STREETCAR ISSUE ISSUE 9 - Summer 2011

RAILBRICKS™

BRICK RAILROADING MAGAZINE

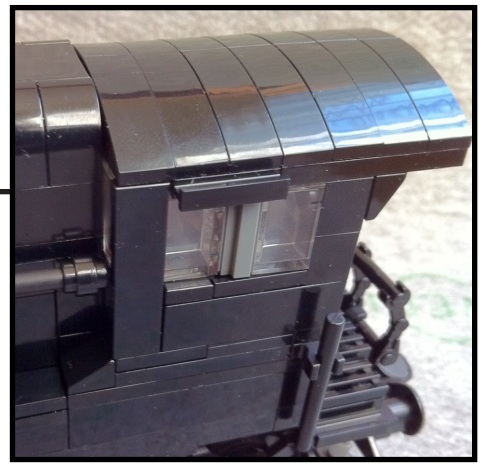
The Trams of Luca Giannitti...

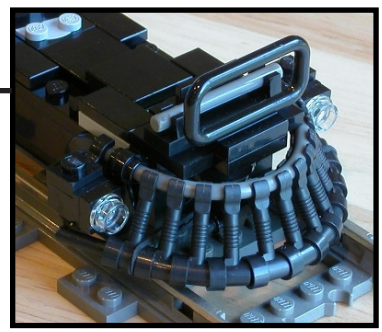
Under The Wire

Catenary with David Stannard and Larry Pieniazek

RAILBRICKS ISSUE 9 - Summer 2011

In This Issue





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ALL ABOARD!

On my way home from work one afternoon, I was reminded of something.

As I drove down the highway, my eyes caught a glint of light ahead through the trees. As I approached, the trees thinned a bit, and the red and white livery of a Vermont Railways GP38 peeked through the green leaves. "The Train!" my brain screamed. My stomach jumped a little, and a small grin appeared on my face. I rolled down the window and slowed the car a bit. The big diesel machine rolled past me in the opposite direction, followed by a leased unit in blue and white paint. The pair rumbled quietly by, pulling a string of empty kaolin tankers northward. I listed to the clank of the wheels as I continued south, mesmerized by the sound till the last car had passed.

It was at that moment that I remembered why I love trains. They make me feel like a kid.

To me, there's something magical about a machine of that size, and with that much power, just idling along through the countryside, easily pulling enough weight to make the biggest trucks cringe. Every time I see a locomotive, I get excited. The type doesn't matter. While in Boston, I get excited by commuter trains. When I was in Denver last year, I almost jumped out of my car when I saw a BNSF locomotive under a bridge. For me, visiting a train museum full of old steam engines is like visiting Disney World for most people.

My excitement isn't just for the machinery. I also love the history of railroading. The tracks along which that VTR GP38 was rolling have been there for over a hundred years. They've seen the rise and fall of the industries in the area. They were a crucial part of the history of the state I live in. They've moved people as famous as Calvin Coolidge and as humble as my great-grandmother. Today they move limestone slurry, but once they moved the marble that helped build Washington, D.C.

While railroading is a business, it's also a lifestyle. I absolutely love talking to retired railroad workers. There's a pride that they display in their work, even if they haven't been near a track in 30 years. It's one thing to see a Big Boy locomotive, but it's quite another to talk to someone who helped move one. Generally these are people who have worked hard, lived long, and, like me, still feel like a kid whenever they see a train.

So what happens when someone visiting my layout says "You do know you're playing with a kid's toy, right"? I smile, look at my little LEGO® locomotive proudly, and say "Yes, I do."

-Elroy

Instructions, Challenges, and Tips & Tricks have been categorized into the following levels:

B Beginner

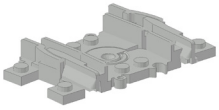
I Intermediate

A Advanced

FROM THE RAILBLOG

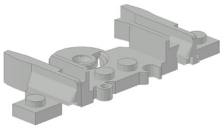
The Flex Track in the Part Tracker
Written by Didier Enjary | Monday, 02 May 2011 15:36

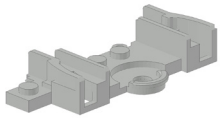
Philippe “Philo” Hurbain did it again.

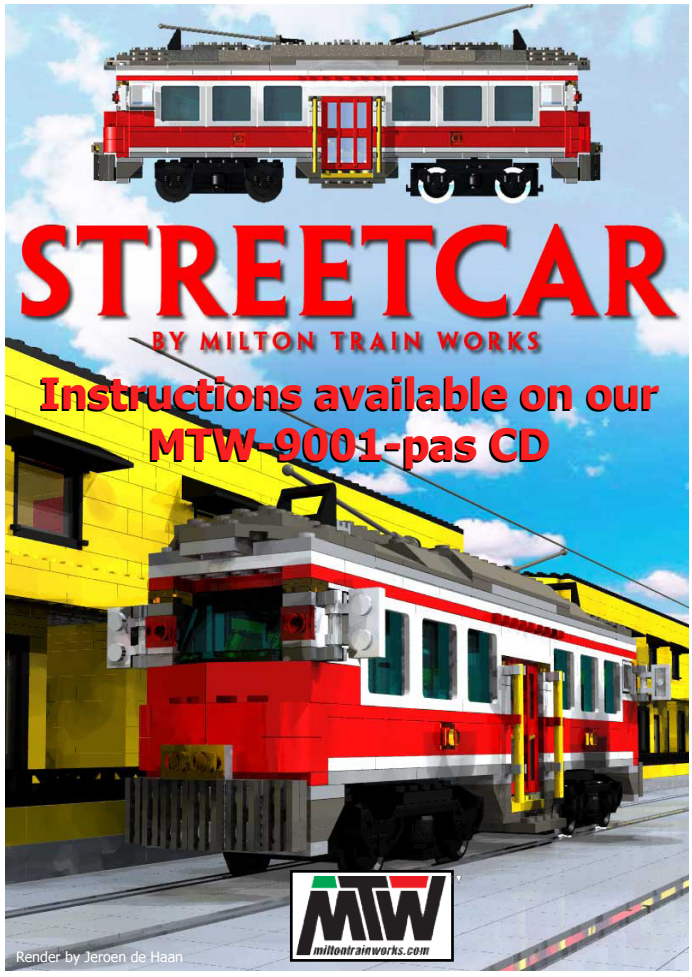


After the cow catcher, Philo bring to us the LDraw Flex Track part.

Waiting the part to be certified, you will find the various files (male half, female half, subfiles) in the LDraw Parts Tracker here [*http://www.ldraw.org/cgi-bin/ptdetail.cgi?f=parts/88492.dat*] and here [*http://www.ldraw.org/cgi-bin/ptdetail.cgi?f=parts/88493.dat*]:







Have an idea for RAILBRICKS? Here are some guidelines for getting your article published in an upcoming issue.

Who may submit an article?

Anyone may submit articles for consideration by the RAILBRICKS staff. Submitted articles are reviewed and, if suitable, used in future issues of RAILBRICKS magazine.

People submitting articles do not need to be professional level writers. RAILBRICKS is a magazine for fans, by fans. We welcome articles from enthusiasts who build, collect, and play with LEGO® trains. When we evaluate articles, we look for quality in the content and the basic writing style. We also evaluate any photos that accompany the submission. Every article to be published is edited by the RAILBRICKS staff to increase readability if needed, and while basic grammar and spelling are expected, perfection is not necessary.

What sort of articles may be submitted?

Any material related to the creation, display, or collecting of LEGO® trains is welcome. This includes articles about prototype trains or railroading locations that may spark inspiration, overviews of models that have been created, or step-by-step instructions for train models. While our focus is LEGO® trains, articles about related items, such as modifying track with non-LEGO® elements, are also welcome. We are also interested in the overall LEGO® train community, so articles about events, people, or clubs are also encouraged.

How long should articles be?

Submissions should be long enough to cover the article’s topic, but short enough to hold the attention of the reader. In general articles should be between 750 to 3,000 words in length, and include any photographs or images that will accompany the text. In addition to images, any sort of source material that was used during the writing of the article, such as website URLs or book titles, should be included in order to give readers additional resources they should they decide to read more about the topic outside of RAILBRICKS.

What if an article is over 3,000 words?

3,000 words is a guideline. If you have an idea for an article that may be over 3,000 words, please send us an outline or summary. We may decide that the idea warrants the extra space, or the article may be a good candidate for being printed in installments across multiple issues.

How should articles be prepared?

Articles should be typed in either a text document or e-mail, and should use proper grammar, punctuation, and spelling.

How are articles submitted?

Completed articles may be e-mailed to *submissions@railbricks.com*. The text of the article may either be in the body of the e-mail, or added as a file attachment (MicroSoft Word, OpenOffice Writer, text file, etc). Images to be included with the article should be submitted as separate attachments, and clearly named.

We can accept images in JPG, GIF, PNG, or TIFF formats. High resolution images, 300 DPI at least, are preferred as they will reproduce better than lower resolution images.

When will my article be printed?

Accepted articles will be included in future issues of RAILBRICKS. When the article is published depends on a number of factors including the amount of content already available to be printed, themes of specific articles, and article length. In short, there is no way to determine exactly when an article will be appear.

Does everything that gets submitted get published?

Unfortunately, no. While we will make an effort to publish what we can, it is not always possible to include everything.

Are authors compensated for their printed articles?

No one is paid for RAILBRICKS, including the editorial and writing staff. RAILBRICKS is an all-volunteer project, and as such, authors are not paid for the use of their material. Articles used by RAILBRICKS remain the property of their authors.

If you are used to browse BrickShelf, you certainly have noticed Luca Giannitti's great works on buses and trams.

RAILBRICKS caught up with this experienced and promising builder from Turin, Italy.

Luca Giannitti drives you to Turin public transportation.

Hi, Luca. Could you introduce yourself to our readers?

And more specifically, could you tell us about you and your hobby as an Adult Fan of LEGO?

Since I was young, one of my dreams was to build a tramway or a bus made out of LEGO® bricks. I liked playing with LEGO®. I grew up with the nice town series of the middle of the '80s. I'm today 28, nearly 29. My passion for tramways, much more than a dream of building a model, was a dream of driving one of them! Due to the fact that I was just a child, the only way to drive a tram was through a little model. I was born in Turin, where I still live, so my inspiration was the public transport vehicles of my city. There aren't more reasons...

"When I discovered BrickLink in 2002, I started with a new way of building."

The first two big problems I had, when I was young, were the color and the purchase of the bricks. The worst problem was the color because all tramway and buses in Turin, up to 1999, had an orange livery and LEGO® didn't produce any orange brick. When I was young I replaced the orange with yellow but I was never satisfied. When I saw the first bright orange bricks, the wish was again awakened.

The second problem, not worse than the first but still not easy to solve, was where to find the right bricks in order to build the model. In the "pre-BrickLink" era, I planned my models with the bricks I had in that moment: so my building capability was very limited. When I discovered BrickLink in 2002, I started with a new way of building: first design, then buy just the needed bricks, in the desired color!

"LEGO® is a toy. You can not make a perfect model, you have to give up on some details."

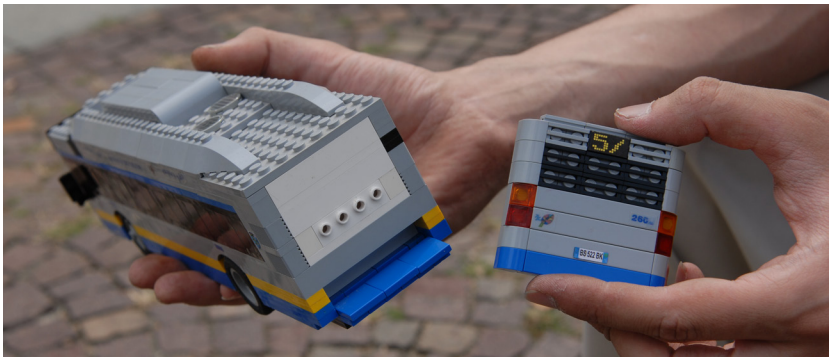
LEGO® had already the Pick-a-Brick service but it was unavailable for my country Italy. So the only way was BrickLink. In the meanwhile, like a twist of fate, the color of the buses in Turin changed! From orange to gray/blue/yellow (all "old" LEGO® colors)... anyway a great number of orange vehicles are still today in service in Turin. So I had the right color, the way to purchase the needed bricks and I started to build my two favourite models: the orange bus type Iveco 480 (1) and the articulated tram type 5000 (2). Those are my first and oldest models. I always liked the trams (and buses too... but much more the trams!) and I used them to go everywhere in Turin, so I knew them really well: every detail, every oddity and I was able to isolate, in the model, the main features. I never forgot that LEGO® is a toy. You can not make a perfect model, you have to give up on some details.

(1) http://www.brickshelf.com/cgi-bin/gallery.cgi?f=143233
(2) http://www.brickshelf.com/cgi-bin/gallery.cgi?f=63616

The cleverness is to select the right details to remove. Together with a friend, I build in 2004-2005 the Sassi-Superga layout (3). It was really important for me because it introduced myself into the Turin public transport company (GTT). Through a friend bus driver, I showed it to a GTT manager that was happy to show it into the real Sassi station. It was the first step to approach GTT...

When I completed my studies at the university, with an informatic degree, I started to get the driving license for buses. I thought: «why not?». I needed about one year to get all the needed driving licences, and another year to wait before GTT hired me as driver, but at the beginning of 2009, I started to drive buses. Less than two years later I've got also the tramway driving license. I was now able not just to drive the models, but also the real ones! In the meanwhile the number of models grew and I'm still designing other ones. At the same time, I've started to work on a nice layout where I can put all those models...

(3) http://www.brickshelf.com/cgi-bin/gallery.cgi?f=153675



"The gauge was the only thing that I could not change."

You have chosen minifig scale for your creations but, as you know, minifg scale ends up with very different sizes (widths) for the cars, buses, trucks, trains,...What is your point of view about this scale? What did you finaly stick with?

The chosen scale is about 1:35-1:40. Why this particular scale? Because of the rail gauge! The Turin gauge is 1445 mm and LEGO® tracks have a 1:38 scale gauge. I wanted to make some realistic models, so the gauge was the only thing that I could not change. Turin trams are from 2.20 m to 2.50 m wide, so if I rebuild them 8-wide, their scale is about 1:35-1:38...Minifigs are a little bit smaller but they can fit to the models without big problems. I think, with their 1:40-1:50 scale, they fit well. They are not perfect, but better than nothing. I built the models thinking to the real gauge and not to the minifigs. In the LEGO® City scale, you should build the tram 6-wide...

Is there a MOC from another builder that has inspired you and why?

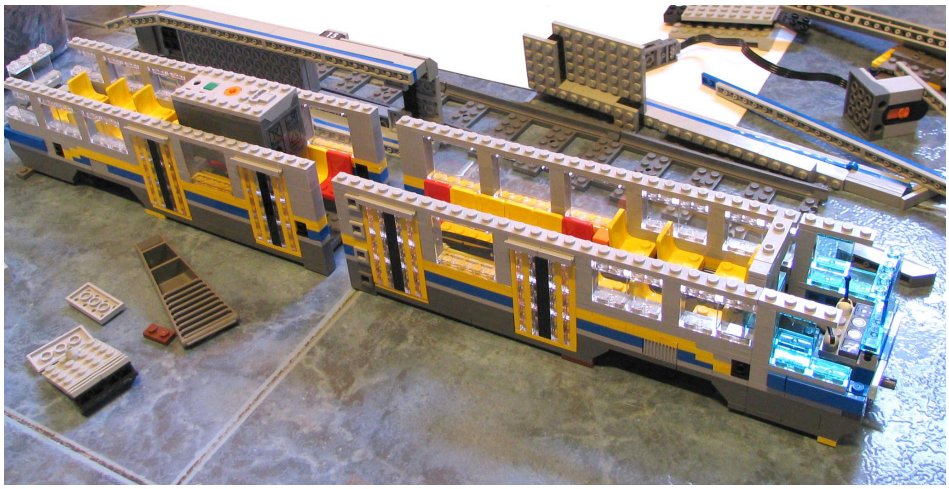
Not just a single MOC. I've learned a lot of things from Gianluca Morelli (gm on Brickshelf) and viewing the pictures of many MOCs from the Internet. Maybe I've taken building ideas from a ship or a building and I've reused them in my models.

Any favorite piece of building advice that you would like to share?

The "Giostra Urbinati" (4): it is so simple to do, but it is really important to make articulated trains that run on such small LEGO® curves. And the double tapered nose of the trams (5): use the hinge plates. It is much stronger than it seems.

(4) http://www.brickshelf.com/cgi-bin/gallery.cgi?i=1856405
(5) http://www.brickshelf.com/cgi-bin/gallery.cgi?i=3478761

You use both 9V and Power Functions System. Could you tell us about your feelings with TLC discontinuing the 9V system and your technical thoughts about the new PF system? How do you implement it in your models?

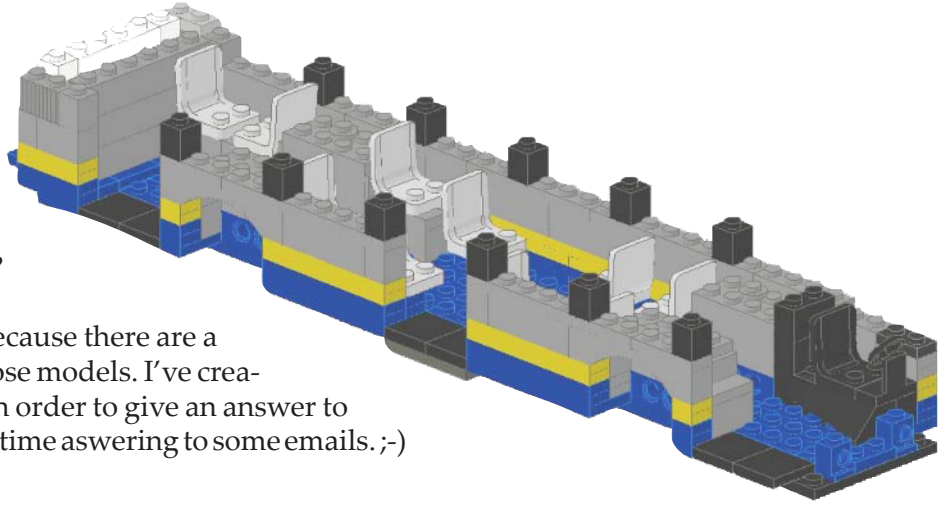


I'm really disappointed that TLC discontinued the 9V and I didn't switch to PF. My latest model is PFed because I wanted to try the new system as I needed a smaller motorized bogie that 9V didn't offer (as usual, the central section of my articulated trams is motorized). Moreover the PF system allows you to drive the tram independently from the rest of the track and this can be useful for a big layout (I don't use the DCC system). But 9V remains the best solution because the battery box, even though small, still needs a lot of space.

PF is a great system but I do not like the batteries. I've bought the expensive lithium battery in order to recharge without dismantling the model every time to recharge it! If I have a 9V motor, I can run it without power during the use. Moreover I don't like the cables of the PF System because they are tied to the parts (i.e. the lights, the receiver or the motor). 9V was better because you had many lengths of cables, so you could choose the best one for your model. With PF you need extension cables, or your cable is too long and you have to hide it in the model...

"PF is a great system but I do not like the batteries."

From your BrickShelf galleries, I see you share some building instructions of your creations. Why and how do you share your designs?



I share some building instructions because there are a lot of people who ask how I made those models. I've created some instructions with MLCad in order to give an answer to all those people. Just a way to save up time aswering to some emails. ;-)

Your work in progress is a large diorama of the Corso Vittorio Emanuele II. Why did you choose this street as your diorama subject?

The Corso Vittorio layout (6) was born to give a setting for the trams. Vittorio Emanuele II was the first king of Italy (1861-1878), when Turin was the capital of Italy (1861-1865). The street in Turin is one of the most important and with nice architecture. The featured buildings are the actual buildings that you can find near the railway station Porta Nuova (that is in Corso Vittorio Emanuele II). The street is a typical big street of Turin, with a central carriageway and two separated carriageways on both sides (in Turin they are called "viale" and "controviale"). The sides are divided from the center with a green surface, with big trees. In Corso Vittorio there are also the tramway tracks.

At the crossing with Corso Galileo Ferraris there is the monument of Vittorio Emanuele II, the statue that I've reproduced in my diorama. The statue is so highly placed that people from Turin call him "the king on the roofs!" In my diorama the statue is much smaller than the buildings. Last, but not least, why I've choosen this street, I live not far from there! So it is something that I know very, very well.

(6) http://www.brickshelf.com/cgi-bin/gallery.cgi?f=407919

The Corso Vittorio Emanuele II

Three-Stud Window

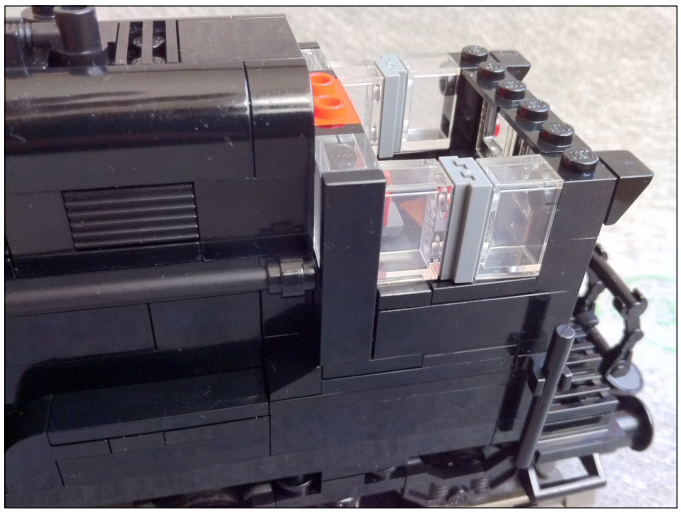
By Falk Schulz

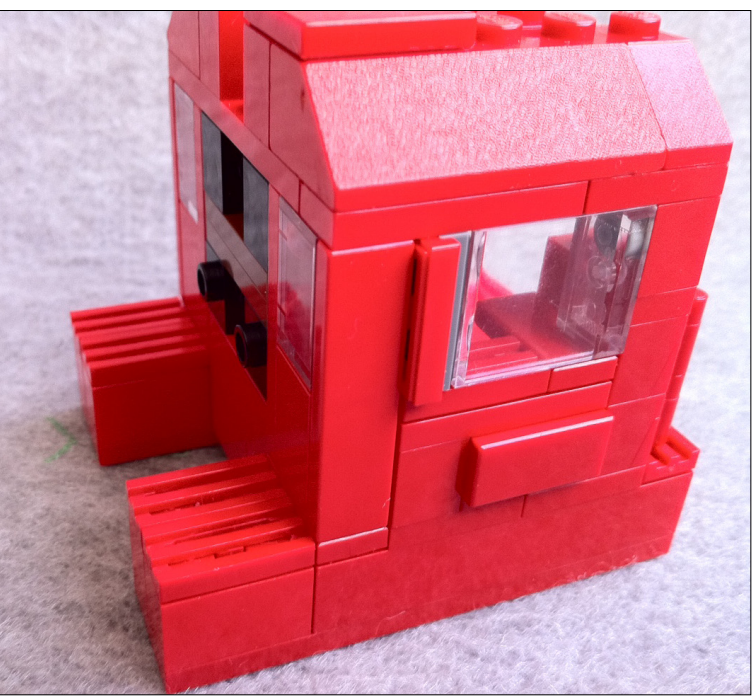
Five-stud-long locomotive cabins often require a three-stud wide window. Using SNOT, the brick math requires a 7.5-plate-wide window, which is sometimes difficult to handle.

Here's my solution: I use two 1x2 transparent bricks with 1x2 grid plates on top, mounted grid-on-grid in a floating way (see picture of my FM H10-44).

This method nicely fills the 0.5 plate gap, keeps the inside of the cabin clear, is quite simple, and matches pretty well the look of an original sliding window.

Another variant of this method turns the floating grid plate into a wind deflector (see picture of a prototype 7x5 cab).





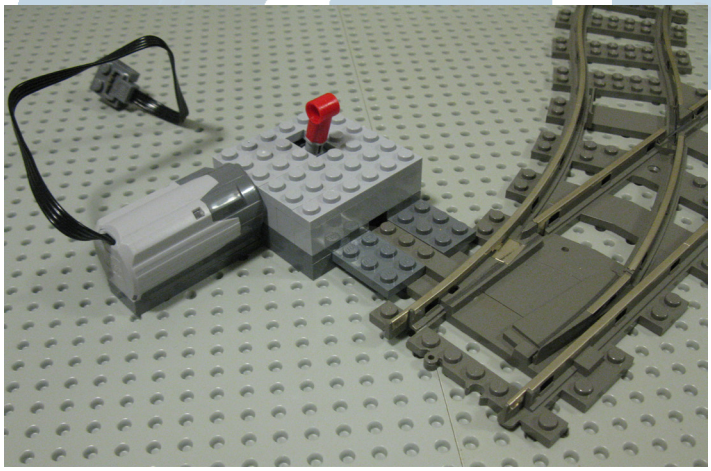
Top: FM H10-44 with roof removed to expose the interlocked grill plates.

Above: The finished locomotive with simulated sliding window.

Left: Grill plate used as a wind deflector with a window panel.

Benn Coifman's

Reverse A Engineering Challenge 8



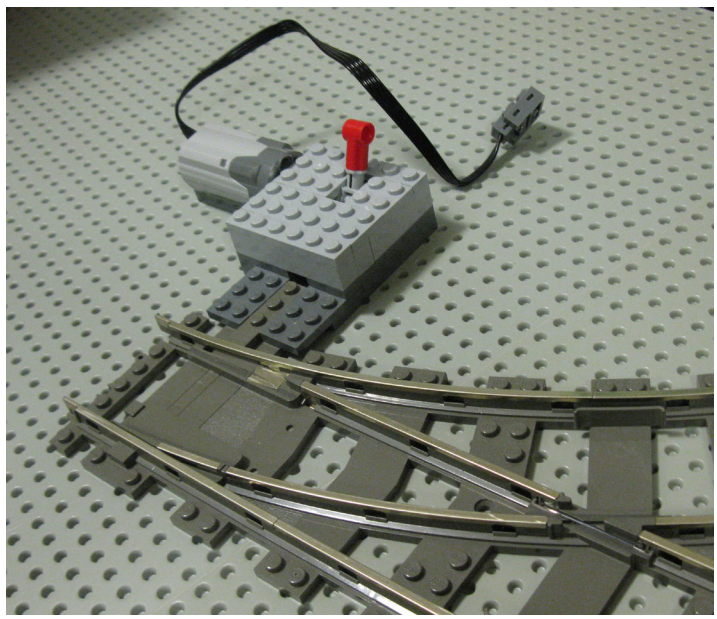
This column seeks to challenge readers to look at other builders' work to tease out how they achieved an effect, an important skill as you wander off the instruction sheet and into your own creations. The last challenge has gone unanswered and remains open. The solution will be revealed after we have a winning submission.

In this issue, we move our attention to switches. Here we have a very space-efficient remote-control switching unit. There is not much to look at, just a clean, efficient mechanism. The pictures show the unit from both sides (note that the switch is lined differently in the two photos). The backside is equally unremarkable. The red Technic connecter serves three purposes: a color code for the switch, an indicator for which way the switch is lined, and a manual override to throw the switch. The switch is un-modified and I have never had a failure with the six remote controlled units I have built.

Your challenge is to reproduce the functionality of this remote control switch in the same space or smaller.

Submit your solution to challenge@RAILBRICKS.com with the title "REVERSE ENGINEERING CHALLENGE 8" in Ldraw format or provide sufficient digital photos on how to construct the feature. Judging will begin on August 1st, and will continue until we are ready to release the next issue. Be sure to get your submission in by opening date for full consideration. If you build a physical model, you can use more common colors. Be sure to include your name and contact information.

The editorial staff will select the best design from all of the buildable submissions and the winner will receive a "RAILBRICKS Challenge" engraved brick. We will publish the winning solution in the next issue. In the event that none of the entries are able reproduce the feature by the deadline, this challenge will remain open until someone is able to solve it.



Creative Cow Catching

By Jordan Schwarz

Ah, the cow-catcher! Such a simple piece of railway equipment, elegant in both form and function… yet so frustrating to many a LEGO® train builder who tried to realize its iconic shape using LEGO® bricks!

In the 1800s, American locomotives ranged over miles of open farmland and prairie, and the cow-catcher became an essential piece of equipment, protecting the train and its crew from stray objects – and cows - on the tracks. The cow-catcher is critical to capturing the aesthetic of American steam engines. Sitting at the very front of the locomotive, it is a magnet for visual attention.

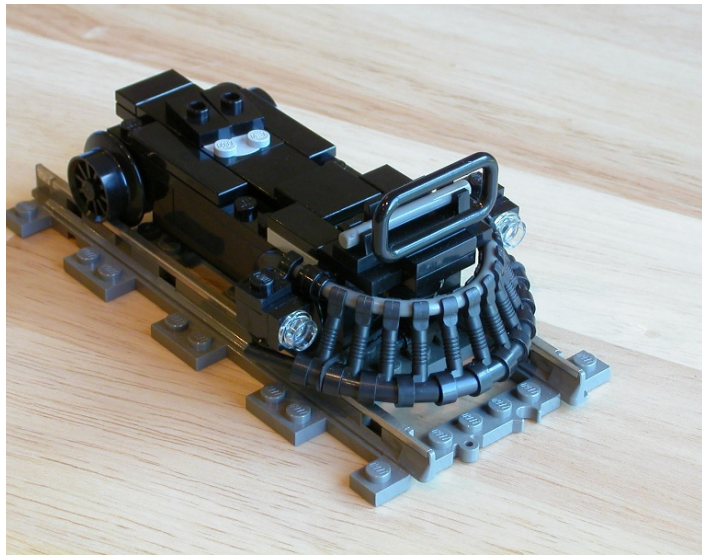
Since the 1960s, only a few train models made by the LEGO® Group have featured cow-catchers, because most LEGO® train models were based on European prototypes. The fenced, protected trackage of Europe did not necessitate cow-catchers for European locomotives in the same sense as their American counterparts. Fittingly, the earliest LEGO® model featuring a cow-catcher is one based on an American prototype: the classic *396 Thatcher Perkins Locomotive* from 1976. As the desert backdrop reflects, this looks like a classic engine from the Wild West. Actually, it's not; the real Thatcher Perkins engine, built in 1863, belonged to the Baltimore & Ohio Railroad and would have only operated in the eastern United States.[1]

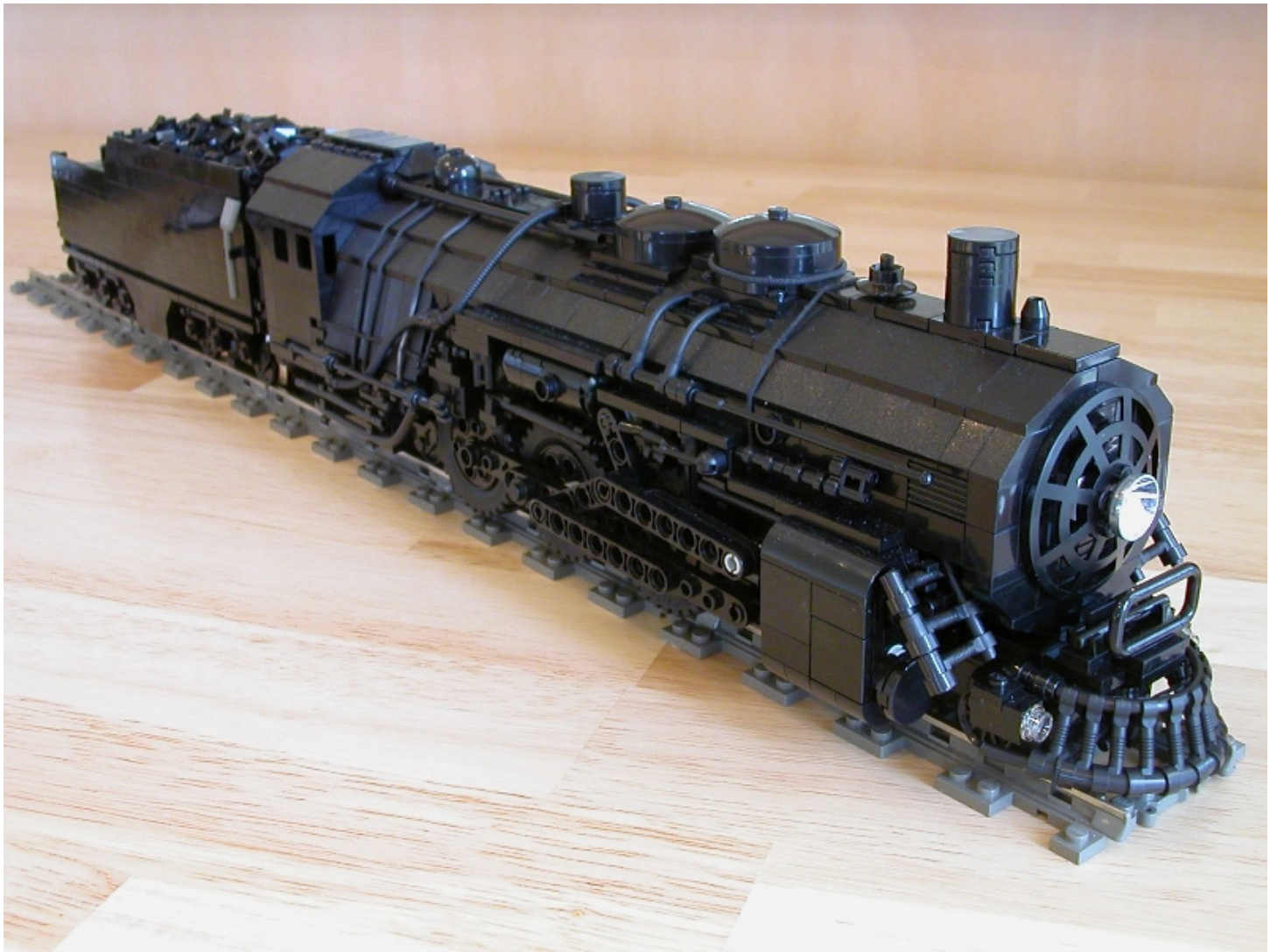
Still, the engine has the big funnel and cow-catcher – the features that always call to mind trains of the old west. In the LEGO® model, these features are captured using basic bricks and slopes, betraying the set's roots in a simpler time, before the era of SNOT. Ironically, as LEGO® historian Gary Istok remarks, this rendition of a classic American steam engine was never available in the United States or Canada.[2]

Fast-forward some two decades to the modern era of fan-designed LEGO® trains. Surely, builder Shaun Sullivan must stand as one of the "godfathers" of the American steam locomotive, as realized in LEGO® bricks. Shaun took on the challenge of building steam trains even before the advent of cheese slopes and

large driving wheels from Big Ben Bricks. Consider Shaun's iconic Hudson locomotive, and take a look at that cow-catcher!

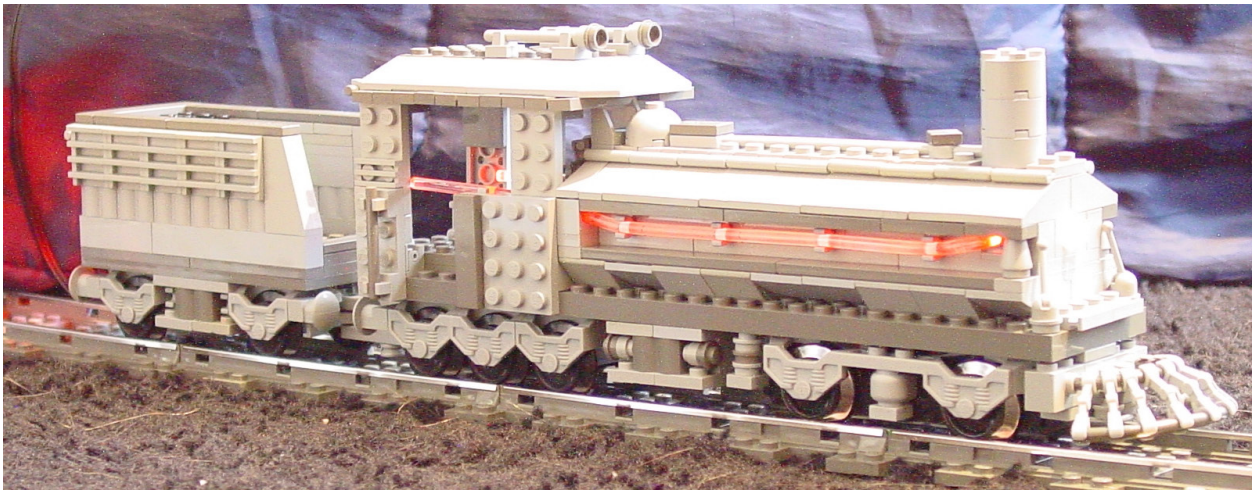
Back in 2002, this engine was something of history in the making, and the cow-catcher technique using flex tubing and robot arms was revolutionary. Shaun says that he first experimented with cow-catcher designs using other elements but, in his words, "When I finally hit on the robot-arm-and-flex-tubing design I immediately fell in love with it." Here, Shaun offers a closer look at the pilot truck from the Hudson showing the elegant mechanism. Note the black rubber band used to hold the curvature of the lower flex-tube.





Since Shaun developed his cow-catcher technique circa 2002, several builders have continued to expand on his original design. Here, Tony Sava's *Polar Express Mark II* shows a similar but less concave version of the cow-catcher:

On his well-known Sava Railways #805 4-4-0, Tony used flex tubing to a different effect, with minifig hands helping to hold the long, shallow cow-catcher together.

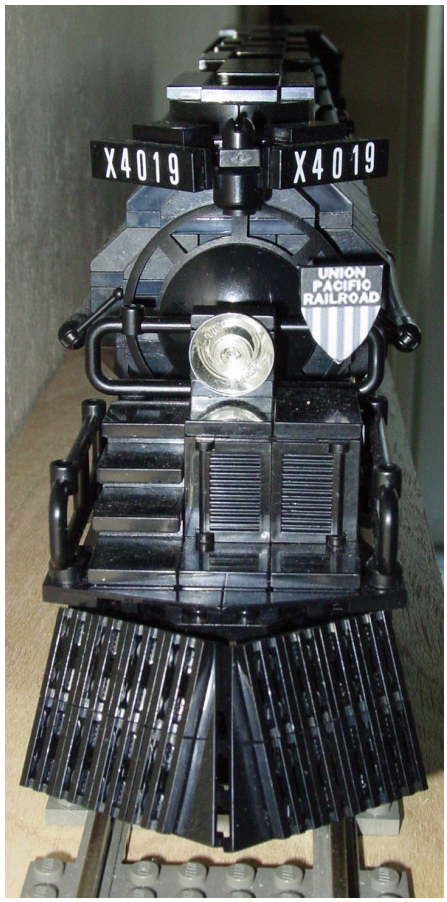


Then there's this variation from a builder known as "Crash", with the familiar flex tubing but droid arms instead of the usual robot arms. The fiber-optic lighting makes this one futuristic-looking steam locomotive!

The flex tubing approach works especially well for creating the style of open-framework cow-catchers typical of engines from the late 1800s. But, by the early 20th century, engines more often used cast cow-catchers with smoother profiles, aiding in the deflection of objects on the tracks.

Builder Cale Leiphart is known for his many steam engines. Here, a good view is afforded of the cow-catcher on his Pennsylvania E6s #460. The look of a smaller, cast cow-catcher is captured well using grille tiles.

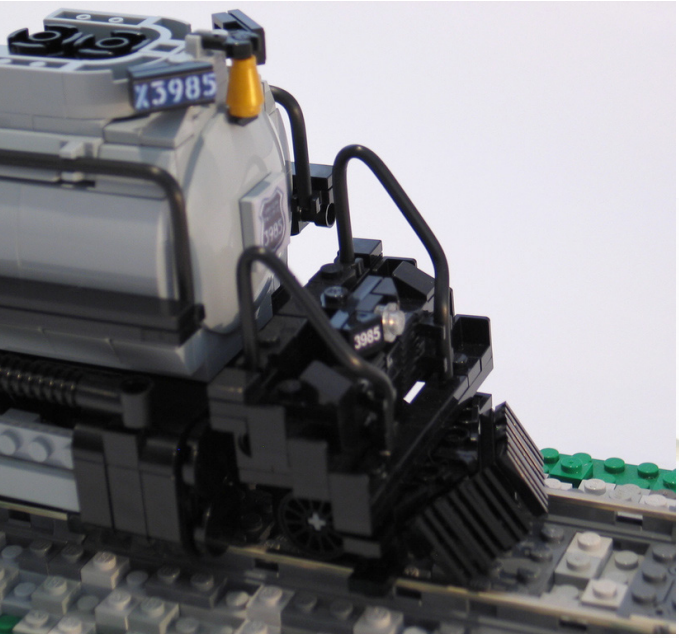
Another grille-based technique is seen on this rendition of a Union Pacific Big Boy, another model by Crash. That's an imposing front end! Oriented horizontally or vertically, grille tiles lend themselves to cow-catchers.

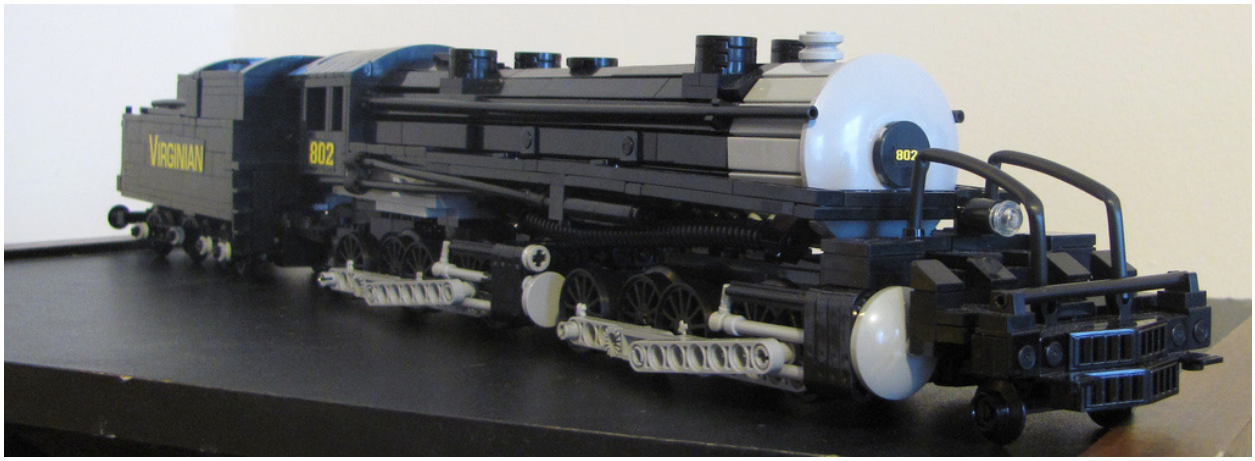


From the same lineage as the Big Boy, builder Scott Wardlaw shows off this fantastic Union Pacific Challenger, part of a consist that received the Best Train award at Brickworld 2010 in Chicago.

Below, the front-end detail is seen up close.

In addition to grille tiles, "grilled cheese" can also be used to good effect. That seems to be the route that Tony Sava is going with some of his recent locomotives, such as the burly Texas Pacific #610 – the "American Freedom Train".





Nathaniel Brill is going in a related direction with his big Virginian AE 2 compound 2-10-10-2 engine.

Now, for something a little different from the Big Ben Bricks archives. Here's a 4-4-0 General by "Thunder Dean". It just goes to show that even basic bricks and plates can still be used to make a convincing cow-catcher, if arranged in the right way.

Ben Fleskes shows that special SNOT techniques are not required to make a great looking cow-catcher on this classic Southern Pacific Daylight locomotive.

Finally, here's one more cow-catcher design brought to you by the author of this article. The cow-catcher on this little 2-8-0 engine is constructed from 45-degree slopes and corners. This gives the cow-catcher a more opaque, utilitarian look in contrast to the elegance of flex tubing and robot arms frameworks. For a small freight locomotive, it seemed like a good fit. The engine is semi-permanently attached to a tender full of Power Functions driving components.

It's been a whirlwind tour of the many ways to construct a cow-catcher for a LEGO® train engine. Clearly, there are more possibilities than could fit in this article, and new designs are being invented almost daily. The models featured here must be viewed merely as a survey of the numerous options available to the LEGO® train builder. If you have an innovative cow-catcher design not seen here, feel free to send it to us at *RAILBRICKS*, and we'll try to include it in our "Trainspotting" section as space permits.

1. http://www.ahrtp.com/HallofFameOnline2/pages/BO4-6-0.htm
2. http://guide.lugnet.com/set/mdata.cgi?q=396_1&v=n

Links to models featured in this article:

Nathaniel Brill on Flickr:
http://www.flickr.com/photos/34338074@N06/

Big Ben Bricks train gallery:
http://bigbenbricks.com/gallery/gallery.html

Crash on Brickshelf:
http://www.brickshelf.com/cgi-bin/gallery.cgi?m=Crashnet

Cale Leiphart on Flickr:
http://www.flickr.com/photos/steampoweredbricks/

Tony Sava on Flickr:
http://www.flickr.com/photos/savatheaggie/

Shaun Sullivan on Brickshelf:
http://www.brickshelf.com/cgi-bin/gallery.cgi?m=sullis3

Scott Wardlaw on Flickr:
http://www.flickr.com/photos/wardlws/

A Power Function Signal Lights

By Viktor Peter Kovacs

The LEGO® Company has been making LEGO® trains since 1966. In the past they included working signals, starting from the start-stop signals for the 4.5V battery sets to the sophisticated light signals and block control of the 12V train era (see: image 1). During the 9V era some form of block control and signalling was still possible, but required many tricks and Technic parts to make it work. With the switch to RC, and later to Power Functions trains, block control and power over tracks was abandoned in favor of the infrared remote control. This got rid of the wires laying around on a layout, but also meant that switches are now manually powered and signals are symbolic. The best example is the 2010 passenger train set, where the included signal is completely non-operational. However, the new Power Functions elements, like the PF LED lights (see: image 2) also create a new opportunity to build working signaling and layout automation components purely from LEGO® parts. In this article I'll describe a few methods to make working light signals with PF elements and a little circuit modding.

Image 1: 12V Signal Set

Building a working light signal is relatively simple with two unmodified PF LED parts. However, the solution requires two switches and leaves one LED unused from both parts. Linking the two switches with gears is possible so only valid aspects are shown, but it is not the most economical solution and it looks rather ugly. However, if there were a PF LED part that would light up only one LED, depending on the polarity of the signal, it would be easy to make a light signal with a PF polarity switch and a single PF LED. This polarity-based signal control is used by most Japanese N-scale model train manufacturers, because it cannot show an incorrect aspect, requires only two wires and with light emitting diodes the natural operation of the diodes allows polarity based operation without external components. The solution is to mount the diodes in parallel, back to back, so the diodes open (light up) on different polarity. This is how 12V LEGO® signals worked.

The question is how to get a standard PF LED light to work this way. After opening up the circuit brick of one

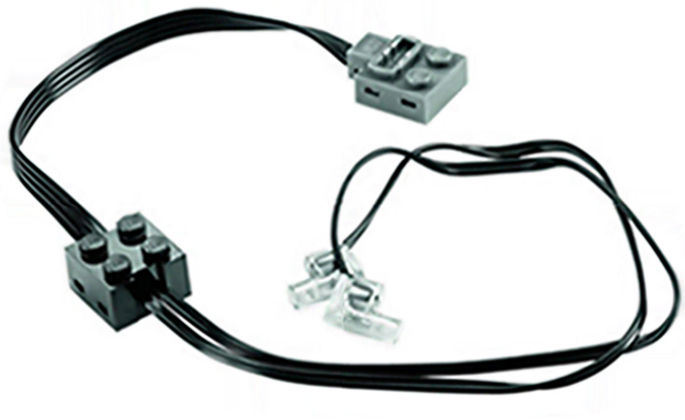


Image 2: PF LED Light

(the black brick between the connector and the LEDs), I discovered that it contains a bridge rectifier chip and support circuits for two separate and parallel wired LEDs (two series resistors and parallel capacitors). The bridge chip contains a diode circuit that always produces the same polarity output, regardless of the input polarity. By removing the bridge chip, connecting some of its legs together and reversing the leads of one of the LEDs, it is possible to make the same circuit that I mentioned earlier (see: image 3). The rest of the circuit can be left as it is, thanks to having all the right parts connected the right way. The modification requires opening up the circuit brick, cutting off the rectifier chip while leaving its legs in place, and connecting the right legs. One of the LED's wires must then be de-soldered and re-soldered to the same pads with reversed polarity. The circuit brick can be reassembled and the part should look like a normal PF LED. The best way to remove the bridge chip is to cut its leads with a sharp knife at the two horizontal red lines. The chip falls off while leaving its leads in place, which makes soldering easier. The leads connected by green lines in image 3 should be connected together. Finally, the two wires indicated by the white arrow should be swapped by removing and then re-soldering them.

When connected to a standard PF polarity switch, the modified LEDs now operate the following way: center, off; one side, one LED on; other side, the other LED on (see: image 4). This means that it is possible to switch between the red and green aspects with a single switch. This looks more like how a classical model railway signal works. It is relatively easy to make a signal mast for the LEDs, since they go into any Technic hole and headlight brick. I mounted them in a 2x4 Technic plate, with red and green 1x1 transparent round bricks as color filters, then fixed the plate to a mast (see: image 5). The result from the front looks surprisingly like an old 12V signal. The signal can also be mounted on signal bridges, and take many shapes.

Another trick is to connect the polarity switch to a motor so that the switch is constantly moved between the two side positions. This gives a simple alternating light that can be used for railroad crossing signs. Since the LEDs are polarity sensitive, it is also possible to add them to locomotives as directional lighting, so the correct white and red lights are turned on depending on the direction of travel. For PF systems, this is usually achieved by using the second output of the receiver for selecting the polarity. However, for analog 9V locomotives, it is possible to connect the LEDs to the

Image 3: Circuit Layout

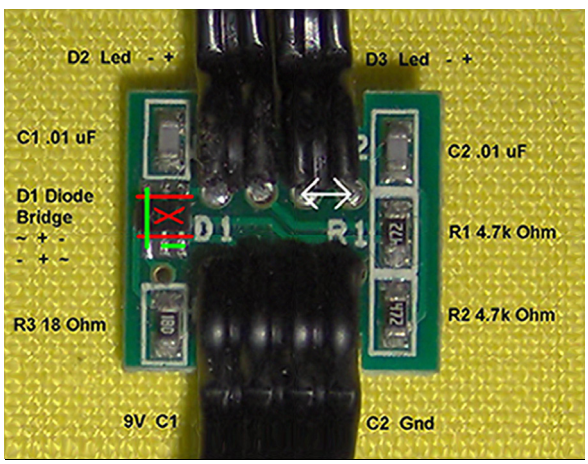
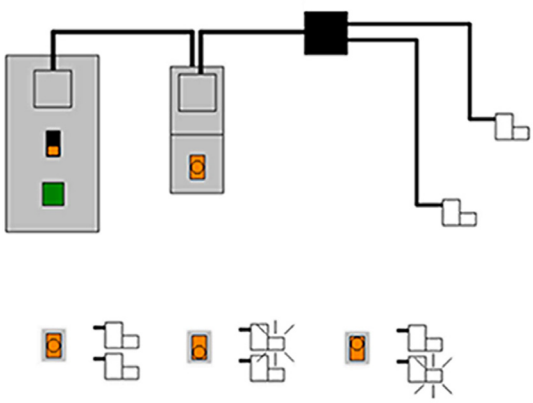


Image 4: Polarity Diagram



output connector of the motor with a PF-9V converter cable. This also gives directional lights, but only when the locomotive is moving (It is not safe to use the 9V PF LEDs with 12V).

For a common European locomotive with two white lights and two red lights on each end, four PF LED parts are required, giving a total of eight LEDs. For locomotives with an additional third white light above, or normal American diesels, an extra LED part is required, with the two white LEDs placed at each end of the locomotive. All these LEDs can be driven from a single PF IR receiver output, or from the single motor connector. The only problem is fitting all the wires into the locomotive.

For analog 9V trains, it is also possible to place a small battery (like an old 9V small battery box or a new PF train AAA battery box) and a PF switch into the locomotive, so directional lighting could work even when the train is standing, but this means the switch has to be moved manually. I use this mode of operation for my driving trailer cars because they don't have power pickups, and all of my PF trains have to be operated in 9V analog mode on 9V club layouts. For this, I use a PF polarity switch to separate the motors from the PF IR receiver. One of the motors is actually a 9V train motor that can pick up power from the 9V metal rails, but the train operates as a normal PF train on 4.5V/12V/RC/PF plastic tracks.

I'm sure readers can find other uses for this small mod in other projects. Two examples for the digitally controlled train lights can be seen in image 5, and for the analog, track-powered version in image 6. All trains, signals and layouts on these images are built by members of the Hungarian LEGO® Train Club (HUNLTC).

Tools required for the modification:
- Small flat screwdriver for carefully opening up the circuit brick
- Fine tipped soldering iron (preferably with temperature control)
- Sharp knife with a thin blade (preferably an X-ACTO™)
- Soldering material
- De-soldering copper ribbon (optional)

You should only do this modification at your own risk, only if you are an adult, or with adult supervision. Also remember that modding a LEGO® circuit means losing the warranty.

Finally, I think it would be really good if The LEGO® Company decided to produce these modified LED lights. It doesn't need new forms, or even a new circuit board, just a few different components, and maybe a different color for the circuit brick to allow the identification of the different LED types. This would allow the same level of railroad signaling that was achieved with the 12V trains, while keeping the new Power Functions system.

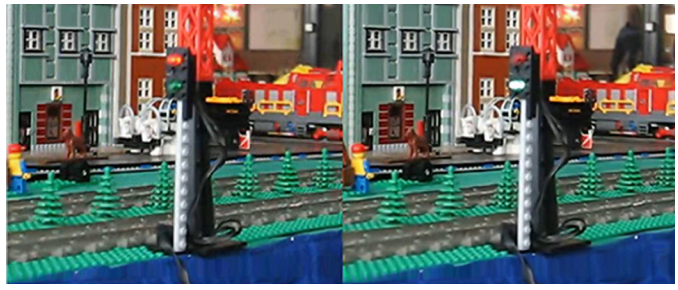


Image 5: Translucent bricks over the PF LEDs display different colored aspects of the completed signal.

Image 6: Modified PF LEDs on this locomotive change the lighting from white to red.

TRAINSPOTTING

FM H10-44 by Falk Schulz (http://www.flickr.com/photos/bricknerd/5743665237/in/photostream)

“John Deere” by Josh Hanes (http://www.flickr.com/photos/jchanes927/5788495443/in/pool-94516438@N00/)

Weathered Boxcar by John Bucy (http://www.flickr.com/photos/jmbucy/5678263050/in/set-72157621763435819/)

0-4-2ST No. 5 “Frank” by DustyBricks (http://www.flickr.com/photos/46846033@N08/5877271543/in/photostream/)

EMD E7A NYC 4027 by Nathaniel Brill (http://www.flickr.com/photos/34338074@N06/5619727241/in/set-72157625841592802/)

Texas State Railroad Engine #400 by Anthony Sava (http://www.flickr.com/photos/savatheaggie/5573207169/in/ set-72157626260516429/)

Well, That's a Relief!

Photos and Story By Elroy Davis

While working on my home layout, I often find myself staring at a blank wall. The white cinder-blocks against which my layout tables rest create a harsh, wide backdrop to my otherwise colorful and detailed switching layout.

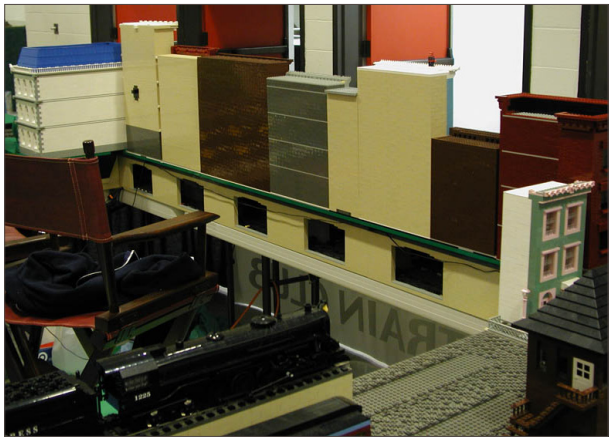
To alleviate this problem, I started looking for solutions. Since I rent the house that I'm currently residing in, painting the walls was not an option. If I were a traditional scale modeler, I would add panels to the back of my tables, painting them in such a way as to make them blend with the layout. While this method would work to rid myself of the blank white wall, I really desired a solution more in line with the rest of my layout. In other words, I wanted something built out of LEGO® pieces.

The solution: low-relief buildings.

Low-relief buildings, or what modeler John Neal refers to as "backdrop buildings", are another trick that builders can use to give a sense of depth to an area of a layout that may not have much space available. Low-relief is a term, often applied to sculpture, in which the subject is raised slightly from a flat plane. For buildings, this may be just the front façade. For greater depth, the modeler may also decide to use high or half-relief buildings, creating more of the building's structure without the need for constructing an entire assembly.

In my case, my layout tables are tight against my basement wall. My track is spaced four studs from the edge of the baseplates, leaving me just a narrow

(Continued on page 29)



Backdrop buildings on the Twin Cities LEGO® Train Club layout have clean, finished backs, capable of supporting the front façades without support of a wall. Models and photograph by John Neal.

This door-study is a nice example of how a small storefront could be done as a low-relief building. A row of small shops could quickly fill out a street. Model and photograph by Deborah Higdon-LeBlond.

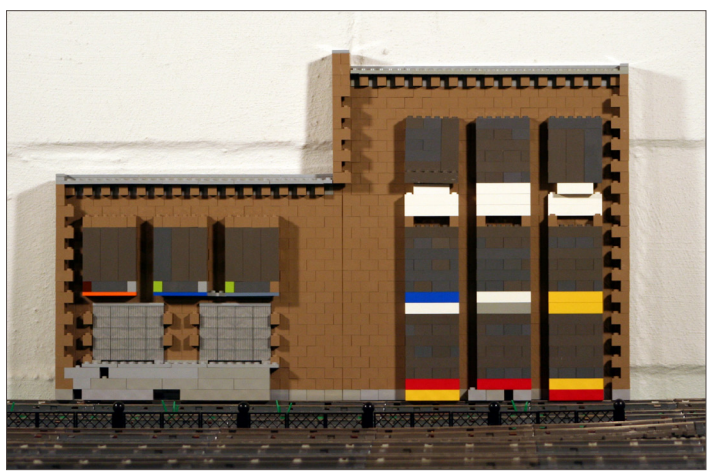
An alpine village by the Schubert family, pictured below as it was seen at BrickFair 2009, shows how low-relief structures can be used to create an entire town in a small amount of space. In addition, a backing mosaic was used to complete the scene.

Before the addition of a background building, the white cinder-block basement wall created a featureless backdrop for the layout.

The façade of a simple warehouse masks the wall, and creates a usable industry for the railroad.

Just a few studs deep, the warehouse building slips between the the wall and the track at the back of the baseplate.

A simple support system in the back blocks the wall from showing through the windows, but helps to create the illusion of an interior when viewed from the front.



band between the rails and the wall. Since my layout is primarily a switching layout, I want to create an industrial backdrop, something that I think will be appropriate for the trains and location that I model. I began the process by building a small warehouse. Eventually, I'll fill the back wall with other industrial structures to create a full backdrop.

My first backdrop building is pictured here. The majority of the structure is just three studs deep, with a couple of detail areas projected out another stud for a total of four studs. The dimensions are just enough to fit between the wall and the nearest track. I started with a warehouse, similar in style to one that I had seen in a model railroading magazine. Being a warehouse, the façade is fairly plain, but I was able to include details such as half-stud offset windows, a loading dock, and roof cornices.

Since the building was going to rest against my basement wall, I didn't worry about finishing the back. The advantage of this decision was that I had more room to work with, and I didn't need to worry about the colors of any of the support elements. The disadvantage is that the building is not as stable as it might be with a completed back. The other disadvantage is that the white wall would be seen through the building's windows. To address this problem, I covered the backs of the windows with dark grey parts, which hide the wall, but still reflect a bit of light through the windows, giving a sense of interior.

This single low-relief building has instantly transformed my layout. Instead of running past a white cinder-block wall, my locomotives can now rumble past a warehouse, or unload boxcars at the building's dock. Not only have I cleared up my blank wall issue, I've created a useful industry in the process!

Fixing the Double Crossover

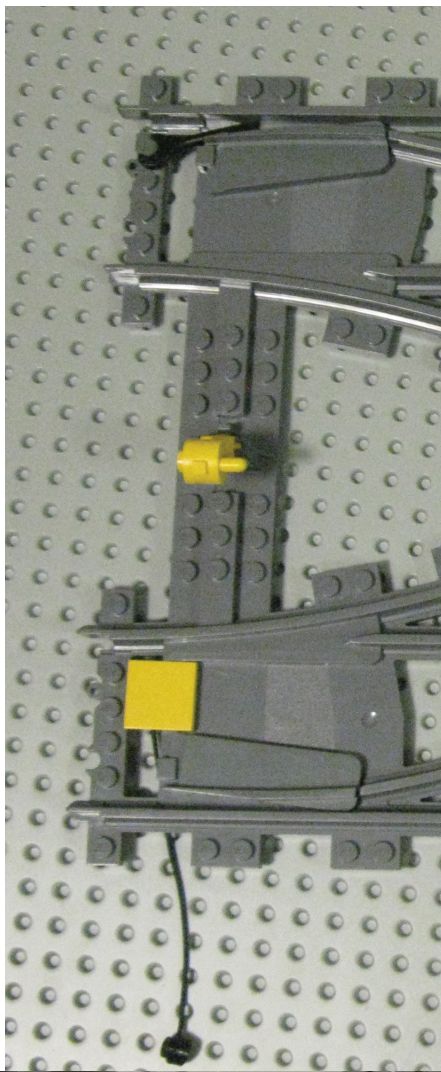
By Benn Coifman

The double crossover, set 7996, is a wonderful configuration, but the implementation had several problems. First, this set aimed at AFOLs was launched in 2007 with the now discontinued RC trains. The RC trains were woefully underpowered for AFOL interests. So the all-plastic crossover was of little use at a time when most AFOLs were still buying the 9v system from LEGO®. It would be a few more years before AFOLs and LEGO® alike figured out how to make powerful enough PF trains that could run on the all-plastic track. By that time, the last of the double crossovers were already on clearance.

The double crossover is so much more space-efficient than the conventional LEGO® switch. But its second problem limits its use, since as designed you cannot simultaneously line both tracks to go straight. On either side the lever controls both tracks, so one or the other track must always diverge. Herein you will find two ideas for turning it into a single crossover without permanently modifying the parts. Just as when a switch has problems on the real railroads, you can temporarily "spike the switch." You can (A) use a wrench to force the points open, independent of the lever, or (B) use a tile to force the points closed. In either case, just be careful to do it in pairs to prevent conflicting movements from occurring (as indicated on the far right and shown in the example for A but not for B).

Finally, in the 9v era Rick Clark came up with a spear switch to bypass the lever control. His trick slid in through the holes used for crimping the metal on to the rails, but this solution did not provide electrical continuity to the divergent leg of the switch. Without the need to preserve conductivity for PF trains the battery powered trains are ideal for the spear switch, but unfortunately LEGO® did away with the holes in the all-plastic track. Eurobricks member aprendiendo posted a great solution with an upside down 1x8 tile beneath the track (a 1x2 door rail plate would work well to force the point in that configuration). Here we see a studs-up variant of that design using a string instead. Just be sure that you do not pinch the 2x2 tile against the track so the mechanism can slide. In either case, you will need to raise the tracks one plate if running on the floor or two plates if running on baseplates.

1



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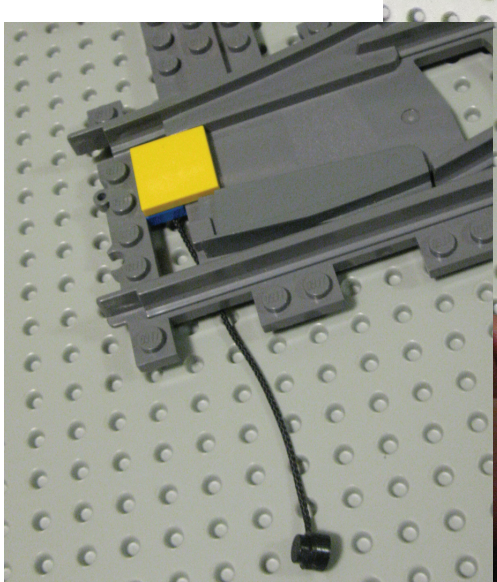

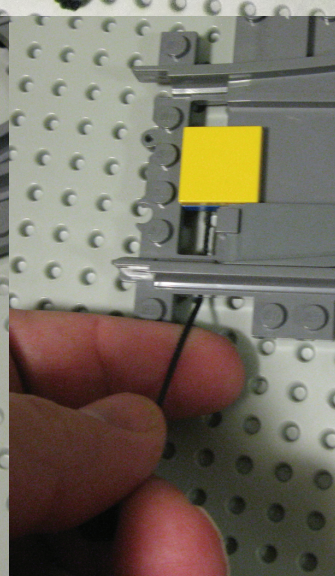

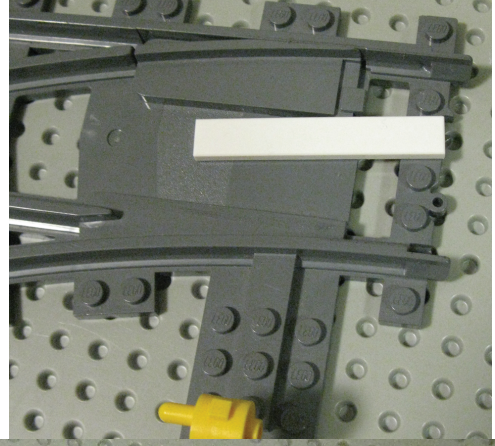

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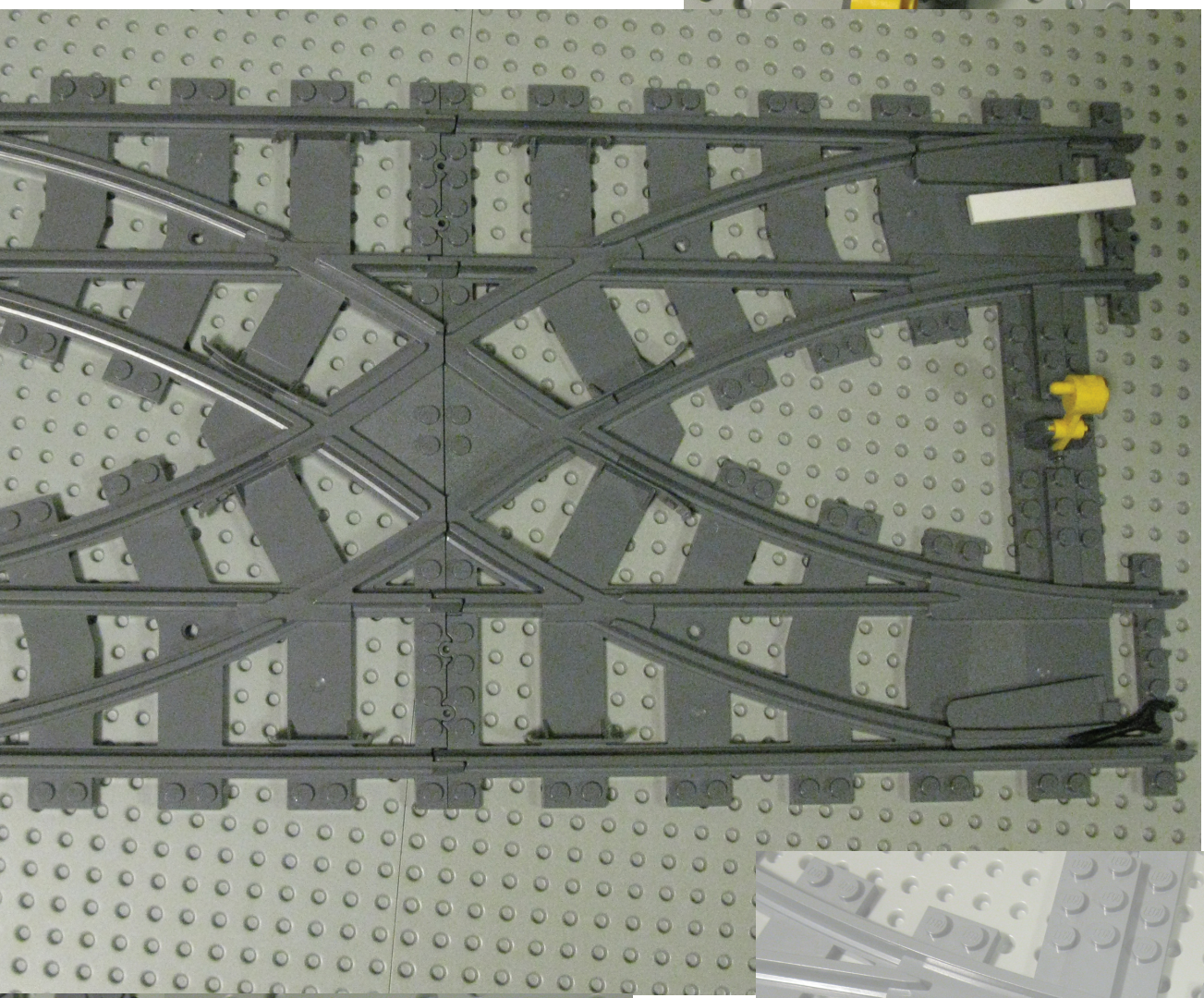

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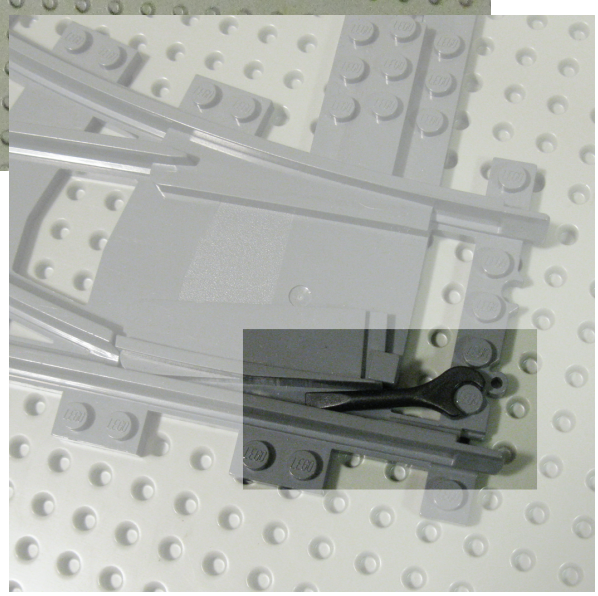

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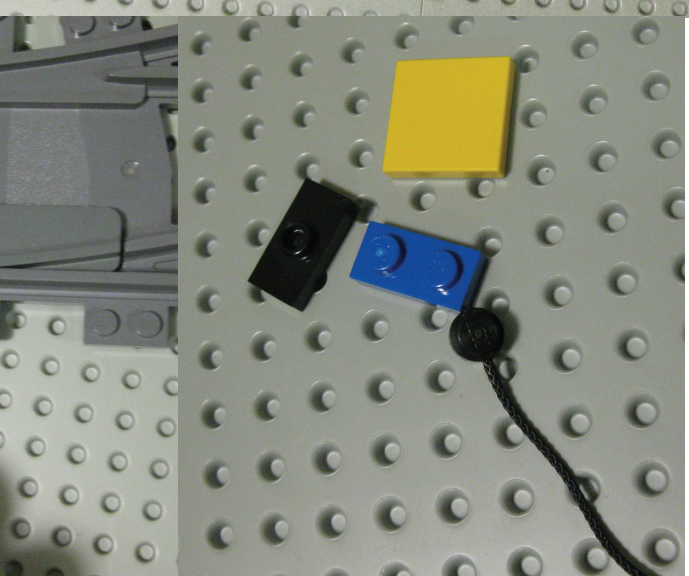


Under The Wire

Article by David Stannard
Instructions by Larry Pieniazek

Ever since the inception of electric traction to railways, catenary, or overhead wiring as it is known, has been one of the most prolific forms of delivering power to electric locomotives and multiple units. Like veins coursing through the body delivering blood, these networks of wire suspended by a forest of steel masts supply the essential life source of electricity that power the forever hungry beasts that run beneath them. In this article we will look at a variety of aspects of this often neglected, as far as modelling is concerned, yet essential element of electric traction. We will also show how to add a touch of realism to your layout.

The initial use of overhead wiring was for tramways, the first example being built by Siemens for display at the International Electrical Exposition in Paris, 1881. A variety of systems had been trialed, but it was not until the early 1900s when the use of overhead wiring for railway usage started to gain momentum, chiefly in Italy, Austria and Switzerland. During the First World War there was a major disruption to the supply of coal. This, in turn, pressed countries such as Italy and Switzerland that had no natural coal or oil supplies, to seek an alternative form of power. With an abundance of mountainous lakes that hydro-electric dams could be built on, there was only one answer to the problem: electrification of the rail networks. The efficiency and cleanliness of "White Coal" was seen as a major selling point to railways that had to concern themselves with operations of trains in tunnels and suburban environments. The use of traditional steam traction was unsuitable or frowned upon due to health hazards or pollution issues.

The supply of electricity to railway networks is composed of a network of traction substations that are connected to the electrical grid. These substations then supply power to the catenary. The catenary network is made up of a variety of masts that are used to support the cables that provide the overhead supply to electrically powered stock. The cables are suspended over the track using crossbars that have insulators fitted to them. The masts can be constructed from a variety of materials that include concrete or wooden poles with metal brackets and cross-arms fitted to hold the wiring. The most common types are of steel lattice or steel H-girder construction. The upper cable is strung at a constant tension between the masts. The lower, or contact, wire is suspended from the catenary wire using a series of drop wires. The contact wire runs parallel to the track.

Opposite Page: A wide variety of masts, including multi-tack and spanner masts.

Below: Show layout preparation showing a vast array of catenary masts in LEGO® form.

There are a variety of masts that have specific purposes. The support mast is the most common, and consists of a single mast that supplies power to one or two tracks. There are then multi-track masts that have a mast on each side of the tracks, with a girder in between them that is used to support the wires. Termination masts are used for each section of wiring, which are around 1800m/2000yds in length. The termination masts can be either a fixed or automatic tensioning type, ensuring that the wiring is kept at a constant tension. The automatic tensioning masts, or Spanners as they are known, have a weight that is suspended by pulleys. This pulley is then connected to the catenary via an insulated attachment. Spanner masts are normally located at one end of a section, sometimes both.

Example of a Fixed Termination Mast.

The need to keep the wire at constant tension is of major importance. The cable has a variety of stresses applied to it, from weather conditions to the force of the train's pantograph pressing against it at a wide range of speeds. Failure to keep a constant tension can result in either the wire snapping or sagging. The later can be extremely dangerous as it can snag on the train's pantograph and then be brought in contact with car body making it electrically live.

Example of a Double Bracket Mast.

The final type of mast is the feeder mast, used to connect the circuit to the traction substation. These masts have a switch mechanism fitted to them so the power supply can be disconnected for safety reasons, or when repairs and maintenance are being conducted.

There are a number of ways to model catenary systems. You can go for just modeling the masts or you can go whole hog and model the masts complete with wiring. The later approach is more difficult as there is more need for structural strength in the masts to support the wires. Also, there is the time associated with setting it up, especially with exhibition layouts. I will add, though, that at the end of the day the effort is worth it.

Example of a Feeder Mast.

For my own personal use with my freelanced railway, the LBB (Legodtenstein Bundes Bahn), I chose to model the masts without the wiring. I find it more flexible when building modular displays for exhibition, and it is easier and quicker to set up.

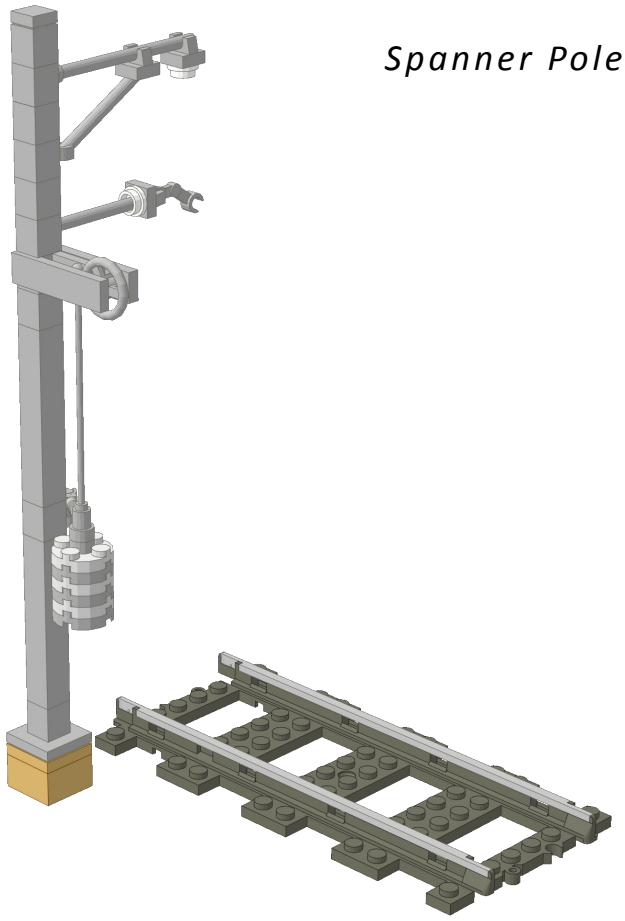
Example of a Fixed Termination Mast and Traction Substation.

Example of a Termination Spanner.

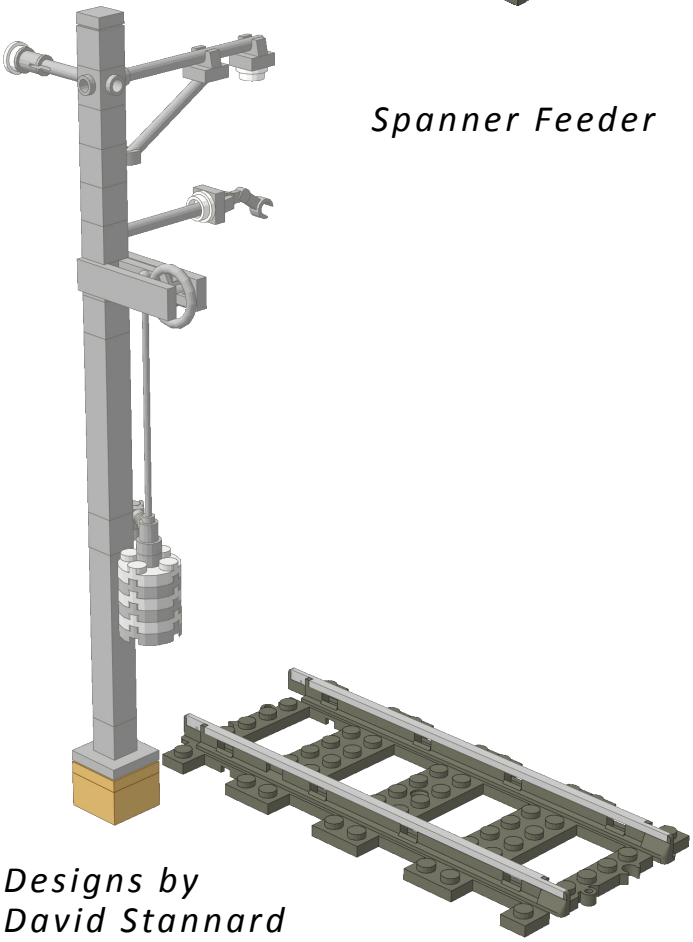
Catenary arrangement on a display, showing different types of masts along both the mainline, and in the locomotive yard area.

Standard Pole

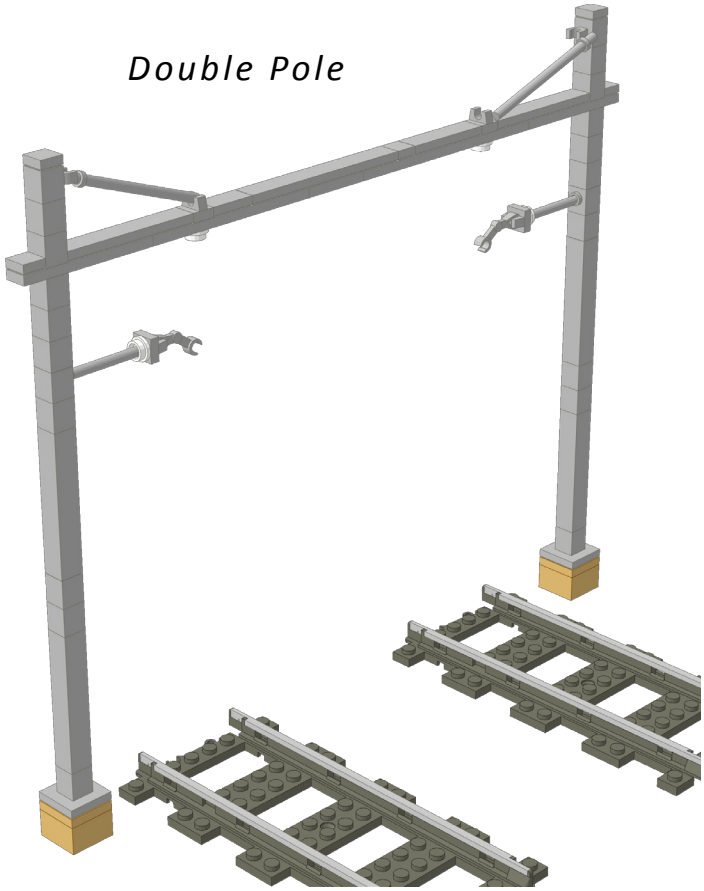
Spanner Pole



Spanner Feeder



Double Pole



Designs by
David Stannard

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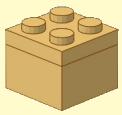

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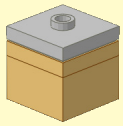

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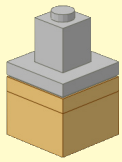

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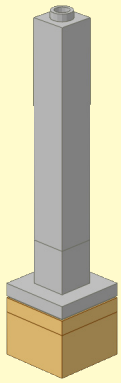

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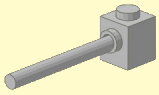

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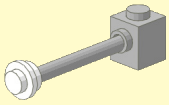

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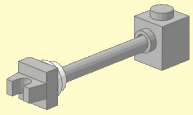

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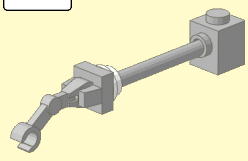

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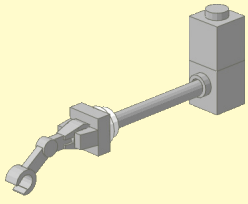

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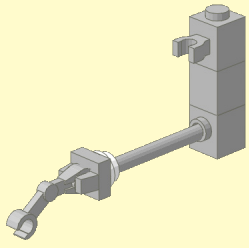

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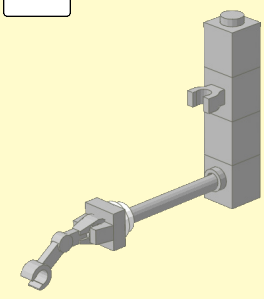

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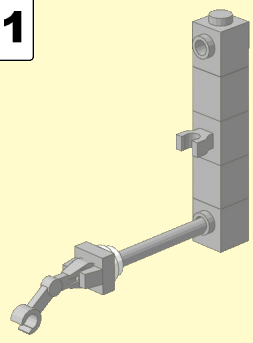

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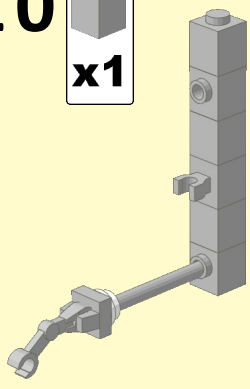

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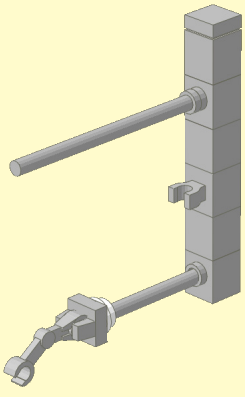

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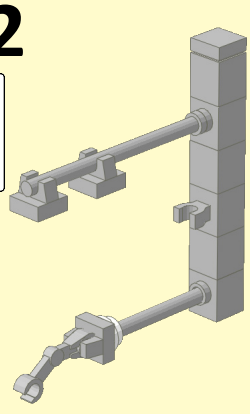

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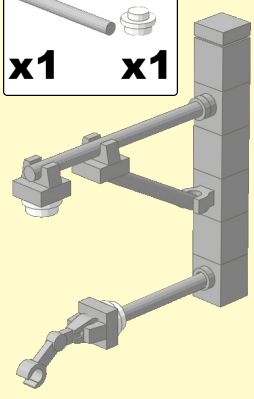

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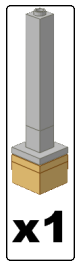

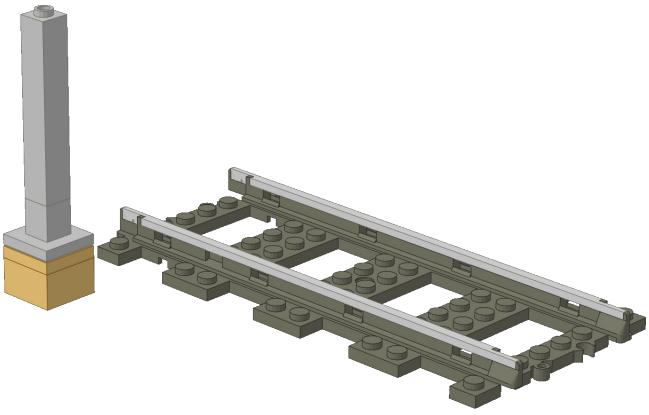

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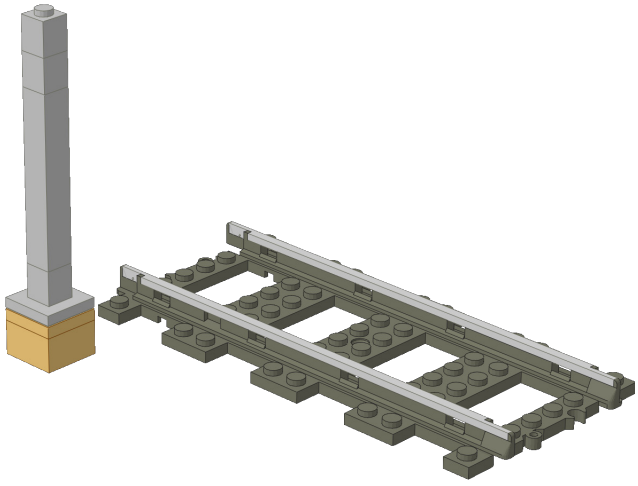

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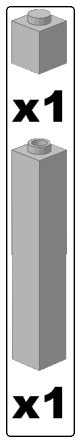

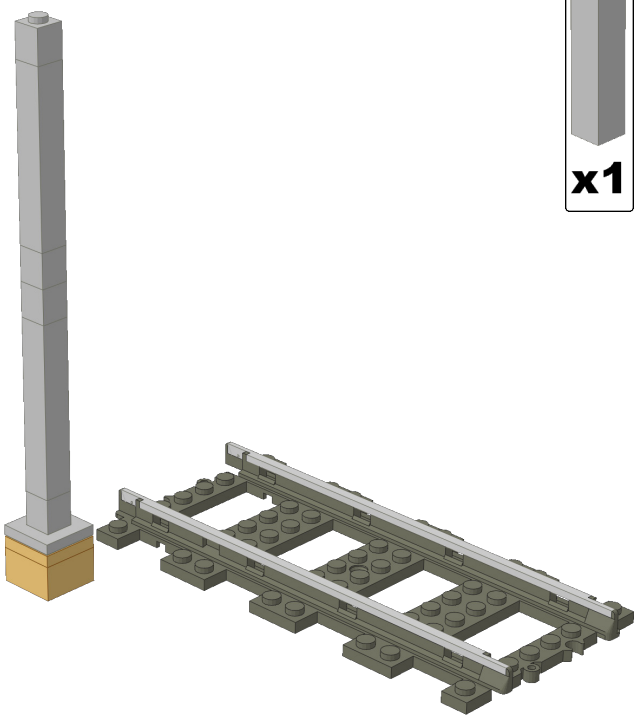

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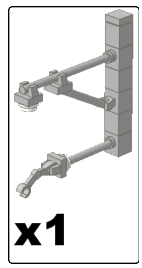

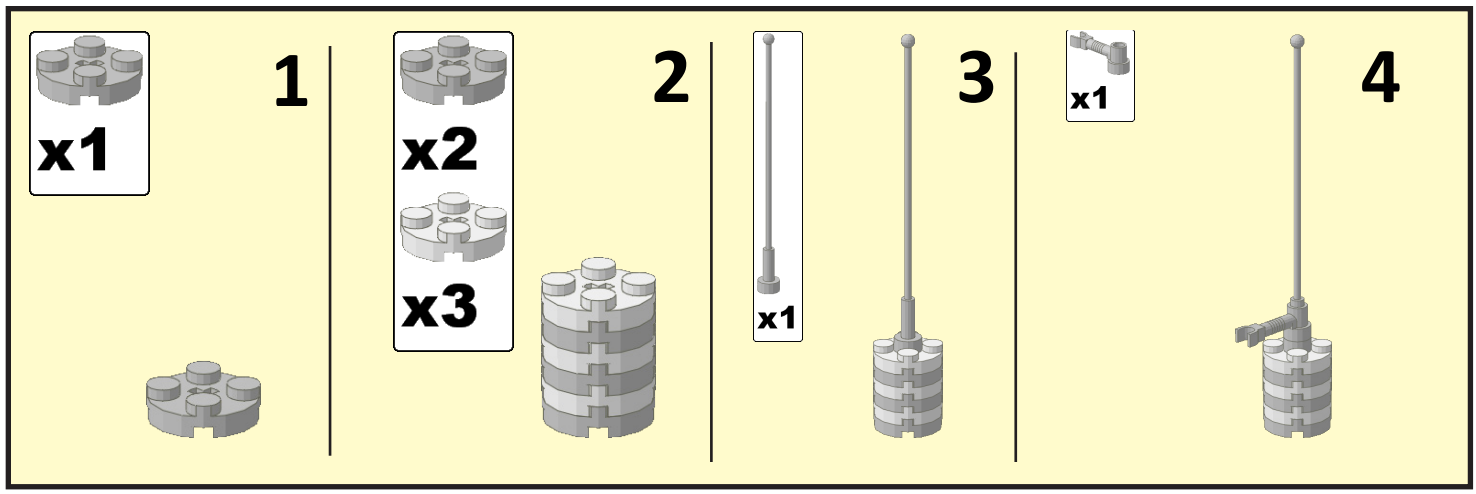
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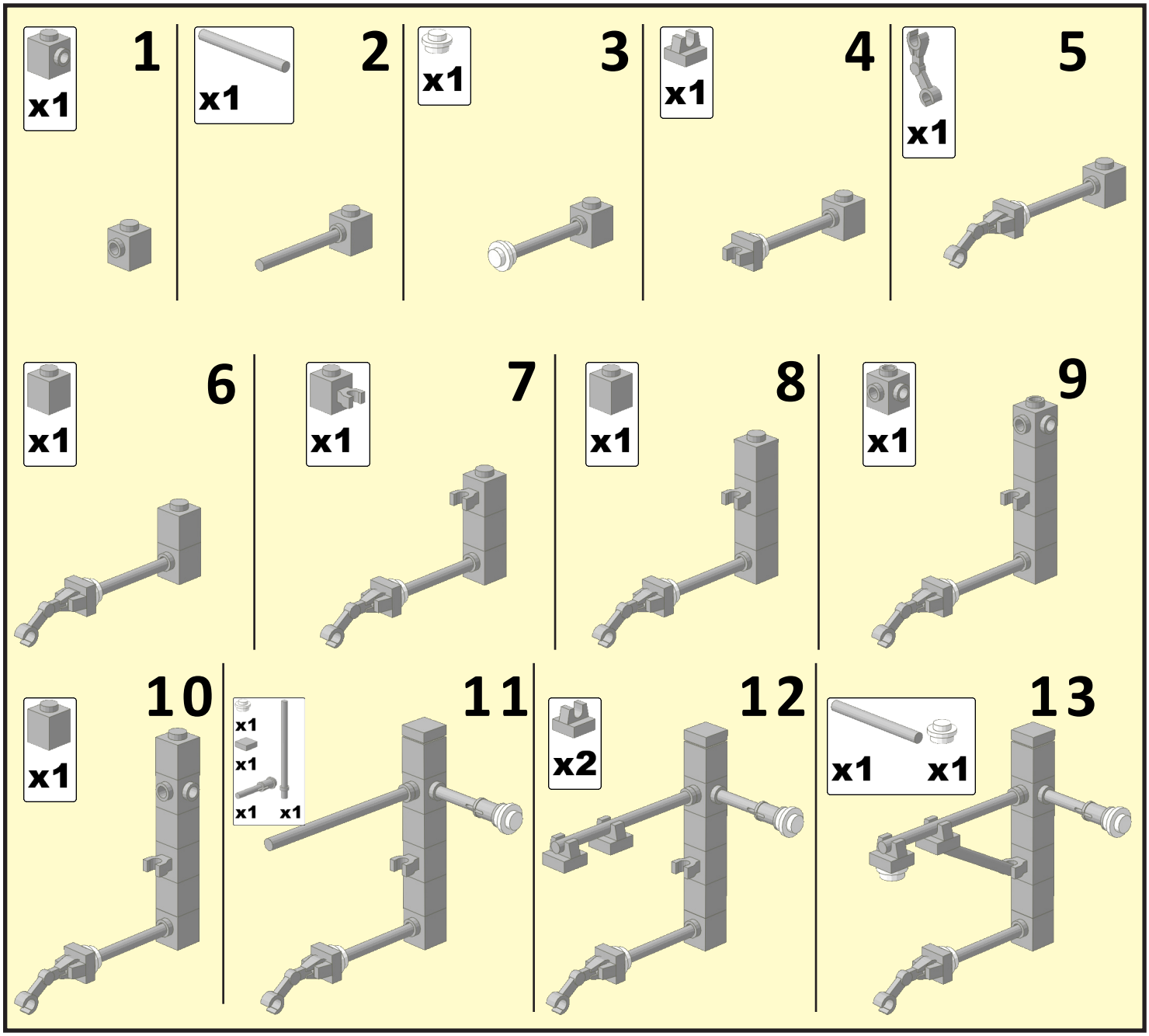
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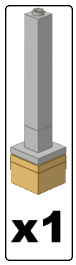

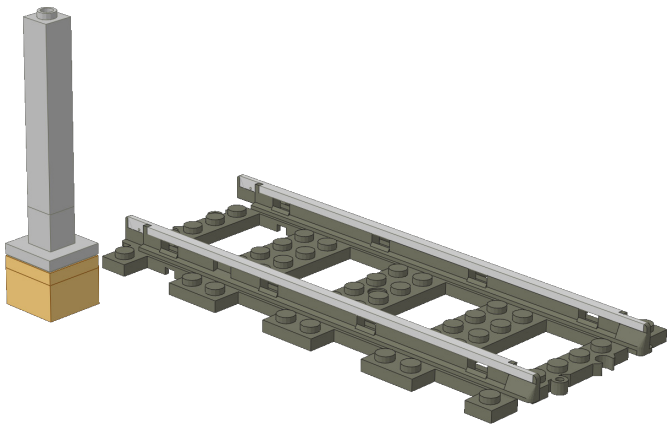

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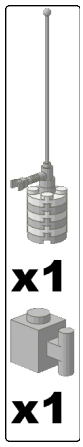

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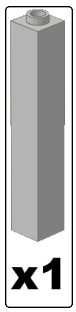

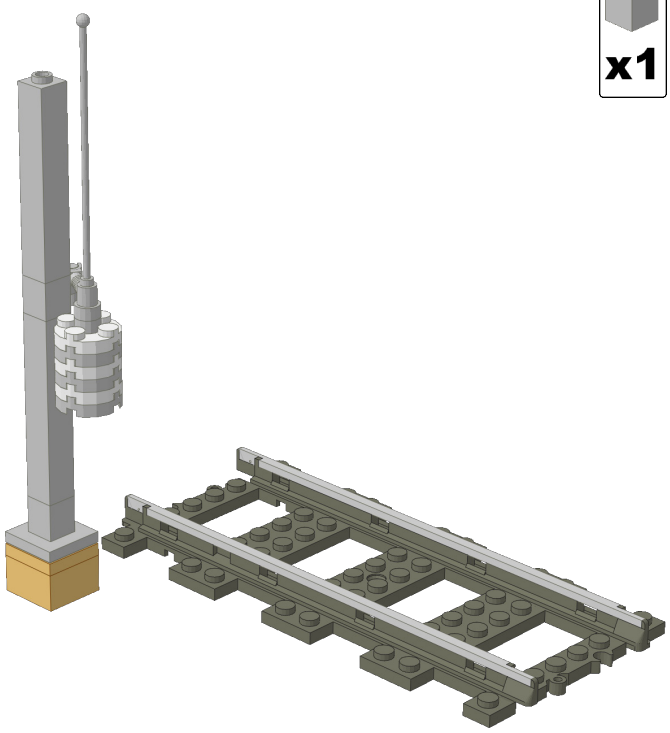

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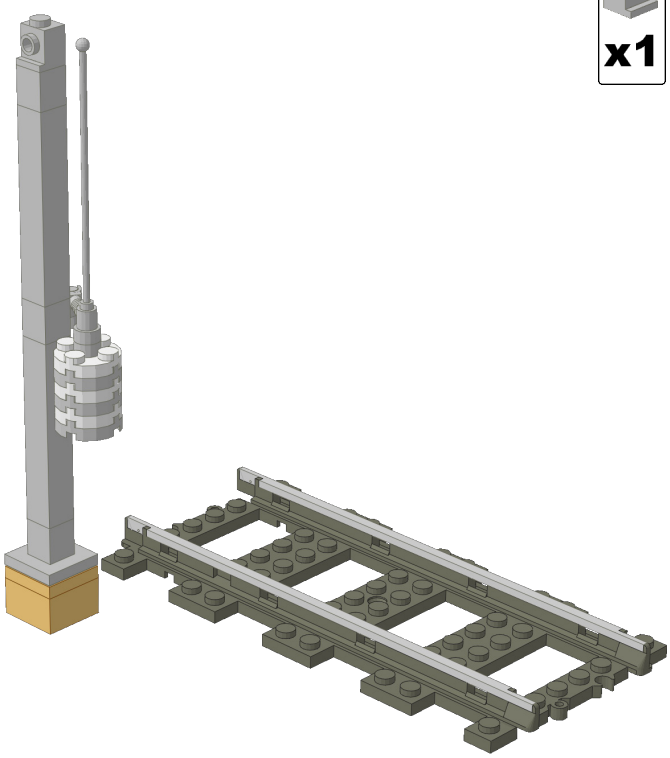

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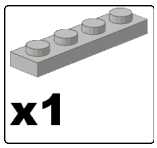

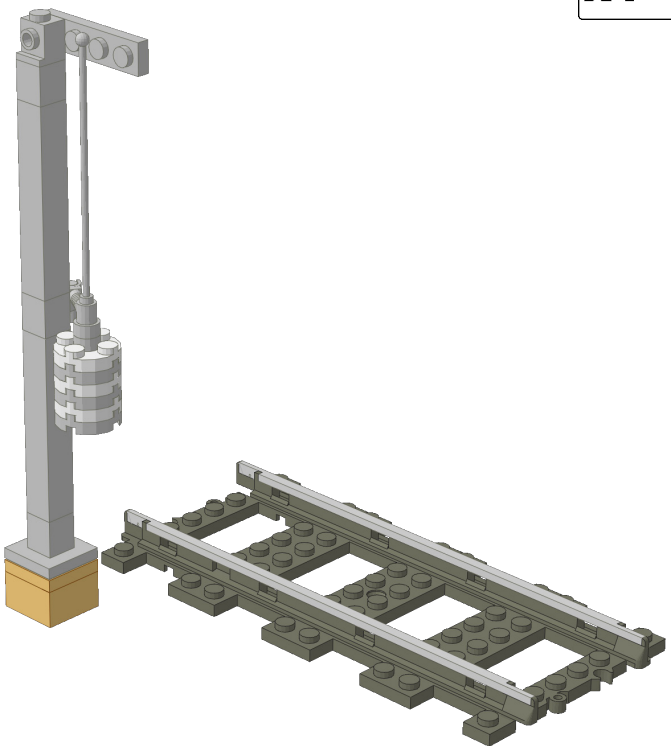

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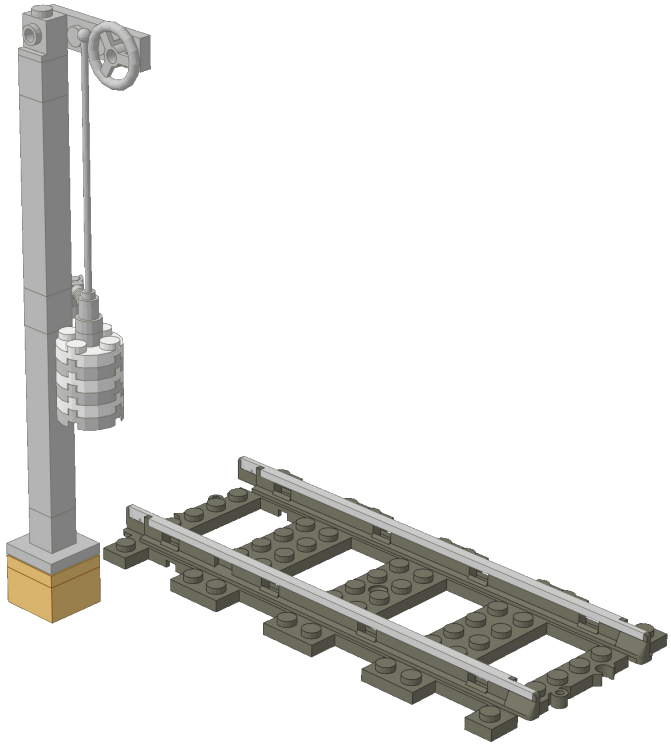

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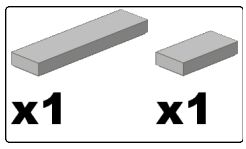

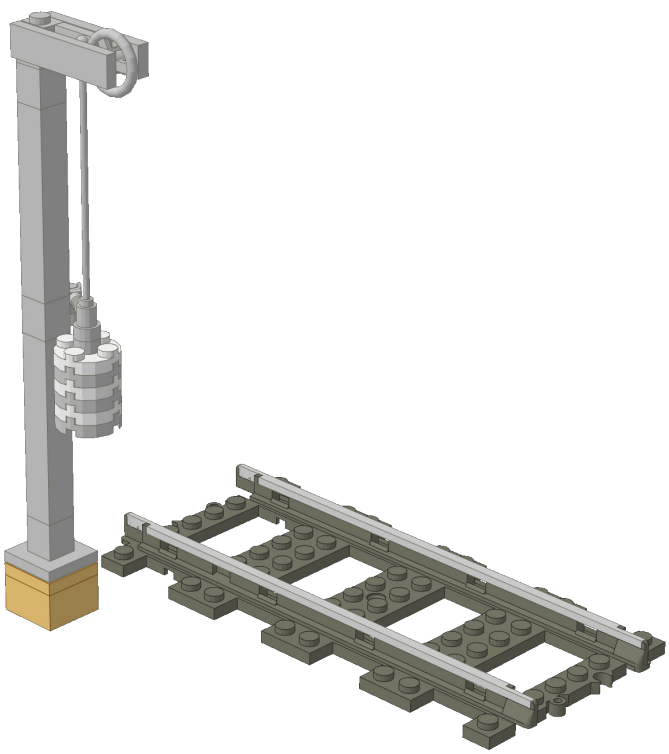

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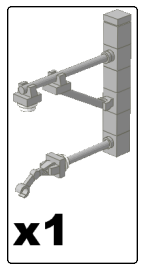

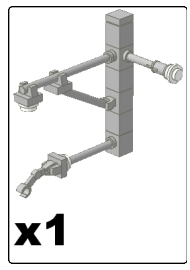

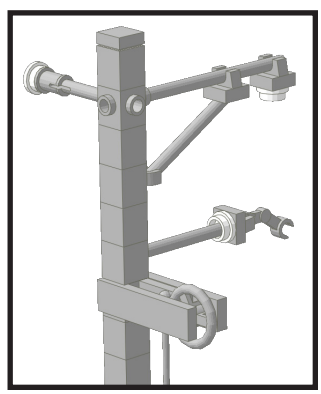

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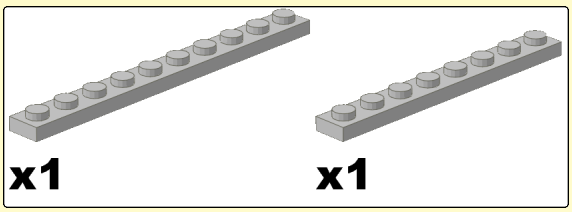

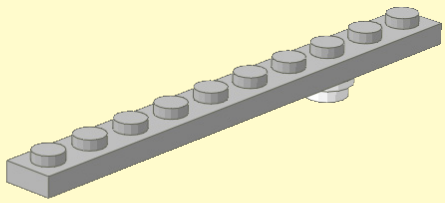

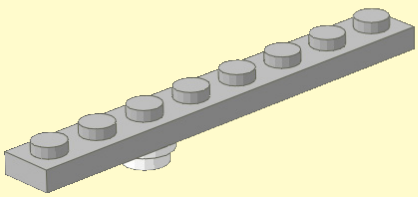

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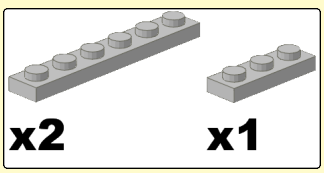

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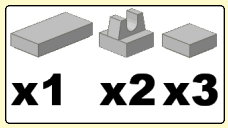

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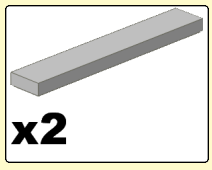

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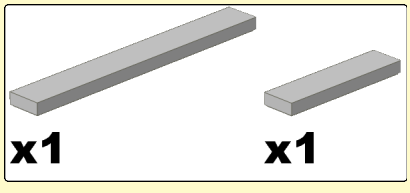

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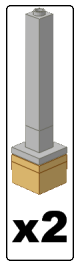

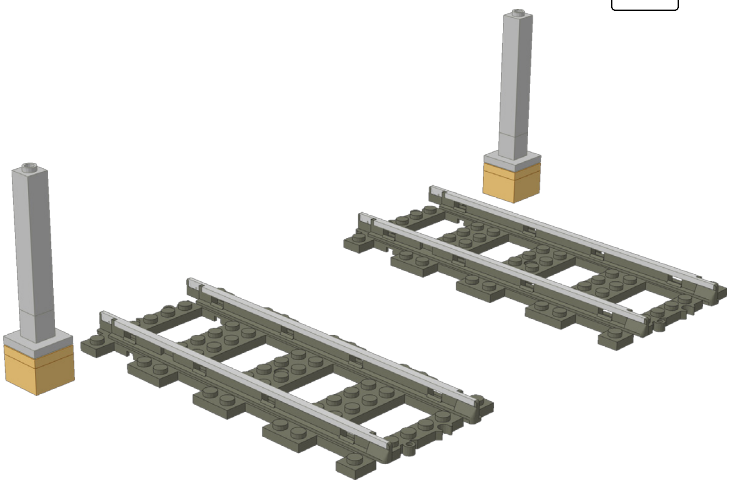

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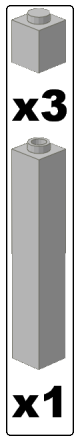

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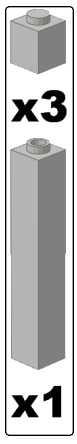

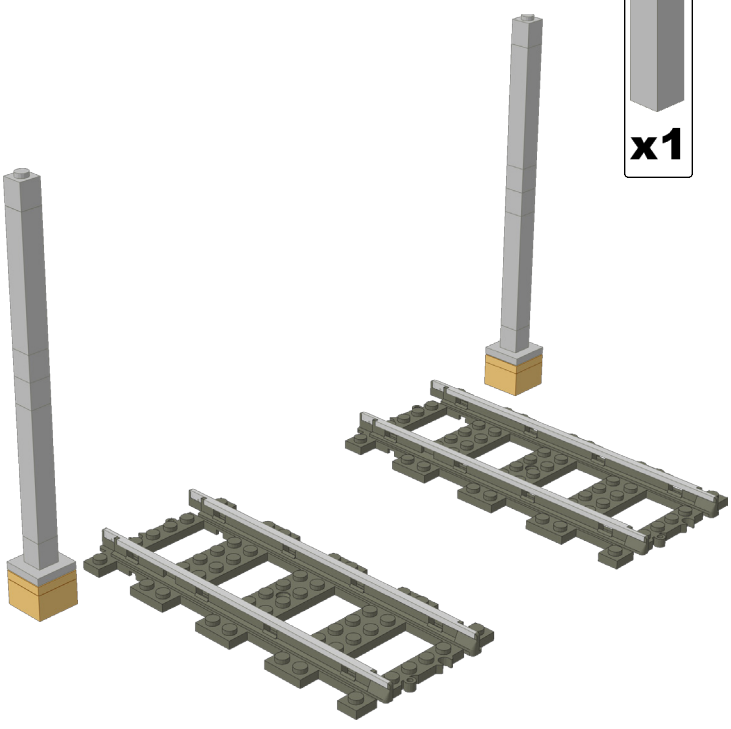

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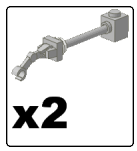

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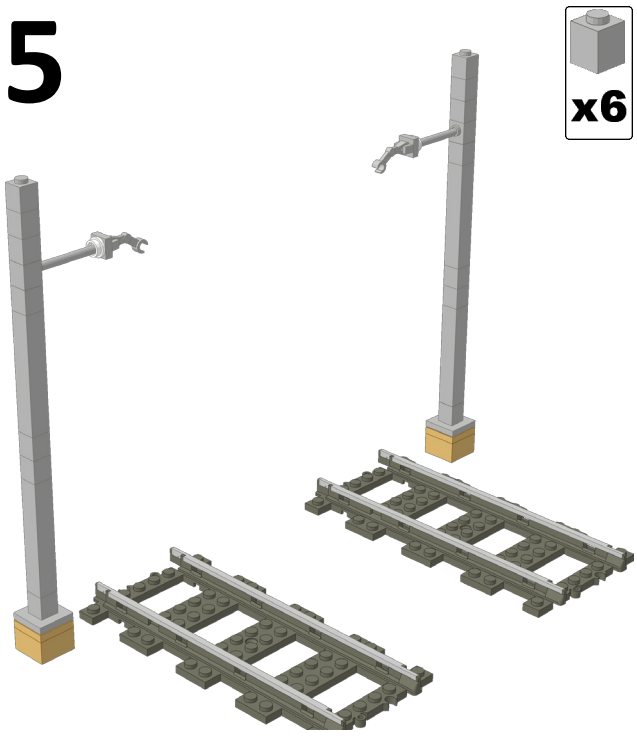

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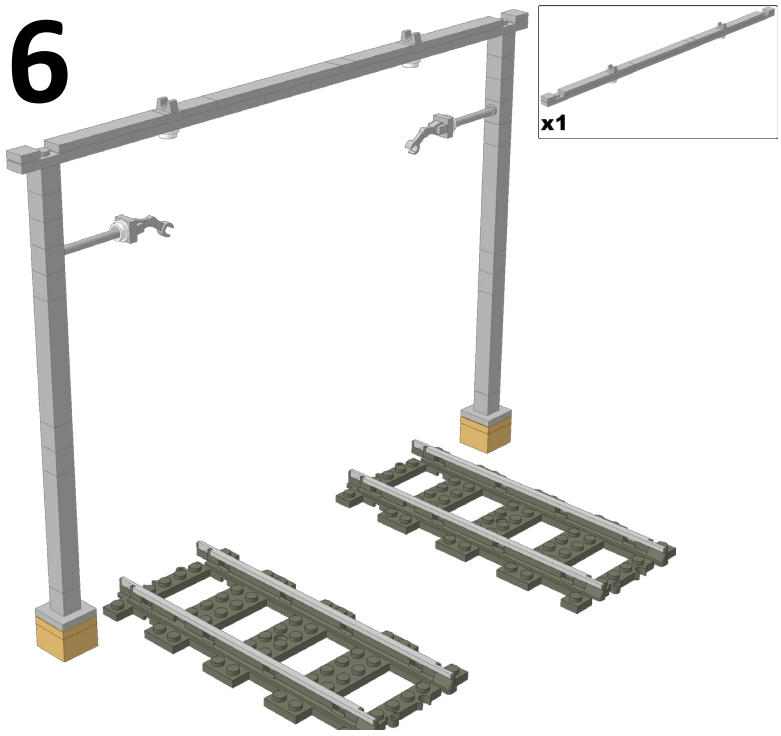

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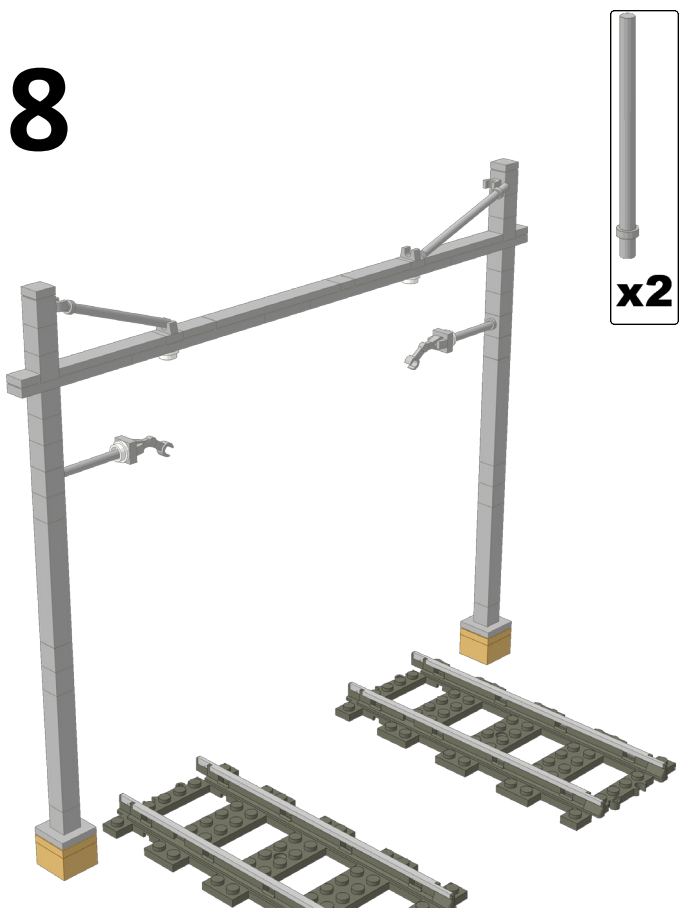

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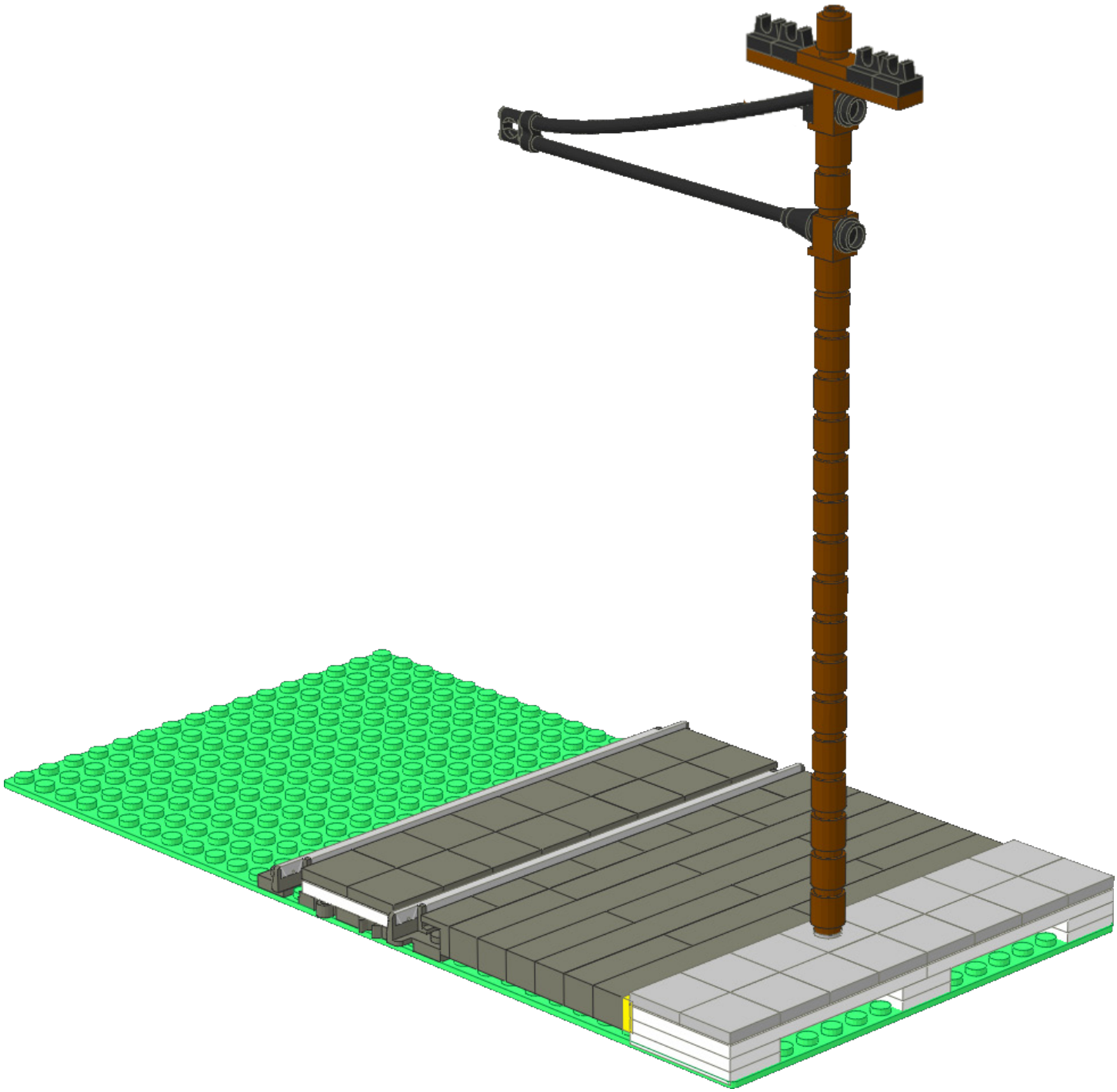

Design by
Cale Leiphart

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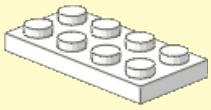

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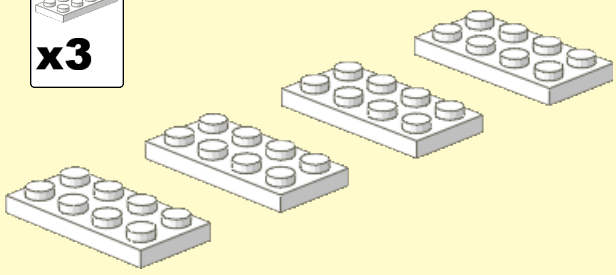

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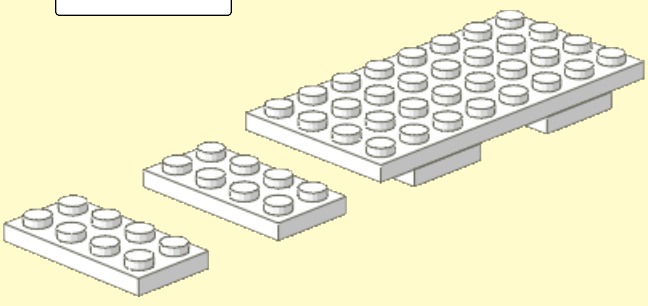

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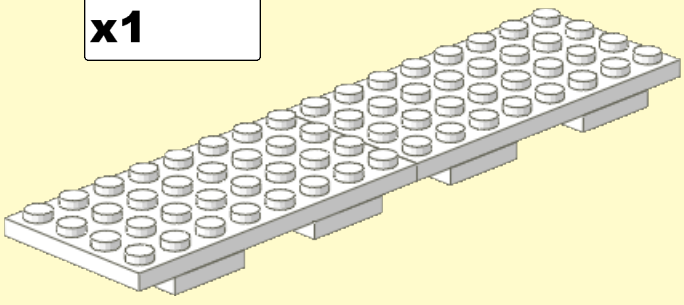

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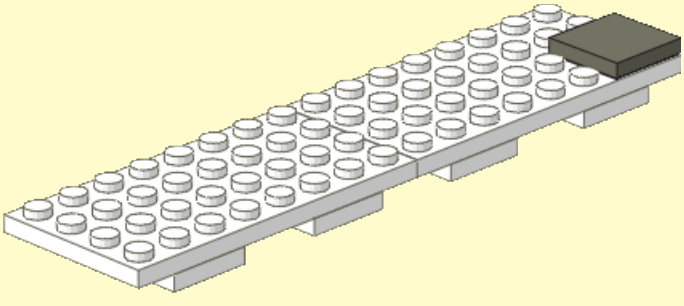

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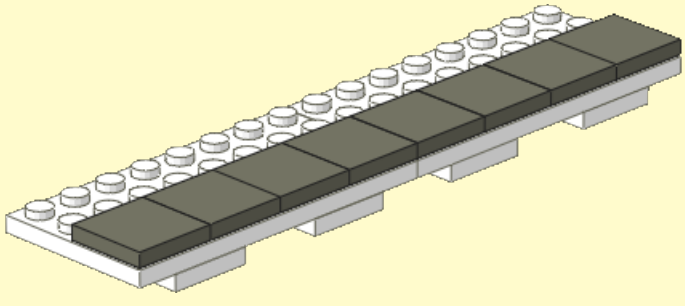

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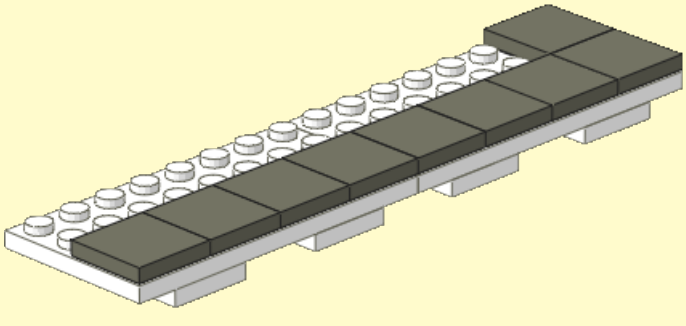

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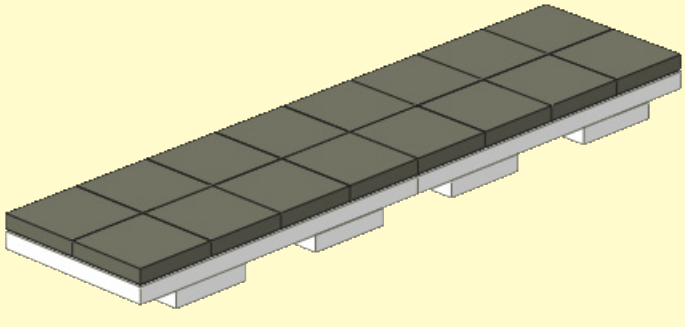

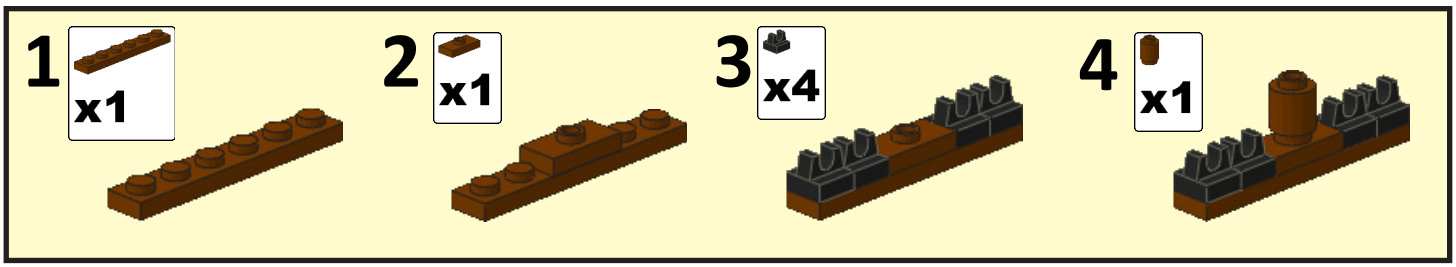
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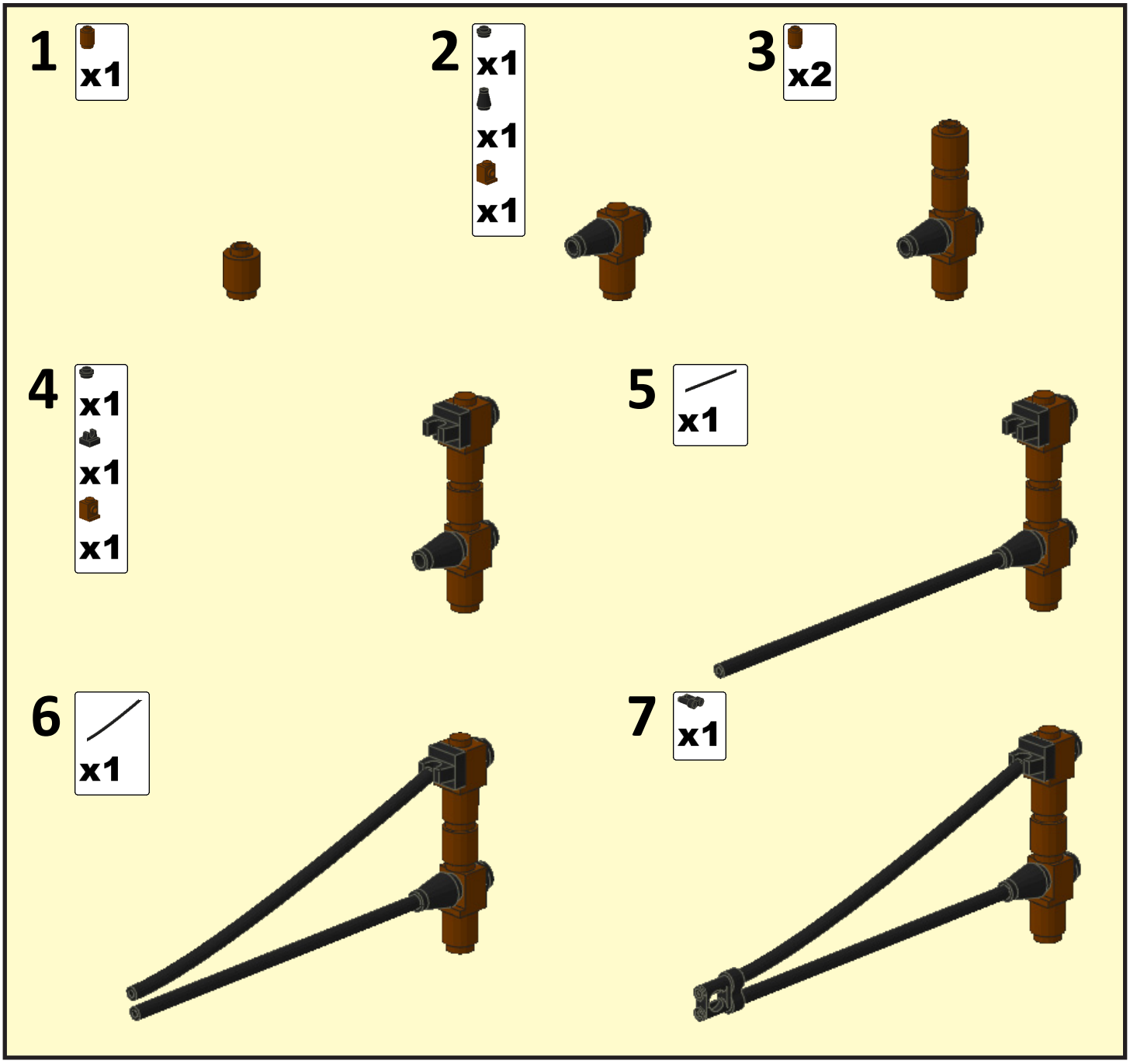
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x1
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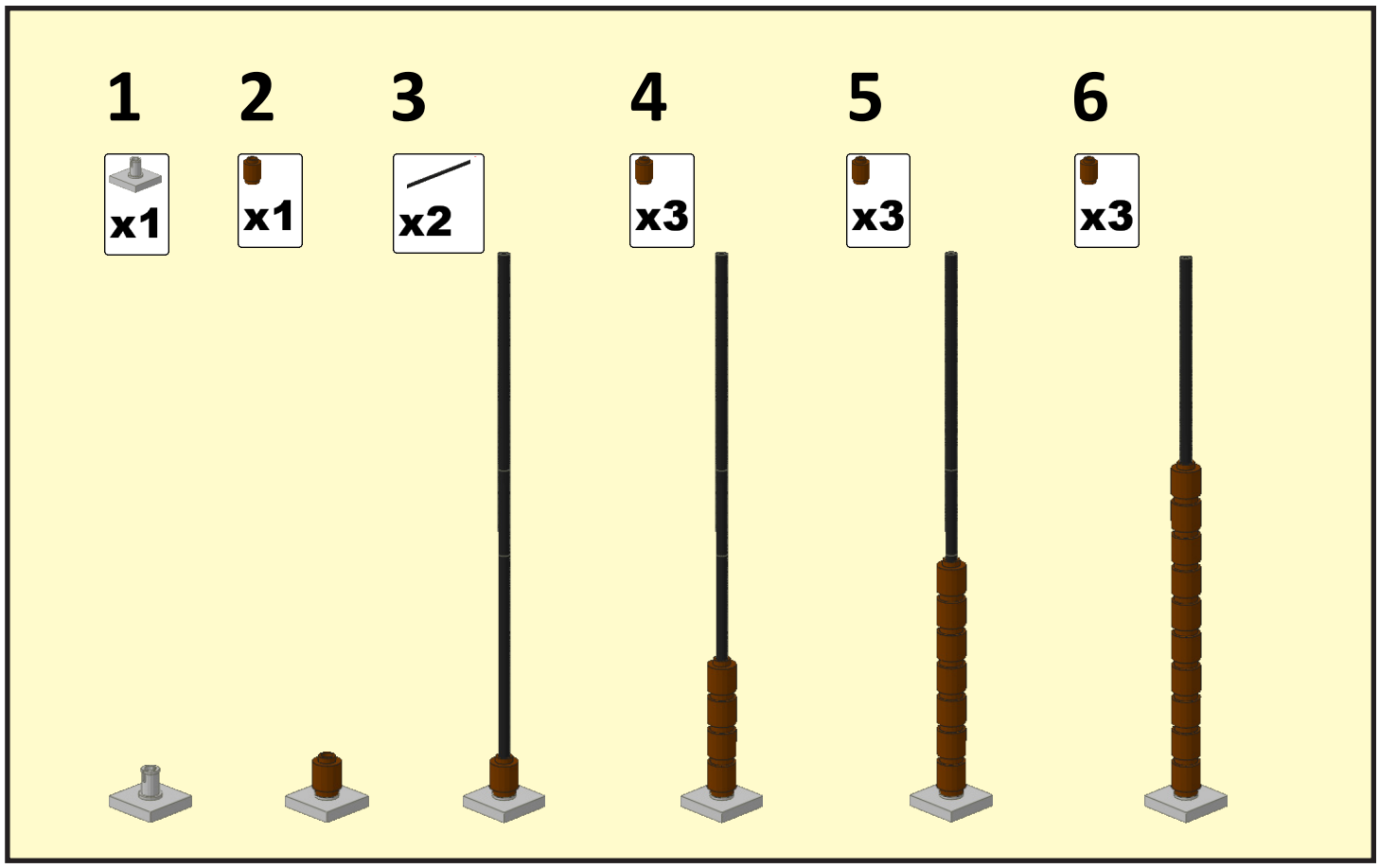
7
x1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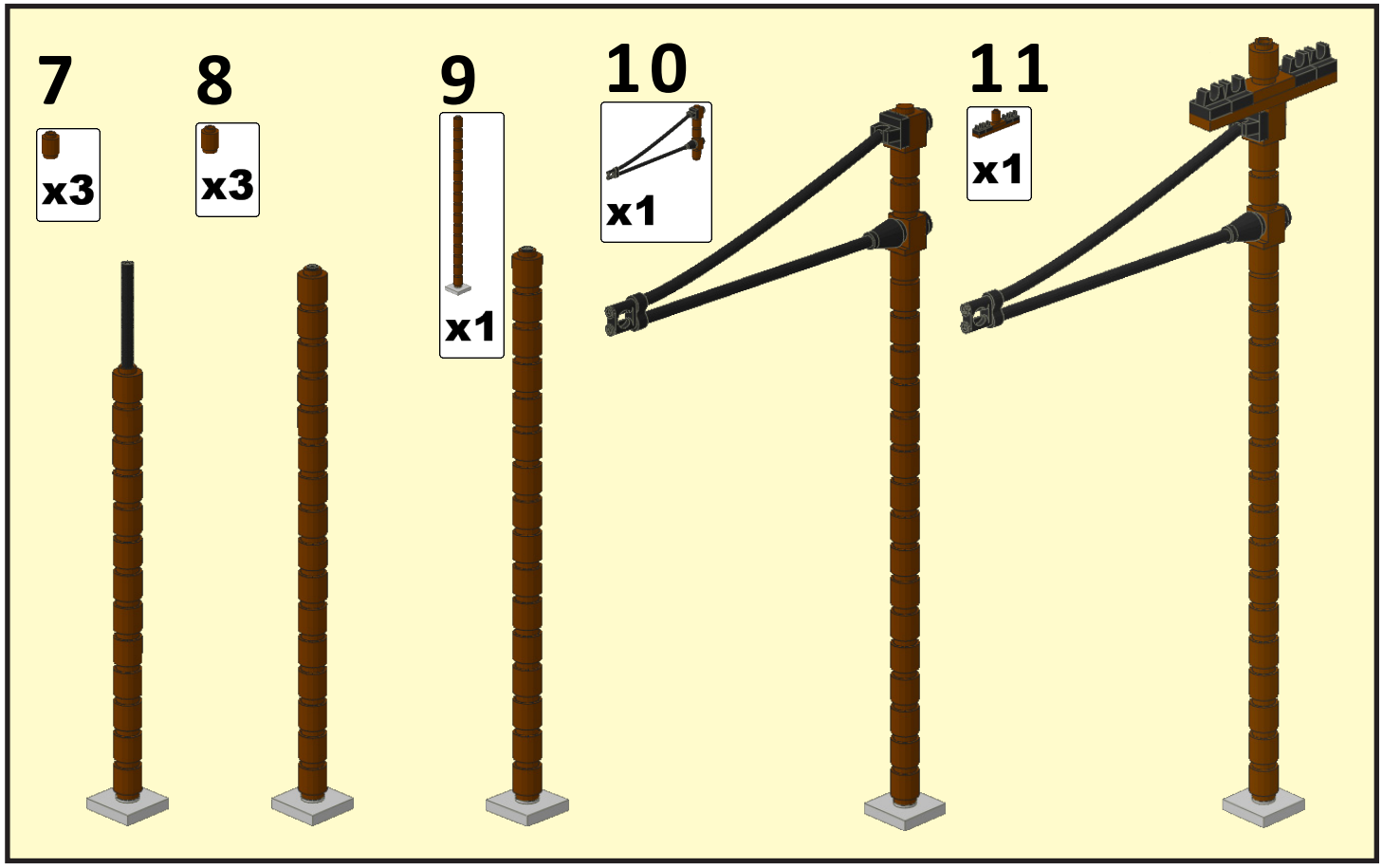
x3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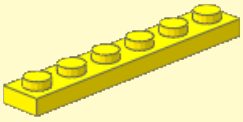
x3
9
x1
10
x1
11
x1

1 x1



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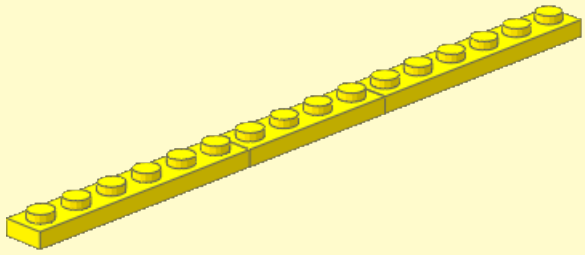

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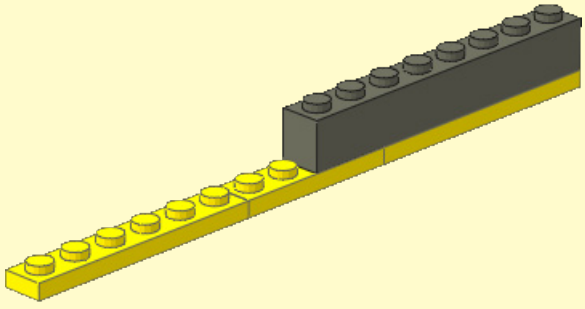

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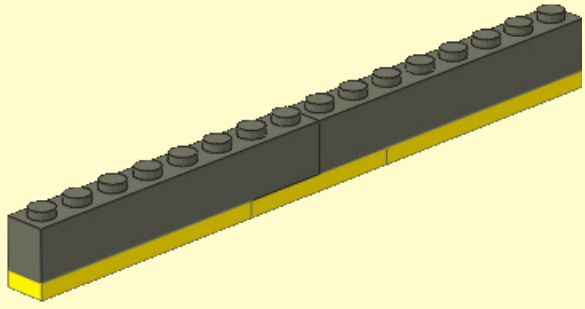

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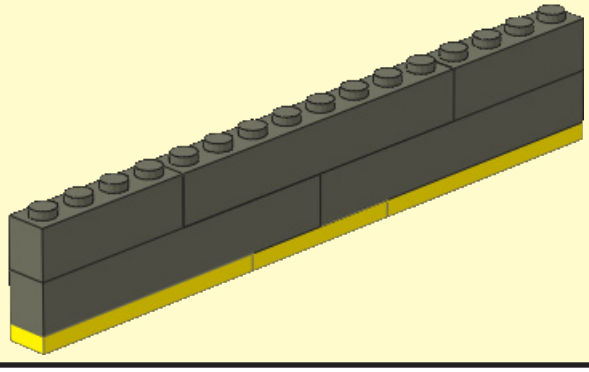

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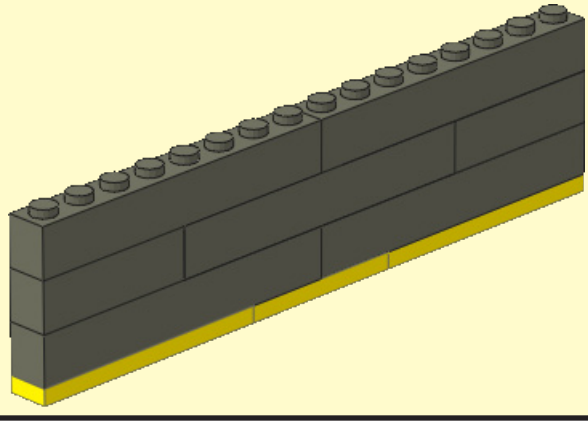

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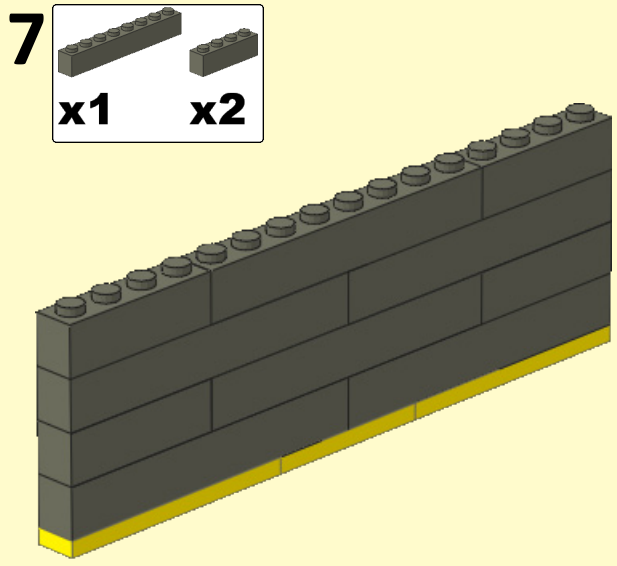

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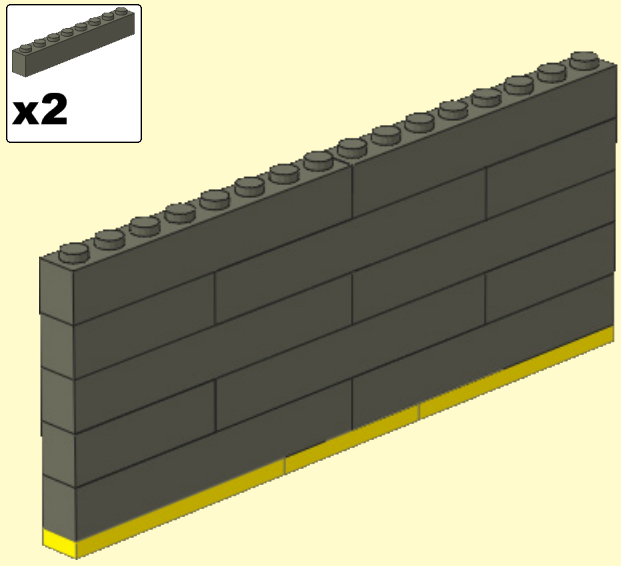

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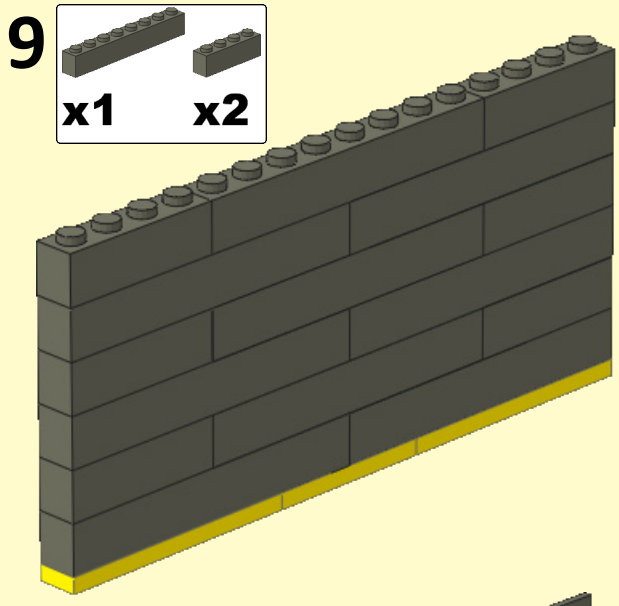

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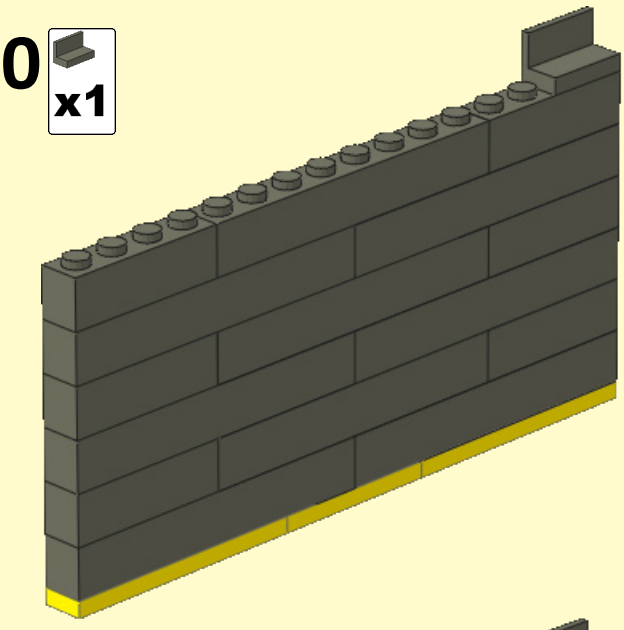

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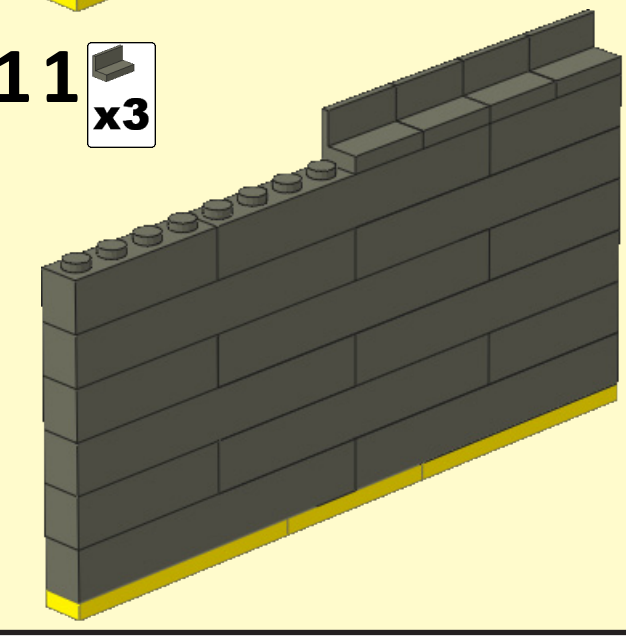

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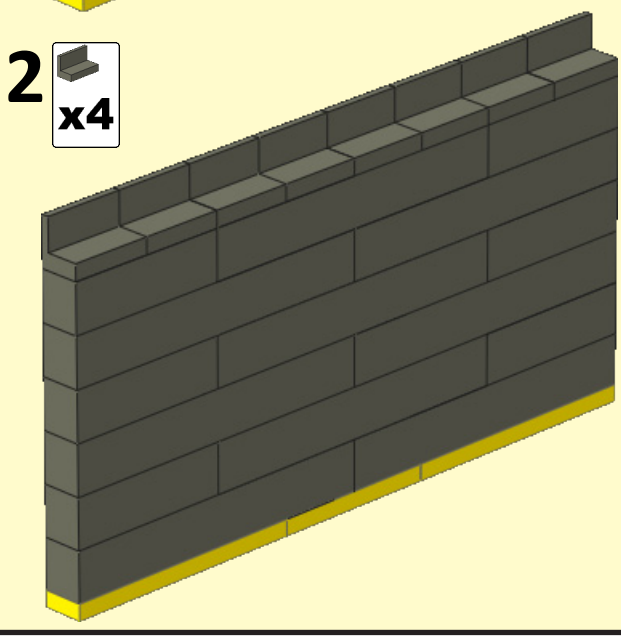

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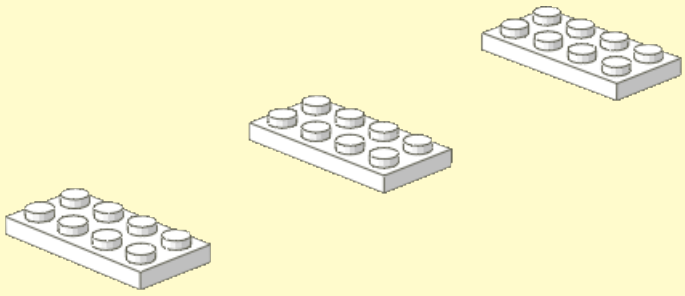

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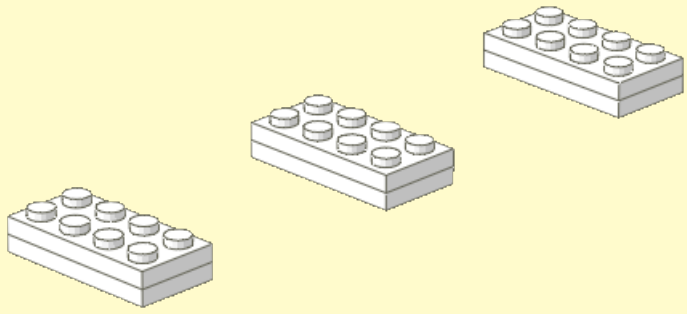

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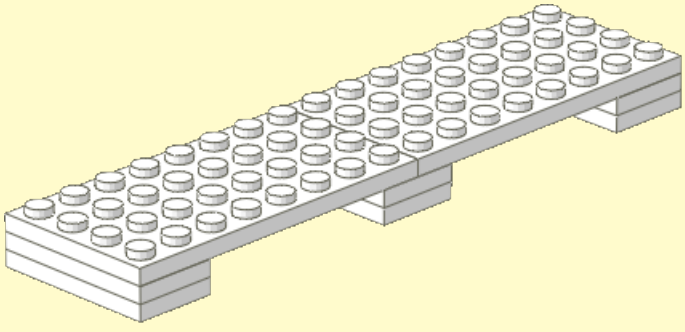

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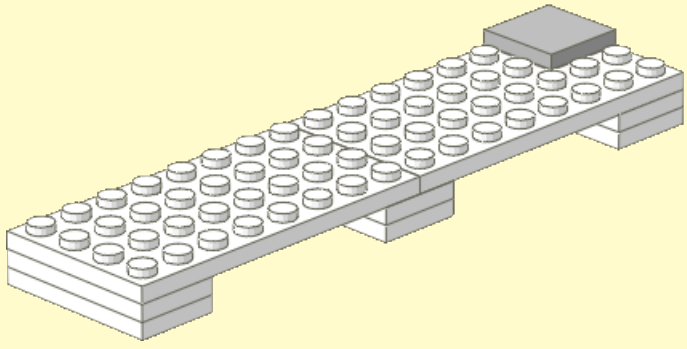

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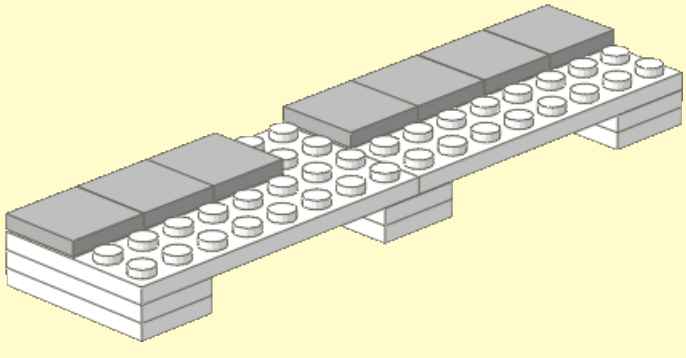

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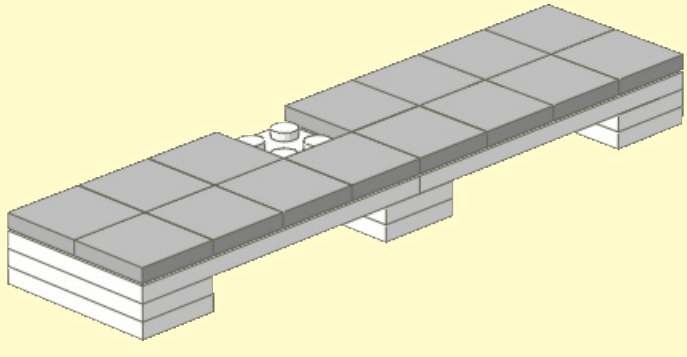

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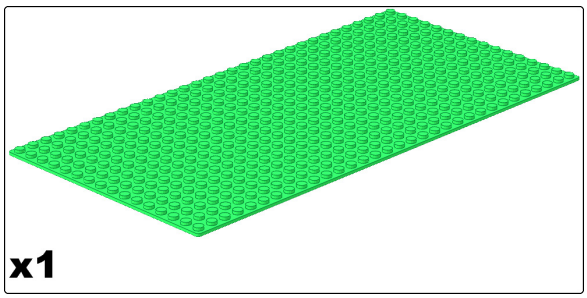

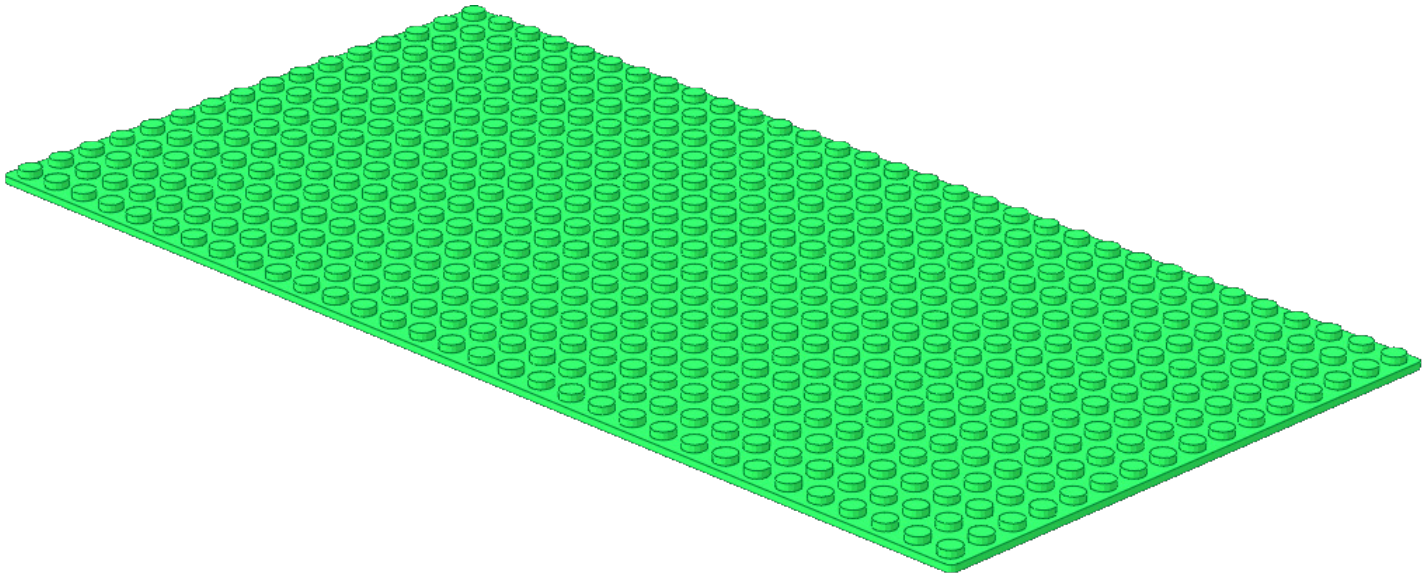

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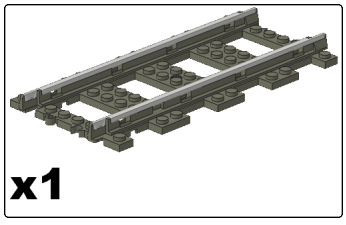

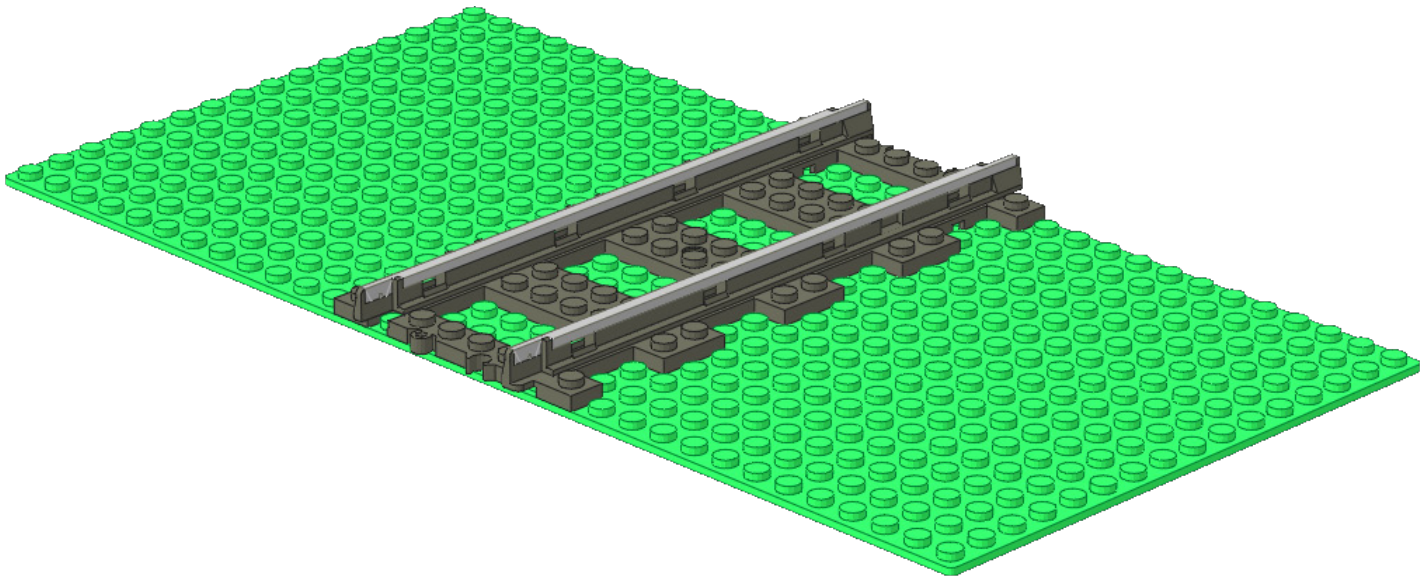

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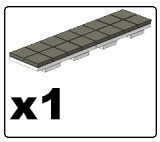

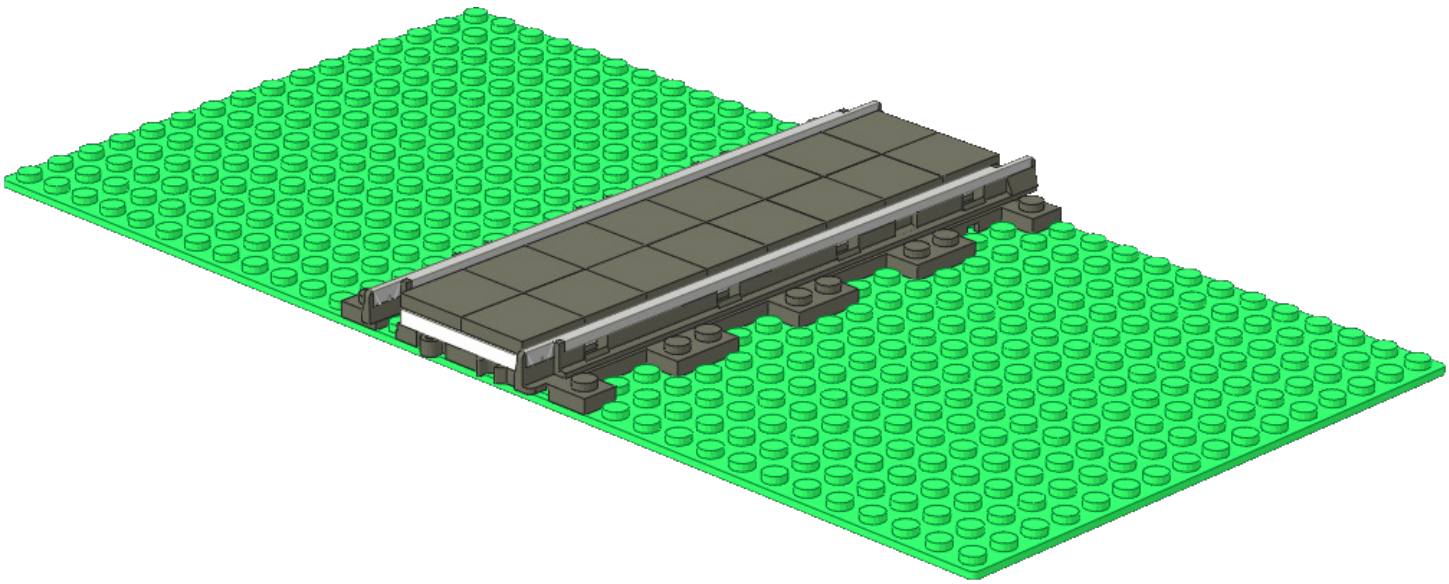

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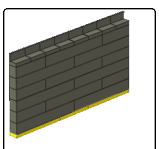

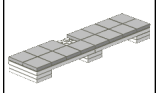

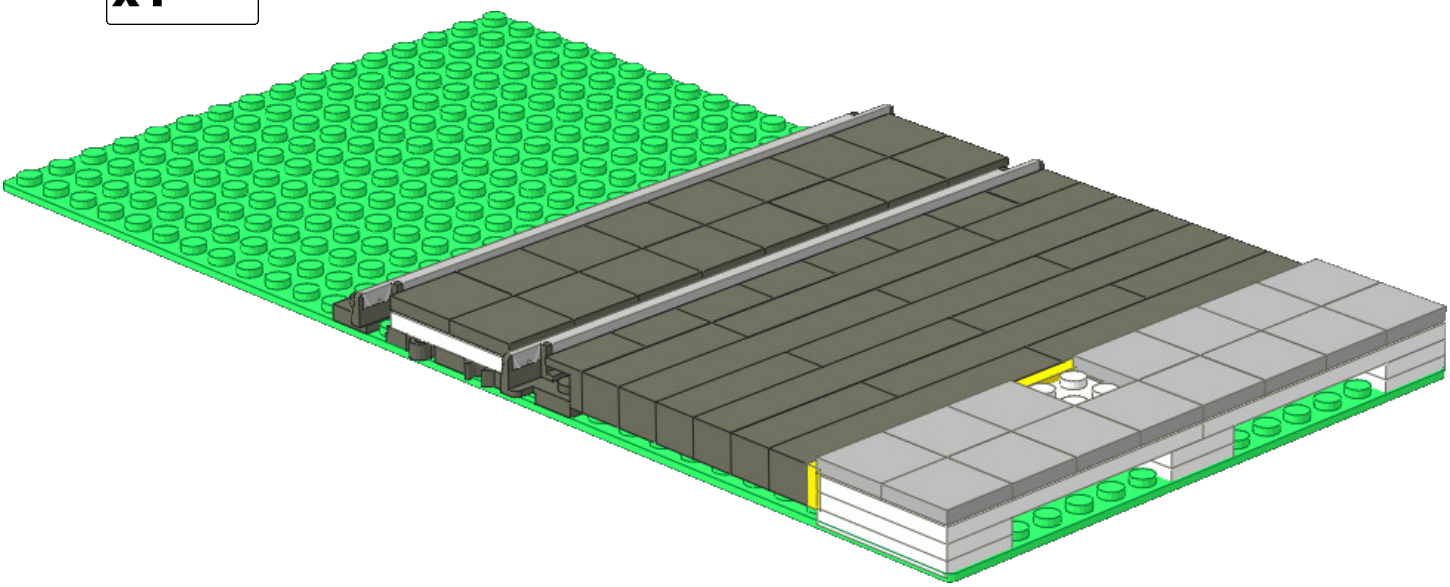

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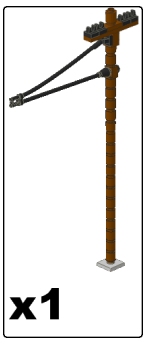
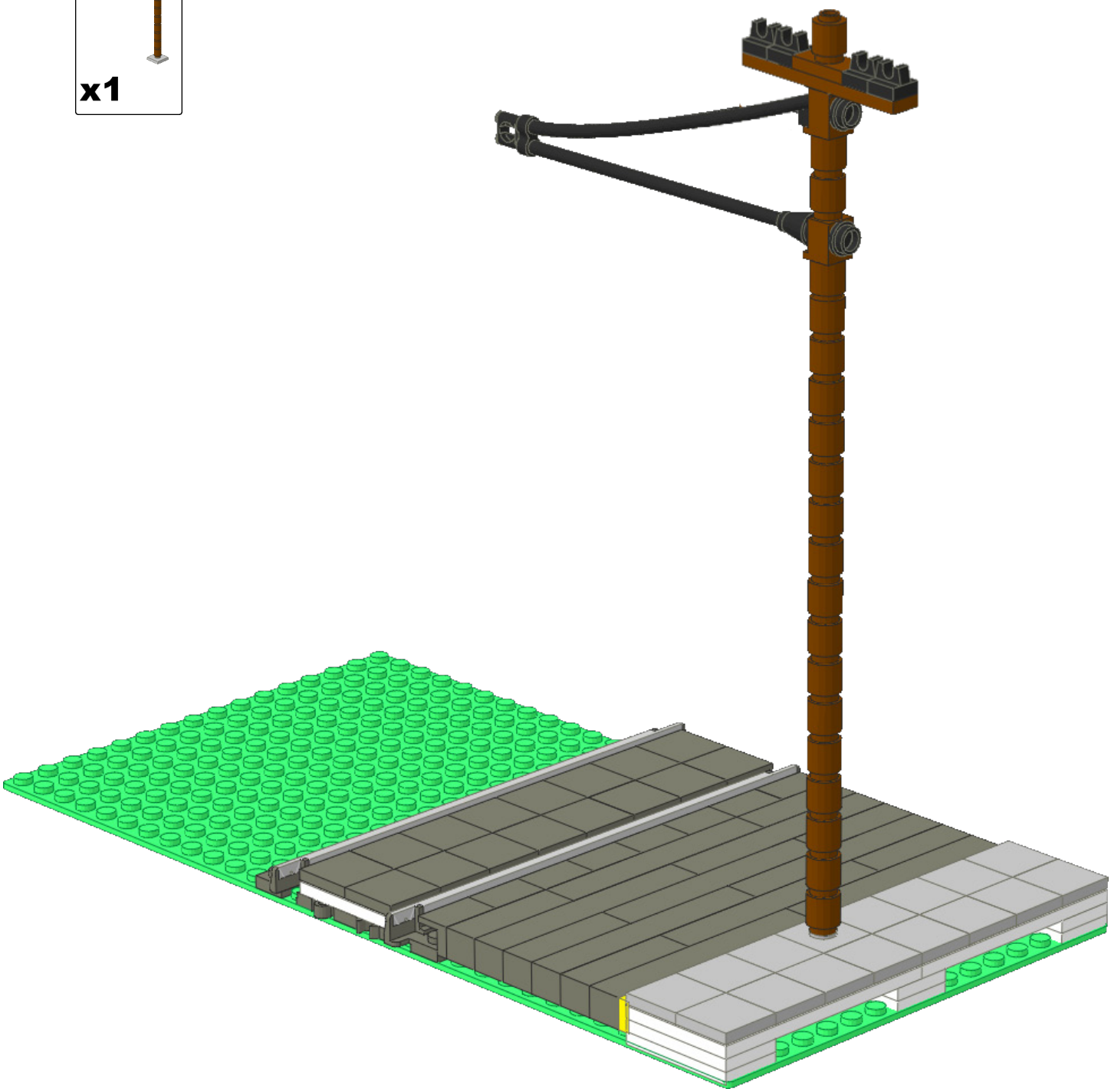
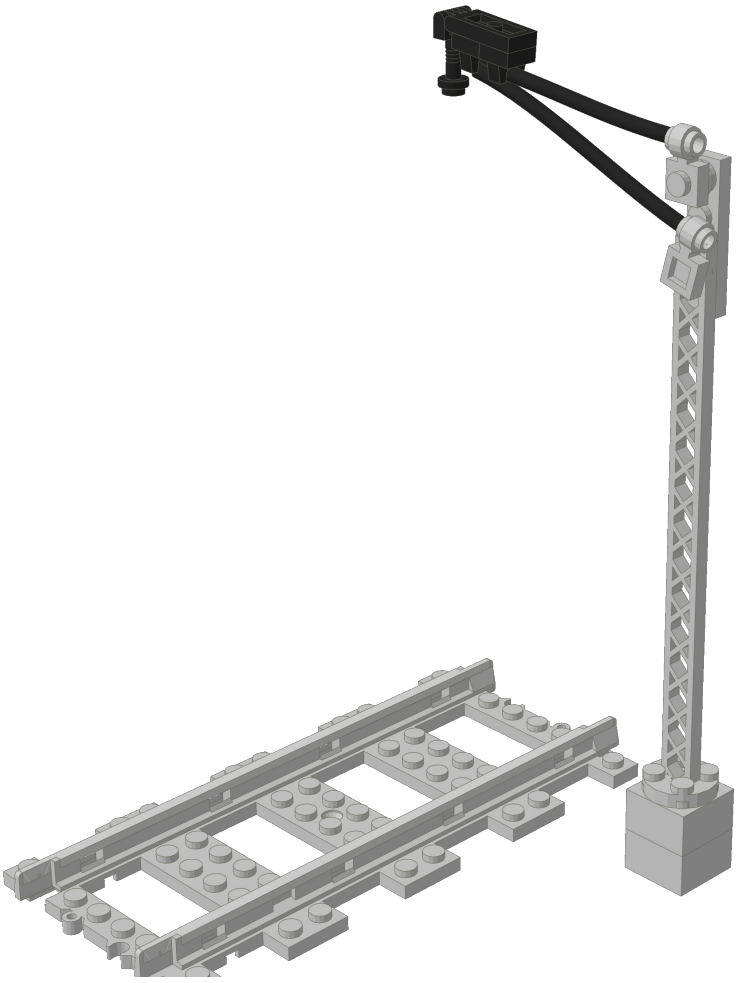


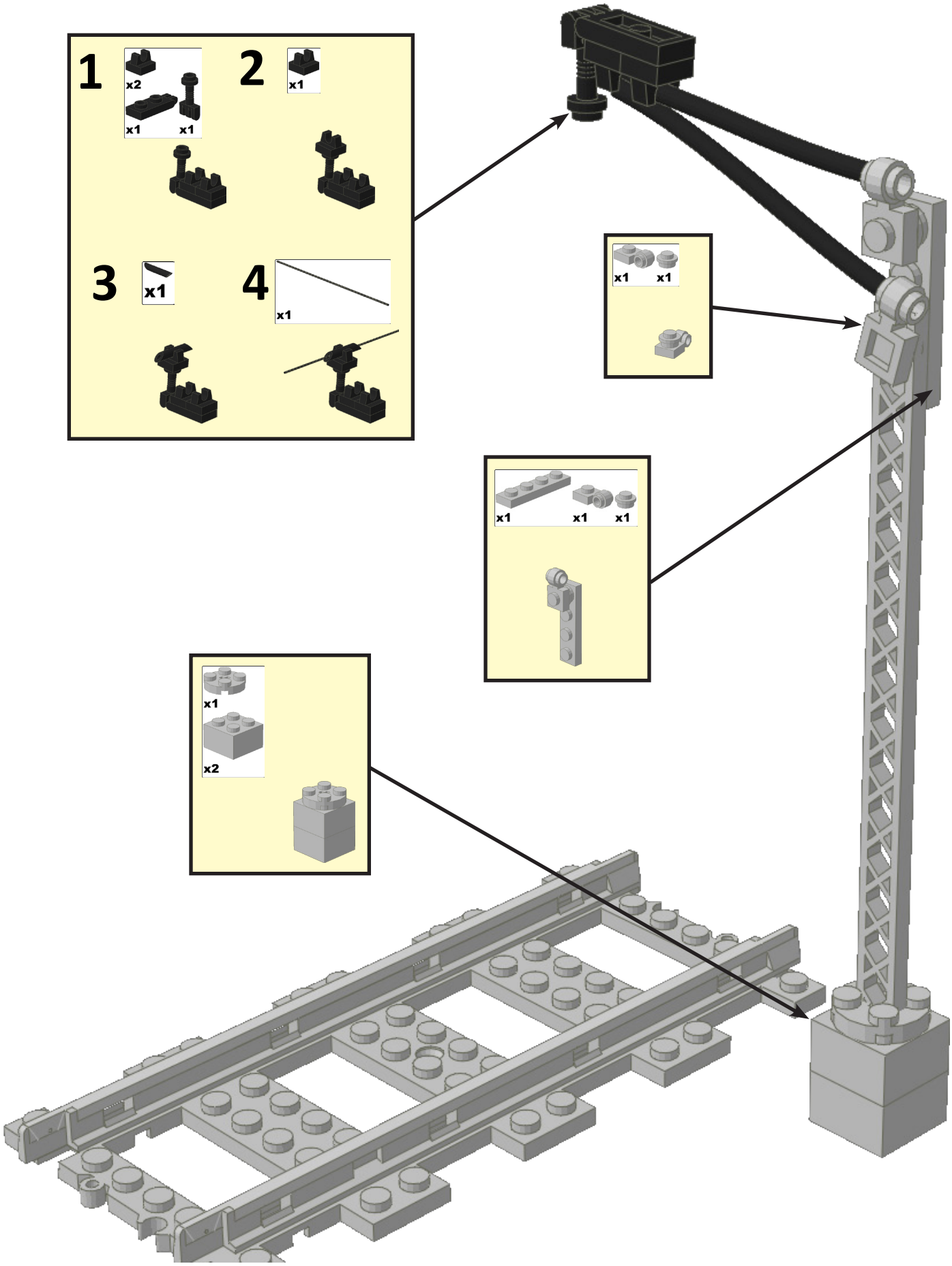


Single Pole



Double Pole

Design by
Larry Pieniazek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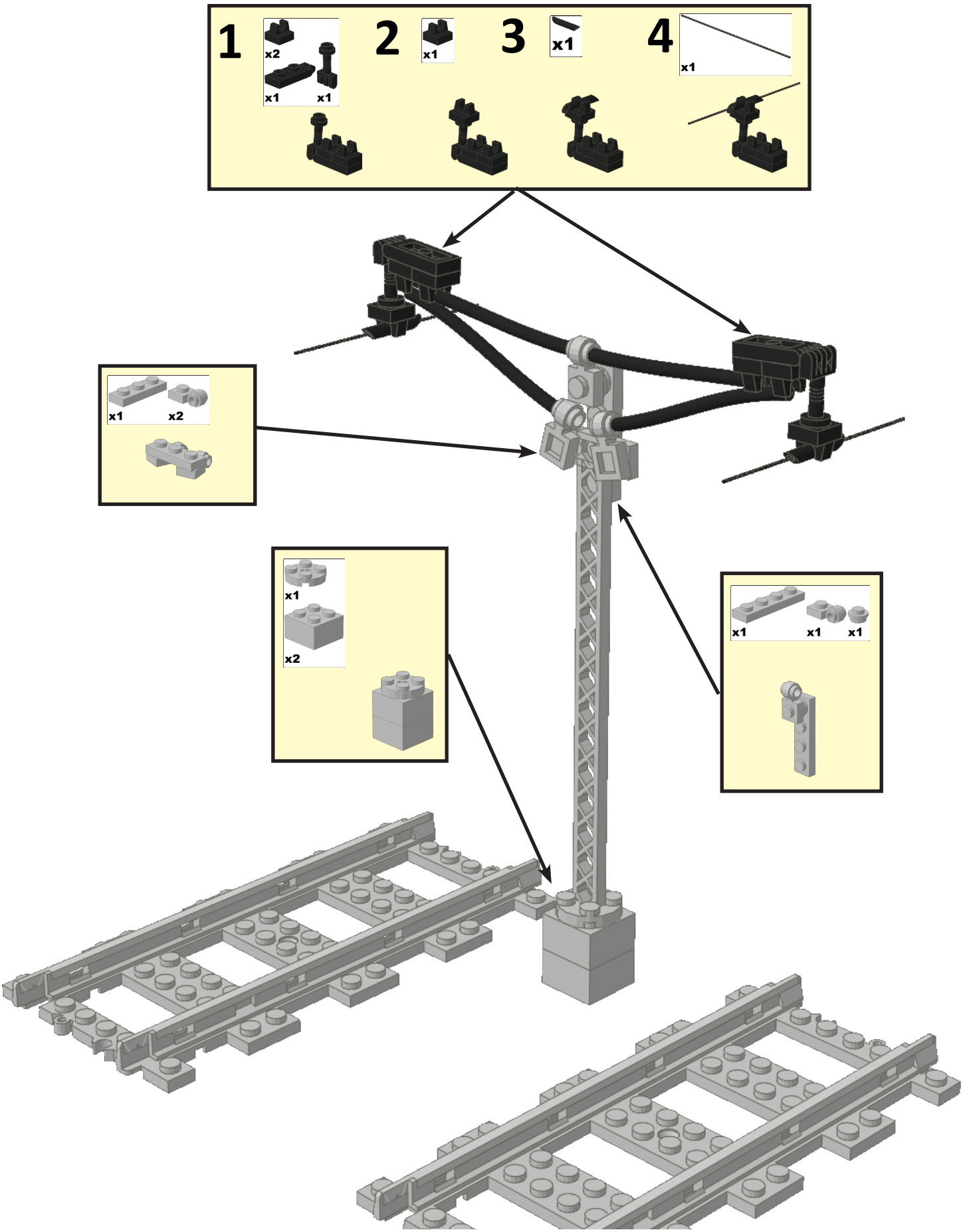
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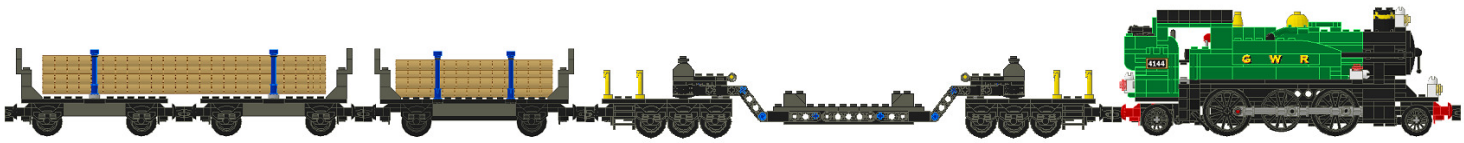
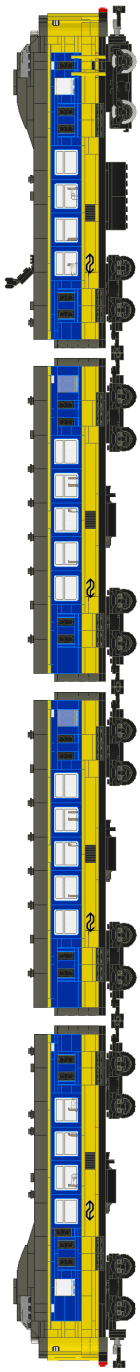
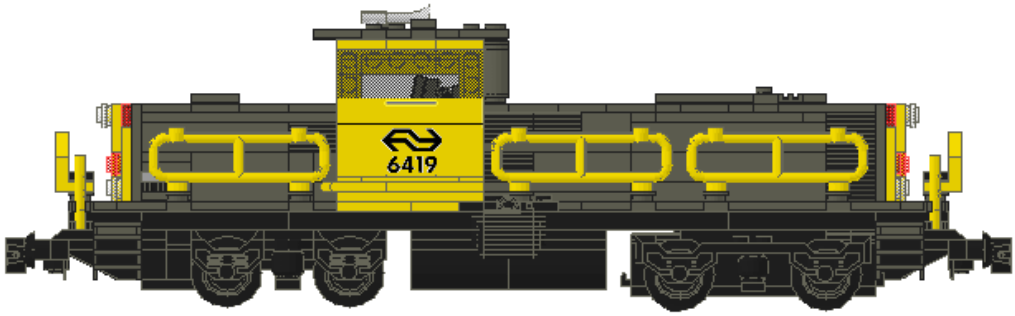




Custom Technic and Train sets

Over 30 models

All wagons and carriages for 9V, 12V or RC



Engines for 9V/12V and some for RC

RC turntable and 9V/RC pneumatic switchpoints.

Sets complete with all parts, stickered box, colourful building instruction (mostly printed, some on CD), list of parts and stickers/decals. All models also available without parts.

For Lego © technic/pneumatic fans: e.g. high quality pneumatic hose in 13 colours and pneumatic compressors.

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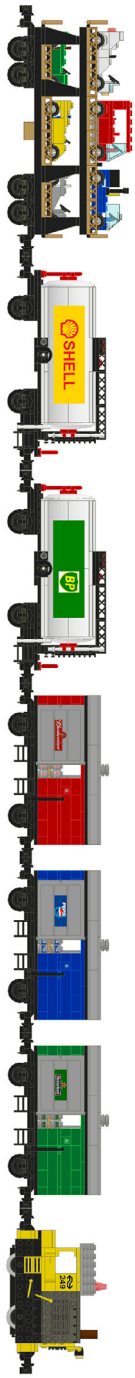

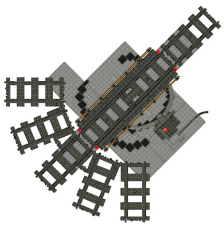

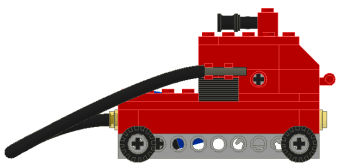

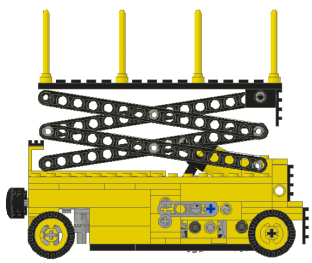

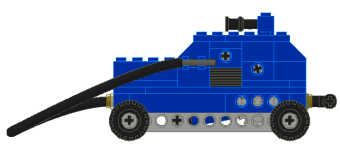

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