

A Short History of Hose

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Below is a picture of early fire hose, as photographed at the [New York City Fire Museum](#). I have been reading and learning about the history of fire hose, and attempting to answer a question about apparatus. Why was hose carried on a reel, and then on a wagon? Here's my best attempt at an answer. Comments, questions, and corrections welcome!

Let's go back to the 17th Century, when the first practical fire hose was invented in Holland in 1673. It consisted of 50-foot lengths of leather (or sailcloth) and was sewn together in a single seam. Brass screw threads were attached at the ends, so sections could be connected. (The inventor, the Superintendent of the Fire Brigade, also created the first version of rigid suction hose.)

Stitched leather hose worked as well as it could. The seams might leak or even burst from excess pressure. The leather could also crack or dry out. Metal rivets were added over a century later, developed in 1807 (or 1808) by a pair of Philadelphia firemen. They bound the seams of their leather hose with copper rivets instead of stitching.

This worked wonders, allowing higher pressures and a greater flow of water. With a double-row of copper rivets, numbering 22 per foot, the result was a nearly leak-proof section of hose. It could also withstand a higher pressure of 200 pounds per square-foot. And it led to the new concept of relay pumping, where water could be moved hundreds or thousand of feet, from engine to engine. (Ditto the development of suction hose, and which replaced the venerable bucket bridge.)



Metal-riveted leather hose was heavy, however. Fifty-foot lengths weighed about 85 pounds, and excluding couplings. Nor was leather hose very flexible. It became stiff with use, and difficult to roll or fold. Thus drums (or reels) were developed for transporting the hose. Short (single?) could be wound on a reel on the hand-engine itself. Longer lengths could be wound on reels mounted on a two- or four-wheel wagon.

Leather hose required quite a bit of maintenance. It was drained and dried after each use. Oils were then applied, to keep the hose preserved. Neatsfoot oil and beef tallow was common. Fish oil was another preservative used. Both likely caused quite an odiferous experience around their application? Removing and rewinding the hose in different direction was also important, to prevent the development of a permanent curved shape.

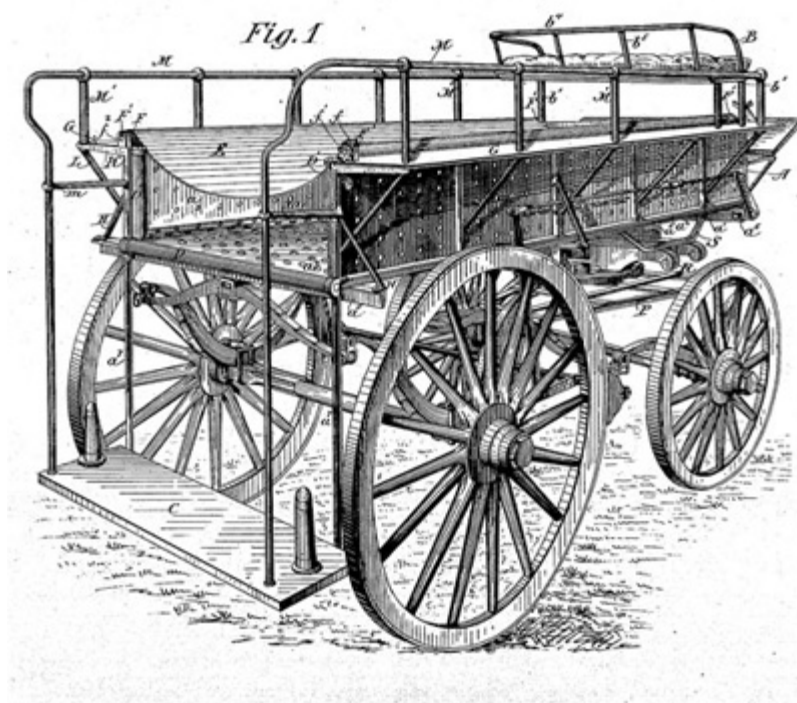
Rubber fire hose appeared in about another decade. A patent for rubber-lined, cotton-web fire hose was received in 1821. The hose-- with soft rubber, or gum rubber, and a cotton jacket-- required as much care as leather hose. Improvements in rubber-making resulted in better fire hose as the century progressed.



Charles Goodyear mastered his process for toughening (or vulcanizing) rubber in 1839. B. F. Goodrich developed rubber hose reinforced with cotton ply in 1871. And even a standard size for couplings was adopted by the International Association of Fire Engineers in 1873.

Fire hose was becoming both stronger and lighter, and fire departments gradually and at times reluctantly made the change. By the 1870s, hose was advertised as tested to 350 PSI. The high-strength hose was produced for steam engines, which were increasingly replacing the lower-capacity hand engines. (Presumably lower-capacity, that is. Need to research that.)

The rubber or cotton hose was wound on traditional hose reels, and where upon it would develop mildew and rot. The problem was poor air circulation. Since hose was now flexible, a method was developed of packing hose on a flat plane. Transportation in the bed of a wagon was ideal, and thus developed the hose wagon. The bed was ventilated, with wooden slates on the bottom and sides. Water could rain, and air could enter. Hose towers were also developed, allowing easy drying of lengths of hose.



By the 1870s, horses were becoming a fixture of the fire service. They were becoming popular for a couple reasons. They could easily pull the heavier apparatus, versus the dozens of men required for same. The largest hand engines by that time could weigh as much as two tons. The

new steam engines were just as heavy, if not more. And in cities that were developing paid fire departments, they couldn't afford the raw numbers of men to pull the engines. Horses were much cheaper. Thus the appearance mid- to late-century of horse-drawn hose reels and later horse-drawn hose wagons. And which is why apparatus changed from reels to wagons.

Sources:

- *The Development of the Fire Hose*, Paul Hashagen, [Firefighter Central web page](#), 1997.
- *Fire Engines of North America*, Sheila Buff, Wellfleet, 1991.
- *Fire in America!*, Paul Robert Lyons, National Fire Protection Association, 1976.
- *The History of Fire Engines*, John Calderone, Barnes & Noble Books, 1997.
- *A Pictorial History of the Fire Engine*, Matthew Lee, self-published, 1997.
- And probably a couple others.

Acknowledgments:

My feet are firmly planted on the shoulders of so many others. Hope this short summary does them a modest amount of justice.

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