

JULY 1980

CATALOG NO. 2730-A
SUPERSEDES NO. 2609

SERIES 45 MILLS WATER-TUBE BOILER

COMBUSTION CHAMBER ASSEMBLY INSTRUCTIONS

For Automatic Firing with Oil or Gas

STEAM, VAPOR OR WATER HEATING

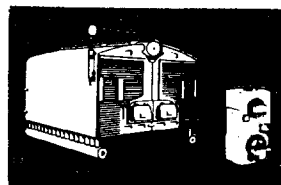
TO STEAMFITTER

**NOTE: READ THESE INSTRUCTIONS CAREFULLY.
THEY WILL SAVE YOU TIME IN ASSEMBLING
BOILER PROPERLY.**

**IMPORTANT: BE SURE AND SEAL ALL JOINTS
TO PREVENT AIR LEAKAGE INTO COMBUSTION
CHAMBER.**

THE **HB Smith**
COMPANY, INC.

WESTFIELD, MASSACHUSETTS, 01086



THESE INSTRUCTIONS TO BE LEFT WITH THE BOILER FOR REFERENCE PURPOSES.

GENERAL

THE BOILER SECTIONS SHOULD BE COMPLETELY ERECTED WITH HEADER NIPPLES MADE UP TIGHT INTO THE SECTIONS AND WITH LOCKNUTS TIGHTENED BEFORE THE INSTALLATION OF THE COMBUSTION CHAMBER IS BEGUN. REMOVE ERECTING BARS AND WORK THRU THE FRONT OPENING. BE SURE THE UPPER AND LOWER SECTION STRAPS ARE BOLTED SECURELY. STUDY THE SCHEDULES OF INSULATING BLOCK AND REFRACTORY BRICK CAREFULLY. THE TILE, BLOCKS AND BRICKS MUST BE LOCATED PROPERLY IN ORDER TO FIT INTO THE BOILER. THE SCHEDULES AND THE DIAGRAMS MUST BE USED TO INSTALL THE MATERIAL ACCORDING TO INSTRUCTIONS.

HOLLOW FLOOR TILE

REFER TO FIG. NO. 3 AND THEN PLACE 3-3/4" x 7-5/8" x 15-5/8" HOLLOW FLOOR TILE IN POSITION STARTING AT THE REAR OF THE BOILER. PLACE TILE AGAINST REAR FOUNDATION WALL. FILL IN AS SHOWN IN FIG. NO. 3.

BLOCK INSULATION AND REFRACTORY

1. REFER TO FIGURES 3 AND 13 BEFORE PLACING PARTS IN POSITION.

2. SELECT THE SIDE REARWARD INSULATION AND PLACE AGAINST REAR WALL AND SIDE WALL. PLACE SIDE FORWARD INSULATION ALONG RIGHT AND LEFT SIDE WALL. SEE FIG. NO. 4.

3. SELECT BACK WALL INSULATION 2" x 4" x 20-1/2" BLOCK AND PLACE IN VERTICAL POSITION IN CORNER AGAINST SIDE INSULATION. PLACE 2" x 12" x 20-1/2" INSULATION AGAINST REAR WALL. TRIM WITH A SHARP KNIFE TO FIT SNUGLY UNDER LEDGE OF BACK END. SEE FIG. NO. 3.

4. PLACE A 12" x 6" x 4" FOOT BRICK IN EACH CORNER AGAINST REAR INSULATION. PLACE A 6" x 6" x 4" FOOT BRICK IN CENTER AGAINST REAR INSULATION. NOTE THAT FOOT BRICKS ARE INSTALLED WITH NOTCHED CORNER FACING UP AND AGAINST INSULATION. SEE FIG. NO. 3. PLACE 12" x 6" x 4" BRICKS ALONG SIDE INSULATION FILLING IN EACH SIDE. PLACE THE TWO 5-1/2" x 5-1/2" x 14-1/2" FOOT BRICKS IN POSITION AND THE 9" x 4-1/2" x 1" SPLIT HALF BRICK IN THE CENTER AS SHOWN IN FIG. NO. 3. BREAK OFF THE EXCESS PORTION OF 1" BRICK. PLACE THE SIX 2-1/2" x 3-1/2" x 9" FIRE BRICKS AGAINST REAR FOOT BRICKS AS SHOWN IN FIG. NO. 3. CENTER THE BRICKS BETWEEN THE SIDE WALLS.

5. SELECT FLOOR INSULATION BLOCKS PER SCHEDULE AND PLACE UPON THE TILE. THE 6" WIDTH BLOCKS ARE FOR THE CENTER AND THE 12" WIDTH BLOCKS ALONG THE OUTSIDE AGAINST FOOT BRICKS AND UPON THE TILE. TRIM TO LENGTH WITH SHARP KNIFE FOR SNUG FIT IN FLOOR.

6. REFER TO SCHEDULE ON PAGE 7 AND DIAGRAM NUMBER 5 BEFORE INSTALLING FORWARD AND REAR SIDE BRICKS IF THE ACCESS DOOR IS TO BE USED FOR COMBUSTION CHAMBER ENTRY, FOLLOW THE INSTRUCTIONS AND ILLUSTRATIONS IN FIG. NOS. 5, 7, 8 & 9 BEFORE PLACING THE BACK BRICKS IN POSITION.

7. PLACE THE 3360A (R. OR L.H.) BACK SUPPORT BRICK IN THE R.H. CORNER OF THE CHAMBER. THEN PLACE THE 3362A R.H. BACK CENTER BRICK IN PLACE. THEN THE 3361A L.H. BACK CENTER BRICK IS LOCATED IN POSITION AND THE OTHER 3360A (R. OR L.H.) BACK SUPPORT BRICK IS FITTED INTO THE L.H. CORNER. THE 3359A LINTEL IS PLACED ON THE BACK BRICKS. FOLLOW SCHEDULE, PAGE 7 FOR USE OF 12" AND 15" FORWARD AND REARWARD SIDE BRICKS TO BE PLACED ON TOP OF FOOT BRICK AND AGAINST SIDE INSULATION. SEE FIG. NO. 5.

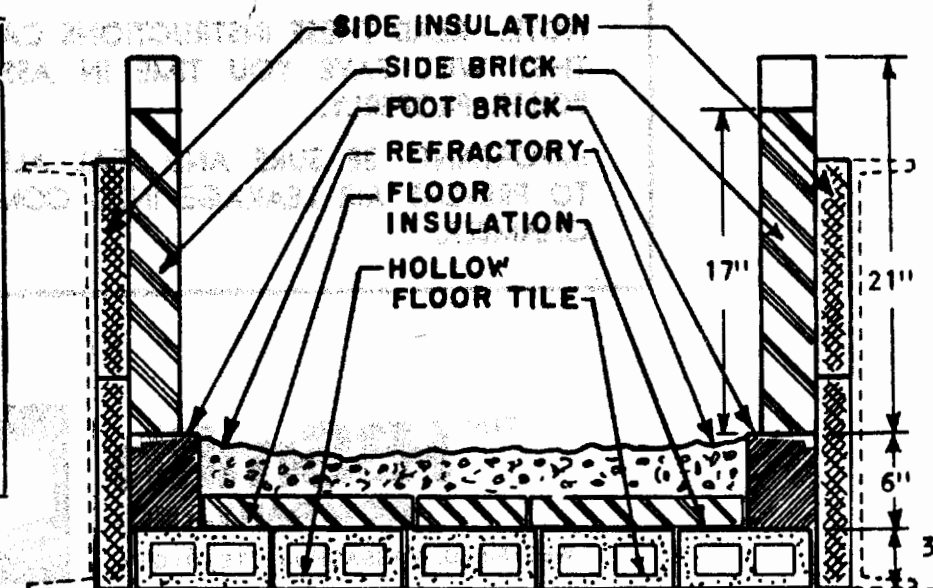
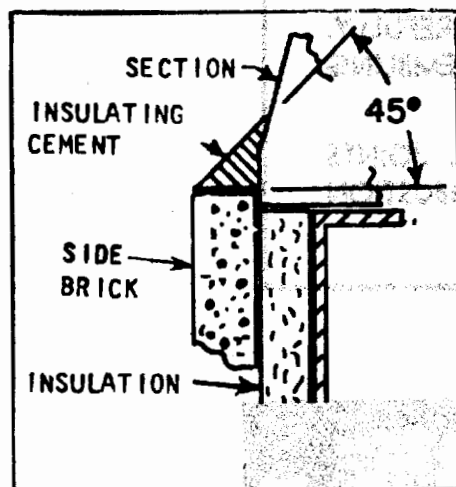
8. SEE FIG. NO. 2 FOR PLACING OF INSULATING CEMENT ON TOP OF SIDE AND REAR COMBUSTION CHAMBER BRICKS, CAP THE TOP OF BRICKS AT 45° ANGLE AS SHOWN.

9. REFRACTORY PELLETS SHOULD BE DISTRIBUTED THROUGHOUT THE COMBUSTION CHAMBER TO A DEPTH ABOUT LEVEL WITH THE TOP OF THE FOOT BRICK. IT IS RECOMMENDED TO PLACE ALL BUT ONE BAG OF PELLETS IN THE CHAMBER BEFORE THE FRONT BRICK, INSULATION AND FRONT PLATE ARE INSTALLED. THEN FINISH THE JOB WITH THE FRONT IN PLACE. SEE FIG. NO. 1.

IMPORTANT:

NOTE: FOR PLATE 3401 (POWERFLAME C-4) THE FOLLOWING DOES NOT APPLY. SEE "FRONT BRICK AND INSULATION NOTE 3" ON PAGE 3.

10. AT THIS STAGE, PLACE THE 4 FRONT BRICKS INSIDE THE BOILER NEAR THE FRONT OF THE CHAMBER. ALSO PLACE THE FRONT INSULATION BOARD NEAR THE FRONT AREA FOR ASSEMBLY BEHIND THE FRONT WALL. DO NOT ATTEMPT TO PRE-POSITION THESE FRONT BRICKS OR INSULATION BOARDS AT THIS STAGE.



3" STEEL CHANNEL
SUB BASE

(FOR 17 SECTIONS AND
UP WITH 1C BURNER)

VIEW THRU SECTION OF COMBUSTION CHAMBER

FIGURE NO. 3

FLOOR TILE, FLOOR INSULATION
AND FOOT BRICK ILLUSTRATION
12 SECTION SHOWN.

SEE PAGES 6 & 7
FOR SCHEDULES

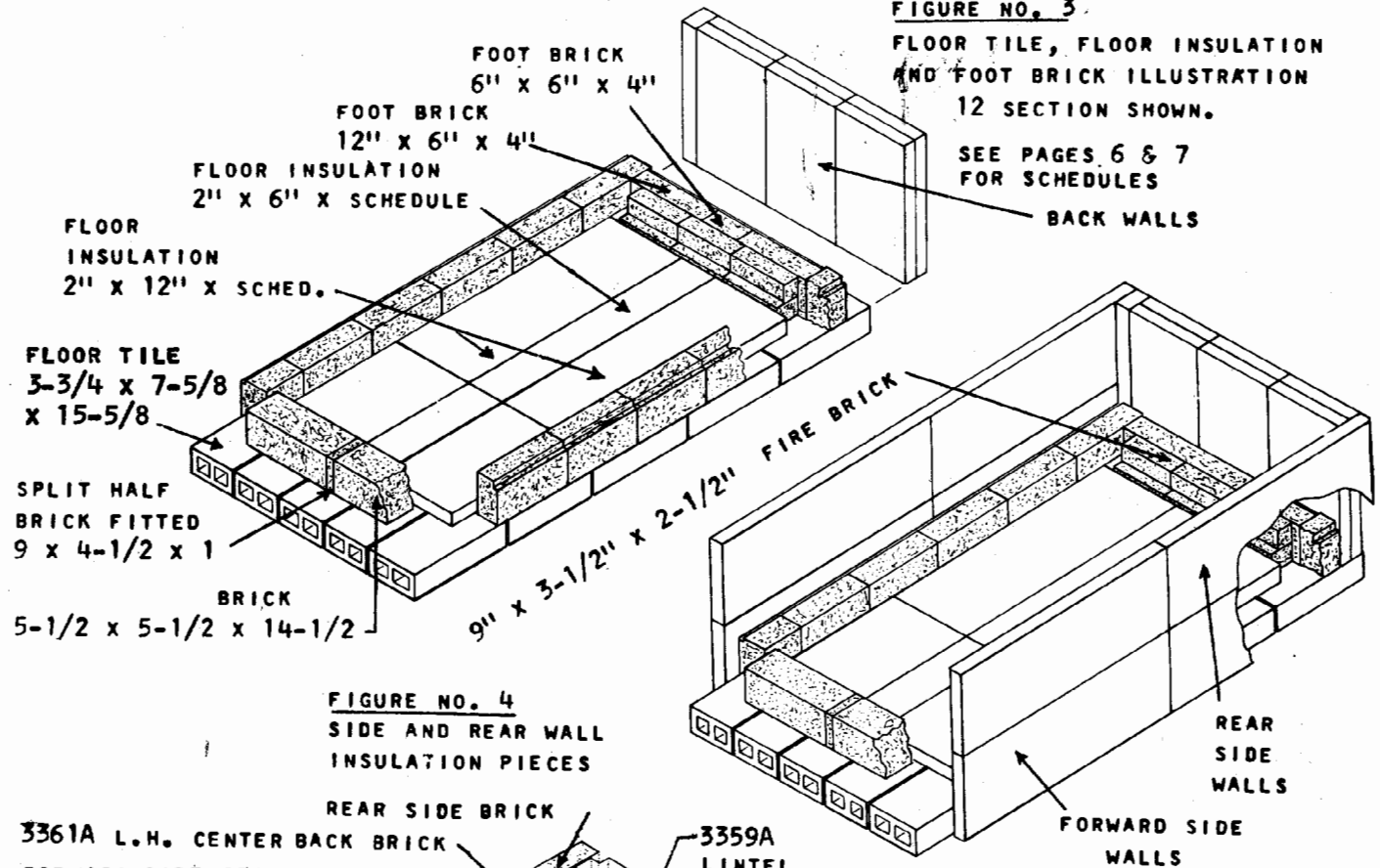


FIGURE NO. 4
SIDE AND REAR WALL
INSULATION PIECES

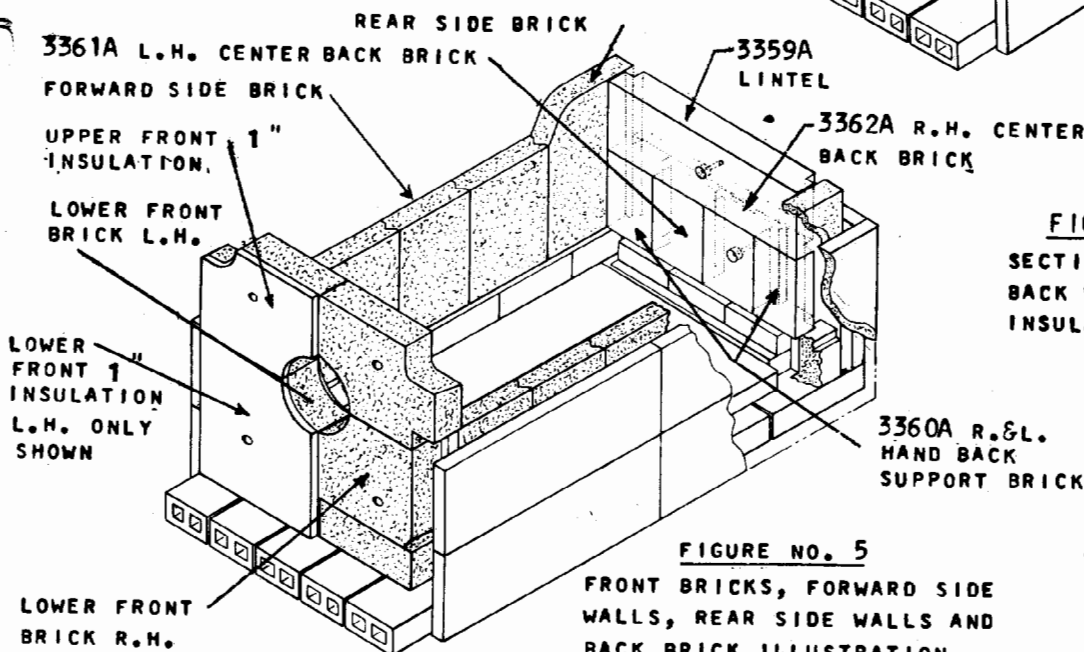


FIGURE NO. 5A

SECTION VIEW THRU
BACK WALL, BRICKS,
INSULATION & TILE.

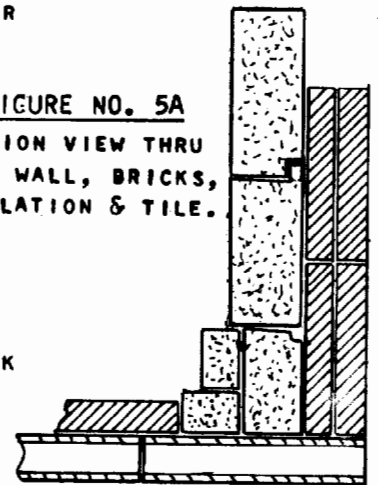


FIGURE NO. 5

FRONT BRICKS, FORWARD SIDE
WALLS, REAR SIDE WALLS AND
BACK BRICK ILLUSTRATION.

FRONT BRICK & INSULATION

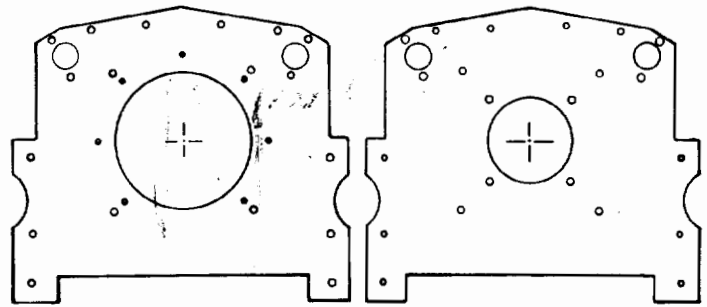
1. PLACE THE TWO LOWER FRONT INSULATION BOARDS AGAINST BACK OF FRONT PLATE 3165. PLACE L.H. LOWER FRONT BRICK AGAINST INSULATION BOARD. LINE UP BOLT HOLES IN FRONT PLATE, INSULATION BOARD AND BRICK, THEN ASSEMBLE 1/2" - 13 x 5" BOLT, WASHER AND NUT. ASSEMBLE R.H. LOWER FRONT BRICK AND HARDWARE.
2. PLACE THE TWO UPPER FRONT INSULATION BOARDS AGAINST BACK OF FRONT PLATE 3165. PLACE L.H. UPPER FRONT BRICK AGAINST INSULATION BOARD. LINE UP BOLT HOLES IN FRONT PLATE, INSULATION BOARD AND BRICK, THEN ASSEMBLE 1/2" - 13 x 5" BOLT, WASHER AND NUT. ASSEMBLE R.H. UPPER FRONT BRICK AND HARDWARE. TRIM INSULATION BOARDS TO BRICK OPENING SIZE.

NOTE:

3. WHEN USING FRONT PLATE #3401 (FOR POWERFLAME C-4) IT WILL BE NECESSARY TO PLACE FRONT PLATE FACE DOWN ON STRIPS OF WOOD AND ASSEMBLE INSULATION BOARD AND FRONT BRICKS ON THE PLATE. THEN STAND UP FRONT PLATE AND JIMMY BACK INTO POSITION AGAINST FOUNDATION SIDE WALLS. BOLT IN PLACE.

FRONT PLATE

1. ASSEMBLE 4-5/16-18" BRASS STUDS TO SCREW SEATS IN THE FRONT SECTION. TROWEL A THIN, SMOOTH LAYER OF BLACK FURNACE CEMENT ON THE FRONT ENDS OF THE FOUNDATION SIDEWALLS.
2. PLACE THE FRONT PLATE IN POSITION OVER THE BRASS STUDS. ASSEMBLE FRONT PLATE TO SIDEWALL USING BOLTS FROM THE ERECTING BARS. ASSEMBLE WASHERS AND NUTS TO BRASS STUDS AND TIGHTEN ALL HARDWARE.
3. HEAVY 7/16" WICKING AND INSULATING CEMENT IS USED TO SEAL FRONT PLATE AFTER IT IS BOLTED TO THE BOILER.
4. FOR PLATE #3401 SEE FRONT BRICK AND INSULATION NOTE 3 BEFORE INSTALLING PLATE.



FRONT PLATE 3165

FRONT PLATE 3401
(FOR POWERFLAME C-4)

FIGURE NO. 6

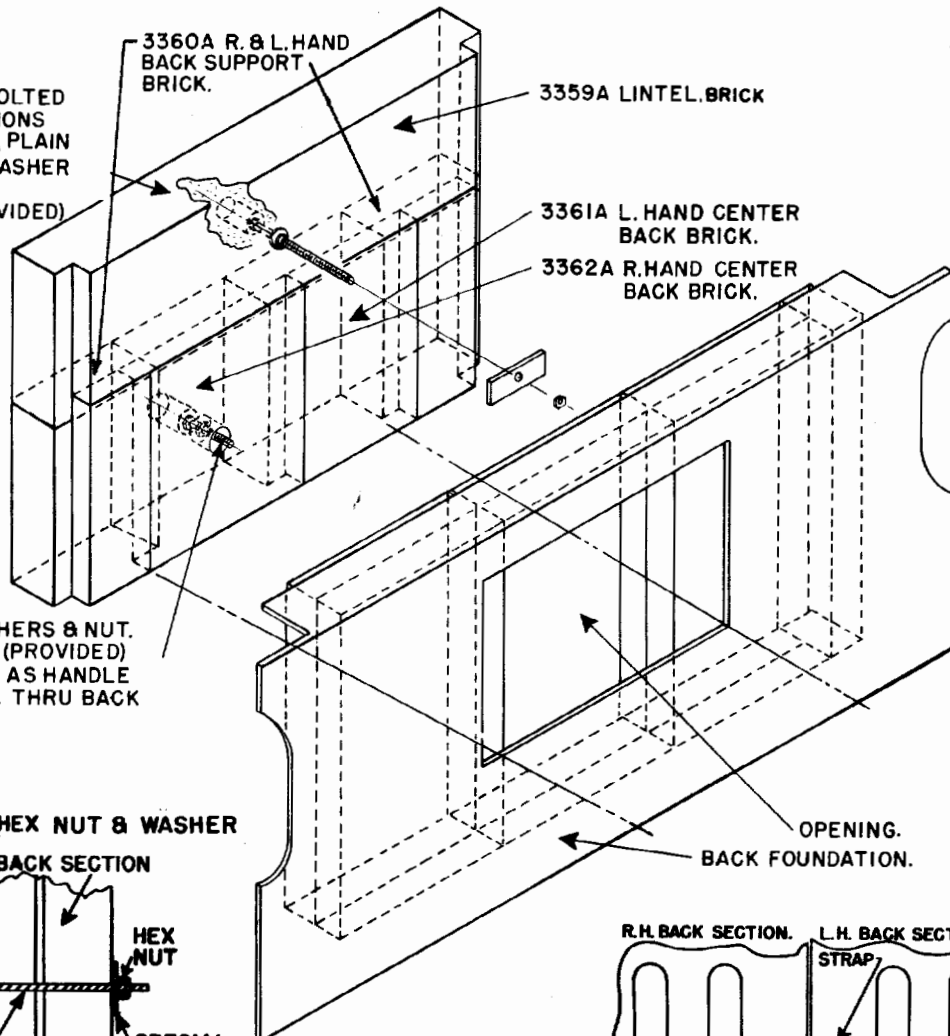
INSTRUCTIONS FOR BACK ENTRY
TO COMBUSTION CHAMBER

- 1.) REMOVE CLEAN-OUT DOOR (NOT SHOWN) AND THEN CUT AWAY THE INSULATION TO REACH THE BACK CENTER BRICKS.
- 2.) REMOVE THE 3362A R.H. BACK BRICK FIRST. USING BOLT AS HANDLE. DRAW OUT THRU OPENING IN THE BACK FOUNDATION. THE R.H. BACK BRICK MUST BE REMOVED FIRST.
- 3.) REMOVE 3361A L.H. BACK BRICK. USE CARE WHILE REMOVING BACK CENTER BRICKS TO AVOID TIPPING THE LINTEL BRICK WHICH IS SUPPORTED BY THE R & L HAND BACK SUPPORT BRICKS.
- 4.) WHEN THE BACK CENTER BRICKS ARE REPLACED THE 3361A L.H. CENTER BRICK MUST BE PLACED IN POSITION FIRST.
- 5.) REPLACE INSULATION AND SEAL JOINTS.

NOTE:

LINTEL BRICK 3359A TO BE BOLTED BETWEEN BOILER BACK SECTIONS USING 9" LGT. THREADED ROD, PLAIN WASHER, SPECIAL 1-1/2" x 4" WASHER PROVIDED AND NUTS. INSERT KAOWOOL PLUG (PROVIDED) IN RECESS IN BRICK AND CEMENT IN PLACE.

FIGURE NO. 7



3/8"-16x4-1/2" BOLT, WASHERS & NUT. INSERT KAOWOOL PLUG (PROVIDED) IN RECESS AND FOR USE AS HANDLE FOR REMOVAL OF BRICK THRU BACK OPENING.

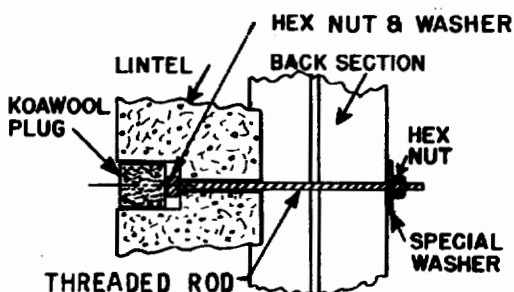
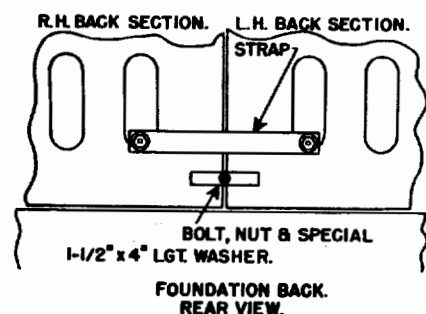
SECTION VIEW THRU LINTEL
BRICK TO REAR OF BACK SECTION

FIGURE NO. 8

FIGURE
NO. 9FOUNDATION BACK.
REAR VIEW.

OBSERVATION DOORS AND FRAMES

1. AFTER THE FRONT PLATE IS IN POSITION, TAKE ONE OBSERVATION COVER FRAME AND INSTALL IT OVER THE OPENING. SEE FIGURE NO.10. NOTE THAT THE L.H. SIDE IS ASSEMBLED WITH THE 5/16-18 x 3/4 HFY BOLT AND LATCH TO ALLOW THE OBSERVATION COVER TO SWING TOWARD THE CENTER OF THE BOILER. ASSEMBLE COVER TO SWING OPEN ON THE 7/16 O.D. BRASS BUSHING WITH 5/16-18 x 3/4 HEX BOLT ASSEMBLY TO THE FRONT PLATE.

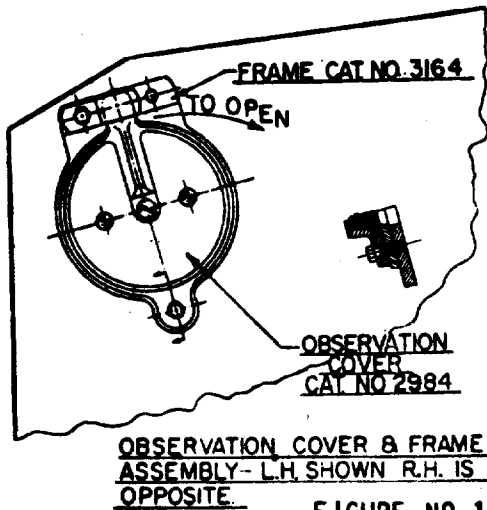


FIGURE NO.10

**HEAVY OIL
BURNER-BOILER SCHEDULE**

BURNER	NO. OF SECTIONS
I.C. BURNER NO. 42, 54 & 63	10-16
I.C. BURNER NO. 85 & 105	17-22
PREFERRED "HS" & "XHS"	10-22

**HEAVY OIL
BURNER BRICK SCHEDULE**

I.C. BURNER NO. 42, 54 & 63 AND PREFERRED BURNERS	DIMENSIONS		
	A	B	C
3364 UP. L.H.	8-3/4	9-3/4	11-3/4
3365 UP. R.H.	"	"	"
3366 UP. L.H.	"	"	"
3367 UP. R.H.	"	"	"

I.C. BURNER 84 & 105	DIMENSIONS		
	A	B	C
3368 UP. L.H.	10	11	13
3369 UP. R.H.	10	11	13
3370 UP. L.H.	10	11	13
3371 UP. R.H.	10	11	13

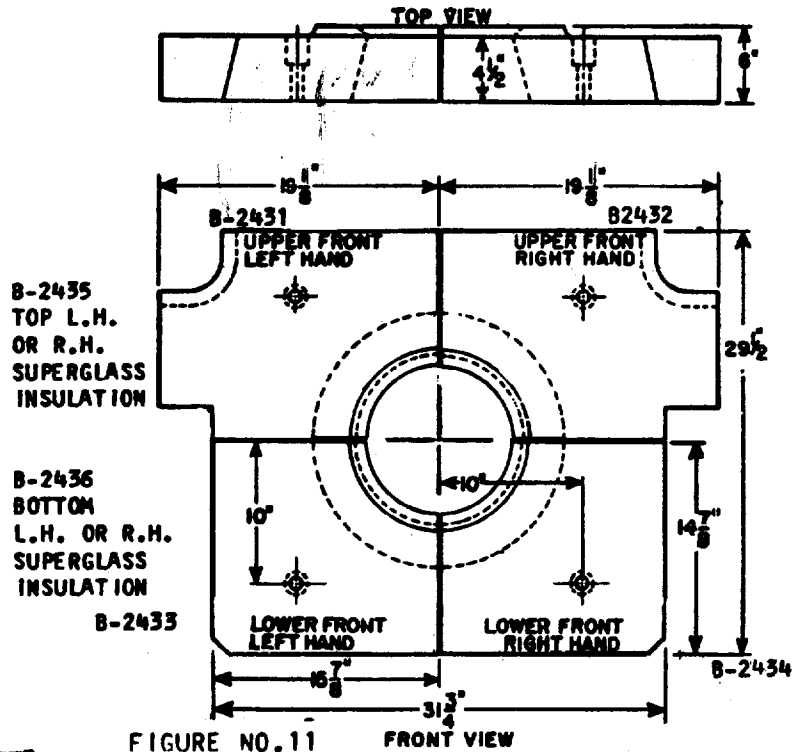
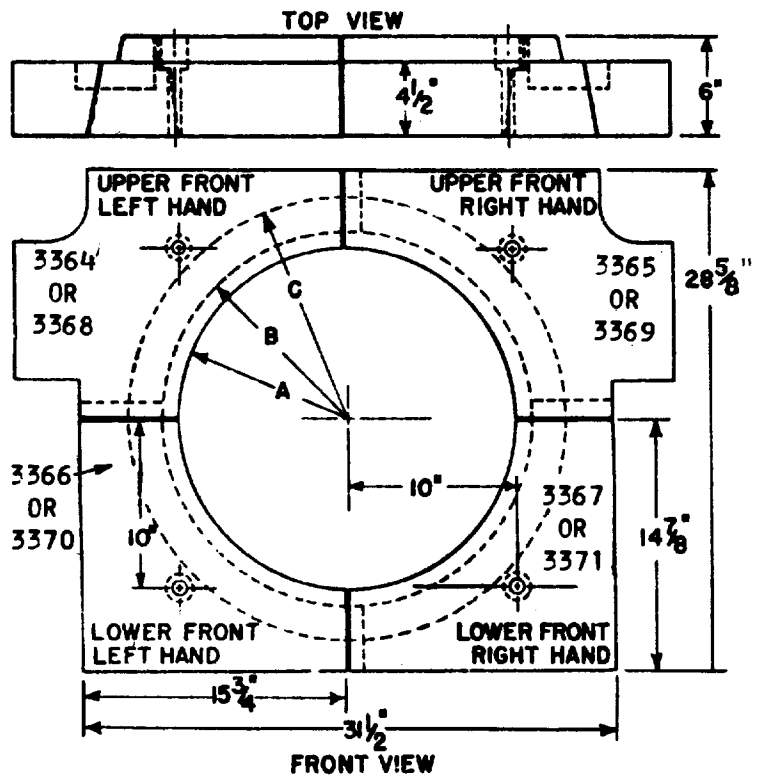


FIGURE NO.11

FRONT VIEW

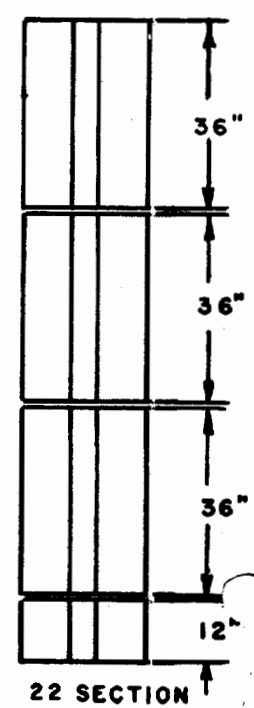
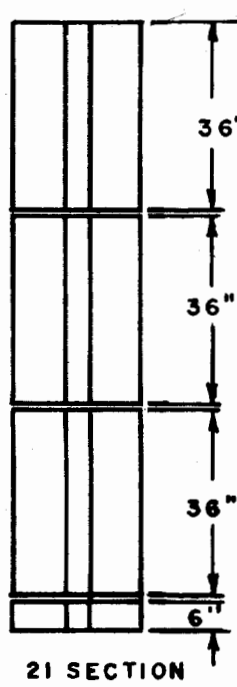
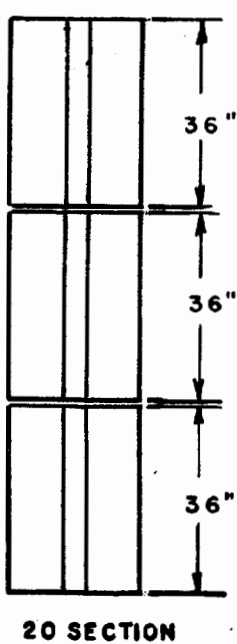
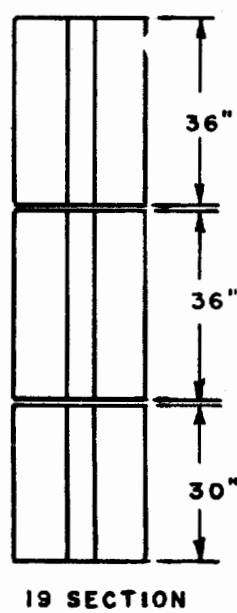
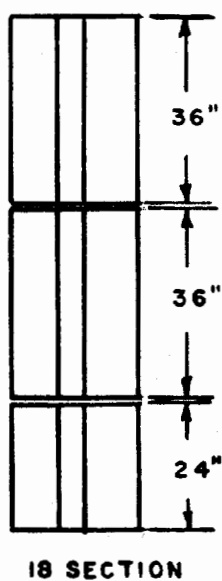
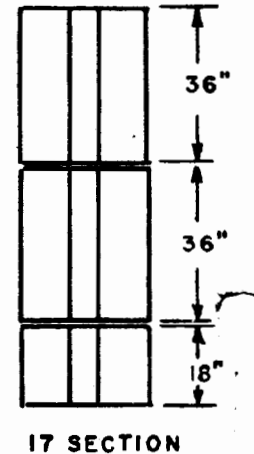
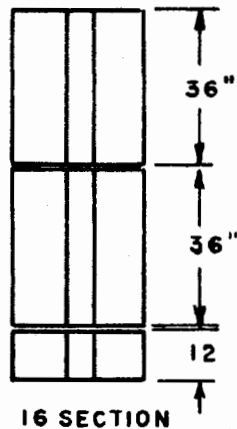
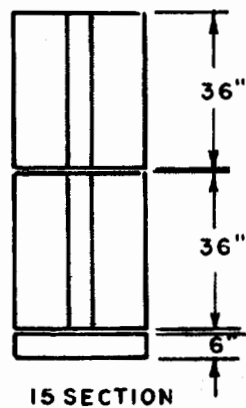
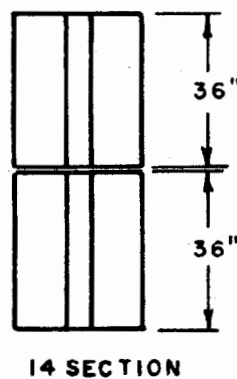
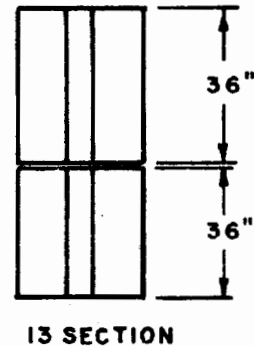
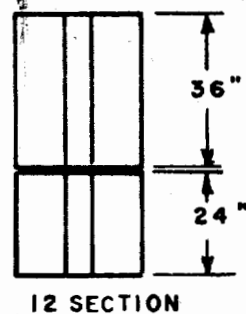
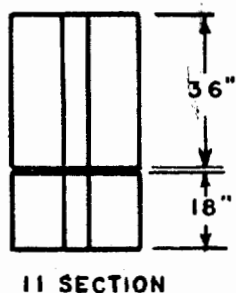
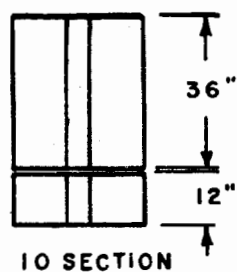
ILLUSTRATION OF BURNER BRICKS USED WITH POWER-FLAME C-4 BURNERS USING LIGHT OIL, GAS OR COMBINATION GAS-OIL.



FRONT VIEW

ILLUSTRATION OF BURNER BRICKS USED WITH PREFERRED UTILITIES AND INDUSTRIAL COMBUSTION BURNERS USING HEAVY OIL.

FIGURE NO.12

COMBUSTION CHAMBER FLOOR INSULATION DIAGRAM
FIGURE NO.13

TRIM TO LENGTH WITH SHARP KNIFE FOR SNUG FIT IN FLOOR.

SERIES 45 MILLS COMBUSTION CHAMBER SCHEDULE FOR USE WITH THE FOLLOWING BURNERS:

HEAVY OIL BURNERS-PREFERED UTILITIES, "HS" & "XHS"
HEAVY OIL BURNERS 1/C #42, #54, #63, #84, & #105.

LIGHT OIL BURNERS - POWER-FLAME
C4-0, C4-G, C4-G0.

SCHEDULE OF INSULATION BLOCKS			NO. OF BOILER SECTIONS													
DESCRIPTION AND SIZE OF INSULATION BLOCKS			10	11	12	13	14	15	16	17	18	19	20	21	22	
HOLLOW FLOOR TILE 3-3/4 x 7-5/8 x 15-5/8			20	25	25	25	30	30	39	35	35	40	40	40	45	
FLOOR INSULATION BLOCKS 2x6x6								1						1		
" " " 2x6x12			1					2	1					2	1	
" " " 2x12x12			2						2						2	
" " " 2x6x18				1						1						
" " " 2x12x18				2						2						
" " " 2x6x24					1						1					
" " " 2x12x24					2						2					
" " " 2x6x30						1						1				
" " " 2x12x30						2						2				
" " " 2x6x36			1	1	1	1	2	2	2	2	2	2	3	3	3	
" " " 2x12x36			2	2	2	2	4	4	4	4	4	4	6	6	6	
REARWARD INSULATION 2x6x24						2						2				
" " " 2x12x18								4						4		
" " " 2x12x24			4				2		4				2		4	
FOREWARD INSULATION 2x12x30				4						4						
" " " 2x12x36			4	4	8	8	8	8	8	8	12	12	12	12	12	
BACK WALL INSULATION 2x4x20-1/2			1	1	1	1	1	1	1	1	1	1	1	1	1	
" " " 2x12x20-1/2			6	6	6	6	6	6	6	6	6	6	6	6	6	
FRONT WALL INSULATION B-2435 TOP LH. & RH.			2	2	2	2	2	2	2	2	2	2	2	2	2	
" " " B-2436 BOT. LH. & RH.			2	2	2	2	2	2	2	2	2	2	2	2	2	
CATALOG NUMBER AND DESCRIPTION OF BRICK																
HEAVY OIL FRONT	FRONT	3364 L.H. UPPER FRONT BRICK	1	1	1	1	1	1	1							
		3365 R.H. " " "	1	1	1	1	1	1	1							
		3366 L.H. LOWER FRONT BRICK	1	1	1	1	1	1	1							
		3367 R.H. " " "	1	1	1	1	1	1	1							
LIGHT OIL FRONT	FRONT	3368 L.H. UPPER FRONT BRICK								1	1	1	1	1	1	
		3369 R.H. " " "								1	1	1	1	1	1	
		3370 L.H. LOWER FRONT BRICK								1	1	1	1	1	1	
		3371 R.H. " " "								1	1	1	1	1	1	
SIDE FRONT	FRONT	B-2431 L.H. UPPER FRONT BRICK	1	1	1	1	1	1	1	1	1	1	1	1	1	
		B-2432 R.H. " " "	1	1	1	1	1	1	1	1	1	1	1	1	1	
		B-2433 L.H. LOWER FRONT BRICK	1	1	1	1	1	1	1	1	1	1	1	1	1	
		B-2434 R.H. " " "	1	1	1	1	1	1	1	1	1	1	1	1	1	
SIDE FRONT	FRONT	B-1818 12" FORWARD SIDE BRICK	4	-	6	2	8	4	-	6	2	8	4	10	6	
		B-2247 15" " " "	2	6	2	6	2	6	10	6	10	6	10	6	10	
		B-2248 15" REARWARD SIDE BRICK	2	2	2	2	2	2	2	2	2	2	2	2	2	
		3359-A LINTEL BRICK	1	1	1	1	1	1	1	1	1	1	1	1	1	
SIDE BACK	FRONT	3360-A R.H. & L.H. BACK SUPPORT BRK.	2	2	2	2	2	2	2	2	2	2	2	2	2	
		3361-A L.H. CENTER BACK BRICK	1	1	1	1	1	1	1	1	1	1	1	1	1	
		3362-A R.H. " " "	1	1	1	1	1	1	1	1	1	1	1	1	1	
		B-1823-A 6 x 6 x 4 FOOT BRICK	3	1	3	1	3	1	3	1	3	1	3	1	3	
SIDE FOOT	FRONT	B-1829-A 12 x 6 x 4 " " "	10	12	12	14	14	16	16	18	18	20	20	22	22	
		FIRE BRICK 9 x 3-1/2 x 14-1/2	6	6	6	6	6	6	6	6	6	6	6	6	6	
		B-2227 FRONT FILLER BRICK 5-1/2 x 5-1/2 x 14-1/2	2	2	2	2	2	2	2	2	2	2	2	2	2	
		THIN SPLIT BRICK 9 x 4-1/2 x 1	1	1	1	1	1	1	1	1	1	1	1	1	1	
SIDE FILL	FRONT	REFRACTORY PELLETS, 1.5 CF/BAG 1/16" - 3/4" MESH. REQ'D.	2	2	3	3	3	3	3	4	4	4	4	5	5	

* SAME INSULATION FOR BOTH BRICK SIZES - CUT TO FIT.

FIGURE NO. 14

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THESE INSTRUCTIONS TO BE LEFT WITH THE BOILER FOR REFERENCE PURPOSES.