



**KEWANEE**

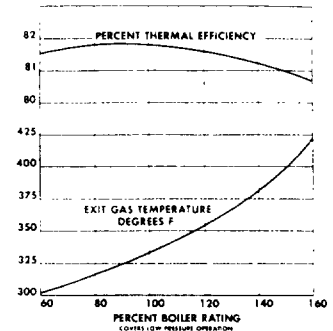


# MATCHED FOR PEAK PERFORMANCE



# Kewanee

|            |       |       |
|------------|-------|-------|
| K I F      |       |       |
|            | sq ft |       |
|            | sq ft |       |
| hour—212°F | lb    |       |
|            | sq ft | 6440  |
|            | sq ft | 10300 |
|            |       | 1546  |
| power      |       | 59    |
| h          |       | 1969  |
|            | gph   | 1F    |
|            | MBU/h | 246   |
|            |       |       |
|            |       |       |

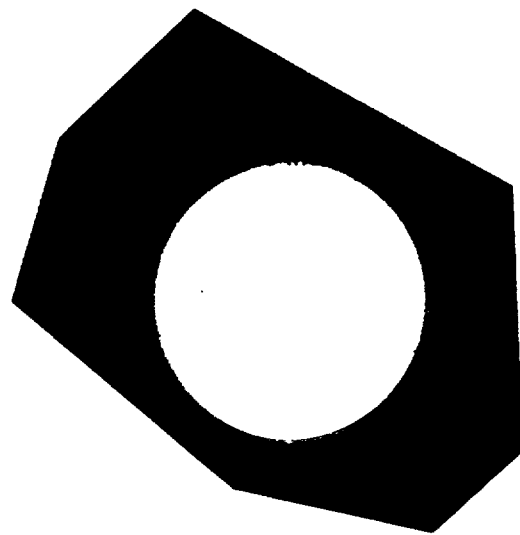


It's easy to "put your finger" on the over-all efficiency of the Kewanee-Iron Fireman Unit. Every gallon of oil or cubic foot of gas which goes into it contains a certain amount of heat. And that amount of heat is capable of producing a known amount of energy . . . an amount accurately measured by the quantity of water evaporated into steam.

The largest part of heat generated is absorbed by the boiler. In actual practice this amounts to at least 80%.

With the Kewanee-Iron Fireman Unit an over-all efficiency has been proved by many tests and 80% is certified. Actually, under normal boiler room conditions, higher efficiencies can be attained and retained throughout the entire firing range.

# MATCHED FOR PEAK



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# IRON FIREMAN

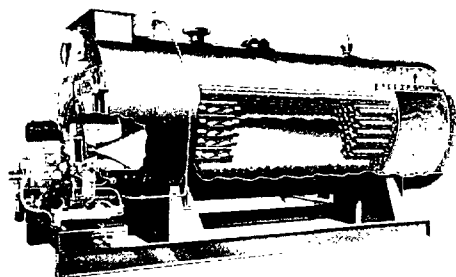
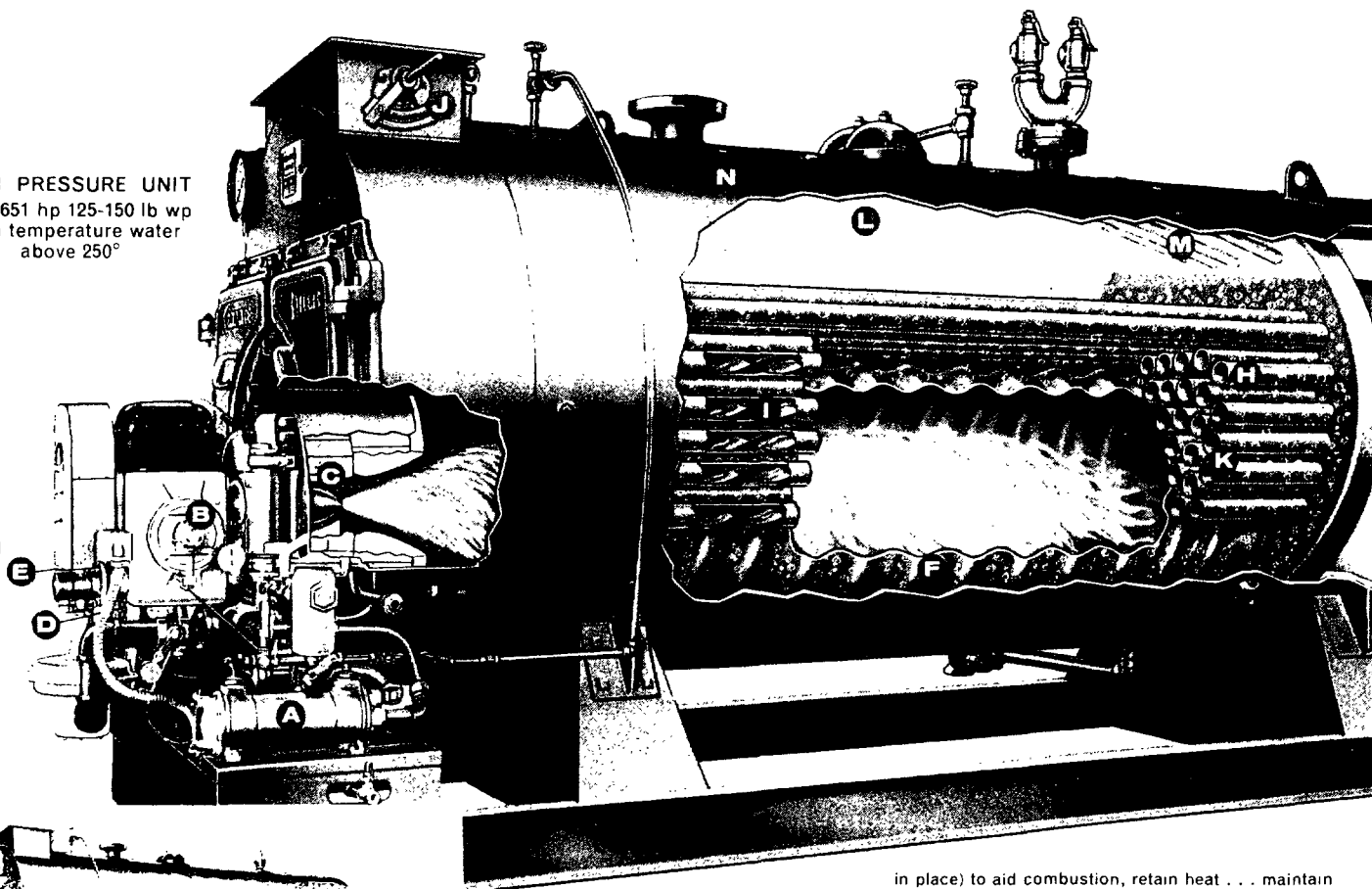
# IRON FIREMAN

## COMBINED GAS AND OIL BURNER UNIT

Kewanee and Iron Fireman engineers have produced a perfectly integrated unit, with firing rate matched to heating surface . . . flame size, shape and swirl matched to furnace tube. Certified ratings are based on approximately 5.5 square feet of heating surface per boiler horsepower. S.B.I. ratings allot 8.2 square feet, for 50% reserve capacity to meet peak loads—provide "cruising speed" operation under normal loads for greater efficiency, longer life.

Normally, the boiler is shipped first—to be installed in position before walls and roof are completed. The burner arrives later, when it can be fully protected against weather, theft and accidental damage. All controls are wired and in place for fast, simple mounting. Whenever specified, however, the unit is fully assembled and fire-tested at the factory, then shipped as a complete package.

**HIGH PRESSURE UNIT**  
52 to 651 hp 125-150 lb wp  
high temperature water  
above 250°



**LOW PRESSURE UNIT**

1,546,000 to 21,855,000 Btuh 15 lb steam or 30 lb water 250° maximum

Incoming fuel enters the *oil heater* (A), a multiple-pass tubular heater with temperature regulating controls, instruments and necessary valves. Heavy oil is automatically kept at the correct temperature for efficient combustion.

Fuel is fed to the burner by the *oil volumeter* (B), a positive displacement, variable-volume pump submerged in the oil reservoir. A simple, positive mechanism controls length of piston stroke, metering by positive displacement the exact quantity of oil needed for varying loads. No regulating valves or viscosity compensating devices are required.

Fuel mixes intimately with air in the *Venturi combustion throat* (C). Throat and chamber are refractory-lined. Flame shape is accurately controlled, with adjustable vanes imparting correct rotation to match furnace configuration.

Ample combustion air is provided by the *forced-draft fan* (D)—with no need for high stack to induce draft. Low-speed, ball-bearing, motor-driven fan is exceptionally quiet. Fan is easily accessible.

All combustion controls are completely assembled, wired and tested at the factory, then fully enclosed in a complete *control panel* (E) for protection against dust and damage. All wiring from panel to motors and instruments is installed and tested.

Flame swirls through *furnace tube* (F), corrugated on high pressure units to provide greater strength and increased heating surface. Also, expansion and contraction of corrugations crack off scale on water side for continued fast heat transfer . . . high boiler efficiency. *INSET*: Low pressure unit has plain furnace tube, welded to flanged openings in tube sheet for greater flexibility and strength.

*Rear combustion chamber* (G) in high pressure unit is heavily lined with insulating-type refractory (shipped

in place) to aid combustion, retain heat . . . maintain efficiency. *INSET*: Low pressure unit features wet-back design, with water completely surrounding rear combustion chamber. Refractory is not required. Both high pressure and low pressure units feature access opening in rear combustion plate.

Hot gases enter *fire tubes* (H) of heavy gage steel, 3" in diameter, set into trepanned holes in head by roller expander with ends firmly rolled and beaded.

*Spinner blades* (I) in all tubes swirl hot gases against tube surfaces for longer gas travel and maximum heat transfer.

Gases exit through welded, gas-tight, smoke-box equipped with *quadrant lock damper* (J).

Water circulates rapidly around furnace tube and through *wide spacing between fire tubes* (K). Steam bubbles rise freely to water surface to disengage quietly. Low water line provides larger—and therefore non-turbulent—disengaging area . . . also provides *larger steam space* (L) for ample reserve of dry steam.

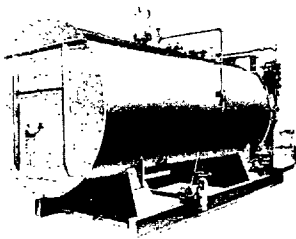
*Head braces* (M) are secured by exclusive one-piece, forged ends extending through boiler shell and heads. This eliminates hidden welds and assures positive dependability.

*Welded shell* (N) is of flange steel . . . heads and furnace tube are of firebox quality. Insulated metal jacket is optional at extra cost.

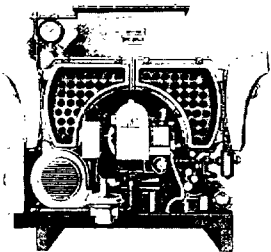
Boiler construction meets or exceeds A.S.M.E. code requirements. Entire boiler-burner unit is approved by Underwriters' Laboratories, Inc.

## COMBINED GAS AND OIL BURNER

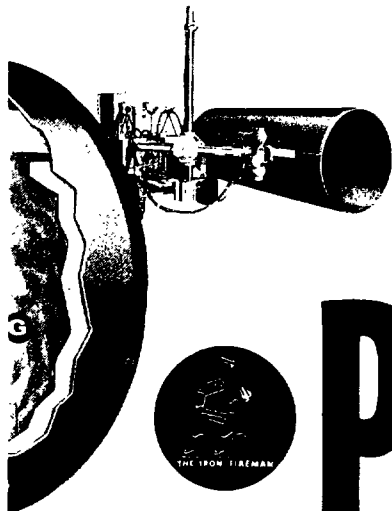
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**TWO-PASS GAS TRAVEL** through large furnace tube provides more primary heating surface and numerous 3" fire tubes means greater flue area—less resistance to draft. Less power is needed for blower . . . yet spinner blades in tubes force all usable heat from gases for efficiency of 80% or higher. With no baffles to burn out (short-circuiting gases directly to vent) costly and frequent baffle inspection and repair is eliminated. Shutdown time is saved. Uniform temperature over entire surface of tube sheet avoids distortion . . . possible leakage around tubes.

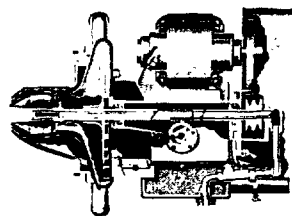


**CAST IRON FLUE DOORS** mean fast, simple access . . . permanent gas-tight fit. Doors are cast in Kewanee's foundry, then precision-machined to close tolerances. An asbestos gasket completes the seal—even the thinnest tissue paper placed in door before securing cannot be pulled out! Special locking clamps release or tighten quickly . . . doors swing on hinges clear of burner, controls and trim. Access to rear of fire tubes is provided through door on rear cover plate—plate need not be removed. All water surfaces are accessible through manhole and hand holes, with wide spacing between tubes aiding in fast, thorough cleaning.

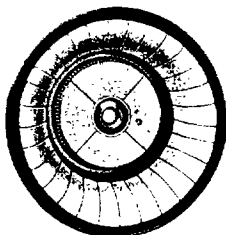


**PRECISION WELDING** provides completely dependable joints on both low pressure and high pressure units. High pressure joints under tension are radiographed by high-voltage X-ray to detect possible faults. Although not required by A.S.M.E. code, Kewanee goes farther and X-rays certain vital compression joints to double-check dependability. After welding, high pressure boilers are heated in a furnace to 1200° F. to stress relieve welds and formed sections. Final check is a hydrostatic test at one-and-a-half times the design working pressure.

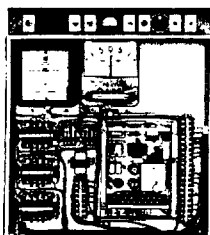
# PERFORMANCE



**HEAVY OILS** are fired dependably in the Iron Fireman Rotary Oil Burner through a patented fuel oil conditioning system with effective preheating at all times. In addition to the steam or hot water preheater, this exclusive oil conditioning system maintains more uniform temperature than other systems and keeps oil fluid during shutdown for instant starting. Entrained air and gases are separated from the oil and vented through the return line . . . water condensate in oil is completely emulsified by rotation of the Oil Volumeter . . . thus eliminating two causes of erratic firing.

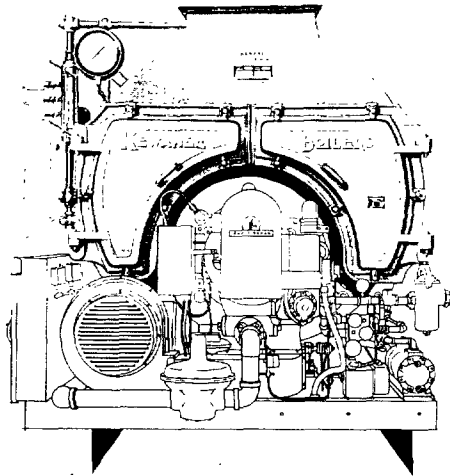


**RING TYPE GAS BURNER** surrounds rotary oil burner for combination oil-gas firing. The flip of a switch changes controls from one fuel to the other. Multi-jet construction gives intimate mixing of gas and air in burner throat ahead of the combustion zone. Annular type inlet volume control system, combined with air control vanes at throat entrance, provides positive regulation of air volume, distribution, and rate of flame rotation. Operates with low pressure or high pressure gas . . . highly efficient at all rates.



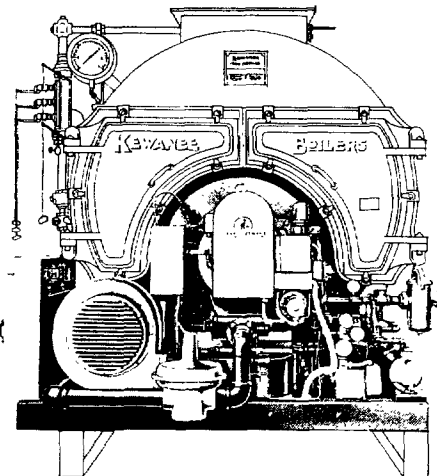
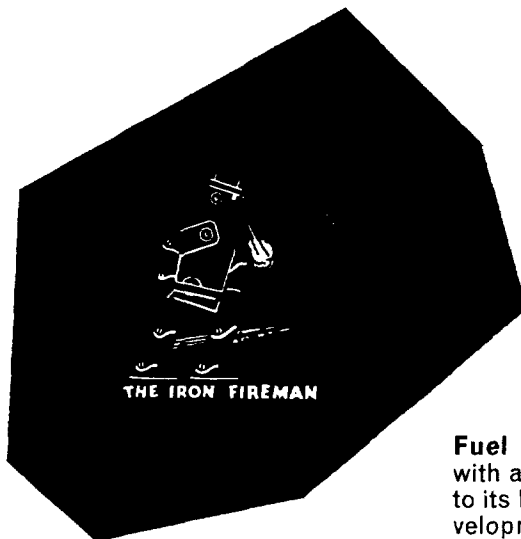
**AUTOMATIC CONTROLS** are housed in a fully enclosed control panel. Starters for all motors and pumps are here, with shutoff devices to insure safe, economical operation. If water drops to unsafe condition, burner shuts down instantly. The main fuel valve is not opened until the boiler is purged of any unburned gases and a safe pilot is proven. In the event of flame failure, the electronic scanner shuts down the burner at once and flashes a warning light.

# SCOTCH BOILER



**Your boiler is vital**—and Kewanee knows it! Since 1868 Kewanee Boilers have been built to play vital roles. Today's Kewanee Scotch Boilers are reliable sources of low cost hot water or steam for plants and buildings everywhere. They are easy to fire, easy to inspect, easy to keep clean and efficient.

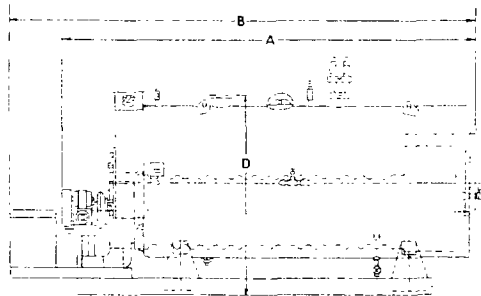
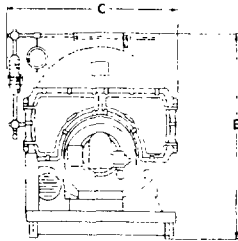
# PERFORMANCE



**Fuel becomes fire**—quietly, smoothly, efficiently—with an Iron Fireman burner drawing-board-matched to its Kewanee Boiler teammate. A pioneer in the development and application of automatic firing equipment for gas, oil and coal, Iron Fireman Manufacturing Company has held a position of leadership in this field for over 30 years.

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# COMBINED GAS AND OIL BURNER



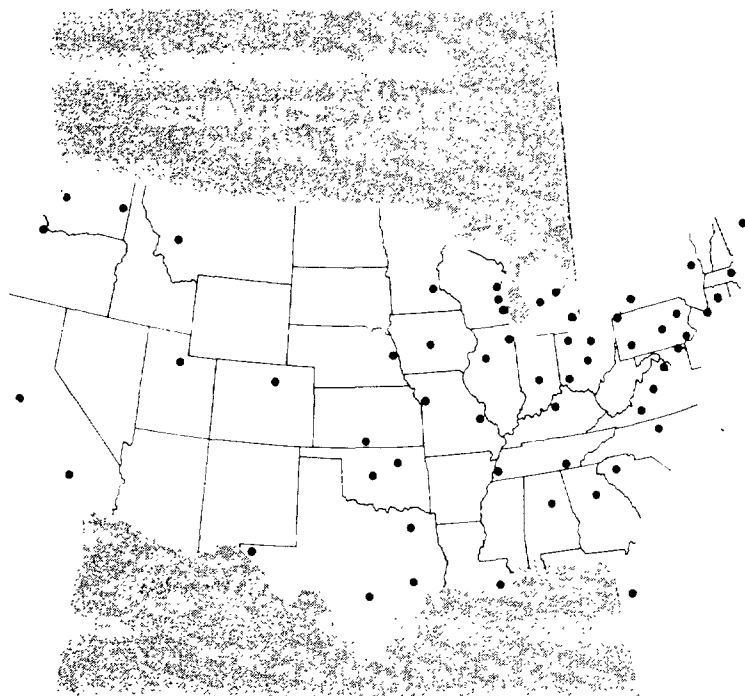
# ratings

|                            | unit number                 | K IF  | 78-25† | 79-25† | 80-25 | 81-25 | 82-35 | 83-35 | 84-50 | 85-60 | 86-60 | 87-75 | 88-100 | 89-125 | 90-125 | 91-165 | 92-165 | 93-165 |
|----------------------------|-----------------------------|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|
| <b>High Pressure Units</b> | SBI rating—horsepower       |       |        |        | 52    | 61    | 74    | 87    | 109   | 130   | 152   | 174   | 217    | 261    | 304    | 347    | 390    | 434    |
|                            | —steam                      | sq ft |        |        | 7290  | 8500  | 10330 | 12150 | 15180 | 18220 | 21250 | 24290 | 30360  | 36430  | 42500  | 48570  | 54640  | 60710  |
|                            | —water                      | sq ft |        |        | 11660 | 13600 | 16520 | 19440 | 24280 | 29150 | 34000 | 38850 | 48570  | 58280  | 68000  | 77710  | 87420  | 97140  |
|                            | —MBtuh                      | lb    |        |        | 1750  | 2040  | 2479  | 2916  | 3643  | 4373  | 5100  | 5830  | 7286   | 8743   | 10200  | 11657  | 13114  | 14570  |
| <b>Low Pressure Units</b>  | net rating—steam            | sq ft | 6440   | 7160   | 8580  | 10000 | 12160 | 14300 | 17860 | 21440 | 25000 | 28580 | 35720  | 42860  | 50000  | 57140  | 64280  | 71420  |
|                            | —water                      | sq ft | 10300  | 11460  | 13730 | 16000 | 19460 | 22880 | 28580 | 34300 | 40000 | 45730 | 57150  | 68580  | 80000  | 91420  | 102850 | 114270 |
|                            | —MBtuh                      |       | 1546   | 1718   | 2059  | 2400  | 2918  | 3432  | 4286  | 5146  | 6000  | 6859  | 8573   | 10286  | 12000  | 13714  | 15427  | 17141  |
|                            | certified output—horsepower |       | 59     | 66     | 78    | 92    | 111   | 131   | 164   | 195   | 228   | 261   | 326    | 392    | 456    | 521    | 585    | 651    |
| <b>All Units</b>           | —MBtuh                      |       | 1969   | 2188   | 2625  | 3060  | 3718  | 4374  | 5464  | 6559  | 7650  | 8745  | 10929  | 13114  | 15300  | 17485  | 19671  | 21855  |
|                            | firing rate—oil*            | gph   | 16     | 18     | 22    | 26    | 31    | 37    | 46    | 54    | 64    | 73    | 91     | 110    | 127    | 146    | 164    | 182    |
|                            | —gas                        | MBtuh | 2460   | 2740   | 3280  | 3830  | 4650  | 5460  | 6840  | 8200  | 9560  | 10920 | 13670  | 16400  | 19120  | 21900  | 24600  | 27300  |

# dimensions

|                       |       |      |      |      |       |      |      |        |        |        |        |        |        |        |        |      |      |      |
|-----------------------|-------|------|------|------|-------|------|------|--------|--------|--------|--------|--------|--------|--------|--------|------|------|------|
| A—length overall**    | ft-in | 13-2 | 14-1 | 14-1 | 15-3½ | 15-7 | 17-3 | 18-5   | 18-10½ | 20-10½ | 20-10½ | 19-11½ | 21-11  | 22-11  | 22-11  | 25-9 | 26-5 | 27-1 |
| B—length overall***   | ft-in | 15-4 | 16-3 | 16-3 | 17-5½ | 17-9 | 19-5 | 20-10½ | 21-4   | 23-4   | 23-4   | 22-5   | 24-11½ | 25-11½ | 25-11½ |      |      |      |
| C—width overall       | ft-in | 5-10 | 5-10 | 6-1  | 6-1   | 6-7  | 6-7  | 7-1    | 7-8    | 7-8    | 7-8    | 8-2    | 8-8    | 9-2    | 9-8    | 10-0 | 10-4 | 10-8 |
| D—steam supply height | ft-in | 6-7  | 6-7  | 7-0  | 7-0   | 7-6½ | 7-6½ | 8-1    | 8-6    | 8-6    | 8-6    | 8-11½  | 9-6½   | 10-1½  | 10-7½  | 11-0 | 11-4 | 11-8 |
| E—smoke outlet height | ft-in | 6-9  | 6-9  | 7-1½ | 7-1½  | 7-7  | 7-7  | 8-1½   | 8-6    | 8-6    | 8-6    | 8-11½  | 9-5    | 10-0   | 10-5½  | 10-9 | 11-1 | 11-5 |

\*Based on 150,000 Btu oil \*\*Control panel on side \*\*\*Control panel in front †78-25 and 79-25 for low pressure only  
Dimensions are approximately correct for low pressure unit. Above dimensions and drawings are high pressure unit and represent the maximum for all units.  
For complete specifications see Catalog Bulletins 3301-3 and 3302-3.



Kewanee-Iron Fireman Boiler-Burner Units earn owner confidence through the long-established reputation of both manufacturers . . . the high quality of design, materials and workmanship found in every component of the units . . . and the wide-spread and capable service organization backing up the units in the field. Over 600 branches and distributors in 48 states provide the skilled personnel to recommend, order and install Kewanee-Iron Fireman Units—and to make certain each unit continues to operate efficiently and dependably throughout its long performance lifetime.



**AMERICAN-Standard**

KEWANEE BOILER DIVISION

101 FRANKLIN STREET, KEWANEE, ILLINOIS

**IRON FIREMAN**

THE IRON FIREMAN

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