

NO. 1 CROSSBAR DIAL TELEPHONE SYSTEM PHOTOGRAPHS

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Western Electric Company
INCORPORATED
HAWTHORNE WORKS

Personnel Service Branch

Training Department

NO. 1 CROSSBAR DIAL TELEPHONE SYSTEM PHOTOGRAPHS

This bulletin is issued to provide general information concerning the equipment used in the Crossbar Dial Telephone System. Information contained herein is to be used for educational purposes only.

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*The weights of frames shown are for equipment and framework, and are approximate weights only. Additional photographs will be issued from time to time to supplement the enclosed, but no attempt will be made to keep up with all equipment changes.

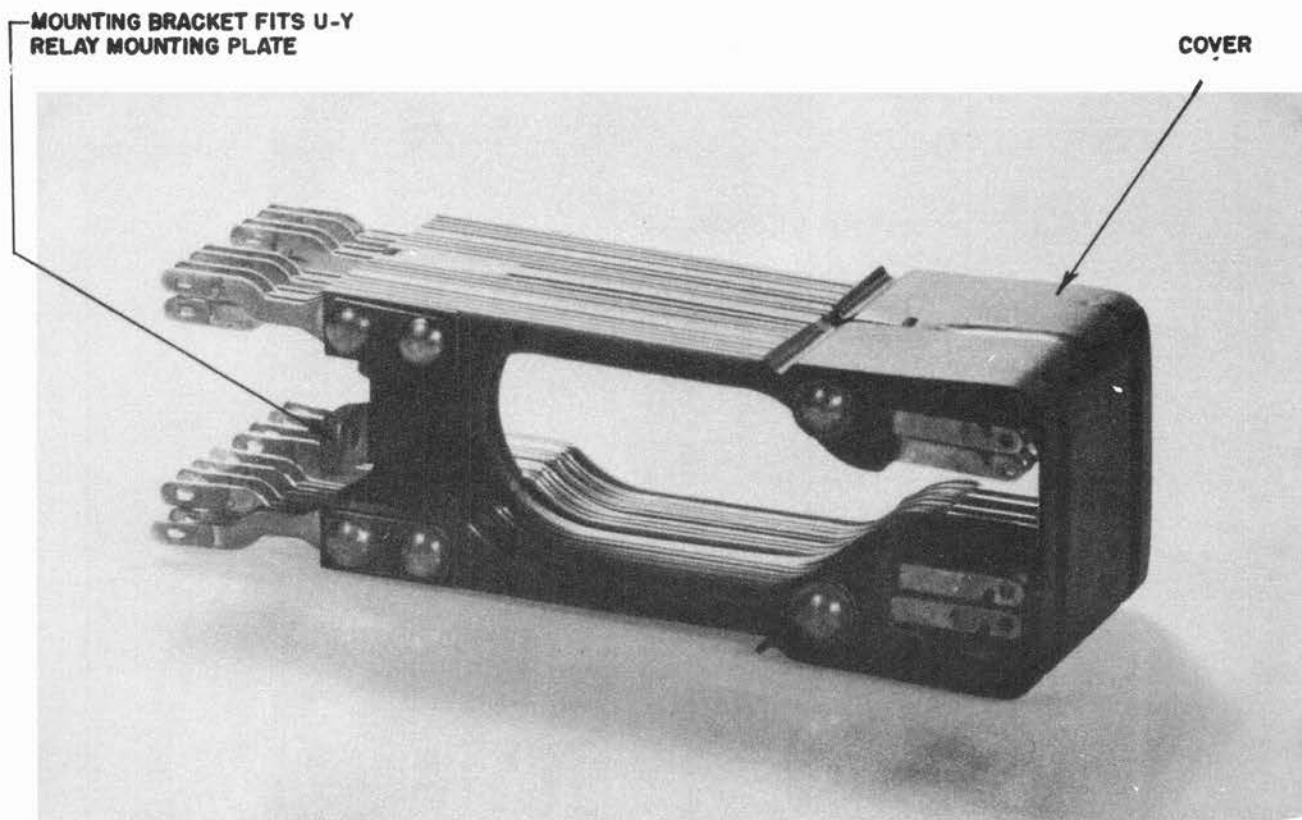
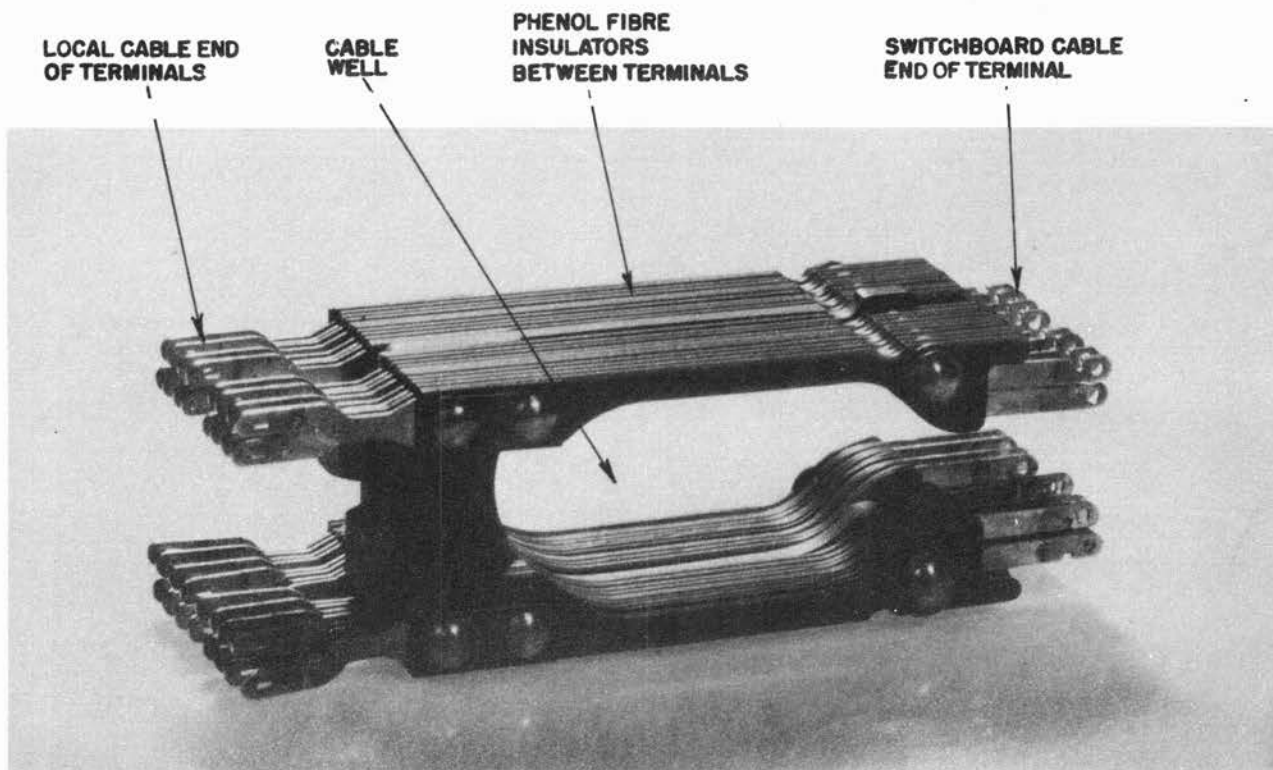
Changes that have been made in the coding of the crossbar switches and multi-contact relays since this publication was issued are shown below:

Crossbar switches are classified as follows:

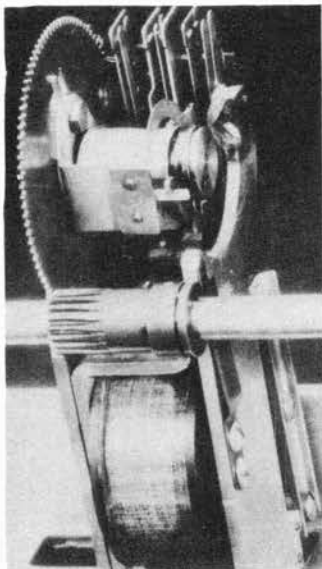
<u>Code</u>		<u>Vertical Units</u>	<u>Cross-points</u>	<u>Wire Sizes</u>
<u>Old</u>	<u>New</u>			
300	304	10	100	3,4,5,6
301	305	20	200	3,4
302	306	19	190	5
303	307	20	200	3 and 5
	308	20	200	6

Multi-contact relays are classified as follows:

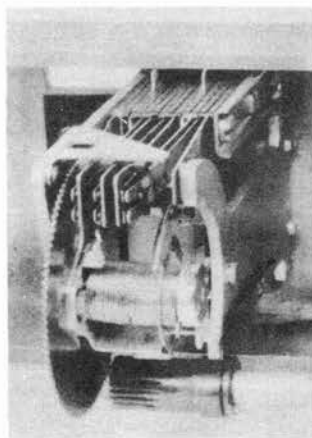
<u>Code</u>		<u>Old and New Codes Identical</u>	
<u>Old</u>	<u>New</u>	<u>Wire Size</u>	<u>Spring Capacity</u>
245-A	263-A	6	60)
B	B	4	40) Arranged for
C	C	3	30) Horizontal
D	D	5	50) Strapping
E	E	6	60)
254-A	264-A	5	50(Arranged for
B	B	6	60(Individual Wiring



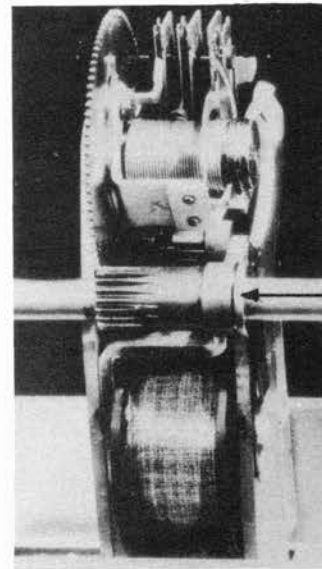
224 A
CABLE WELL TYPE TERMINAL STRIP



TIMING UNIT



FRONT VIEW

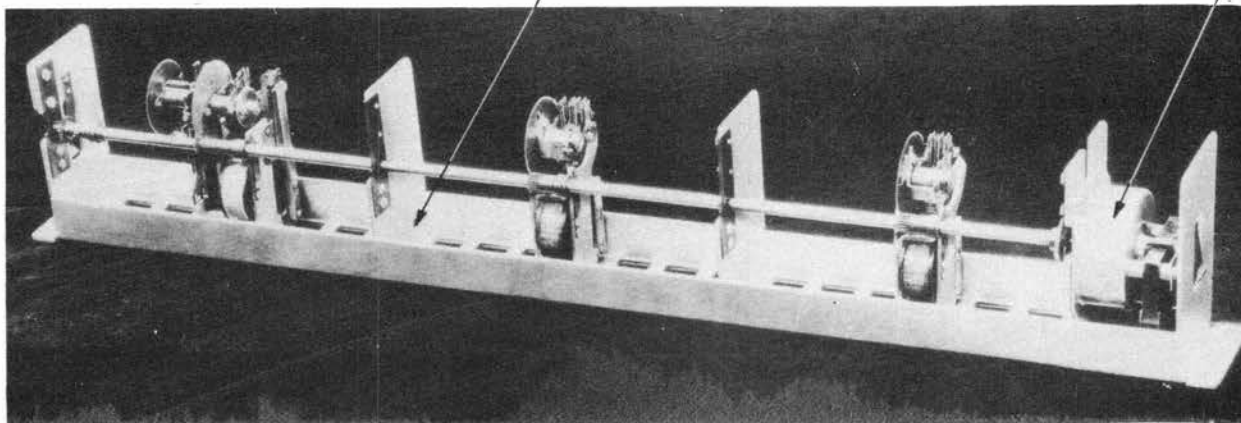


CLUTCH

TIMING UNIT

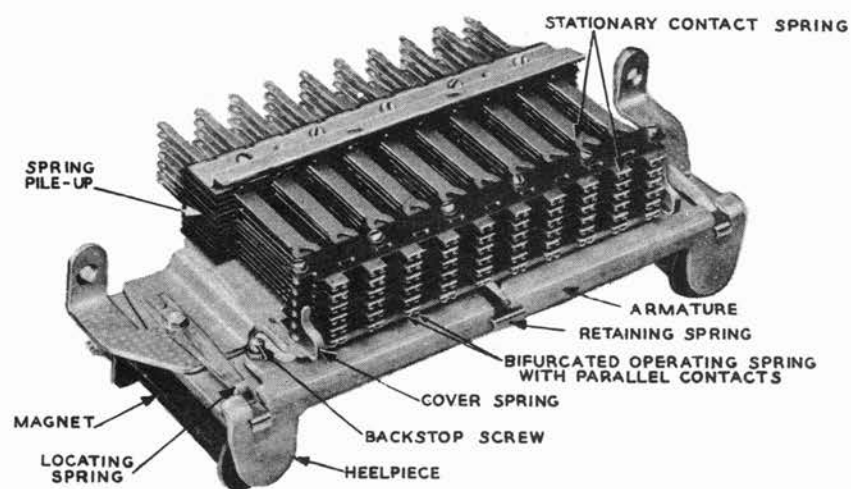
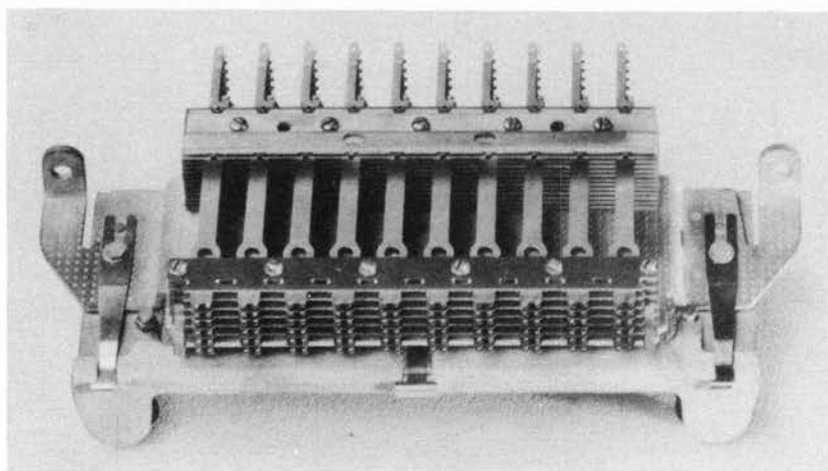
MOUNTING
PLATE HOLDS
A MAXIMUM OF
20 TIMING UNITS

TELECHRON MOTOR
(22 V. A.C.)



UNITS AND DRIVE

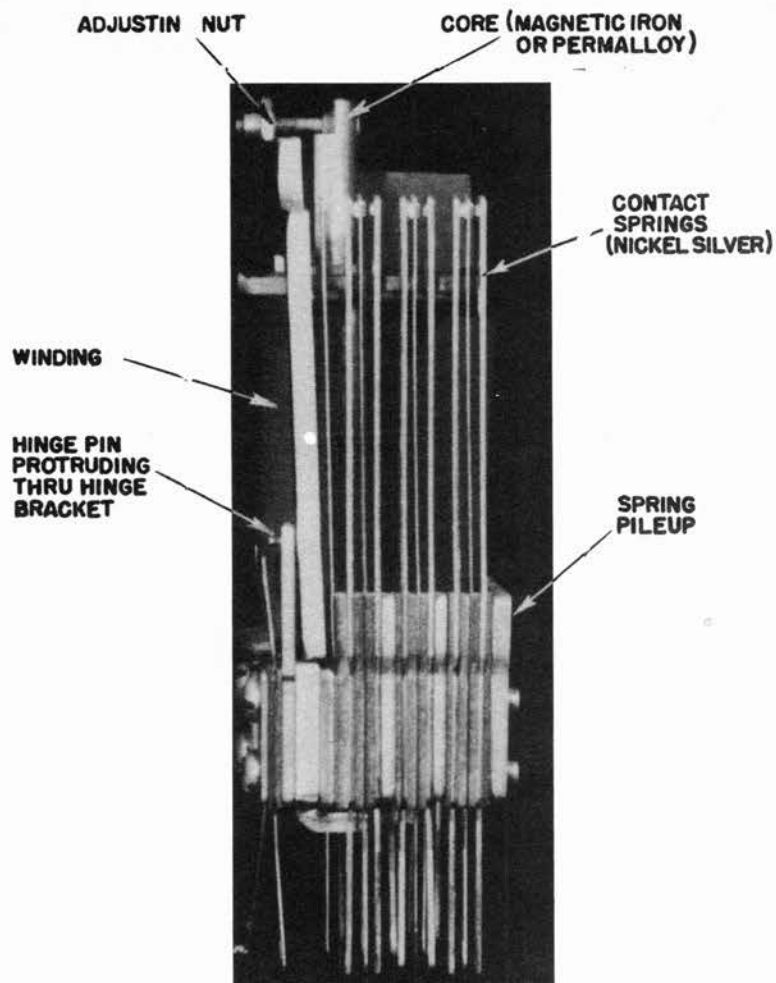
MULTIPLE REGISTRATION TIMING UNITS AND DRIVE



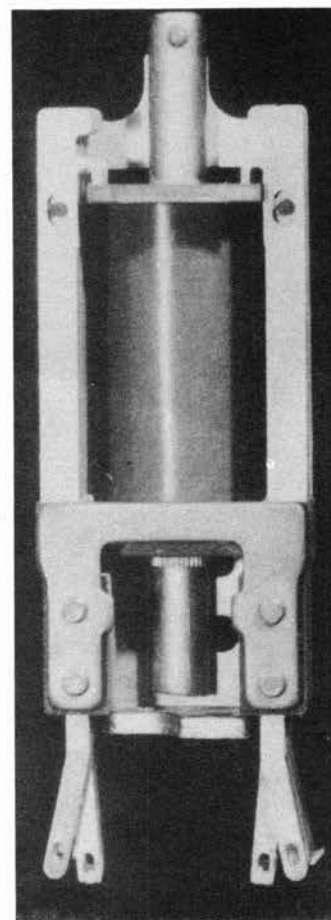
245 TYPE ARRANGED FOR HORIZONTAL STRAPPING

254 TYPE ARRANGED FOR INDIVIDUAL WIRING

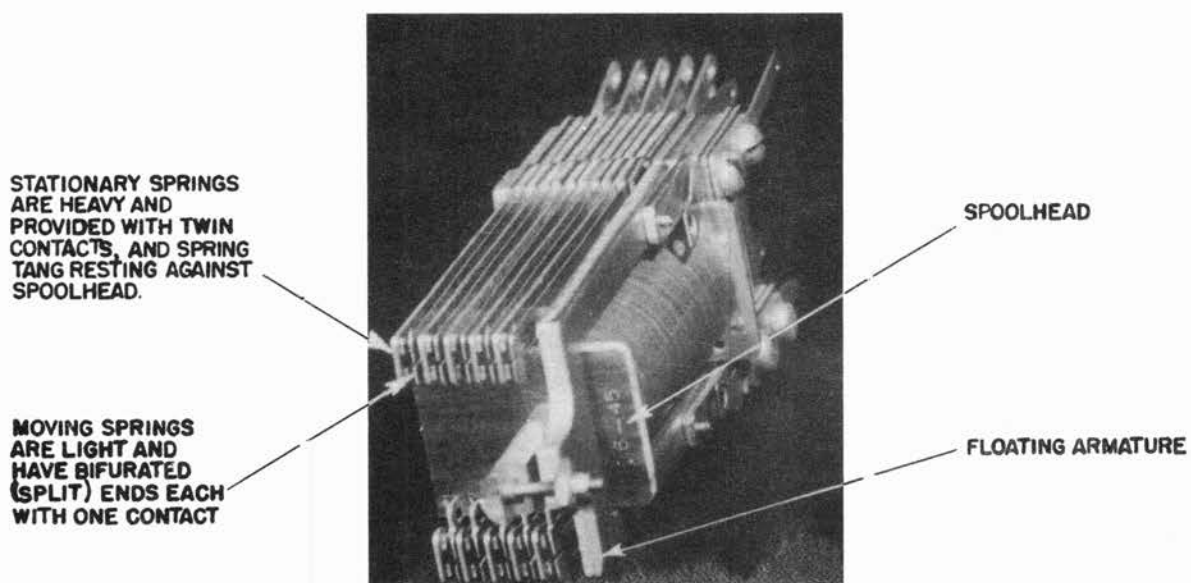
MULTI-CONTACT RELAY



TOP VIEW



SIDE VIEW



U & Y TYPE RELAYS

30 LBS

1' 8 1/2"

9 1/4"

SELECTING
MAGNET

SELECTING
BAR

SELECTING
OFF NORMAL
SPRINGS

GUIDE POST
AND JACK

HOLDING
OFF NORMAL
SPRINGS

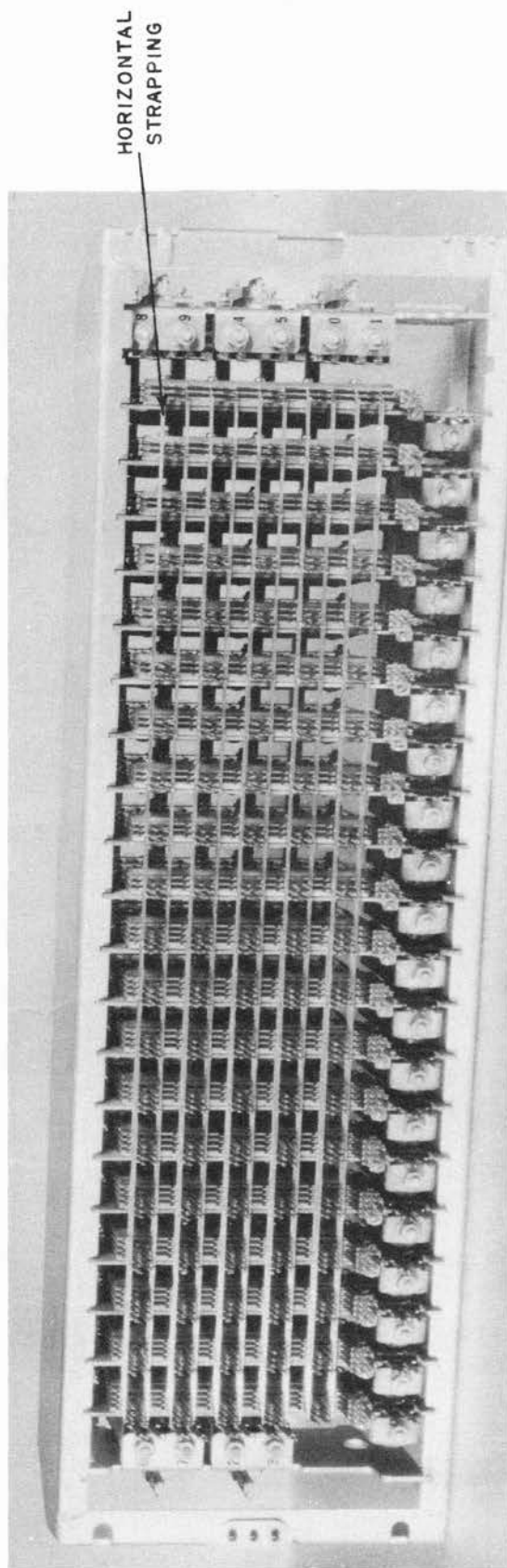
HOLDING
MAGNET

VERTICAL
UNIT

VERTICAL
ARMATURE

CROSSBAR SWITCH

(300 TYPE-100 POINT)



9 1/4"

(REAR)

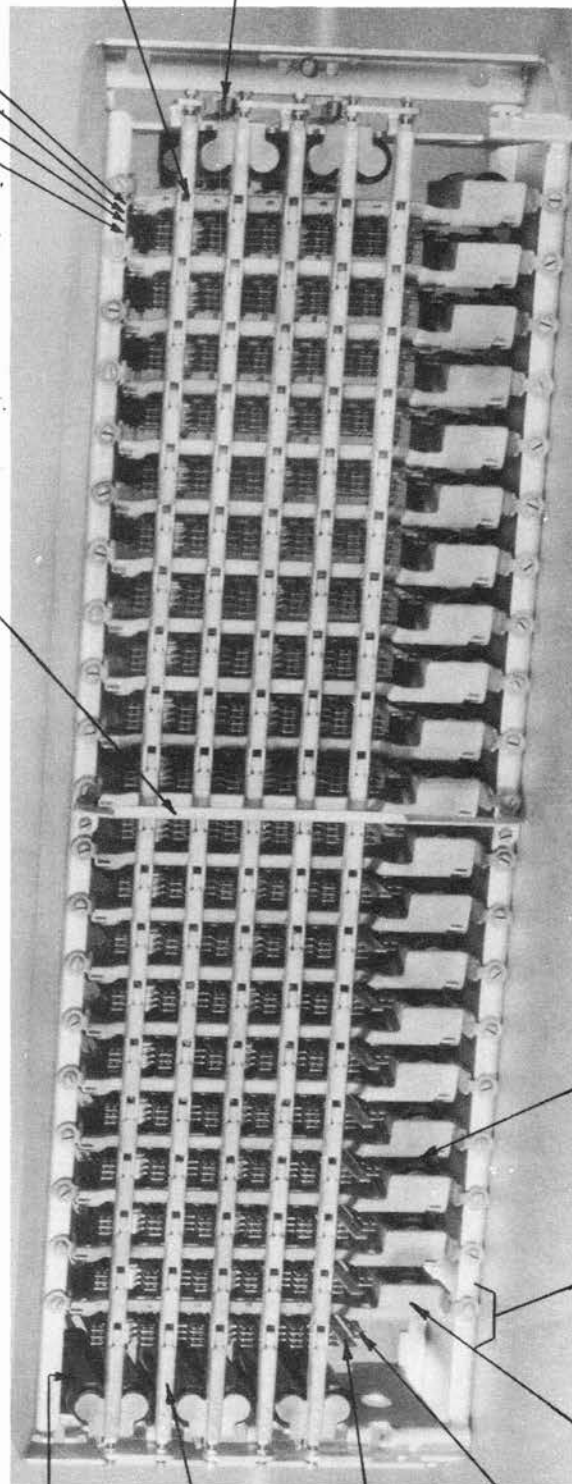
2' 6 1/2"

55 LBS.

CONTACTS
M, T, R, S
3, 2, 1, 0

GUARD

ADJUSTABLE
SUPPORT FOR
SELECTING
FINGER.
CENTERING
SPRINGS
UNIT



SELECTING
MAGNET

SELECTING
BAR

GUIDE
POST AND
JACK

HOLDING
OFF NORMAL
SPRINGS

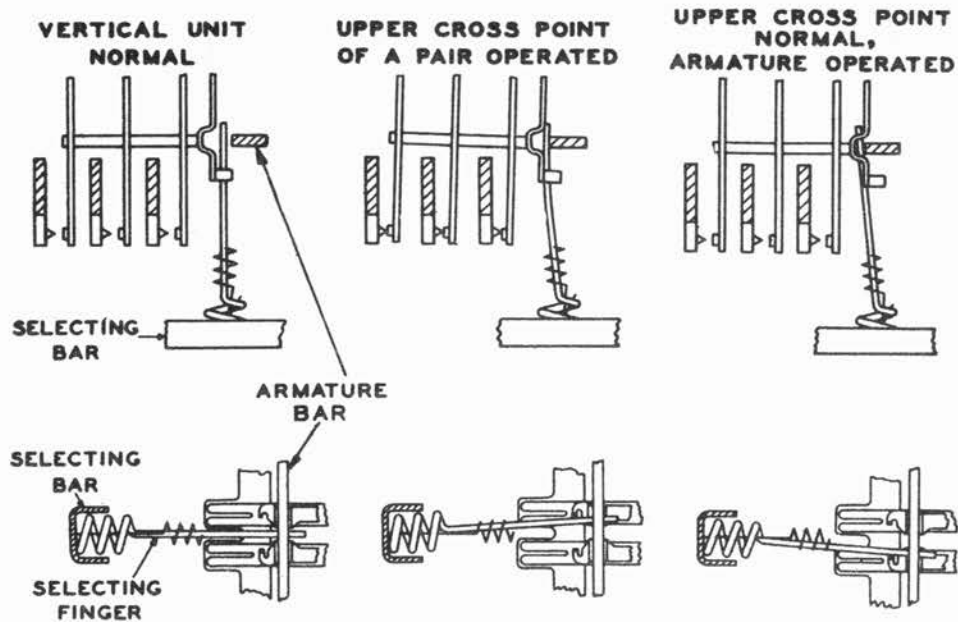
ARMATURE

VERTICAL
UNIT

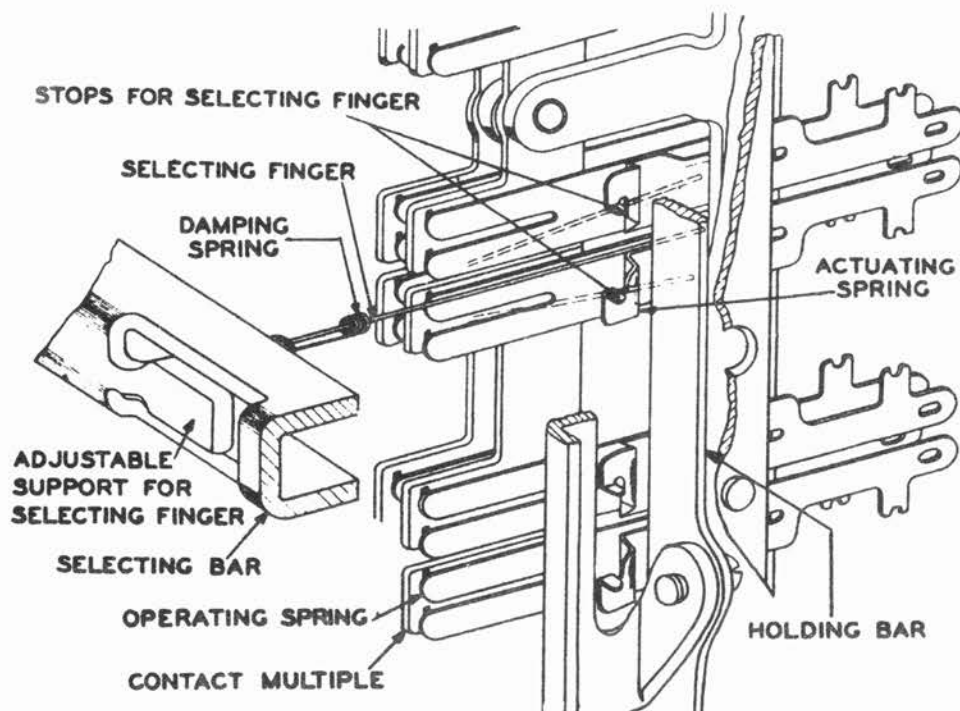
HOLDING
MAGNET

(FRONT)

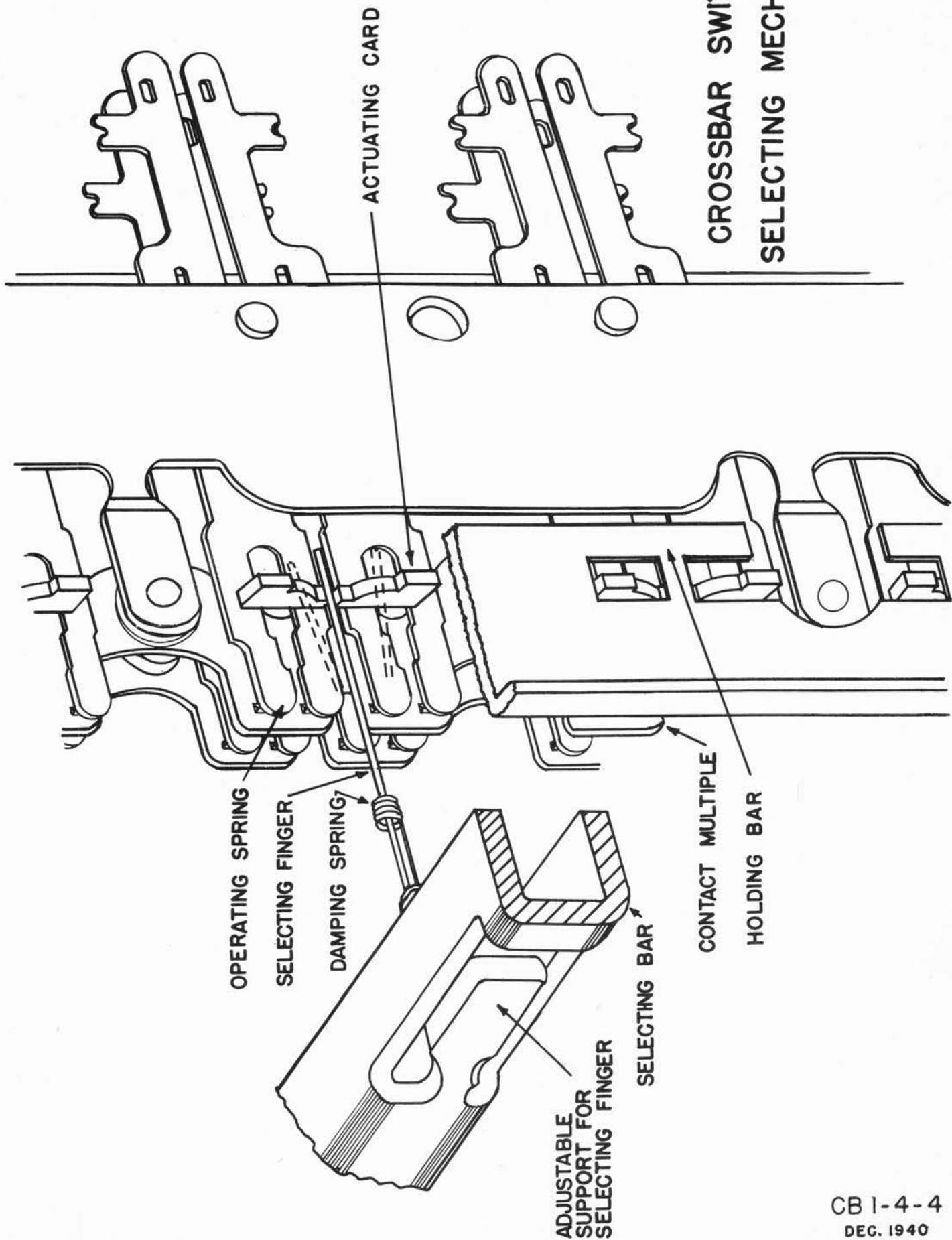
CROSSBAR SWITCH (301 TYPE-200 POINT)



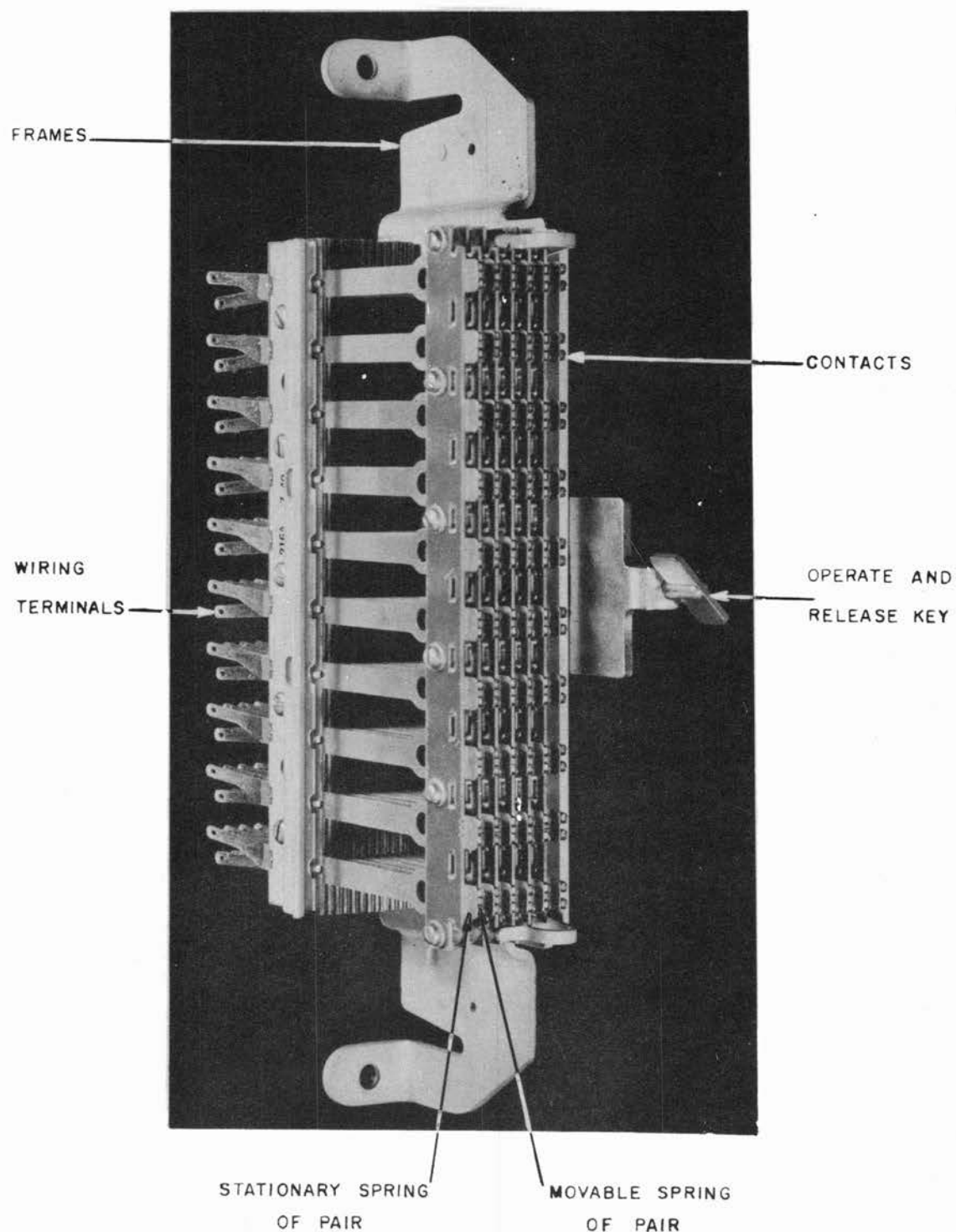
TOP VIEW



CROSSBAR SWITCH SELECTING MECHANISM



CROSSBAR SWITCH
 SELECTING MECHANISM



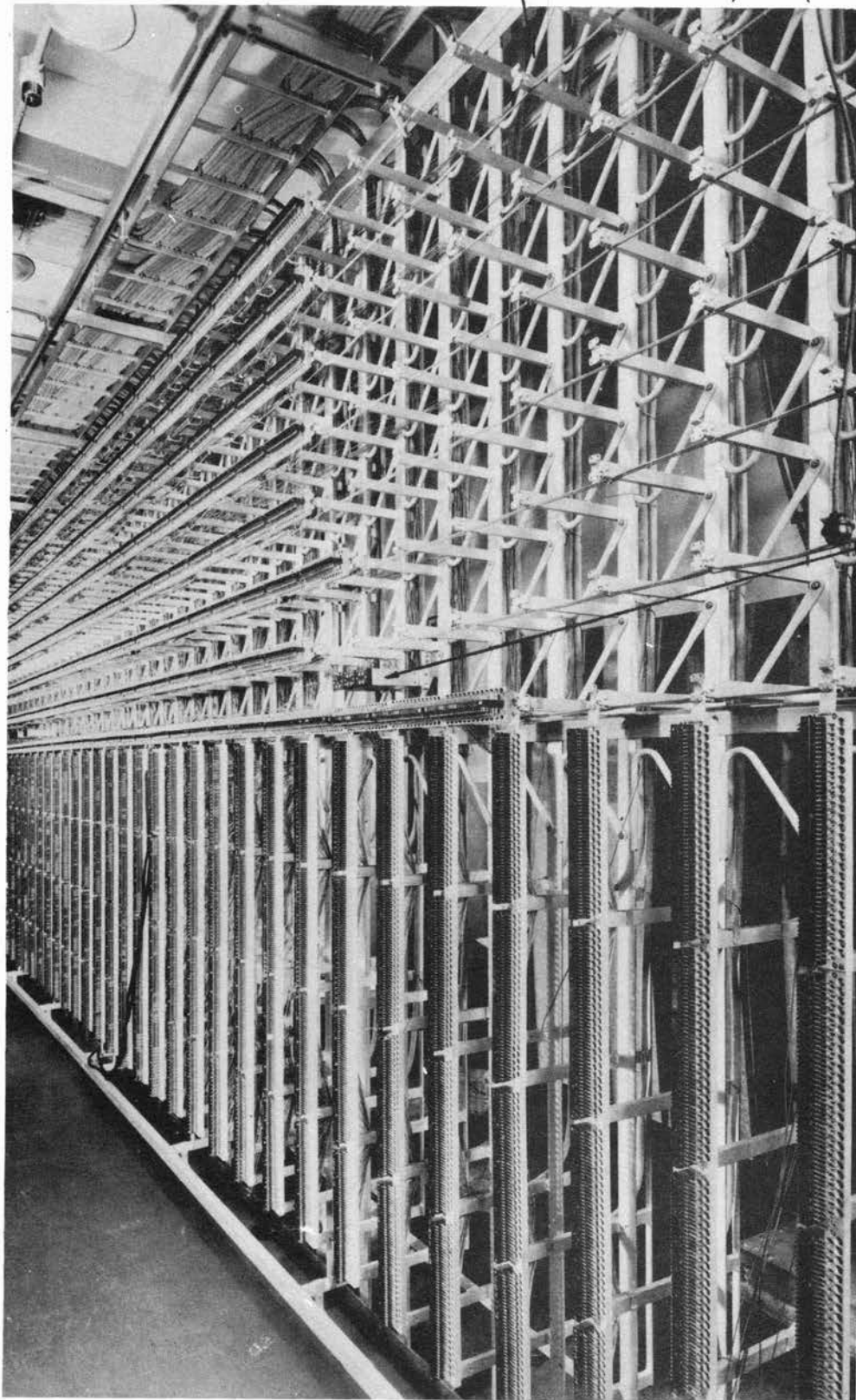
216A MULTI-CONTACT SWITCH

6-WIRE

CB 1-5-1
MARCH 1941

V SHAPED TUBULAR
DISTRIBUTING RINGS

BAY



211 B, C, F, G, OR H
TERM STRIPS

S AND M
LEADS FROM
LINE LINK FRAMES
TERMINATE HERE

MISC. JACK
MOUNTINGS

SHELF

210 A OR 210 B
TERM STRIPS

S LEADS FROM
BLOCK RELAY
FRAME AND M
LEADS FROM MESS.
REG. RACK
TERMINATE HERE

VERTICAL

LINE DISTRIBUTING FRAME
MURRAY HILL-6 OFFICE, EAST 30 TH. ST. NEW YORK

CB2-3-1
AUG. 1939

S AND M
LEADS FROM
LINE LINK
FRAMES
TERMINATE
HERE

S LEADS
FROM
BLOCK
RELAY
FRAME
AND M
LEADS
FROM MESS.
REG. RACK
TERMINATE
HERE



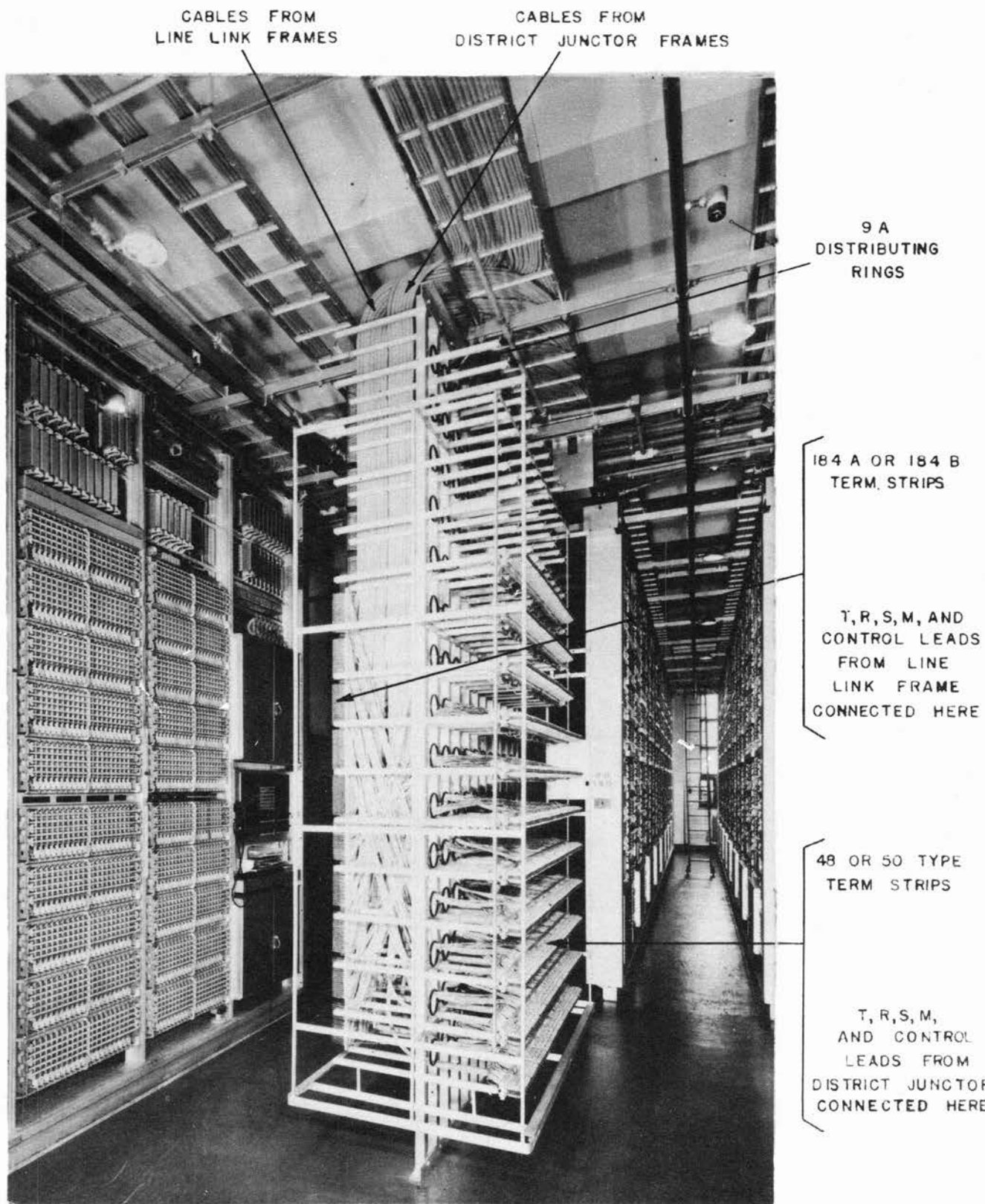
TEMPLE ALEXANDRIA
LINE DISTRIBUTING FRAMES

BLOCK RELAY
FRAMES

LINE DISTRIBUTING FRAMES

ALEXANDRIA-TEMPLE OFFICE
ALEXANDRIA, VA.

CB 2-3-2
APRIL 1940



DISTRICT JUNCTOR GROUPING FRAME

MURRAY HILL-6 OFFICE, EAST 30 TH. ST. NEW YORK

CB3-1-1
AUG. 1939

WIRES
FROM
CABLES
TO
DISTRICT
LINK
FRAMES

WIRES
FROM
CABLES
TO
OFFICE
LINK
FRAMES

MAX.
100 - 100 D
TERM
STRIPS
PER
FRAME

JUNCTOR
HOLD
MAGNET
BATTERY
LEAD
TERM
STRIPS

2-212 A T.S.
1-191 A T.S.



4' 1"

GROUPING FRAME

4' 1"

OFFICE
LINK FRAMES

OFFICE JUNCTOR GROUPING FRAME (FRONT)

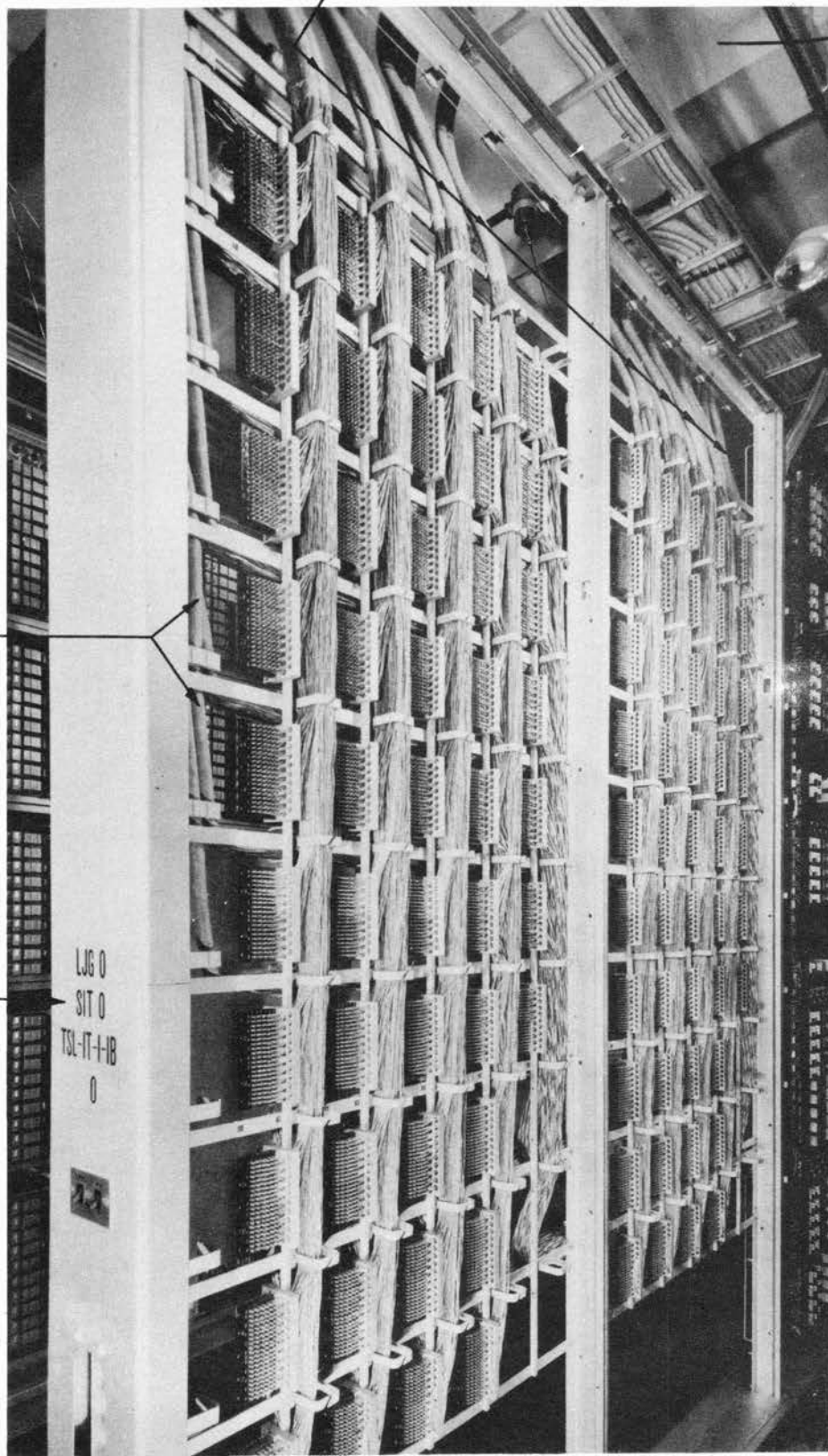
LYNN OFFICE, LYNN, MASS

CB3-2-1
AUG. 1939

CABLES FROM
INCOMING LINK FRAMES

CABLES
FROM
LINE LINK
FRAMES

FRAME
DESIGNATIONS



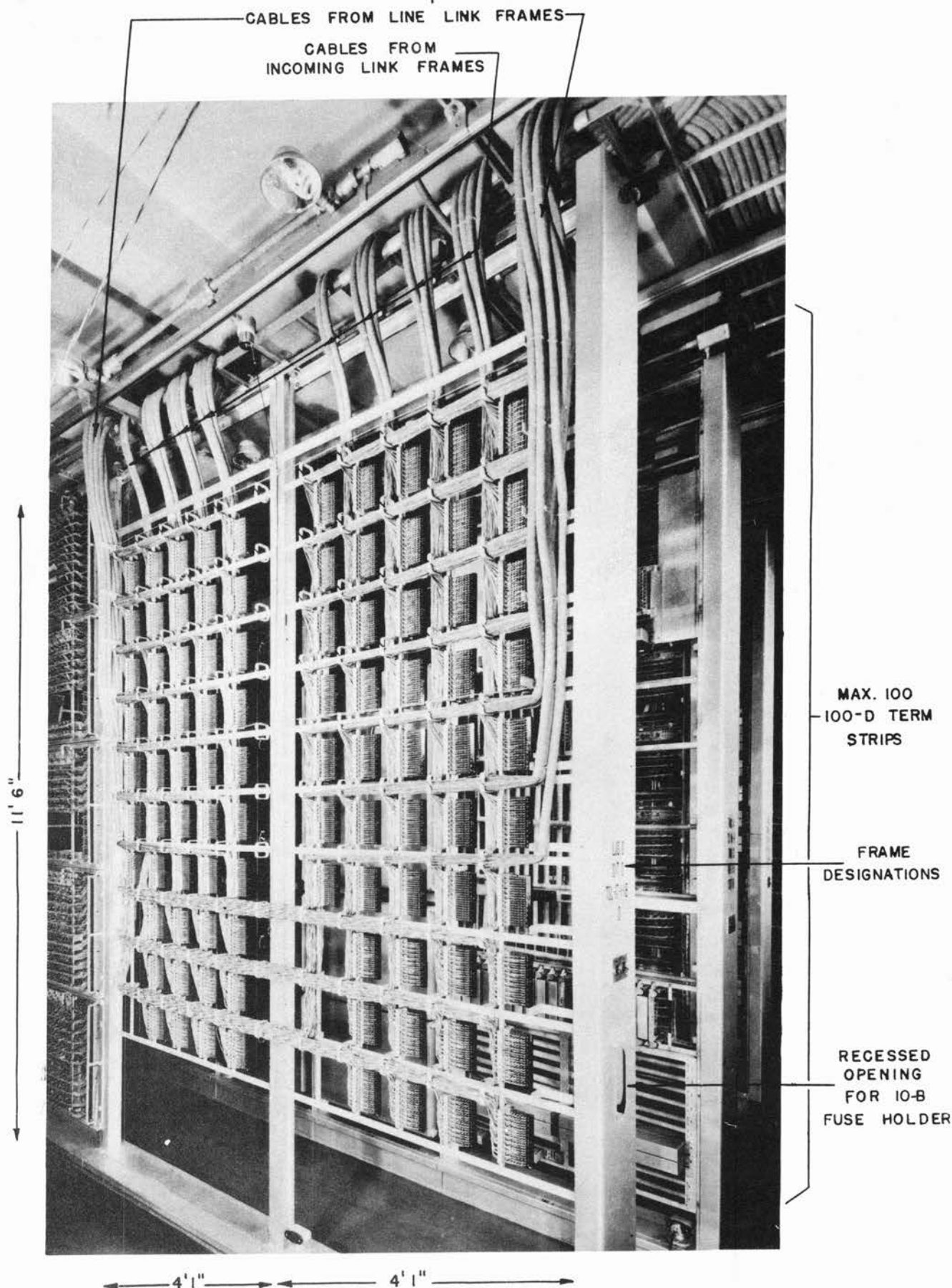
MAX. 100
100-D TERM
STRIPS

4' 1" 4' 1"

LINE JUNCTOR GROUPING FRAME (FRONT)

MURRAY HILL-6 OFFICE, EAST 30 TH. ST. NEW YORK

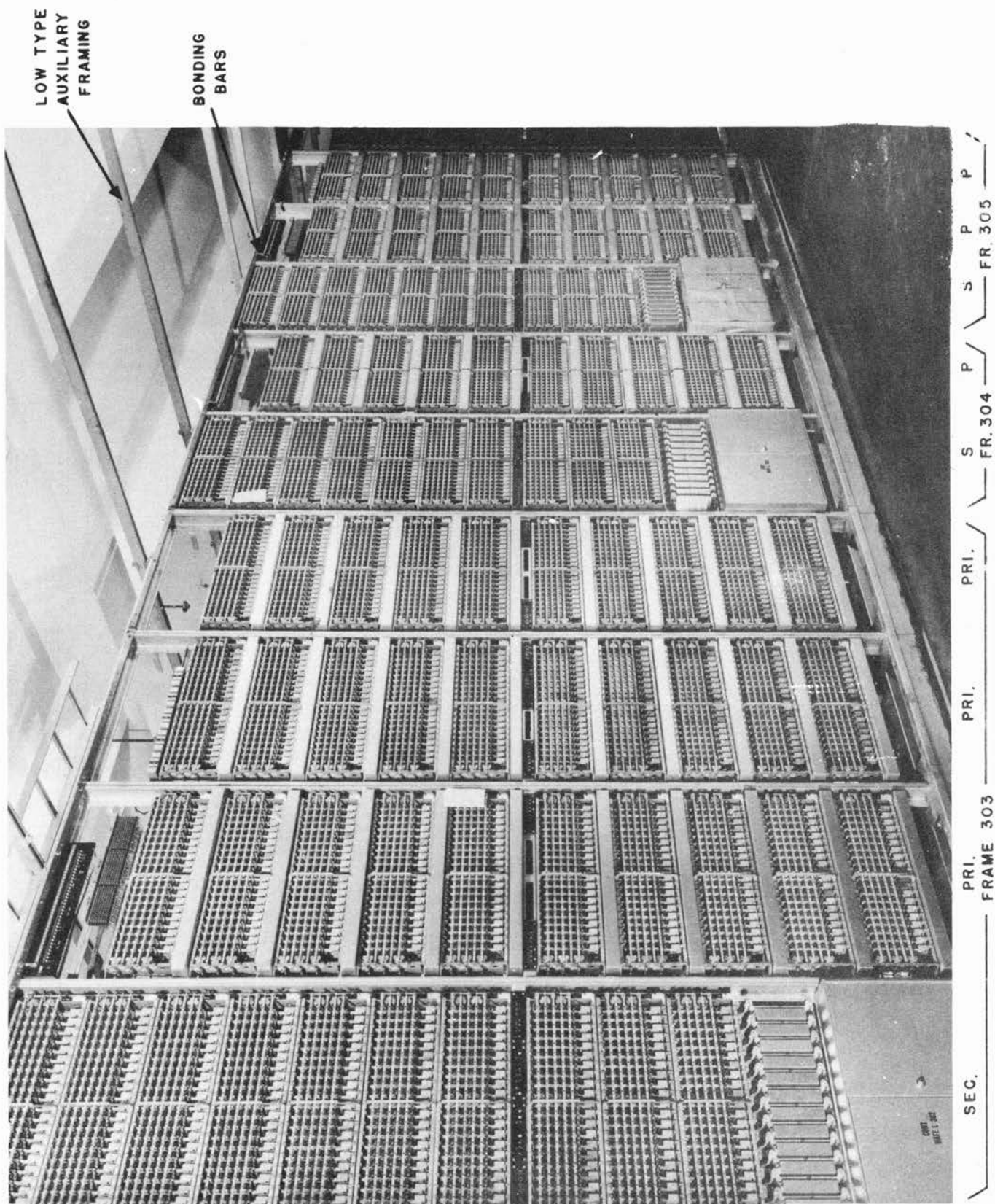
CB3-3-1
AUG. 1939



LINE JUNCTOR GROUPING FRAME (REAR)

MURRAY HILL - 6 OFFICE, EAST 30 TH. ST. NEW YORK

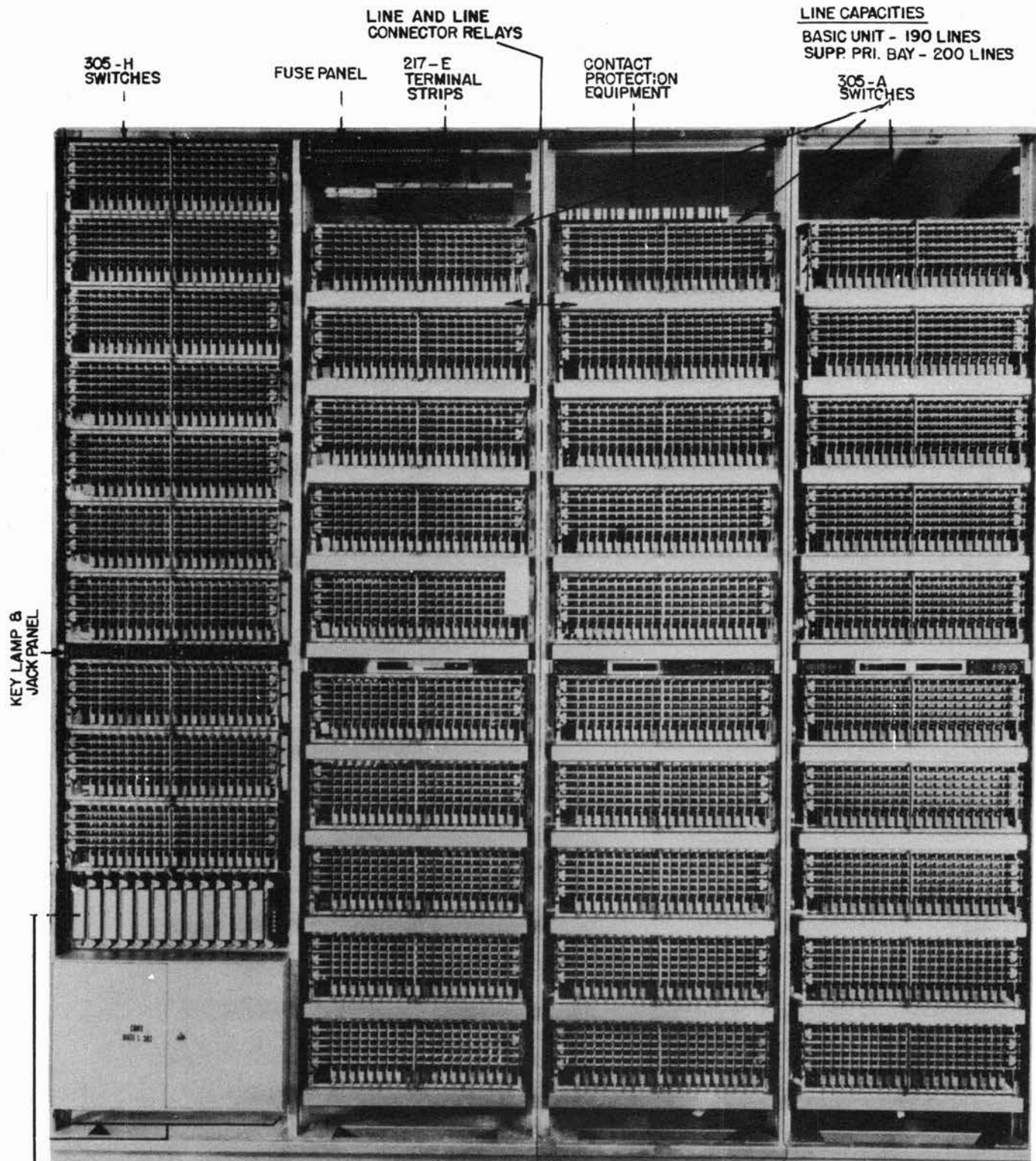
CB3-3-2
AUG. 1939



LINE LINK FRAMES

PRESIDENT-2 OFFICE, TROY AVE. BROOKLYN

CB4-1-1
AUG. 1939



SEC BAY

PRI. BAY

PRI.

PRI.

BASIC UNIT
5'-4 $\frac{1}{4}$ "
1715 LBS.

SUPP. BAY
2'-8 $\frac{1}{8}$ "
820 LBS.

SUPP. BAY
2'-8 $\frac{1}{8}$ "
820 LBS.

GROUP AND
CONTROLLER
CIRCUIT RELAYS

12 - 263-A
MULTI-CONTACT
RELAYS

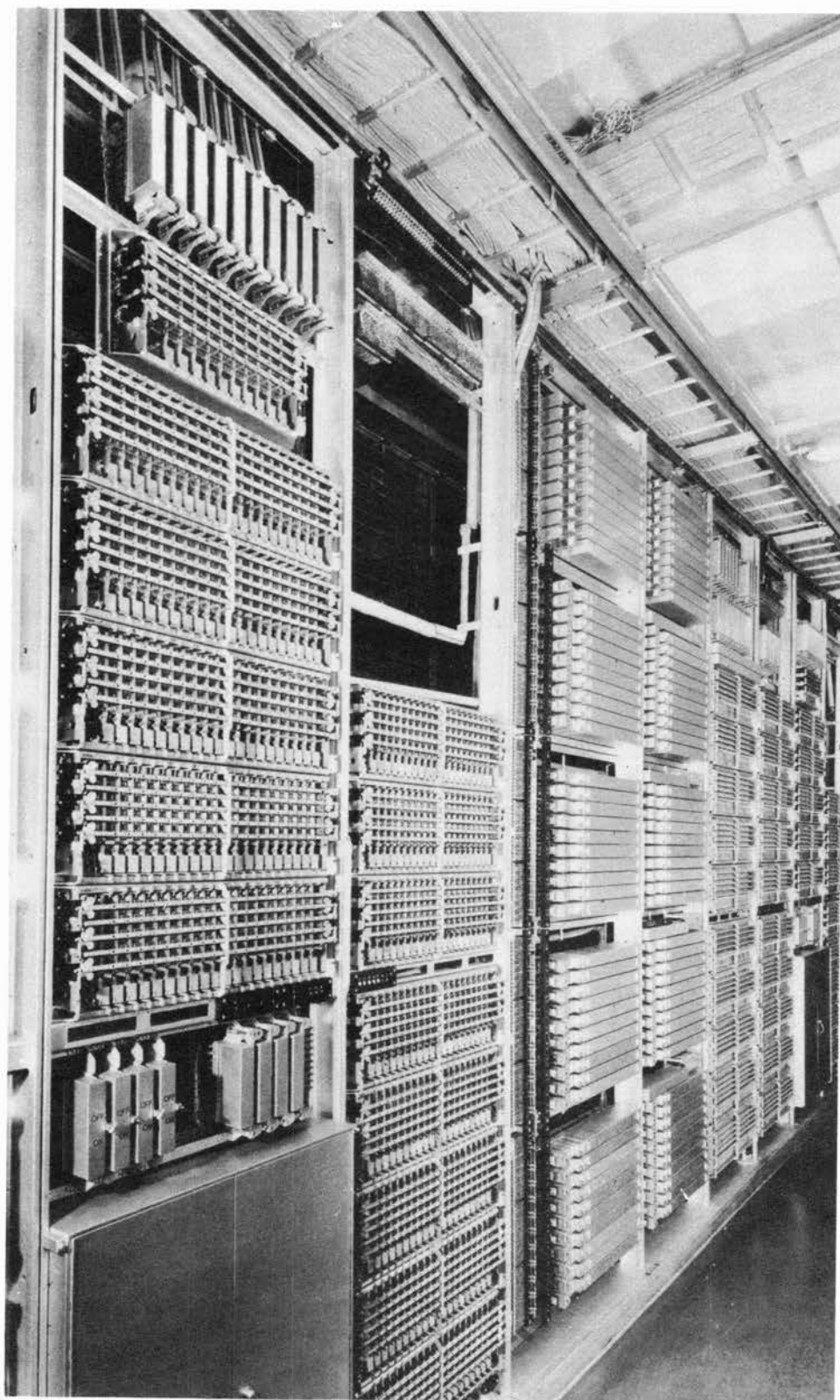
LINE LINK FRAME

FR (FLAT RATE)

MRI (SINGLE PARTY MESSAGE RATE)

AMA (AUTOMATIC MESSAGE ACCOUNTING)

C (COIN)



SUBSCRIBER
 SENDER LINK
 FRAME

DISTRICT
 JUNCTOR
 FRAME

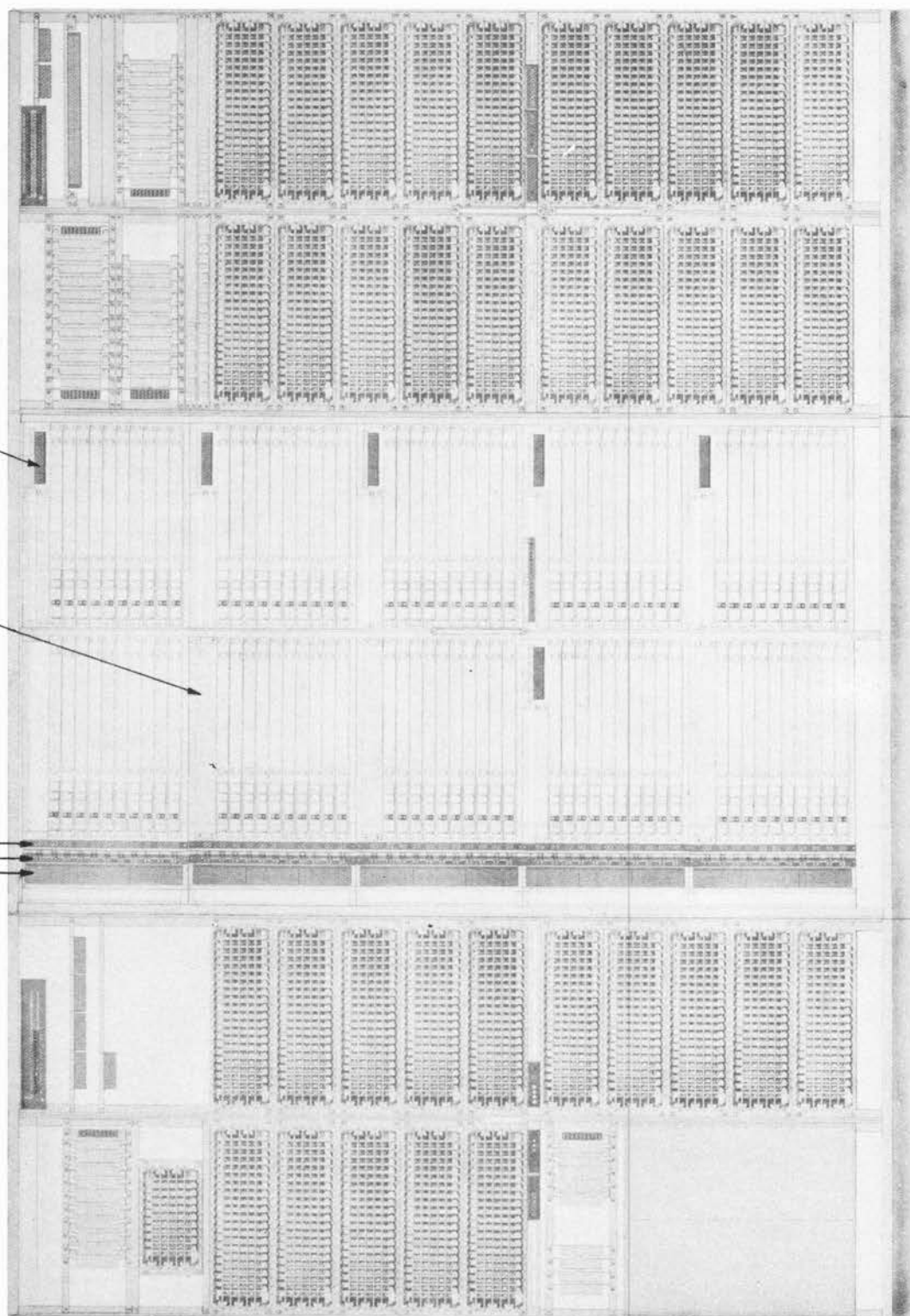
DIST.
 LINK
 FRAME

DISTRICT FRAME GROUP

MURRAY HILL -6 OFFICE, EAST 30 TH. ST. NEW YORK

CB5-1-1
AUG. 1939

2/5 A OR B TERM STRIPS
 FUSE PANEL
 JACK PANEL
 MULTIPLE REGISTRATION TIMING UNIT
 223 A TERM STRIP

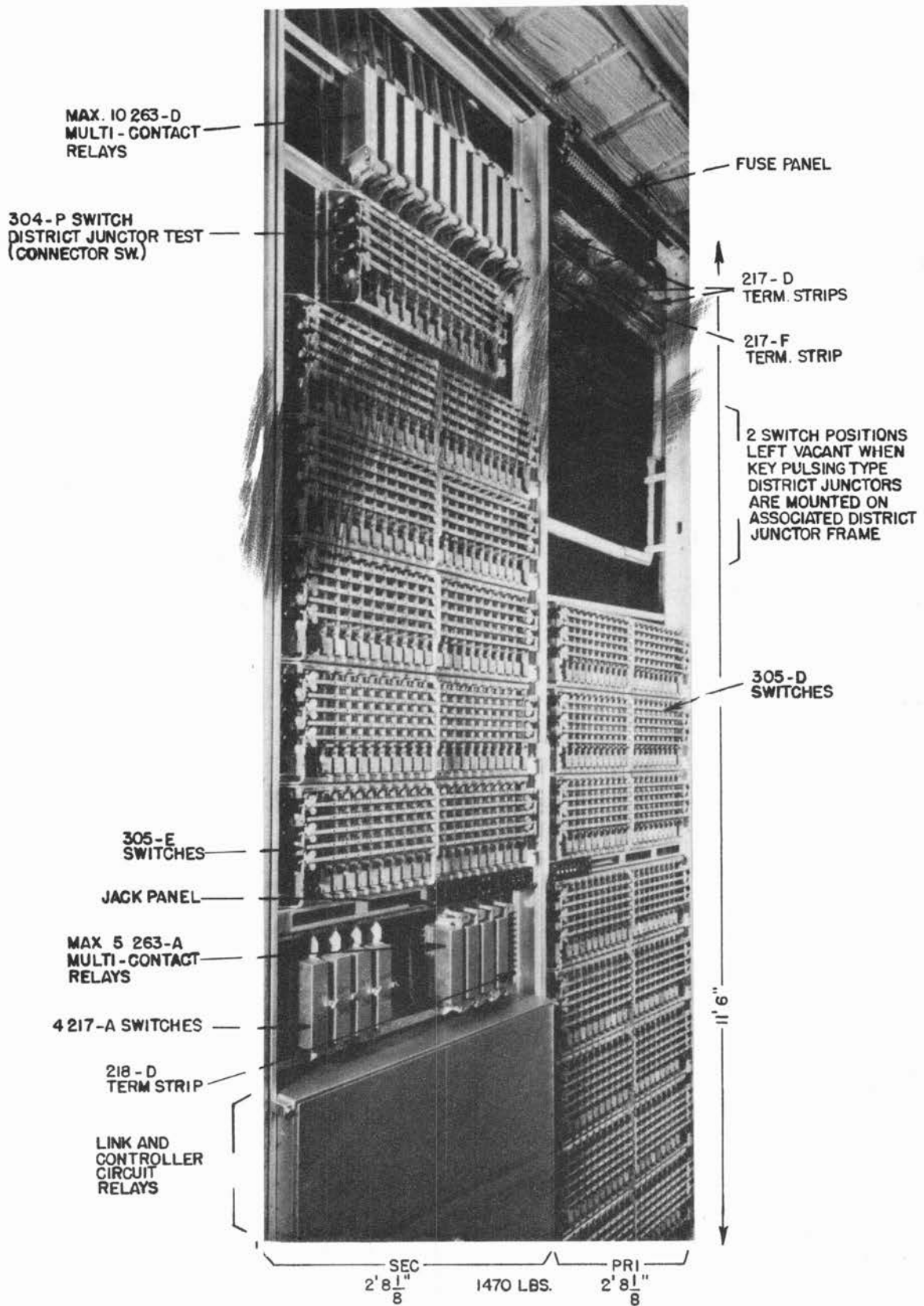


SUBSCRIBER SENDER
 LINK FRAME

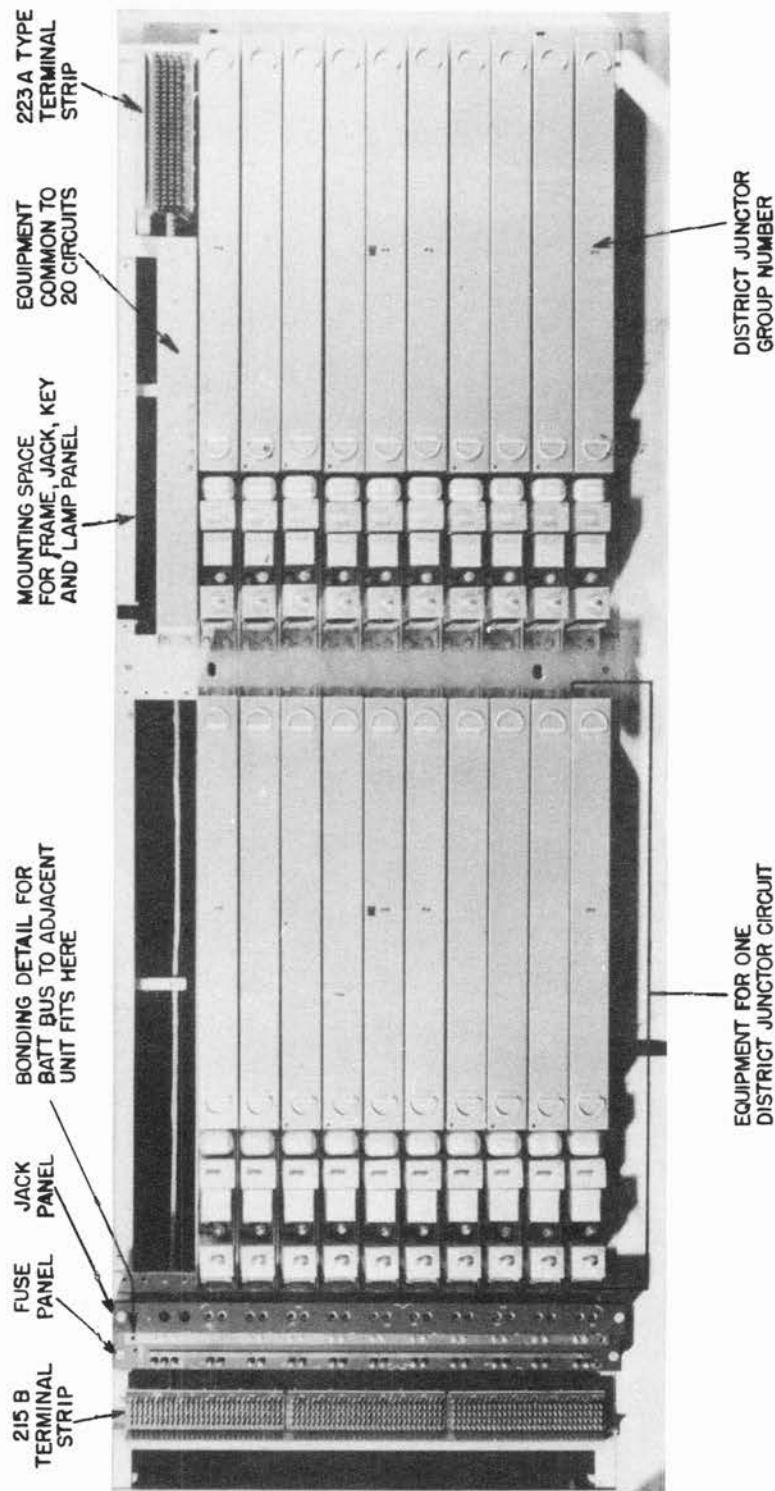
DISTRICT JUNCTIOR FRAME

DISTRICT LINK FRAME

DISTRICT FRAME GROUP



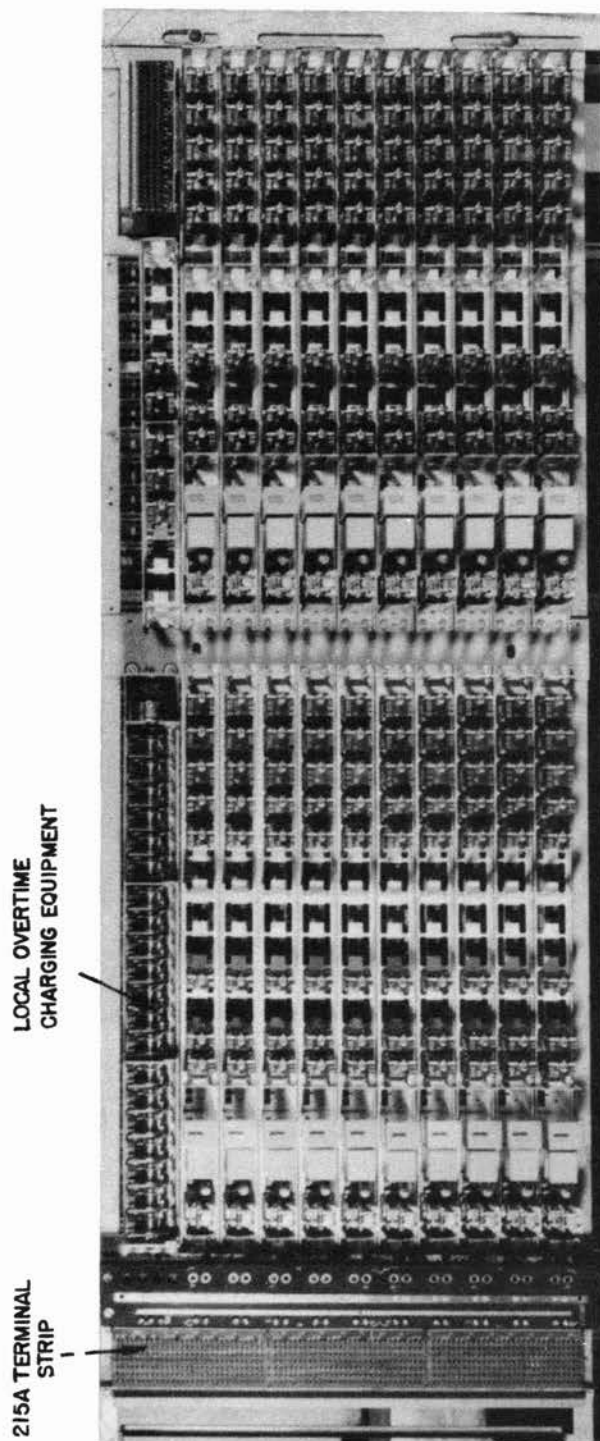
SUBSCRIBER SENDER LINK FRAME



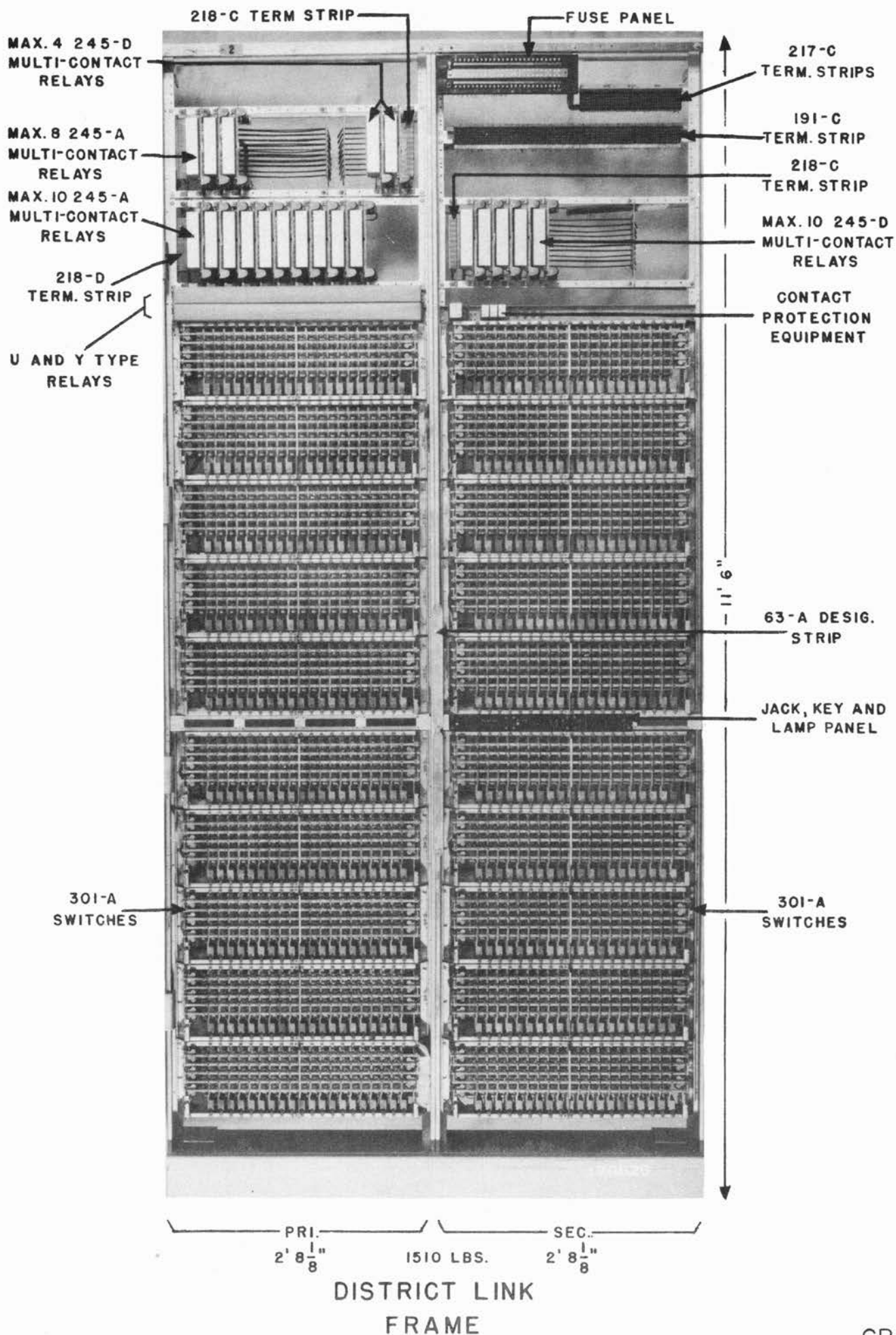
DISTRICT JUNCTIOR UNIT

(COVERS IN PLACE)

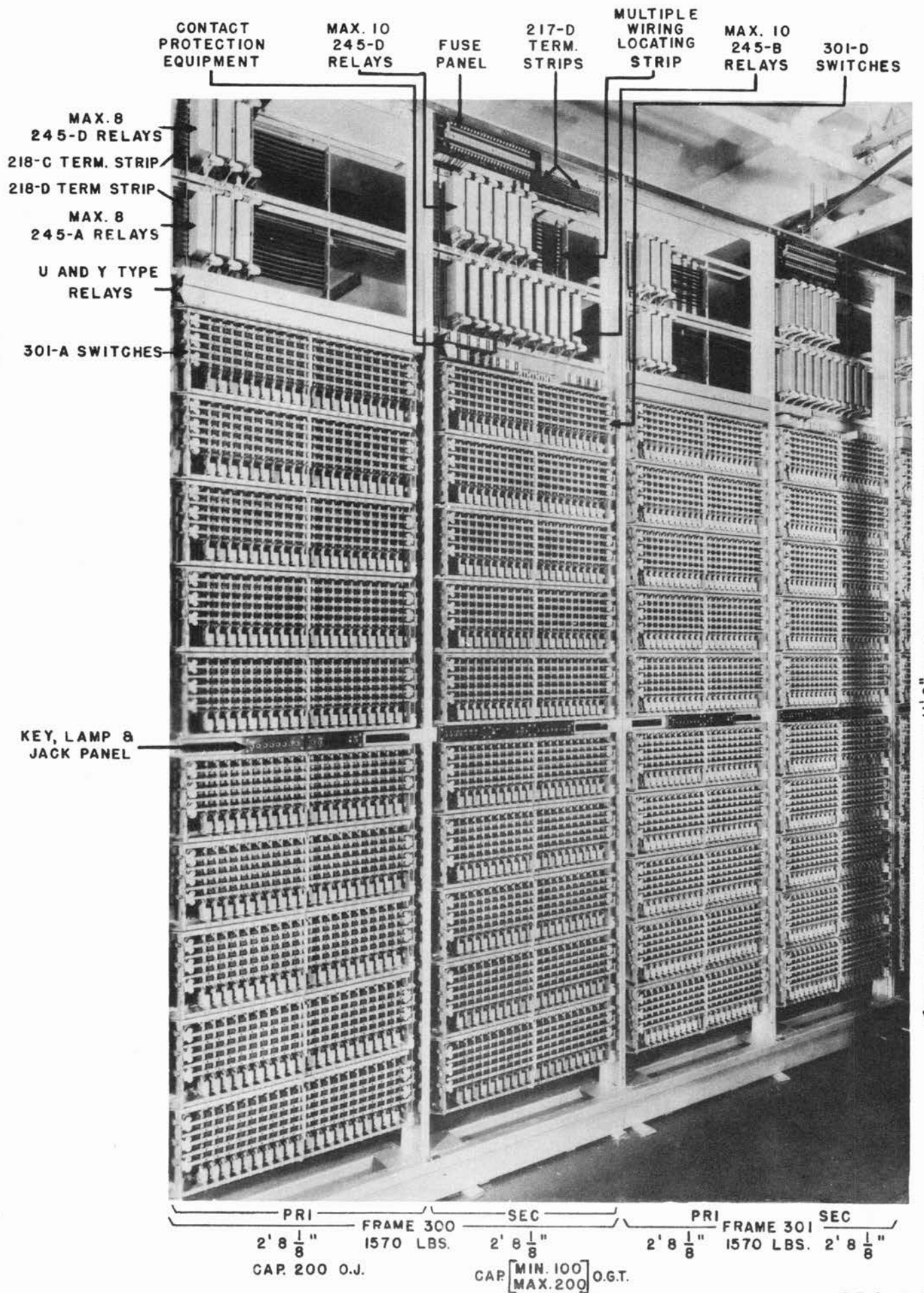
MESSAGE RATE (IND.)



DISTRICT JUNCTOR UNIT
 (COVERS REMOVED)
 MESSAGE RATE (PTY)
 NON-ZONE, OVERTIME



CB8-1-1
AUG. 1939

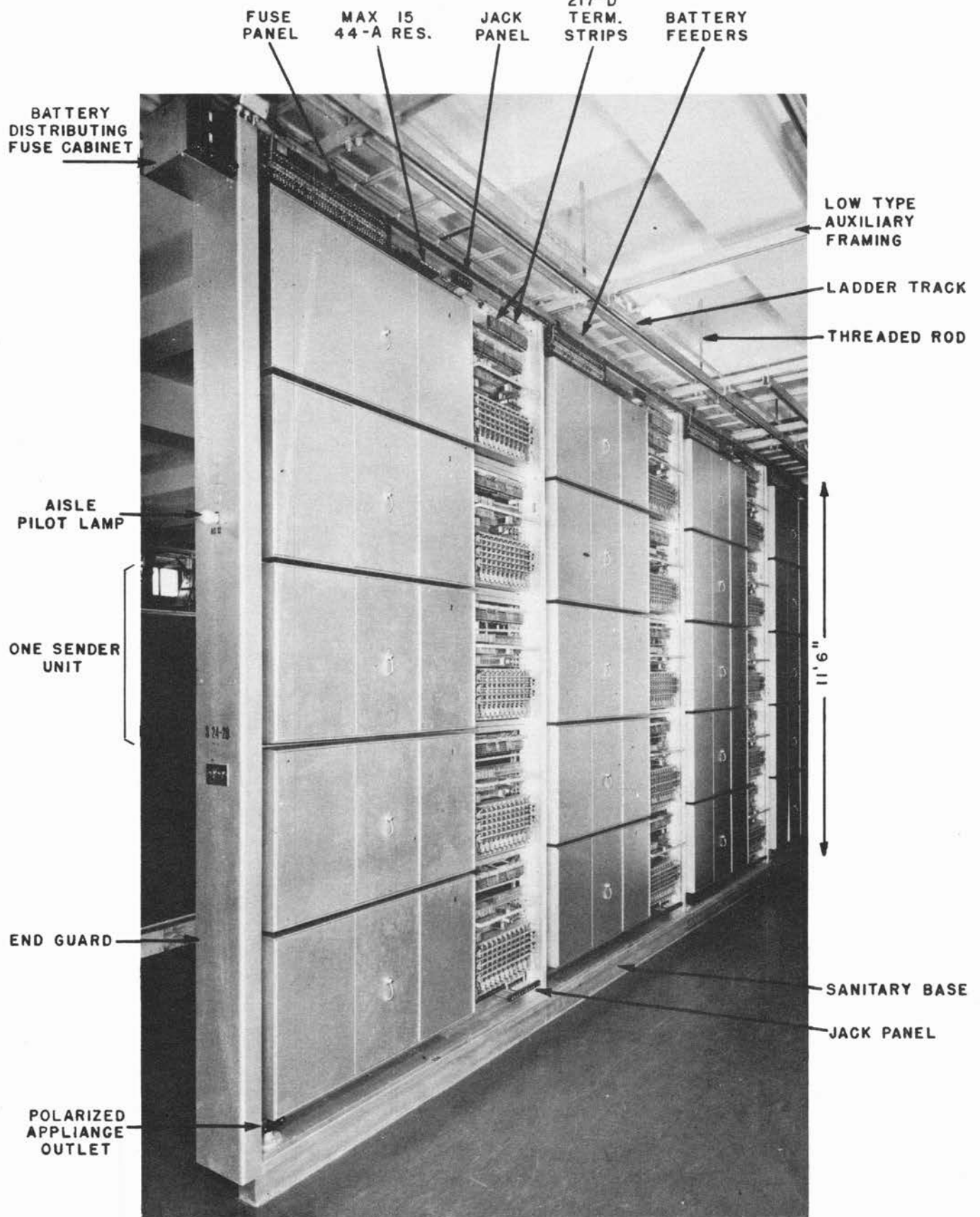


PRI	FRAME 300	SEC	PRI	FRAME 301	SEC
2' 8 1/8"	1570 LBS.	2' 8 1/8"	2' 8 1/8"	1570 LBS.	2' 8 1/8"
CAP. 200 O.J.		CAP. [MIN. 100] O.G.T.		CAP. [MAX. 200] O.G.T.	

OFFICE LINK FRAMES

CB9-1-1
AUG. 1939

CAPACITY
5 SENDER UNITS



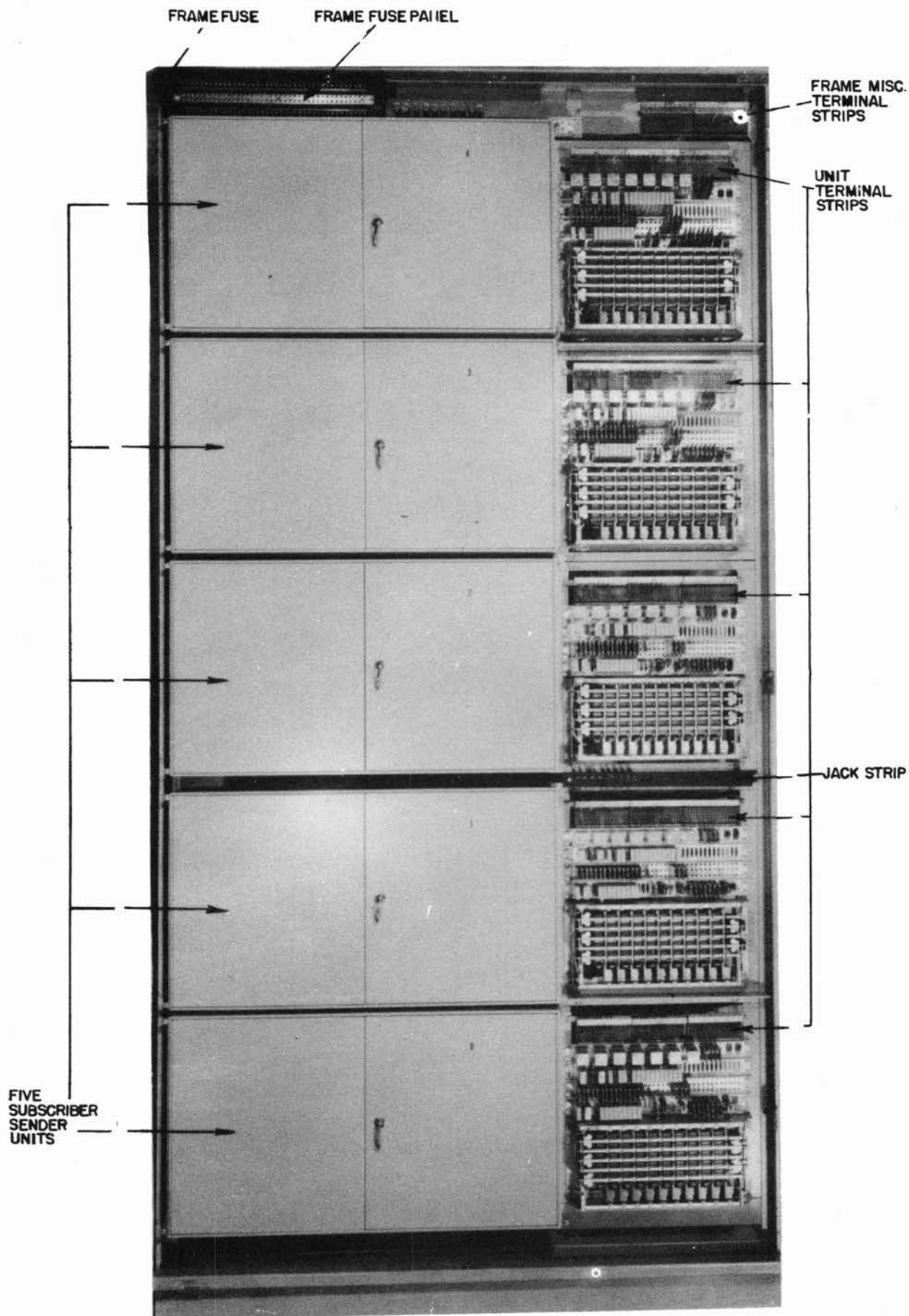
FRAME 24
5' 6 $\frac{7}{8}$ "
1430 LBS.

FR. 25 FR. 26

ORIGINATING SENDER FRAMES
MURRAY HILL - 6 OFFICE, EAST 30 TH. ST. NEW YORK

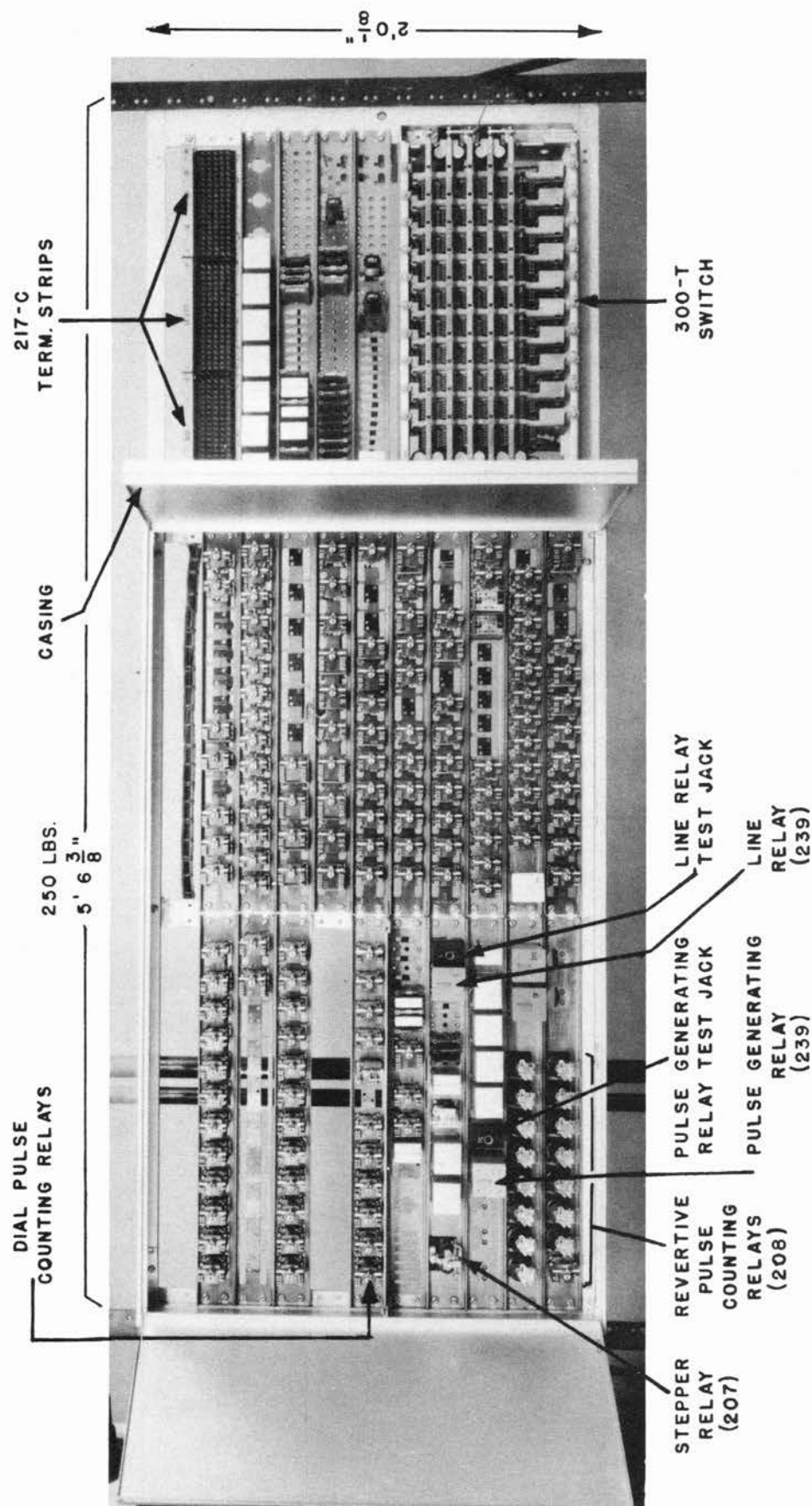
TCI Library www.telephonecollectors.info

CB12-1-1
AUG. 1939



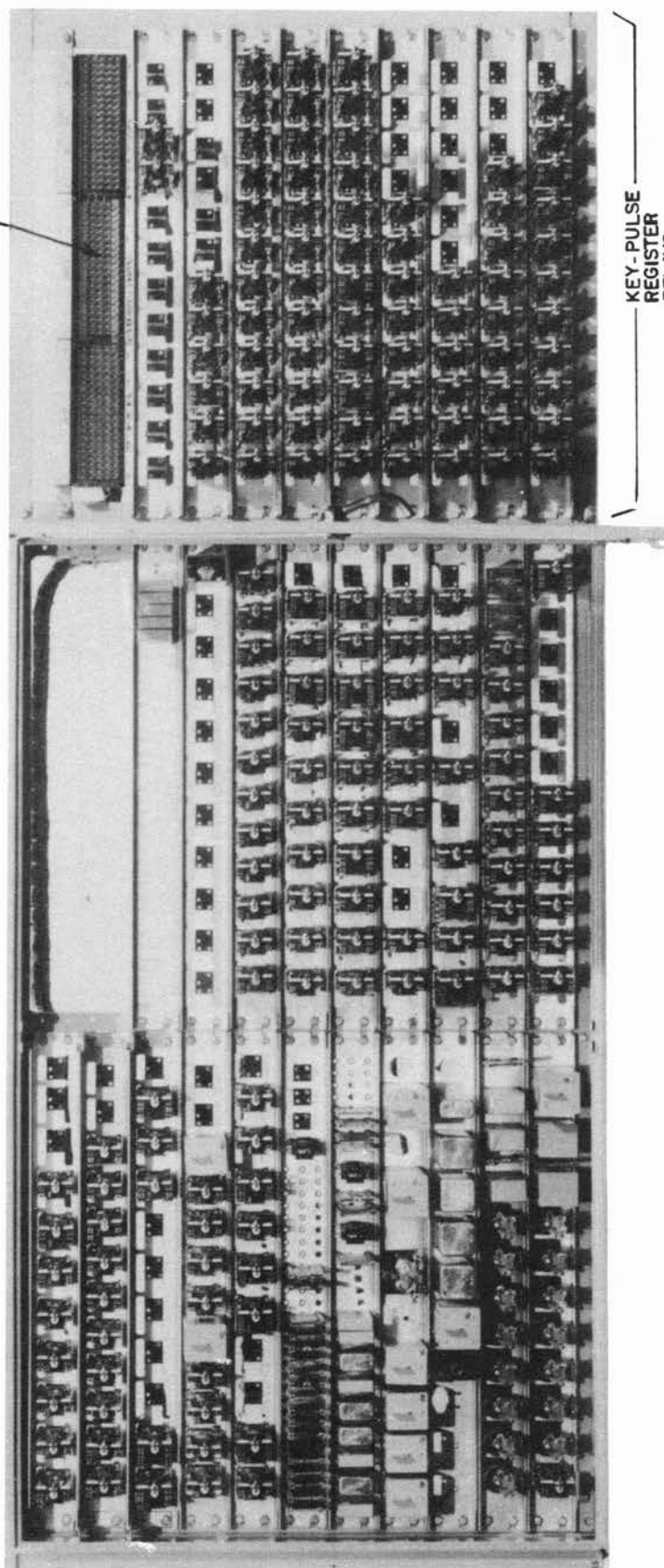
ORIGINATING SENDER FRAME

CB 12-2-1
DEC. 1947



SUBSCRIBER SENDER UNIT

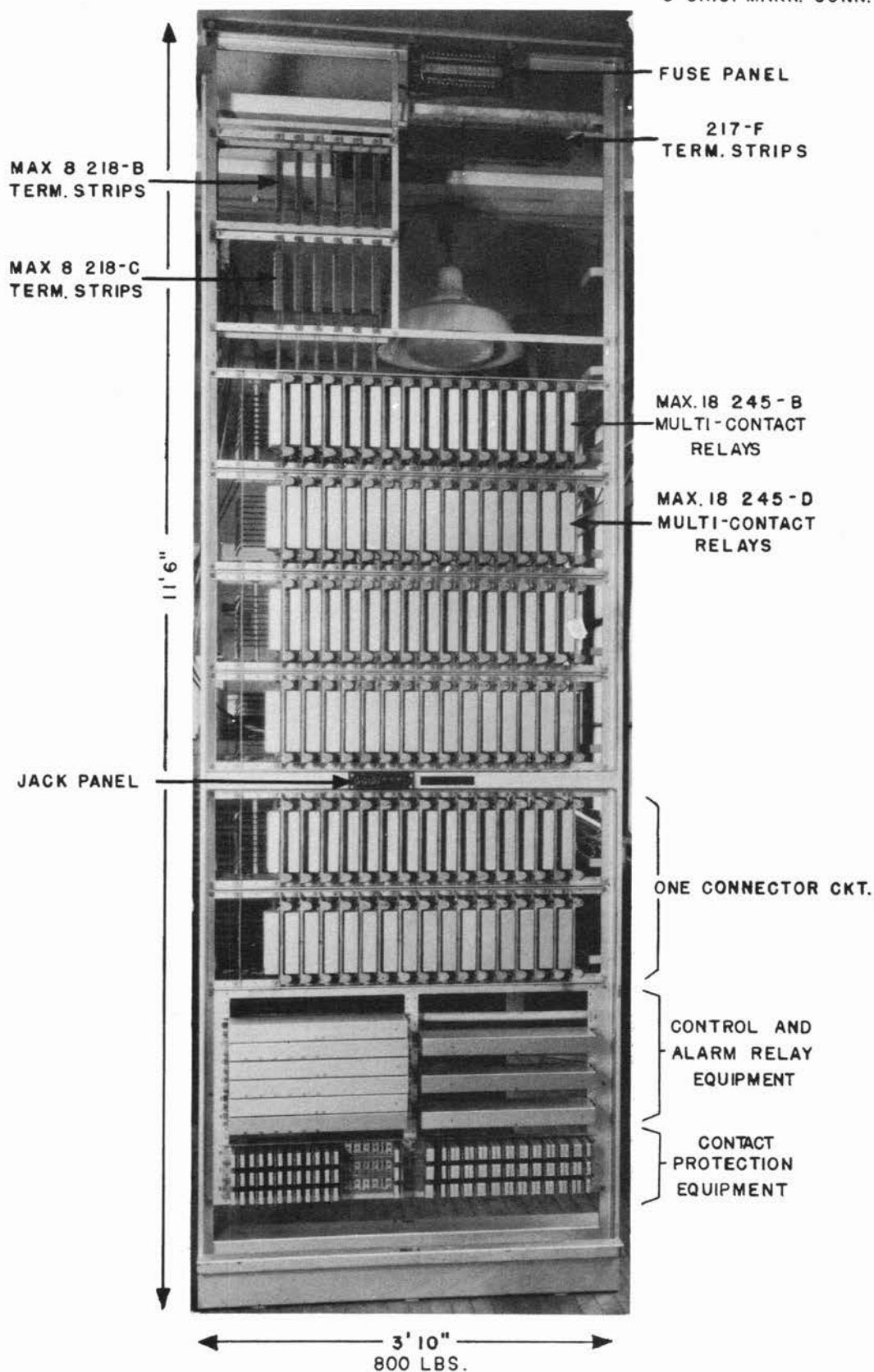
UNIT TERMINAL STRIPS



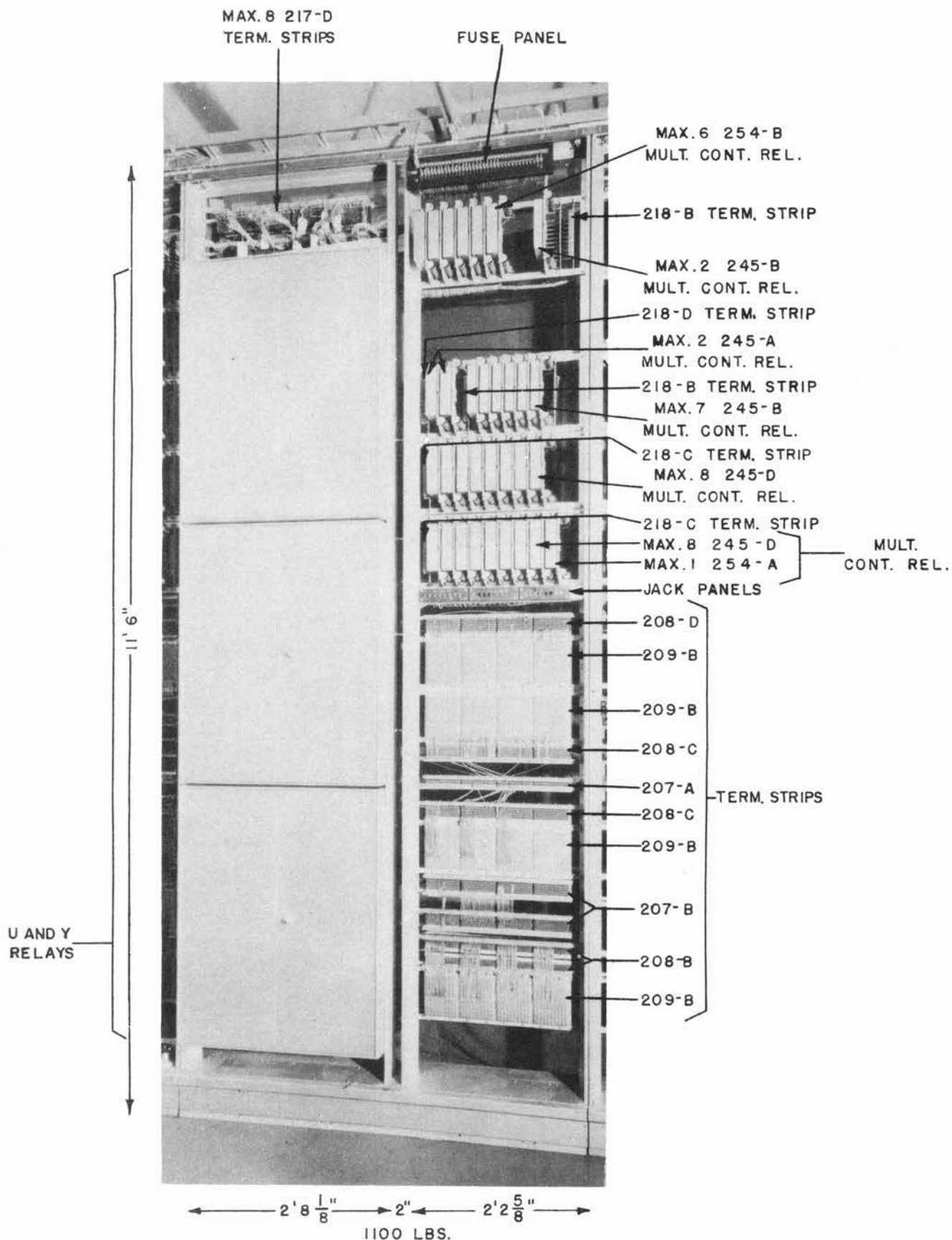
KEY-PULSE
REGISTER
RELAYS

KEY PULSING SENDER UNIT

CAPACITY
 8 ORIGINATING MARKERS
 30 SUBSCRIBER SENDERS
 3 ORIG. MARK. CONN. CKTS



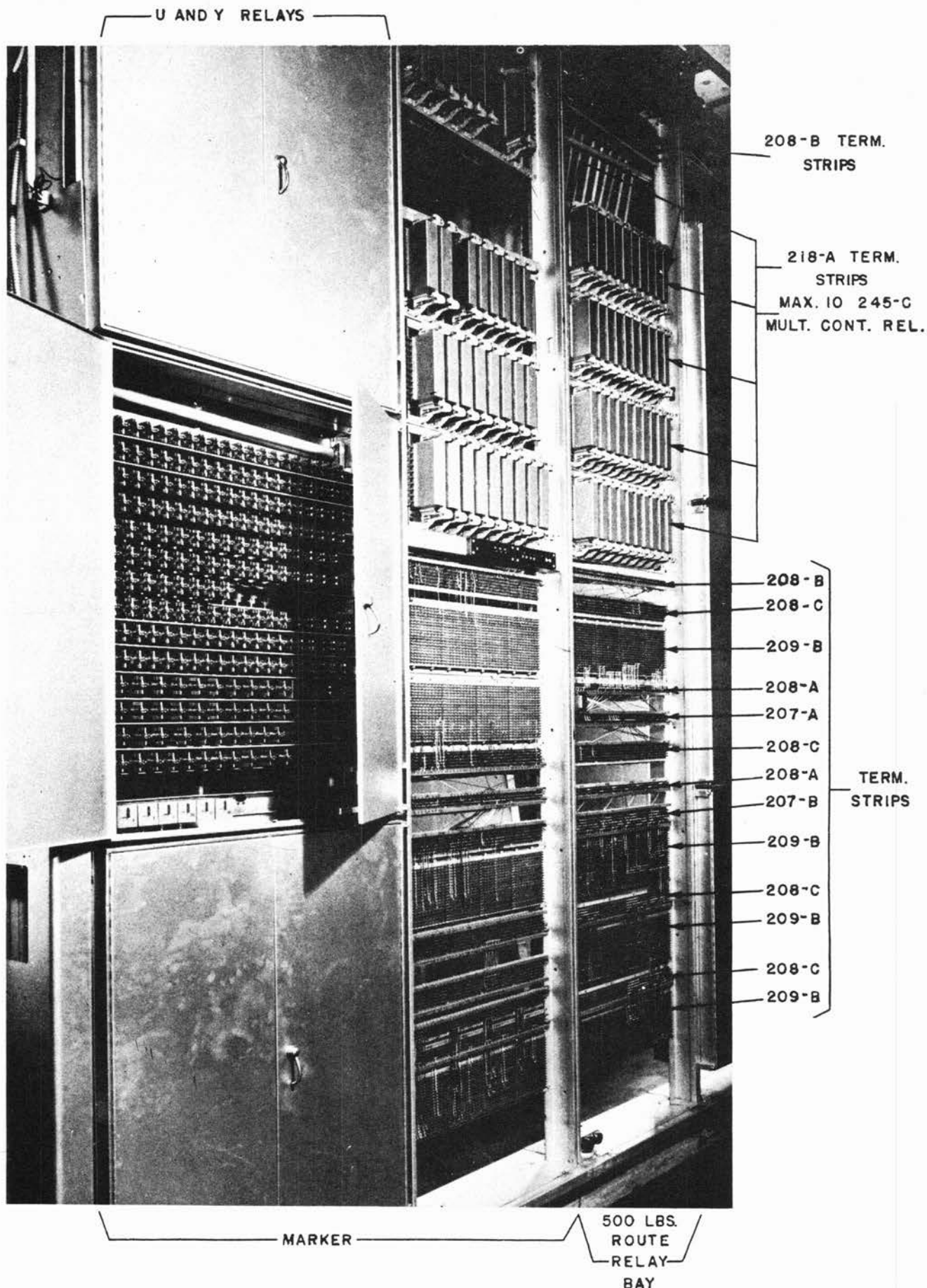
ORIGINATING MARKER CONNECTOR FRAME



ORIGINATING MARKER FRAME

PRESIDENT-2 OFFICE, TROY AVE. BROOKLYN

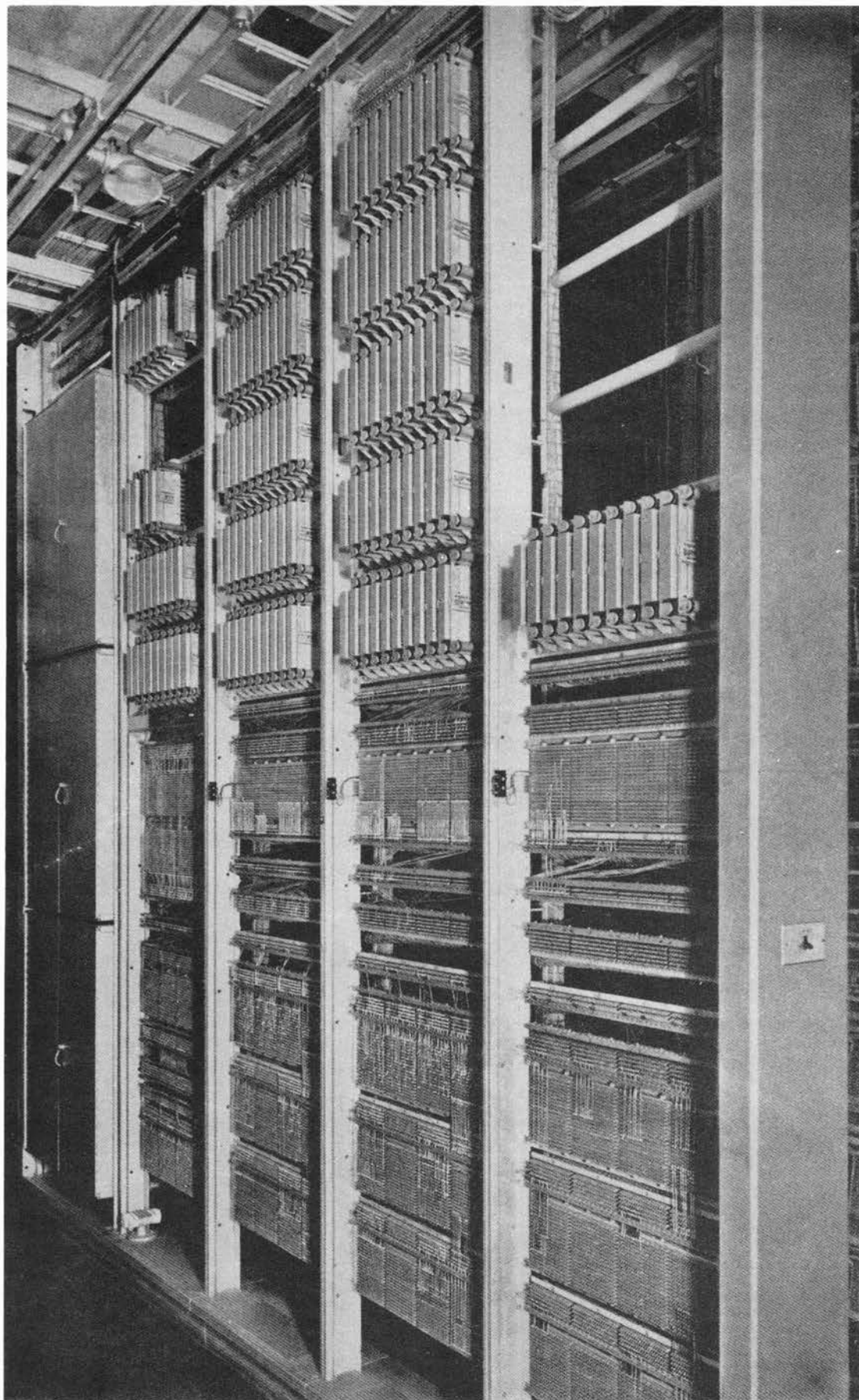
CBI4-1-1
AUG. 1939



ORIGINATING MARKER FRAME AND ROUTE RELAY BAY

LYNN OFFICE, LYNN MASS.

CBI4-1-2
AUG. 1939

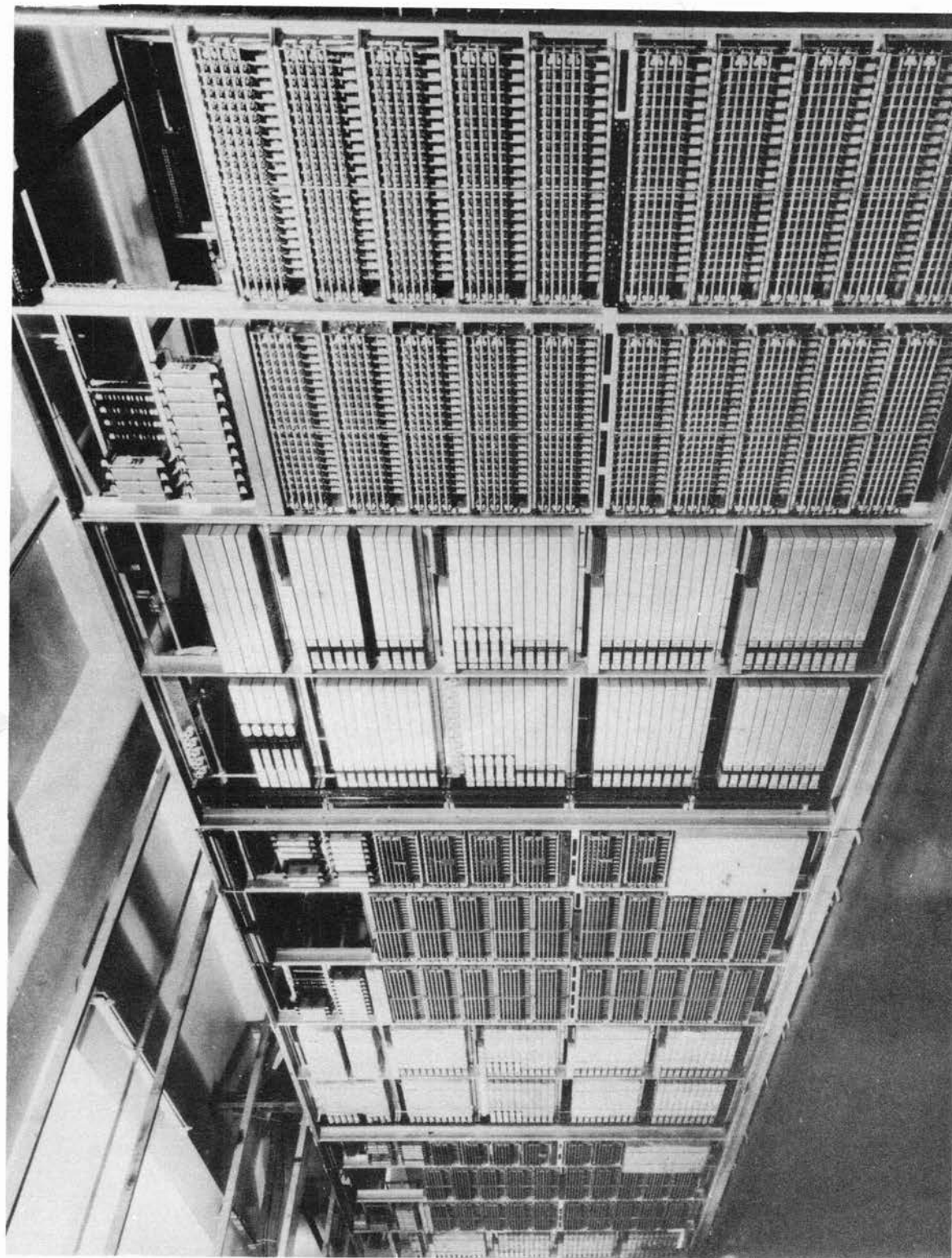


\ MARKER — R.R. — R.R. — R.R. /
 FRAME BAY BAY BAY

ORIGINATING MARKER FRAME AND ROUTE RELAY BAYS

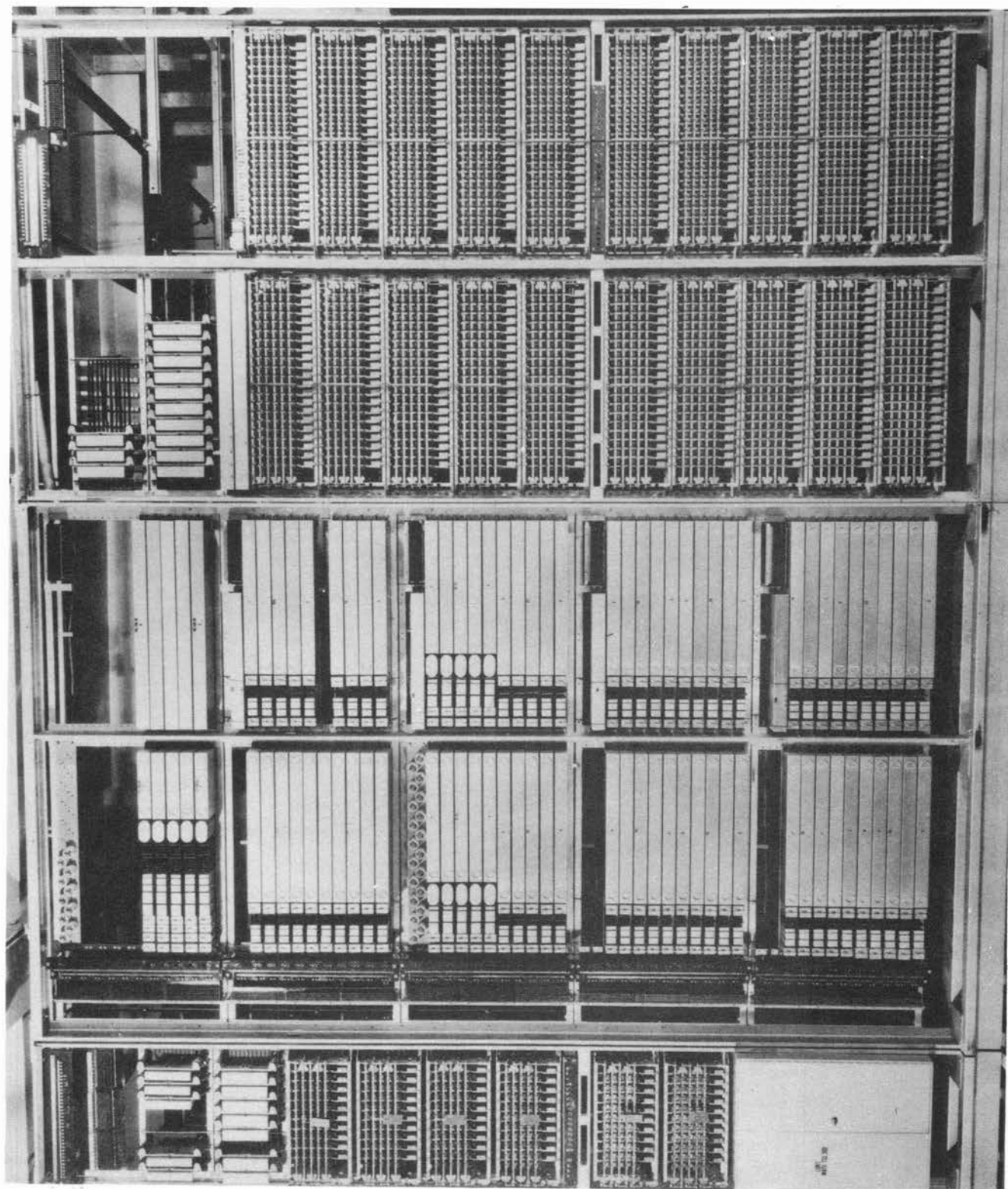
MURRAY HILL - 6 OFFICE, EAST 30 TH. ST. NEW YORK

CB14-1-
AUG. 193



INCOMING FRAME GROUPS
PRESIDENT- 2 OFFICE, TROY AVE. BROOKLYN

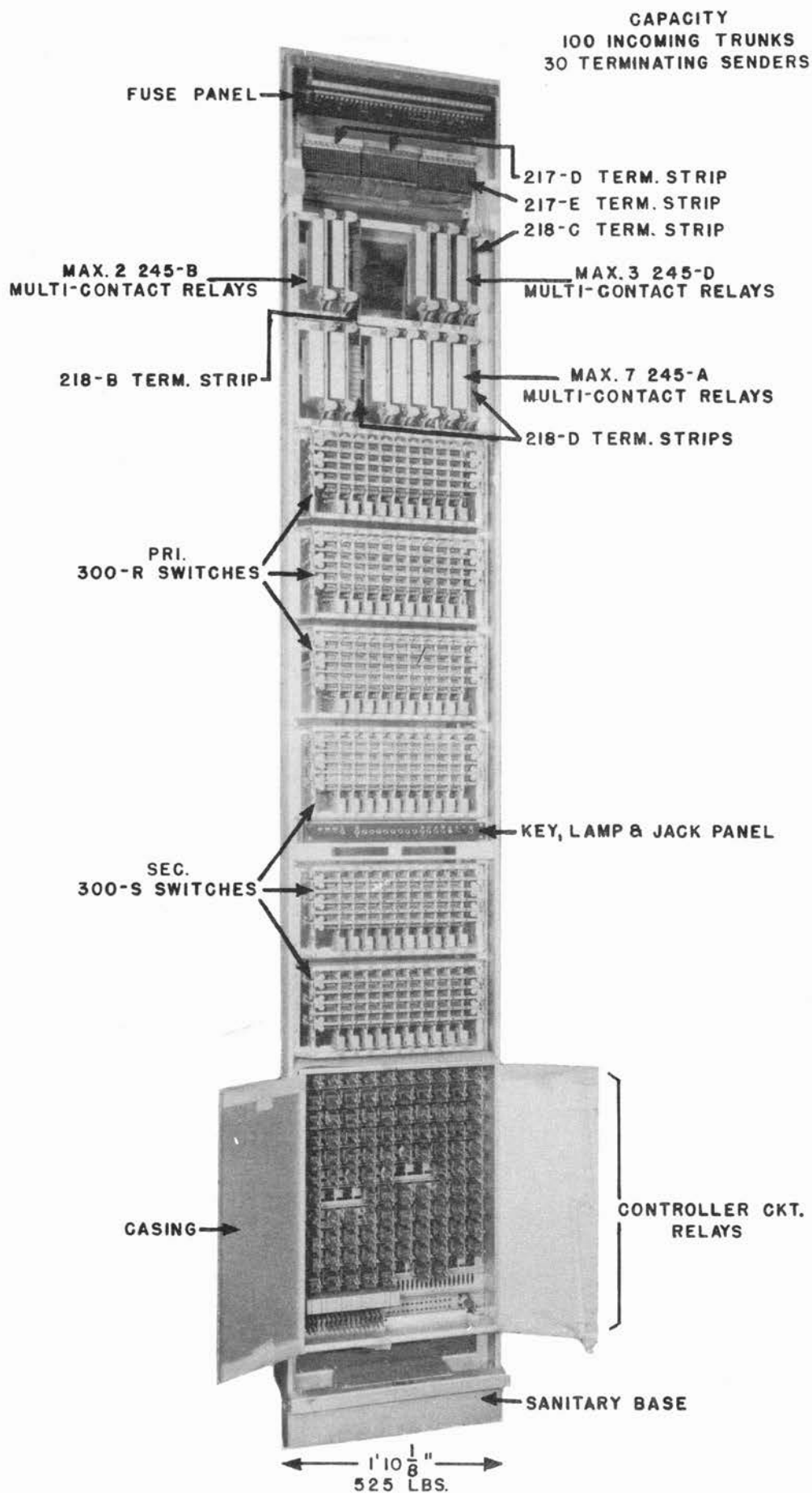
CB15-1-1
AUG. 1939



TERM SENDER LINK FRAME — INCOMING TRUNK FRAME — INCOMING LINK FRAME

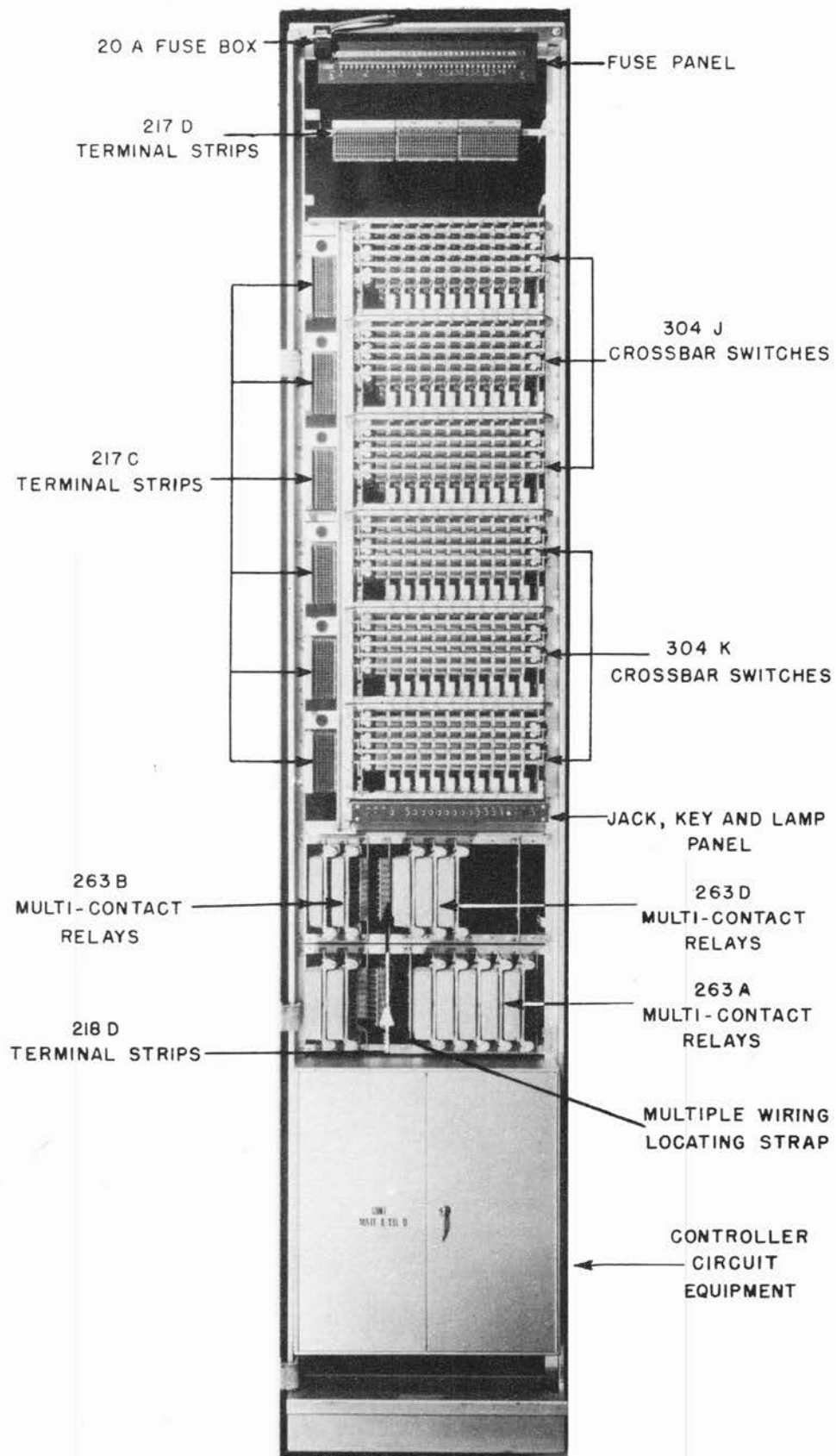
INCOMING FRAME GROUP

CB15-1-2
AUG. 1939



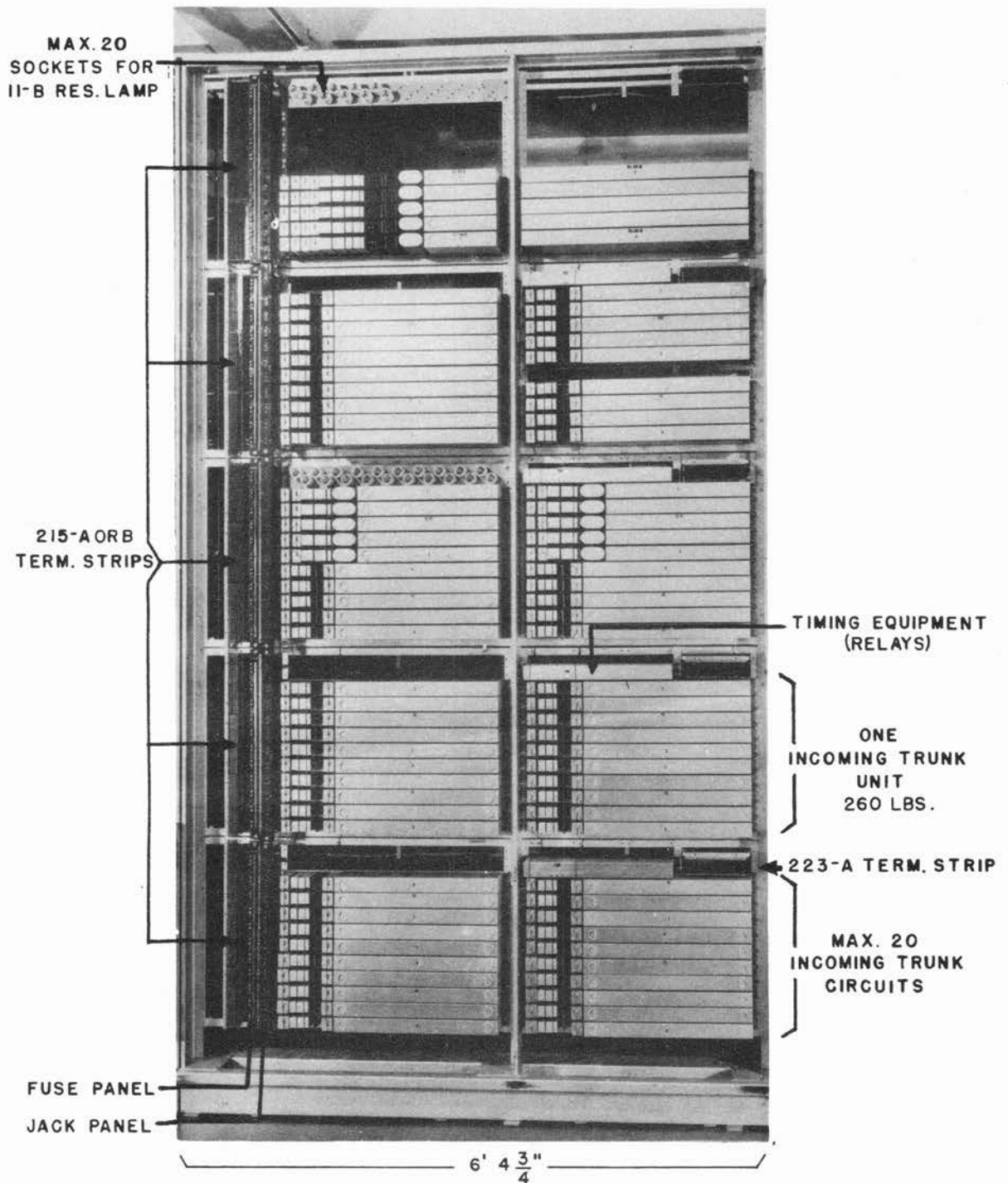
TERMINATING SENDER
LINK FRAME

CB16-1-1
AUG. 1939



TERMINATING SENDER LINK FRAME

CAPACITY
100 INCOMING TRUNKS



INCOMING TRUNK FRAME

215 B
TERMINAL
STRIP

FUSE
PANEL

JACK
PANEL

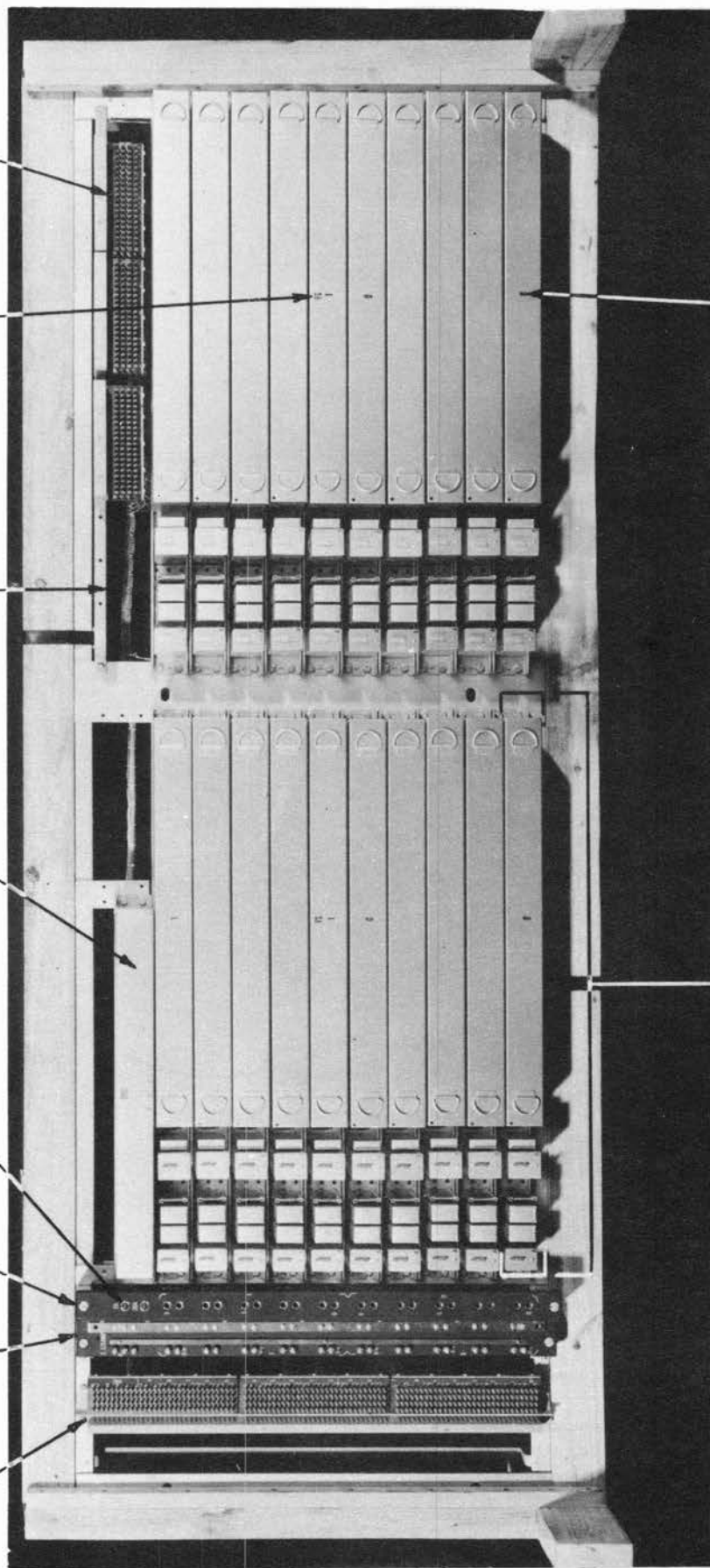
FUSE ALARM
LAMPS

TIMING EQUIPMENT
COMMON TO
A UNIT

MOUNTING SPACE
FOR FRAME, JACK, KEY
AND LAMP PANEL

TYPE OF
TRUNK
CIRCUIT

217 B
TERMINAL
STRIPS

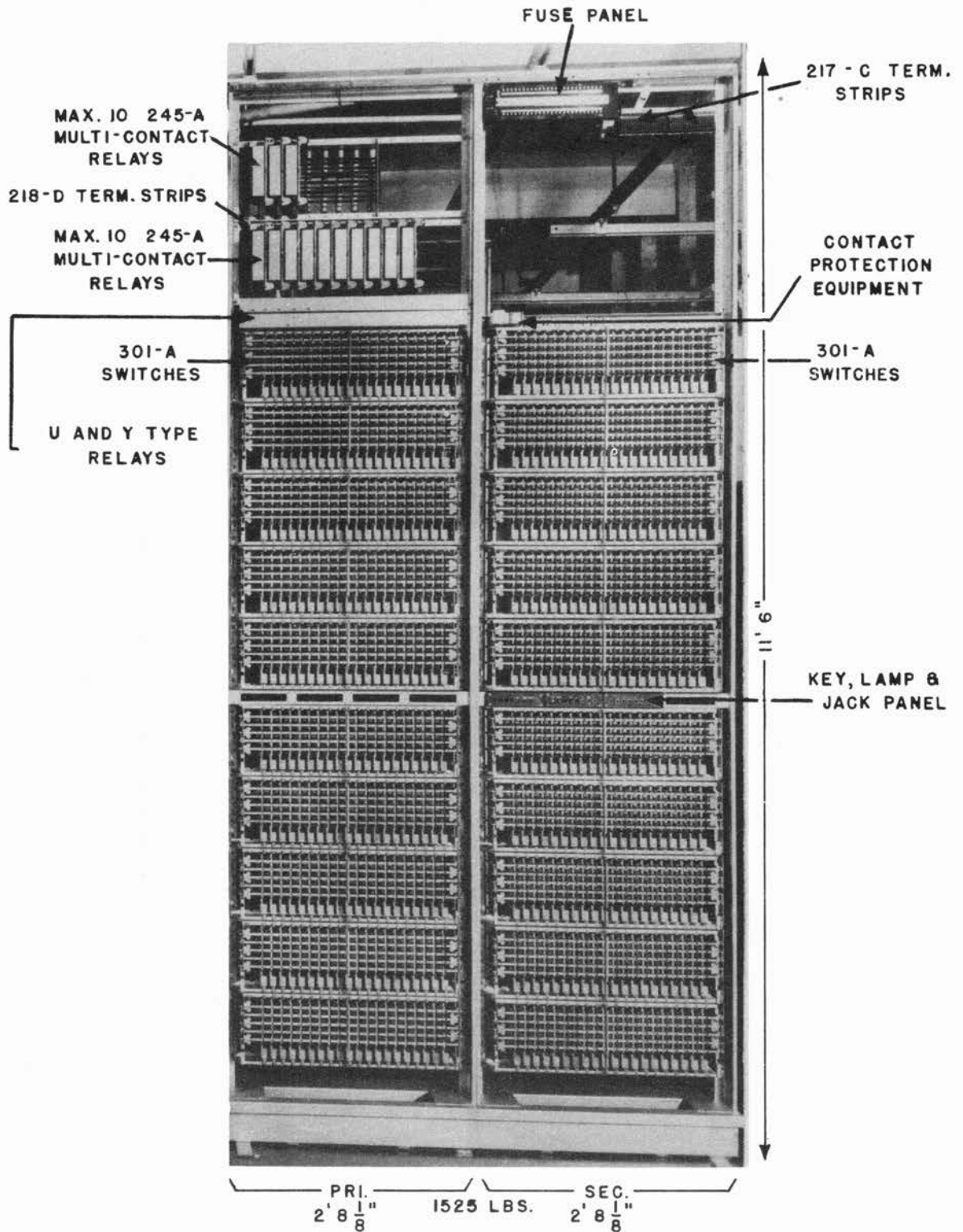


TRUNK GROUP
NUMBER

EQUIPMENT FOR ONE
TRUNK CIRCUIT

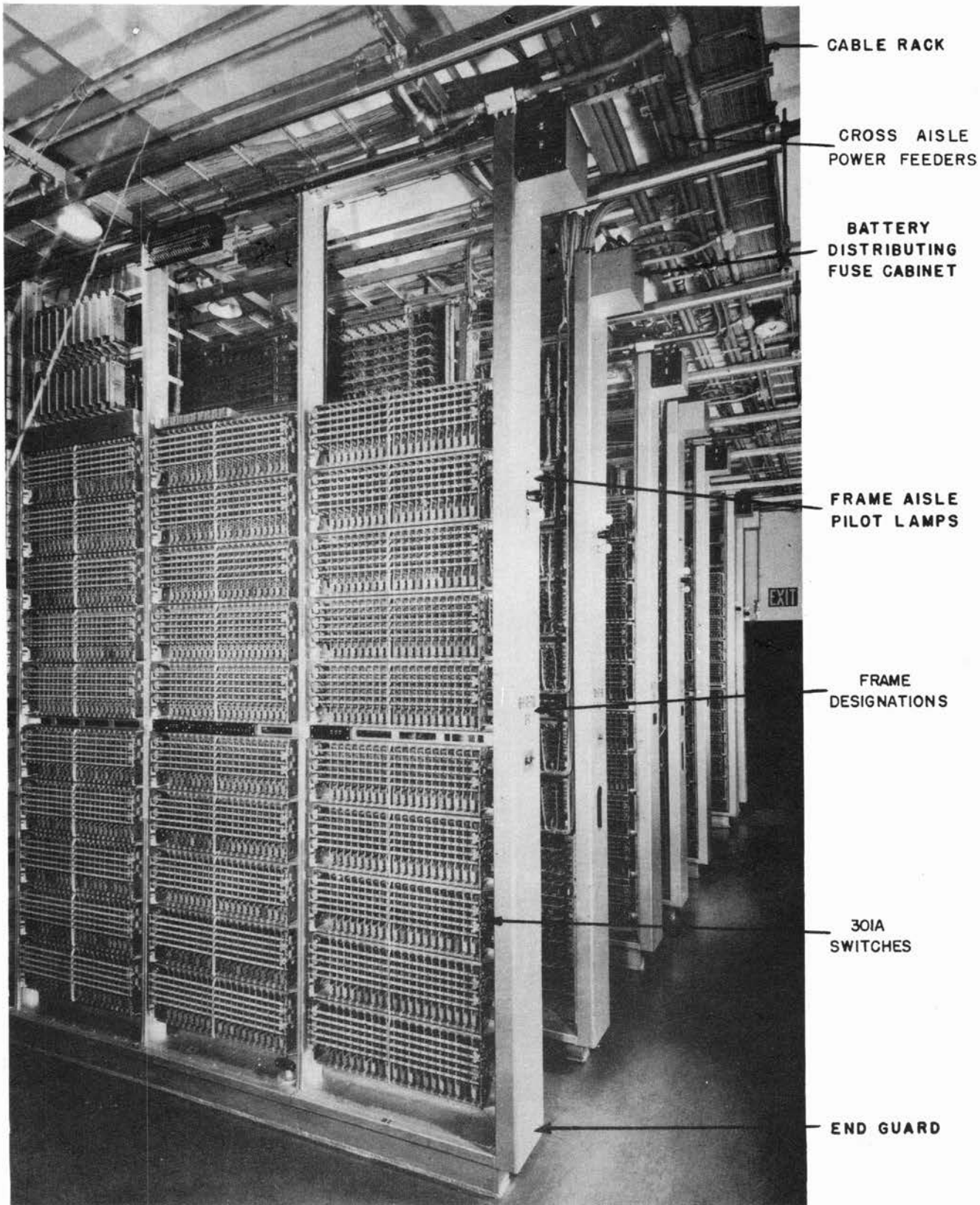
INCOMING TRUNK UNIT

CAPACITY
 100 INC. TRUNKS
 200 LINE JUNCTORS



INCOMING LINK FRAME

CB18-1-1
 AUG. 1939




 PRI. SEC.
 INCOMING LINK FRAME EXTENSION FRAME

INCOMING LINK FRAME WITH EXTENSION FRAME

MURRAY HILL - 6 OFFICE, EAST 30 TH ST. NEW YORK

CB18-1-2
AUG. 1939

MAX. IO 263-A
MULTI-CONTACT-
RELAYS

308-A
SWITCHES

2 217-D TERM STRIPS

2 217-C TERM STRIPS

IO 263-A
MULTI-CONTACT
RELAYS

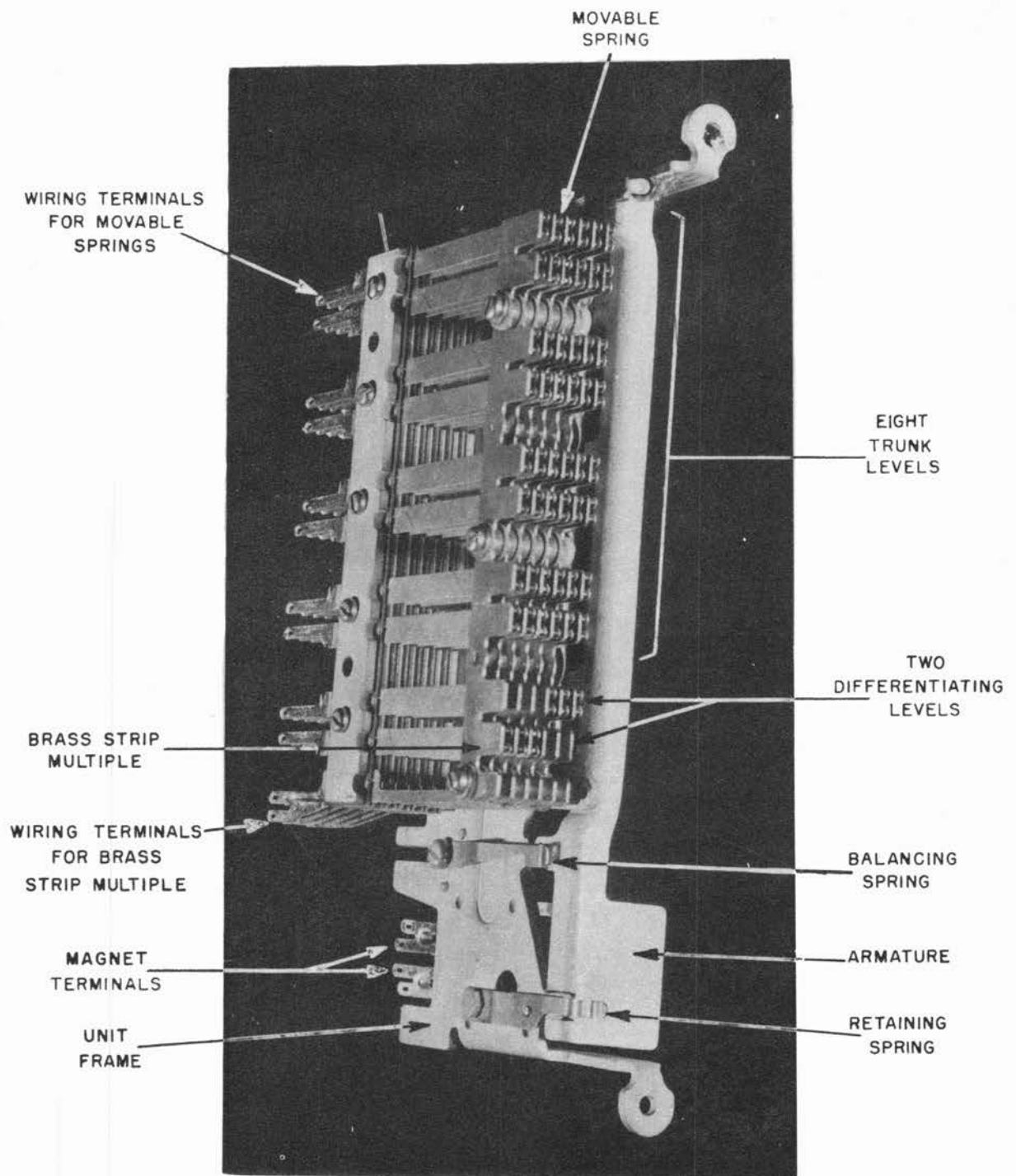
305-B
SWITCHES

CAPACITY

160 INC TRKS
200 LINE JUNCTORS

INCOMING LINK FRAME

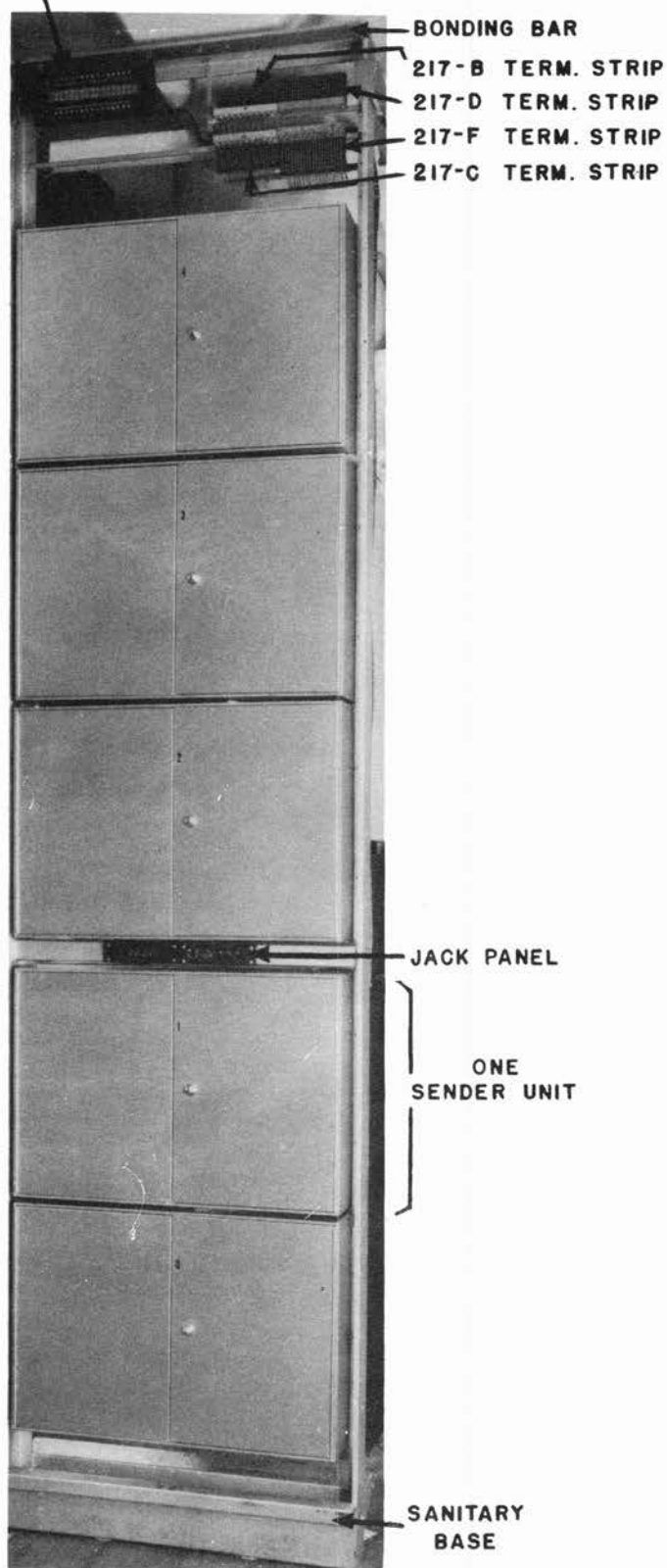
CB 18-1-3
DEC. 1947



VERTICAL UNIT USED IN 160-TRUNK
INCOMING LINK PRIMARY
CROSSBAR SWITCH

CAPACITY
5 SENDER UNITS

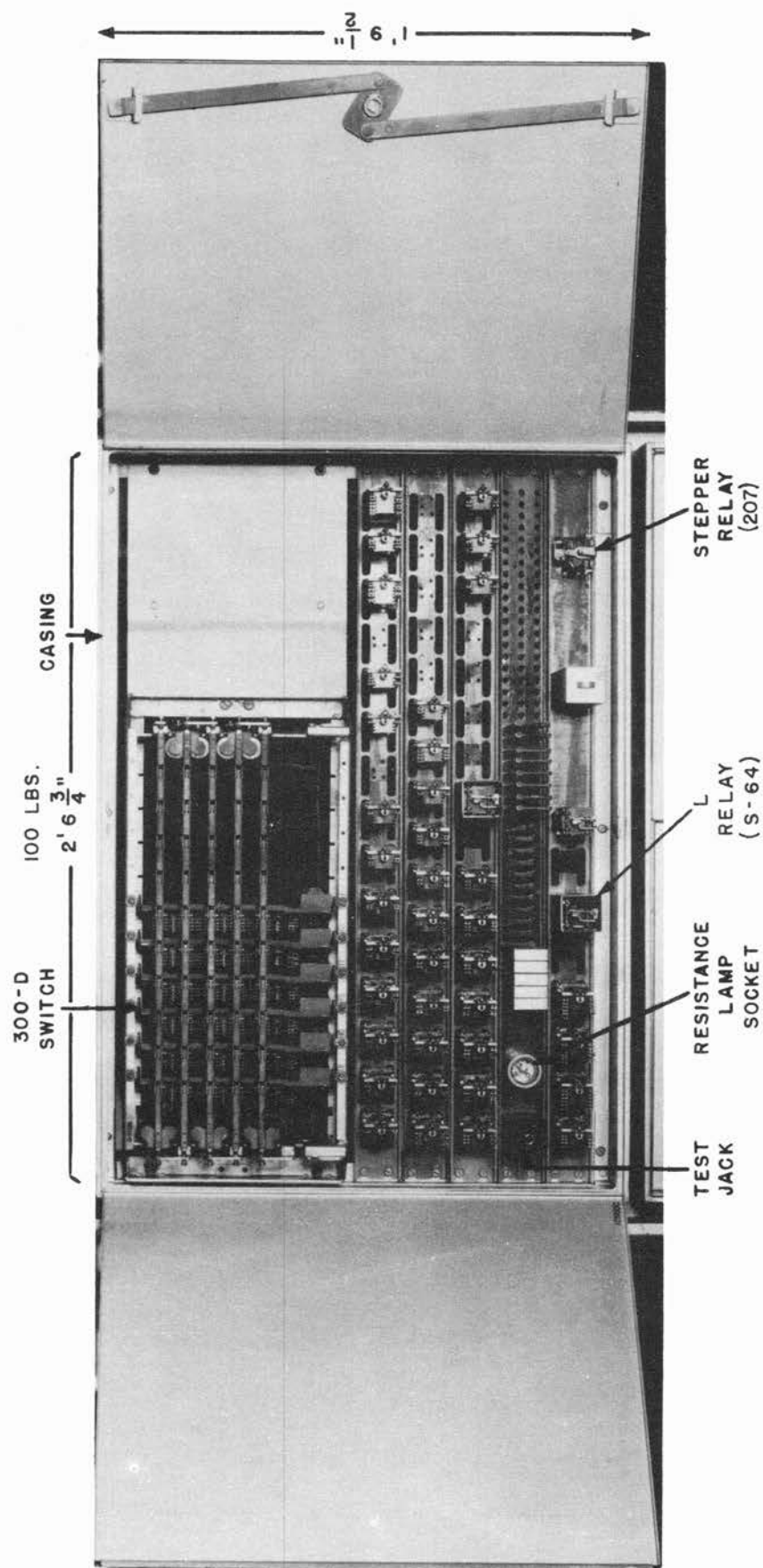
FUSE
PANEL



2' 10"
735 LBS.

TERMINATING SENDER FRAME

CB19-1-1
AUG. 1939

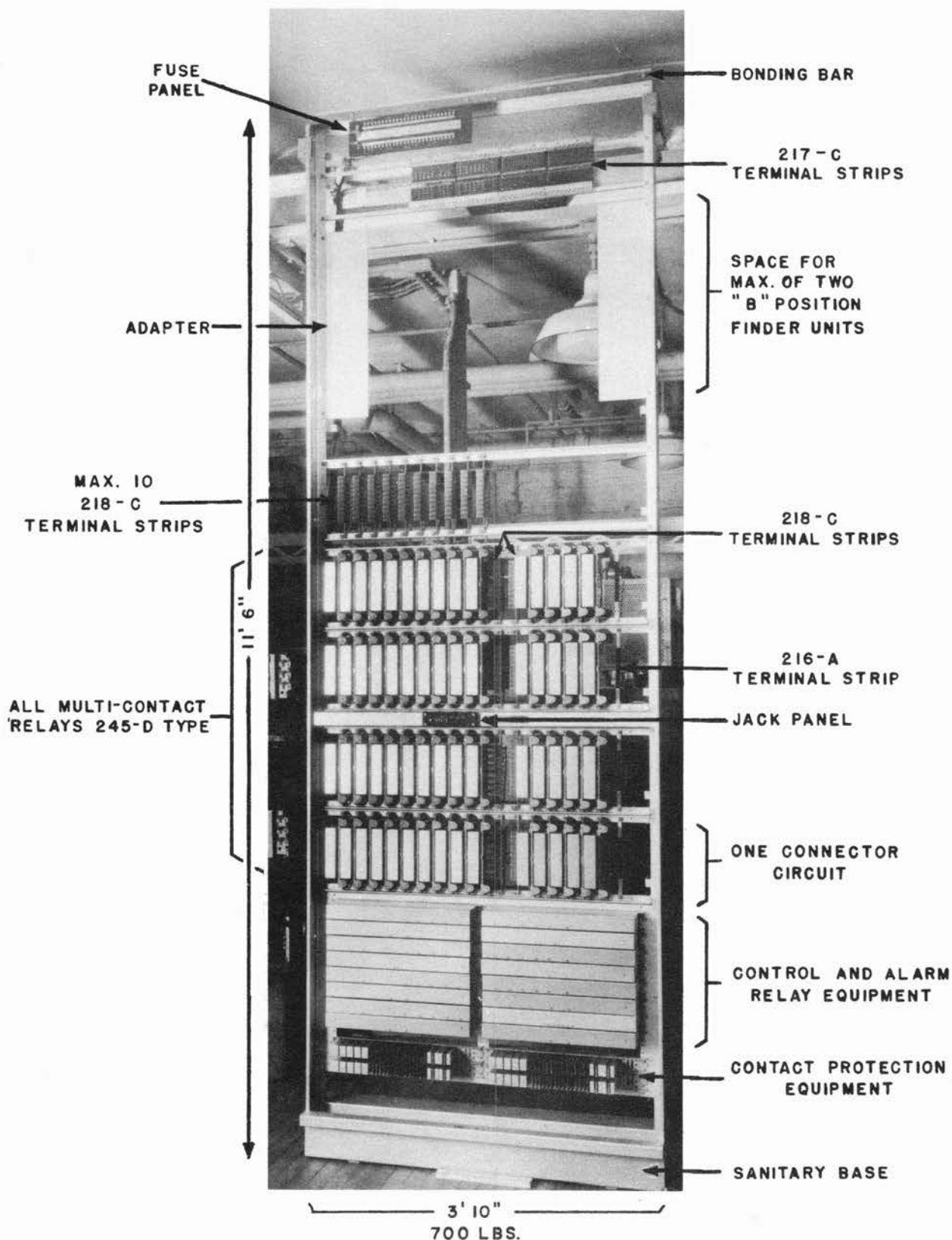


TERMINATING SENDER UNIT
(FULL SELECTOR TYPE)

CB19-4-1
AUG. 1939

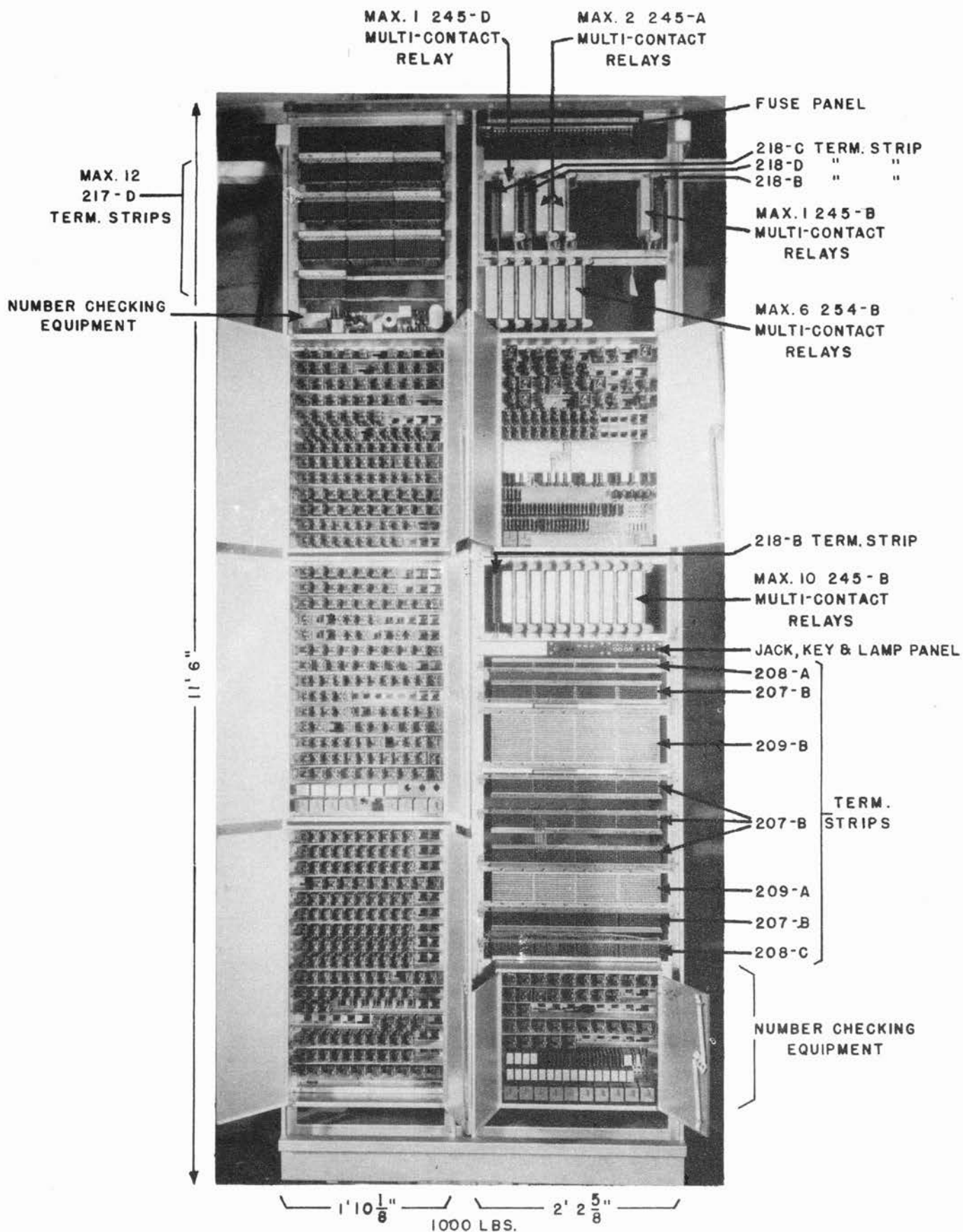
CAPACITY

4-CONN. CKTS. PER. FRAME
5-SENDERS PER CONN. CKT.
10-MARKERS PER CONN. CKT.



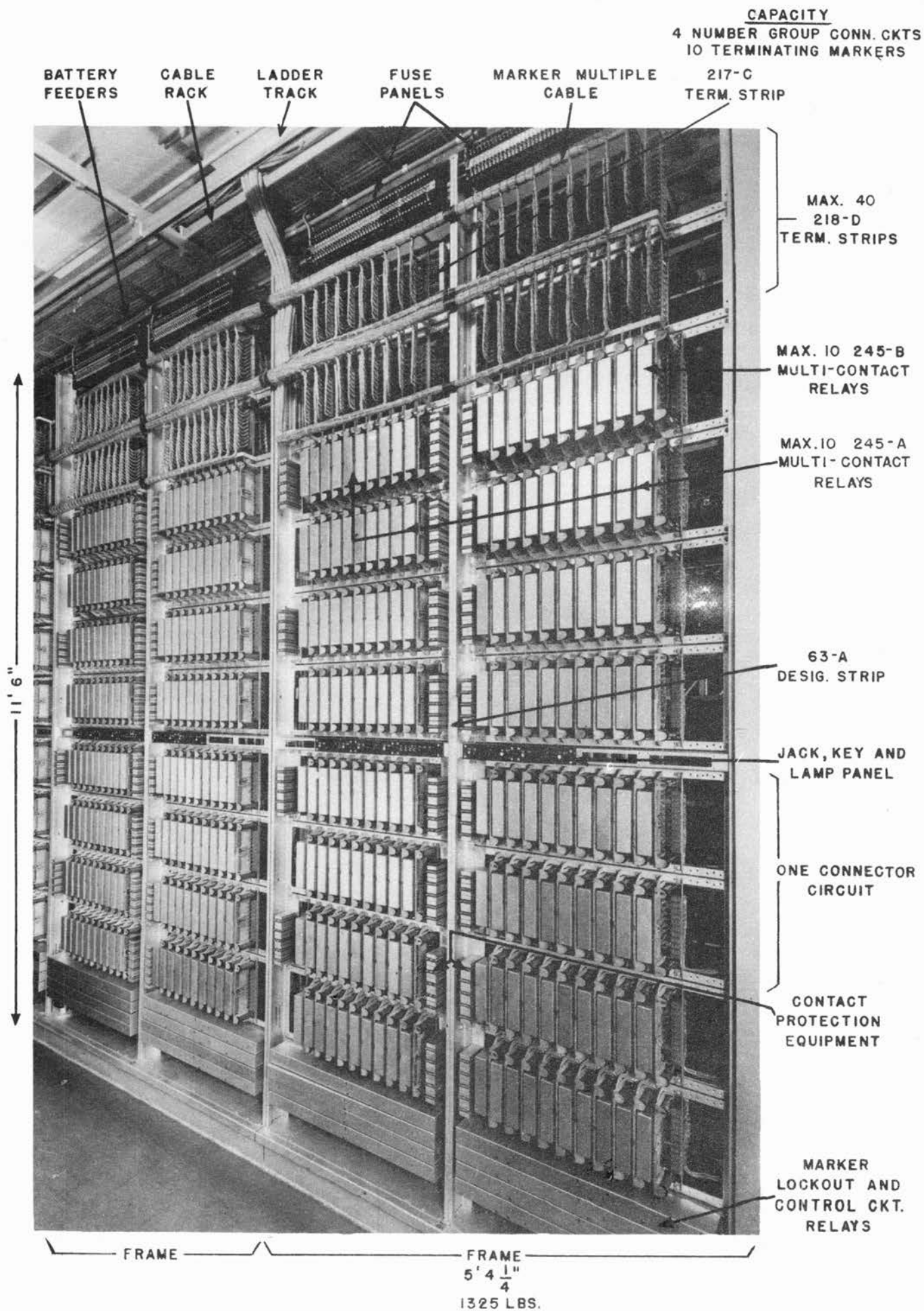
TERMINATING MARKER
CONNECTOR FRAME

CB 20-1-1
AUG. 1939



TERMINATING MARKER FRAME

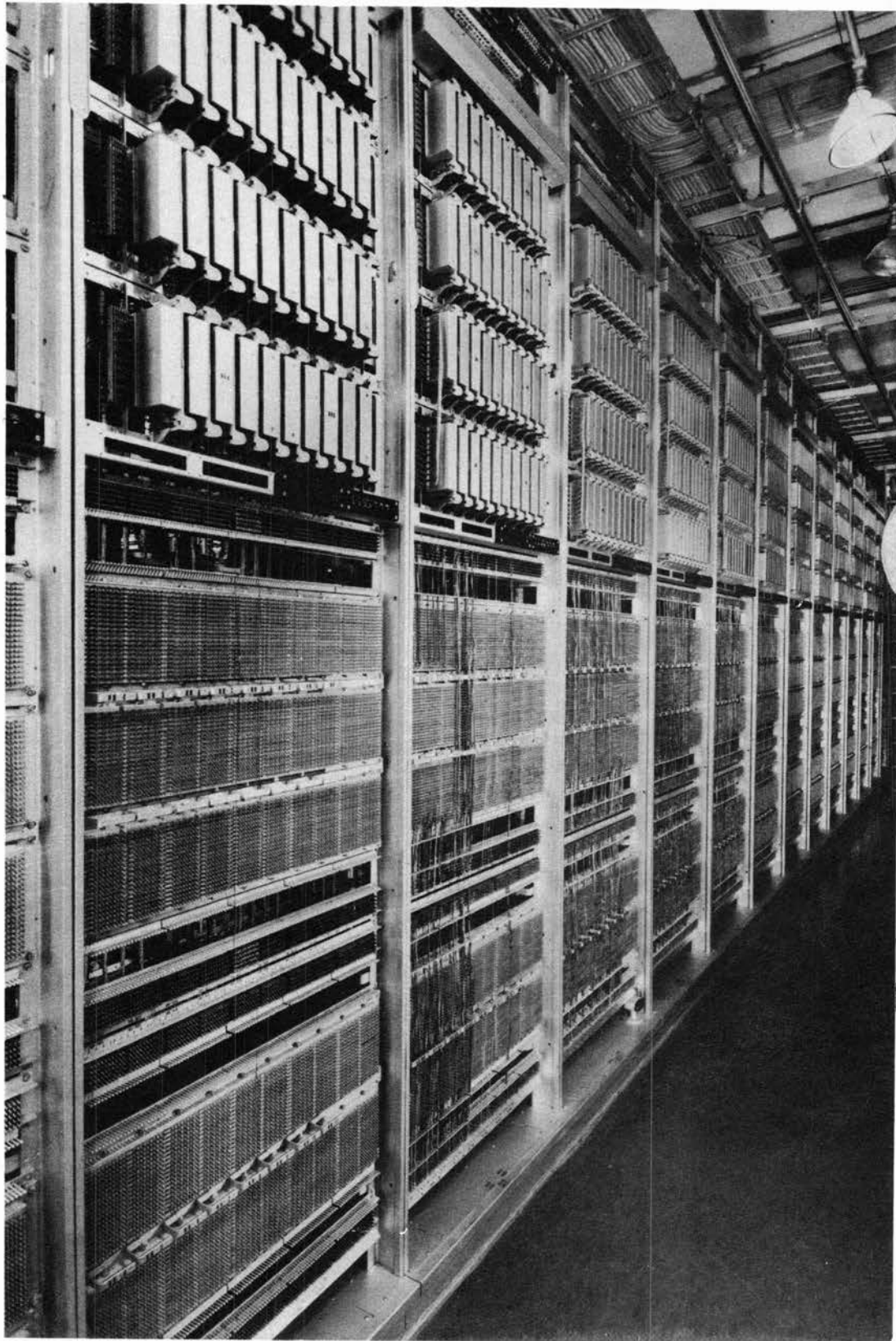
CB21-1-1
AUG. 1939



NUMBER GROUP CONNECTOR FRAMES

TCI Library www.telephonecollectors.info

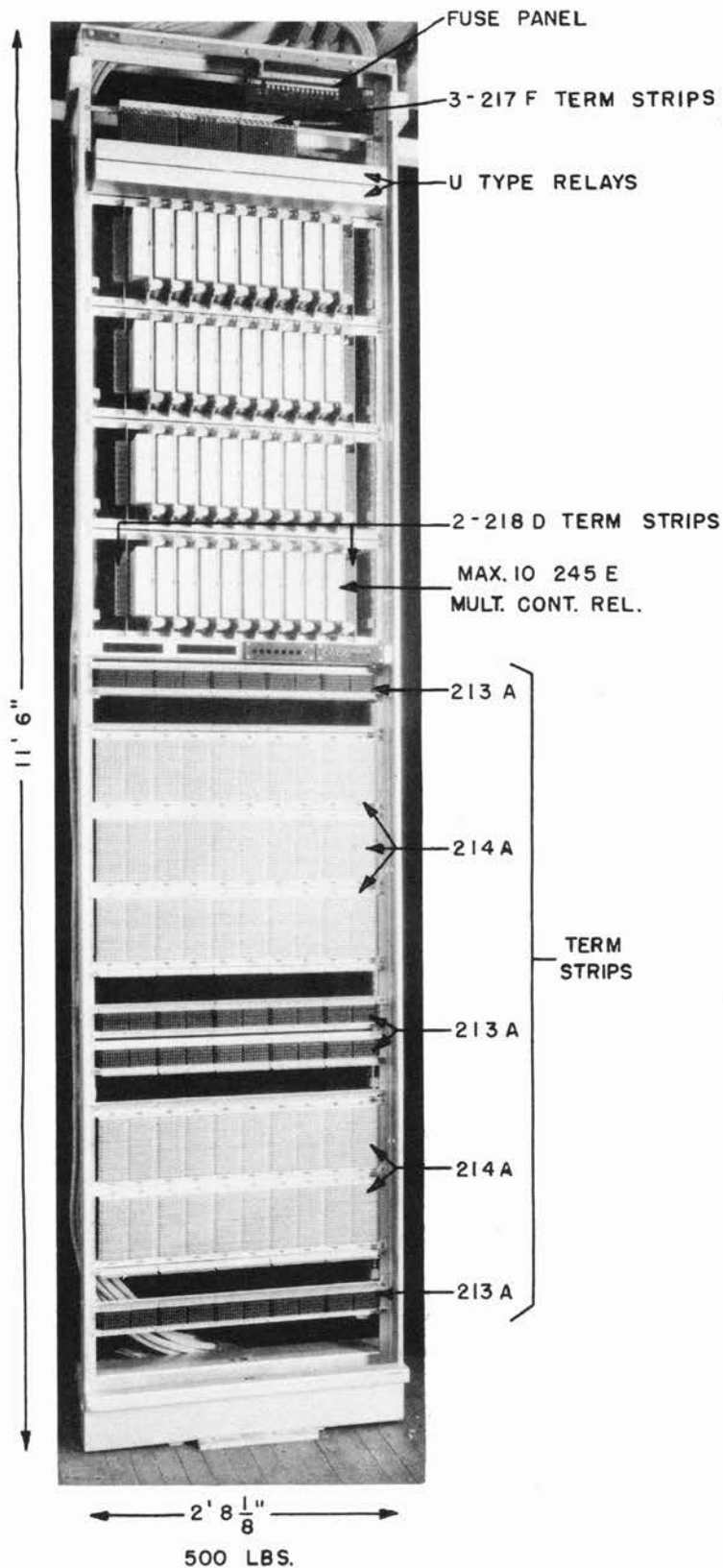
CB22-1-1
AUG. 1939



BLOCK RELAY FRAMES

MURRAY HILL - 6 OFFICE, EAST 30 TH. ST. NEW YORK

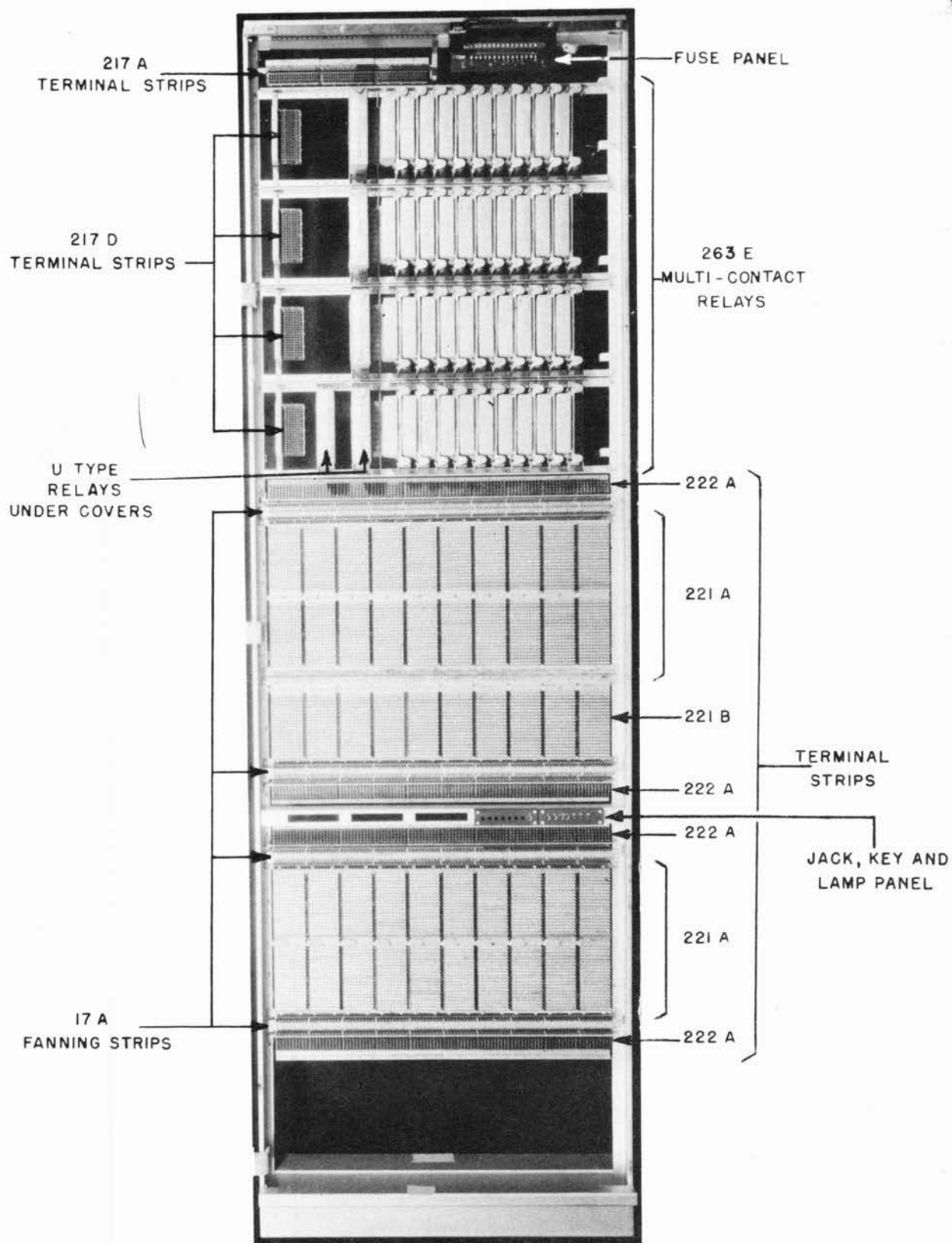
CB23-1-1
AUG. 1939



BLOCK RELAY FRAME

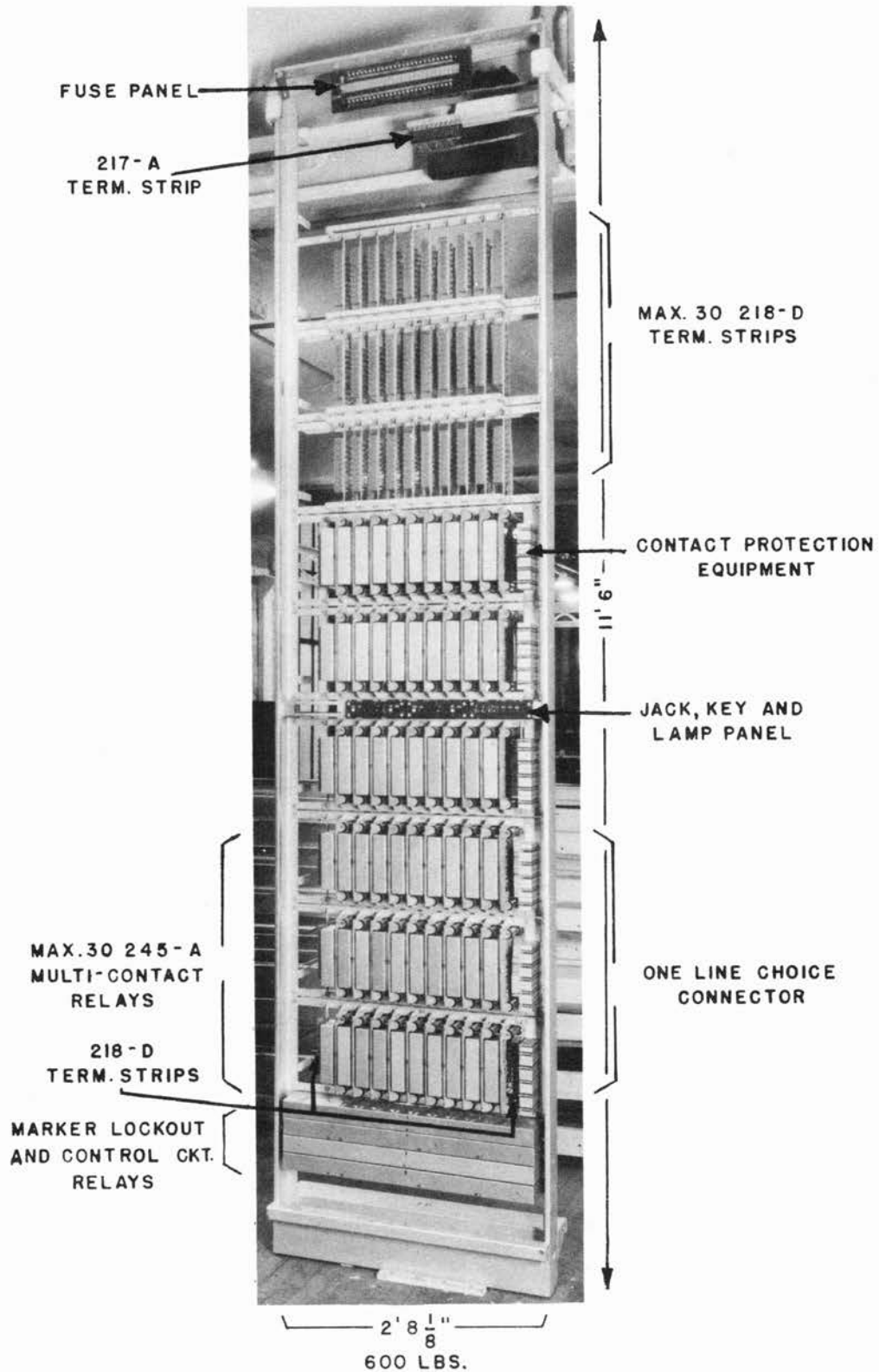
MURRAY HILL-6 OFFICE, EAST 30 TH. ST. NEW YORK.

CB23-1-2
AUG. 1939



BLOCK RELAY FRAME

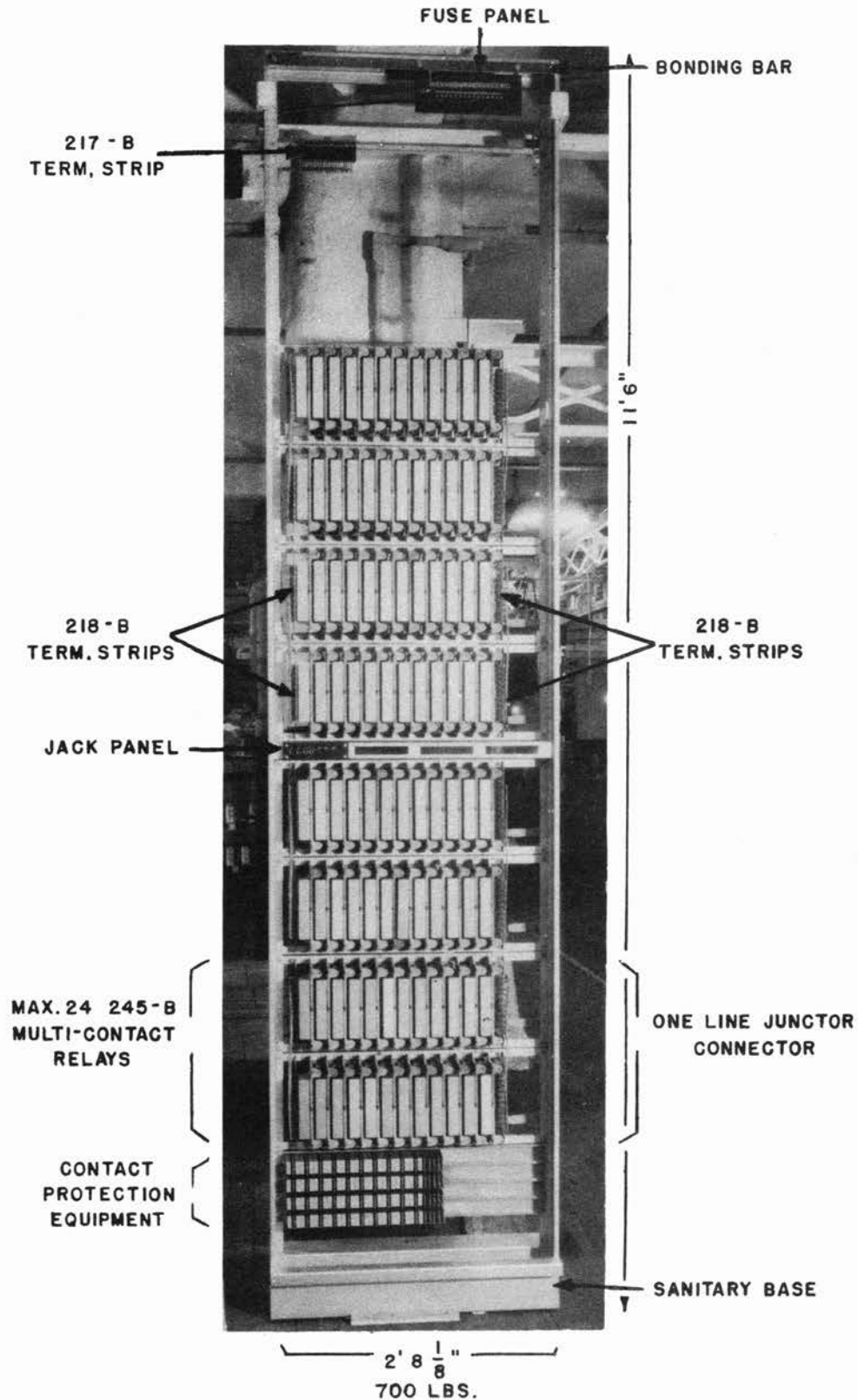
CAPACITY
2 LINE CHOICE CONNECTOR CKTS.
10 TERMINATING MARKERS



LINE CHOICE CONNECTOR
FRAME

CB24-1-1
AUG. 1939

CAPACITY
4 LINE JUNCTOR CONNECTOR CKTS.



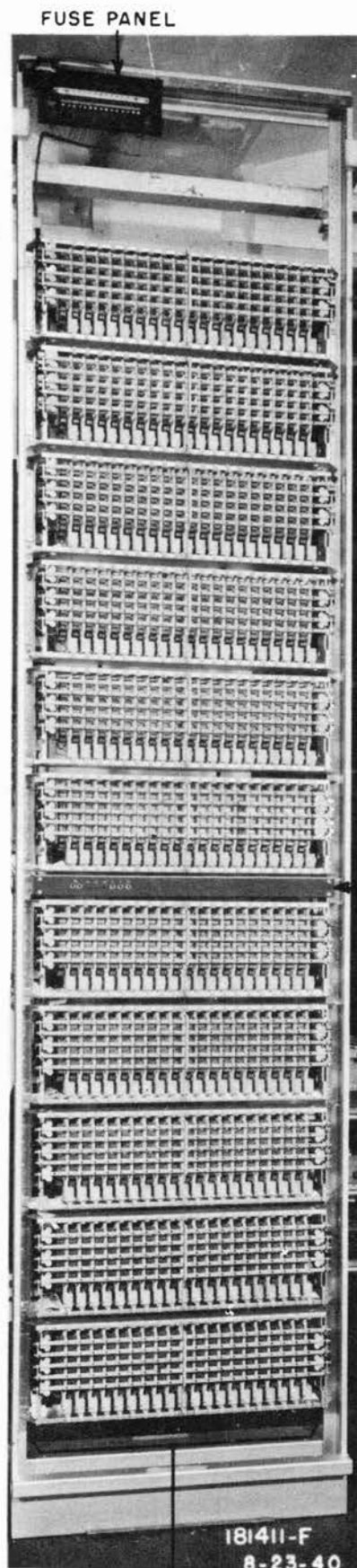
LINE JUNCTOR CONNECTOR
FRAME

CB25-1-1
AUG. 1939

305 G
SWITCHES

LEADS
FROM
DISTRICT
JUNCTOR
CIRCUITS
CONNECTED TO
VERTICAL UNITS

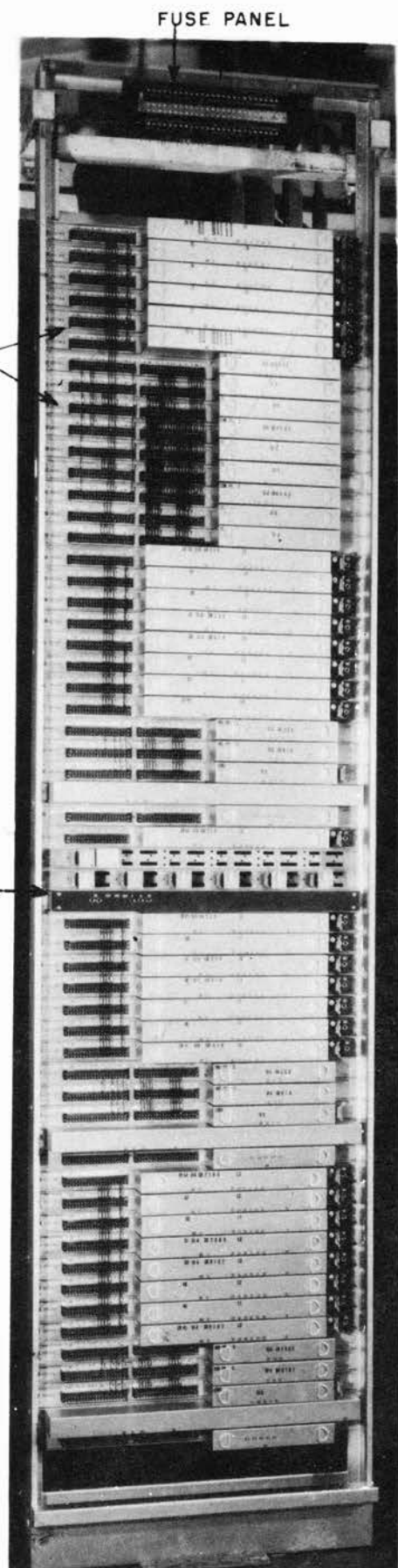
ZONE REGISTRATION DISTRICT
CONNECTOR FRAME



219 A
TERM.
STRIPS

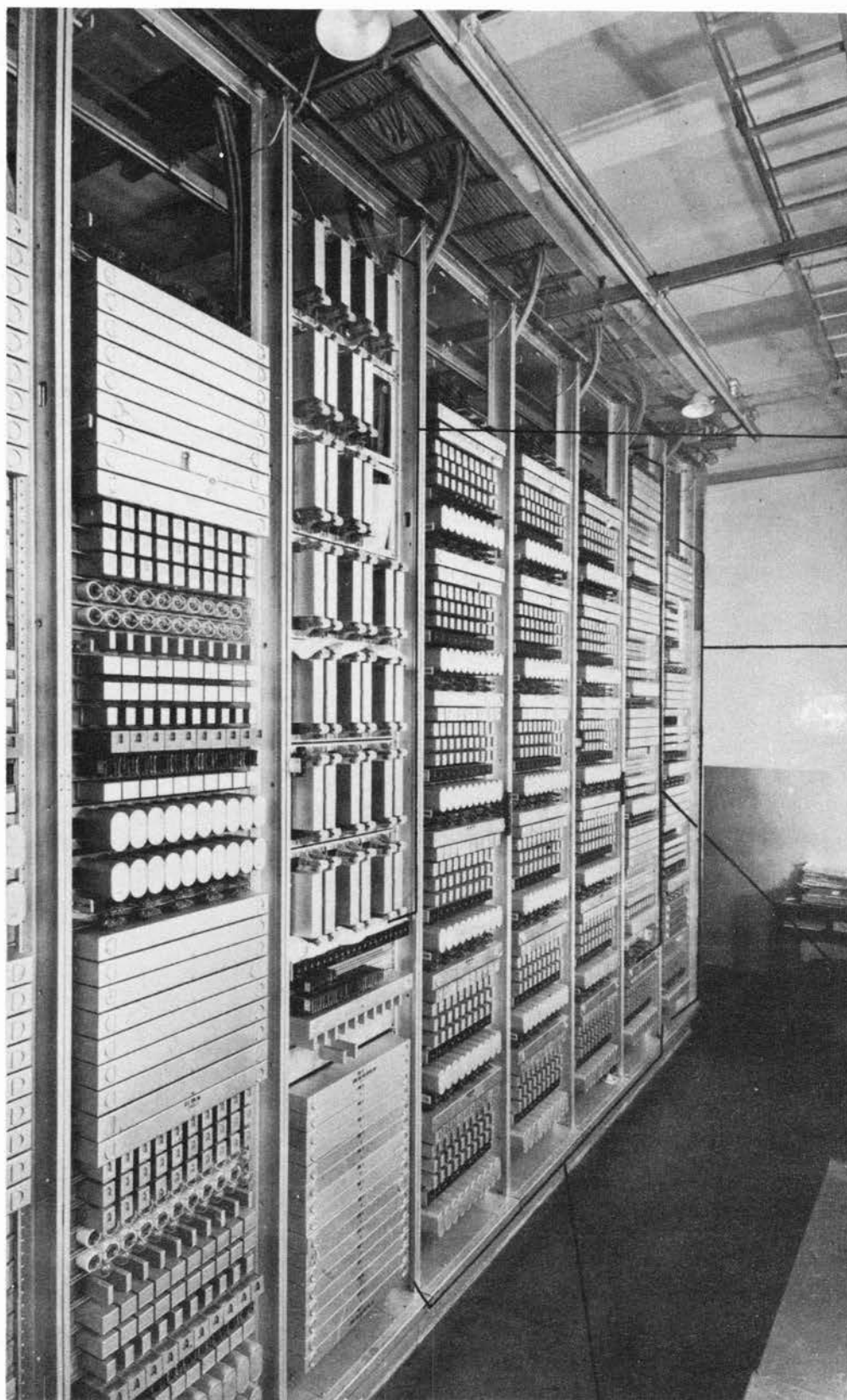
KEY,
JACK
AND
LAMP
PANELS

LEADS TO
ZONE
REG. CONT.
CIRCUITS
CONNECTED TO
LEVELS



ZONE REGISTRATION
CONTROL FRAME

CB 26-1-1
AUG. 1940



CALL THRU.
TEST EQPT.
(TEMPORARY)

INTERCEPTING
TRUNK
UNITS

PERMANENT
SIGNAL HOLDING
TRUNK UNITS

REC. COMP
TRUNK UNITS
NON-COIN

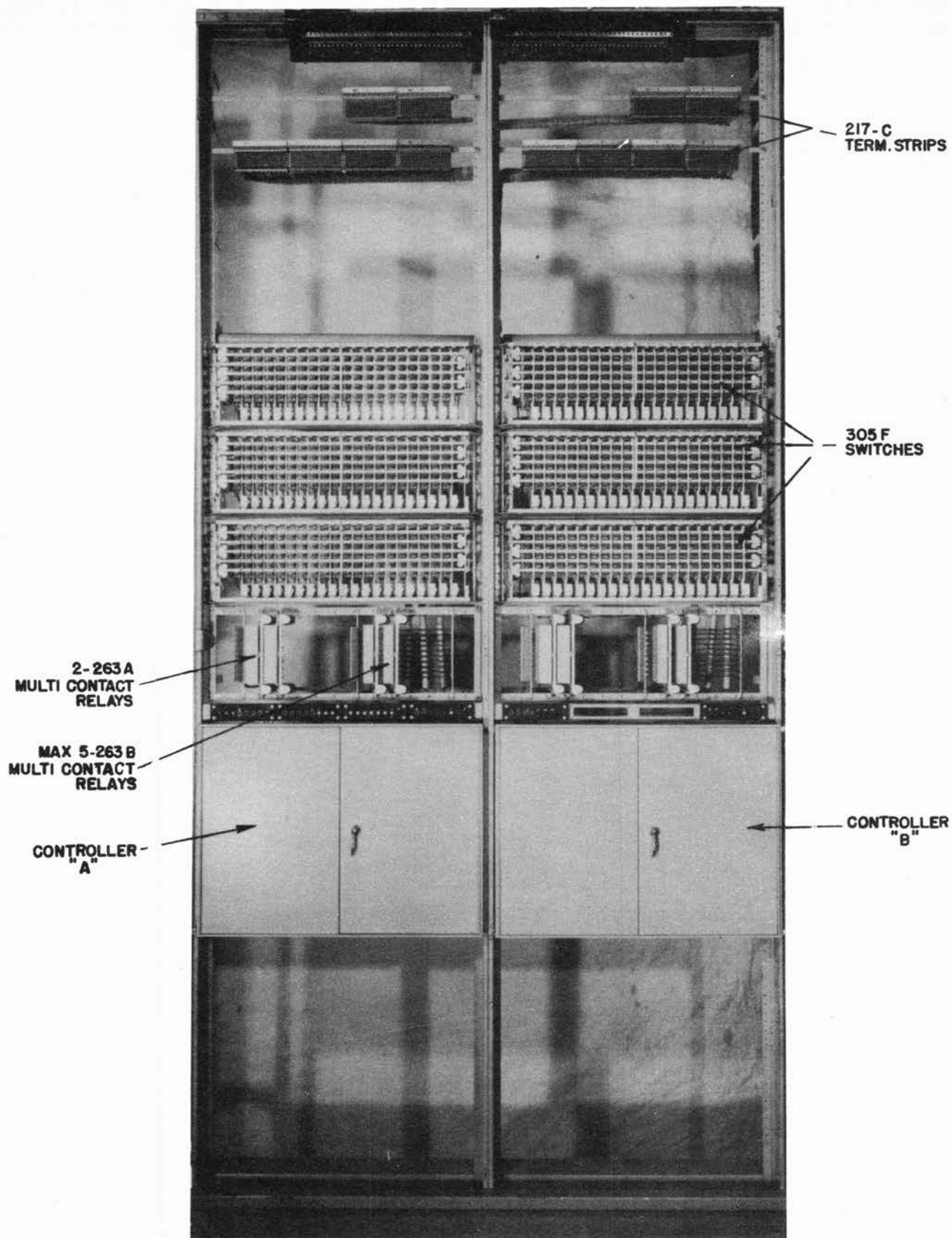
ZERO ANS.
JK. & LAMP
RELAY CKTS

CALL DIST. "B" SWBD.
AUX. INCOMING TRUNK UNITS
(FROM MANUAL OFFICE)

RELAY RACK 605-BAYS 8 TO 14

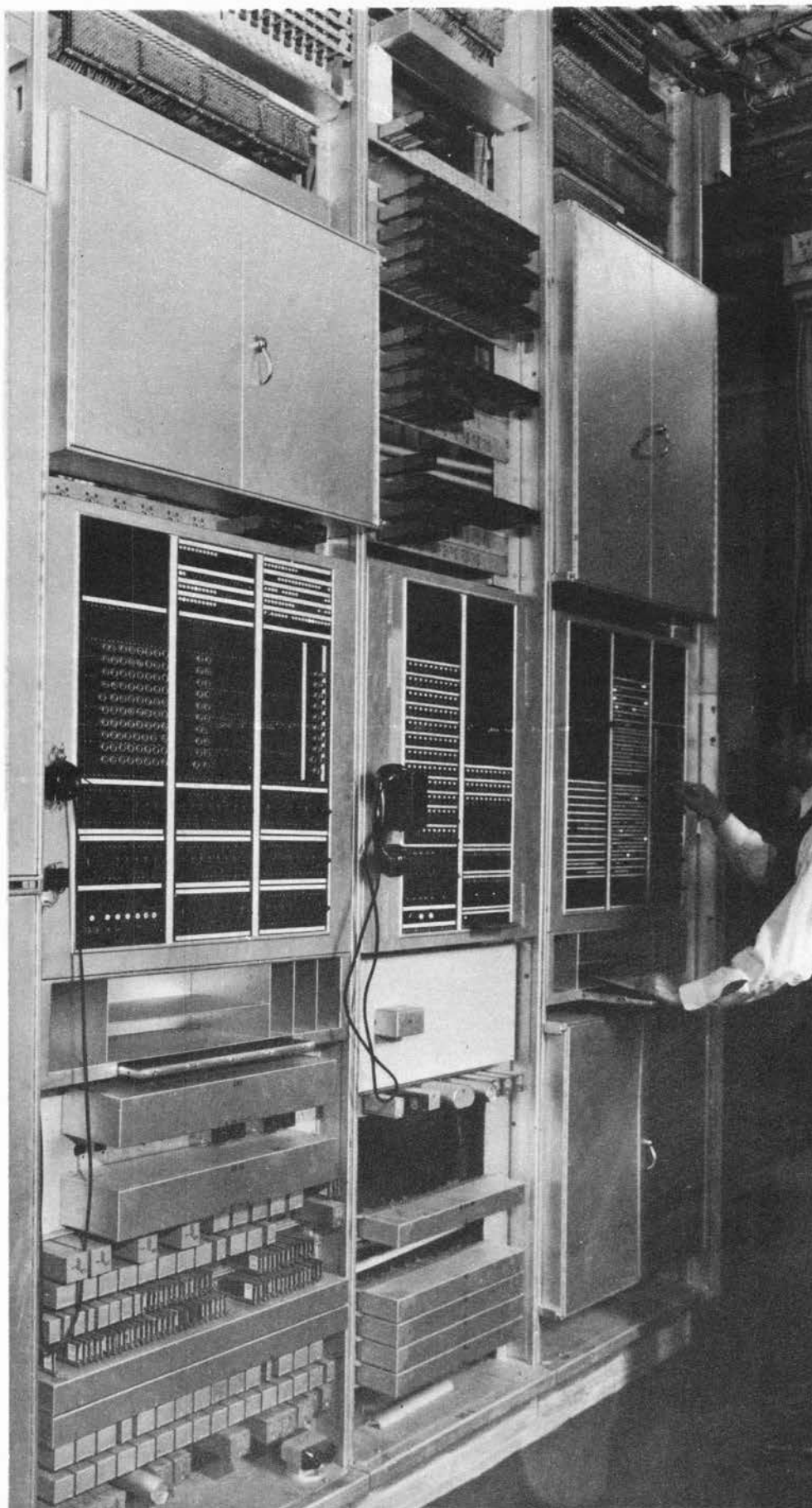
MURRAY HILL - 6 OFFICE, EAST 30 TH. ST. NEW YORK

CB27-1-1
AUG. 1935



COIN SUPERVISORY LINK
KEY PULSING SENDER LINK

CB 28-1-1
DEC. 1947



ORIGINATING SENDER
TEST FRAME

SENDER MAKE
BUSY FRAME

ORIGINATING TROUBLE
INDICATOR FRAME

MAINTENANCE CENTER

LYNN OFFICE, LYNN, MASS.

CB30-1-1
AUG. 1939

HIGH INTENSITY
LIGHTING UNIT

ORIGINATING
TRUNK TEST
FRAME

SENDER
MAKE
BUSY
FRAME

ORIGINATING
TROUBLE INDICATOR
FRAME

TERMINATING
TROUBLE INDICATOR
FRAME

INCOMING
TRUNK TEST
FRAME

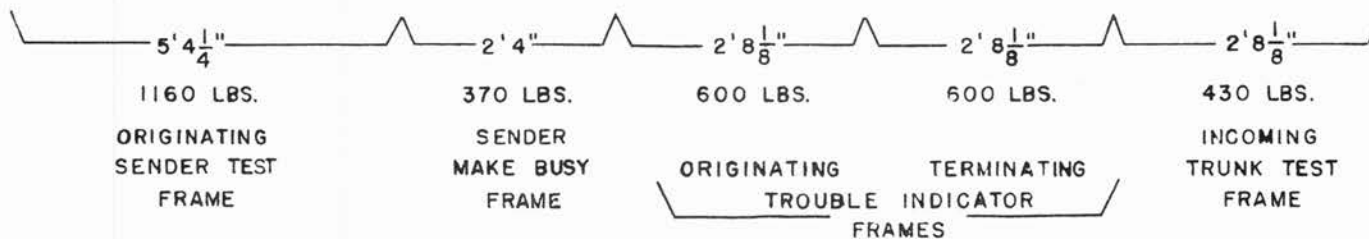
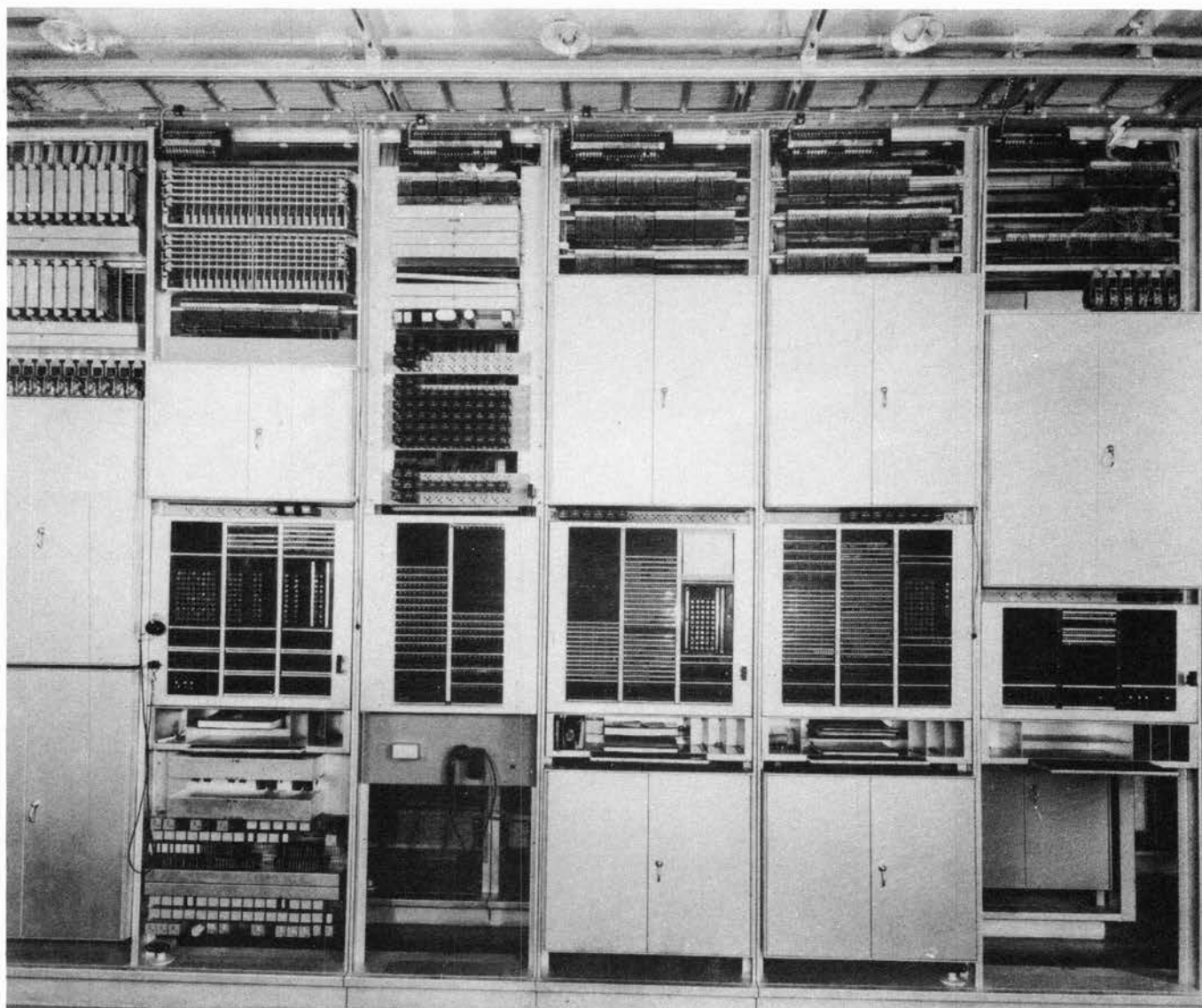
OUTGOING
TRUNK TEST
FRAMES

ROUTE
RELAY
BAY
(REAR)

MAINTENANCE CENTER

MURRAY HILL-6 OFFICE, EAST 30 TH. ST. NEW YORK

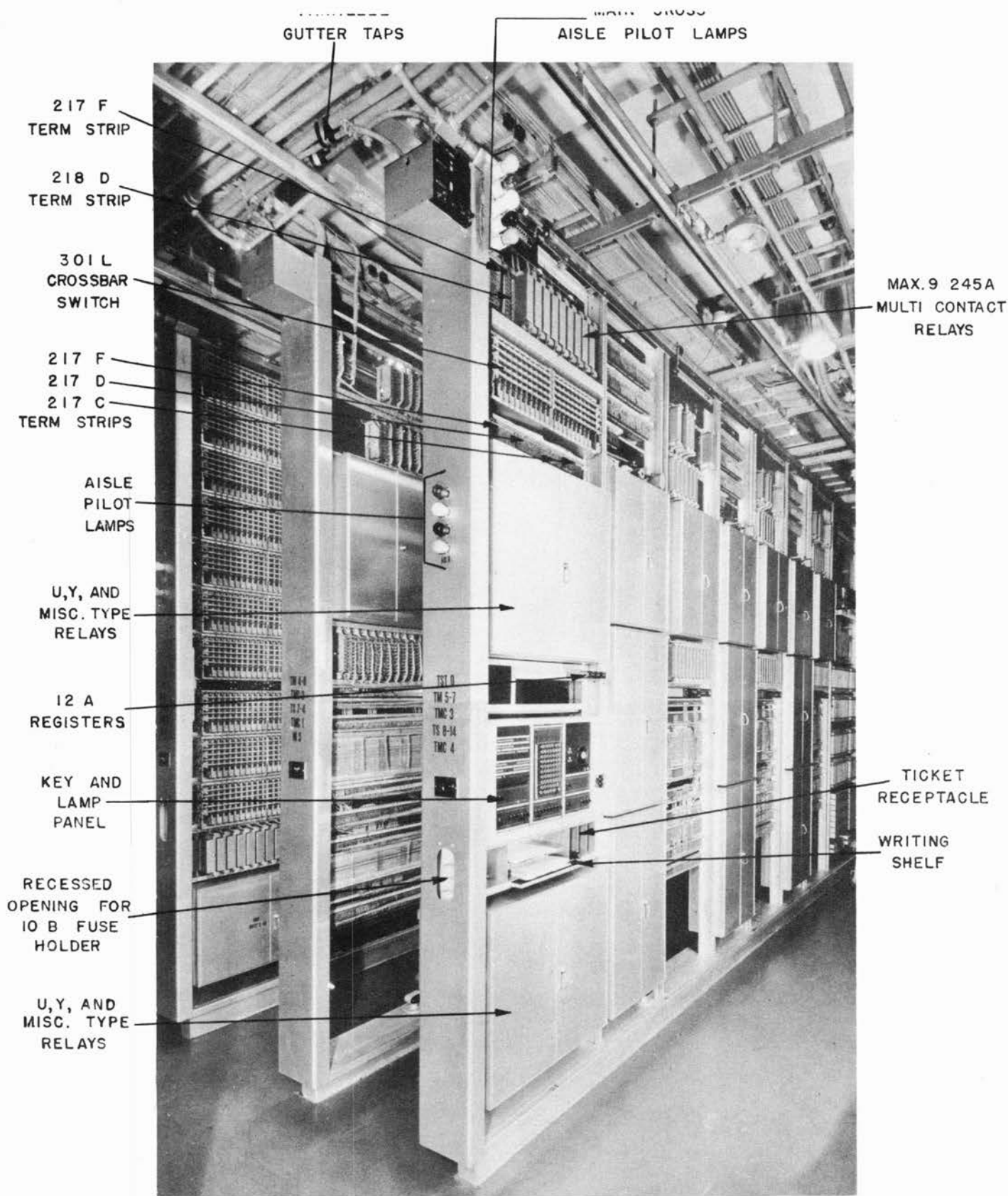
CB 30-2-1
AUG. 1939



MAINTENANCE CENTER

MURRAY HILL -6 OFFICE, EAST 30 TH. ST. NEW YORK

CB30-2-2
AUG. 1939

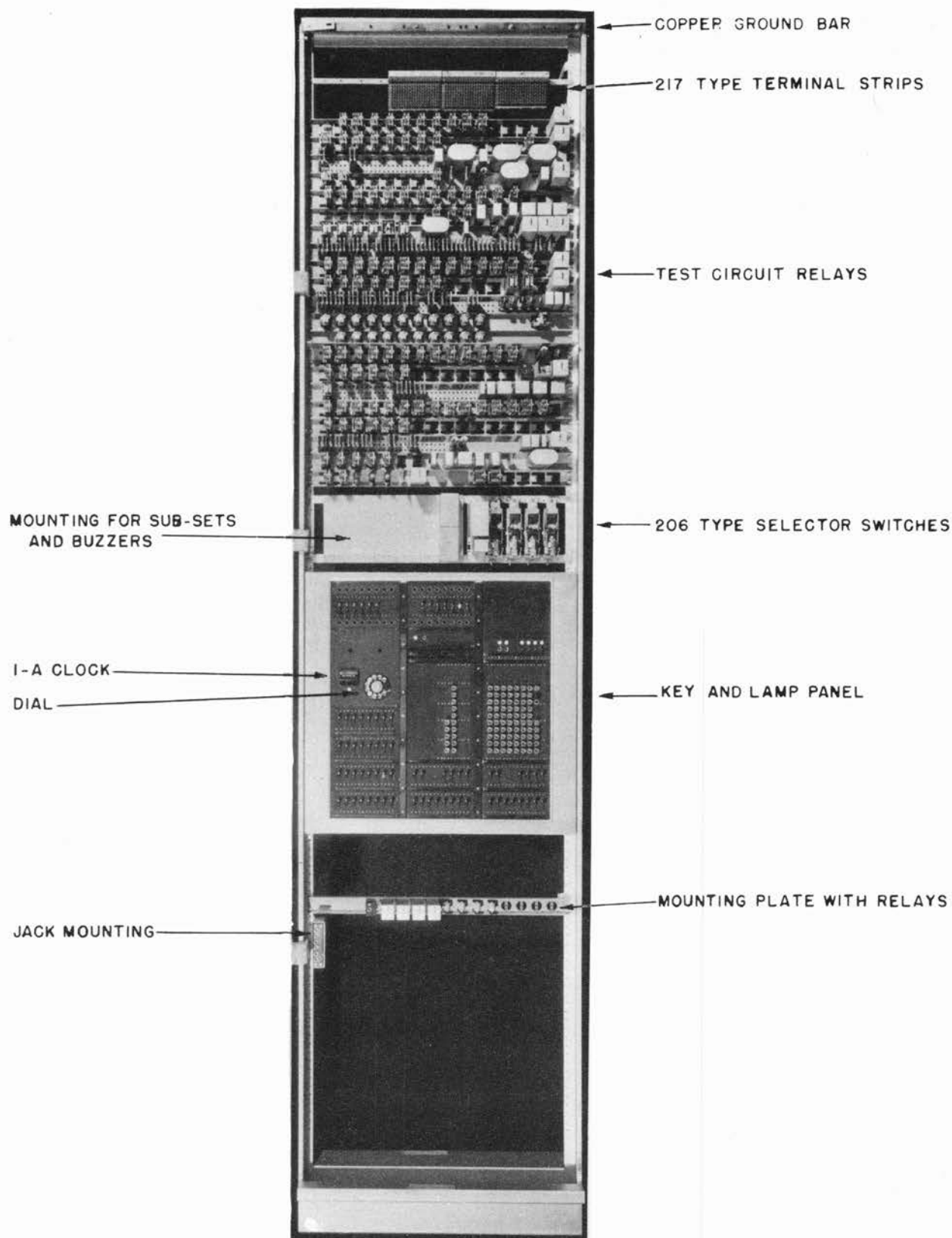


2' 8 ¹/₈"
 650 LBS.
 TERMINATING
 SENDER TEST
 FRAME

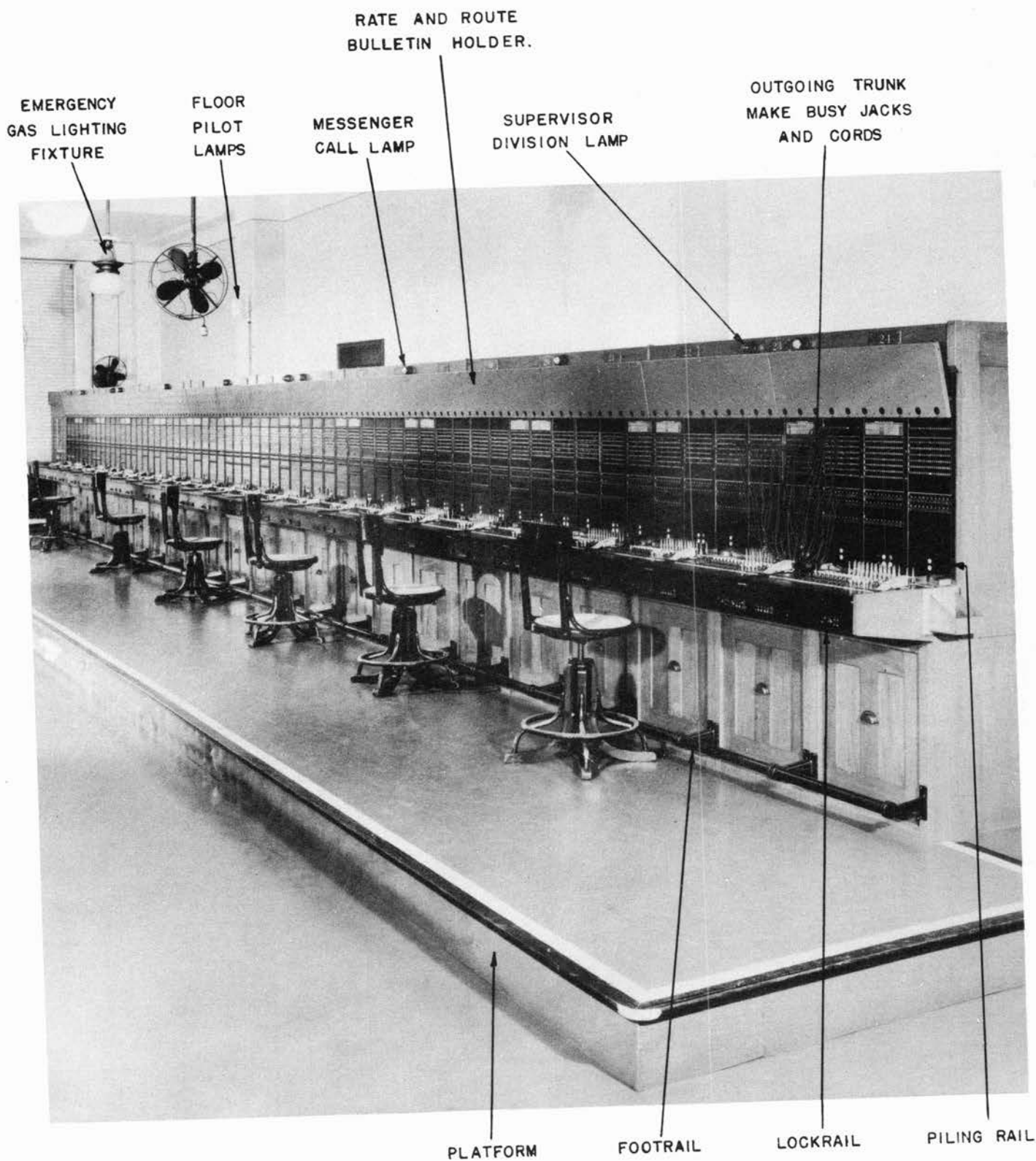
TERMINATING
 MARKER
 FRAMES

TERMINATING SENDER TEST FRAME

CB31-1-1
 AUG. 1939



OUTGOING TRUNK TEST FRAME
TEST BAY

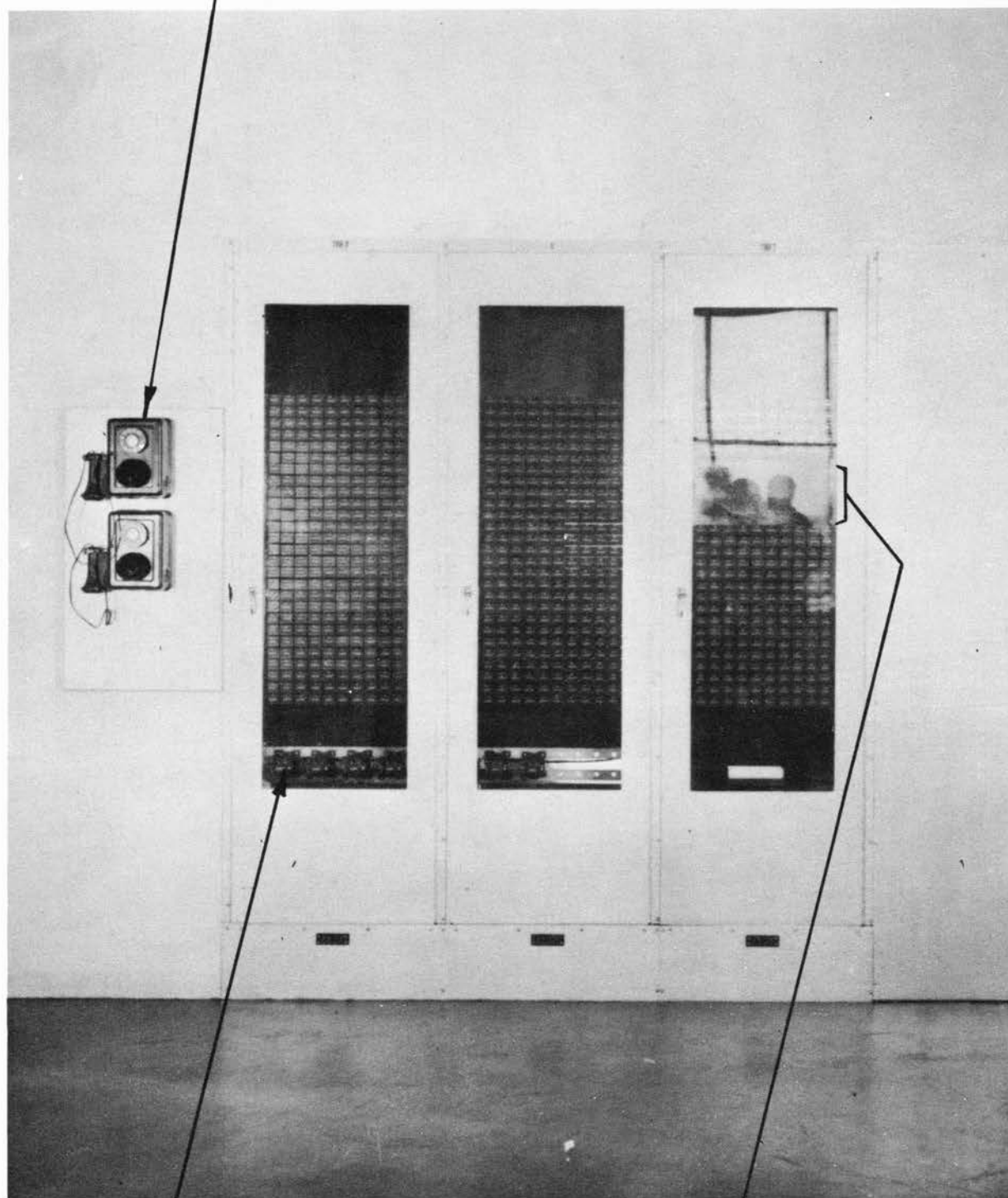


NO. 15 - C DIAL SYSTEM "A" SWITCHBOARD
(KEY PULSING)

MURRAY HILL - 6 OFFICE, EAST 30 TH. ST. NEW YORK

CB 32-1-1
AUG. 1939

RECORDERS TALKING LINE SUBSCRIBER SETS



ORIGINATING MARKER REGISTERS
(MAGNETIC COUNTERS)

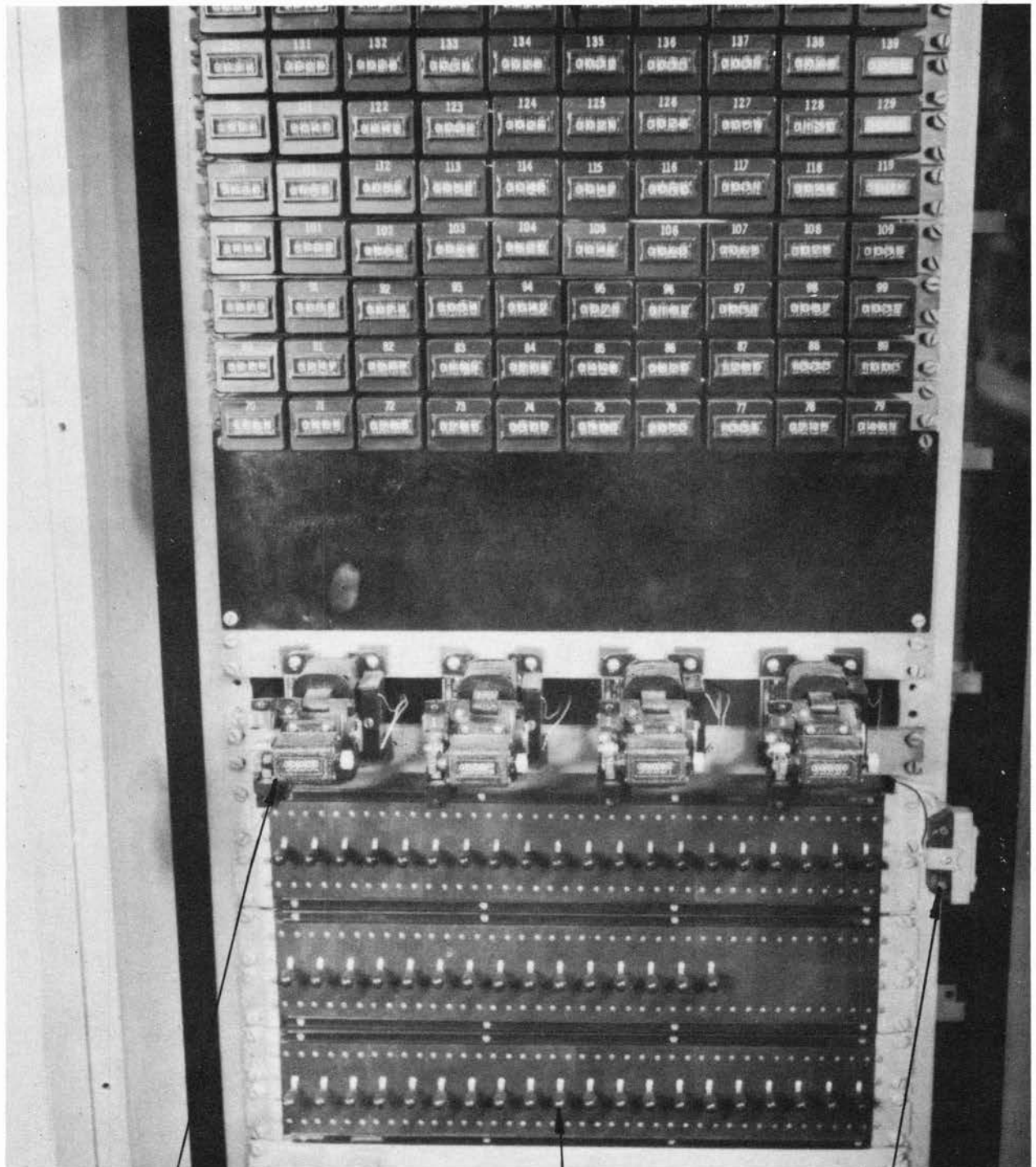
SUBSCRIBER LINE OVERFLOW JACK FIELD

TRAFFIC REGISTER RACKS

OAKLAND OFFICE ,CHICAGO

CB33-1-1
APRIL 1940

12 TYPE MESSAGE REGISTERS



ORIGINATING MARKER REGISTERS
(V.R. MAGNETIC COUNTER)

LINE LINK
BATTERY KEYS

33B CONN. BLOCK

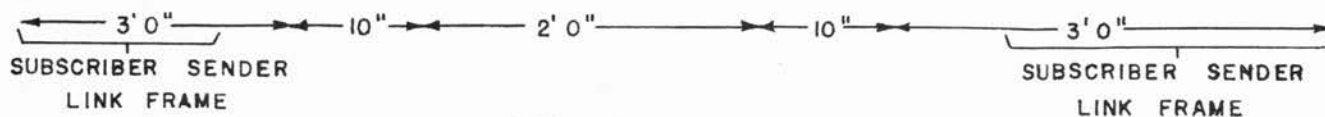
TRAFFIC REGISTER RACK

(CLOSE UP VIEW)

OAKLAND OFFICE, CHICAGO

CB33-1-2
APRIL 1940

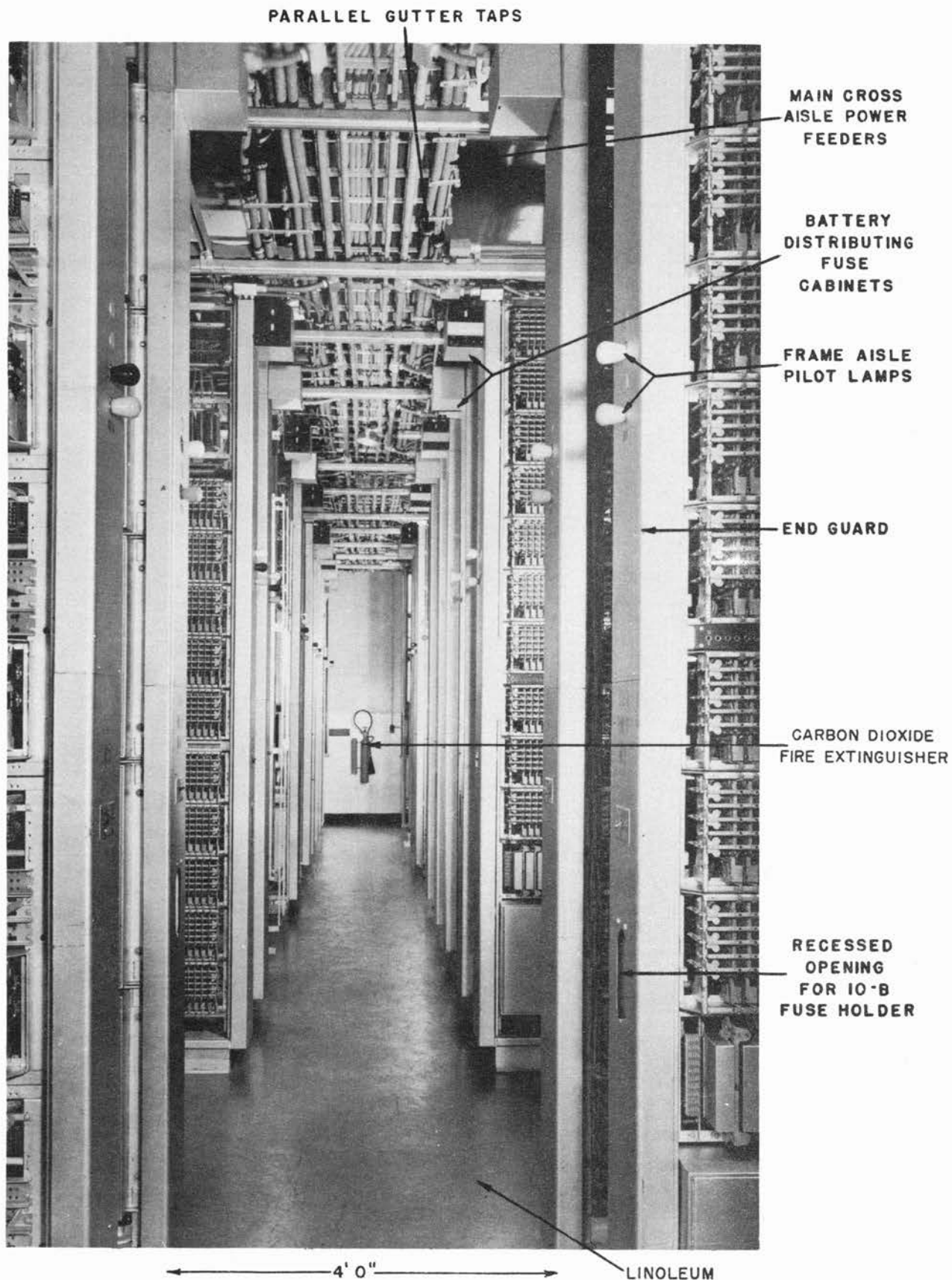
END GUARDS



FRAME AISLES

MURRAY HILL -6 OFFICE, EAST 30 TH. ST. NEW YORK

CB35-1-1
AUG. 1939

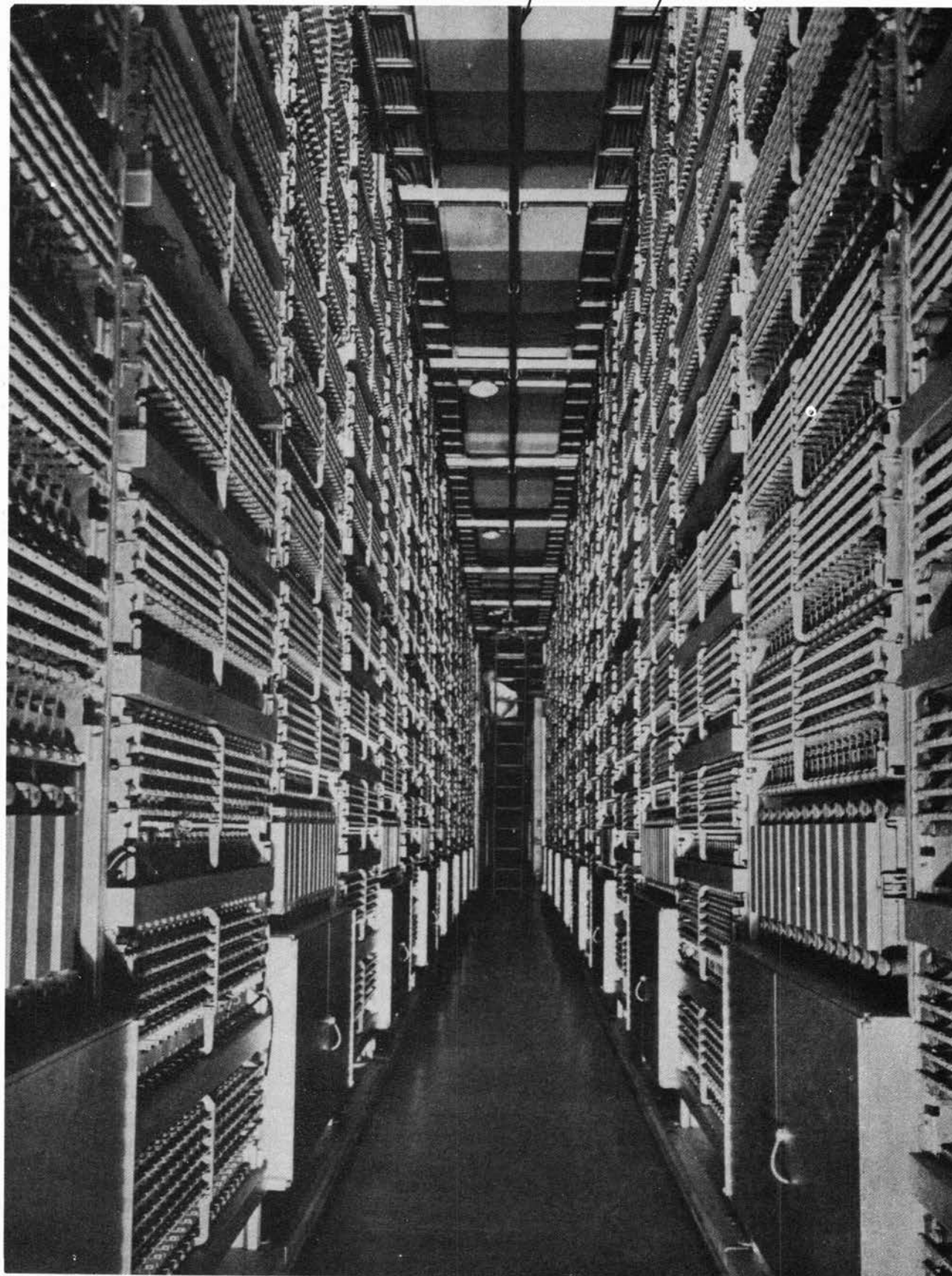


MAIN CROSS AISLE
MURRAY HILL - 6 OFFICE, EAST 30 TH ST NEW YORK

CB35-1-2
AUG. 1939

LADDER TRACK

CABLE RACK

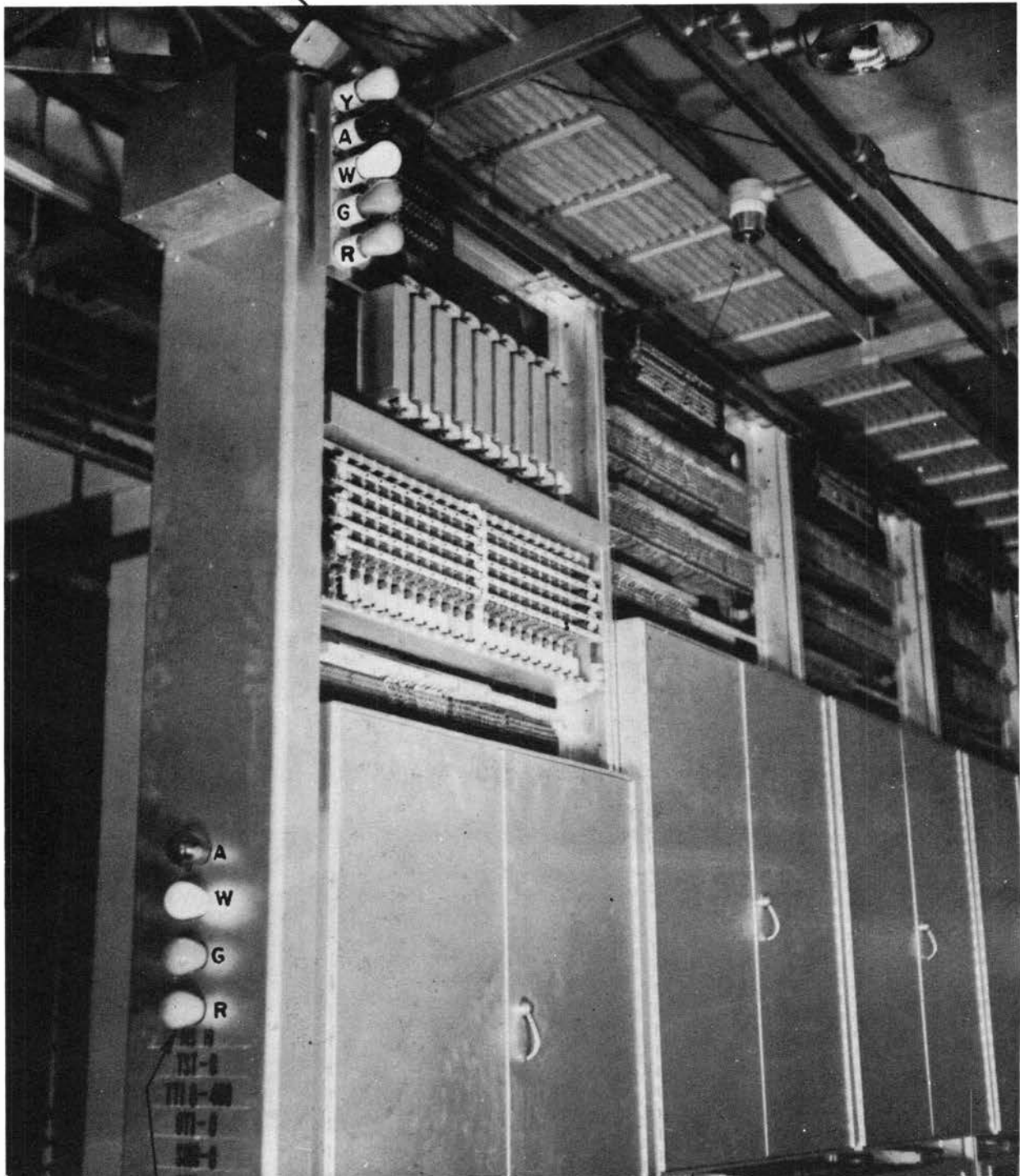


3' 0"

FRAME AISLES
LINE LINK FRAMES

CB-35-1-3
DEC. 1947

MAIN AISLE PILOT LAMPS

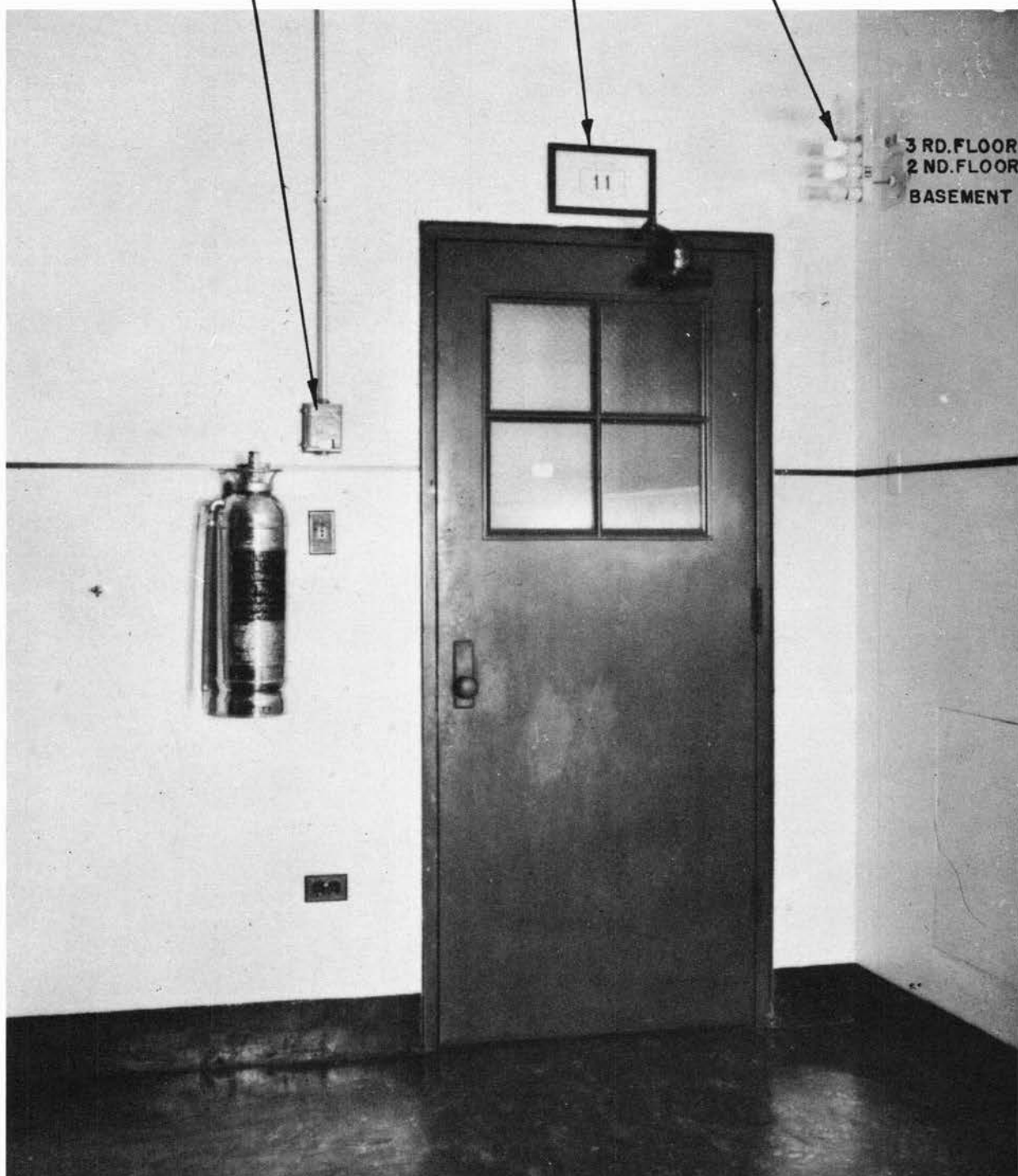


FRAME AISLE PILOT LAMPS

FRAME AND MAIN AISLE PILOT LAMPS
OAKLAND OFFICE, CHICAGO

CB36-1-1
APRIL 1940

EMERGENCY ALARM ZONE DESIGNATION
EMERGENCY ALARM STATION BOX
EXIT PILOT LAMPS (ALL YELLOW)



EXIT PILOT LAMPS

(FIRST FLOOR)

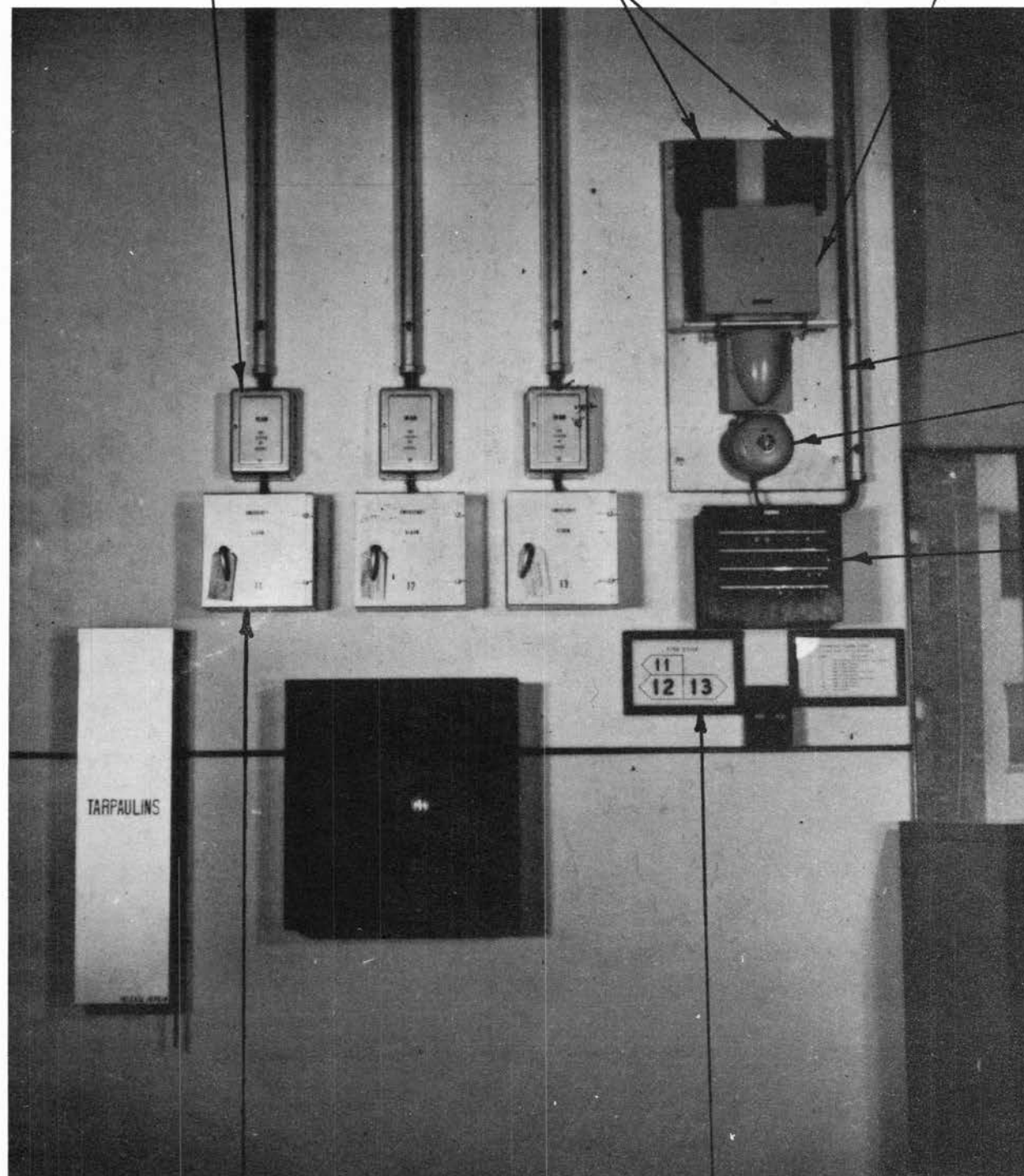
OAKLAND OFFICE, CHICAGO

CB36-1-2
APRIL 1940

FIRE DETECTION ZONE RELAY HOUSING

584 DF SUB-SETS

BX91 TONE BAR



ALARM BELL
PANEL

VIBRATING
BELL
BX6-15 6"

FLOOR ALARM
CABINET

CODE SIGNAL SENDING DEVICE HOUSING

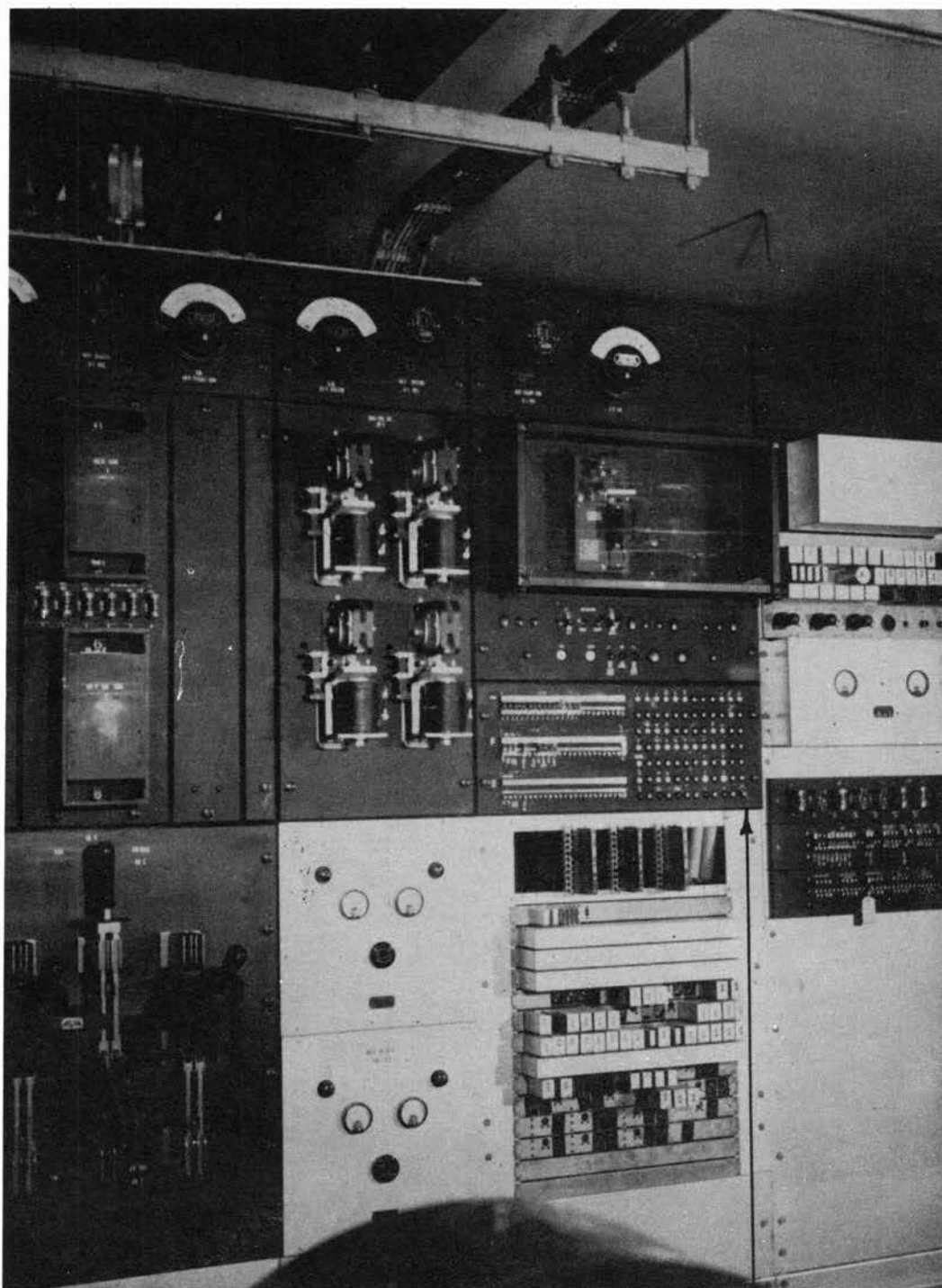
EMERGENCY ALARM ZONE DESIGNATIONS

ALARM EQUIPMENT

(LOCATED ON WALL)

OAKLAND OFFICE, CHICAGO

CB36-1-3
APRIL 1940



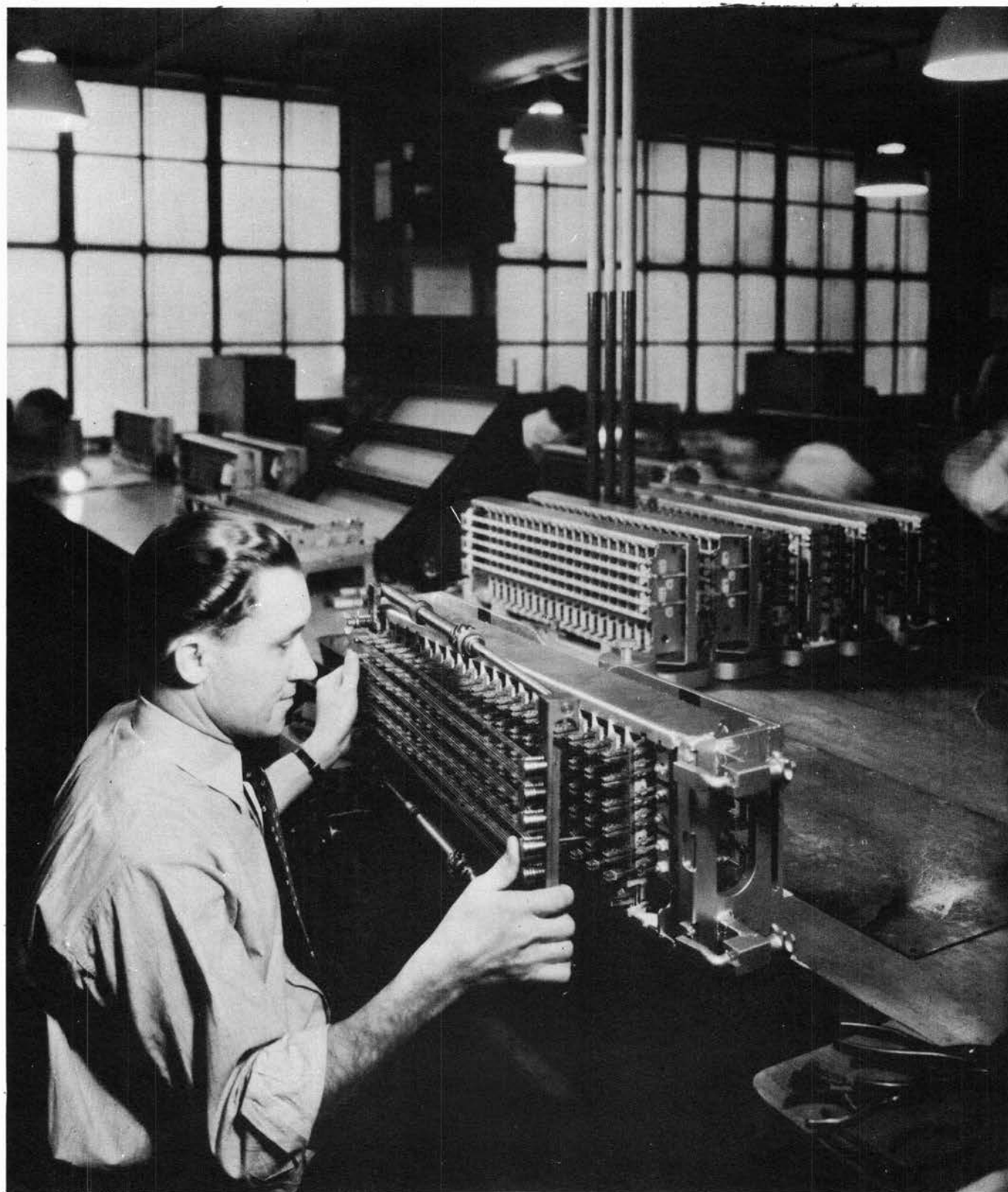
FUSE AND LAMP PANEL

FUSE AND LAMP PANEL

POWER ALARMS

OAKLAND OFFICE, CHICAGO

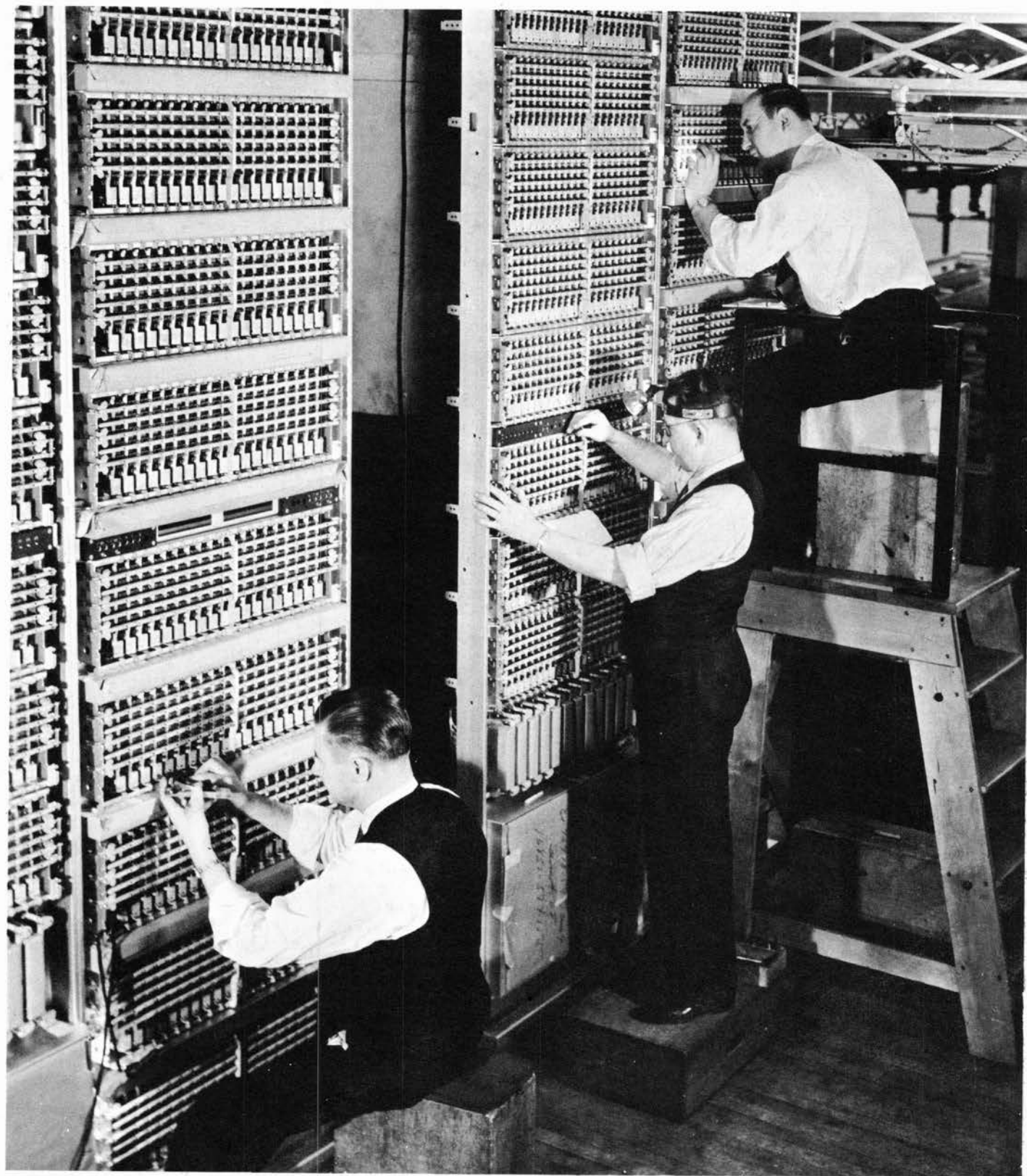
CB36-1-6
APRIL 1940



PREPARATION FOR STRAPPING CROSSBAR SWITCHES

HAWTHORNE, CHICAGO

CB40-1-1
APRIL 1940



INSPECTING CROSSBAR FRAMES

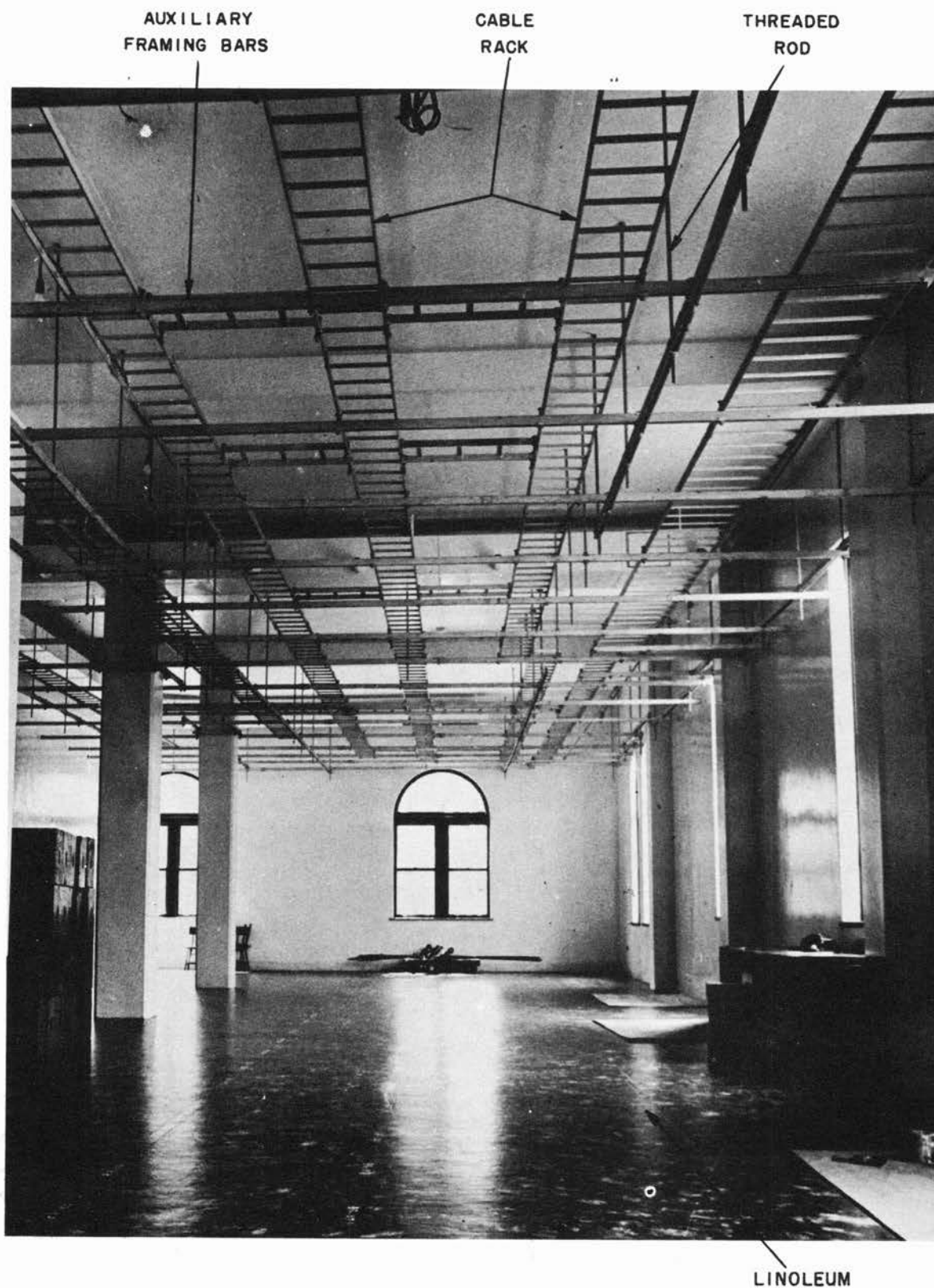
HAWTHORNE, CHICAGO

GB40-1-2
APRIL 1940



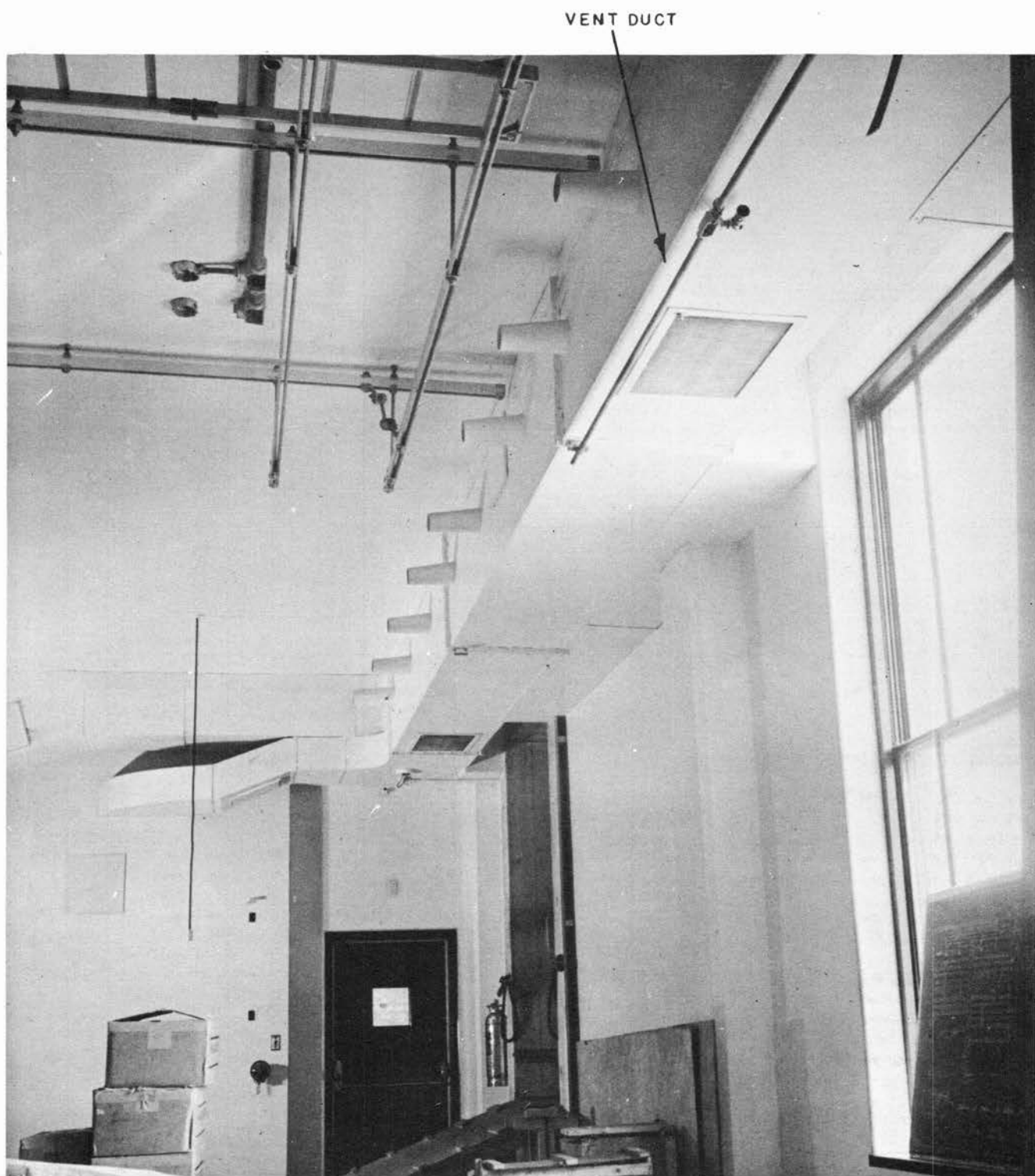
CRATING CROSSBAR FRAMES
HAWTHORNE, CHICAGO

CB40-1-3
APRIL 1940



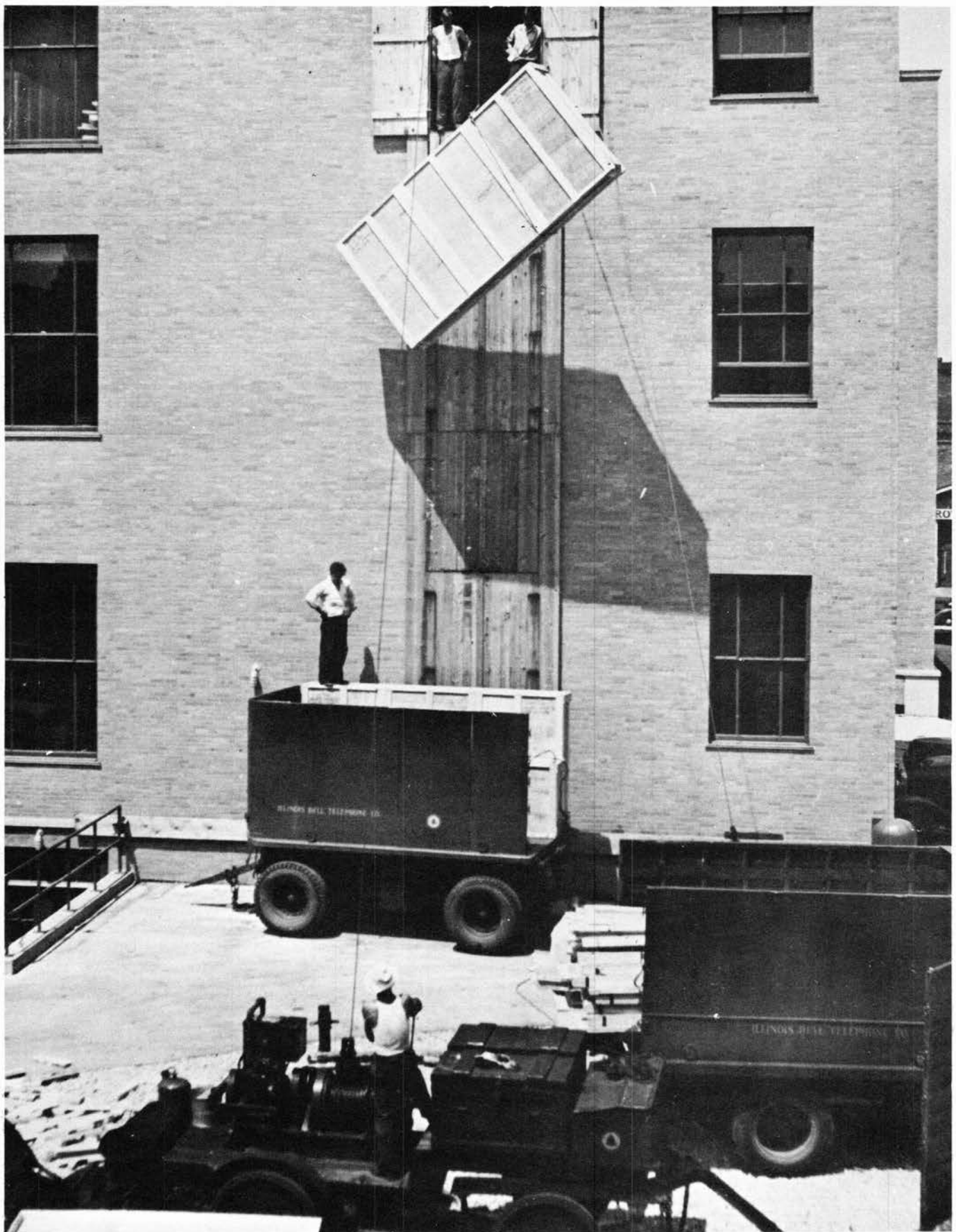
AUXILIARY FRAMING IN PLACE
LAFAYETTE OFFICE, CHICAGO

CB40-I-4
AUG. 1939



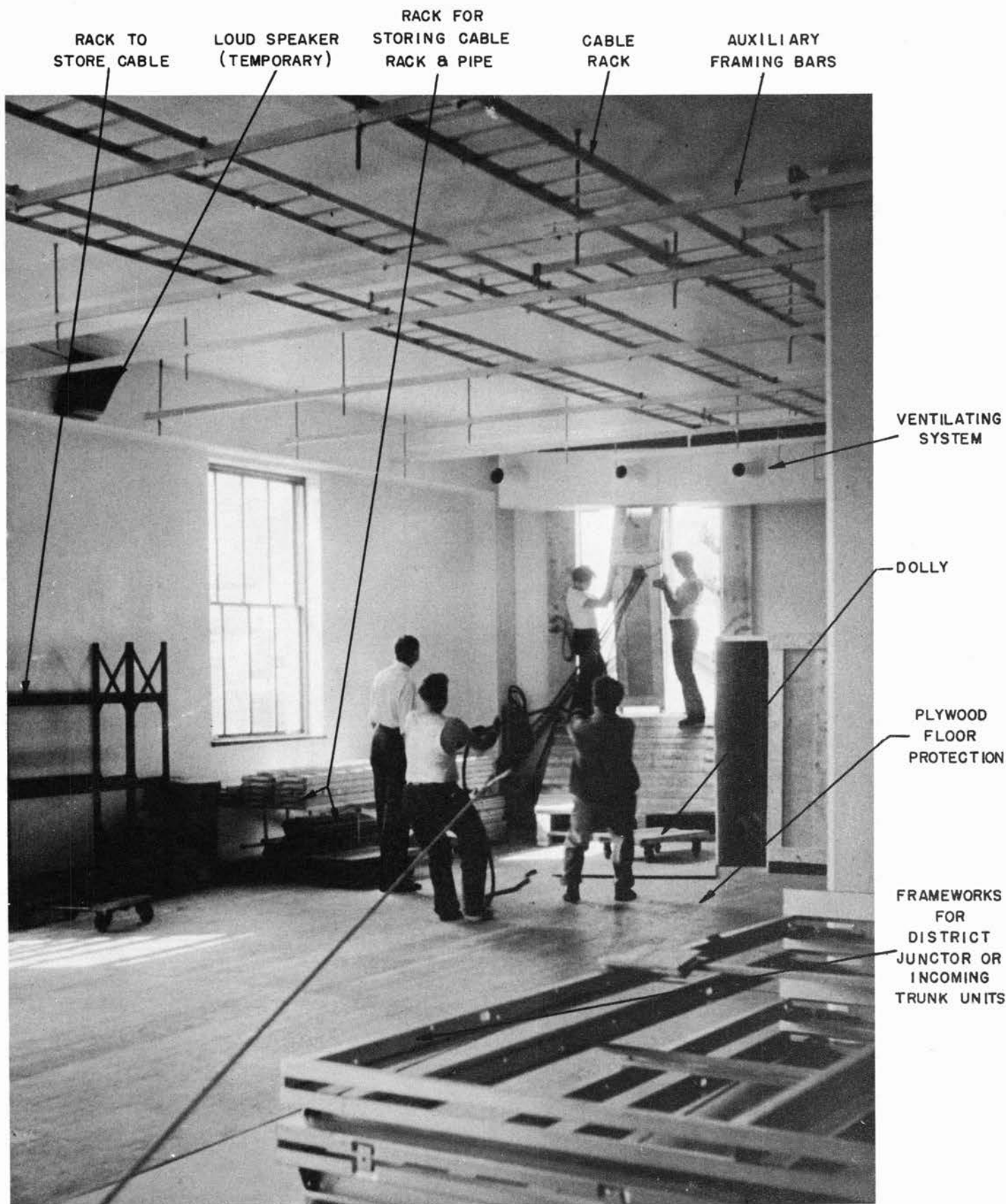
VENTILATING SYSTEM
OAKLAND OFFICE, CHICAGO

CB40-I-5
AUG. 1939



HOISTING FRAMES INTO TELEPHONE OFFICE
OAKLAND OFFICE, CHICAGO

CB40-1-6
AUG. 1939



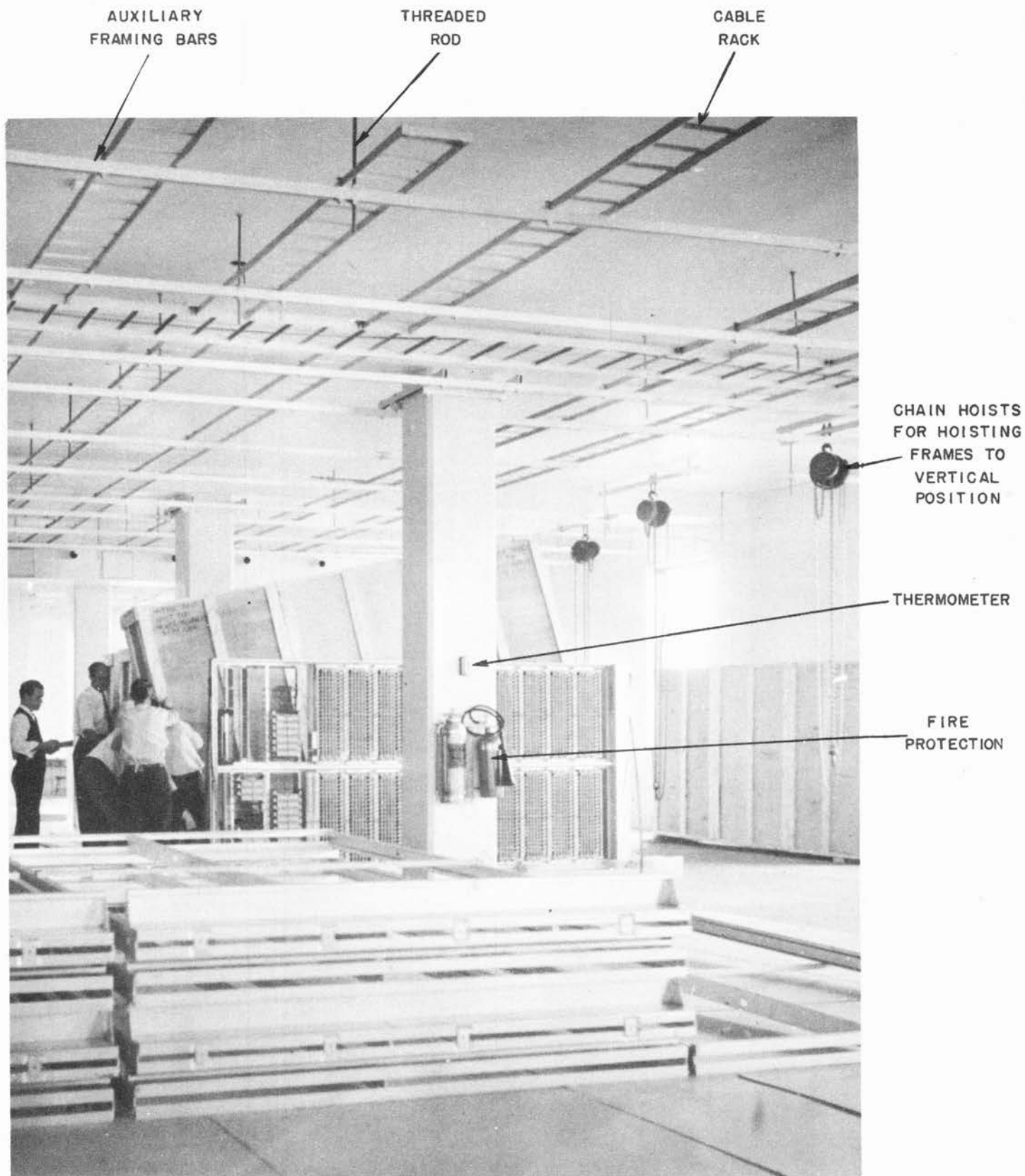
BRINGING IN FRAMES
LAFAYETTE OFFICE, CHICAGO

CB40-1-7
SEPT. 1939



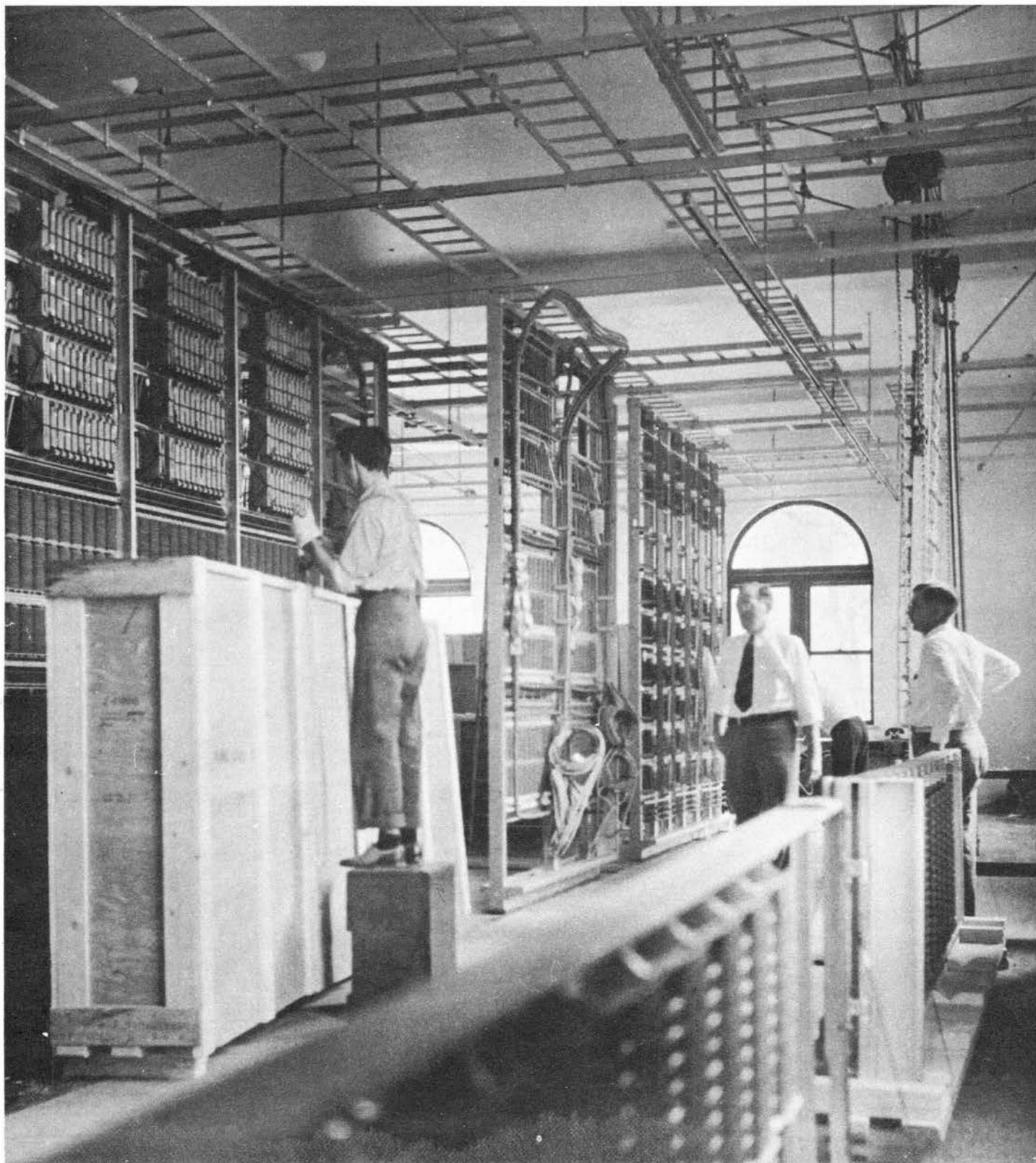
FRAMES ON FLOOR
LAFAYETTE OFFICE, CHICAGO

CB40-1-8
SEPT. 1939



UNCRATING FRAMES
LAFAYETTE OFFICE, CHICAGO

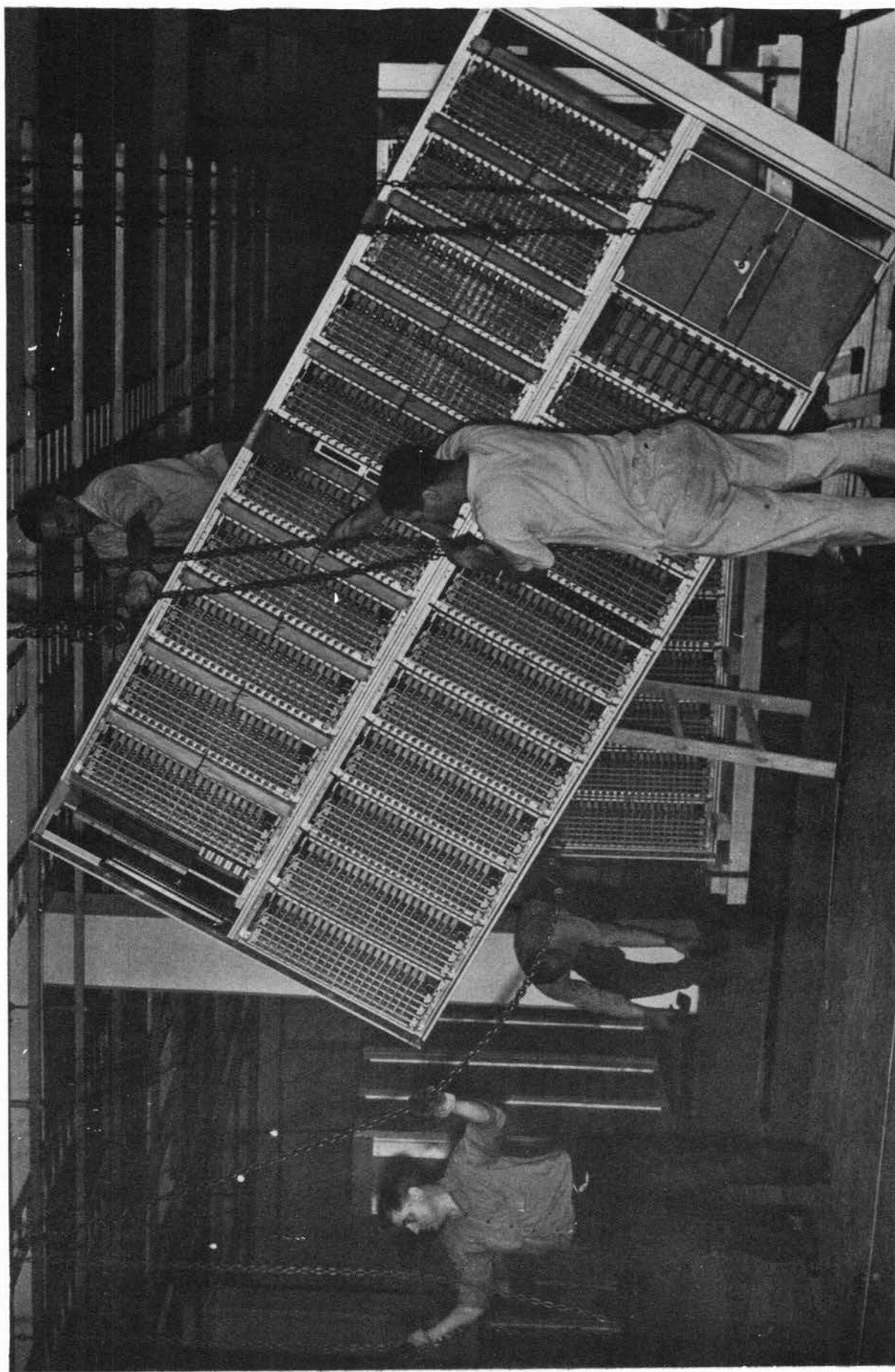
CB40-1-9
SEPT. 1939



PREPARING FRAMES FOR HOISTING

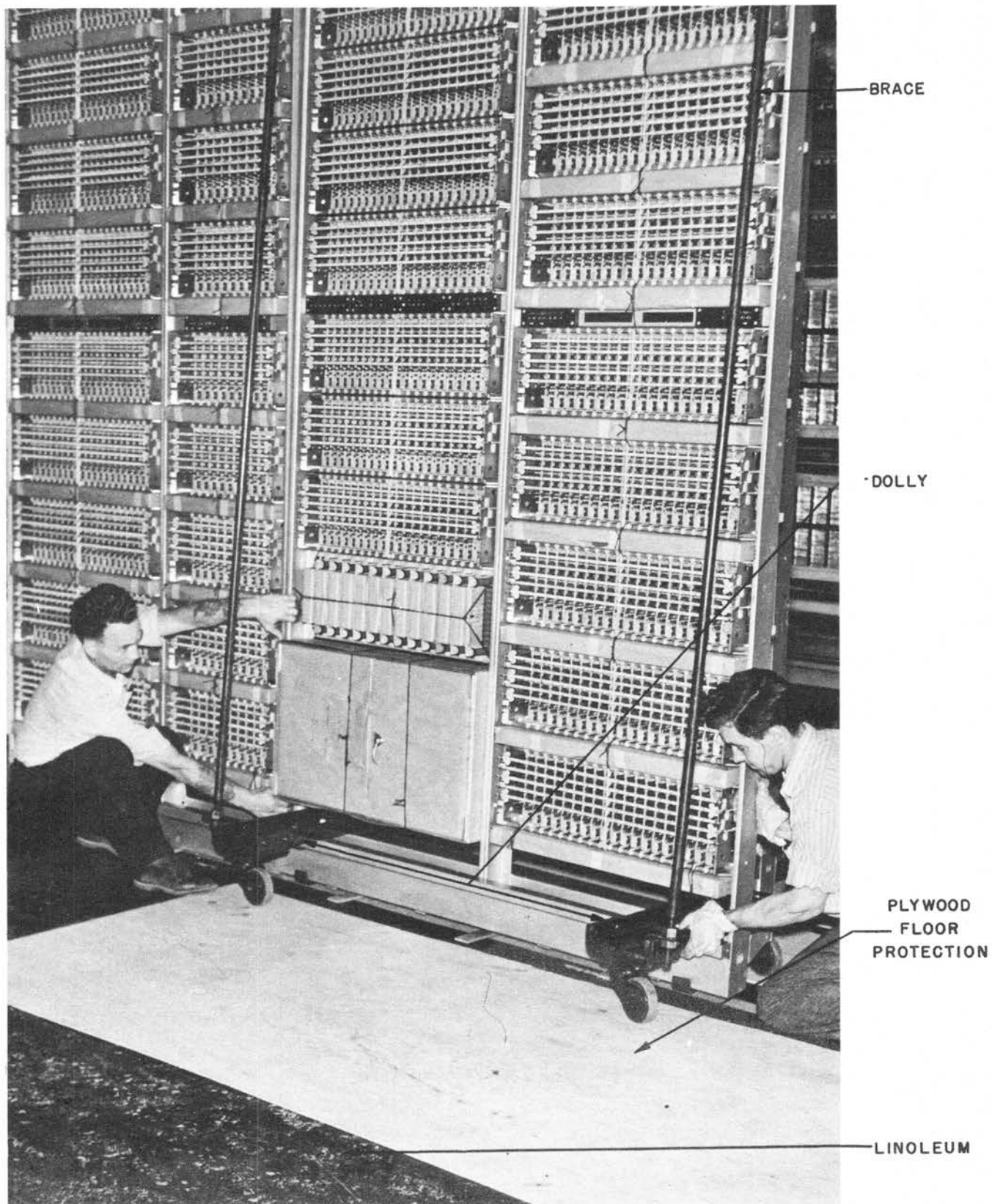
LAFAYETTE OFFICE, CHICAGO

CB40-1-10
OCT. 1939



LIFTING FRAME TO PLACE ON DOLLY
OAKLAND OFFICE, CHICAGO

CB40-1-11
SEPT. 1939



MOVING FRAMES TO PROPER FLOOR LOCATION

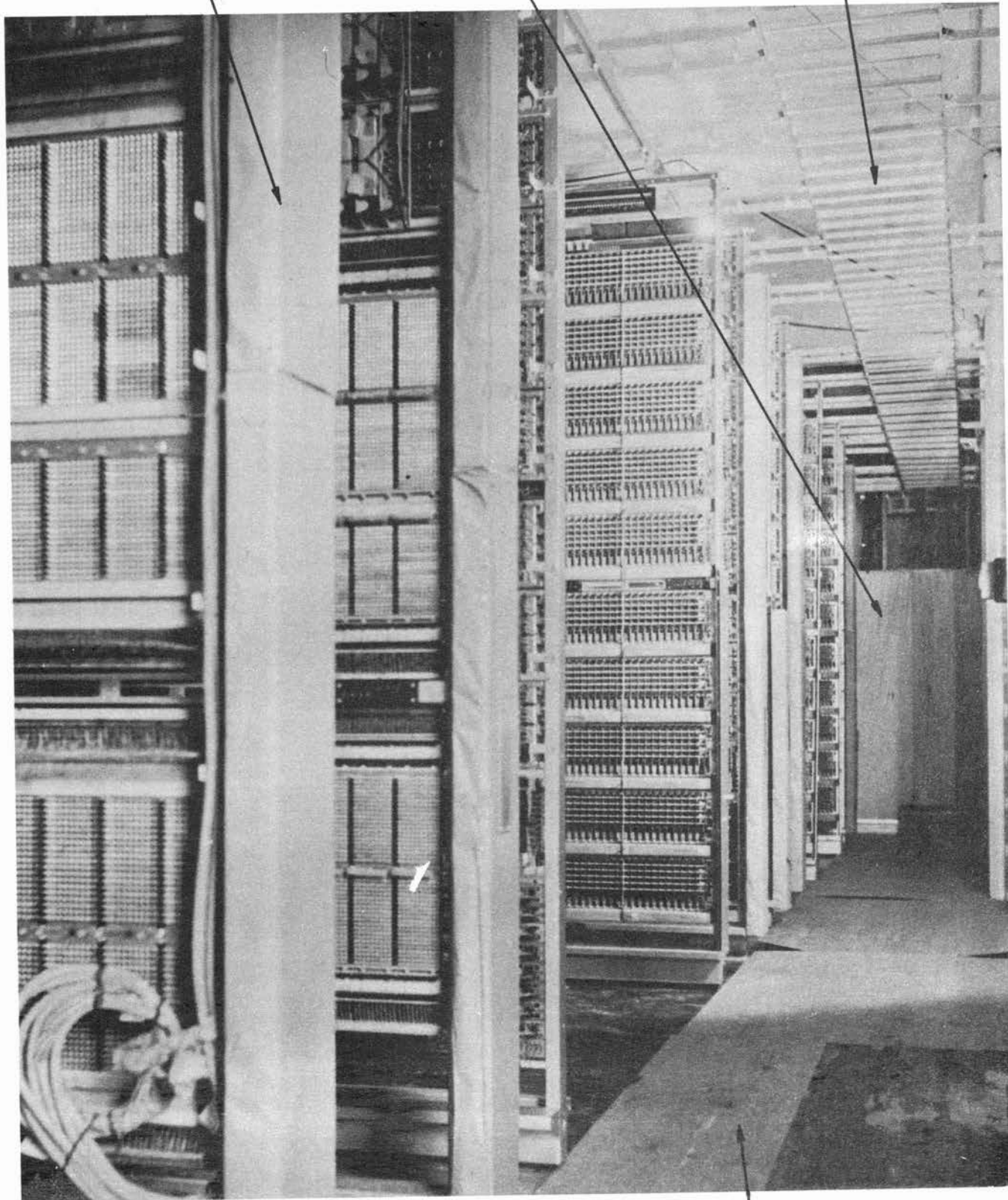
OAKLAND OFFICE, CHICAGO

CB40-1-12
SEPT. 1939

END GUARDS
WRAPPED IN PAPER

PROTECTION FOR
WORKING EQUIPMENT

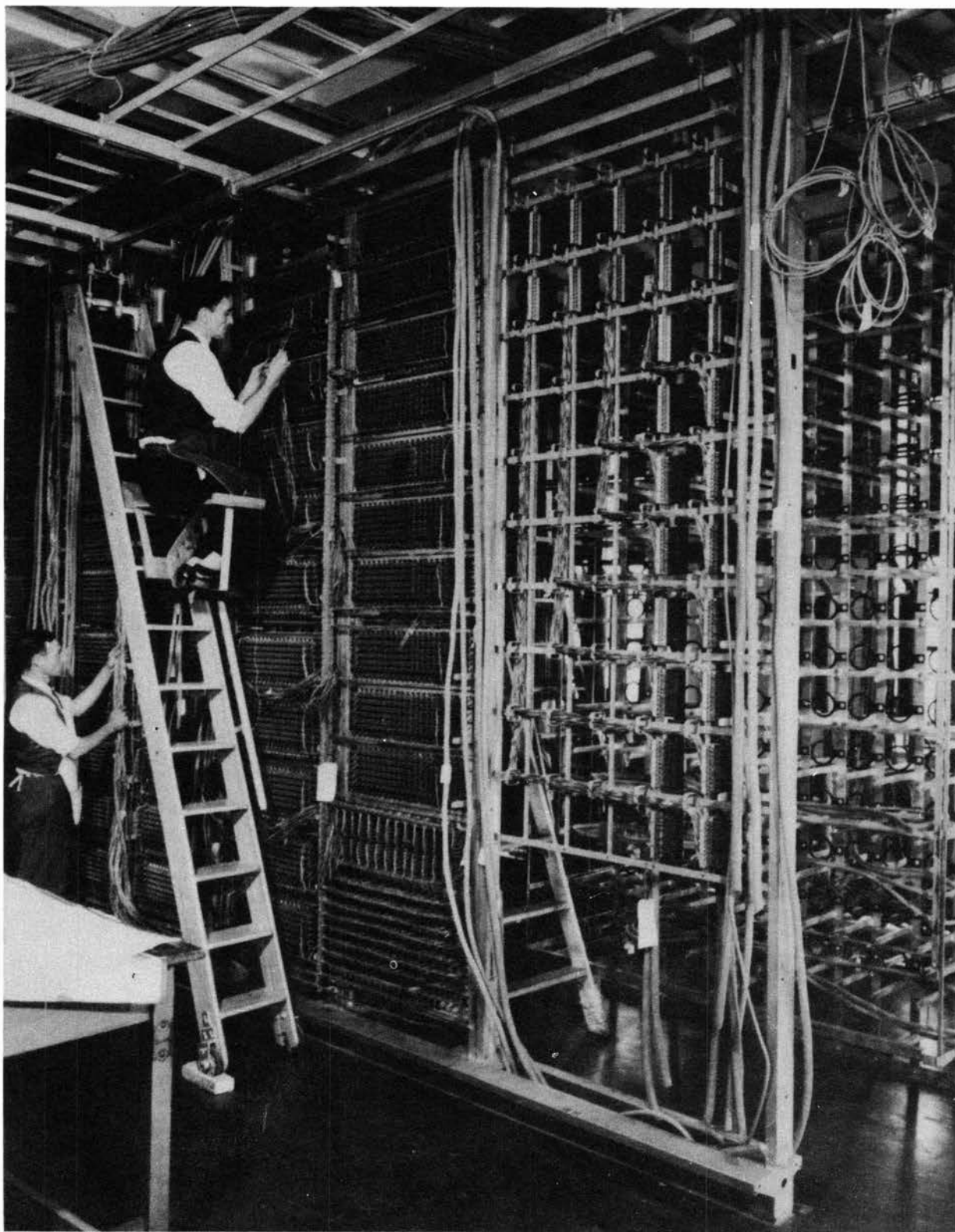
MAIN CROSS AISLE
CABLE RACK



PLYWOOD FLOOR PROTECTION

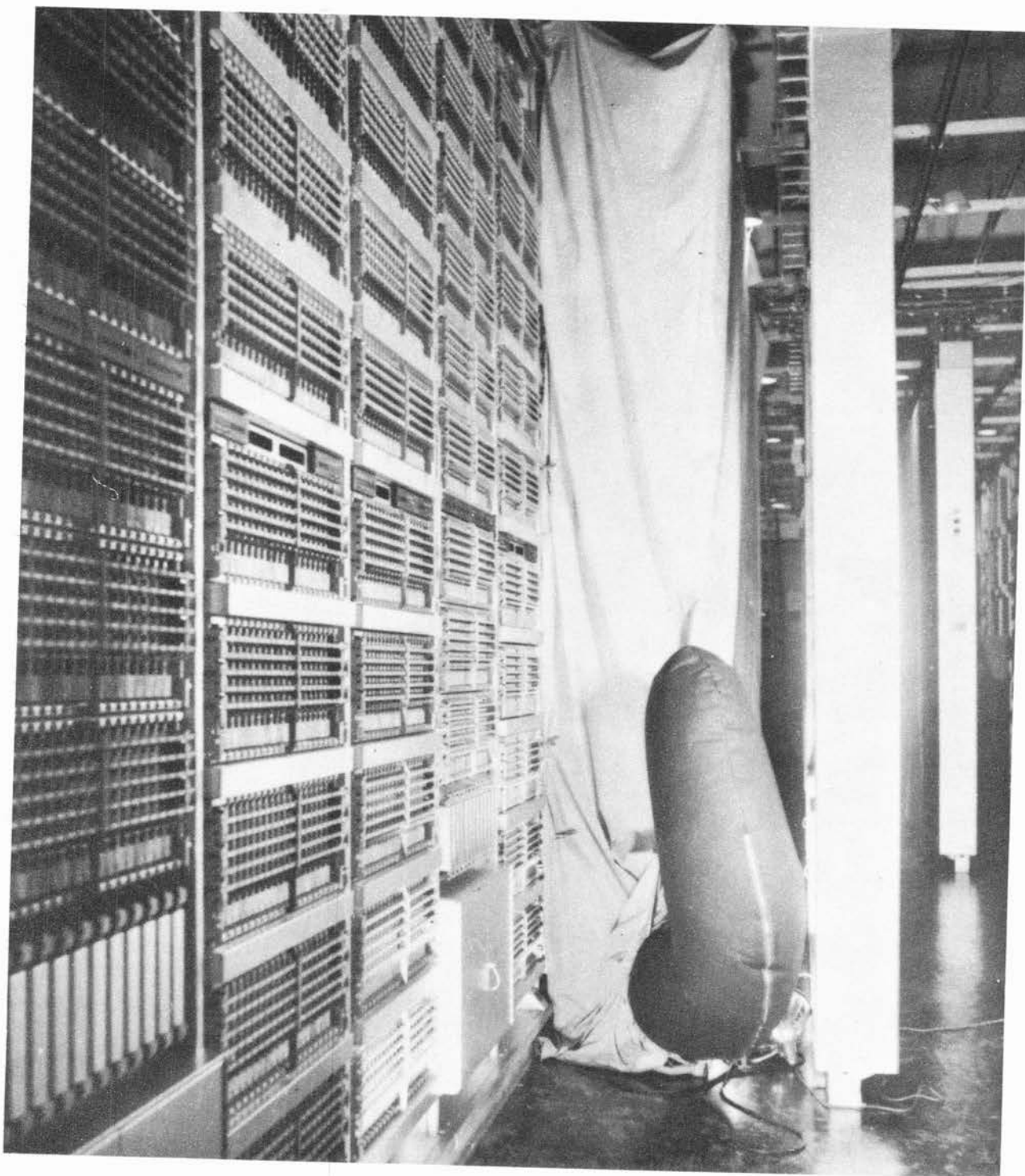
FRAME LINEUPS OFF MAIN CROSS AISLE
LAFAYETTE OFFICE, CHICAGO

CB40-1-13
SEPT. 1939



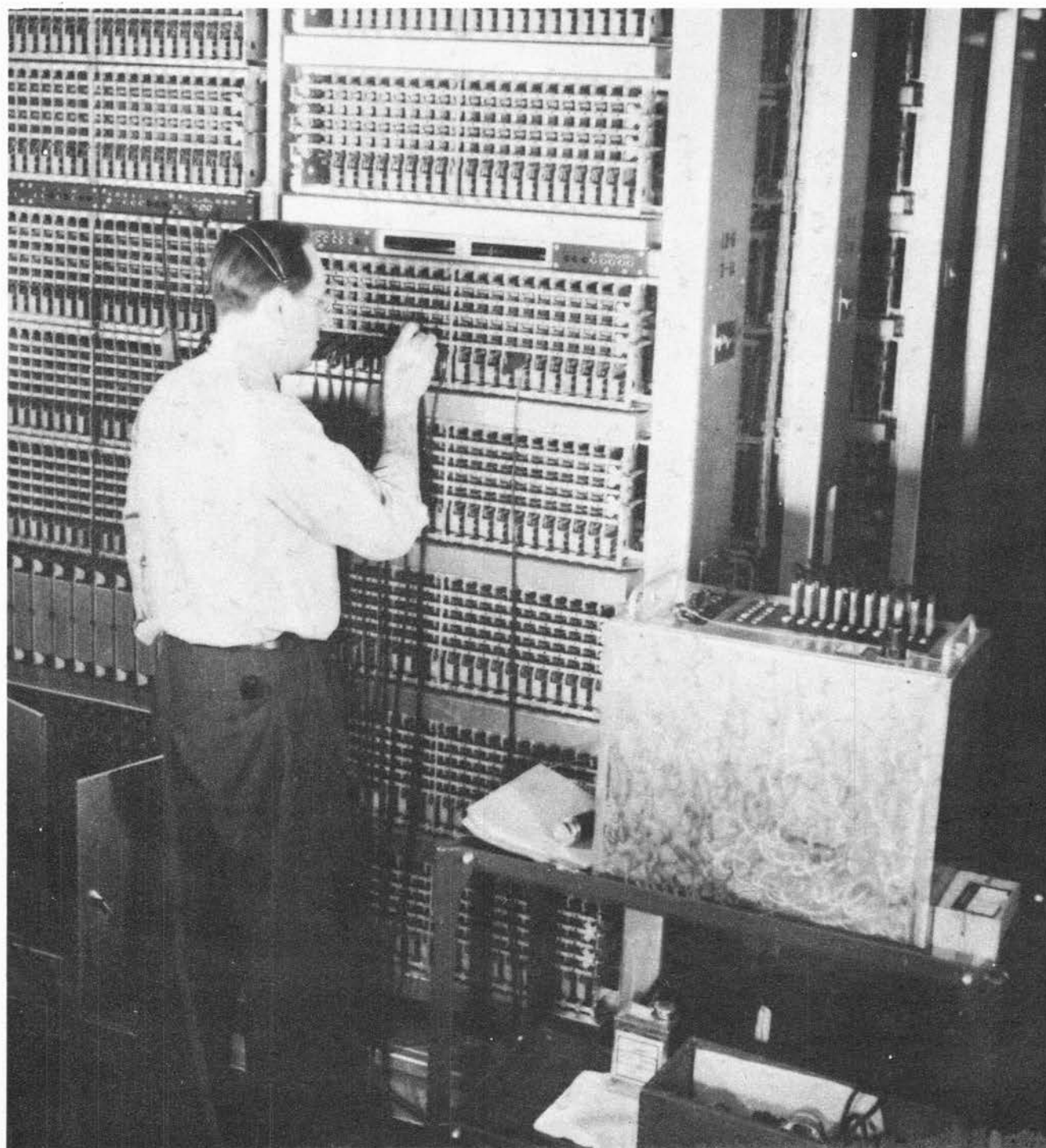
SWITCHBOARD CABLING OPERATIONS
STRIPPING (LEFT) AND FANNING OUT INTO JIG (ON LADDER)

CB 40-1-13.1
DEC. 1947



CLEANING FRAMES
(SHOWING CURTAIN AND EXHAUSTER)
OAKLAND OFFICE, CHICAGO

CB40-1-14
MARCH 1940



TESTING FRAMES WITH A TESTBOX
OAKLAND OFFICE, CHICAGO

CB40-I-15
APRIL 1940