Challenge for Vision: Seeing a Toy Crane
Crane-episodic-memory

Aaron Sloman

Last updated: 8 Mar 2009; 23 Oct 2011; 12 Jun 2013 (links added)
Installed: 10 Jul 2007

NOTE:

This file is http://tinyurl.com/CogMisc/crane/
It is available as a stand alone PDF file Seeing_a_Toy_Crane.pdf

A draft paper closely related to this is here:
http://www.cs.bham.ac.uk/research/projects/cosy/papers/#tr0801
TR-0801 Architectural and representational requirements for seeing processes and affordances. (PDF)

For a partial overview of other online material here see
http://tinyurl.com/CogMisc/AREADME.html

Introduction

This is a sequel to two previous challenges for machine vision

- Seeing cups spoons and saucers
- Seeing impossible objects
- More impossible objects
- Seeing and thinking about loops in strings

A presentation related to these topics can be found here:

http://www.cs.bham.ac.uk/research/projects/cogaff/talks/#compmod07
Architectural and representational requirements for seeing processes and affordances.

Presented at BBSRC funded Workshop on

Closing the gap between neurophysiology and behaviour: A computational modelling approach
University of Birmingham, UK
May 31st-June 2nd 2007

The polyflap challenge is also relevant
http://www.cs.bham.ac.uk/research/projects/cosy/papers/#tr0605

The Crane Challenge(s)

What follows is a collection of pictures of a toy crane made from plastic meccano (by Alison Sloman), viewed from various angles, along with pictures of some meccano parts.

The challenge is this: for every identifiable entity in any picture, small or large, find in other pictures

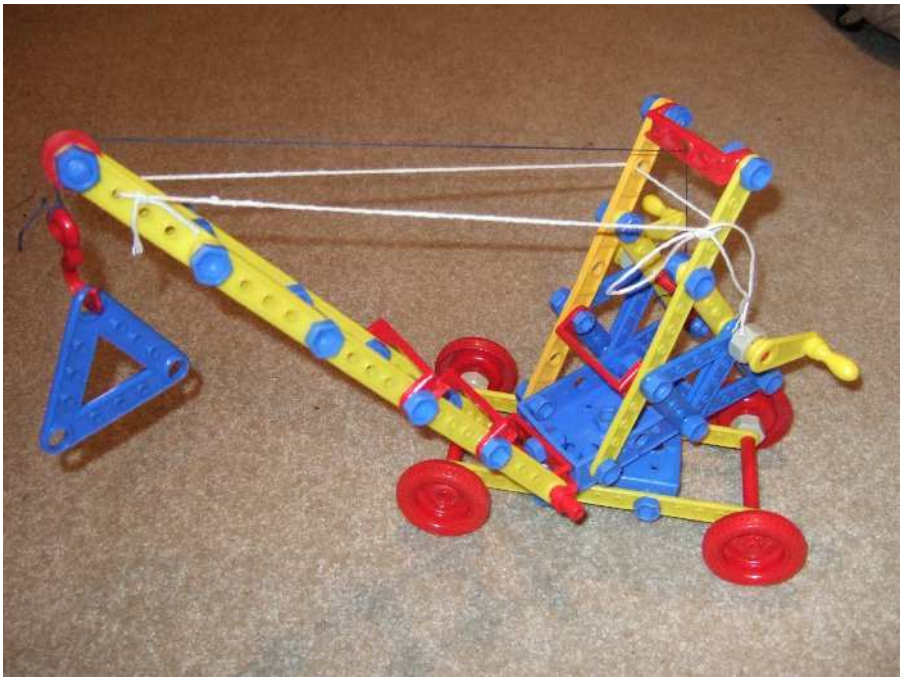
- Other entities of the same type (at various levels of abstraction)
- The very same entity (e.g. the same nut, or bolt, or wheel, or hook)
- Specify the 3-D position and pose of the object in the scene
- Describe its 3-D relations to other objects in the scene
- Find whether its shadow is visible in the scene, and if so identify the relevant portion of shadow.

NOTE: merely identifying locations of parts *in the images* is of no interest in this challenge, though it may be an intermediate stage in processing, if found useful.

Related challenges:

- Wherever a crank handle is visible, work out what the consequences will be of turning it in either possible direction.
- Describe how the viewpoint is related to the objects in the scene, including the floor.
- Describe how the crane in the photographs differs from the crane depicted in the manual (see picture at end).

The Pictures

Picture {1} 

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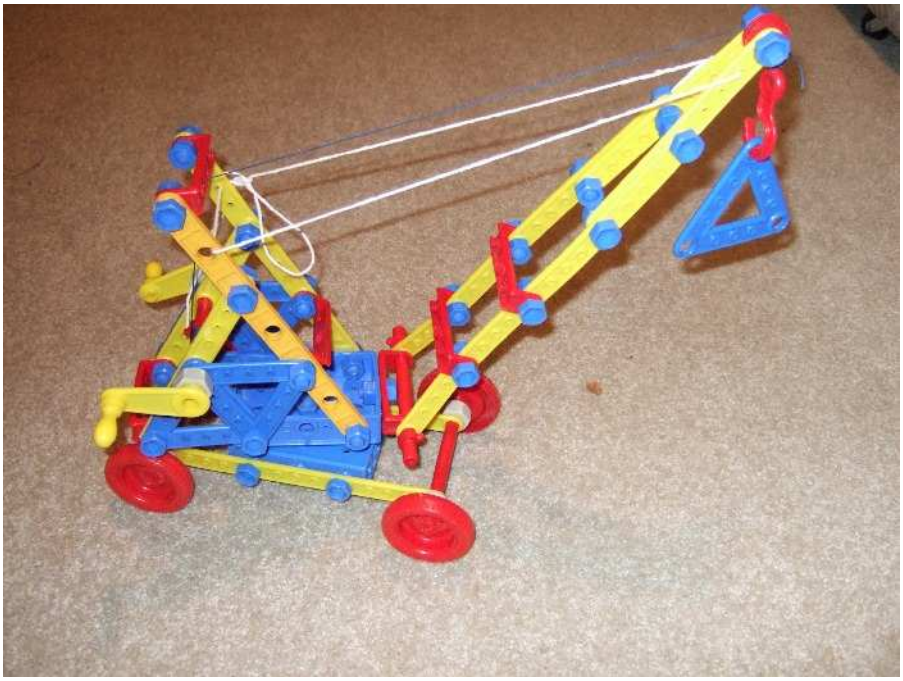
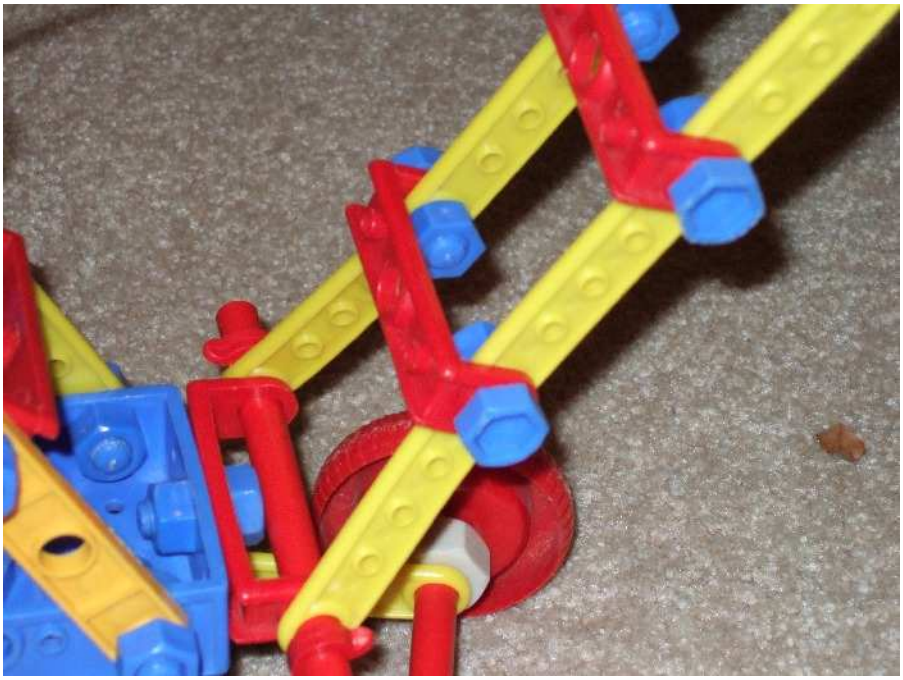
Picture {3} 

Picture {4} 

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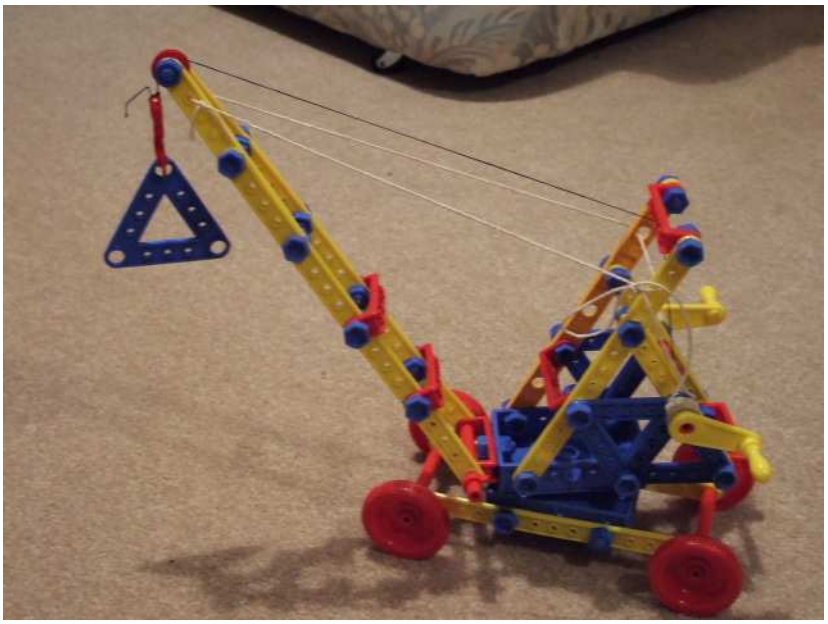
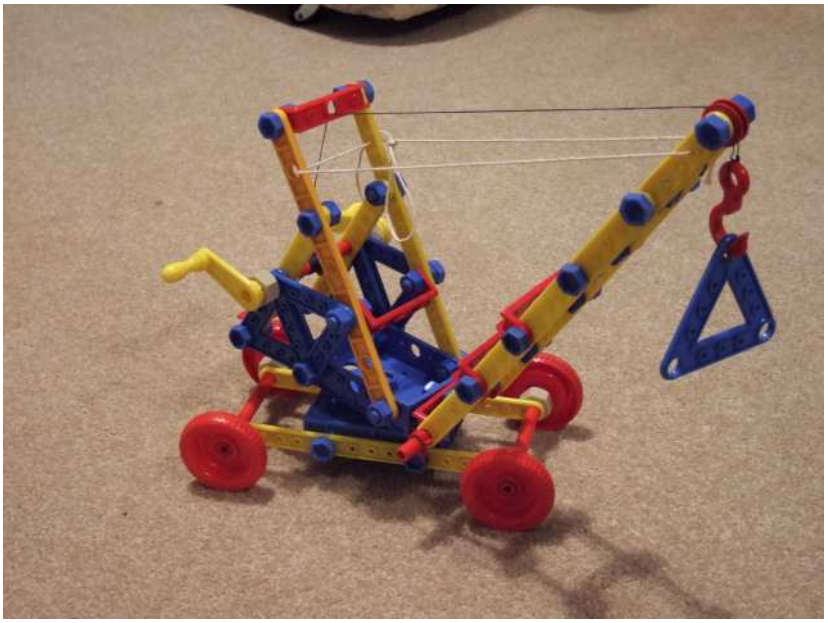
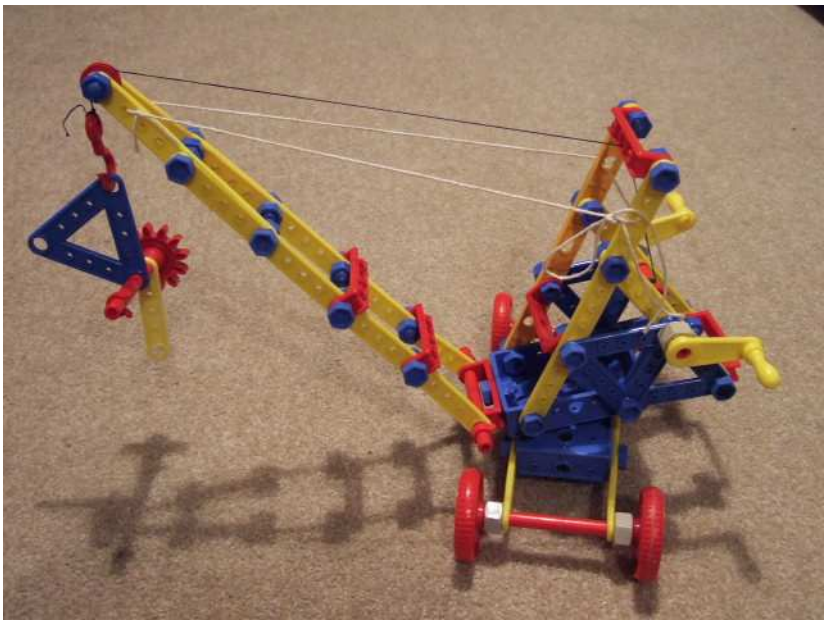
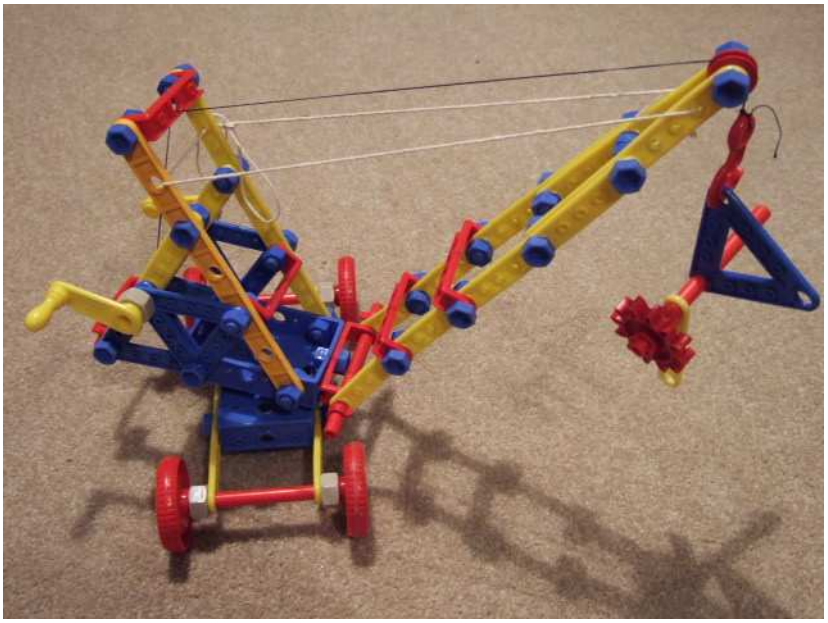
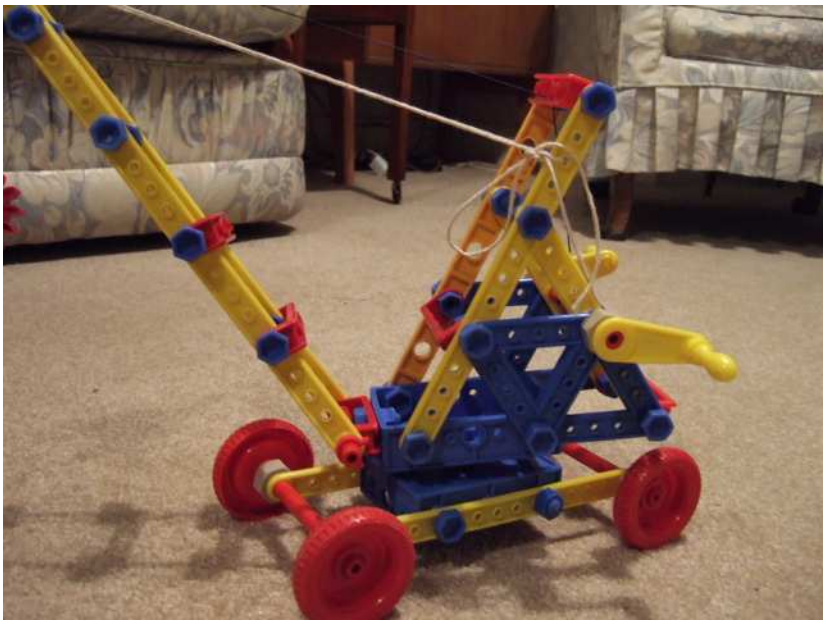
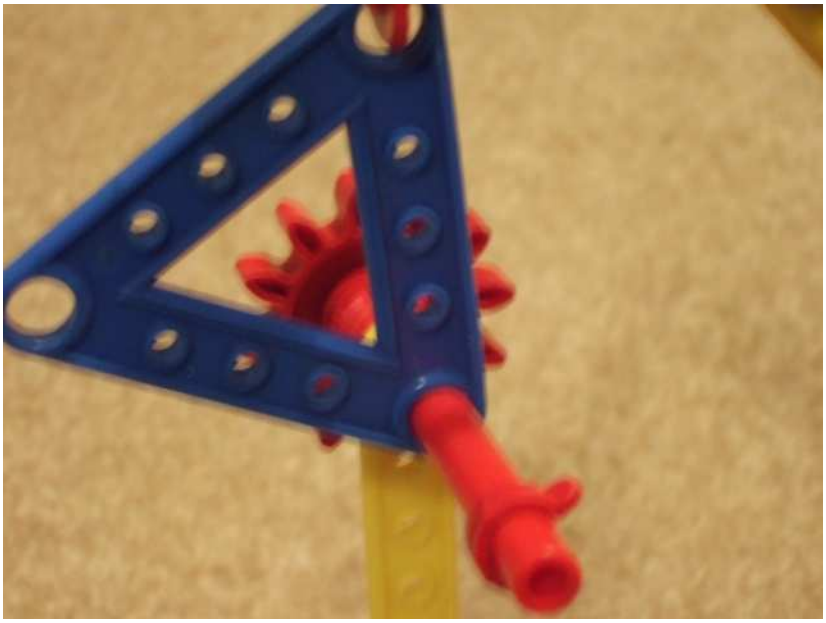
Picture {6} 

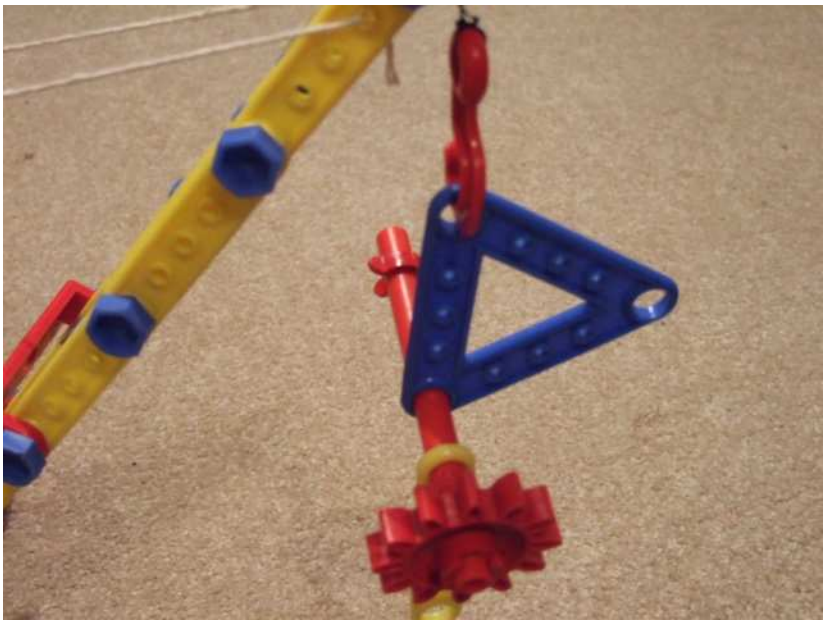
Picture {7} 

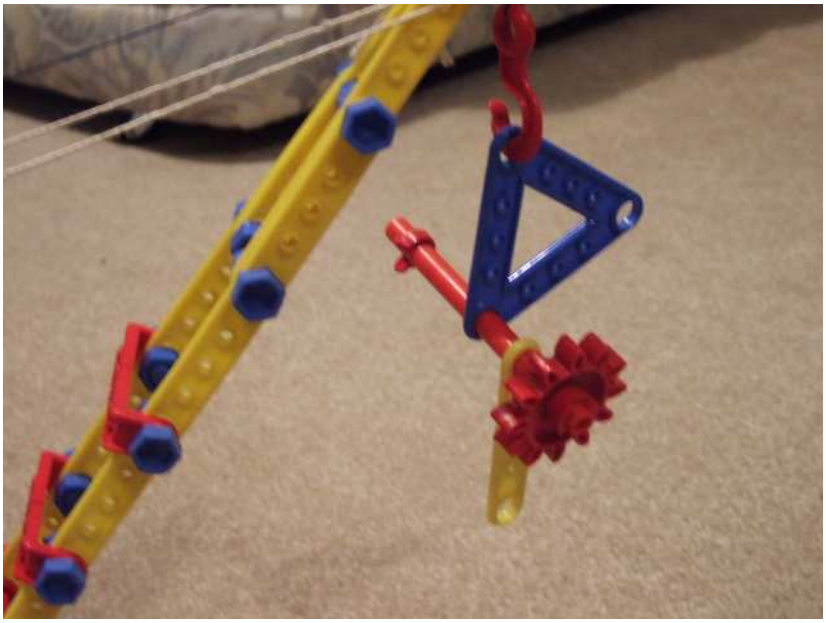
Picture {8} 

Picture {9} 

Picture {10} 

Picture {11} 

Picture {12} 

Picture {13} 

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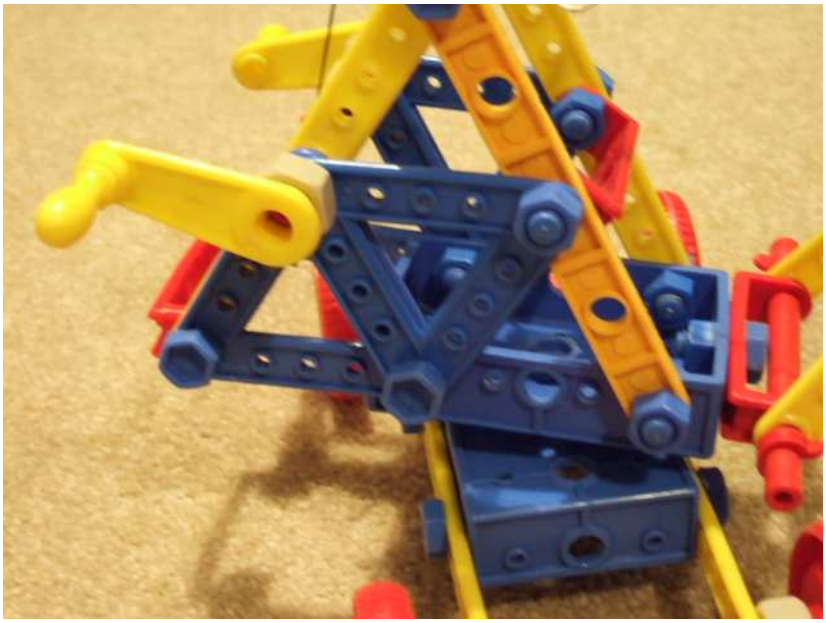
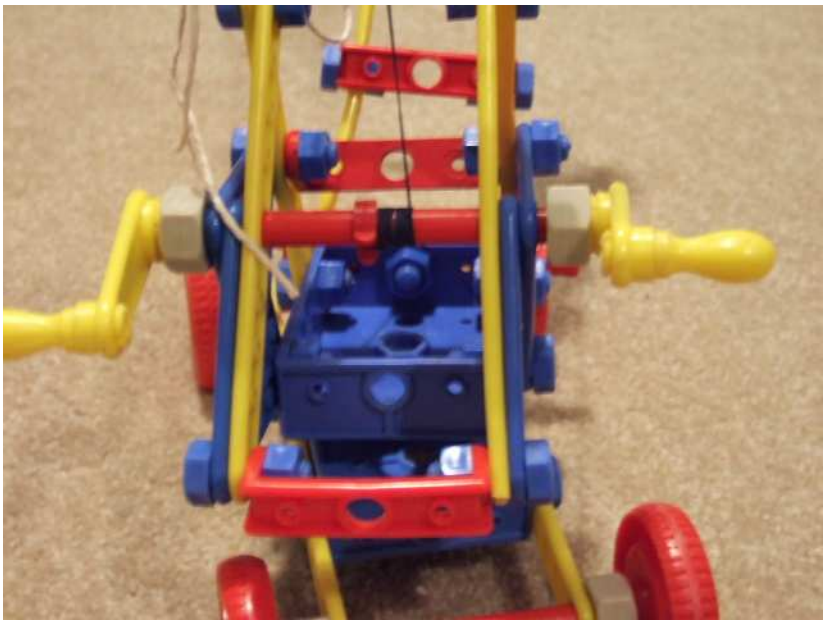
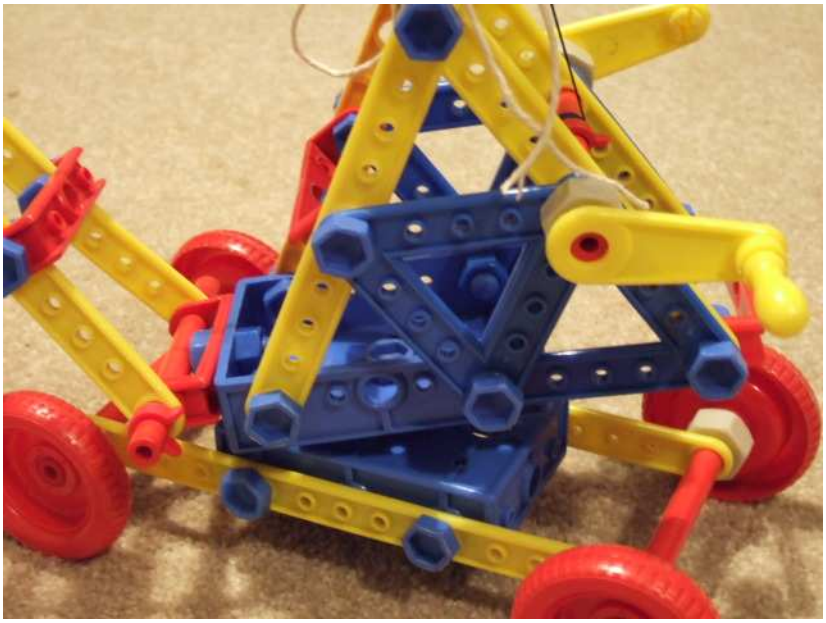
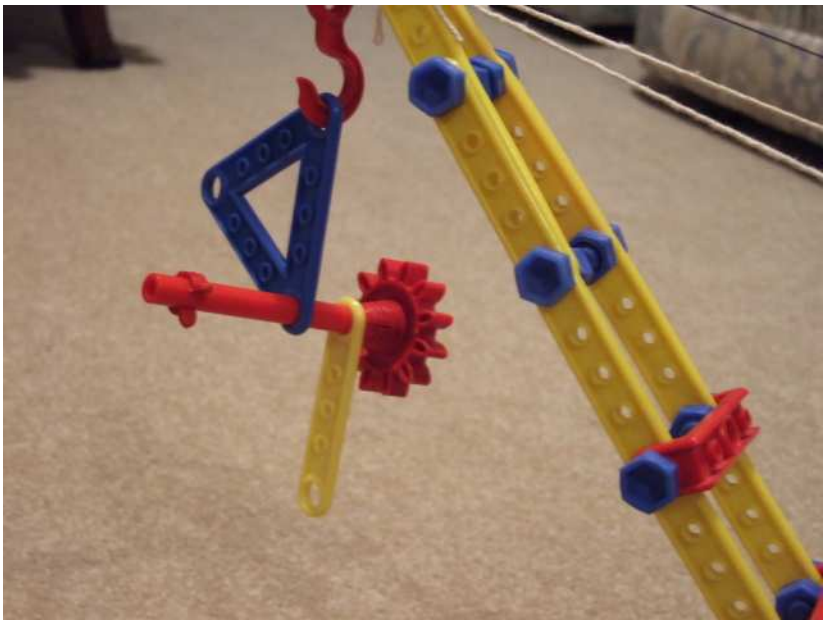
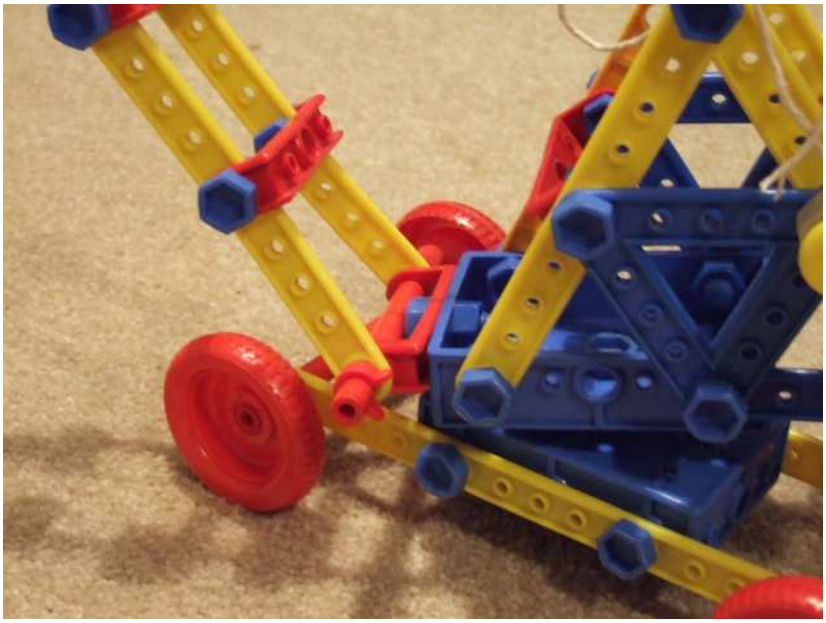
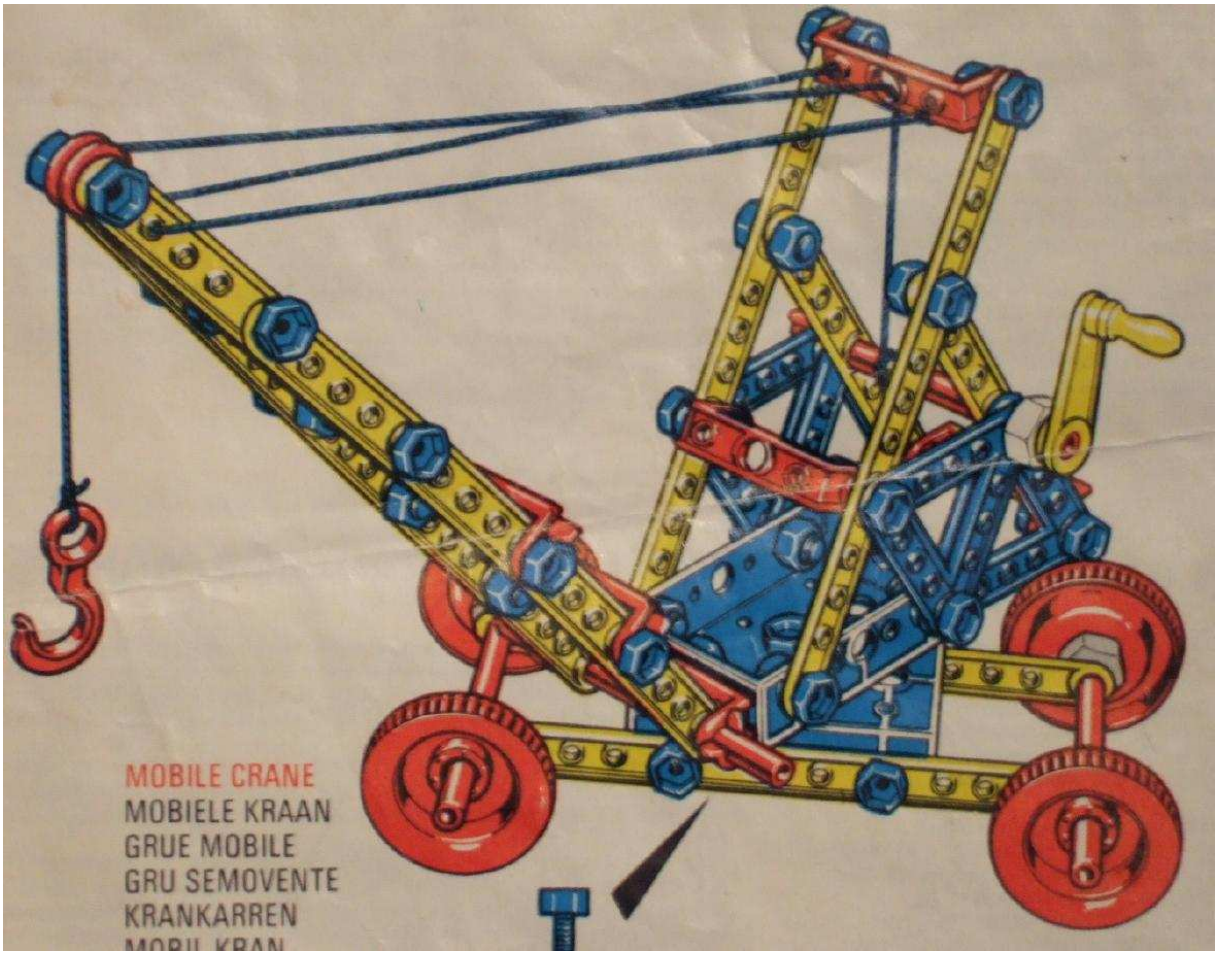
Picture {15} 

Picture {16} 

Picture {17} 

Picture {18} 

Picture {19} 



The diagram in the instruction manual.
(Not followed precisely.)

Meccano Online Web pages

http://www.internationalmeccanomen.org.uk
Home page

http://www.internationalmeccanomen.org.uk/EXHIB/Henley2008/
Pictures showing some amazing things built by Meccano enthusiasts in 2008.

See also

http://www.cs.bham.ac.uk/research/projects/cosy/photos/penrose-3d

http://www.cs.bham.ac.uk/research/projects/cosy/movies/sample-actions/

A multi-picture challenge for theories of vision, and machine vision systems
http://www.cs.bham.ac.uk/research/projects/cogaff/misc/multipic-challenge.pdf

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Maintained by Aaron Sloman
School of Computer Science
The University of Birmingham