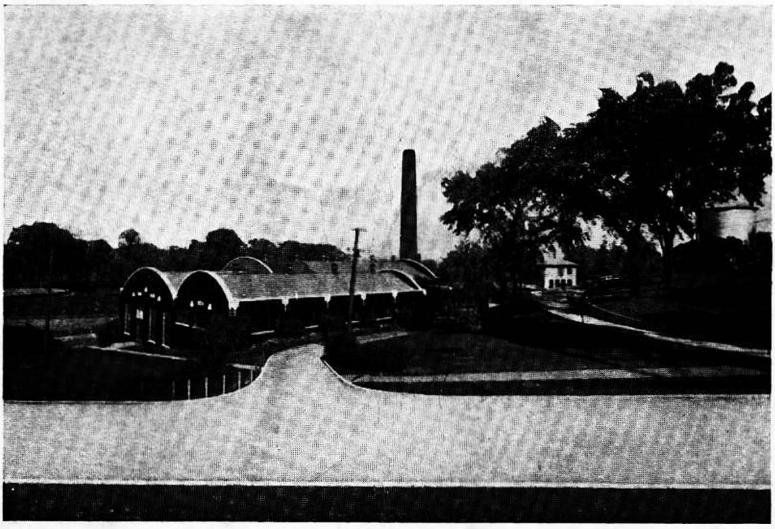
MARSHALLTOWN, IOWA

Municipally Owned and Operated

WATER WORKS



PUBLISHED

BY

The Board of Water Works Trustees

MAY, NINETEEN HUNDRED AND THIRTY-FIVE

A TREATISE

DEALING WITH THE HISTORY
AND GENERAL DEVELOPMENT
OF THE MUNICIPALLY OWNED

WATER WORKS

OF MARSHALLTOWN, IOWA

DATA COMPILED BY H. V. PEDERSEN

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Foreword

Since May 1923, when the first board of water works trustees was appointed by the Mayor of Marshalltown, Iowa, reports have been made by the trustees at regular intervals to the city council as required by law, and these reports have been given more or less publicity by the local newspapers.

However, the average citizen has little time to locate these reports and read them and inquire about their contents. Now that the major improvements which the trustees planned to make in 1923, have been completed, this general report is made to give all the facts in condensed form so that any one may read and learn in a short time just what has been and is the condition of the water works that is owned and operated by the city of Marshalltown, Iowa.

COUNCIL WHICH BUILT THE FIRST WATER WORKS SYSTEM IN MARSHALLTOWN IN 1876

Historical

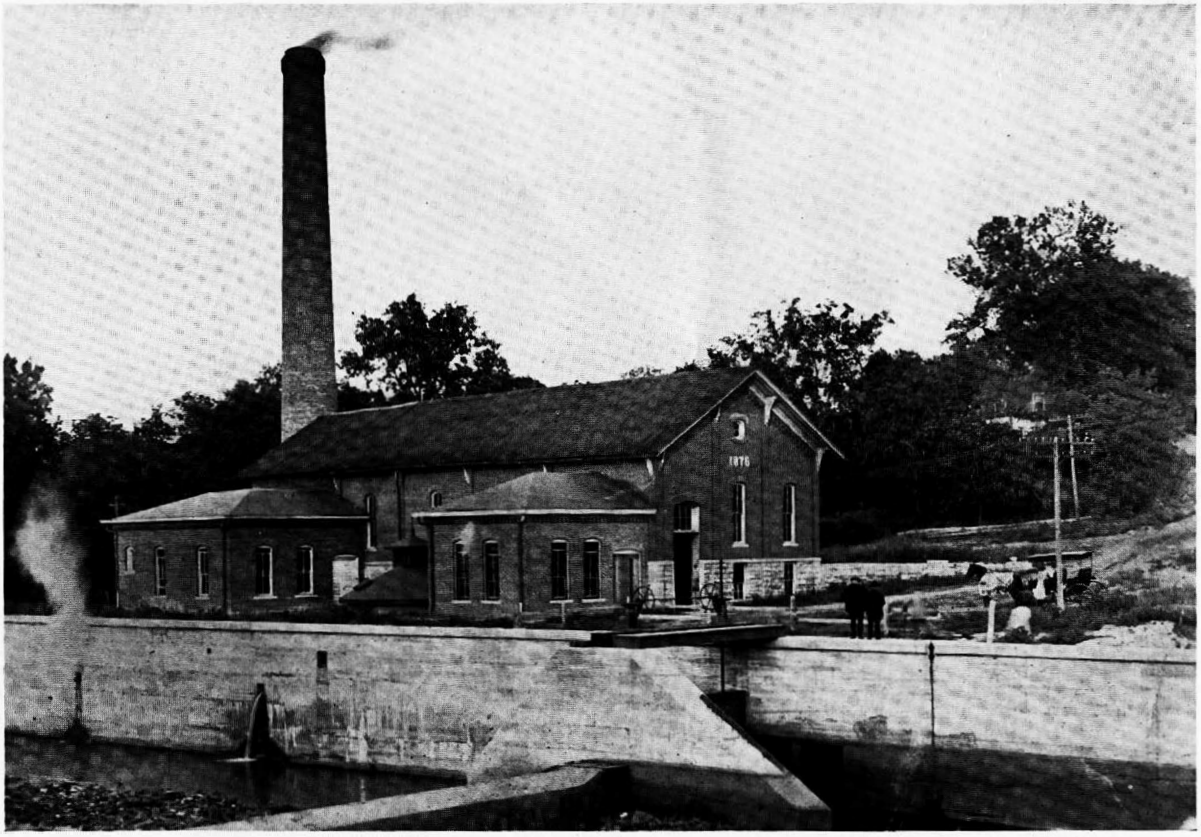
It was in May 1876 that the city council of the growing city of Marshalltown, Iowa, then having a population of five thousand, first took steps to build a water works system and to maintain a public drinking water supply for the benefit of the citizens. A bond issue of forty-seven thousand dollars was voted on favorably and on June 12, 1876 a contract for doing the work was awarded to Carpenter & Company.

The original water plant was located on the same spot as the present main pumping station. A strip of land along the southeast side of the Iowa river was deeded to the City for water works purposes by Mr. E. J. Woodbury in consideration that the city would guarantee him the right to make a service connection to his dwelling house.

Plans for the water system were prepared by Engineer T. N. Boutelle who came from some place in the east. Water was taken from the Iowa river through a twenty inch pipe to a slow type sand filter sixteen feet wide and thirty-two feet long where it filtered down through twenty-four inches of sand, six inches of charcoal and six inches of crushed rock to a gallery below. The filter material was supported by a false wood bottom, drilled full of holes. The water was then pumped from a small clear water gallery below the false bottom direct into the distribution system by two steam driven direct acting double plunger Knowles pumps having a combined capacity of two and one-half million gallons per day. The two pumping engines and two forty-eight inch boilers were housed in a brick building thirty-one feet wide and fifty-four feet long. A sixty foot brick chimney also was provided.

The original distribution system consisted of a twelve inch main from the plant along Center Street to Webster Street and then a ten inch main from Webster Street to Main Street. An eight inch main was laid along Main Street for six blocks. The rest of the system consisted of six inch and four mains serving the most centralized portion of the city. The entire distribution system was between four and five miles long.

With the exception of the filter, the original system seemed to be satisfactory. Every time the water in the river became turbid as a result of rain storms, the filter clogged badly preventing a proper downflow of water to the gallery below. To overcome this difficulty



THE PUMPING STATION AS IT LOOKED BACK IN 1910. THE LARGE STRUCTURE IS THAT PART OF THE STATION BUILT IN 1876.

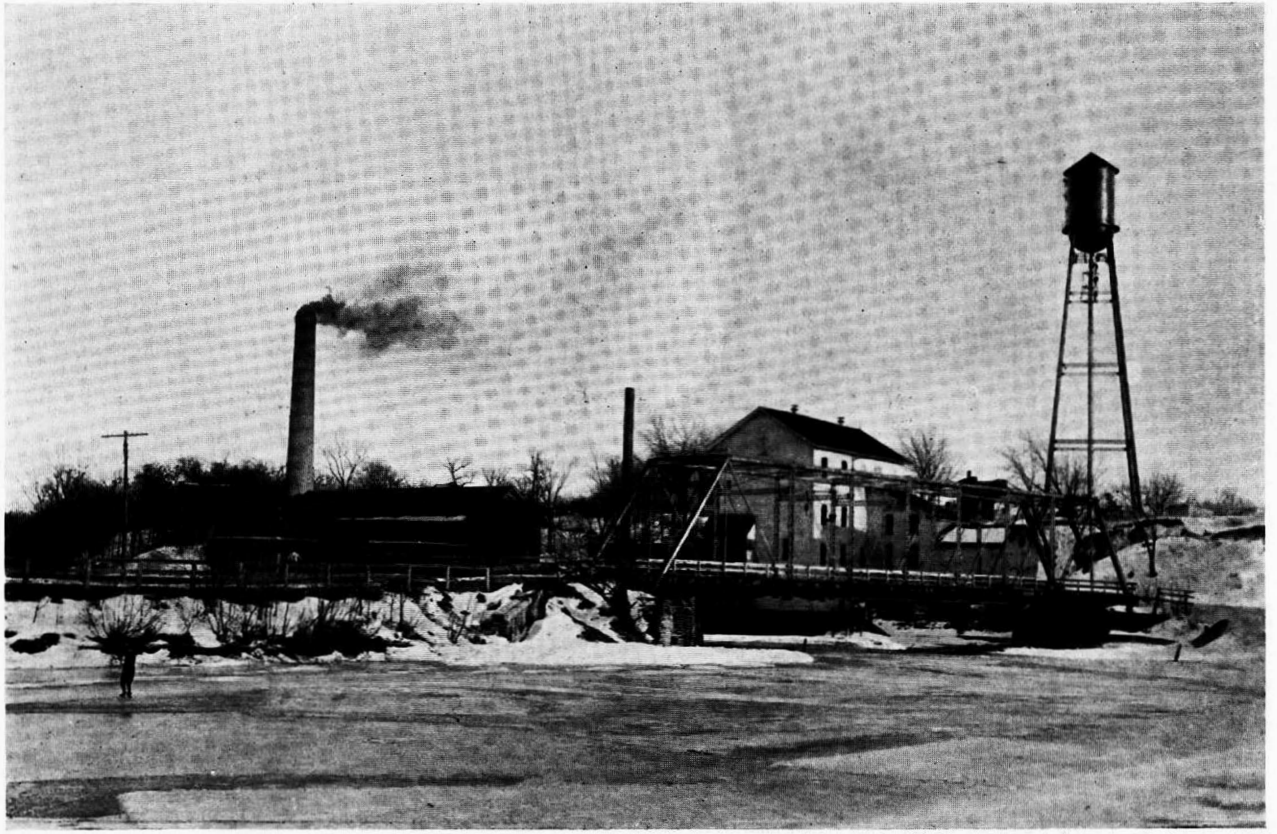
a second filter, the same type and size as the first one was constructed in 1881. At first the second filter was provided with porous terra cotta brick as part of the filter medium. Experience soon taught, however, that the porous brick, in which a great deal of faith had been placed, clogged up much more rapidly than the first filter did, so the material was removed and a false bottom similar to the first filter was constructed.

As the city increased in population and the demand for more water increased, it became more and more difficult to supply the demand from the two small slow type sand filters. In fact, it was quite apparent that a great deal of unfiltered river water was pumped direct into the mains. Old records are not specific but there is no doubt but that the many complaints about dirty water and high typhoid death rate caused the council to look for a better source of supply. Around 1885 or 1886 several wells were drilled on the water works property near the pumping station. Just what happened no one seems to know, but the wells were never utilized.

By 1888 the water problem had become so acute that it was decided to abandon the slow type sand filters. A combination of shallow dug well and infiltration galleries was developed on the opposite side of the river from the pumping plant just about where the present concrete storage tanks are located. The water flowed by gravity from the collecting well, under the river, through a sixteen inch cast iron pipe to a pump well built next to the pumping station. This pump well was made of rock and no mortar was used to make it water tight. Every time the river rose above its normal stage, some surface water no doubt found its way into the pump well and hence into the distribution system.

Although the shallow well and infiltration galleries no doubt proved a great improvement over the slow type sand filters, it was apparent that the supply was not entirely adequate because by 1893 the council began looking for an additional supply. In 1894 the city spent forty-five thousand dollars developing what was then known as the Bunce spring. The exact location of this spring is not definitely known but it was at the foot of the bluff somewhere between Third and Fourth Streets at the northern extremity. A ten foot diameter well was dug near the spring and a twenty inch cast iron pipe was laid to the pumping station. The elevation was such that the water flowed from the spring to the rock built pump well located at the pumping station.

With this additional supply, the city got by for a number of years. But it seemed that trouble had just begun. A sanitary survey made



WINTER SCENE OF 1910 AND FEW YEARS BEFORE THE OLD MILL WAS ABANDONED AND TORN DOWN

as a result of Typhoid Fever which had become epidemic, showed that the water from the Bunce spring was highly contaminated and both sources of supply were condemned for drinking purposes by the State Health authorities which had just then been organized. There was nothing left to do but to seek a new source of water supply.

In 1890 an engineer named J. W. Hill from Cincinnati was employed to seek and develop this new source. After an extended survey Engineer Hill located the present well field and began to develop it. Twenty six-inch well points were sunk into the water bearing sand to a depth of thirty feet. A twenty inch cast iron suction pipe was laid between the well field and the pumping station. A pump pit twenty feet in diameter and twenty-five feet deep was constructed at the pumping station and two steam driven triplex pumps were installed to draw the water from the wells. This source of water proved to be an excellent one and the same well field is still in use today, although the design and depth of the wells have been changed.

By 1892 the original high duty Knowles pumps were worn out and inadequate so two new compound condensing Ludlow Don Gordon pumps were installed having a total capacity of five million gallons daily. In 1904 a one million gallon concrete storage reservoir designed by engineer Meed of Chicago, and a new water tight pump well to replace the poorly constructed rock pump well were built. The distribution system had grown by this time to twenty-eight and one half miles of water mains with two hundred fifty-six hydrants, three hundred eight valves and four hundred ten water service meters. In 1908 the present one hundred thousand gallon capacity steel elevated tank was added to the system.

By 1912 the number of wells had been increased to fifty. The distribution system had been added to, until there were three hundred fire hydrants, twenty-four hundred consumers with eighteen hundred meters. An engineer estimated the physical value of the entire system in 1912 to be Three hundred seventy-five thousand dollars.

By 1916 the smallest of the high duty Gordon steam pumps was worn out and a four million gallon capacity Allis Chalmers steam pump was installed in its place. This pump is still in service.

Although new mains and new wells had been added to the water system from time to time, the entire system, taken as a whole, in 1921 was in a run down condition. The council at that time realized that something had to be done so they employed engineers Alvord,

THIS PICTURE WAS TAKEN IN 1909 SOON AFTER THE ONE MILLION GALLON RESERVOIR WAS COMPLETED, WHILE THE CONCRETE DAM WAS UNDER CONSTRUCTION.

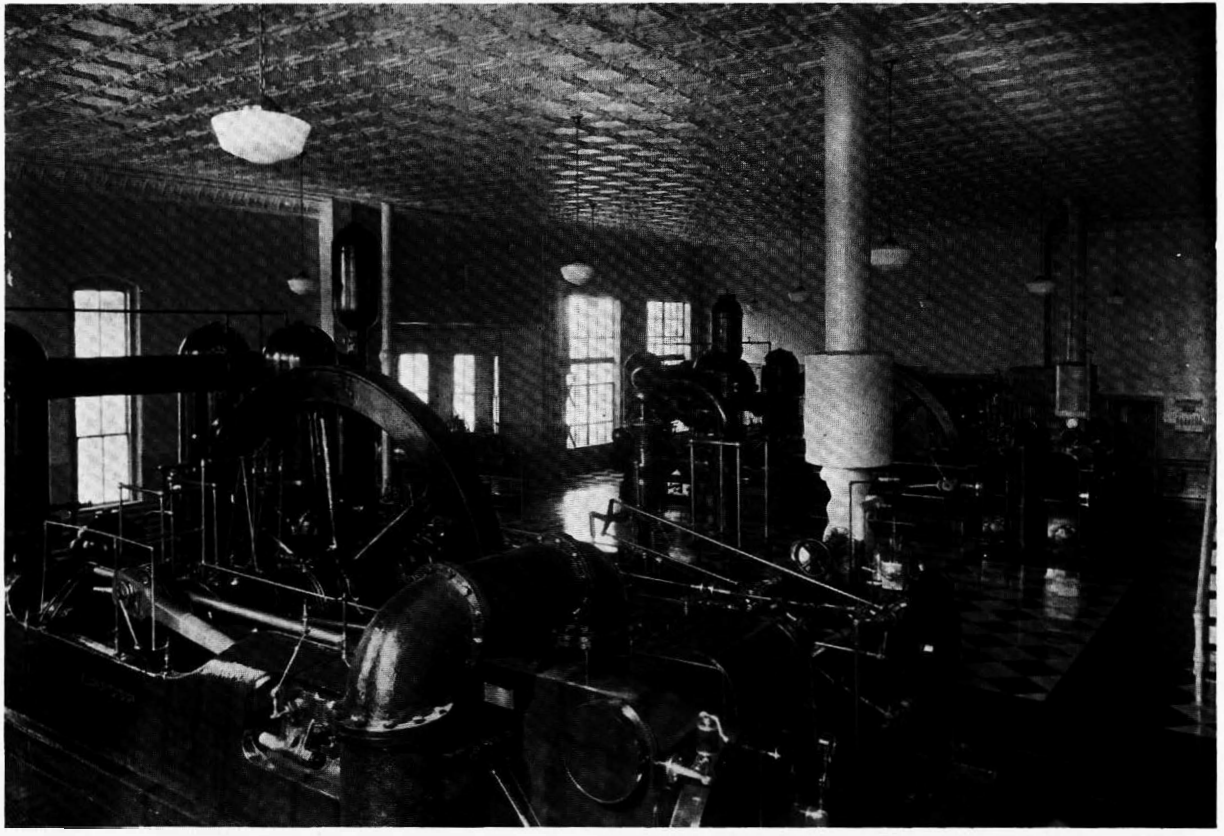
Burdick and Howson of Chicago to prepare recommendations. A new addition was built onto the front of the pumping station and a six million gallon capacity Allis Chalmers pump was contracted for.

During the winter of 1922 heaving ice broke the twenty inch cast iron pipe line between the well field and the pumping station. This break put the entire city out of water for several weeks before it was successfully repaired. This experience hastened the action of the council and a proposition of rebuilding the water works was submitted to a vote of the people on June 22, 1922. However, a proposed bond issue to provide the necessary funds was voted down.

On March 5, 1923 an election was held to change the commission form of government to the ward system. This election turned out in favor of the ward plan and on March 26th a regular election was held to elect a mayor and council. As a state law had been passed, previous to this time, providing that the water department of any city of over fifteen thousand population under the ward system of city government, be managed by a Board of Water Works Trustees, such a board was immediately appointed by Mayor Conaway and this date marks a new period in the history of the Marshalltown Water Works System.

Members of Board of Water Works Trustees For Past 12 Years

E. N. Farber	1923-1935
A. R. Cooper	1923-1935
Tom Elder	1923-1925
Merritt Greene	1925-1927
H. E. Nason	1927-1931
Frank Pierce	1927
H. H. Hunt	1931-1935



INTERIOR VIEW OF MAIN ENGINE ROOM SHOWING SIX MILLION GALLON ALLIS CHALMERS PUMP IN THE FOREGROUND AND THE FOUR MILLION GALLON CAPACITY PUMP IN THE BACKGROUND. THE ENGINE ROOM IS 50 FEET WIDE AND 100 FEET LONG. TAKEN IN 1935.

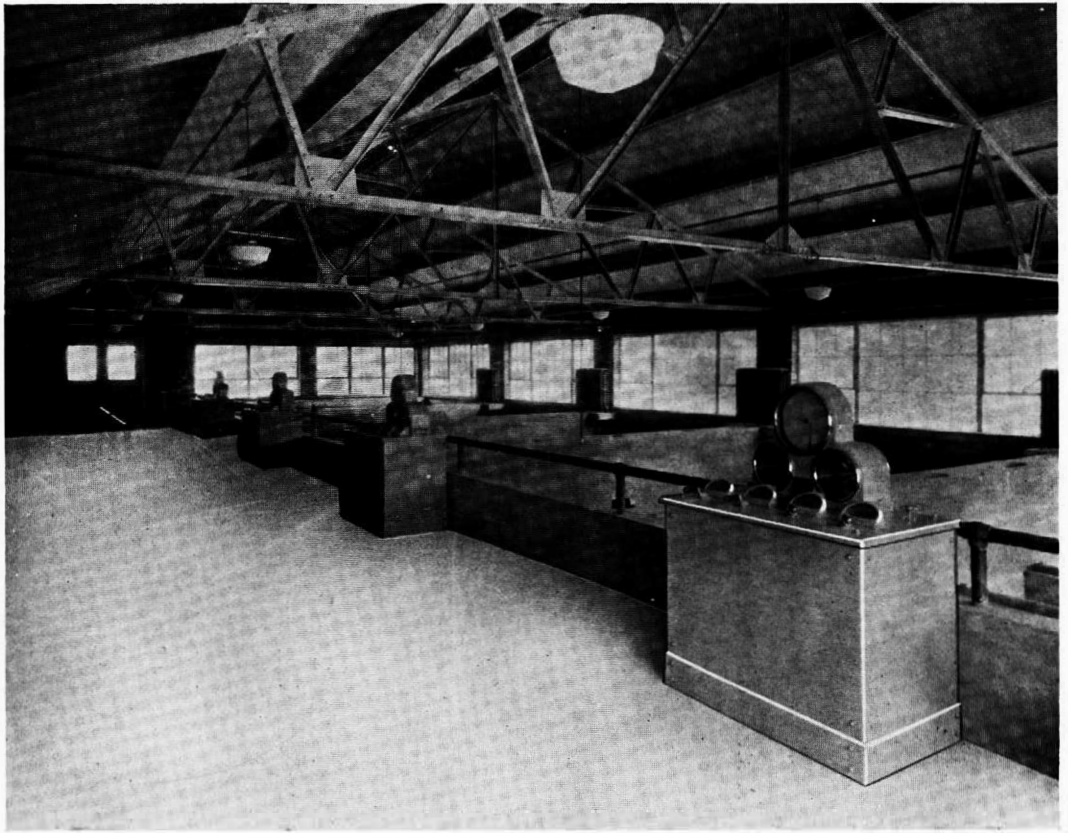
Developments Under a Board of Trustees

The first definite action the Board of Trustees took after they were appointed was to employ A. T. Luce as Superintendent. Then they arranged for payment of the cost of the new addition to the pumping station, the six million gallon Allis Chalmers pump and other indebtedness amounting to a total of approximately sixty-eight thousand dollars, which debt had been contracted by the council prior to the time the Water Board took office. A short time bond issue of twenty-four thousand five hundred dollars was arranged to take care of part of the debt while the rest was paid for out of the general income in regular monthly installments.

A study of the entire water works system showed it to be inadequate in a number of its departments. First, the water supply was not only inadequate but it was found that the method of pumping the water from the well to the main pumping station had been severely criticized by the State Health Department. Second, the water contained a large amount of iron which was a continuous source of aggravation to the consumers. Third, the water pressure was found to be very poor in various parts of the city.

The plan of procedure worked out by engineers Alvord, Burdick & Howson of Chicago, who had been engaged by the city council, before the trustees were appointed was adopted in full by the Board of Water Works Trustees. This plan naturally fell into three groups, namely, to increase the water supply and change the method of pumping, build an iron removal plant and strengthen the distribution system. A bond issue of three hundred thousand dollars, recommended by the Board of Trustees, was voted on favorably by the citizens and everything was ready early in the spring of Nineteen hundred twenty-four to begin the work of rehabilitation.

In the well field a group of nine wells, averaging about one hundred feet in depth was connected to three two-million gallon capacity Delavaue centrifugal pumps located in a circular, subgrade pumping station. An electrical remote control system was installed to permit stopping and starting of these pumps from the main pumping station. A second twenty inch cast iron pipe line was laid from the well field to the main pumping station to lessen the hazard of a shut down. It is not likely that both of these twenty inch discharge lines from the well field will be out of service for repairs at the same time.



INTERIOR VIEW OF FILTER ROOM. FIVE MILLION GALLON CAPACITY EACH 24 HOURS. IN THESE FILTERS REMOVE TONS OF IRON YEARLY FROM THE WATER.

An iron removal plant was built at the main pumping station. This plant consists of an aerator, a settling tank having a capacity of six hundred thousand gallons, a filter plant consisting of five one million gallon units and a sixty thousand gallon steel wash water tank. The water is pumped from the well field to the aerator and then flows by gravity through the settling tank and filter to the clear water concrete storage tank located across the river from the main pumping station.

The distribution system was reinforced by laying four thousand three hundred thirty-seven feet of sixteen inch cast iron main from the pumping station to Main Street and then a complete loop consisting of ten thousand two hundred fifty feet of twelve and seventeen thousand twenty-seven feet of eight inch pipe around the entire business and industrial section of the city. A total of nine and fifty-seven hundredths miles of mains were laid during nineteen hundred twenty-four and nineteen hundred twenty-five.

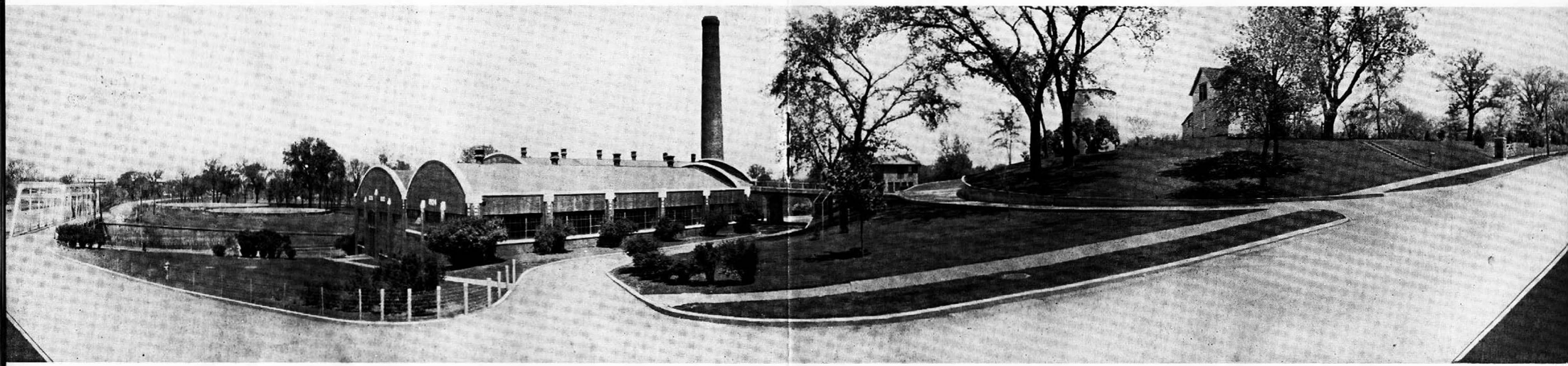
A pressure of eighty-three pounds at the plant will now maintain fifty pounds of pressure at the fire hydrants along main streets and enough water can be delivered to fight any size fire within the loop. All of this first part of the program of rehabilitation was completed by the summer of nineteen hundred twenty-six at a cost of approximately Three hundred eighty-three thousand dollars.

In August of nineteen hundred twenty-six, Mr. Luce resigned as Superintendent and H. V. Pedersen was employed by the Board of Trustees to take his place. Each year since then, some improvements have been completed to make the Water Works system more dependable.

In nineteen hundred twenty-seven, the major job consisted of breaking up and removing from the river bed, the large pieces of the old concrete dam. This dam had been built in 1909 by joint owners. Why it broke and gave way, no one seems to know, but after the damage had been done, the Water Department was compelled to remove it in order to protect the Water Works property against a possible ice jam.

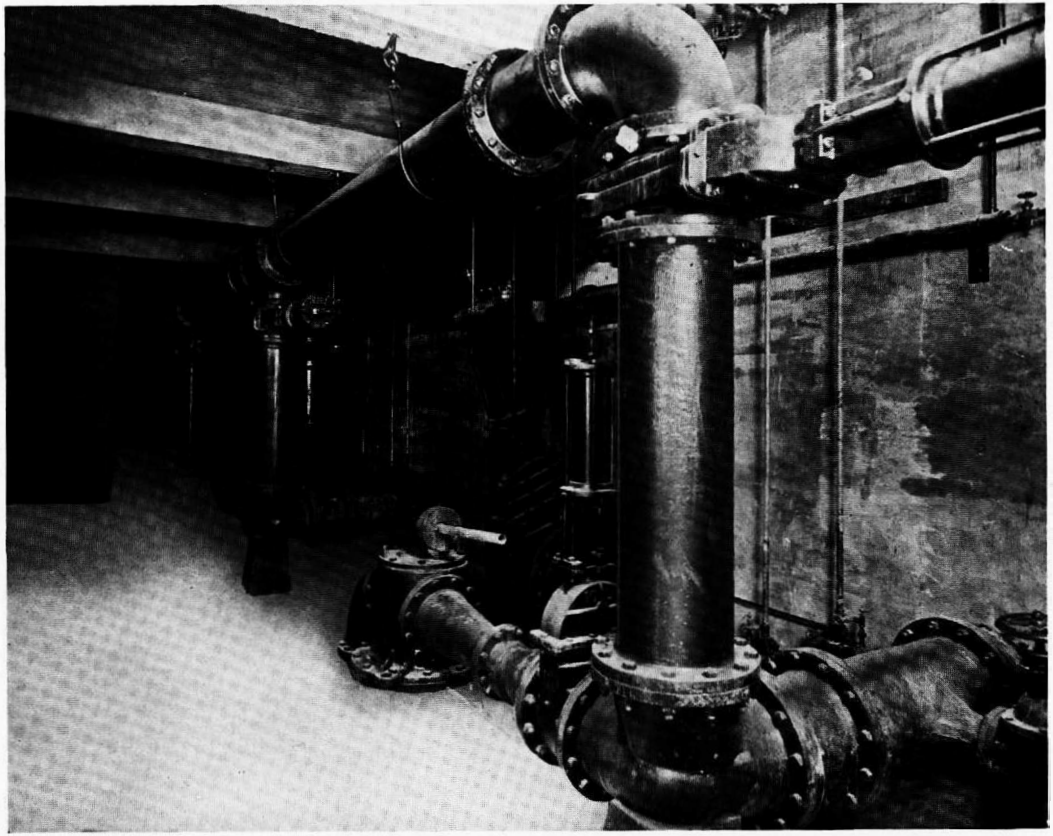
In nineteen hundred twenty-eight, the oldest portion of the main pumping station which was in a very dangerous condition was torn down and a new structure fifty feet wide and one hundred feet long, built in its place. Concrete coal bunkers large enough to hold ten cars of coal was constructed in the rear of this building.

In nineteen hundred twenty-nine a new concrete filtered water storage reservoir having a capacity of one and one-half million gallons of water was constructed west of the old reservoir. This reser-



PANORAMIC VIEW OF MAIN PUMPING STATION, IOWA RIVER, STORAGE RESERVOIR, WASH WATER TANK, CHEMICAL HOUSE AND CHIEF ENGINEER'S HOME.

PANORAMIC VIEW OF WELL FIELD SHOWING PUMP HOUSES, WELLS, LAGOON.



THIS IS A VIEW OF THE PIPE GALLERY IN CONNECTION WITH THE FILTERS OF THE IRON REMOVAL PLANT.

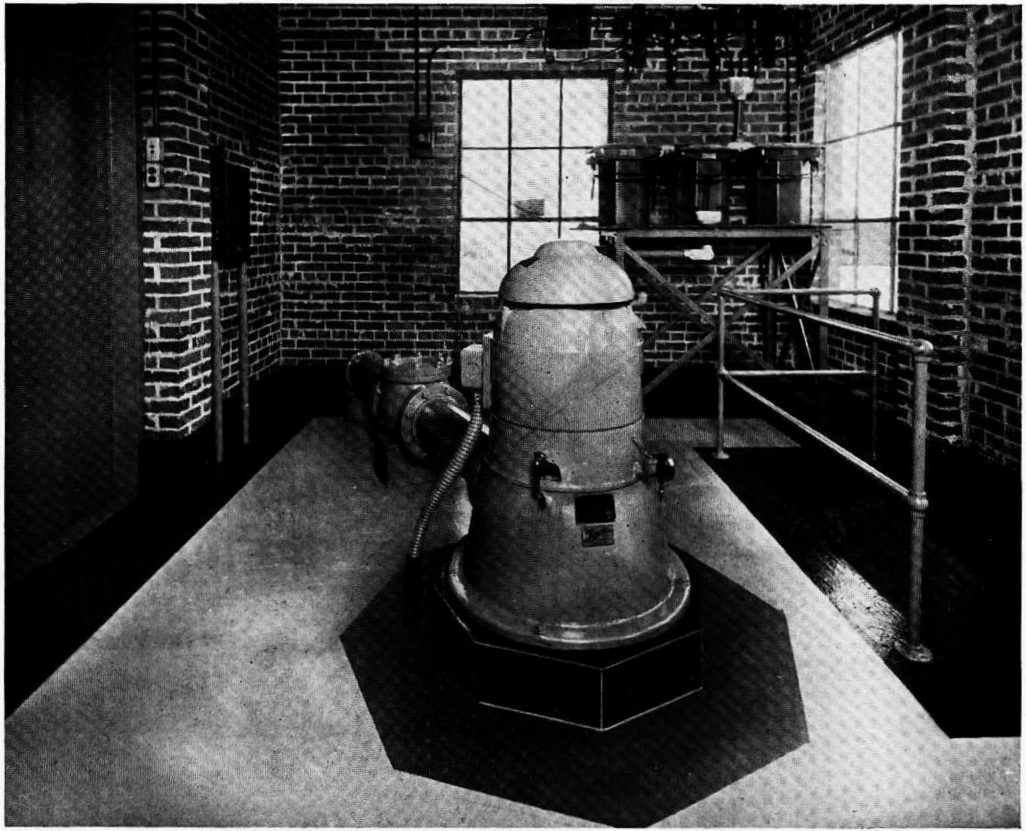
voir was much needed in that the old reservoir was in a dangerous condition and because the total storage capacity was not adequate for the size of the city. The city now has at least twenty-four hours filtered water storage on hand for emergency.

In nineteen hundred thirty the wood roof of the old one million gallon reservoir was removed. Upon inspection the condition of the concrete walls was found to be so bad that it was necessary to construct an entirely new concrete tank inside of the old one. A flat slab concrete top was built to replace the old conical shaped wood roof.

During the year of nineteen hundred thirty-one the lack of rainfall affected the nine wells to such an extent that providing new wells was imperative. A gravel packed well was sunk to a depth of fifty feet near the lagoon and equipped with a turbin type pump. This well proved to be a good one and can produce one million gallons per twenty-four hours. During this same year the aerator was reconstructed and a new chemical house was built. This chemical house can be used in connection with softening the water and can also be used in case it should become necessary to purify river water. A sludge removal machine was also installed in the settling tank to remove the settled sludge when chemicals are used for softening or purification.

In nineteen hundred thirty-two a new brick warehouse and garage was built on the corner of Third and Center Street to house the meter department and all of the maintenance crew equipment. Prior to this time this equipment was kept in several old sheds where the yearly loss from theft amounted to a considerable sum. This building is a two story fire proof structure fifty feet by sixty feet and supplied a much needed improvement to the Water Department. Nineteen hundred thirty-two was also a very dry year. To insure an adequate supply of water a deep well was drilled in the north end of the well field. This well utilized both the water bearing sand at one hundred twenty feet depth and the sand at two hundred fifteen feet depth and proved to be a most excellent producer. A one million gallon vertical type pump was installed in the well and connected up independent from all the rest of the wells. It was the installation of these new wells that made it possible for Marshalltown to go through the last few years without a shortage.

During the year of nineteen hundred thirty-three the old coal conveyor which elevated the coal into the coal bunkers broke down beyond repair. To eliminate a coal elevator a concrete viaduct was built so that it is now possible to back a truck load of coal directly



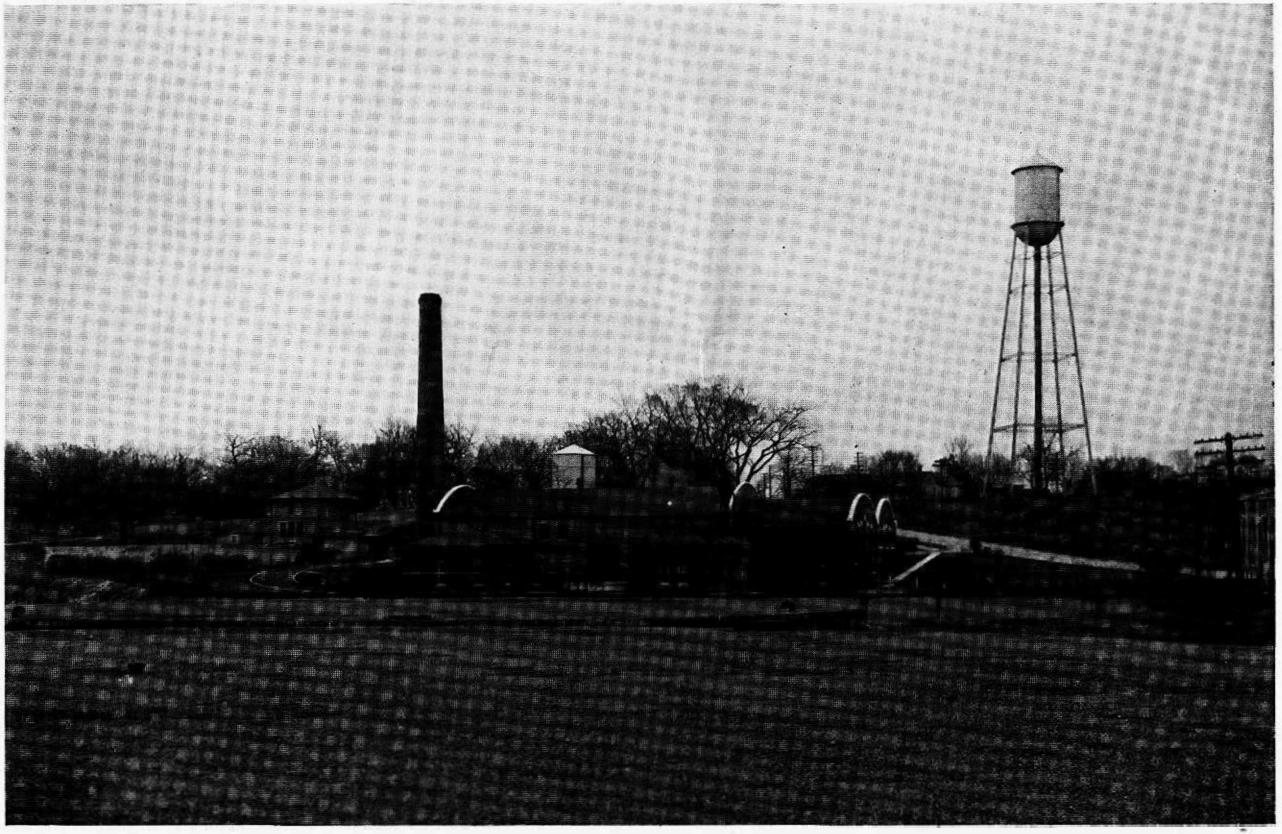
INTERIOR VIEW OF A WELL FIELD PUMPING STATION. SHOWING ONE MILLION GALLON CAPACITY VERTICAL TYPE PUMP.

over the bin and dump into it. A new concrete driveway to the coal viaduct greatly added to the appearance of the property. It is estimated that the cost of this improvement will be saved in five years time from the saving effected by eliminating the coal conveyor. During the winter of this same year a new two million gallon capacity centrifugal pump was installed in the old original pump pit and connected up so that it can pump filtered water into the mains. This addition increased the total pump capacity at the main pumping station to twelve million gallons per twenty-four hours. Regardless of which steam pump may now be out of service for repairs, six million gallon pump capacity is available for fire fighting purposes. A new river intake was also constructed and a pump installed to make it possible in case of emergency to pump river water to the settling tank. Now if some emergency should arise whereby all the well field pumps should be temporarily out of commission, river water can be pumped and purified equal to any other surface water in the state. It is an improvement which is well worth the cost from an insurance standpoint.

In nineteen hundred thirty-four one of the old original filters built back in eighteen hundred seventy-six was relined with concrete and utilized as a secondary pump intake well. It is now possible to use the two intake wells as one, or either one can be used independently while the other is being cleaned. During this same year all the electrical wiring and panel system belonging to both the water department and street lighting department was completely rebuilt. All the worn out overhead wires were replaced with new underground cables. The location of the panel was changed to get away from the steam pumps. The old wiring was a hazard both from a possibility of a fire and from the danger to the operator and was a much needed improvement. Most of the cost of doing this work was paid for out of water works funds.

In addition to the major items listed above, each year from a quarter to a half mile of water mains were laid. Between nineteen hundred twenty-five and nineteen hundred thirty-four, ten thousand six hundred sixty feet of water mains were laid. The distribution system now consists of fifty-six and thirty-five one hundredths miles of mains, three hundred ninety-six fire hydrants and six hundred fifty-four valves, not counting the valves installed with hydrants.

Prior to nineteen hundred thirty-two all water meters were owned by the property owner. Since that time, the Water Department has replaced all old meters and installed new ones without cost to the property owners. All repairs, except those due to freezing or



THIS IS A VIEW OF THE MAIN PUMPING STATION AS IT LOOKS AT THE PRESENT TIME. TAKEN FROM ON TOP THE STORAGE RESERVOIR.

backing up of hot water, are also made by the water department without cost to the owners. This policy amounts to a saving of approximately six thousand dollars a year to the property owners, without increase in water rates.

The entire water works system of Marshalltown has an estimated physical valuation at this time on one million seventeen thousand nine hundred twenty dollars. Almost fifty per cent of this estimated valuation, or four hundred ninety-two thousand eight hundred nine dollars, represents the amount of work that has been done during the last ten years under the direction of the Board of Trustees. In other words, approximately fifty per cent of the entire water system has been built new during the last ten years.

The total indebtedness of three hundred seventy-four thousand five hundred dollars was set up in such a way as to retire it all by the end of twenty years. The half way mark on this schedule has now been reached and all payments of principal and interest have been made as per schedule. To date one hundred forty thousand five hundred dollars worth of bonds have been retired and one hundred forty-four thousand eight hundred eighty-six dollars and fifty cents has been paid out in interest. About one third of the total income of the water department must be set aside each year for the retirement of bonds and payment of interest. Ten years from now, or on October first, nineteen hundred forty-four, the last of the bonds will be retired.

It will be noted that for the first ten years the interest amounted to more than the principal. During the second ten years the interest will be materially less, but even then the interest for the twenty years will amount to about two thirds of the principal. To prevent future bond issues and the payment of interest which is in a sense a dead loss, the Board of Trustees has adopted a policy of building up a replacement fund. Five thousand dollars is set aside each year in this fund and it is estimated that by the time the present indebtedness is retired a sum of seventy thousand dollars will be on hand to buy whatever will have to be replaced at that time. If this policy is continued, all major replacements will be paid for out of this fund. If during the next ten years the entire system is kept up and the usual maintenance work paid for out of the general income, there should never be occasion again to issue bonds. This policy applied over a period of years will save the city a great deal of money.

It has been a policy of the Board of Water Works Trustees to invest the money set aside as a replacement fund in state authorized county road bonds. This is done for the purpose of keeping the

money in this fund in a safe place as well as to derive interest which would otherwise be lost if the money were left in the bank. Last year the amount of interest from all such saving bonds netted the water department the sum of one thousand two hundred nine dollars and eight-three cents. Not only have the trustees met all payments of interest and principal on bonds when they came due, but they have taken up some bonds before their maturities when opportunity to purchase was afforded.

All of the improvements made during the past ten years have been accomplished under the direction and supervision of the water works superintendent and without employment of outside engineers, except the making of the preliminary survey and report which was provided by the city council before the trustees were appointed, and without claims or suits for damages of any kind.

Future Water Works Development

No water works can rest long upon its laurels. The important part that water plays in the life and progress of a city demands that the water system be kept in a high state of perfection. A neglected pump or boiler or any other single thing connected with a water system might easily result in serious fire losses. A water works must be prepared to fight any size fire upon a moments notice. A water system must also be planned and kept ahead of the growth of the city.

If the city of Marshalltown continues to grow in the future as it has in the past, from one-half to one mile of water mains should be laid each year. No one can accurately prophesy what any city will be fifty years from now but reasonable consideration of future trend can save a lot of trouble and expense.

All water works equipment has a definite age limit. A boiler can not be safely used more than twenty years. The age limit of centrifugal pumps is between fifteen and twenty years. A heavy duty steam pump seldom operates over forty years. Much of the equipment will not give satisfactory service more than five years. Knowing the age and the average life limit of any particular piece of equipment, it is not hard to predict the time new equipment will need to be installed. Experience has taught that wells seldom last over fifteen years, and knowing this, new wells must be developed in the well field from time to time. Fifty hydrants and between two and three hundred valves will have to be replaced as fast as finances will permit.

It has been stated that the present bonded indebtedness will all be retired in nineteen hundred and forty-four. Since about one-third of the present income is set aside for bond retirement, it may seem logical to some that when the debt is all paid the rates can be reduced. This is true to a certain extent but it must not be forgotten that all during the twenty years that the bonds are being retired much machinery and equipment is wearing out and it will cost money to make replacements.

No city should be satisfied with any other than the very best water. The water at Marshalltown is unquestionably safe from a sanitary standpoint and has a pleasing taste. It can not be denied, however, that the water is twenty-two grains per gallon hard. The water supply can be softened to seven or eight grains per gallon

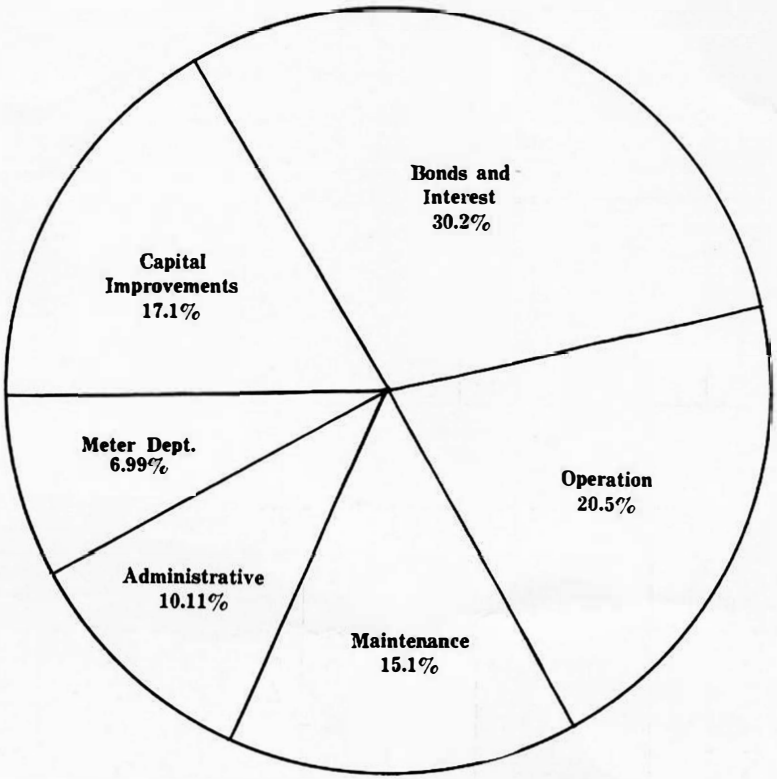
without destroying it's pleasing taste. As the bonded indebtedness is reduced, more thought will be given to the question of softening and it is the hope of the present Board of Water Works Trustees that softening can be undertaken soon as a regularly established practice.

After ten years of using water free from iron, no one should wish to go back to the old red water. At least no one who can remember the red stains on all fixtures and utensils would wish to use such water again. It is safe to say that if the water is softened for a year or so in Marshalltown, no one would wish to return to the present hard water. Usage would establish a confidence which many can now conceive and the public would demand softer water when once accustomed to it.

For ten years now, the City Water Works of Marshalltown has operated without a single minute of interrupted service. This gratifying feat was due to two reasons. First, the management has striven to build up the system and maintain it in a dependable condition. Second, the loyalty of the employees. These men are devoting their lives to the job of keeping the water system in condition twenty-four hours a day, three hundred and sixty-five days a year to deliver clean wholesome water to kitchen and bathroom and ready to fight the biggest fire ever seen in Marshalltown. Men who are willing to work in mud and water in any kind of weather, any time of day, when an emergency arises. People who find it so easy to turn on a faucet for their daily water supply seldom think of and appreciate the untiring efforts of those who make that possible. Stop the flow of water and there is plenty of adverse criticism. Why not give thanks, now and then, that there is someone constantly striving to maintain a uniform flow of water.

Marshalltown should have a constant growth. How much it grows in the future depends largely upon the progressiveness of the people and upon the willingness and ability of both public and private owned utilities to keep ahead of the growth. If Marshalltown grows the City Water Department must grow and keep ahead of the progress of the times. With co-operation and continued good management the citizens of Marshalltown should ever be proud of this water works system.

H. V. Pedersen, Superintendent.



THIS FIGURE SHOWS HOW EACH DOLLAR OF INCOME IS SPENT. THE AMOUNT OF PERCENT REPRESENTS AN AVERAGE OVER PAST SEVERAL YEARS.

GENERAL INCOME FOR PAST NINE YEARS

Year Ending April 1st	Total Income	Income from Sale of Water	Income from Taxes	Income from Sale of Meters and Meter Parts	Misc. Income Turn Off & On Tapping Permits Sale of Junk Advanced Payments
1927	$ 93,589.54	$75,446.43	$5,138.62	$3,523.18	$9,481.31
1928	89,124.74	78,170.56	5,591.87	3,164.83	2,197.48
1929	115,707.35	79,575.35	5,611.36	2,801.62	2,383.98
1930	125,423.67	86,206.40	5,009.23	3,427.59	3,497.73
1931	122,110.98	107,208.40	8,530.86	3,336.25	3,035.47
1932	118,866.41	103,021.82	8,589.97	1,811.79	5,442.83
1933	99,110.63	88,202.64	6,733.28	12.35	4,162.36
1934	97,325.31	93,201.04		220.57	3,903.70
1935	102,876.40	97,781.87		343.44	4,951.09

GENERAL EXPENDITURES FOR PAST NINE YEARS

Year Ending April 1st	Total Expenditures	Improvements and Betterments	Plant Operation	Total Maintenance	Meter Department	General and Administrative
1927	$ 93,393.27	$14,647.79	$30,068.46	$ 9,464.89	$8,466.23	$30,601.40
1928	82,001.51	4,295.47	21,349.33	9,623.47	7,010.64	39,657.01
1929	115,878.02	37,809.59	22,194.78	9,893.76	7,216.32	38,763.59
1930	123,610.72	44,676.73	23,287.58	9,666.14	7,491.83	38,488.44
1931	112,167.45	32,119.12	23,498.49	13,316.37	7,818.60	35,414.87
1932	126,123.54	25,258.49	23,047.78	16,454.86	7,256.13	54,106.28
1933	102,247.14	11,500.06	22,207.81	14,518.24	6,837.16	47,183.87
1934	88,419.45	13,533.04	20,142.57	14,780.59	7,972.24	31,991.01
1935	101,302.17	16,883.43	20,741.18	16,556.94	6,106.43	41,014.29

INCOME OF SINKING FUND FOR PAST NINE YEARS

Year Ending April 1st	Total Income	Income from General Fund	Income From Taxes	Income from Interest from Saving Bonds
1927	$23,698.96	$18,610.97	$5,087.99	
1928	34,453.27	29,300.26	5,153.01	
1929	33,509.44	27,829.58	5,611.36	$ 68.50
1930	33,711.71	29,148.03	4,258.30	305.38
1931	30,928.75	26,278.29	4,226.14	424.32
1932	40,297.82	41,726.30	4,078.43	493.09
1933	43,689.76	38,070.09	4,571.21	1,048.46
1934	27,383.22	22,542.31	3,637.73	1,203.18
1935	36,630.54	30,726.31	4,694.40	1,209.83

EXPENDITURES OF SINKING FUND FOR PAST NINE YEARS

Year Ending April 1st	Amount of Bond Retired	Interest Paid on Bonded Indebtedness	Depreciation Savings Fund
1927	$ 9,000.00	$15,102.76	
1928	1,000.00	14,596.91	
1929	24,500.00	13,960.00	
1930	12,000.00	16,514.75	
1931	15,000.00	14,928.75	$ 5,125.75
1932	15,000.00	14,200.04	11,097.78
1933	25,000.00	13,598.12	2,091.64
1934	14,000.00	12,370.00	2,013.22
1935	16,000.00	11,705.00	5,200.67

TOTAL WATER PUMPED AND COAL CONSUMED

Year Ending April 1st	Total Gallons of Water Pumped	Tons of Coal Consumed	Cost of Coal	No. of K.W. Used	Cost of Light and Power
1927	842,680,140	1,194.28	$11,113.17	282,950	
1928	858,298,151	1,020.60	5,700.18	267,010	$3,055.75
1929	926,525,988	1,274.00	6,058.81	300,050	3,492.63
1930	950,423,806	1,264.56	6,532.20	317,820	3,725.78
1931	984,695,440	1,247.65	6,705.58	367,070	4,130.35
1932	908,937,360	1,250.82	6,118.75	343,730	3,563.05
1933	753,578,610	1,070.73	6,270.40	246,440	2,677.45
1934	743,060,430	1,178 61	5,627.43	251,010	2,727.10
1935	786,159,072	1,222.94	5,070.32	283,600	3,143.79

MAINS LAID AND MAINTENANCE COSTS

Year Ending April 1st	No. of Feet of Mains Laid	Cost of Extensions	Cost of Distribution Maintenance	Cost of Pumping Station Maintenance	No. of New Meters Installed
1927	1,758	$5,884.67	$4,147.79	$4,645.13	
1928	2,150	2,232.64	3,352.85	5,125.35	112
1929	6,523	7,655.46	1,110.44	7,502.35	96
1930	2,228	3,368.00	2,799.21	6,432.82	161
1931	2,608	5,826 63	2,133.90	9,114.13	129
1932	5,057	8,258.64	3,567.16	10,149.54	175
1933	2 972	3,737.45	1,966.33	9,119.44	222
1934	3 859	5,018 82	4,093.00	4 911.28	205
1935	4 225	7,314 27	3 941.22	6,766 45	199

COMPARISON OF METERED AND UNMETERED WATER

Year Ending April 1st	Total Gallons of Water Pumped	Gallons of Metered Water	Gallons of Unmetered Water Used By City	Per cent of Water Used By City
1929	926,525,988	639,314,902	287,211,086	31
1930	950,423,806	644,959,632	305,464,174	32
1931	984,695,440	672,432,040	312,263,400	31.8
1932	908,937,360	610,059,367	278,877,993	30.7
1933	753,578,610	500,210,044	253,368,566	33.8
1934	743,060,430	521,692,040	221,368,390	29.7
1935	786,159 072	531,009,851	255,149,221	32.4

MONEY SPENT DURING PAST TEN YEARS UNDER BOARD OF WATER WORKS TRUSTEES

WATER SUPPLY

Circular pump house and equipment	$ 50,000.00
Shallow well	6,000.00
Deep well	6,043.00
	$ 62,043.00

BUILDING AND MACHINERY

Storage Tanks	$ 56,000.00
Pumping station	22,000.00
Paid for 6 MG pump	24,500.00
River intake	2,456.00
Stand by high duty pump	3,000.00
Garage and warehouse, furnished	9,455.00
Coal viaduct and road	2,100.00
Pump well	2,050.00
	$121,561.00

IRON REMOVAL PLANT

Settling tank and filter	$ 90,000.00
Wash tank	2,000.00
Chemical feed house and feeders	2,600.00
	$ 94,600.00

PIPE LINES

Distribution System	$199,625.00
Well field	15,000.00
	$214,625.00
Total	$492,829.00

ESTIMATED PHYSICAL VALUATION OF MARSHALLTOWN WATER WORKS SYSTEM

BUILDING AND GROUNDS

51 acres of land	$ 5,100.00
Main pumping station	51,000.00
Settling tank and chemical house	25,000.00
Warehouse and garage	9,000.00
Main well field pumping station	14,000.00
Gravel packed well pumping station	1,500.00
Deep well pumping station	1,100.00
1½ Million gallon reservoir	34,000.00
1 Million gallon reservoir	27,000.00
Smoke stack	10,000.00
Concrete dam and retaining walls	20,000.00

Concrete retaining walls along river	15,000.00
Coal dumping viaduct and roadway	2,500.00
Suction wells	8,000.00
Old pump well	4,000.00
Fences	2,000.00
Cottage	2,500.00
11 Wells	16,000.00
River intake	1,100.00
Wash water tank	2,500.00
Steel elevated tank	9,000.00
	$260,300.00

MACHINERY

1-6 MG Allis Chalmers Pump	$ 37,000.00
1-4 MG Allis Chalmers Pump	25,000.00
2 Boiler feed pumps	750.00
3 - 150 HP Boilers	15,000.00
3 - 2 MG Cap. Centrifugal pump	4,000.00
3 Vacuum pumps	900.00
2 - 1 MG Cap. Vertical pump	2,400.00
River intake pump	1,300.00
Electrical driven 2 MG cap. high duty pump	3,000.00
Electrical control panels	15,000.00
Chemical feed equipment	4,000.00
Filter plant equipment	40,000.00
Chlorine machine	1,300.00
Master meter	350.00
Plant gauges	350.00
Steam header system	4,000.00
Heating system	1,500.00
Lighting system	400.00
500 meters at $11.00	5,500.00
Meter testing equipment	1,000.00
Tools and equipment	2,000.00
	$164,750.00

PIPE SYSTEM

56.35 miles of mains	$463,485.00
396 hydrants @ $85.00	33,660.00
929 Valves	23,080.00
929 Valve boxes	4,645.00
Well field piping system	68,000.00
	$592,870.00
Total	$1,017,920.00

Marshalltown, Iowa
Water Works