

Parts List

Only the essential parts are listed here.

Quantity	Part Description
1	#4539 Strand Junction (Level Crossing)
2	#5119 Micro Motors
1	#5115 9V Battery Control Box
2	#5111 9V Wires (or similar)
2	1x2 Technic Beams
2	1x4 Technic Axles
2	Small Pulleys
2	16mm Diameter Rubber Belts
1	2x4 Grey Plate
2	1x8 Grey Plates
4	2x2 Grey L Shape Plates

Would you like to motorize your #4539 Level Crossing? This project shows you how using a couple of the new Micro Motors. There aren't many sets that include the Micro Motors but you can purchase them individually from LEGO® Service or Shop at Home as set #5119.

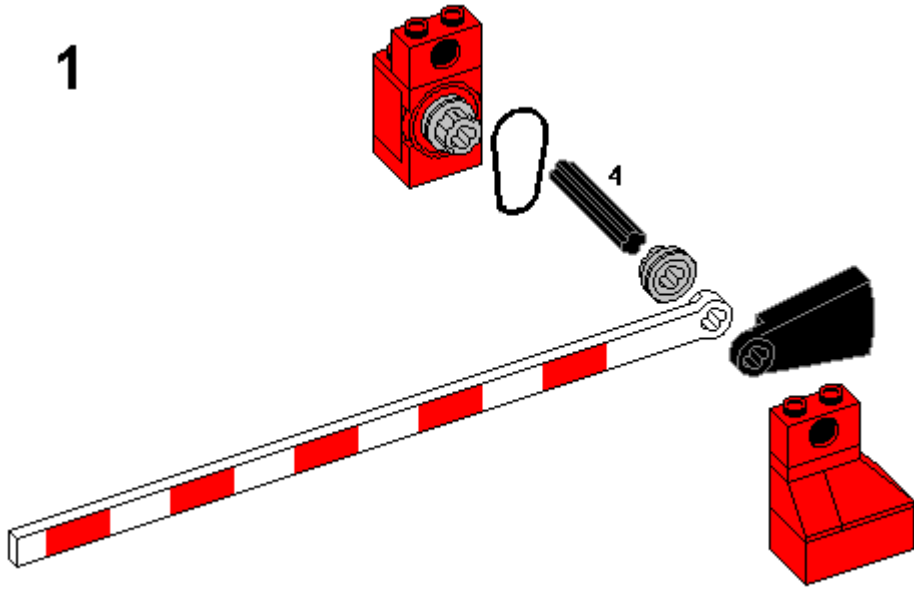
My first attempt at motorizing the barriers didn't work very well for two reasons. I attached the barriers directly to the output of motors using 2 stud-long axles and the first problem was that the barriers went up and down too fast. The Micro Motors are geared down internally (don't ask me how they fit the gears inside there) but not enough, they need a bit more reduction. The second problem was more serious, when the barriers came down on the stops they sometimes jammed the motors internally. It seems they do not like to be brought to a hard stop, something nasty happens inside, the only way to get them to move again was to give them a nudge manually. I was a bit disappointed when I discovered this but persevered with a modified design.

The final design I came up with is still fairly simple. Instead of direct drive it uses a small rubber belt to drive the barrier via a couple of pulleys. I use the pulley that comes with the Micro Motor and another one like it on the final shaft. To get the reduction I have the pulleys facing opposite directions and attach the belt so that it goes around the bushing of the pulley on the motor. The belt is the smallest one I have in my collection, about 16mm diameter. Set #5277 Pulleys and Rubber Belts contains these pieces if you don't have them. Alternatively you can use two of the small bevel gears placed back to back (they act as a small pulley).

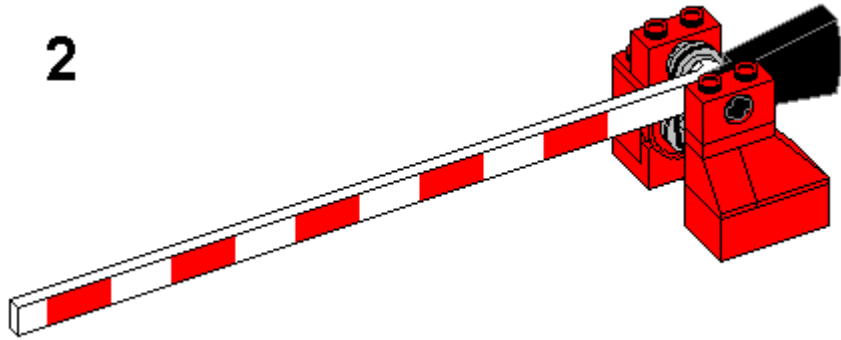
The other modification to the original set is to make a tunnel under the road so that the wires from both motors can be routed in the same direction to the battery box.

You'll notice in the instructions that I show the barrier supports in red instead of black. I've done this on my model so that the red Micro Motors blend in better but obviously you don't have to do this and I haven't included these changes in the parts list.

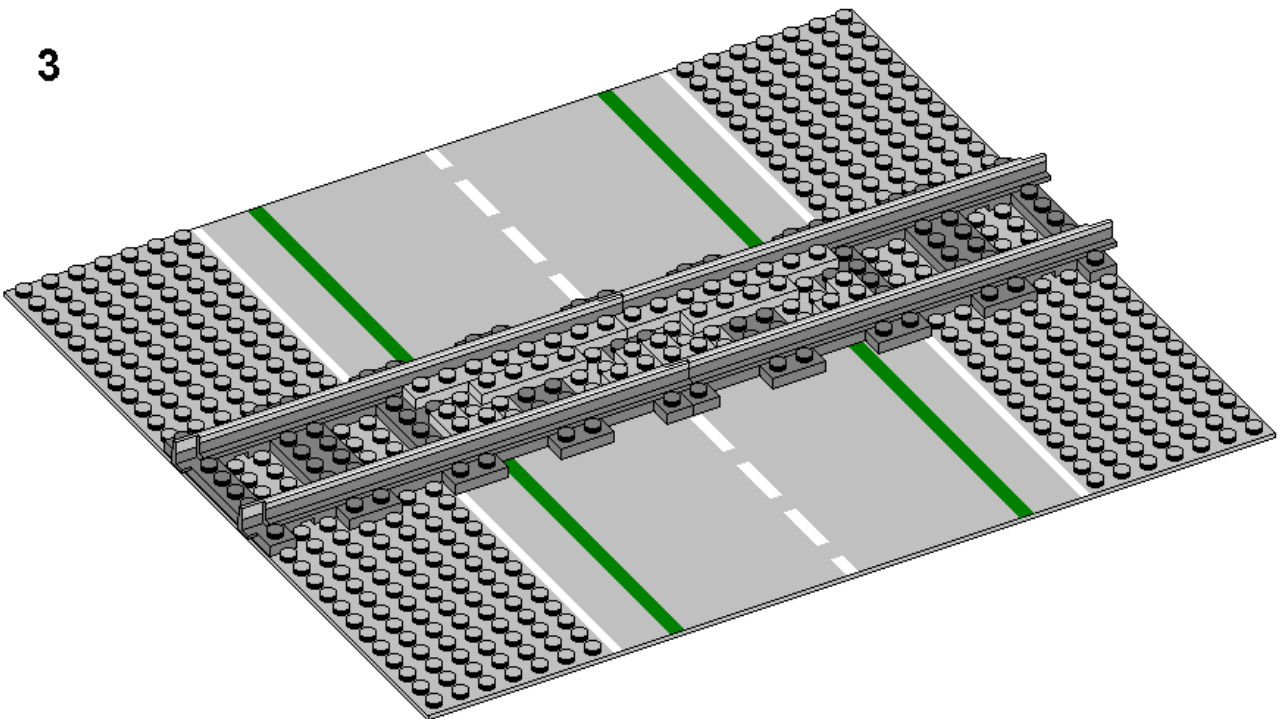
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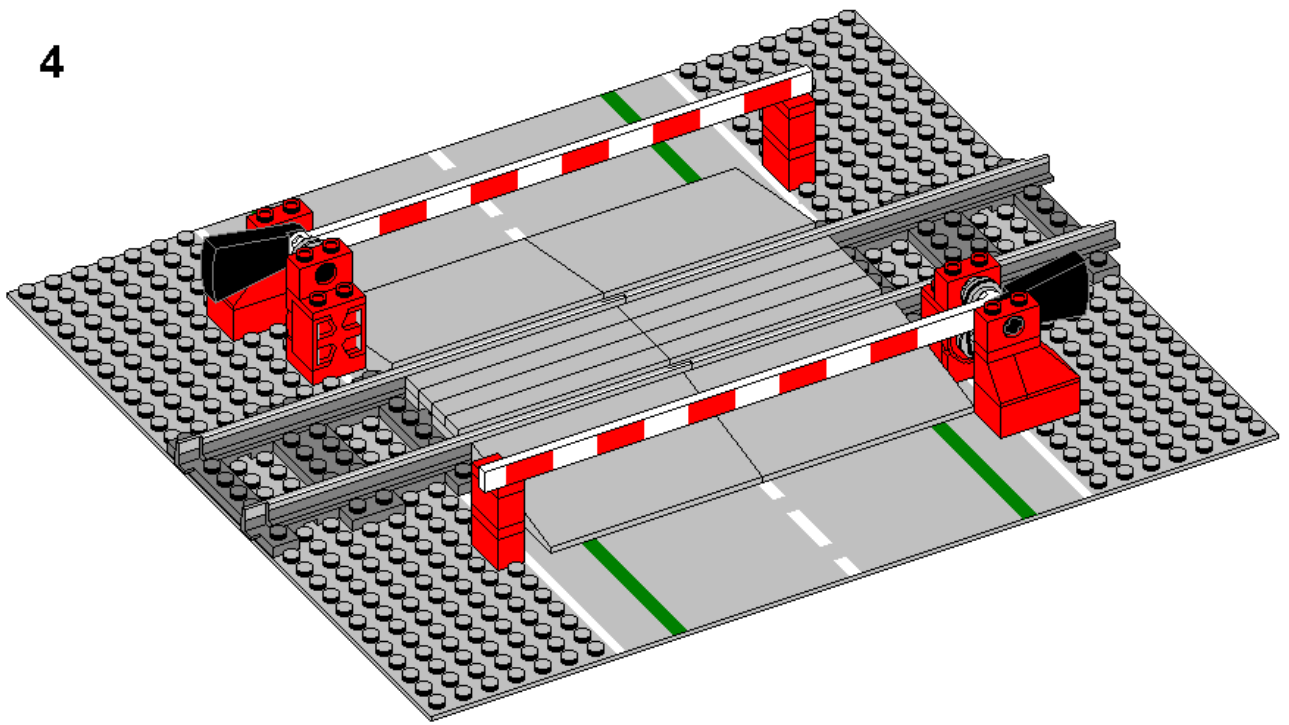
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