HANDOUT FOR
FIREFIGHTING AND YOUR MODEL RAILROAD

The triangular science of fire

PRESENTED BY EDWARD M. KOEHLER JR.

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NOTES

No author or presenter is perfect and I include myself in that category. If you have a comment, constructive criticism or correction, please E-Mail me at EdwardMKoehler@NYC.RR.COM. Thank you.

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A TOO BRIEF HISTORY OF ORGANIZED FIREFIGHTING

The 1666 Great Fire of London inspired the creation of fire insurance. In turn, the fire insurance companies caused the establishment of firefighting brigades by 1680. Organized firefighting in modern times had begun. The laws of Queen Ann for 1707 required each parish to have a fire extinguishing appliance. Curiously the law did not require the parish to *actually operate* the fire apparatus, just be in possession of one.

In the American and Canadian Colonies, the local governments took over the role of parishes and in the larger cities began to provide fire protection in varying degrees.

THE MYTH OF THE FIRE INSURANCE BRIGADES AND FIRE MARKS

We don't have time to discuss it during this presentation, may I recommend the following volume:

Wright, Brian: **INSURANCE FIRE BRIGADES 1680-1929 – The Birth of the British Fire Service**; Tempus Publishing; Stroud, Gloucestershire, United Kingdom; 2008.

FIREHOUSES

The history of these buildings can be rather complicated. I would recommend as a good guide the following book:

Rebecca Zurier with photographs by A. Pierce Bounds: **THE AMERICAN FIREHOUSE – An Architectural and Social History**; Abbeville Press. New York,1982.) as a good guide.

Firehouses are utilitarian structures that are often rebuilt or adapted as changes to the fire service take place. Usually, the buildings have only been given up when the size or weight of the apparatus have increased to the point that the old structure is no longer adaptable. There is a former volunteer fire house from 1854 that still houses an active FDNY Engine Company (26) in midtown Manhattan. For many years basement of Engine 26 was occupied by a wooden bridge used to support the apparatus room floor. This building has since been gutted and a new modern interior has been built inside of it.

MAIN FIRE APPARATUS (HAND DRAWN ERA)

1. hand powered pumping apparatus (also referred to as a pumper or engine)
2. ladder truck (basically a ladder rack on wheels)
3. hose reel or hose wagon

The era of the hand drawn apparatus started in Colonial times. In urban areas horse drawn apparatus began to appear around the Civil War. In rural areas, hand drawn equipment was still responding into the early 20th Century. As an outlier to that statement, four companies (three hose reels, one ladder truck) in Georgetown, Colorado still responded with hand drawn equipment until 1951, but by then it was often towed behind volunteer's automobiles.

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MAIN FIRE APPARATUS (HORSE DRAWN ERA)

1. steam powered pumping apparatus (also referred to as a pumper or engine)
2. ladder truck (either a 'city service' type truck (basically a ladder rack on wheels) or an early 'aerial ladder' (a 'city service; truck with a larger extension ladder mounted on a turntable above the ladder rack that was raised by either spring or water power.
3. hose wagon and in decreasing numbers, hose reels (some hose wagons in this period would also carry chemical tanks
4. chemical engines: Chemical Engines had a tank of baking soda infused water. As a firefighter turned an agitator a charge of sulfuric acid was admitted to the tank. The immediate and somewhat violent carbonation that took place forced the water into the rubber hose. Chemical Engines became popular in small towns where there were no water mains. The chemical apparatus carried their own water supply to the scene of an incident and it was usually enough for a room and contents fire. Plus, they were ready to go faster than a steamer! (hand drawn chemical engines also were developed during this period.
5. water towers: The wood aerial ladders of the time had a hard time handling the back pressure on hose lines. The water tower was a 'last ditch' tool used to drown out blazes on upper floors.

Horse drawn apparatus had its day from the Civil War to the decade after World War I. Steamers that survived after circa 1920 were usually motorized. The last motorized steamers in Baltimore were retired after World War II, in the FDNY in 1949. Chemical tanks on apparatus remained in service in some locations into the early 1950's. Water Towers became obsolete with the adoption of metal aerial ladders during the 1940's – 1950's that could handle the back pressure of hose lines.

MAIN FIRE APPARATUS (MODERN MOTORIZED ERA)

Note that the types of apparatus of the early motor era resembled the list of types in the horse drawn era.

1. triple combination pumper: this is a combination of the pumper, the hose wagon and the chemical engine with the addition of a water tank. In the case of the chemical engine, the borderline destructive chemical reaction was replaced with a small pump feeding water to a small diameter, often rubber hose
2. water tankers or tenders: as motor vehicles in the post World War II era became able to carry quantities of water, this form of a mobile water supply was adopted by the fire service.
3. aerial device: most of these apparatus are the basic aerial ladder, but the second most popular type of aerial device is the ladder tower; the snorkel once in favor in the late 1950's early 1960's has fallen out of favor in the United States
4. rescue truck: the fire service has taken on responsibility for various hazards other than fire, this vehicle has been developed to carry the train crews and specialized tools.

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APPARATUS AND CREW FUNCTIONS ON THE FIRE GROUND

1. pumper: On the fireground the function of a pumper is to take water from a source, re-pressure that water and pump it into hose line(s) either relaying the water to another apparatus or to firefighters attempting to extinguish the fire. The crew of a pumper will operate the hand lines to fight the fire.
2. tanker: On the fireground the function of a tanker is to supply water for firefighting purposes. Often tankers will work in relays to supply water to the scene from another location referred to as the 'tanker fill site'. At the fire, a tanker will usually discharge into a folding tank ('swimming pool')
3. aerial device (ladder): On the fireground an aerial device will supply ladders to access a building when the normal points of access are unavailable or blocked. The crew of a ladder apparatus are charged with ventilating the building, searching and resolving life safety issues, and generally evaluating the incident.
4. rescue truck: A rescue truck carries hand tools similar to those of a ladder truck along with a number of more specialized tools. At a fire scene the crew of a rescue truck will often perform work similar to a truck company unless there is a special hazard (i.e. gas leak) involved.

Need to know what these apparatus are carrying in their compartments? Visit the National Fire Protection Association ("NFPA") website at https://www.nfpa.org/ where you can research the answer to that question.

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SOME SUGGESTED READINGS

In addition to the two books mentioned in the above text, may we suggest the following volumes if you wish to research fire apparatus further. I believe that all of these volumes are out of print but can probably be found on www.abebooks.com.

Calderone, John A.: **THE HISTORY OF FIRE ENGINES** Barnes and Noble Incorporated; New York, New York; 1997.

Conway, W. Fred: **CHEMICAL FIRE ENGINES**; Fire Buff House Publishers; New Albany, Indiana; 1987.

Douglas, Emmons E.: **WHILE THE FLAMES RAGED – Fire Patrols and Salvage Corps in the United States**; The Engine House; Middletown, New York; 1993.

Hass, Bill: **HISTORY OF THE AMERICAN WATER TOWERS**; Ed Hass; Sunnyvale, California; 1988.

Hass, Ed **AHRENS-FOX: THE ROLLS-ROYCE OF FIRE ENGINES**; Ed Hass; Sunnyvale, California; Third Printing 1990 Unrevised.

Lee, Matthew: **A PICTORIAL HISTORY OF THE FIRE ENGINE – Volume 1 - From Hand Equipment to the Early Motor Period**; Matthew Lee; Plymouth, Michigan; 1997.

Lee, Matthew: **A PICTORIAL HISTORY OF THE FIRE ENGINE – Volume 2 - Decade of the 1920's**; Matthew Lee; Plymouth, Michigan; 1999.

Lee, Matthew: **A PICTORIAL HISTORY OF THE FIRE ENGINE – Volume 3 - Decade of the 1930's**; Matthew Lee; Plymouth, Michigan; 2015.

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