11/20/19

REMINISENCE AND THE EARLY DAY STRUGGLE

OF

CENTRAL STATION STEAM HEATING.

In the early sixties there was organized in Lockport, a company known as the Holly Manufacturing Company, for the manufacture of sewing machines, skeins and boxes, flat iron, sinks, and many little articles of iron and brass, and with Birdsall Holly as it's manager.

Mr. Holly originally came from Seneca Falls, N.Y., where he had been in the machine business for many years, and had invented and given to the world the great "Sybills Steam Fire Engine" and the rotary pump. But Lockport afforded him a larger field and the shop he managed soon became not only a success, but quite an item to the success of a number of industries for Lockport.

In 1864-65 larger and more modern shops were built on Lock Street and they added to their product a manufacture of all kinds of cistern pumps, and also the rotary pump on a larger scale.

Under Mr. Holly's inventive ability the company soon employed a very large number of men, until a demand for its product demanded still larger shops and additions thereto.

At this time Holly also gave to the world the benefit of his now famous system of water works, by pumping water, under pressure, directly into mains laid underground, thus dispensing with the use of reservoirs and stand pipes, and steam fire engines, and hand operative engines. The latter was the only fire protection Lockport had at that time and the new system was at once installed by the city.

This system was a pronounced success and the demand for it was so great, from many parts of the country, that shops for its manufacture had to be more than doubled, and it soon became known all over the country until pumping directly under pressure is now about the only system used, except in districts reached by fire engines, outside the line of pipe.

Other stirring and important things, from Holly's brain were soon to follow, as he had conceived the idea of ~~central station~~ District steam heating, or the heating by steam of buildings, from a line of pipe laid underground, the same as water and gas.

This scheme did not meet with the instant success that the water system had, but on the contrary met with much criticism, pronounced by mechanics and the leading papers as both foolish and visionary, and totally impractical.

For a time Holly failed to get not only financial aid but moral support to make any experiments but he persisted and made many experiments at his own expense, to demonstrate his theory.

As no small boilers were then being made, he had constructed, a crude affair like a locomotive boiler, about twofeet in diameter and six feet long, with four or five large tubes.

The grate consisted of boiler iron drilled full of holes, and this boiler he set up in the basement of his own residence, and in his yard and the adjoining one, laid a continuous line 1-1/2 inch pipe back and forth, making in all 700 feet of line.

No small fittings were to be had and this pipe and fittings were sent from Seneca Falls, all fittings could be had only in brass. No wood casings could be had so this line of pipe was laid in a wooden box made of two inch plank and some three and one half feet underground. The pipe was covered by heavy asbestos, then a sort of felt, then building or porous paper, then Manilla paper was put on with twine.

Connections being made to boiler it did not take long to try the experiment. The writer does not recall that any tests were made, other then to demonstrate that steam could be carried underground. Very much interest was displayed by a

number of people in this test. Ten pound pressure was used and was soon heated up and was soon returning to boiler, and after days of such testing, was pronounced a success.

Then Holly had his residence fitted up with crude coils of pipe to try out the house heating problem.

Steam was first taken to the attic, and into what he called a distributor. Placed upon the ceiling from the sides of this distributor, separate supply pipes were taken down to each separate heater, or coil, and the returns taken to the basement into a loop used as a trap, and the condensation wasted.

And with this crude outfit the heating problem was solved, but the critics said "yes, he may succeed in carrying steam underground around a small yard, but let him try to carry it a considerable distance and he will surely fail."

Holly had now given up the active management of the Holly Company that he might give his entire time to the further developmentof the underground heating problem, and he spent much time trying to interest capital to organize a company for a further and larger development of the scheme. He found much up-hill work so far. He had been so persistent that many considered him lightly and visionary, still his friends, and he had many of them, had great confidence in his past engineering ability, but it seemed quite significant that now or for many years after, did a single one of my mechanical

ability seem to consider Holly's idea of carrying steam underground, anything but a foolish vision. But he finally secured some financial help and all his backers were men in other walks of life than mechanics.

Finally in the early spring of 1877 a company was organized with a capital of twenty five thousand dollars, and was called the Holly Steam Combination Co., limited. The then, town of Lockport, willingly granted the company a franchise to open the streets for the laying of steam pipes on any streets, and at any time they saw fit.

Only enough of the capital stock was payed in to enable the company to build a small boiler house and coil shed and a chimney 30" square by 50 feet high and equipped the station with one boiler and pumps and to lay the necessary underground mains, and then commenced a very busy seasonfor the parent company.

Ground was soon broken on Elm Street for the boiler house, all of the devices for street work, such as fittings and expansion joints had to be made new. No drawings of any kind were to be had except such sketches as were made on scraps of paper by Holly. No pipe for such a large job could be had except from a long distance, and a long wait. Casing or bored out wooden water pipe was obtained from a wood water pipe mill at Williamsport. The one boiler used at station was a second hand, upright, with dropped tubes about seven feet in diameter, and ten feet high. This came from Buffalo, by boat, and was soon

erected and connected to the stack before the station walls or roof were finished.

Pipe now commenced to arrive and the street mains were started, and guesses were made as to the proper size mains to lay. Finally a trunk line of four inch pipe, 350 feet long was laid from the station up an alley to Locust Street, then 500 feet of three inch south on Locust to Genesee, then 700 feet of 2-1/2 inch pipe east on Genesee to the Dr. Bishop house, then 200 feet of 2 inch was laid west on Genesee to the Eliot house and the widow Holmes house, then 250 feet of 3 inch pipe north on Locust Street to Walnut, then 350 feet of 3 inch west on Walnut to the Lutheran Church, the Harmony house, the Hooper house and Emmons house, and this was the extent of the mains laid this season as no more customers could be had.

The usual committee of forty seven was everywhere, at the station, along the lines of pipe, telling Holly and the men just how to do the work. No services larger than 3/4 were put in except to the Lutheran Church, and this was one inch, and in some cases two houses were connected to one 3/4 inch service.

Everything was ready in due time and the coils for heating were placed in the houses. The writer does not recall the day steam was turned into the mains but it was quite cool weather and much interest was manifested by the citizens and a large number was at the boiler house to witness

the success or failure of the heating scheme.

When all was in readiness a young son of Mr. Holly turned thirty pounds pressure of steam into the mains and in thirty minutes every house on the line had steam and in all houses all of the coils were hot, and then the entire system was pronounced a success.

Steam gauges were placed in all the houses and the loss in pressure was but two or three pounds, and everything ran smoothly for some days but trouble soon appeared.

The water used to make steam came from a point in the canal where the water works company's pumps took suction, and near where the main sewers of the city emptied, and this water contained all kinds of foreign matter, and frequently stopped the boiler feed pumps until screens had to be placed before the pumps and even them, cleaned two to four times a day, such matter as small fish, lizzards, eels, grass, coal and chips and all kinds of paper accumulated.

Much of the finer matter found its way into the drop tubes of the boiler and as they were solid on the ends over the fire, they could not be cleaned and the boiler was run until accumulated matter baked in the end of tubes, then they would burn off two to six at a time and put out the fires. This caused a considerable number of embarrassing shut downs during the winter, for repairs, but as none of the houses on the line had abandoned their stoves or furnaces, nor was any house completely fitted, some had only one coil and others three or four, so they did not suffer much for the lack of our steam, still it gave

the critics a chance to say, " I told you so ".

The company finally struggled through the winter, and at a loss, but this was expected. The second season more capital was called in and they installed another boiler 5 x 16, made by the Holly Company, and they also extended the mains three hundred feet on east Genesee Street to the Van Horn house and the Bray Fregle house, and the Atwater house; on west Genesee they extended 800 feet to the McCrea house and the Judge Holmes house, and the Williams house, also a short spur 150 feet to the Baptist Church, which was the second church on the line.

The line was then extended west on Walnut Street some 1300 feet to the James Jackson house, the Croker house, the Woodward house, and the A.F.Brown house, and to the residence of Samuel Rogers, and east in the alley to the Washburn Street school. Experts had come from New York to fit up this school but did not complete their work until late in the season, at which time they came on the line.

This summer the company also installed a small plant at Auburn, New York, also quite a plant at Garden City, Long Island, and at the Soldiers Home in Dayton, Ohio. All these gave the company considerable prestige as well as some money.

The second winter was now upon the company and they passed through it with little trouble. The upright boiler in the station was fitted with new tubes but was used only while cleaning the horizontal boiler and this had all it could do to supply the demand, but only minor trouble prevailed until Spring, then considerable extensions were made.

Now that the underground heating was made a success, considerable short extensions were necessary, everywhere.

The company was much handicapped to obtain pipe and fittings and some form of heater, to take the place of the crude and unsightly box coil. No radiators being made at that time and no such thing as steam fitters, all had to follow Holly's plans and learn the best they could, by experience. Holly's idea in fitting was as described in his own residence but he met the situation as to radiators by designing the tin atmospheric radiator, and these were a great improvement, and many were made and sold for the next three years to parties using central heat, but he still used the attic down feed from the distributor into the top of radiator. Soon committees from other cities came to Lockport to look into this question of central station heating.

Later in the second spring 1878 the noted engineer, Charles G. Emory, was sent to Lockport, by moneyed men of New York, to make experiments and tests as to the success or failure of underground heating, and he remained here some weeks and made many tests at the Samuel Rogers house which was then the farthest point from the station, he tested with all houses on that line and all off. He left Lockport giving the company little information as to his findings but his report to the moneyed men of New York resulted in an immense plant being installed in that city and is being maintained as the largest power and heating plant in the world today.

Up to this time very little was thought of heating by exhaust steam but in the winter of 1880 the company contracted with capitalists in an Eastern city for quite an installation, of a high and low pressure plant of this kind.

Two eight inch lines were laid in one trench, one supplied power at eighty pounds to a large number of factories along the line, whose engines exhausted into the other line as a trunk line and this was further extended into a heating district and the buildings along the line heated by this exhaust steam. This was considered a great success and exhaust steam since then has played an important part in underground heating.

The following three years the company put in a number of underground plants, both in Pennsylvania and in the west, and this added to the treasury and enabled the company to put more boilers in the station, but they decided not to extend their lines any more until those already laid were better filled, and well it was, for the winter proved many of the lines laid were entirely too small, and they were compelled to enlarge several and to build a larger stack at the station.

Up to this time all heating was done by flat rate, but Holly designed a meter now and customers made a vigorous protest against it's use, and some gave up the service, but the meter prevailed and proved that many of the customers were using twice what they payed for and so this large waste was stopped.

and for sometime it resulted in dispensing with the use of one boiler.

The company now commenced to get a little profit by the sale of steam and the variator soon took the place of the junction box and all other devices had undergone many changes and improvements.

The very large use of traps, regulators and meters, etc. kept the local machine shops very busy building our devices, and they charged enormous prices for this work. The company payed $1300.00 for one 5 x 16 boiler and the same was had later from the Erie Boiler Works for $550.00. It seemed the great amount paid for our work to local shop as though everyone who furnished any material or labor for the company had set out to "skin" them, and this proved, early, the wisdom of owning their own shops. Shortly after the company started it's first shop, by renting two rooms on the third floor of the Market St. store and they actually installed one 18 inch lathe and one 18 and one 12 inch drill, and a 20 inch planer, and a one-man pattern shop. This large equipment employed five men, but enabled the company to build it's own traps, regulators, meters and patterns, and the next year more machinery was added, but other local shops still built all of the larger devices.

For some time previous we had rented a store on upper Main Street, for a ware-room and steam fittings department; we also had a two room office further down Main St., and also had two local machine shops building our larger work and a local foundry furnishing castings. We had one store-house back of Savings Bank and another on Market St., and with the boiler house on Elm St. we were pretty well scattered over the town, but in time all came together.

Still contracts from out of town came in slowly and for a while we saw many dreak days, with little coming in and much going out. However, our management was always on the alert and kept the credit of the company good, and the officers always worked in perfect harmony and in order to meet all bills promptly the officers were obliged, many times, to go down in their own pockets for funds to bridge them over. I am quite sure the early officers did not receive any salary for a long time, nor did the anxious stockholders get any dividends but brighter times were ahead and soon contracts for underground work came in and the money from same enabled the company to soon enlarge it's shops, and to do all it's own work, and build it's devices, and also to build shops of it's own instead of building them for others.

New coal sheds were built at the station and the old ones were converted into a two story shop. This, together, with many more machine tools enabled the company to undertake a manufacture of all it's own work and devices.

The first floor of this shop, 34 x 100', was used to assemble all devices, and for storage, and the steam fitting department. The second floor for machine shop, a pattern shop, a 25 h.p. slide valve engine for power, and with a small upright boiler. This engine could always use more steam than the boiler could make.

The building did not have any elevators — 4 and as all castings to be machined had to be done on the second floor, everything was hoisted through a trap door by block and tackle.

This shop, as well as the boiler house, was illuminated at night by "kerosene" boat lamps. If Arthur Lerch is present, he will recall this pattern shop, as he came here as an apprentice, at this time, and between the necessary talking and the agency of bicycles he sometimes found time enough to sand paper and varnish some patterns. And he most always had them done two or three days after the foundry was ready for them.

Holly now brought out the iron pipe atmospheric radiator and many hundreds of these, of all sizes, were 5. made and sold throughout the country, where district plants were in use.

Soon the Walworth Company brought out an iron — 6 pipe radiator and the Reed Company brought out the first cast iron radiator.

Steam heating became very popular and the company now employed several gangs installing heating plants all along the lines and outside the lines to the extent of over two hundred individual boilers.

So may we not say the influence of central station heating made possible the great number of radiator works, and pipe and fittings, and boiler works all over the country.

Less than two years in our second shop the increased demand for our work so demonstrated to the company that we must have larger, better and more modern shops, so the company at once began the erection of a four-story stone building across the way, where they later moved.

This new shop was fitted with modern tools from basement to top floor, and still in a short time it proved too small so an addition of 40 x 90 ft. was built, and soon this larger shop was filled up with tools and men. It was here that the company organized it's first drafting room where prints and drawings could be had. Up to this time during the past years, the writer made all drawings for the pattern shop and street plans, and such other drawings as were necessary. All castings up to this time were made by the local foundries but the company soon built modern foundries at North Tonawanda, and this shop soon demonstrated that we could make all our own work at about one-half the amount paid to outsiders.

This brought dividends and enabled the company to build at North Tonawanda the present modern shops. This shop was equipped with the best tools and today we can say we have the most modern and best equipped shop in the country, and can now say we have plenty of room and are at peace with the world.

Holly did not live to see the full realization of his early efforts in central station heating, and, after giving to the world his many valuable inventions, he died, a comparatively poor man.

Now in conclusion, a few words in behalf of the writer. I saw the beginning. I did it's first work, I made it's first experiments under the direction of Mr. Holly, I saw it's many ups and downs, and it's many struggles when it seemed that it had but a mere chance. Mechanically speaking, many mistakes were made which proved good lessons in the end, and yet they were mostly due to a lack of knowledge of the element (Steam) which we had to deal with. I saw many changes in the personnel of the company and it's different managements and as I look back to certain of it's dark days I wonder that they ever succeeded.

My relation with the various officers and managements up to the present have been most friendly and the culmination of the present shops was the ambition of the past thirty-eight years of my life.

Now that old age has crept upon me, and I am no longer physically able to hold my own, I have many thanks to offer the present management for numerous kindnesses and indulgences shown me.

John D. Walsh.