



825' slope @ 100<sup>00</sup>  
 Plus 10%  
 Total

150,000 <sup>00</sup>	installed
82,500	
232,500	
23,250	
155,750 <sup>00</sup>	

11-20-47

## OTIS ELEVATOR COMPANY

## TECHNICAL DATA



October 31, 1947

PROPOSED PASSENGER ELEVATORFORSTANSBURY MINETHE UNION PACIFIC COAL CO.,ROCK SPRINGS, WYOMING

It is proposed to install a modern electric, high speed, Passenger Elevator in a new shaft to transport miners in and out of this mine which is located about 9 miles from Rock Springs. This elevator is to be a strictly passenger elevator and is not to be used for handling any materials.

The elevation of this working is approximately 7,000 feet where the surface temperatures vary from -20 degrees F. to 100 degrees F. This mine is considered a "Dry" mine where humidity is negligible, and where the mine temperatures vary from 55 degrees F. to 65 degrees F.

It is expected that a small amount of water (about 5 to 10 gallons per minute) will flow down this shaft due to seepage, which is considered negligible in a mine shaft, and the mining company will make arrangements to tap this flow at various points to divert it from the elevator equipment, and will arrange to keep the elevator pit clear of water.



The depth of this shaft will be about 825 feet, and the coal lies in 3 veins at approximately 500', 600' and 825' below the surface. The shaft is to be sunk for the sole purpose of accommodating this elevator and is not to be used for ventilating purposes and is to be timbered in California Redwood with suitable spacing.

Although this shaft is not to be used for ventilating purposes, since the mining level will be provided with forced ventilation, it may be expected that a considerable flow of air will be encountered, which may or may not be at a sufficient velocity to interfere with the proper functioning of some parts of the elevator equipment, such as the traveling control cable and the automatic car and shaft door operating devices. Further this air flow may readily be expected to carry with it a considerable amount of mine dust which would be deposited on the elevator equipment in the shaft and even be carried to the equipment in the elevator machine room or headhouse. It therefore would seem to be desirable when designing the walkways or access to the 3 veins, to give consideration to providing some sort of vestibule with possibly a revolving door at each level to provide an air lock to minimize this possible air flow.

The passenger handling requirements of this elevator are as follows:

At 7:00 A.M. - #1 Shift of 275 men into the mine

At 3:00 to 3:30 PM- #1 Shift of 275 men out of the mine and  
#2 Shift of 225 men into the mine

At 11:00 P.M. - #2 Shift of 225 men out of the mine



The distribution of the miners is as follows:

#1 Shift - 150 men at upper level  
75 men at middle level  
50 men at lower level

#2 Shift - 125 men at upper level  
67 men at middle level  
33 men at lower level

The following tabulation indicates the expected time elements involved in handling (A) #1 shift into the mine at 7:00 A.M. and (B) #1 shift out of the mine and #2 shift into the mine concurrently at 3:00 to 3:30 P.M., based on an elevator with a platform 10' 4" wide x 8' 4" deep, with 5' 0" center opening power operated car and hatch doors, rated at 9,000 pounds lifting capacity at a speed of 900 FPM and allowing a space of 2 1/4 square feet per passenger:

	At 7:00 A. M. One-Way Traffic <u>275 In</u>		At 3:00-3:30 P.M. Two-Way Traffic <u>275 Out - 225 In</u>	
Travel Down	Two Int. Stops	66	Two Int. Stops	66
Travel Up	Full Run (825')	58	One Int. Stop	62
Pass. into car	34 at top landing	19	28 at top landing	16
			34 at 2 landings	20
Pass. out of car	34 at 3 landings	22	28 at 3 landings	19
			34 at top landing	17
Term. Slow Down		4		4
Door Time	(4)	<u>16</u>	(5)	<u>20</u>
		185		224
Synch. Time	3%	<u>5</u>	5%	<u>11</u>
Average Round Trip Time (Seconds)		190		235
No. of Trips		8		8
Elapsed Time (Seconds)		1520		1880
Handling Capacity:	272 Pass. in in 25.3 Min.		272 Pass. Out - 224 in in 31.3 Min.	



During the shift changing periods when full loads will be carried, the elevator should have an "attendant" to operate it, but in between these periods the elevator will be expected to make occasional trips to carry other mine personnel into and out of the mine, at which times it should operate as an automatic self-service collective control elevator.

Since this elevator is to be used for high speed passenger service, it should be of a design equivalent and similar to that employed in the latest tall buildings and equipped with all of the customary safety devices and features as recommended in the American Standard Safety Code for Elevators.

The platform size selected (10'4" wide x 8'4" deep) will provide a net inside area of 78 square feet which according to the A.S.S. Code requires that all equipment shall be designed and suitable for a lifting capacity of 9,000 lbs. which insures safe operation in event of a fully loaded car.

With a car of this size carrying ordinary passengers, normally clothed and packed solidly, each passenger would occupy a space of about 1 1/2 square feet. However, where miners are transported it has been variously estimated that, due to their bulky clothing and the small amount of equipment which they carry, they would occupy from 2 to 2 1/2 square feet per passenger. In preparing the tabulations indicating the passenger handling capacity of this elevator an area of 2 1/4 square feet per passenger was used which indicates that a

normally loaded car would carry 34 passengers plus the attendant. With the car crowded to a greater extent, it has been found that considerable time is lost in loading and unloading the car which might readily result in a reduction in the passenger handling capacity.



The following recommendations are made for this elevator:

#### REQUIREMENTS

LIFTING CAPACITY AND SPEED:- 9,000 lbs. at 900 F.P.M.

CAR SIZE:- 10'-4" wide x 8'-4" deep - (78 sq. ft. net inside area)

HATCH AND CAR DOORS:- 5'-0" wide, center opening, horizontal sliding, high speed power operated and provided with automatic mechanical and electrical interlocks.

OPERATION:- Collective automatic push button arranged for "Attendant" and "Non-Attendant" operation.

CONTROL:- Generator field.

SIGNALS:- Electric car position indicator in car, directional lights in car indicating landing push button, "Car Here" gong and light over each landing entrance, and telephone from car to top and bottom landings.

POWER SUPPLY:- 2,300 Volts, 3 Phase, 60 Cycles, Alternating Current.

#### RECOMMENDED EQUIPMENT

MACHINE:- Otis #90 gearless double wrap traction type with driving sheave, motor and brake all mounted and aligned in the shop on one self-contained steel bedplate.

The driving sheave is 40" in diameter, suitably grooved double wrap for 8-13/16" ropes and to provide proper traction relation at all times between car and counterweight sides.

The driving sheave and brake pulley are mounted on the armature shaft and bolted directly to it.

The brake is of the electro-magnetic self-aligning shoe type, electrically released and spring applied.







MOTOR GENERATOR: A specially designed motor generator set is employed with this machine to provide generator field control, which operates at 900 R.P.M. and consists of:

(a) An eight pole, low slip, squirrel cage driving motor, wound and insulated for 2,300 volts, 3 phase, 60 cycles, alternating current.

(b) A four pole direct current generator, compound wound with interpoles, and provided with type "A" insulation, which delivers up to about 300 volts direct current to the elevator motor. The generator is provided with main fields which are separately excited and elevator micro leveling fields which receive their exciting current from the excitor.

(c) A four pole direct current excitor, compound wound with interpoles, and provided with type "A" insulation. It delivers 110 volts direct current for magnetic controller switches and control circuits, brake magnet and elevator motor fields;

(d) The entire motor generator set is of the three bearing type, with driving motor rotor, generator armature and excitor armature all mounted on one continuous shaft mounted in split sleeve bearings for quiet operation at 900 R.P.M. The rotating element is balanced for freedom from vibration.

All parts of the set are assembled and aligned in the shop on a single steel bedplate.

The motor generator set is illustrated by the following photographs:

Photo. No. 9294      10-36 Motor Generator Set

Photo. No. 9295      10-36 Motor Generator Set

The main generator is rated 90 K.W., A.C. driving motor 140 H.P. and exciter 5 K.W.

The ratings are based on temperature rise of 50 degrees C for continuous operation and have no definite relation to the elevator motor ratings.

MOTOR GENERATOR STARTER:- A. C. combination magnetic starter, either Full Voltage across the line type, or Reduced Voltage autotransformer type, with high-interrupting-capacity control with current-limiting fuses.

With the Full Voltage type the line current when starting the motor generator from rest will be about 250 amps, while with the Reduced Voltage type and using the 50% tap, it will be about 80 amps.

The line current with the elevator ascending, fully loaded will be about 65 amps. running and about 110 amps. starting.



ELEVATOR CONTROLLER: The elevator controller is fully electro magnetic and governs direction of car travel, rates of acceleration and retardation, and speed regulation. It is interlocked with the power door control. The magnet switches are provided with arc deflectors and blowouts where required and are mounted on an Ebony Asbestos wood panel supported by a substantial steel frame for floor mounting. Carbon to copper contacts are employed on the switches for main elevator control circuits to eliminate any possibility of welding, and silver to silver contacts are employed on auxiliary switches to insure contact reliability.

The general construction and design of the controller are illustrated by photos Nos. NY-2807 and NY-2808 (80 U.S.L. controller - Front and rear views).

OPERATION:

(a) When miners are being carried to and from the mine, and the elevator is under control of an attendant in the car -

Assume that the elevator is standing at the top landing with the car and shaft doors open. When the permitted number of passengers have entered the car, the attendant pushes a constant pressure button in the car and both car and shaft doors close, and with the momentary pressure of the car buttons corresponding to the lower landings, the doors are mechanically locked and the elevator proceeds to descend. When the car reaches and stops at a landing a signal light is illuminated and a warning gong sounded to announce the arrival of the elevator and the shaft and car doors open automatically. The same procedure is followed for the ascending trip.



During this period, the landing buttons are used to register the calls and advise the attendant that passengers may be waiting at a landing.

(b) When the elevator is being used for carrying other workmen or inspectors to and from the mine or for shaft inspection -

At this time the elevator is arranged as a self service elevator with both car and landing buttons operative. By momentary pressure of a landing call button the shaft and car doors close automatically and the elevator proceeds to the landing corresponding to the button pressed and the doors automatically open. The passengers then enter the car, pressing the car button for the desired landing, the doors close and the elevator proceeds to the designated landing and the doors open automatically. The signal light and gong at the landings announce the arrival of the elevator.

The change in the method of operation is accomplished by key operated switches at the top landing.

The shaft and car doors are both mechanically and electrically interlocked so that the doors must be closed and locked before the elevator can proceed and the doors cannot be opened until the elevator arrives at a landing.

#### FLOOR SELECTOR AND RELAY PANEL:

A floor selector is employed for initiating slow down and stopping at the floors for which calls have been registered. These calls, from both car and hall push buttons, are registered by means of magnetic relays which are mounted on an Ebony Ashes-tes wood panel mounted on the selector frame. All calls remain



registered until reset individually as the selector initiates the slow down and stopping for each floor. The floor selector and relay panel are illustrated by photos Nos. NY 3364 and NY 3494 (140 M Selector).

TOOTHED TAPE DRIVE FOR FLOOR SELECTOR:

The floor selector is driven directly from the car by means of a toothed tape, one end of which is fastened solidly to the car, the other end being fastened to the counterweight with a spring hitch to allow for rope stretch. The drive assembly is equipped with a cast iron sprocket with precision machine cut teeth in the periphery of the sprocket. This sprocket is driven by the toothed tape made of high grade polished spring steel 1" wide and .018" thick. A special process is used to form accurate teeth in the center of this tape so that the teeth in the tape will mesh with the teeth in the sprocket. The drive assembly is connected directly to the floor selector. By means of this drive, a definite relation is maintained between the car and selector thereby insuring accurate floor landings. The general principal of this drive is illustrated by sketch "Toothed Tape and Drive Arrangement for Floor Selector."

AUTOMATIC SELF-LEVELING:- Up-Down leveling switches are mounted on top of the Selector, actuated by revolving cams on the selector. The cams are readily adjustable to provide automatic leveling of the elevator platform at the floor landings, either from above or below the landing with an accuracy of not over plus or minus 1/2" regardless of load, up to full load, in car and return the car to its landing if slightly depressed during loading. The levelling switches are purposely mounted on the selector to eliminate corresponding switches in the hoistway as sometimes used for this purpose.



TERMINAL SLOW DOWN AND STOPPING SWITCHES: Terminal directional slow down and stopping switches, actuated by cams are provided for the bottom and top terminals to insure terminal stopping. As a further safety feature, final limit switches are provided, separately mounted and separately actuated, designed to stop the elevator at either terminal in event of failure of the normal stopping devices.

HATCHWAY SWITCHES: Hatchway limit switches, safety operated switch and stopping switches are of the explosion proof type as illustrated by drawing sheet #6098FC (assembly - 6098FC mechanical switch - explosion proof or moisture proof limit switch type).

CAR AND HALL PUSH BUTTONS: Push buttons for both car and hall are "Appleton" vapor proof units mounted in nests as shown on drawing Sheet No. 6613D (general arrangement - mounting of 6613C car operating panel in freight enclosure, explosion or vapor proof).

CAR FRAME: A heavy structural steel car frame is provided to support the entire weight of the car and load. Drawing sheet #A1020 SA (Arrangement - Car frame for #20 Duplex flex. guide clamp safety) illustrates a type which was used on a similar installation. For the subject elevators, the 2:1 sheave in the cross-head would not be used as a direct rope hitch to the cross-head is contemplated.

The total weight of the car complete for the subject elevator is estimated at 15,000 lbs. including, complete car frame with Duplex safeties, platform, enclosure and accessories.

CAR SAFETIES: All elevators having ropes as hoisting means and especially elevators used to carry passengers should be provided with governor operated safety devices to guard against accidents due to a falling or runaway car, and these devices must be capable of stopping and sustaining the car with rated load without injury to passengers.



With the Flexible Guide Clamp Safety, illustrated by drawing sheet No. 6370A (general arrangement, 20A Flexible Guide Clamp Type Safety), the predetermined retarding force is obtained by clamping each guide rail between a knurled hardened steel roller and a steel jaw which lifts a wedge into place, creating a predetermined clamping force, sufficient to retard and bring the loaded car to rest promptly and with certainty and without any danger of a too sudden stop.

The clamping force is obtained by a compression spring in the back of the clamping jaws and is brought into action by the roller and movable wedge when they are up on the steel wedge's sloping plane. The rollers are actuated by levers connected together by shafting and lift rods to insure simultaneous action, the lift rods being connected to the governor rope. Two sets of safety jaws are used (Duplex) to distribute the load on the guide rails.

GOVERNOR: The elevator governor has two functions to perform; (a) to apply the safety in case of over-speed of the car in the descending direction, (b) to actuate certain switches for speed control of the elevator motor. The governor used in elevator installations of this type is of the fly ball type and is illustrated by drawing sheet No. 131 Gov. (general arrangement type "J-1" Governor - Parallel Jaw - single acting governor), and photo No. 9620.

The usual location of the governor is above the hatchway. An endless rope, laid over the governor sheave, drawn through a rope



clutching device by the motion of the car, is connected to the car safety apparatus so that any change in speed of the car is simultaneously registered by the governor. The rope clutching device is not actuated until a certain descending car speed is obtained, called governor tripping speed, at which time the clutching device grips the governor rope thereby actuating the car safety devices.

Each governor is carefully adjusted and tested in the shop as to proper rope clutching force, tripping speed and switch setting before being shipped.

PLATFORM AND ENCLOSURE: It is suggested that an all steel platform be used with a multi-grip floor plate and the enclosure on the three sides and front return panels be of #14 gauge solid sheet steel to a height of 6' and with perforated sheet steel 2' above, the car top to be peaked and made of #14 gauge solid sheet steel. The general design is illustrated by Form B-560.

CAR AND HATCH DOORS: These doors should be of the hollow metal type, 5'0" wide, center opening and mounted on high speed, heavy duty two point suspension hangers. The doors should be guided at the bottom in open, self cleaning slots in the car and landing sills. The doors and hangers are illustrated by Forms B-3001 and B-605.

DOOR OPERATOR: The high speed electric door operator is mounted on the car and designed to open and close the car and hatch doors (at the landing at which the car has stopped) simultaneously. It is illustrated by Form B-540.

COUNTERWEIGHT: The counterweight which in this case would weigh about 19,000 lbs. would consist of cast iron weights supported in a heavy structural steel frame to which the hoisting ropes are attached, and is illustrated by drawing sheet no. 6055AK (assembly - 6055AK counterweight).



BUFFERS: Especially designed oil buffers are mounted underneath the car and counterweight frames to stop the elevator car or counterweight, should either run by the terminal landing. These buffers are designed to meet all the requirements of the American Standard Safety Code for Elevators, and are furnished with a stroke corresponding to the car speed. These buffers are illustrated by drawing 6136A, used for the car and drawing 6156C used for the counterweight.

ROPES: Each elevator would be provided with eight (8) 13/16" diameter, 8 x 19 high rise seal-special traction steel hoisting ropes which would have a factor of safety of eleven to twelve as required by the elevator code. These ropes would be fastened directly to the car and counterweight frames in babbitted sockets with long thimble rods for ample adjustment.

ROPE COMPENSATION: The eight hoist ropes on this elevator will weigh about 7,000 lbs. and it therefore becomes necessary and desirable to compensate for the changing position of these ropes so as to keep the machine hoisting effort to a minimum and maintain required traction relation. Accordingly, compensating ropes would be provided, connected to the bottom of the car frame and to the bottom of the counterweight; guided by tension frame in pit.

GUIDE RAILS: The car and counterweight will be guided by heavy planed steel tees securely fastened to the shaft framing. The car guides will measure 5 1/2" x 5" x 1 1/4" face weighing 31 lbs. per foot and the counterweight guide will measure 5" x 3 1/2" x 5/8" face, weighing 15 lbs. per foot.



TRAVELING OPERATING CABLE: The electrical equipment on the car, such as operating push buttons, stopping and leveling switches, interlocks, lights, signals, telephone and power door devices are electrically connected to the control system in the penthouse by means of a multi conductor, flexible traveling cable connected to a junction box on the car and at the center line of the shaft and extended to the fixtures and the control system by stationary wiring in rigid conduit. The Otis control cable is very flexible, the wires stranded and covered with cotton and rubber insulation and provided with an outer enclosing braid treated with a fire resisting and water proofing compound. In addition, it is the intention to completely enclose the entire cable in a neoprene jacket. The cable is provided with a stranded steel center for supporting the cable, thus relieving the conductors from any strain.

The general arrangement and space required for the major parts of this elevator equipment are shown on sketches

The entire elevator is so arranged that it can be dismantled and moved to another location when desired.


All equipment in penthouse to be standard open type as regularly employed in buildings, but with explosion proof door devices, switches, push buttons, signals, etc. where used on the car and throughout the hatchway.

All unfinished structural parts in the shaft, such as the car, car frame, counterweight, guide rails, etc. will be given a heavy coating of a corrosion resisting compound and safety parts will be heavily cadmium plated.

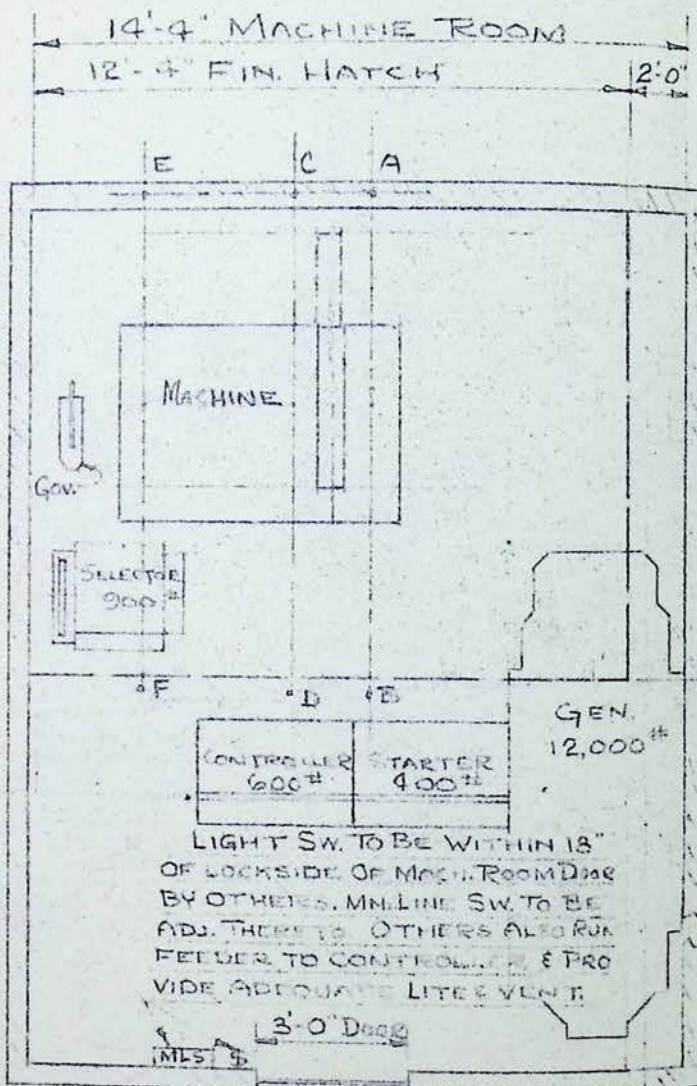
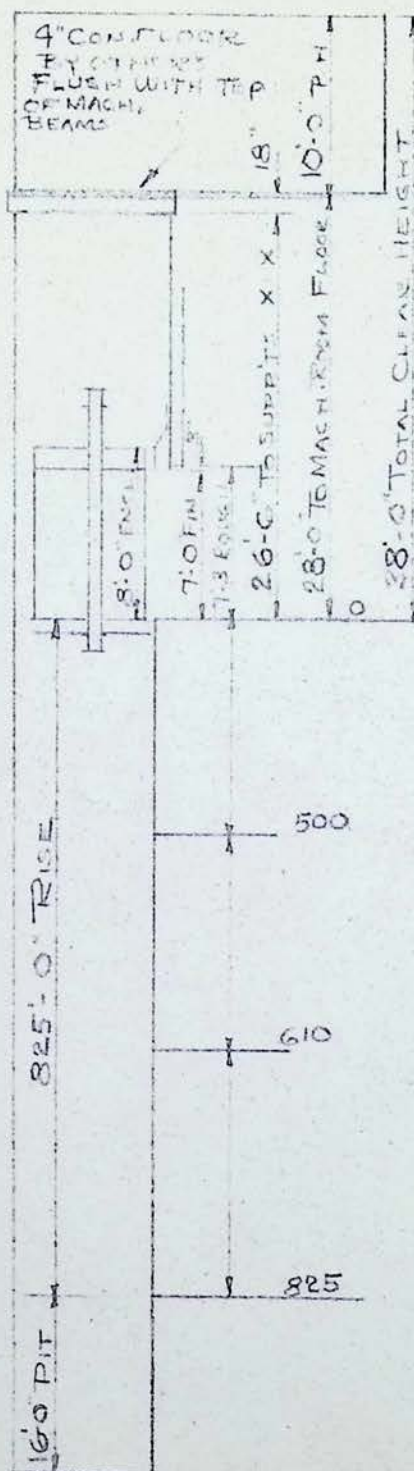


An elevator such as described and illustrated will comply with all of the requirements of the American Standard Safety Code for Elevators and with the Federal Mine Safety Code. A typical installation of an Otis High Speed Passenger Elevator employing a gearless traction type machine is illustrated by Form B-607.

OTIS ELEVATOR COMPANY

By   
V. F. Anderson

A	43,500
B	35,500
C	62,000
D	50,000
E	21,000
F	17,000



MACHINE ROOM

REACTIONS DO NOT INCLUDE

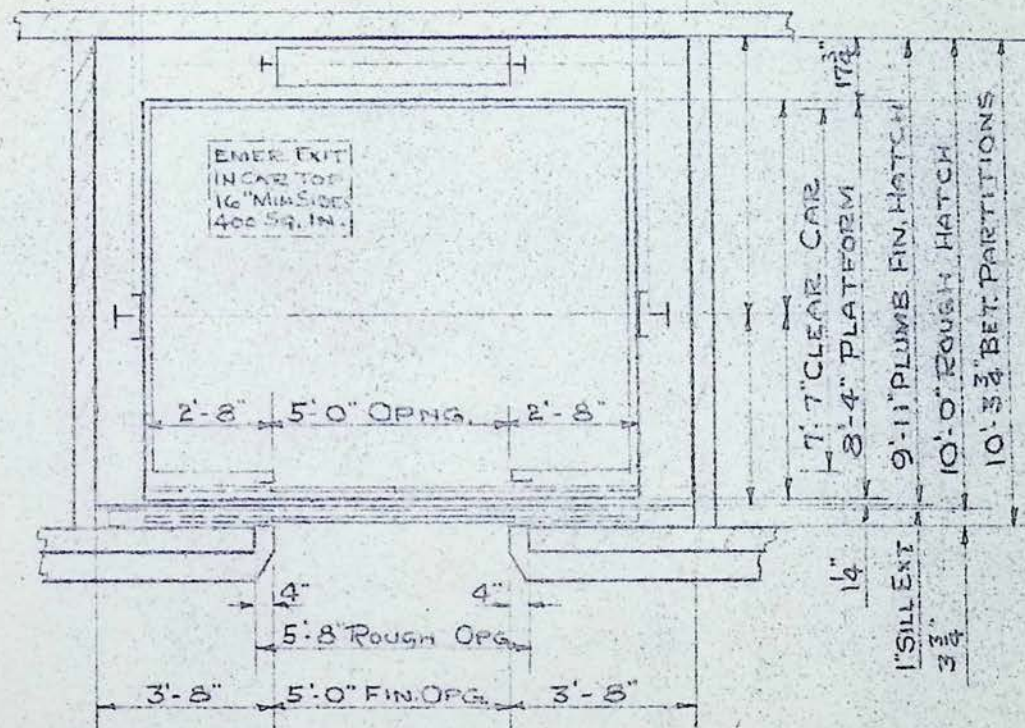
## ANGLE PROJECTION

OTIS ELEVATOR CO

DATE	RECORD CHANGES	AUTH'D	DATE	REVISIONS	AUTH'D	DATE
K						



12'-4" PLUMB FIN. HATCH  
 BET. GUIDES  
 12" 10'-4" PLATFORM 12"  
 10'-0" CLEAR CAR



HATCH PLAN

UNION PACIFIC COAL CO.

ROCK SPRING, WYOMING

ONE COLLECTIVE CONTROL PASSENGER ELEVATOR

WEIGHT OF CONC. SLAB

DUTY: 9000# @ 900 FPM.

COMPANY

REVISIONS	AUTH'D	DATA	DATE	SHEET NO.
		BEGUN BY: <i>HH</i>	11-3-47	P-7502
		FINISHED BY:		
		CHECKED BY:		
		APPROVED BY:		
		AUTHORIZED:		

4-18-48 11-10



2:1 HITCH - 1 SHEAVE		DIMENSIONS	
AD	SHEAVE	A	B
000#	40"	6 $\frac{1}{4}$ "	20 $\frac{1}{2}$ "
	48"		24 $\frac{1}{2}$ "
000#	40"	7 $\frac{3}{4}$ "	20 $\frac{1}{2}$ "
	48"		24 $\frac{1}{2}$ "

2:1 HITCH - 2 SHEAVES

LOAL	SHEAVE	C	D
40 000 <sup>#</sup>	34"	5 $\frac{1}{2}$ "	17 $\frac{1}{2}$ "
	40"		20 $\frac{1}{2}$ "
	48"		24 $\frac{1}{2}$ "
48 000 <sup>#</sup>	40"	6 $\frac{1}{4}$ "	20 $\frac{1}{2}$ "
	48"		24 $\frac{1}{2}$ "

SEE DWG 296 RC

⑩⑥⑨-DWG A-197-CF  
 ⑪⑫⑬⑭⑮⑯⑰⑱  
 DWG A-203-CF  
 ⑲-DWG A-1033-SA  
 ⑳-DWG-IX-233  
 ㉑-DWG-A-1033-SA  
 ㉒-DWG-1021-SA  
 ㉓㉔ DWG-198-CF

PART N° 810538  
FOR UPPER SAFETY

DWG. №.237A

PART NO 810530  
RDR 10/10/88

PART N° 81

### 1:1 HITCH

ROPE	RISE IN FT.	E	F	G
6-1"	0'-200'	19"	7/8"	8 3/8"
	OVER 200'	27 1/2"	1 3/8"	
8-1"	0'-200'	19"	7/8"	
	OVER 200'	27 1/2"	1 3/8"	

SEE DWG. 295 RC

A-REDESIGNED.

DISTANCE BETWEEN GUIDE SHOES = D.B.G. - \frac{1}{8}

USE THIS BRACKET WHEN DISTANCE BETWEEN GUIDES IS 12'0" AND OVER

PAT. NO 196-SA-1

1. Dwg. A-152-CF

120 PART № G2202

PART # 6202

LENGTH OF HEAD I's = D.B.G. +  $5\frac{3}{4}$ "

HITCH AS SPECIFIED

~~BASK PLATE DWG A1033SA~~

PART # 63631

MALE JAWS PART NO 601255  
FEMALE JAWS PART NO 60322

-DISTANCE BETWEEN SHIP CHANNELS = D.B.G. - 6' 1/4"

- DISTANCE BETWEEN GUIDE RAILS = D.B.G

### PLATFORM

LENGTH OF PLANK CHANNELS = DRG + 5

BACK PLATE DWG A1033SA

(3) BUFFER BEAMS  
DWG. 304AR

MIN. D.B.G. 3 SPRING BUFFERS WITH OR WITHOUT CHAIN COMPENSATION

HITCH					
1:1	2:1				
	1 SHEAVE		2 SHEAVES		
7' 4 <sup>1</sup> / <sub>4</sub>	40"	48"	34"	40"	48"
	8' 0 <sup>1</sup> / <sub>4</sub>	8' 8 <sup>1</sup> / <sub>4</sub>	11' 2 <sup>1</sup> / <sub>4</sub>	12' 2 <sup>1</sup> / <sub>4</sub>	13' 6"

### GENERAL ARRANGEMENT

№ 20 DUPLEX FLEXIBLE GUIDE CLAMP SAFETY  
OTIS ELEVATOR COMPANY-ENG. DEPT - NEW YORK

DRAWN BY: L.D.S. 5-28-4.

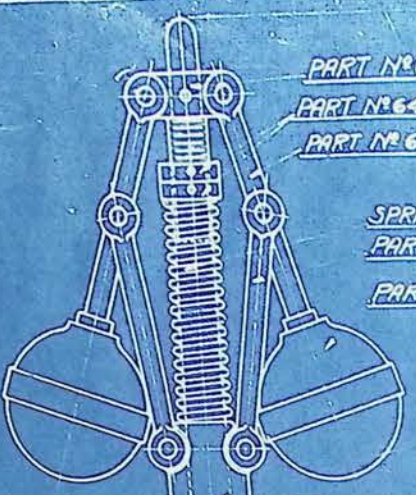
**CHECKED BY:**

APPROVED BY

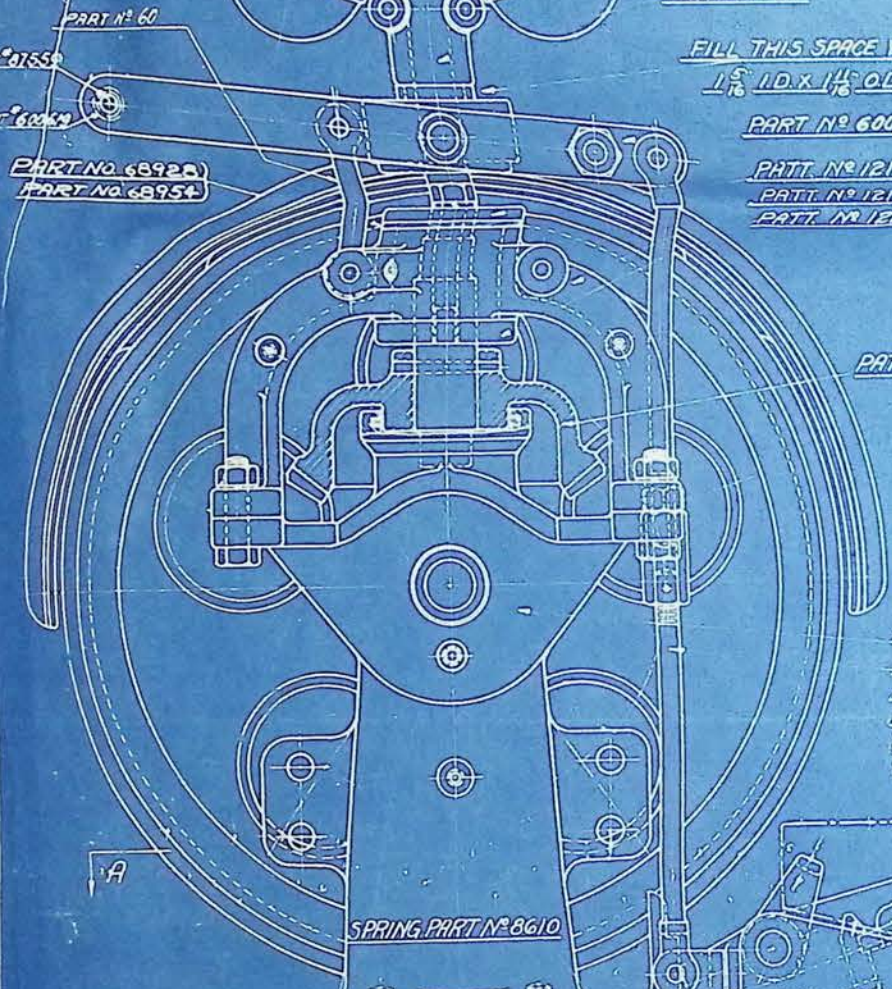
SHEET N <sup>o</sup>	CLASS	DATE
A 1020	SA	MAY 28, 1941

FOR ASSEMBLY OF LEVER FOR CROSSHEAD  
SAFETY ROLLER SEE DWG. NO. A1033SA





TIMKEN BEARING SET UP  
 HEAT ALL CONES IN OIL AT 175°F TO ASSEMBLE.  
 TO SET UP BRG'S DRAW UP CUP FOLLOWER UNTIL  
 BRG'S BIND SLIGHTLY WHILE ROTATING MEASURE  
 GAP BETWEEN FOLLOWER FLANGE AND HOUSING AND  
 ADD .003 TO .005 AS TOTAL THICKNESS OF SHIMS  
 REQUIRED.



FILL THIS SPACE WITH C.R.S. COLLAR  
 1 1/8" I.D. X 1 1/8" O.D. LENGTH TO SUIT.

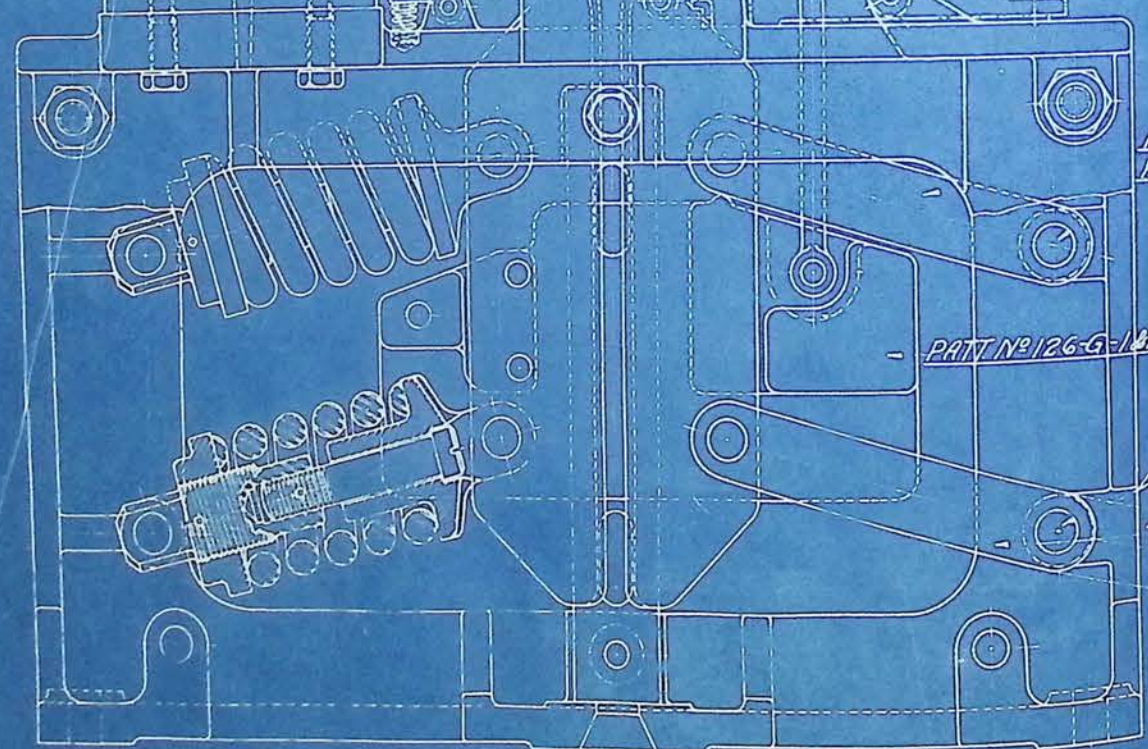
PART N° 600100  
 PATT. N° 121-G-3  
 PATT. N° 121-G-1  
 PATT. N° 121-G-2

PATT. N° 124-G-2 OR 124-G-4

PATT. N° 120-G-1  
 PART N° 61417  
 PART N° 63712  
 PATT. N° 130-G-3 OR 130-G-4  
 PATT. N° 27-G-1 OR 27-G-2

TRIPPING MECHANISM GUARD PATT. N° 121-G-1  
 PART N° 601301  
 PATT. N° 130-G-5  
 OR 130-G-6

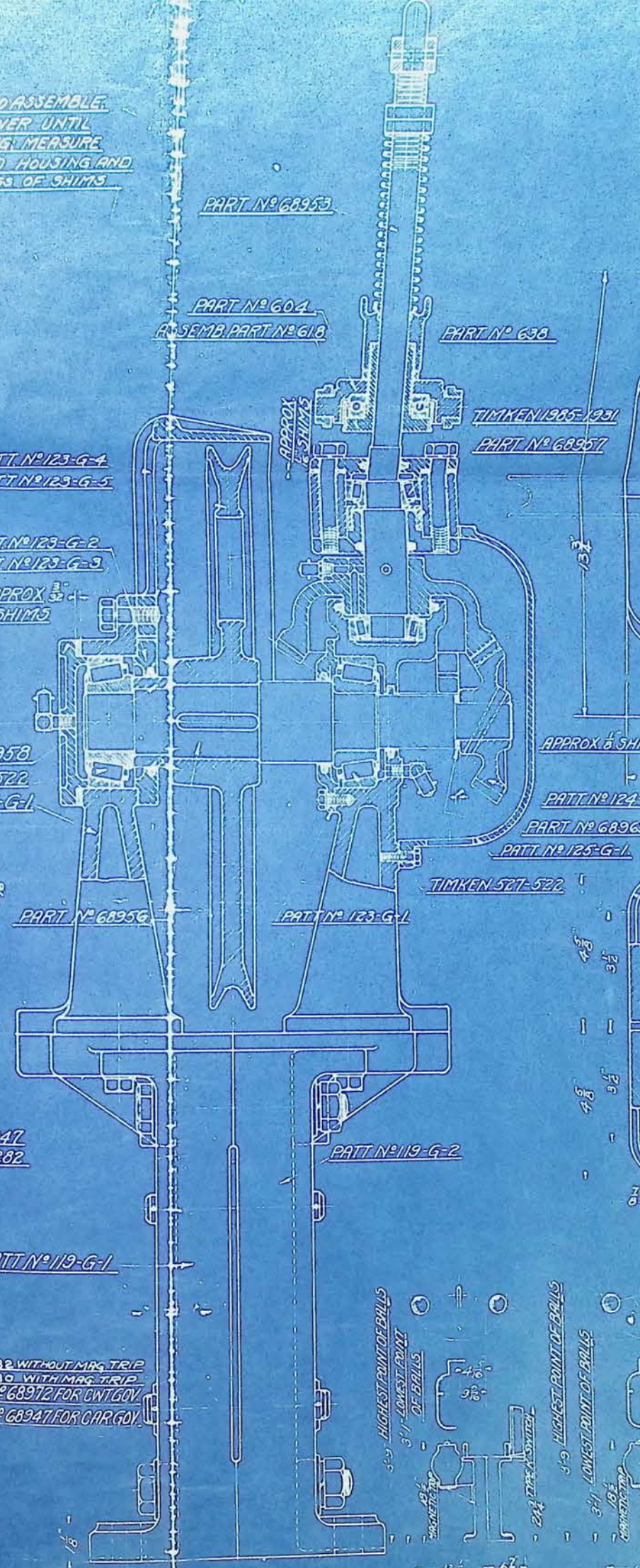
PART N° 63714



PART N° 68947  
 PART N° 813282

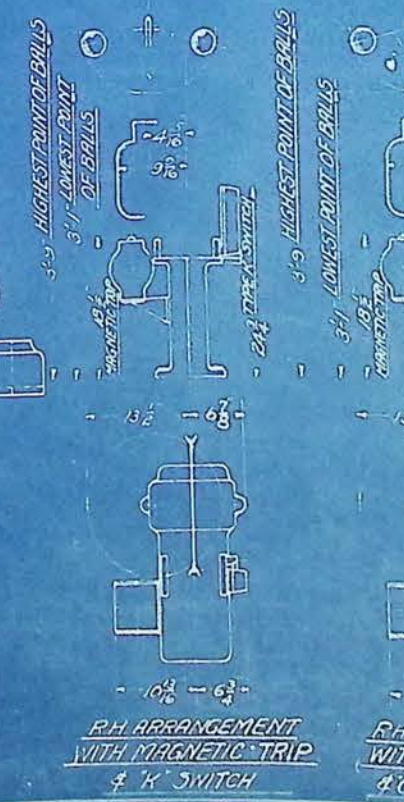
PATT. N° 119-G-1

PART N° 813532 WITHOUT MAG TRIP  
 PART N° 813530 WITH MAG TRIP  
 PART N° 68972 FOR CWT GOV.  
 PART N° 68947 FOR CARGO



FIRST ANGLE PROJECTION

ARRANGEMENT AS SHOWN IS FOR R.H. GOV.



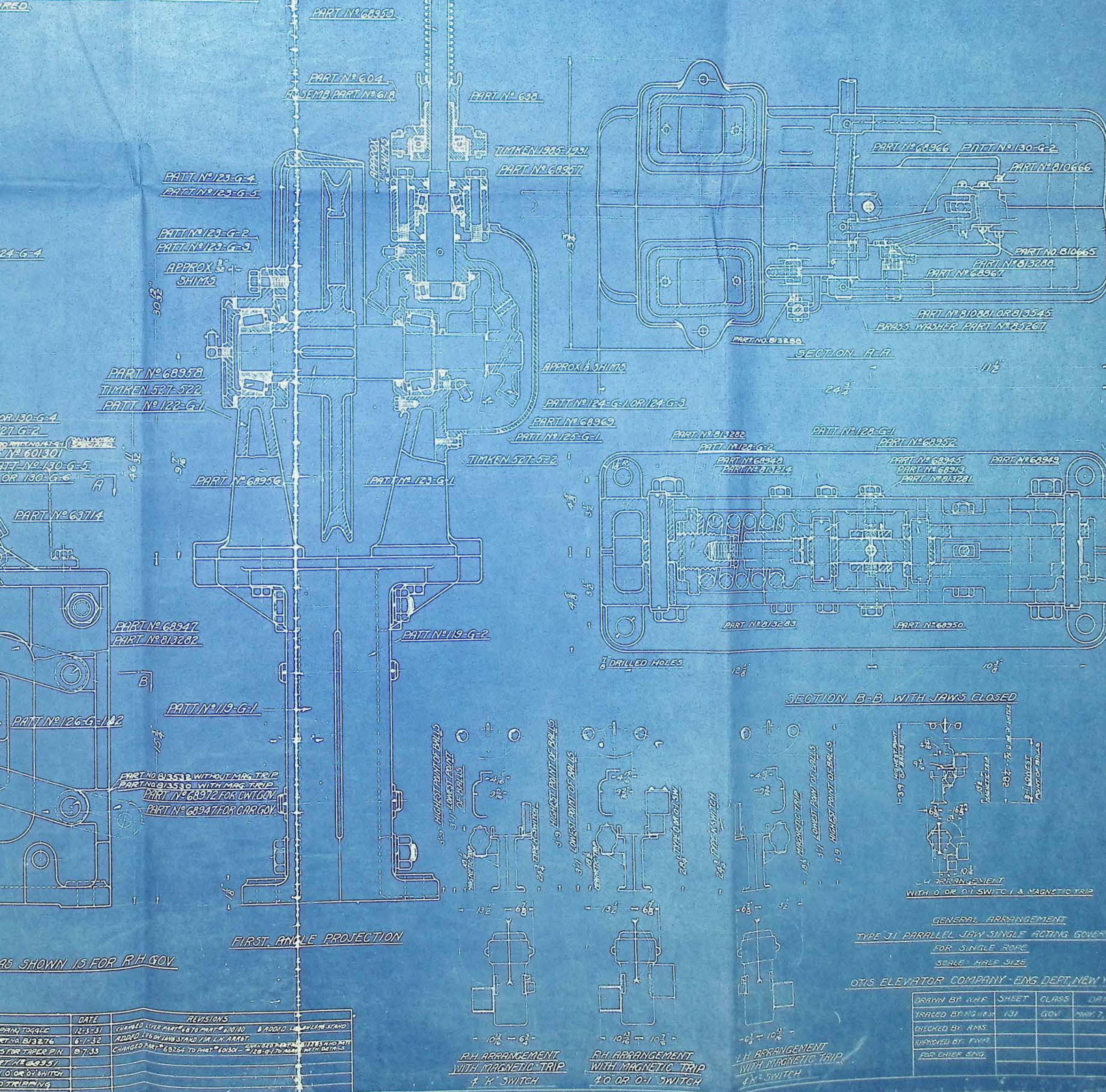
RECORD CHANGES

DATE	REVISIONS	DATE	REVISIONS
1-6-31	CHANGED BASE FOR CLEARANCE AROUND TRIP PIN TO 1/4"	12-3-31	CHANGED LIVER PART N° 8 TO PART N° 80100
	PART N° 68928, 68954, 813530 ADDED PART N° 813276	6-1-32	ADDED LUG ON LHS STAND FOR L.H. ARRANG.
	REMOVED ADDED LUG ON BASE & STANDS FOR TAPER PIN	9-7-33	CHANGED PART N° 68954 TO PART N° 601301 - 1/2" DIA. TO AGMT. WITH DETAILS
	SUBSTITUTED PART N° 68928 FOR PART N° 68951		
2-25-31	ADDED TEMPLATE OF L.H. ARRANGEMENT WITH O' OR OY SWITCH		
7-21-31	REMOVED NOTE FOR LUBRICATION, ADDED TRIPPING MECHANISM GUARD		



ALL COMES IN OIL AT ITS FTD ASSEMBLE.  
T UP BRGS DRAW UP CUP FOLLOWER UNTIL  
AND SLIGHTLY WHILE ROTATING. MEASURE  
BETWEEN FOLLOWER FLANGE AND HOUSING AND  
003 TO .006 AS TOTAL THICKNESS OF SHIMS  
USED.

SUPERSEDED BY NLM G07 247



	DATE	REVISIONS
DRING TOGGLE	12-3-31	CHANGED LITER PART #6870 TO PART #60100 8 ADDED LUGS AND LONG STAND
ETNA BJB276	6-1-32	ADDED LUGS AND LONG STAND FOR LIT. ARREST.
5 FOR TAPER PIN.	8-7-33	CHANGED PART #68254 TO PART #60301 - CHANGED PART #60301 TO PART #60301 AND PART #60301 TO PART #60301
TT/1200951		
10'0'0' SWITCH		
OTRIPING		

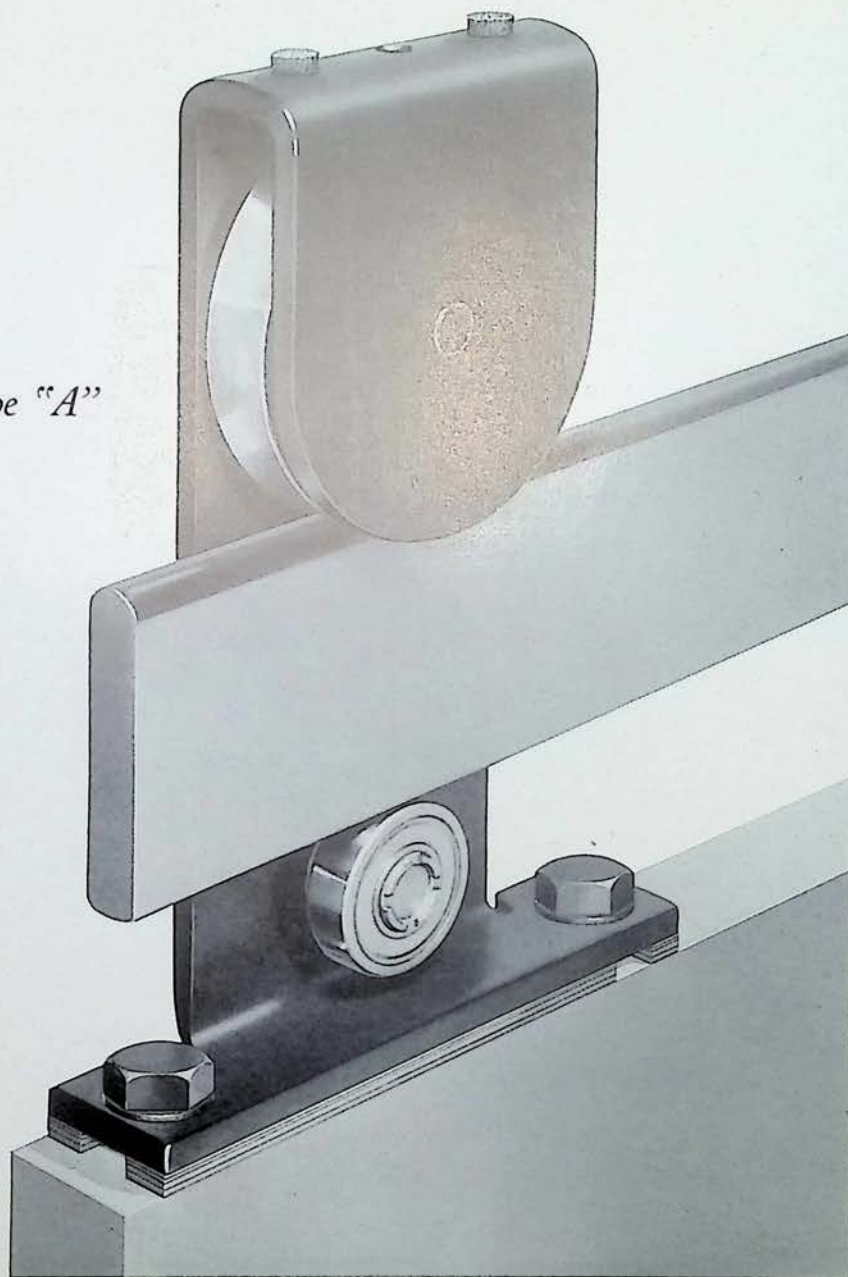


# TWO-POINT SUSPENSION

## *Elevator Door Hangers*

for HIGH-SPEED POWER OPERATED DOORS

*Type "A"*



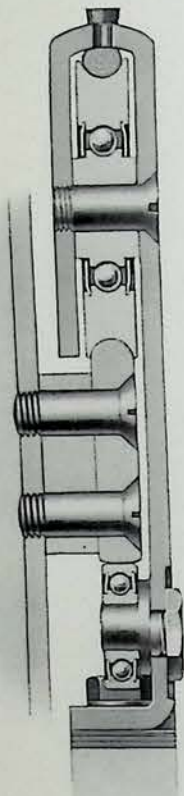
THE TYPE "AU" HANGER has the same rollers and track as used with the Type "A". But in order to separate the supporting points for very narrow doors a single housing is used for both rollers.

*HANGERS are available with steel or rubber tired rollers.*

(over)



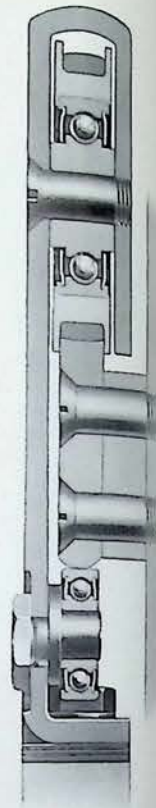
## SECTIONAL VIEWS



TYPE "A"  
HANGER  
WITH  
STEEL  
ROLLER



TYPE "A"  
HANGER  
WITH  
RUBBER  
TIRED  
ROLLER



Rubber tired hangers should be used on all passenger car doors except when the doors are very narrow.

Rubber tired hangers are also available for use on hoistway doors in buildings where exceptionally quiet operation is a factor.

## SPECIAL FEATURES

Large diameter roller with large ball bearing.

One-piece pressed steel housing.

Oil wick lubrication of steel rollers prevents undue track wear.

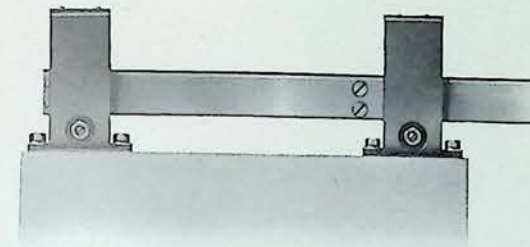
Adjustable up-thrust roller with ball bearing.

Maximum strength many times greater than average loads.

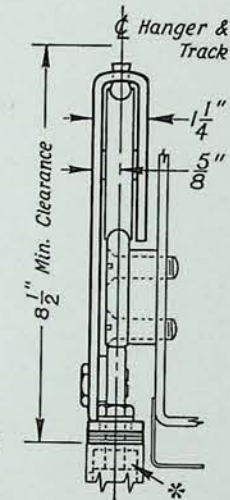
Slotted bolt holes and shims facilitate accurate alignment of door.

All ball bearings permanently lubricated at the factory.

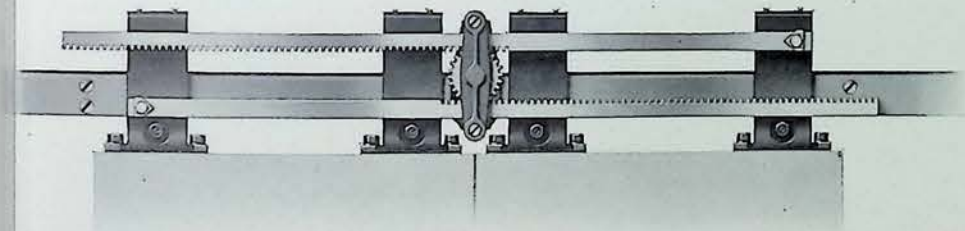
## TYPE "A" HANGERS



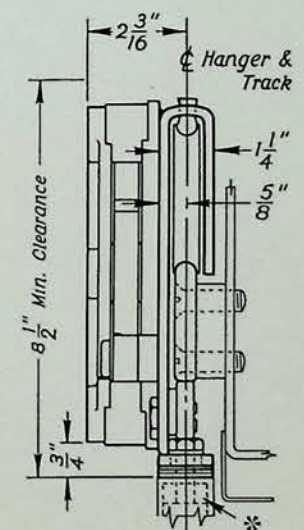
for Single-Slide Doors



## TYPE "A" GEARED HANGERS

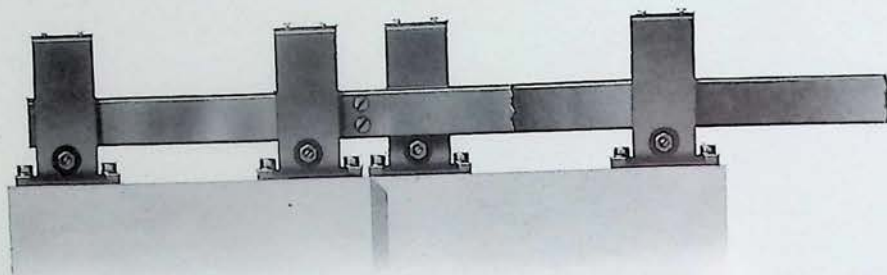


for Center-Opening Doors

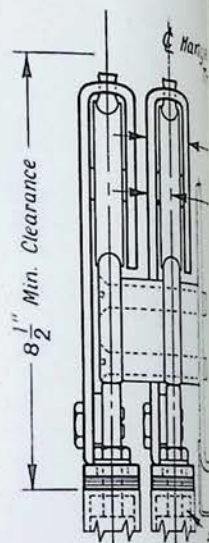




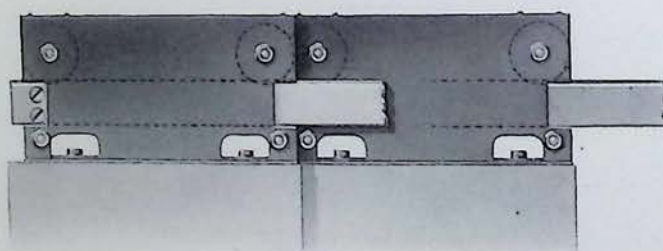
## TYPE "A" GEARLESS HANGERS



*for Two-Speed Doors*

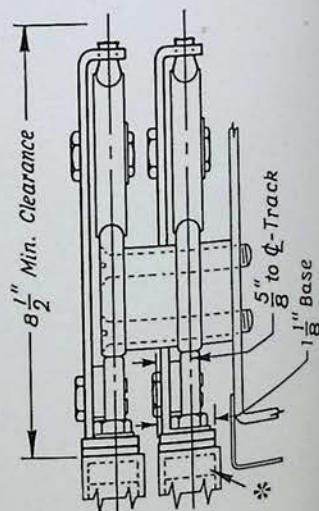


## TYPE "AU" GEARLESS HANGERS



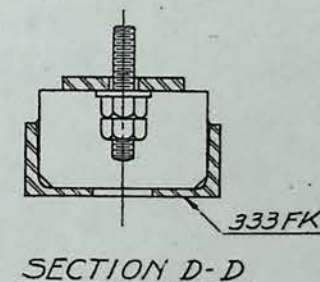
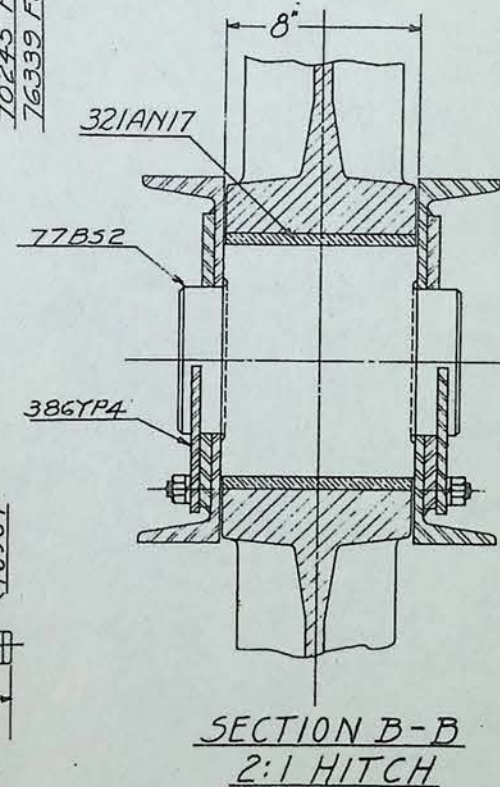
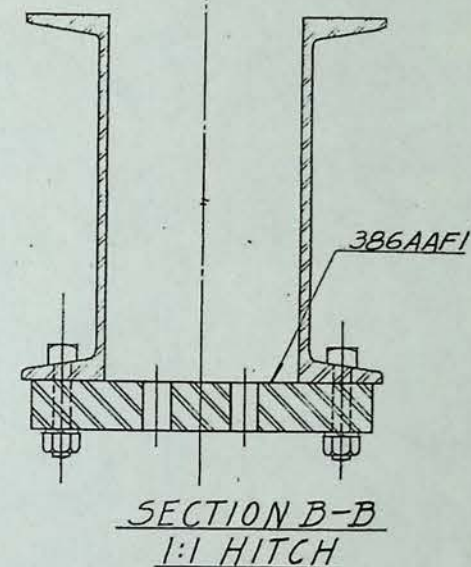
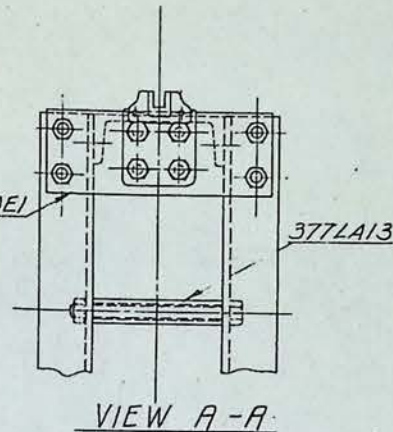
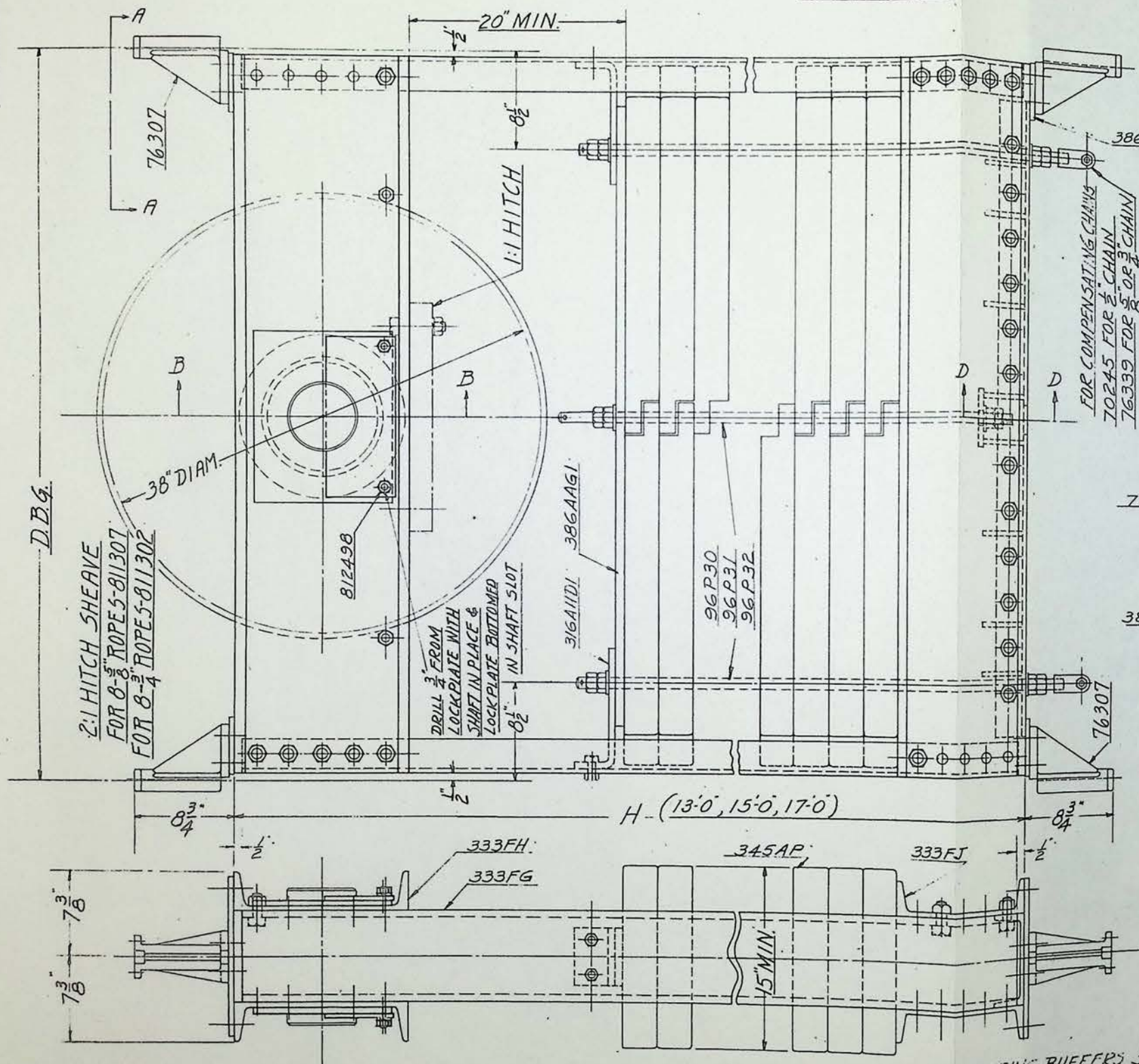
*for Two-Speed Doors*

Note how the design of the "AU" Hanger with a single housing permits wider separation of the rollers thereby giving a longer wheelbase.



\*1/2" steel reinforcement bar, full width of door, by door manufacturer.





## ASSEMBLY

6055 AK COUNTERWEIGHT

FOR GEARED MACHINES - 1:1 & 2:1 HITCHES-

NO 1 OR 2 RAILS - SPRING BUFFERS - 57 1/2" 60 1/2" 63 1/2" 66 1/2" 69 1/2" DBG

UPRIGHT	HITCH	MAX ROPES	DIAM. SHEAVE	MAX. TOTAL WGT INCL. COMPENSATIO
8"	1:1	8-1"	—	34000*
	2:1	8-3/8" 8-3/4"	38"	

USE SPRING BUFFERS 320AT1  
3 BUFFERS UP TO AND INCL. 25000#  
4 BUFFERS ABOVE 25000 TO 32000#  
5 BUFFERS ABOVE 32000 TO 34000#

**TOLERANCE UNLESS OTHERWISE STATED.**

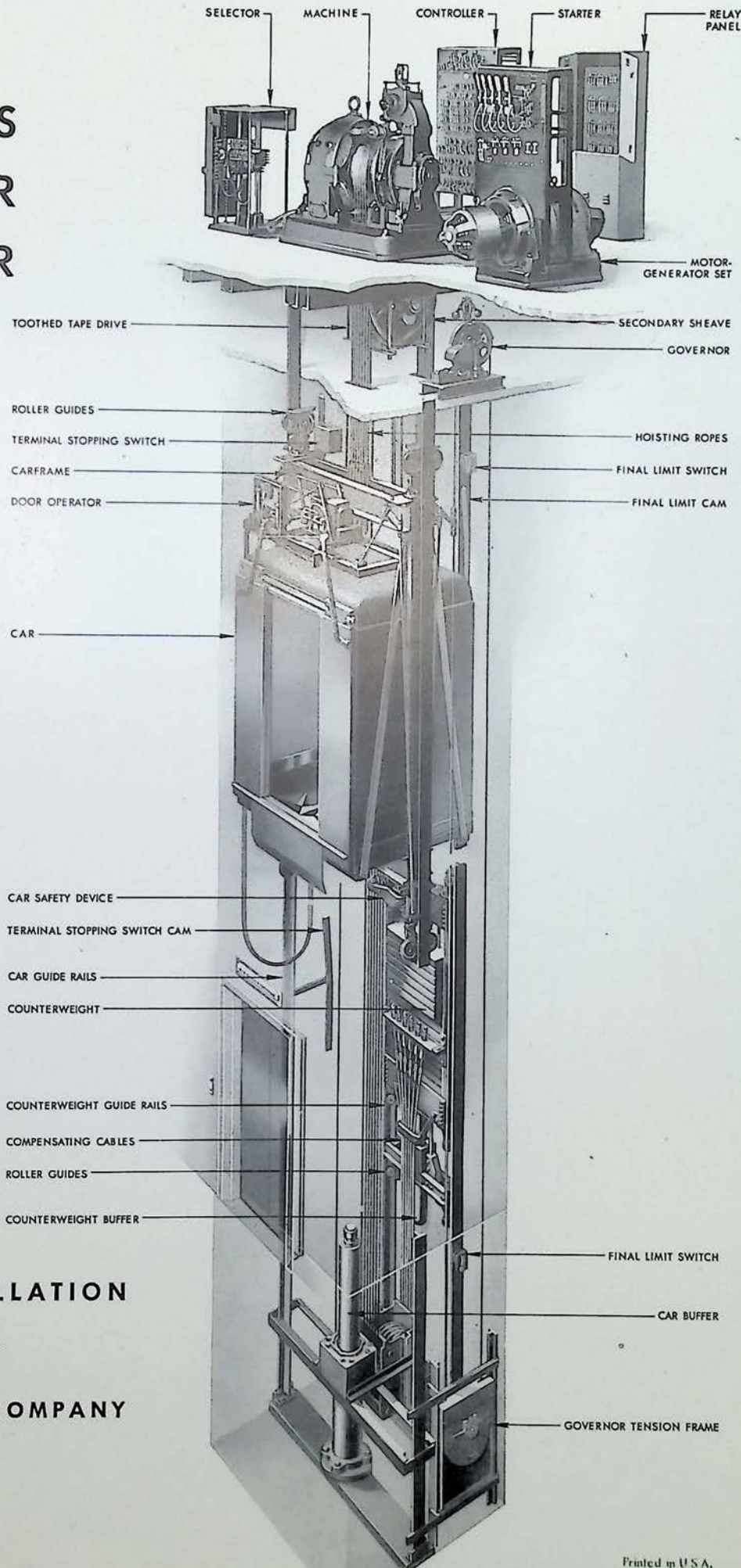
FIRST ANGLE PROJECTION

OTIS ELEVATOR COMPANY NEW YORK

FIRST ANGLE PROJECTION				OTIS ELEVATOR COMPANY <u>NEW YORK</u>													
DATE	RECORD CHANGES	AUTH'D	DATE	REVISIONS	AUTH'D	DATE	REVISIONS	AUTH'D	DATE	REVISIONS	AUTH'D	DATE	REVISIONS	AUTH'D	DATA	DATE	SHEET NO.
															BEGUN BY: <u>GH</u>	<u>9-3-41</u>	<u>6055AK</u>
															FINISHED BY: <u>C.A.A.</u>	<u>10-3-41</u>	
															CHECKED BY: <u>H.B.J.</u>	<u>10-23-41</u>	
															APPROVED BY: <u>J.N.A.</u>	<u>10-30-41</u>	
															AUTHORIZED: <u>K.R.W.</u>	<u>11-5-41</u>	
<u>L</u>																	



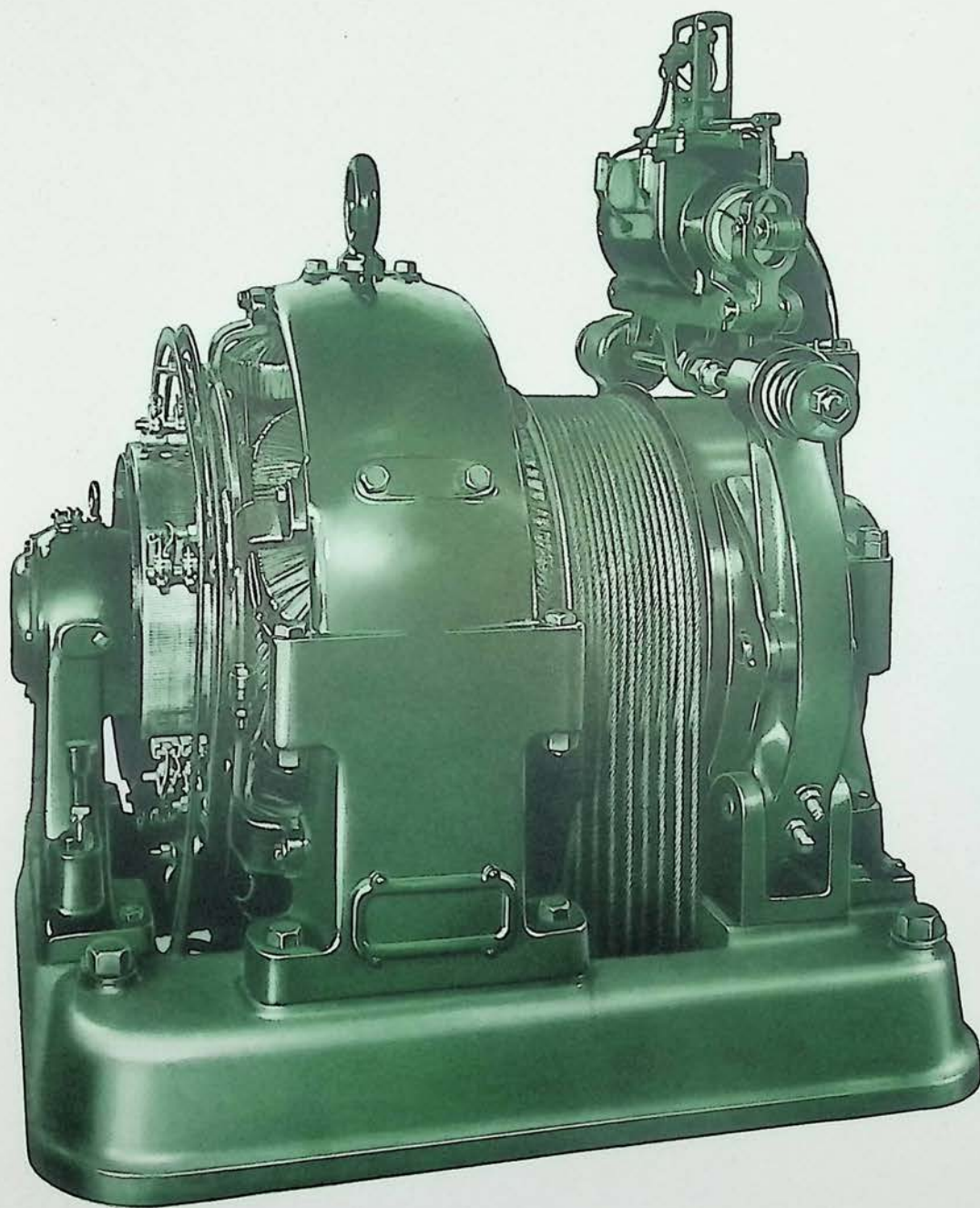
# OTIS PASSENGER ELEVATOR



TYPICAL INSTALLATION  
Gearless Machine

OTIS ELEVATOR COMPANY





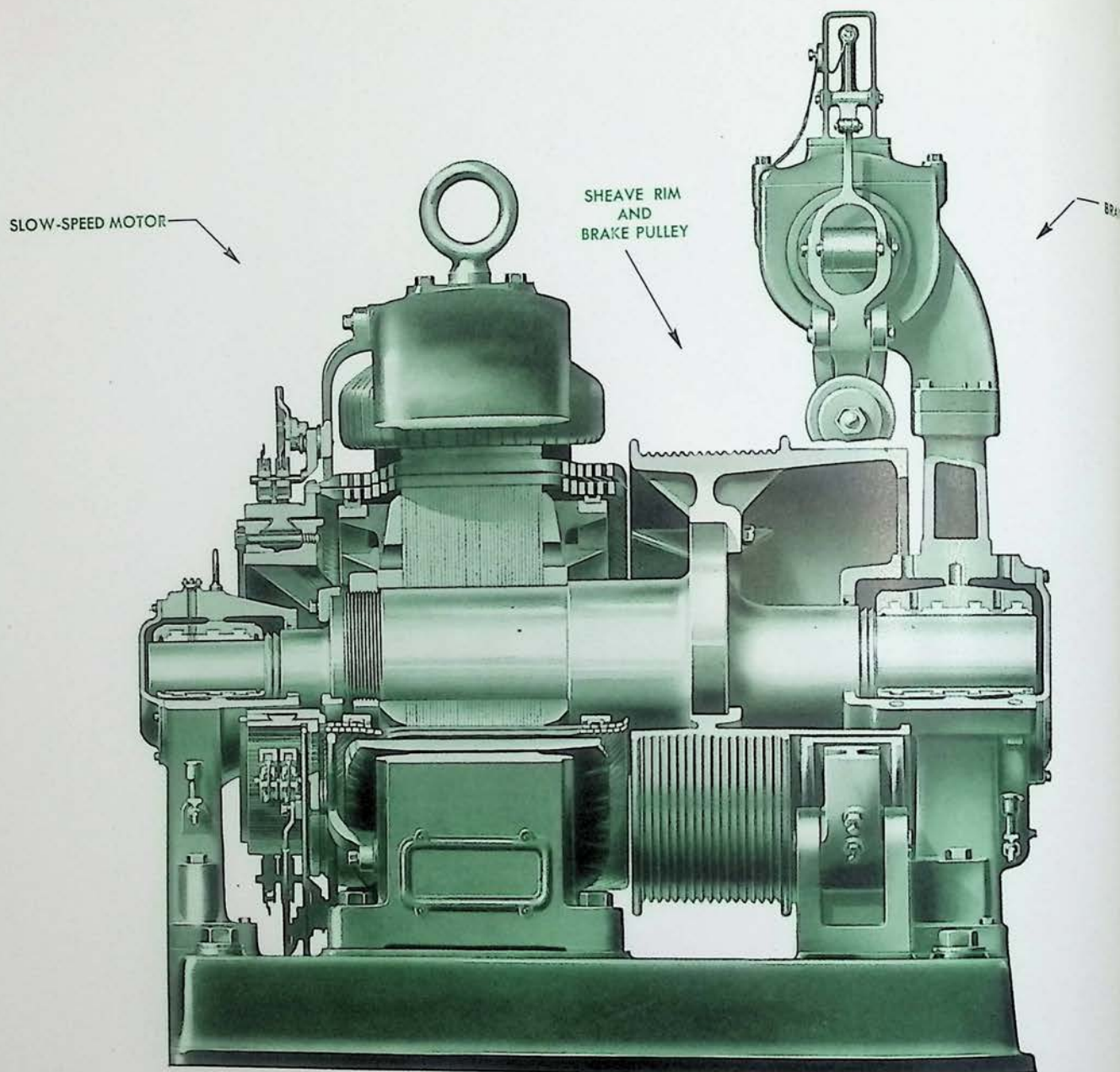
## GEARLESS TRACTION MACHINE

OTIS GEARLESS ELEVATOR MACHINES are basically simple and have few moving parts. They are therefore more efficient, more rugged and have a longer-life than any other type of elevator machine.

They are available in several sizes applicable to a wide variety of passenger and freight installations.

(over)





## SPECIAL FEATURES

### Gearless Traction Machine

**SIMPLE** — It consists of only three main components — a slow-speed motor, a driving sheave and a brake. The sheave rim and brake pulley are a one-piece casting which bolts directly to the shaft.

**EFFICIENT** — Since there are no gears, and all rotating parts are mounted directly on one solid

forged steel shaft, power is delivered to the hoist ropes with the absolute minimum of loss.

**QUIET AND LONG WEARING** — Because the sheaves rotate at slow speed and because they have so few moving surfaces in contact, Otis gearless machines run quietly and last indefinitely.

OTIS ELEVATOR COMPANY



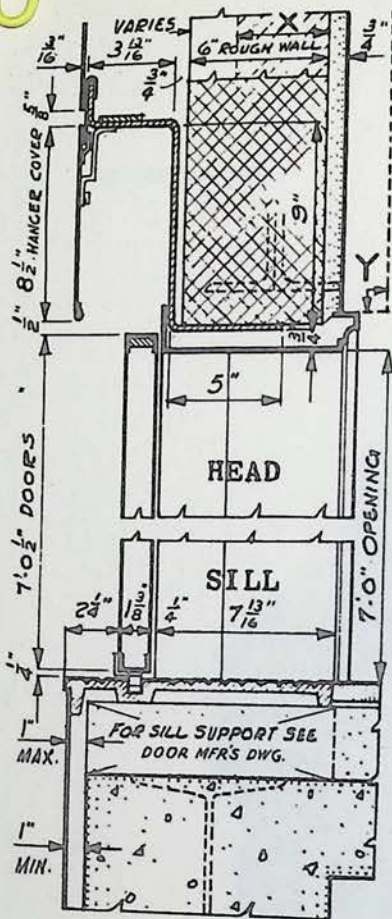
**APPROVAL DRAWING**

**STANDARD ENTRANCE**

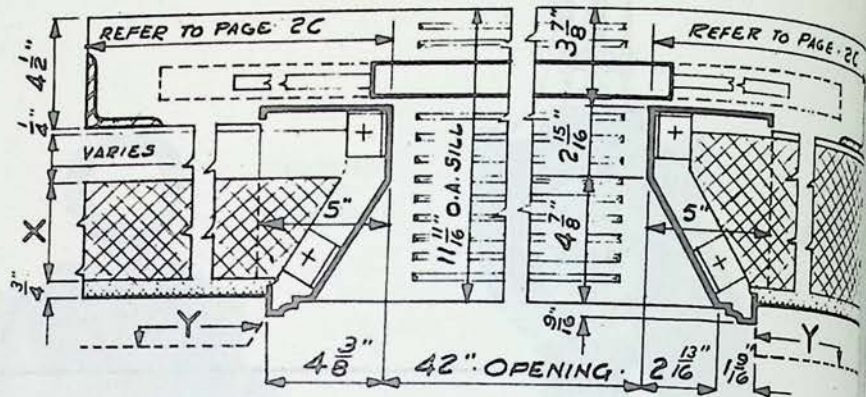
**CENTER-OPENING DOORS**

**42" DOOR OPENING**



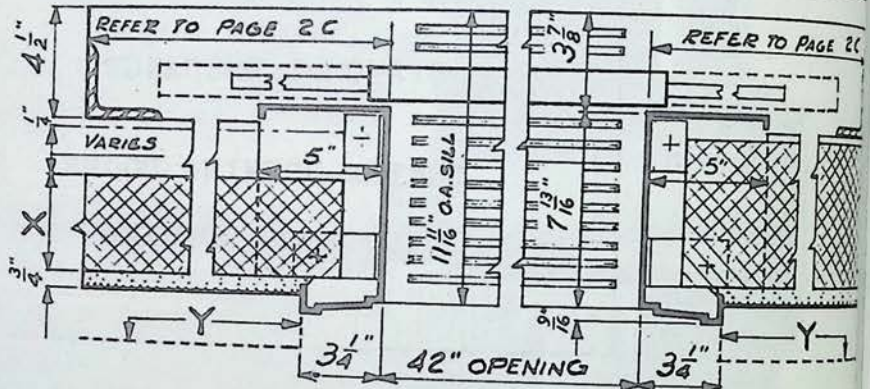


SECTION A A



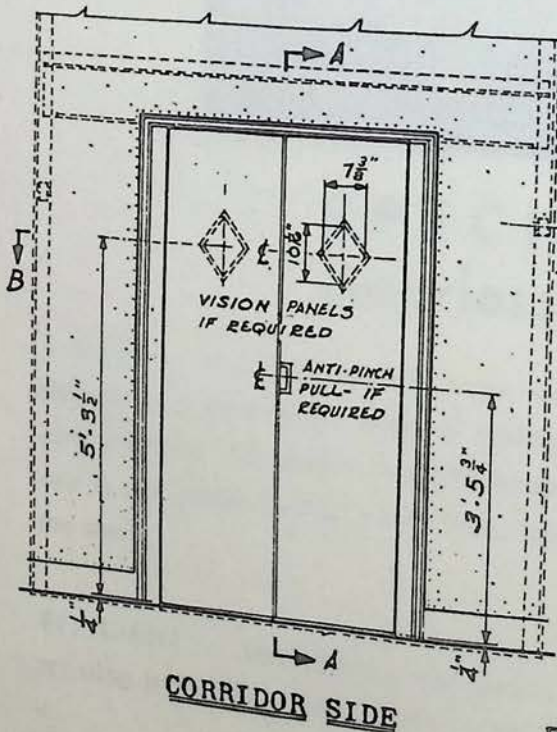
SPLAYED JAMBS

X - ROUGH WALL WHEN DEPTH IS LESS THAN 6 INCHES, USING STANDARD  
Y - TREATMENT WHEN DEPTH OF WALL IS GREATER THAN 6 INCHES. LINTELS



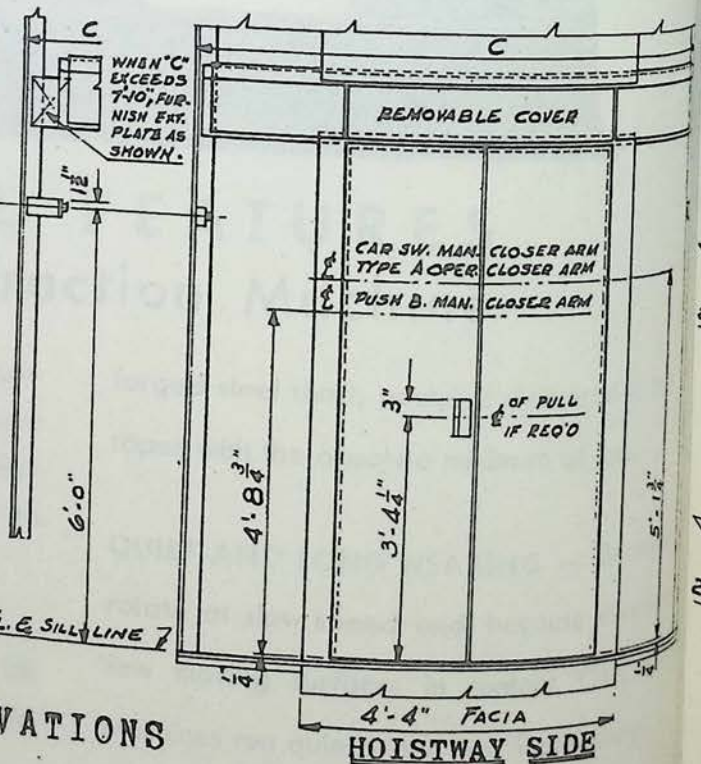
CONVENTIONAL TYPE JAMBS

PLAN VIEW B B



CORRIDOR SIDE

ELEVATIONS



HOISTWAY SIDE

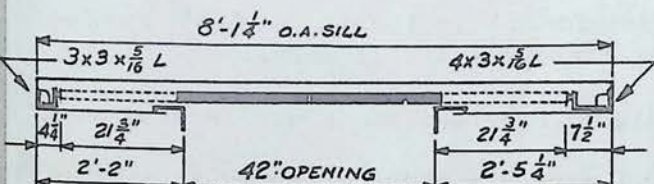


FOR DRILLING, REINFORCING, KEY HOLES, SILL SUPPORTS, ETC. - SEE DOOR MFR'S. DETAIL DRAWINGS.



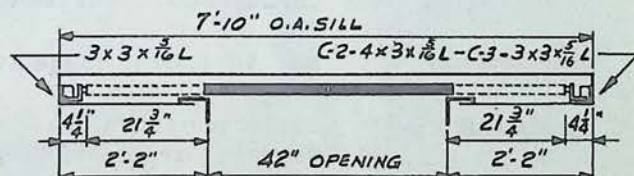
# DETAIL DATA SHEET ——— CENTER-OPENING DOOR

TYPE OF CONTROL	CAR SWITCH				CAR SW. OR SIGNAL		AUTO. RB. OR COLLECTIVE		
DOOR OPERATING EQUIPMENT	4B - 4B1 - 4PA		Type "0" W/O Safety Shoe		4B-4B1-4PA R.H. Type "0"	Type "A"	4PB		R.H. Type "0" With Saf. Shoe
FUTURE DOOR OPERATING EQUIPMENT	R.H. Type "0" With Or W/O Safety Shoe		Type "0" With Saf. Shoe	-	Type "A"	-	R.H. Type "0" With or W/O Safety Shoe		-
SPACE FOR DOOR CLOSER	7-1/2"	4-1/4"	-	-	Special To Suit Layout		7-1/2"	4-1/4"	-
DOOR MFR'S. ARRT. SYMBOL	C-1	C-2	C-3	C-5	C-6		C-1	C-2	C-4
HAND OF DOOR OPERATING EQUIPMENT	R or L Door Closers		R.H. Only		R or L Closers R.H. Type "0"	R or L	R or L Closers		R.H. Only
LUNAR EMERG. KEY AND ROUND SERVICE KEY	As Required By Code				As Required By Code		In Wall		As Required By Code
TYPE OF HANGER	Type A With Gears, Type B With Chain				Type A W/ Gears Type B W/ Chain	Type A W/Gears	Type A With Gears Type B With Chain		
DRILLING BY DOOR MFR. IF SPECIFIED	Closer Supports And Doors		-		Closer Supp. And Doors	Supp. Angle	Closer Supp. And Doors		-
DIAMOND VISION PANELS	-				-		With or Without		
ANTI PINCH PULL CORRIDOR SIDE	-		-		-	-	With		-
PULL AND PROTECT PLATE HATCH SIDE	With		-		With	-	With		-



**ARRANGEMENT C-1**

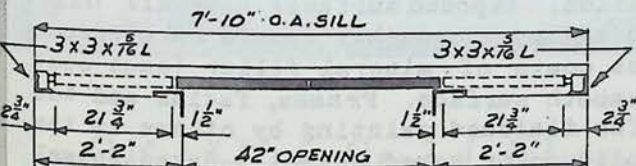
DOOR CLOSERS AND FUTURE "0" OPERATOR  
WITH OR WITHOUT SAFETY SHOE



**ARRANGEMENTS C-2 AND C-3**

C-2 DOOR CLOSERS AND FUTURE "0" OPERATOR  
WITH OR WITHOUT SAFETY SHOE

C-3 "0" OPERATOR WITHOUT SAFETY SHOE AND  
WITH FUTURE SAFETY SHOE



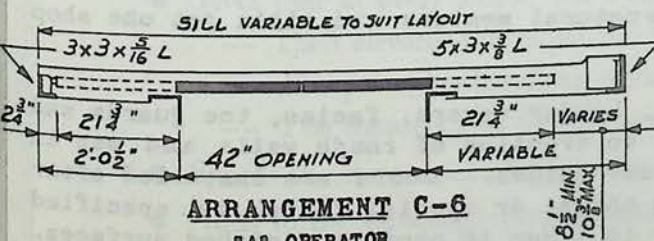
**ARRANGEMENT C-4**

"0" OPERATOR WITH SAFETY SHOE



**ARRANGEMENT C-5**

"0" OPERATOR WITHOUT SAFETY SHOE



**ARRANGEMENT C-6**

"A" OPERATOR

ARRANGEMENTS C-1, C-2, C-6 -  
L.H. as shown, R.H. opposite  
Note: R.H. Type "0" Operator  
suits LH or RH Arrangements.

ARRANGEMENTS C-3, C-4, C-5  
R.H. Type "0" Operator Only.

<b>OTIS ELEVATOR COMPANY</b>	
<b>BUILDING:</b>	_____
<b>ADDRESS:</b>	_____
<b>ARRANGEMENT APPROVED:</b>	_____
<b>SIGNED:</b>	_____ <b>DATE</b> _____
<b>HOISTWAY DIMENSIONS GUARANTEED:</b>	_____
<b>SIGNED:</b>	_____ <b>DATE</b> _____
<b>FOR SPECIFICATIONS SEE BACK OF PAGE</b>	



## SPECIFICATIONS

<b>UNIT FRAMES</b>	No. 14 (.078) gauge steel, conventional or splay type with integral trim. Welded at corners to form a unit frame. No plinths. Frame is securely fastened to sill and hanger support.
<b>DOORS</b>	No. 18 (.050) gauge steel 1-3/8" thick, flush design both sides. All doors are rigidly constructed and contain suitable material for effective sound-deadening. Doors reinforced and provided with keyways (as required) for door operating mechanisms. Each door has two removable laminated canvas phenolic door guides. Diamond vision panels (7-3/8" x 10-1/16") are optional at extra cost, and are located 63-3/4" from the floor to the center of panel opening.
<b>SILLS</b>	Cast iron with anti-slip abrasive surface. Machine-planed grooves with minimum clearance for door guides. Sills supported on steel anchors securely fastened to floor beams.
<b>HANGER SUPPORTS</b>	3/16" steel bolted to strut angle and closer support angle. A bottom flange serves as lintel supporting rough masonry (walls up to 6" thick). Size accommodates most types of hangers.
<b>STRUTS AND CLOSER ANGLES</b>	3" x 3" x 5/16" strut angles and closer support angles of sufficient size to accommodate door closers are continuous and fasten to sill and building beam above.
<b>HANGER COVER PLATES</b>	No. 14 (.078) gauge steel extending full travel of doors. In three sections for convenient access in servicing hangers. The section above door opening is removable from within the car.
<b>FACIAS</b>	No. 14 (.078) gauge steel. Reinforced to insure a flat surface throughout. Fastened to hanger housing and sill above.
<b>TOE GUARDS</b>	No. 14 (.078) gauge steel 10" high. Provided at lowest landing only.
<b>HARDWARE</b>	Pulls provided on hoistway and corridor sides of door as required. Service or emergency keyways supplied to meet local code requirements when specified. Finish is Satin Bronze or Chrome.
<b>FINISHES</b>	All inside surfaces are thoroughly cleaned and coated with rust-inhibiting paint before fabrication. Exposed surfaces have all oil, dirt and other impurities removed and are thoroughly sanded and cleaned. Exposed areas receive sufficient coats of mineral filler (each coat baked and sanded) to insure a smooth surface. Frames, facias and toe guards finished in Grey Prime for finished painting by others at the building. Doors finished in solid color baked enamel. Baked enamel finishes for frames and facias, also stippled, grained or special finishes for doors and frames are available at extra cost. Striping is optional, at extra cost. Eggshell gloss rubbed finish is standard for doors and frames. All structural members and sills get one shop coat of black paint.
<b>ERECTION</b>	Sills, struts, hanger supports, hanger covers, facias, toe guards and unit frames are erected prior to erection of rough walls and set in proper relation to elevator car guides. Doors are installed after walls are finished. When baked enamel or special finish is specified for unit frames, special care is taken to protect finished surfaces.





## *Otis High-Speed Electric* DOOR OPERATOR

- Saves time at every stop. As a result:
  - Each elevator can make more round trips every hour.
  - The passenger-handling capacity of the elevator plant is increased.
  - The frequency of elevator service at all floors is improved.
- Speeds the movement of passengers in and out of the cars.
- Adds to the building's prestige and value.
- Leaves the elevator attendant free to render courtesy service to his passengers.
- Keeps elevator service at a high peak by minimizing the physical and mental fatigue of the operator.



# THE OTIS TYPE "A" DOOR OPERATOR

THROUGH MANY YEARS OF SERVICE, this operator has proved itself capable of providing, with complete safety, the high-speed car and hoistway door operation essential to elevators subjected to intensive traffic.

## OPERATION

With elevators equipped with self-leveling, the doors open automatically as the car levels to the floor, with all types of control. With Collective operation, the doors close automatically. With Signal Control operation and Car-Switch operation, the closing of the doors is initiated through the lever which controls the starting of the elevator. The car and hoistway doors open and close together. Operating speeds remain at their peak regardless of the intensity of traffic, as no physical effort by the attendant is required.

*When applied to elevators without self-leveling, the doors will not open until the elevator stops and, if these elevators are the Car-Switch Control type, the opening must be initiated by the momentary pressure of a button in the car.*

## MECHANISM

The Otis High-Speed Electric Door Operator consists of a motor-driven power unit on top of the car, a retiring cam (which opens the hoistway doors) mounted on the side of the car, and complete door-closing equipment for the car door and each hoistway door.

When stopping at a floor, the power unit rotates two disc cams. Each cam raises a pivoted follower arm. One arm is connected by a chain to the car door mechanism and, when raised, opens the car door. The other arm is connected by a chain to the retiring cam and, when raised, extends the retiring cam and opens the hoistway door.

Each hoistway door is equipped with a complete door-closer and interlock. The hoistway door is opened by the rotation of the sill-trip which is connected to the door-closer arm by a push-rod.

The power unit returns to its original position upon the initial act of starting the elevator. The retiring cam is retired by gravity and the hoistway and car doors are closed simultaneously by individual springs.

Liquid checks on all doors prevent slamming at extremity of travel.

## SAFETY

The doors are under full control of the attendant all times and may be reversed at any point in their travel. The interlock on each hoistway door meets the requirements of the American Standard Safety Code for Elevators and similar requirements of local codes. These interlocks prevent movement of the elevator away from a landing unless all doors are *locked* in the closed position.

Only the door at the landing where the car is stopping — and no other door — will be opened. The zone of advance-door-opening is limited to the length of the retiring cam face.

Motor power is applied only for the opening of the doors being closed by spring pressure. This arrangement permits individual adjustment at each floor as well as separate adjustments for door-opening and door-closing speeds, thus permitting safe closing without sacrificing the advantages of high-speed opening action.

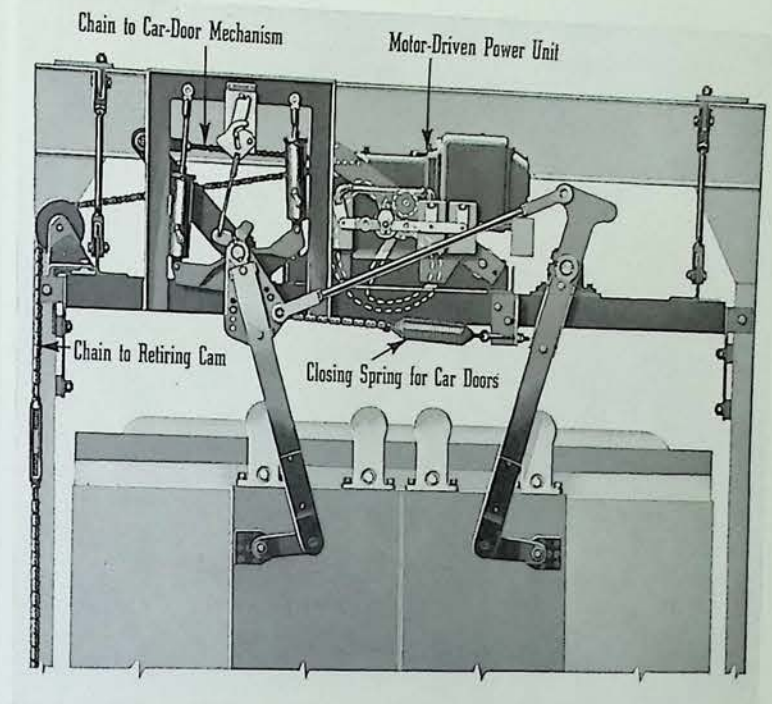
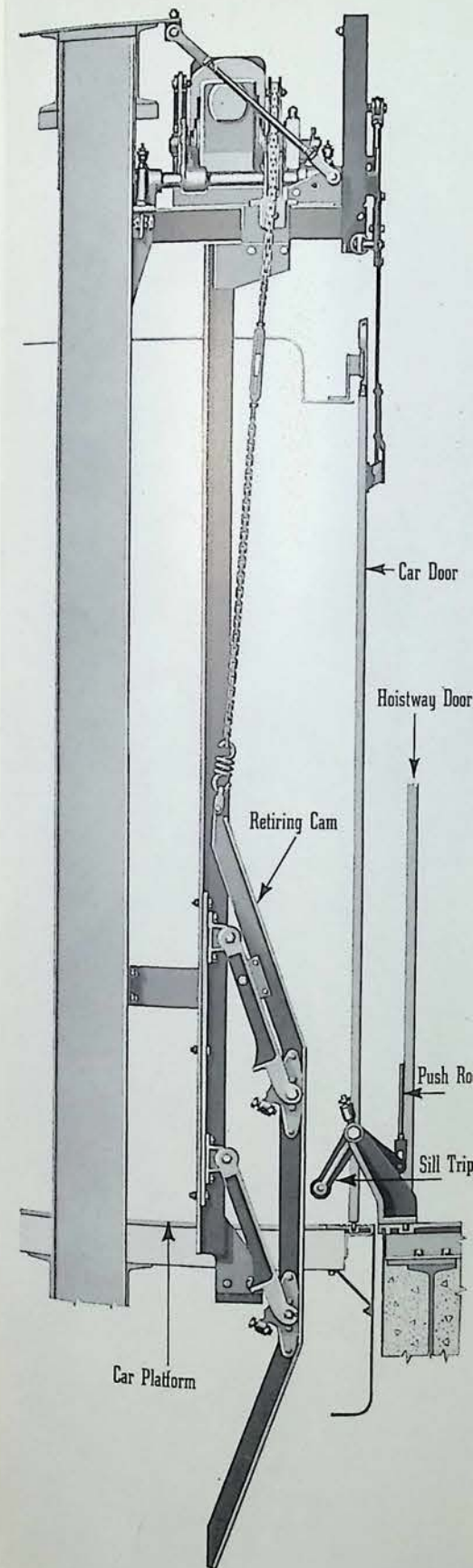
## SPECIAL OPERATION

The individual "open" and "close" liquid cushioning springs on each car and hoistway door are designed to permit manual operation from within the car. This feature is particularly valuable during building construction, in an emergency when the power supply is interrupted, or in a progressive modernization plan, where the advantages of power operation will be delayed until a future date.

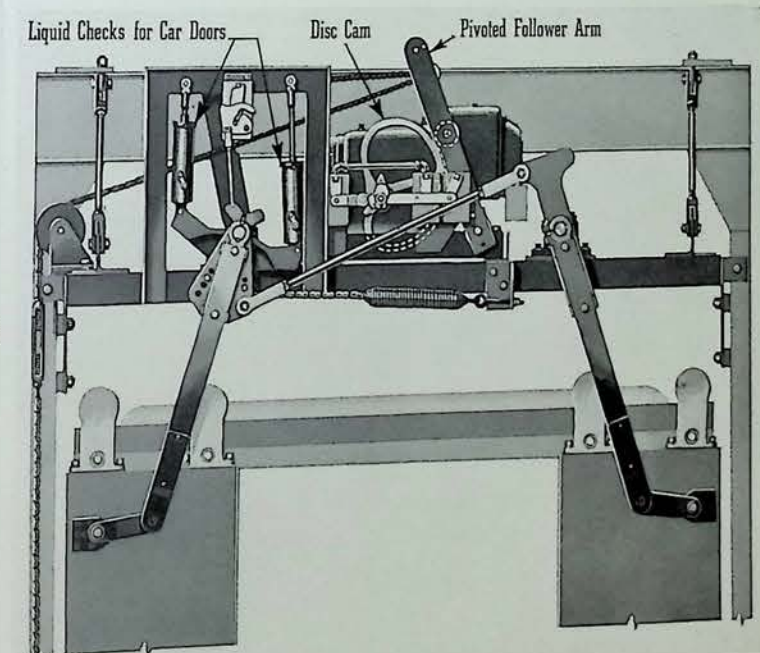
## UPKEEP

The Otis High-Speed Door Operator employs a single motor, regardless of the number of openings the elevator may serve. Accurate regulation of this power reduces wear of doors, hangers and guides to a minimum. This economy of working parts, and the few electrical accessories in the hoistway and machine room, keep the cost of labor and replacements required for the maintenance of the unit consistently low.

The illustrations opposite indicate the relation between the various elements of the complete operating mechanism.



*Car doors shown in the Closed Position.*

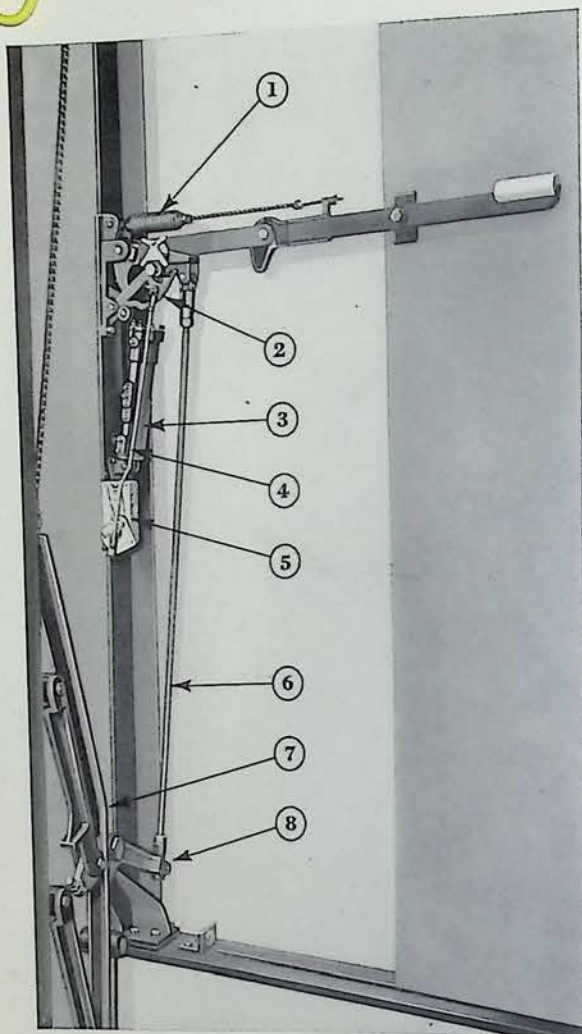


*Car doors shown in the Open Position.*

*View at side of car showing the cam which operates the hoistway doors. Cam shown lowered to the Retired Position.*



# HOISTWAY DOOR MECHANISM



Door Shown in the Closed Position.

The Otis Type "A" Hoistway Door Interlock has successfully passed tests conducted by the National Bureau of Standards.

1. **Closing Spring** — closes the doors, motor power being applied only for opening, thereby permitting safe closing speed without sacrificing the advantages of a quick opening.
2. **Latching Device** — prevents the re-opening of the door from the corridor side when closed to within 4" (2" in the States of Pennsylvania and California) of the fully-closed position.
3. **Liquid Check** — cushions the doors, for both opening and closing without noise or jar.
4. **Connecting Rod** — causes the electric switch to operate in proper relation to the latching device.
5. **Electric Switch** — prevents the car from being started until the door is locked. This occurs when the door is within 4" (2" in the States of Pennsylvania and California) of the fully closed position, at which point the latching device locks the door and closes the electric contact. This combination of switch and locking mechanism forms a true interlock.
6. **Push-Rod** — transmits sill-trip motion to the door operating arm.
7. **Retiring Cam** — mounted on the side of the car is normally in the retired position and is extended by the power unit on top of the car as the elevator stops. When extended the cam engages the roller on the sill-trip, and through the push-rod opens the hoistway door.
8. **Sill-Trip** — mounted on the hoistway entrance sill, rotates when engaged by the extended cam on the car.

**Note:** For elevators that can be operated without an attendant a modified arrangement of the Hoistway Door Mechanism is used to comply with code requirements.

## BRIEF SPECIFICATIONS FOR HIGH-SPEED CAR AND HOISTWAY DOOR OPERATORS FOR SELF-LEVELING ELEVATORS REQUIRING AN ATTENDANT

### Car and Hoistway Door Operators:

A motor-driven electric operator on (the) (each) car shall be provided to open the car and hoistway doors automatically as the elevator levels to the landing. (The) (Each) car door and every hoistway door shall be equipped with a door closing mechanism. Electric power shall be used for the opening and spring power for the closing. The equipment shall be capable of opening or closing the doors simultaneously. Both opening and closing motions shall be cushioned by adjustable liquid checks that will prevent slam or shock and will permit individual adjustment for each door.

Closing motion shall be initiated by movement of the operating lever in the car to the "start" position. During the closing motion,

it shall be possible to quickly stop and reverse the doors by movement of the operating lever.

The apparatus shall be so arranged that in case of interruption or failure of electric power, the doors can be operated by hand from within the car.

Emergency devices and keys for opening the doors from the landing shall be provided as required by the local code.

### Electric Interlock:

Each door closer shall be equipped with a true interlock, meeting the requirements of the American Standard Safety Code for Elevators, consisting of a latching device and switch permanently inter-connected. The latching device shall prevent the door from being opened from the corridor side after it

has been closed to within 4" (2" in the States of Pennsylvania and California) of the fully closed position. The switch shall be wired to the elevator controller so that it prevents the starting of the elevator until the latch locks the doors. The interlock shall immediately cut off the power to the elevator should any door be opened or locked.

### Emergency Release Switch:

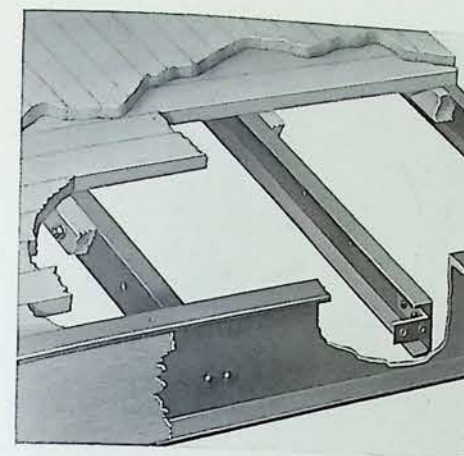
A glass-covered emergency release switch and glass breaking hammer shall be provided in (the) (each) elevator car to permit operation of the elevator with the doors open in case of emergency. It shall be necessary to break the glass and hold the emergency switch in the depressed position to operate the elevator.

## CAR PLATFORM

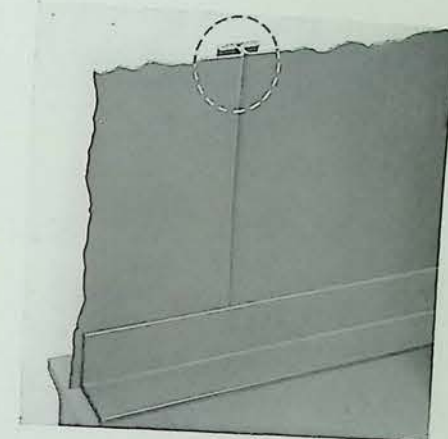
The car platform is framed with heavy steel channels. The flanges of the front and rear channels form a trucking threshold. The platform is hard maple fastened to a sub-floor of spruce.

## CAR SIDE PANELS

The side panels are interlocked with each other and permanently clamped in position.



PLATFORM CONSTRUCTION



PANEL CONSTRUCTION

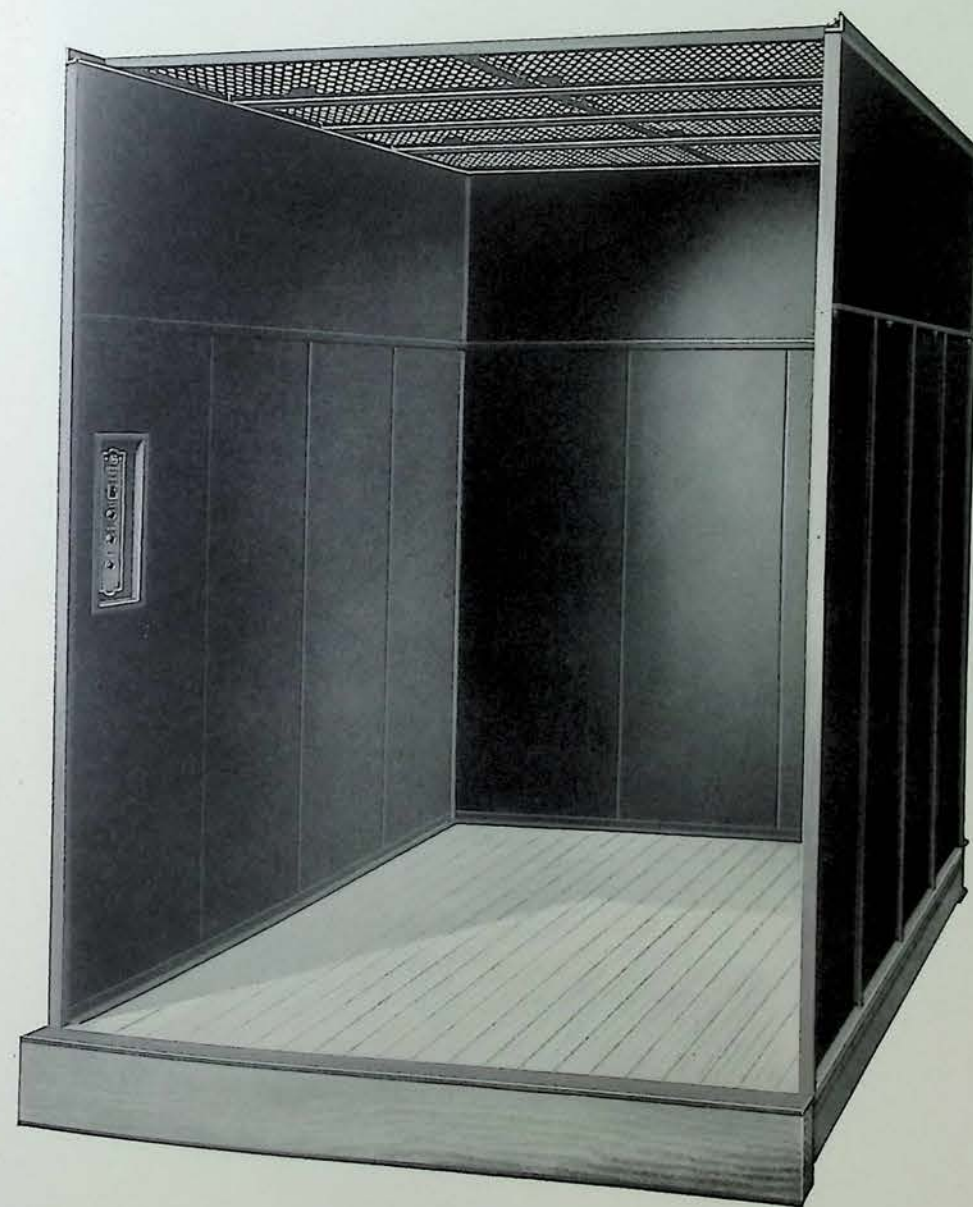
## THIS FREIGHT Elevator Car

Enclosure is constructed entirely of heavy gauge steel.

The perforated sheet steel top affords protection, and ventilation. Hinged panels may be provided at either or both ends of the top.

The enclosure may be arranged for car gates at one or both ends of the car.

The car-operating device is mounted in a recessed box.



ALA. File 33 G 2

## FREIGHT ELEVATOR CAR

OTIS ELEVATOR COMPANY

Printed in U.S.A.

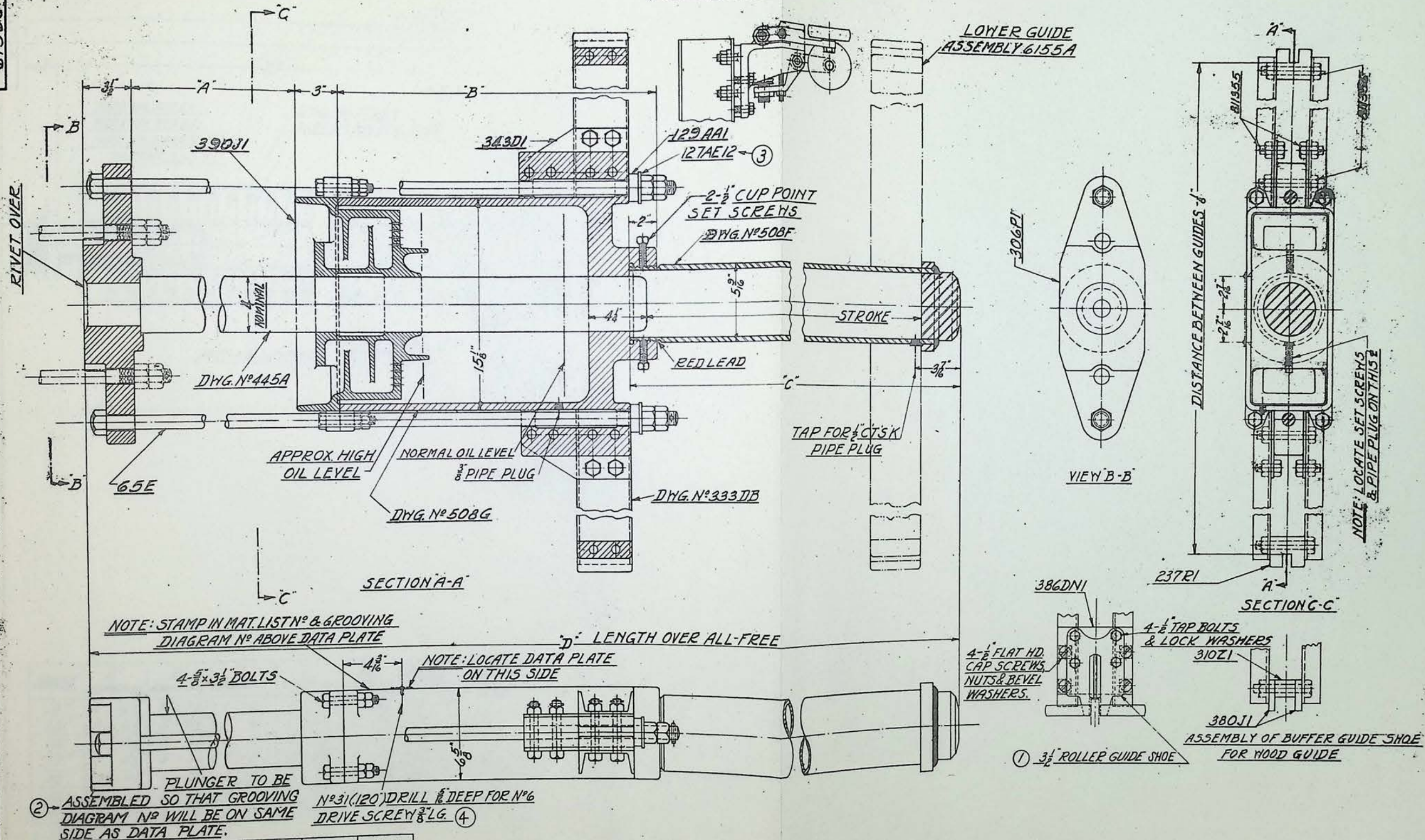
B-560 (9-46)

B-540 12-40

OTIS ELEVATOR

1943





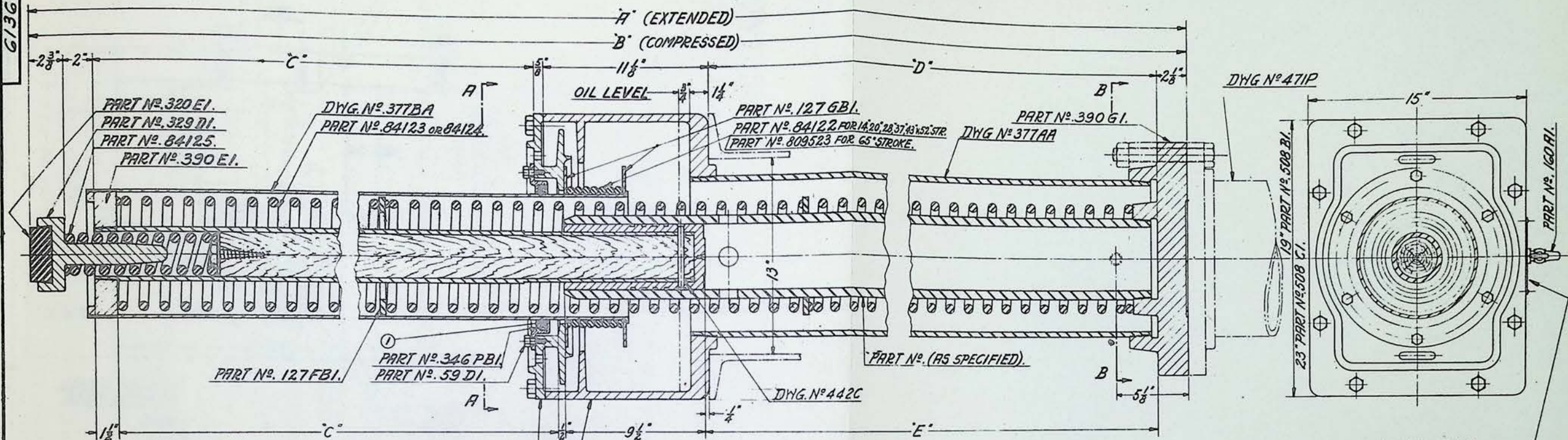
STROKE	A	B	C	D
41"	44½"	23"	45½"	9'-9"
50"	53½"	23"	54½"	11'-3"
63"	66½"	25½"	67½"	13'-7½"

**ASSEMBLY**  
**41", 50" & 63" STROKE**  
**GRAVITY RETURN OIL BUFFER**

FIRST ANGLE PROJECTION				OTIS ELEVATOR COMPANY NEW YORK				REVISIONS				SCALE: NONE	DATE	SHEET NO.
TOLERANCES	DATE	RECORD CHANGES	DATE	RECORD CHANGES	DATE	REVISIONS	AUTH	DATE	①	②	③	BEGUN BY-	7-3-34	6156C
					9-26-34	④ WAS	NAF	9-30-34	① ADDED 3½" ROLLER GUIDE SHOE	② ADDED NOTE	③ WAS 1" STD. NARROW GAUGE STEEL WASHER	FINISHED BY-	9-10-34	
												TRACED BY-		
												CHECKED BY-	9-10-34	
												APPROVED BY-	9-18-34	



6136 A



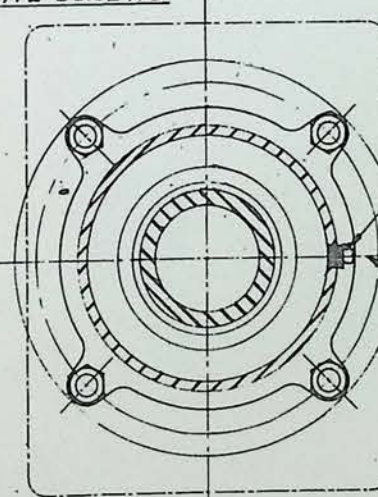
SECTION A-A.

NOTE: DATA PLATE ON THIS SIDE.

NO. 31 (120) DRILL  $\frac{5}{16}$  DEEP FOR NO. 6 DRIVE SCREWS

STROKE	A' STROKE - $1\frac{1}{2}$ "	B' STROKE - $1\frac{1}{2}$ "	C' STROKE - 2"	D' STROKE - $1\frac{1}{2}$ "	E' STROKE - $1\frac{1}{2}$ "	LONG SPRING PART NO. 84123	SHORT SPRING PART NO. 84124
14"	3' - $6\frac{1}{2}$ "	2' - $4\frac{1}{2}$ "	1' - 0"	1' - $0\frac{1}{2}$ "	1' - $0\frac{1}{2}$ "	USE 1	—
20"	4' - $6\frac{1}{2}$ "	2' - $10\frac{1}{2}$ "	1' - 6"	1' - $6\frac{1}{2}$ "	1' - $6\frac{1}{2}$ "	USE 1	USE 1
28"	5' - $10\frac{1}{2}$ "	3' - $6\frac{1}{2}$ "	2' - 2"	2' - $2\frac{1}{2}$ "	2' - $2\frac{1}{2}$ "	USE 2	—
37"	7' - $4\frac{1}{2}$ "	4' - $3\frac{1}{2}$ "	2' - 11"	2' - $11\frac{1}{2}$ "	2' - $11\frac{1}{2}$ "	USE 2	USE 1
43"	8' - $4\frac{1}{2}$ "	4' - $9\frac{1}{2}$ "	3' - 5"	3' - $5\frac{1}{2}$ "	3' - $5\frac{1}{2}$ "	USE 2	USE 2
52"	9' - $10\frac{1}{2}$ "	5' - $6\frac{1}{2}$ "	4' - 2"	4' - $2\frac{1}{2}$ "	4' - $2\frac{1}{2}$ "	USE 4	—
65"	12' - $0\frac{1}{2}$ "	6' - $7\frac{1}{2}$ "	5' - 3"	5' - $3\frac{1}{2}$ "	5' - $3\frac{1}{2}$ "	USE 3	USE 3

SPACE FOR MATERIAL LIST NO. & DRILLING DIAGRAM



SECTION B-B.

NOTE: BUFFER TO BE ASSEMBLED WITH TAPPED HOLE ON THIS CENTER LINE AND HOLES FOR MACH. BOLTS AS SHOWN.

ASSEMBLY  
COMPACT SPRING RETURN OIL BUFFER  
14, 20, 28, 37, 43, 52 & 65 STROKE.

FIRST ANGLE PROJECTION

OTIS ELEVATOR COMPANY NEW YORK.

TOLERANCES	DATE	RECORD CHANGES	AUTH'D	DATE	RECORD CHANGES	AUTH'D	DATE	REVISIONS	AUTH'D	DATE	REVISIONS	AUTH'D	DATE	DATA	DATE	SHEET NO.
FRACTIONAL MACHINING DIM. $\pm \frac{1}{16}$														BEGUN BY: W.H.F.	2-19-34	6136 A.
														FINISHED BY: W.H.F.	5-16-34	
														CHECKED BY: W.H.F.	5-25-34	
														APPROVED BY: F.W.M.	4-6-34	
														AUTHORIZED: W.H.F.	5-19-34	

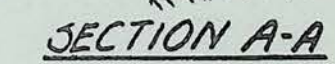




ASSEMBLY  
20A-FLEXIBLE GUIDE CLAMP  
TYPE SAFETY  
FOR CA & 1/2 RAILS

FIRST ANGLE PROJECTION										THIS ELEVATOR COMPANY									
V	TOLERANCES		DATE	RECORD CHANGES	AUTH'D	DATE	RECORD CHANGES	AUTH'D	DATE	REVISIONS	AUTH'D	DATE	REVISIONS	AUTH'D	DATA	DATE	SHEET NO.		
									12-6-37	①, ② ADDED. ③ REVISED	NEW 12-15-37				BEGUN BY - G.C.	12-6-35	6370A		
															FINISHED BY - G.C.	12-12-35			
										NOTE.					CHECKED BY - G.B.G.	12-12-35			
															APPROVED BY - F.W.M.	9-27-37			
															AUTHORIZED - L.V.	11-1-37			



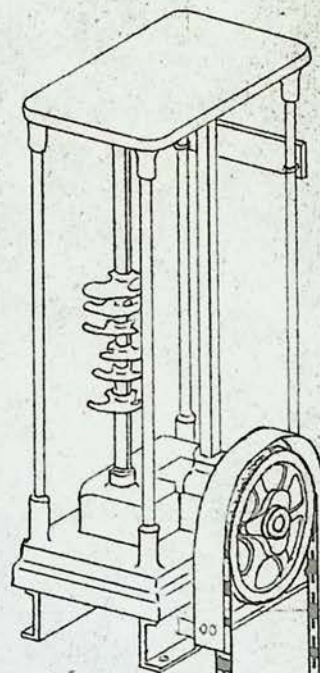


GENERAL ARRANGEMENT  
MOUNTING OF 6613C CAR OPERATING PANEL  
IN FREIGHT ENCLOSURE  
EXPLOSION OR VAPOR PROOF

OTIS ELEVATOR COMPANY NEW YORK

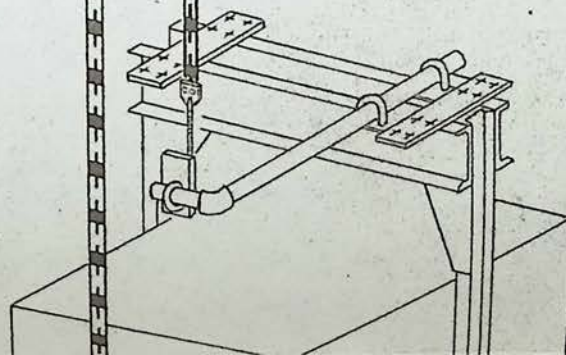
DATE			RECORD CHANGES			AUTH'D			DATE			REVISIONS			AUTH'D			DATE			REVISIONS			AUTH'D			DATA			DATE			SHEET NO.								
																											BEGUN BY: EP			4-30-40			66/3D								
																														FINISHED BY: SP			5-1-40								
																														CHECKED BY: HBJ			5-8-40								
																																	APPROVED BY: JNA			5-9-40					
																																	AUTHORIZED: WRN			5-15-40					



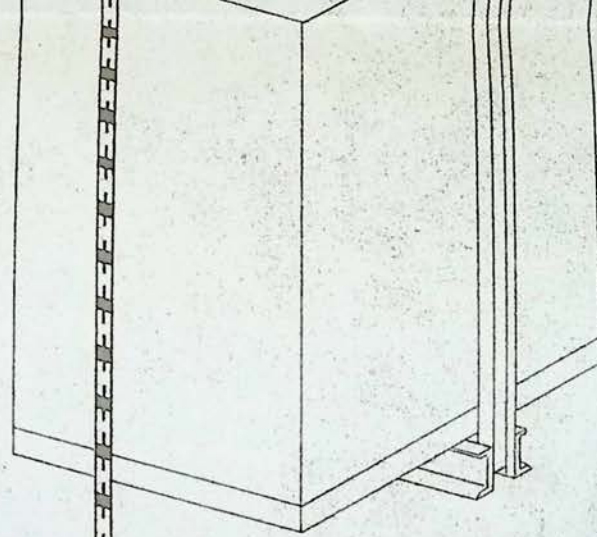


FLOOR SELECTOR

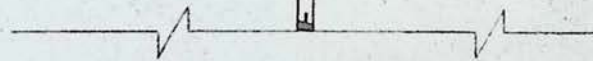
TOOTHED TAPE



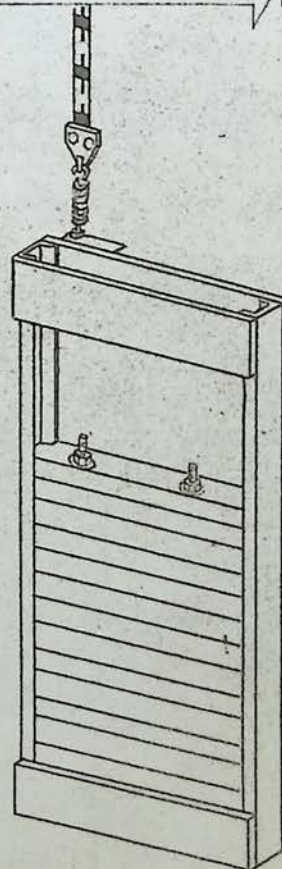




CAR

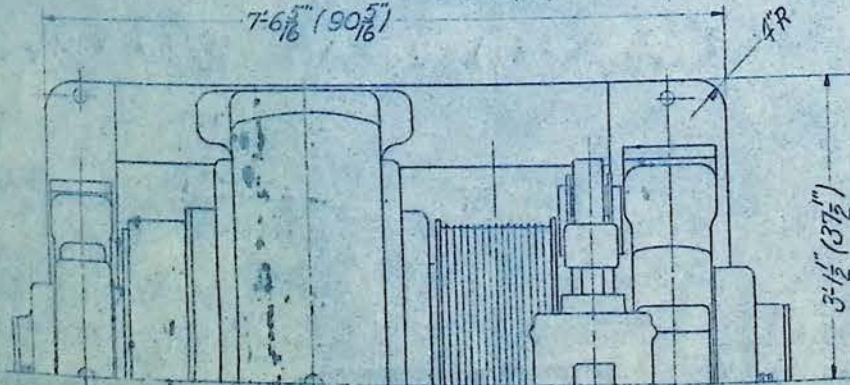
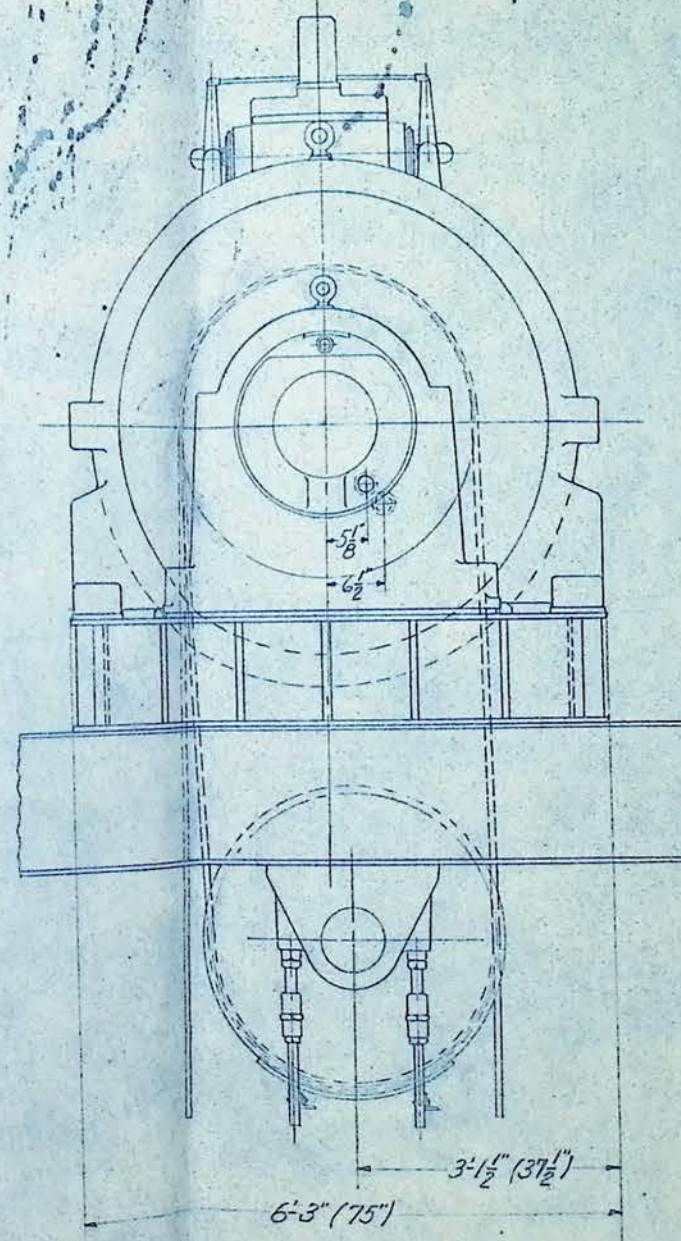
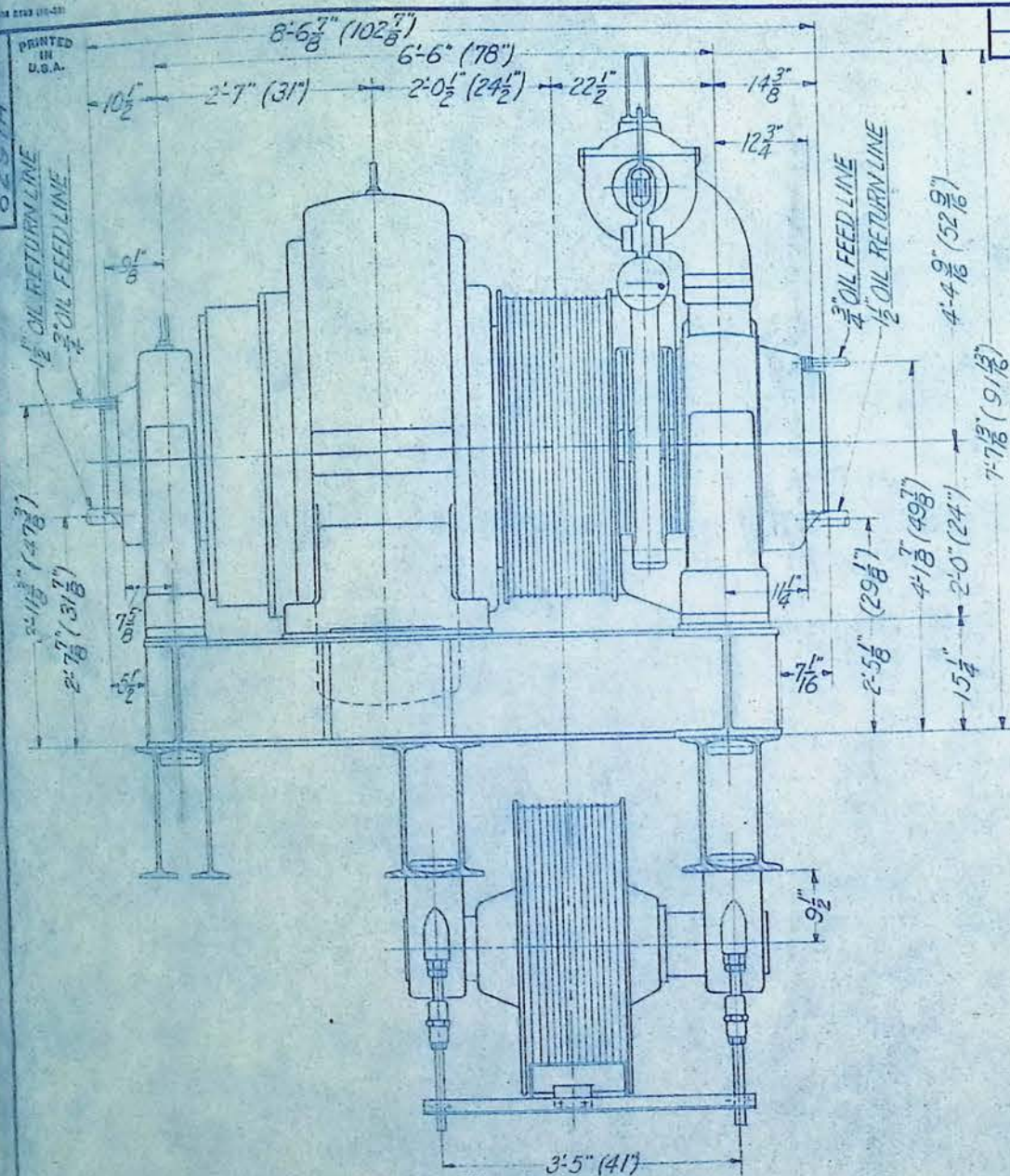


"TOOTHED TAPE &  
DRIVE ARRANGEMENT  
FOR FLOOR SELECTOR"



COUNTERWEIGHT





FIRST ANGLE PROJECTION

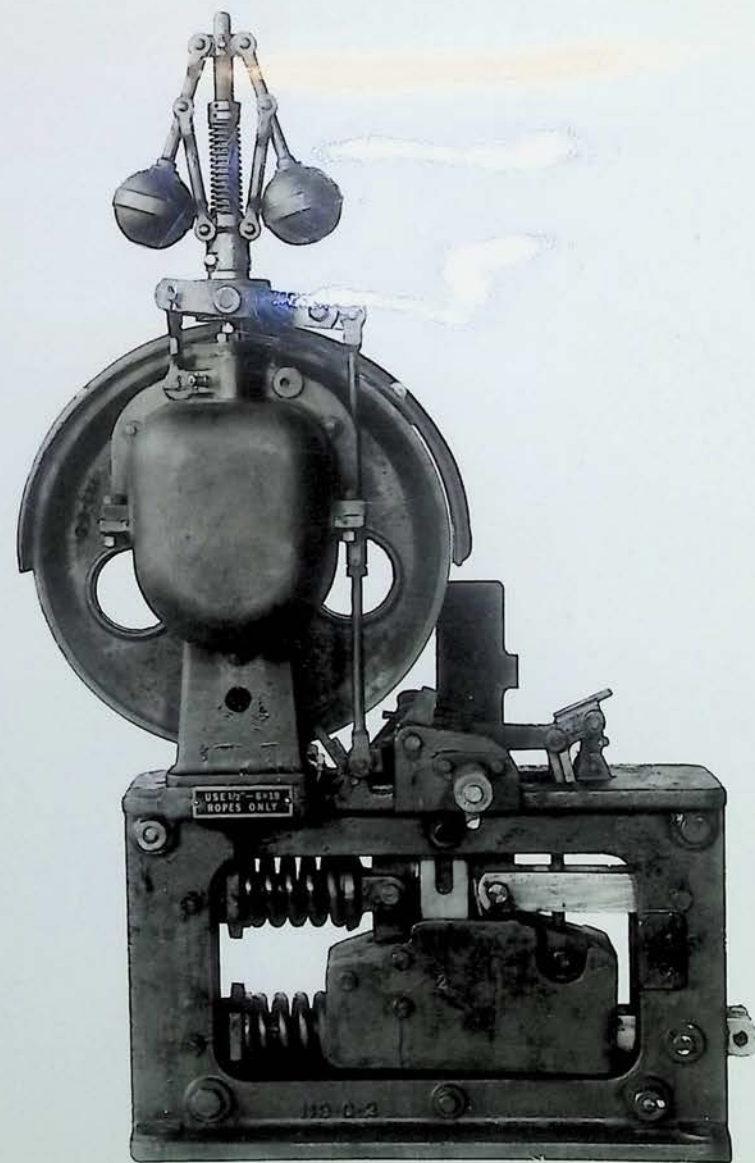
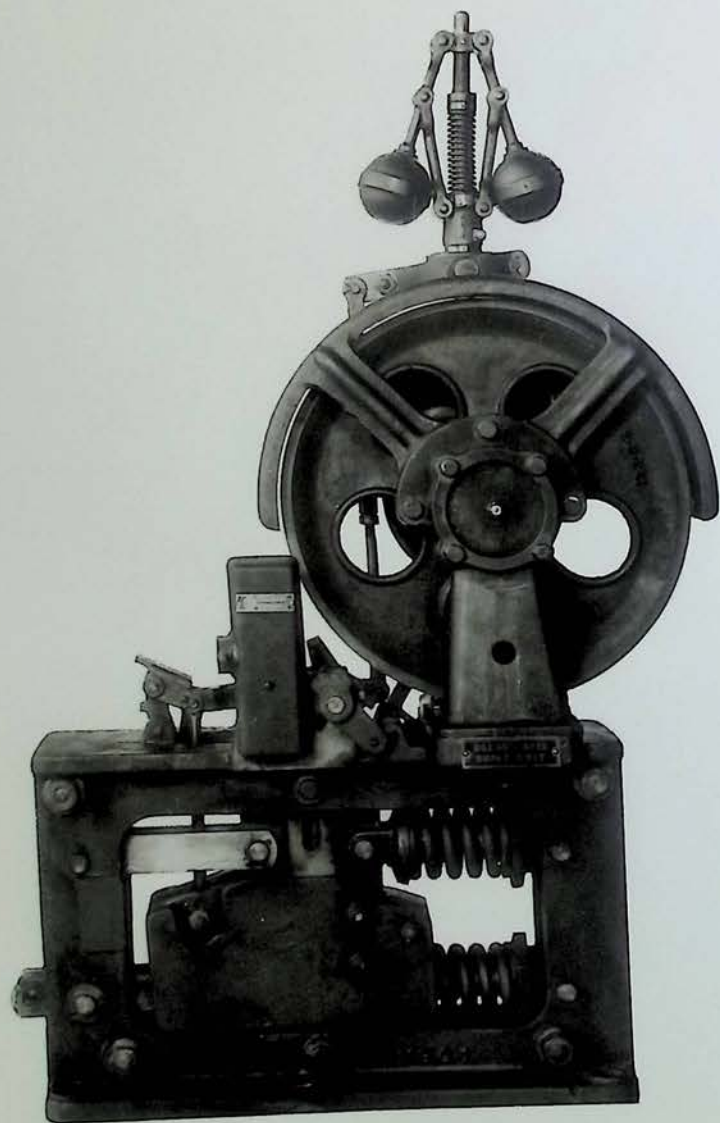
- SYMMETRICAL ABOUT  $\phi$

OTIS ELEVATOR COMPANY *NEW YORK*

ASSEMBLY  
№ 90 EIGHT POLE MOTOR TRACTION MACHINE  
WITH SLEEVE BEARINGS  
MACHINE ABOVE

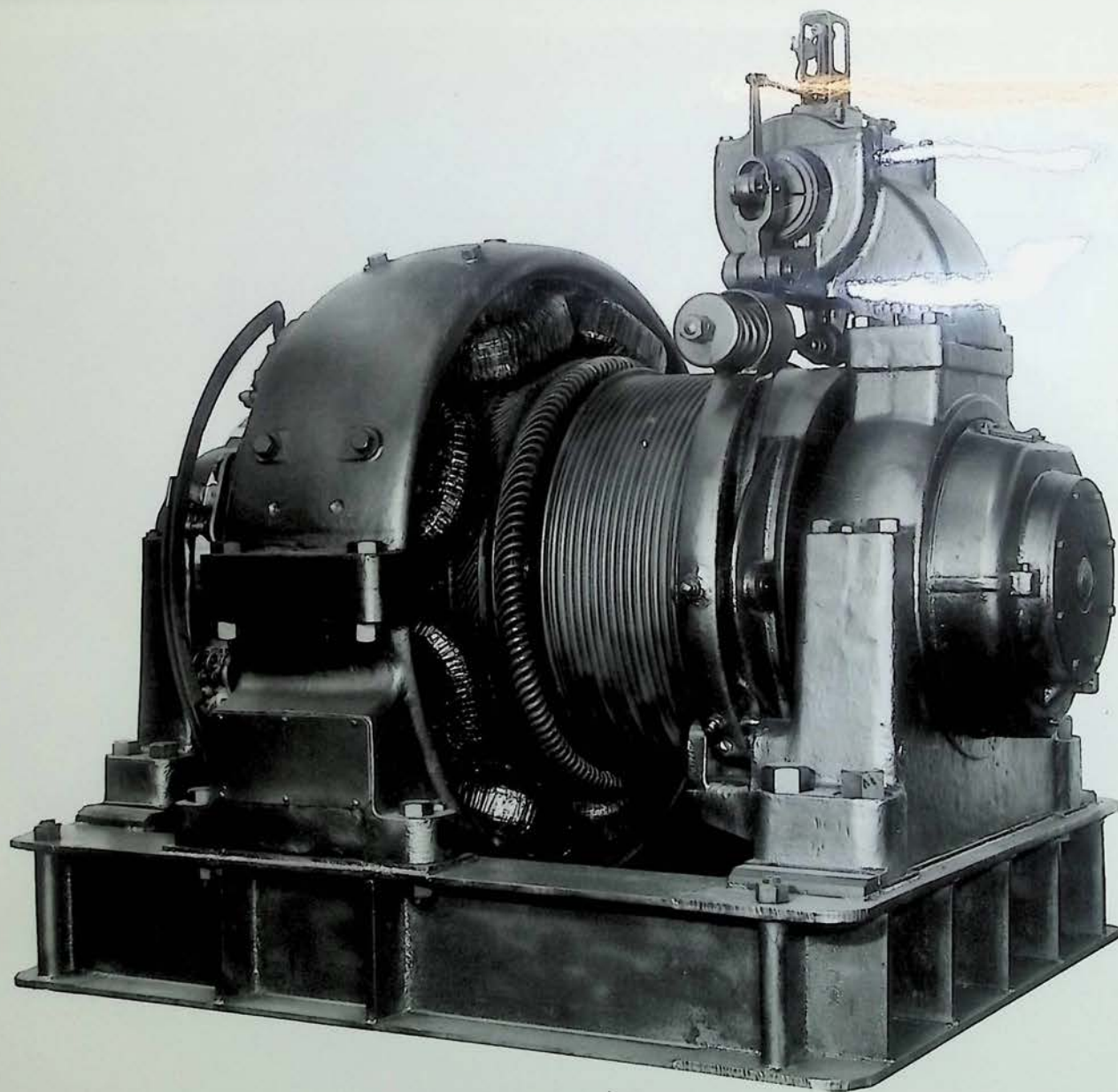
FIRST ANGLE PROJECTION						OTIS ELEVATOR COMPANY									
SYMMETRICAL ABOUT C						REVISIONS									
TOLERANCES		DATE	RECORD CHANGES	AUTH'D	DATE	RECORD CHANGES	AUTH'D	DATE	REVISIONS	AUTH'D	DATE	REVISIONS	AUTH'D	DATA	SHEET NO.
														BEGUN BY: A.D.B.	58-35 6297A
														FINISHED BY: A.D.B.	50-35
														CHECKED BY: A.R.	6-11-35
														APPROVED BY: J.M.	1-22-35
														AUTHORIZED: H.S.	6-27-35





J-1 GOVERNOR, DRG. 131-GOV., ML 610-VI-2





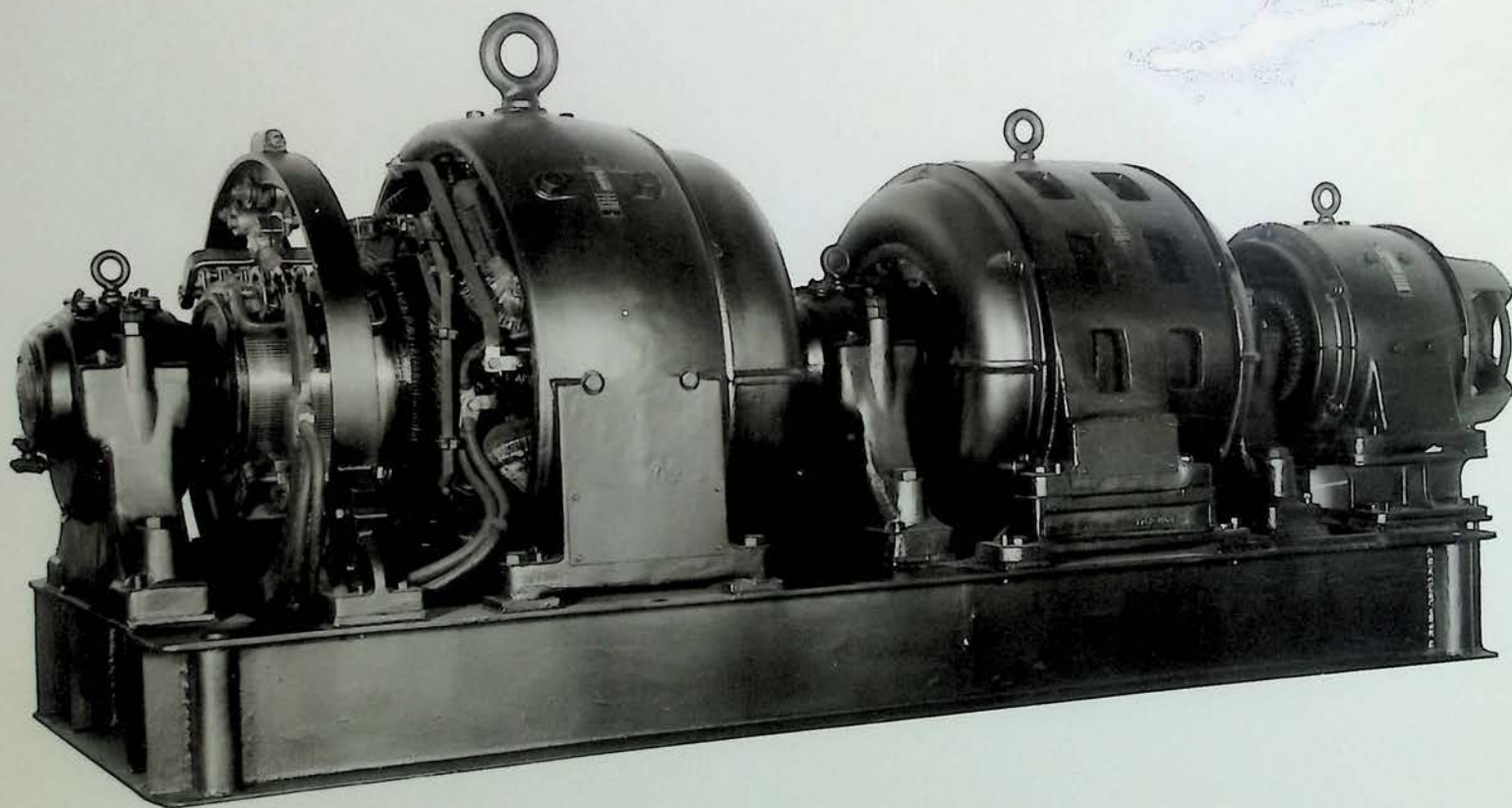
#90 EIGHT POLE MOTOR TRACTION MACHINE, DRG. 586-TM, ML 790-III-10





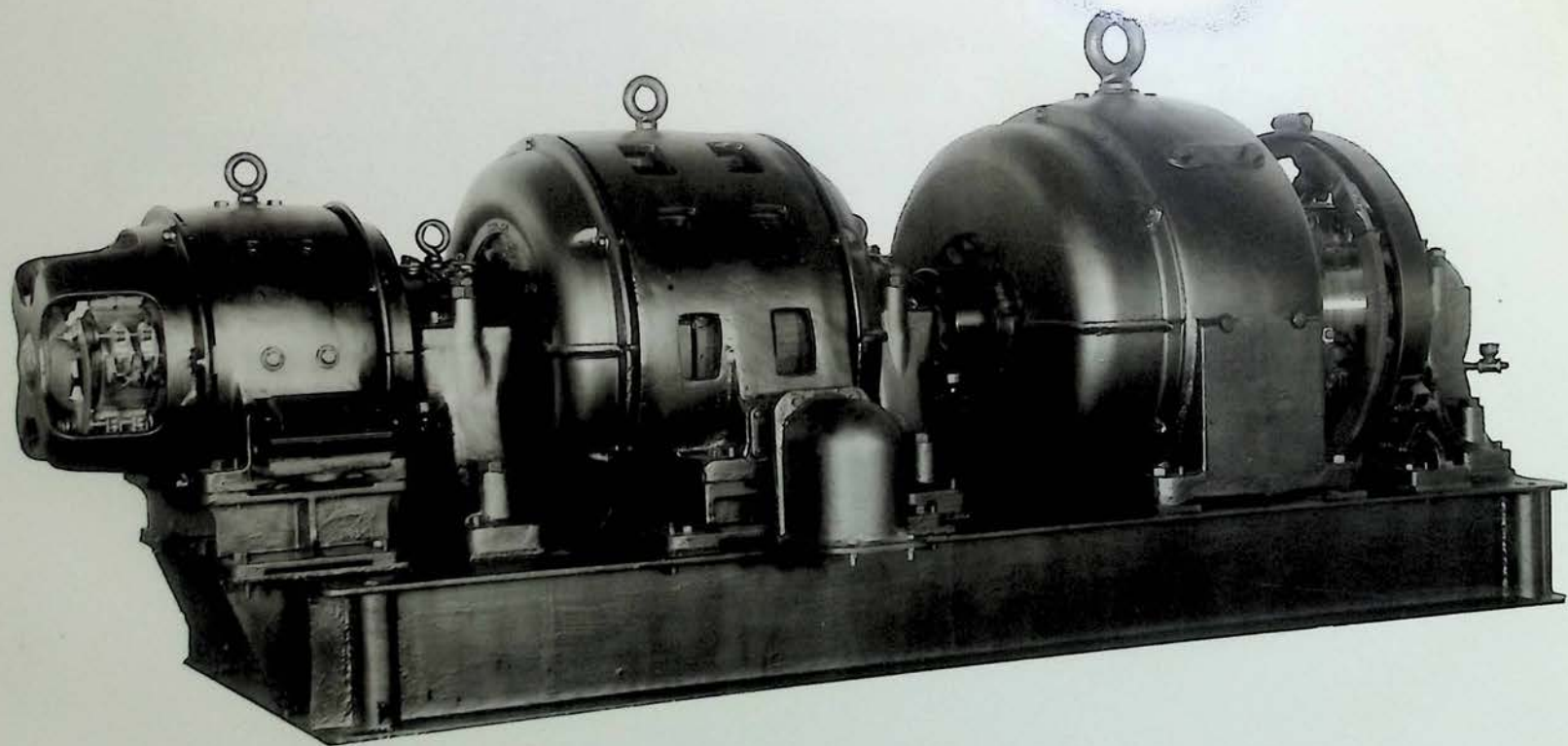
#90 EIGHT POLE MOTOR TRACTION MACHINE. DRC. 586-TM. ML 790-III-10





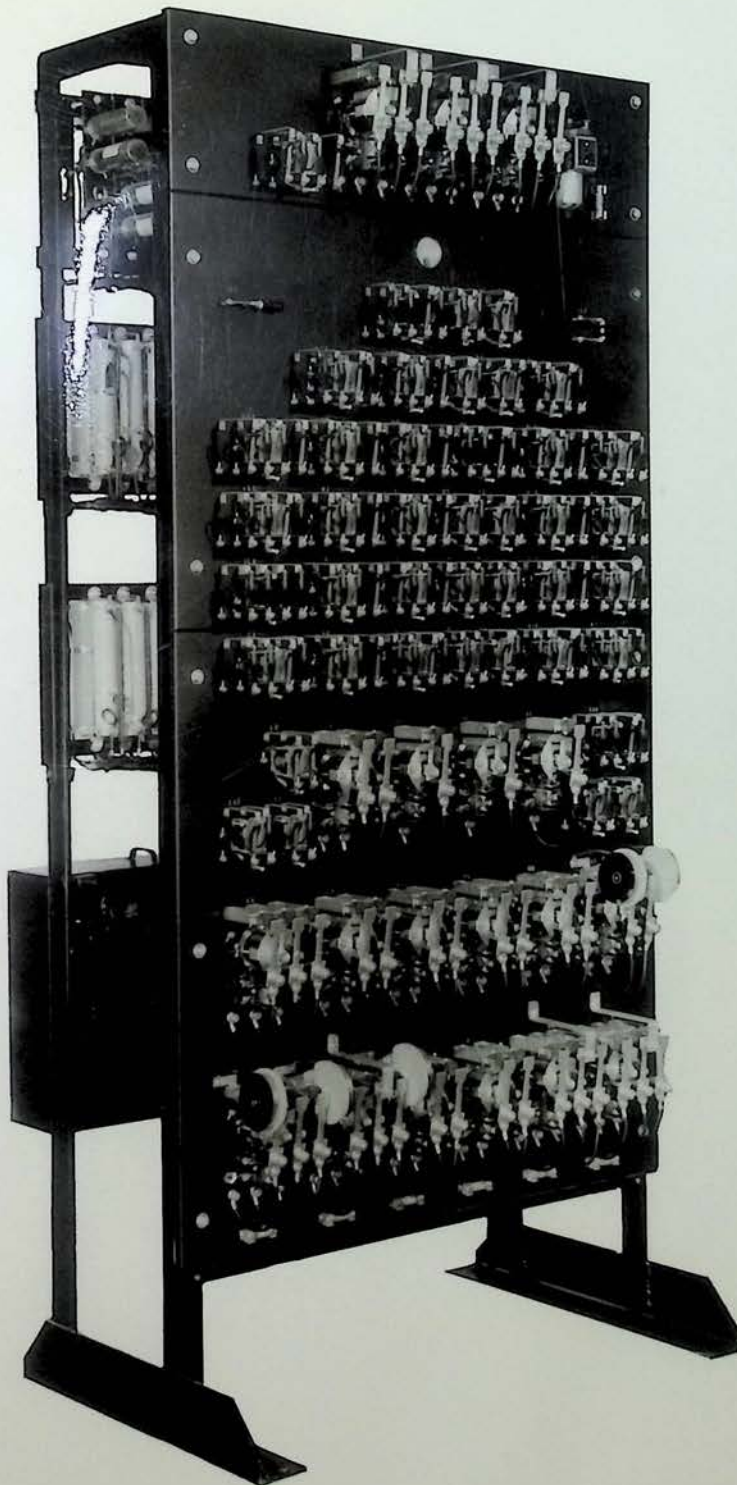
10-36 M. G. SET WITH #1-A-M. G. EXCITER, DRG. 1751-MO, "L 217-SP-72





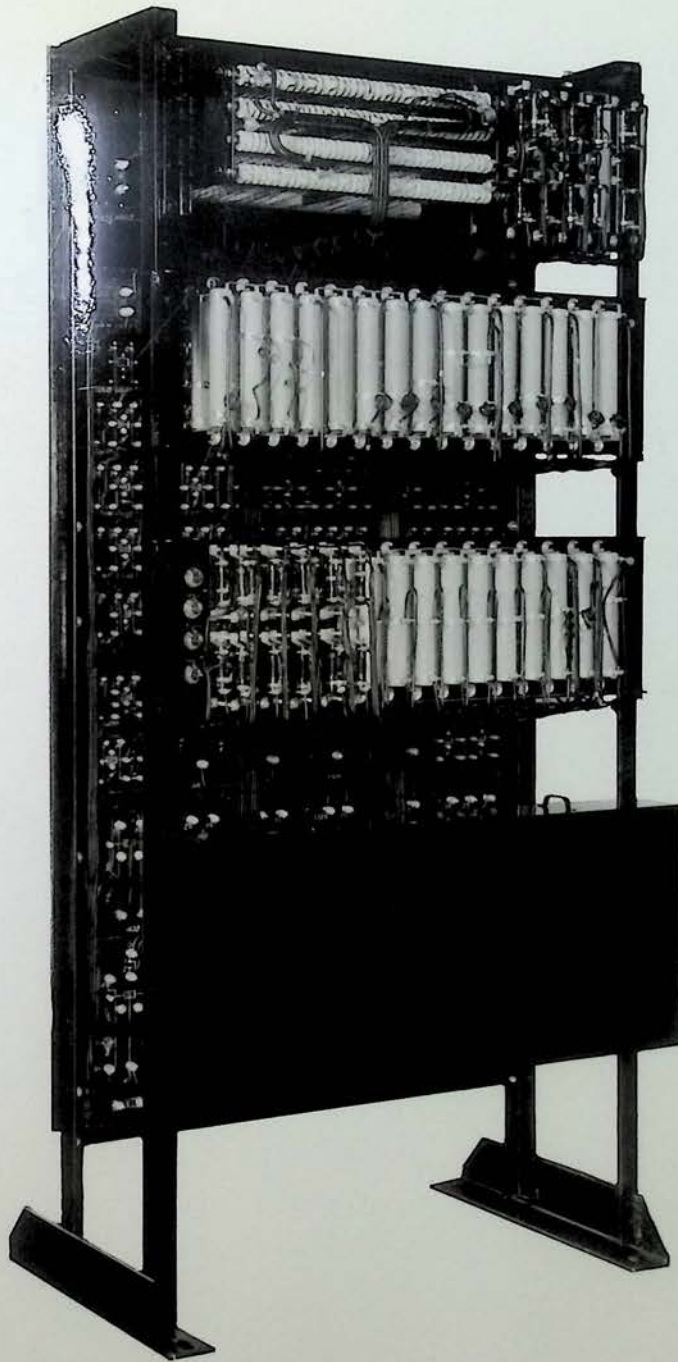
10-36 M. G. SET WITH #1-A-M. G. EXCITER, DRG. 1751-MO, ML 217-SP-72





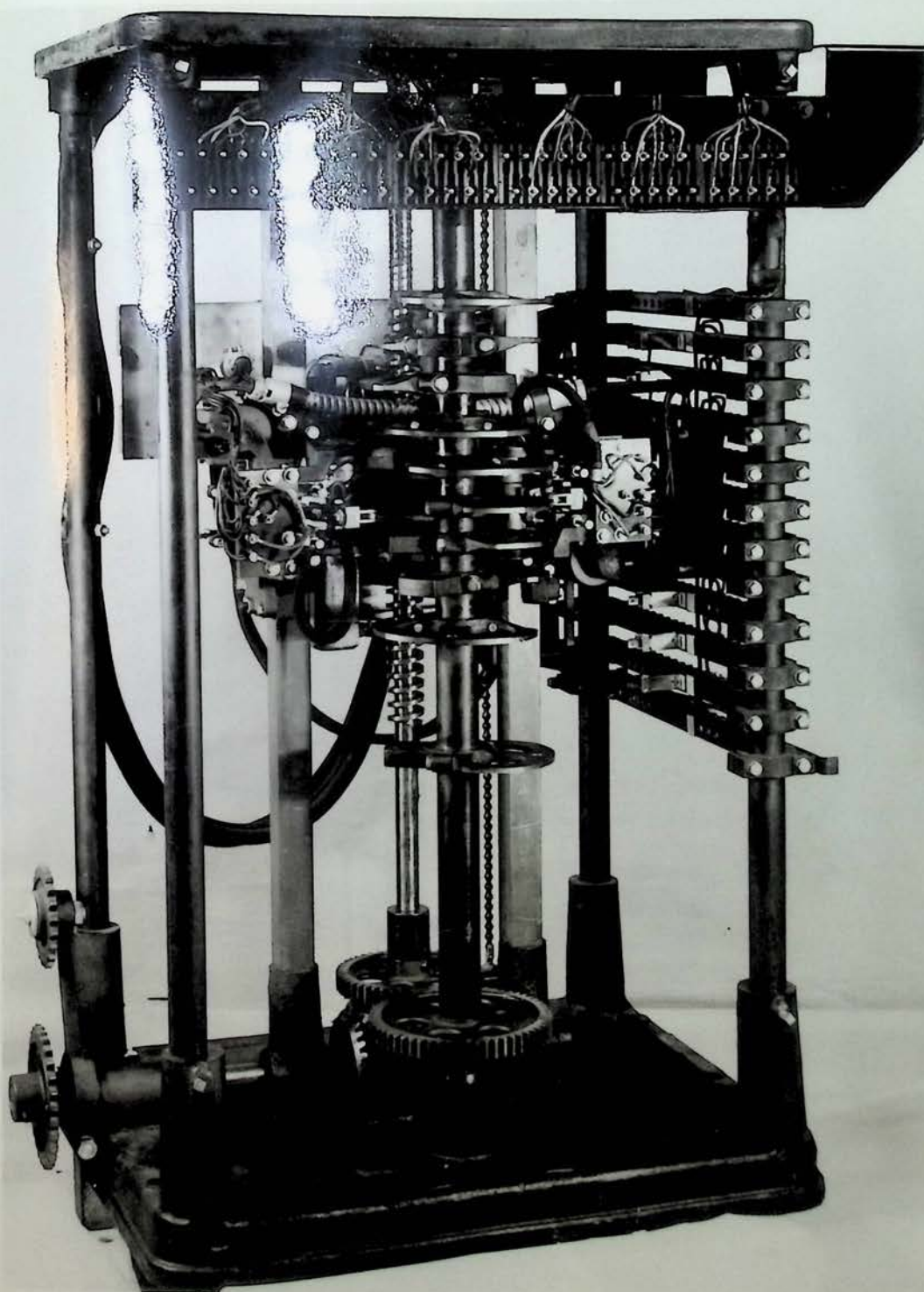
80 U.S.L. CONTROLLER - FRONT VIEW





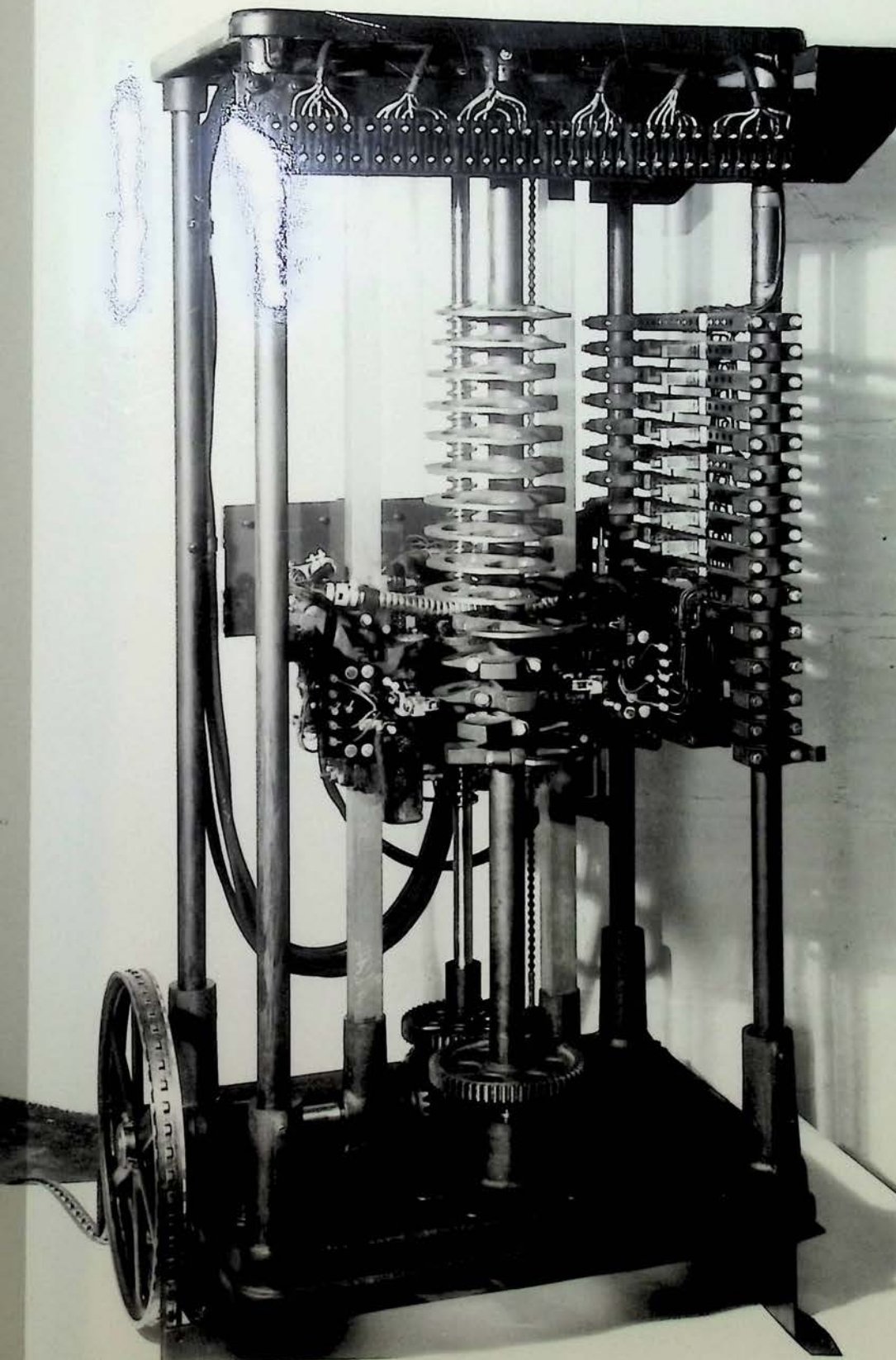
80 U.S.L. CONTROLLER - REAR VIEW





140-M SELECTOR - DRAWING 2846-FY





140M SELECTOR - TOOTH TAPE DRIVE

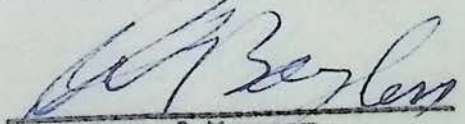


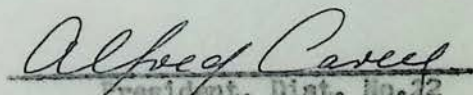
MEMORANDUM AGREEMENT TO COVER AN EMERGENCY ONLY

Complaint made by miners at Reliance that the present bathhouse is crowded. Due to the difficulty of obtaining material to enlarge this bathhouse at this time of year, we, the undersigned, agree that the men at Reliance, who do not use the bathhouse, will not be charged for its use until such time as The Union Pacific Coal Company enlarges the bathhouse or the number of employees at Reliance is reduced to the extent that there is sufficient room in the bathhouse provided for all employees.

It is agreed that, when either the bathhouse is enlarged to accommodate all employees, or, the employees are reduced to the extent that the facilities in use are ample, all employees will pay bathhouse charges.

This agreement is only temporary and will in no way alter or change the status of the original contract between The Union Pacific Coal Company and U.M.W. of A., which provides that all employees be charged for the use of bathhouses.

  
General Manager  
The Union Pacific Coal Company

  
President, Dist. No. 12  
United Mine Workers of America

Rock Springs, Wyoming  
October 13, 1943



V.P.R.G.M. No. 57  
Auditors No.  
Contract Dept. No.  
Land Dept. No.  
No.  
No.

THE UNION PACIFIC COAL COMPANY

Electric service for mine workers' tenements

During the life of the existing wage agreement expiring June 30, 1932, The Union Pacific Coal Company will furnish electric service on the following terms to such employees of Local Union No. 2337 employed by The Union Pacific Coal Company at Kimberland, Wyoming as may occupy tenements belonging to the Coal Company:

1. Continuous electric service will be furnished at the following rates:

For lamps up to and including 40 watts ---	.50	per month
For 60 Watt lamps -----	.75	" "
For 100 Watt lamps -----	1.25	" "
For 150 Watt lamps -----	1.50	" "

2. The charges set forth in paragraph 1 will apply to regularly installed lights whether suspended from walls or ceilings but the use of extension cords that admit of carrying lights in and about the tenements is strictly prohibited.

3. Employees using lights shall not waste energy by burning lights during daylight hours nor shall same be left burning when the house is vacant, the occupants are absent from home or have retired for the night.

4. Employees will be privileged to use electrical energy without additional charge for use in operating electric washing machines, refrigerators, radios, vacuum cleaners, percolators, toasters, and other like household appliances.

5. The use of electric energy for cooking ranges or stoves, air or room heaters or water heaters is strictly prohibited. The use of electrical energy for these prohibited purposes will result in the offending employee being assessed in addition to the regular light charge:

- (a) For the first violation a penalty equal to the regular monthly light charge collected;
- (b) for a second violation a penalty equal to twice the regular monthly light charge collected; and
- (c) for a third violation all electric service of whatever character will be refused the offending tenant during the term of his employment.



6. The Union Pacific Coal Company, through its employees and agents, shall have the right to enter the premises of the employe at all reasonable hours for the purpose of inspecting all electric wiring and the appliances attached thereto.

7. An employe using electrical energy will promptly notify the Superintendent of any defects in wiring or connections that may occur on the premises.

Dated at Cumberland, Wyoming.

March 20th, 1930.

Witness:

THE UNION PACIFIC COAL COMPANY.

(Sgd.) James R. Sewar

By (Sgd.) George B. Prude  
Vice President & Gen. Mgr.

Accepted on the date last above written,

Witness:

LOCAL UNION NO. 2337  
in Cumberland, Wyoming.

(Sgd.) C. J. Blacker

By (Sgd.) Sam Dexter  
President.

Approved on behalf of District No. 22, U. M. W.  
of A. as of the date last above written.

By (Sgd.) George Young  
Vice Pres.



