Master Modeler - Motive Power: You Can Do It

By Alan Mende

You don't have to scratchbuild a steam locomotive in brass to complete this category.

These are the requirements for the NMRA Motive Power category

- 1) Build three scale models of railroad motive power, one of which must be scratchbuilt. **Motive Power is defined as a locomotive or a self-propelled vehicle.**
- To qualify as scratchbuilt, the motive power must contain the following scratchbuilt items as applicable:
  Steam Locomotives: frame, boiler, cab, tender frame and body, either valve gear or main and side driving rods.
- **Other Motive Power**: body, frame, cab, power truck side frame, pantograph or trolley poles where appropriate.
- All models must be capable of self-propulsion on track of the same gauge as the model. Power trains for all models may be commercial motors and gears.
- All models must be super detailed either with scratchbuilt parts or with commercial parts as defined in the Definitions Section.

These are the requirements for the NMRA Motive Power category

- The following parts are specifically excluded from the scratchbuilt requirement.
  - Motor
  - Gears
  - Drivers and wheels
  - Couplers
  - Light bulbs & electronics
  - Trucks
  - Paint, decals, etc.
  - Bell
  - Marker and classification lights
  - Brake fittings
  - Basic shapes of wood, plastic, metal, etc. ("Basic shapes are things that builders of the prototype would have used as raw materials. For example an "I" beam would be a basic shape; a commercial door or window casting would not.)

These are the requirements for the NMRA Motive Power category

- The term "scratch built" implies that the modeler has done all of the necessary layout and fabrication that produces the final dimensions, appearance, and operating qualities of the model. This is a good statement of the intent and spirit of the 'scratch built' requirement. Notice that it does not say that the use of a few commercial detail parts will disqualify the model as being "scratch built". In general, the same standard applies that is used in contest judging: *"Completely Scratch built" means that 90% or more of the model by parts count was scratch built.* (But you do need to scratch build the listed items in requirement 1-A above.) *Taking an existing model and modifying it to be a powered model is not considered "scratch building."* Examples of this would be taking a passenger car and converting it into a trolley, or a box car and converting it into a box-cab locomotive. These do not meet the definition or the spirit of the term "scratch built" given above.

These are the requirements for the NMRA Motive Power category

- 2) Earn a Merit Award of at least 87.5 points with each of the three scale models of motive power either via an NMRA sponsored contest or AP Merit Award Evaluation.
- 3) You must submit a Statement of Qualification (SOQ, see below) which includes the following:
- An attachment giving a detailed description of each model, including:
  - Identification of all scratch built features
  - All commercial components used
  - Materials used in building the model
  - Copies of the plans you used to establish conformity are NOT required, but many people do submit them, and they are reviewed by the person evaluating the model for conformity.
- Verification of the Merit Awards (photocopies of the certificates)
- Photos of the model are helpful, but not required

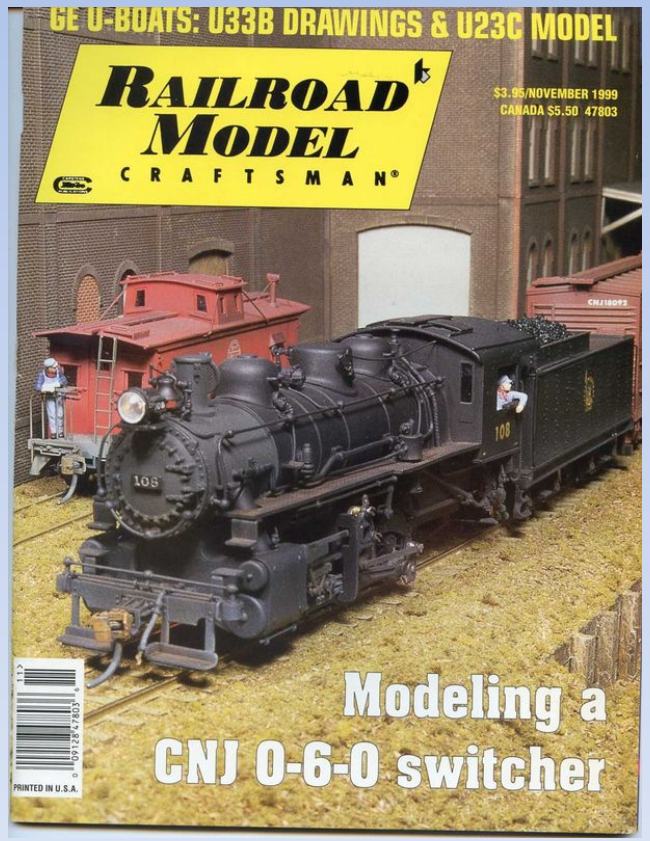
The first two of your models can be relatively easy to complete; **it's all in the details**.

These are Jerry Lauchle's (MMR) two engines. They're both Intermountain kits, detailed as Pennsy F-units with lots of extra details.

Note the windshield wiper paths. It's details like these that make models look more realistic and garner extra points. Also note the paint, lettering, and weathering.

The first two of your models can be relatively easy to complete; **it's all in the details**.

Here's my first one, a redetailed NWSL USRA 0-6-0.



November 1999 Railroad Model Craftsman

And this is my CNJ E2-s 0-8-0, a more complex kitbash.

March 2010 Model Railroader Magazine

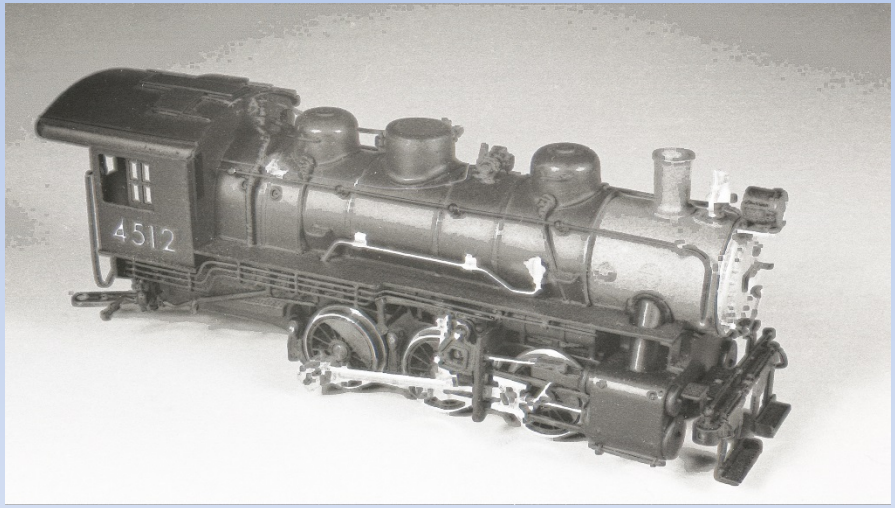
Jerry’s two kitbashed engines

Jerry made use of the many photographs published in *The Keystone*, Vol. 37 & 38, published by the Pennsylvania Railroad Technical and Historical Society, P.O.B. 712, Altoona, PA 16603-0712. The page shown was scanned from this reference. Jerry used the middle photograph of the typical 1951-52 as a guide for the detailing of these HO-scale models.

Even if you don't model a prototype railroad, it's important to follow prototype practice.

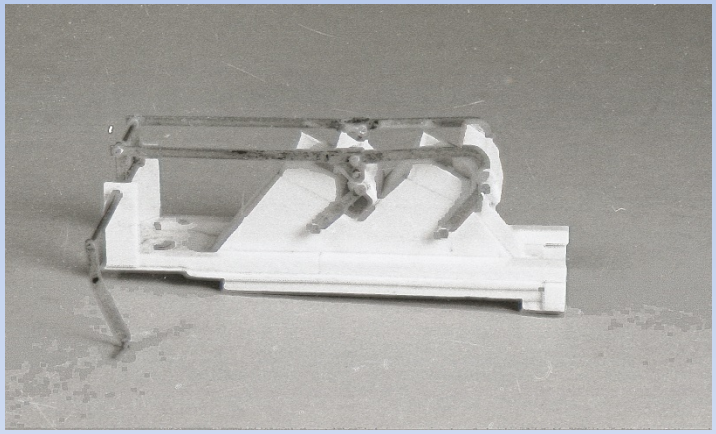
Kitbashing is a good way to start.

I started with an NWSL USRA 0-6-0. I've already added new boiler check valves from Lee Town and moved the bell to match the prototype.



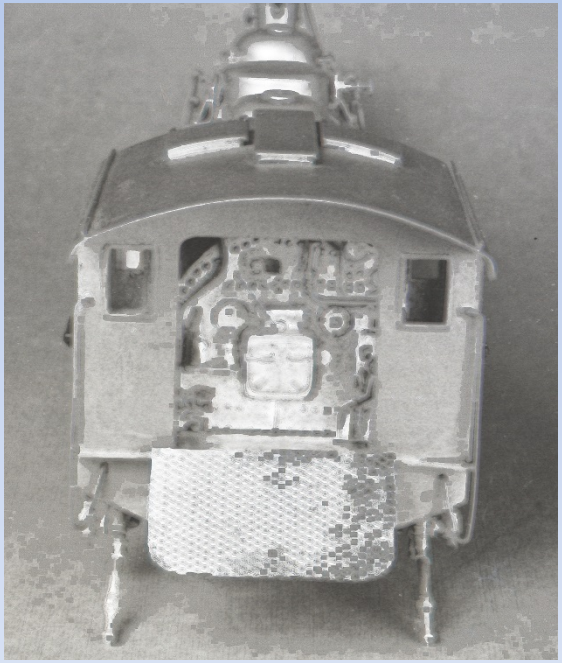
I exchanged the USRA tender with a Lee Town clear vision tender.

I also changed out the cross compound air pump with a single-phase one. The model didn't include ash hoppers, so I made my own – operating, no less.

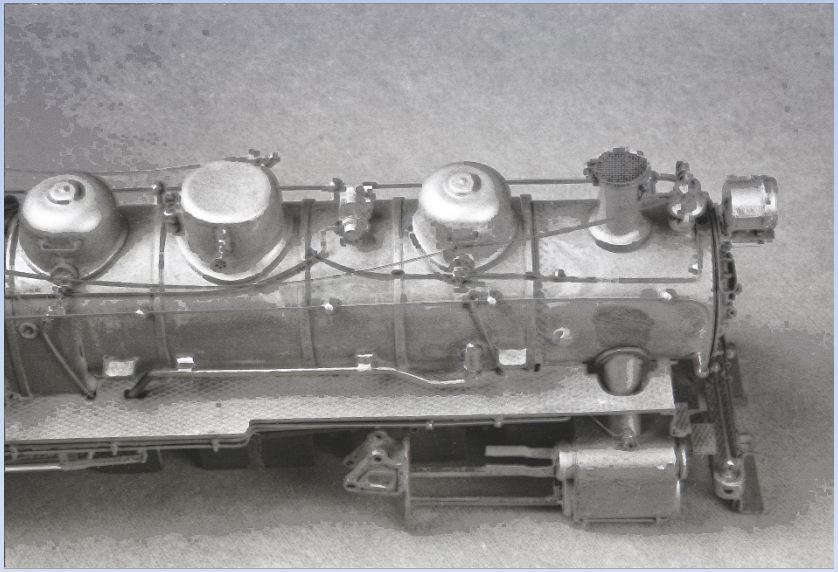


Adding details improves the model and will increase your contest points.

Here is the deck that I scratchbuilt from styrene sheet and expanded metal mesh; a Cal-Scale detail wouldn't work.

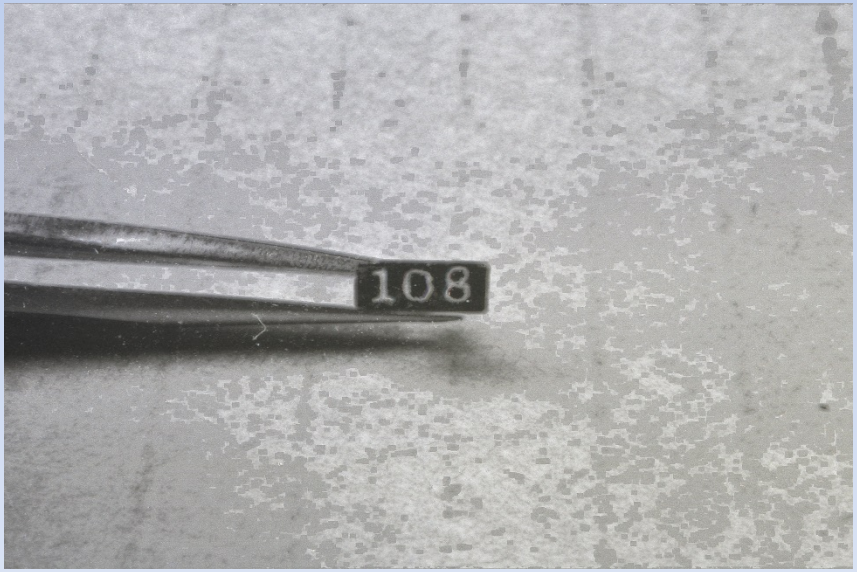


I also added bell and whistle ropes and a spark arrestor on the stack – easy things to add.



Adding details improves the model and will increase your contest points.

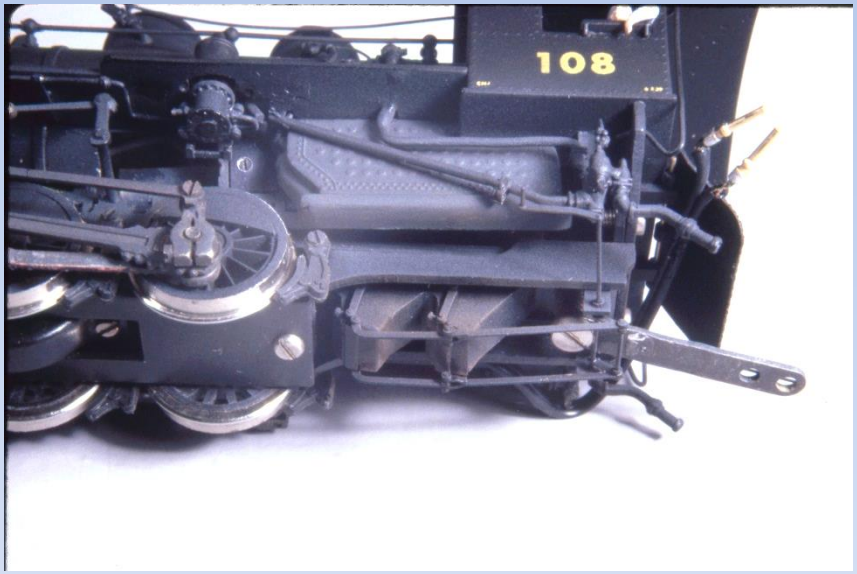
I made my own number plates using Precision Scale number plates separated into individual numbers as stamps. I pressed the numbers into clay and poured molding resin into the impression.



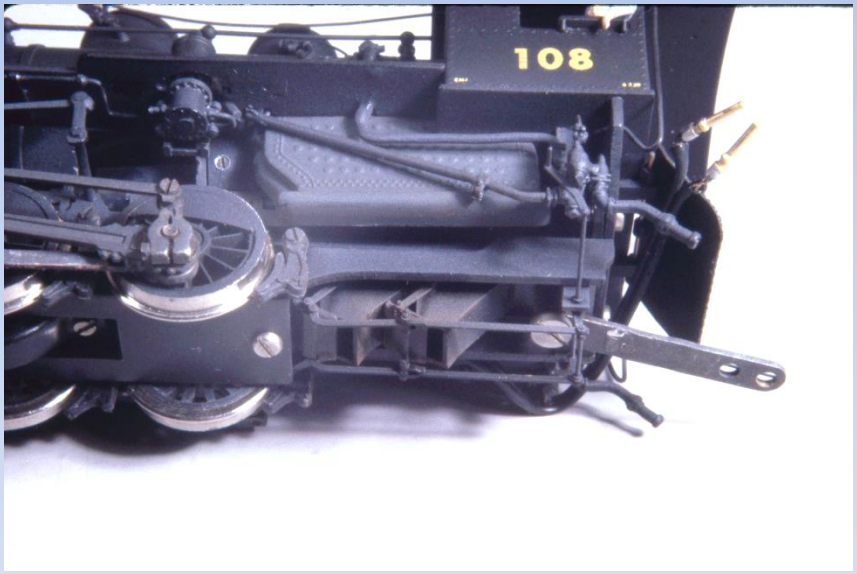
I modified a Lee Town headlight and added it to the back wall of the tender tank…along with another number plate.

Here’s that ash hopper again.

Closed



and opened



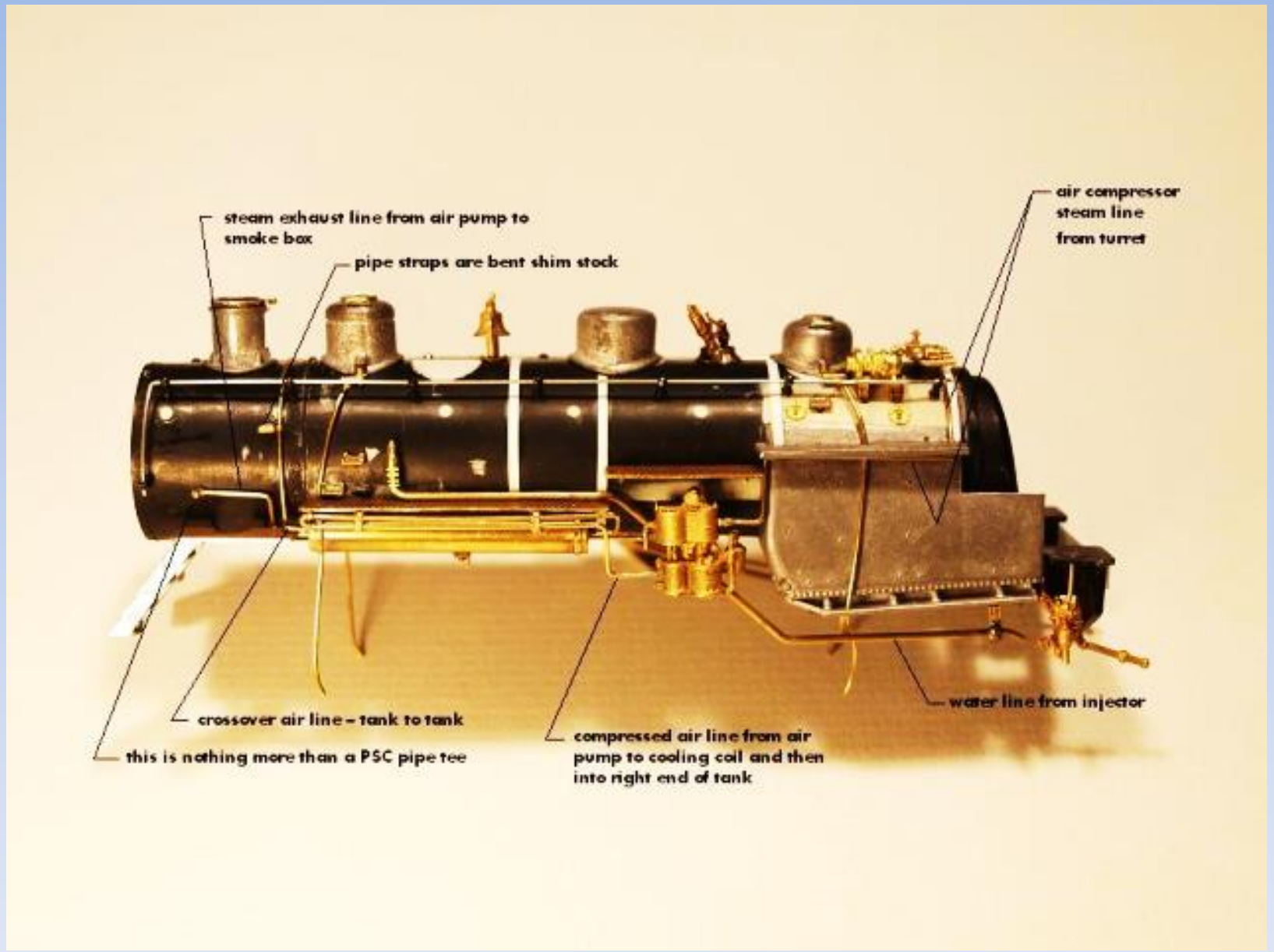
It’s all in the details.

Putting it all together, this is what I ended up with, a model of the Jersey Central's No. 108.

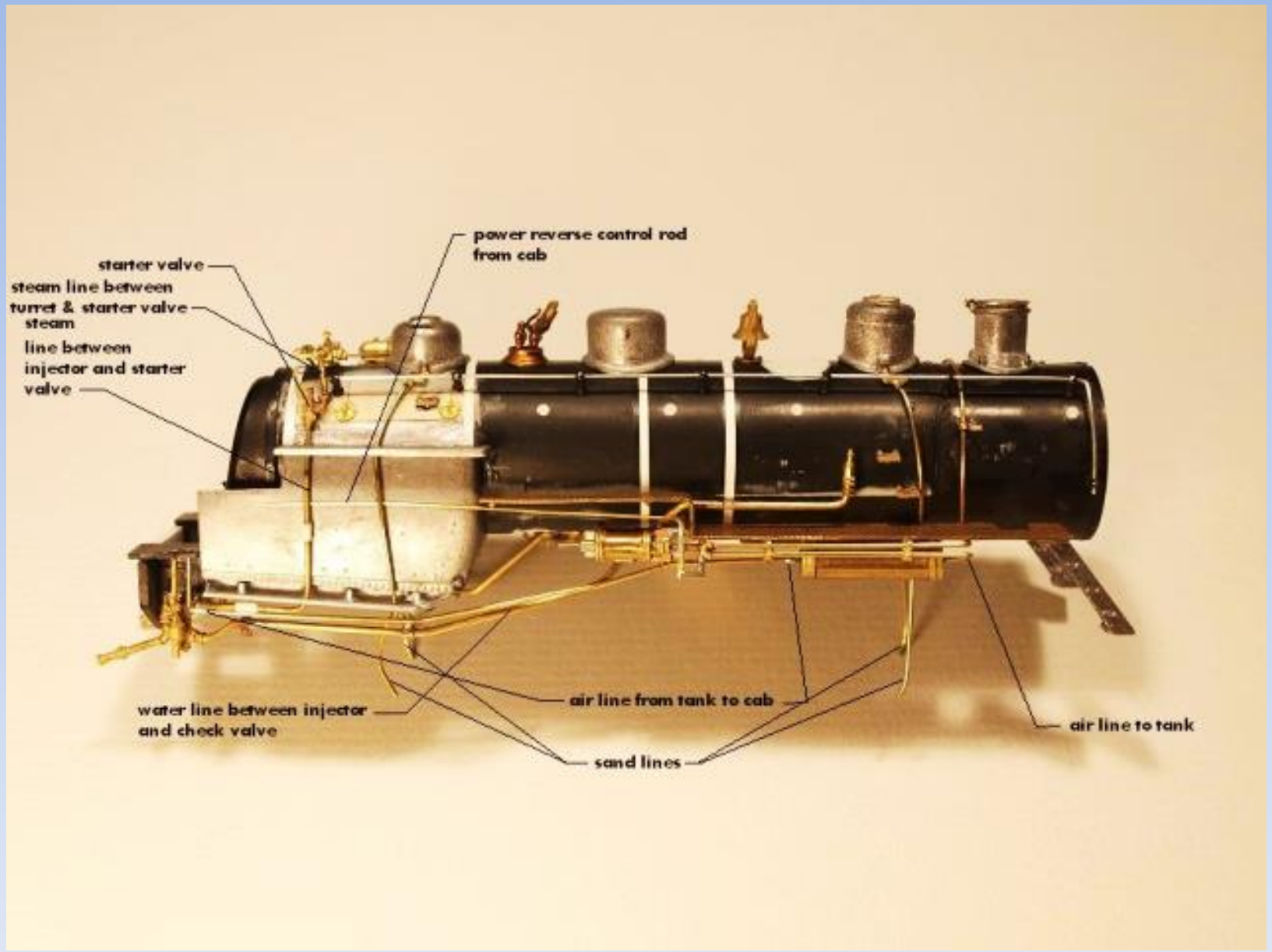
For my second engine, this is what I started with, a Mantua Alco 2-8-0. The drivers were too small and on the wrong wheelbase for an CNJ E2-s end cab switcher.

When kitbashing, get rid of everything that isn't right first.

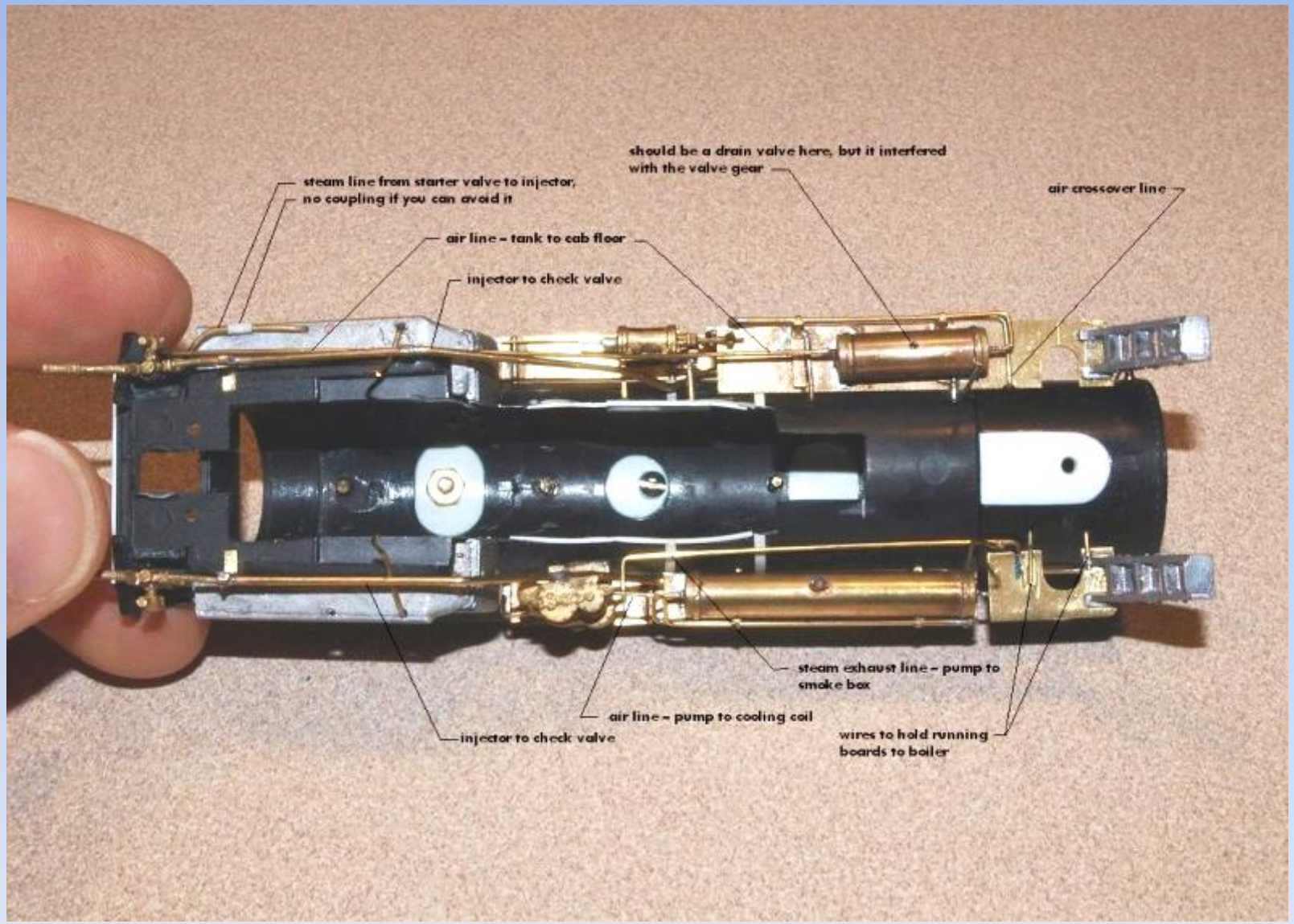
Then add the details following photos of the prototype.



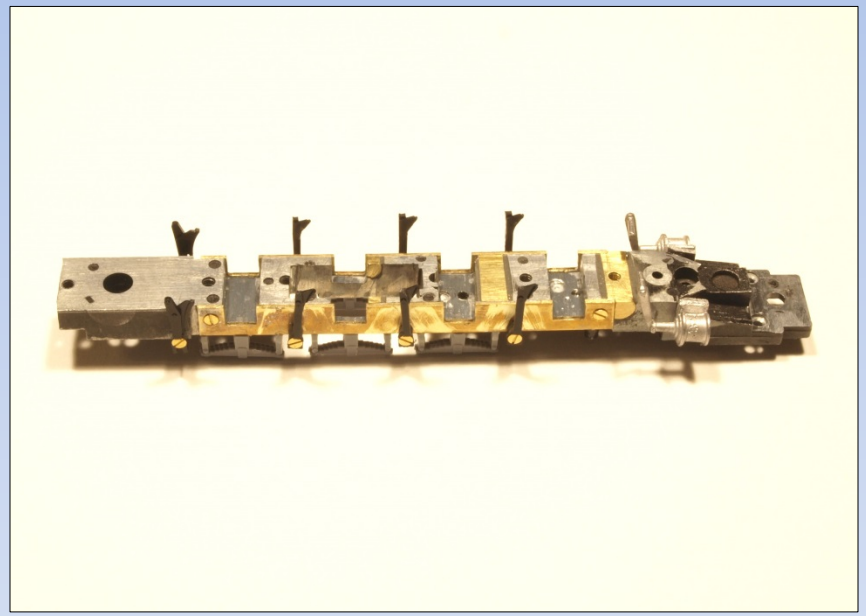
Keep adding them – the more the merrier.

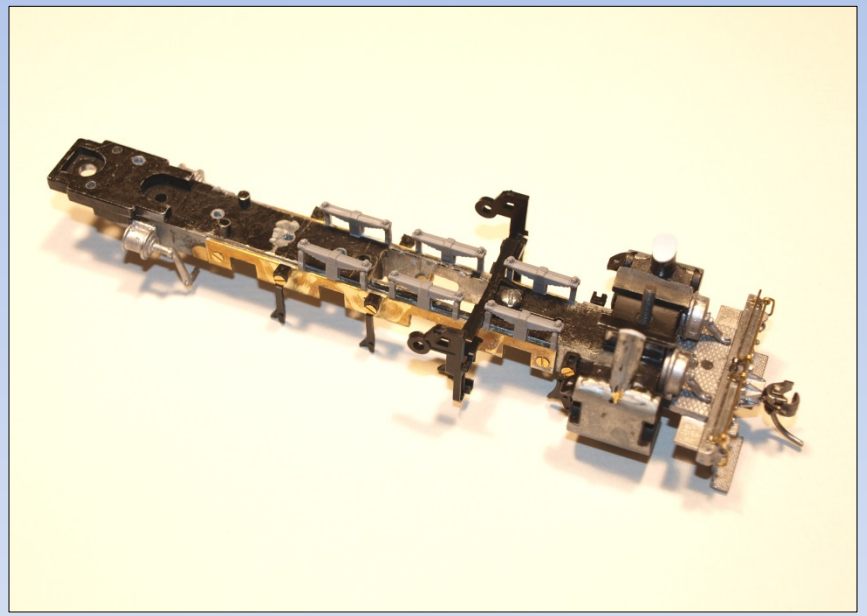


Add more.

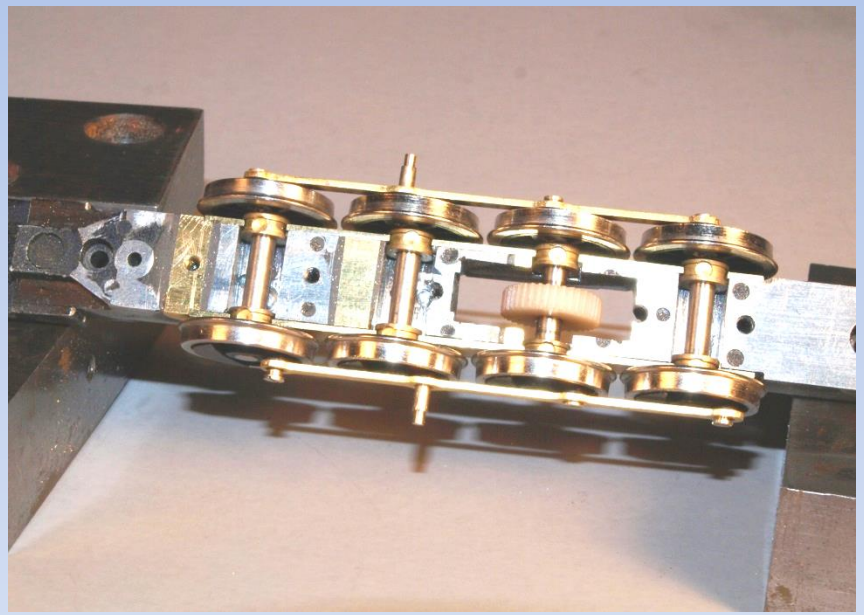

should be a drain valve here, but it interfered with the valve gear
steam line from starter valve to injector, no coupling if you can avoid it
air crossover line
air line – tank to cab floor
injector to check valve
steam exhaust line – pump to smoke box
air line – pump to cooling coil
injector to check valve
wires to hold running boards to boiler

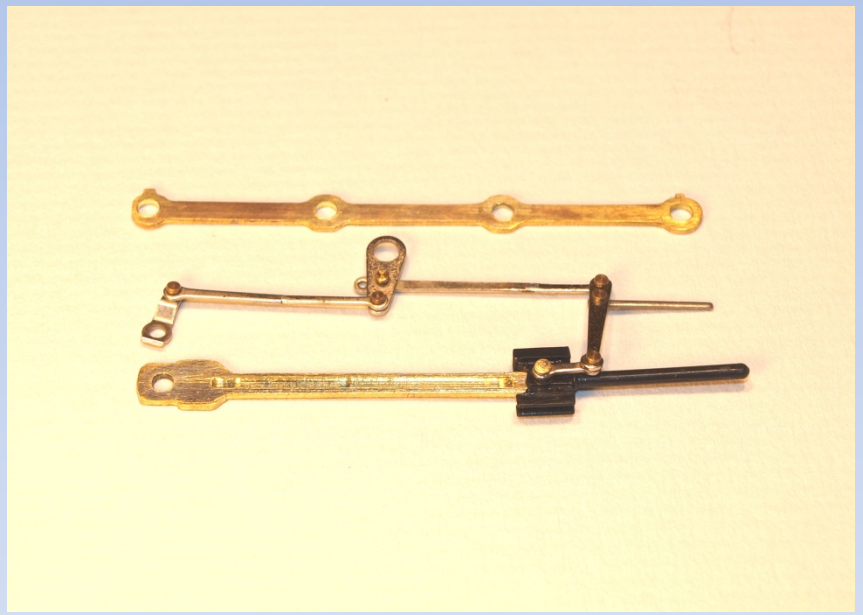
I kitbashed the Mantua frame, too, cutting new axle slots, adding brake shoes, springs, and a new pilot.



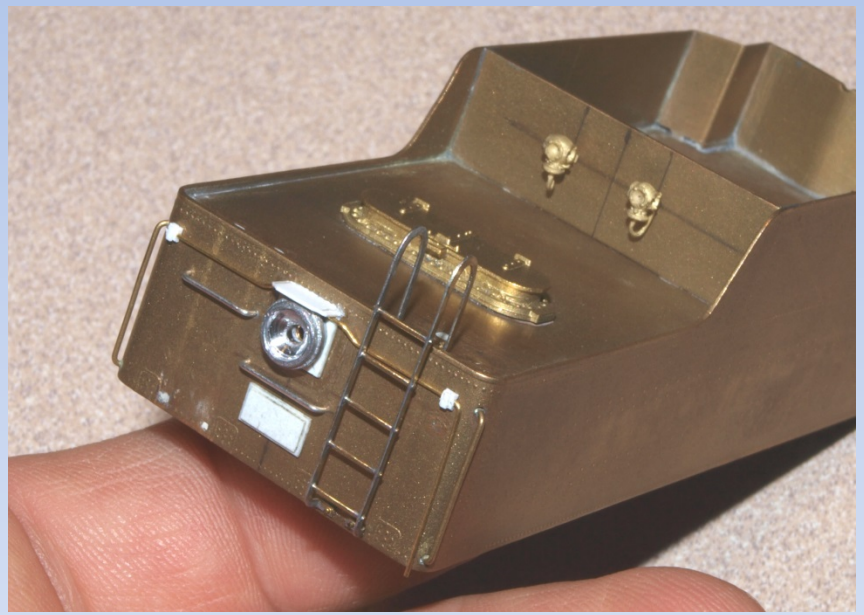


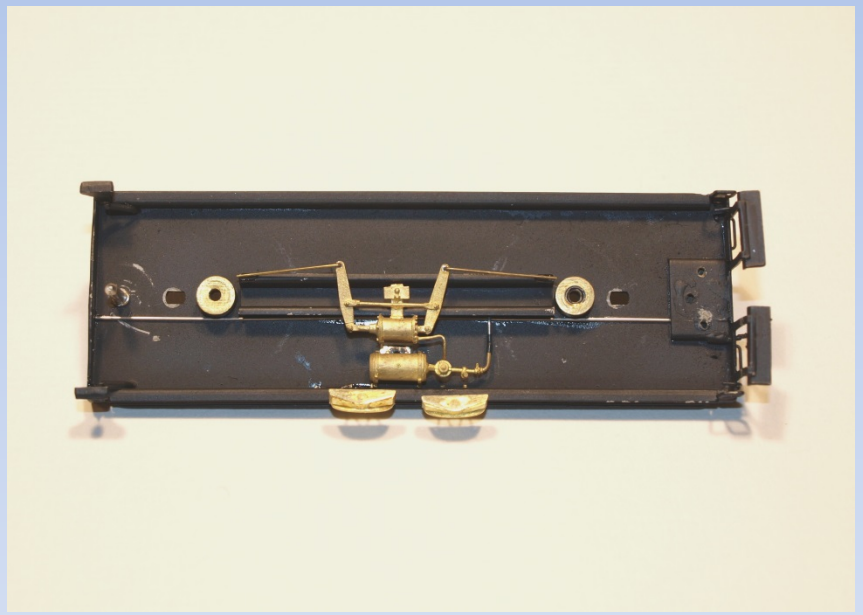
I added 55-inch drivers from Greenway Products, made new main rods, and modified the remaining Mantua rods.



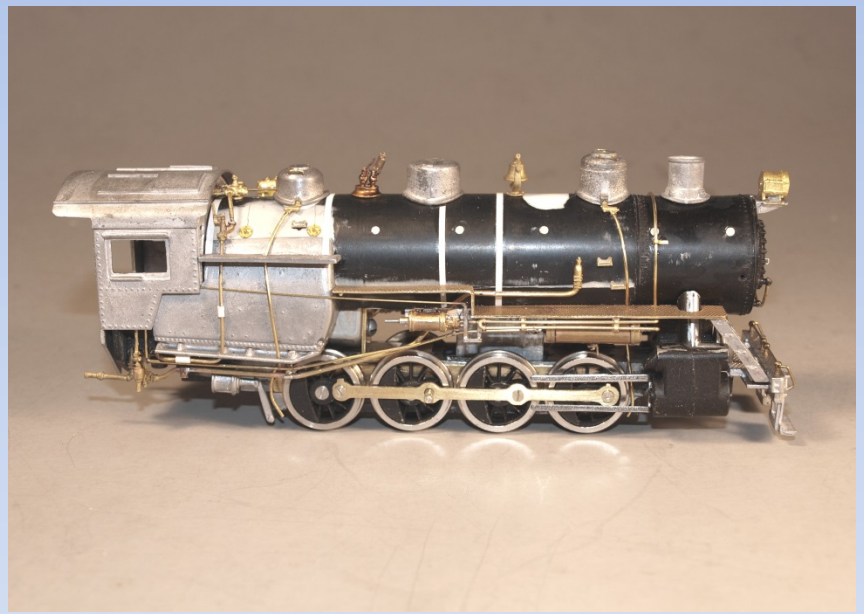


I used the NWSL USRA tender for the 0-8-0, just like the Central Railroad of New Jersey did; they ordered clear vision tenders with the 0-8-0s and then swapped them for the tenders that came with the 0-6-0s.





Put it all together.



And this is what you end up with. Yes, this was a very complex kitbash, but you don’t have to go this far.

You could redetail a diesel.

Like this CNJ GP-7,

Or this CNJ RS-3.

June 2019 Model Railroader Magazine

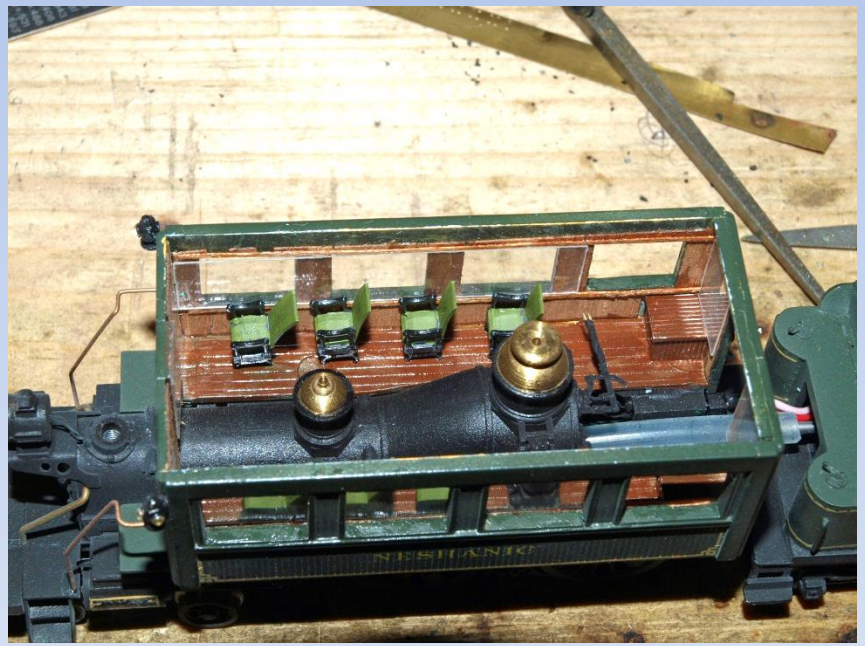
Or one like this Alco C-424 that I built for a friend. It's a redetailed Atlas model with Reading-specific details.

July 1997 Model Railroader Magazine

Or kitbash something like this.

This freelanced inspection engine was made from a Mantua General drive and a cut down Roundhouse Overland coach.

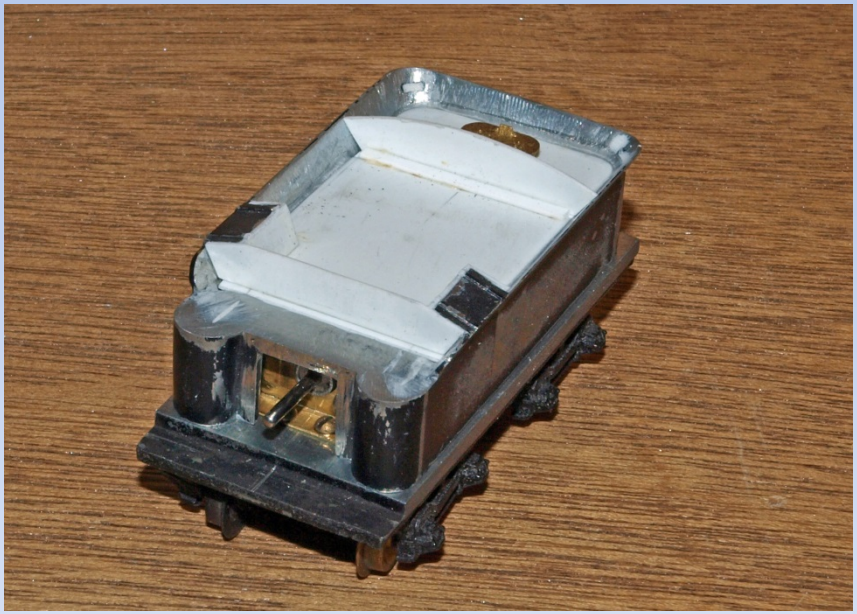
For the added details that "make" the model, I detailed the interior with modified Grandt Line coach seats.



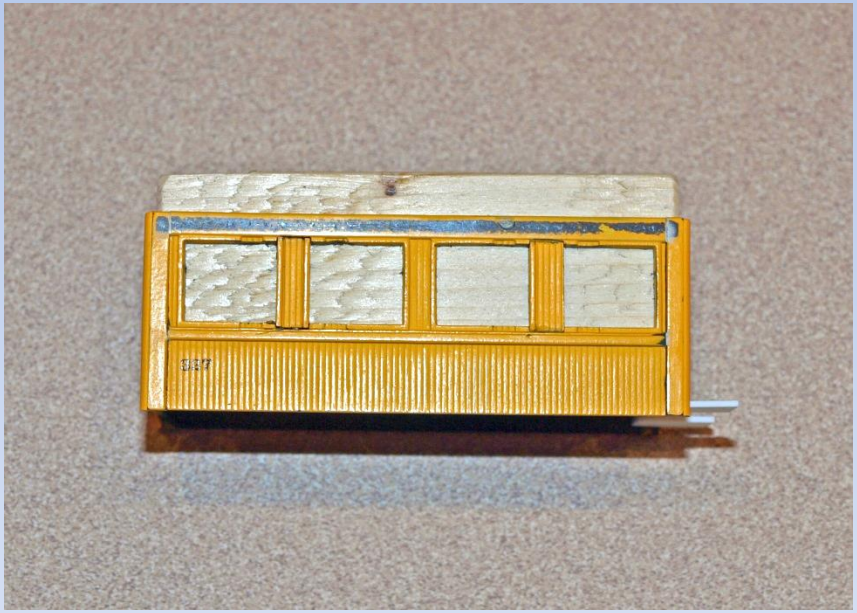
July 2018 Railroad Model Craftsman

Inspection engine kitbash

I modified the Mantua tender shell and added a can motor,



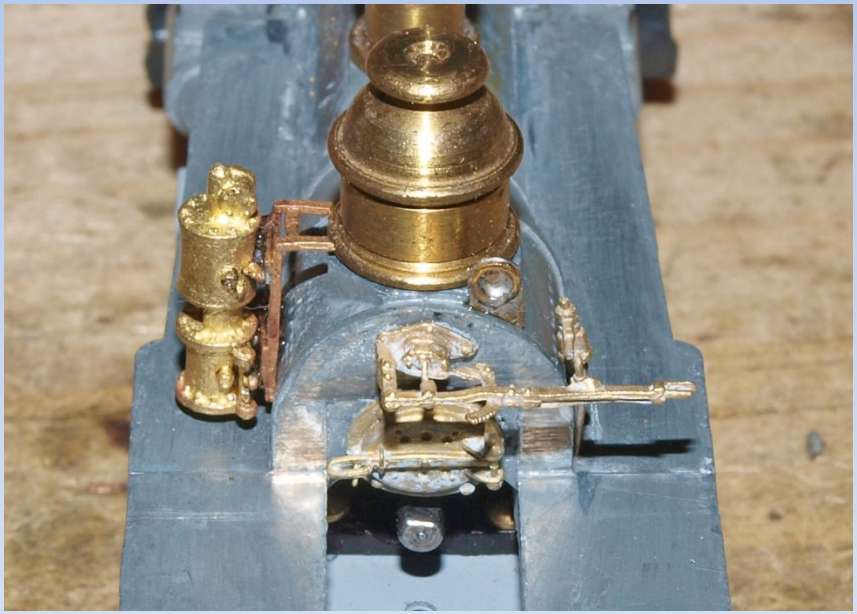
shortened the Roundhouse coach, and reworked the windows.



Again, details make the model and add up in the points department.

The stack is from Precision Scale, extended with some brass tubing. The front steps are from the Roundhouse coach. The hand rails are just bent wire.

Along with the seats in the coach body, I also added some commercial castings to the boiler.



So, now comes the elephant in the room – the scratchbuilt piece of motive power. It doesn't have to be a brass steam engine like some crazy people (like me) do.

You must remember this

A kiss is just a kiss; a sigh is just a sigh (sorry, I got off track)

- To qualify as scratchbuilt, the motive power must contain the following scratchbuilt items as applicable:
  Steam Locomotives: frame, boiler, cab, tender frame and body, either valve gear or main and side driving rods.
- **Other Motive Power**: body, frame, cab, power truck side frame, pantograph or trolley poles where appropriate.

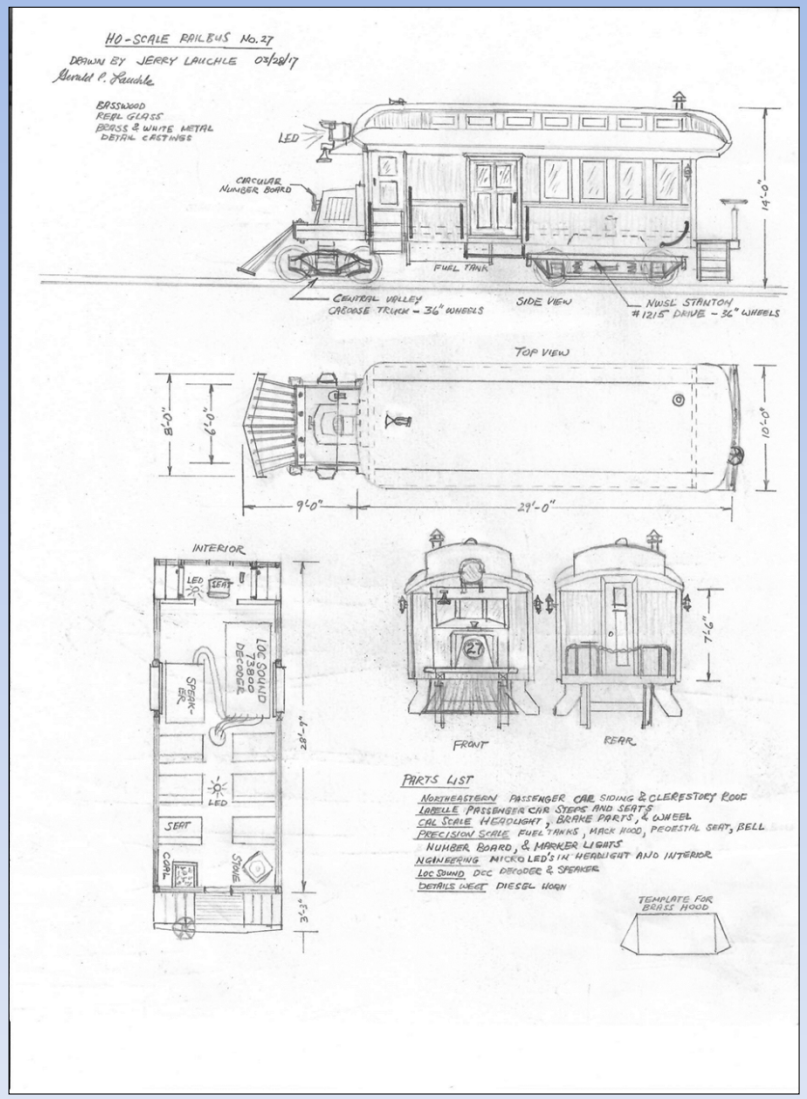
The following parts are specifically excluded from the scratchbuilt requirement.

- Motor
- Gears
- Drivers and wheels
- Couplers
- Light bulbs & electronics
- Trucks
- Paint, decals, etc.
- Bell
- Marker and classification lights
- Brake fittings
- Basic shapes of wood, plastic, metal, etc. ("Basic shapes are things that builders of the prototype would have used as raw materials. For example an "I" beam would be a basic shape; a commercial door or window casting would not.)

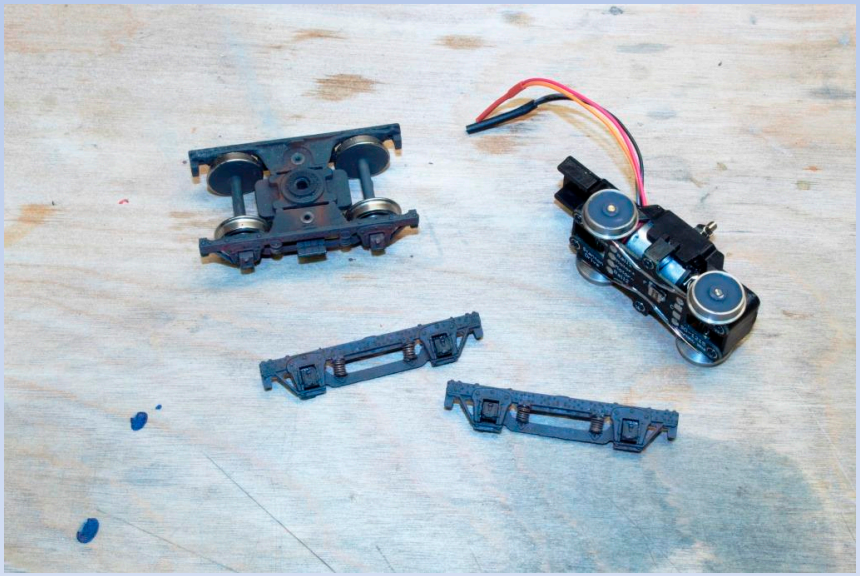
It doesn’t have to be a steam engine at all. Jerry Lauchle scratchbuilt this beautiful Mack railbus – mainly from wood.

Here is how he did it.

He drew his own plans.



He took an NWSL Stanton drive and added sideframes from a Central Valley passenger car truck.

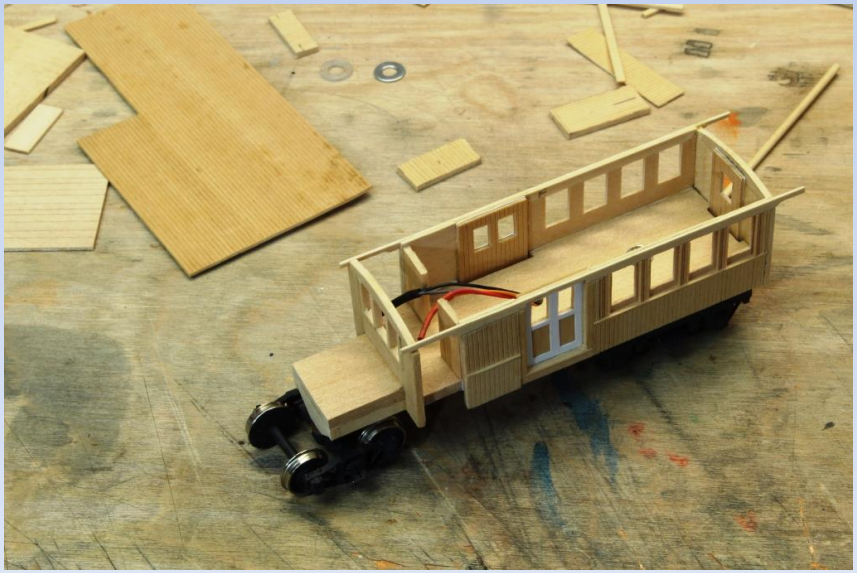


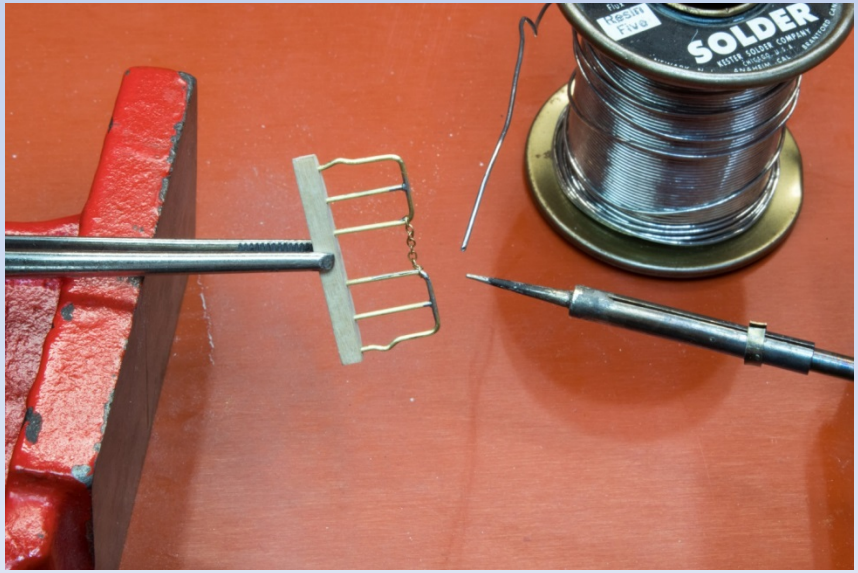
Scratchbuilding a Mack railbus

in Jerry's own words

Build the ends and sides before attaching them to the floor. The door frames are created with cardstock cemented to the basswood. The open platform passenger car steps are white metal castings purchased from LaBelle Woodworking.

The rear railing was formed from .032" brass wire and soldered; the chain is brass. A brass shaft and brake wheel was also added to the platform.



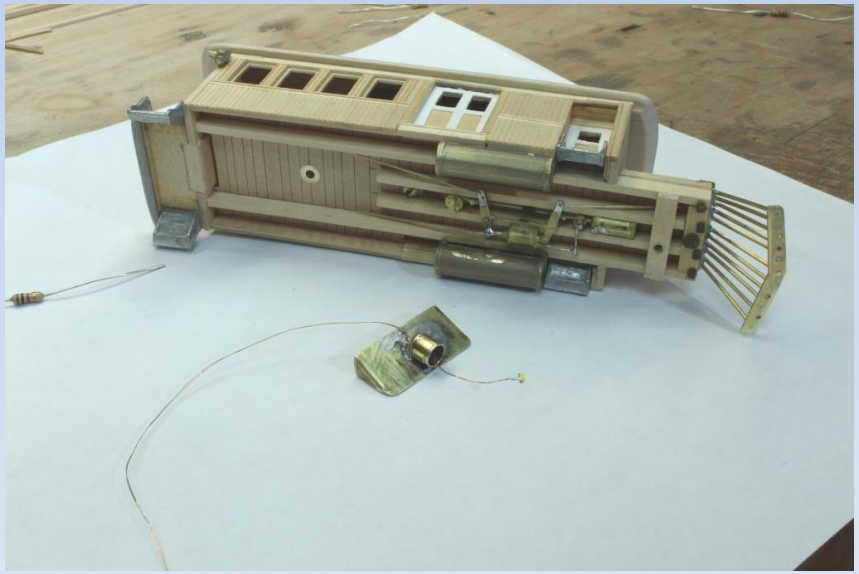


Scratchbuilding a Mack railbus

in Jerry's own words

The pilot was made from sheet brass cut with a jeweler's saw to the V-shape and drilled to accept .032" brass rods which were bent before soldering. These rods were then inserted into holes drilled into a length of 1/8" brass angle and soldered. Resistance soldering is useful here to prevent previously soldered rods from becoming un-soldered.

The Cal-Scale headlight casting was soldered to the formed brass windshield hood and a micro LED from Ngineering was wired and routed via a 560Ω resistor to the decoder inside the baggage compartment. Cal-Scale "U" brake details are used on the underside and Precision Scale fuel tanks and marker lights are epoxied to the body. Tichy nut-bolt-washer castings are located on both the top and bottom of the pilot.



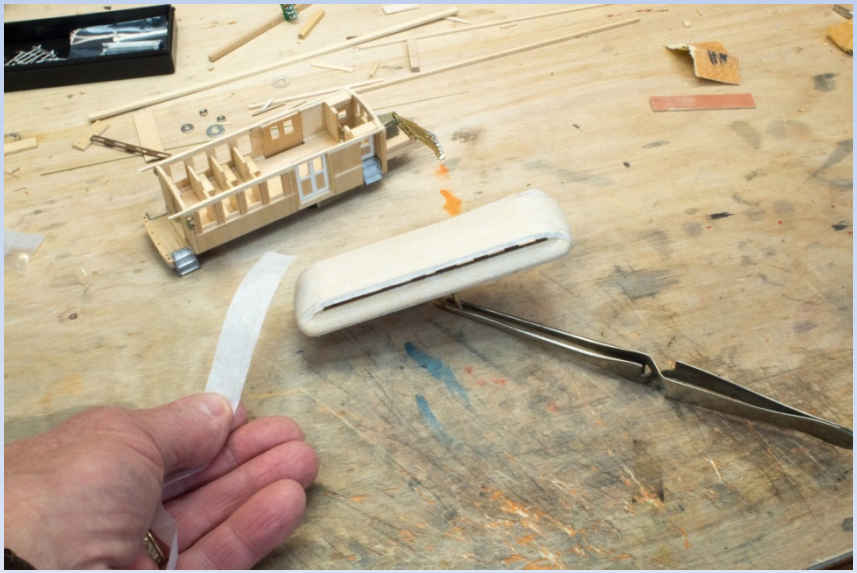
Notice in the right-hand photo that the frame is scratchbuilt – one of the requirements.

Scratchbuilding a Mack railbus

in Jerry's own words

Fine tissue paper that simulates tar paper is bonded to the roof with diluted white glue. It will be then painted with a weathered black paint.

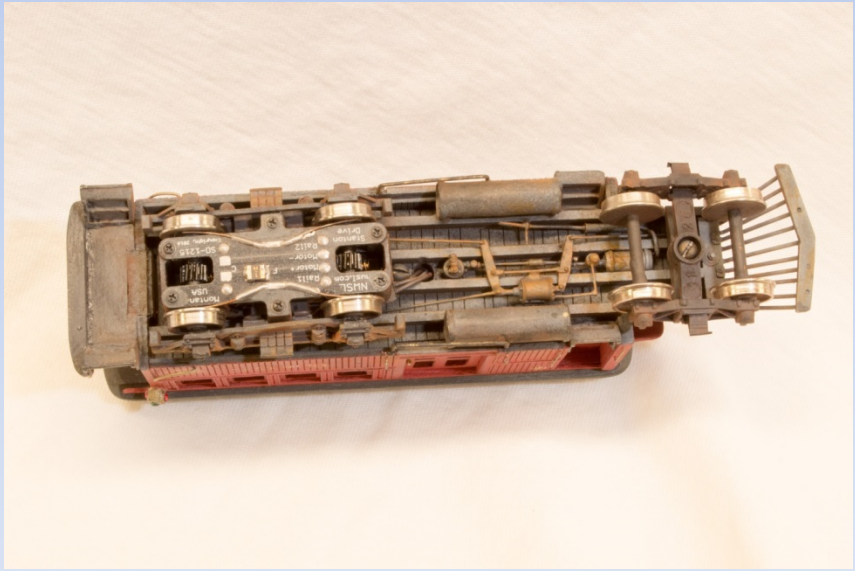
The railbus, being made mostly from wood, needed weight to assure good electrical pickup by the power truck. I added a little lead between the decoder and speaker, but most of the weight came from the addition of low-melting point alloy (Cerrobend) in the clerestory roof.



Scratchbuilding a Mack railbus

in Jerry's own words

The underside of the railbus is fully detailed and weathered.

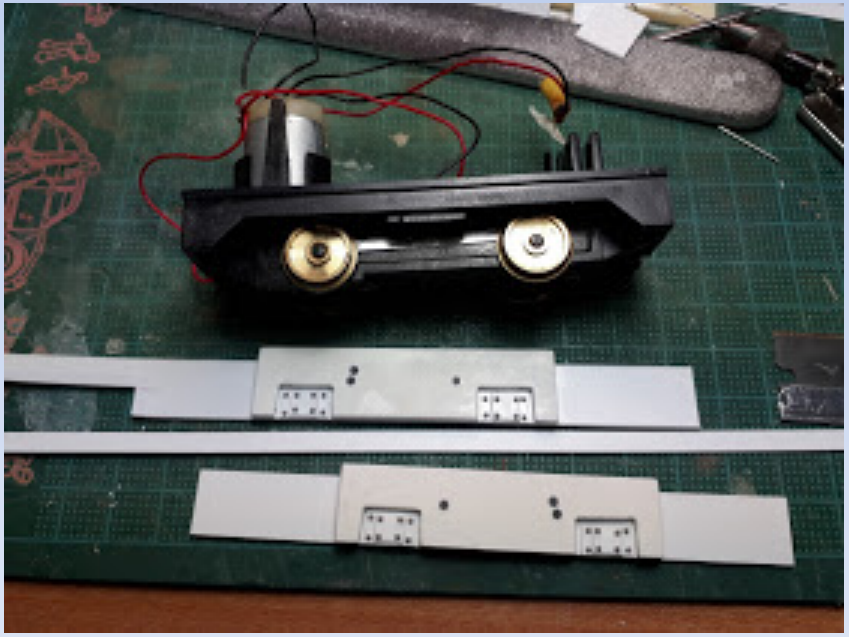


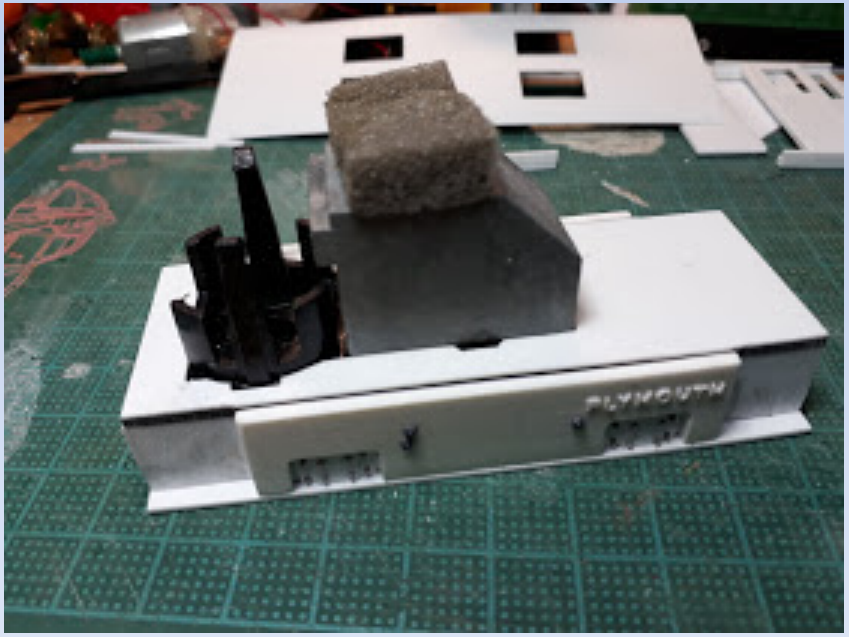
The railbus interior is detailed with seats, passengers, a stove, a coal box, and of course, a driver. Concealed in the baggage compartment is the N-scale LocSound decoder and speaker.

Here is how another MMR scratchbuilt his Plymouth Industrial Diesel in 1/35 scale

Alain Kap used a powered drive from Model Power. Whereas their Plymouth diesel has the side sills cast to the frame, the Porter drive is clipped into the body of their Hustler locomotive.

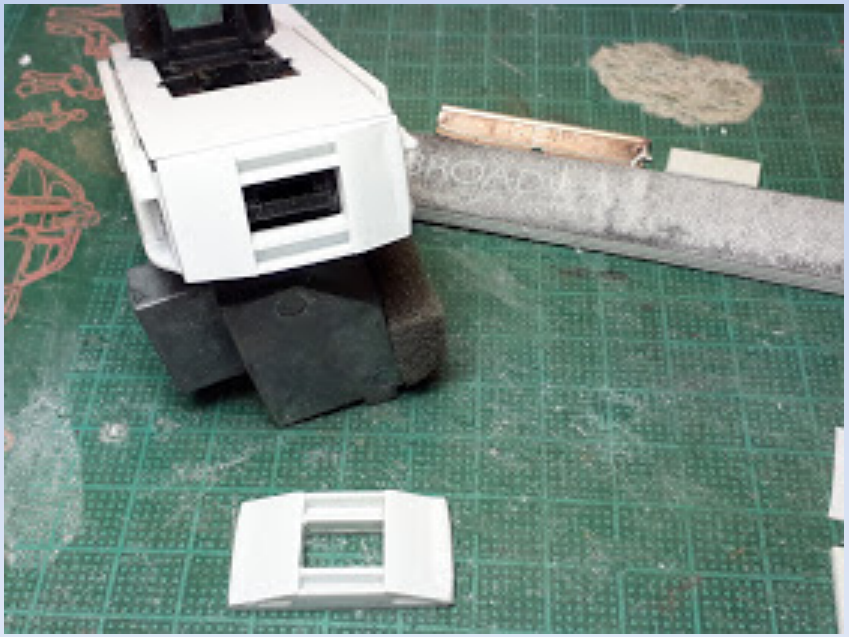
He had to make a cut-out in the deck for the engine mount and a large die-cast weight. With the side sills and buffer plates, he built a new frame with the drive attached.





Here is how Alain built his Plymouth in his own words.

The buffer beams are pieced together with different bits of styrene strip and sheet. I sanded the to achieve the rounded shape. The larger opening is where the Kadee coupler protrudes. The locomotive may also be used with link and pin draft gear.

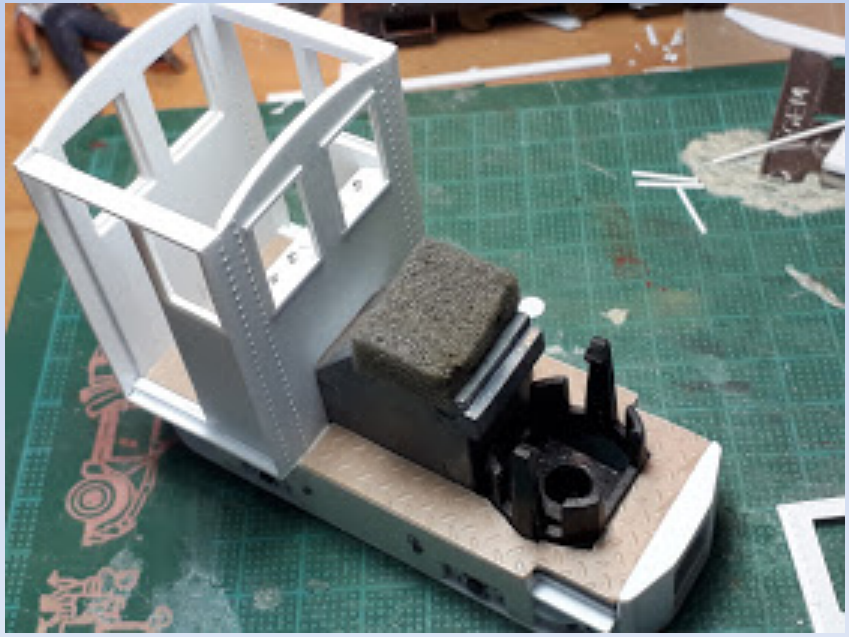


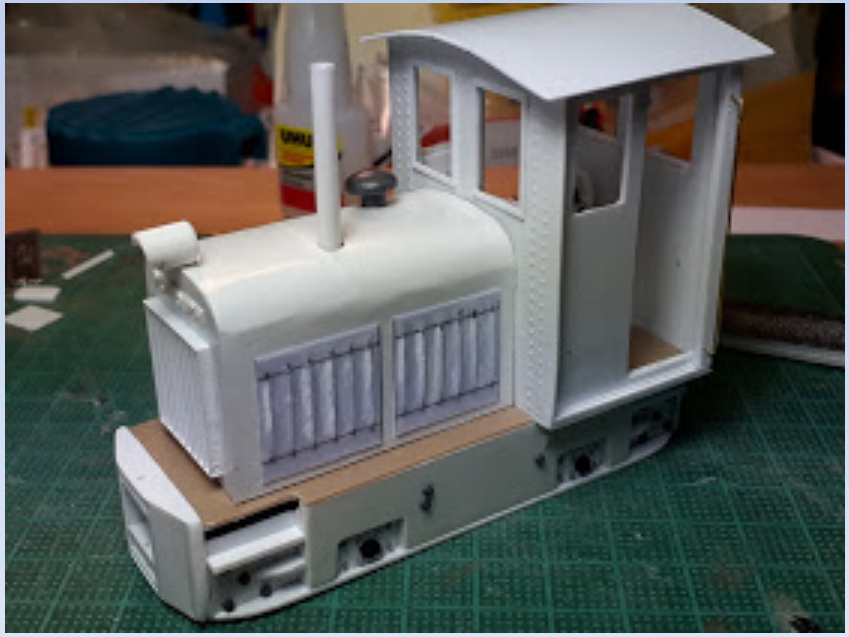
I added steps, nut-bolt-washer castings and Slaters 2 mm letters for the Plymouth signage. The wheel bearers are also layered styrene with n-b-w's. I lined the top of the frame with Slaters styrene tread pattern sheet.

Here is how Alain built his Plymouth in his own words.

The cab is also built by laminating an inner wall to a base sheet and a thinner sheet with embossed rivets to the outside. Small styrene strip is used for the window trim and styrene channel for the sliding door guides.

The hood was formed around a styrene core, sanded to shape. The radiator grill is pieced together using styrene strip and the engine doors are cardboard with louver slots cut and hardened with Super Glue. On my previous industrial diesel I used quarter round styrene strips to simulate the louvers, but the openings cut into cardboard are more realistic.





Here is how Alain built his Plymouth in his own words.

The interior features a dashboard with gauges, buttons and ignition key. The buttons are sewing pin heads and the gauge is cut with a paper punch. A folding seat and brake wheel with chain is attached to the rear wall.

The lamp shades are cut from styrene tube with LED's added. The LED legs serve as mounting pins as well. The horn is scratchbuild using .005" styrene rolled around a core of styrene rod. The chimney is also a piece of styrene tube.

Alain's Plymouth Industrial Diesel garnered 106 point in NMRA judging.

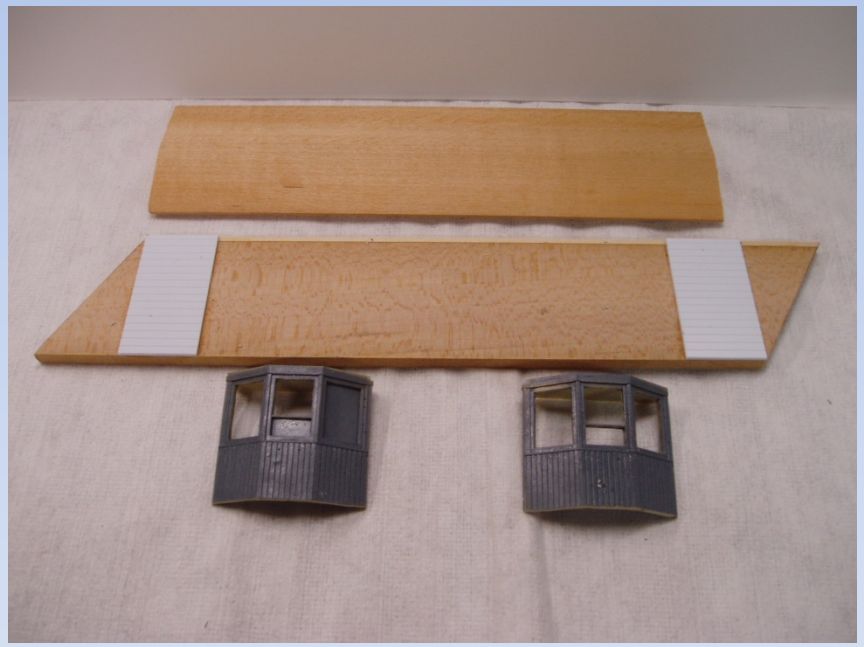
I painted the locomotive Golden Olive for the interior and Medium Sea Grey on the outside. I finally weathered the locomotive with Pan Pastels.

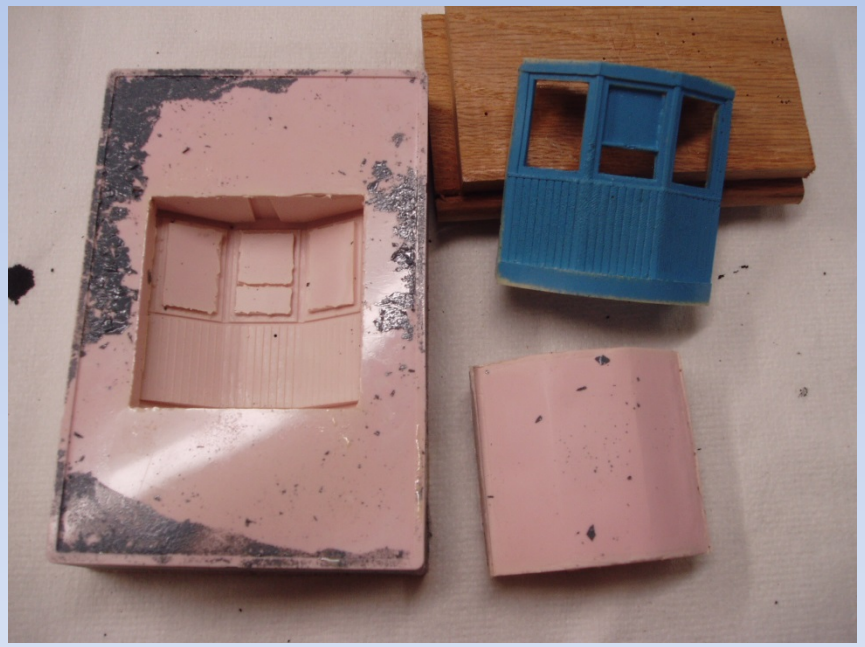
Finally, let's take a look at Martin Brechbiel's CG&W's trolley snowplow.

His inspiration was a Philadelphia & Western double-ended snowplow in the Rockhill Trolley Museum's collection.

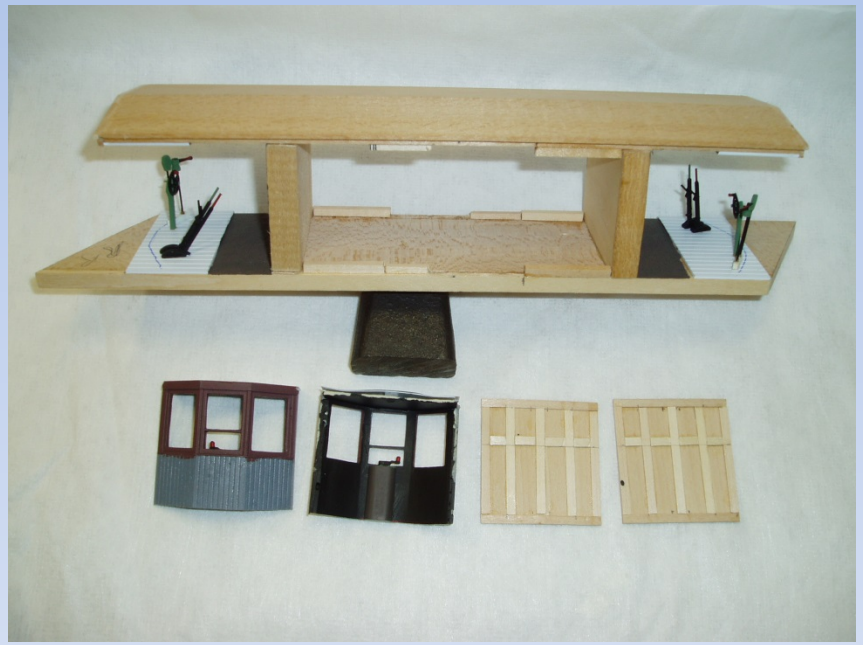
Martin's CG&W trolley snowplow

He began with basswood and his own resin cast ends patterned after Pittman trolley ends that are no longer available.





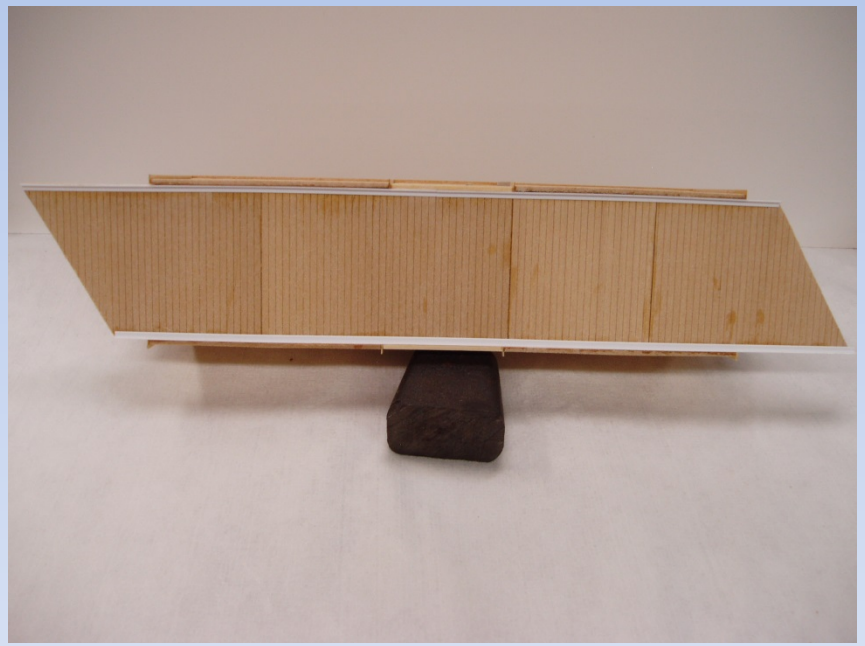
Martin scratchbuilt sliding freight doors and added interior details before closing in the car.



Martin’s CG&W snowplow

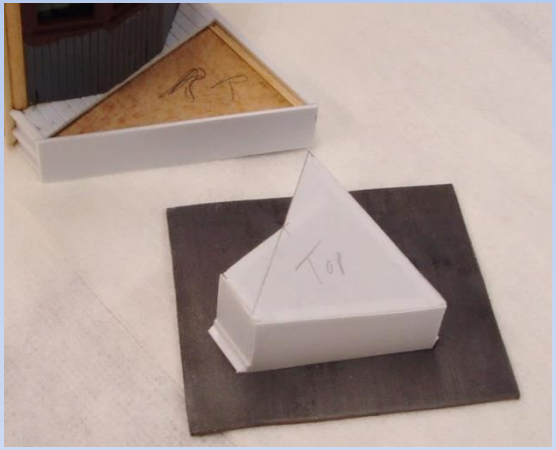
The Arttista motorman is a nice touch along with other details.

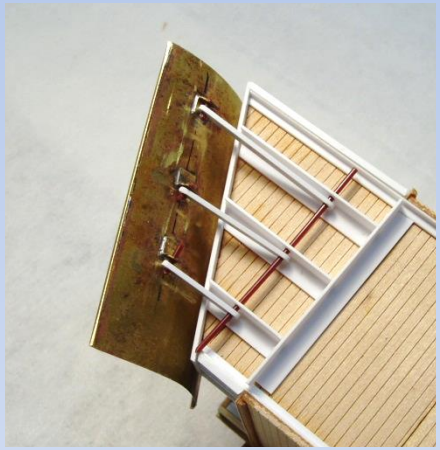
He added scribed basswood to the underside of the body in preparation to adding plow details.

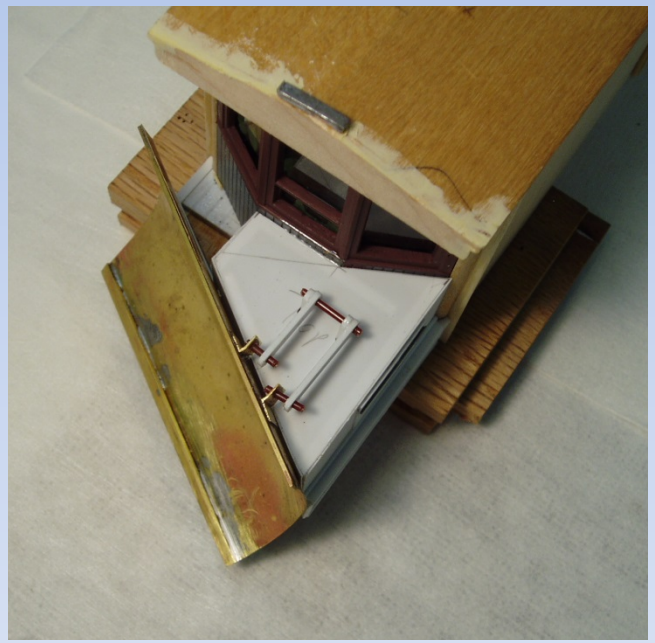


Martin's CG&W snowplow

The plow mechanism was built from styrene and mounted on top of the angular floor. He then scratchbuilt the blade from brass sheet and added lifting mechanism details.



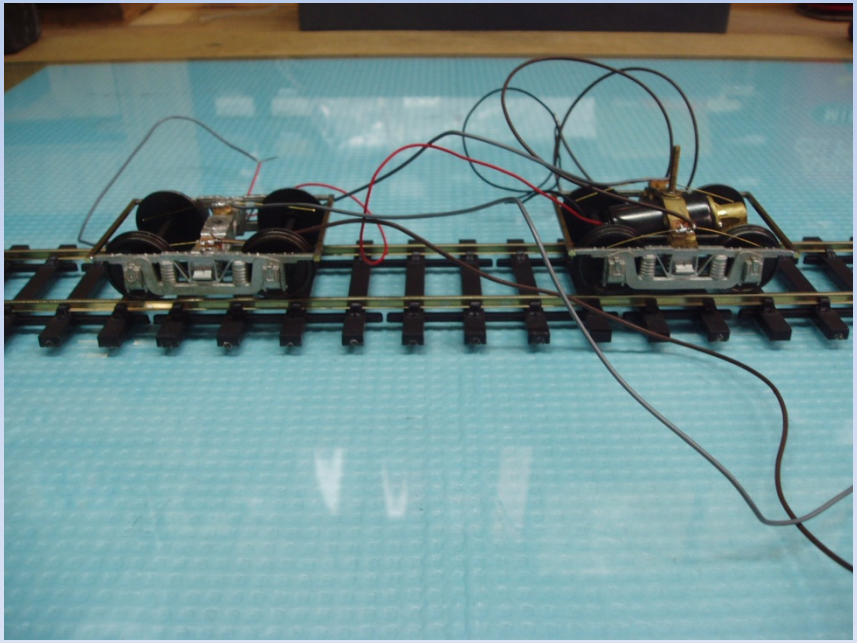




Martin's CG&W snowplow

The drive system was a Q-Car Company insulated truck and trailer with CS205 sideframes. Martin added wipers and electrical leads for 8-wheel pick-up that could be switched over for overhead power supply.

He added many commercial castings for underbody detail and painted everything grimy black.



Martin's CG&W snowplow

The roofwalk is scratchbuilt; other details come from Precision Scale and Q-Car Company.

Martin chose not to model his trolley as a weather-beaten relic.

In NMRA judging, Martin's trolley snowplow achieved a score of 97.5 points.

So there you have it.

The things to remember are:

1. You don't have to scratchbuild a steam locomotive in brass to qualify.
2. Kitbash your first two pieces of motive power.
3. Review what has to be scratchbuilt and what doesn't have to be scratchbuilt.
4. Work with wood or styrene if you're not comfortable working with metal.
5. The name of the game is **Details**, the more the merrier.
6. Also keep in mind all the items that are judged:
    A. Construction (40 points max.)
    B. Details (20 points max.)
    C. Conformity (25 points max.)
    D. Finish & lettering (25 points max.)
    E. Scratchbuilt (15 points max.)

YOU CAN DO IT!

Questions?