AMERICAN
DISTRICT STEAM CO.

HOLLY SYSTEM

OF

STEAM HEATING

FOR

CITIES AND VILLAGES

THROUGH

Pipes Laid in the Public Streets.

LOCKPORT, N. Y.
AMERICAN DISTRICT STEAM COMPANY

HOLLY SYSTEM

Street Distribution in Cities and Villages

FOR PURPOSES OF

HEATING AND POWER SUPPLY.

OFFICERS.

R. S. BISHOP, - - - - - - - - - - President
W. C. ANDREWS, - - - - - - - - - - Vice-President
J. H. BABCOCK, - - - - - - - - - - Treasurer
B. D. HALL, - - - - - - - - - - - - Secretary
BIRDSILL HOLLY, - - - - - - - - - - Engineer

OFFICE:

LOCKPORT, N. Y.

1890.
Sectional View Inside of Small Boiler Station.
The District System of Steam Distribution.

The tendency of the age is to a consolidated service in all matters relating to the necessities or comforts of the people. Particularly is this so in closely settled communities.

By a division of labor, the few minister to the wants of the many.

Systems of lighting by gas, and of water supply through underground pipes from a common source, have been in use for many years. And later, the electric current generated at a central point is conveyed to light our streets and our buildings. These are now regarded as a necessity in every well ordered community.

Then the world demanded to know why its comfort and convenience could not be still further promoted by an extension of this beneficent provision of

CONSOLIDATED DISTRICT SERVICE.

For eight months of the year we require artificial heat. There is no living without it; so we store fuel and build fires in our houses, requiring much daily labor and care, and risk to person and property.

Then the question arose. Why can we not have heat for daily use supplied to our houses, stores and public buildings from a central station, the same as water and gas are now supplied?

Mr. Birdsill Holly, the inventor of the system of direct pumping and distribution of water, said it could be done through underground mains; and to prove it, in the face of much opposition, incredulity, and even ridicule, an experimental plant was constructed at Lockport, N. Y., in 1877, and many houses, stores, offices and churches were successfully heated through the winter.

The plan was a success from the start. It was popular with the people and successful as a business venture.

For thirteen years since that time the Company’s patrons have not been without steam a day during the heating season. In brief, the

DISTRICT SYSTEM OF STEAM DISTRIBUTION

Is a steam generating station, in capacity depending upon the amount of service to be performed; it may be one boiler or an aggregation of
boilers; mains of wrought iron pipe radiating therefrom, laid under the streets and protected so as to prevent the radiation of heat, with provision for the expansion and contraction of the iron; from the mains services taken off and leading to the buildings on either side of the street; in the buildings, whether residences, stores, churches, or public buildings, radiators of some kind to contain steam at a reduced pressure, and measured to each customer through a meter.

The same generators and system of street mains and services supply steam for power. It may be to run elevators, to pump water, to generate electricity for lighting on the premises; to do all the varied branches of manufacturing required by industries in large cities.

The system which brings

FIRE TO YOUR DOORS IN PIPES,

with which to warm your apartments, cook your food, wash, dry and iron your clothes, run your steam engines, with steam hose clear the snow from the streets, heat and ventilate your school houses and public buildings, extinguish fires, and, in fact, do all and everything that either fire or water (for steam is both) may accomplish in the domestic economy of cities, at a cost below what you now pay for the uses of fire; and what is especially interesting to cities where soft coal is used, without soot, smoke and ashes, with their vexatious train of coal buckets and ash barrels, is a system of such far reaching benefits that it has come to stay.

Your heat in the form of steam is

ON TAP

night and day. You may regulate it in your apartments by merely the opening or closing of a valve. You have no care, you provide no fuel, you avoid the risk of fire, and yet you are always warm. What other system contributes so much to the happiness and comfort of the people?

In those districts in cities where steam is on tap, it is ruining the business of the doctors. Their testimony is that there is much less sickness among the residents whose homes are warmed by District Steam. Where there are children and ladies, often in delicate health, and old people whose life is spent mostly within doors, it is important to have a uniform degree of temperature in our houses; and that the air we breathe should be free from coal gas, which is seldom the case where stoves and furnaces are in use. In our capricious climate this immunity from sudden changes of the weather can only be secured where your heat is on tap the same as your gas and your water. That
is popular, goes without saying. This is shown by the introduction of natural gas for fuel in some sections. Yet the quality of heat thus obtained is far inferior to steam. It is not so mild a heat, and plants die in rooms so warmed. Besides it is only a question of a little time when this supply will fail. This fact is emphasized by the recent cutting off of all mills and puddling furnaces at Pittsburgh, and those concerns are now restoring their coal burning apparatus. The price of gas for heating has also been increased by fifty per cent. The experiments in the manufacture of a cheap fuel gas for heating have not been reassuring. The calorific value of this product, according to trusted experts in gas manufacture, is not sufficient to allow it to profitably compete with solid fuel at ordinary prices. This fact is enforced by disastrous failures in St. Louis and many other places where large amounts of money have been invested in the manufacture and supply of fuel gas. The final result will be that all will return to solid fuel, and that steam will be regarded as the only reliable and satisfactory medium for the supplying of heat.

**STEAM SYSTEMS**

of our construction are now in operation in more than forty different cities and villages, and more than one hundred miles of underground mains are in use. Every heating and power system so constructed by us has been a success where our directions have been followed, and where the Company's affairs have been conducted in a business manner. A majority of these are purely

**HEATING SYSTEMS**

which do not run during the summer months. From these plants are heated, houses, stores, offices, churches and public buildings. They are run on comparatively low pressure. Steam is kept on night and day during the heating season.

**HEATING AND POWER PLANTS.**

These are what may be termed mixed systems, furnishing steam for all classes of engines, both large and small, and using much of the exhaust from the engines to heat the buildings in which they are located and adjoining buildings. Other buildings are heated with steam direct from the mains. These plants carry higher pressure, as high as is necessary to run the power which is connected to the steam lines. For heating, the steam is reduced to the ordinary house pressure by our regulating valve.
Smokeless Furnace, with Automatic Feed, for Burning of Bituminous Coal Slack.
The oldest and largest of these plants is that of the New York Steam Company. More than six hundred engines are connected and supplied from the Greenwich Street Station. These range from a single horse power to 2,500 horse power. Six hundred or more customers also receive their heat from the Company's mains. These comprise all classes from single offices up to the Mills building, the Western Union Telegraph building and the Government Post Office with fourteen elevators run by steam, also their engines and dynamos. Two other plants in upper New York are in operation by this company.

In addition to other work, ice factories have been started at each of the three stations, turning out three hundred tons daily.

The recent uncalled for and unwarranted attack of the Superintendent of Public Works of the city, resulted in greatly strengthening the position of the Company with the various departments of the city government; and the President of the Company reports that they did not lose a customer during the contest, and have never at the same time during any previous season taken on so much new business.

A statement of the last year's business of the New York Steam Company shows as follows:

| Total income | $470,558.94 |
| Expenses | 293,072.28 |
| Surplus | 177,485.76 |

In regard to the question of danger in operating steam mains laid under the streets, the report of the Board of Vital Statistics of the City of New York for the year 1888 shows:

- Killed by the horse cars: 64
- " Wagons: 55
- " Illuminating gas: 23
- " the electric current: 5
- " The New York Steam Company: None

Official record of deaths from injuries for 1889:

- Total deaths: 1,496
- Killed by railroads, including horse cars: 89
- " vehicles in the streets: 57
- " illuminating gas: 33
- " electric wires: 8
- " The New York Steam Company: None

For eight years past the Company has carried constantly night and day eighty pounds pressure of steam, and during that time the records show that no person has been killed and no one has been injured.
Sectional View.—Service Variator.
The following affidavit speaks for itself:

173 Broadwav. New York, June 27, 1890.

F. H. Prentiss, being duly sworn, says: "I am Chief Engineer and General Manager of The New York Steam Company, and have been in the employ of said Company and familiar with its affairs for seven years.

There has never been an explosion of a steam pipe of this Company in the streets of New York; there has never been a paving-stone lifted, to my knowledge, except by a crow-bar, in the usual way. All talk of explosions in this connection is supreme nonsense. The sudden generation of force necessary to produce an explosion, which can and frequently does take place in a steam boiler, cannot occur in the street pipes. I state as an engineer and expert in steam matters that such a thing is physically impossible, as there is no fire under the pipes in the streets. They are as safe and free from explosion as Croton Water pipes.

(Signed) F. H. PRENTISS.

Sworn to before me this 27th day of June, 1890.

LEWIS COON, Notary Public.
New York County.

THE SO-CALLED EXPLOSIONS.

which have occasionally occurred in the streets in New York, have without exception, been from the accidental igniting of illuminating gas from leaky pipes, which has collected in the subways and manholes below the surface of the streets. Sometimes this occurs in streets where no steam pipes are laid and sometimes alongside of steam pipes. In a few instances these explosions have disrupted service steam pipes leading to the buildings and caused an escape of steam. Where this occurs the trouble has often been ignorantly or maliciously charged against the steam system.

Professor William P. Trowbridge, who graduated at the U. S. Military Academy at West Point in 1848, and was afterward an officer of the Corps of Engineers of the United States Army, and who is now Professor of Engineering in the School of Mines of Columbia College, says that he has long been generally familiar with the operations of the New York Steam Company, and within the last few weeks has carefully examined its methods, plant and appliances.

The possibility of supplying steam from central stations to populous districts for the purpose of heating buildings, for power and for cooking, and for other domestic uses, has for a long time engaged the earnest attention of engineers, and not from the point of view of creating a new and remunerative enterprise so much as from the consideration of the beneficent results and public benefits which must attend the successful establishment of such systems of supplying heat.

It has been recognized that among the important benefits to the public of such systems, the most prominent and incontestable would be, first, public safety or immunity from the danger of destructive boiler explosions; second, the great diminution in danger and risks from fire; third, greater economy in the use of fuel; and fourth, improved sanitary conditions, especially of buildings, public schools and private dwellings.

It is a well established fact in steam engineering that the cost of producing a given quantity of steam from a number of boilers as compared with the cost of producing the same quantity from one boiler, is very largely in favor of the single boiler.

There is necessarily greater waste and greater cost of attendance connected with the use of a number of boilers than in a single larger boiler which produces the same amount of steam.

To no class does this consideration of economy apply more emphatically than to the middle classes and to the poor; those that are obliged to occupy tenement houses.

The waste of coal in ordinary domestic use is very great, and the dirt, the furnace emanations, and the confined air caused by the necessity of economizing fuel, are concomitant evils which the supply of steam brought from the street would in a large
Showing Line of Pipe with Single Variator and Anchorage Bar.
measure prevent. When it is considered that there are about six thousand steam boilers in the City of New York, one-third of which, perhaps, are under sidewalks or in the basements of hotels, public buildings and public schools, and that these boilers have diameters from three to six feet; that the pressure in these boilers is usually much above fifty pounds; that the boilers are constantly more than half full of water, at explosive temperatures; that they are often managed by incompetent stokers and janitors, and that with the best management they are recognized sources of danger from destructive explosions and fires; it is evident that a system in which steam pipes not over sixteen inches in diameter, made without seams or rivets, or thicker iron proportionately than that used in shell boilers, and containing no water, is comparably less dangerous than such extensive use of shell boilers.

That the public will be vastly benefited by the continuance and extension of the system does not admit, it seems to me, of a shadow of a doubt. Compared with the benefits, the slight inconveniences incident to the laying of the pipes have little weight. Much also might be said in favor of the system from a sanitary point of view. The ordinary methods of heating houses at the present day which come within the means of those in moderate circumstances, and the poor, are the use of stoves and hot air furnaces. The poorer classes not only pay higher prices for fuel than any other classes, but the expense of multiplying fires in their homes to the extent which comfort and health demand, prohibits the use of sufficient heat, and results in deficient ventilation, vitiated atmospheres, and in case of hot air furnaces, frequent and poisonous emanations, all of which are recognized conditions for inviting and promoting disease and ill health. If tenement houses were supplied with steam pipes and steam heat, these evils for the poor might be greatly ameliorated. On the score of public health, therefore, as well as public safety, the advantages in my judgment are incontestably in favor of the general supply system which the New York Steam Company has established, and I consider that on purely humanitarian grounds the Company should receive every possible encouragement at the hands of the public.

This new system is incomparably less dangerous, more healthful and more economical to the public and should be extended to all who wish to avail themselves of its advantages.

On the subject of steam mains being in any way

DETREMENTAL TO HEALTH,

Professor Charles F. Chandler, a distinguished professional chemist, says that in his opinion the matter of temperatures in the ground or in sewers has no influence upon public health in cities; that the heat would probably be greater if buildings were served by hundreds of stationary boilers, instead of taking steam from the mains of the Steam Company.

Besides, these boilers placed under sidewalks are a constant menace to life and limb by the danger of explosion.

He says further on the subject of

MICROBES,

that their production is not limited to high temperature, but takes place as low as 33 degrees Fahr., and he fails to discover anything which the Steam Company in New York has done which is dangerous to life or detrimental to health.

Mr. Charles E. Emery, an eminent practicing engineer of thirty years experience, says that in his opinion the pipes of the New York Steam Company are an actual safeguard, dispensing as they do, with the use of comparatively weak boilers placed in dangerous locations.
As regards strength of metals, 80 pounds pressure in the Company's pipes would be safer than 27 pounds in stationary boilers, whereas in actual practice these boilers are allowed to carry a steam pressure of 60 to 80 pounds and upwards, in positions where explosions would endanger the lives of many people.

The latest and among the most successful of the combined systems is that of the Syracuse Steam Heat & Power Company organized in 1889.

Length of mains, about two miles; boiler station located north side of Erie Canal: ten horizontal boilers 150 H. P. each; one large Hazleton upright 750 H. P.; largest size main, 12 inch; crosses Erie Canal on an iron bridge constructed for the purpose; then goes underground through principal streets: one branch recrosses Canal by going under in cast-iron conduit.

This plant runs the year round, operates a large number of engines, and heats largest blocks in the city. At the end of the first year the management reports, amount of business secured between $75,000 and $80,000 per annum, with a large amount more in prospect.

The margins of profit are understood to be eminently satisfactory.

**ELECTRICAL COMPANIES**

For lighting and for operating street car lines have sprung up as if by magic all over the country. Many of these employ large steam power. The profits of most of them are not understood to be so great that they would refuse to increase their net revenue in a legitimate way. Some have already acted upon this theory by adopting the Holly System of steam heating, by laying lines of street mains radiating from their boiler station into which their

**EXHAUST STEAM**

is turned and conveyed to buildings on either side of the streets so occupied. This is a waste product, and utilized in this way in heating, costs nothing for fuel or for labor in the boiler station, and but little more for office expenses.

Street Railway Companies may also

**WARM THEIR CARS**

by means of a system of stored heat in iron cylinders filled with some absorbent material, which are located under the seats and occupy no available space.

By having a few steam hydrants at convenient points on the streets these cylinders may be charged with steam in a few minutes, and which
Holly's Patent Reducing Valve and Steam Meter.
will give off their heat gradually and warm the car for hours. This is believed to be a coming method for street car heating.

The Edison Electric Light & Power Company of Kansas City, laid some mains a year ago and paid back total investment from net income first season, and anticipate making large extensions.

The Ottumwa (Iowa) Railway Electric & Steam Company employed us to build about two miles of mains a year ago, for the utilization of exhaust, and are deriving a large income from its sale of steam for heating purposes.

The Auburn Electric Light Company has been supplying steam for heating with success for several years.

Several other companies are now putting down mains so as to utilize this waste product. It should be borne in mind that the only investment required by these Electric Companies who desire to make this addition to their business, is for the underground mains to receive and distribute the exhaust.

Our facilities for constructing this work are of the best, and our experience is of value. We invite inquiry from such corporations.

The proper heating and ventilating of

**ColIge and University Buildings**

is a problem that had not been solved until the recent adoption by several of these institutions of the Holly System of underground mains, by which the various detached buildings, frequently separated by considerable distances, are all connected with a single boiler station, and a single fireman supplies heat to all the buildings.

The service is found to be infinitely better than by furnaces or individual boilers: a large amount of labor is dispensed with, and the risk of loss and damage by fire is obviated. By using cheaper grades of fuel the expenses are very much reduced.

Our system is in use at Cornell University, which heats about 7,000,000 cubic feet of space from a central boiler house.

The same system has been adopted at several other Educational and Reformatory institutions.

For the economical heating of

**Suburban Homes**

this plan is especially adapted.

Many business men in the larger cities, and men who have retired from active business to spend the evening of their days, have built elegant residences on the various railroad lines a few miles out from the busy
Holly's Patent Steam Trap.
centers of trade. They desire for their families the luxuries and comforts of city life. Nothing contributes more to this than to have their homes contain a summer warmth at all hours of the day or night independent of the care of heedless servants.

Messrs. Wendell & Smith in connection with Messrs. Drexel & Childs of Philadelphia, are building up a large tract with elegant suburban homes at Wayne, Pa., and we have just completed the construction of an extensive system of underground mains through which steam is to be ultimately supplied to some two hundred or more residences. There will not be a heating stove, a furnace, or an individual boiler in the whole place.

As yet no other product can compete with steam for heating, and none is likely to.

However much has been accomplished by the electric current in lighting and in the supplying of power, there seems to be no possibility that it can be commercially successful in producing heat as some have claimed.

We have not space to go into this demonstration, but quote in part from an exhaustive article on this subject from the “Progressive Age” of September 1st, 1890:

“Among the numerous lines of impracticable inventions referred to above is the production of heat from electricity. We do not refer, of course, to the class of inventions which utilize the electric current for heat for special uses, as the welding or smithing of metals, the heating of various instruments, etc., but to the numerous schemes for warming buildings, cars, etc., by the electric current. That this is not only theoretically but practically possible is, of course, true; but the commercial test is the one by which an invention must stand or fall, and by this test the electric radiator is at once seen to be nothing more than a scientific toy.

“The most surprising thing about this matter is that even electrical engineers seem slow to perceive this fact. Tests show the efficiency of the electric system is to the efficiency of the steam heating system as 87.2 is to 96.52, or about as 1 is to 1.1. Then if the building which requires 50 tons of coal per annum when heated by steam is to be heated by electricity, 550 tons will be required. With the utmost fuel economy which the steam engine has ever developed, this would only be reduced to some 300 tons against 50 tons for steam heating. To heat a train of seven cars in cold weather would require a 300 H. P. engine and dynamo.

“It is probably too much to expect that the simple but fundamental laws of energy will be generally grasped during the present generation; but it is the duty of every engineer to post himself upon them, and, so far as possible, to keep hare-brained inventors and ignorant capitalists from throwing away money in fruitless attempts to perfect inventions which can be seen at once to be of necessity commercially impracticable.”

Great claims have been made for

SUPER-HEATED WATER.

to be circulated in underground pipes for heating buildings.

About three years ago quite a plant was constructed in Boston with expensive and complex pumping machinery for forcing the water out and returning it to the boilers under three or four hundred pounds pres-
Simplicity Itself.

There is no complicated machinery, no engines, no pumps, no forcing process whatever in the delivery of the steam from the central station to its hundreds of consumers.

The pressure accumulated in the boilers at the station, like the heart in the human body sends the vital fluid automatically to the extremities.

Steam at a given pressure has fixed properties, inasmuch as temperature and pressure always correspond; and when delivered at any point distant from the place of generation is equally effective for use as if taken from the boiler at the point of delivery. Hence, by reason of this property, in connection with its elasticity and rarity contributing to its rapid movement, steam is better adapted to transmission over long distances than any other carrier of heat or of mechanical force. Some have supposed that steam conveyed to a distance away was damp steam, but to have dry steam pressure controls and not distance.

For obvious reasons it is more expensive to build steam mains than mains for water or gas. In the first place the pipes must have protecting coverings to prevent undue radiation.

Tests show that with our protection the loss of steam by radiation is not greater than five per cent. The Gas Companies loose far more than this from ordinary leakage. In the next place the contraction and expansion of iron at varying temperatures must be provided for, else the pipes would buckle and break. The best devices for this purpose are somewhat expensive, and it does not pay to use any but the best.

In constructing

A Steam System

the boiler house should be as central as the circumstances will admit, preferably upon a railroad track for the convenient delivery of coal. The
building in size should be proportioned to the amount of anticipated business.

The main pipe leading from the Station must be large, as all the steam manufactured must pass through it. From the point at which the pipe branches to supply different streets the size is reduced from time to time and adapted to the work which it will be required to do.

These pipes are of the best lap-welded wrought iron, tested to many times the pressure ever required in actual use, and the service pipes leading to the buildings are of the same material. No Explosion of the pipes has ever occurred and none is possible, since all the conditions leading to such a result are wanting. The mains are ordinarily laid four to six feet under ground. The iron pipe is covered with asbestos and other wrappings. It is then inserted in a wood log of best pine coated with asphaltum, the shell being four inches thick and the logs tenoned together. We have then the wood log, the air space within, and the asbestos covering, making together a very complete protection from the surrounding earth. For mains larger than twelve inch we construct Brick Conduits, the space within and around the iron pipe being filled with non-conducting material.

The single and double

VARIATORS

shown in the cuts take care of the expansion and contraction of the iron pipes. These are placed at intervals of 50 or 100 feet. No manholes are required in the streets. This device is indispensable in a perfect working Steam System. The expansion of wrought iron between the extremes, say 32 deg. and 397 deg. is about \( \frac{2}{10} \) inches in 100 feet. This difficulty caused by the use of pipes at varying temperatures is completely overcome by the Service Variator. The Service Pipes which supply the buildings are taken off from the Variators, the same protection being employed to the basement wall. To insure a fixed condition of the whole main line of steam pipe we provide Continuous Anchorage.

Inside the building

HOLLY'S PATENT REGULATOR

reduces the pressure to about three pounds, which is sufficient to circulate steam throughout the building.

HOLLY'S PATENT METER OWNED AND USED BY

this company is regarded by experts as the most novel and ingenious device in the series, and is the first actual steam-measure yet produced.
By this only reliable means, correct proper relations are preserved between the producer and the consumer. After several years of actual use by our companies, this meter is demonstrated to be practically correct, and in all recent work, no consumer is allowed to take steam except it be measured to him through a meter.

On the subject of correctness in operating, we quote from Prof. John E. Sweet of Syracuse, who in March last made a series of tests to determine this point. He says:

"With the assistance of your Superintendent, Mr. Ira A. Holly, I have made a careful examination of your steam meters, as to their construction and the manner in which they measure the quantity of steam which passes through them.

"There was set up in the works of the Heat & Power Company, first, a one and one-half inch meter for measuring the steam delivered. This one and one-half inch meter discharged the steam into a one inch meter under a pressure of 60 pounds to the square inch, and from a one inch meter the steam was delivered to an electric light engine 67 inches running 300 revolutions per minute. The meter dials were started at zero. After running eight days the one and one-half inch meter registered 5,385 units as having passed through. Price per 1,000 units, $3.15 (the rate for a one and one-half inch meter), would be $16.00. The inch meter had registered 17,250 units, which at 93 cents per 1,000 units (the rate for a one inch meter), would be $16.00, showing a difference in eight days run of only 0 units.

"We then reversed the meters, putting the steam through the one inch meter first, then through the one and one-half inch meter, thence to the engine under the same conditions.

"After running four days the one inch meter registered 9,000 units delivered, which at 98 cents per 1,000 amounts to $8.82. The one and one-half inch meter registered 2,798 units at $3.15 per 1,000, or $8.81, showing a difference of one cent between the registering of the two meters, also showing that in the aggregate the steam meters, when multiplied by their respective ratios as given in the table, are practically the same. In other words, the one inch meter has to run nearly three times as fast to do the same work in the same length of time that the one and one-half meter does, but the amount of cost to the consumer in dollars and cents would be practically the same, whether running a one inch or one and one-half inch meter to do the same amount of work, and from the care in their construction, I should expect equally accurate results from the 2 inch and 3 inch meters."

Respectfully submitted,

JOHN E. SWEET.

Passing the regulator and meter at a given and automatically regulated pressure, an accident from steam within the building, even in the most ignorant and careless hands, is no more liable to occur than from a tea-kettle.

The steam now enters the

RADIATORS

to perform the work which we set out to accomplish. No particular style of Radiator is necessary, and buildings already fitted and supplied with steam from a house boiler can, with little expense, be connected with the street main. With scarcely an exception such buildings are certain to connect within a year from the time that a street main is laid contiguous.
THE HOLLY SYSTEM OF STEAM HEATING.

THE INDIRECT.

Now, let us follow the steam, or rather water (for after losing all this heat, it becomes water at 212 deg. of heat), we cannot afford to lose the heat, and we want the water. It is conducted in protected pipes from all parts of the building where steam has been used, back into the basement; through the trap into coils of pipes set in a chamber; into the bottom of this chamber, cold air is admitted from outside of the building as in the air-furnace, and coming in contact with the coils of hot water, abstracts the remaining units of heat, and passes up through the registers into the rooms above, warm, pure air, while the water, now cold, passes into the well for future use, if required, or to the sewer.

PRESSURE IN MAINS.

The usual pressure carried in the mains of Heating Companies is fifteen to twenty-five pounds. Pipes of liberal size are recommended, as lower pressure can be maintained, which experience shows, leads to economical results.

Where steam is supplied for power, high pressure sufficient to run the different styles of engines must be carried. The same kind of pipe and the same devices are used in the street as for heating mains.

Besides heating and power other uses to which steam may be applied should be briefly stated. The water for

BATH TUBS

can be heated in a few minutes by the application of a jet of steam through a small box filled with gravel. Hot water for any purpose may thus be secured at all times with little delay. Coils of pipe arranged in suitable closets furnish the best possible

DRYING ROOM FOR CLOTHES.

Water can be forced by steam pressure to a tank in the attic, either hot or cold, and thence distributed through the building in the usual manner.

GREENHOUSES AND CONSERVATORIES

may be heated directly with steam, or by the hot water of condensation.

COOKING BY STEAM

is not new, but steam supply systems as soon as introduced in cities are likely to bring this method into common use, and steam ranges are being perfected which will hasten this consummation. One restaurant in New York City, probably the largest in the world, buys from the
steam company there fifteen thousand dollars worth of steam per annum, and serves ten thousand meals per day. It can be further stated that

**STEAM FIRE ENGINES**

may dispense with furnaces and boilers altogether, by attaching hose to street steam hydrants; more than this, every building may have a steam fire apparatus of its own, on its own premises, by simply having a stand-pipe within, connecting with the street mains, so that any floor in the building can, in a few minutes after a fire is discovered, be flooded with steam, and the fire instantly extinguished. In our large cities, vast wealth is concentrated in small areas of territory, and very few, if any, of the so-called fire-proof structures are practically fire-proof; and the liability of a great fire like that of Chicago or Boston is constantly staring property holders in the face. It is well known that steam, if supplied in sufficient quantities in an enclosed apartment, is the most effective element in extinguishing fires. It simply expels and takes the place of air, and the fire goes out. Why has not this potent agency been employed to any extent before? Plainly because the requisite conditions never before existed which the District System now affords. A small boiler on the premises would not supply steam enough to do any good. But the District System, with its immense batteries of boilers and large reservoirs of steam, held by the mains at high pressure, furnishes an adequate supply. This supply is always on hand, night or day, week-day or Sunday. It can readily be seen that the effect will be to materially reduce the

**COST OF FIRE RISKS**

within the limits of the steam supply.

To sum up briefly, some of the advantages of district steam arc:

*Steam for Heat and Power,* always on tap night or day like gas or water.  
*Lower Insurance Rates,* because of the absence of fires on the premises, and the certain means at hand for extinguishing incipient fires.  
*No Smoke from Central Stations,* saving a great loss to stocks of goods in stores from soot, and dust from registers and stoves.  
*Saving of Space,* usually occupied by boilers and coal piles.  
*Saving of Labor,* in tending fires and in removing ashes.  
*Steam for Power,* for running elevators and light machinery, thus utilizing all upper floors for manufacturing purposes.  
*Buildings with Steam* will simply disconnect from boilers and connect with street system.
Buildings without Steam can be fitted up for much less than with individual boilers.

Health is Promoted wherever a Florida temperature is introduced in our houses and obnoxious gases are banished.

Real Estate is Enhanced in Value on any street in which a steam pipe is laid, because more rentable on account of this added improvement.

As a business venture, it may be asked what are the conditions which will secure to the investor a reasonable

MARGIN OF PROFIT.

First. It is well known that there is a great advantage in making steam in large batteries of boilers, which easily evaporate 8 to 10 pounds of water from one pound of coal, while four to five pounds is the usual evaporation in house boilers. At the same time the householder must suffer wear and tear on his individual boiler, and will gladly pay more than his fuel bills to be rid of this expense, and the care and labor connected with his apparatus, and the additional advantage of steam always being on tap.

Second. While the individual apparatus must use the most costly grades of anthracite coal,

LARGE BATTERIES OF BOILERS

will consume the various grades of bituminous coal, with which nearly all sections of the country are supplied, and even the slack or refuse of the mines is brought into use, and will, ton for ton, in properly constructed furnaces, produce as much steam as the more expensive grades.

We have a dozen or more successful companies in operation right in the anthracite region where the best stove coal is supplied to houses at $2.50 per ton. They are popular and successful because of the better quality of heat supplied, and because the companies use the cheapest grades of coal from the mines.

Another thing, this cheap coal can be burned in

SMOKELESS FURNACES.

One of the greatest evils to be overcome, and which is causing much trouble and anxiety in many of our cities, is the

CLOUDS OF SMOKE AND SOOT

pouring from hundreds of chimneys. The authorities are endeavoring to

ABATE THIS NUISANCE

and to protect tradesmen from the damage which ensues to large and
costly stocks of goods and fabrics. A Steam Company with its smokeless apparatus can supply steam to all within the radius of its lines and the atmosphere can be cleared from this nuisance.

In the west and northwest where bituminous coals are plentiful and cheap, this fuel can in cities be made thus to take the place of anthracite for house use, which is dear on account of long distance transportation.

**PATENTS.**

At the inception of this enterprise patents were obtained by Mr. Birdsill Holly, not only for the separate devices in use, but upon the system as a whole. The claims which were allowed therein are very comprehensive, embracing every conceivable combination of boiler station, mains leading therefrom, with service pipes leading to a reducing valve, a meter, radiators and a trap. These are adjudged particularly strong, and are now owned by this Company. Other patents issued to Charles E. Emery are also owned by us. One or two attempts have been made to infringe, by using different devices, but on account of mechanical failures in every such attempt, it has not been necessary for us to institute proceedings in the courts.

When companies are formed we prefer to have them construct their own boiler station complete, but stand ready to give such advice and information as may be desired. But experience has shown that it is not for the company's interest to construct for themselves the street mains for the initial plant. We therefore contract for this work and turn it over to the company fully guaranteed.

The house devices, such as Meters, Traps and Regulators, we also supply, as it would not be expedient for each company to undertake this branch of manufacture for itself.

We invite

**CORRESPONDENCE,**

and will make surveys, maps and plans when desired, and furnish estimates for work to be done by us.

Address all letters,

**AMERICAN DISTRICT STEAM CO.**

Lockport, N. Y.

Following may be found a partial list of places where

**STEAM HEATING AND POWER PLANTS**

have been constructed and are now operating under our patents:
Lockport, N. Y., which is the pioneer plant, was organized in 1877. Extended from time to time and now has four miles of pipe underground. A heating system. Boiler capacity, 800 H. P.

Auburn, N. Y.—Organized 1878. Two miles of pipe underground. Owned and operated by Electric Light Company. Boiler capacity, 600 H. P.

Springfield, Mass.—Organized 1878. Four to five miles of underground pipe. Boiler capacity, 1,500 H. P.

Dubuque, Iowa.—Organized 1879. Two and one-half miles of pipe underground. Boiler capacity, 800 H. P.

Burlington, Iowa.—Organized 1880. Two and one-half miles of pipe underground. Boiler capacity, 600 H. P.

Garden City, L. I.—Put in for the Stewart estate. Heats Cathedral and many other buildings. Boiler capacity, 250 H. P.

New York City.—New York Steam Company. Organized 1882. Boiler capacity, 12,000 H. P. Fifteen miles of underground pipe. Constant pressure of 80 pounds. Steam has not been let down since plant was started in 1882. Supplies over 600 engines, including Westinghouse Electric Light Co., requiring 4,500 H. P. Three stations, at each of which in addition to steam for heating and power, ice factories are now turning out 100 tons daily. Nearly 700 takers of steam for heat.

Denver, Col.—Organized 1880. Four and one-half miles of pipe underground. Heat and power. Boiler capacity, 2,500 H. P. Heating 25,000,000 cubic feet of space.

Williamsport, Pa.—Organized 1884. Five miles of pipe underground. Boiler capacity, 1,000 H. P. Amount of cubic feet of space heated, 9,000,000. At the great Williamsport flood in 1889, the entire plant, including boilers in station, was under water to the depth of ten feet. As soon as the flood subsided, the boilers were fired up to dry out the houses. No especial damage to plant.

Clearfield, Pa.—Organized 1883. Two miles of pipe underground. Boiler capacity, 400 H. P.

Bellefonte, Pa.—Organized 1883. Two miles of pipe underground. Boiler capacity, 500 H. P.


Lock Haven, Pa.—Organized 1884. About two and one-half miles of pipe underground. Boiler capacity, 400 H. P.

Bloomsburg, Pa.—Organized 1885. Two miles of pipe underground. Boiler capacity, 500 H. P.

Wilkes-Barre, Pa.—Organized 1886. Four miles of pipe underground. Boiler capacity, 1,000 H. P. Heating Court House and other large buildings. City underlaid with anthracite.


Reading, Pa.—Organized 1887. Three miles of pipe underground. Boiler capacity, 900 H. P.

Hazleto'n, Pa.—Organized 1887. Two and one-half miles of pipe underground. Boiler capacity, 400 H. P.

Cornell University, Ithaca, N. Y.—Plant constructed in 1888. Connecting all University buildings and residences of the Faculty. About one and one-half miles of pipe underground. Boiler capacity, 400 H. P.

Allentown, Pa.—Organized 1888. Two and one-half miles of pipe underground. Boiler capacity, 600 H. P.

Lebanon, Pa.—Organized 1888. Two miles of pipe underground. Boiler capacity, 400 H. P.

Pottsville, Pa.—Organized 1888. Two miles of pipe underground. Boiler capacity, 400 H. P.

Syracuse, N. Y.—Organized 1889. Two and one-half miles of pipe underground. Heat and power. Boiler capacity, 2,500 H. P.

Ottumwa, Iowa.—Organized 1889. Two miles of pipe underground. Owned and operated by Electric Light and Railway Company. Use exhaust steam for heating.
Among the many smaller plants put in by this Company for heating and power may be mentioned those for the

Massachusetts Institute of Technology Buildings, Boston, Mass.
Phillips Exeter Academy Buildings, Exeter, N. H.
Pennsylvania Railroad Co.'s Shops and Buildings, Altoona, Pa.
Dickinson College Buildings, Carlisle, Pa.

As an evidence of

we subjoin a variety of testimonials freely given in several different cities. A great many others are at hand which space will not allow us to publish.

Dear Sir:—In reply to yours of the 26th inst. regarding the success of the New York Steam Company, I wish to say that this company was organized in 1881 and has been in operation for the last six years. It has three different plants in operation: one at Greenwich street, which supplies all that portion of the city south of Chambers street and Broadway for heating and power purposes; one at 38th street near Madison avenue, from which steam is furnished to the residential portion of the city, for heating purposes during a period of seven months of the year, and one at 115th street near East river, which, for the time being, supplies steam to a large manufacturing concern for both heating and power purposes. I enclose you maps and a list of the consumers from the down town plant and testimonials from the consumers using steam from the up town plant; the names therein appearing being known all over the country, and the expressions therein made speak plainly of the grand success this company has achieved.

The principle used in the construction and operation of the works is one known as the "Holly District Steam System." Every consumer is delighted with the facilities which the company offers, as in districts where our pipes are laid, the consumer finds steam on tap just the same as gas and water at any hour during the day or night.

The financial success of the company has enabled it to make extensions from time to time, as it was deemed advisable to use the surplus earned in further extensions of the plant, as we find the business very remunerative: the gross profit is seldom less than 10 per cent., and in smaller towns, I am satisfied the operating expenses could be reduced so that a large part of that 40 per cent. could remain as net profits.

I think the best evidence of success is the steady growth of the business.

Very truly yours,

W. C. ANDREWS, Pres. New York Steam Co.

Dear Sir:—I understand you are about to organize a Steam Heating Company in Syracuse, using the Holly System. We have just put in a forty thousand dollar plant of the same. I have had oversight of all the work and in my opinion it will be a success. By their devices, the parent company at Lockport perfectly solves the difficulties of expansion and contraction in the mains and services.

Our University Com., Mr. H. W. Sage, Prof. Thurston and Mr. Geo. R. Williams, thoroughly investigated the system before letting the contract. Prof. Anthony and myself had previously done so.

Yours truly.

J. L. MORRIS.

NOTE—The system now is in full operation and giving the most perfect satisfaction.
THE HOLLY SYSTEM OF STEAM HEATING.

BLOOMSBURG, Pa., July 28, 1888.

Gentlemen:—Yours of the 26 ult., at hand. We have been in operation two seasons and the half of another. We made the first season, a little over four per cent. upon amount invested in our plant. This last season we made full six per cent. A portion of the earnings have been expended in betterments and extensions. We are heating about 31,000,000 feet of space.

Both our customers and stockholders are satisfied with the heat furnished and the returns from the business, so far as we can learn. We do not furnish power, but heat alone.

Yours truly,

JOHN M. CLARK, Sec'y.

THE WILKES-BARRE HEAT, LIGHT AND MOTOR CO.,
WILKES-BARRE, Pa., Dec. 13th, 1888.

Dear Sir:—Yours of the 26th inst., received: replying I would state that our plant has been a decided success, growing from 15 consumers in '86 to 180 in '88: this is for the supply of heat, the company furnishing no power.

We heat the Court House and other large blocks of buildings and are running very successfully. Expect to pay a dividend from the present season's work.

Very truly yours,

J. J. ROBBINS, Supt.

AUBURN, N. Y., July 28, 1888.

Gentlemen:—Your favor inquiring about the success of the Auburn Steam Heating Co., is received.

Our Company now owns the franchises and plant of the Steam Co.; having purchased it some years ago for an Electric Light Station. We found that the plant was put in early in the history of the Holly system, was poorly constructed, pipes and mains too small, and often laid too close to the surface, but we made some changes, re-laid mains and expect to change more, and can say that it pays very well, but not as well as if it could all be constructed over to meet the advanced state of the art. It has been a great success with consumers. People are anxious to have us increase our plant and take new streets on. At present we have nearly all the stores, banks, offices, several churches and some of the best dwellings, including General Seward's residence. We have made no cash dividends, all our earnings have gone into bettering of plant.

Yours very truly.

THE AUBURN ELECTRIC LIGHT CO.,
Per B. C. SMITH, Sec'y.

HARRISBURG, Pa., July 30th, 1888.

Gentlemen:—Yours of the 26th inst., received, and in reply would say last season was our first season. The plant was not finished till late in the spring of '87. Our Board are perfectly satisfied with the financial and mechanical success of last season. We only had 53 consumers with three million cubic feet of space heated, whereas, our capacity is 20 million with about 500 consumers. (Street Mains, 2½ miles; Service pipes, ¾ of a mile.) We more than cleared expenses for the small amount of business done on a capital stock of $50,000. And we are satisfied, after obtaining sufficient consumers, that it will be a good investment. Our consumers are pleased with the service. We do not furnish power as yet. We have had no trouble with our Steam Mains, part of which lay under Sheet Asphalt street pavement; no leaks or repairs. The pressure of Mains has never exceeded 20 lbs. in the coldest weather, and have been tested at 100 lbs. pressure. And will close by saying a street system, properly managed, is a complete success.

Very respectfully yours,

HARRISBURG STEAM HEATING AND POWER CO.,
R. HENRY GALLAGHER, Supt.

PHILLIPSBURG ELECTRIC LIGHT, GAS, POWER AND HEATING CO.,
PHILLIPSBURG, Centre Co., Penna., July 30th, 1888.

Gentlemen:—Your favor of the 26th inst., received. We started our plant in 1884, combining it with the Electric Light Co., which had started in 1883. We heat over 1,500,000 cubic feet of space at distances from the plant, varying from one-half to three-quarters of a mile, in different directions. The plant is a success, and we compete with hard coal heating. Two years ago, we leased the plant for three years at 6 per cent. net to stockholders, and I believe the lessee is making money.

We furnish no power except from Electric circuit.

Yours very truly,

J. N. CASANOVA.
We are heating three and a half millions of feet, and pay 5 per cent. on our stock and probably more. We have no difficulty with pipes leaking. Our consumers are delighted with the results we have obtained, and we have no stronger advocates of the system than those who have used it.

BLOOMSBURG STEAM CO.,
J. M. CLARK, Secretary.

Gentlemen,—We have a plant of the Holly Steam System in our city, and I do not exaggerate when I say our people are delighted with it. It is a great luxury over the old system of heating buildings. Last year being our second winter, paid us six per cent. clear, and we think the future bright for big dividends. We did not have one particle of trouble with leaky pipes in the two years we have been running. We have not laid out one cent for repairs, outside of our boiler house, and in boiler house, only such repairs as you know would be necessary under boilers.

R. M. FORSMAN, Sec'y and Treas.

SPRINGFIELD, Mass., July 10, 1886.

Your letter of 17th ult., came duly to hand; we have a great many similar letters but have not time to answer them. We have been in the business seven years and learned the workings of the system pretty well and it is all right. We carry steam over three miles, heating large public buildings and private dwellings, without any difficulty whatever.

Consumers are delighted with the service rendered, and if we had room at our works for more boilers could extend our pipes and double our business. This is why some time do. You ask does it pay? Below I give figures of last season’s business:

Capacity of boilers about 700 horse power.
Coal used 4,366 gross tons. Cost of coal $3.28 per ton.
Revenue per ton Coal used 6.37 per ton.
Total cost Coal, Firemen........................ $17,604
Revenue.................................... 28,027

$10,423

Cost of Water, Boiler and Street Repairs,
Teaming, Men and Meters......................... 2,127

Net $8,295

Capital Invested......... $58,518.60

The figures will enable you to form an opinion as to what you can do in your city. I think that with the late improvements or devices of the American District Steam Co., we would show better results.

J. L. HALLETT, Superintendent.

(Note—Since the above was written the Springfield Steam Co. has built a new boiler Station, and more than doubled its boiler capacity and lines of pipe.

DENVER, July 26th, 1886.

Our Capital Stock is $120,000. Received from Steam revenue last season $36,311.03.
Our profit was $14,208.42. We have 15 boilers, 17 feet long, 5 feet diameter. Our coal is a very inferior quality, giving very bad results.

We are paying cash dividends of 8 per cent. per annum.

WILLIAM RIDGEY, Engineer and Supt. Denver City Steam Heating Co.

(Note—In 1885 this company put in $50,000 in extensions, and now furnish steam for power as well as heating.)

SYRACUSE, N. Y., October 31st, 1890.

Gentlemen:—I have been superintendent of the Syracuse Heat and Power Company since it commenced business, in the supplying of steam for heat and power. The boilers were first fired up October 1st, 1885, and steam has been on every day since that time. We carry 65 pounds pressure for regular work during the day and about 40 pounds at night. The company commenced work with a battery of ten horizontal boilers of 150 H. P. each. Before the end of the first year the business had outgrown our boiler capacity, and the company contracted for a 750 H. P. Hazleton Upright Boiler, it being the largest one of the kind ever constructed. The boiler is 62 feet high by 52 inches in diameter and contains 1,966 tubes, 4 inches in diameter by 40 inches long. In connection with this boiler we also have four of the Murphy Automatic Smokeless Furnaces, which are working splendidly with not one particle of smoke, and we are burn-
THE HOLLY SYSTEM OF STEAM HEATING.

We are now supplying steam from this boiler and are much pleased with its operation. We are serving steam to fifty engines and have about 350 heat consumers, and will soon have all the business we can take care of, and will be compelled to erect another large Hazleton boiler. Our customers are very much pleased with the service. Our main steam pipe crosses the lane over an iron bridge erected for the purpose, and one branch re-crosses the canal through an iron conduit. It looks as if the increasing demand for steam would require some material extensions of mains another year.

Yours respectfully,
IRA A. HOLLY, Supt.

TESTIMONIALS FROM INDIVIDUAL CONSUMERS.

859 FIFTH AVENUE, NEW YORK, April 14, 1888.

Gentlemen:—I have been using your service pipes for the supply of steam to my house for the past two seasons with entire satisfaction, and gladly attest its merits. Can recommend it to the public.
Respectfully,
H. O. ARMOUR.

23 WEST 57TH STREET, NEW YORK, April 10th, 1888.

Gentlemen:—Last Summer I put in the service pipes of The New York Steam Company, and have found my heating apparatus so arranged and controlled by the introduction of the thermostat that human interference ceased, and, under all conditions of the weather this winter, my house has been most delightfully warmed. The bill for the service were entirely satisfactory, and it affords me pleasure to send you this.
Respectfully,
SIDNEY BILLON.

689 FIFTH AVENUE, NEW YORK, April 10th, 1888.

Gentlemen:—I have used the steam service supplied by your street mains for two seasons, and do not hesitate to say that the even and abundant supply at all times enables me to obtain much more satisfaction in providing heat for my residence than I ever had before.
Yours truly,
WM. ROCKEFELLER.

28 WEST 57TH STREET, NEW YORK, April 13th, 1888.

Gentlemen:—The steam service furnished by your Company is certainly one of the important improvements of the age. Experience enables me to give it the highest praise and unqualified commendation. Very truly yours,
GEORGE S. SCOTT.

810 FIFTH AVENUE, NEW YORK, April 13th, 1888.

Gentlemen:—I take great pleasure in commending the steam service of your Company to the public. We have used it for two winters and find it a great comfort. The uniform temperature obtained must be largely beneficial to health.
Yours truly,
WILLIAM BELDEN.

817 FIFTH AVENUE, NEW YORK, March 30th, 1888.

Gentlemen:—The supply of steam furnished by your Company has kept my house much more comfortable than I could have it by the use of my own boiler. After trying it two seasons, I recommend your service.
Respectfully,
C. A. POSTLEY.

22 EAST 62D STREET, NEW YORK, April 1oth, 1888.

Gentlemen:—Those who order the steam service put in will be glad they have done so, and those who don't will be sorry when they learn what "perfect comfort" their neighbors have secured. These are the sentiments of your consumer.
SOLOMON TURCK.

Metropolitan Club, 756 FIFTH AVENUE, NEW YORK, April 2d, 1888.

Gentlemen:—We are very much pleased with the steam service supplied by your Company. We think we have got a corner on the cold weather that used to invade our house. We get Florida temperature when zero weather is full grown outside. It is very satisfactory.
Respectfully yours,
D. S. RITTERHAN, President.

6 EAST 67TH STREET, NEW YORK, April 1oth, 1888.

Gentlemen:—I am much pleased with the steam service. It is a convenience that will become indispensable to housekeepers, steam is so much preferable to the old style of furnace.
Very truly yours,
MRS. A. MURRILL.

22 EAST 64TH STREET, NEW YORK, April 3d, 1888.

Gentlemen:—After my winter's experience with your steam service I would not willingly be without it, and hardly know how to say enough in its favor.
Sincerely yours,
HARRIET A. WALTER.

709 FIFTH AVENUE, NEW YORK, April 3d, 1888.

Gentlemen:—I find a decided improvement in the quality and temperature of the heat supplied to my house this winter over last, and glad I demolished the hot.
furnace. Your Company is supplying my house with heat so satisfactorily that I will take pleasure in recommending my friends to do likewise.

Respectfully, 

JOHN A. C. GRAY.

31 WEST 57TH STREET, NEW YORK, April 2d, 1888.

Gentlemen:—I have had the steam service as supplied by your Company for heating my house for the past two winters. It is a very great improvement on running one's own boiler and has worked to my entire satisfaction.

Yours truly, 

J. ROTHSCHILD.

47 EAST 66TH STREET, NEW YORK, March 31st, 1888.

Gentlemen:—Have had the steam service all winter and cheerfully indorse it as being the most thorough way of heating. I regard it as worth all it costs over the hot-air system of furnaces.

Yours truly, 

W. M. HOLT.

14 WEST 58TH STREET, NEW YORK, April 2d, 1888.

Gentlemen:—I can safely recommend the steam service as supplied by your Company in preference to other tried methods of heating one's home. I am so greatly pleased that I discontinued the use of my boiler and connected with your steam service.

Respectfully, 

HENRY SAMPIISON.

21 EAST 57TH STREET, NEW YORK, April 2d, 1888.

Gentlemen:—We are all very much pleased with the steam heat, and find that we can thoroughly warm our house, even in the coldest weather.

Yours very truly, 

W. JENNINGS DEMOREST.

602 MADISON AVENUE, NEW YORK, April 17th, 1888.

Gentlemen:—The steam service supplied by your Company, and introduced into my house last fall, has been highly satisfactory. The house has been much more comfortable than it ever was with the furnaces, and I am pleased at having made the change.

Very truly, 

GEORGE STORM.

23 EAST 57TH STREET, NEW YORK, April 16th, 1888.

Gentlemen:—The service is all I had hoped for. I have not the slightest reason to say a word against it. On the contrary, I shall not be slow to inform my neighbors that it is the most perfect method of heating a house extant.

Respectfully yours, 

A. D. BREED.

656 MADISON AVENUE, NEW YORK, April 18th, 1888.

Gentlemen:—I cannot speak in too high praise of your steam service. I would not be without it, and feel confident if people generally knew of its merits as I do they would all want it.

Respectfully, 

V. HENRY ROTHSCHILD.

Gentlemen:—I have now been supplied by your Company with steam from the street mains to my house, No. 800 Fifth Avenue, for two winters, during which time it has given me entire satisfaction, and the supply has been continuous without a break.

My experience during the past winter has been that your bills for steam have been less than I would have been obliged to pay for coal if I had run my own boiler. A constant supply of heat, light and day, we find a very great convenience, especially in case of sickness, as we are enabled to keep the temperature satisfactory at all hours. To be relieved from the dirt, dust and other annoyances on account of handling coal and ashes in and out is a very great comfort, which none can appreciate until they have tried it.

Yours truly, 

J. A. HOSTWICK.

WILSON PETERTON, M. D.

668 FIFTH AVENUE, NEW YORK, April 17th, 1888.

Gentlemen:—By your system of supplying steam I have had my house heated for the past two winters. I am pleased with it. I never had my house warmed so comfortably before. Your patronage should increase amazingly, once the people get to understand its superiority.

Respectfully yours, 

E. FRANK COE.

670 FIFTH AVENUE, NEW YORK, April 18th, 1888.

Gentlemen:—I have been a consumer of steam supplied by your service pipes for the past two seasons, and have had a great satisfaction as compared with the supply made by the use of a boiler on the premises. I much prefer that furnished by your Company, and hope you will receive liberal patronage from the property owners on your line.

Yours truly, 

FREDERICK GALLATIN.
THE HOLLY SYSTEM OF STEAM HEATING.

600 MADISON AVENUE, NEW YORK, April 20th, 1888.

Gentlemen,—I take pleasure in testifying to the efficacy, comfort and healthfulness of your method of heating dwellings by steam, which I have employed during the past winter. It has given me so much satisfaction, that I would return to the old plan of heating by furnace with great regret.

Yours respectfully,
T. GAILLARD THOMAS, M. D.

685 MADISON AVENUE, NEW YORK, April 20th, 1888.

Gentlemen,—In answer to your inquiry, I am happy to say that I have found the steam heat all that I expected. It heats my house in the coldest weather; it is equally manageable and desirable in the moderate and very mild weather. The quality of the heat is admirable. With a little attention, it is easily controlled and regulated. I regard it as one of the greatest luxuries afforded by modern invention, and I am sure, when known it will be generally used. When you make the cost not to exceed that of a furnace, it will leave little to be desired.

Yours truly,
WHITTIER H. PECKHAM.

781 MADISON AVENUE, NEW YORK, April 19th, 1888.

Gentlemen,—The steam supplied by your Company has been in use the past winter in the Church of the Holy Spirit and also in the rectorcy. The supply has been regular, and the comfort of all interested has been greatly enhanced. We would not go back to the old and imperfect method of heating for thrice the amount the steam costs.

Very truly yours,
REV. DR. EDMUND GUPTILL.
Rector Church of the Holy Spirit.

703 MADISON STREET, NEW YORK, April 18th, 1888.

Gentlemen,—Have used your steam heat for two years. I cannot write you how much I value it, for its uniformity of heat, its comfort and cleanliness to both furniture and paintings. I have never enjoyed so much comfort for so little expense.

Yours truly,
C. LAMBERT.

NEW YORK, April 23d, 1888.

Gentlemen,—I have used your steam service supplied by your Company during the past winter in my house, No. 685, Fifth Avenue, and take pleasure in saying that the service has been entirely satisfactory.

Truly yours,
H. M. FLAGLER.

NEW YORK, July 27th, 1886.

Sir,—In answer to your letter asking a few questions about the Holly Steam System, we would say that we have been using it since it was introduced in this city, and it has never failed to do our work. We do all our cooking by steam. We have found the supply sufficient and reliable at all times. As to the difference in cost between this system and the old way, we cannot inform you, as we have never used steam from a boiler of our own.

Before using the steam furnished by this system we got our supply from the boilers of the N. Y. Times. Our experience with this system has been entirely satisfactory. Your letter was misplaced in some unaccountable way, therefore you will please excuse the delay in answering.

Yours truly,
NASH & CROOK.

NOTE.—These gentlemen are the proprietors of the well known restaurant in Park Row, New York City, serving 3,000 meals daily.

Dear Sir,—In regard to the use of steam by me, as furnished by the New York Steam Co., I would say they have always furnished an abundance of it night and day at a pressure of 80 lbs., this pressure I use for driving machinery and throttle it down to 30 or 40 lbs. for cooking. Steam is a great necessity for power, light and heat, and will eventually be used and furnished from the street the same as gas or water.

The longer I use it the better I think of it.

Success must attend good management in making of steam for cities, the same as gas, water or street railways.

Yours respectfully,
SMITH & MCNEILL.

NOTE.—This firm, corner of Fulton and Washington streets, New York City, supplies on the average 10,000 meals daily.

From Governor James A. Beaver, present Governor of Pennsylvania:

BELLEFONTE, Pa., May 24, 1886.

Your letter of the 17th inst., has been received. We have had the Holly System of steam heating in successful operation in Bellefonte, for two years. It has given a doubted and universal satisfaction. It has been a success in every way.
The patrons of the Company are well satisfied and the system is being extended every year. It costs us less than heating in the ordinary way, heats our house much more satisfactorily, is much more cleanly and more desirable in every way.

Very truly yours,

JAMES A. HEAVER.

HARRISBURG, June 14, 1888.

Having requested my views on the use of steam heat in my residence, as furnished by the Harrisburg Steam Heating Company, I cheerfully give them in brief. I may premise by stating that fully believing steam heat to be the heat of the future, and in order not to have any responsibility divided in the success of its introduction, I had the work done at my residence by the Heating Company.

As to freedom from gas, dust, and other vexatious annoyances of coal burning, I cannot speak too highly. The steam heat has proved a charm. Its absolute safety also relieves the minds of the household, for there was no wandering over the house at bedtime to ascertain if “all was safe.” They can “lie down to pleasant dreams,” feeling that, so far as their own house is concerned, there are no fears of fire.

As to its excellent sanitary effect upon our dwellings there can be no doubt. No coal gas! No dust! The steam heat requires regulating, however, but this is easily learned and done, for not only on this is depending the comfort of our homes, but economy in the use of steam heat.

To sum up, permit me to say that I could not be better pleased than I am with the entire workings of the steam heat during the past winter.

Yours with respect,

WILLIAM H. EGGLE, M.D.

HARRISBURG, Pa., August 9, 1888.

We heated our store room last winter with steam supplied by the Harrisburg Steam Heat and Power Company, and can heartily recommend it, both for convenience and efficiency.

In answer to your inquiry in regard to steam heat furnished us by your Company, I take pleasure in stating that it has given us full satisfaction in all respects. There is no convenience we prize so highly as the steam heat in our house, except the water. We have used it since February 22, 1887. It has afforded all the heat necessary since then. There is no other mode of heating that I would exchange it for.

D. Z. CUNKLE, 310 Market Street.

HARRISBURG, Pa., July 26, 1888.

The store rooms, Nos. 334 and 336 Market street, occupied by Dives, Pomeroy & Stewart, dry goods, are heated with steam supplied by the Harrisburg Steam Heat and Power Company. It affords us great pleasure to say that the heat has been highly satisfactory, and can substantiate all the advantages claimed by the Company as far as our experience goes. By reason of the uniform pressure through the street mains, we were enabled to maintain an even temperature at all times, even during the severe cold spells of the season, and were often complimented by the ladies as having the most comfortable shopping quarters in Harrisburg. We would not like to do without it.

WM. H. BENNETHUM, Manager.

Dives, Pomeroy & Stewart.

HARRISBURG, Pa., July 24th, 1888.

During the past winter College Block has been heated from your plant and has given entire satisfaction, not only to myself, but to the numerous tenants throughout the building. It has given satisfaction not only as to cost, but in regular, uniform heat. It avoids the dirt from coal and ashes and necessitates the cleaning of rooms less frequently, which makes it more valuable in stores and offices. The danger from fire is decreased to a minimum, which is a fact that the Fire Insurance Companies should not fail to recognize.

S. W. FLEMING.

HARRISBURG, Pa., August 2, 1888.

I desire to say to you that the apparatus and the steam service furnished to me in storeroom and entire building has been so much superior to what we have had in the use of furnaces and stoves that I can without hesitation pronounce it perfect. The entire absence of dirt and dust makes this manner of heating very desirable, especially in storerooms. The cost has been low, very little if any more than cost of coal, removing of ashes and attention to furnace, not to speak of the convenience of having heat at any and all times. I assure you I would not be without it if the cost were double what it has been. It has given me perfect satisfaction.

HARRY C. ROSS, 21 North Third Street.