPLICATION FILED JULY 18, 1910.

989,751.

Patented Apr. 18, 1911.



Witnesses:
E. A. Jarvis
Mabel Dittentoefer

Inventor:
William Andrews
by F. W. Wright
attorney.

BOSTEDO STEAM-HOT WATER RAD 1928

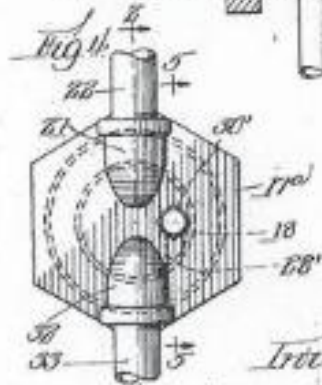
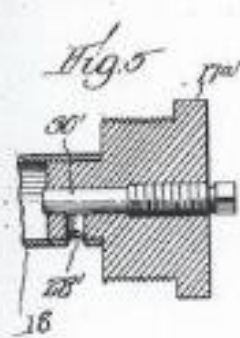
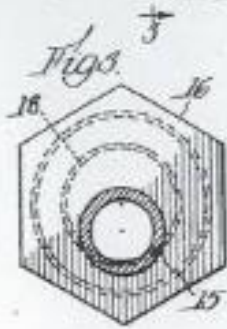
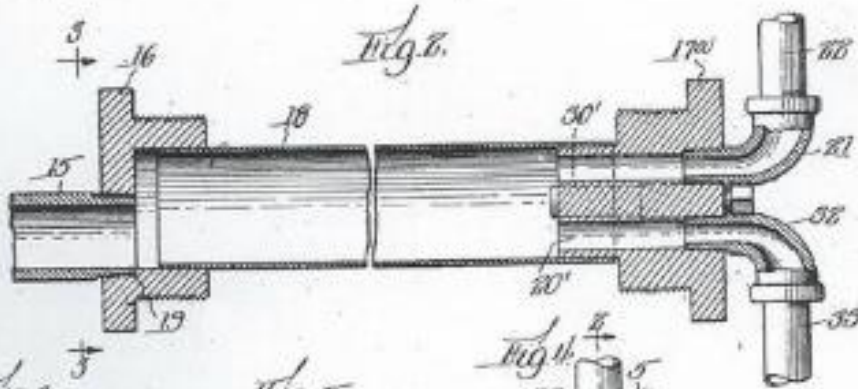
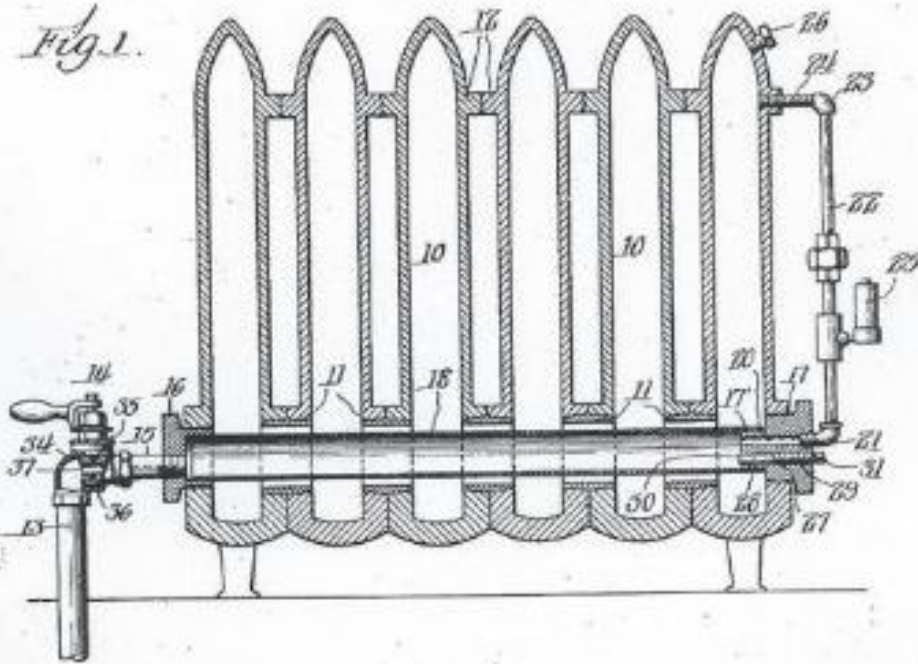
Dec. 4, 1928.

1,694,201

L. G. BOSTEDO

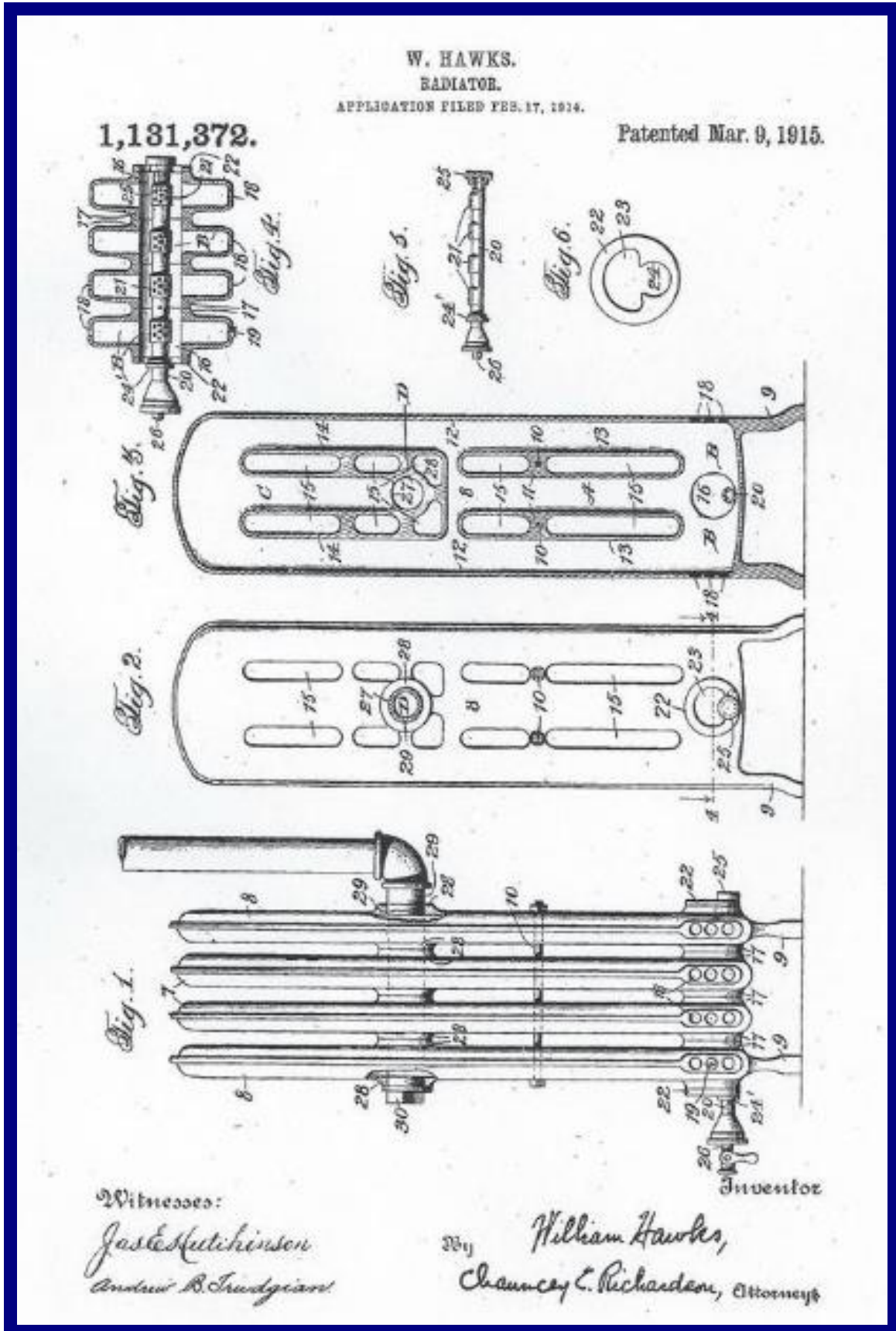
CONVERTIBLE STEAM AND HOT WATER RADIATOR

Filed Aug. 15, 1927



Inventor
L. G. Bostedo

HAWKS RADIATOR 1915



KEITH RADIATOR 1898

(No Model.)

J. KEITH.
RADIATOR.

No. 599,611.

Patented Feb. 22, 1898.

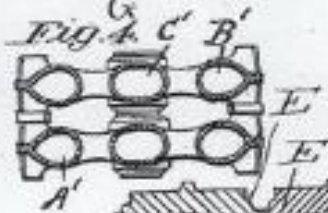
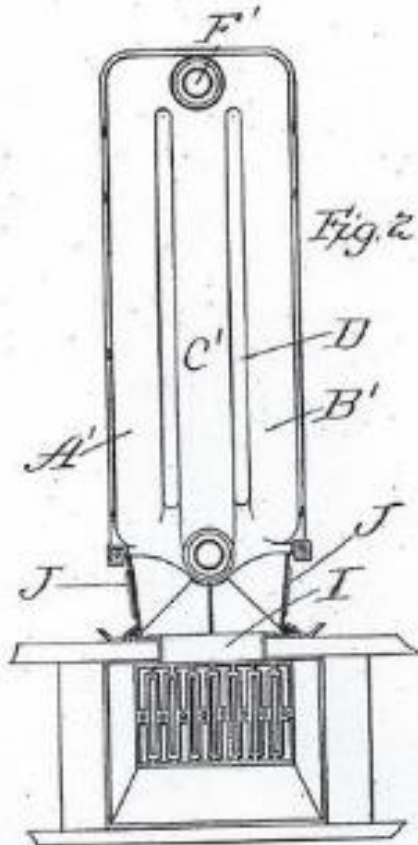
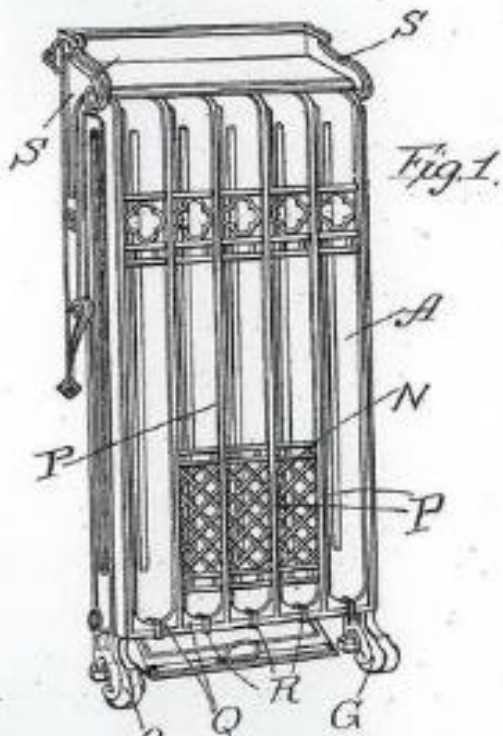
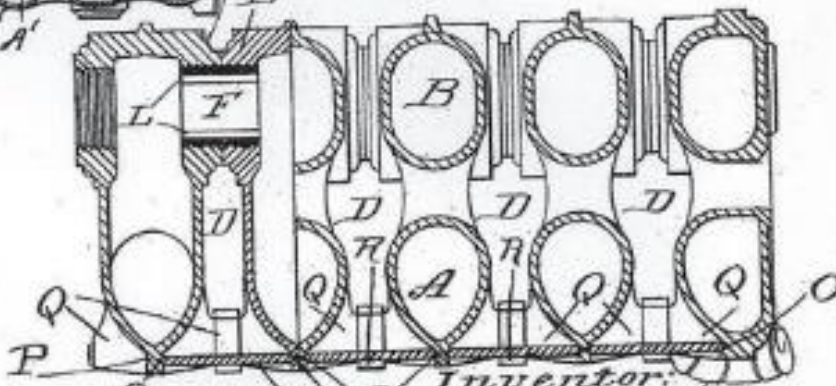


Fig. 3.



Witnesses: N
P
Ed. Bolton
O. W. Wink

Inventor:
James Keith

By *W. H. ...*
his Attorneys.

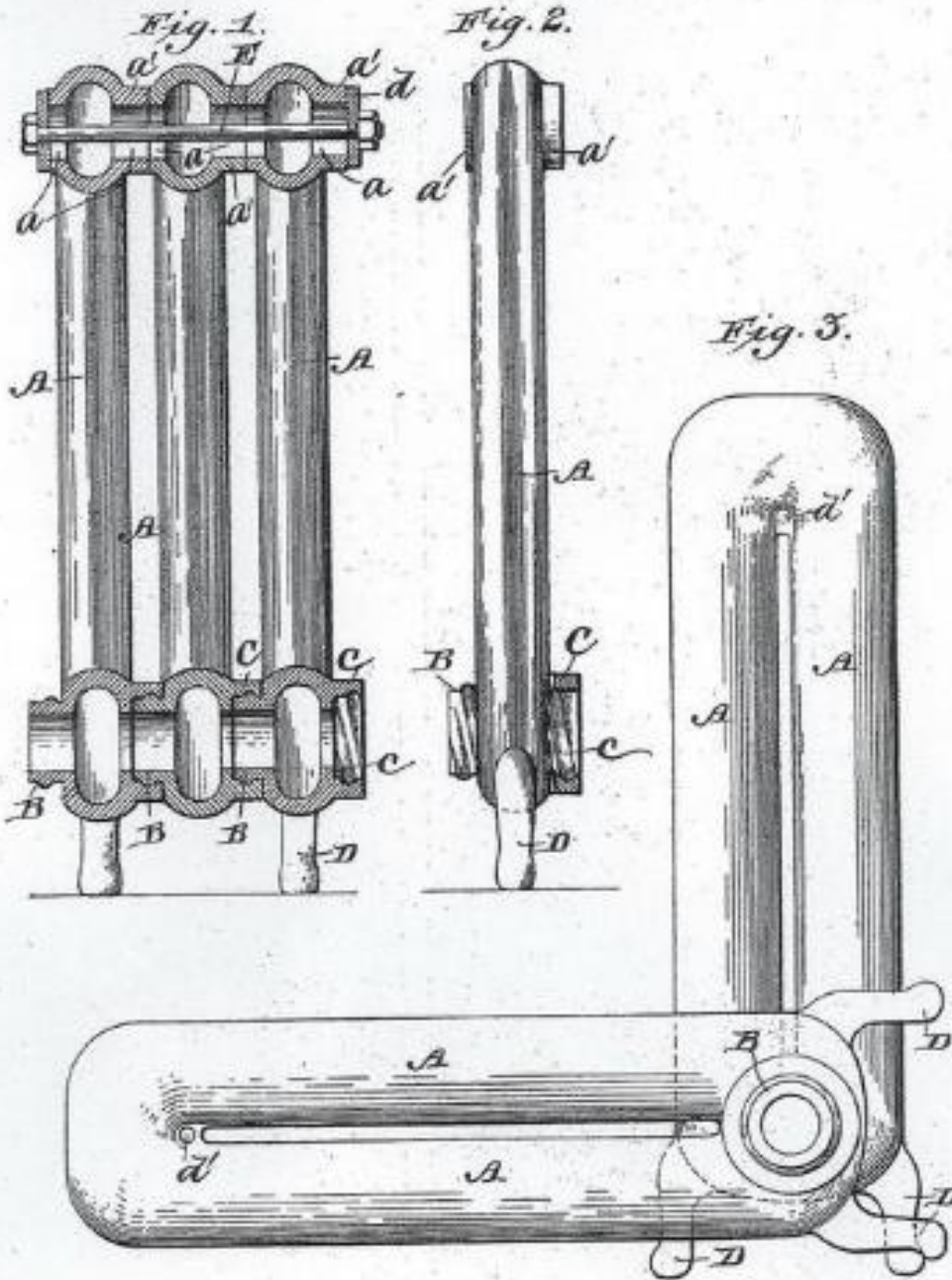
YOUNG STEAM-HOT WATER RAD 1894

(No Model.)

J. D. YOUNG.
STEAM OR HOT WATER RADIATOR.

No. 530,317.

Patented Dec. 4, 1894.



Witnesses

A. Leverance
W. H. Young

Inventor

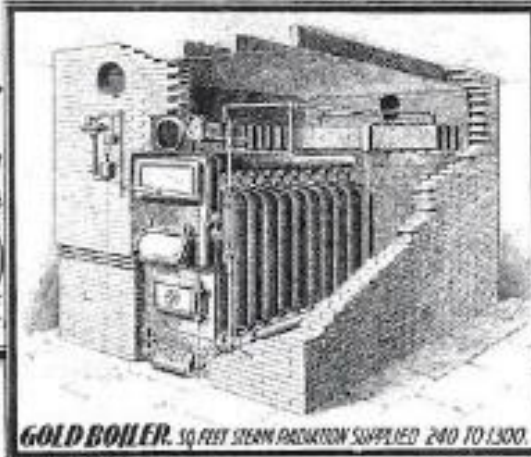
James D. Young
by *Maximilian K. Hammer*
his Attorneys

SMITHS BOILERS WESTFIELD 1900

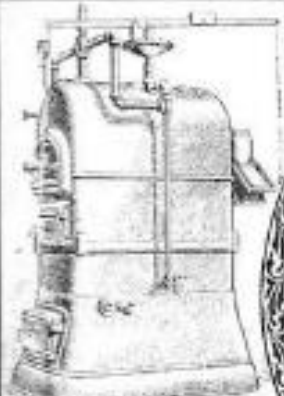
THE H. B. SMITH CO. WESTFIELD, MASS.

EUROPEAN AGENT,
AUG. EGGERS
BREMEN
AND NEW YORK CITY

PACIFIC COAST AGENTS,
HOLBROOK, MERRILL &
STETSON,
SAN FRANCISCO, CAL.



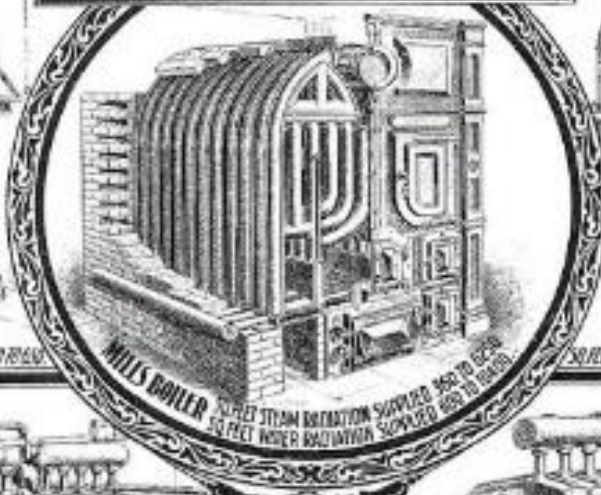
GOLD BOILER. 50 FEET STEAM RADIATION SUPPLIED 240 TO 1,300.



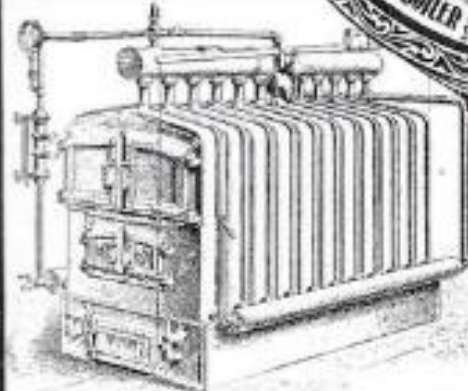
COTTAGE BOILER
50 FEET STEAM RADIATION SUPPLIED 100 TO 160.



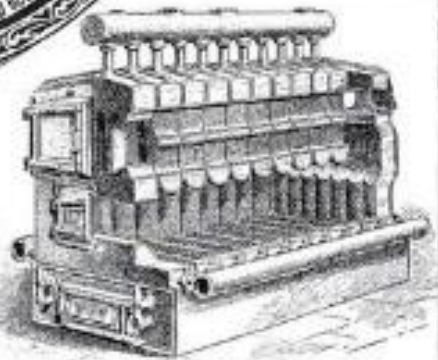
COTTAGE BOILER
50 FEET WATER RADIATION SUPPLIED 150 TO 200.



MILLS BOILER 50 FEET STEAM RADIATION SHIPPED 300 TO 600
50 FEET WATER RADIATION SUPPLIED 400 TO 800.



MERCER BOILER. 50 FEET STEAM RADIATION SUPPLIED 300 TO 3500.



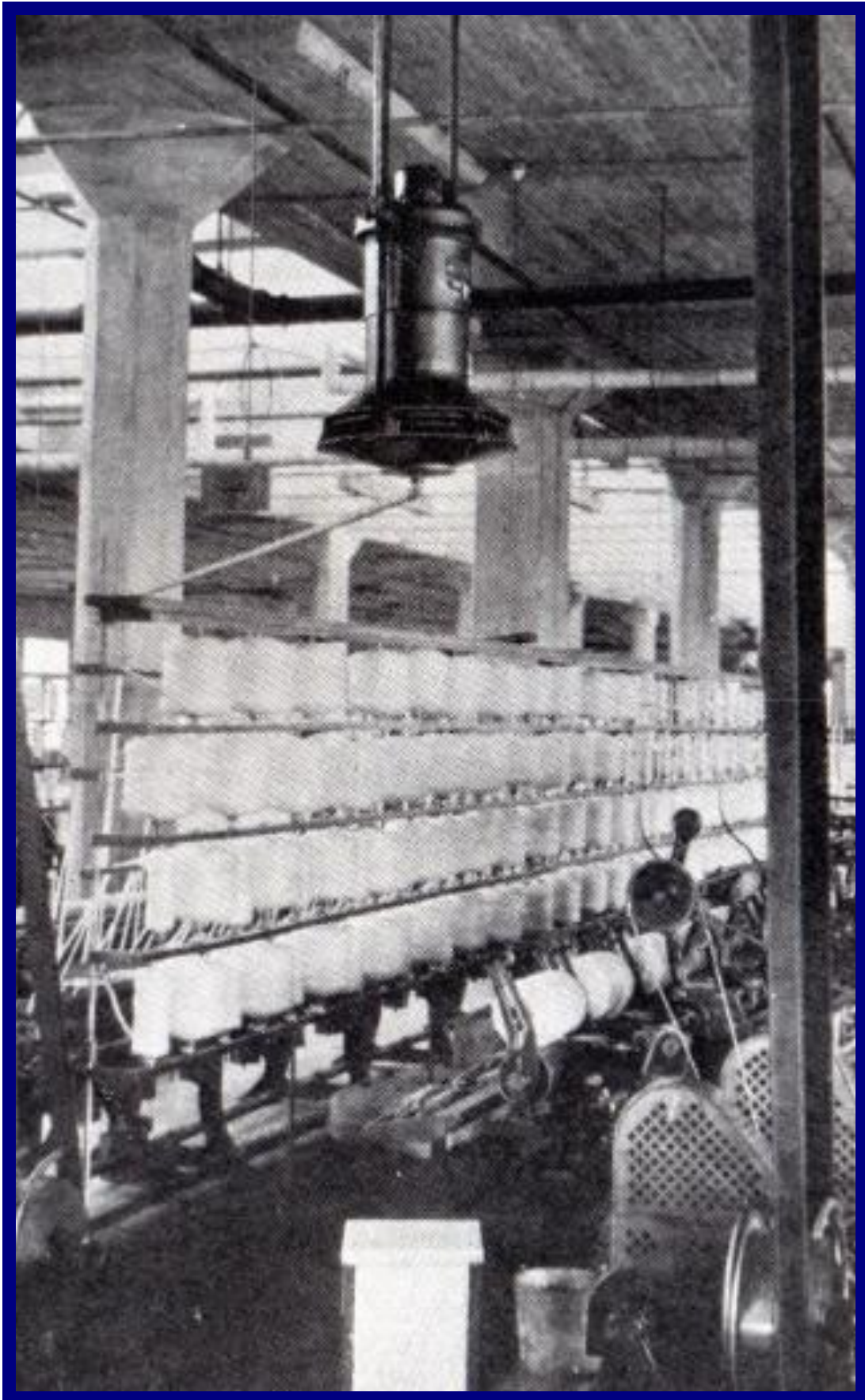
MERCER BOILER. 50 FEET WATER RADIATION SHIPPED 450 TO 6900.

WESTERN AGENTS, WESTERN BRASS MFG. CO, ST. LOUIS, MO.

SALESROOMS

133 CENTRE STREET, NEW YORK CITY. 510 ARCH STREET, PHILADELPHIA, PA.

CRAMER TEXTILE MILL HUMIDIFICATION



CARRIER TEXTILE MILL CONDITIONING



CRAMER HUMIDIFIER 1906

No. 821,989.

PATENTED MAY 29, 1906.

S. W. CRAMER.
HUMIDIFYING AND VENTILATING APPARATUS.
APPLICATION FILED JUNE 1, 1906.

3 SHEETS-SHEET 1.

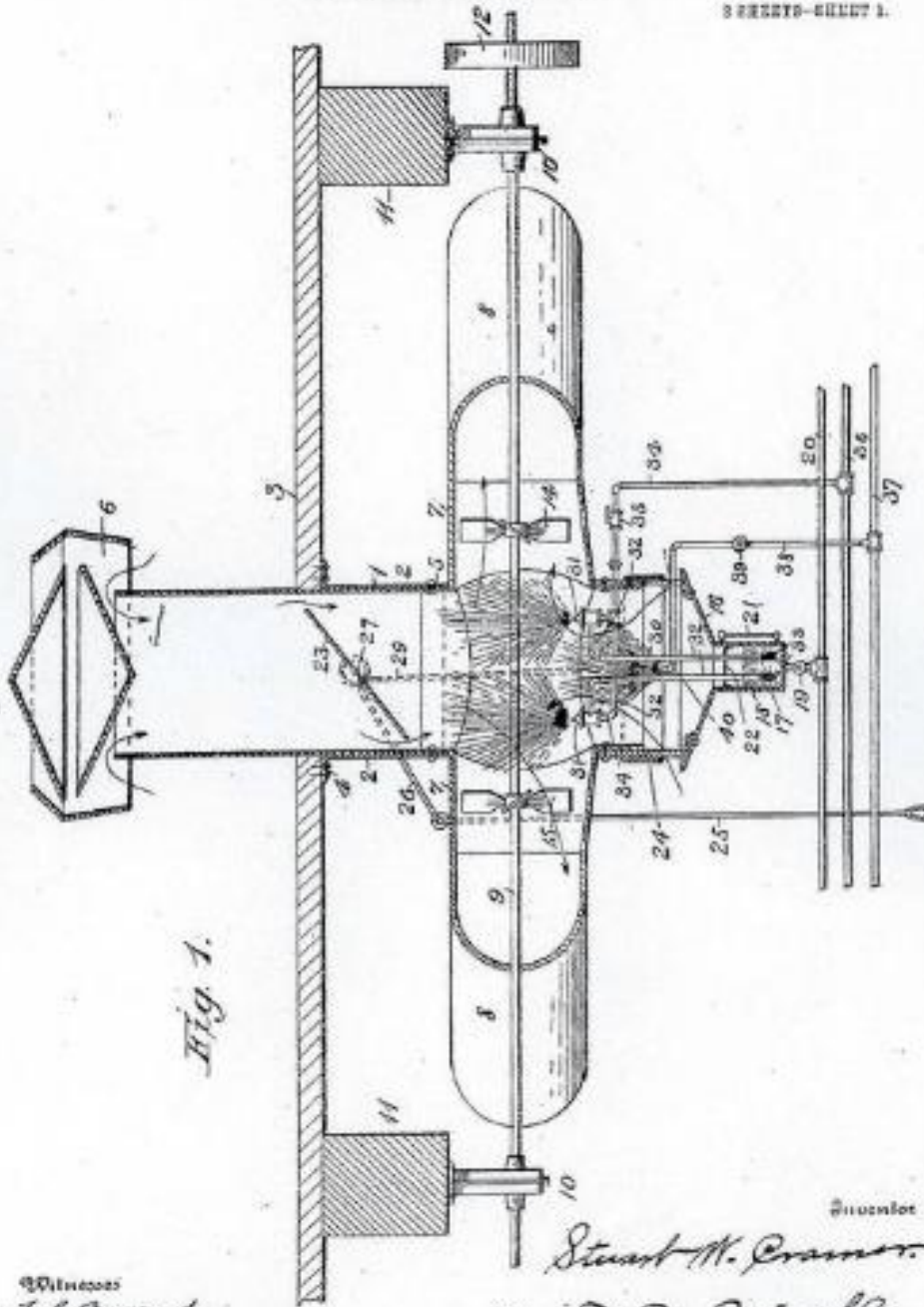


Fig. 1.

Witnesses
J. L. Orrange
W. Parker Remond.

Stuart M. Cramer.
D. E. Reinohl.
Attorney

ASHLEY AIR CONDITIONING SYSTEM 1935

Aug. 6, 1935.

C. M. ASHLEY

2,010,001

AIR CONDITIONING SYSTEM EMPLOYING STEAM FOR HEATING AND COOLING

Filed Aug. 12, 1932

5 Sheets-Sheet 1

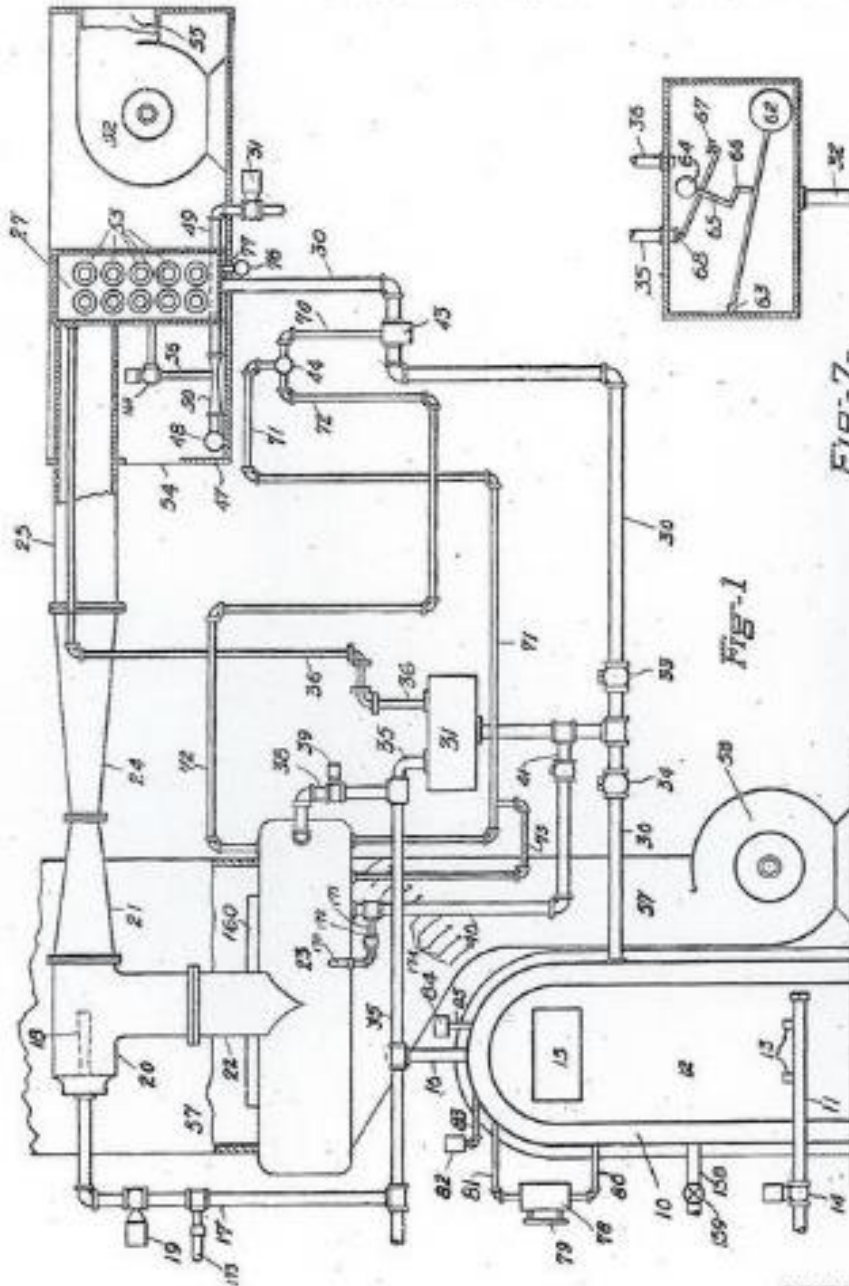


FIG-7-

FIG-1

INVENTOR.

Carlyle M. Ashley

BY

Thomas S. Sill

ATTORNEY

CARRIER DRYING SYSTEM 1921

W. H. CARRIER.
METHOD OF AND APPARATUS FOR DRYING, CONDITIONING, AND REGULATING THE MOISTURE
CONTENT OF HYGROSCOPIC MATERIALS.
1,393,086. Patented Oct. 11, 1921.
APPLICATION FILED MAR. 27, 1917. 3 SHEETS—SHEET 1.

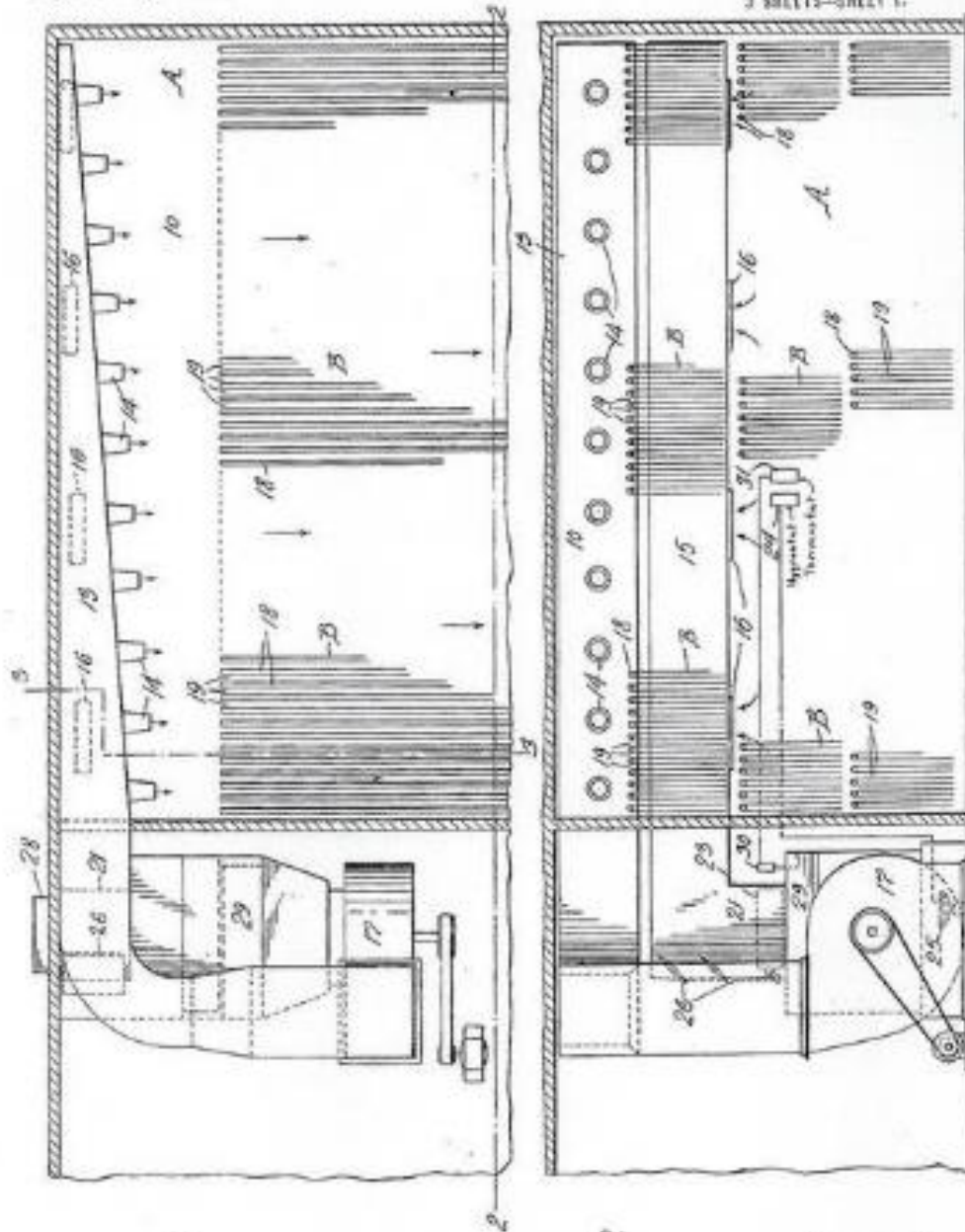


Fig. 1

Fig. 2

Inventor:
Wells H. Carrier,
By Nicholas Parker,
Attorneys.

CARRIER SPRAY HUMIDIFIER 1907

No. 854,270.

PATENTED MAY 21, 1907.

W. H. CARRIER.
METHOD OF HEATING AND HUMIDIFYING AIR.

APPLICATION FILED JULY 18, 1906.

2 SHEETS-SHEET 1.

Fig. 1.

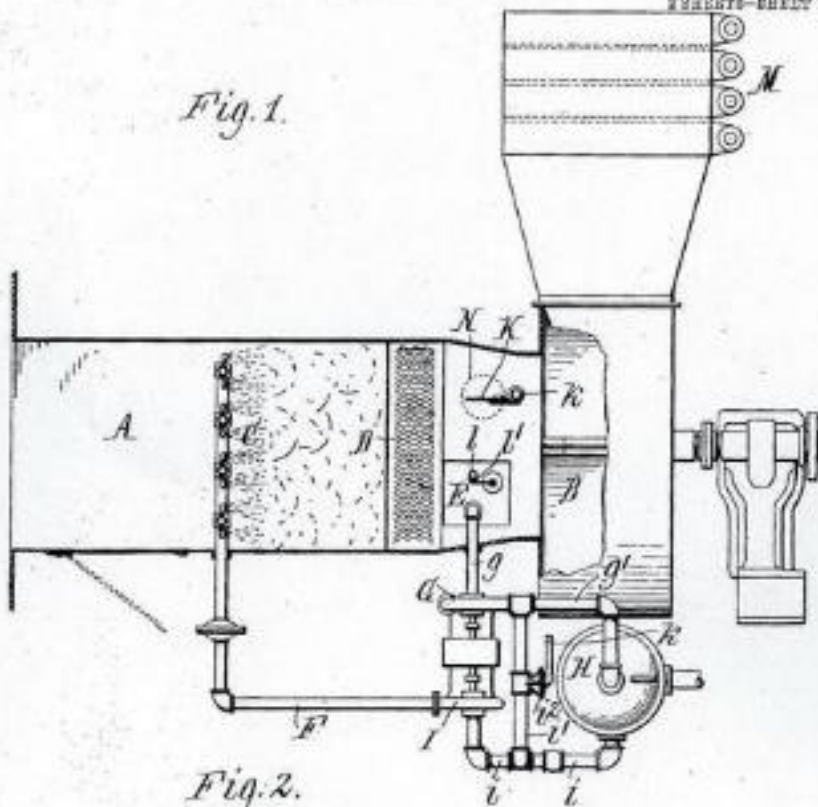
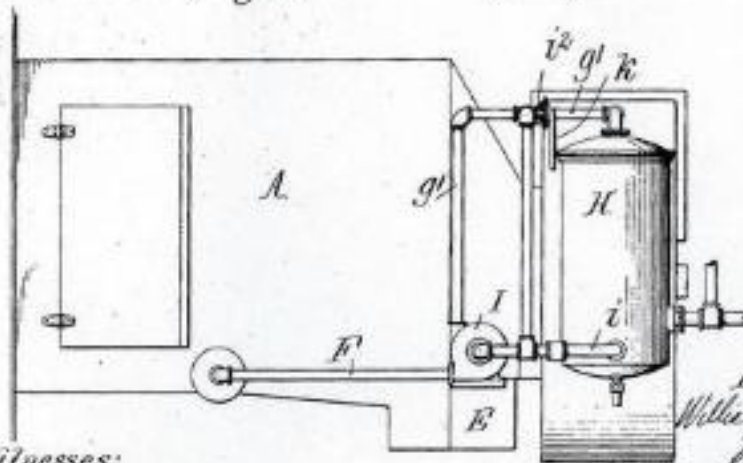


Fig. 2.



Witnesses:
E. A. Volk.
A. P. Diamond.

Inventor
W. H. Carrier
By
Wilhelm, Baker & Hard
Attorneys.

CARRIER SPRAY HUMIDIFIER 1906

No. 808,897.

PATENTED JAN. 2, 1906.

W. H. CARRIER.
APPARATUS FOR TREATING AIR.
APPLICATION FILED SEPT. 16, 1904.

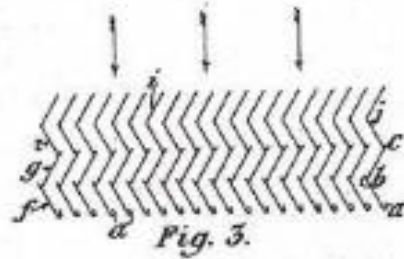
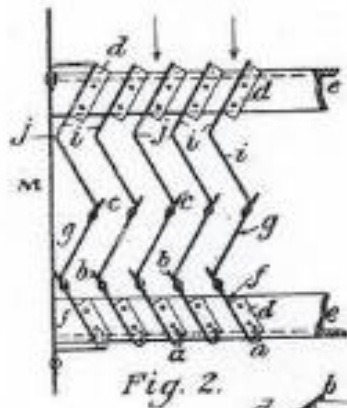
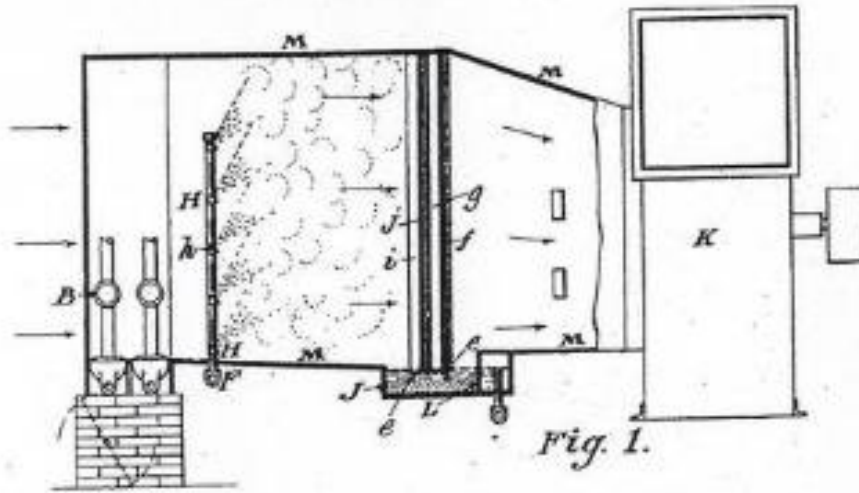


Fig. 2.

Fig. 3.

Fig. 4.



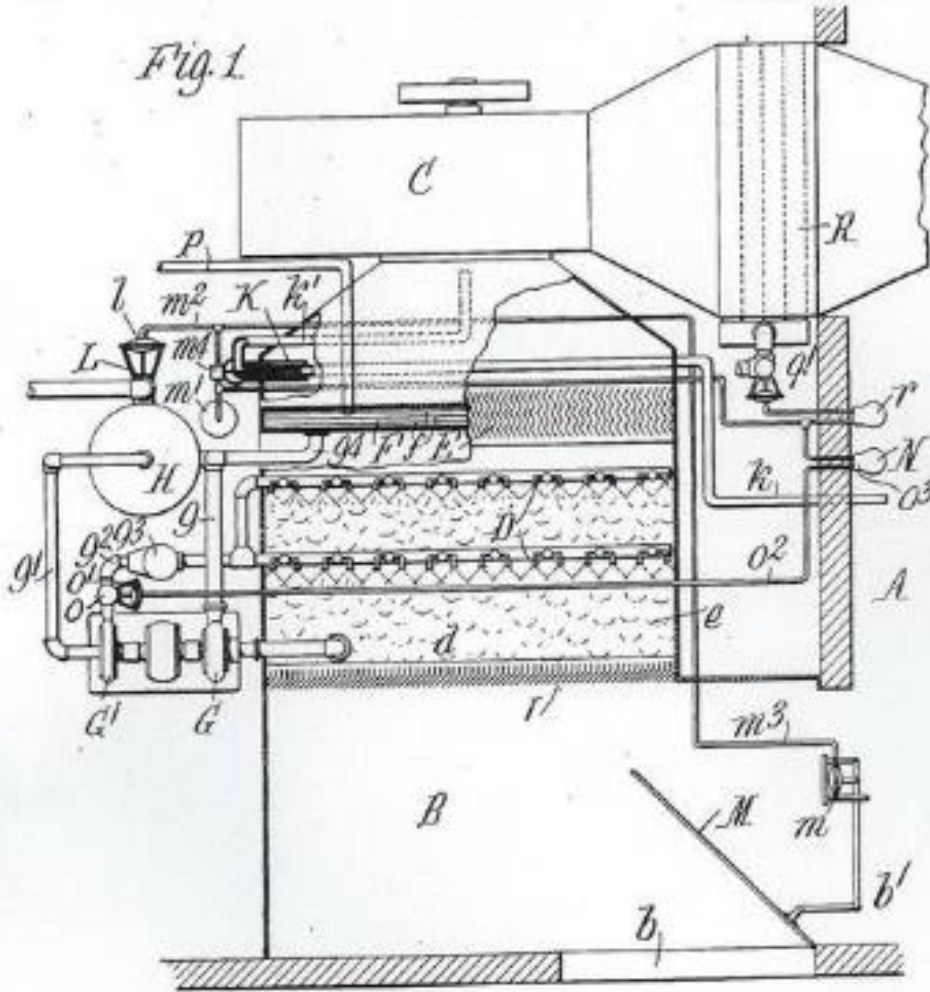
Fig. 6.

Witnesses.
E. A. Volk.
R. W. Pomeroy.

Inventor,
Willis H. Carrier
by *Willis H. Parker & Hard*
Attorneys

CARRIER SPRAY HUMIDIFIER 1913

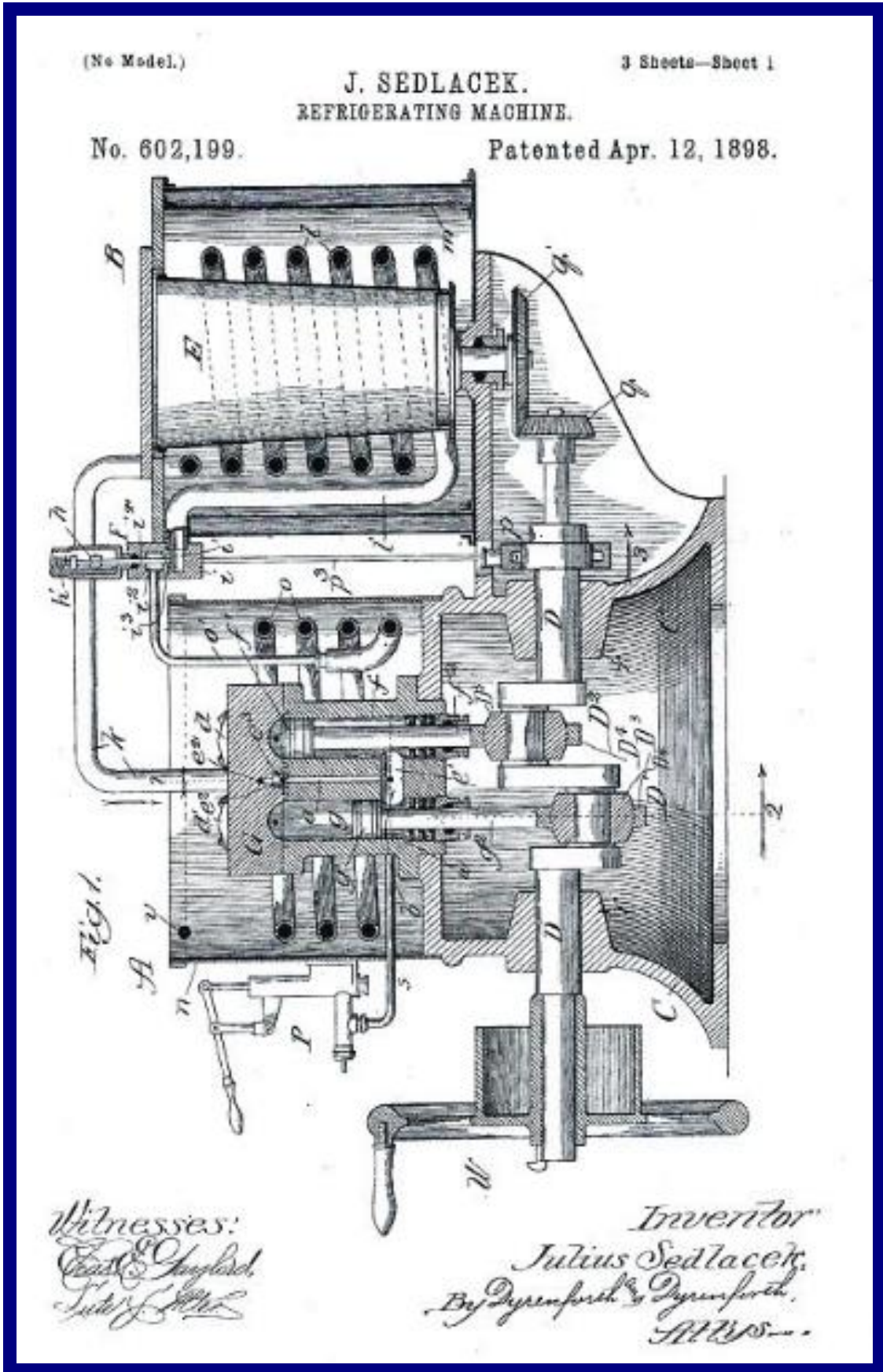
W. H. CARRIER.
SYSTEM FOR PURIFYING, HUMIDIFYING, AND CONTROLLING THE HUMIDITY OF AIR.
APPLICATION FILED APR. 22, 1908. Patented Apr. 29, 1913.
1,059,976. 2 SHEETS-SHEET 1.



Witnesses:
E. A. Volk.
A. J. Diamond.

Inventor:
W. H. Carrier,
By W. H. Parker & Hard,
Attorneys.

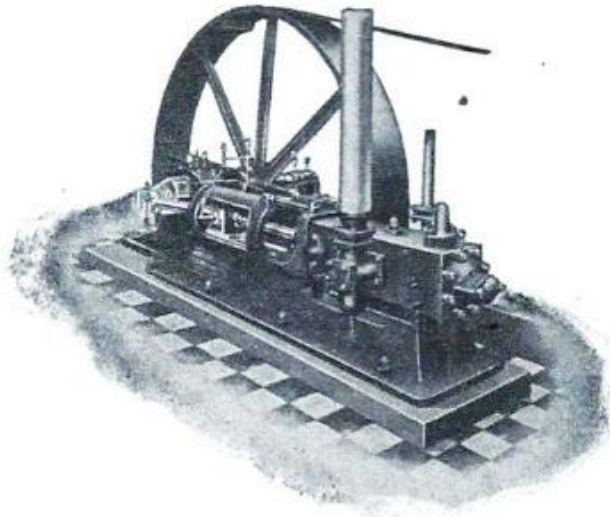
KROESCHELL AND SEDLACEK PATENT



KROESCHELL CO₂ ICE MACHINE

KROESCHELL CARBONIC ANHYDRIDE SYSTEM

SAFE
—
ECONOMICAL
—
EFFICIENT



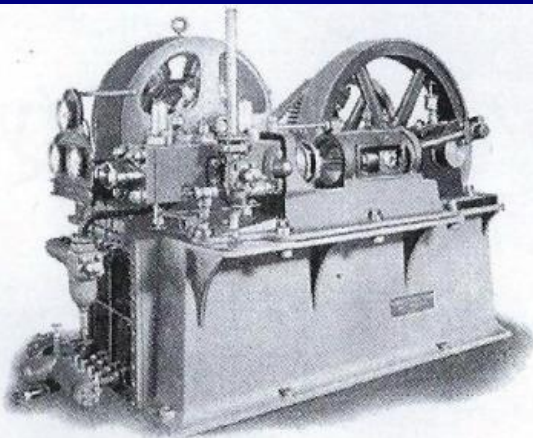
FOR
ICE MAKING
AND
REFRIGERATION

Catalog And Information On Request

KROESCHELL BROS. ICE MACHINE CO.

MAIN OFFICE AND WORKS
472 W. ERIE ST., CHICAGO, ILL

EASTERN OFFICE
30 CHURCH ST., NEW YORK, N. Y.



The Carbonic Anhydride System of Refrigeration

GIVES THE BEST ECONOMY AND EFFICIENCY WITH SAFETY IN OPERATION

No Odor No Explosions

OUR MARINE AND LAND TYPE MACHINES OPERATING IN HUNDREDS OF PLANTS GIVE BEST RESULTS EVER OBTAINED. ~ ~ ~

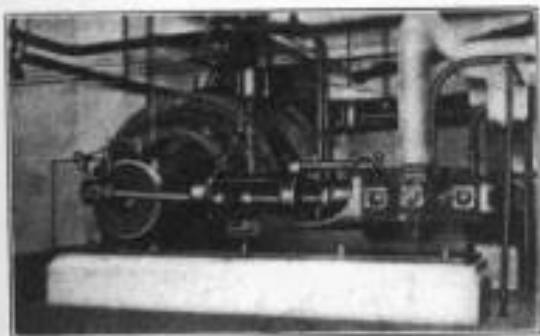
KROESCHELL BROS. ICE MACHINE CO.
29-39 Erie Street CHICAGO, ILL.

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WITTENMEIER VITOLYZED AIR

Ventilation

Complete Air Conditioning Installations Cooling—Refrigerating—Washing



Wittenmeier Horizontal Compressor CO₂

A Few Representative Installations

CAPITOL THEATRE, New York, N. Y.
 WARNER BROS. THEATRE, New York, N. Y.
 KEITH'S FORDHAM, New York, N. Y.
 LOEW'S NEW ROCHELLE, New Rochelle, N. Y.
 FOX ACADEMY OF MUSIC, New York, N. Y.
 UNITED ARTISTS THEATRE, Los Angeles, Calif.
 METROPOLITAN THEATRE, Boston, Mass.
 PYTHIAN TEMPLE, New York, N. Y.
 ELKS CLUB, Union Hill, N. J.
 MASONIC TEMPLE, Kansas City, Mo.
 ILLINOIS ATHLETIC CLUB, Chicago, Ill.
 UNION LEAGUE CLUB, Chicago, Ill.
 N. Y. COUNTY COURT HOUSE, New York, N. Y.
 FEDERAL RESERVE BANK, Chicago, Ill.
 U. S. NAVAL HOSPITALS, San Diego, Calif.
 CONGRESS PLAZA APTS., New York, N. Y.
 RALEIGH APTS., New York, N. Y.
 WEYLIN HOTEL, New York, N. Y.
 MONTAUK POINT HOTEL, Montauk Point, N. Y.
 RITZ-CARLTON HOTEL, Boston, Mass.
 NEW BEDFORD HOTEL, New Bedford, Mass.
 AMBASSADOR HOTEL, Chicago, Ill.
 WINDERMERE HOTEL, Chicago, Ill.
 AUGUSTINIAN FATHERS, Staten Island, N. Y.
 BOARD OF EDUCATION, Chicago, Ill.
 N. Y. TELEPHONE COMPANY, New York, N. Y.
 NATIONAL CITY BANK, New York, N. Y.
 WRIGLEY BUILDING, Chicago, Ill.
 TRIBUNE BUILDING, Chicago, Ill.
 KINGS COUNTY HOSPITAL, Brooklyn, N. Y.
 CITY OF NEW YORK NURSES' HOME, Welfare Island, N. Y.
 NORTH COMMUNITY HOSPITAL, Glen Cove, N. Y.
 MICHIGAN CHILDREN'S HOSPITAL, Detroit, Mich.
 ILLINOIS CENTRAL E. E. HOSPITAL, Paducah, Ky.
 NORTHERN PACIFIC HOSPITAL, St. Paul, Minn.
 LUCKEY PLAYT DEPT. STORE, Poughkeepsie, N. Y.
 HORNE DEPT. STORE, Pittsburgh, Pa.
 CURETTS CANDY CO., Chicago, Ill.
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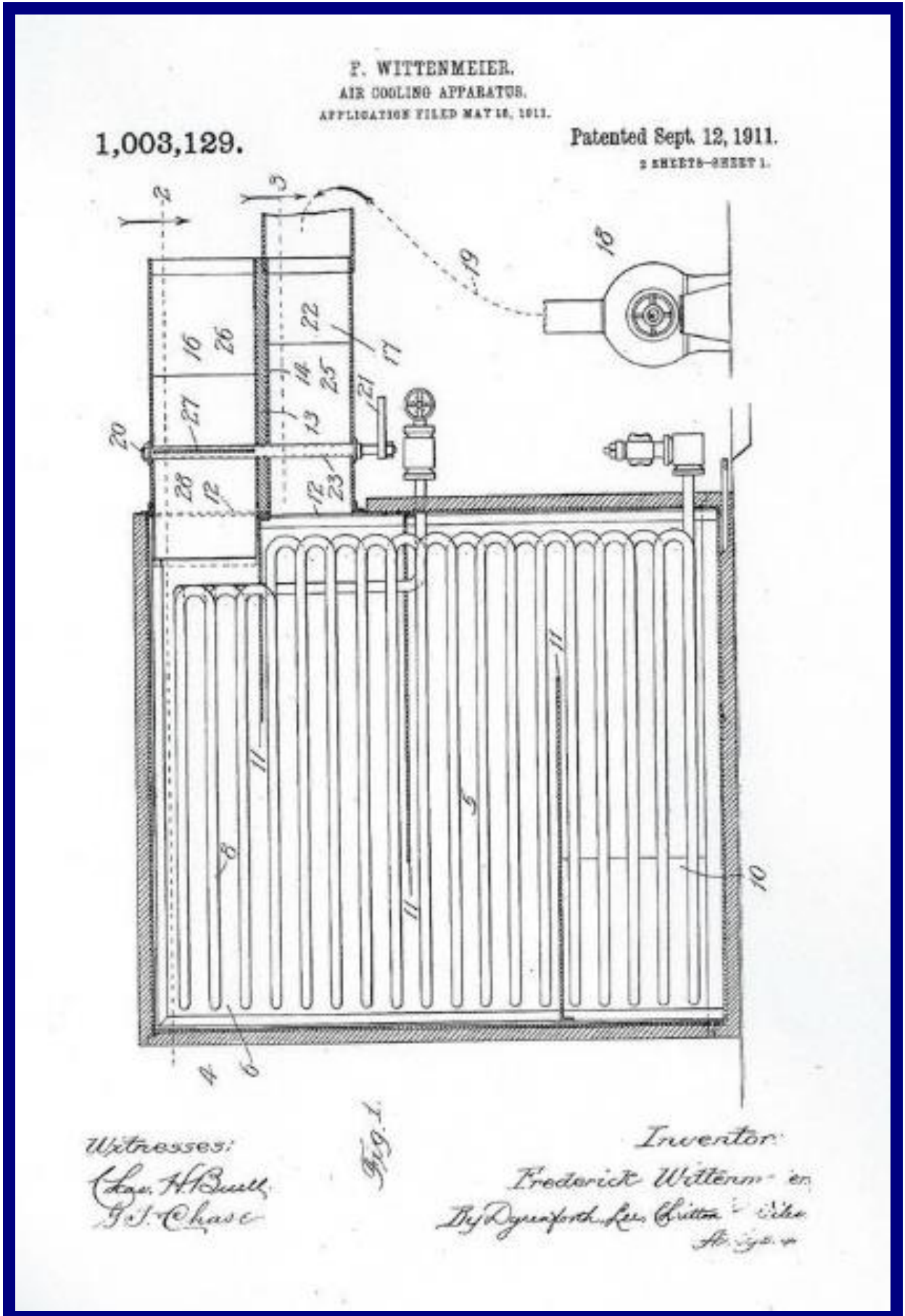
Air washer and eliminator as installed by Wittenmeier-Vitolyzed-Air

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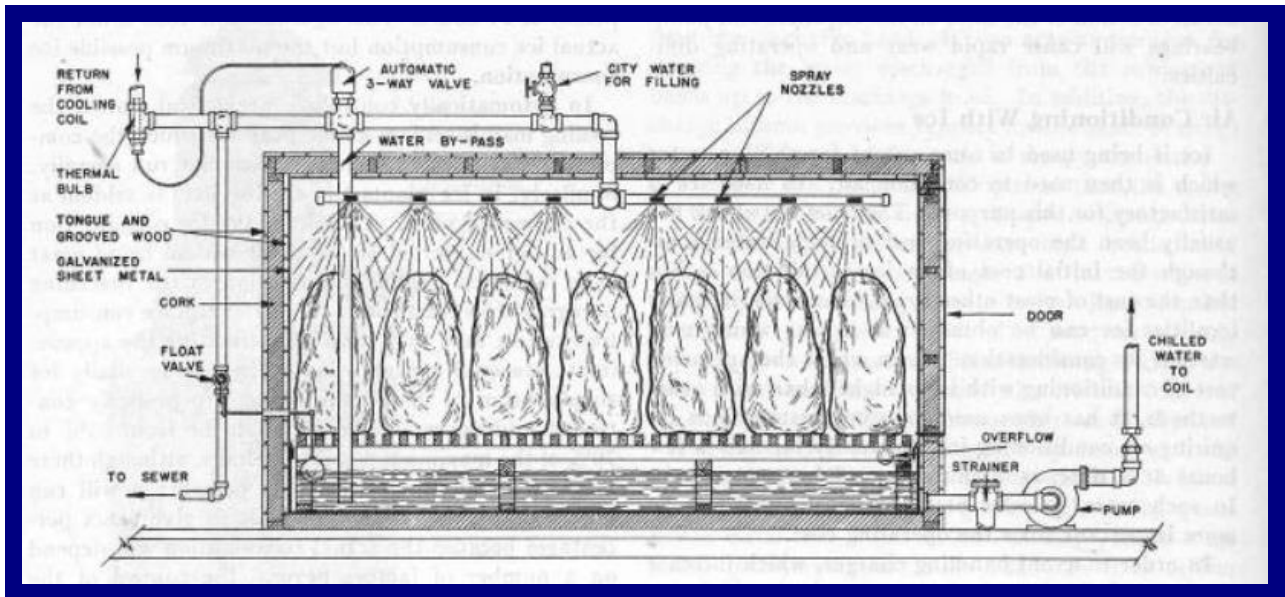
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1926 BROADWAY—NEW YORK CITY

WITTENMEIER COOLING APPARATUS 1911



AIR WASHER WITH ICE BLOCK COOLING



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HVAC System and Equipment Plans, Sections and Drawings are from *The Engineering Record* magazine of New York. Other information is from the United States Patent Office, the Heritage Group Archive and website.