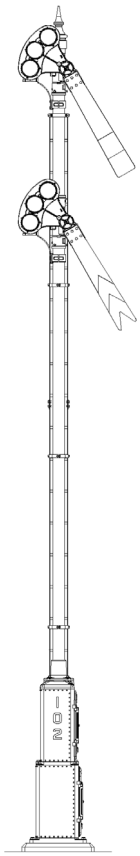
Union Switch and Signal's Style-B

Boston & Maine Railroad – Signal 102

The Boston & Maine Railroad was a very early user of the Style-B signal with their first installation being in the late 1890's. Between 1898 to 1925 over 2500 semaphore signals were installed throughout the B&M's system. In 1929 the first wholesale displacement of Style-B's were made by the color-light and searchlight signal types with the last of these signals finally being retired in 1973.

Having often seen the wrecked cases of a signal found in Oakdale, MA., curiosity about it and a little research determined it to be #102, the Inward Signal on the WN&P Division (to Worcester, MA), a US&S Style-B having home and distant semaphores.

The 3D illustrations show this signal in its likely "as built" condition when installed sometime around 1903 as part of the reconstruction at Oakdale due to the building of the Wachusett Reservoir. Some of the notable points of interest are as follows.



Cases appear to be an early design with the most distinguishing missing feature seen on all later cases being the cast "arched weather-lip" located above each door and there were no vents anywhere on the case except for the doors. As built, the electrical connection from the battery well was hard-piped into the top part of the lower case. Later during this signals life and likely with most other signals, the case connection was moved to the bottom of the lower case, the upper hole was plugged. There was also a second hard-piped connection remaining above ground but no connection into the cases. The signal square concrete base was poured on-site; later versions of which were pre-cast having a tapered profile.

The spectacle design is the so-called "lightweight" cast iron version, having a 17" shaft hub center to roundel center spacing, 60 degrees of travel with 8.38 diameter roundels. It is not known if this signal and the other signals along this line originally had the heavyweight version. Both versions however were used by the B&M but the history and usage of ether of these unclear.

Wood semaphore blades at 48" long are used based on original B&M Signal Department drawings B52 (Home) and B53 (Distant). Originally, each were held in the spectacle by six carriage bolts which were reduced to only four on later installations. The painting of the blades also has the back side painted white with a 10" wide black stripe on the home and distant blades. Starting around the 1916 time period these and all signal blades would have their back faces and surrounding edges painted entirely black.

One feature perhaps found on wood blades is a brass 5/8" wide stiffening strip attached by four 3/16" flat head rivets. The strip helped keep the blade from curling and perhaps reduced the tendency to split due to long term exposure to the elements. Wood blades were gradually replaced in the 1920's by the 42" long steel enamel ones commonly found in signal collections today.

Another change with the home blade came with the introduction of the “Automatic Block System” and its full adoption on entire lines by the B&M in 1917. This introduced a pointed end home blade as a “permissive stop” and the square end blade designated as “absolute stop”. This line was converted to this signal system and the blades were changed to the pointed end type where applicable.

The oil lamp for illumination was manufactured by Peter Gray, however other lamp manufacturers were likely used. When signals were electrified and as a cost saving measure, the old lamp body was reused and modified with a base and socket for the bulb which replaced the oil burner and font. In some versions a new lens-bulb combination was used. The light bulb was a 10-volt with power supplied from primary batteries. Some signals used in latter years had modern electric lamps replacing the earlier converted lamps.

For each signal, a back spectacle was included in the original design which contained a flat blue roundel. Under night time conditions as the arms moved into the most restrictive position the blue light indicated to signal maintainers that the lamp was lit and the signal was properly operating when viewed from the signals rear side. Later in the signal life most of the back spectacles had their blue roundels broken-out, others were removed but many Style-B’s retained them as well.

A cast iron Ladder Foundation is shown however the B&M also used concrete ladder foundations some of which were poured on-site and others using an assembled pre-cast concrete block with a cast iron frame.

The battery well shown is a standard concrete B&M 24-cell version - however a wood version may have been originally installed for this signal and later replaced by the standard concrete well. It is not known if the (lower) battery case of this signal type was ever used to store batteries.

The signal is painted all black with white numbers “102” displayed on the sides of the upper case. Sometime during the late 1920’s these signals had the prefix “N” added thus becoming signal N102. After 1946 the B&M repainted all signals silver with black lettering.

Automatic block signals were numbered by the decimal systen, - odd numbers being used for outward, and even numbers for inward signals. The number indicates the miles and nearest tenth of a mile in the next mile for outward and the miles and even tenth of a mile in the next mile for inward signals, figured from the terminal or starting point of the numbering. The “N” stood for Nashua, NH. with Worcester, MA. as the starting point.
Example: Signal 102 is for inward trains, and is located about ten and two-tenths miles from Worcester, MA.

In a number of instances some of these signals had a rebirth. As a cost saving measure their mast height was reduced and color search lights replaced the semaphores, their cases left in place. It is possible signal 102 was modified for this purpose but has yet to be determined. It is not known when this signal was removed from service.

All images were created from 3D based solid models. Each and every part seen being an individual model with the final assembly being complete to the last cotter pin. Unfortunately the internals of the signal are omitted since creating solid models of all these hidden components would be extremely time consuming requiring each part to be back-engineered.

No known drawings from Union Switch and Signal are known to exist with the exception of catalog pages. This project therefore could never have come to completion without the gracious help and contributions through numerous photos, measurements and a multitude questions and their respondent answers by the following individuals:

Rick Conard
Brian Dame
Roy Frenberg
Pete Mcfall
Eric Schmelz
Mike Spencer
Scott J. Whitney

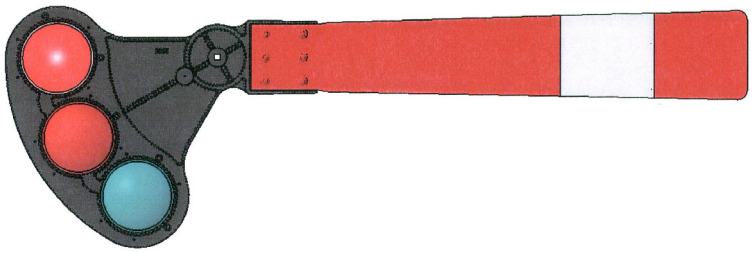
Additional References:

The Boston and Maine Railroad Historical Society Archives located at the
Morgan Center, University of Massachusetts Lowell, 40 French Street, Lowell, MA.

Article: Silent Sentinels by Brian Dame, C1991 Boston and Maine Railroad Historical Society, B&M Bulletin Vol. XVIII, No.2, pg.14-27.

Also with information from the following web sites:
Zachary G. - ZCG Utility Scrap, Union, MO.
Robert Schoenberg - Rob's Pennsy Home Page, PRR Signal Standard Plans

Many thanks to all of you for your help!



Please Note:

For any comments, questions or suggestions, please contact me.

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BOSTON AND MAINE

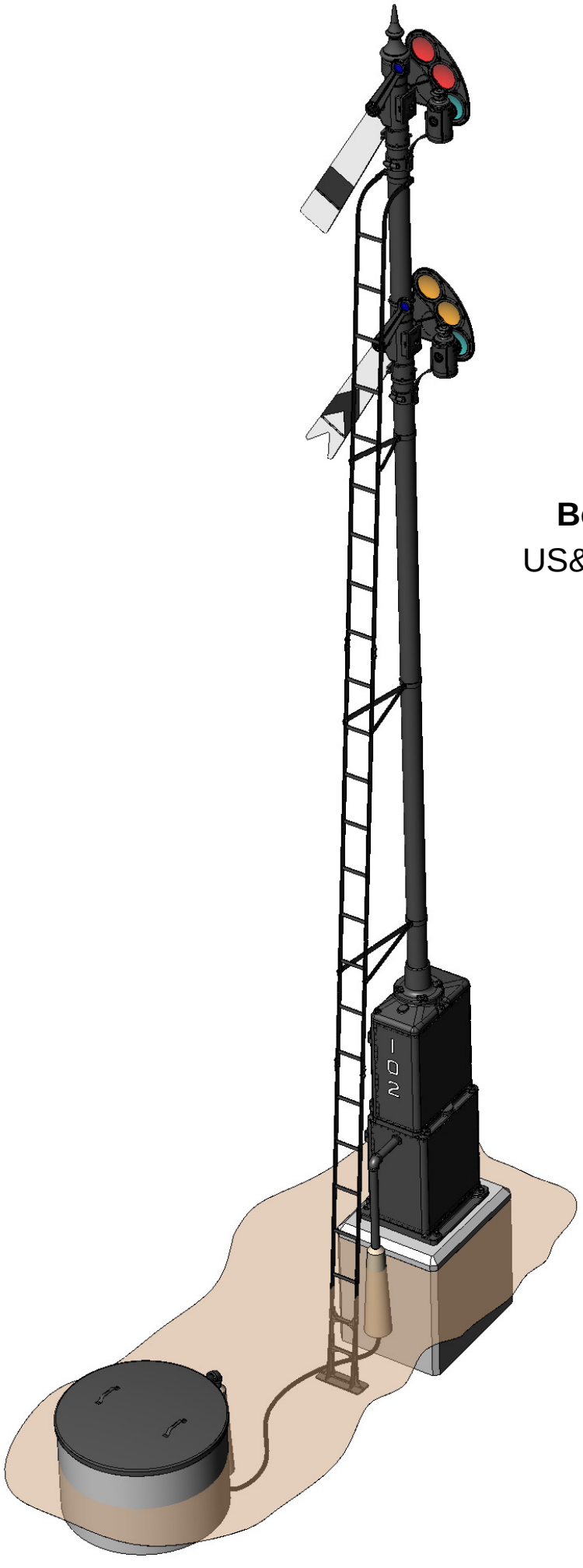
Boston & Maine Railroad

US&S Style-B Signal Assembly

(Overall View)

Image Created by Alan LePain

C2008



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US&S Style-B Signal Assembly

(Overall View)

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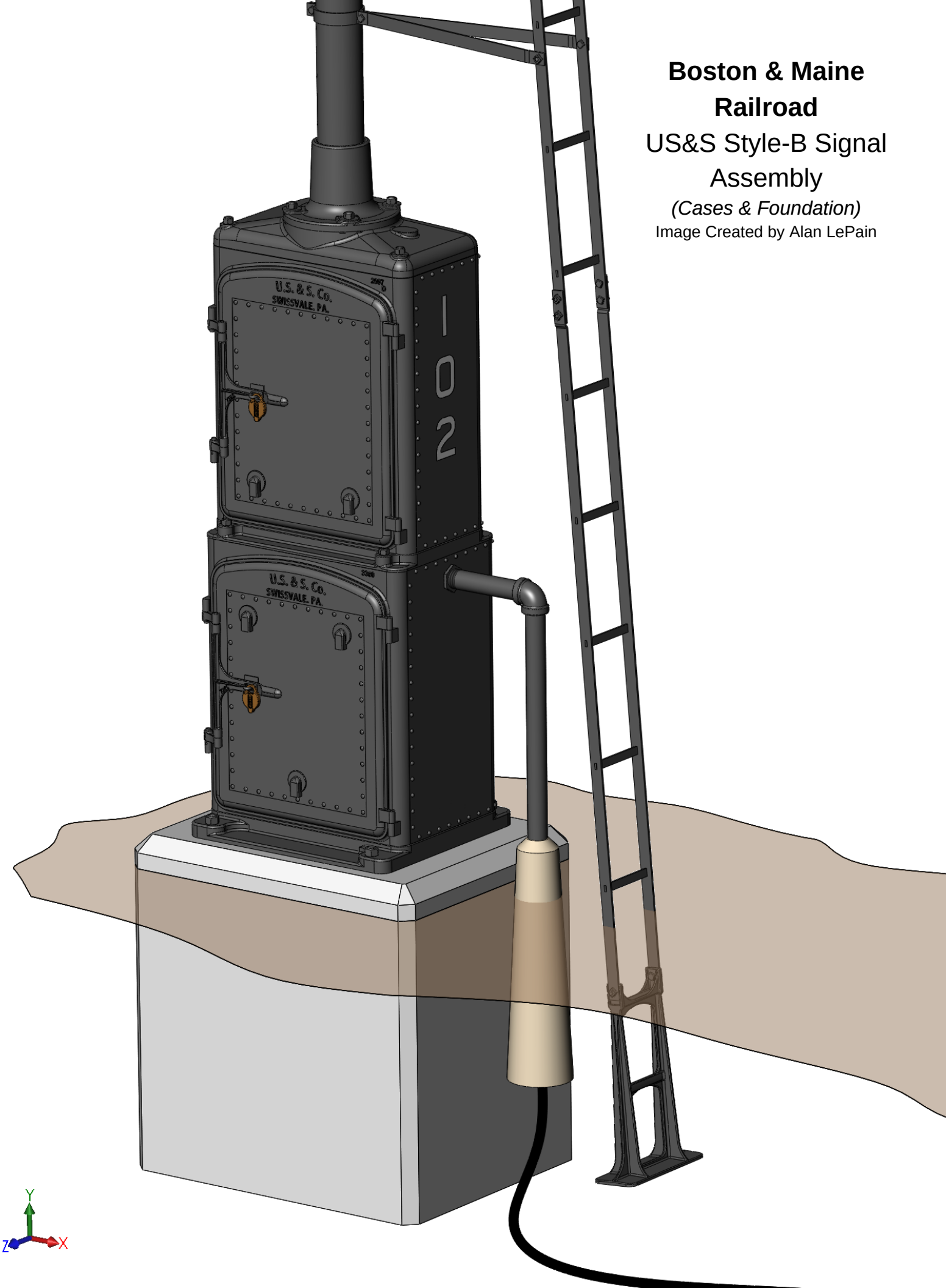

Boston & Maine Railroad

US&S Style-B Signal Assembly

(Cases & Foundation)

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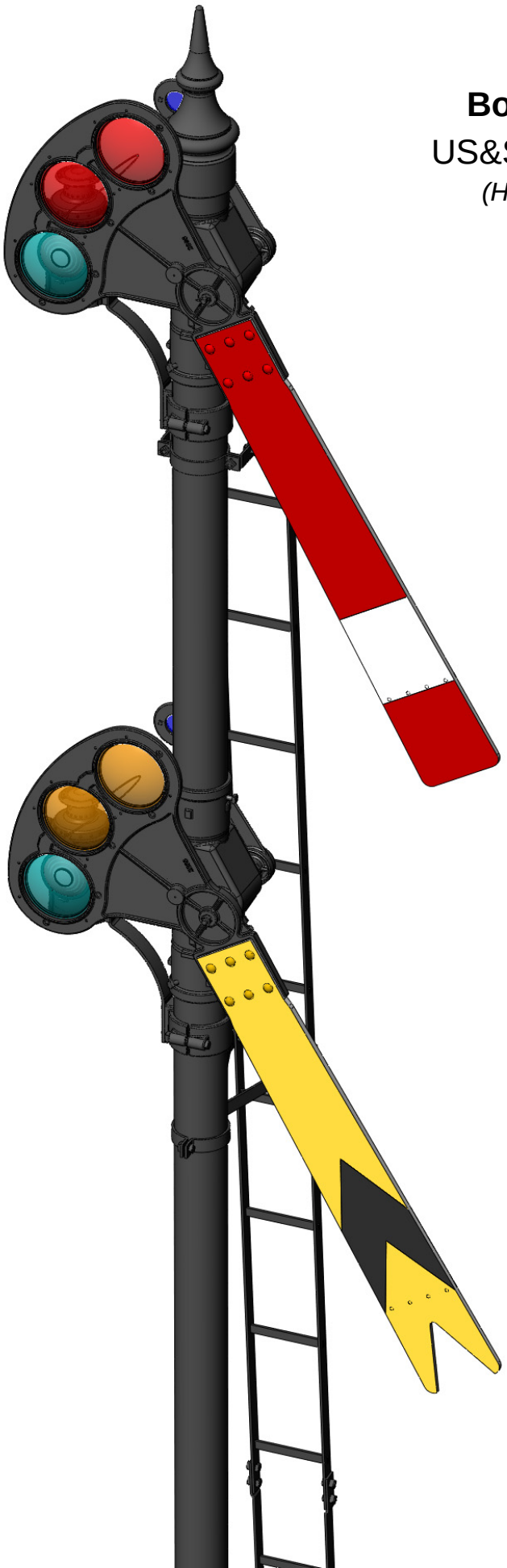

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US&S Style-B Signal Assembly

(Home and Distant Semaphores)

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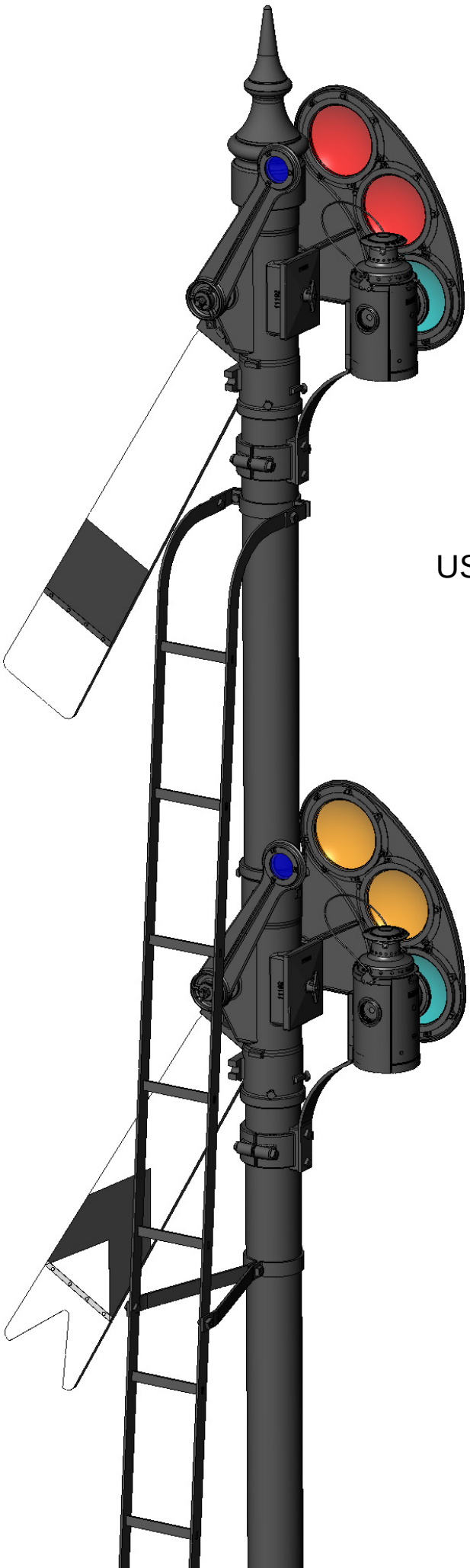

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US&S Style-B Signal Assembly

(Home and Distant Semaphores)

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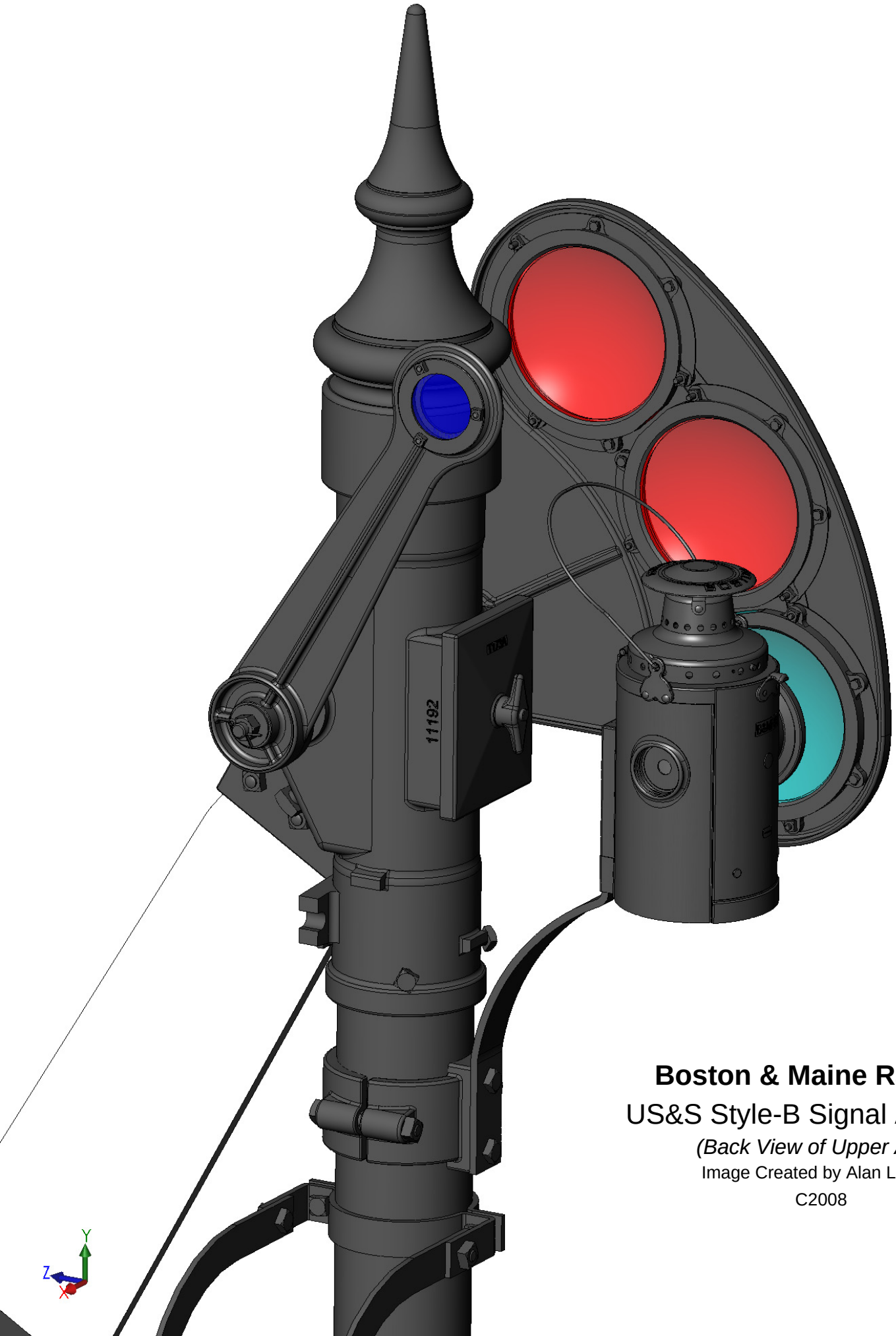

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US&S Style-B Signal Assembly

(Back View of Upper Area)

Image Created by Alan LePain

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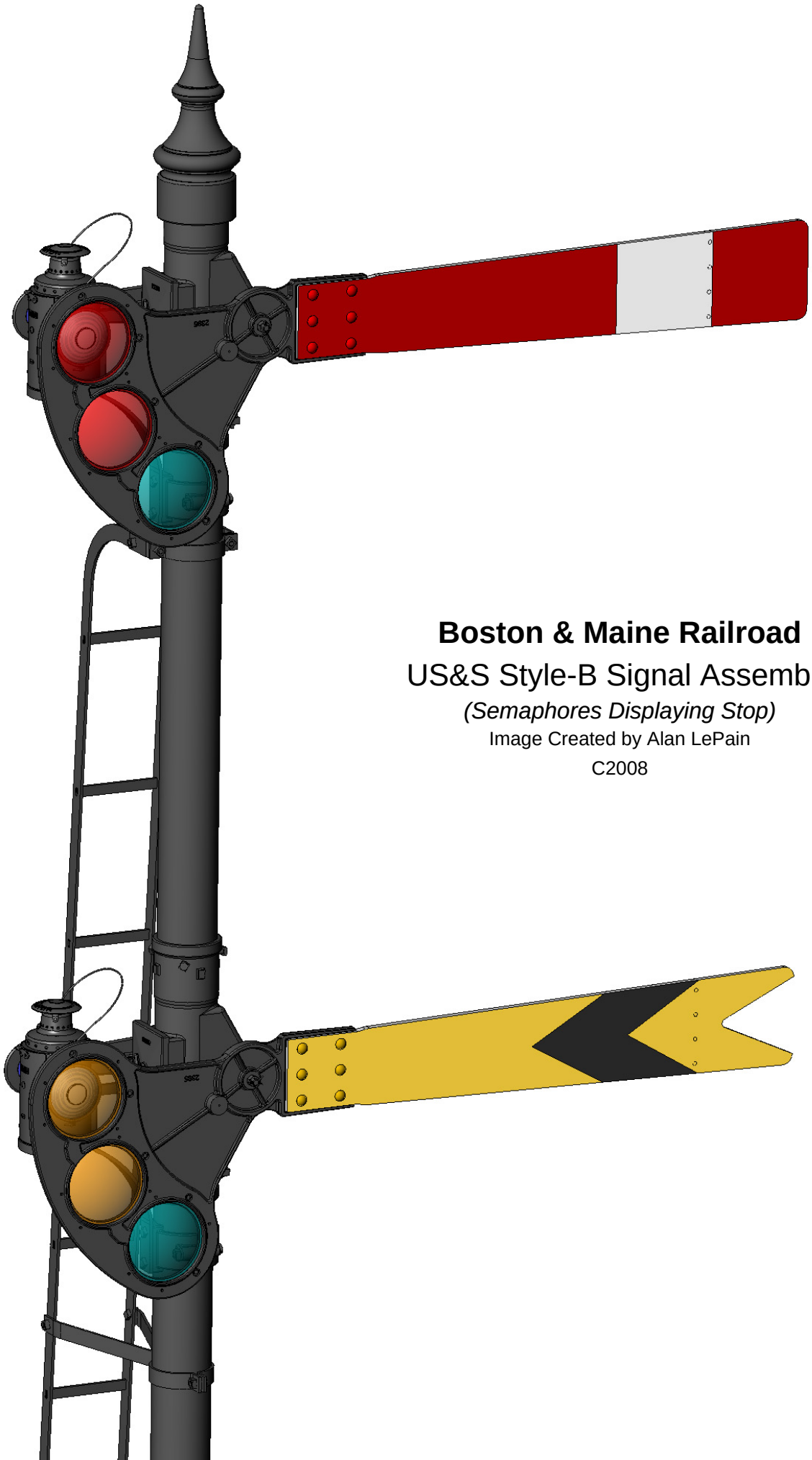

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US&S Style-B Signal Assembly

(Semaphores Displaying Stop)

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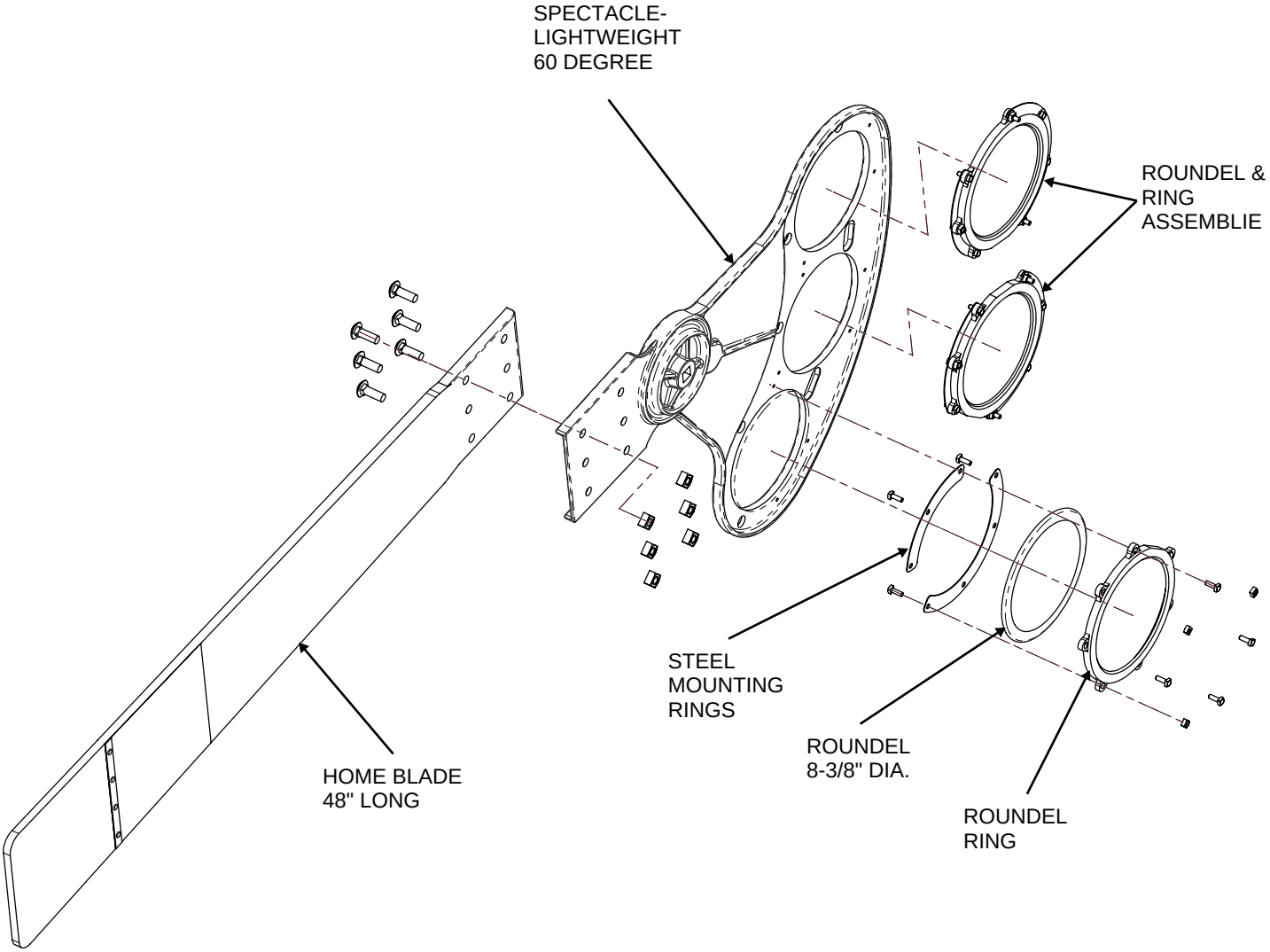

Boston & Maine Railroad

US&S Style-B Spectacle Assembly

(Exploded View)

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Boston & Maine Railroad

Peter Gray Signal Lantern

(Frontal View)

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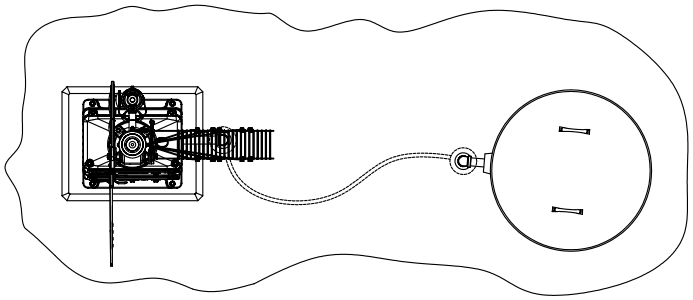

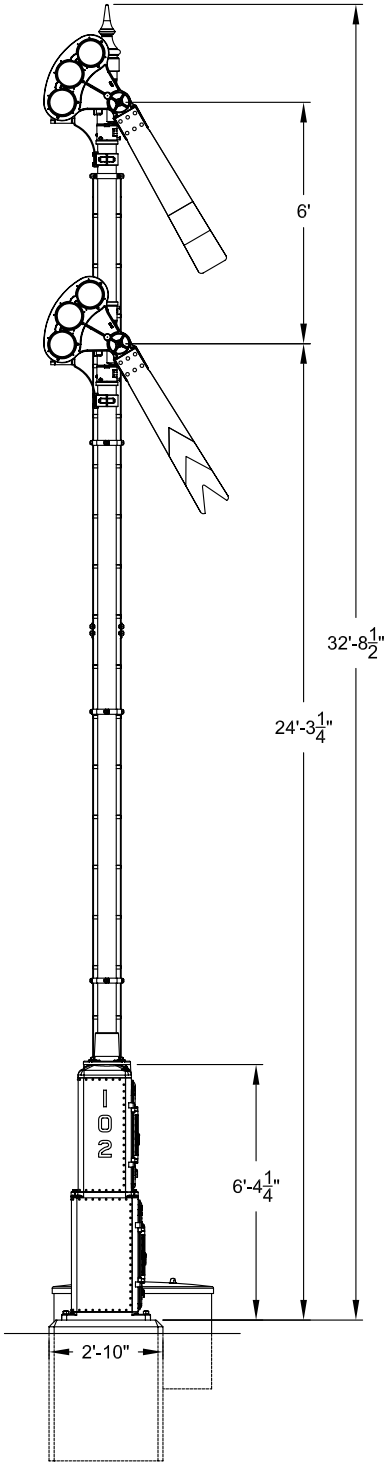

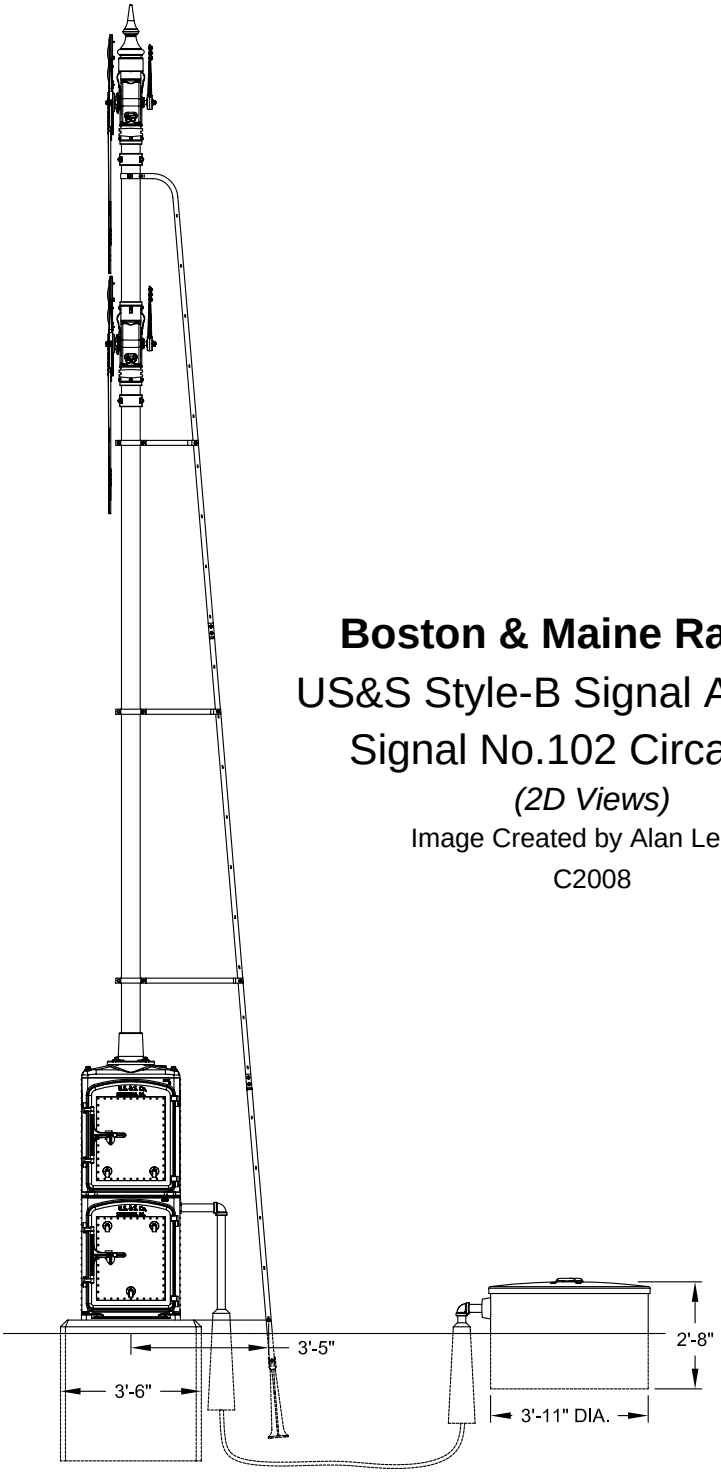

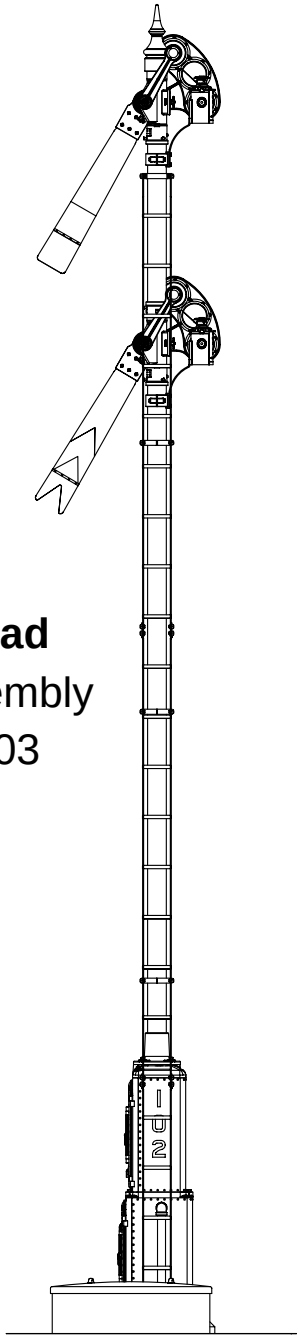

Boston & Maine Railroad

US&S Style-B Signal Assembly

Signal No.102 Circa 1903

(2D Views)

Image Created by Alan LePain

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