MUELLER RECORD

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TO MAKE CONNECTIONS SAFELY

DEPEND UPON MUELLER SAFE-WAY WELDING TEES

When making service connections to the main, no gas can escape during any phase of the operation if you use MUELLER SAFE-WAY WELDING TEES and a Mueller E-4 or D-4 Drilling and Inserting Machine. Since no gas escapes, the work is done in ABSOLUTE SAFETY!!!! Connections can be made to low, intermediate or high pressure lines. The outstanding feature of MUELLER SAFE-WAY WELDING TEES is the INSIDE and OUTSIDE thread at the top of the Tee that permits drilling and shutting off operations under pressure and without loss of gas.

A valve and machine can be attached to the OUTSIDE threads, the work accomplished, and final sealing effected by inserting a plug in the INSIDE thread and a cap over the outside threads. This gives a double, leak-proof seal with the further advantage that the Tee can always be used as a shut-off at any future time. SAFE-WAY TEES are made in sizes from ¾ to 2 inch inclusive and will withstand pressures up to 500 lbs.

DEPENDABLE SINCE 1857 FULLY WARRANTED OUR 91st YEAR

MUELLER CO.

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MUELLER RECORD

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COVER

Portland Head Light, Portland, Maine
Ewing Galloway from American Photo

MOSTLY PERSONAL

WE HAVE SUSPECTED for some time that Ray Fallon, the Mueller Co. salesman whose territory includes Monte Vista, Colorado, has been suffering a secret frustration as a result of his inability to install Mueller Improved Fire Hydrants in that city.

So far as can be determined Monte Vista is the only city in the United States that just hasn't any particular need for hydrants—at least not the conventional types.

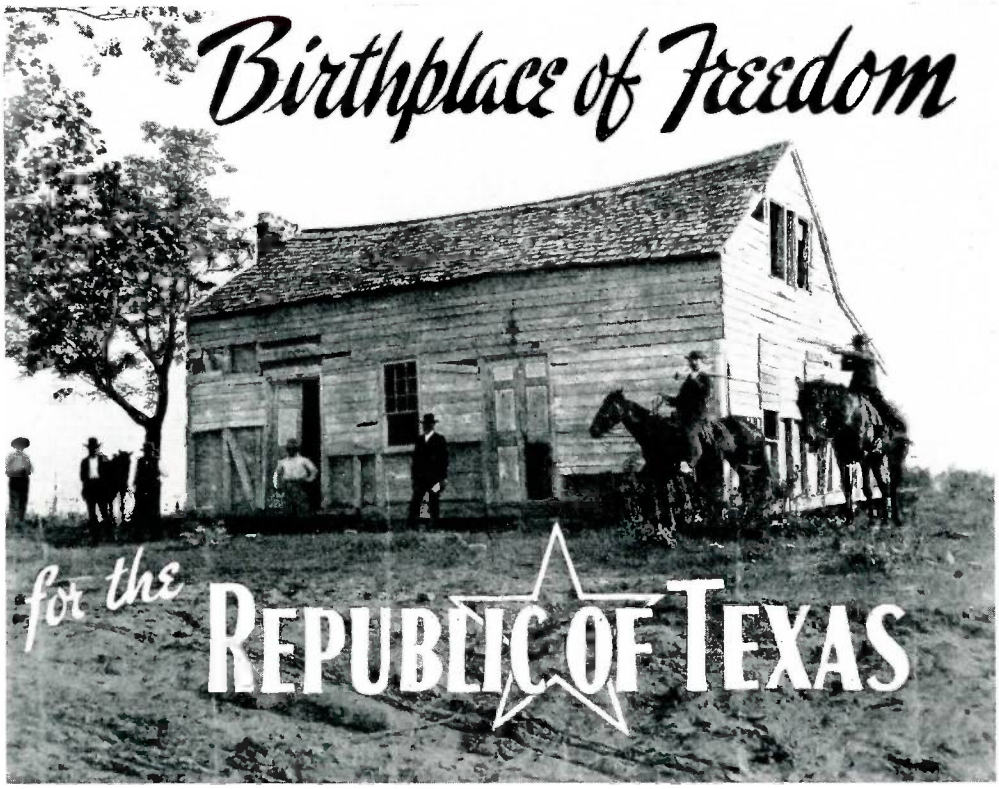
We think you'll be interested in reading Wilbur Erickson's account in this issue of the situation that exists there.

* * *

Remember reading in our first issue after publication of the Mueller Record was resumed about the Los Angeles plumber, E. O. Stice, the owner of On Trust?

Well, the horse isn't doing too badly as a four-year-old this year. On January 10 On Trust out-ran six other California-breds to win the $50,000 Santa Catalina handicap. First prize money for the mile and one-eighth

(Continued on page 28)



Noah T. Byars' blacksmith shop, Texas' Independence Hall.

The delegates who made Texas a nation followed a pattern set in the Continental Congress in 1776.

IT WAS A COURAGEOUS and determined band of Texans who convened at the appropriately named village of Washington on the Brazos on a cold March morning in 1836. The siege of the Alamo had been raging since February 23, General Jose Urrea and a strong Mexican force were advancing on Goliad, and the cause of Texas, then a province of Mexico, appeared almost hopeless.

The delegates to the Washington convention had come "with ample, unlimited, or plenary powers as to the form of government to be adopted," and, knowingly or not, they were following a precedent that had been set by Colonial patriots sixty years earlier in the Continental Congress—and for about the same reasons.

Their meeting place was the blacksmith shop of Noah T. Byars, a frontier smithy. It was unfurnished, without doors or window panes. In place of glass, cotton cloth had been stretched across the window openings, only partially excluding the cold wind. However, it had the advantage of being the largest building in the community.

The night before had been exceedingly warm, but a Texas norther sprang up, accompanied by lightning, thunder, rain and hail, and, according to the diary of one of the delegates, the temperature "was down to thirty-three degrees and everyone was shivering and exclaiming against the cold."

There was an urgency in the matters the delegates were to consider that com-

pletely overshadowed personal discomfort or the crudeness of their surroundings. The delegates were well aware of the significance of their task, and there was no question about the course their action was to take.

The convention convened the morning of March 1, and by 2 o'clock that afternoon George E. Childress had entered a motion that the convention's president and the delegate from Red River, Richard Ellis, appoint a committee of five to draft a declaration of independence.

Indeed, such was the speed at which the delegates worked that, according to an anecdote told later, when Lorenzo de Zavala, one of the delegates arose and started to make a lengthy speech, starting with, "Mr. President, an eminent Roman statesman once said," he was interrupted by Thomas J. Rusk with the comment that the convention should give less consideration to dead Romans and more to live Mexicans. Incidentally, de Zavala, a Mexican refugee, was chosen vice-president of the temporary government set up by the convention.

With Childress, who is credited with writing the declaration, the other members of the committee appointed were James Gaines, Edward Conrad, Collin McKinney, and Bailey Hardeman. The following day, March 2, on the motion of Sam Houston, the report of the committee on the declaration was received, and, again on the motion of Houston, the declaration was engrossed and signed by the delegates, proclaiming Texas a free and independent republic.

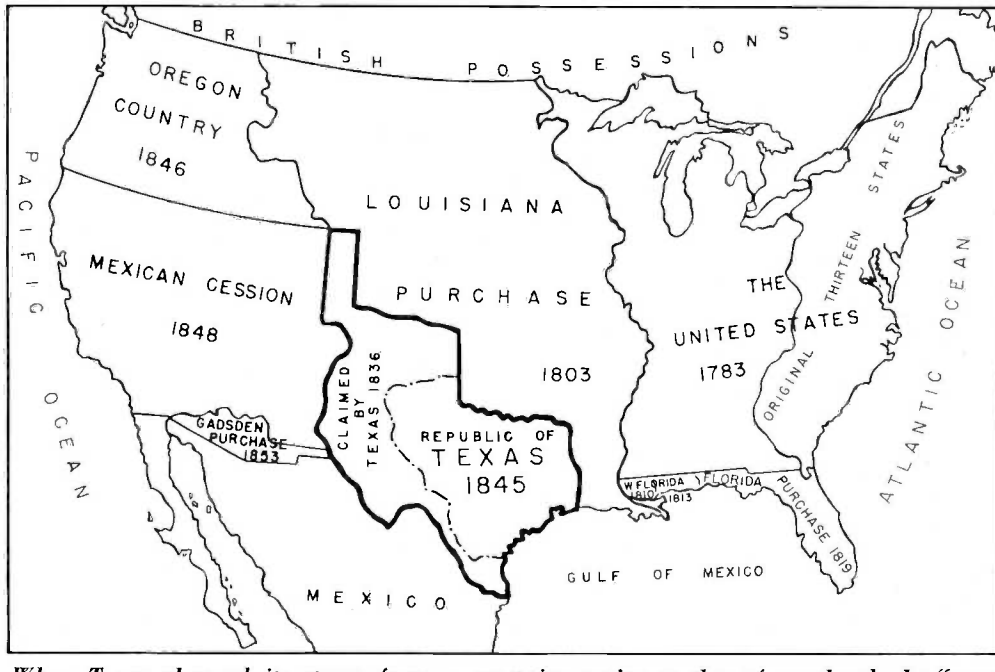
Like the American declaration of independence of 1776, the Texans detailed reasons for severing their connections with the mother country. These grievances, following many of the main features of the document drafted by Thomas Jefferson for the Colonies, stated:

That the Mexican government had failed to secure for the colonists "that constitutional liberty and republican government to which they had been habituated in the land of their birth, the United States of America;"

That General Antonio Lopez de Santa Anna, who at that moment was commanding Mexican troops against the Alamo, had overthrown the government;

That a republican constitution for Texas, offered in accordance with the Mexican national constitution, had been "contemptuously rejected;"

That Stephen F. Austin, who had gained colonization concessions from the



When Texas changed its status from a sovereign nation to that of statehood, the "westward movement" in the United States was given additional impetus.

Mexican government, had been imprisoned for his attempts to obtain the acceptance of a republican constitution and the establishment of a state government;

That the Mexican government had failed and refused to secure the right of trial by jury;

That the Mexican government had failed to establish any public system of education;

That the government rendered the military superior to the civil power;

That the state congress of Coahuila and Texas was dissolved by force of arms;

That the government had demanded the surrender of a number of Texas colonists and ordered the military to seize and try them, in contempt of civil authorities;

That piratical attacks had been made upon commerce;

That the right of free worship had been denied;

That the government demanded that the Texans deliver up their arms;

That the Mexican government had invaded Texas by both land and sea; and

That the government had incited savages to massacre the inhabitants of the frontier.

These and other reasons, the declaration stated, prompted the delegates to end their political connections with Mexico, and to declare "that the people of Texas do now constitute a free, sovereign, and independent republic and are fully invested with all the rights and attributes which properly belong to independent nations."

The convention then addressed itself to the framing of a constitution for the new republic and the election of provisional officers. Sam Houston was appointed commander-in-chief of all Texas troops on March 4. General Houston left the convention two days later for Gonzales, hoping to pick up troops there to go to the relief of Lt. Col. William B. Travis and his gallant men at the Alamo. Orders were sent to Col. J. W. Fannin at Goliad to march to Cibolo Creek, where Houston planned to join the forces.

Upon his arrival at Gonzales March 11, General Houston received word that the Alamo had fallen on March 6. In the

—Courtesy Texas State Library

REV. NOAH T. BYARS

The blacksmith who became a Baptist missionary fought for liberty with a rifle, but found his most rewarding work in ministering to the spiritual needs of the Texas frontiersmen.

fierce hand-to-hand fighting, all of the 182 Texan defenders were killed—at a cost to Santa Anna's army of between 500 and 600 men killed and wounded.

News of the fall of the Alamo did not reach the convention at Washington on the Brazos until March 15. During that time, the delegates had been working day and night, and at midnight on March 16 the constitution of the Republic of Texas was adopted. The delegates completed their work about 4 o'clock the morning of March 17 and adjourned a few hours later.

Meanwhile, General Houston decided to retreat from Gonzales with the 374 untrained men he found there, and a change of orders was sent Col. Fannin, directing him to fall back to Victoria.

Leaving Goliad with 350 men and ten pieces of artillery, Col. Fannin had halted for a rest about three miles from Coleto Creek when General Urrea's Mexican cavalry made a surprise attack, surrounding the Texans, who were saved temporarily by nightfall. The next day,

March 19, the Texans successfully withstood Urrea's charges, but on the following day, the Mexicans were reinforced by several hundred fresh troops. The Texans chose to surrender rather than abandon their wounded.

Col. Fannin and his men were returned to Goliad as prisoners of war, and while there they were joined by Lt. Col. William Ward and his force, which had surrendered to the Mexicans at Victoria. All in all, about 440 Texans were held as prisoners at Goliad.

On March 27—Palm Sunday—at the order of General Santa Anna, all men who could walk were formed up into three sections and marched out of town under guard. They were halted, and at a word of command, the Mexicans slaughtered them in cold blood. Nearly all were killed at the first volley. Those who were not were dispatched with bayonet or clubbed musket.

The disasters at the Alamo and at Goliad and the continued retreat of General Houston were terrible blows to the young republic. Santa Anna's successes had made him overbold, and he failed to see that Houston was keeping out of his way until he made one mistake that might give the Texans the opportunity they so desperately wanted.

Santa Anna's mistake came finally when he became separated from his main army in his anxiety to capture President David G. Burnet and his old enemy, de Zavala, the vice-president of the Republic.

On April 20 the opposing forces were camped facing each other near the junction of Buffalo Bayou and the San Jacinto river. Santa Anna was reinforced by General M. P. Cos with about 500 men, bringing the Mexican forces to about 1,600 men as compared to about 925 Texas troops.

General Houston ordered the famous Texas scout, Deaf Smith, and a small detachment to destroy the bridge over Vince's Bayou to prevent either the reinforcement or the retreat of Santa Anna's army.

A council of war was then called, but it was dismissed when the officers present could not agree on plans for either offense or defense. Despite the odds, the Texans wanted to fight and they became mutinous when Houston would not give the order to attack.

Gus Byars, water superintendent at Tucumcari, New Mexico, is a great-grandson of the late Rev. Noah T. Byars, Texas patriot, blacksmith, armorer to the Texas Army, judge, missionary and college founder. Mr. Byars has been with the water department there for the past eight years, and has been superintendent for the past year and a half.

Gus Byars

Finally, at about 3:30 o'clock in the afternoon, while the Mexicans were taking their customary siesta, General Houston gave the order to attack. The Mexicans were taken by complete surprise. Screaming "Remember the Alamo" and "Remember Goliad," the Texans routed Santa Anna's army, killing 600 Mexicans, wounding 250, and capturing more than 700, including the infamous Santa Anna himself. The Texans had two killed and 23 wounded, six of whom later died from their wounds. General Houston's ankle was shattered.

General Houston and General Santa Anna agreed to an armistice, and on May 14 President Burnet and Santa Anna signed the Treaty of Velasco. The Battle of San Jacinto had established the independence of the Republic of Texas.

Thus, a proud nation had emerged from the humble surroundings of Noah Byars' blacksmith shop. However, Byars is entitled to a greater claim to distinction in the history of Texas than that of owner of the building which served as the birthplace of Texas' independence.

He had arrived at Washington on the Brazos in February, 1835, and being a blacksmith by trade, opened a shop in the village. He became the official armorer and blacksmith for the Texas

(Continued on page 29)

They Don't Use FIRE HYDRANTS at Monte Vista, Colorado

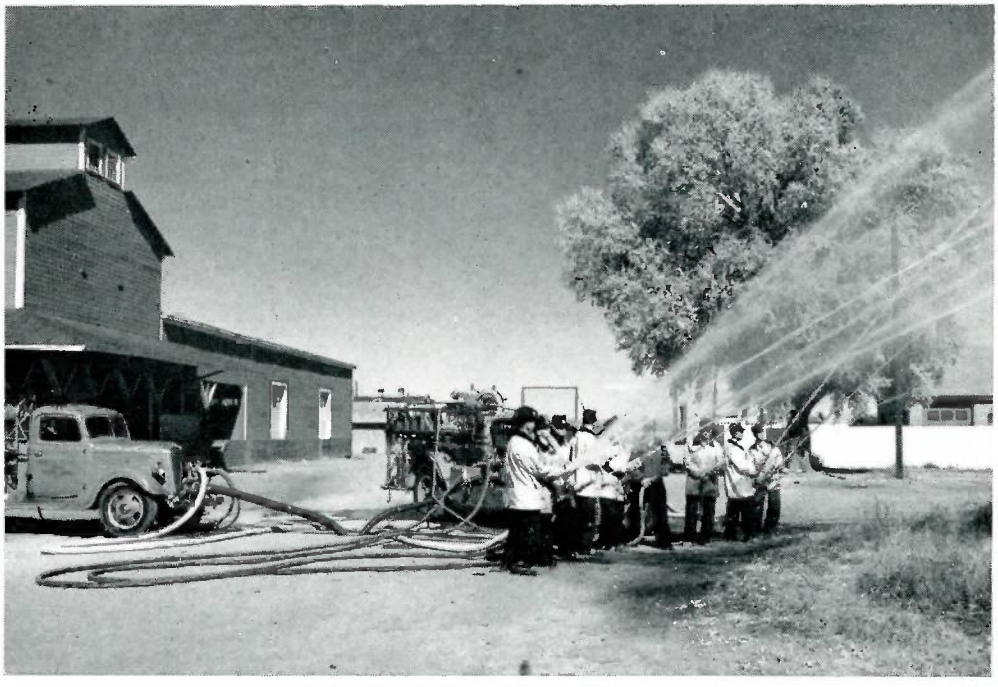
By WILBUR G. ERICKSON

THE CITY OF MONTE VISTA with a population of some 4,500, located in the San Luis valley of southern Colorado, has a unique fire fighting system—possibly the only one of its kind in the world. This system is made possible by the city being built on the floor of a valley which was formerly the bottom of a lake. The lake has long since vanished by cutting an outlet through the rim of the valley, but the water table still remains at a level of about three to four feet under the surface.

Large surface wells, 12 to 20 feet deep and some five feet in diameter are dug in the sandy or gravely soil, and the sides are walled up with brick or planking as the well is being excavated. Holes or crevices are left in the wall, so that when water is pumped out, additional water will rush in. The top of the well is domed over to the size of an ordinary manhole,

Members of one of the world's most unique fire departments drop the intake hose from No. 2 truck into an open manhole, one of 24 located throughout Monte Vista, which serve the same purpose as fire hydrants. The firemen, left to right, are: R. M. Williams, George Haller, Virsh Robb, Edgar Sanderson, Howard Crinklaw and Lee Howard.

Next step is connecting up the intake hose to the pumper. Here the firemen are connecting up No. 1 truck. The intake hose to No. 2 truck already has been connected. The firemen here are Sanderson, Crinklaw, Riley Masseger, Chief Howard, Harold Ferguson and Williams.



The two Monte Vista Fire Department trucks, both pumping from the same well, put out nine streams of water. Even with as many as nine or ten streams the draw-down of a well will be only a couple of feet if operated day and night. Firemen here are Howard, Masseger, Robb, Don Haller, Crinklaw, Ferguson, Sanderson, Williams and Haller.

and the top remains flush with the surface of the street or alley. These wells are inexhaustible and can be pumped day and night, delivering sufficient water to operate nine or ten strings of hose, and the draw-down of the well will only be a couple of feet.

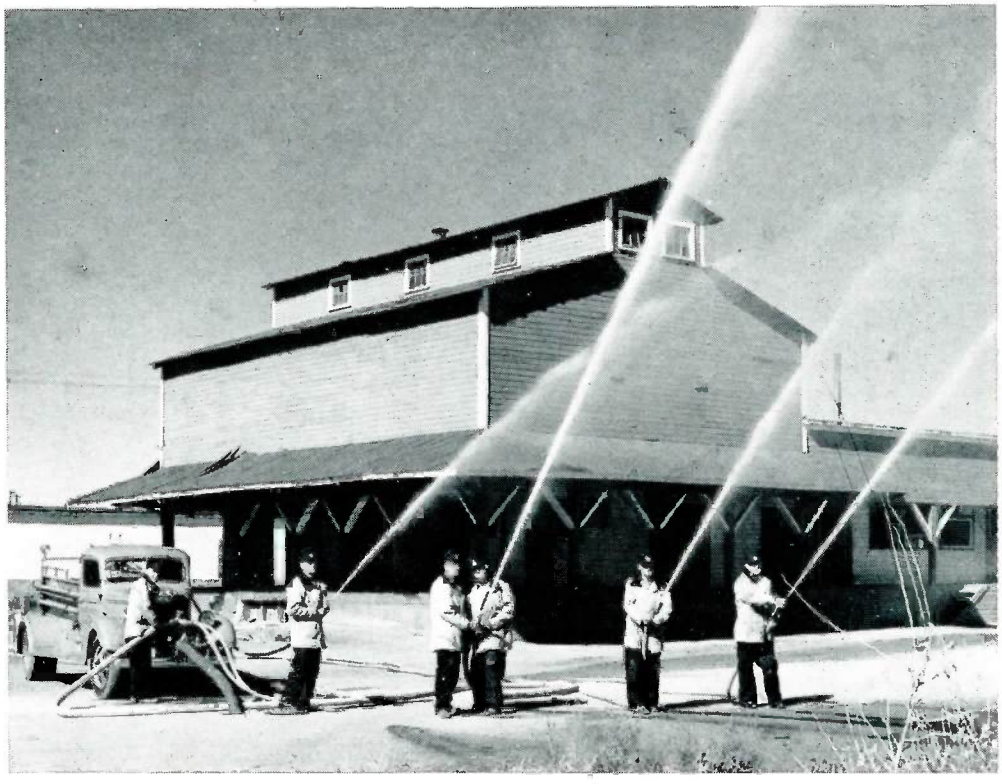
These wells are located at street or alley intersections about two blocks apart, so that four city blocks can be served from each well. The water never freezes in the wells, and summer or winter, all that is necessary to start pumping is to kick the manhole cover off and lower the intake hose from the fire truck.

Lately a good many of the wells that serve only a small area are being constructed by sinking a 16 or 18 inch perforated casing to a depth of about 30 feet, which gives an adequate supply of water for a localized blaze.

A rural fire truck is also maintained by the Monte Vista Fire Department, and many of the farmers have their own wells on the farm to pump from. The rural fire department is supported by membership, and to secure fire protection the farmer must be a member.

The fire fighting equipment at Monte Vista consists of 24 wells and two fire trucks. Each truck is equipped with sufficient hose to extend the nozzles to any part of the city, and to double up on the main line if the situation becomes necessary.

The volunteer fire department personnel consists at the present time of 12 men: Lee Howard, "A" Chief; R. M. Williams "A" assistant Chief; Edgar Sanderson "A" Captain and "B" Engineer; Harold Ferguson "A" section of City and "B" first Engineer; Virsh Robb, "A" section of Rural; George Haller "A" Engineer; Riley Masseger "A" Engineer; and Firemen Howard Crinklaw, Woody Brewer, Louis Warren, Elton Davenport, Robert Pier.



The rural fire truck, maintained by the department for the protection of farm members, is shown here as it produces four streams of water from one of the wells. Left to right are: Sanderson, Chief Howard, Williams, Haller, Crinklaw and Robb.

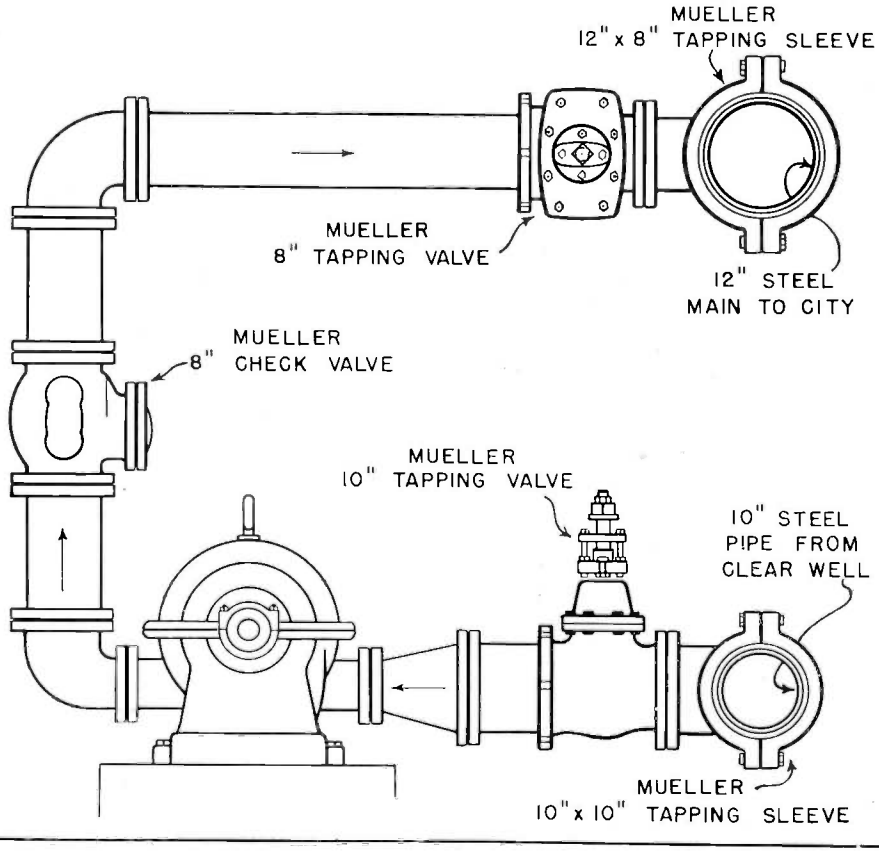
Charleston, Illinois Solves a Problem

WHEN THE CITY of Charleston, Illinois, recently decided to install a new 1,500-gallon-per-minute centrifugal pump between a line from the clear well and the main feeder line to the city, one of the questions that immediately arose was the manner in which it was to be connected.

As Ervin Light, water superintendent, sized up the situation, installation of the pump would require a complete water shut-down while tee connections were added to the lines unless some means could be found to make the necessary connections while the lines were under pressure.

Since Charleston does not at present have an elevated tank in which reserves for fire-fighting or other emergencies could be stored, Mr. Light was reluctant

DIAGRAM OF CHARLESTON'S NEW PUMP INSTALLATION, USING MUELLER TAPPING SLEEVES AND VALVES



to advise a shut-down for the eight or more hours the tee connections would require.

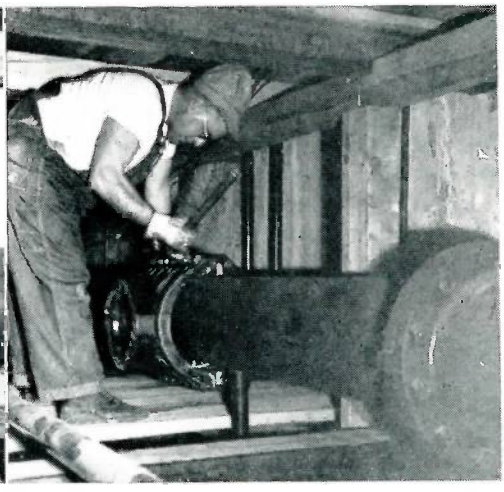
Therefore, it was decided to use Mueller tapping sleeves and valves for the fittings while making cuts in the two lines with a Mueller C-C drilling machine.

The pumping station itself presented certain difficulties because of the limited working space. A scaffold was erected to furnish access to the 12-inch main feeder line, and the sleeve and valve hoisted up. A 12″ by 8″ tapping sleeve and an 8-inch valve were calked on the main and tested with 125 pounds of water pressure, the same as that inside the main, before an 8-inch cut was made in the main.

A 10″ by 10″ tapping sleeve and a 10-inch valve were installed on the intake line from the clear well, which ran about three inches below the floor level. It was necessary to cut out some of the concrete floor beneath the pipe in order to calk on the sleeve.

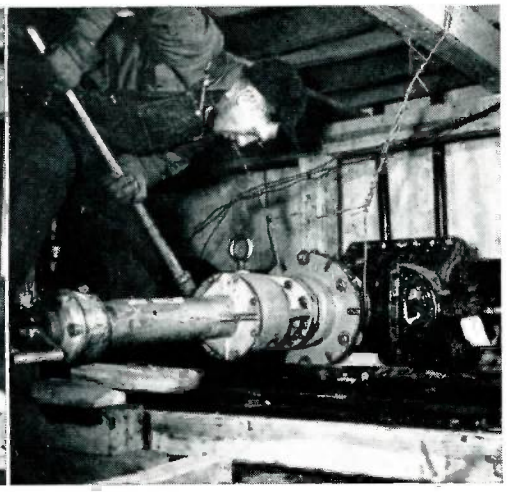
No difficulty was experienced in making the cuts, Mr. Light reported.

Jack Chepan, Mueller Co. service foreman, is shown with half of the tapping sleeve at the point where the main feeder line, under 125 pounds pressure, was cut.

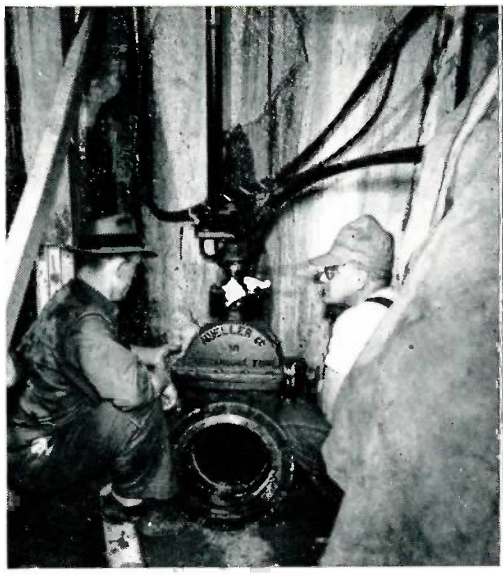


Roy Ehrsam, water works employee, bolts on the 12″ by 8″ tapping sleeve before it is calked and leaded to the 12-inch steel feeder line to the city.

Chepan checks valve's alignment with Glen Wilson and Marion Myers, Charleston water works employees.



Myers operates the Mueller C-C drilling machine, which was used to cut the main.



Chepan and Ehrsam look over the installation of the tapping sleeve and valve on the 10-inch steel line from the clear well.

Ehrsam operates the Mueller C-C machine as it completes the 10-inch cut in the clear well line. The cramped quarters are apparent.

The job completed, Chepan holds the 10-inch steel coupon cut from the clear well line and Ervin Light, center, water superintendent, is shown with the 8-inch coupon from the main feeder line. Henry Elliott, water works employee, is on the right.

NORWAY Hasn't Forgotten

THE PEOPLE OF NORWAY, who for five years fought the German occupation of their land with every means at their disposal, have not forgotten the part American soldiers played in their liberation, which came on May 8, 1945.

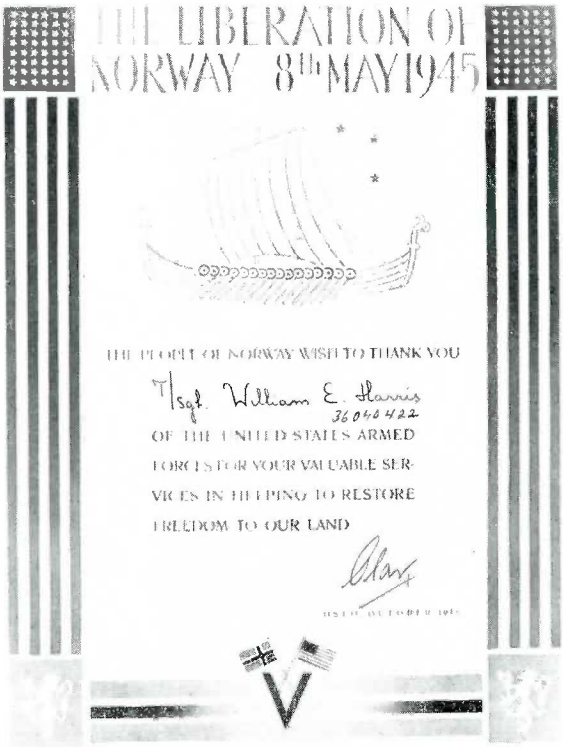
Through Crown Prince Olav, heir to the Norwegian throne, they are sending individual tokens of their gratitude to personnel of the 474th Infantry Regiment, formed of the remnants—after Anzio—of the first, third, and fourth Ranger battalions and what was left of the First Special Service Force, for "valuable services in helping to restore freedom to our land." One of the citations was recently received by William E. (Earl) Harris, assistant Mueller Co. paymaster and a former technical sergeant in the 474th.

Germany invaded Norway by land, sea, and air on April 9, 1940, for the purpose of "protecting" it for the duration of the war against the Allies. The people were warned against resistance, but general resistance developed immediately, and on April 27 Adolph Hitler said the Norwegians had "created a state of war" through their failure to submit to the Nazi invasion.

The German advance was lightning-swift. The British were caught by surprise, but managed to land a few troops at Trondheim and later at Narvik. However, these later were withdrawn, the troops being so short of ammunition and explosives that ship depth charges were used to blow up the bridges behind them in an effort to slow the German advance.

The Norwegian government and the royal family had been forced to flee Oslo when the city was occupied by the Germans, and a new government was formed by the Nazi party leader, Major Vikdun Quisling, whose name became synonymous with traitor. From London the Norwegian government-in-exile continued to rally and encourage the people.

Norwegian resistance to the Nazis was carried on in the open and through a highly organized underground. During December, 1940, the Norwegian Supreme Court resigned in a body as a gesture of defiance against the Germans; when the Nazis seized control of a Norwegian medical association, more than 2,000 of



The people of Norway are saying "thank you" to American armed forces with these tokens of gratitude.

its 2,339 members resigned; when a Nazi president replaced the head of a nurses' association, 3,700 nurses resigned; when the teachers' union became Nazi-dominated, more than 12,000 of Norway's 14,000 teachers resigned; and when the Quisling government tried to block a church service at Trondheim cathedral and required all children between ten and eighteen years of age to enroll in a Nazi youth organization, all seven bishops of the state church resigned.

In 1940 more than 10,000 persons escaped from Norway, risking their lives in small boats to cross the dangerous waters of the North Sea. Many of those escaping were young men who made their way to England and joined the royal navy or the R.A.F. Many, under the auspices of the Norwegian government-in-exile, received air training at "Little Norway" in Canada.

Acts of sabotage, slowdowns and active aid in British and American commando and air raids, plagued the German occupiers, who, following a pattern of terror technique which was perfected in Poland, seized and executed hostages in reprisal. The perpetrators escaped to plan even greater damage to the Germans.

William E. Harris

The importance of Norway to Germany's plan of conquest cannot be minimized. Germany was able to maintain a strong advantage with Norway's northern airports and the numerous fjords which served to base planes and seclude warships between attacks on Russian-bound convoys. The Murmansk run was one of the most hazardous for Allied convoys. However, the Norwegians saw that the Germans paid a high price for their strategic positions.

—Press Association, Inc.

Crown Prince Olav, heir to the Norwegian throne, in the uniform of a general of the Norwegian Army.

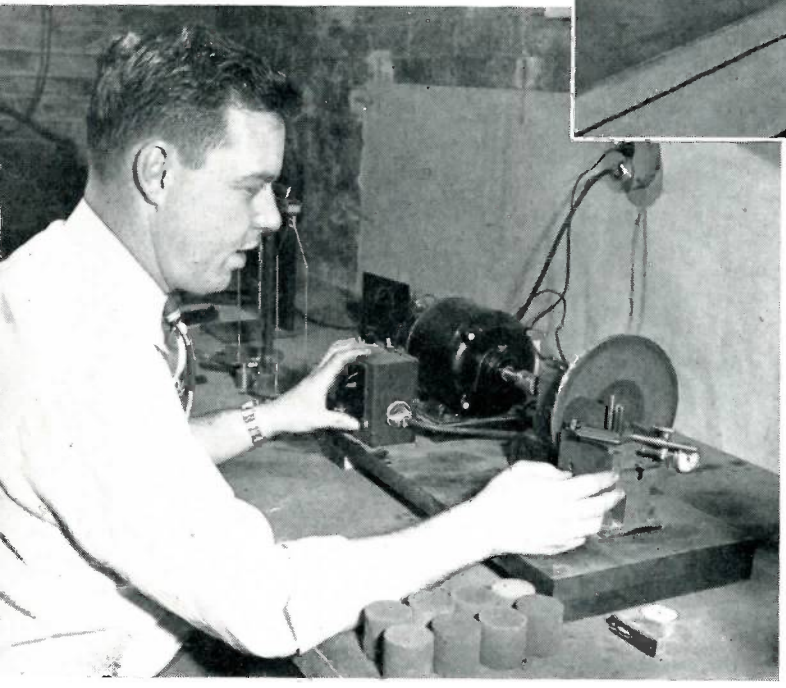
When the American liberation forces, composed of veterans who had fought in Africa, Sicily, Italy, and through France and Germany to the Czech border, arrived in Norway they were greeted, literally, with open arms by the Norwegians. Harris said the treatment accorded the G.I.'s was nothing short of wonderful. Every private was a hero, and every Norwegian a friend.

Harris' citation was dated October, 1945, the date the 474th Infantry Regiment sailed for the United States. The citations are being distributed through the adjutant general's office of the War Department.

The date also coincides with the time the Norwegian government got around to tending to an important item of unfinished business, which had been deferred but not forgotten. For on October 23, 1945, Major Quisling was executed by a firing squad.

CORE RESEARCH FOR

A CASTING is only as good as the core which forms its inside cavity. Without high quality cores, the final casting is subject to imperfections which may not become apparent until after the product has been placed in service, entailing unsatisfactory service and costly replacement. To maintain and constantly improve the quality of its castings, Mueller Co. conducts a continuing study of the materials used in core-making. Results from this research are incorporated in the standards required for the cores used in the manufacture of the company's products.

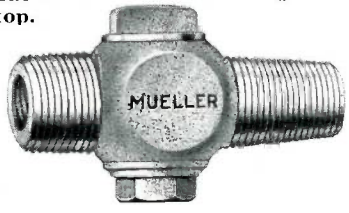


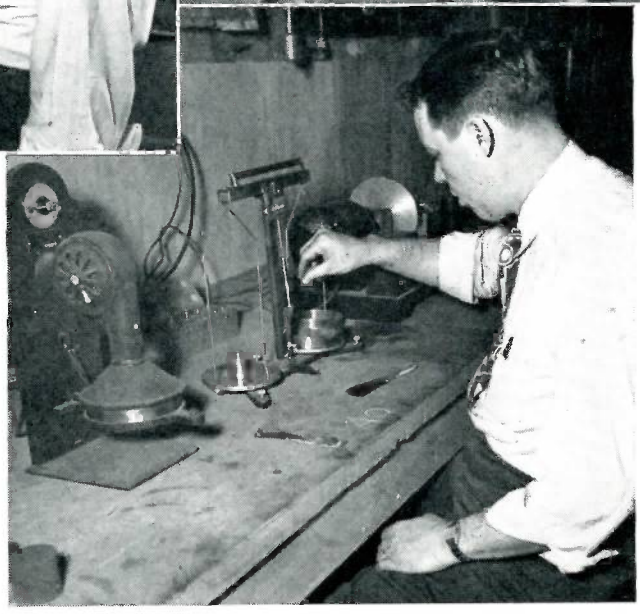
Above: Carlton Hackman, assistant foundry engineer, tests the compression strength of a "green" or unbaked core. This determines, in part, whether a core-maker can handle a core without deforming or breaking it. *Left:* The quality of a core to withstand abrasions is measured with this equipment. A core is subjected to an abrasive wheel at a certain pressure for a certain length of time, and the amount of abrasion measured. From a comparison of the friability of various sands and binders, the best can be determined.

BETTER PRODUCTS

Right: Test runs of core mixtures are mulled for varying times in this muller. Foundrymen and core-makers have found that sand loses its "life" if over-mulled, and, if under-mulled, the binder does not thoroughly permeate the sand, conditions that result in poor cores. *Below:* Hackman tests a green core for its permeability, green compression strength and flowability. The better the flowability, the better the sand will conform to the dimensions of the core box, resulting in a better core and a better casting.

Below: Cores shown on these pages are used in the manufacture of the Mueller Co.'s H-10003 corporation stop.





Right: Green sand is carefully weighed, dried, and re-weighed, the difference in weight after drying furnishing the amount of moisture in the sand. The strength of a core is influenced to a great extent by moisture content.

SHELL INCREASES THROUGH-PUT WITH NEW

AN INCREASED through-put of approximately 4,000 barrels of fuel oil and gasoline a day will be made possible within the next few weeks as the last of five new pumping stations is placed in operation on the Shell Oil Company's north pipe line, from Wood River, Ill., to its terminal at East Chicago.

The new stations were constructed as part of a three-quarter of a million dollar expansion program, which got under way late last summer. The old booster plants, which housed reciprocating type pumps, have been replaced by more compact diesel-driven centrifugal pumps, resulting in a new installation that provides a smaller station and a greater pumping capacity.

The north pipe line, which extends for about 250 miles, was originally built in 1926 for crude oil service, the refinery being located in East Chicago. In 1940, the eight-inch line was converted to a products pipe line, the former refinery serving as the northern terminal. The new pumps will increase the line's through-put by approximately 20 per cent.

Four of the five stations have been completed, and the fifth is expected to be in operation shortly. Stations already completed are the Mt. Auburn and Sibley stations, the Barnett station, which is located near Litchfield, Ill., and the Bradley station, near Kankakee, Ill. The fifth is the Dewitt station, located between Clinton and Farmer City, Ill.

Mueller Co. drilling machines and line stopper equipment, standard with Shell Oil Company pipe line crews, were used as the old stations were by-passed and the new stations put on the line. The accompanying photographs were made recently at the new Mt. Auburn pumping station.

With the cut in the pipe line completed, the gate valve has been closed and the Mueller C-1 drilling machine and the machine adapter are lifted off, and the Mueller stopping machine bolted solidly to the valve (lower photo). After the stopping machine is in position, the rubber stopper is forced down until it strikes the stop lugs in the welding fitting. The stopper is then expanded, shutting off the flow in the pipe line which in this case was No. 3 fuel oil.

John Riggs, welder helper and Mueller machine operator for the pipe line crew, cuts into the Shell Oil Company's 8-inch products line so that flow can be stopped and section of line removed, first step in by-passing old Mt. Auburn, Ill., booster station.

Next step is the actual cutting of the pipe line. Maintenance Foreman O. H. Day, left, checks the alignment of the cutter before the line is severed.

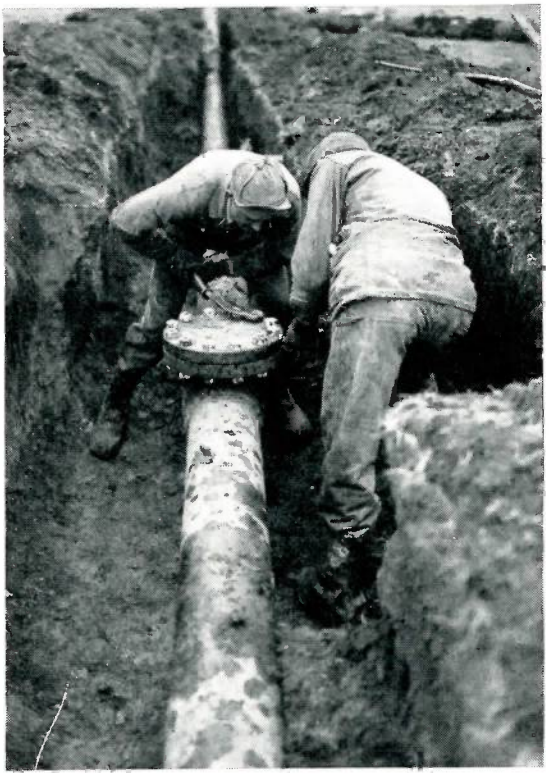
A new section of line, by-passing the old station, has been laid in the ditch. Welder Howard Shacklet watches as the crew trues up the line.

Welders Art Reed and Shacklet apply a little heave-ho to withdraw the stopper. The H-17335 stopping machine is then unbolted and removed.

The completion plug has been inserted in the welding fitting, and the gate valve is lifted out of the ditch to permit permanent tightening.

The new line just misses being a perfect fit, and Shacklet and Riggs pare off a small section of pipe with an oxy-acetylene cutting torch.

Welder Shacklet then joins the new section to the main pipe line with an electric weld, and the down-stream by-pass is nearly completed.



The completion cap is then put in place and bolted solidly to the fitting flange, completing the installation. May also be used in the future.

Welding the line on the upstream side of the station completes the by-pass and ties on the Shell Oil Company's new pumping station.

Today's pipe line patrolman uses a plane to make his rounds—at speeds of 90 to 100 miles an hour.

Walking On Air

By G. F. LEAMON
Contract Patrol Flier
Panhandle Eastern Pipe Line Company, Northern Natural Gas Company, and Natural Gas Pipe Line Company of America.

ON ALMOST every airport, someone learns that we are patrolling pipe lines, and then the questions start flying: "What do you look for? How do you find leaks?"

Pipe line personnel know the answer to those questions, and also that there are many other things to report besides just leaks.

First, I would like to describe how the pipe line looks from the air. Those who have never before flown will be amazed at the ease of following a line. The pipe line shows up greener, darker, lighter, dryer, or wetter, or in the case of snow, has more or less snow over it than the ground adjoining the line. In other words, there is a definite contrast between the pipe line and the surrounding soil. This is one of the advantages of such an air patrol. On the ground it is often impossible definitely to locate the line, while from the air trained personnel have no difficulty in pin-pointing the line.

Our patrol is conducted at speeds from 90 to 100 miles an hour. A person who has never flown will say that this is too fast, and I may be able to describe the feeling of speed in this manner. In riding in a train and looking out the window, you have observed the fence posts along the right-of-way going by at a terrific rate of speed, much too fast to count. Yet, you can easily count the posts of a fence 200 or 300 feet away from a train. The same is true in flying. If we were to "buzz" the ground at 25 or 50 feet, we would be able to observe nothing; while at an altitude of 300 or 400 feet we experience no difficulty in locating and reporting troubles on the pipe line.

We have found that, at least in the parts of the country covered by Panhandle Eastern and the Northern Natural lines, air patrol can be flown on a year around basis, with almost timetable like precision. Although mud and snow may hamper the walker, only very poor visibility and ceilings will delay the aerial patrolman. For all practical purposes, delays in air patrol can be disregarded, as they occur so infrequently, and are usually made up on that same trip.

Last fall down in Texas extremely heavy rains uncovered some of the pipe lines, and the extent of the damage was not known. Although the rain was continuing, the patrol plane was sent out to patrol areas where the heavy rain had been recorded, and two hours later reported back the locations and an estimate of damages at each point where damages occurred. It is doubtful if such

a check of the lines could be made by other means of patrol in less than a week's time. On this same day food and coffee were flown in to a marooned crew, engaged in repairing a washed out line.

The aerial patrol can and does report leaks, some being so small that the pipe must be soaped to find them. The first year's patrol over the Panhandle system reported 141 leaks, and subsequent checking in the field proved the patrolman to be 90 per cent correct. Other troubles of primary importance reported by the air patrol are washes, and construction endangering the lines.

The following reports cover a two-year period of patrols for the Panhandle Eastern Pipe Line Company, from January, 1946, to January, 1948:

131,000 miles patrolled.
207 leaks.
334 washes.
44 faulty backfills.
67 high water.
224 construction endangering lines.
20 eroding fields.
22 streams endangering lines.
48 faulty pipe line appurtenances.
48 lines exposed.

Following are reports submitted to Northern Natural Gas Company for the period August, 1946, to January, 1948:

54,000 miles patrolled.
81 leaks.
81 washes.
45 faulty backfills.
18 highwater.
178 construction endangering lines.
1 eroding field.
9 streams endangering lines.
14 faulty pipe line appurtenances.
24 lines exposed.

Summary reports are not immediately available for Natural Gas Pipe Line Company, but the troubles reported are essentially the same as for the other two companies.

Practically all the leaks investigated and repaired were of the small pinhole variety. Washes reported included all washes, even though small, close to or on the pipe line, and those working toward the pipe line although some distance away from the right-of-way. The soil in the rough country in Eastern Kansas, all of Missouri, and Western Illinois, which is traversed by the Panhandle Eastern Pipe Lines, is by far the most susceptible to erosion of any which we cover. Pipe line appurtenances include disarranged covers over farm tap meters, styles and line marker posts out of plumb, gate valves, meter, and regulator station fences that have been disturbed by cattle rubbing against them, and so forth.

The ground patrolman's vision and observation are often limited to a few feet on either side of the line. Due to his bird's eye point of view, the aerial patrolman is definitely at an advantage in observing washes that originate off of the line, and in reporting them before they can cause damage to the right-of-way. It seems as if someone is continually building something over or near the line that would be hazardous to the pipeline and to the builder, and such construction can usually be reported in time to eliminate the hazard.

The cost of air patrol is small. Prices generally run between 18c and 22c an air mile, depending of course, on the individual line concerned. Based on the above, a line 1,000 miles in length may be patrolled up and back twice a month for considerably less than $1,000.

Some pipe line companies hesitate to put their patrol in the hands of inexperienced personnel. This is an important problem. There are several concerns doing aerial patrol work, using only experienced pipe line men. Another method is for the pipe line company to furnish the observer for each trip, and this, of course, will increase the cost of patrol. Regardless of the method used, we have found that it is a desirable policy to have the pipe line foremen and division superintendents patrol over their sections of the line three or four times a year. There are several definite advantages to this:

1. The foreman or superintendent immediately sees the advantage and value of air patrol, and becomes one of the patrol's strongest supporters.

2. It gives him a chance to observe all the lines that are under his supervision, taking a minimum of his time. (Chances are ten to one that on his first trip he will see pipe line that he

has never before had the opportunity to see.)

3. He will be able to solve problems of washes, drains, creeks, etc.

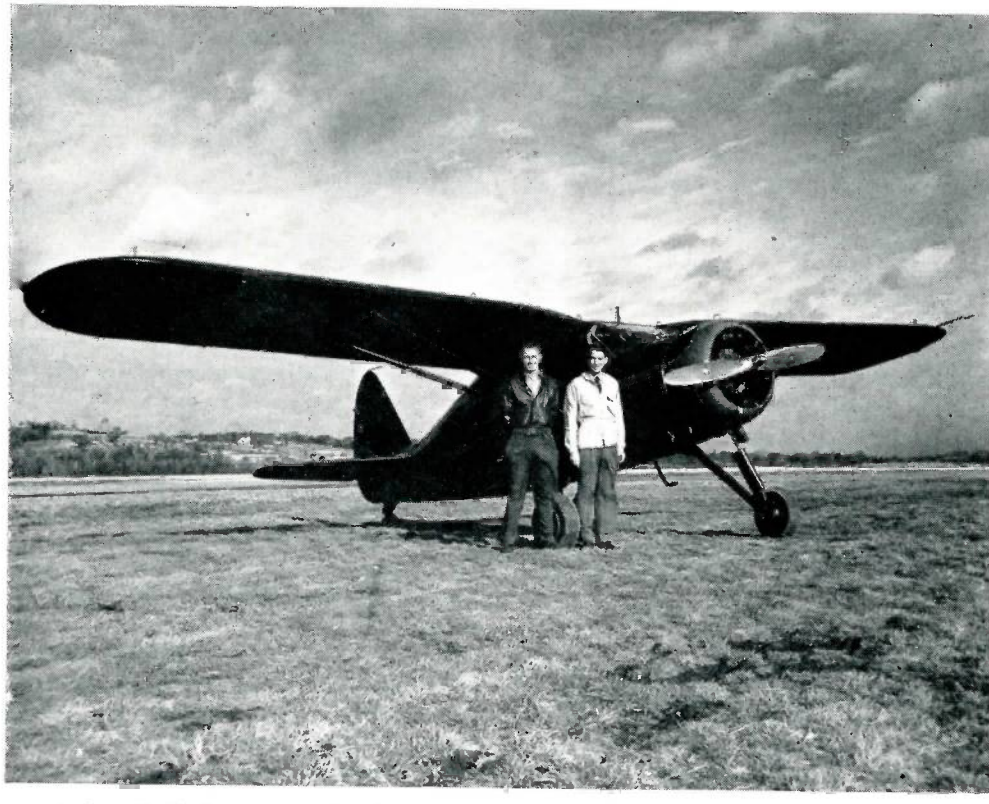
The aerial patrol contractor handles or takes care of all work pertaining to the patrol, such as scheduling of flights, performing flights, and submitting reports. Patrol schedules are sent to the pipe line department about a month in advance, and the patrolman is notified a few days in advance as to what stops he should make in order to pick up observers. At the end of each day's flight, reports are made covering that day's patrol. Reports are broken down into districts or divisions, copies going to the foreman, division superintendent, and the superintendent of pipe lines. The report form includes the following: pilot, plane, date, weather, take-off time, landing time, lines patrolled (including mileage), and troubles reported. In the case of trouble requiring immediate action, landings are often made at a compressor station, or near a farm house, or any place where telephone communications can be found, and a call placed to the nearest pipe line office. Two-way radio equipment will be installed when it becomes available, and the aerial patrol will be able to talk directly with mobile and fixed stations operated by the pipe line company.

In conclusion, there are three points I should like to mention:

1. Ground patrol costs approximately $1 per mile. Air patrol costs are a fraction of that amount.

2. Ground checks made by the pipe line walkers have verified the efficiency and accuracy of the air patrol.

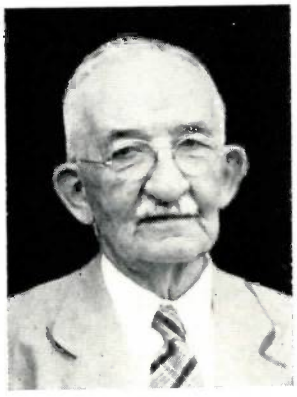
3. Transmission and pipe line departments are satisfied with the results of aerial patrol.



Author G. F. Leamon, right, is shown in front of a four-passenger Fairchild 24 used for pipe line patrol work. Beside him is R. H. Mahon, a pilot. The flying service Mr. Leamon operates also uses a 1947 Stinson Voyager and a 1948 Stinson Station Wagon, both four-passenger aircraft, for patrols which are flown on regular schedules.

Charlotte, N. C., Filtration Plant A Memorial To W. E. Vest

RELATIVELY FEW MEN in the water works field can look back on a record of accomplishments comparable to those effected under the administration of W. E. Vest, consultant and former superintendent of the Charlotte, North Carolina, water department who will retire July 1.



W. E. Vest

Mr. Vest, who observed his eighty-first birthday February 8, became superintendent of the Charlotte water department on December 1, 1910. Since that time, the city's population has more than tripled, and the fact that Charlotte's water department has more than met the ever-increasing demands placed upon it is due to the foresight and ability of Mr. Vest.

In 1910 Charlotte was a city of 34,000 population, and its water works system included a pump station on Irvin's Creek, a small filter plant, and about 40 miles of distribution line. The complete system was valued at considerably less than a half-million dollars.

Entrance to Vest Station, Charlotte's 17-million-gallon-per-day filtration plant, which was named in honor of W. E. Vest, the city's veteran consultant and former superintendent.

By 1940 the city's population had grown to 101,000 with a proportionate increase in the demand for water service by both domestic and industrial users. That year marked Mr. Vest's thirtieth year as superintendent, and the changes and improvevments that had been made in that time were remarkable. The city was pumping from the Catawba River,

which furnishes an inexhaustible supply, a 17,000,000 - gallon - per - day filtration plant had been constructed, and the water works also included a storage lake, elevated tanks and 277 miles of distribution lines.

When the filtration plant was built, the city of Charlotte paid tribute to its highly respected superintendent by naming it the Vest Station, a fitting memorial to a man who has devoted as many successful years to his profession as has Mr. Vest and certainly an unusual honor for a city to pay to a departmental head while still actively in charge of his department.

Improvements and expansions had become a continuing process during Mr. Vest's long tenure as superintendent, and apparently the same policy has been adopted by W. M. Franklin, his successor in the office. According to estimates, the city's population has shown an increase of almost 20,000 since 1940. During the past year alone, the city water department installed 2,099 new water services. To meet these and future demands, construction is now underway at the Vest Station to increase the filtration plant's capacity from 17 to 25 million gallons daily.

This continual expansion in the face of constantly increasing demands has presented a challenge to Mr. Vest ever since he first took over the duties of superintendent. Quite probably it has had a great deal to do with the lightness with which Mr. Vest carries his age—a matter which has caused considerable comment for some time.

Five years ago, when Mr. Vest was elected an honorary member of the American Water Works Association in recognition of his extended and distinguished service. The Charlotte *Daily News* mentioned in the account that he was seventy-six years of age and then went on to relate the following incident:

"Seen one day recently trudging up the long stairs from the first floor to the second floor of the city hall, Mr. Vest was asked, 'Why don't you ride the elevator?' He leaned over and shielding one side of his face he replied in a stage whisper, 'Too damned slow.'

"That reply" the article continued, "is characteristic of him and his activities as an official and an individual.

"He carries under his hat more information about the Charlotte water works than most of the younger men can collect in a book . . . If he is asked a question involving some policy that might be out of his province, he'll be quick to reply, 'Don't ask me. Go see the city manager or the members of the council.' But if it is about the water department and its operation he will answer quick as a flash and assume full responsibility. That's why the newspaper reporters like him. And that same straight-forward treatment is afforded anyone who comes into his office to do business with him."

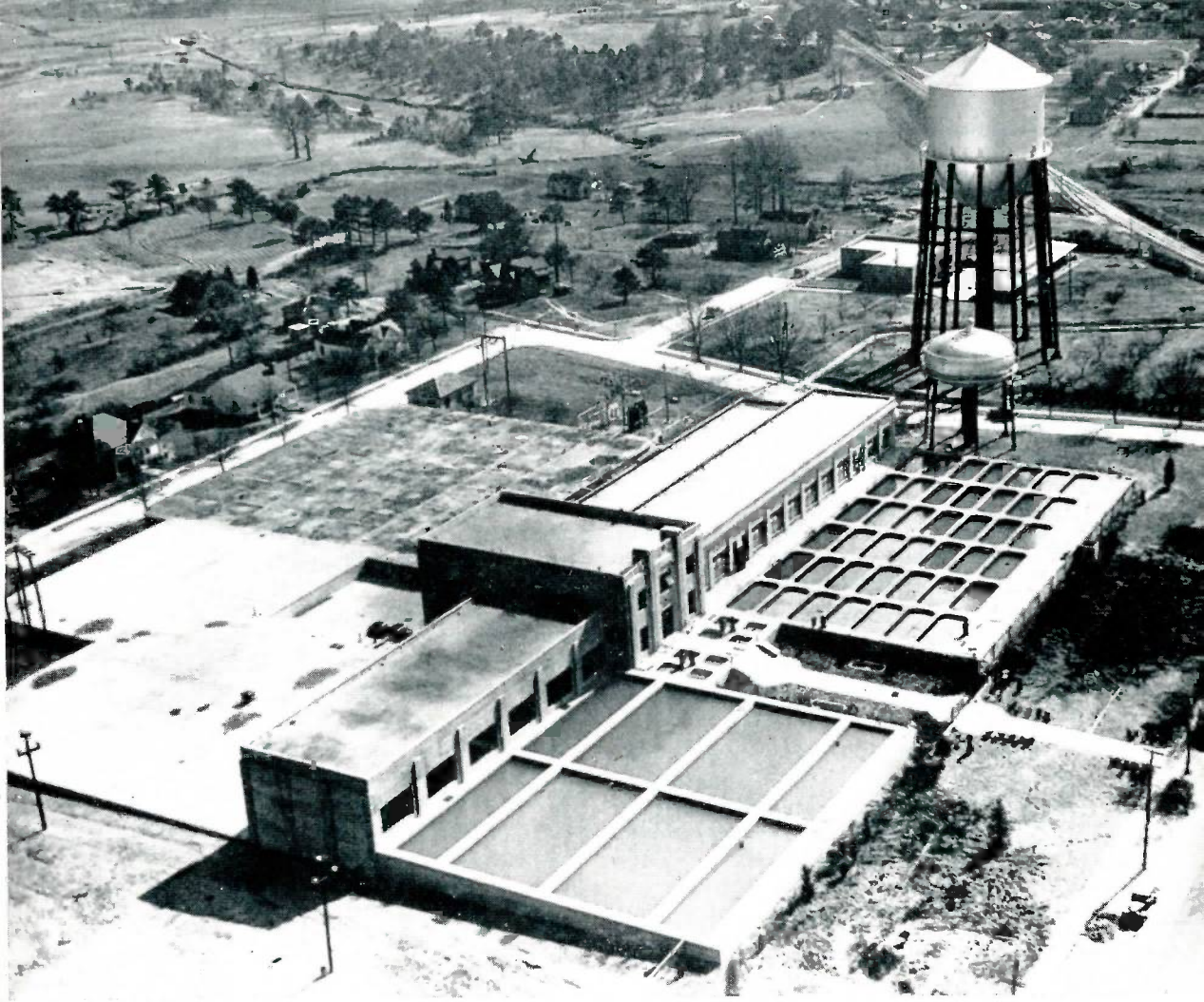
This *News* story tells a lot about Mr. Vest, and the same is true of him today. He is in excellent health, and is one of the most popular officials in Charlotte's city hall. His complete and accurate knowledge of Charlotte's water system is very valuable to the younger members of the water department.

Mr. Vest has been a member of the American Water Works Association since 1911, and served as a director in 1931. He is a charter member of the Association's North Carolina section, and he also served as chairman of the section. He has maintained an active part in the section's activities since its organization in 1921.

He was the first North Carolinian to be honored with honorary membership in the American Water Works Association, the certificate having been presented at the Chicago meeting in June, 1942. The citation to the organization's board of directors from the North Carolina section stated that Mr. Vest has "rendered outstanding service to his community and has been an inspiration toward better water works operation."

This citation aptly describes Mr. Vest's service with the water department, for he has long been recognized professionally for his ability and his work at Charlotte and he fully deserves credit for his part in the growth of the city.

Harry E. Jordan, secretary of the American Water Works Association, said recently in speaking of Mr. Vest:



Vest Station, Charlotte's filtration plant, as seen from the air. Considerable expansion work is now underway at the station to increase its capacity from 17 to 25 million gallons of water per day to meet the demands of the city's rapidly growing population, which has tripled since Mr. Vest first became superintendent of the water department.

"Across the country, one can find in the water works industry men who have been inspired by the opportunity to serve their communities and have spent their lives in protecting the health and safety of their fellow citizens. They have that inner fire which leads some men to preach and other men and women to teach. Their worldly compensation is never great, but the satisfaction of having served human needs is with them.

"Such a man is William E. Vest, whose beginnings in the water department of Charlotte are well nigh forgotten, but whose life of serving the needs of his fellow citizens cannot be forgotten.

"The American Water Works Association is proud of such men as Vest, so in 1942 it chose him to be one of the few it calls honorary members.

"In that category, we can find noted engineers, university professors, men distinguished for research they have done, industrialists and the like. There also we find such men as Davis of Bryn Mawr, Dobbin of Peterborough, Ritchie of Melbourne (Australia) and Vest of Charlotte, each a man who through many years has been the leader in a community's water service.

"So long as such men as these continue to serve their fellow men, the integrity of public water supply will never be endangered."

Off the . . Record . .

A man went into a bar, ordered a Martini, drank it, nibbled the rim of the glass and threw the stem over his shoulder. He continued this for about six Martinis and noticed that the bartender was staring at him.

"I guess you think I'm crazy, don't you?" he asked.

"I sure do," replied the bartender. "The stems are the best part."

* * *

"So you're 100 years old? How have you managed to live so long?" the young reporter asked the centenarian.

"Well, son, I got married when I was 21, and the first thing the missus and I did was to have a long talk. We decided that if we had an argument the loser would take a long walk, so he wouldn't stay mad. I guess, son, that the 79 years of fresh air has done me more good than anything else."

* * *

Trudy, aged four, was entertaining the visiting clergyman while her mother was upstairs dressing.

"Do you say your prayers every night?" asked the minister.

"Oh no. Mummy says them for me," answered Trudy.

"Indeed, and what does she say?"

"Thank God, you're in bed."

Teacher: "Who can tell me what the former ruler of Russia was called?"

Class: "Czar."

Teacher: "Correct, and what was his wife called?"

Class: "Czarina."

Teacher: "Correct, and what were the czar's children called?"

A pause, and then a small, timid voice piped up: "Czardines."

* * *

A merchant took out a fire insurance policy, and the same day his store and its contents burned to the ground. The insurance company suspected arson, but couldn't prove anything. It had to content itself with writing the following letter:

"Dear Sir: You took out an insurance policy with our firm at 10 A.M., and your fire did not break out until 3:30 P.M. Will you kindly explain the delay?"

* * *

Son: "Paw, does bigamy mean that a man has one wife too many?"

Paw: "Not necessarily. A man can have one wife too many and still not be a bigamist."

* * *

First Scot: "Let's go out and get tight."

Second Spendthrift: "What are you trying to do, kid me?"

* * *

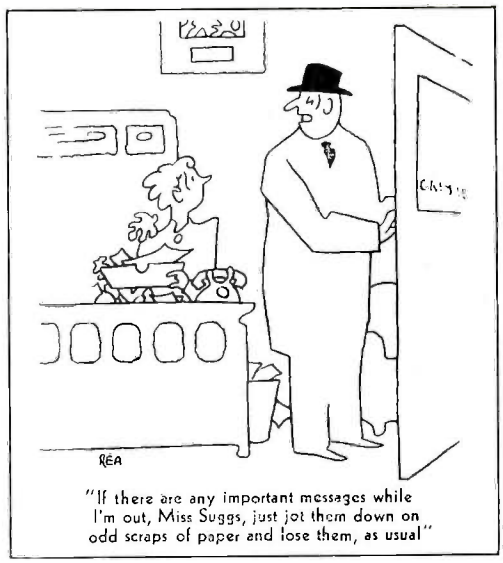
"Did you know," the wife asked, making conversation, "that a great many accidents occur in the kitchens of our homes?"

"Yes," was the answer, "and we men have to eat them and pretend we like them."

"Something durable, please---his creditors always grab him by the tie."

"Is there a form or something I have to fill out to apply for a modeling job?"

"No, I'm not particular—any make of suspenders will do!"



"If there are any important messages while I'm out, Miss Suggs, just jot them down on odd scraps of paper and lose them, as usual"

Then there was the story about a woman in Connecticut who called up the First National Bank in her community to arrange for the disposition of a $1,000 railroad bond she held. The man at the bank whom she called asked: "Is the bond for conversion or redemption?" There was a long pause, and the woman asked: "Am I talking to the First National Bank or the First Parish Church?"

* * *

Jones: "I'm sorry, but I can't give anything to the church right now. I owe nearly everybody in town."

Mrs. Smith: "But don't you think you owe the Lord something?"

Jones: "I do, I certainly do. But he ain't pushing me like the rest of the creditors are."

* * *

"Are you absolutely sure that stuff will grow hair?"

"Sure, I'm sure! Do you see this hair brush? Until some of this hair grower got spilled on it last week, it was just a ping-pong paddle."

* * *

Policeman: "But, lady, didn't you suspect burglars had been in the house when you found all the drawers pulled out and their contents scattered all over the floor?"

She: "Certainly not! I just thought my husband had been looking for a clean shirt."

"Daddy, may I ask you a question?"

"Yes, son, but it must be a short one."

"If a doctor is doctoring a doctor, does the doctor doing the doctoring have to doctor the doctor the way the doctor being doctored wants to be doctored, or does the doctor doctoring the doctor doctor the doctor the way he usually doctors?"

* * *

The little girl awakened at 4 o'clock in the morning and went to her mother, asking that she tell her a story.

The mother replied: "Your daddy should be home soon, and he'll tell us both a story!"

* * *

Constable: "Hey, miss, no swimmin' 'lowed in this here lake."

Fair Young Bather: "Then why didn't you tell me before I undressed?"

Constable: "There hain't no law agin undressin'."

* * *

"Grass never grows under his feet."

"A go-getter, eh?"

"Nope, sailor."

* * *

Voice on phone: "Are your mother and father at home?"

Little Johnny: "They was, but they isn't now."

V. o. p.: "They was, but they isn't—where's your grammar?"

Little Johnny: "She went out, too."

MOSTLY PERSONAL

(Continued from page 1)

handicap was $31,500. However, On Trust lost to Flashco by a neck in the $100,000 Santa Anita maturity, the nation's largest purse exclusively for four-year-olds, on January 31.

* * *

January and February are never the brightest months in the year for water works men in the northern states, and Chicago has been having a full share of trouble with winter weather.

Dynamite charges were used to blast ice from the water intake at the Edward F. Dunne crib, one of the intakes for the South District Filtration plant, the subject of an article in the last issue of the Mueller Record. Explosives also were used at several of the other cribs to keep them free from ice.

* * *

This is as good a place as any to mention that Chicago and the suburbs served by its pumping system used 358,047,000,000 gallons of Lake Michigan water during 1947, according to a year-end report. This was more than three billion gallons above the pumpage figures for the previous year. Biggest day of the year was August 6, when 1,414,000,000 gallons were pumped.

* * *

Stanley Johnson, Mueller Co. salesman, vouches for the authenticity of this story, which was relayed to us from our New York branch:

Seems that one of the local social organizations at Westfield, Massachusetts, planned a minstrel show, but ran into the problem of finding material for Mr. Bones and the end men.

Harry Angel, Westfield's water superintendent, became the hero of the hour when he went up into his attic and got out his file of old Mueller Records and went through the jokes. Believe it or not, every joke told at the minstrel show came out of that collection of Records.

Moral: better start a collection. You, too, might want to produce a minstrel show some day.

* * *

And from Calipatria, California, comes word, via J. H. Harris, manager of the Southern California Water Company's plant there, that Mose Dobbs, the desert reporter, left an epistle near one of the water holes he frequents for forwarding to us. It follows:

"When the Mueller Record comes out recently, we wuz a readin it & there pops up a picture of Old Charly DuBois & it looks so natcheral, we sez hello Charly. It is jest like him & that's why it ain't purty.

"You tell him that all us desert fellers wants to see him agin & tell funny stories like he usta do. Long time ago Charly comes down in the desert a sellin things fer Mueller Co. & he stops along at all the water holes & he comes into our shack to see us & tell stories jest like the other Mueller Co. fellers allus does.

"Of course, we don't believe all the stories them Mueller Co. fellers tells us, but they don't care fer that, they don't expect us to believe it.

"News has come that Charly ain't feelin so good like he usta be. Now you tell him to git back to the desert & eat plenty jackrabbit & goat meat & he'll perk up right pronto.

"The Record also has got a pickture o this boy Jimmy Potts that sells things fer Mueller all over the desert & we tells Jimmy that we wuz usin Mueller stuff 16 years before he wuz borned. He jest laffs & sez its purty good stuff.

"Him & Charly don't care how hot it gits, they comes rite along when its so hot the billy goats horns is wilted down fur enuff to whup their old knnee bones.

"Seein as how Mueller keeps on sellin things all over the desert & got no reporter down here, we decided to report these hevvy matters to you."

We know Charley DuBois will be glad to receive this message from Mose. And we hope Mose will continue to report any other hevvy matters that occur around that water hole.

* * *

We are indebted to Miss Harriet Smither, state archivist at the Texas State Library, Austin, for her cooperation in arranging to have copies made of the old photographs on file there of the Rev. Noah T. Byars and his black-

smith shop in which the Texas Declaration of Independence was drafted and signed.

* * *

Credit was unintentionally omitted from the photo of the carbon black plant at Ryus, Kansas, one of the world's largest, which was forwarded to us by the Kansas Industrial Development Commission for use as an illustration for an article on the Hugoton gas field in our last issue. A. G. Treadgold, Charleston, West Virginia, informs us the carbon black plant is owned by the United Carbon Company, Inc. Mr. Treadgold is assistant treasurer of the company.

* * *

Coinciding with the publication of the article in the Mueller Record on the Hugoton gas field was another in The Kansas City *Star* on the experiments Stanolind Oil and Gas Company is conducting in making gasoline from natural gas, air and water. The company's pilot plant at Tulsa, Oklahoma, has succeeded in producing a few barrels of gasoline a day from natural gas.

* * *

The article, "Walking on Air," by G. F. Leamon, Kansas City, Mo., presents the modern means of "walking" a pipe line. Not all pipe line companies feel that regular aerial patrol of their lines is justified economically, but few question its effectiveness. Mr. Leamon spoke on aerial patrols at the meeting of the American Gas Association last Spring.

■ ■ ■

BIRTHPLACE OF FREEDOM FOR THE REPUBLIC OF TEXAS

(Continued from page 5)

Army, winning the approval and friendship of General Houston. Partly as a result of this friendship, as well as his character and ability, he became sergeant-at-arms in the senate of the Republic of Texas in 1837 and served until 1842. He also was appointed associate justice of the county court of Travis County.

He had become a charter member of the Washington Baptist Church, organized in 1837 and believed by many authorities to be the first church of that

denomination organized on Texas soil. On October 16, 1841, he was ordained as a Baptist preacher. President Mirabeau B. Lamar of the Republic of Texas and several of his cabinet were present for the ceremony.

The Baptist State Convention was organized in 1848, and the Rev. Byars was elected as its first missionary. Despite the hardships and discouragements that went with the duties of a frontier missionary, he played a prominent part in organizing 60 churches, including the First Baptist Churches of Waco and Brownwood, and six Baptist associations. In one of his reports, following a disappointment he had experienced with other missionaries, he said, "One has gone to his farm, another to his merchandise, and still another to his pill bags, so the vineyard of the Lord is a moral waste." Until 1867 he was the only missionary west of the Brazos.

It is also interesting to note that he led in the establishment of Byars Institute, which was to be both a school of instruction and a haven of refuge from Indians, who made frequent raids on white settlements. The prudent Man of God of that era traveled with a Bible in one hand and a rifle in the other.

Rev. Byars was identified with many early Baptist educational activities, and was a member of the Texas Baptist Education Society that organized Baylor University and Mary Hardin-Baylor College.

Marking the work of the Texas patriot and missionary are a monument, erected by the school children of Texas, on the site of the old blacksmith shop in the state park at Washington; a monument somewhat similar in design on the campus of Howard Payne College at Brownwood; and a bronze tablet in the First Baptist Church at Waco, honoring its founder.

Rev. Byars is buried in the Brownwood Greenleaf Cemetery and his grave is simply marked with this inscription:

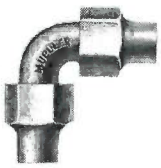
N. T. BYARS
Born in Spartanburg District
South Carolina
May 17, 1808
Died at
Brownwood, Texas, July 17, 1888

On Copper Service Pipe These Fittings and Tools Make Neater, Stronger, Longer Life Connections

H-15405

H-15386

H-15425



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H-15530

MUELLER

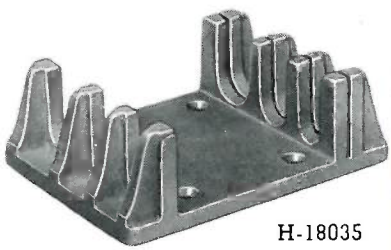
Copper Service Pipe Fittings are made especially to enable you to make neater, stronger and longer-life connections to Service Pipes and do it in far less time. Due to their accurate machining from high copper content bronze, installation is quick and simple, the alignment is always easy and many leaky elbows and joints are eliminated. The Mueller Copper Service Pipe Flanged Connection is made without the use of solder. The pipe is cut to length and the coupling nut placed over the pipe and the end of the pipe is then flanged. A convex surface in the nut opposes a convex surface in the spud that gives a line contact initially but does not compress the end of the flange. Since the end of the pipe is not compressed, it maintains the full pipe thickness and gives a tight joint that is highly resistant to pulling out. The extra long skirt on the nut gives added support to the pipe and prevents leaky joints. Since these connections also serve the purpose of a union, the pipe may be taken apart at any joint at any time.

Mueller Tools assure the utmost efficiency when making accurate connections to Copper Service Pipe. The Miter Box makes an exact square cut for a perfect flange and a leak-proof joint. The Pipe Reamer is most convenient for reaming the inside of the pipe after cutting. The Flanging Tool makes a perfect flange on the end of the pipe and the Copper Hammer prevents damage to pipe sometimes caused by using make-shift equipment. Your jobber has these items in stock. Order today.

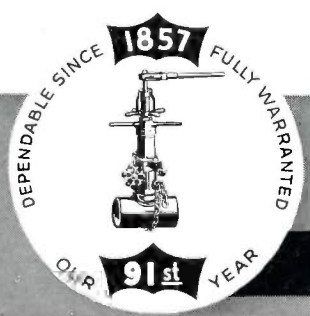
H-18025

H-18000

H-18010



H-18035



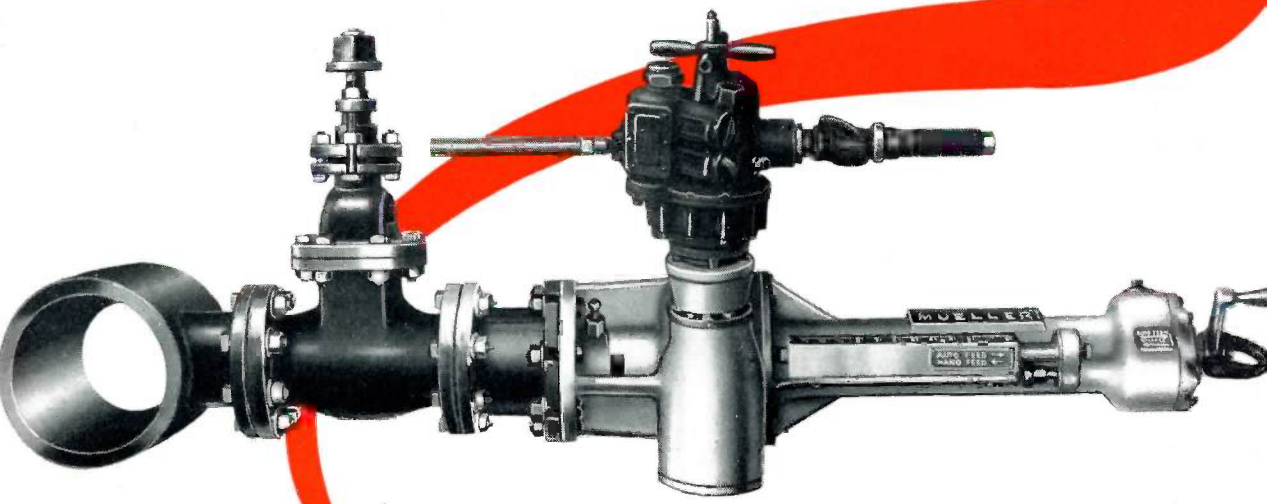
MUELLER CO.

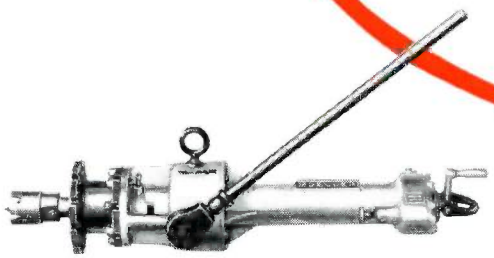
MAIN OFFICE AND FACTORY.....DECATUR, ILLINOIS

OTHER FACTORIES: *Los Angeles, Cal.; Chattanooga, Tenn.; Sarnia, Ont. Canada*

DRILL UNDER PRESSURE

WITH THE MUELLER "C-1" MACHINE





The Mueller "C-C" Machine operates exactly like the Mueller "C-1" Machine except that it is hand operated. Large bevel gears multiply the power of the operator, making even the larger cuts an easy operation.

Mueller Drilling Machines are widely used for making economical cuts in a line under pressure. You can weld a flanged nipple to the line, attach a gate valve, then bolt on a Mueller Drilling Machine and cut into the line under pressure. After the cut is made, the gate valve is closed and the machine un-bolted and removed. You need not shut down the line nor is there any loss of gas.

The operation of the Mueller "C-1" Machine requires a minimum of labor as it is powered by an air motor and makes cuts up to 12" easily and speedily. Since the cost of cutting into a line is directly affected by the speed and efficiency with which the work is done, most Gas Companies have long standardized on Mueller Machines to reduce these costs.

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MAIN OFFICE AND FACTORY.....DECATUR, ILLINOIS

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THEY'RE THERE *TO STAY*

An installation of Mueller 30" Inside Screw, Spur Geared Valve with By-Pass.

Since most Gate Valves are usually buried, water works men want to be sure that the ones they install are going to STAY THERE!!! That simply means that the BEST valves they can buy and install will be the cheapest for them — valves that will operate over the years without binding — valves that will open widely and close tightly without leaking and operate year after year without constant maintenance and repair.

These are some of the reasons why Mueller Gate Valves have been widely accepted by alert-minded planners and operators of water and sewage systems. All Mueller Gate Valves have extraordinary thickness of section and are fully bronze mounted. The exclusive 4 Point Wedging Mechanism prevents warped discs and the high tensile strength bronze stems with accurately cut threads open and close the valve with a minimum of effort. The standard line of Mueller Gate Valves includes all sizes from 2" to 48" with either rising or non-rising stem, hand or power operated and with or without by-pass valve. Consult Mueller Co. for engineering advice, recommendations or quotations. There is no obligation.

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FACTORY: *Chattanooga, Tenn.* MAIN OFFICE AND FACTORY: *Decatur, Ill.*
OTHER FACTORIES: *Los Angeles, Cal.* ★ ★ ★ ★ *Sarnia, Ont. Canada*