

The First Lionel 381

By Dr. Gerald C. Wagner
TCA 74-6574

Note: These notes were cut down and published in the TCA Quarterly, Vol. 60, No. 2, April, 2014, pages 17-19. I seek your comments.

- In 1925, the “Dorfan Loco-Builder Engine” was introduced. In 1926, Dorfan introduced the wide gauge 3930 Loco-Builder with a 4-4-4 wheel arrangement. Ives had been offering their 4-4-4 3243 locomotive since 1921.
- Lionel was a responder as well as an innovator. Design for their 4-4-4 “Lionel Bild-a-Loco Locomotive” likely began early in 1926 as the 381 prototype discussed in these notes was assembled and painted before the 408E went into production in 1927.
- The prototype 381 suggested changes were needed. It was easy to drop out the drive wheels, but it took skillful hands to remove the motor. And the prototype is top-heavy. So Lionel released the 408E in 1927. It is simply a 402E with 381 features added.
- And, as shown below, the prototype 381 preceded the Super 381.

In 1928, Lionel first cataloged the hand reverse 381 and remote control 381E locomotives. They were toy models of the Milwaukee Road’s bi-polar electrics, and the largest and heaviest locos that Lionel ever put into production. The 1928 catalog used artist renderings, and the early Bild-a-Motor shown wouldn’t work with the mounting latches common on Bild-a-Loco engines. Production motors have a longer base and extra brass spacer bars to accommodate the latches.

Fred Braun (TCA 67-1910) found this Red sub-frame, hand reverse 381 in the mid 1960’s through a ‘picker’ who was a San Francisco bus driver. Besides this 381, the haul included a set of three State cars, a 390E Blue Comet set, two Flyer sets, brand new Lionel freight cars, etc. Fred is more into condition than rarity, so he traded the Red sub-frame 381 to the late Jon Lundberg (TCA 67-1758) for a very nice production 381E. Jon was the caretaker of this prototype for forty years. I bought it from Jon.

All but a small handful of 381E’s have Apple Green sub-frames. In the Appendix, there is a photograph of a Red sub-frame 381E. It is similar to production 381E’s in all other aspects but the sub-frame color. The subject of these notes appears to be the first Red sub-frame, hand reverse 381 found, and it’s materially different from production models.

As these notes show, this locomotive is definitely a prototype with many differences between it and production models. The hand reverse brass plate is blank; it doesn’t say ‘forward’, ‘reverse’. And Lionel had not yet had etching designed for the large brass name plate.



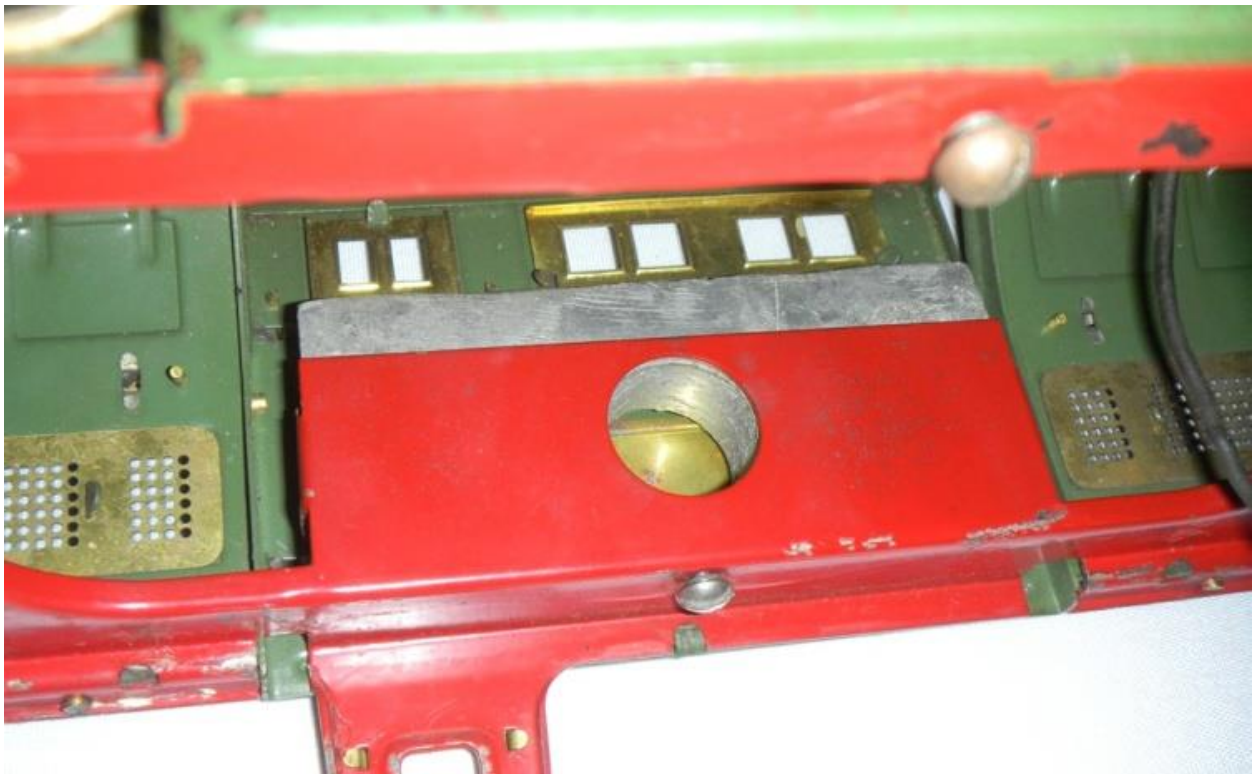
Before getting into the unique details of this loco, here are some thoughts on Lionel production planning. Have you noticed that the #300 Hell Gate Bridge, first offered in 1928, was designed for 4-tie standard gauge straight track? Yet 4-tie straight track did not appear until 1931; three years later. Have you noticed the 392E with a 12-wheel tender on page 3 of the 1933 catalog? Yet the 12-wheel tender did not appear until whistles were introduced in 1935.

I mention these delays in Lionel production because I believe this Red sub-frame 381 is a prototype made for a new locomotive intended for release in 1927, not 1928. But the prototype had to be re-designed – it was top-heavy and Lionel likely desired to make it a true Bild-a-LoCo. So they fluffed up the 402E to create the ‘new’ 408E -- the premier locomotive of 1927. The changes to the 402E were simple – just add some of the features from the planned 381 -- more hand rails including roof railings, operating pantographs, Green acetate flags, and four running lights. See “Comments from a noted collector” in the Appendix.

The cover of the 1927 catalog shows an ‘artist’s conception’ of the 408E with brass running light housings like the 381, operating pantographs, extra hand rails including roof railings, and Green acetate flags. In the 1927 catalog, the new ‘finest gift’ 407E set, priced for \$300, on page 26 lists the 408E in its table of contents, yet the picture shows a 402E. Catalog printing was ordered before a 408E was assembled.

The Red sub-frame of this prototype 381 is quite different from the production sub-frame. It goes up higher inside the loco body and holds large lead weights on the sides of the cab. There are no punch outs to mount weights on the floor like production locos, nor punch outs to mount a light bar. The side weights make this prototype top-heavy, so Lionel switched to weights mounted on the floor of the sub-frame.





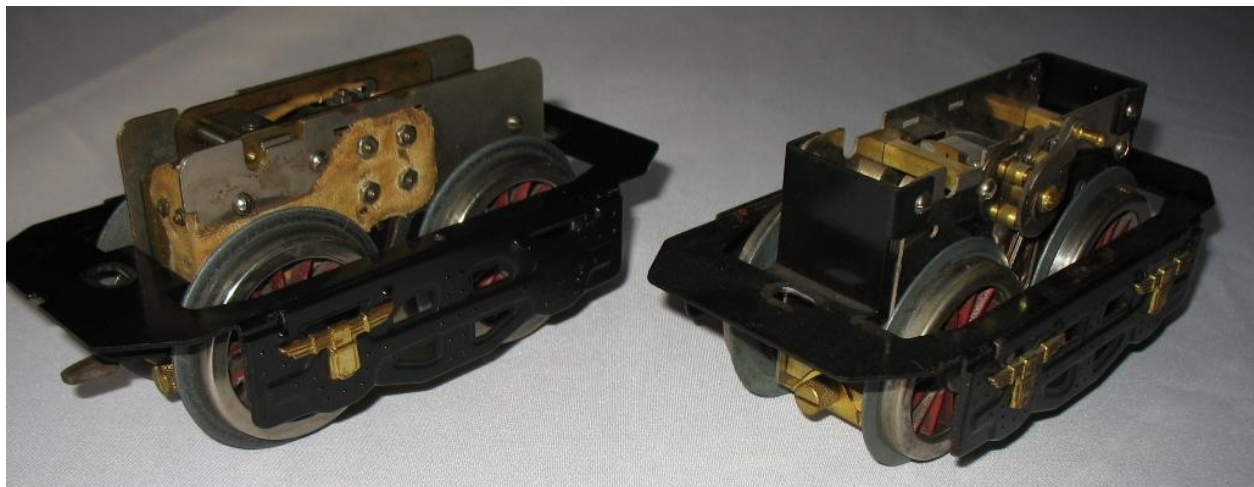
For comparison, here is a similar view of a production 381E. The Black blocks peeking out of either end are iron weights riveted to the sub-frame.



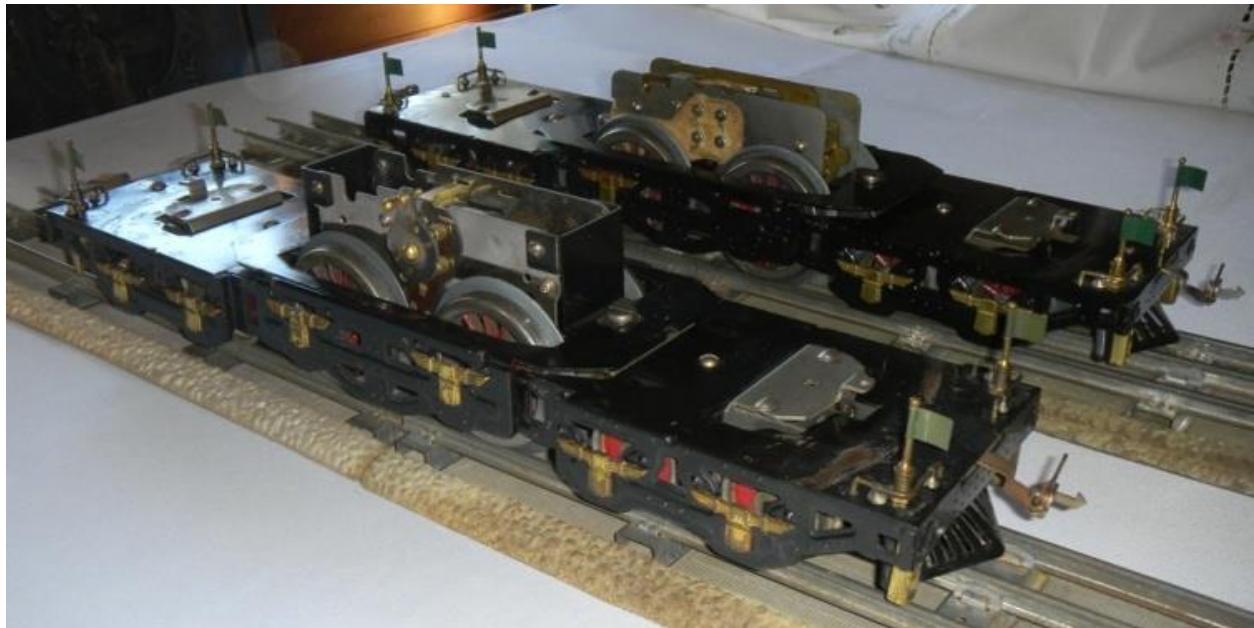


Studying the photo above, we see that the prototype's brass ventilators on the sides of the noses are wide open. The production ventilators have Apple Green backing plates.

Besides the Red sub-frame, another odd thing you notice is that the center Black frame has integral risers to hold the motor, and the Bild-a-Motor is held in by screws like an early 9 or 9E. So an early Bild-a-Motor like that shown in the 1928 catalog works just fine.

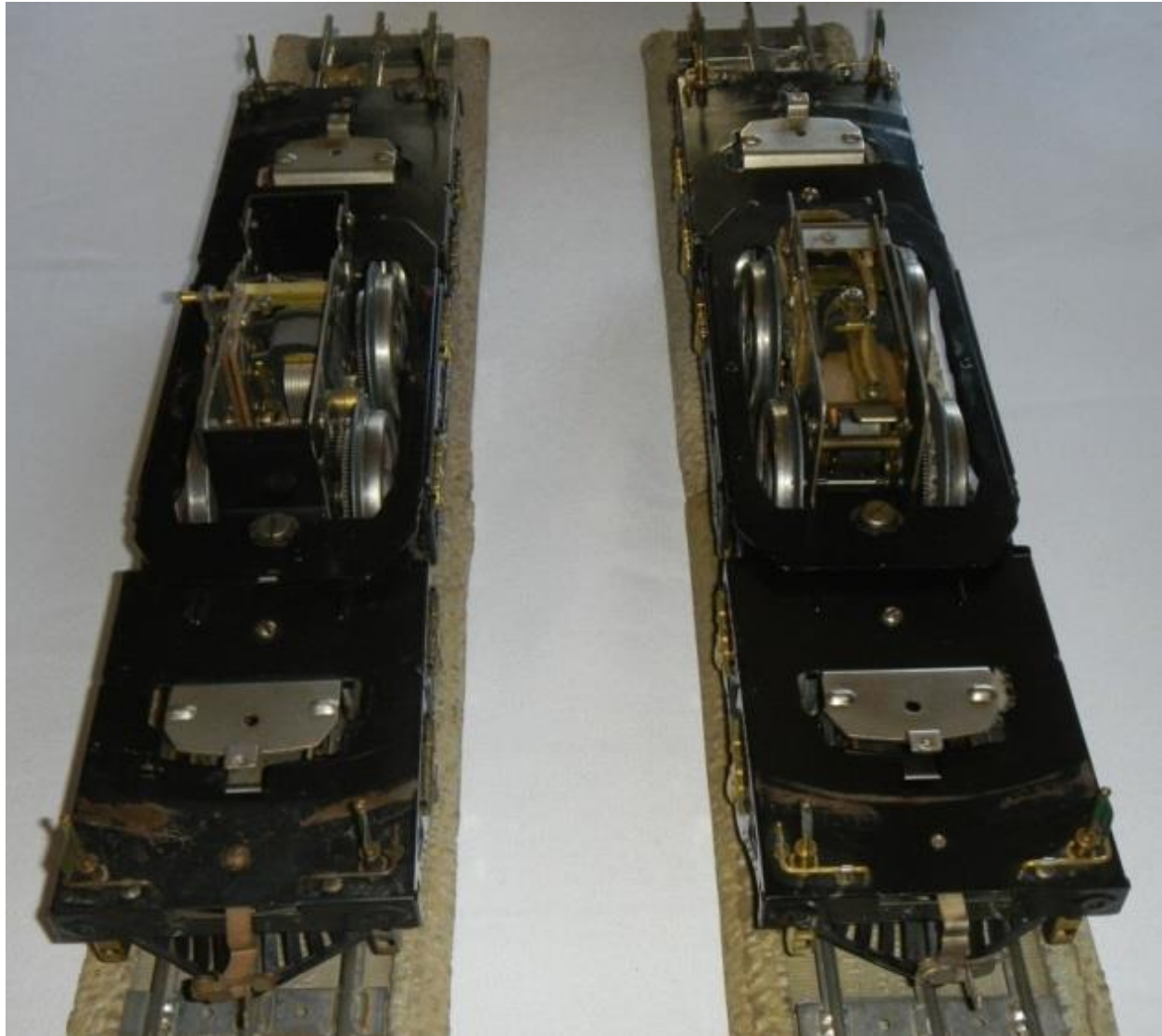


Production motors have longer side plates and extra brass spacer bars to accommodate the Bild-a-Loce latches.





The prototype's couplers are mounted with a slotted screw and hex nut. The pressed in pins were not yet available. I have a photo of the same set-up on an early 9E with a screw-held motor.



This loco has several other unique features:

Pilot Trucks: The bogie truck stampings themselves, and their base plates, appear identical to production pieces. But the bogie wheels are brass turnings that were nickel plated and have their solid faces hand-painted Red. Across the treads, they measure $1 \frac{7}{16}$ th inches in diameter. Production die-cast bogie wheels measure $1 \frac{3}{8}$ th inches and have Red spokes and steel treads. When the prototype was put together, Lionel did not have a production wheel that would work as a 381 bogie wheel.

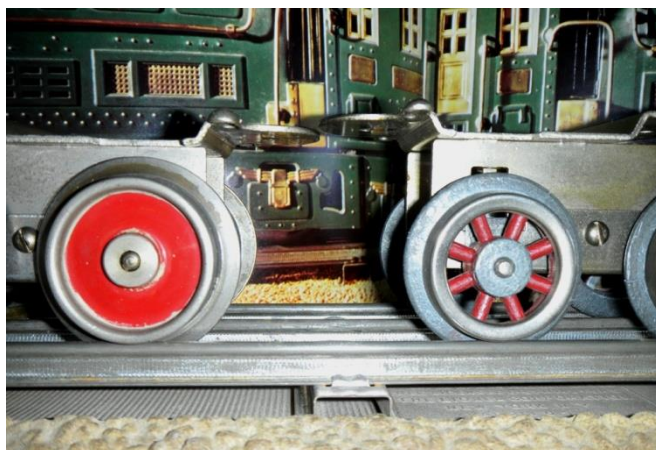
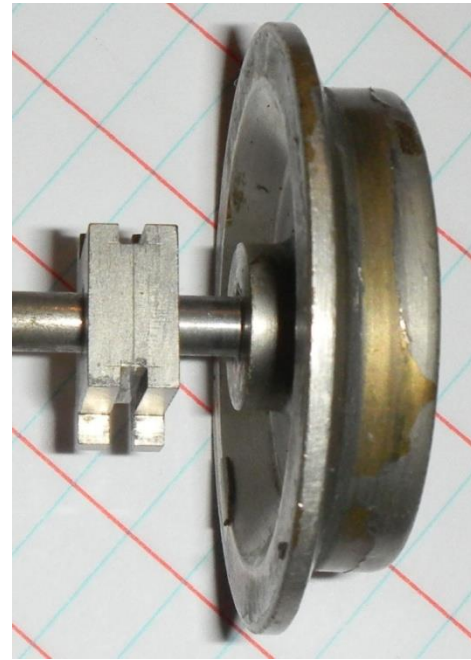
Side note: The prototype's brass wheels are tightly pressed onto steel axles. A micrometer shows the gauge to be exactly $2 \frac{1}{8}$ th inches.

Here is a production wheel set compared to the prototype.



Production axle bearings are die-cast and chemically blackened. The prototype bearings are 'tool and die shop' parts machined from steel stock. The machinist's scribing marks are visible.

Prototype bearings and production bearings measure differently. In the production bearings, the axle holes are $1/8''$ lower, but the production wheels' radius is $1/32^{\text{nd}}$ of an inch smaller, so, overall, the production bogie trucks compress their springs $3/32^{\text{nd}}$ of an inch more than the prototype.



The bogie trucks (actually their springs) are compressed on their rear by the motor frame. At their front they are compressed by the sub-frame. The extra “free ride” height of the production bogie trucks means more downward force on the bogie wheels.

Side note: The prototype's bearing springs appear weaker than those on my production loco. The production springs narrow near one end so the shorter round pins hold them fine. The prototype's springs do not taper but hold fine on the longer pins – likely they are simply commentator brush springs – and weaker than the production bogie truck springs.

Side note: I only took apart one bogie truck on my production 381E. There is a die number inside the circular depression where the sprue was taken off. Three show 1 and one shows 6 or 9. The die-casting equipment produced several with each throw. These numbers let Lionel know when one of the mold's cavities was getting worn.

Running Lights: The rectangular metal back plates holding the four running light brass covers are painted Ivory rather than being plain steel as on production models. On the 381 prototype, the internal lamp socket brackets are blackened whereas production brackets are plain steel.

The shape of the prototype's four brass lamp covers differs noticeably from production covers. They have more definition. Production covers are less angular. There is a large photograph of the twin-motor Super 381 on pages 8 and 9 of *The Shempp Collection, Toy Train Treasury, Vol. 2*, Iron Horse Productions, Inc. 1975 (a scan is below in this paper's appendix). Most collectors believe this large loco was the precursor to the single motor 381. Not so! The Super 381 has production running light covers, so it postdates this prototype 381.





Side note: If the Green acetate flags on 381E's are pointing toward the loco, they interfere with the brass snouts of the running lights as the bogie trucks swing out on curves. Perhaps the smoother contours of the production snout (left above) cause less damage to the flags.

The brass ventilators on the sides of the noses of production locos have backing plates to keep light from the exposed bulbs of the running lights from shining through them. The backing plates are painted Apple Green to match the production sub-frame. The prototype's brass ventilators don't have any backing plates – light shines through. So on the prototype, Lionel experimented with shielding the running lights. One of the prototype's four lights has pieces of a tubular dime bank added to fully enclose its light bulb. Heat affecting bulb life likely ended this experiment. So on three corners of the prototype, the running lights shine thru the side ventilators.

On eBay I found a dime bank identical to the one Lionel cut up.



The Red and Green colored pieces of acetate in Production 381's are machine-stamped ovals. The Green acetate most often has turned muddy and reddish. The prototype running lights have hand-cut rectangular acetate inserts. The running light colors are situated at the four corners so as to match the Red and Green painted side panels of the headlights.

The tabs of the prototypes brass covers are hand bent just enough to hold them in place. Production running lights have the tabs firmly pressed down, certainly by tooling. This is probably the reason the production back plates are plain steel. The Ivory paint, as used on the prototype, would have gotten scratched up by tool pressing.



- This prototype 381 loco does **not** have a Bild-a-Loco “light bar”; simple wiring feeds the six lights.
- The cover of the 1927 catalog shows that these brass lamp covers were intended for the 408E (see a scan in the Appendix).

Other Unique Features:

The four ‘sand pipes’ are 1/8” brass stock that appears to be hand bent. The sand pipes of production 381’s are 1/8” copper and machine formed. 408E’s were introduced in 1927 and their trim used the **same** copper stock as the production 381 sand pipes, so using brass stock on this prototype 381 is **inexplicable** – unless it was made in 1926 or early 1927 – **before** the 408E went into production.



Note that you can see right through the ventilators; they had no backing plates to block light from the running lamps. Again, the hand reverse lever plate is blank. It doesn’t say Forward – Reverse. And the large brass nameplate on the other side is also blank.



Like production models, the center frame that holds the motor has a notch in one end. On production locos, the sub-frame has a tab that meshes with the notch to make sure the motor has correct contact with the light bar. The prototype sub-frame has no tab.

Like the catalog renditions, this prototype has a brass ‘journal/spring’ mounted behind the ladders on each side. Lionel saved pennies by dropping these in production.

Side note: The late Tom Sefton (TCA 59-360) had a bunch of NOS brass ‘journal/spring’ stampings that he bought from Madison Hardware. Tom added them to his six 381E’s filling up the extra slots behind the ladders. He gave me several of the stampings, and I did the same thing. In the comparison photographs, I removed the extra stampings from my production center frame to return it to its stock configuration. Too bad that Tom didn’t live to see this prototype; he was ahead his time.

Recap: Considering Lionel’s practice at this time, it’s likely that all the heavy tooling was made in Italy. All major stampings on this prototype are the same as production pieces except (1) the center frame change to use Bild-a-Loce clips rather than a screw-held motor, (2) removing the risers on sides of the sub-frame that held the prototype’s lead weights, and (3) punching slots and holes for the iron weights and light bar. In New Jersey, Lionel could make these tooling changes, arrange for production of the die-cast parts, and engraving of the nameplates.

The May 2007 issue of *Classic Toy Trains* magazine has an excellent article on the Super 381 and the larger “Brute” (designed for Buddy-L 3 ¼ inch gauge). The Brute, made in Italy, has 402 ‘journal/spring’ stampings and early 402 strap headlights, but otherwise appears hand made. The Buddy L Railroad was introduced in 1927, and it’s doubtful the Brute, with this unusual gauge, preceded it.

We again note that this prototype 381 preceded:

- the Super 381 because the Super 381 used 381 production running lights, and
- the 408E introduced in 1927 because the 408E used copper sand pipes

In summary, I believe that this loco is the factory 381 prototype and was produced before the 408E and before the Super 381. Maybe the few existing Red sub-frame 381E's were those shown at the New York Toy Fair in February 1928. And this prototype 381 is most likely the 'First 381' because 62 years ago, on page 43 of the July 1950 *Railroad Model Craftsman*, Louis Hertz states "Around 1929 Lionel also contemplated still larger ... types than in 381. The handmade samples for two such units may be seen at their New York showroom." (See the Appendix).

And Louis Hertz should know!

Revised: April 24, 2013





APPENDIX - Comments from a noted collector.

“Of particular interest to me is Jerry’s conclusion that the 408 was an "accident" - born of necessity rather than as a planned model in the line. It makes sense to me - and is important new insight to my knowledge.

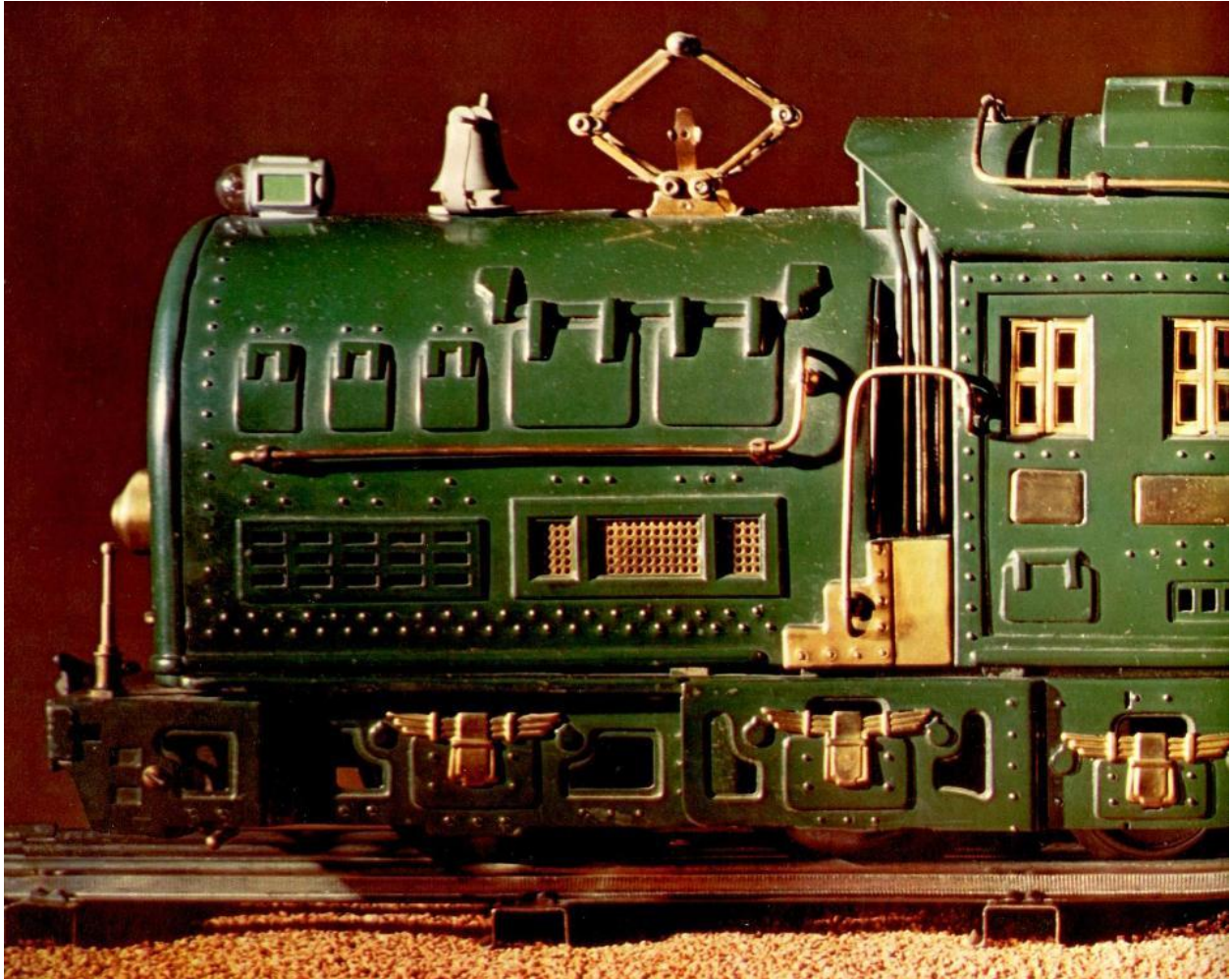
I would add that Lionel was not in the habit of making cosmetic changes to their locos and then rebranding them as a new item. In fact, I can't think of any examples other than the 402 to 408 in the Classic Period. Even in the early years, there are examples of a change in which one item succeeds another (the 34 becoming a 33 and the 1911 Special morphing into the 53 - changes of motors and wheel arrangements - and ultimately whole bodies), but thinking quickly I don't recall any that then continue to be marketed in both forms.

Most of the other manufacturers (American Flyer, IVES, Dorfan) would rearrange the trim and assign a new number at the drop of a hat. But Lionel had several price points for each product (think 10/380/381 or 384/390 or 385/392/400 with each having a distinct difference - almost always an increase in SIZE as the price went up. They didn't merely make a cosmetic change in order to achieve a new product in the line.”

Wagner comment: Although the 1835E was a downgraded 385E.

ADDITIONAL NOTES:

The Super 381 has 381 production running lights.



Scans of the 1950 Hertz article:

looks more like at least two feet!

Originally Ives introduced their 0-4-0 2 3/8" gauge 3237 St. Paul type in 1926. In 1928 they also supplied a St. Paul 4-4-4, 3245, placing the short 3237 body on a 4-4-4 frame, just as they made the 3243 NYC 4-4-4 using the 0-4-0 3242 body on the twelve wheel frame. In 1929, however, an entirely new 3245 was brought out with cast aluminum frame, and the body end sections extended half again as long as on the 0-4-0 model. The manufacture of a 4-4-4 St. Paul in O gauge, to be known as the 3265, was also contemplated, and it was listed in an early advance catalog, but this model was never put into production.

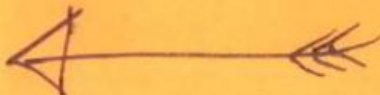
Around 1929 Lionel also contemplated still larger and more elaborate model St. Paul types than in 381. The hand-made samples for two such units may be seen on display at their New York showroom. The depression and the trend to smaller gauges prevented these models ever being put into production. Had either been made they would have topped anything else in tinsplate St. Paul types for size and detail.

It might be noted that the St. Paul type was never selected by any European manufacturer as a prototype for American type equipment intended for sale in the United States. It was made by but four companies, the famous "Big Four" of American tinsplate in the 1920's, and most of the models were typical of all that was both good and bad in tinsplate design in that era.

	pair	2.75
HO Gauge:	each	1.25
	pair	2.40

The best models deserve the delicate

LOUIS HERTZ
 "Along the Tinsplate
 Track"
 July 1950



Mail coupon for 10 days free trial

..... **Mail Coupon Today**

Suckert Loose Leaf Cover Co.
 234 W. Larned Street,
 Detroit 26, Michigan

Mail postpaid binders for The
 Railroad Model Craftsman for Vol. No.....
 I will remit \$..... in ten days or return
 binders collect.

Name

Address

City State

RAILROAD MODEL CRAFTSMAN

JULY 1950
35 CENTS

File out shaded area after assembling frame

Drill 1/8"

Drill 1/8"

Drill 1/8"

Tap 2-36

Spring fiber from 1/2 sheet brass

1/2" x 3/8" brass bent to shape

File chamfer for gear clearance after assembling frame

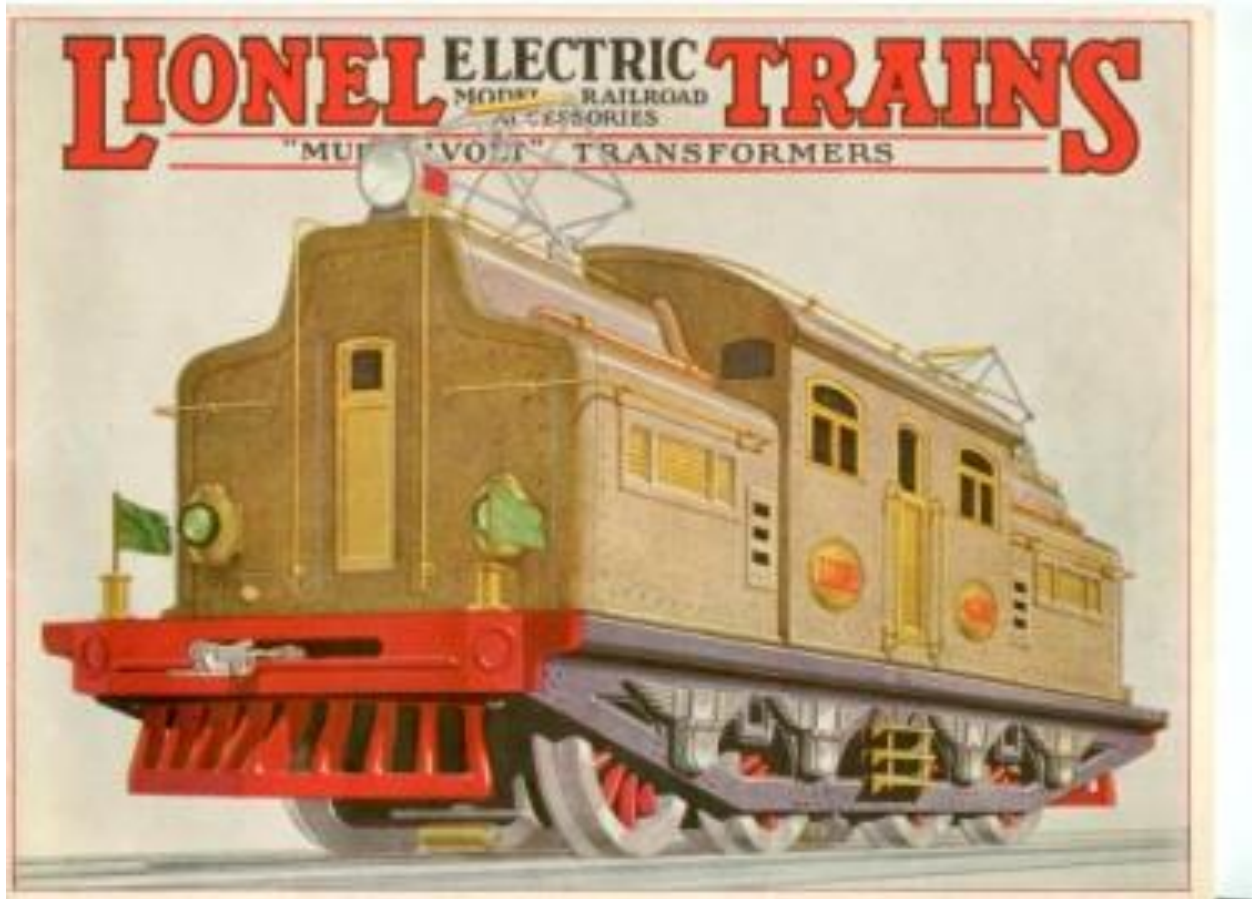
File journal from 3/32 sheet

Hide for spring

Build a Light Pacific

CLEVELAND CYCLE & MODEL CO.
AUTHORIZED ELECTRIC REPAIR SERVICE
14679-81 EUCLID AVE. GL 0644
14424-26 ST. CLAIR AVE. PO. 2978

Cover of the 1927 Lionel catalog showing an artist's conception of what a 402E would look like with the new 381 features added.



Pages 15 and 16 from the 1928 Lionel catalog showing Green sub-frames and an extra spring/journal behind the ladder. Note that the 381U display shows an early Bild-a-Motor without the extensions for Bild-a-Loce clips.

This block contains two pages from the 1928 Lionel catalog. The left page, titled "Bild-a-Loce and BILD-A-MOTOR Outfits", displays various mechanical parts and sub-frames, including a green sub-frame. It includes text such as "No. 1 Lionel Standard Electric 'Bild-a-Loce' Locomotive" and "No. 2 Lionel Standard Electric 'Bild-a-Loce' Locomotive". The right page, titled "Assembled Bild-a-Loce Locomotives", features three assembled locomotive models: "No. 4 'Bild-a-Loce' Locomotive For 'O' Gauge Track", "No. 4 E 'Distant-Control' 'Bild-a-Loce' Locomotive For 'Lionel Standard' Track", and "No. 381E 'Distant-Control' 'Bild-a-Loce' Locomotive For 'Lionel Standard' Track". Each model is accompanied by a small illustration and descriptive text.

Ed Prendeville (TCA 71-3926) has a Red sub-frame 381E. It is identical to production locos except for the sub-frame color. (Ed, Am I correct on that? Does it have backing plates to block light from showing through the ventilators? What color are they?)



Following are three views I hope you never see in real life. This loco was on eBay. The tabs holding the body to the sub-frame are “one time use”. These tabs usually break off.

Here you can see the production Black weights and the production light bar.



The motor automatically makes contact with the light bar. So a kid doesn't need to mess around with hooking a wire for the lights to the motor.



Here you can see the sprung headlight contacts that meet the top of the light bar.



END NOTES

The mythology of the twin-motor “Super 381” and the oversized “Brute” has come down largely from the 50-year old article copied below. Old time collectors called them the 381S and 381SS respectively. I agree that the Brute could well predate the Super 381 and the 381 prototype described above. The Brute was hand built at Lionel's La Societa de Meccanica La Precisa tool and die works in Naples, Italy, where Lionel had much of its tooling made. Frank Pettit, a Lionel retiree, reminisced about going down to the docks to pick it up. It uses several parts found on a Lionel 402.

In the 1963 article below, Irving Shull, Lionel's Service Manager in the day, states that the Super 381 was “made sometime in 1927”. That may well be, but it has “production” pilot light housings, so it was made after the 381 prototype described above. LaRue Shempp thinks the Super 381 was pre-production. Yet the 381 prototype was found in San Francisco in 1965 as part of a three-car State Set with old play wear. So it most likely left the Lionel factory in 1933-1934 when they were selling everything they could to come out of bankruptcy. It wasn't in the Lionel show room's museum, so perhaps Shull wasn't familiar with it.

Dissect these sentences from Irving Shull's 1960 Letter to LaRue Shempp: “... the #381 sample was made sometime in 1927. This was our **second attempt** at making them by hand to determine the correct size for production. **It was the only one that was made, not produced.**”

**This implies the first attempt was produced!
The red-frame, hand reverse 381 prototype?**

TRAIN COLLECTORS QUARTERLY

APRIL, 1963 VOL. 9, No.2.

Here Are Some Rare Ones!!

Page 3

LIONEL'S SUPER #381-s

LaRue Shempp

It is not generally known that prior to the introduction of Lionel's classic model of the Chicago Milwaukee & St. Paul 4-4-4, #381 electric--type locomotive in 1928, two "pilot" models preceded her. These were built in order to determine the correct size, shape and weight to be used for the production locomotive. These two pre--production models were under glass, for over thirty years in Lionel's New York City show-room. However, early in the '60s, with the change in Company management, they were sold.

It was my privilege to obtain the smaller of the two locomotives.

The first of the hand-made samples was a huge 4-4-4 twin-motored locomotive over 2' in length, articulated at the cab ends and having massive pantographs on top of the cab. Body detail was lacking on the smooth metal surface. It was designed for a 3" gauge then being considered by the Company but never made. Standard motors were employed with spacers to provide the extra width between wheel tread. The management having tabled THAT sample

for production ordered another one built for their Standard (2-1/8") Gauge somewhat shorter in length and without body articulation. That this smaller sample was actually considered for production is verified by its being complete in all parts even to the minutest detail of simulated articulation. It is the only tinsplate locomotive to authentically create that impression. Body detail was attached separately and is exquisite in workmanship. The front and rear movable trucks house regular standard gauge motors and drivers, and in the mid-section there is a four-wheel spring idler. It must have been a painful decision for the Company management, to further reduce the dimensions of this 23½" beauty, whose design was used in the production model of the single-motored 381. This latter, by the way, was considered by Mr. Cowen as an artistic masterpiece BUT a colossal sales disappointment. The late Mr. Irving Shull, Lionel's Service Manager in New York, told me the reason this super 381 was tabled in favor of a further scaled-down design was that "she was simply too big and too heavy for a boy to put-on and take-off track, AND she required wide radius curves". With two motors, added length and weight, this imposing engine was an adequate complement for a long string of "State" cars. She could really pick up the train, with all the powerful aura of the Milwaukee prototype itself.

Representative of management's opinion of the hand--made #381. Mr. Shull in writing to me prior to his untimely death had this to say: "In reply to your letter please be advised that the #381 sample was made sometime in 1927. This was our second attempt at making them by hand to determine the correct size for production. It was the only one that was made, not produced. Regarding the cost, this I cannot tell you. I don't think anyone knows the amount of time involved in making this hand sample."

Later, a letter was received from Mr. Ronald D. Saypol, Administrative Vice President of Lionel writing for Mr. Cowen under date of September 19, 1960, a continuation of the discussion on this particular locomotive. Of interest to us he said in part: "The #381 which you describe was a favorite of Mr. Cowen's. He's happy that it is in good hands -- one who will, I am sure, cherish and take good care of this wonderful old model. As to some of the questions which you ask I was able to get some answers for you. On others, I am afraid the history is lost. Models such as you have in the 381 are made for each item which we intend to make. We maintain a complete model shop at our factory as an adjunct to our Engineering Division. We have always made at least one prototype -- frequently as many as fifteen or twenty prototypes -- before we accept such an item for inclusion in the line and before we send to Design Engineering. Frequently, we will spend \$50,000 or \$60,000 on the development of such a model".

In my 'teens, upon my visits to New York a trip to Lionel's show room was always included. I'd stand in front of the glass case housing this wonderful handcrafted masterpiece and wonder who eventually would be privileged to display her. Little did I realize that the privilege would become mine for this spot in time. It was the "Day of Days" in collecting for me when the best and greatest of the Lionel motive power in Standard Gauge found a new home in Williamsport, Pa. Should you be in this area and care to feast your eyes upon her, I would be happy to have you call.