The picture on the cover of this catalog shows the World's Greatest Oil Well.

Cerro Azul No. 4. Measured flow for twenty-four hours prior to closing in was over 260,000 barrels at a pressure of 1035 pounds per square inch. This well was brought in production on February 10, 1916 by the Huasteca Petroleum Corporation, Delaware. The oil production of this well for 24 hours would equal nearly 75,000 tons of coal.

Oil—The Modern Fuel

with

The Fess System

Fuel Oil Burning Equipment

for

Heat and Power

FESS ROTARY OIL BURNER, Inc.

PROVIDENCE, R. I. BOSTON, MASS.

Oil bubbles in one of the many thousand natural oil springs located in the oil fields of Mexico.

Oil—The Modern Fuel

THE coal famine during the past winter and the prevailing high price, with no prospect of relief, provides an object lesson which justifies the awakening public interest in the matter of not only future supply but a more economical and cleaner fuel.

It is gratifying to relate that of the many that had the courage to convert their plant to oil fuel, not a single consumer experienced any difficulty in obtaining all their requirements, and in addition have made a very substantial saving; in fact in a number of those plants that have used oil exclusively during the past three years, the saving has been sufficient to more than pay the entire cost of installing the equipment.

That the fuel consumers are keen to appreciate the many advantages derived from adopting oil fuel is clearly indicated by the large number of plants being equipped to burn oil.

In the purchase of any mechanical equipment there are three important factors that should govern a final selection, namely:

The Company making the equipment.
The design and operating characteristics of the equipment.
The service available in the future.

If the company maunfacturing and installing the equipment is not substantial, reliable and conservative, financially sound and permanent, its responsibility as to guarantee for future service is worthless.

The installation of an oil burning plant should be entrusted to only those who are thoroughly trained in the work. Every boiler plant requires a careful analysis of the operating conditions in order that the type of equipment best suited to meet the individual requirements may be selected.

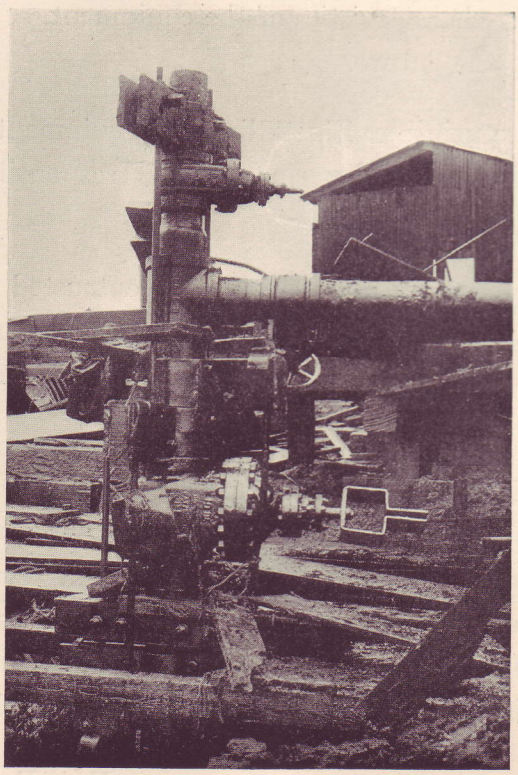
The equipment herein illustrated is the result of fifteen years' practical experience by the engineers of this company and therefore embodies many features that are exclusive. The policy of this company is to manufacture and install a complete oil burning equipment in every detail and contract to deliver the consumer's requirements in fuel oil. Under this plan the interest of consumer and seller continue mutual, in support of which we will be glad to submit an extensive list of installations we have made and furnished with fuel oil during the past three years.

FESS ROTARY OIL BURNER, INC.

Bringing the World's Greatest Oil Well Under Control

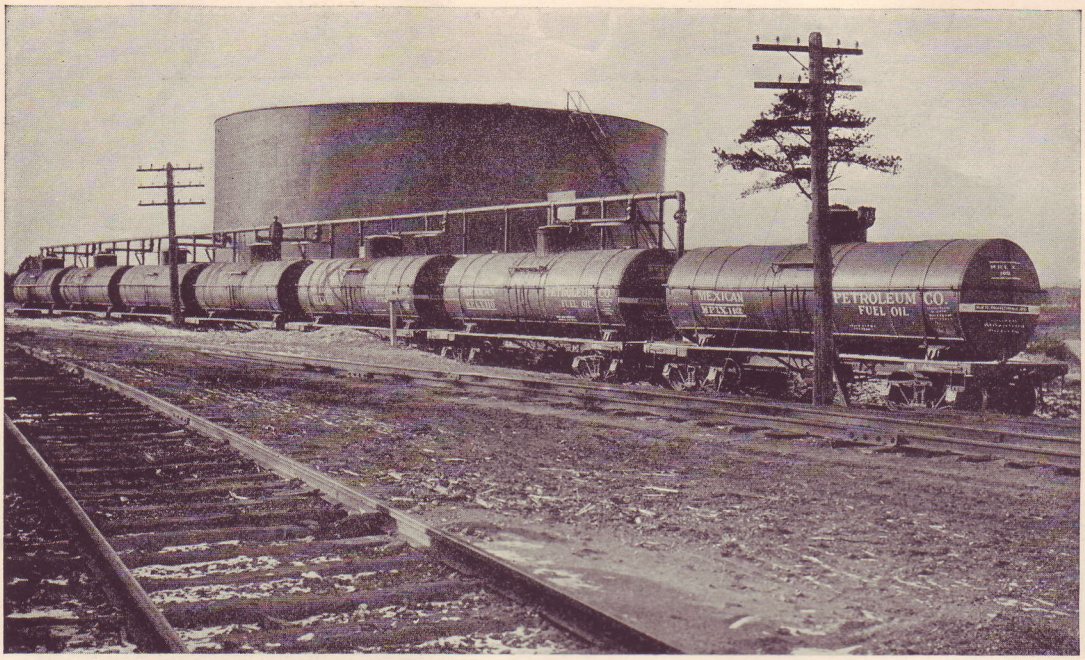
Valve half-way in place. As the heavy valve cut its way thru the column, the oil fanned out hundreds of feet to one side.

Valve on but open. When properly seated it was bolted down and the stem was lengthened thirty feet with a two inch pipe so that a man could get a safe distance from the well to close it in case of accident.



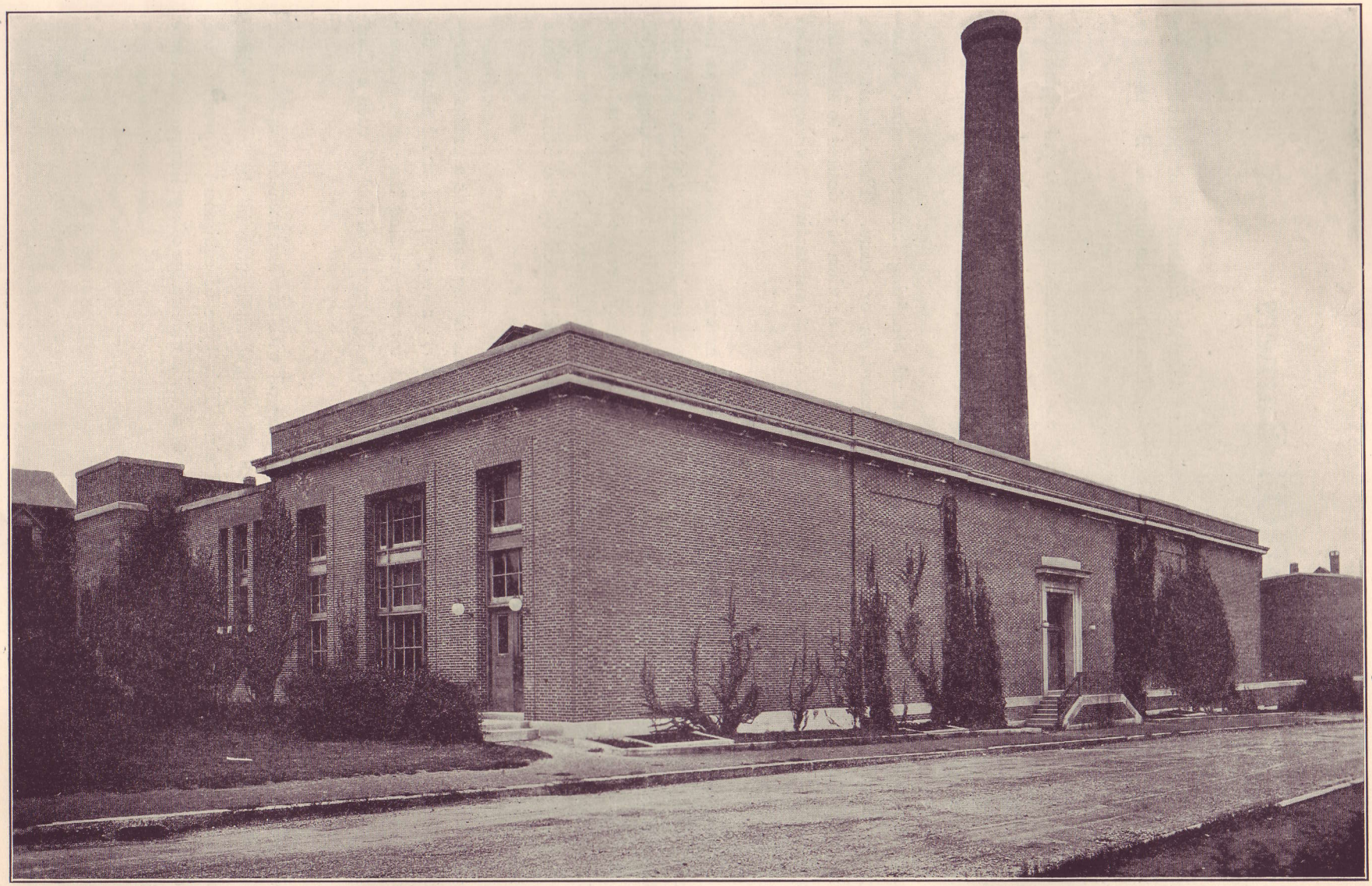
Under Control. Showing Valve on and closed, also method of anchoring.

Oil Tanker, George W. Barnes, built by the Fore River Ship Building Corp., at Quincy, Mass. 9,100 tons dead weight, length 415 ft., beam 56 ft., depth to upper deck 32 ft. Oil cargo capacity 68,000 barrels, or equivalent in heating value to 18,000 tons of coal.



Loading tank cars at distributing station. Opening and closing valves only labor necessary.

One of a fleet of trucks operated by this company delivering fuel oil to one of the many consumers.



HARVARD MEDICAL SCHOOL POWER PLANT

Furnishing light, heat, power and refrigeration for a group of thirty-four buildings of the Harvard Medical School, Peter Bent Brigham Hospital and the Children's Hospital, where we are now installing the most complete and modern oil-burning plant yet designed and which will displace 12,000 tons of coal annually.

Boiler equipment, eight 300 horse-power, Water Tube.

Complete data and photographs will be furnished in our next issue.

Plant designed by Densmore & LeClair, Engineers.

Types of Oil Burners

The term "oil burner" is applied to all types of devices used in the combustion of petroleum, regardless of the purpose for which it was designed or the grade of fuel oil to be burned. But there are five distinct types briefly described as follows:

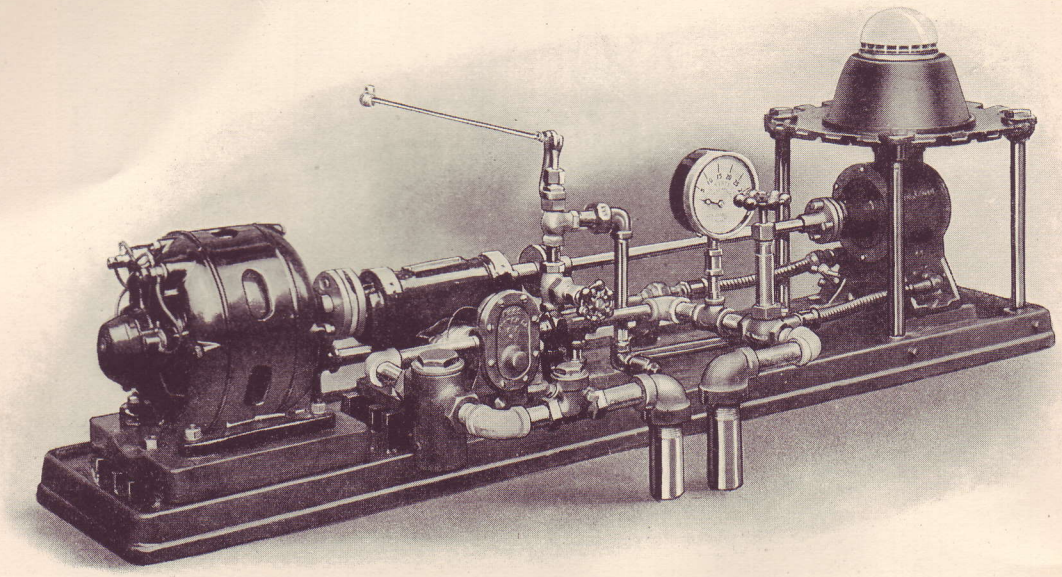
VAPOR BURNERS.—The higher grades of petroleum, such as kerosene, gasoline, and engine distillate, are vaporized in a retort under pressure, and injected into an air-mixing chamber where combustion takes place. Burners of this type are used extensively for industrial purposes but are not practical for general domestic use owing to the high cost of fuel.

ROTARY BURNERS.—The low-pressure rotary mechanical atomizing burner atomizes a low-grade of fuel oil by centrifugal force without the aid of compressed air or steam. These elements are not available in systems using vapor, low-pressure steam, or hot water, or when it is desired to start the fires from a cold boiler. The rotary burner operates continuously and automatically without skilled supervision.

STEAM ATOMIZERS.—Steam atomizers are those burners in which dry steam is used as the atomizing agent. They are particularly adapted to and generally used for generating steam in stationary boilers of various types where steam pressure is maintained constantly for operating the oil pumps and atomizing the oil. When properly designed and installed, they are simple in operation and highly efficient. Oil used in such a plant may be of the lower grades. The combustion is more nearly perfect when the oil is heated; this is done by passing it through a coil heated by the exhaust steam from the pump.

SPRAY BURNERS.—In these burners, compressed air is the atomizing agent, at a pressure varying from 10 to 25 pounds per square inch. Spray burners are used extensively in industrial plants for tempering, forging, annealing, and glass-making. As the equipment for compressing the air is cumbersome and expensive, requiring a considerable amount of power and a light grade of fuel oil, such a plant is impractical for steam boilers.

TURBINE BURNERS.—A modified method of atomizing oil with air has been developed in the Turbine Burner. Low-pressure air operates a turbine or centrifugal distributor in the burner which atomizes the oil and thoroughly mixes this oil vapor and air. This type of equipment represents the most modern development of the art, and is so designed as to cover a wide range of application. A more detailed description will be found on page 17.



SMALL-SIZE UNIT of Fess System Rotary Oil Burner

Low-Pressure Mechanical Burner

The Fess Rotary Oil Burner is a self-contained unit of original type, particularly designed to burn the lower grades of fuel oil in low-pressure steam and hot-water heating boilers. The essential parts are as follows:

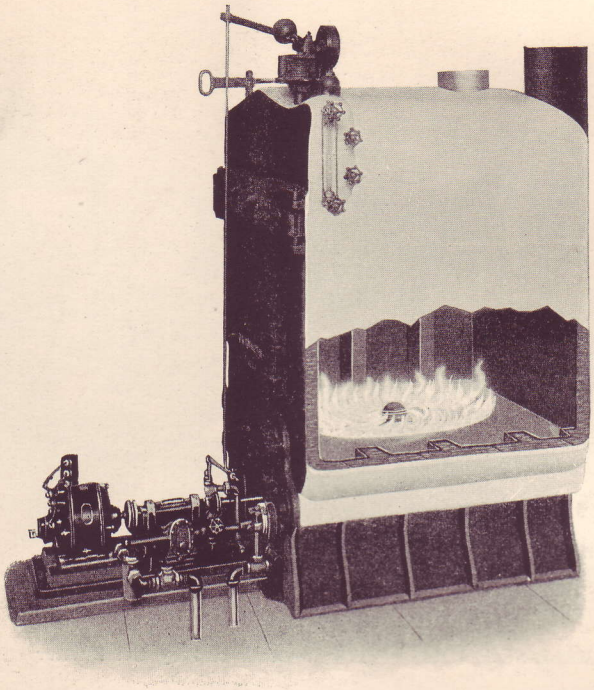
A fractional horse power motor, worm reduction-gear, oil pump, bevel-gear transmission, and rotary burner-head.

MOTOR.—The motor, of 1-4 horse power, standard speed, 1750 r. p. m. for the small units, is of substantial design, with ring-oiling bearings. By means of a flexible coupling of approved design the shaft is direct-connected to the worm reduction-gear.

WORM-REDUCTION GEAR.—This consists of a steel worm carried on two annular ball-bearings of liberal capacity. The worm gear is of bronze with extended shaft for operating the oil pump. The housing is of cast iron and dust-proof. All moving parts operate in an oil bath insuring perfect lubrication and long life.

PUMP.—The oil pump is of the twin gear type, of cast bronze, accurately machined. The base is securely bolted and dowelled by jig to a cast-iron bracket which forms a part of the worm case, thus assuring perfect alignment.

TRANSMISSION.—The rear end of the worm shaft is provided with a flexible ball-socket slip coupling from which a horizontal shaft extends to a bevel gear transmission for rotating the burner. This transmission consists of a bronze gear and a steel pinion having ball-bearing thrusts. The bushings of the main bearings are of high-grade bronze, splash lubricated. The case is of cast iron and dust-proof. The spindle carrying the burner head is hollow; through it extends a stationary hollow steel tube which conducts the fuel oil to the burner. This tube also supports the stationary burner top.



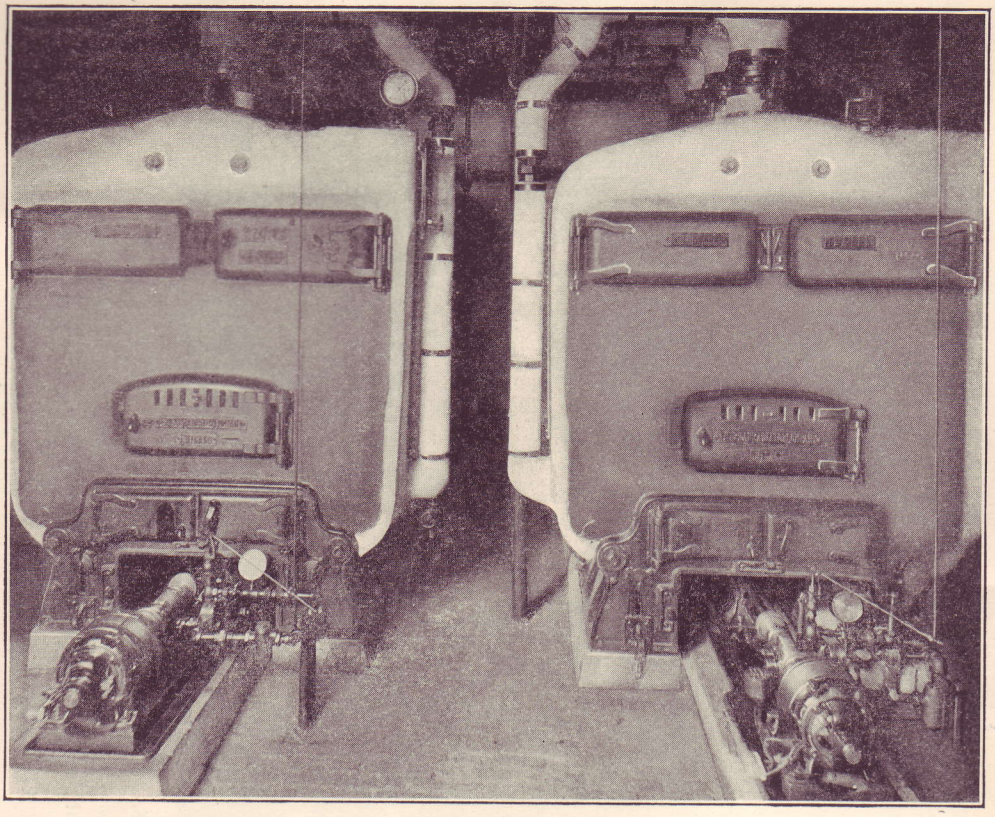
Small unit of the Fess Rotary Oil Burner under a low-pressure cast-iron sectional boiler. Part of the boiler is cut away to show the horizontal distribution of the flame which insures the heat uniformly over the entire heating surface.

BURNER.—The rotary burner may properly be called a "centrifugal atomizer," for the oil is delivered within the burner head which is revolved at high speed and so designed that the oil is discharged at right-angles to the axis of rotation, at high velocity by centrifugal force. The upper and lower surfaces of the oil-atomizing disc is equipped with webs or vanes which draw the required amount of air from beneath the furnace floor. With the oil spray the air is discharged into the fire box where combustion takes place; the flame being evenly distributed over the area of the fire box.

MOUNTING.—The principal operating parts are securely bolted to a heavy cast-iron bed plate. The rear end also carries four legs which support the circular iron hearth-plate. The center of this plate is provided with a cone-shaped ring which forms a central port in the fire hearth in which the burner head revolves.

OIL PIPING.—The suction line from the oil storage tank is provided at the pump with a check valve to hold priming when cleaning the detachable basket of the oil strainer. The discharge from the pump is connected to the return pipe extending back to the storage tank. This line has a pressure gauge, pressure-regulating valve, and branch line extending forward to the burner. This branch line is equipped with a hand-control valve by which the oil supply is turned on or off or regulated. There is also an automatic valve which is connected to and operated by a damper regulator. This may be adjusted to maintain the desired steam pressure or temperature automatically and continuously.

FIRE BOX.—In installing the equipment in a coal-burning boiler, the grate bars are removed and substantial channel-iron supports are substituted. On these is constructed the fire hearth of first quality fire brick carefully set in high-temperature cement and asbestos. The fire box is so designed as to permit a uniform distribution of the products of combustion and yet prevent the flame from impinging directly on the heating surfaces.



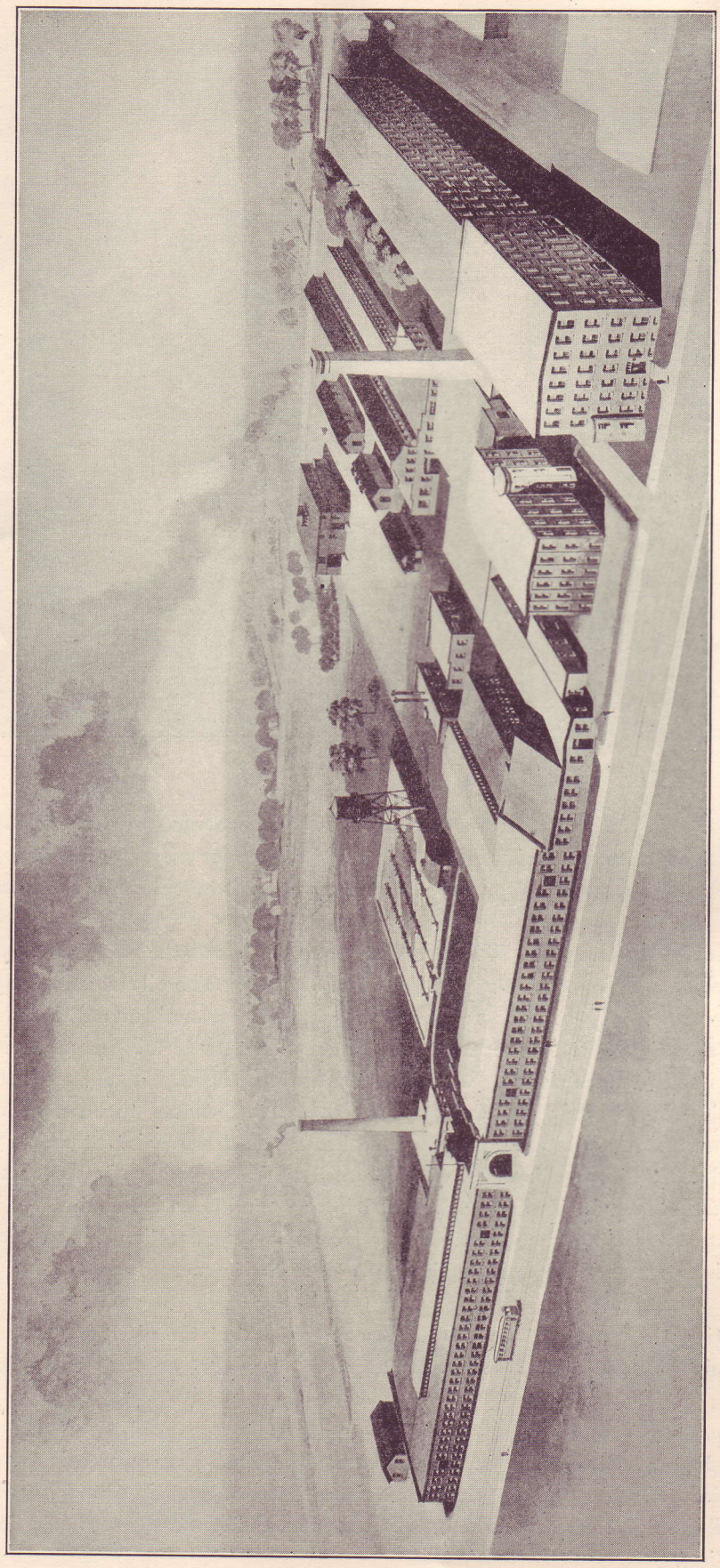
MOTOR SERVICE SWITCH.—The motor service switch is provided with no-voltage release, so adjusted as to open the circuit should the supply of current be temporarily interrupted. This device prevents the motor from re-starting the oil pump and discharging oil after combustion ceases.

OPERATION.—In starting the plant it is only necessary to close the motor service switch and adjust the oil pressure which will immediately register on the gauge. The oil pressure may be increased or diminished by opening or closing the pressure-regulating valve. Under this condition the oil is merely being drawn from and returned to the storage tank. When the desired oil pressure is attained, a lighted torch is placed on the furnace floor adjacent to the burner head. The hand-control valve is opened admitting oil which is immediately atomized and ignited. It continues to burn in a steady flame until the steam pressure or temperature within the system has reached the point at which the automatic control valve has been adjusted, when this valve will reduce the rate of combustion to meet the requirements, and continue to increase or diminish the rate of firing as conditions demand.

In closing down the plant, the hand-control valve is closed and combustion ceases immediately; the motor is allowed to continue running for half a minute to clear the burner of oil.

CARE.—In re-starting the burner, it is only necessary to see that the plant is properly lubricated, the oil pressure steady, and the motor operating parts are free from dirt or dust that might injure the winding or bearings.

NOTE.—The Fess Rotary Oil Burner was the first and original burner of this type to which the term "Rotary" was applied. Due to the fact that centrifugal force is used in atomizing the oil and discharging both air and oil at right-angles to the axis of rotation, the term "Rotary" applied to any other type of burner is misleading.

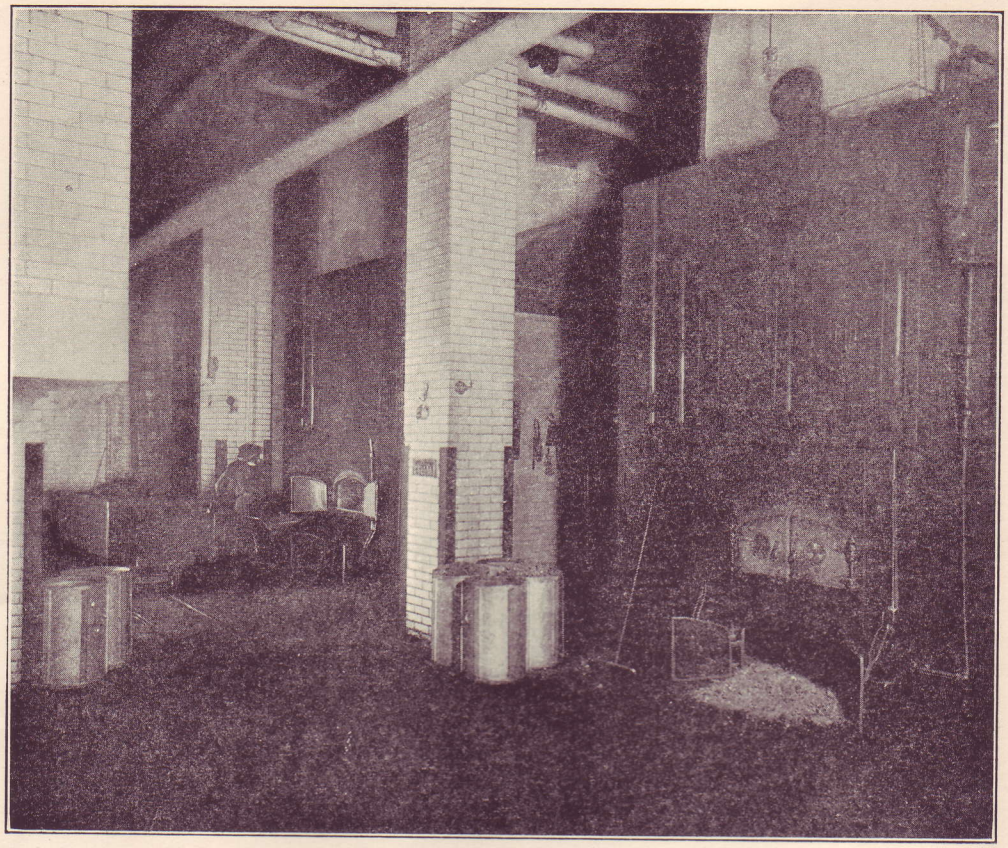


SAXONY WORSTED MILLS, NEWTON, MASS.

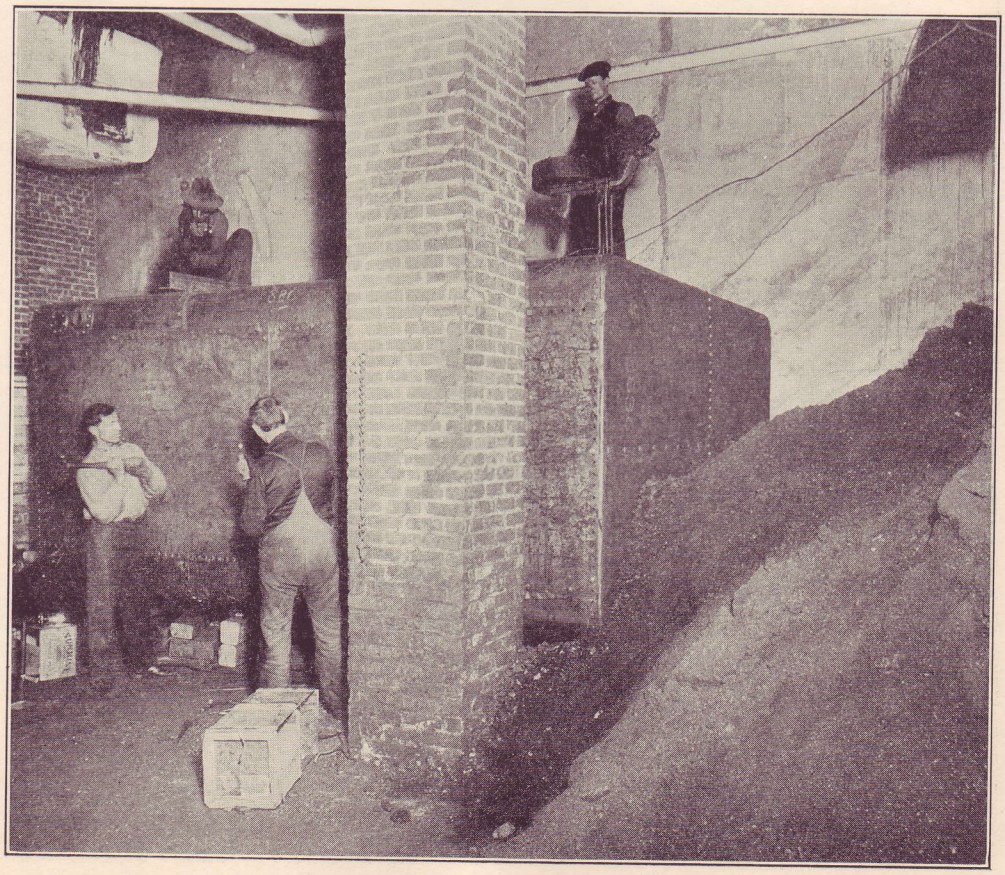
One of the many plants of the United States Worsted Co., now being equipped with Fess Steam Atomizing Burners, complete with Automatic Control, which will aid the management in its maintenance of a beautifully clean plant.

TURKS HEAD BUILDING, PROVIDENCE

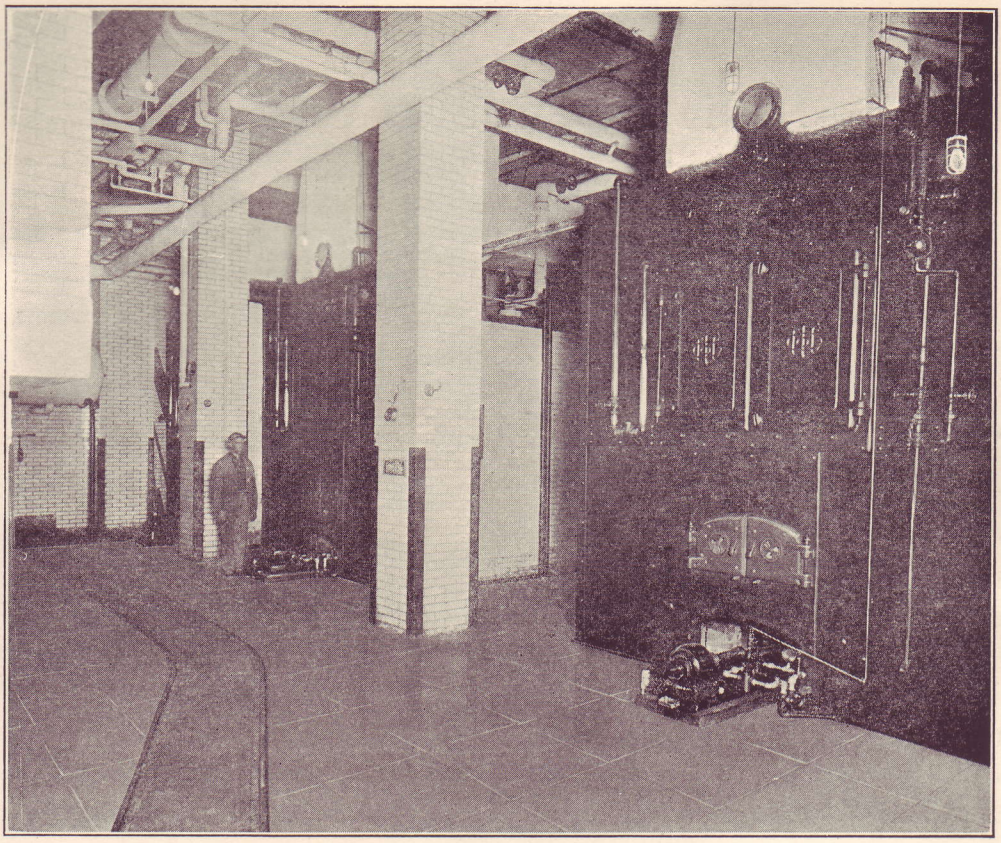
Rhode Island's tallest office building, which has been burning oil with the Fess System since 1916. This company's office is located on the ninth floor.



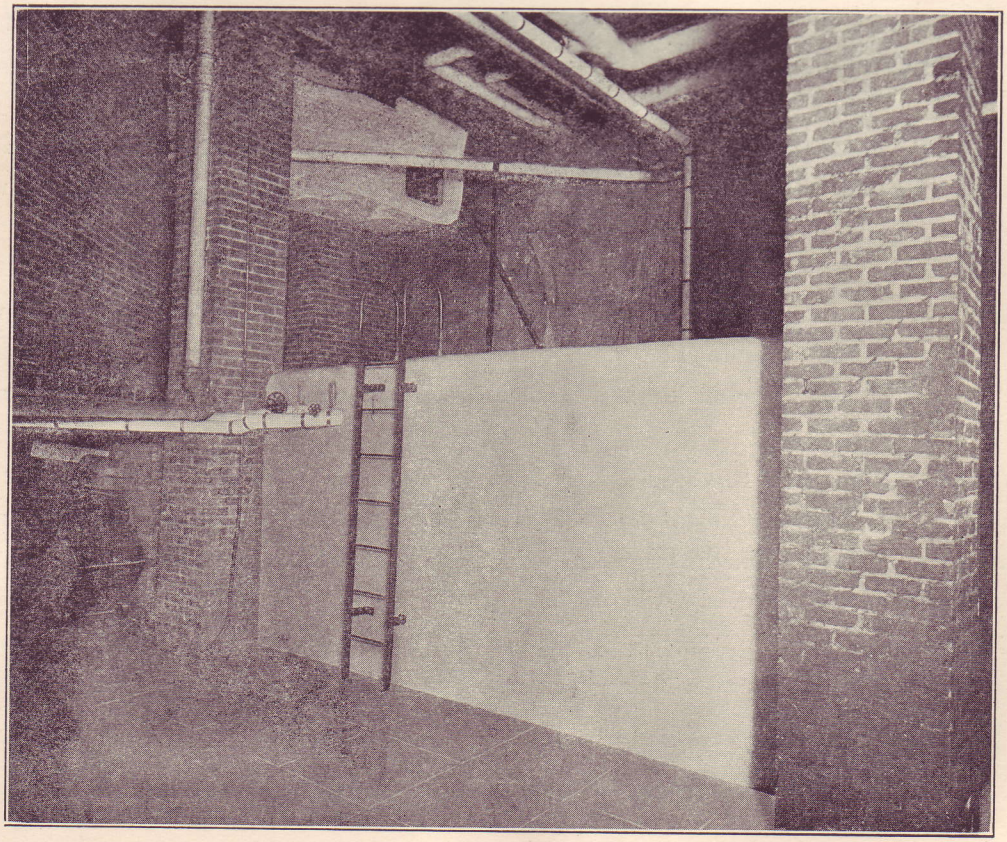
Boiler Room, Turks Head Building, Providence, R. I. Showing Boilers coal fired.



Erecting Oil Storage Tank in a coal pocket. Turks Head Building, Providence, Rhode Island.



Boiler Room, Turks Head Building, Providence, R. I. Showing Boilers with Fess Rotary Oil Burners. Note the absence of ashes and dirt. Fires are automatically controlled.



Finished Oil Storage Tank in place, enclosed in reinforced concrete. Turks Head Building, Providence, R. I.

Oil Superior to Coal

HIGHER EFFICIENCY.—Boiler efficiency, when coal-fired, averages about 65 per cent; with fuel oil about 80 per cent. With oil there is more perfect combustion, more equal distribution of heat, practically no deposit of soot to retard the heat flow, uniform rate of combustion, and no excess air such as enters the furnace in stoking coal and cleaning the fires.

ABSENCE OF DIRT.—In delivery of oil to storage or to boiler, there is no coal dust; there is no dirt in stoking, no cleaning of fires, no removing of ashes with consequent cost of haulage and labor or blocking of thoroughfares.

SAVING OF TIME.—Only a few moments are required for lubricating the oil-burning equipment and for lighting the fire, after which it may be maintained at maximum capacity. No banking of fires is necessary. The consumption of fuel is stopped by closing one valve and opening motor switches.

STEADIER PRESSURE.—A uniform rate of combustion is maintained automatically by the steam pressure, insuring a steady temperature resulting in the maximum efficiency during the entire period of firing.

QUICKER STEAM.—Rapid changes in demand for steam are promptly met without undue strain on the boiler for there is no necessity of opening the furnace doors. A reduction in the rate of firing may also be quickly accomplished without undue losses.

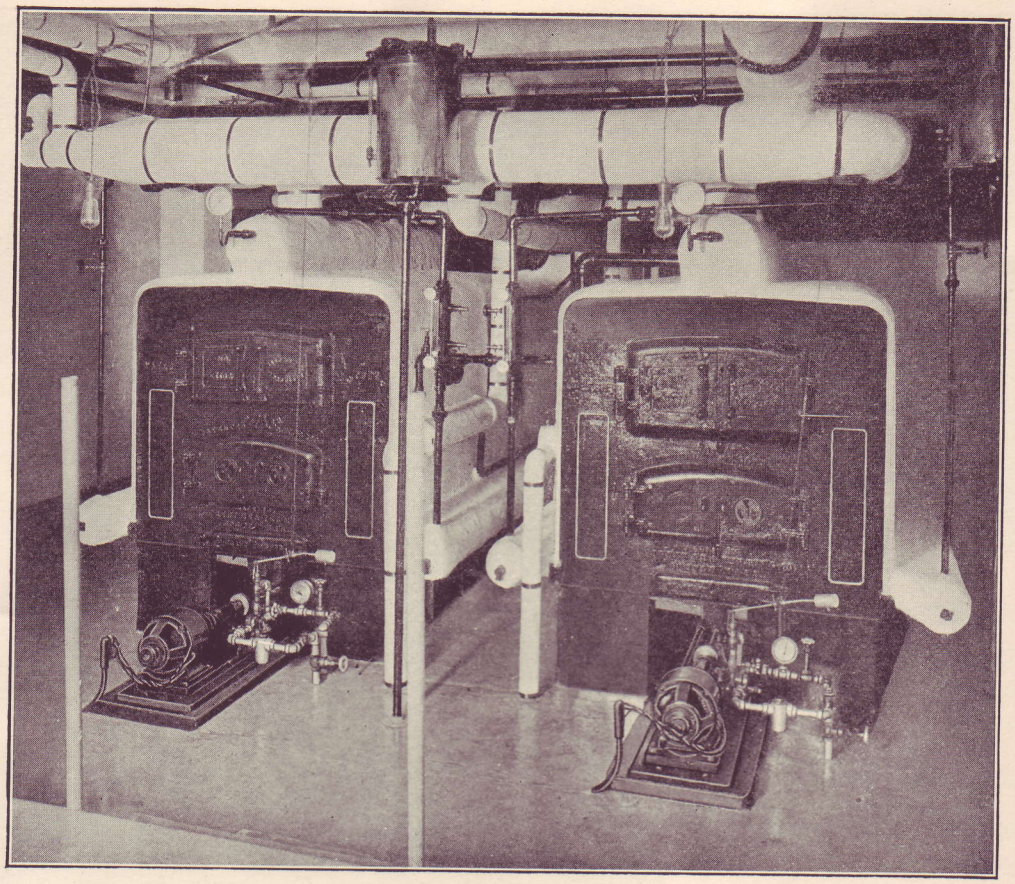
ECONOMY OF LABOR.—The labor of handling and firing coal, cleaning and banking fires, removing ashes, etc., may be devoted to other duties, for all such labor is entirely dispensed with when oil is burned.

LABOR MORE EFFICIENT.—The work of firing coal causes unusual discomfort as well as arduous toil. The attendants in oil-burning plants show a keener appreciation of the advantages of oil by a better performance of other duties, as is shown by the cleanliness of the plant in general.

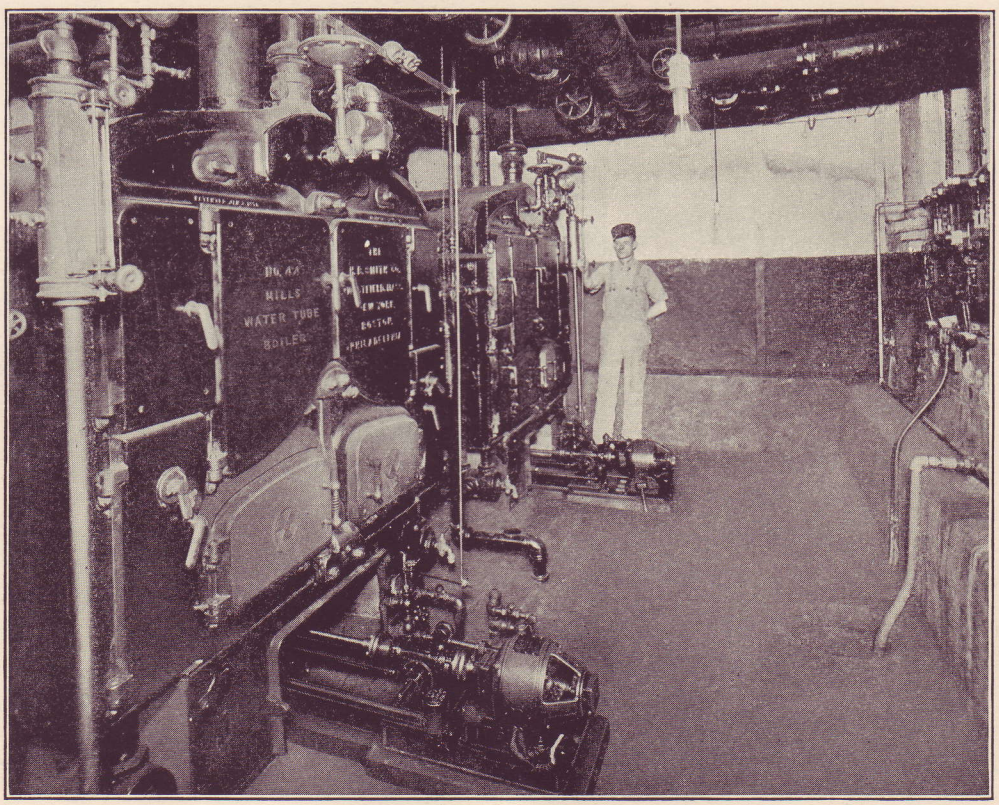
SAVING OF STORAGE SPACE.—A ton of coal occupies about 43 cubic feet, while the equivalent in heat value of oil occupies only about 20 cubic feet; therefore, coal requires 50 per cent more storage space. Oil may be located at some distance from the boiler without inconvenience.

CLEANLINESS.—The adoption of oil fuel renders available space adjacent to the boiler room that would be practically useless when firing coal, owing to the dust and dirt which cannot be controlled.

PIERCE HALL.—HARVARD COLLEGE, CAMBRIDGE, MASS.
Where we are now installing complete oil-burning equipment.

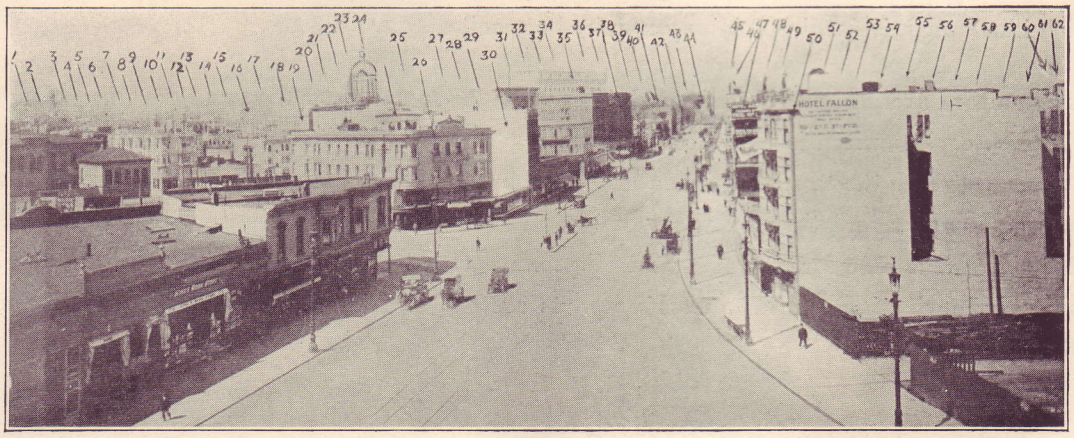


Front view of two cast iron sectional boilers equipped with Fess Rotary Oil Burners showing automatic fire control valves and connections.



Two 44 inch cast iron sectional boilers equipped with Fess Rotary Oil Burners heating offices of O'Brion, Russell & Co., General Insurance Brokers, 108 Water St., Boston, Mass.

Haddon Hall hotel apartments, Berkeley St. and Commonwealth Ave., Boston, heated with Fess Rotary Oil Burners.



View from terminal of Market and Velentia Streets, San Francisco, Cal., showing 62 Fess System Installations within the focus of the camera. Since this photo was taken, many additional installations have been made. An important factor in rebuilding a city.

Fess Turbine Burner

The burner consists of an iron case in the center of which is located the fuel oil delivery tube thru which the oil is carried to the centrifugal atomizing cup. This cup is provided with a small turbine wheel and is carried on two annular ball bearings and is driven by the air pressure from the fan at about eight ounces. The velocity of the air, combined with the centrifugal force of the oil as discharged from the cup, creates a cyclonic action on the two elements and produces a very thorough mixture.

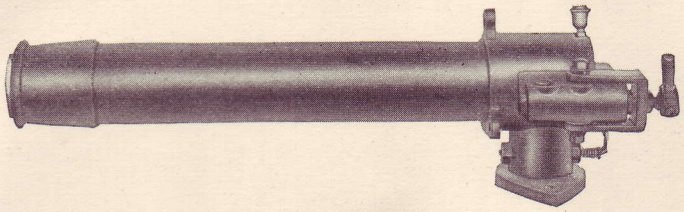
The mechanical atomization of the oil by this method is very effective and of great value, not only for high pressure work where boilers are operating continuously, but also where boilers are fired intermittently. When applied to either high pressure or low pressure heating boilers, the rate of combustion is automatically controlled and so regulated as to maintain any desired pressure.

The suction line of the oil pump is equipped with a basket strainer of liberal size and arranged for convenient cleaning. The discharge line is provided with a pressure gauge, pressure regulating valve and by-pass.

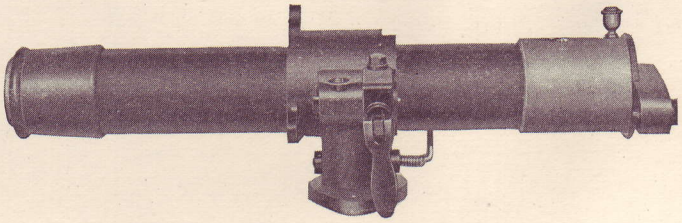
The oil pump is of the twin-gear type of cast bronze, accurately machined, and securely bolted and dowelled by jig to a rigid cast-iron bracket, which is part of the worm case. The suction line is provided with a basket-strainer and check valve to hold priming. The discharge is equipped with pressure gauge, and pressure-regulating valve, so that the oil pressure may be regulated to suit requirements. The pressure need be only sufficient to overcome the friction in the feed line. This insures a minimum consumption of power and wear on the worm transmission and pump.

These burners are furnished in various capacities and sizes to cover a wide range of service. A number of burners of different sizes may be supplied by a single oil pump and fan unit. Where conditions are such that it is found desirable to have the oil pump independent of the fan set, an individual unit, as herewith illustrated, is furnished in any required capacity.

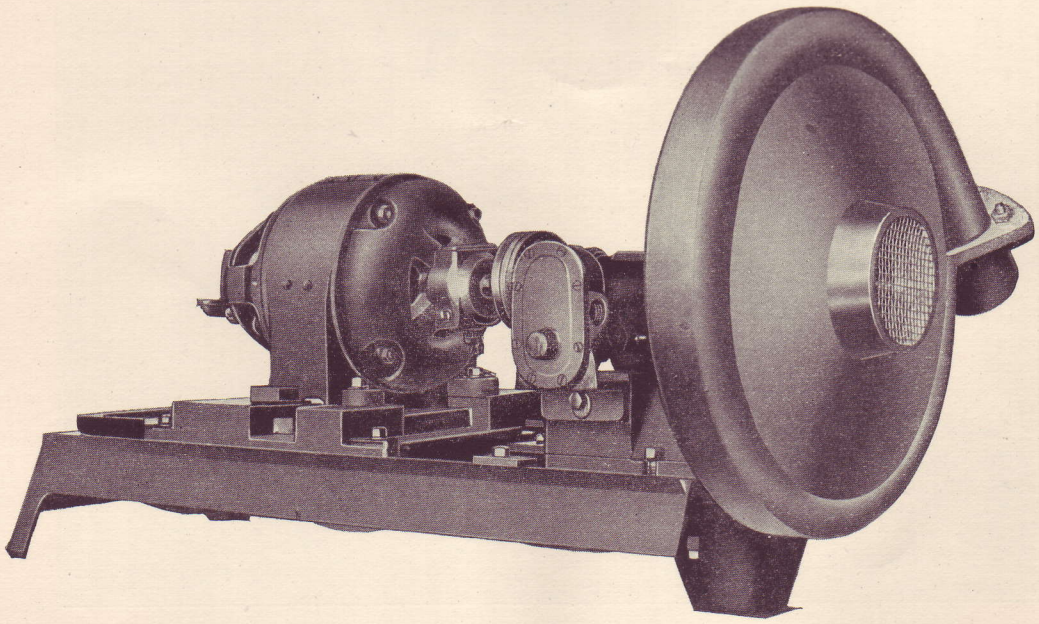
The motors are designed for a speed of 3400 to 3600 RPM, and wound for the voltage available. The electric service switch is provided with a no-voltage release and overload protection. The motor shaft is connected to the worm reduction gear by means of a flexible coupling. The worm is of steel carried on two annular and thrust ball bearings. The worm gear is of bronze with a steel shaft extending thru the side of the case for operating the oil pump. The shaft is also provided with a packed gland for retaining the lubricating oil. The working parts are enclosed in a dust-proof case and operate in an oil bath.



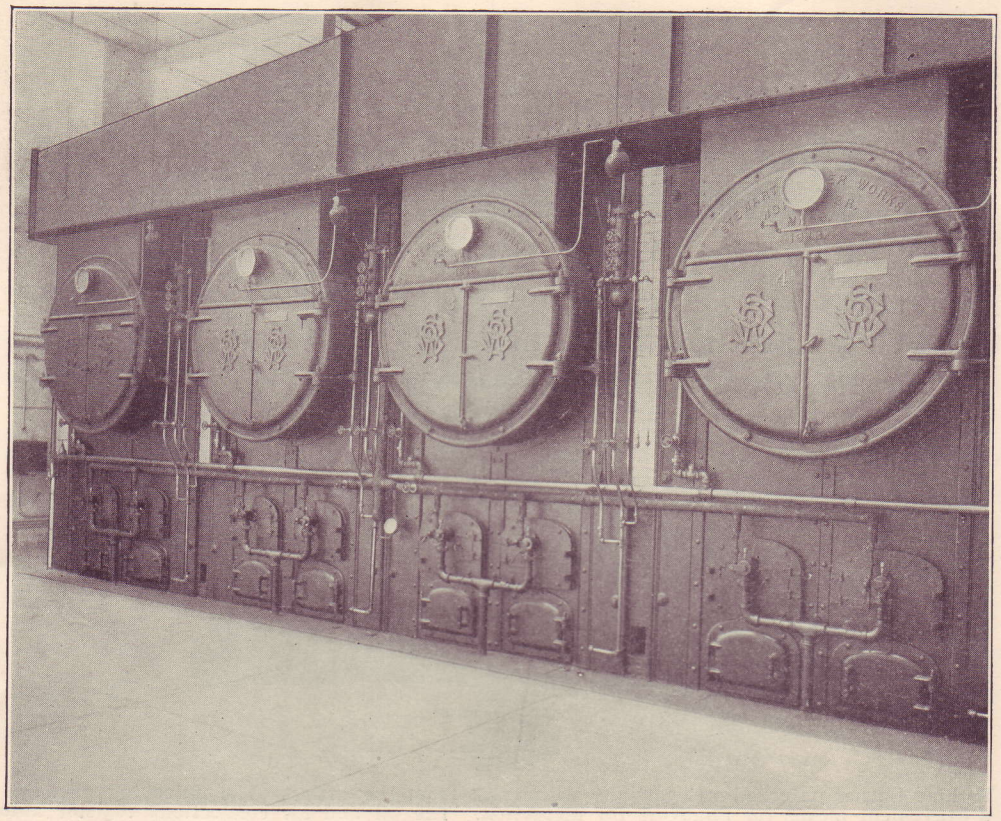
No. 3 Fess Turbine Burner clamped into firing position.



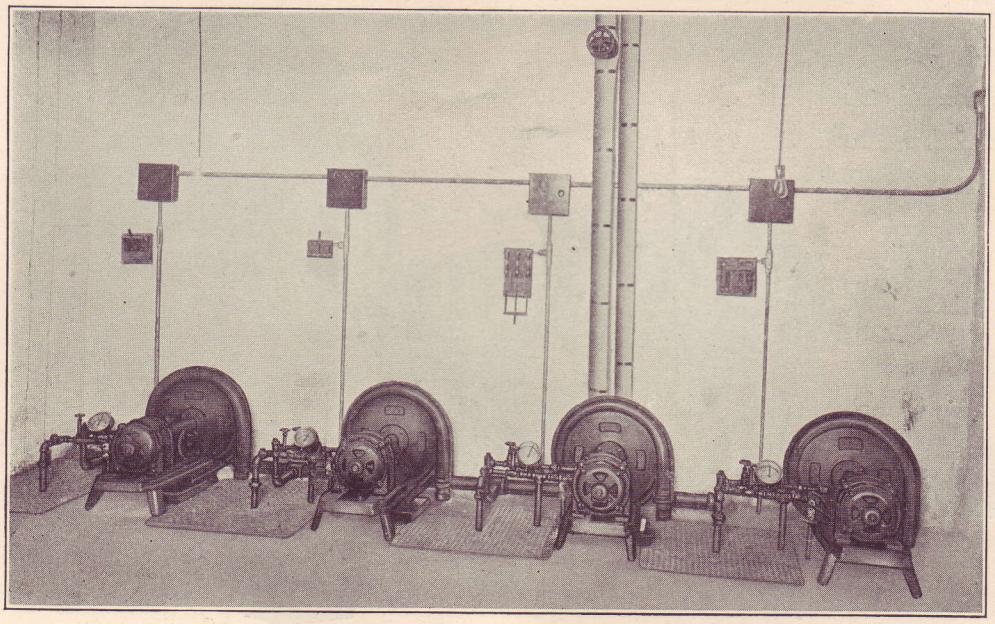
The Fess Turbine Burner unlocked and partially withdrawn from the casing. The unlocking principle provides a convenient means for removing for inspection. The oil and air connections register automatically when clamped in place without threaded connections.



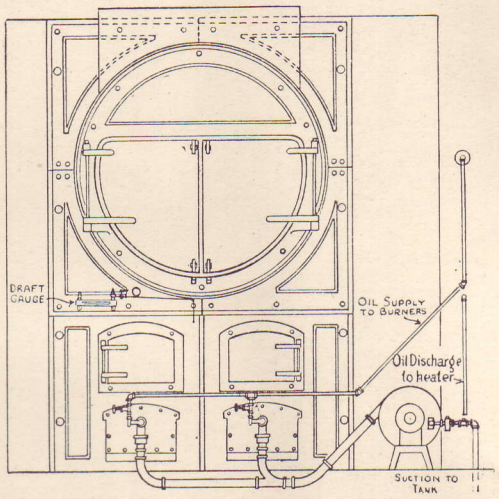
Motor Driven Oil Pumping and Air Fan Set. Floor space occupied: length 40″, width 24″, height 24″. These equipments are furnished with pumps and fans of various capacities necessary to operate one or a number of burners of size suitable for firing boilers ranging from 10 h. p. to 200 h. p.



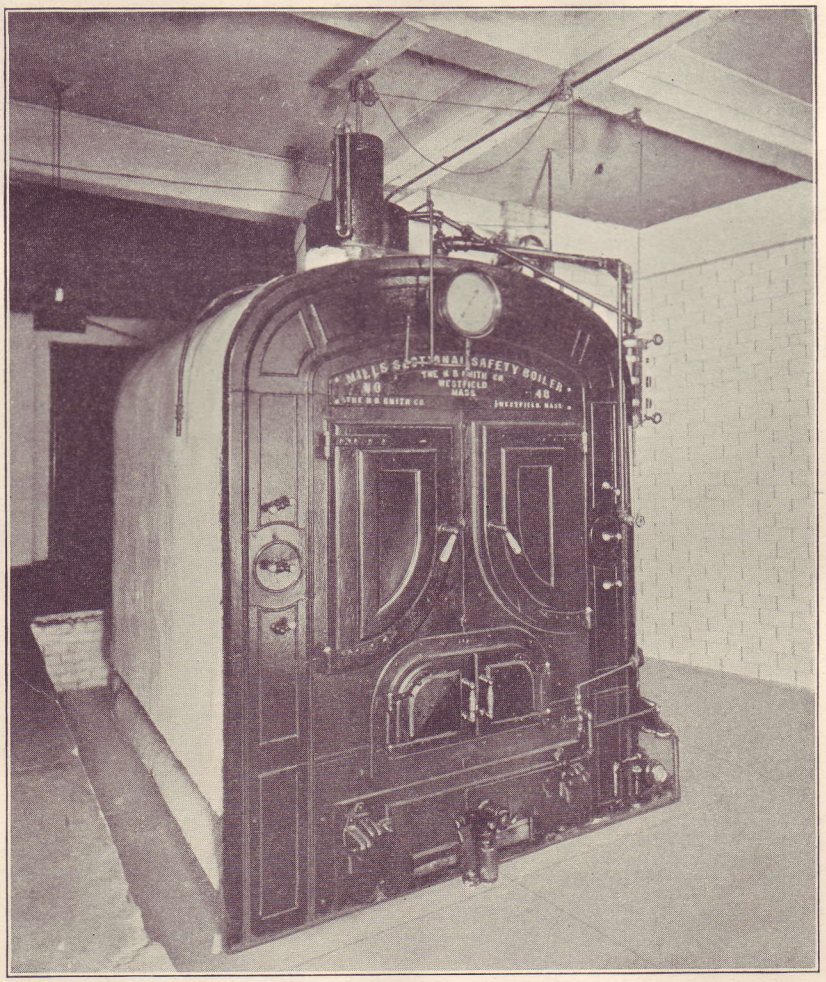
Battery of four 150 horse-power horizontal tubular boilers equipped with Fess Turbine Burners. These boilers are used exclusively for heating at a pressure not exceeding five pounds. The Turbine Burner is particularly well adapted to this work because the Turbine operates on low-pressure air. The absence of high-pressure steam requires a mechanical method of atomizing the oil.



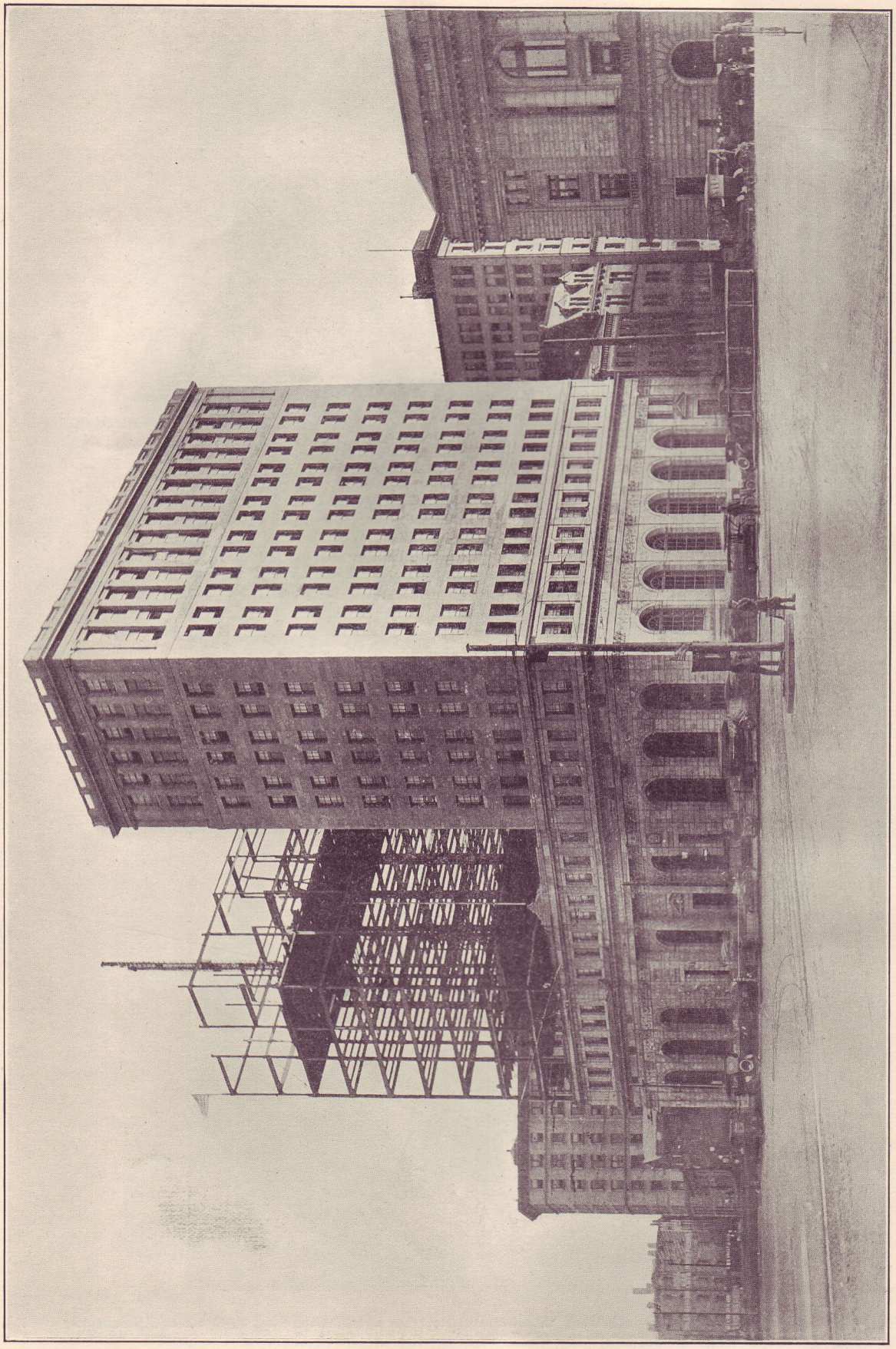
Battery of four electrically driven oil-pumping and air-blowing sets connected in tandem for supplying Fess Turbine Burners for firing the battery of boilers shown above. Any one or more equipments may be operated as desired to meet the requirements of the load.



Front view of horizontal tubular boiler equipped with two Fess Turbine Burners with air and oil connections to motor-driven oil-pumping, and air fan set.



Cast Iron Sectional Boiler equipped with Fess Turbine Burner. As usual, with this type of equipment the rate of combustion is automatically controlled by the steam pressure of the boiler.



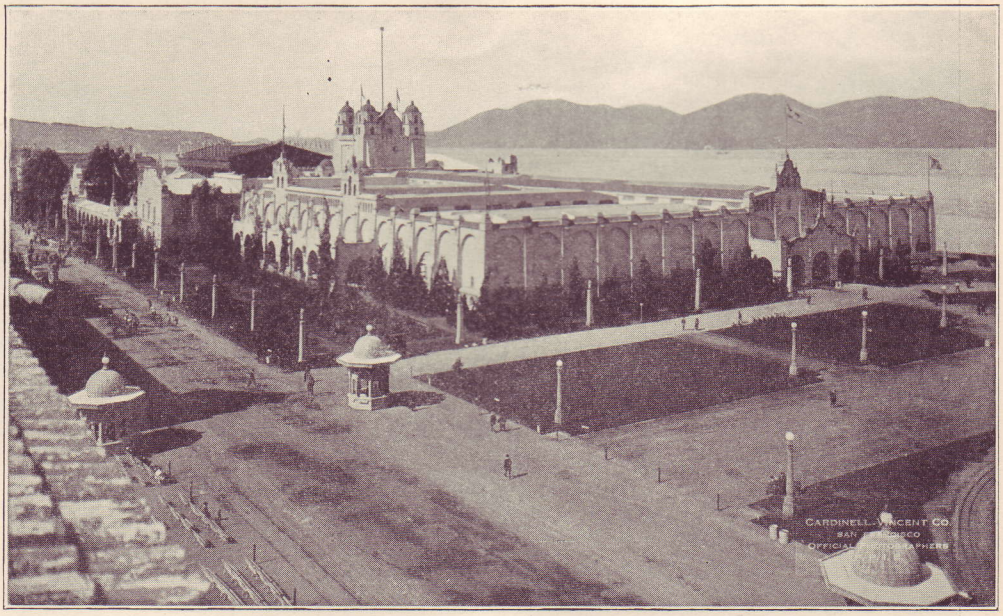
RHODE ISLAND HOSPITAL TRUST COMPANY'S NEW BANK BUILDING

When completed, to be the largest office building in Rhode Island and one of the largest and finest in New England. The Fess System of Oil Burning was installed and operated the plant even during construction.

Fuel Oil delivery truck on grade at College Hill, Providence, R. I. Capacity 1200 gallons fuel oil equal to 8 tons of coal.

One of the new additions to fleet of Oil Delivery Trucks on grounds of Brown University, Providence, R. I., showing power house in the background.

Five Apartment Houses, 1080 to 1120 Beacon St., Brookline, Mass., owned by Charles A. Newhall & Sons. Heated with Fess Turbine Fuel Oil Burners, firing cast iron sectional boilers.



California Building at Panama-Pacific & National Exposition which was heated with Fess Rotary Oil Burners and which were used exclusively for heating where required.

CHARLES A. NEWHALL
REAL ESTATE
18 TREMONT STREET
BOSTON, MASS.

June 16, 1919.

Mr. William C. McTarnahan,

Fess Rotary Oil Burner, Inc.,

19 Central Street,

Boston, Mass.

Dear Sir:-

I am much pleased with the Fess Burners installed in our five apartment buildings, numbers 1080, 1090, 1100, 1110 and 1120 Beacon Street, Brookline, Mass.

Owing to the fact that the oil was put in in the middle of the Winter, it is impossible accurately to state the actual saving in the cost of fuel, but I feel sure it is considerable.

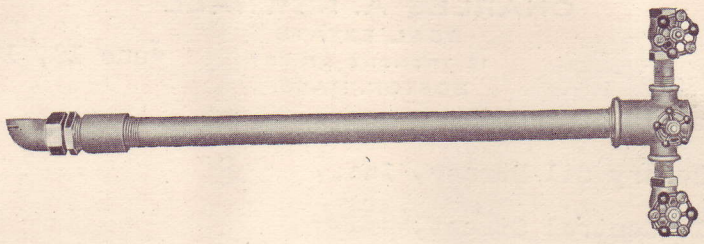
The janitors have practically their whole time free for other work, in fact the janitors' wives take care of three of the boilers most of the time. There is no dust and dirt working up the stairways and through the buildings. As the Inspector of the Town of Brookline expressed it, "You could eat your dinner in the boiler room."

In the Spring and Fall, when heat is needed for only a few hours a day, it is a simple matter to light the oil burner and turn it out when it is no longer needed, instead of starting a coal fire which is expensive.

My best endorsement of your burner is the fact that I have just placed a contract for two additional installations, making seven buildings equipped with Fess oil burning systems.

Very truly yours,

Charles A. Newhall



Single Tip Steam Atomizing Burner made in various capacities ranging from 25 h. p. to 100 h. p.

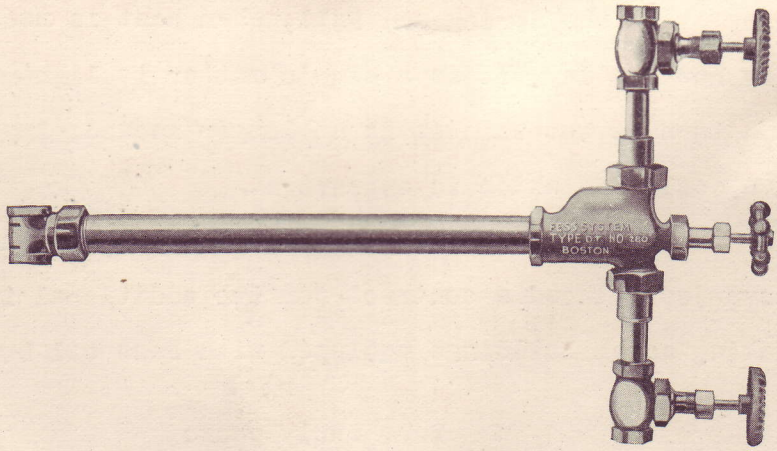
STEAM ATOMIZING BURNER

The steam atomizing burner is well adapted for use in many power plants that are fired continuously, or where steam at a pressure of forty pounds or more is constantly available for operating the oil pump and supplying the burners.

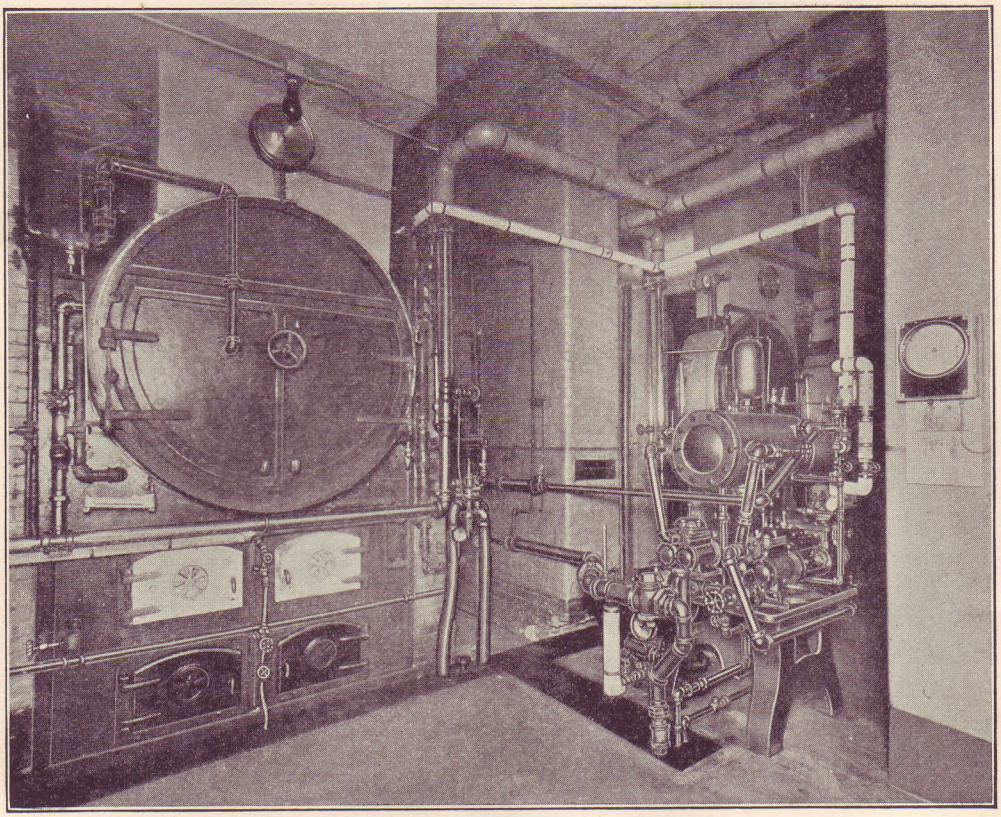
By the use of a single and double tip, a wide range of capacities is furnished and may be applied to boilers of various types. The inside mixing principle insures a high degree of atomization with the minimum consumption of steam.

The furnace is specially constructed so as to provide a combustion chamber of ample size to insure complete combustion and a thorough distribution of the heat without undue stress on the heating surface of the boiler.

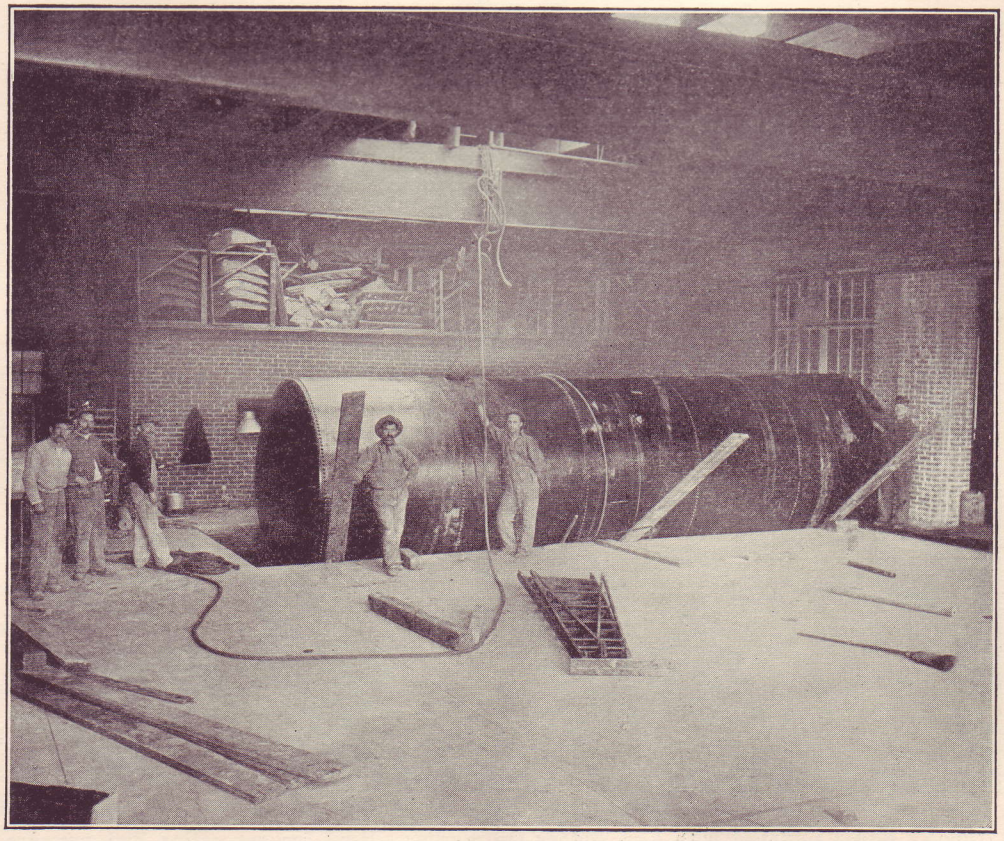
These burners, when installed in connection with an automatic oil pumping and heating set, together with automatic fire control governor, make the most complete equipment of this type yet developed.



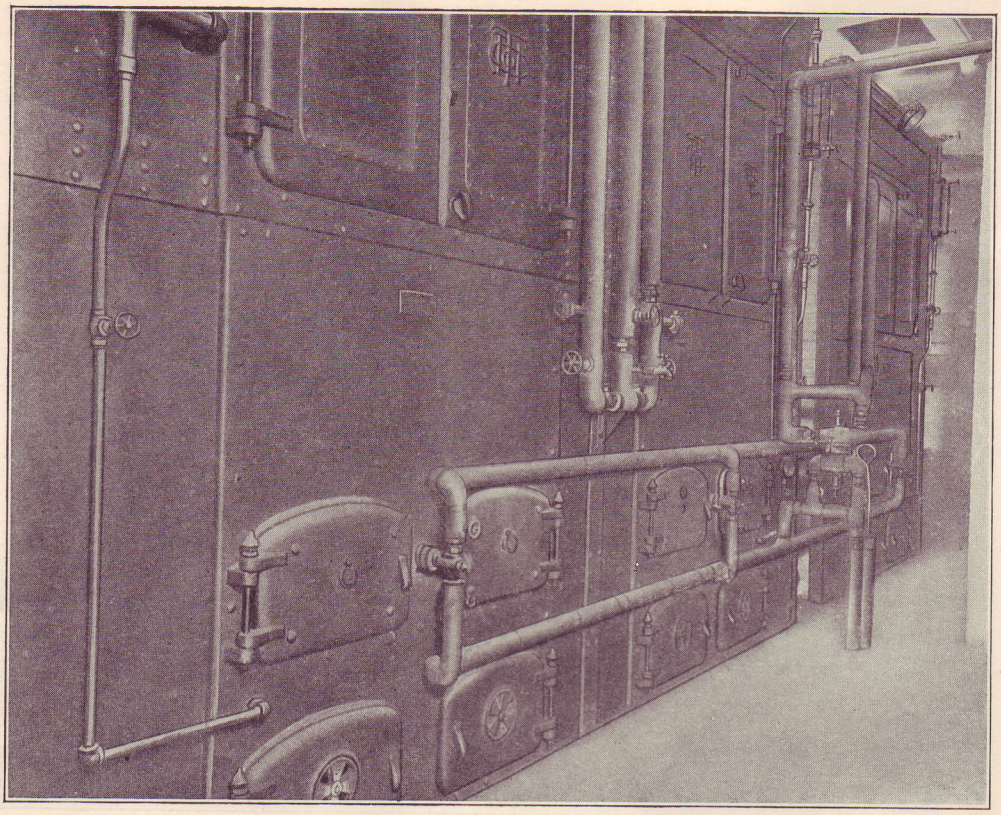
Double Tip Fess Steam Atomizing Burner made in capacities ranging from 100 h. p. to 250 h. p. These burners are especially designed for burning low grade fuel oil. They are of the inside mixing type and equipped with steam by-passes for cleaning or shutting down.



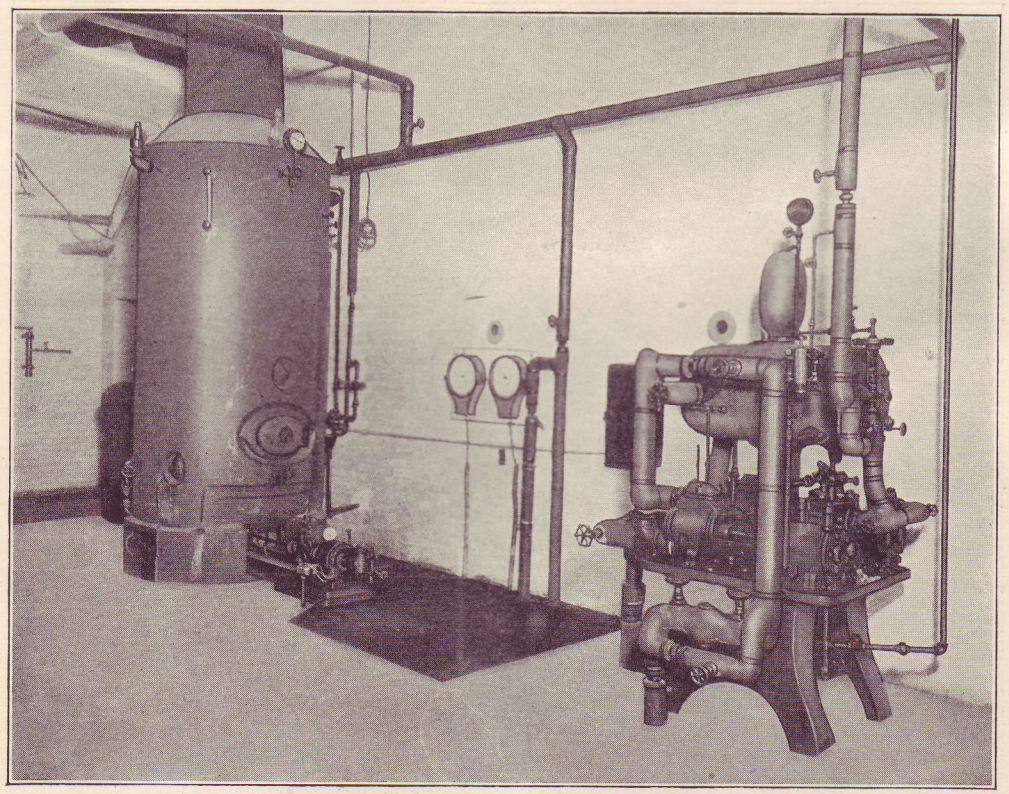
Typical installation of High Pressure Steam Atomizing Burner, showing one of a battery of four tubular boilers, steam pumping and heating set with automatic fire control governor at right of boiler.



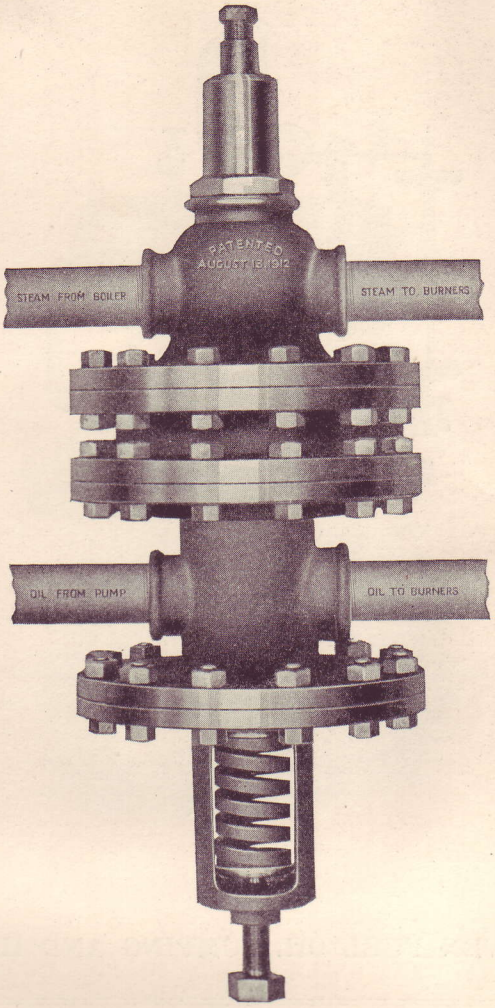
Installing 10,000 gallon Oil Storage Tank at the Ford Service Station of D. W. Flint, Providence, R. I.



Battery of three horizontal tubular boilers, equipped with Fess Steam Atomizing Burners and automatic fire control, used in heating the Rhode Island Hospital Trust Building, Providence, R. I.



Vertical Tubular Boiler equipped with Fess Rotary Oil Burner. Used for generating high-pressure steam for driving pumping and heating set which supplies the steam atomizing burner for boilers shown above.



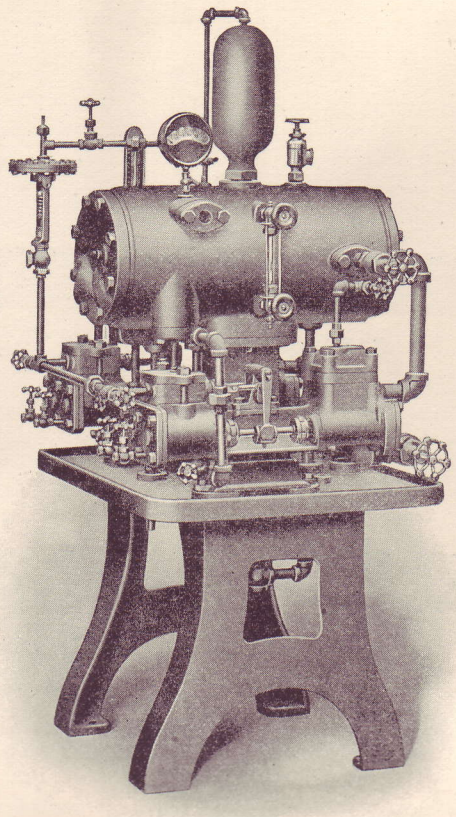
Automatic Fire Control for Steam Atomizing Burners

In operating fuel oil burners of the steam atomizing type, practice has etsablished the fact that with most careful attendants the maximum efficiency is difficult to maintain owing to the frequency that the oil and steam valves must be regulated to meet varying load conditions.

In order to accomplish this by automatic means, the present type of governor was designed and consists of a system of supporting the controlling valves between diaphragms free from stuffing boxes, glands or frictional parts, allowing a perfect freedom of action, such that the valves at all times may take up their natural balanced positions in relation to the pressure on the diaphragms.

The oil valve is suspended between two diaphragms, the upper diaphragm being in direct connection with the boiler pressure, the lower diaphragm being acted upon by a spring in opposition to the steam pressure, and by the adjustment of this spring the desired boiler pressure is maintained.

The quantity of steam for atomizing is controlled entirely by the oil actually delivered to the burner. The back pressure on the oil line between the regulator and the burner acts upon the diaphragm, which controls the valve admitting the proportionate quantity of steam to the burner, and thus maintains a constant relative admission of steam and oil to meet the load requirements.



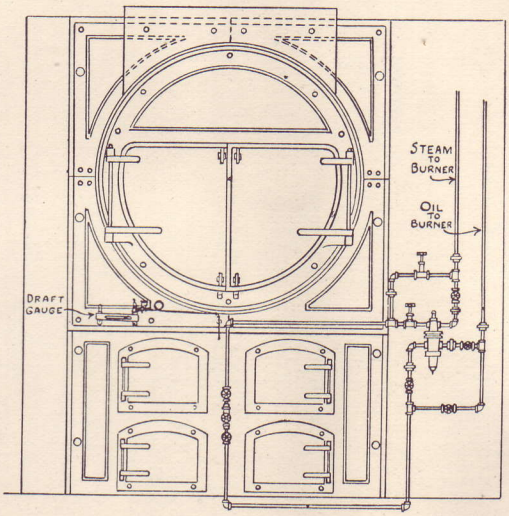
STEAM DRIVEN FUEL OIL PUMPING AND HEATING SET

Size and No.	Size of Duplex Pumps Inches	CAPACITY PER MIN.		H. P. Boiler (at 35 lbs.) Will Supply Conservative Estimate	Steam	Exhaust	Suction	Discharge	Length	Width	Height
		No. Single Strokes Each Piston	Gals. Both Cyls.								
2	2 x 1¼ x 2¾	50 – 150	1 to 4	100 to 400	⅜	½	1	¾	33	33	65
3	3 x 2 x 3	50 – 125	4 to 10	400 to 1000	⅜	½	1¼	1	33	35	65
4	4½ x 2¾ x 4	50 – 100	10 to 20	1000 to 2000	½	¾	2	2	40	35	75
5	5¼ x 3½ x 5	50 – 100	20 to 40	2000 to 4000	¾	1¼	2½	2½	50	45	85

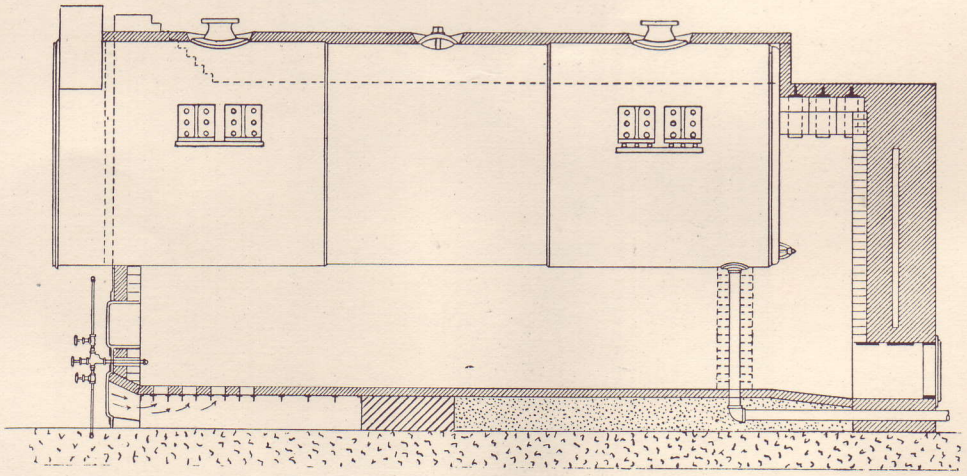
Complete outfit covers two pumps and receiver on base with water gauge, glass oil pressure gauge, thermometer, pressure regulator, relief valve and necessary valves and fittings.

Assuming an evaporation of 14 pounds per hour of water for each pound of oil burned one-half gallon of oil per minute will supply a 100 H. P. Boiler.

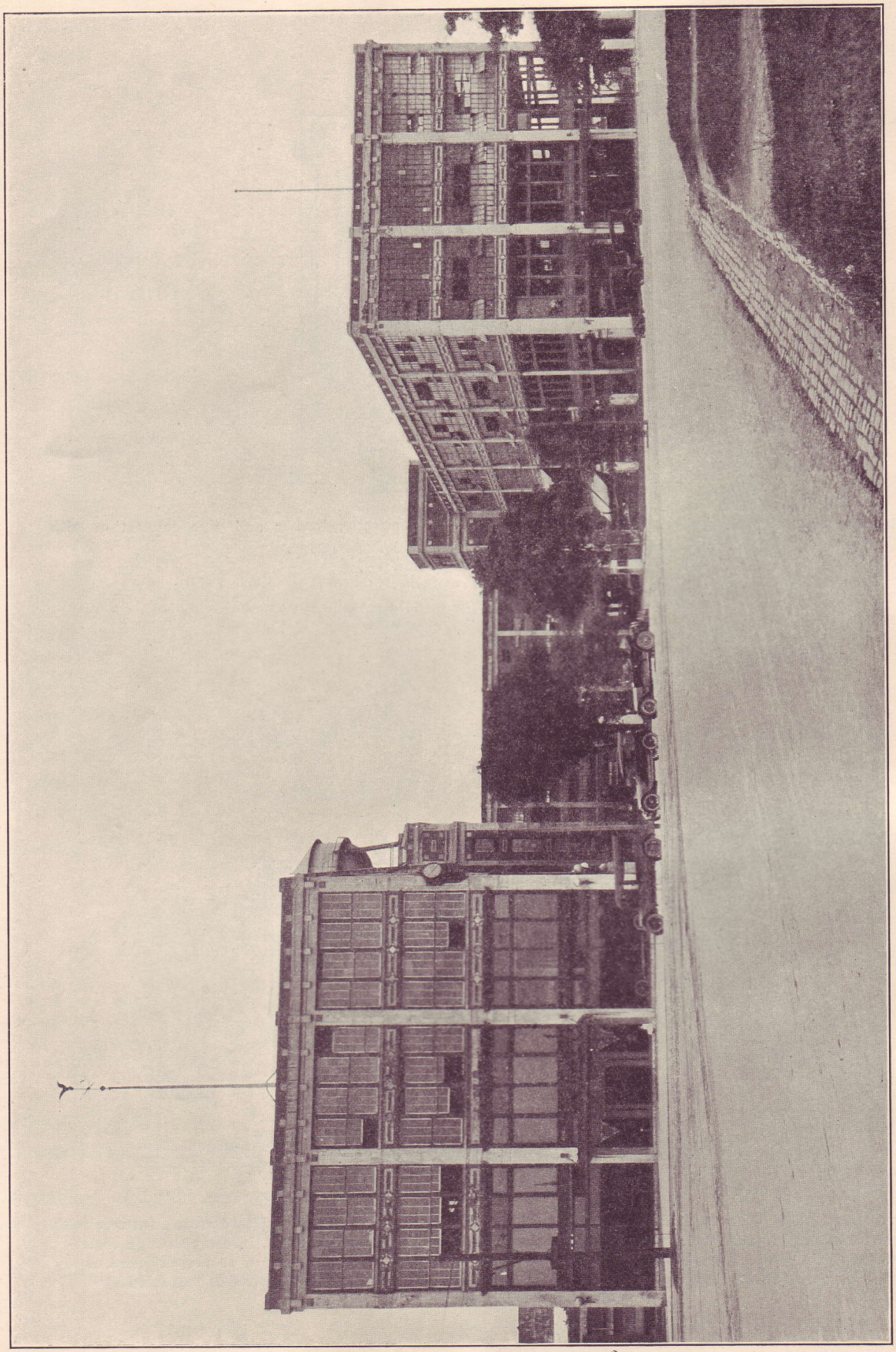
Regulator is set for 20 pounds oil pressure but may be adjusted for pressure ranging from 10 to 35 pounds.



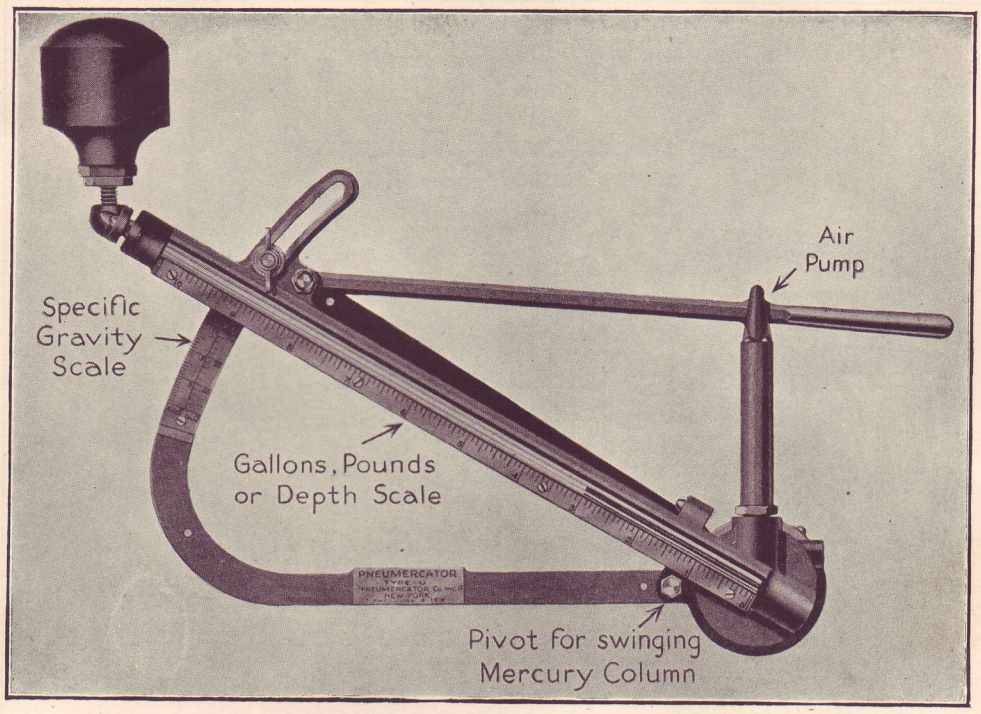
Front view of a tubular boiler showing location of steam atomizing burner and pipe connection with automatic firing control, governor and draft gauge.



Sectional view of a brick-set horizontal tubular boiler, showing general design of oil-burning furnace with steam atomizing burner. Such arrangement provides ample combustion space to insure thorough distribution of the heat. The checker work for admitting air thru the furnace floor is so proportioned as to allow a wide range in the rate of combustion. The draft that may be required is regulated by the damper and ash pit doors.



PACKARD MOTOR COMPANY'S PLANT, COMMONWEALTH AVE., BOSTON, MASS.
Now being equipped with the Fess System of Mechanically Driven Turbine Burners, which is the latest development in Mechanical Oil-burner Equipment



OIL TANK GAUGE

This instrument was designed to provide a simple and accurate means of indicating the quantity of oil the storage tank may contain. Owing to the simplicity of the principle of operation, the gauge may be located at any convenient point within a reasonable distance of, and either above or below the level of the tank without affecting the accuracy of operation.

The principle of operating the gauge is briefly as follows:

After mounting the instrument at the desired location, a small metal tube is connected to the gauge and extended through the top of the tank to an equalizing chamber located on the bottom. As this chamber remains submerged, the pressure, due to the head of oil, is exerted on the mercury column of the gauge through the medium of the air cushion within the connecting tube, which is maintained by a small air pump mounted on the instrument for this purpose. This pressure causes the mercury to rise a distance corresponding proportionately to the specific gravity or weight of the two elements.

Each inch of depth of oil in the tank is accurately indicated, and with a schedule chart giving the number of gallons per inch, the total quantity on hand at any time may be readily determined.

This instrument will accurately indicate the depth of liquids of any specific gravity by adjusting to the scale provided for this purpose on the gauge.

Boston Evening Transcript
LOUIS M. HAMMOND, BUSINESS MANAGER.

Boston, May 15, 1919.

Fess Rotary Oil Burner, Inc.,
19 Central Street,
Boston, Mass.

Gentlemen:-

I am pleased to write you that we are entirely satisfied with the oil system which you installed in our plant some two years ago.

We use this liquid fuel for our two buildings - The Transcript Building, and the Franklin Building in the rear - and during the coldest weather it has proved entirely capable of giving us all the steam we require.

The system is clean, easily taken care of, and for buildings such as ours it can be highly recommended as being economical and efficient.

Yours respectfully,
L. M. Hammond
Manager

PROVIDENCE PUBLIC LIBRARY.
229 WASHINGTON STREET.
PROVIDENCE, R. I.

April 19, 1919.

Mr. W. C. Mc Tarnahan,
Fess Rotary Oil Burner, Inc.,
19 Central Street,
Boston, Mass.

Dear sir,

In answer to your inquiry, I will say that we find the oil burning plant very satisfactory, for several reasons. It has proved economical. It has enabled us to be independent of the coal shortage which was so serious an interruption to some institutions last year. The heat can be readily supplied, at short notice, and as readily shut off. The plant can be kept in a cleanly condition; and we are relieved from the trouble and expense of taking ashes out of the building.

Yours truly,
William E. Foster

TURKS HEAD BUILDING
PROVIDENCE, R. I

April 21, 1919.

MARTIN S. FANNING
AGENT

Fess Rotary Oil Burner Co.
19 Central Street,
Boston, Mass.

Gentlemen:-

In April 1917 we installed you rotary oil burner system in The Turks Head Building, a 16 story office building in Providence, R.I. The system is used for heating only and has proved most satisfactory. The winter of 1918 was a very severe one and we had a good chance to test out the qualities of our plant. It proved equal to the task and in addition saved us much money over the price of coal. We formerly used around 900 to 1,000 tons of coal each year. We have been able to make a most satisfactory saving on the removal of ashes as well as the saving of one fireman for the summer months. The maintainence of the plant has been low and if the price of oil does not go to a too high level we shall hope to continue our oil plant indefinitely.

Yours very truly
Martin S. Fanning
Agent.

EDWARD ABORN GREENE, PRESIDENT
WM. P. GOODWIN, TREASURER

INCORPORATED 1851

GILBERT H. HAGAN, ASST TREASURER.
CLINTON F. STEVENS, ASST TREASURER.

HOME OFFICE 27 MARKET SQ

PEOPLES SAVINGS BANK
IN PROVIDENCE
PROVIDENCE, R.I.

April 24.1919.

Fess Rotary Oil Burner Inc.

Providence, R.I.

Gentlemen:-

Replying to your inquiry as to our satisfaction with the use of fuel oil in heating our building I have to say.

Our experience, now extending through three seasons of use, has been satisfactory in all respects; quick heating and economical.

Even tho coal fuel were cheaper than oil, we would prefer and continue the use of oil fuelbecause of its superiority in every way over coal.

Very truly yours.
Wm. P. Goodwin
Treasurer.

Rhode Island Hospital Trust Company

CAPITAL $3,000,000. – SURPLUS $3,500,000.

H. J. WELLS, President.
H. A. HUNT, Vice-President.
P. H. GARDNER, Vice-Pres't. and Trust Officer.
T. H. WEST, JR., Vice-President.
H. L. SLADEN, Vice-President.
J. H. WELLS, Secretary.
G. A. HARRINGTON, Asst. Trust Officer.
E. A. HARRIS, Asst. Trust Officer.
R. T. DOWNING, Asst. Secretary.
J. E. WILLIAMS, Assistant Secretary.
H. S. ADAM, Asst. Secretary.
H. CAPRON, Asst. Secretary.
R. S. RICHARDS, Asst. Secretary.
G. B. HIBBERT, Asst. Secretary.

Providence, R.I. April 23, 1918,

Fess Rotary Oil Burner, Inc;

Boston, Massachusetts.

Gentlemen:-

The Fess Rotary Oil Burner was installed in the Enterprise building, which is under our care, in 1917. We have therefore had something over two years' experience with it, and we are glad to say that it has worked very satisfactorily.

It has required but very little repairs and the difference between the cost of the oil and the price of coal has shown a good profit to us, and the disagreeable handling of coal and ashes has been eliminated.

We have installed a much larger plant in our new Hospital Trust Building, but it has been in operation for such a short time that we do not feel that our experience is sufficient to warrant our expressing an opinion as to the merits of this new plant.

Yours Truly

BAP

CLINTON T. GAMWELL WALTER S. INGRAHAM

THE AGENCY OF SERVICE
GAMWELL & INGRAHAM
INDUSTRIAL TRUST CO. BLDG.
PROVIDENCE, R.I.

INSURANCE OF ALL KINDS

April 22, 1918.
Monday.

Fess Rotary Oil Burner, Inc.,
Turks Head Building,
Providence, R. I.

Gentlemen:-

Attention of William C. McTarnahan

Perhaps you will be interested to know that we have just completed some figures showing the result of the first year's experience with Fess Rotary Oil Burner in two buildings in which we have them installed. They are as follows:-

Saving in fuel alone, firguring coal @ $10 per ton	$1580.
" " Pay Roll $51. per week for at least eight months.....	1632.
" " Ashes removed	84.
Total,.....	$3296.

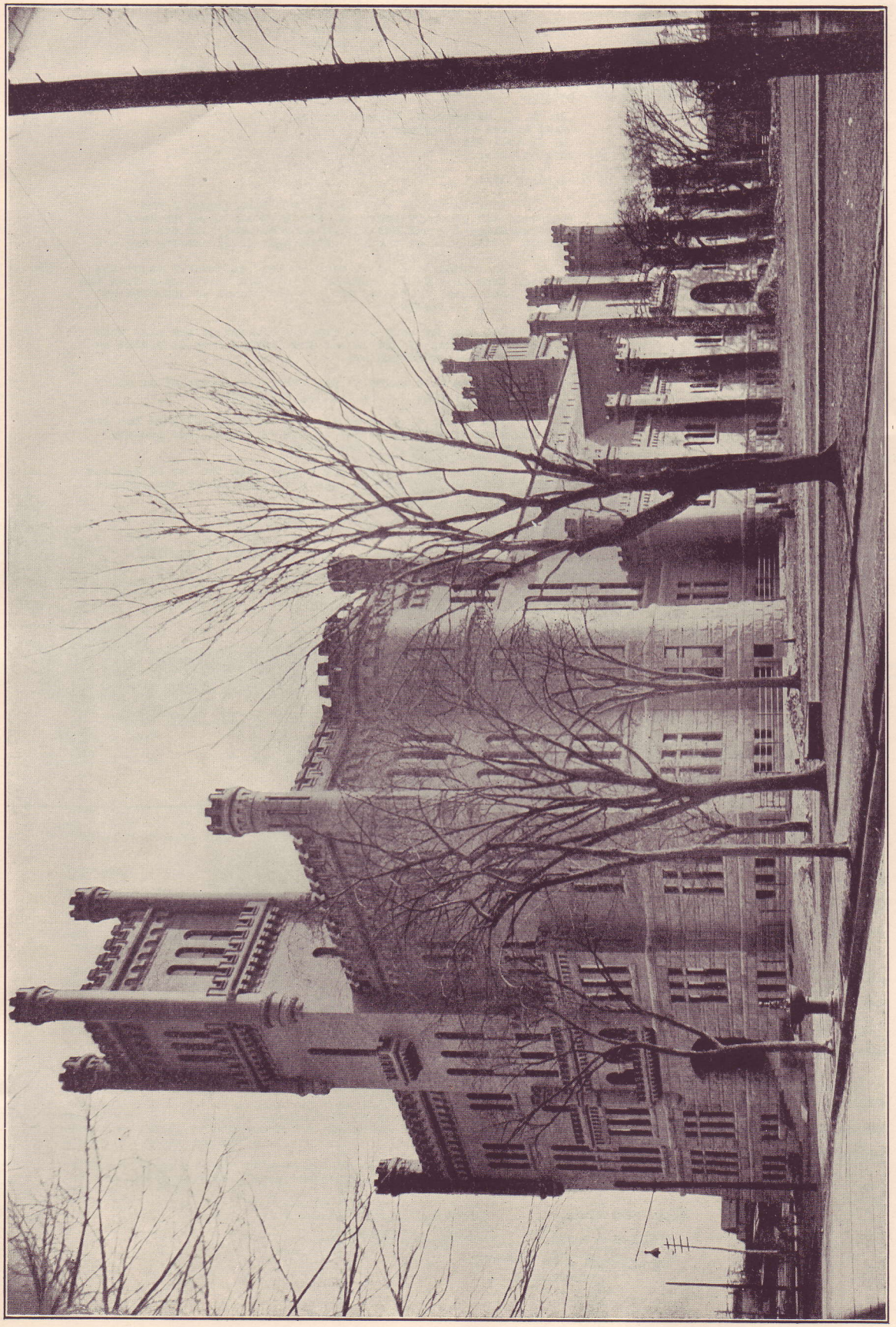
In one building your men have never returned to make any adjustments or repairs since the first day the fires were started.

In the other building we have had occasion to send for your men a number of times and the prompt service rendered free of charge has been greatly appreciated.

In fact we are prompted to say that it would give us great pleasure to show either of these heating plants to anyone interested, at any time, and go into the matter with them in detail.

Very truly yours,

W.S.I./B.



STATE ARMORY OF RHODE ISLAND

Where the Fess System of Oil Burning has been in use since 1917. This building was the scene of great activity during the war, and the oil-burning plant did its bit in keeping this enormous structure comfortable.

THE BOSTON WESLEYAN ASSOCIATION
581 BOYLSTON STREET
BOSTON

May 9, 1919

Mr. W. C. McTarnahan, General Manager,
Fess Rotary Oil Burner, Inc.,
19 Central Street,
Boston, Mass.

My dear Sir:

Your letter of April 10th, was duly received and I supposed was promptly answered, but in clearing up my desk this morning, I found the letter covered over with other papers. This much by way of explanation of my seeming neglect.

As to the working of your system, we greatly enjoy the freedom from many of the burdens, which are inseparable from the use of Coal, such as Ashes, and the dirt which accumulates so rapidly in a fire room.

Out tenants have been greatly pleased at the ease with which the building is heated and the freedom from complaint on this score is a great comfort.

We have also saved in our labor, which was after all the principal reason for installing the system.

The sudden closing of the war, greatly relieved the labor situation, but we faced the winter with much less anxiety after the Oil Burners were installed.

We have gone through the winter with the use of but one burner at a time and have no reason to complain of the success of the system.

Very cordially yours,

Frank L. Meyer
Treas.

TELEPHONE MAIN 5894
CABLE ADDRESS, "BANGWILL"

WILLIAMS & BANGS,
KIMBALL BUILDING,
18 TREMONT STREET,

MOSES WILLIAMS, JR.
FRANCIS REGINALD BANGS.

BOSTON, MASSACHUSETTS

May 12,1919.

Fess Rotary Oil Burner Inc.,
19 Central St., Boston, Mass.

Gentlemen:

We wish to apologize for the delay in answering your letter of recent date advising us of the present and future oil situation. We thank you for this information.

Referring to the oil burning apparatus which you installed in the Hinckley Building, 112 Water Street, we beg to advise that the plant has given us very satisfactory results during the time it has been in operation and we do not hesitate in recommending this equipment to any one.

We have experienced many advantages, such as cleanliness about the place, which is due to the absence of handling coal and ashes, the quickness of getting up steam, and more especially the economy we have derived.

Trusting this may be of some interest to you, we are,

Yours very truly,
WILLIAMS & BANGS,
By A. B. Parkin
Gen'l Supt.

INSPECTION DEPARTMENT
ESTABLISHED 1871
INCORPORATED 1905

GEO. L. SHEPLEY, PRESIDENT

J. F. HUNTSMAN, JR., VICE PRES.
W. J. TULLY, SECY. LIABILITY DEPT
E. C. CHENEY, SECY. LOCAL DEPT

J. S. NEWELL, ASST. SECY. LOCAL DEPT.
C. B. MACKINNEY, SECY. INSPECTION DEPT.
E. G. PIEPER, SUPT. OF AGENCIES

NEW YORK OFFICE
55 JOHN STREET
CHICAGO OFFICE
175 W. JACKSON BLVD.
BOSTON OFFICE
43 KILBY STREET
PARIS, FRANCE, OFFICE
20 RUE CHAUCHAT
CABLE ADDRESS STARSHEP

INSURANCE
STARKWEATHER & SHEPLEY
INCORPORATED
17 CUSTOM HOUSE STREET

CBM:CES

PROVIDENCE, R. I.
April 7,1919.

Fess Rotary Oil Burner, Inc.
19 Central Street,
Boston,Mass.

Gentlemen:-

We beg to acknowledge your favor of the 3rd and glad to know that there is to be apparently no shortage of fuel oil.

We are now merging from the third winter during which we have heated our office building with your system of oil burning. The system has been absolutely satisfactory, it has cut down our heating cost in various ways and is much more flexible, cleanly and satisfactory in every way than the old arrangement of burning coal, handling ashes and other attendant disagreeable features.

Yours very truly,

STARKWEATHER & SHEPLEY, INC.

SECRETARY
INSPECTION DEPT

ESTABLISHED 1878
INCORPORATED 1893

The Holtzer-Cabot Electric Co.

BOSTON · CHICAGO · NEW YORK · BALTIMORE
EXECUTIVE OFFICES: 115-135 AMORY STREET, ROXBURY, MASS.
CABLE ADDRESS, HOLTZER, BOSTON.

C. W. HOLTZER, PRESIDENT
W. S. KEMP, TREASURER
T. W. NESS, GEN'L MGR.
W. E. HASELTINE, ASST. GEN'L MGR.
E. R. HARDING, VICE PRES. & WESTERN MGR.

ROXBURY, BOSTON, MASS. April 10,1919

IN REPLY REFER TO WEH/A/209

Fess Rotary Oil Burner, Inc.
19 Central Street,
Boston, Massachusetts.

Attention Mr. W. C. McTarnahan

Gentlemen:

In reply to your letter of the 9th. inst.we wish to say that we have now used the oil burning equipment through two winters, one exceedingly severe and one mild. The plant has given us most excellent service and we have no hesitancy in giving you a complete endorsement of the system.

Apart from the actual fuel economy there are other important economies.

(1) No banking fires is required and very little time is required on the part of any one to look after the operation of the system.

(2) The expense of removing ashes is eliminated.

(3) The flexibility of the system in meeting the extremes of our New England climate has thoroughly proven itself. If is possible to operate it within very wide limits and to adjust it very quickly to sudden changes. It is probable that the greatest economy is secured in the Spring and Fall when only a little heat is required.

If there is any further information you would like regarding our experience with the system please do not hesitate to call upon us.

Yours very truly,
The Holtzer-Cabot Electric Co.

Treasurer.

INSTALLATIONS IN PROVIDENCE & VICINITY

Brown University, Providence
Turks Head Bldg., Providence
Rhode Island Hospital Trust, Providence
Peoples' Savings Bank, Providence
Industrial Trust Co., Providence
Pawtucket Institution for Savings, Pawtucket
Pawtucket Public Schools (8), Pawtucket
St. Mary's School, Providence
St. Anthony's School, Providence
St. Francis Xavier's Convent, Providence
Providence Armory, Providence
Rhode Island Hospital, Providence
Home for Aged Men, Providence
Home for Aged Women, Providence
Providence Public Library, Providence
Providence Public Market, Providence
Enterprise Bldg., Providence
Grosvenor Bldg., Providence
Lauderdale Bldg., Providence
Studley Bldg., Providence
Dorrance Bldg., Providence
Kinsley Bldg., Providence
Franklin Block, Providence
Palmer Block, Providence
Taylor Bldg., Pawtucket
Smith Bldg., Providence
Smith Realty Bldg., Providence
Mathewson Bldg., Providence
Lederer Bldg., Providence
Howard Bldg., Providence
Minden Apartments, Providence
Plymouth Congregational Church, Providence
O. A. Jillson, Providence
J. McCormick & Co., Providence
Auto Sales Room, Providence
F. C. Hoffman, Providence
Lederer Mfg. Co., Providence
Chelsea House, Providence
Peck & Sons, Providence
Dyer St. Land Co., Providence
Maine Creamery Co., Providence
Emery Apartments, Providence
Hill & LaCrosse, Providence
St. Joseph's Hospital, Providence
Bowen Bldg., Providence
Industrial Chemical Co., Providence
Improved Seamless Wire Co., Providence
Hope Paper Co., Pawtucket
Anchor Webbing Co., Pawtucket
John M. Dean Co., Providence
Shannock Narrow Fabric Co., Pawtucket
Congdon & Carpenter Co., Providence
Jencks Paper Box Co., Providence
Geo. M. Baker Co., Providence
American Emery Wheel Wks., Providence
McKenzie-McKay Co., Pawtucket
Hesse Mfg. Co., Valley Falls, R. I.
Mexican Petroleum Corp., Providence
Lumb Knitting Co., Pawtucket
Baird-North Co., Providence
J. O. Draper Co., Pawtucket
Potter & Johnston, Pawtucket
C. Moulton Stone Co., Providence
Comstock & Co., Providence
Starkweather & Shepley, Providence
Silverman Bros., Providence
Stevens & Co., Providence
Beaman & Smith, Providence
New England Supply Co., Providence
Shubert-Majestic Theatre, Providence
Keith's Theatre, Providence
Strand Theatre, Providence
Dutee W. Flint, Providence
H. J. Waterhouse, Ea. Greenwich, R. I.
Eden H. Bigney, Providence
William Wood, Cuttyhunk, Mass.
Almy Water Tube Boiler Wks. Providence
E. Bruce Merriman, Providence
Home Washing Co., Providence
Charles H. Field, Providence
Mrs. F. D. Olney, Providence
Hopkins Hotel, Providence
Dr. Edgar B. Smith, Providence
J. G. McIntoch, Providence
Bantam Ball Bearing Co., Bantam, Conn.
Pearson's Garage, Providence
Brook St. Garage, Providence
Miss Irene Stearns, Providence
Thurston Mfg. Co., Providence
Submarine Tender-Electric Boat Co.

PLANTS CONTRACTED FOR AND UNDER CONSTRUCTION

Mt. St. Mary's Convent, Fall River, Mass.
St. Joseph's Church, Providence
Notre Dame School, Central Falls, R. I.
Slade Bldg., Providence
Mason Mfg. Co., Providence
Tilden & Thurber, Providence
Koppleman's Greenhouse, Providence
Theo. W. Foster & Bro., Providence
J. C. Potter Garage, Providence
St. Maria's Home, Providence
St. Margaret's Home, Providence
Hemphill Mfg. Co., Providence
St. Peter & St. Paul's Church & Rectory, Prov.
Woodlawn Finishing Co., Providence
Providence Braid Co., Providence
Pawtucket Hoisery Co., Pawtucket
Conrad Bldg., Providence
Graham Mfg. Co., Providence
United Lace & Braid Co., Providence
Manufacturing Bldg., Providence
St. Elizabeth's Home, Providence
Providence Lithograph Co., Providence
Cohen Bros. Greenhouse, Providence

LIST OF BOSTON INSTALLATIONS

Christian Science Publishing Soc., Boston
Sterling Elliott, West Newton
Second Congregational Church, West Newton
J. M. Longyear, Brookline, Mass.
J. Randolph Coolidge, Boston
Elliott Company, Cambridge
Pneumatic Scale Corp., Norfolk Downs
Massachusetts Cremation Soc., Forest Hills
Holtzer-Cabot Co., Roxbury
Hinckley Bldg., Boston
Francis J. Oakes Jr., Brookline
Boston Transcript Bldg., Boston
F. L. Ames, No. Easton
Haddon Hall, Boston
Fenway Studios, Boston
Oliver Ames, No. Easton
Wesleyan Bldg., Boston
Charles A. Newhall (Apartment Houses No. 1101 and No. 1080 to No. 1120 Beacon St., Brookline, Mass. 7 Buildings.)
Employers' Liability Assurance Corp., Boston
Warren Institution for Savings
Hotel Hemenway, Boston
Bellevue Hotel, Boston
Trinity Court, Boston
American House, Boston

PLANTS CONTRACTED FOR AND UNDER CONSTRUCTION

Harvard Medical School, (Embracing Peter Bent Brigham Hospital, Children's Hospital, and Huntington Hall)
Pierce Hall, Harvard College
Packard Motor Car Co., Boston
Kidder, Peabody & Co., Boston
Youth's Companion Bldg., Boston
Hotel Hamilton, Boston
Winsor School, Boston
Stillman Infirmary, Harvard College
Technology Chambers, Boston
Hotel Braemore, Boston
Charlesgate Club, Boston
Washington Court, Cambridge
Oliver Ditson Bldg., Boston
Waquoit Bldg., Boston
Academy of Notre Dame—Fenway
R. H. White Co.'s Bldg., Boston
Memorial Hall, Harvard College
Harvard Union, Harvard College
Slocum Bldg., Boston
Brooks Hospital, Brookline
H. G. Lapham, Brookline
The Washington Apts., Boston
Columbian Life Bldg., Boston
Saxony Worsted Mills, Newton
Free Hospital for Women, Brookline
Convent of Notre Dame—Waltham

COMPARATIVE HEAT VALUE OF COAL AND OIL AT 18500 B. T. U. Per Lb.

Gross Boiler Efficiency with Fuel Oil	Net Boiler Efficiency with Fuel Oil	Net Evaporation from and at 212 degrees F. per pound of Oil	Pounds Water Evaporated From and At 212 Degrees Fahrenheit per Pound of Coal							
			5	6	7	8	9	10	11	12
			Pounds of Oil Equal to One Pound of Coal							
73	71	13.54	.3693	.4431	.5170	.5909	.6647	.7386	.8124	.8863
74	72	13.73	.3642	.4370	.5099	.5827	.6556	.7283	.8011	.8740
75	73	13.92	.3592	.4310	.5029	.5747	.6466	.7184	.7903	.8621
76	74	14 11	.3544	.4253	.4961	.5670	.6378	.7087	.7796	.8505
77	75	14.30	.3497	.4196	.4895	.5594	.6294	.6993	.7692	.8392
78	76	14.49	.3451	.4141	.4831	.5521	.6211	.6901	.7591	.8281
79	77	14.68	.3406	.4087	.4768	.5450	.6131	.6812	.7493	.8174
80	78	14.87	.3363	.4035	.4708	.5380	.6053	.6725	.7398	.8070
81	79	15.06	.3320	.3984	.4648	.5312	.5976	.6640	.7304	.7968
82	80	15.25	.3279	.3934	.4590	.5246	.5902	.6557	.7213	.7869
83	81	15.44	3238	.3886	.4534	.5181	.5829	.7447	.7125	.7772

		Net Evaporation pounds of Water from and at 212 degrees F. per Gallon of Oil	Gallons of Oil equal to one Ton of 2000 lbs. of Coal Oil at 60 degrees F.							
73	71	108.32	92.31	110.79	129 23	147.67	166.11	184.59	203.07	221.55
74	72	109.84	91.05	109.24	127.47	145.65	163.88	182.07	200.29	218.48
75	73	111.36	89.79	107.73	125.70	143.64	161.61	179.55	197.62	215.50
76	74	112.88	88.62	106.34	124.06	141.79	158.51	177.24	194.96	212.64
77	75	114.40	87.44	104.91	122 38	139 86	157.33	174.80	192.27	209.74
78	76	115.92	86.26	103.53	120.79	138.01	155.27	172.53	189 75	207.01
79	77	117.44	85.13	102.18	119.19	136.20	153.25	170.26	187.32	204.33
80	78	118.96	84.08	100.88	117.68	134.50	151.28	168.12	184.92	201.72
81	79	120.48	82.99	99.58	116.25	132.80	149.39	165.98	182.61	199.20
82	80	122.00	81.98	98.36	114.74	131.12	147.54	163 92	180.30	196.68
83	81	123.52	80.93	97.14	113.35	129.57	145.74	161.95	178.12	194.33

		Net Evaporation pounds of Water from and at 212 degrees F. per Gallon of Oil	Gallons of Oil equal to One Long Ton of 2240 lbs. of Coal Oil at 60 degrees F.							
73	71	108.32	103.38	124.08	144.73	165.39	186.04	206.74	227 45	248.13
74	72	109.84	101.97	122.34	142 76	163.12	183 54	203.71	224.32	244.69
75	73	111.36	100 56	120.65	140.76	160.87	181.00	201 09	221.33	241.36
76	74	112.88	99.25	119.10	138.94	158.80	178.58	198.50	218.35	238.15
77	75	114.40	97.93	117.49	137.06	156.64	176.20	195.77	215.34	234.90
78	76	115.92	96.61	115.95	135.28	154.57	173.90	193.23	212.52	231.85
79	77	117.44	95.34	114.44	133.49	152.54	171.64	190.69	209.79	228.84
80	78	118.96	94 16	112.98	131.80	150.64	169.43	188.29	207.11	225.92
81	79	120.48	92.94	111.52	130.20	148.73	167.31	185.89	204.52	223 10
82	80	122.00	91.81	110.16	128.50	146 85	165.24	183.59	201.93	220.28
83	81	123.52	90.64	108.79	126.95	145.11	163.22	181.38	199 49	217.64

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