

The MODELMAKERS NOTEBOOK



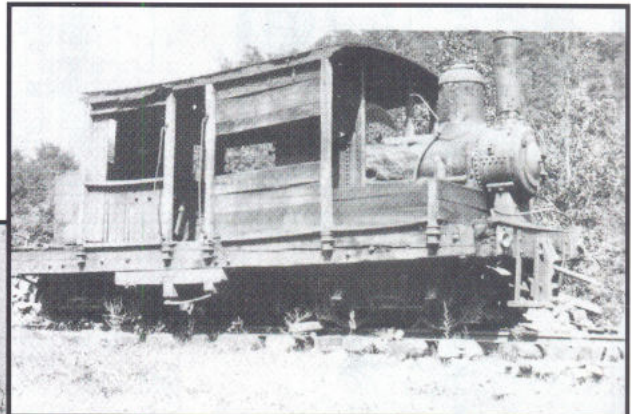
by Al Armitage

A 22-Ton Class A Climax

Below: Previously published in the March 1976 **GAZETTE**, this photo shows a steel-framed Class A Climax on the McNitt-Huyett Lumber Company of Waddle, Pennsylvania. *Photo, collection of Ben Kline Jr.*

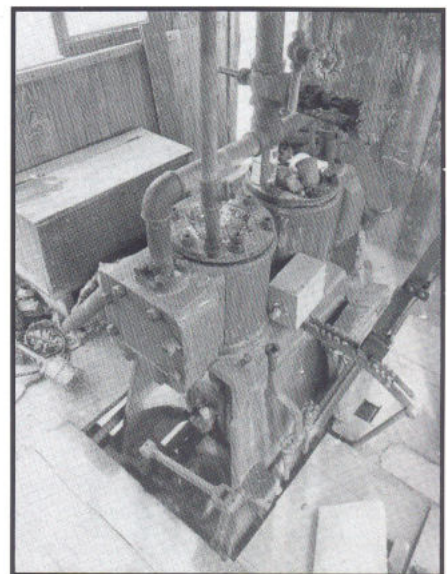


Below: The remains of a 3-foot gauge Class A Climax photographed in January 1980 in Eagle River, Alaska. These remains were discovered in Nome, Alaska, shipped to Seattle, and then to Anchorage by barge. From there the wreck travelled to present owner Keith Christenson's house by truck. The locomotive was built in 1902 as c.n. 313, and ran on the Wild Goose Railway. Keith is restoring it. *Photo by Stewart Sterling III.*



Above: Previously published in the March 1976 **GAZETTE**, this photo shows a Class A Climax nearing the end of its career in the 1930s on the Wilson Lumber Company in West Virginia. *Photo, collection of Ben Kline Jr.*

Right: Here are shown the cylinders and throttle of the derelict Class A Climax. In 1980, the cylinders had no rust and would not need to be re-bored. The owner, Keith Christenson hoped to have this Climax running in a couple of years, but it is still being restored since many of the deceptively sound wood parts shown here were actually rotten. *Photo by Stewart Sterling III.*



The actual inventor of the Climax locomotive is unknown, although the 1889 Climax Catalog credits a Pennsylvania "lumberman of large experience in hauling logs by steam engine" with the idea. But George Gilbert, mechanical engineer of the Climax Company, is credited with designing the Climax driving mechanism.

The earliest Climax locomotives were simple machines weighing 10 tons each. They had vertical boilers and two-cylinder vertical engines mounted on a wood frame. Even their trucks were mostly wood. Most of these, and many later versions, were built to run on wood rails, either square timbers or on the round logs of "pole roads." Climax locomotives were noted for their ability to traverse crooked and rough track with few derailments.

For many years Class A Climaxes were the mainstay of the Climax Company. Class A's were cheap to construct and inexpensive to operate, making them popu-

lar with small logging operators. The original idea was that these low-cost locomotives were to be used for a few years and then discarded when a small timber tract was logged off. They proved to be so durable, however, that they were often used to help log numerous tracts. Many remained in service for 30 years or more.

Although most Class A's were used in the U.S., hundreds were built for use all over the world. While most worked in logging operations, they also found favor with coal companies and brick yard operators. Their use began in Pennsylvania, then spread to Virginia, the Carolinas, and Kentucky. Very few Class A's, however, worked in the West. Pacific Coast operators handled larger logs, and often traveled greater distances from woods to mill than was common in the East.

My plan shows a typical 22-ton Class A Climax – the largest Class A ever built.

Constructed in the mid 1920s, this locomotive featured a "high-speed" upright engine with 8- x 7-inch cylinders and a "boot" type boiler. (Earlier models had vertical or "tee" boilers.)

A 22-ton Class A Climax carried 750 gallons of water in a cylindrical tank, and burned either coal or wood. Wood was stacked alongside the boiler, while coal was carried in bunkers in that area.

A boiler pressure of 160 pounds produced a tractive effort of 9,680 pounds in high gear, and 19,360 pounds in low gear.

To say that the Class A Climax was a unique design is to belabor the obvious. Besides their general configuration, perhaps the most unusual feature of these locomotives was the drive with the odd "skewed" bevel gears. This is reputed to be the only commercial use of such gears in industry. This unusual design was necessary to allow the line shaft to cross

over the axles so all wheels could be powered.

Another unique feature of the Class A design was the gear shift that gave the operator two options for speed and power. High gear produced a speed of about 10 mph, while low gear allowed about half that, but gave considerably more power. The sketch of the spur gears and the shift lever show how this feature worked.

Class A Climaxes used Stephenson Link Valve Gear on their vertical engines. The arrangement was similar to that on a Shay locomotive.

Besides a few engravings and photos in books, little is known about the "interior" details of a Class A Climax. Much is certainly hidden behind the side sheathing and under the canopy roof. The underbody details are always in shadow. To the best of my knowledge, no detailed drawings of Class A's exist. Unfortunately, none have survived intact.

A 22-TON CLASS A CLIMAX

DRAWN BY AL ARMITAGE
SCALE: 3/8 INCH = 1 FOOT

GEAR SHIFT DETAIL

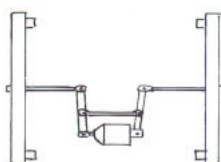
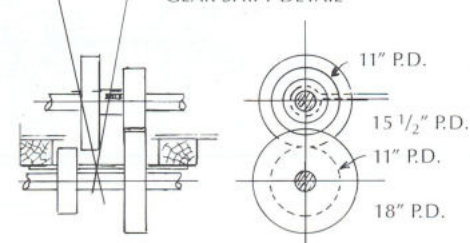
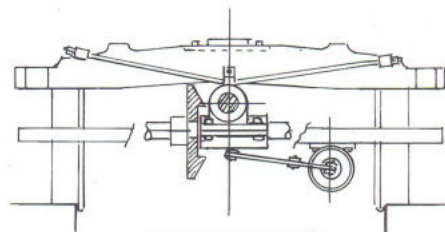
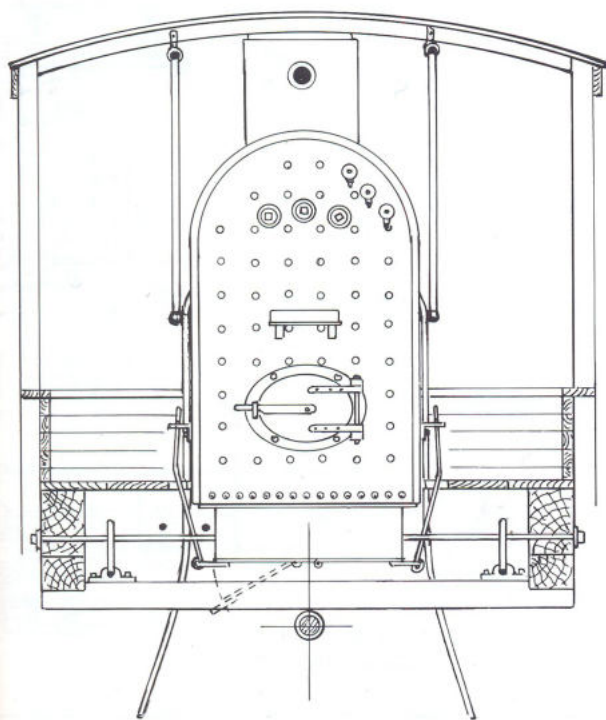


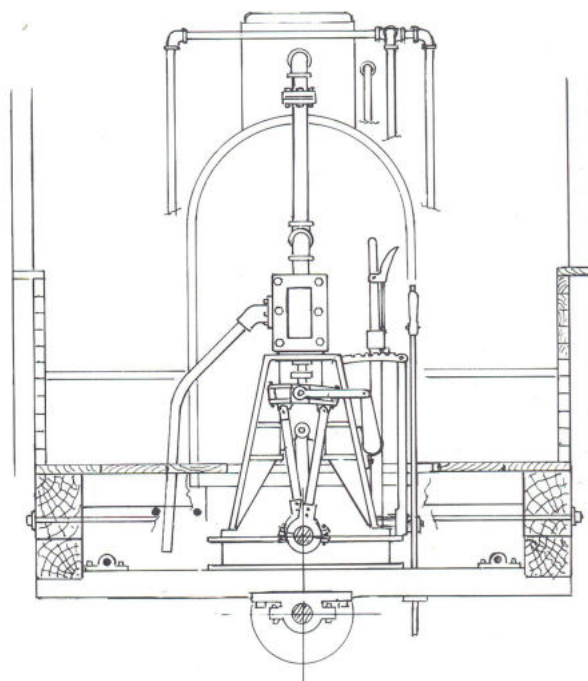
DIAGRAM OF BRAKES



SECTION AT TRUCK



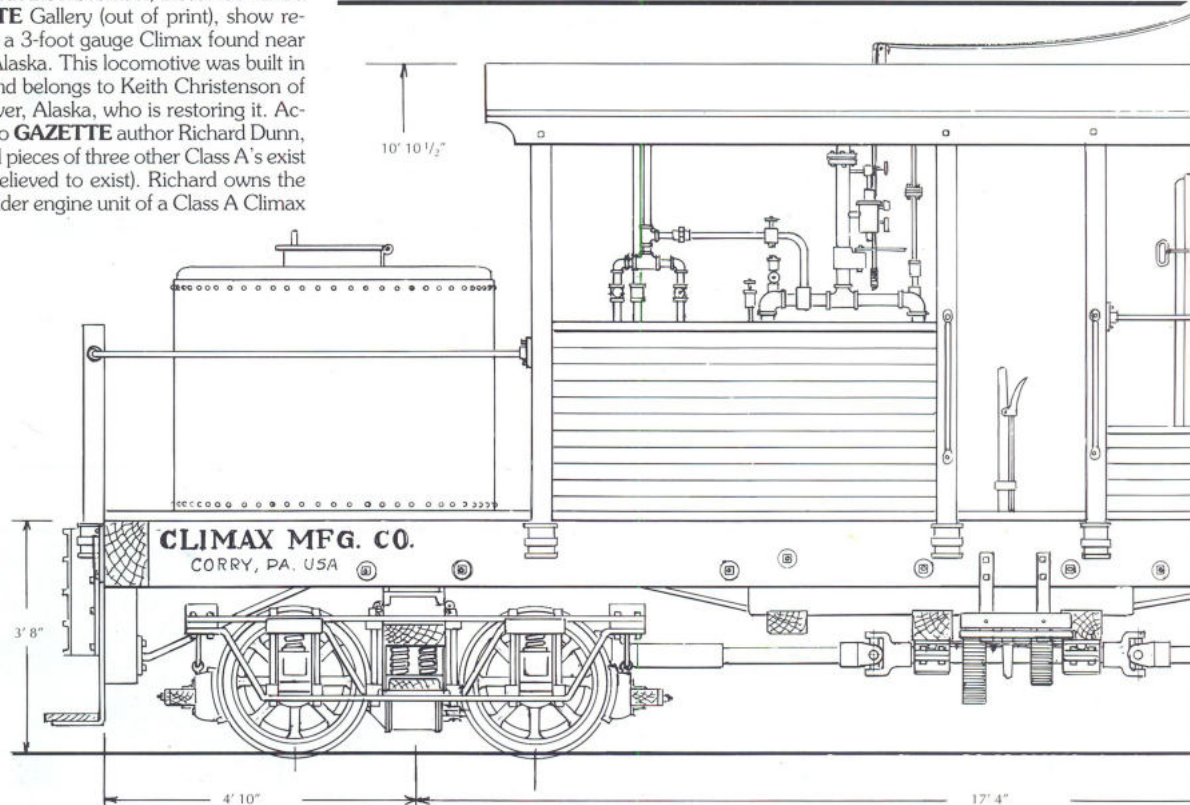
SECTION B



SECTION C

Two of the photos show the remains of a derelict Class A. These photos, originally published in the November/December 1980 **GAZETTE** Gallery (out of print), show remains of a 3-foot gauge Climax found near Nome, Alaska. This locomotive was built in 1902, and belongs to Keith Christenson of Eagle River, Alaska, who is restoring it. According to **GAZETTE** author Richard Dunn, parts and pieces of three other Class A's exist (or are believed to exist). Richard owns the two-cylinder engine unit of a Class A Climax

A 22-TON CLASS A CLIMAX



found in Australia. Parts of yet another one were found at an excavation site in Nome, Alaska, and parts of still another are rumored to exist in the Dismal Swamp in New Zealand.

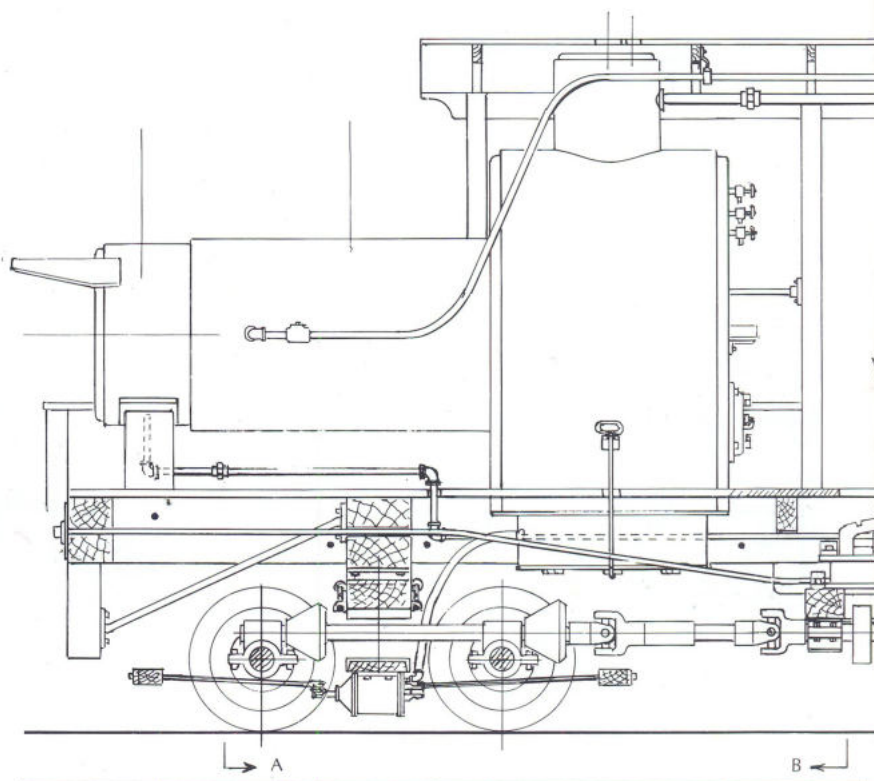
Since I have seen no air pumps on any photos of Class A's, I assume they had steam brakes. In lieu of more specific information, I've worked out what may have been the possible brake system on these locomotives. It may not be correct but it's an "educated guess."

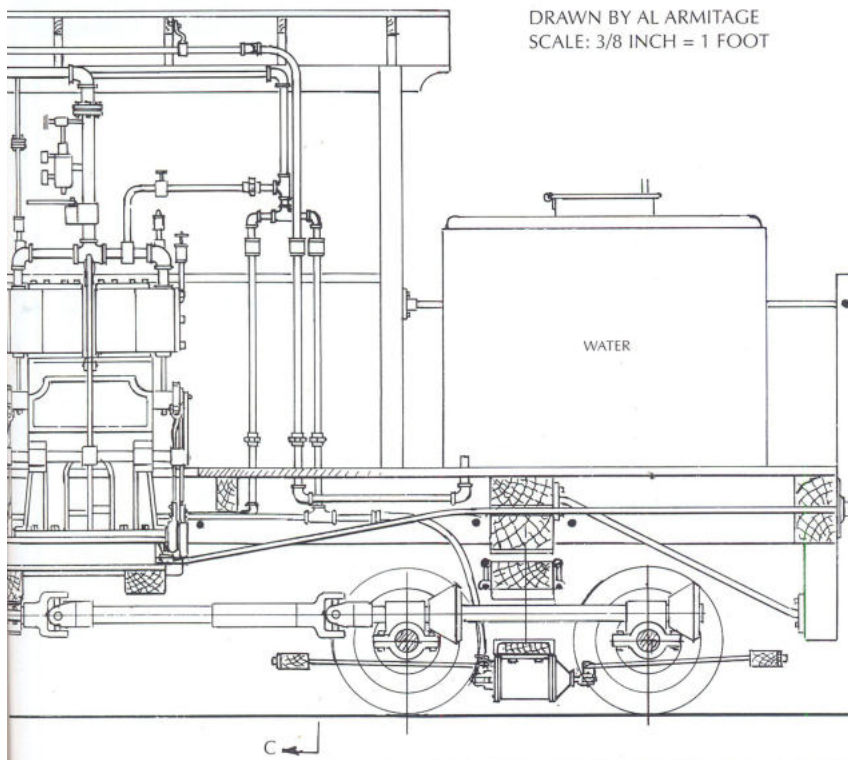
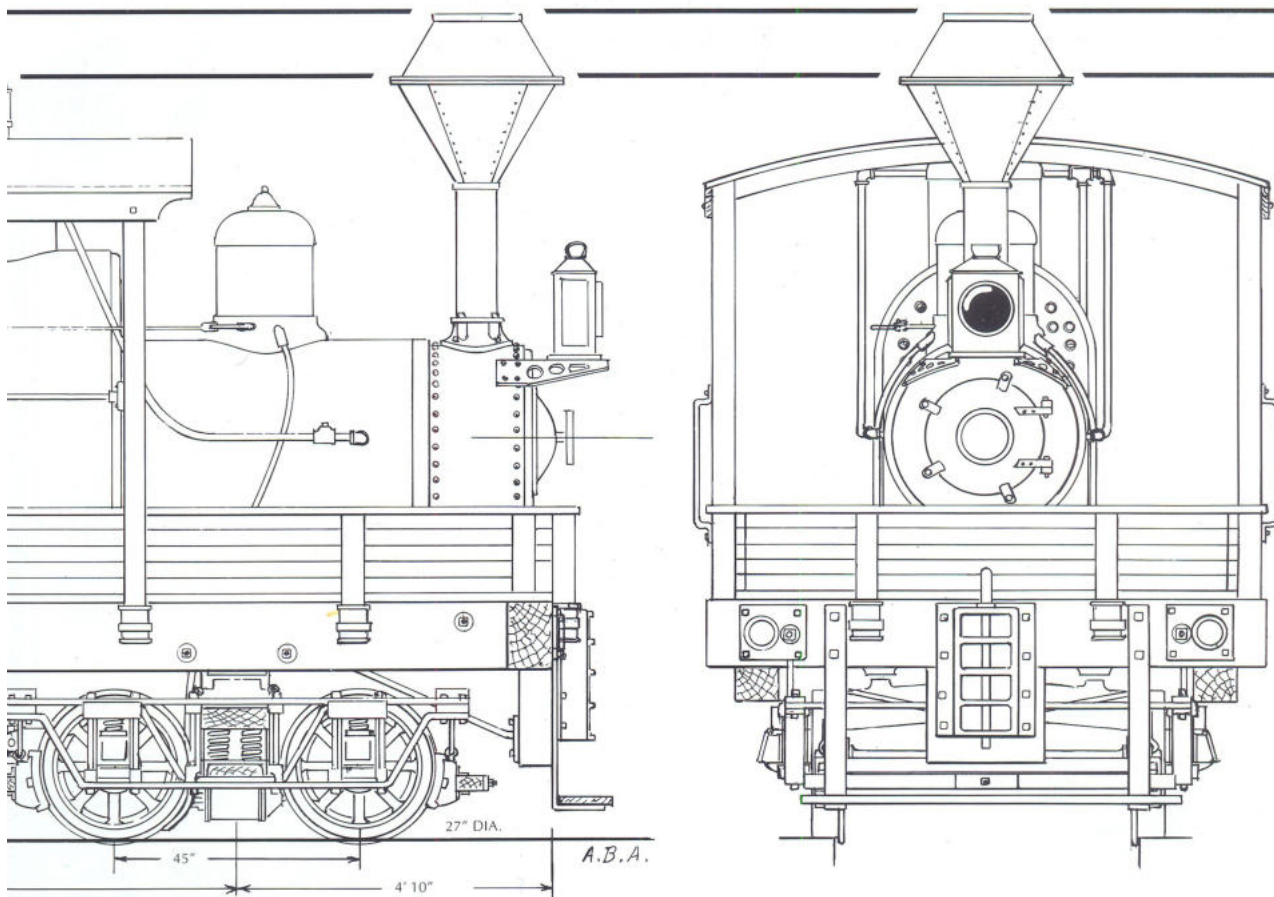
Figuring out the purpose of all that vertical piping behind the engine required a bit of imagination, too. Again, I'm not sure I've gotten it right, but it's the best I could do.

I could find no sign of a known type of injector in any photos of Class A's, so I guess it's one of the "valves" on the piping. The throttle appears to be a little horizontal lever on the main steam pipe to the cylinders. Some of the Class A's had sliding windows in the rear of the side walls, though I guess this was not a common practice.

Another unusual detail I have found in photos are two round cannister-type sand boxes mounted on the rear corners of the deck with pipes and hoses leading down to the track. How these were activated, I don't know.

I have seen a Class A in a photo with two tool boxes mounted on the front deck





in place of the front sheathing shown in my drawing. In still another photo, a large siphon hose was draped over the rear railing.

Since the rear deck is open all around, and the pilot beam duplicates the one on the front one, I didn't draw a rear view.

Despite its unusual characteristics, a Class A Climax was one of the last locomotives built just before the Climax factory closed in 1928. For a locomotive designed as a cheap, almost throwaway piece of logging machinery, the Class A turned out to be the proverbial cat with nine lives.

AL —

References:

Hoffman, David M. "Climax - A Historical Survey," **NARROW GAUGE AND SHORT LINE GAZETTE**. March 1976. Pages 26-31.

Taber III, Thomas T., and Walter Casler. *Climax - An Unusual Steam Locomotive*. Railroadians of America, Rahway, New Jersey. 1960. 97 pages.