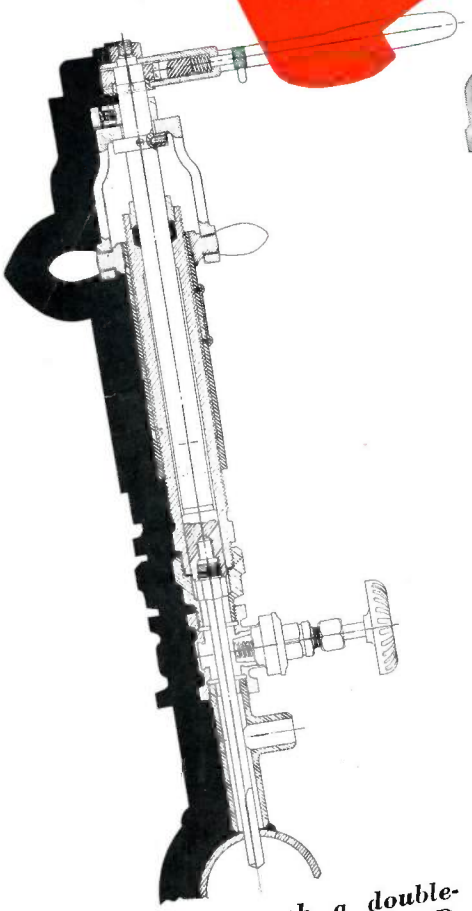
MUELLER RECORD

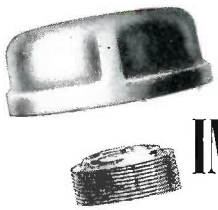
Vol. XXXIV MAY • 1948 • JUNE No. 6

very EASY TO USE!

MUELLER SAFE-WAY WELDING TEES with INSIDE AND OUTSIDE THREADS



Drilling through a double-threaded SAFE-WAY WELDING TEE with a Mueller "E-4" Drilling & Inserting Machine.



Mueller SAFE-WAY WELDING TEES are made from low carbon steel of the same analysis as steel pipe. This makes strong, even fusing between the Tee and the pipe. The Tee will withstand pressures up to 500 lbs. Used in combination with a Mueller Drilling and Inserting Machine, it is the easy method of making a connection under pressure in absolute safety without shutting down the line or without loss of gas.

There are both inside and outside threads on the top of the Tee. A valve is screwed on to the outside threads between the Tee and the Mueller Drilling and Inserting Machine. After the main is drilled, a brass plug is inserted into the inside threads under pressure and a cap screwed on the outside threads to protect the plug. Made in sizes ¾″ to 2″ inclusive.

DEPENDABLE SINCE 1857 FULLY WARRANTED OUR 91st YEAR

MUELLER CO.

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

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

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CONTENTS

COVER
Ewing Galloway from American Photo

MOSTLY PERSONAL

ACCOMPANIED BY George White, Mueller Co. representative for the Illinois sales territory, we recently had the pleasure of meeting "Bannerstone Ben" Nussbaum, the water superintendent and city engineer of Fairbury, Ill., and a serious amateur archaeologist. Mr. Nussbaum found time to show us his collection of Indian artifacts, and to tell us something about his hobby. The prize items in his collection are his bannerstones, but he has many other relics of ancient Indian culture in the Midwest.

One thing that interested us was the contrast in Indian pipes before and after the coming of the white man. The first pipes had very little in the way of a stem and must have set right under the smoker's nose; the influence of the white man is shown by the development of a stem. The stem permitted the smoker to take a more objective view of the situation and doubtless led to the coining of

(Continued on page 32)

SHOWER SATISFACTION

Your customer gets complete shower satisfaction when you recommend and install a Mueller SELF-CLEANING Shower Head because he is assured of a head that will never clog---never sputter---and never needs to be removed for periodical cleaning.

Every time he turns the handle to regulate the stream from a stinging needle shower to a soft rain patter, he forces 28 stainless steel pins to move back and forth through the holes in the face of the head that keep it always clean. Order your supply today.

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With Ball Joint, Arm and Wall Flange

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Development of the Fire Hydrant Parallels Growth of Water Works

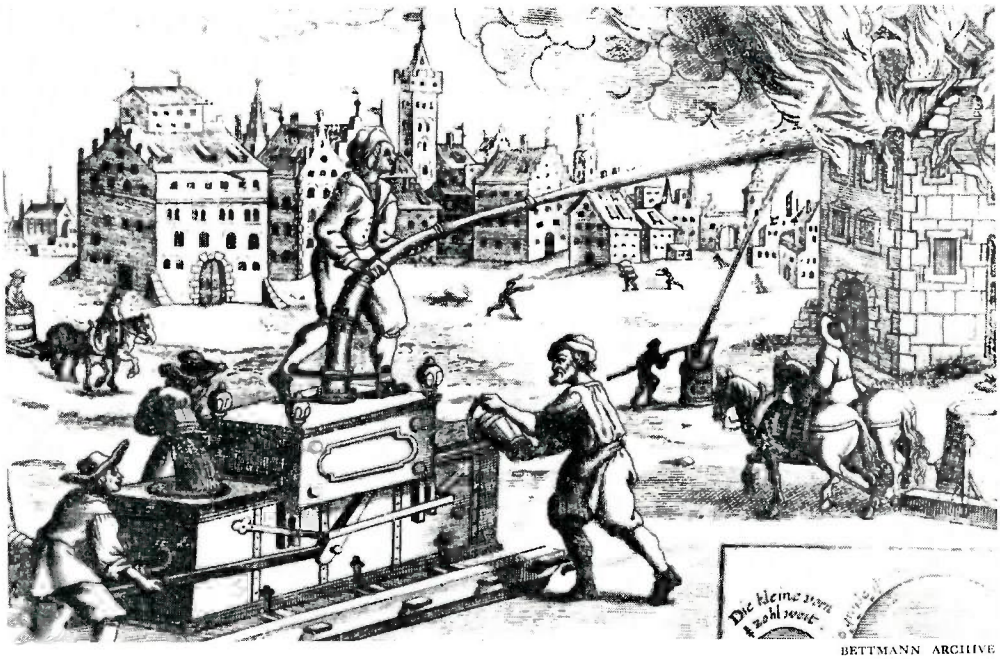
The first crude hydrant was literally a "fire plug," and the name has carried over into present day usage.

THE DEVELOPMENT of methods and equipment for fighting fire started very shortly after its discovery. Man soon learned through his experience with fire that, properly controlled, it was a valuable ally, but that unleashed it was a dangerous and wanton enemy. It was early recognized that effective fire fighting depended upon an adequate supply of water, and as the centuries passed, man's ingenuity has been directed along this channel.

Unlike fire engines, extinguishers and many other items of fire-fighting equipment, whose development can be traced in the earliest known records of Phoenicia, Greece and Rome, the fire hydrant is of comparatively recent origin, having been developed within the past century and a half.

Hero of Alexandria, a mathematician and physicist, who lived in the first or second century, B. C., described a siphon which was used to combat fires, and the Romans, in the time of Marcus Trajan (53-117 A. D.) are said to have used "leathern bags with metal pipes attached." These were filled with water, and in operation the bag was squeezed, forcing water through the outlet pipe or pipes.

During the sixteenth and seventeenth centuries, large metal squirts, patterned after the syringe, came into use, and as early as 1650 James Colquhoun of Edinburgh built a fire engine for that city



BETTMANN ARCHIVE

Modern pumpers apparently have little advantage over these hand-operated pumps of the seventeenth century, if the imagination of the artist can be trusted. This drawing, made in 1662, shows two models, the large, skid-mounted pump and the small, portable size. Note the barrels of water being brought up on horse-drawn skids to replenish the supply.

BETTMANN ARCHIVE

This woodcut, published in a magazine in 1869, is typical of the volunteer fire departments which flourished throughout the country before organized and more efficient departments came into existence. Brawn and buckets were standard equipment. The sword for the chief and the drum for sounding the fire alarm were extra, but prized, accessories.

and another for Glasgow. However, the fire engine which led to the development of the more modern manual engine was built in 1670 by Van der Heide, a Dutch engineer, who also introduced a flexible leather hose.

Richard Newsham built the first successful engine in England in 1721, a model that was adopted in the principal cities of England and America. Engines fundamentally similar to Newsham's engine were used in New York for more than a hundred years after the first two had been imported from London.

These first engines were crude affairs. Although the best produced streams of 80 to 100 feet, this could be maintained for only a few seconds. Then, too, as the firemen manning the pump tired, the stream showed a corresponding decrease in its velocity. The engines depended upon bucket brigades, operating from the nearest well or cistern, to keep them supplied with water. The first steam fire engine was built in 1829 in England, and shortly after that, experimental machines were built in the United States. But the stumbling block to all advancements in the development of the fire engine—and to effective fire fighting—continued to be lack of a sufficient supply of water.

Water works systems for public supply date back to the nations of antiquity, and considering the status of engineering progress, many of them were masterpieces of design and skill. In Rome, water was supplied to the city by means of aqueducts which conveyed water by gravity to the distribution system and sold to customers according to the amount of water used, as determined by orifices of different sizes.

The first known public water supply system in the United States was completed in Boston in 1652, and consisted of wood pipes to carry water from springs to a reservoir near Dock Square.

BETTMANN ARCHIVE

The improved fire engine of the early 1860s was a two-horsepower model. It is a combination of the extensively used endless apron horse-power machine with a force pump, the pump and reel being placed at the front, as shown. Intake hose was dropped in a well or cistern. Another engine, left background, is speeding to the scene to lend its support.

The next public water works on record in the United States was completed in 1761 at Bethlehem, Pennsylvania, by Hans Christopher Christensen, a millwright and a native of Denmark. In this system, the first to utilize a steam pump, water was lifted 70 feet from a spring into a tank, which was located in the village square.

Distribution lines were generally made by boring out wooden logs. Pipe sections were short, and the manner in which they were joined together did not permit high pressure, even if a means of supplying it had been available.

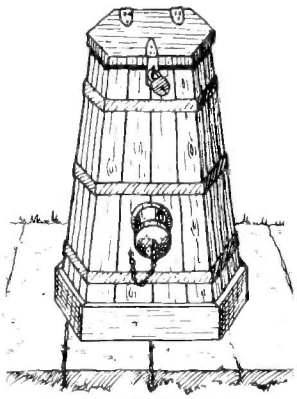
The forerunner of the modern fire hydrant was literally a "fire plug," a name which has carried over to this day. A water main was located, and a hole bored in it, the water being collected in the street hole. The suction hose from the fire engine was then placed in the hole and water was fed to the pump. When the fire was extinguished (or had burned itself out) a plug was inserted in the hole in the main and the street hole filled.

When, in 1799, New York's first water works system was begun by the Manhattan Water Company, large corks were inserted in the log mains. Theoretically at least, the corks could be withdrawn at points along the route of the distribution line and the water used for fighting fires. However, the flow of water was so small that the system seldom was of much help to the fire department.

George B. Smith, a member of Engine Company No. 12, is credited with installing the first fire hydrant in New York in 1817. Smith built the hydrant at his own expense in front of his home in Frankfort Street. Other hydrants were installed as additional wooden and iron mains were laid, and in 1831 special hydrant companies were formed to care for them.

If the introduction of the fire hydrant or "fire plug" seems to have been a slow evolution, it must be remembered that in 1800 there were only 17 water works systems in the United States. Bucket brigades were an accepted part of fire fighting in many sections of the United

States until the latter part of the nineteenth century. At late as 1850 there were only 83 water works systems in the United States, and twenty years later the number was 243. However, the number of water works jumped from 1,878 in 1890 to 3,196 in 1896. At present there are more than 13,000 water works systems in the United States.



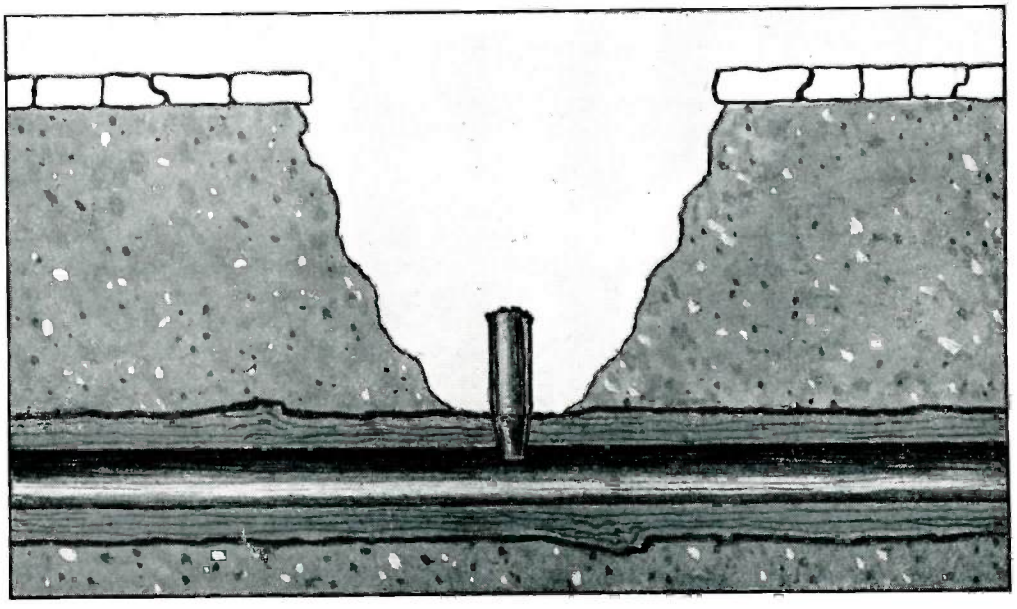
An early hydrant

Herbert Asbury, in his history of New York City's fire department of more robust yesterdays, tells of the intense rivalry of fire companies in the era of 1830-1850, and adds a sidelight to the history of the fire hydrant.

Once a fire call had reached a company headquarters, an advance force was dispatched to capture or defend a fire hydrant near the scene. One of the members of this advance party wore no uniform, but carried a small barrel, which was placed over a hydrant. He then sat on it as nonchalantly as possible, while the rival engine or hose company scurried about trying to locate it. When his own company arrived, the barrel was tipped over and the hose connected to the hydrant. Once, so Mr. Asbury records, Lady Suffolk Hose Company No. 14 fought for two hours with another company for possession of what was thought to be a hydrant, but which proved to be a half-buried cannon.

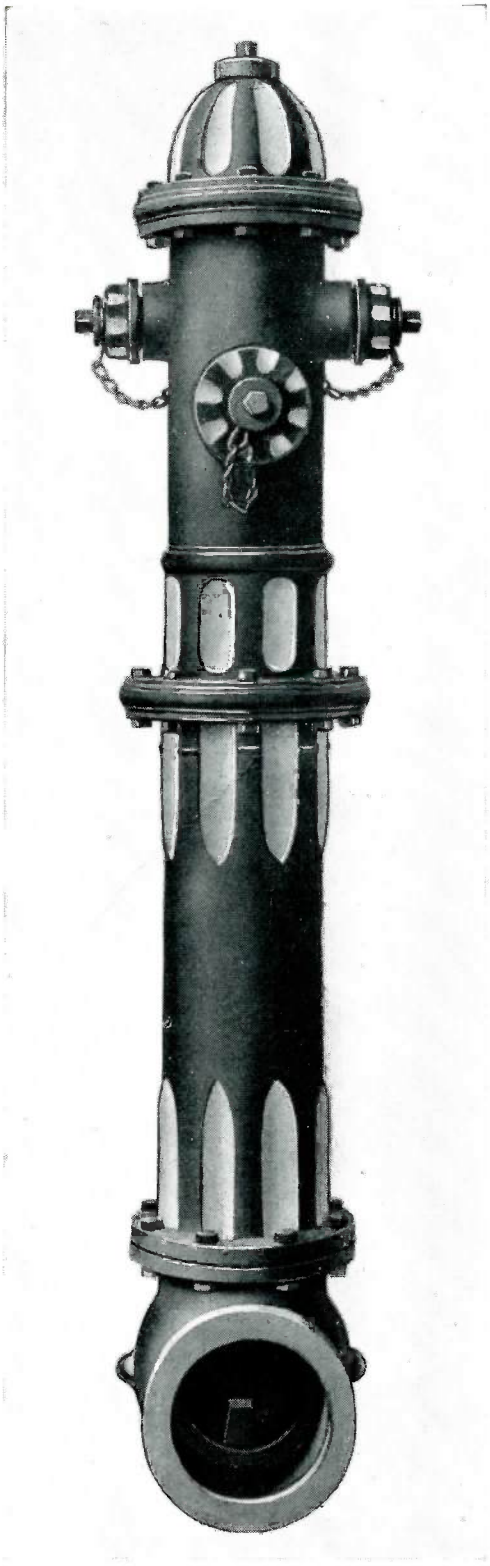
The first refinement to follow the use of the crude "fire plug" came with the more general use of cast iron pipe. Sockets or branch fittings were placed at intervals in the water mains, and wooden plugs were inserted in these openings. A metal or wooden shield extended from the main to the street surface. This prevented excessive washing away of soil under the street surface, but there was considerable waste of water, since it was difficult to collect.

As the use of cast iron distribution lines increased, pressures were increased, and it became possible to use a standpipe-type hydrant. One end of the stand-



Fire hydrants are still called "fire plugs," a carry-over from the days of wooden mains and iron men. A water supply is the first requirement for fire-fighting, and in the early days it was necessary to dig down to the main and drill into it. After the fire had been extinguished, a wooden plug was driven into the main to prevent any further loss of water.

Outgrowth of the need for providing dependable protection for homes and buildings has been the Mueller-Columbian Improved Fire Hydrant. The safety-flange prevents collision damage to the hydrant, and the compression-type main valve eliminates the necessity for digging it up to make nozzle changes, repairs, or the adding of extension sections.



pipe was inserted directly into the main, and the other had a hose connection outlet. The standpipe hydrant was still just a refinement of the old fire plug, but with constantly increasing pressures in the distribution mains, the possibilities of improving hydrants came in for more and more study.

Frederick Graff, chief engineer of the Philadelphia Water Works, is credited with designing the first post type hydrant about 1801. It was a "wet barrel" design, and gave trouble from the start. In the summer, small boys found it great sport to open them, and in winter they were usually frozen or surrounded by ice formed by leakage.

Although the greatest developments in fire fighting took place in the larger cities, the need for better equipment was making itself felt throughout the nation. Otis S. Eastman, editor of the Fairbury (Ill.) *Journal,* described a fire which raged through the small country village, destroying eighteen buildings, in an extra edition published on February 27, 1868, and commented:

"Fifteen minutes' work with a good hand engine now would save property enough to buy and equip half-a-dozen new steam fire machines. But, alas! human power hath its limit; and without any of the appliances to which, under such circumstances, modern economy must everywhere resort, the *forlorn hope* had to be abandoned,—and to save their own lives men must retire, not only to see their property burn, but their struggles against the fiery elements futile."

Improvements to valves, facilities to drain the hydrant barrel to prevent frost damage, and many other innovations in design followed the Graff hydrant—all having the same ultimate goal: to provide a reliable supply of water.

As fire hydrants became an accepted means of supplying water to hoses and to

(Continued on page 32)

Top Performance From Hydrants and Valves Depends Upon Simple—But Regular—Upkeep

By J. G. Carnes, Jr.

Don't install them and forget them. Routine maintenance will assure satisfactory service in emergencies.

WHY do we install hydrants and valves? The question is absurd and the answer is obvious. Hydrants are installed in order that fire departments will have water available in adequate quantities to combat fire, and valves are installed so that necessary repairs and extensions may be made without shutting off the entire distribution system to do so.

J. G. Carnes, Jr.

Yes, the question may appear rather absurd and the answer quite obvious, and yet if many of us would think of them more often, it is quite possible there would not be so many problems in connection with hydrant and valve maintenance. Certainly when the hazard to life and property is realized if hydrants are not maintained in proper working condition, it is difficult to understand why reasonable, definite and adequate steps are not taken to see that proper maintenance is carried out. Although lack of proper valve maintenance is not so vital and usually results in making our own work more difficult, we certainly expect too much for too little in both instances.

We buy what we consider to be the very best hydrants and valves, use extreme care in their installation, and then forget them! Certainly none of us expect to buy a new automobile, store it away for months or years, and then have the motor start without even charging the battery. We think nothing, however, of installing valves and in some instances hydrants and forgetting all about them for years, expecting that when they're needed, they will function perfectly. This is just not possible.

Causes of Difficulties

Although valve and hydrant difficulties are many and devious, troubles are principally due to one of the following three basic causes:

(1) Fault of design, material failure, or faulty workmanship in manufacture;

(2) Natural deterioration;

(3) Neglect or abuse.

As is common with other items of water works equipment, hydrants and valves are purchased on the basis of standard specifications and there is little difficulty usually encountered which can be attributed to faults in design or workmanship.

Specifications covering both hydrants and valves state that all parts requiring special ability to resist corrosion are to be made of bronze or other suitable noncorrodable material. This requirement helps materially in having these items operate satisfactorily for extended periods but in itself is not enough to guarantee their continued satisfactory operation. This can only be assured by periodic routine operation and inspection. The fact that such routine is not generally practiced is the source of most of our headaches with these items.

It is most unreasonable to expect satisfactory operation if, as so often happens, valves are not operated for 5, 10, or 20 years. How much more sensible it is to practice preventive maintenance than it is to wait until an emergency

---

Editor's note: Mr. Carnes is associated with Water Works Service Co., Inc., New York City.

1 *Periodic examination and maintenance of hydrants should include a check of the oil reservoir. Operating nut of Mueller-Columbian hydrants can be removed for this purpose without shutting off water.*

3 *Operating the hydrant from time to time serves to oil working parts automatically, offers a check on whether drain openings are clear, and determines whether or not the hydrant is in first-class shape.*

2 *Inspections also will determine whether nozzle caps are stuck, lost or off. Use a regular hydrant wrench to prevent mutilation of operating nuts and nozzle cap nuts. The right tools are important.*

4 *After completing the inspection, replace nozzle caps correctly to avoid damage to threads. Simple, routine checks on hydrants will assure years of dependable, trouble-free service — at low cost.*

develops requiring use of these facilities and then having to repair them before they can be used. An emergency has a peculiar habit of occurring at the most inopportune moments when we can least afford to waste time and effort doing work which should have been done long before. In the long run, preventive maintenance is more efficient and serves as insurance against large future costs of repair or replacement.

Now, what are some of the hydrant and valve troubles and which ones would be materially reduced, if not eliminated entirely, when frequent routine inspections are made?

Hydrant Damage

Hydrants seem to have an affinity for attracting automobiles, no matter how hard we try to place them in protected locations. Hydrant damage, due to being struck, cannot, of course, be guarded against except to a limited extent. The extent of such damage can be controlled, however, by purchasing hydrants with breakable joints in the barrel and stem. These joints have sufficient strength to withstand normal use, but will break without causing damage to other parts when the hydrant is struck by a car. No excavation is required and much less time and expense is necessary to make repairs than with hydrants not so equipped. The repair kit, which consists of a breakable flange ring, breakable stem thimble and gasket, costs less than $8.00, and two men can make the necessary repairs on a broken hydrant in about one-half hour.

Except for this one source of hydrant maintenance, periodic examination will afford the opportunity of materially reducing all hydrant difficulties. A common source of difficulty with hydrants is that the drains plug up and water does not drain out of the hydrant barrel. If not corrected before cold weather, the hydrant barrel may be damaged beyond repair by freezing. Other faults which will be detected include:

(1) Nozzle caps stuck, lost, or off;

(2) Main and drip valves and stuffing boxes leaking;

(3) Operating nuts mutilated by use of pipe wrenches so that a regular hydrant wrench will not fit the nut;

(4) In certain areas, ground water enters the hydrant barrel to a height so that danger of the hydrant freezing is ever present. Close scrutiny of these hydrants should be maintained. In extreme cases, hydrant drains can be plugged to prevent ground water from entering the barrel. This, of course, requires pumping out such hydrants after they are used.

All of these difficulties are disclosed by inspection, and in addition to correcting them, opportunity is had to thoroughly oil and grease the hydrants, the lack of which causes hard operating hydrants, stuck nozzle caps and bent or broken operating stems.

Valve Troubles

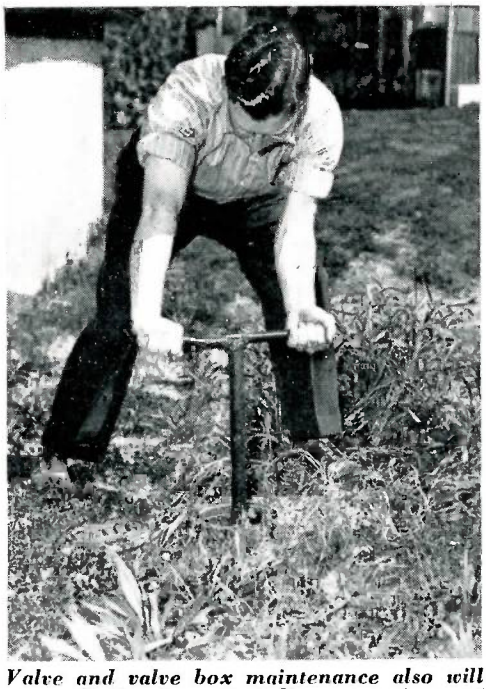
Now let us look for a few minutes into the difficulties experienced with valves. These are in general more numerous and varied. Take a typical example: a blown joint in a main must be repaired. First of all we have difficulty locating the valves necessary to make the shut-out, and eventually find two paved over with asphalt.

After locating all of the necessary valve boxes, we find we still are not able to close all of the valves as the box of one has shifted so that the key will not engage the operating nut. In another, the box is found full of dirt, small stones, etc. Finally, after getting these small annoyances out of the way, what do we find? One of the valves won't budge! We try turning the key one way and then another. If we are unfortunate enough to have some valves which open right and some which open left, which is this, a right or left hand valve? More likely than not, if we don't break the stem, we bend it so that it never will function properly.

If we are fortunate enough to loosen this valve, which has not been touched for years, the stuffing box begins to leak and it won't close due to scale and corrosion becoming wedged under the gates. The gates then have to be run up and down, up and down, sometimes endlessly, before shutting the water off sufficiently to be able to make the needed main repair.

Periodic Valve Inspection

Periodic valve inspection would eliminate much of this difficulty. At least,



Valve and valve box maintenance also will pay dividends. Periodic operation of valves prevents them from becoming so encrusted that they will not operate. Inspections may also show valve boxes paved over and valves not fully opened.

Lubricate valves and tighten packing gland nuts, if required, on inspections. Preventive maintenance by periodic inspection and operation will rid water utilities of "one very large and painful headache," author says from experience.

necessary valve and valve box maintenance would not have to be piled on top of the immediate problem of repairing the leak. More frequent operation of valves would prevent them from becoming so encrusted with corrosion that they become impossible to operate. If these inspections are made annually and the stuffing box is lubricated each time inspection is made, the valves do not get in such condition that you dread the thought of having to touch them.

One other important result of periodic valve inspections is the finding of closed valves. These inspections will invariably disclose valves which have been closed and not turned on when service was restored. As a matter of fact, it is amazing to find the number of times valves are never even fully opened when new mains are installed. Once we installed a 12-inch reinforcing extension and the valves were apparently only partially opened to permit slow filling of the pipe line. Unfortunately, this must have been done about quitting time and by the next morning something else came up so that the fact the valve was not completely open was forgotten. This condition was not found for over two years on the first general valve inspection made at this plant. All told, in that one inspection we found three closed valves and an additional 6-inch valve only partially opened, together with five or six valves with broken stems, and an embarrassingly large number of valve boxes on which work was found necessary. After once absorbing this initial expense, subsequent valve inspections disclosed very little difficulty and we now have reasonable assurance that when valves have to be operated, we can depend on them.

There is no sense in closing your eyes to the fact that there is a minimum amount of required maintenance which must be done if valves and hydrants are to continue to give satisfactory service and the best way to expend energy and money is in preventive maintenance by periodic inspection and operation. When such inspections are carried out, then and not until then will water utilities be rid of one very large and painful headache.

New Pipe Line Will Make 50 Per Cent More Gas Available To Kansas City Area

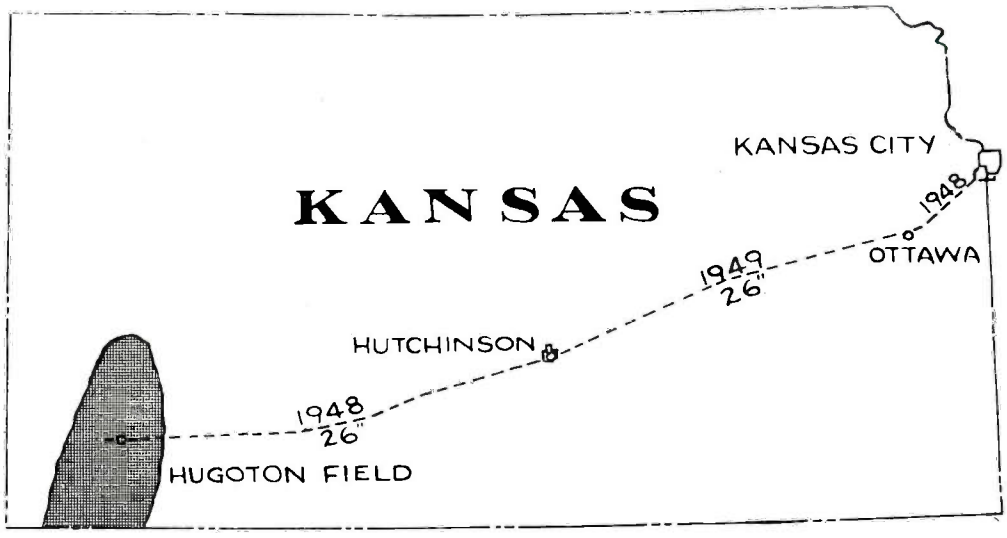
Cities Service Gas Company is running a 26-inch line 405 miles across state of Kansas to the Hugoton field.

THE FIRST LINK of a 405-mile, 26-inch pipe line from the Hugoton gas field in southwestern Kansas to Kansas City just has been completed, and work has started on the second of the three sections of the Cities Service Gas Company project, which will increase the gas available to the Greater Kansas City area in excess of 50 per cent.

George H. Baird, Oklahoma City, vice-president of the company, said the estimated cost of the initial project ranges between 25 and 30 million dollars. Construction of the line will be completed by November, 1949, according to present estimates.

In addition to the greater service that will be made available to the Gas Service Company of Kansas City, a subsidiary of Cities Service, the pipe line also should qualify as a sort of monument to Yankee ingenuity. The line will require about 92,000 tons of pipe or about 3,300 carloads, and approximately 350 cars of other material. Pipe was originally scheduled for delivery beginning in May,

A delay of two years in construction of the 405-mile gas pipe line was eliminated when Cities Service Gas Company purchased Steel plate at the mill, had it fabricated into pipe at another mill. Forty-foot joints of pipe are welded into lengths between one-fourth and one-half mile in length, depending upon topography, set in the ditch and covered.



Route of Cities Service Gas Company's new 26-inch pipe line is shown on this map. Two links in the line will be completed in 1948, the third and final section, between Hutchinson and Ottawa, in 1949. The cross-Kansas line will increase gas available to the Greater Kansas City area in excess of 50 per cent. Estimated cost of the line: 25 to 30 million dollars.

1947, but the steel situation was such that the pipe manufacturer had to revise that date to May, 1949. To avoid a setback of two years, the company bought steel plate directly from steel mills and shipped the plate to the pipe mill to be fabricated into pipe. This enabled the company to start construction on its first link, from Ottawa to Kansas City, a distance of 49 miles, on April 29.

The second section of the pipe line will be from the Hugoton gas field to Hutchinson, a distance of approximately 187 miles. The third and final section, which will link up these two sections, runs from Ottawa to Hutchinson. The final section is about 152 miles in length, and construction is expected to start in the spring of 1949.

As originally planned, the total line was divided into two sections, one between Hugoton and Hutchinson, and one between Hutchinson and Kansas City. This was revised to include the three sections: Kansas City to Ottawa, Hugoton to Hutchinson, and Hutchinson to Ottawa.

When the total project as outlined is completed, the company's pipe line system, which traverses Texas, Oklahoma, Kansas, Missouri and Nebraska, will have a capacity on peak days of more than one billion cubic feet of gas. This will be equivalent, under normal efficiencies, to approximately 50,000 tons of coal, a pile that would require the facilities of a freight train eight miles long for transportation.

Maximum pressure on the Hugoton-Kansas City natural gas pipe line will be 900 pounds per square inch. The initial compressing station on the line is located about thirteen miles east of Ulysses, Kansas. The field compressor station, now better than 25 per cent completed, will include thirteen units initially for a total of 20,800 horsepower. No other stations will be in the initial project, but if the line capacity is increased in the future, intermediate stations will be installed, Mr. Baird said. Locations for possible intermediate stations have not been determined as yet.

Building such a line requires the best in brains, brawn and machines. Entering into the preliminary steps are the factors of financing, obtaining materials, surveys, the legal work of securing easements for right-of-way, finding contractors able to handle jobs of this stature, and a multitude of lesser details. Then, after materials have been shipped to various points along the route of the line and the men and machines assembled, the job is ready to start.

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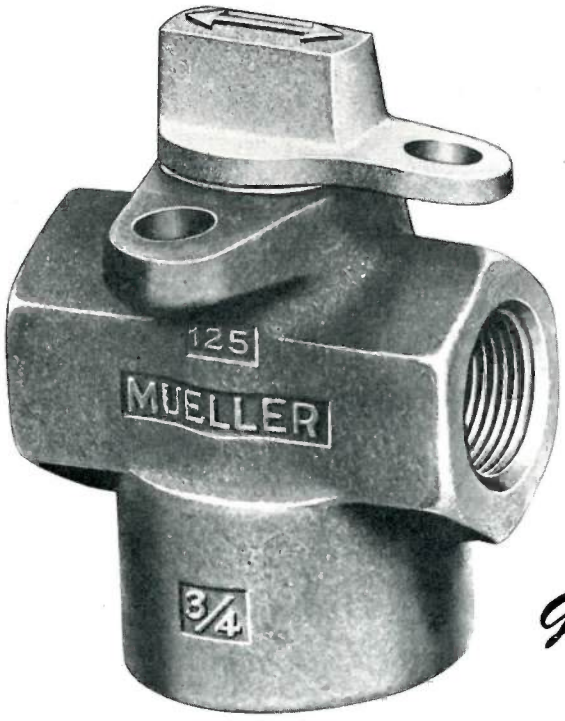
A NEW PRODUCT



Mueller Lubricated Gas Meter Stop

H-11112

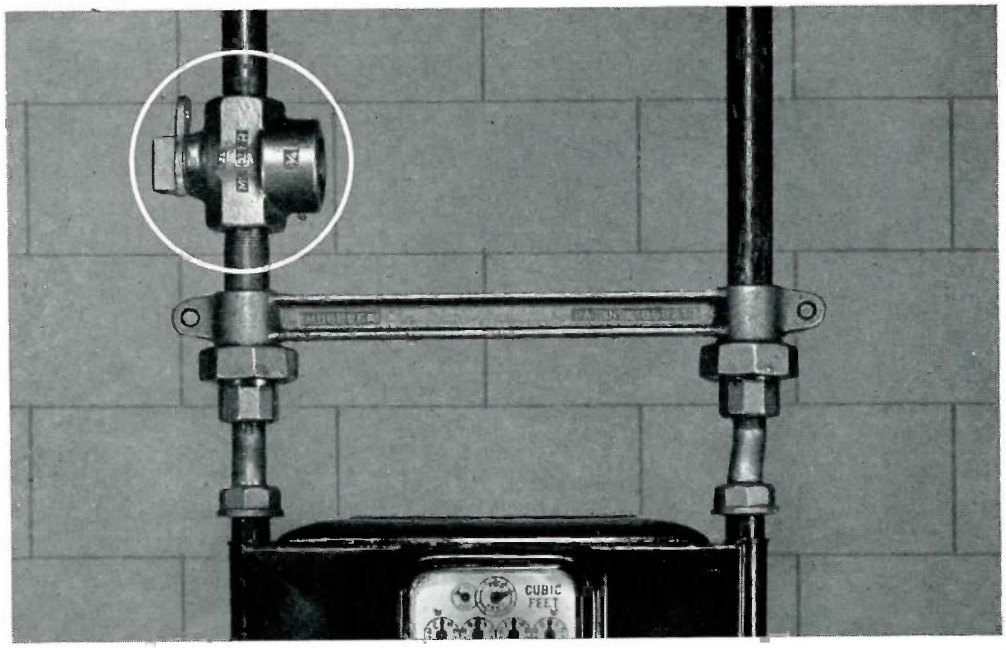
Tamper-proof inverted key stop developed to provide for safe control of gas service at the meter.

A NEW GAS METER STOP, designed to fill a long-expressed need for a safe, tamper-proof stop for home services, just has been announced by Mueller Co. The new stop comes in two models: H-11112 (shown above), a lock wing stop with a flat head; and H-11110, a plain stop with flat head. Both models feature a permanently pinned head which makes it impossible to remove the inverted bronze key from the body without completely destroying the stop.

Heretofore, accidental explosions have occurred in homes when householders, attempting to tighten key nuts on other types of gas stops to prevent small leaks, managed to twist the nut off, allowing a full flow of gas into basements or other confined spaces. The head assembly of the H-11110 and H-11112 gas meter stops is pinned into a blind hole, and cannot be removed without the use of a saw to cut off the head. A customer with only ordinary tools cannot remove the key from the body. The lubricating plug in the base of the stop permits lubrication of the stop without danger of the key falling out or being blown out. It also has a recessed pentagonal head that can be operated only with a special wrench available exclusively to gas companies.

The heavy gray iron body of the stops, cast with extra thick sections, has been designed with an ample factor of safety for the maximum design pressure of the stop of 125 pounds per square inch. All stops are thoroughly inspected and tested before leaving the factory.

The use of bronze and gray iron in bearing contact reduces the coefficient of friction, and results in easier turning



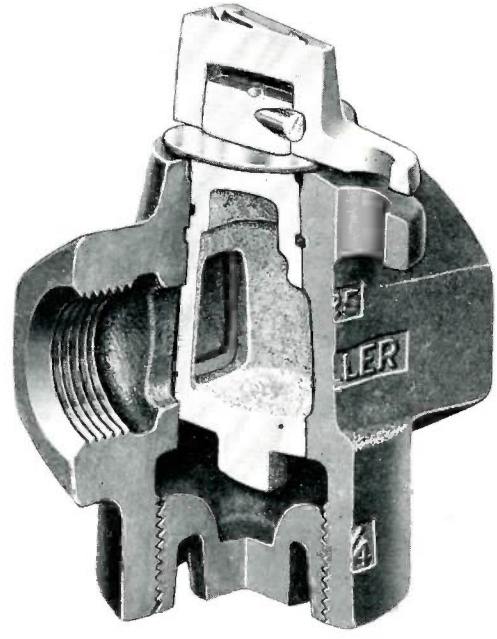
The H-11112 lock wing gas meter stop, enclosed in white circle upper left, is shown as it appears in a typical meter installation. Its tamper-proof design and solid construction are features which are not available in any other make of gas meter stop. The individually ground and lapped key cannot be removed from the iron body without destroying the stop.

and more effective seating. Grease channels completely surround the port, providing a complete seal and easy turning.

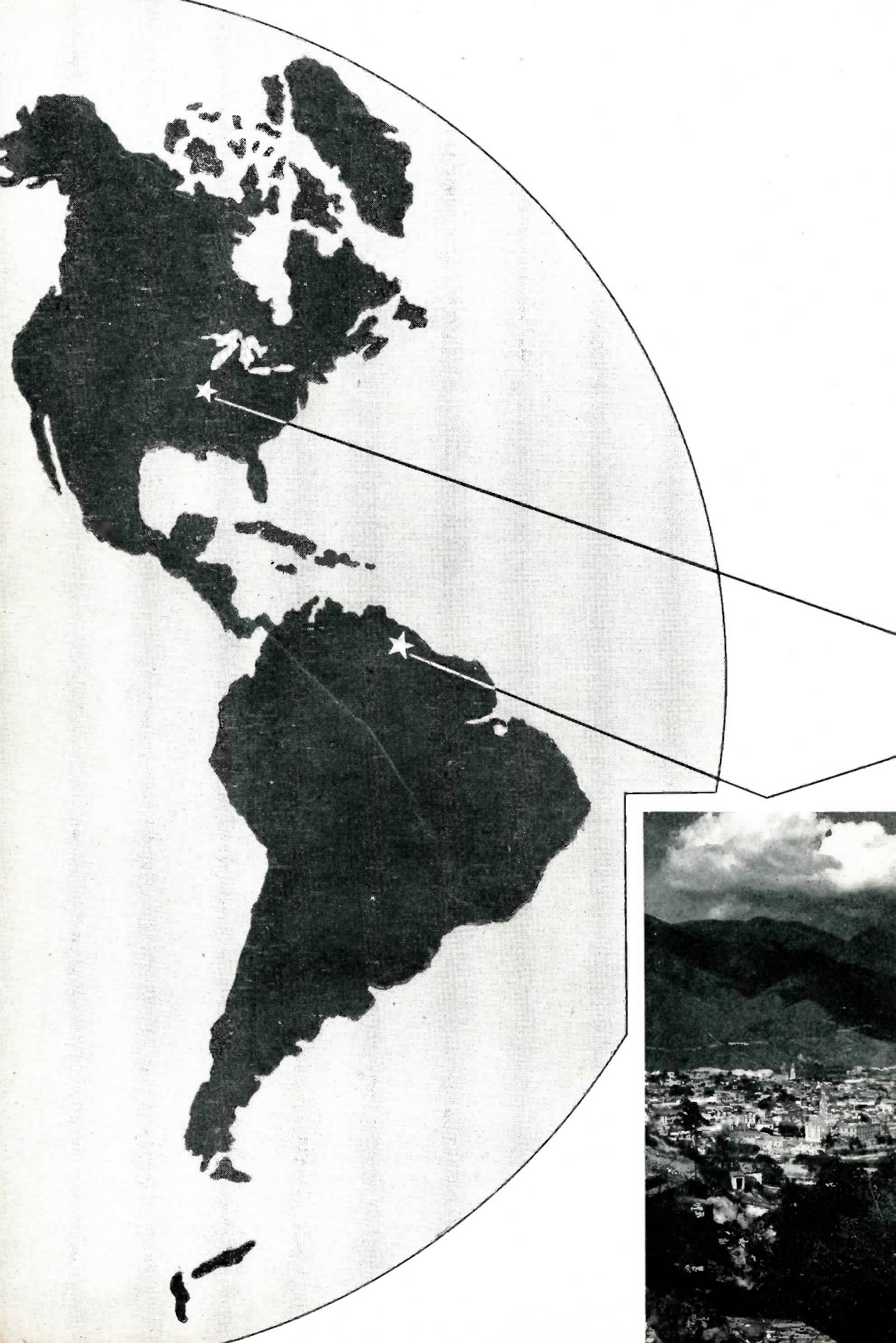
In the ordinary lubricated stop, a screw at the top forces grease down the grooves to the lower chamber. Additional pressure forces grease out of the grooves as well as against the bottom of the key. Such a condition unseats the key, allows gas to escape, and permits grease to enter the pipes.

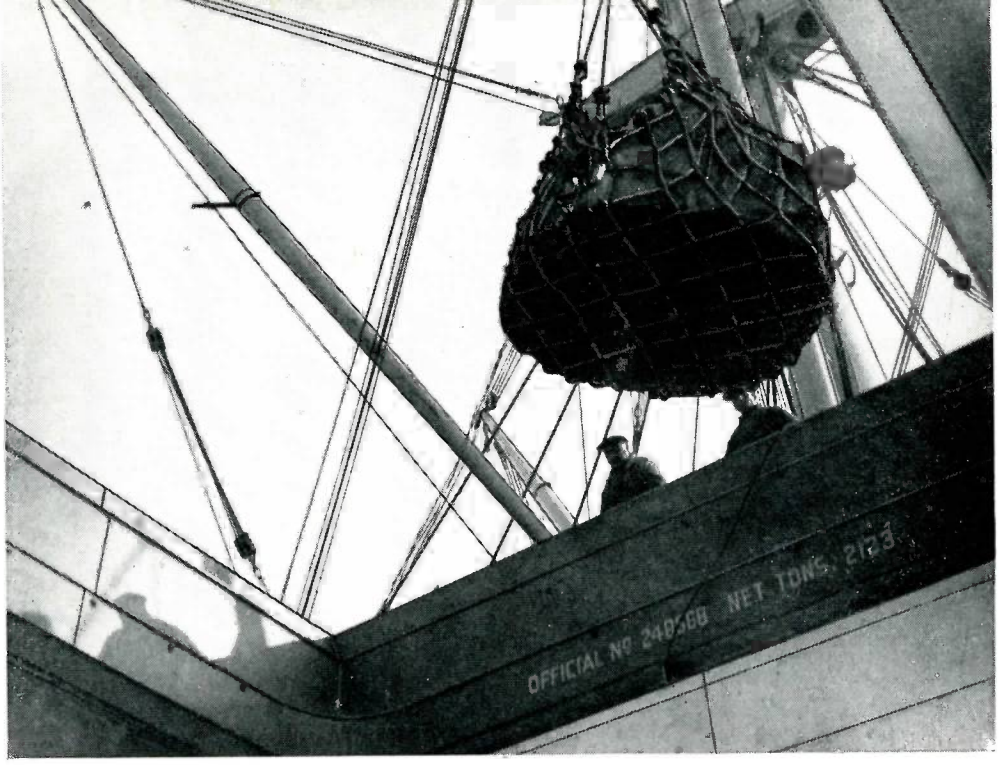
However, in the new Mueller Co. stop, the key is inverted, and when the lubricating plug at the bottom is tightened, lubricant is forced up the grooves in the body and around the annular ring connecting them at the top. The pressure of this lubricant against the large end of the key helps to seat the key firmly while positively sealing the stop against leakage. Lubricant cannot go between the body and key, into ports and then into the pipe. Lubricant can be added without disassembling the stop, and there is no danger of the key falling out of the body.

Additional information on the new stops may be obtained from Mueller Co. representatives or by writing to the company's Decatur plant.



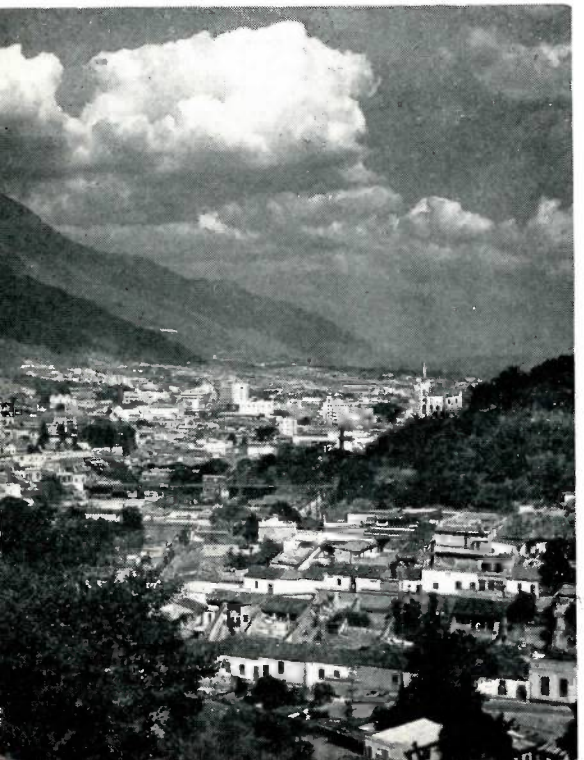
This sectional view of the H-11112 gas meter stop shows its rugged construction. Details shown include the permanently pinned head, the heavy gray iron body, the stop's inverted key, and the special lubricating plug.





EXPORT SHIPMENT TO *Caracas, Venezuela*

ALCOA LINES PHOTO



WHEN THE SS *Republica de Colombia* sailed recently from New York, she carried a wide variety of manufactured goods in her holds, including a shipment of Mueller Co. brass goods for important additions to the water supply of Caracas, Venezuela.

After docking at La Guaira, a settlement of more than 10,000 population which is located on a narrow strip of land at the foot of the coastal range, the cases were unloaded, then loaded again in railroad cars for the mountainous, 23-mile trip to Venezuela's capital.

Venezuela, which made a highly important contribution in producing oil for the Allies in World War II, again is undertaking a vast modernization program, particularly in the public health field, which was delayed during the war years.

STANDARD OIL CO. (N. J.)

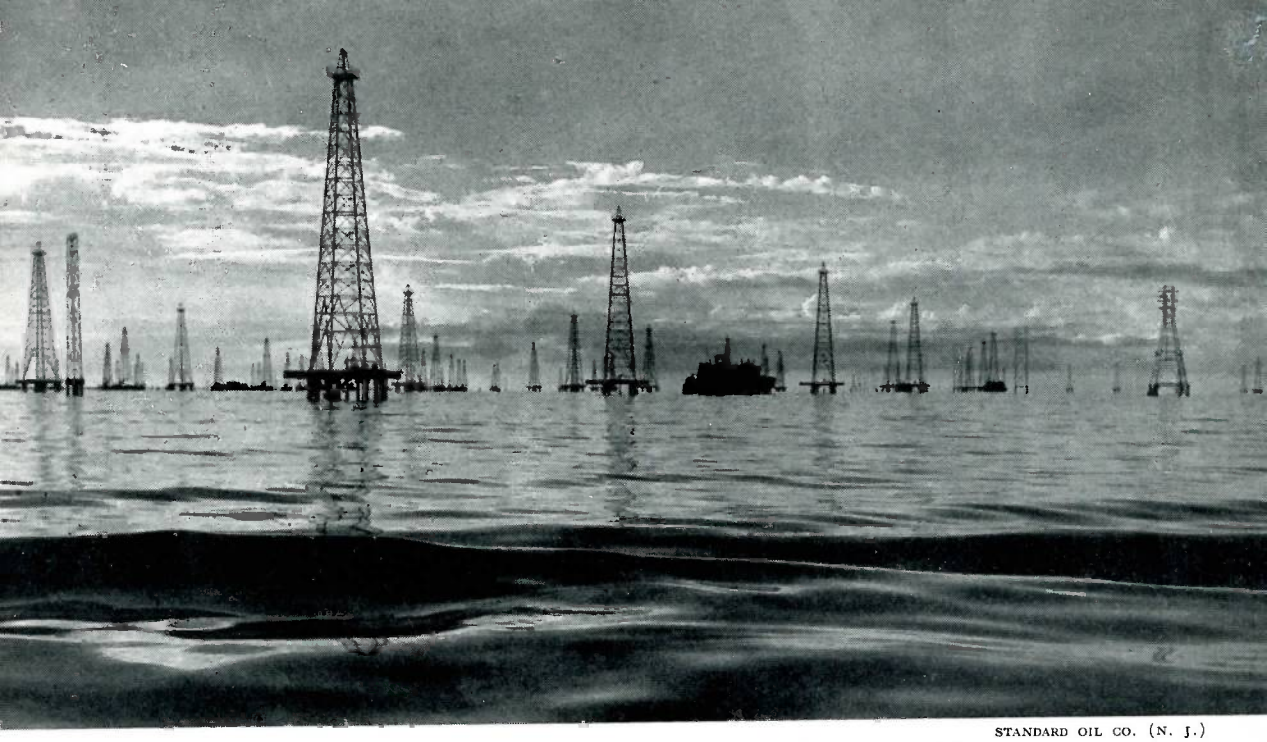
Plaza Bolivar, the official center of Caracas, is a popular meeting place for residents of the city. Foreground: equestrian statue of Simon Bolivar, who secured Venezuela's independence from Spain in 1823.

Start of the program is comparatively recent, for the formation of the Ministry of Health and Social Welfare in March, 1936, is considered the initial move in providing Venezuela with modern services for water and sewage. Outgrowth of the program was the creation of the National Institute of Sanitary Works (Instituto Nacional de Obras Sanitaria), an organization of the Ministry of Public Works.

The country now is attempting to make up for lost time. Lack of trained personnel was one of the early stumbling blocks in extending sanitary measures, and INOS, immediately after its formation, found itself unable to obtain necessary manufactured products, because American manufacturers were in war production and were unable to supply even the domestic market. However, the flow of needed products is resuming and work has again begun in earnest.

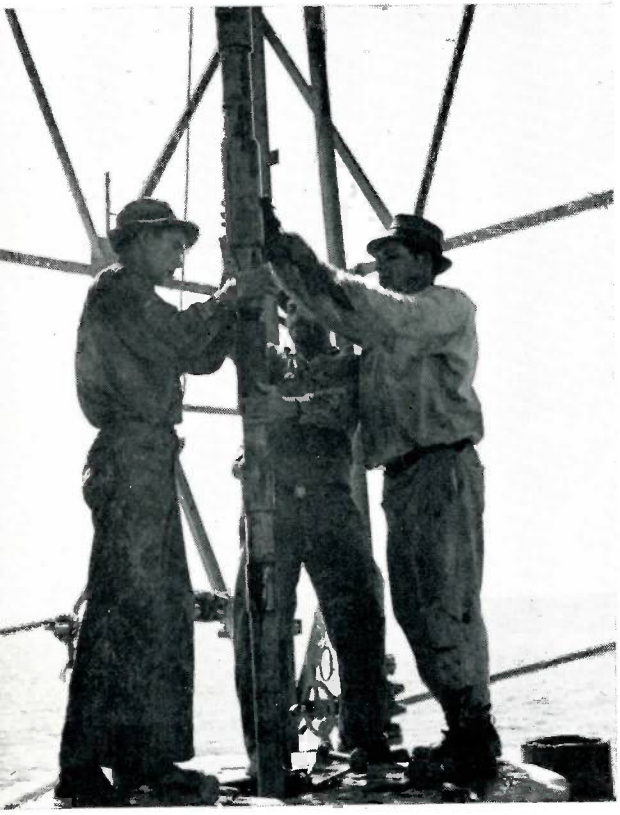
Assisting the Venezuelan government in this program is the Institute of Inter-American Affairs, which was set up after the Third Meeting of Ministers of Foreign Affairs at Rio de Janeiro in 1942. Delegates to the conference agreed that the defense of the western hemisphere depended in a large measure on adequate health and sanitary facilities, which constituted an essential contribution in safeguarding the defensive power and the ability to resist aggression of the people of the American republics. Immediate purpose was to protect Latin American workers producing vital war materials (high octane gasoline, oil and rubber, to name a few) and troops stationed in strategic areas; the long term purpose, and now the major one, was the elevation of health standards in the hemisphere. Better health, it has been pointed out, means an expanding economy in all the Americas.

The first few shipments of Mueller Co. products will be used to equip the new water works system in the city of Caracas. A distribution goal of more than 80,000 buildings, mostly homes, is planned. However, emphasis is being placed on improvements in rural areas, and the program for installation and reconstruction includes the building of more than 600 water supplies in 25 municipalities throughout the country. Fewer fittings will be required for the rural program, because it is planned that the major part of the water consumption will be taken from public taps. Only a small percentage of the population in the rural communities can afford to pay for private service connections.



STANDARD OIL CO. (N. J.)

The "big three" in world oil production are the U. S., Russia and Venezuela. Wells shown here are in the Tia Juana field of Lake Maracaibo, site of one of the richest oil strikes in the industry's history.



Oil field workers at one of the well locations which tap the rich deposits beneath the lake's surface.

Workmen are shown unloading pipe from a drilling barge at a well location on Lake Maracaibo.

STANDARD OIL CO. (N. J.)

Nearly four centuries old, Caracas, the chief metropolis and capital of Venezuela, is a city of many contrasts between the old and new. These homes are in one of the city's modern residential districts.

STANDARD OIL CO. (N. J.)

High mountains surround the city, which is located 3,000 feet up the coastal range in a sloping valley. The city is growing rapidly and is pushing out from its old center.

STANDARD OIL CO. (N. J.)

These residences in the Los Caobos district of Caracas follow a style of architecture which is typical in many cities of Central and South America. Rents are highly inflated, range from $170-$300 a month.

STANDARD OIL CO. (N. J.)

Modern business buildings and apartments are common sights in the city. This is a view of one of the principal streets in Caracas. Note the narrow street and irregular curbs.

ALCOA LINE PHOTO

La Guaira is the seaport through which Caracas takes most of its imports, and the 23-mile rail trip follows this route. A 9,000-foot peak, the Saddle, is between the cities.

Both surface and ground water are used as sources for the water supply of the city of Caracas. Surface water projects include the storage of the run-off from the Jarillo, San Pedro and Macarao river basins. An earth-fill dam, impounding the water from the Jarillo river catchment area, eventually will have a storage capacity of 5,800,000 cubic meters; the San Pedro reservoir will impound 103,000 cubic meters; and the Macarao reservoir will store 186,000 cubic meters. The largest project is the Mariposa dam, which will hold almost nine and a half million cubic meters of water. Ground water supplies have been obtained in the Caracas suburbs of El Paraiso, San Antonio and La Florida. El Paraiso is one of the city's most fashionable suburbs.

Aqueducts convey the water from these sources to two new treatment plants. The Las Adjuntas plant for water from the Macarao dam will have a capacity of 110,000,000 liters per day; the other, near the La Mariposa dam, will have a capacity of 56,000,000 liters per day.

After arriving at Caracas, water from the two large dams is stored in a number of conveniently located storage reservoirs within the city. Ten pumping stations are being installed with the present Caracas water supply project.

Caracas, now almost four centuries old, is a contrasting mixture of the old and the very new. The city was founded in 1567 by an adventurer named Diego de Losada as he was returning to the coast from an exploration trip. The cool climate of the mountain valley was a welcome relief after his months of marching across the barren Llanos, and he liked it well enough to found a settlement and name it *Santiago de Leon de Caracas*. It is now a prosperous, busy city of almost 400,000 population. Its projected population for the year 1982 is 752,736.

The city is the birthplace of the revolutionary patriots, Simon Bolivar and Francisco Miranda, who led the fight against Spain. Bolivar's final victory over the Spanish came in 1823. A lock of George Washington's hair, sent to Bolivar after Washington's death in 1799, is on display in the Bolivar Museum in Caracas.

The Plaza Bolivar is the official center of the city. Four main thoroughfares, Avenidas Norte, Sur, Oeste, and Este (North, South, West and East), pass through the Plaza Bolivar at perfect right angles. The city's narrow streets are laid out in almost perfect rectangular symmetry.

Brown and Sites Co., New York, acted as agent for the export shipment.

"Bannerstone Ben"

Ben Nussbaum, water superintendent at Fairbury, Ill., an ardent amateur archaeologist for 50 years.

IN ILLINOIS WATER works circles, Ben Nussbaum is known as city engineer and superintendent of the municipal water works at Fairbury. But to members of the Illinois State Archaeological Society and other delvers into Indian lore, he is more picturesquely--and, for such staid company, perhaps even flamboyantly—identified as Bannerstone Ben.

Ben Nussbaum

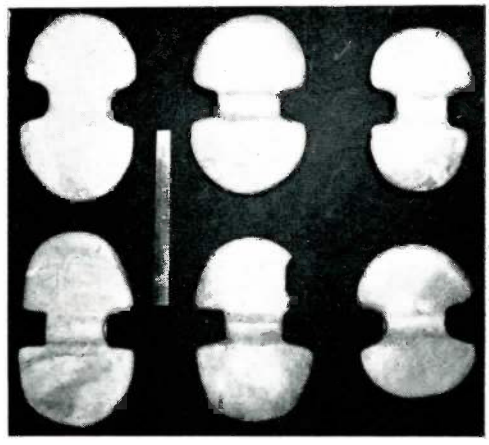
Mr. Nussbaum, who is treasurer of the society, has been collecting Indian artifacts for fifty of his fifty-five years, having picked up an arrowhead, which he still has, on his father's farm southeast of Fairbury on Good Friday, 1898. Although there was a lapse of two years before he began a collection at the age of seven, the society chose to name its spring meeting in April the "Nussbaum Commemorative Semi-Centennial Observance." The meeting was held at Fairbury, and more than 250 members of the society attended.

Mr. Nussbaum gets his name "Bannerstone Ben" from his archaeological specialty. His particular interest is the bannerstone, and he has about 70 of these of various shapes and sizes in his collection, which is displayed in cases in his attractive basement den. It also contains hoes, axes, pipes, spear and arrowheads, and many other items. Only the better specimens have been mounted or are on display, for the collection is so numerous that many items have been allowed to overflow to the anonymity of cigar boxes.

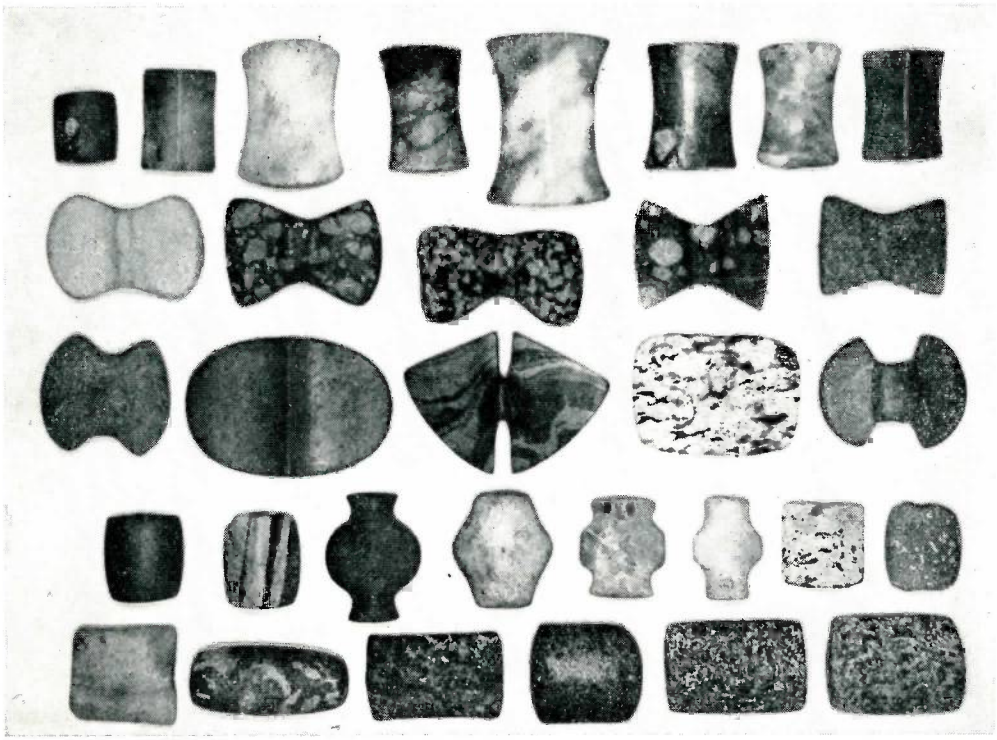
Archaeologists, both professional and amateur, are somewhat vague on the exact use to which bannerstones were put by Indians. They believe, since the stones were selected for their grain and color and obviously required skilled and painstaking work, that they were used in ceremonies. However, they are a little uncertain as to whether they were mounted for use on a staff, on a handle as a ceremonial weapon, or possibly used as an ornament for a headdress.

The bannerstones are found in a number of shapes, and this furnishes the basis on which collectors classify them: hourglass, butterfly, saddle faced, triangular, rectangular, tubular. Practically all, Mr. Nussbaum said, are found east of the Mississippi River. It is significant, the archaeologists feel, that no white man ever recorded seeing any of the tribes using bannerstones. The art of making them probably died out with the moundbuilders of the Mississippi valley.

Each bannerstone — or at least the completed ones — is perforated, and from the depressed ring and elevated



One of the prize exhibits in Mr. Nussbaum's collection is this cache of six quartz bannerstones. All were found in a field in Muscatine County, Iowa, by different individuals, and four years were required to trace them.



This photograph shows part of Mr. Nussbaum's fine collection of bannerstones. The top row includes specimens of the hourglass group; second row, Wisconsin winged group; third row, type specimens of the double-notched butterfly, rectangular barrelled, and quartz butterfly group; fourth row, various blending forms; and sixth row, type specimens of the saddle-faced, triangular, rectangular and tubular group. Many are highly polished with perhaps centuries of handling, while others are rough from erosion over the years.

core found in the unfinished specimens, the archaeologists figure the Indians used a tubular drill, possibly a length of reed, and an abrasive.

Byron W. Knoblock, Quincy, Ill., author of "Bannerstones of the North American Indian" and a personal friend of Mr. Nussbaum, says that drilling a perforation four and three-fourths of an inch in length, using the reed and sharp sand abrasive, probably required almost 31 million grinding revolutions, requiring 285 hours of work. Since many of the better bannerstones in his collection have been worn smooth by much handling, Mr. Nussbaum believes that the bannerstones must have had a great deal of significance in Indian ceremonies and that they probably were passed down through several generations.

The Nussbaum collection is regarded by authorities as one of the most extensive in the country, and the cache of six quartz bannerstones, the only cache ever found, is of the greatest interest to collectors.

Mr. Nussbaum tracked down the six bannerstones over a four-year period, from 1933 to 1937. The six were found individually by different persons who had worked in a small field in Muscatine County, Iowa. Each had caught the eye of its finder and had been picked up and removed. The finders lived in the Muscatine-Davenport area of Iowa, and it required a great deal of sleuthing and numerous trips before Mr. Nussbaum was able to purchase them from the various owners.

Collectors are notably shy of mention of the monetary value of the specimens, preferring to stick to historical values only, but it has been reported that Mr. Nussbaum probably could dispose of the cache to interested collectors for several thousand dollars, if he had a mind to—which he hasn't. Bringing up money values is definitely frowned upon, be-

cause the intrinsic value of a specimen is largely a matter of the value the owner places on it—and its rarity. One collector may have a specimen which he would sell for, say, two or three dollars, while the purchaser, once he adds it to his collection, wouldn't resell for a hundred times that—even though he might give it to a fellow collector or trade it for another specimen.

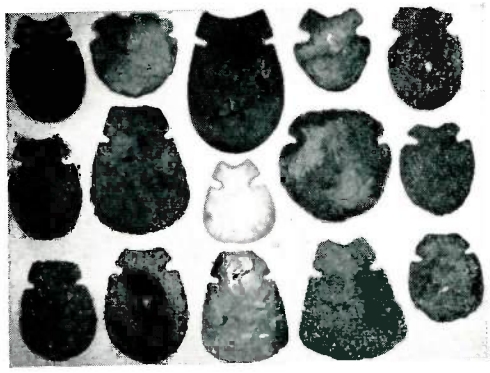
The Nussbaum collection also contains what Mr. Knoblock terms "The largest and most beautifully made hourglass bannerstone in existence." Continuing, Mr. Knoblock said, "This superb specimen was formerly in the E. L. Renno collection. Mr. Nussbaum is most deserving of owning this greatest of all hourglass bannerstones. It gives me great pleasure to know that it has now found a place with the largest and finest butterfly bannerstones ever discovered in the state of Iowa."

Mr. Nussbaum's collection includes, in addition to the group of six bannerstones, several other caches of flint pieces. In most instances caches yield unfinished articles which were probably hidden at various points against the owner's need for them. Mr. Nussbaum has never found a cache, although he has found hundreds of single articles on field trips.

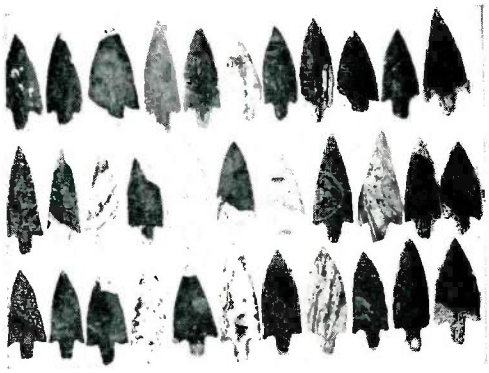
Plowed fields near creeks and rivers offer one of the best hunting grounds for traces of ancient Indian culture, Mr. Nussbaum said, since the Indian trails usually followed waterways.

More and more difficulty is being experienced in finding good stone relics nowadays, Mr. Nussbaum said. The use of heavy, tractor-drawn plows by farmers in tilling bottom lands puts the collector at a disadvantage, for many of the relics now being found are chipped or broken.

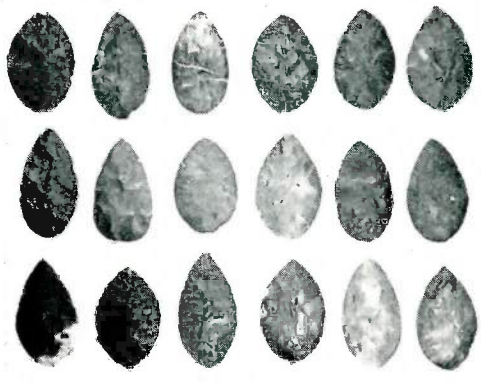
Mr. Nussbaum designed the pine-paneled room in the basement of his home especially for his collection. He planned the fireplace, display cases, and even the den's floor tiling, which correspond to the four colors used by the American Indian: light red, dark red, yellow and black. The tiling was made to correspond with Mr. Nussbaum's detailed drawings, and it fitted exactly when the shipment was sent to him by the manufacturer.



Mr. Nussbaum's collection also includes this group of notched flint hoes, all found in southern Illinois, a prize hunting ground for those interested in ancient Indian artifacts.



This group of spears is said to be the only known cache of stemmed flint spears. It was found in southern Ind. Caches of any kind are considered extremely rare and amateurs and professionals prize them accordingly.



These flint pieces are part of a cache which was found in the southern part of Indiana. Like the articles found in most caches, these pieces are unfinished, and probably would have been used for scrapers or knives.

Members of Central Illinois Water Works Operators Conference Visit Mueller Plant

ABOUT 80 MEMBERS of the Central Illinois Water Works Operators Conference attended the annual spring meeting of the organization at Decatur June 16. The conference was sponsored by the Illinois Department of Public Health.

Following a morning business session at which several papers were presented, members were taken on a tour of the Decatur water works and Mueller Co. Forty-five persons toured the main plant of Mueller Co. in small groups and saw at first hand how many of the products they use are manufactured.

One of the most interested spectators was Mrs. Lizzie Beatty, water works superintendent of the City of Rushville, which has a population of 2,500. Mrs. Beatty disclaimed the honor of being the only woman operator in the state, since she said she believed one other city had a woman superintendent.

Henry Wagner, Pontiac, former secretary of the conference, was elected president, succeeding Frank Turner, Paris. Gerald (Doc) Davis, City of Decatur chemist, was elected secretary of the conference.

Among those making the trip through the Mueller Co. main plant were Henry Wagner, Pontiac, newly-elected president of the Central Illinois Water Works Operators Conference, and William Downer, Springfield, division of sanitary engineering, state board of health.

Mrs. Lizzie Beatty, one of the two women water superintendents in the state of Illinois, watches Tom Bowman, second grinder, at work on one of the operations that go into the manufacture of Mueller Co. products. She is accompanied by George White, left, Mueller Co. representative, and Ted Seabrooke. Mrs. Beatty is from Rushville, a city of 2,500.

Jack Bain, core room foreman, is listening intently to a question put to him by one of the members of the group watching Mrs. Fedora Walton, bench coremaker, as she makes a core which will be used for a ground key stop. Cores form the cavity of a casting.

More Water for Air Conditioning

Plumber uses Mueller tapping sleeve and valves on a job to provide larger services to several Decatur firms.

WHEN SEVERAL Decatur, Ill., business firms recently decided to install air conditioning equipment in their stores, their water services were found to be inadequate to supply the equipment and still meet their regular requirements.

To avoid shutting down the six-inch main serving the downtown section in which the stores are located while new connections were installed, a Mueller tapping sleeve and valve were used and the main cut into under pressure.

A six-inch cut was made in the main. From the tapping valve, a 6x4 reducer was leaded to a bell end cross, where a four-inch nipple was connected to a four-inch Mueller gate valve. Two-inch copper services were led from the other two outlets of the cross. The plumbing firm handling the job was George S. Walker, Inc., Decatur.

Use of Mueller tapping sleeves and valves has solved any number of special problems which involve cutting into main under pressure. Mueller tapping sleeves and valves are made exceptionally heavy to withstand the severe strains to which they may be subjected in service, and are individually tested at 300 pounds per square inch hydraulic pressure and 100 PSI air pressure. They are recommended for working pressures up to 100 pounds per square inch.

A six-inch cut was made in a six-inch water main at this corner in downtown Decatur, Ill., to provide larger services for the use of air conditioning equipment for several stores.

Helper E. L. Moore opens the 6-inch tapping valve before the ditch was backfilled. A 6x4 reducer was used between the Mueller tapping valve and the cross shown below.

R. W. Edwards, a plumber with George S. Walker, Inc., is shown leading a nipple into the bell end of the cross. A 4-inch Mueller gate valve is shown in the foreground of the photo.

Off the . . Record . .

All the animals had left the ark except two snakes lying over in the corner.

"Why don't you go forth and multiply?" asked Noah.

"We can't," answered one, "we're adders."

■ ■ ■

Professor: "What is the outstanding contribution that chemistry has given to the world?"

Student: "Blondes."

■ ■ ■

A sentimental woman was married to an unromantic man. One evening she said to him with a sigh: "Would you mourn for me if I were to die?"

"Oh, yes," he mumbled, "of course I would."

"And would you visit the cemetery often?"

"Certainly," he said, with a little more animation. "I pass it on my way to the club, anyhow."

■ ■ ■

"My, what a strange looking cow!" exclaimed the sweet young thing. "But why hasn't she any horns?"

"Wal, you see," said the farmer, "some cows we dehorn and some cows is born without horns and never has 'em and some cows shed 'em. But the reason that cow ain't got horns is she's a mule."

Centenarian: "Yup, I'm 100 years old, Bub, and I'm proud to say I ain't got an enemy on earth."

Nephew: "That is a very beautiful thought, sir."

Centenarian: "Yup. Last one died 'bout a year ago."

■ ■ ■

Customs Officer: "Lady, you said this bag contained clothes, but it's full of brandy."

Woman: "Certainly . . my husband's nightcaps."

■ ■ ■

"What a change has come over your husband Zeke since we persuaded him to join the church," exulted a preacher in the mountain country. "Have you noticed it?"

"Sure have," agreed Zeke's wife. "Before, when he went visitin' on Sundays he carried his jug o' corn whiskey on his shoulders. Now he hides it under his coat."

■ ■ ■

When a pretty girl got on the crowded bus, a pale-looking fellow started to get up. But she pushed him back in the seat, and said she preferred to stand. Again he tried to get up and again she pushed him back. Finally he yelled, "Now listen, lady! I passed my stop two blocks back —let me out!"

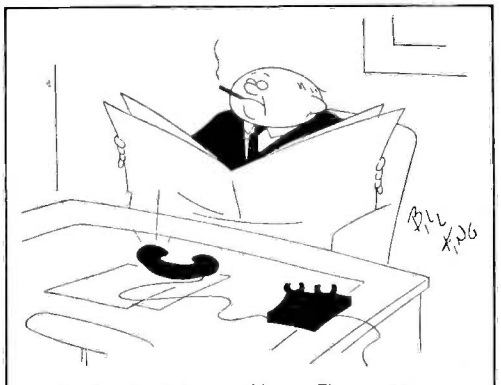
■ ■ ■

The automobile motor pounded, sputtered and finally stopped.

"I wonder," mused the sailor, "what that knock is?"

"Maybe," said the beautiful blonde, "it's opportunity."

"B. J. practically had that buyer signed up at the Club 88 last night, and he's making sure he doesn't lose interest!"



"...I'm going to hang up, Henry. There must be a bad connection - I can't hear a word you're saying..."

"I never saw anybody so anxious to get married as you. That's no way for a woman of your age to act."

"I have to act that way. I'm at the in-between age."

"In-between age?"

"Yes, in-between eager and desperate."

■ ■ ■

The elderly treasurer of a women's aid society went into a bank to deposit the organization's funds. She handed the money to a hard-of-hearing cashier with the casual remark that it was "the aid money."

The cashier thought she said "egg money," and wanted to compliment her.

"Remarkable," he said, "isn't it, how well the old hens are doing these days?"

■ ■ ■

Joe: "Did you hear about the goat that fell off the cliff?"

Mike: "No. How come?"

Joe: "He didn't see the ewe turn."

■ ■ ■

An Irishman was telling a friend of his narrow escape in the war.

"The bullet went in me chest and came out me back," he said.

"But," queried his friend, "how come it didn't go through your heart and kill you?"

"Me heart was in me mouth at the time," replied the Irishman.

■ ■ ■

Wife: "Is it true that money talks?"

Husband: "That's what they say, my dear."

Wife: :"Well, I wish you'd leave a little here to talk to me during the day. I get so lonely."

City Visitor: "What do you raise on your farm?"

Farmer: "Hogs."

City Visitor: "Do they pay better than corn or tobacco?"

Farmer: "Nope, but they don't need hoeing."

■ ■ ■

The newly-weds had just got off their train.

"John, dear," said the bride, "let's try to make the people think we've been married a long time."

"All right, honey," was the answer, "you carry the suitcase."

■ ■ ■

A minister was asked to pray for a rain, and his prayer was followed by such a downpour that the crops were injured. One old farmer said to another: "That's what comes of trustin' sech a request to a preacher who ain't acquainted with farmin'."

■ ■ ■

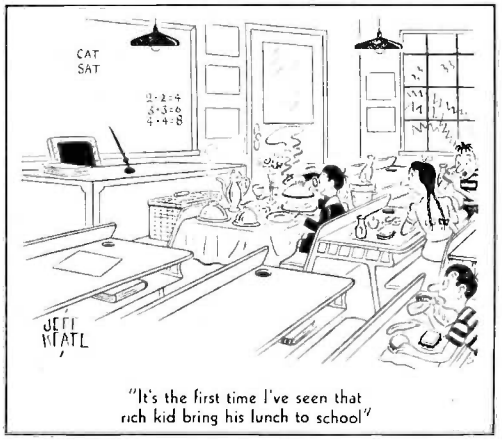
Shnotinsotski, a Rashan, returned to Rahshia after a year in the United States. He met a friend soon after his arrival and lost no time in telling him about the wonders of America.

"Sasha, it's nice in Rahshia, bot you should see it in America. Dare you ride everyvare in ah limousine. It costs nattin'! Dare you itt at de bast hotel. It costs nattin'! Dare you gat all kinds dimonds, fuzz, jools. It costs nattin'! You stay in movvelous rooms. It costs nattin'!"

"All dis happened to you?" cried the open-mouthed Sasha.

"To me, no," replied Shnotinsotski, "bot to my sister, yes."

"... and when the housewife slams the door, don't use your foot - you can't sell brushes with your foot!"



"It's the first time I've seen that rich kid bring his lunch to school"

Mostly Personal

(Continued from page 1)

such adjectives as now appear in the cigaret ads.

We both enjoyed Mr. Nussbaum's hospitality and were glad that we could welcome him shortly after, when he visited the Mueller Co. main plant with other water works men attending the Central Illinois Water Works Operators Conference at Decatur, June 16.

* * *

Ever use a corporation stop like this? If you have, you're an old-timer in the

water works field, and we'd like to hear from you concerning your experiences with such stops. It's a drive corporation stop which was sent to Mueller Co. some time ago.

■ ■ ■

Development of the Fire Hydrant

(Continued from page 7)

engines, a number of different types were placed on the market by various manufacturers. It was not unusual for firemen to go out on a call only to find that they could not couple their hose to a hydrant because of a variation in the size of the hydrant nozzle. Cities began standardizing the size of their connections, and there gradually evolved a movement to standardize certain hydrant features on a national basis. Specifications also were set up governing maximum friction losses and other hydraulic factors. Design of hydrants became more scientific as competition developed among manufacturers, and the changing conditions of the times also influenced engineering considerations.

Traffic accidents, for example, constituted one of the problems that had to be met. Drunken drivers seemed to have an affinity for hydrants, which, when struck and damaged, let go a veritable geyser of water and necessitated costly repairs. In some communities today this is still a serious matter, for elevated water storage tanks have almost been drained, with a consequent loss of pressure and a resulting lack of fire protection, before repairs to a hydrant could be made. Mueller Co. met this problem with its safety flange construction and its specially designed compression-type main valve. If the hydrant is struck in a collision the safety flange and coupling let go, while the valve remains seated, and there is no loss of water. Repairs are made quickly and inexpensively. Hydrant design has incorporated many changes since the days when a combination hitching post and hydrant was offered on the market.

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New Pipe Line to Kansas City Area

(Continued from page 13)

This line is being laid at least six feet under the natural surface of the country it traverses, and the first task is for the huge ditching machine. Power shovels follow for handling rock and cave-ins, and then the pipe gang gets going.

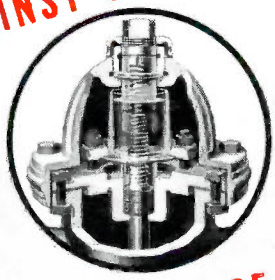
The 26-inch pipe comes in sections averaging about 40 feet in length, and it must be lined up for the welders, the pipe line prima donnas whose skill determines the strength of the completed line. All welds on the line are arc welds and all are made by hand.

The pipe sections, held in position by tractor cranes, are welded into units which are usually from a quarter to a half-mile long, the length of the units being determined mainly by the topography of the land and the ease with which the line can be handled.

After the welds are checked by an inspector, another crew cleans the pipe, coats it with a bituminous material, and then wraps it to prevent corrosion. Tractors with cranes and dollies then start from one end and lay the treated sections into the trench. When the pipe has been bedded down and joined, the backfill gang then comes along and uses bulldozers to cover it.

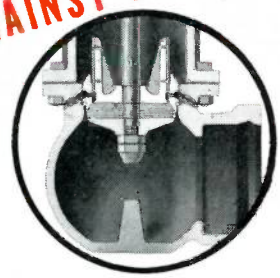
COMPLETE *Protection*

AGAINST CORROSION



AGAINST DAMAGE TO VITAL PARTS

AGAINST FREEZING



When you install a MUELLER Improved Fire Hydrant, you get complete protection against Corrosion, against damage from Traffic Accidents and against Freezing. The Self-Oiling Top keeps all working parts constantly immersed in an oil bath and the All-Weather Cap prevents entrance of water or ice to the Bonnet Section. The easily replaceable Safety-Flange Section accepts the impact and breaks when the hydrant is hit a blow hard enough to cause damage, leaving the top and bottom sections of the hydrant undamaged. The compression type Main Valve with the two large Double Drains always assure a dry barrel when the hydrant is not in use and gives no chance for freezing.

These are just a few of the many outstanding and exclusive features of the MUELLER Improved Fire Hydrant. Ask any Mueller Representative to give you the complete story, or write us direct

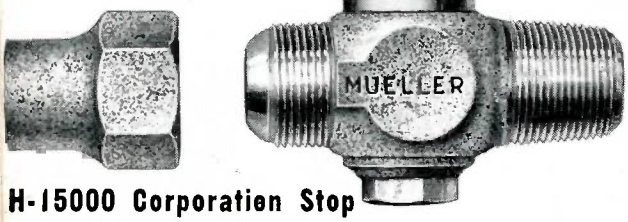
DEPENDABLE SINCE 1857 FULLY WARRANTED OUR 91st YEAR

MUELLER CO.

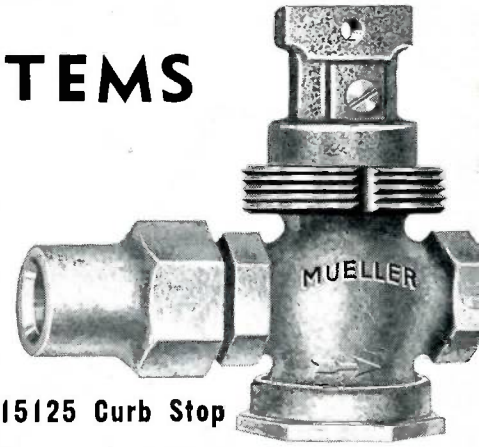
FACTORY: *Chattanooga, Tenn.* MAIN OFFICE AND FACTORY: *Decatur, Ill.*
OTHER FACTORIES: *Los Angeles, Cal.* ★ ★ ★ ★ *Sarnia, Ont. Canada*

WHEN YOU USE
COPPER SERVICE PIPE

YOU'LL NEED THESE ITEMS



H-15000 Corporation Stop



H-15125 Curb Stop

Mueller Corporation and Curb Stops for use with Copper Service Pipe have a Flanged Connection that 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. The Stops are cast from heavy bronze with each key ground and lapped into its body to insure easy turning and a tight seal.

Mueller Extension Service Boxes are designed with upper sections that slide freely up and down in the base so that "frost heave" or any impact to the upper section does not damage the curb stop or the service pipe. There are many sizes and types available. Write for full information.

H-10300 Service Box

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MUELLER CO.

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

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