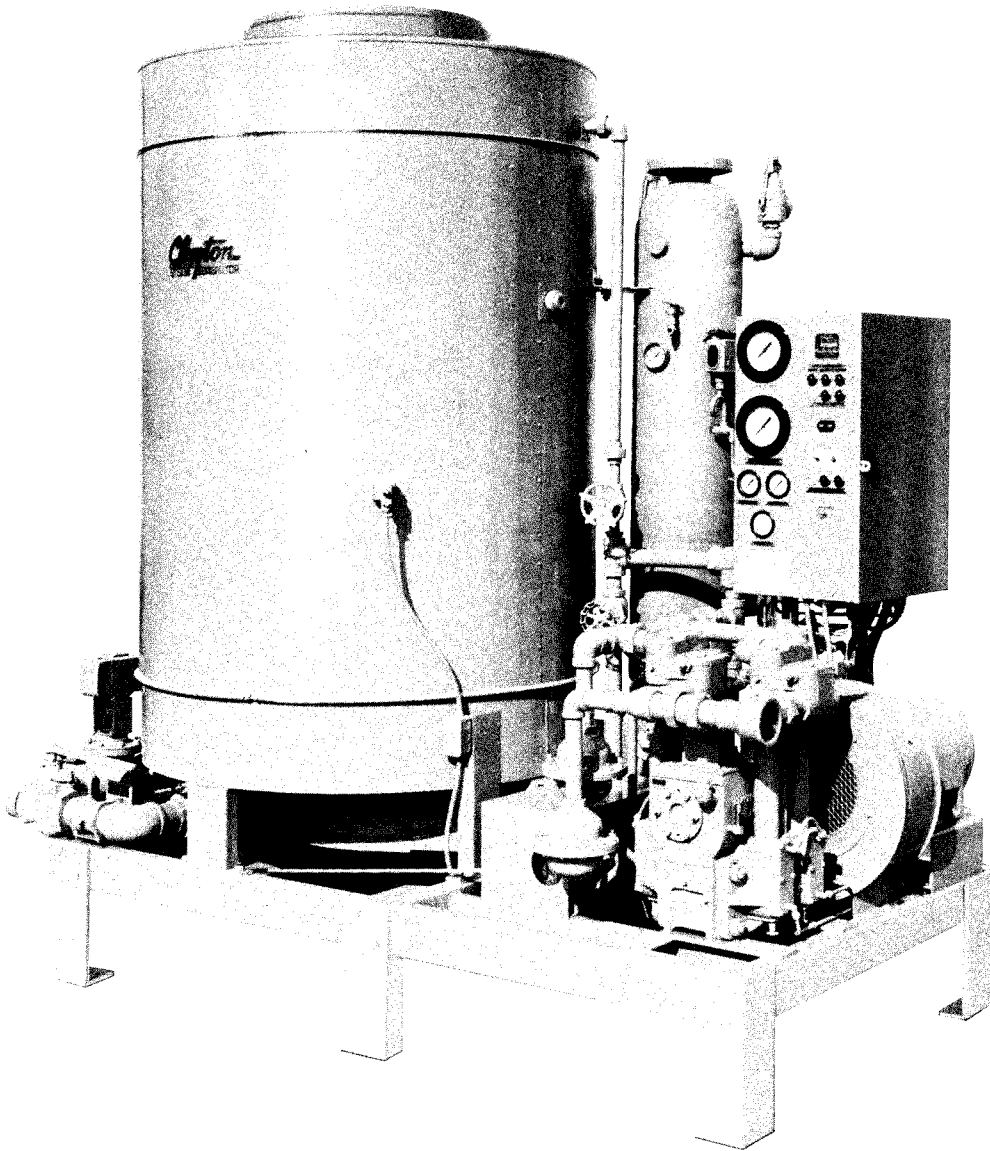
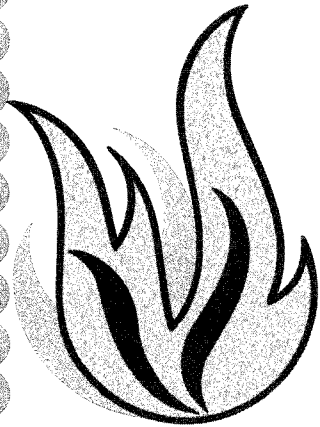


**Another
Clayton
Steam Generator
Documented
Performance
Case History**

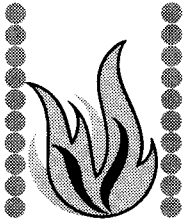
BAY CITY FORGE

ERIE, PENNSYLVANIA



PREFACE

Clayton Steam Generators are producing extremely significant fuel, labor and maintenance savings for major industrial and commercial firms throughout the world. To document these savings, Clayton Manufacturing Company retained an independent, professional photo-reporting team, Field Associates, Ltd., Monticello, New York, to gather a series of authenticated Case History Reports, this being one of them.



Clayton Manufacturing Company has the permission of each customer to reprint the Case History Report involved, and we do so with an expression of gratitude for allowing us to demonstrate conclusively that Clayton Steam Generation Systems will, in fact, produce the operating economies stressed in Clayton published literature.

When the Bay City Forge Company, Inc. wanted to hammer out a solution to their steam heat and power problems two years ago, they turned to the Clayton Manufacturing Company of El Monte, California. The firm, located in Erie, Pennsylvania, manufactures large and small forgings. It produces flat-die forgings in a variety of sizes and weights. The results of the decision to go to Claytons, according to the company's general manager, have been excellent and have paid off in economy, efficiency, and in a job well done for Bay City Forge.

Bay City Forge has a Clayton E-300 and a Clayton E-200 in its boiler room. The units provide all of the necessary process steam to drive the company's three huge hammers, and to heat the large building housing the machine shops, storage area and shipping department. The hammers, forges and other specialized devices that prepare the rough metal are housed in the same building as the boiler room. This building is adjacent to the machine shop complex.

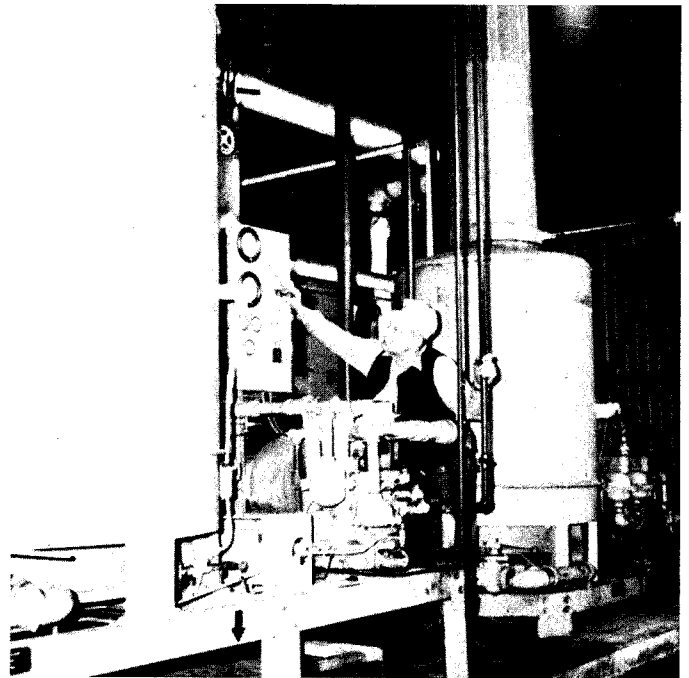
The company presently produces about four hundred tons of forgings a month, and turns out crank shafts, pump shafts and motor shafts for such firms as General Electric and for the punch press industry. The complex has the machining capacity to rough machine any piece that it forges. The pieces range from fifty pounds to six thousand pounds in weight, and from 3-1/2 inches to 15 inches in diameter. The products also include bars, blocks, bushings, spindles and special shapes of many kinds.

Elmer M. Brunner is vice-president and general manager of Bay City Forge and it was he who made the decision to go to Clayton equipment. He had heard about the Clayton Steam Generators installed at a nearby Kaiser Aluminum plant. These units were performing the same type of function required by the Bay City Forge plant — that of producing process steam to operate hammers. Kaiser uses the equipment to turn out aluminum airplane props.

The State of Pennsylvania mandates that when an industrial boiler reaches a certain age, pressure output of the unit must

be dropped. A cut in the pressure output of Bay City Forge's old boilers would affect the plant's steam hammer capabilities and this possibility was drawing near. Mr. Brunner checked on Clayton equipment as well as on other units. The result was that Bay City Forge ordered a Clayton E-200 gas-fired unit in mid-1973 and followed up this purchase a short time later with a Clayton E-300.

Matthew Stuczynski is Stationary Engineer at the Bay City Forge Company plant. The responsibility for the operation of the units that produce heat and power for the firm has been his for the past six years.



"When I first came here," he said, "our boilers were coal-fired. Their bulk took up one-quarter of this building. In addition, the room where we have our two Claytons now was our coal storage bin. Later on, we converted the old boilers to gas. We used to have to call people in to do brick work on the

fireboxes of the old boilers, and there was constant maintenance work, cleaning and attention required. Every three weeks we had to change over from one unit to another, shutting down to clean the scale because it was so heavy. The old units were one and a-half stories high. . . Look at the size of these Claytons and the job they do. There's no problem checking any part of the unit. All of the equipment I have to get to is accessible and within easy reaching height. The boiler room is open, nice looking, and there's no uncomfortable heat escaping from any part of the boiler. The tubes on the old boilers had to be replaced regularly and we had to call in extra help to keep the units in working condition. These Claytons need very little attention. I spend some time with water tests, water treatment procedures and blowing down the units, but very little on anything else relating directly to this equipment. We were also able to make good use of the extra space that we gained from removal of the large old boilers.



"Heat demands on the boiler," according to the Stationary Engineer, "amount to one-half million Btu's per hour. This is mainly for the adjacent machining building. The rest of the steam demand is to power the hammers that produce our product. We have three of these hammers at the plant. . . one 5000 pound, one 2500 pound and one 1500 pound. This steam power is exhausted by the equipment after use. In fact," Mat continued, "if you look outside at our stack, you can see the exhaust waste. Someday perhaps, we'll install a unit to trap this power and recycle it. The problem, of course, will be to remove the oils and waste products contained in this exhaust steam so that it doesn't cause operational difficulties when its recycled."

Bay City Forge began as the Open Die Forge Company back in 1907. A lot of automation has been added to the production

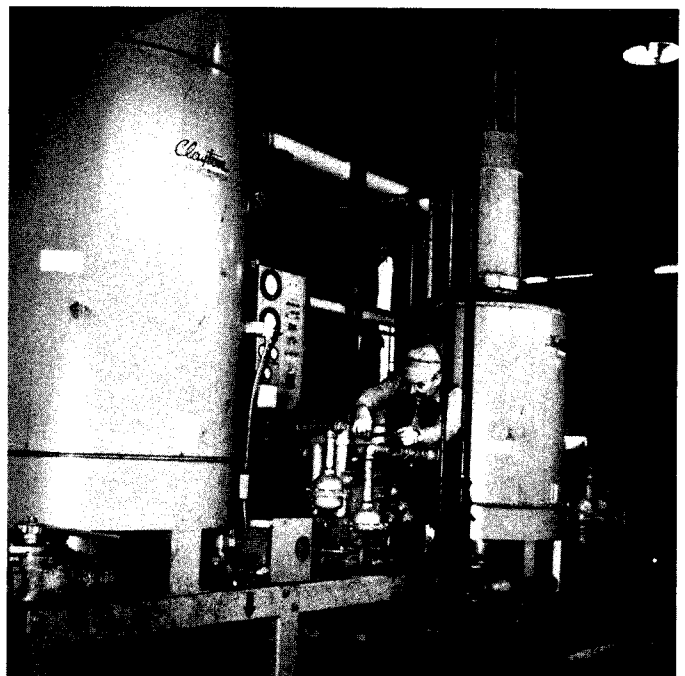
process through the years. Now, an immense gas oven with electric blowers heats the huge bars of metal to red hot in preparation for working. A mechanical manipulator with gripping teeth lifts the tons of hot metal from the furnace and transports it to the hammer for working. Powerful steam hammers — operated by the Clayton steam generating equipment — pound the tremendous bars into prescribed shapes. The teeth and arms of the manipulator do the rotating duty as the hammer head shapes the item. Manpower is still important, though, as it makes the choice of striking position and product design.

"Instead of me telling you about our fuel savings with the Clayton equipment," noted General Manager Elmer Brunner, "suppose that I let the gas company figures do the talking for themselves."

Gas for the steam generator operation at Bay City Forge is supplied by the National Fuel Gas Company. This firm, like many in the country today, issues an allocation to the industrial users that it supplies. In the case of Bay City Forge, the allocation was 90% of its regular supply over the years. In order to enforce this rule, the gas firm has a pretty stiff penalty for scofflaws.

If a company goes over the allocated amount by a cubic foot, it is charged the full amount of its normal billing. For example, a company uses X number of cubic feet of gas. The cost is \$50,000. If the user violates the allocation, the penalty is an additional \$50,000. This cutback and penalty threat has eliminated overtime, and cut back production in many plants.

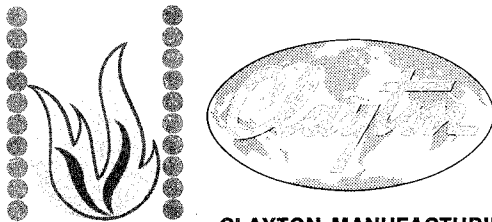
The National Fuel Gas Company regularly issues to its industrial users a computer print-out indicating fuel



consumption at the individual plant on a monthly and yearly basis. In addition, the print-out has a summary showing the EXPECTED VOLUME used by the customer, and the VARIANCE in cubic feet of gas used. These figures are also given in percentages.

Based on fuel company calculations, Bay City Forge was EXPECTED to use 60,798,000 cubic feet of gas for its operation last year. The firm ACTUALLY used 31,409,000 cubic feet. This represented a VARIANCE of 29,389,000 cubic feet of gas, or a savings of 48.3% that Clayton Steam Generators were able to effect at the plant in a year.

"The gas company was surprised the first time they checked our figures showing the large fuel savings," indicated Elmer Brunner. "For the Bay City Forge Company the savings were not only in fuel dollars. We were able to re-schedule our production operation and run two work shifts at the plant because of the extra fuel supply. We're now working 18 hours a day instead of ten. We were also able to purchase a new annealing furnace operated by gas and we still haven't reached our gas limitation. We can credit Clayton equipment," concluded Brunner, "for being able to increase our production from 200 tons a month to 400 tons a month, despite an energy allotment cutback."



CLAYTON MANUFACTURING COMPANY • WORLD HEADQUARTERS and FACTORY

4213 North Temple City Boulevard, El Monte, California 91731 • P.O. Box 550, El Monte, California 91734 • Telephone: (213) 443-9381 or (213) 283-4131 • Telex: 67-4404