PLAINTIFF'S EXHIBIT

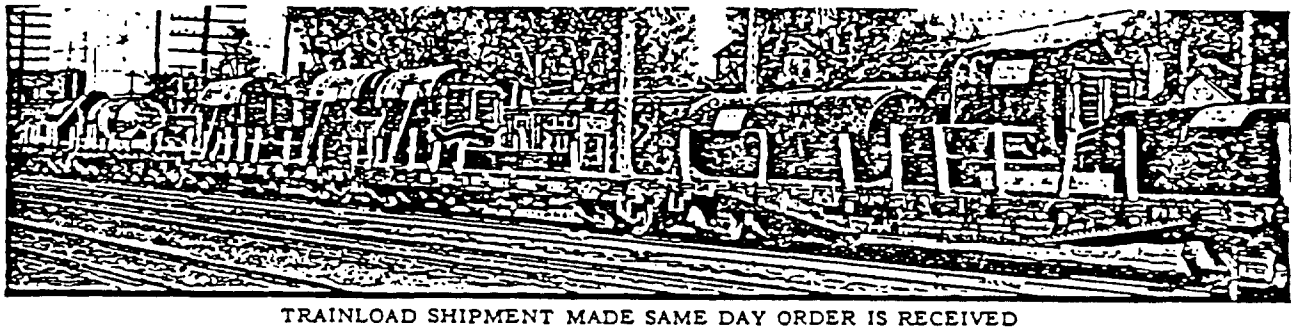
ASI-230

KEWANEE

TYPE C

Electric-Weld

STEEL BOILERS



TRAINLOAD SHIPMENT MADE SAME DAY ORDER IS RECEIVED

Catalog No. 84e

Coal Burning Boilers —Pages 2 to 8

Oil Burning Boilers —Pages 9 to 11

KEWANEE BOILER CORPORATION

division of American Radiator & Standard Sanitary Corporation

Head Office and Works
KEWANEE, ILLINOIS
MEMBER OF STEEL HEATING BOILER INSTITUTE
Branch list page 12

C. U. MARTIN, AGENT
637 MINNA STREET
SAN FRANCISCO
PHONE: MARKET 3612

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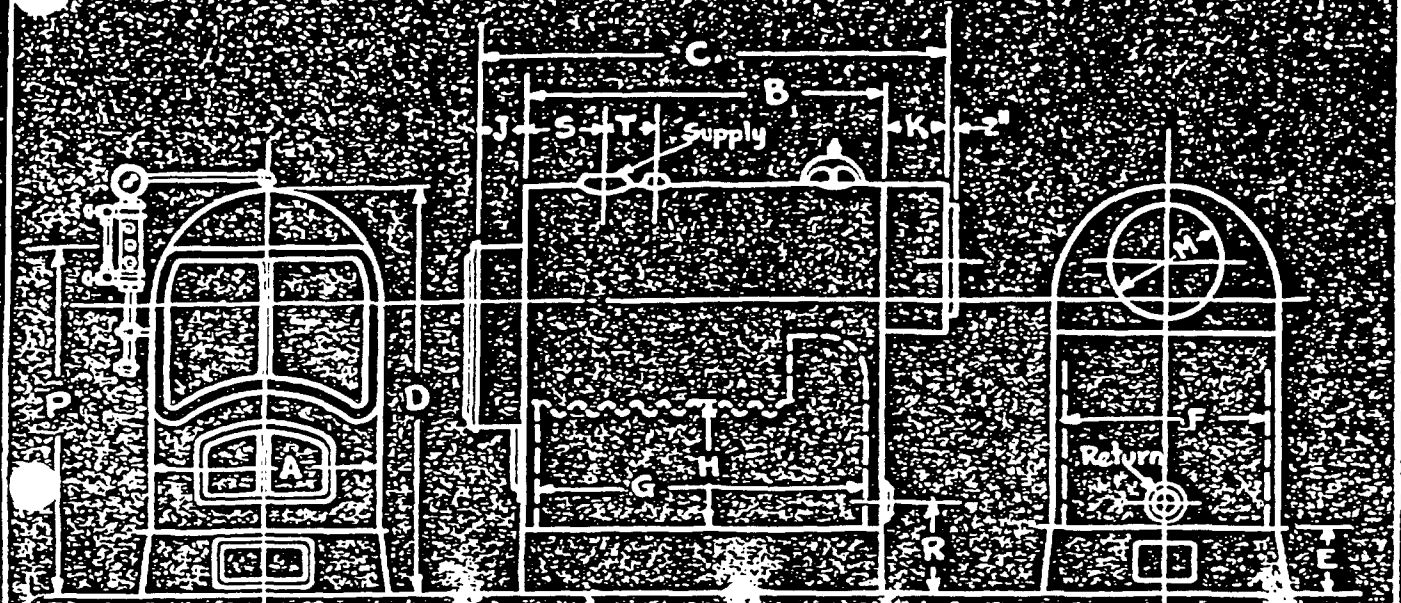
A5000031

PRINTED IN U. S.

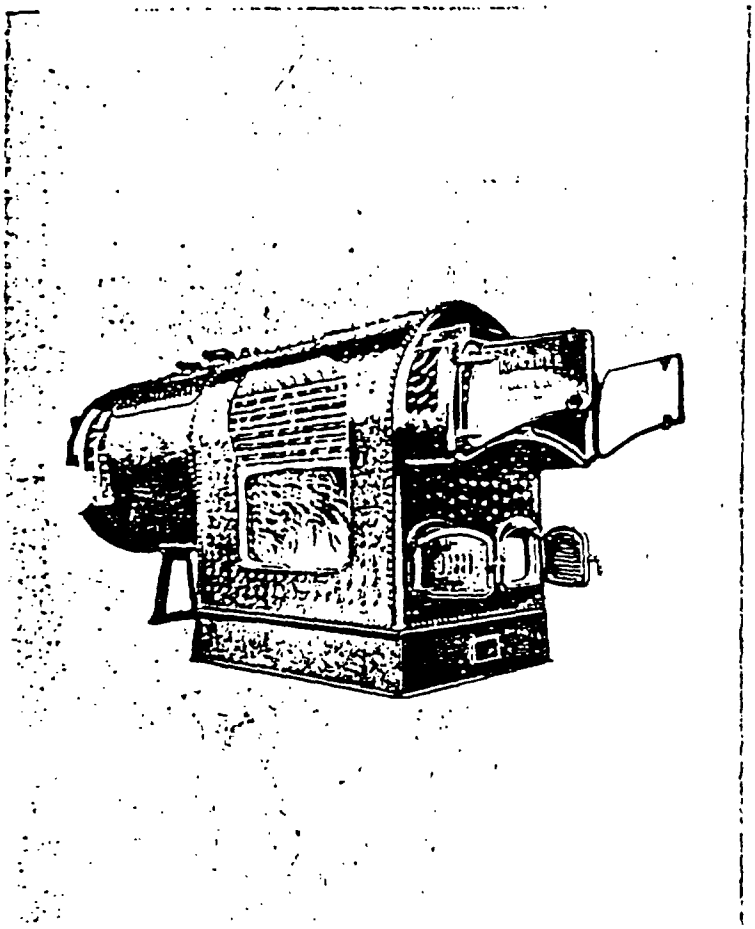
KEWANEE TYPE "C" GAS BOILERS

2" Tubes



Boiler Number		1211	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170
Steam Rating	Sq. Ft.	360	420	510	580	670	760	860	950	1050	1150	1250	1340	1430	1520	1620	1710	1800	1900	1990	2080	2180	2270
Heating Surface	Sq. Ft.	212	248	304	345	395	440	496	545	621	679	741	863	1025	1141	1383	1561	1731	1913	2091	2273	2520	2712	2882	3094
Furnace Volume	Cu. Ft.	19.6	22.0	25.9	28.7	33.4	37.1	44.7	50.5	54.4	58.0	65.6	80.3	90.8	98.2	124.9	141.0	151.3	166.5	177.1	196.9	209.7	214.1
Width of Boiler	Ins. A	36	36	36	36	42	42	42	48	48	48	54	54	60	60	66	66	72	72	78	78	84	84
Length of Boiler	Ft.-Ins. B	4-2	4-8	5-8	6-4	5-10	6-10	7-6	7-2½	7-10	8-5	7-5½	8-7	9-0½	8-11	9-1	10-10	9-10½	10-11	10-10	11-7½	10-11	12-5
Length Overall	Ft.-Ins. C	5-10	6-4	7-4	8-0	7-10	8-8	9-6	9-4½	10-0	10-7	9-8½	10-10	10-4½	11-3	11-11	13-2	12-8½	13-9	13-8	15-0½	13-9	15-3
Height Overall	Ins. D	111½	111½	111½	111½	83½	83½	83½	85	86	85	99	99	108½	108½	111½	111½	117½	117½	121½	121½	135	135
Length Base	Ins. E	14	14	14	14	14	14	14	14	14	14	14	14	17	17	17	17	17	17	17	17	21	21
Firebox Width	Ins. F	30	30	30	30	36	36	36	42	42	42	48½	48½	54½	54½	58½	58½	64	64	70	70	76	76
Firebox Length	Ins. G	43	44	62	70	64	72	84	80	87½	94½	83	97½	89	100	107	122	111	122	123	134	123	141
Firebox Height	Ins. H	25	25	25	25	28	28	28	27	27	27	33	33	35	35	36	36	40	40	38	38	38	38
Front Smokebox	Ins. J	9	9	9	9	10	10½	10	11	11	11	12	12½	12	12	12	12	14	14	14	14	14	14
Rear Smokebox	Ins. K	11	11	11	11	14	14	14	15	15	15	16	15	16	16	16	16	20	20	20	20	20	20
Smoke Outlet Dia.	Ins. M	20	22	22	22	24	24	24	26	26	26	28	28	32	32	34	34	36	36	40	40	42	42
Stack Dia.	Ins. N	15	16	18	20	20	21	23	25	26	26	28	28	32	32	34	34	36	36	40	40	42	42
Stack Height	Ft. R	35	35	40	45	40	45	50	45	45	50	50	55	50	55	65	70	75	85	85	90	85	90
Breeching Dia.	Ins. S	15	16	18	20	20	21	23	25	26	26	28	28	32	32	34	34	36	36	40	40	42	42
Water Line Height	Ins. P	69	69	69	69	72	72	72	74	74	74	85	85	94	94	95	95	101	101	103	103	114	114
Return Height	Ins. R	18	18	18	18	18	18	18	19	19	19	19	19	22	22	22	22	22	22	22	22	26	26
Location Steam Supply	Ins. S	10½	14	14	16	14	16	18	16	18	21	18	21	18	21	18	21	21	21	21	21	21	24
Location Safety Valve	Ins. T	8½	10	10	10	10	10	11	12	13	14	13	14	13	14	13	14	14	14	14	14	14	15
Surface for Cover	Sq. Ft.	62	68	80	89	93	102	115	116	129	132	145	165	172	189	210	234	231	252	265	294	294	328
Shipping Weight	Lbs.	3310	3460	3940	4570	4850	5270	5910	6060	6660	7240	8010	8440	9310	9960	11410	12110	12880	13960	14660	15810	16810	18110

KEWANEE



500 Series . . . heavy duty

15 sizes . . . 30 to 304 hp
125 and 150 lb swp

for heavy-duty service . . . providing heat for large apartments, schools, hospitals, office buildings and factories, or for power or process steam . . . Kewanee "500" is a real giant. It is strong, dependable and very efficient. A two-pass firebox type, it is the design which made the name Kewanee famous.

From top to bottom and from front to rear it is built with just one idea . . . to make it the most efficient, dependable and long lived boiler that can be constructed.

Big high fireboxes provide plenty of space and air for the fuel to combine with oxygen and burn, completing the process of combustion before the gases reach the return tubes. In the long travel of the hot gases through the firebox and the lower tubes, then through the upper tubes to the exit chamber, all usable heat is transferred to the boiler's water.

Water surrounds both upper and lower banks of tubes and all sides and top of the fire chamber so the transfer of heat is rapid and certain. Waterways are free of obstructions promoting rapid rise of the steam bubbles to the steam disengaging area and into the capacious steam chamber at the top of the boiler.

The use of 3 inch tubes permits more tubes and more heating surface further helping make the "500" a very fast and efficient steamer. And this efficiency is maintained even when the boiler is pushed to produce 50%, and more steam than is guaranteed by its rated capacity.

Both banks of tubes are easily accessible through the large doors at front and rear . . . manholes and hand holes provide access to the waterways.

Specifications and data are shown for mechanically-fired boilers. For information regarding hand fired coal types consult the nearest Kewanee representative.

ratings • mechanically fired—oil, gas or coal

boiler number	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590
rating—horsepower	30	35	39	44	52	61	74	87	109	130	152	174	217	261	304
—steam radiation sq ft	4250	4860	5470	6080	7290	8500	10330	12150	15180	18220	21250	24290	30360	36430	42500
—Btu per hour 1000's	1020	1166	1313	1459	1750	2040	2479	2916	3643	4373	5100	5830	7286	8743	10200
—steam per hour 212 F lb	1050	1200	1350	1500	1800	2100	2560	3010	3750	4510	5260	6010	7510	9010	10510
firing rate—oil gph*	13	15	16	18	22	26	31	37	46	54	64	73	91	110	127
—gas Btu per hr 1000's	1910	2180	2460	2740	3280	3830	4650	5460	6840	8200	9560	10920	13670	16400	19120
heating surface (SBI rtng) sq ft	750	286	322	358	429	500	608	715	893	1072	1250	1429	1786	2143	2500
furnace volume (SBI rtng) cu ft	30.4	34.8	39.1	43.5	52.1	60.8	73.8	86.8	108.5	130.2	151.8	173.5	216.9	260.3	303.6
furnace height (SBI rtng) ft in	2-6	2-6½	2-7¼	2-7¾	2-8¼	2-10	2-11½	3-1½	3-4¼	3-7	3-10	4-0½	4-6½	5-0½	5-6
firebox vol above mudding cu ft	39.6	39.6	48.5	48.5	62.1	69.6	97.0	110.4	130.9	137.2	160.2	183.2	207.8	231.9	245.5
**additional furnace height for stoker (SBI rtng) ft in.														0-6	1-1
safety valve capacity															
—oil gas fired lb steam per hr	2000	2288	2576	2864	3432	4000	4864	5720	7144	8576	10000	11432	14288	17144	20000
—stoker fired lb steam per hr	1750	2002	2254	2506	3003	3500	4256	5005	6251	7504	8750	10003	12502	15001	17500

*Fuel burning rates based on 150,000 Btu oil

**Represents distance below bottom of water leg that hearth must be set for SBI minimum furnace volume and height.

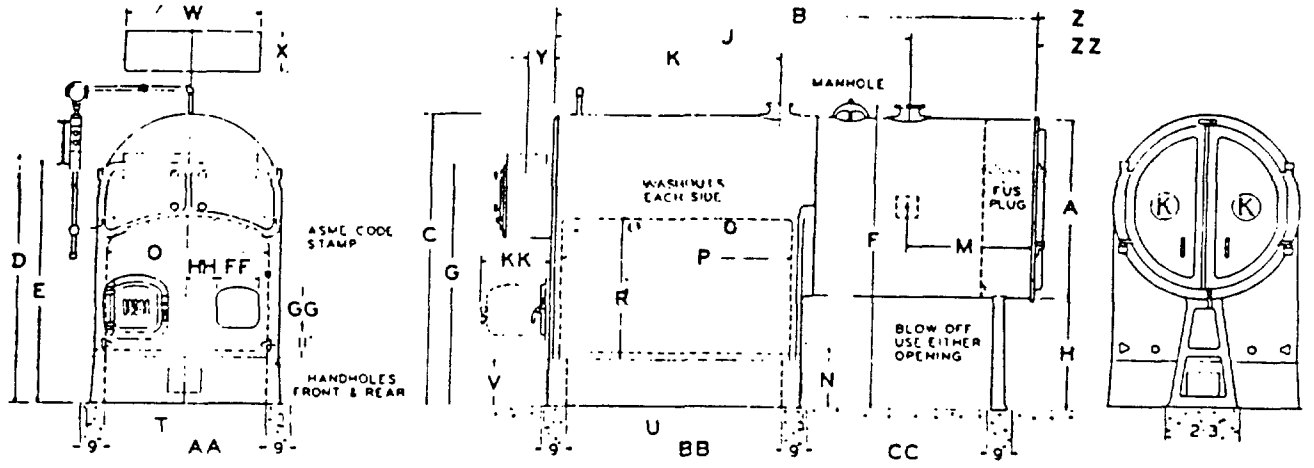
*Standard equipment—Front and rear base panels have 8½ x 11½ in. opening and plate. Flue cleaner and handle. Manhole furnished on 580 and larger. Baffle plate or combustion chamber furnished on 576 to 588.

Standard trim, steam only—Safety valve, steam gauge with syphon and cock, water column with water gage glass and three gage cocks, chain operated on 586 and larger.

AS 000033

500 series

high pressure • oil, gas or coal fired



NOTE: *Use dimension drawing on this attached fly-sheet. Do not use drawing printed beneath.*

dimensions and data (feet—inches)

boiler number	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590
A—boiler diameter	3-6	3-6	4-0	4-0	4-6	4-6	5-0	5-0	5-6	5-6	6-0	6-6	6-6	7-0	7-0
B—boiler length	8-7	9-6½	8-11½	9-8	9-2½	10-6	11-1	12-9	12-10	14-9	14-9	14-9	17-7½	17-9½	20-0½
C—boiler height	6-8½	6-8½	7-2½	7-2½	7-10½	7-10½	8-6	8-6	9-0	9-0	9-6	9-8	9-8	10-6	10-6
D—water line height	6-1	6-1	6-4	6-4	6-11	6-11	7-4	7-4	7-9	7-9	8-1½	8-4	8-4	9-0	9-0
E—water column height	5-11	5-11	6-2	6-2	6-9	6-9	7-2	7-2	7-7	7-7	7-11½	8-2	8-2	8-10	8-10
F—steam supply height	7-2	7-2	7-8	7-8	8-5	8-5	9-1	9-1	9-7	9-7	10-1	10-3	10-2½	11-0½	11-0½
G—smoke outlet height	5-11	5-11	6-2	6-2	6-9	6-9	7-3	7-3	7-7	7-7	8-1	8-2	8-2	9-0	9-0
H—rear stand height	3-2	3-2	3-2	3-2	3-4	3-4	3-5	3-5	3-5	3-5	3-5	3-1	3-1	3-5	3-5
J—steam supply	6-0	6-6	6-0	6-6	2-1½	2-1½	3-4	3-6	3-9	3-8	3-8	2-9½	12-6	12-6	13-3
*K—safety valve	4-5	4-5	4-5	4-5	4-5	4-11	6-4	6-11	6-11	7-3	7-3	7-7	14-8	14-8	16-5
M—feed water, each side	2-3	2-9	2-6	2-8	2-7	2-11	2-9	3-2	3-2	3-9	3-5	3-7	4-1	4-3	4-3
N—blow-off height	1-7	1-7	1-7	1-7	1-9	1-7	1-10	1-10	1-10	1-10	1-10	1-10	1-10	2-2	2-2
O—firebox—width	3-0	3-0	3-6	3-6	4-0	4-0	4-5	4-5	4-11	4-11	5-5	5-11	5-11	6-5	6-5
P— —length	4-2	4-2	4-2	4-2	4-2	4-8	6-0	6-10	6-10	7-2	7-2	7-6	8-6	8-6	9-0
R— —height	3-5½	3-5½	3-8	3-8	4-1	4-1	4-1	4-1	4-4	4-4	4-6½	4-7	4-7	4-9	4-9
T—base—width	3-11½	3-11½	4-5½	4-5½	4-11½	4-11½	5-6	5-6	6-0	6-0	6-6	7-0	7-0	7-6½	7-6½
U— —length	4-11½	4-11½	4-11½	4-11½	4-11½	5-5½	6-11	7-9	7-9	8-1	8-1	8-5	9-5	9-5	9-11
V— —height	1-2	1-2	1-2	1-2	1-2	1-2	1-3	1-5	1-5	1-5	1-5	1-5	1-5	1-9	1-9
W—smoke outlet—length	2-8	2-8	2-10	2-10	3-4	3-4	3-8	3-8	4-3	4-3	4-8	5-0	5-0	5-4	5-4
X— —width	0-9	0-9	0-11	0-11	1-0	1-0	1-2	1-2	1-3	1-3	1-7	1-6	1-6	1-10	1-10
Y— —location	0-6½	0-6½	0-7½	0-7½	0-8	0-8	0-9	0-9	0-9½	0-9½	0-11½	0-11	0-11	1-1	1-1
Z—rear door clearance, min	3-6	3-6	4-0	4-0	2-6	2-6	2-9	2-9	3-0	3-0	3-3	3-6	3-6	3-9	3-9
AA—foundation—width	3-0	3-0	3-6	3-6	4-0	4-0	4-5	4-5	4-11	4-11	5-5	5-11	5-11	6-5	6-5
BB— —length	3-6½	3-6½	3-6½	3-6½	3-6½	4-0½	5-6	6-4	6-4	6-8	6-8	7-0	8-0	8-0	8-6
CC—rear stand	2-9	3-8	3-0	3-8	3-3	4-0	3-0	3-10	4-0	5-6	5-6	5-2	6-10	6-8	7-0
FF x GG—firedoor opening or boiler width x height	one 2-3 x 1-1				two 1-3 x 1-3						two 1-6 x 1-4				
HH—centerline blr to firedoor opg					0-5¾	0-5¾	0-8	0-8	0-11	0-11	0-11	1-1¾	1-1¾	1-4¾	1-4¾
KK—opened firedoor to boiler	1-8	1-8	1-8	1-8	2-3	2-3	2-3	2-3	2-3	2-3	2-6	2-6	2-6	2-6	2-6
ZZ—tube replacement space	6-10	7-9	6-10	7-7	6-9	8-1	8-4	10-0	10-1	12-0	11-8	11-4	14-2	14-0	16-3
breeching diameter—one boiler	1-7	1-8	1-9	1-10	1-11	2-0	2-2	2-4	2-6	2-7	2-9	2-11	3-3	3-5	3-7
stack—diameter	1-5	1-6	1-7	1-8	1-9	1-10	2-0	2-2	2-4	2-5	2-7	2-9	3-0	3-2	3-4
—height	4'0	50-0	45-0	50-0	45-0	50-0	50-0	60-0	60-0	70-0	70-0	70-0	85-0	90-0	105-0
breeching diameter—two boilers	2-1	2-2	2-3	2-4	2-6	2-7	2-10	3-0	3-4	3-5	3-8	3-11	4-2	4-6	4-8
stack—diameter	1-11	2-0	2-1	2-2	2-4	2-5	2-8	2-10	3-1	3-2	3-5	3-8	3-11	4-2	4-4
—height	55-0	60-0	55-0	60-0	55-0	60-0	60-0	70-0	70-0	80-0	80-0	80-0	95-0	100-0	115-0
**steam supply size	0 4	0 4	0-4	0-4	0-4	0-4	0-6	0-6	0-6	0-6	0-6	0-6	0-8	0-8	0-8
blow off size	0 1½	0 1½	0-1½	0 1½	0-2	0-2	0-2	0-2	0-2	0-2	0-2½	0 2½	0-2½	0-2½	0-2½
feed water size	0-1¼	0-1¼	0-1¼	0-1¼	0-1¼	0-1¼	0-1½	0-1½	0-1½	0-1½	0-1½	0-1½	0-1½	0-2	0-2
***outside surface to cover sq ft	130	140	150	160	180	195	275	255	285	320	340	360	415	455	505
approximate weight															
—125 lb swp lb	7980	8510	9590	10100	11700	12760	14930	16530	19230	21940	24100	26840	31210	35000	38870
—150 lb swp lb	8780	9360	10550	11110	12870	14030	16420	18180	21150	24130	26510	29520	34330	38500	42700

*For safety valves, see page 31. **300 lb American Standard Flange. ***Includes front head and smokebox.

A5000034

KEWANEE-ROSS CORPORATION

Division of American Radiator & Standard Sanitary Corporation

KEWANEE, ILLINOIS