Portland Oregon Fire Hydrants

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Provided by Portland Water Bureau – Edited for presentation by Don Porth

Introduction

Portland Oregon is the 28th largest city in the United States, with a population of 530,000 people (2003). The City's water utility, the Portland Water Bureau, maintains approximately 2,000 miles of pipe and 13,000 fire hydrants. Portland has an unusually varied fire hydrant population, including designs and manufacturers found nowhere else.

Most of Portland's newer fire hydrants are common varieties that are already well documented. Bearing this in mind, this city specification page focuses on locally manufactured hydrants and how they fit into the history of Portland's water system.

History

The Portland Water Company, a privately owned business, installed Portland's first fire hydrant in 1864. There was no public water utility and the City's water was drawn from nearby creeks or pumped from the Willamette River. Few details concerning fire hydrants from this time period survive, but they were probably paid for by private businesses desiring increased fire protection. By the 1880s, Portland's fire hydrants (all 47 of them) were operated by The Portland Hydraulic Elevator Company under a contract with the City.

The Portland Water Board, predecessor to the modern Water Bureau, was formed in 1885. The Board's plan for a municipal water system called for purchasing all water rights for the Bull Run River to the East. The water would be conveyed to the city by means of a 27-mile long conduit. As part of the plan, a new system of 400 fire hydrants would protect the entire city center.

Portland was a long way from any established fire hydrant manufacturer in 1885, but it was the region's center of industry and the largest port North of San Francisco. There were a number of local foundries and iron works with the skills and equipment needed to manufacture fire hydrants. Although no detailed records concerning these hydrants have been found, some locally manufactured hydrants from the 19th century are still in service today.

The original 1885 plan called for fire hydrants to be installed and maintained by the Water Board's main contractor, P.F. Morey. At some point these duties became the domain of the Portland Fire Department. Concrete information about fire hydrants remains elusive until 1904, when the responsibility for installing new hydrants was given to the Water Board for budgetary reasons. A substantial number of Water Board hydrant records from this period still exist.

Much of Portland's municipal water system is made up of smaller private water companies purchased by the City as it expanded. These companies each had their own standards and specifications for everything from meters to hydrants. During the early 20th century, Portland's water system resembled a patchwork

that defied standardization. Many of the city's hydrants were produced by major hydrant manufacturers in the East like Ludlow Valve, Waterous Engine Works, or R.D. Wood. A substantial number of locally manufactured designs by Phoenix Iron Works, Oregon Foundry, and Willamette Iron Works were already in service as well.

The joint administration of fire hydrants by the Water Bureau and Fire Department did anything but increase standardization. The Fire Department, in charge of maintaining the hydrants, desired standardization and ease of maintenance in its new hydrants. Some Fire Chiefs also favored additional features like independently gated hose connections that added to the cost of the hydrants. The Water Board, which purchased new fire hydrants out of its own budget, was inclined to favor the low bidder whenever practical.

The City's hydrant specifications and purchasing decisions reflected the current state of compromise between the two departments and often changed when their leadership changed. Attempts to satisfy both departments resulted in some unusual compromises like the "Corey" Standard that existed from 1922 through the 1930s.

Hydrant Specifications

Included below are examples of Portland hydrant specifications past and present. These are representative samples for the time period in which hydrants were manufactured in Portland. Specifications for 1907, 1910, 1915 and many later sets of specifications still exist in the City Archives. The following specifications are shared later in this article.

1911 Hydrant Specifications - Hydrants for the boom that followed the activation of Conduit 2 (1911)
1922 Hydrant Specifications - First year of the "Corey" Standard.
1933 Hydrant Specifications - Last year that a local manufacturer won a hydrant bid.
2002 Hydrant Specifications - Modern hydrant specification.

Portland Oregon Fire Hydrant Color Codes, 2002

HYDRANT COLORS				
Type of Hydrant	**Barrel**	**Caps**	**Steamer Cap**	**Dome**
Standard Hydrant	Orange	Black	Red	Orange
Dry Hydrant	White	White	White	White
High Pressure Hydrant	Blue	Blue	Blue	Blue
Private / Non-City	Red	Red	Red	Red
Non-Hydrant (bypass or blow off hydrant)	Black	Black	Black	Black
Low-Flow Hydrant (4 inch main)	Orange	Black	Red	Black

Circa 1890s: Early Single-Valve Frost Jacket Hydrants

The nature of Portland's fire hydrants at the turn of the century is somewhat murky, but it is known that a lot of them had frost jackets. The Water Board inherited an unknown number of Waterous Engine

Works hydrants when it began dealing with hydrants in 1904. Without ever buying another one, there were still more than 270 of them in service at the end of 1912. The only hydrant design Waterous was making at the time was the frost jacket type.

> *A "Frost Jacket" fire hydrant's barrel is cast in iron and surrounded by a separate cylindrical jacket that fits over it. This jacket is bolted or screwed in place and can be unscrewed, allowing the entire hydrant to be lifted out of the ground without digging a new hole. The jacket also insulates the hydrant from frost heave and cold soil, preventing damage in winter.*

It's possible, but unlikely, that these hydrants were inherited from water utilities purchased by the Water Board before 1912. More likely, they were part of the original municipal water system in 1895 or they were added by the Fire Department between 1895 and 1903. There may or may not have been a serious attempt to standardize all of Portland to use frost jacketed hydrants, but once the jackets were installed it was advantageous to continue using them. The Water Bureau was still purchasing hydrants compatible with their old frost jackets until 1913.

Portland has a mild climate and the risk of damage to fire hydrants from frost heave is negligible. For Portland, the primary benefit of frost jackets was easy removal and replacement. Once the frost jacket is installed, the hydrant can be unscrewed and removed with surprisingly little work and no excavation.

This has created some problems in researching Portland's old fire hydrants, since their easy removal and replacement has allowed many of them to migrate. Damaged hydrants were often removed and replaced with entirely different hydrants. Once repaired, the original hydrant would be used as a replacement somewhere else instead of being returned to its original position.

Circa 1886-1894 Long & Scott / Waterous Hydrant

Long & Scott were "manufacturers agents" in Portland at the end of the 19th Century. They acted as distributors, resellers and local representatives for companies that had no offices in Portland. It seems likely that Long & Scott specialized in fire-fighting equipment.

The Long & Scott fire hydrant is essentially a Waterous frost jacket hydrant. The barrel was manufactured in Portland by Long & Scott, while the bonnet and (presumably) the valve mechanism were manufactured by Waterous in Saint Paul. It may have been cheaper in the 1890s to have a local company manufacture the cast iron barrels under license than to ship them roughly 1,500 miles from Saint Paul to Portland.

Rather than being a hybrid constructed from standard Waterous parts, the Long & Scott hydrant seems to have been manufactured with this arrangement in mind. The Waterous bonnet is a different shape than usual, and "ST. PAUL MINN" is cast on the back of the barrel instead of in its usual place on the bonnet.

There are no dates on these hydrants, but we can estimate their date of manufacture with reasonable accuracy. Waterous began manufacturing frost jacket hydrants in 1886 and Long & Scott was replaced by A.G. Long (see below) in 1894.

There are only two known Long & Scott hydrants in service. Another survives at the Water Bureau. The bonnets seem prone to cracking, so this is the only one with its original bonnet, though signs of repairs are visible.

1894-1903 A.G. Long / Waterous Hydrant

In 1894 Long & Scott became A.G. Long. The exact date of the change is currently unknown. The reorganized company is known to have specialized entirely in fire apparatus and supplies. They also continued to manufacture frost jacket hydrants with Waterous parts. This arrangement continued through at least the 1920s.

Except for changes in markings, this hydrant is identical to the earlier Long & Scott variety.

Portland Water Board hydrant records begin in 1904 and show no purchases of A.G. Long hydrants. A.G. Long didn't exist prior to around 1894, so this hydrant was likely manufactured between 1894 and 1903. It's also possible that it may have been manufactured after 1904 and later "inherited" by the City from another utility. However, its similarity to the Long & Scott hydrant suggests strongly that it was manufactured during the 1890s.

This is probably the last A.G. Long hydrant in Portland, though later models are still fairly common in Astoria, Oregon. The bonnet of this hydrant has cracked in a manner very similar to the Long & Scott hydrant above.

1888-1902 Wolff & Zwicker Iron Works Hydrant

Even without Waterous components, many of Portland's oldest hydrants bear a strong resemblance to early Waterous frost jacket hydrants. It seems likely that the city adopted a standard based on existing hydrants to ensure compatibility, though no copies have been found.

Wolff & Zwicker Iron Works manufactured a frost jacket hydrant that could be the Waterous design's twin but for a few details. It has a generic bonnet held on by two bronze bolts, and the barrel is fluted rather than having flat facets. Like Waterous hydrants of similar design, these have no dates on them. Fortunately, Wolff & Zwicker were only in business for about 15 years so that limits the range of possible dates considerably.

A firm of machinists called "Trenkmann & Wolff" existed in Portland until about 1888, then that company disappeared and "Wolff & Zwicker Iron Works" shows up. Wolff & Zwicker were in business until about 1902, when they were replaced by Phoenix Iron Works (below).

Although it is possible that these hydrants were manufactured as late as 1902, the Fire Department had already switched to larger and more complex designs by 1900 or so. These hydrants were likely manufactured in the early 1890s.

Wolff & Zwicker hydrants appear very infrequently in city records. They are typically lumped together with the identical but more numerous Willamet's (below). There are just a handful of Wolff & Zwicker hydrants in service today. Most are on older side streets or slopes, possibly because their lack of a steamer port was not viewed as a serious disadvantage on a main with good pressure and flow rate.

1889-1900 "Willamet Iron Works" Hydrant

Except for the manufacturer's name cast on the barrel, the Willamet hydrant is identical to the Wolff & Zwicker Iron Works hydrant. Whether this similarity is because of a city specification or some connection between the two companies is currently unknown.

Willamet Iron Works is better known as Willamette Iron and Steel, manufacturer of everything from war ships to forklifts to steam locomotives. When the company was formed in 1865 it was called "Willamette Iron Works". For some reason the spelling was changed to "Willamet Iron Works" in about 1889. Then the name was changed again, to "Willamette Iron and Steel Works" in 1900 or 1901. These hydrants all have the "Willamet" spelling cast on the barrel.

Despite the earlier spelling of the company name on the barrel, city records usually refer to these hydrants as "Willamettes." There are probably one or two dozen Willamettes in service today. They are usually found in the same places as Wolff & Zwicker hydrants and both types are often found within a few blocks of each other.

Unidentified 4-Port Hydrant

Most of Portland's locally manufactured hydrants are undated but do have clear manufacturer's marks. Unfortunately, this design has neither. Except for having "Portland ORE" cast on the back of the barrel, it is unmarked.

There are just two hydrant designs in Portland with three hose ports, and neither of them are especially numerous. The four-port specification may have been very short-lived or only used in certain places. All known examples of this hydrant design are located along the same street. That water main was laid in 1902.

This design shares the cosmetic details of the Willamette/Wolff & Zwicker hydrants, so it's possible that one of those companies manufactured it. It also shares the same conical bonnet used by both those designs. (The bonnet appears smaller because of this hydrant's larger barrel diameter.) Phoenix Iron Works, which manufactured Portland's only other four-port hydrant, was formed in about 1902. That may have been early enough to make Phoenix the manufacturer of this design as well.

Only four of these hydrants have been found, and they are probably the last ones in town.

1900-1904 Multiple Valve Frost Jacket Hydrants

Right around the turn of the century, the Fire Department began to favor larger and more complex hydrant designs. Equipped with steamer ports and independent hose port valves, these new hydrants were superior to the old ones but likely much more expensive. Exactly why this change occurred is currently unknown, but it may have been the result of a change in leadership at the Fire Department. What we do know is that the Fire Department's financial situation deteriorated rapidly at the turn of the last century. Within a few years the Fire Department was $20,000 in the red and could no longer afford to purchase hydrants. With some reluctance, the Water Board took over the responsibility for purchasing new hydrants in 1904.

The Water Board continued to follow the Fire Department's purchasing practices for several years, but gradually changed back to smaller, cheaper hydrants. Frost jackets do not seem to have been a priority, but independent hose port valves were in the specifications until they were dropped in 1912.

Sometime between 1912 and 1922, it was decided that independently gated hose ports were not just unnecessary, but undesirable. Hydrants with independent port valves had the valves removed and the stems cut off. The ports in the bonnets that allow access to the valve stems were plugged. Independent valves were back in favor in 1922 and the Fire Department requested not only to have independent valves included in the city's new hydrant specifications, but also to have the previously removed valves put back into Portland's old hydrants. It does not appear that this was ever done, since most of these old independently gated hydrants seem to have been missing their valves for a long time.

"Portland" Hydrants (3 Types)

The next three hydrants are still difficult to classify. They appear in some city records as "Portland" hydrants. All three are very similar or identical, despite being manufactured by three different companies. All three hydrants were probably made under the same city specification at around the same time. They are old enough, and scattered enough, to defy attempts to date them based on the age of water mains, installation or maintenance records.

The oldest maintenance records found so-far show that many of these hydrants have been in their current locations since before 1915. The estimated dates of manufacture for these hydrants are based on what we know about the manufacturers of individual types.

Smith & Watson Iron Works "Portland" Hydrant

Smith & Watson Iron Works was in business from 1896 until the 1920s. It looks like Smith & Watson were just getting out of the hydrant business at about the time the Water Board started purchasing them. The company did submit bids for hydrants in 1904 and 1905, but the Water Board did not purchase them. There are no further records showing that Smith & Watson ever bid on another hydrant contract.

The almost total lack of any mention of Smith & Watson hydrants in the City's old installation and maintenance records also points to this design being installed prior to 1904. What records do exist show individual hydrants being replaced or repaired.

These hydrants are widely scattered and do not appear in large concentrations. There are only a couple dozen left, mostly on the East side.

Oregon Foundry "Portland" Hydrant

The most common variety of "Portland" hydrant is the Oregon Foundry type. In addition to the company logo on the right side of the barrel, it also has "P. F. D." in large cursive script on the left side. Aside from markings, these hydrants are identical to the Smith & Watson hydrant.

Oregon Foundry was in business from about 1900 until at least 1910. The Oregon Foundry version of the "Portland" hydrant was probably manufactured before 1902, since the Howes patent hydrant (below) came along in 1902. Records showing Oregon Foundry hydrant bids do exist for 1904 and later. The Howes hydrant was the only design that Oregon Foundry offered from at least 1904 on.

Slightly more common than the Smith & Watson version, and found in all parts of the city, there are still a few dozen Oregon Foundry "Portlands" in service.

Phoenix Iron Works "Portland" Hydrant

The Phoenix version of this hydrant sports a third hose port, indicating that it may have been built somewhat earlier or later than the Oregon Foundry or Smith & Watson versions. Since adding a third hose port, especially one with an independent valve, would add to the cost of the hydrant, it's likely that the specifications at that time demanded it.

Portland's only other four-port hydrants have been tentatively dated 1902. That's right about the time Phoenix Iron Works opened its doors, and about the same time that the other "Portland" hydrants are thought to have been made.

Broadway downtown has the only large concentration of these hydrants. The rest, maybe a dozen in total, are widely scattered around the city.

1902-1910 Oregon Foundry Howes Patent Hydrant

Claude L. Howes developed a new style of port valve for fire hydrants. He was granted U.S. Patent number 733,483 on July 14, 1903. Howes' design called for large, elliptical valve chambers running vertically through the hydrant body. These spacious chambers would allow easy access to the valves for maintenance and allow water to flow unimpeded through the valves when opened. It is these later internal valve chambers that give the Oregon Foundry Howes hydrant its distinctive shape.

Oregon Foundry was in business in Portland during the early 20th century, though the exact dates are currently unknown. The company does appear in local business directories as early as 1901 but disappears sometime between 1910 and 1915.

There are four major types in service and one type that was presumably in service and removed. Although only one barrel style has a date cast on it, other clues allow reasonable assumptions to be made about their date of manufacture.

1. **1902 -** With "PAT APPLIED FOR" cast on the barrel front, this version would have been manufactured between February 1902 (when the patent was applied for) and July 1903 (when it was granted). This variety has short valve chambers that extend just a little below the top of the pumper port. Also note the large, rounded barrel top. Only a handful of these hydrants are still in service.
2. **1902-1903 -** Another variant manufactured before the patent was granted, this version was probably manufactured in late 1902 or early 1903. The entire barrel has become more angular, and the valve chambers are larger and longer, reaching the middle of the pumper port. The bonnet looks very similar to that of the "Type A" but is slightly larger. This is the most common variety of Howes hydrant in Portland, with perhaps two dozen surviving examples.
3. **1903-1910 -** This version has the patent date cast on the back of the barrel, so it was manufactured sometime after July 1903. The Portland Water Board's first hydrant purchase was 100 Howes hydrants in August 1904. Those hydrants were likely of this variety. The bonnet is larger and more angular than previous types and rests on a ledge around the top of the barrel. The barrel itself is noticeably different in appearance, and the chain lugs are now at the bottom of the valve chambers. This is the second most common type, with a dozen or more examples still in service.
4. **(Not Shown) -** Some examples of the "Type C" have no markings on the barrel at all. This is the least common version of Howes hydrant still in service. Only two of this type are known to exist, though some may have been mistaken for "Type C" hydrants since they are identical from the front. Just 25 Howes hydrants were purchased in 1910, so these unmarked hydrants may have been from that batch.
5. **Unknown -** This design is not in service anywhere in the city. The only known example is on display in the Portland Water Bureau offices. It appears to be a very late design based on the Howes patent. The valve cylinders and chain lugs suggest that this design is newer than other types. It also has a two-piece barrel, a feature that was not common in Portland until the 1940s. This may have been a special purpose design not intended for normal street use.


1


2


3


4

Howes hydrants can be found anywhere frost jackets were installed. The largest concentration is downtown, where examples of all four in-service types (1-4) can still be found.

Possible Phoenix Iron Works Hydrant (?)

Another ambiguous hydrant design. Except for "The Phoenix" cast in large characters on the bonnet, this design has no identifying markings. It is assumed that this design was manufactured in Portland because it has not been documented anywhere else. The logo on the bonnet suggests that it was manufactured by Phoenix Iron Works, though Phoenix does place a clear company name and location on two other hydrant designs.

These hydrants are old, almost certainly older than 1915 (which is the time of the oldest maintenance records on many of them). They are almost always referred to in Water Bureau records as "Phoenix" type hydrants, which is the same designation normally used for known Phoenix designs from 1902 and 1912. There are no significant installations of Phoenix hydrants after 1912, and no unknown types that could account for these hydrants being installed after 1912. Records of contracts awarded show that Phoenix Iron Works made 200 hydrants of a type called "Fire Dept." in 1905. This may be that design. The independently gated hose ports on this design indicate that they were probably manufactured before 1912 in any case.

There are probably 40 or 50 of these hydrants around Portland. They tend to show up in areas where Coreys are common rather than the older frost jacket sections of the water system.

1912-1913: Late Single-Valve Frost Jacket Hydrants

The second conduit from Bull Run was completed in 1911, greatly increasing the city's water supply and sparking a boom in the installation of water mains and fire hydrants. The need for more than a thousand fire hydrants in the next few years seems to have caused a revision in the City's specifications. The requirement for independent hose port valves was dropped, allowing the City to return to smaller and less expensive hydrant designs. The specifications from this period do not require frost jackets, but this design feature did enjoy a revival at this time.

1912 Phoenix Iron Works Hydrant

Despite being modernized to include angled hose ports and a steamer port, the 1912 Phoenix looks remarkably similar to the old Willamettes. This would be the last of Portland's really decorative hydrants.

The resemblance to earlier hydrants is understandable based on what is known about the formation of Phoenix Iron Works. In 1902, Wolff & Zwicker Iron Works disappears from local business directories and a new company called Phoenix Iron Works appears. Listed among Phoenix' management is one "Fritz Wolff – Superintendent and Manager," undoubtedly the same Fritz Wolff who had been President of Wolff & Zwicker Iron Works.

Phoenix Iron Works created at least two, possibly as many as four, hydrant designs for the city of Portland. There are no dates on any of them, but Water Bureau records from 1913 comment on the similarity between the Helser & Unden hydrant (below) and hydrants previously purchased from Phoenix Iron Works. Since this design and the 1913 Helser & Unden are nearly identical in all ways save decoration, this should be the 1912 Phoenix.

The Portland Water Board purchased four hundred of these hydrants, and many of them are still in service today. They can be found all over the city, though seldom in large groups.

Possible John Wood Iron Works Hydrant (?)

The most ambiguous of Portland's fire hydrants, this design is completely unmarked. No manufacturer, no date, no city, no valve size, not even an arrow to show which way the valve opens. It is similar in design to other Portland frost jacket hydrants, and uses the same conical bonnet found on the Willamette/Wolf & Zwicker designs.

The conical bonnet suggests that this hydrant was manufactured around the turn of the century. The presence of a steamer port indicates that it is newer than the Willamette/Wolff & Zwicker designs. It may be from the previous period of frost jacket hydrants, but its similarity to other designs in this section, the large numbers remaining in service, and evidence of missing "Wood" hydrants, all indicate that the design belongs here.

The manufacturer is currently unknown, but circumstantial evidence suggests that these hydrants were purchased from the John Wood Iron Works Company at the end of 1912. Little is known about the company except that they were in business in Portland during the early 20th century.

The John Wood Iron Works Company does show up on bid proposals from 1910 until 1914. In October 1912 the company submitted the lowest bid and was recommended by the Water Board as the hydrant to purchase. Shortly thereafter, installation records show large numbers of "Woods" hydrants being installed. Since the R.D. Wood Company did not submit a bid for hydrants that year, these "Woods" hydrants were probably the recommended John Wood Iron Works hydrants. (This scenario contradicts the Water Board's 1913 hydrant audit, which shows the contract being awarded to Oregon Foundry. The audit's list of contracts awarded appears to be inaccurate, since most related documents show that Oregon Foundry did not submit a bid for this contract).

These hydrants are still reasonably common. They are scattered all over the city, with higher concentrations in North and Northwest Portland. There is a fairly dense group of them on N Wabash Street. City records show that the water main on N Wabash Avenue was installed in 1913 and most of the hydrants are identified as a type called "Wood".

1913 Helser & Unden Machine Works Hydrant

The 1913 Helser & Unden hydrant is essentially a less decorative version of the 1912 Phoenix Iron Works hydrant (above). Following the pattern of earlier designs, this hydrant shares a common bonnet with the 1912 Phoenix. These bonnets are technically interchangeable with the conical type, but larger in diameter.

Helser & Unden were in business as machinists for years before they started manufacturing fire hydrants. Their first attempt at a hydrant contract from the city (bids opened January 1913) was successful, and Helser & Unden hydrants were installed starting in March or April. Little else is known about the company during this period. By the 1920s the company had been renamed Helser Machine Works.

Portland made just one purchase of 350 hydrants from Helser & Unden in 1913. Thus, all Helser & Unden hydrants were manufactured in 1913. Many of these are still in service today. Like the similar Phoenix design above, these hydrants can be found scattered across the city anywhere frost jackets were installed.

1922-1930s: The "Corey" Standard

Based on Water Board records, there were probably a number of Rensselaer Valve Company List 90 hydrants in Portland prior to 1910. They would have been inherited from other water utilities since the City had not purchased any at that time. Rensselaer List 90s are always referred to as "Corey" hydrants in City records, so that term has been used throughout the city specification page.

The Water Board began purchasing Coreys in 1910, shortly before Conduit 2 became operational. During the hydrant boom of 1911-1913, more than 1,000 more Coreys were purchased. By the end of 1912 they were the most common hydrants in the city with more than 1,600 in service.

The specifications in 1910 called for independently gated hose ports but that requirement was soon dropped. Nearly all of Portland's Coreys are the 5-bolt internally gated variety, though some appear to have been intentionally manufactured with the valves missing. (They have no hose port valves, but the valve stems are simply not present instead of being hacksawed off.) These "multiple valve" hydrants with no port valves would have been manufactured between 1911 and 1922, probably to make them as compatible as possible with existing 1910 Coreys.

Many cities have a unique hydrant specification that any company can manufacture for the city. This allows the whole city to have one consistent standard for hydrants without giving any one company a monopoly on hydrant contracts. In 1922 the Water Bureau and Fire Department resolved to stop the proliferation of different hydrant types and create a standard hydrant for the City.

The City already had a standard hydrant of sorts in the Corey, which was well liked by the Fire Department and already the most numerous hydrants in the city. With the assistance of the Corey's manufacturer, Rensselaer Valve Company, an unusual arrangement was reached. The city would use plans provided by Rensselaer to draw up a set of specifications that would be virtually identical to the

Corey. After an okay from patent attorneys, the new standard was put into effect and local companies began manufacturing their own duplicates of the Corey.

1924-29 Helser Machine (& Marine) Works Gated "Corey"

This is by far the most common of the locally manufactured clones. Helser Machine Works' 5-bolt independently gated Corey is indistinguishable from the Rensselaer version at a distance. Because the parts of all these hydrants are interchangeable, there are a number of hydrants in service with a combination of Rensselaer, Helser and/or Western parts.

Rensselaer hydrants of the same type may have either large or small openings in the bonnet for the port valve stems. All Helser bonnets have large openings or (after the valves were discontinued again) no openings at all.

During the 1920s, Helser Machine Works briefly changed its name to "Helser Machine & Marine Works" and that name appears on some of their hydrants. There are still hundreds of these hydrants all over the city.

1927 Western Foundry Gated "Corey"

The Western Foundry independently gated Corey is, naturally, identical to both the Rensselaer and Helser versions. Almost nothing is known about Western Foundry itself.

Gated Western Coreys are uncommon, but they blend in with the rest of the population, making an accurate estimate of their numbers difficult.

1931 Western Foundry "Corey"

By the 1930s, independent hose ports valves were out, but the Corey specification continued.

The bonnet used on the ungated clones is slightly different in shape than the bonnets on the original Rensselaer hydrants, having steeper sides and a flatter top. This may have been done to ensure that the bonnets would be fully interchangeable with the gated hydrants. This design allowed enough clearance for the portion of the port valve that extends into the bonnet.

There are at least 40 or 50 ungated Westerns left in service, including some large patches in the Eastern suburbs.

1933 Helser Machine Works "Corey"

The 1933 Helser Coreys are the last known fire hydrants made in Portland. Rensselaer Coreys continued to be the mainstay of Water Bureau hydrant purchases into the 1950s.

The black bonnet on this hydrant indicates that it's on a main with lower than usual pressure or flow rate.

Due to a leaking problem with the valve mechanism, many of the 1933 Helser Coreys have been removed and replaced. Some of those that remain have been refitted with different valve mechanisms from older hydrants. The handful of unmodified examples that remain are in remote parts of the city and/or water system.

Portland Oregon Fire Hydrant Specifications, 1911

Source: City of Portland, Stanley Parr Archives and Records Center, *Water Bureau, Bound Correspondence, A2001-020, 16/15* "Volume 19 - pages 500-599", 1911
(Excerpt from a set of instructions to bidders for a City hydrant contract.)

These hydrants must be of some standard make, with one four (4") inch steamer butt, and two two-and-one-half (2-1/2") inch hose butts, having independent valves. The dimensions and details of the hydrants shall be as follows:

- Depth below sidewalk to bottom of connecting pipe, four (4 ft.) feet.
- Diameter of valve opening, five (5") inches.
- Size of pipe connection to main, six (6") inches.
- Number and size of butts: Two (2) two and one-half (2-1/2") inch and one (1) four (4") inch.
- Size of nut: According to template.
- Number of threads per inch on butts: As per sample furnished by Engineer.
- Diameter at top of threads, hose butts: As per sample furnished by Engineer.
- Diameter at top of threads, steamer butt: As per sample furnished by Engineer.

Detailed plans, showing all materials, dimensions and parts of the hydrants to be furnished with each proposal.

Hydrants must be so designed that with ordinary usage they will not cause water hammer; also change of the water passages through the hydrant must have easy curves, and all outlets must have rounded corners of good radius.

Hydrants shall be iron body, with bronze mountings and shall open by turning to the left. Each hydrant shall bear the name or trademark of the manufacturer and shall have an arrow with the word "Open" on the casting, indicating the direction of the opening. Working parts shall be so arranged that they may be removed without digging around or disturbing the bottom of the hydrant. Each hydrant shall have hub end of the size and shape as specified for six-inch cast iron pipe by the New England Waterworks Association specifications.

The portion of the hydrant barrel which goes below the sidewalk, after being cleaned, shall be painted with three coats of paraffine varnish, applied hot, or other equally efficient coating shall be applied. The top, or that portion above the ground, will have two coats of best white enamel paint. All the iron castings shall be made from a superior quality of iron, tough and of even grain, and shall possess a tensile strength of not less than eighteen thousand pounds per square inch. Test bars, each 25 inches long, 2 inches wide and 1 inch thick, shall be made from each heat or run of metal. The bars when placed flatways upon supports 24 inches apart and loaded in the center, shall support a load of 2,000 pounds and show a deflection of not less than .30 of an inch. The test bars shall be poured from the ladle before or after the casting has been poured and shall present a true specimen of the iron used in making the casting.

All composition metal used, except the valve stems, shall be non-rusting and shall have a tensile strength of not less than 30,000 pounds per square inch.

Valves to be made of rubber where they come in contact with the seat.

Valve stems to be made of bronze.

The working portions of the valve spindles to be made of Tobin bronze, or an equally strong and non-rusting material.

Drip, or bleeder valve, to be so constructed that it shall be closed and watertight when the main valve is open, and it shall be open when the main valve is closed.

All of the inside working parts, including the independent valve spindles must be constructed in such manner and with such materials that a force of 300 lbs. applied at the end of a 13-inch wrench, when the hydrant is either fully open or fully closed, will not damage said parts.

All parts of the hydrants to be fully interchangeable.

All operating nuts to be pentagonal and of such dimensions as to fit the template furnished by the Engineer. These operating nuts to be connected to the stems in such a manner that they cannot be removed without first removing the cap or hood of the hydrant.

The friction losses in the hydrants when flowing through two 2-1/2 inch butts at a rate of 800 gallons per minute shall not exceed 3.5 pounds.

Hydrants to withstand, without leaks, a hydraulic pressure of 300 pounds per square inch.

Portland Oregon Fire Hydrant Specifications, 1922

Source: City of Portland, Stanley Parr Archives and Records Center, *Water Bureau, Subject Files, A2001-021, 15/1* "Hydrants", 1919-1923

1. No experimental or untried type of fire hydrant will be accepted. The contractor, therefore, must be able to prove that the type of fire hydrant proposed by him has been in actual use for at least five (5) years in a water works system and has proven satisfactory.

2. **SIZE**
    a. The size of hydrants shall be designated by the nominal diameter of the valve opening which must be at least 4 inch for hydrants having two (2) 2½ inch hose connections, and 6 inch for hydrants having three (3) 2½ inch hose connections, and 6 inch for hydrants having four (4) 2½ inch hose connections. Any hydrant having valve openings of shapes other that circular, the designation of size, must be the diameter of the circle equal in area to that of the valve opening, which area shall not be less than for the following sizes; 4 inch - 12.566 square inches; 5" - 19.635 square inches; 6" - 28.274 square inches. These areas must be maintained as a clear water way through the gate openings, in excess of the gate, rod and other appurtenances in the bottom of the hydrant.
    b. The net area of the water way at the smallest part when the hydrant is wide open must not be less than that of the valve opening and there must be sufficient clear water way through the hydrant when wide open to allow the passage of a solid ball at least 2 inches in diameter for a hydrant with a 4 inch valve opening and 2-3/8 inch in diameter for a hydrant with 5 inch or 6inch valve openings.
    c. The inside diameter of the standpipe of hydrants shall not be less than 5-7/8 inch, 6-7/8 inch and 8 inch respectively for hydrants having 4 inch, 5 inch, and 6 inch valve openings.
    d. The hydrants must be fitted with bell ends to fit standard pipe, or if flanged they must be fitted with flanges of standard dimensions, having standard layout for drilling, for pipes to be used under 80 pounds pressure. Four inch valve opening hydrants shall be made suitable to connect to either 4 inch or 6 inch pipe as may be ordered and the 5 inch inch and 6 inch valve opening hydrants shall be made suitable to connect to either 6 inch or 8 inch pipe as may be ordered.
3. **GENERAL DESIGN**
    a. Any changes in diameter of the water passage throughout the hydrant must have easy curves, and all outlets must have rounded corners of good radius.
    b. Hydrants must be so designed that with ordinary usage they will not cause water hammer.
    c. Valves when shut must remain tight when the upper portion of barrel is broken off.
    d. Hydrants are to be of the compression type.
4. **MATERIALS**
    a. The metal for all iron castings must be of good quality, strong, tough and even grain, and soft enough to satisfactorily admit of drilling and machining. The metal must be made without an admixture of cinder iron or other inferior metal, and must be remelted in a cupola or air furnace. The castings must be smooth, clean and perfect without blow or stand holes or defects of any kind. No plugging or filling will be allowed. Specimen bars of the metal used, each being 26 inches long by 2 inches wide and 1-inch thick must be made without charge as often as the Inspection Department may direct, and in default of definite instructions the manufacturer must make and test at least one bar from each heat or run of metal. The bars when placed flatwise upon supports 24 inches apart, and loaded in the center, must support a load of 2,200 pounds, and show a deflection of not less than .35 of an inch before breaking; or if preferred, tensile bars may be made which must show a breaking point of not less than 22,000 pounds per square inch, bars to be cast as nearly as possible to the dimensions without finishing, but corrections may be made by the Inspection Department for variations in width and thickness, and the corrected result must conform to the two requirements.
    b. All wrought iron used must be of the best quality of double refined iron, of a tensile strength of at least 50,000 pounds per square inch.
    c. All composition metal used must be of the best quality, to have a tensile strength of not less than 28,000 pounds per square inch, with 18% elongation in a test bar of 2 inches

and 5% reduction of area at breaking point. Composition for the main operating stem as well as the inside hose valve stems must have a tensile strength of not less than 55,000 pounds per square inch and an elastic limit of not less than 25,000 lbs. per square inch.

5. **HOSE NIPPLES AND VALVES**
    a. Hose nipples must be of bronze threaded with a fine thread into the hydrants.
    b. Hose threads on all hydrants to be installed in any given community must of necessity be interchangeable with those already in service, but where practicable threads should conform to the 1911 National Standard adopted by the National Fire Protection Association.
    c. Where independent hose gates are required, the inside type must be used and must have composition metal working parts and be of rugged design and must not introduce an unnecessary friction loss. There must be ample clearance between the gates and the hydrant body when the gate is in any position. The gate and parts are to be interchangeable, and the valve shall be located so as to be accessible as possible for repairs. The gate must be so designed that it cannot become detached from the stem or stem nut while in use. The top of the stem must be below the level of the hydrant stem nut so that the hydrant can be freely operated. Hose nipples must be of bronze threaded with a fine thread into the hydrant and it must extend through the hydrant standpipe so as to form the seat for the independent gate.
    d. The stems of the hose valves must be not less than ¾ of an inch in diameter for the 2½ inch valves, and not less than 7/8 of an inch in diameter for the valves at the steamer connections.
6. **HYDRANT SEAT AND GATE**
    a. The seat must be made of bronze or a suitable non-corrosive composition, securely fastened in place.
    b. The valve must be faced with a yielding material, such as rubber or leather. The valve must be designed so that it can be easily removed for repairs without digging up the hydrant.
7. **DRIP VALVE**
    a. A positively operating non-corrodible drip valve must be provided and arranged so as to completely drain the hydrant when the main valve is shut.
    b. The seat of the drip valve must be made of a non-corrodible material and must be securely fastened in the hydrant. All other parts of the drip mechanism must be designed to be easily removed without digging up the hydrant.
8. **OPERATING PARTS**
    a. The operating threads of the hydrant must be so arranged as to do away with the working of any iron or steel parts against iron or steel. Either the operating screw or the operating nut must be made of non-corrodible material consisting of either Tobin or Phosphorous Bronze and both must be of rugged design and sufficiently strong to perform the work for which they are intended.
    b. The stem must terminate at the top in a nut of pentagonal shape finished with a slight taper to 1½ inches from point to flat, except for hydrants to be installed where existing hydrants have different shape or size of nut, in which case the additional hydrant must have the same operating nut as the old ones for uniformity. The nut socket in the wrench must be made so as to be reversible.
9. **STUFFING BOX AND GLAND**
    a. The stuffing box and gland must be of bronze. When a packing nut is used, it must be made of bronze. The bottom of the box and end of the gland or packing nut must be slightly beveled.

b. Gland bolts or studs must be at least ½ of an inch in diameter.
c. Gland bolts or studs must be of bronze with bronze nuts.

10. HYDRANT TOP

a. The hydrant top must be designed so as to make the hydrant as weatherproof as possible and thus overcome the danger of freezing the stem. Provision must be made for oiling, both for lubrication and to prevent corrosion. A reasonably tight fit should be made around stems.
b. There must be cast on top of the hydrant in characters raised 1/8 of an inch, an arrow at least 2½ inches long and the word "Open" in letters ½ of an inch high and 1/8 of an inch in relief.

11. HOSE CAPS

a. Hose caps must be provided for all hose outlets and must be securely chained to the barrel with a chain not less than 1/8 of an inch in diameter.
b. The hose cap nut must be of the same size and shape as the stem nut.

12. MARKINGS

a. The hydrant must be marked with the name or trademark of the manufacturer. Such letters and figures to be cast on the hydrants above the ground line.

13. TESTING

a. Hydrants after being assembled must be tested to at least 300 pounds per square inch before leaving the factory. If the working pressure is over 150 pounds per square inch the hydrants must be tested to twice the working pressure. The test must be made with the valve open in order to test the whole barrel for porosity and strength of hydrant body. A second test must be made with the valve shut, in order to test the strength and tightness of the valve.
b. Hydrants must be fully opened and closed before shipping in order to test the freedom and strength of the parts. This test must be made under as severe conditions as are liable to occur in actual service when using a hydrant wrench at least 17 inches long.

14. DIRECTIONS TO OPEN

a. Hydrants must open to the left (counterclockwise) except those to be installed where existing hydrants open to the right, in which case the additional hydrants must turn the same as the old ones for the sake of uniformity.

Portland Oregon Fire Hydrant Specifications, 1933

Source: City of Portland, Stanley Parr Archives and Records Center, *Auditor, Council Documents, Series 2001-09, 2/18* "Proposals 857-1219", 1933

The work to be done under these specifications consists in manufacturing and delivering to The City of Portland, Oregon, six-inch (6") post Fire Hydrants in accordance with the following specifications.

The hydrants are to be similar in design and equal to the "Corey" hydrant as manufactured by the Rensselaer Valve Co., Troy, N.Y., with one four inch (4") steamer butt, and two, two and one-half inch (2-1/2") hose butts. Diameter of valve opening shall be five inches (5") and hydrant shall have bell connection to main for six-inch (6") cast iron pipe.

- **Plans -** The bidder shall submit with his proposal detailed plans of the hydrant he proposes to furnish.
- **Thread Dimensions -** Threads for hose and steamer butts shall conform to template, or be of the following "National Standard" dimensions:

Inside diameter of hose coupling	2.5"
Outside diameter of finished thread	3-1/16"
Diameter root of thread	2.8716
Total length of male thread	1"
Clearance between male and female threads	0.030"
Number of threads per inch	7-1/2
Pattern of thread	60° V
Cut off at top of thread	0.01"
Left in bottom of thread	0.01"

Steamer Thread Details.

Inside diameter of hose coupling	4"
Blank end of male part	0.250"
Outside diameter of finished thread	4.890"
Diameter root of thread	4.609"
Clearance between male and female thread	0.050"
Total length of thread, male end	1.375"
Number of threads per inch	6
Pattern of thread	60° V
Cut off at top of thread	0.01"
Left in bottom of valley	0.01"
Female end to be cut 0.125" shorter than male end for clearance	

- **Materials -** The metals for all cast iron parts of the hydrants shall be of good quality, strong, tough and of even grain and soft enough to admit of satisfactory drilling and machining. The castings must be smooth, clean and perfect without blow holes or defects of any kind. No plugging or refilling will be allowed. Specimen bars of each heat of metal used, each bar being 26 inches long by two inches wide and one inch thick, shall be made without charge. Such bars when placed flatwise upon supports 24 inches apart and loaded in the center must support a load of 2,200 pounds and show a deflection of not less than .35 inch before breaking; or if preferred, tensile bars may be made which must show a breaking point of not less than 22,000 pounds per square inch.

  All composition metal used must be of the best quality, to have a tensile strength of not less than 32,000 pounds per square inch, with 18% elongation in a test bar of 2 inches and 5% reduction of area at the breaking point. Composition for the main operating spindle must be hot rolled Tobin bronze, having a tensile strength of not less than 55,000 pounds per square inch and an elastic limit of not less than 25,000 pounds per square inch, or of cast bronze of equal strength and of a composition to be approved by the Engineer.

All wrought iron must be of the best quality, double refined iron of a tensile strength of at least 50,000 pounds per square inch. All other materials must be of the best quality.

- **Direction of Operation -** All hydrants shall open by turning to the left, or counterclockwise, and there must be cast on the top of the hydrant an arrow at least 2-1/2 inch long and raised 1/8 inch and the word "OPEN" in letters ½ inch high and 1/8 inch in relief indicating the direction of turning to open the hydrant. Each hydrant shall bear the name or trademark of the manufacturer.
- **Hydrant Bottom -** Hydrant bottom shall be of cast iron with finished flange for connection with standpipe by suitable bolts.
- **Spindle -** Spindle shall be hot rolled Tobin bronze, threaded right and left, with threads for drip valve operation on the bottom.
- **Operating Arms** - Operating arms shall be drop forged steel with bronze bushings, connected to hydrant valve with Tobin bronze, gate pins having bronze cotter pins.
- **Valve Seat Ring -** The valve seat ring shall be of bronze and shall be leaded to valve seat.
- **Main Hydrant Gate -** Main hydrant gate shall be cast iron with rubber valve, and cast iron valve washer held by a suitable bronze stud with bronze nut.
- **Drip Barrel -** Drip barrel shall be of bronze and shall be leaded to hydrant bottom.
- **Drip Valve -** Drip valve shall consist of a bronze drip valve holder, with rubber cup-shaped drip valve held by a bronze washer with suitable bronze tap bolt.
- **Top and Bottom Stem Nuts -** Top and bottom stem nuts shall be of bronze.
- **Couplings -** Couplings between stem and spindle shall be of bronze, riveted with suitable bronze pins.
- **Hydrant Standpipes -** Hydrant standpipes shall be of cast iron, flanged and finished at bottom for connection with hydrant bottom by suitable bolts, and with acceptable gasket.
- **Operating Rod -** Operating rod shall be of first quality steel, riveted at the bottom to the coupling and connected at the top to a sleeve collar of cast iron with four suitable screws.
- **Operating Sleeve -** Operating sleeve shall be of cast iron and shall be provided with an operating nut of pentagonal shape, finished with a slight taper and 0.8 inch on each side at the bottom.
- **Main Stuffing Box -** Main stem stuffing box shall be of bronze, provided with a bronze follower.
- **Head -** A cast iron head shall be attached to the hydrant standpipe with suitable bolts.
- **Dome -** The hydrant dome shall be of cast iron and shall be attached to head with suitable bolts.
- **Caps -** Hose caps must be provided for all outlets, and must be securely chained to the barrel with swivel ring and chain not less than 1/8" in diameter.
- **Hose Nipples -** Hose nipples must be of bronze, threaded into the hydrant and pinned in place.
- **Tests -** Hydrants shall withstand, without leaks, a hydraulic pressure of 300 pounds per square inch.

Portland Oregon Fire Hydrant Specifications, 2002

Source: Portland Water Bureau

506 FIRE HYDRANTS

506.2 DRY BARREL FIRE HYDRANTS

2.1.A GENERAL

1. Fire hydrants shall be new and unused, 150 psi (1034 kPa) working pressure, 300 psi (2064 kPa) test pressure, and shall conform to AWWA C502 "Standard for Dry Barrel Fire Hydrants," except where these specifications take exception. Certificate of compliance to AWWA C502-85 is required.
2. Internal parts to be removed without removing port section.
3. No part of hydrant shall be attached by lead or be made of lead in concentration above 20%.

2.1.B NOZZLES

1. Hose and Pumper Outlet Ports - Two 2-1/2-inch (64 mm) hose outlet ports and one 4-1/2-inch (115 mm) pumper outlet port. Hydrant caps will have inside gaskets.
2. Ports shall be lug or screw type and shall be brass. Leaded ports will not be accepted.
3. Outlet Port Threads - Conform with NFPA No. 194 for National Standard Fire Hose Coupling Screw Threads.

2.1.C OPERATING VALVE

1. Size of Hydrant - Minimum 5-inch diameter main operating valve opening.
2. Furnish two or more bronze bushed drain valves.
3. Drain valve shall close within six turns, at start of opening hydrant.
4. Direction of Operation - Open by turning to the left or counterclockwise direction.
5. Main valve seat ring and seat ring bushings shall be bronze. Removal of main valve assembly including seat ring shall be by a tool that engages the stem either at the breakaway stem coupling or the upper stem section.

2.1.D CONNECTION

1. Inlet Connection - 6-inch mechanical joint, accessories NOT required.

2.1.E STANDPIPE

1. Cast as one piece, screwed flanges, or mechanical joint retaining ring, flanged extensions may be used for different bury lengths. Flanges shall be cast integral on extension barrel, or screwed flanges.
2. Standpipe Extension Kits - Shall be 6 inch, 12 inch, or 18 inch of breakaway design.

2.1.F TOP CASTING

1. Cast on top of hydrant an arrow and the word "OPEN" in relief indicating the direction of turning to open the hydrant.

2.1.G PAINT

1. Barrel painted orange to the bury line, OSHA Standard Safety Color OA-36 or equal.
2. Port caps painted black, Federal Color Standard 595, #17038 or equal.
3. Pumper caps painted red, OSHA Standard Safety Color OA-41 or equal.
4. Dome or top painted Orange, OSHA Standard Safety Color OA-36 or equal
5. All paints shall be lead free.

2.1.H BREAKAWAY SECTION

1. Furnish traffic model hydrants with breakaway bolts, flanges or lugs. Design shall also include a breakaway stem coupling. Aluminum couplings are not acceptable. Fire hydrant head section shall have either 4, 6, or 8 bolts at the connection of the standpipe.

2.1.I NOZZLE CAPS

1. Operating and Port Cap Nuts - Pentagon shape, 1-1/4-inches from point to opposite flat at base of nut and 1-3/16-inches (30 mm) from point to opposite flat at top of nut with a tolerance of 1/64-inch for each dimension from flat to opposite point.
2. Port Cap Chains or Cable are not to be included.

2.1.J SEALS

1. O-ring stem and valve seals throughout.

2.1.K SHIPPING

1. Hydrants shall be palletized in such a way that there is no contact made between hydrants or other objects.

2.1.L THRUST COLLAR

1. Operating nut thrust collar and threaded stem drive shall be one piece bronze. Oil filter plug or grease fitting shall be furnished in bonnet to lubricate thrust collar and stem drive. A Lubricant reservoir shall be a permanently sealed reservoir. Furnish a positive stop to prevent over travel of the stem.

2.1.M APPROVED MANUFACTURER

1. Mueller Centurian model A-423
2. American Darling B62B
3. M&H Style 929
4. Clow Medallion 2500
5. Kennedy Guardian K81D
6. AVK 27-80
7. U.S. Pipe Metropolitan 250 and M94

Acknowledgments / Source Material

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#END#