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Published by the AMERICAN DISTRICT STEAM COMPANY
North Tonawanda, NY
OVER 50 YEARS IN BUSINESS
There's an **ADSCO** Expansion Joint to meet your requirements... perfectly!

**INTERNALLY-GUIDED**, externally guided or semi-guided expansion joints. Slip type joints for service above ground and underground where occasional inspection and attention to packing are possible.

Variators—the packless expansion joints—for use in underground installations where permanently efficient service without attention is desired.

Expansion Joints for high pressures, high temperatures, and for low pressures, low temperatures... for every size pipe line and every purpose.

That, plus **ADSCO**'s 50-year record of building dependable pipe line equipment, warrants your investigating **ADSCO** Expansion Joints for use in repairs to old systems and in the installation of new.

Complete Literature on request.

**AMERICAN DISTRICT STEAM COMPANY**

Branches or Agencies in Principal Cities

Over 50 Years in Business

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**THE** most recent step in the growth of the Edison Electric Illuminating Company's District Heating Service is a new central steam heating plant with a capacity sufficient to supply the business district.

Watching the progress of this utility, one can only speculate on the possibilities ahead for its district heating service which has been in operation in Boston since 1887.

In the year 1887 steam had been supplied to properties adjoining the steamplants of the Edison Company. Additional plants were acquired from time to time until last year there were ten in operation in downtown Boston. Before 1922 no effort had been made to connect these plants. It was necessary to keep them in continuous operation throughout the year, although during the summer or non-heating period the...
total demand upon the combined system might well have been carried by one of the plants. This condition, together with a growing demand for steam service, gave rise to consideration of the possibilities of connecting the stations by underground mains.

In the winter of 1922-23 five plants were interconnected. More mains were added and now the ten plants are operating together on a common distribution system. Early in 1928 the Edison Company entered into an agreement with the Boston & Maine Railroad to supply the entire steam and electric requirements of the North Station and associated buildings, buying from the railroad company the boiler plane located at Minot and Nashua Streets and installing the necessary mains in Nashua and Causeway Streets.

Downtown the steam heating business had been confined for years to the district between Boylston and Winter Streets but an extensive study of the possibilities led the company to seek permission of the Public Utilities Commission to engage in the sale of steam on a large scale. To replace the fourteen ground pipes from four to sixteen inches in diameter, to the buildings which will be served. The under- ground work done in Tremont Street last summer, from Winter to Beacon Streets, was an extension of the pipe line to a point from which it can be readily extended to the State House, if it is decided to heat that building from the district heating plant. The extension permitted the serving of King’s Chapel and the Park Street Church. Since that time underground work was installed in Bedford, Chauncy, Devonshire Streets and Winthrop Square, Federal and Franklin Streets.

The system of installing the mains is interesting. In the open trench a hollow tile under-drain is laid in crushed stone to take care of the drainage of surface waters. Upon the crushed stone a foundation of concrete is laid and on this foundation the pipe is installed with its necessary anchor supports and service connections. All joints are made by the oxy-acetylene welding process. The steam pipe is covered with two layers of asbestos insulation, having a thickness of three inches. This is covered with a roofing paper which is then waterproofed.

Several types of conduit have been used to encase the steam mains. The first mains installed by the Edison company were encased in an envelope built up of multi-cell vitrified tile, plastered with mortar to provide protection against seepage. In some of the later construction the multi-cell tile has been omitted and the pipes encased in a solid concrete envelope. A free air space is left between the covering and the outer casing. Construction of this type was used last summer and this summer in Kneeland Street, Harrison Avenue, Milk Street and summer Street, with the possibility also of mains being installed in Lincoln, Kingston and South Streets.

The new central heating station will have an ultimate capacity of approxi-

(Continued on page 7)
danger from fire, no worry. You have heat instantly where you want it, when you want it."

The District Heating System was designed by Fay, Spafford and Thorndyke of Boston in collaboration with the Engineering Department of the American District Steam Company. The system is of ample size and capacity to take care of the expanding needs of the village. Because of the unconventional plotting of the community in park style, rather than in the orthodox block pattern, the installation may be regarded as unusual and interesting.

In the first installation work, over 11,000 feet of steam main was laid. Since then approximately 3,500 feet have been added with further additions in prospect. The size of these mains ranges from 12 inches at the power house, to 24" pipe for the service line to the buildings.

For the first few hundred feet from the power house, the steam line is suspended fifteen feet in the air... and provides some notable differences from the usual type of aerial work. A runway of heavy planking 2 feet wide was placed on top of a line of concrete pillars. On this planking, was laid the casing covered pipe. Over the casing, and held away from it by half inch wood stringers was placed a galvanized iron hood. All joints in the hood were soldered.

This aerial line terminates in the side of a hill, and from there travels upward to the plateau on which the village is located. From that point, it fans out in many branches to all parts of the village.

The Mariemont steam line is laid at an average depth of 53½ feet which was decided to be best suited to the local conditions as well as to provide trenches for utilities installing gas, electricity and water at the same time.

Wrought iron pipe was used throughout the entire installation; and to eliminate all need for manholes, as well as to insulate permanency of service without maintenance, ADSCO Variators were selected to provide for pipe expansion and contraction. ADSCO Red Diamond Brand Casing was used on all lines; and because of the clay soil, unusual care was taken to provide under-drainage that would carry off all surface water.

The generating plane to supply steam for the distribution mains. The size of these mains may be gained from the fact that the center line of the rear steam drum will be forty-eight feet in diameter. Another important difference is in the amount of make-up water. In a district heating plant, such as the above, the "make-up" approaches 100%, quite different from the small amount required in an electric generating plant.

The new station will ultimately contain ten boilers, two of which will be installed at this time. Each boiler will be capable of evaporating 250,000 pounds of water per hour continuously when operating at a pressure of two hundred pounds gauge. The furnace of each boiler will be twenty feet wide with a volume of 12,500 cu. ft. It will be water-cooled on three sides. Some idea of the size of the boilers may be gained from the fact that the center line of the rear steam drum will be forty-eight feet in diameter. Mariemont is beautiful. Its parks, schools, golf courses, tennis courts, and the sparkling Little Miami River make it almost irresistible to the home lover. But, it is significant that its founders contrived to
DEMAND GROWS DAILY . . .

For ADSCO Multiple Diaphragm Variator

Engineers Welcome New Expansion Device as Valuable Aid to Efficient High Pressure Service

Several months ago, ADSCO announced the new Multiple Diaphragm Variator.

It met a growing need for a packless expansion joint for high pressure, high temperature pipe lines.

Engineers recognized in its design the same time-proved principles which made ADSCO'S low pressure variator renowned for efficiency and long, carefree service.

And they adopted it, without hesitation, for use on underground steam mains, where the expansion device would be buried, out of sight, indefinitely.

With the exception of new metals in diaphragm and other parts, the design of the new ADSCO Variator for high pressures (to 400 lbs.) and high temperatures (to 750 degrees Fahrenheit) is substantially the same as the ADSCO Low Pressure Variator, thousands of which have been installed during the past 30 years, with less than 1/10 of 1% ever having required attention.

Each diaphragm of this new Variator accommodates a full 3/4" movement, and can be assembled in series to provide for any expansion requirement up to 4/4" per unit. Per inch of traverse, they cost little, if any, more than much less satisfactory equipment.

Every engineer who has specified the ADSCO Multiple Diaphragm Variator has done so with the knowledge that it will live up to the high standard of performance established by every other ADSCO Expansion device. You can use it on your lines with the same assurance of faultless, cost-free service.

Write for complete technical description and prices on sizes for your lines.

ADSCO Multiple Diaphragm Variator . . .
Prior to thirteen years ago a steam distribution system could not be profitably operated in St. Louis. Before this time the business consisted of isolated plants and a few block systems. The first step in developing the present modern system was to install an eight-inch high pressure line from the St. Charles Street Plant to the Central National Bank Building, a distance of about 1,000 feet. The next year meters were put in to measure the steam used by each consumer. Formerly a flat charge was made for the service.

With the advent of meters and accurate measurement of usage, there was a demand for efficiency both in the building heating methods and distribution. Steam lines began to reach out and connect to block systems and isolated plants, every year fewer separate plants were operated. Today we have the Ashley Street Plant as the main supply with the St. Charles Street plant as a booster and the Railway and Cupples Plants as emergency plants.

The St. Charles Street Plant is used during winter months to absorb the pressure drop, which would be too great west of 10th Street in very cold weather.

To make this distribution, there is a network of underground lines of extra heavy steel pipe from 6 to 20 inches in diameter, and all in special conduit. The conduit is of multi-cell vitrified tile sides with concrete bottom and top. Crushed stone is used at the sides of the conduit and under bottom and drain tile to take seepage water to sewer.

The bottom is a four-inch slab of concrete on which the pipe rests on roller supports and guides. After being placed on the guide supports the pipes are welded end to end until they form a single piece 150 feet to 175 feet long.

This Company was among the pioneers in street main welding having used this type of construction for thirteen years. For the past seven years the company has eliminated all flanges, even welding the valves in the lines.

After the pipe lines are tested, either with steam or hydraulic pressure, they are covered with felted layer asbestos in two layers, each 1 3/8-inches thick with the joint staggered both horizontally and vertically. Over this is placed an outside cover of heavy asbestos, asphalt impregnated, and all wired tight to the pipe with copper wire. The entire pipe and conduit is then thoroughly waterproofed.

With the temperature we have on the lines there is an expansion movement of about 3 3/8 inches to each 100 feet of line. This movement is taken care of by a packed sliding joint. At each
IMPROVED EQUIPMENT FOR HIGHER STEAM PRESSURES

H. C. Kimbrough

Taking advantage of the tremendous improvements in the power plant practices of central stations, many important industrial plants, seeking increased efficiency and increased output, have adopted higher steam pressure, heat reclaiming devices, automatic regulators, improved fuel burning devices and other allied equipment.

The use of high pressures for process work, such as the manufacture of synthetic chemicals and in making paper and paper products, may be rightly regarded as the outstanding forward step in the industrial use of steam. The higher steam pressures have made possible the employment of high pressure turbines, exhausting as "process" at pressures formerly necessitating live steam. At present, there are a number of factories in United States operating at 300 lb. or more steam pressure.

Coincident with this advancement in the transmission and control of high pressure steam has been the development and perfection of the Adams line of semi-guided, externally-guided and Duplex-Sleeve Expansion Joints, as well as the Adams Multiple Diaphragm Variator.

The Adams Duplex-Sleeve Expansion Joint is designed and proportioned to meet exacting requirements of high pressure service and is manufactured of close grained grey iron for saturated steam up to 250 pound pressure and of steel for super-heated steam and higher pressures.

The Duplex-Sleeve of this joint is a feature of prime importance in the reduction of packing costs and the elimination of excess maintenance. The design of Duplex Sleeve provides an open area between the inner and outer sleeve, properly proportioned to allow circulation of air by greatly lowering the temperature of the outer sleeve, adds tremendously to the life of the packing, saves on renewals, and reduces shut downs for packing replacement to a minimum.

Duplex Sleeve construction consists of an inner sleeve of extra heavy steel pipe and an outer larger sleeve of steel. These two sleeves are joined at one end by welding which assures both a tight joint and the maximum of strength. The opposite end of the outer sleeve is held rigid and concentric by steel spacing blocks, welded into position. The surface of the outer sleeve is machined and accurately ground, then treated with a process to prevent rust and corrosion, and specially chromium plated. The stuffing box is worthy of attention. As every engineer knows, too much packing is as bad as too little, since proper compression is of great importance. The stuffing box and packing gland in the Duplex-Sleeve Joint are scientifically designed to provide for just the correct amount of packing ample, but without wasteful excess, so that the compression is evenly distributed.

Particular study has been given to the Anchors and their position on the body of the Expansion Joint to provide...
security of anchorage with a minimum of strain and to give easy access to the anchor bolts. Anchors may be provided to meet each particular condition, either in Power Plant or in transmission lines. Flanges are regularly faced and drilled according to A.S.M.E. Standards for 250 lb. pressures. The Cast Steel Body can be furnished with beveled ends for welding, when so desired, or with 400 lb. flanges.

The perfecting of this Expansion Device permits of great simplification in piping design and reduction in construction costs of high pressure, high temperature steam piping power plants, tunnels or area-ways. Actually the space occupied by the Duplex-Sleeve Expansion Joints is but 1/10th the area similarly required, where bends or ells are used.

Another recent contribution to the field of high pressure service is the ADSCO Multiple Diaphragm Variator. This, like ADSCO Low Pressure Variators, is an expansion device utilizing a flexible diaphragm to absorb movement in the pipe line. As no packing is used and as the diaphragm is practically indestructible under normal service, the joint can be buried underground with a care-free life expectancy of twenty to thirty years. The Multiple Diaphragm Variator is designed for pressures up to 400 lb. and temperatures to 750 degrees Fahrenheit. Its design, except for changes in the metals used for body and diaphragm, follows very closely that of the ADSCO Low Pressure Variator, thousands of which have been in service a quarter-century or more without attention of any kind.

Every industry endeavors to expand and with such expansion comes an increased demand for steam. It is highly important to follow such a tendency with accurate and dependable knowledge of the AMOUNT OF STEAM USED in any "process". It is even more important that any contracts to supply steam to nearby plants show an adequate rate of return, based upon known cost of producing such steam.

Elaborate control boards and the most economical steam production, with the last word in boiler plant equipment means little, if the records or the recording instruments are lacking or are of uncertain dependability.

The St. John Steam Flow Meter is designed for measuring the quantity of steam used in the operation of any "process" and to record the amount of steam required for engines, pumps, heating systems, drying rooms or other processes. Any plant using high pressure steam, will find it of immeasurable value in recording the amount of steam used in each department. It is simple in construction, has few parts and operates almost indefinitely without maintenance. The only moving part is the valve and spindle which flows with and in the current of steam.

Prevaling rates, or the selling price, for steam depend largely upon location of the producing plant, since such items as the cost of coal, delivery, labor and overhead have considerable influence upon the cost of production.

SILICOL-HYDROGEN is one of the most commonly used gases for inflating dirigibles. It is highly explosive. Pipe lines conveying it must be 100% leak-proof.

The St. Hubert airport, 14 miles from Montreal, Quebec, contains the most modern dirigible mooring mast on the American continent. Silicoll hydrogen is conveyed to this mast from the airport gas plant, ½ mile away.

Permanently leak-proof construction was imperative in the installation of the gas mains from the plant to mast top. And, to doubly insure that the performance of the line would attain as near as possible to perfection, ADSCO Engineers' Service Department was called in on all phases of design and installation as the work progressed.

The result was an installation which earned the sincere commendation of both the Dominion Government and the Airport officials.

For years Adsco Engineers' Service Department has been rendering similar service for the leading Public Utility Corporations, District heating enterprises and great industries of North America.

This same-broad experience is available to you on all major pipe line work involving the installation of new lines or the extension of old systems.

Bring your pipe line problems to
When you install an Adasco Meter you know that it will stay accurate, because careful testing has proved its reliability before it was shipped to you.

Ten different times, 500 pounds of water is run through the meter with accuracy checked at every hundred pounds. At each of these points the recording on the meter dial must coincide with the weight shown on the scale. In these tests, first cold water then hot water is used, run through at 25, 50, 75, 100 and 125% of meter capacity speed. Any error beyond the most minute tolerance means that the meter is rejected and must be recalibrated.

That’s why you can depend on Adasco Meters. That’s why in hundreds of user tests, these meters have shown a sustained accuracy within plus or minus 1% of absolute.

Write for complete specifications and prices.

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NORTH TONAWANDA, N.Y.

Over 50 Years in Business

must point to the same numeral—otherwise the Meter is rejected. This is your assurance of Adasco accuracy.

When the hand on the scale dial reaches 200 or any other figure—the hand on the meter dial

"The Meters that Tell the Truth"