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TREMENDOUS LOSS THROUGH SMOKE NUISANCE
GREATEST efficiency and durability at reasonable cost are obtained with ADSCO Standard Casing Construction, utilizing ADSCO (Red Diamond Brand) kiln dried wood casing.

The above cross section shows the details of this construction:

(a) Wrought Iron Pipe.
(b) Tin Lining.
(c) Standard Wood Casing — over 91% efficient.
(f) Asphaltum Coating.
(g) Roofing.
(h) Dead Air Space.
(k) Crushed Stone.
(l) Drain Tile.
(m) Roofing Strips over Tile Joint.
(n) Wrought Iron Pipe.
(p) Tin Lining.
(q) Standard Wood Casing — over 91% efficient.
(r) Asphaltum Coating.
(s) Roofing.
(t) Dead Air Space.
(u) Crushed Stone.
(v) Drain Tile.
(w) Roofing Strips over Tile Joint.
(x) Wrought Iron Pipe.
(y) Tin Lining.
(z) Standard Wood Casing — over 91% efficient.

Ample provision is made for underdrainage. The porous drain tiles are laid to grade with outlets to sewers at all low points. Crushed stone or coarse screened gravel is used over the drain tile and forms the bed on which the steam line is laid.

This type of construction is recommended for steam pressures up to 50 lbs. For higher pressures refer to Engineers' Service Department.

Write for bulletin "Underground Pipe Construction for Steam Distribution."

Rudolph Wurlitzer Manufacturing Company Heat New Building From Central Plant
ADSCO Engineers Solve Typical Industrial Heating Problem for World's Largest Musical Instrument Manufacturers

The engineers of the Rudolph Wurlitzer Manufacturing Company of North Tonawanda, N. Y., were concerned as to the most economical and modern method of heating a factory addition to their large plant.

After an inspection of the facilities for furnishing heat to present buildings, it was decided to supply steam to the new building from the power house then in use. It was found that sufficient steam was available from their present system to amply supply the new building.

The problem presented in this instance was to deliver this steam from the power house to the new building, a distance of about 160 feet, with as little heat loss as possible and through a steam line that was both practical and economical.

It was determined that by putting the steam into the line at 60 lbs. pressure, the required amount of steam could be delivered during maximum demand through a 3½ pipe line. The heating system in the new building did not require 60 lbs. pressure; however, in fact, 5 lbs. pressure was sufficient to operate it efficiently. Therefore, where the 60 lb. line entered the building, a reducing valve was installed; the pipe leaving the delivery side being 10½ in.

New plant building of Rudolph Wurlitzer Manufacturing Company for which ADSCO installation was made as mentioned in above article.
size. The volume of steam delivered through the 3'' pipe at 60 lbs. pressure easily handled the volume required for the larger pipe at the lower pressure.

The reasons for delivering the steam at 60 lbs. pressure will be readily apparent from these facts:

1. Smaller pipe was required—consequently less heat loss resulted through line radiation.

2. An ample supply of steam was available at all times for the new building—with more flexible control of pressure and volume under fluctuating conditions.

3. Desirability of having higher pressure steam available in new building.

The next consideration was the method of insulation for the 3'' line and where it should be installed. Overhead lines presented many obstacles, chief among them being the obstruction offered by such a line and its supports, and the expense and difficulty of applying and maintaining adequate insulation.

It was decided to install underground steam lines, insulated with ADSCO scientifically constructed wood casing which has been standard since 1877; a proven superior insulator and a durable, lasting conduit.

This type of installation is not only inexpensive to make, but ADSCO experience over a period of more than 50 years has shown it to test over 91% efficient, with a normal life of satisfactory service exceeding 25 years.

The ADSCO Engineers' Service Department furnished recommendations which greatly facilitated the work.

Within a week from the date the plans were approved, every item of equipment was delivered, and in a surprisingly short time the line was installed and delivering steam.

How The Installation Was Made

The installation procedure was as follows: A trench approximately 5 ft. deep was dug; common drain tile was placed at the bottom to grade and connected to the sewers. The trench bottom was then covered with a 4'' fill of about 3/4'' size stone which made a perfect underdrain, for quickly carrying surface or seepage water from the installation. The matter of proper underdrainage is always an important factor in the satisfactory operation of underground steam lines.

The properly graded, dry trench bottom was then ready for the pipe. Sections of genuine wrought iron pipe were connected and a standard thickness of asbestos covering applied. Over this was slipped 7'' bore, 4'' wall ADSCO Red Diamond Brand kiln dried casing, leaving an air space of 1'' between the asbestos covering and the casing. (For pressures below 50 lbs. ADSCO casing

(Concluded on page 11)

Cross section of ADSCO underground main (ADSCO Red Diamond Brand Casing) used in Rudolph Wurlitzer installation. Steam line enters new building at X. Perfect insulation qualities proven by fact that snow above main is not even melted.

History of District Heating

In Three Installments

No. 2

New York Capitalists Retain General Herman Haupt, C. E., to Make Exhaustive Investigation

Soon after the first district heating plant was built in Lockport, N.Y., other municipalities began to investigate the possibilities of the new method of heating.

One of the first was an organization for the introduction of district heating in New York City. These New York capitalists appointed General Herman Haupt, a prominent military and railroad engineer, to determine the practicability, utility, economy and advantages of the Holly System for furnishing heat and power.

With possibly a single exception, the subject was the most difficult that the General ever undertook to investigate. The few who had written on the transmission of elastic fluids through pipes had given rules and formulas which were inconsistent with each other and with facts proved by direct experiment.

It proved to be a most difficult task to reconcile these inconsistencies and develop a theory that would conform to known and established principles, and at the same time be consistent with the facts elicited from direct experiment.

A satisfactory solution was indispensable as on it was to be based the solution of all questions as to the capacity of mains, the losses by radiation and friction, the sizes and locations of boilers and all other fundamental considerations affecting the determination of plans of operations, capital, operating expense, profits and dividends.

General Haupt prepared a voluminous report containing rules, formulas and conclusions.

On the strength of this report a company was organized for the installation of district heating in New York City.

Some of the recommendations in the report are interesting in view of later developments. For instance,
in those days there were no modern electric light and power companies such as we have today. The use of electricity was confined chiefly to manufacturing establishments, and each company generated its own electricity.

General Haupt in discussing the possibilities of district steam heating wrote:

"It is, perhaps, not unreasonable to predict that the introduction of this system will extend the uses and applications of the electric light, one of the principal objections to which is the power required to rotate the magnets; but this power, after the introduction of steam mains, can be furnished like gas, simply by turning a cock, and at no cost whatever; for the steam, when it has done its work, can escape into the radiator, and pay for itself in warming the apartment, so that a wide door is thus opened for the use of the electric light for domestic purposes."

At the time General Haupt prepared his report, a man by the name of Ashcroft was experimenting on a steam stove. The General, seeing many possibilities if steam could be made to replace gas for cooking, conducted experiments with the steam stove which are interesting. He wrote in his report:

"A most important extension of the field of useful application of the Holly System is found in the steam stove.

"It is now conclusively established that steam under a pressure of 40 pounds per square inch, and a consequent temperature of 300°, can be utilized as a substitute for stoves, ranges and ovens for at least nine-tenths of the cooking required for families and hotels, and that the cooking done by steam is a wonderful improvement upon the ordinary mode."

The confidence in district heating expressed by General Haupt in his report to the New York capitalists has been amply justified by the successful development of the New York Steam Company which was formed as a result of his findings.

In 1882 this company was organized and eight years later a statement of its business showed:

Total Income $470,558.04
Expenses 293,072.28
Surplus 177,485.76

In that year, 1890, the New York Steam Company had a boiler capacity of 12,000 H.P.; had laid fifteen miles of underground pipe; had connected and supplied steam to more than 600 engines from its Greenwich Street station, and served over 600 customers with heat from the company’s mains. In addition, it was then operating two other steam plants in upper New York City.

The Edison Electric Light and Power Company of Kansas City laid mains for a district heating system in 1889 and paid back total investment from net income the first season.

Numerous other examples could be cited of the profitable operation of district heating projects even in the early days of its development.

Today, district heating is a known factor in the efficient and economical distribution of steam. Its rapid growth and acceptance in the past decade is an evidence of the confidence of its founders.

Plan of typical sub-division or community real estate development. Heavy lines show location of underground mains for district heating.
The old way of eliminating expansion troubles in pipe lines was with heavy cumbersome pipe bends which took up a great deal of space. In many cases the room required for pipe bends cost money—in other cases it simply wasn't available.

Often space conditions necessitated installing the pipe bends in a vertical position, in which case it was necessary to install drip traps which added to the expense.

Considering the relative costs, all items considered, the expansion joint not only simplifies the installation but actually effects large savings. The servicing and many obvious advantages of specially designed Aasco expansion joints are responsible for the rapid increase in application of these devices to all pipe expansion problems.

Aasco Expansion Joints cost less in place, remain tight, are easily installed and outlast the pipe line.

Get your Expansion Joints from Expansion Joint Headquarters.
can marshal these facts as follows:

Increased value of real estate.
No boiler to be installed.
No depreciation of apparatus.
No fires to build and look after.
No ashes to be removed.

Abatement of the smoke nuisance.
Help keep you and your house clean.
Easier to secure and maintain help.
Time saved for both servants and householders.
Reduction of fire, health and consequent insurance.
Life and health not jeopardized by coal gas or boiler explosions.

Increased value of property. Realtors find the operation of such plants quite as profitable as community theatres, garages, etc. In some cases the steam plant and garage are combined under one roof.

Steam is furnished from the central heating plant by means of well insulated underground mains, which, when properly installed, provide over 91% heat efficiency, and maintain their insulating qualities over a period exceeding 25 years.

Numerous instances of the farsightedness of real estate development operators in providing central heating systems, have come to the attention of ADSCO Engineers. In fact ADSCO service and ADSCO equipment have been utilized in carrying out many projects of this kind.

Word has just come to us of a new real estate development in Ohio, where the streets are being laid out. Not a building is in sight, yet the men at the head of this enterprise have shown foresight by including in their plans a Central Plant where steam is to be generated for heating. The underground mains conveying the steam to the radiators parallel the gas and water mains into each of the buildings as they are built. This development is to be the last word in all that goes to make the modern home comfortable.

A similar project in a suburb of a large city in Virginia went a step further and actually built all the homes on its property, establishing a community center and offering the home owners numerous conveniences which included the purchase of heat. In this operation a district heating plant is used to furnish heat and hot water. Only enough heat is sent out of the system to heat houses to 70 degrees; thus it is impossible to waste any considerable quantity. For a period of five months (October 1st to February 18th of one year) the cost of heat per house amounted to $88.00 only slightly more than the average heating expense would run in the home with individual boilers.

Rudolph Wurlitzer Installation—(Concluded from page 4)

At intervals of about 6 ft., pipe guides were inserted to hold the pipe concentric in the casing. The lengths of ADSCO casing averaged from 5 ft to 8 ft and were supplied with mortice and tenon ends, which were driven together within about 3/4 inch. A hot asphaltum preparation was poured into this space and the joint then driven together, making the installation absolutely water tight.

With the completion of the casing installation, a standard width of tar paper was placed over the top of the wood casing to further protect it by quickly shedding seepage water. The line was graded towards the delivery end and the steam condensation drip was handled through a High Pressure trap.

Expansion in the line was absorbed by a slip type ADSCO semi-guided expansion joint.

This same principle of heating buildings from a central power plant is being applied to many other industrial plants with scattered buildings, as the individual heating boilers wear out. ADSCO steam distribution from a central source saves the cost of new boilers, cuts fuel and maintenance expense and releases valuable space formerly utilized by boilers and fuel, for productive purposes.

The foregoing account of the ADSCO installation for the Rudolph Wurlitzer Manufacturing Company is but one of hundreds of examples where ADSCO service and ADSCO equipment have helped to provide manufacturers with modern, efficient and economical heating facilities, at a distinct saving in operating expense.
Railroads Losing Large Sums Through Wasteful Distribution of Steam

(Concluded from last issue)

On many roads there is a tendency to carry steam lines on overhead structures, placing dependence upon ordinary insulating methods to avoid excessive condensation losses. On the majority of railroads, however, it is the practice to carry all high and low pressure steam lines underground. These underground steam line systems employ numerous different types of construction.

Various Types of Construction Used

Some roads carry their pipe in wood casing and conduit — some lay their steam lines in vitrified tile conduit, and some in concrete. In the majority of cases, however, underground steam lines are carried merely in wooden boxes of rectangular section with practically no insulation other than that provided by the wood and the surrounding ground. These wooden boxes are susceptible to rapid decay due to moisture either from leaks in the lines themselves, or from surface water percolating through from above. In view of these conditions, it will be evident that steam line construction of this character can last only a few years at best. This is particularly true where steam lines have been laid without adequate provision for expansion — or when the pipe is carried through cinder fills, full of sulphur and other corrosive elements.

Generally speaking, the railroads have not given this matter the careful study that its importance warrants. Usually, the installation of steam lines is handled by local forces, with-
Bring Your Problems To Headquarters

Because ADSCO was the pioneer in the distribution of steam from a central source, and has maintained its leadership ever since, our Engineers' Service Department is regarded as Headquarters for information pertaining to steam distribution.

Whenever you require authoritative data on the subject, write us, and we will recommend the best practice for your particular case, as demonstrated by over fifty years experience.

Our recommendations may save you thousands of dollars on one job. If in doubt, write us.

ENGINEERS' SERVICE DEPARTMENT

AMERICAN DISTRICT STEAM COMPANY

GENERAL OFFICES AND WORKS
NORTH TONAWANDA, N.Y.
Branches and Agents in all Principal Cities

Specialists in Steam Distribution for over 50 Years.

“Our Costs Are Running Higher Than They Should,”

—began the Production Manager, “and I can’t discover the reason why.

“...and I can’t discover the reason why.”

“You make practically all of your product in your plant, don’t you?” asked the Consulting Engineer.

“Yes,” replied the Production Manager.

“If I’m not mistaken,” remarked the President, “we are processing more materials that go to make up our product than any of our competitors, yet our costs are higher than theirs.”

“That is just the point,” replied the Consulting Engineer. “It might be more profitable for you to buy certain materials from outside producers. Steam is a big factor in most of your processes, isn’t it?”

“It certainly is,” exclaimed the Plant Engineer. “You’d think so if you had to keep your eye on those hungry boilers.”

“But do you know what the steam is costing you by different departments?” asked the Consulting Engineer.

“We have no way of telling,” answered the Plant Engineer.

“It seems to me that it would pay you to meter your steam by departments,” advised the Consulting Engineer. “If you do, you may find that it is unprofitable for you to process certain materials—that they can be bought cheaper outside.”

“What meters do you recommend?” asked the President.

“There are two meters, the ADSCO Simplex Condensation meter and the St. John Steam Flow meter, both made by the American District Steam Company,” replied the Consulting Engineer. “The first is used where the steam condensate can be metered, the latter is used in live steam lines where there is no condensate to return, as would be the case, for example, where steam is run through the open end of a pipe into a tank of water.”

“I think our Consulting Engineer is right,” said the Production Manager, addressing the President. “I don’t see how we will ever know where we are at, unless we meter our steam by operations and departments.”

“That’s my conclusion,” replied the President. “Let’s put in ADSCO meters and know what our costs really are.”
Red Heat!

Is only a few degrees removed from temperature for which this valve is made.

752° is the temperature at which red heat begins to become visible in the dark according to Halcomb.

This ADSCO Nelson No. 400 Gate Valve, illustrated above, is completely mounted with high temperature, non-corrosive metal and is for 400 lbs. working steam pressure and 750° temperature.

Study the cross section and you will realize why this valve withstands the rigid service of extreme high pressure and superheat work. No detail has been overlooked. Note particularly the following:

- Deep Stuffing Box.
- High Temperature Metal Seat Bushing, insures tightness of valve when repacking under pressure.
- Solid One Piece High Temperature Metal Stem.
- Guided Wedge.
- Seat Rings of High Temperature Metal threaded into body.
- Wedge Rings of High Temperature Metal threaded into wedge.
- Long Condensing Chamber, keeps stuffing box cool. Male and female connections on bonnet flanges insure perfect alignment.

ADSCO Nelson Gate Valves are the well known Nelson Gate Valve, refined in design and manufacture. They embody such features as our forty nine years' experience in the use of gate valves has demonstrated to be desirable for better valve operation.

Write for Bulletin No 301 which describes and illustrates ADSCO Nelson Gate Valves for various pressures and temperatures.