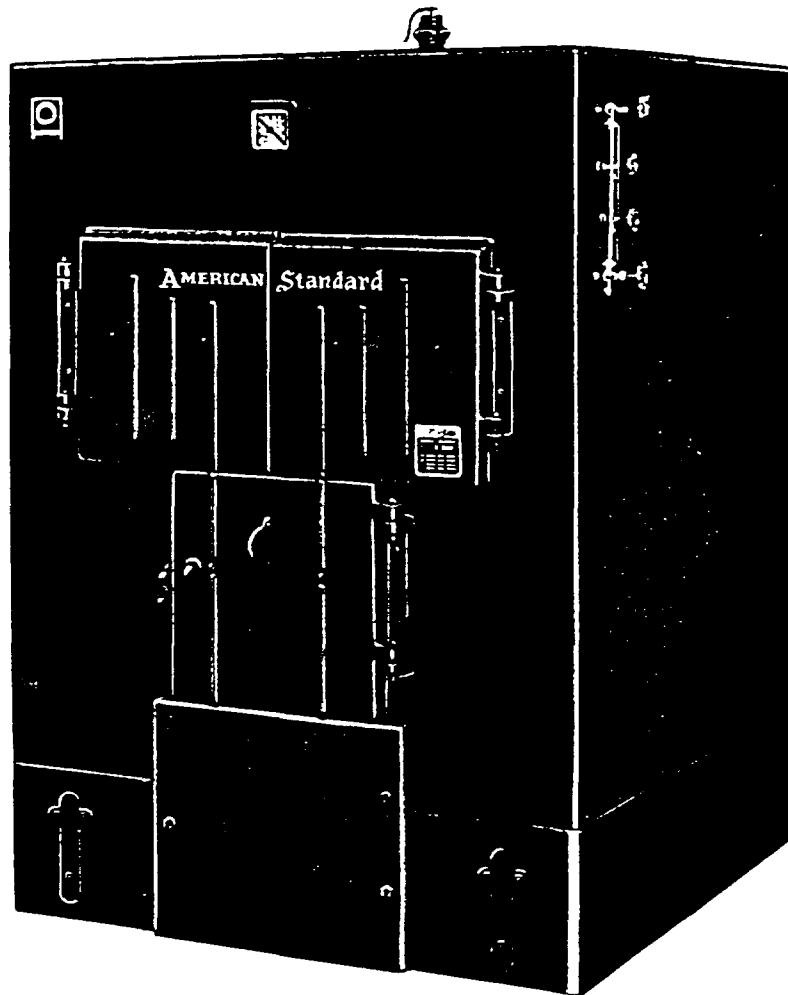




A-7 cast iron boiler
for use with all fuels

AMERICAN-Standard

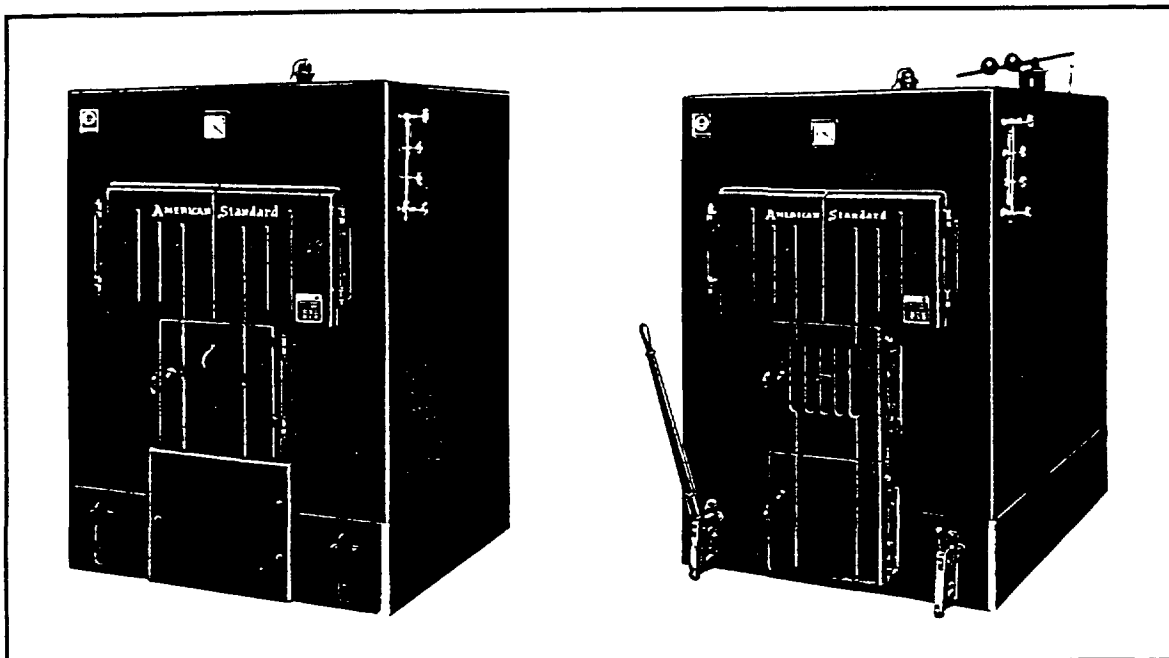
AIA File No. 30 C 1 (September, 1958)

PLAINTIFF'S
EXHIBIT

ASI-330

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▶ the A-7 cast iron boiler—expertly engineered—durably constructed



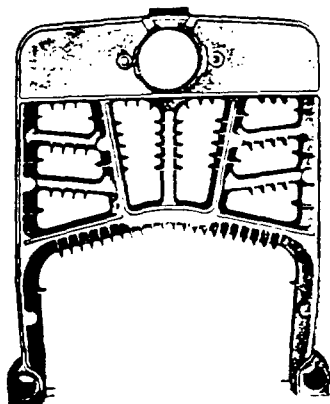
The A-7 is a compact, high-capacity, cast iron boiler developed by American-Standard for use with all fuels. Primarily designed for oil firing, it is also available in models for stoker and hand firing and is converted easily from one fuel to another. The A-7 is ideal for hot water or steam heating in all commercial and industrial buildings, and may be installed singly, or in battery, to cover a wide range of heating requirements, economically and efficiently. It combines such features as time-defying cast iron construction; completely new section design, outstanding I=B=R approved steam and water ratings, a unique steel sub-base; and maximum internal circulation to assure years of dependable heating.

■ **New section design—peak internal circulation**—One of the most important features of the A-7 is its completely new, research-engineered section design. Upward and outward flow of waterways, combined with a high water level, assure top-flight internal circulation which results in faster, smoother steaming. Special arrangement of fins on each section and the crown sheet provides an extra-large area of heating surface resulting in rapid heat transfer to boiler water. Combustion gases flow forward through outside flues, then rearward through center flues for maximum concentration and thorough flue travel.

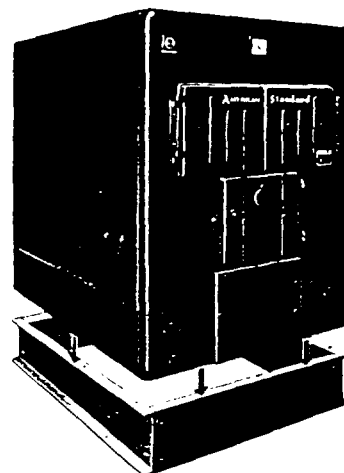
■ **Modern styling, rugged construction, exclusive steel pedestal base**—The A-7 is unusually compact in size. Ruggedly constructed cast iron sections, which are easy to handle and assemble, fit conveniently into the regular cast iron boiler base. In addition, a completely new, exclusive, steel pedestal base has been developed for the A-7 to save installation time and costs! Available as an optional feature, the base creates the additional height and combustion area necessary for oil and stoker firing—eliminates the expense and labor of digging a floor pit or constructing a special fire brick base. An attractive steel jacket, finished in Forge Red and black, encloses the A-7—gives it a smart, clean look.

■ **High I=B=R outputs—wide range of sizes, models**—The A-7 is available in automatic and hand-fired models ranging in size from 5 to 12 sections. It develops gross I=B=R outputs from 866 Mbh to 2454 Mbh, making it ideal for large hot water or steam installations. Hand-fired models of the A-7 incorporate smooth operating grate assembly, conveniently located shaker handle and large fire and ashpit doors to facilitate firing and simplify boiler maintenance. Highly economical fuel-saving operation is achieved on all hand-fired models by a Barocheck damper control—standard equipment with the A-7 hand-fired boiler.

Check these important features



■ **Highly efficient cast iron sections** of the A-7 incorporate a newly designed and scientifically engineered upward and outward flow of waterways, plus a partially submerged upper nipple, to provide the best internal circulation and peak heating performance. This unique arrangement of waterways means uninhibited circulation of water throughout the boiler—prevents water lag in pockets. The new section design also prevents collection of sediment which often impedes circulation. Each section is lined with multiple fins to achieve maximum heat extraction from hot combustion gases. Special downward slope of the fins prevents soot collection—keeps boiler cleaning and maintenance at a minimum. To assure years of dependable performance, each section is factory tested at two-and-one-half times normal operating pressure. Another feature is that rear sections of all models of the A-7 have strategically located 3-inch external water heating tapplings. This arrangement eliminates costly header piping usually required for external water heaters connected to boilers with side tapplings in sections.



■ **Steel pedestal base** provides for fast, low-cost boiler installation. This unique optional equipment provides the additional base heights required for oil and stoker firing and eliminates the costly and time consuming operation of digging a floor pit or building a specially-constructed fire brick base. Consisting of four separate steel channels, the base provides the additional height and combustion area required for automatic firing. Assembly of the base is accomplished by bolting the corners of the steel channels together quickly and easily with corner tie rods. The special base is available in 8 and 10 inch heights depending on the size of the boiler. It is assembled, then placed in position to form a sturdy foundation for the regular 12-inch base of the boiler. Compact construction of the A-7 cast iron boiler, plus the ready-made steel pedestal base, permits time-saving, low-cost installations designed for years of continuous, dependable, economical and highly efficient heating performance.

▶ All models of the A-7 All-Fuels Boiler by American-Standard have ratings approved by the Institute of Boiler and Radiator Manufacturers and are constructed of durable time-defying cast iron to the specifications of the American Society of Mechanical Engineers.

1—jacket—sturdy 20-gauge steel with attractive Forge Red and black finish completely encloses boiler, gives installation a neat, compact appearance.

2—safety relief valve—A.S.M.E. rated and furnished as regular equipment on all models.

3—high water level—assures proper internal circulation of water throughout boiler. Extra large nipples extend below water line providing fast, smooth steaming. Rear sections are provided with tapings for external water heaters.

4—finned heating surfaces—extract maximum amount of heat from combustion gases for rapid transfer to boiler water. Special downward slope of fins on flue and crown sheet surfaces prevents soot collection, minimizes boiler cleaning.

5—baffles—flue baffles channel and deflect hot combustion gases for efficient, thorough heating of all boiler surfaces. Flue baffles provided for 5-7 section oil-fired boilers only.

6—extensive flue travel—forward through outside flues, rearward through center flues assures maximum concentration of heating gases.

7—cleanout and service doors—large size for easy access to boiler sections and flue surfaces. Machine ground and constructed of sturdy cast iron, they keep boiler airtight, simplify boiler cleaning.

8—sections—constructed of rugged cast iron and factory-tested at $2\frac{1}{2}$ times normal operating pressure to assure positive performance.

9—insulation—heavy Fiberglas insulation keeps hot gases in boiler, saves fuel and prevents excessive heat loss.

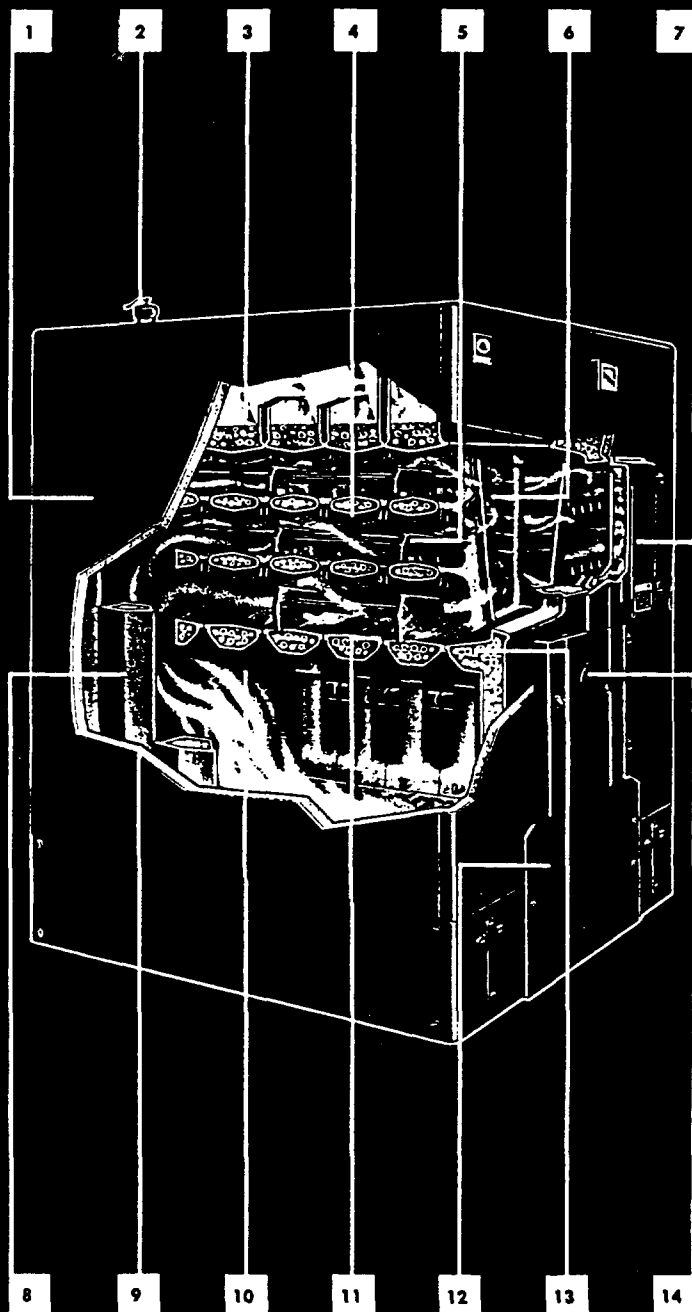
10—combustion area—scientifically designed and correctly proportioned for oil firing; also provides top heating performance for automatic or hand-fired boilers.

11—tight joints—all contacting surfaces of sections are machine ground to a smooth finish; metal-to-metal contact of sections assures tight fit, prevents air infiltration from interfering with combustion.

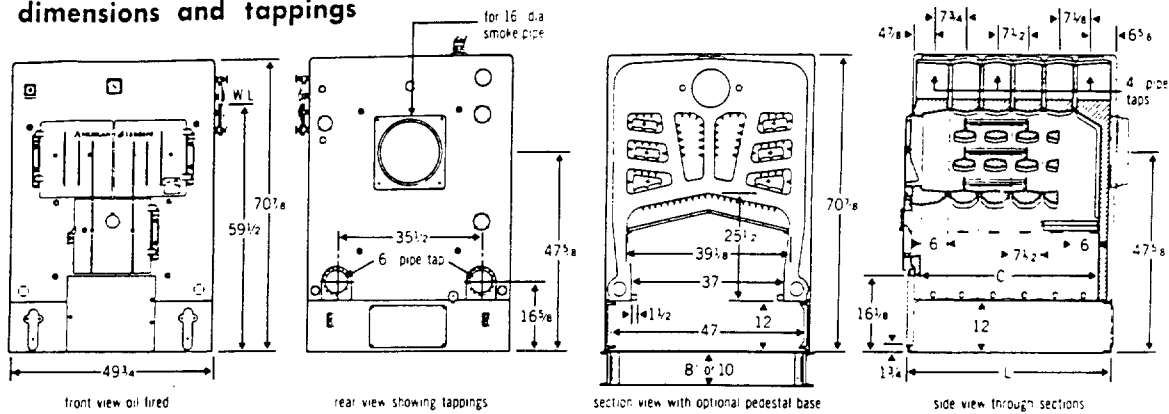
12—base opening plate—constructed of sheet steel; permits rapid installation of burner or stoker for automatic firing. Hand-fired models equipped with regular cast iron ashpit door.

13—water content—all sections water backed for peak heating performance. Correctly balanced for rapid heat transfer from hot gases to boiler water.

14—observation port—for oil boilers permits convenient flame viewing without opening boiler doors; simplifies burner and control adjustments while boiler is firing.



dimensions and tappings



dimensions—inches

number of sections	dimensions		number of 4" flow tappings	number of 6" return tappings
	C	L		
5	34 $\frac{3}{8}$	41 $\frac{1}{2}$	2	2
6	42 $\frac{1}{8}$	49	3	2
7	49 $\frac{3}{8}$	56 $\frac{1}{2}$	3	2
8	57 $\frac{1}{8}$	64	3	2
9	64 $\frac{3}{8}$	71 $\frac{1}{2}$	4	2
10	72 $\frac{1}{8}$	79	4	2
11	79 $\frac{3}{8}$	86 $\frac{1}{2}$	4	2
12	87 $\frac{1}{8}$	94	5	2

assemblage of sections

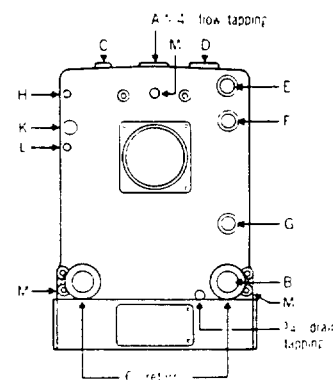
boiler number	arrangement of sections
A 705	FX, C, C, C, BX
A 706	FX, C, CX, C, RC, BX
A 707	FX, C, C, CX, C, RC, BX
A 708	FX, FC, C, CX, C, RC, RC, BX
A 709	FX, FC, CX, C, C, CX, RC, RC, BX
A 710	FX, FC, CX, C, C, CX, C, RC, RC, BX
A 711	FX, FC, FC, CX, C, C, CX, RC, RC, RC, BX
A 712	FX, FC, FC, CX, C, C, CX, C, RC, RCX, RC, BX

legend:

FX—Front Connecting Section
 C—Center Section
 CX—Center Connecting Section
 FC—Front Center Section
 RC—Rear Center Section
 RCX—Rear Center Connecting Section
 BX—Back Connecting Section

control applications

location on boiler	size inches	steam	water
A	4		Water Heater—External Type
B	6	Water Heater—External Type	Water Heater—External Type
C	1	Damper Regulator—Hand Firing	
D	2 $\frac{1}{2}$	Pop Safety Valve	Relief Valve
E	3	Blow-Off or Pop Safety Valve	Water Heater—External Type
F	3	Water Heater—External Type	Water Heater—External Type
G	3	Water Heater—External Type	Water Heater—External Type
H	$\frac{3}{4}$	Steam Pressure Limit Control	Water Temperature Limit Control
K	2 $\frac{1}{2}$	Low Water Cut-Off	
L	$\frac{3}{4}$	Water Temperature Control, Domestic Hot Water	Water Temperature Control, Domestic Hot Water
M	1 $\frac{1}{2}$	Nipple Port Inspection Tapping	Nipple Port Inspection Tapping



A-7 ratings



oil fired		net I = B = R ratings			gross I = B = R output mbh	I = B = R burner capacity gph	chimney	
boiler number		steam		water mbh			size inches	height feet
steam	water	mbh	sq ft					
*A-705-SO	*A-705-WO	649.7	2707	649.7	866	8.15	16 x 16	28
A-706-SO	A-706-WO	759.2	3163	759.2	1012	9.55	16 x 16	30
A-707-SO	A-707-WO	897.2	3738	897.2	1196	11.25	16 x 20	36
A-708-SO	A-708-WO	1041.6	4340	1041.6	1376	12.90	16 x 20	42
A-709-SO	A-709-WO	1203.1	5013	1203.1	1570	14.65	16 x 20	45
A-710-SO	A-710-WO	1361.2	5672	1361.2	1760	16.30	20 x 20	50
A-711-SO	A-711-WO	1518.6	6328	1518.6	1956	18.00	20 x 20	55
A-712-SO	A-712-WO	1667.7	6949	1667.7	2148	19.65	20 x 20	60

*Crown sheet refractory baffle furnished on 5 section oil fired boilers only.

stoker fired		net I = B = R ratings			gross I = B = R output mbh	I = B = R burner capacity lbs per hr	chimney	
boiler number		steam		water mbh			size inches	height feet
steam	water	mbh	sq ft					
A-705-SC	A-705-WC	649.7	2707	649.7	866	95	16 x 16	28
A-706-SC	A-706-WC	759.2	3163	759.2	1012	111	16 x 16	30
A-707-SC	A-707-WC	897.2	3738	897.2	1196	131	16 x 20	36
A-708-SC	A-708-WC	1041.6	4340	1041.6	1376	151	16 x 20	42
A-709-SC	A-709-WC	1203.1	5013	1203.1	1570	172	16 x 20	45
A-710-SC	A-710-WC	1361.2	5672	1361.2	1760	194	20 x 20	50
A-711-SC	A-711-WC	1518.6	6328	1518.6	1956	215	20 x 20	55
A-712-SC	A-712-WC	1667.7	6949	1667.7	2148	236	20 x 20	60

hand fired		net I = B = R ratings			gross I = B = R output mbh	I = B = R burner capacity lbs per hr	chimney	
boiler number		steam		water mbh			size inches	height feet
steam	water	mbh	sq ft					
A-705-S	A-705-W	625.4	2606	625.4	1122	—	16 x 16	40
A-706-S	A-706-W	744.3	3101	744.3	1298	—	16 x 20	45
A-707-S	A-707-W	894.0	3725	894.0	1510	—	20 x 20	50
A-708-S	A-708-W	1042.1	4342	1042.1	1708	—	20 x 20	55
A-709-S	A-709-W	1202.0	5008	1202.0	1910	—	20 x 20	60
A-710-S	A-710-W	1363.5	5681	1363.5	2108	—	20 x 24	65
A-711-S	A-711-W	1518.2	6326	1518.2	2288	—	20 x 24	70
A-712-S	A-712-W	1667.3	6947	1667.3	2456	—	24 x 24	75

Note: All sizes and models of the A-7 Boiler have tapings for external-type domestic water heaters

► American-Standard A-7 Boilers are another development in hydronics—the science of heating and cooling with water.



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