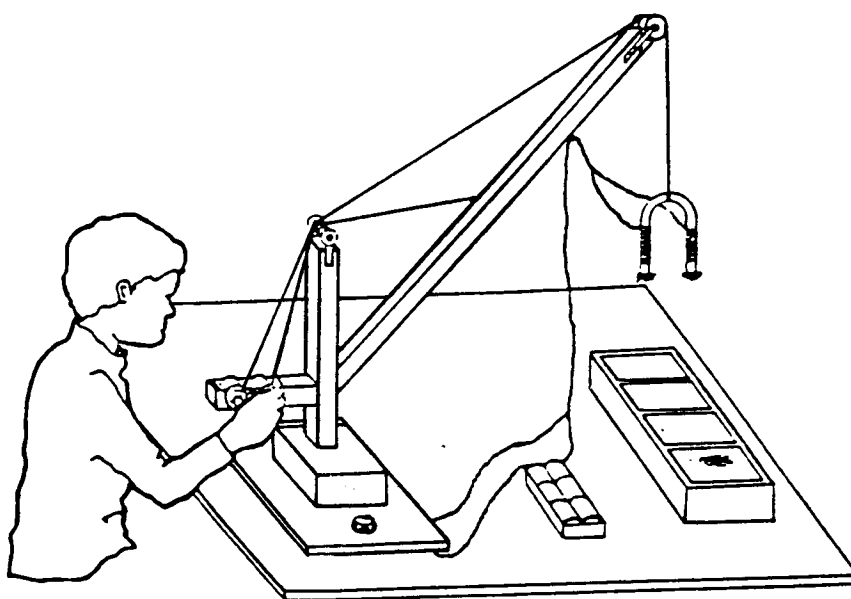


An Electromagnetic Crane

Suitable for the 8 years and upwards age range.

This crane is an example of a 'construction toy' which can be made by pupils working in groups of two.



Educational Concept/Skill to be developed

- i. an understanding of electromagnetism and its application.
- ii. an understanding of mechanics and the application of levers, pivots, structures, etc.
- iii. designing and constructing.
- iv. manipulating materials and equipment effectively.
- v. observation and communication.

Construction details

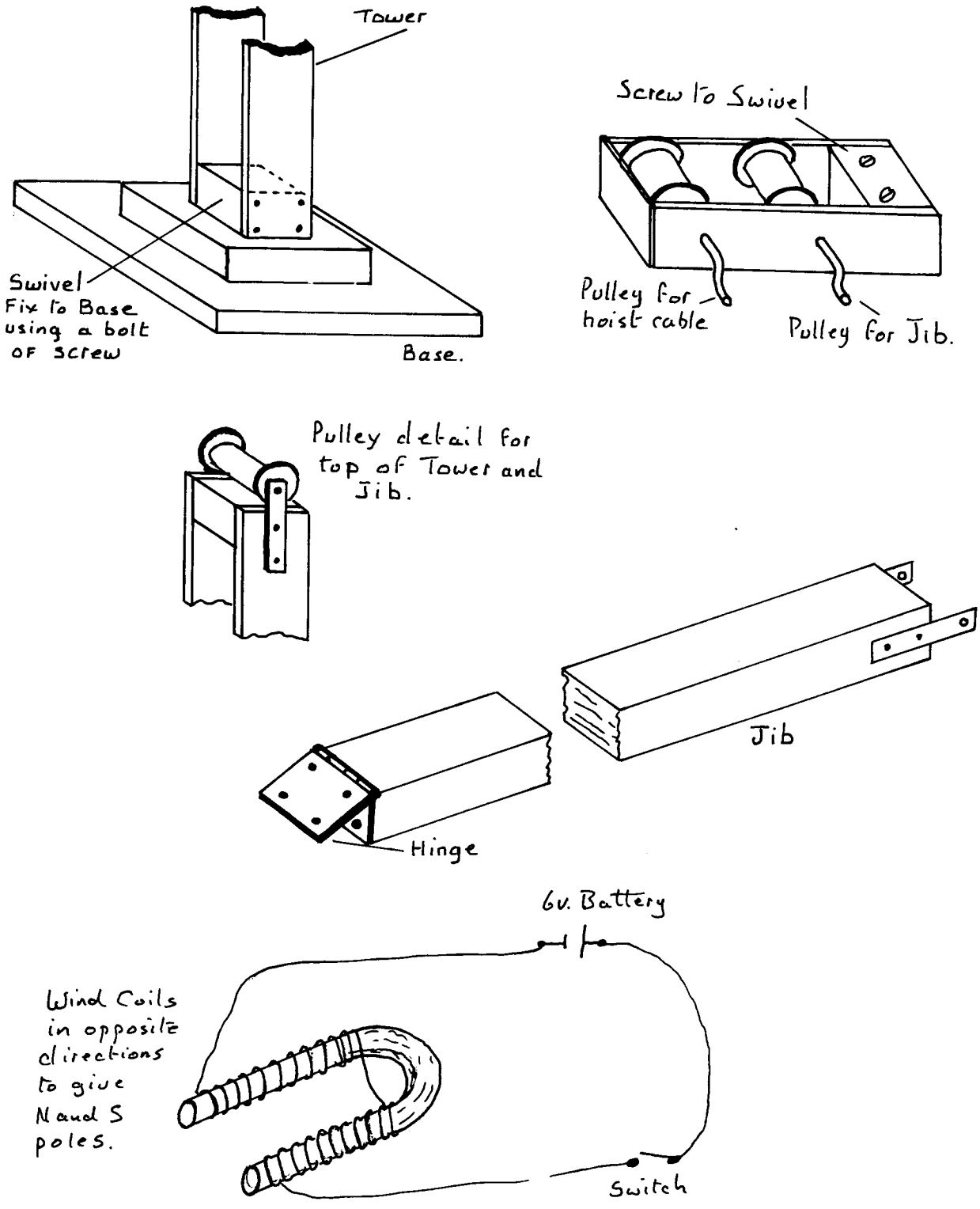
The exact dimensions of each of the parts will depend upon the material available to the teacher and the specific design of the pupils. The components which make up the crane are shown in the following sketches.

Points for the teacher to consider

The angle of the jib can be varied by turning the pulley and varying the length of cord wound on the pulley. Similarly, the height of the magnet can be varied by turning the second pulley. The crane can be rotated by turning the tower on the base.

Allow some 15 minutes for the group to set up and demonstrate the use of their crane. Then suggest a series of variations on using the crane such as, varying the load for fixed positions of the jib. This would lead to an observation that light loads can be lifted with the jib

almost horizontal whilst to lift heavy loads the jib must be getting closer to the vertical position. For the older age range of pupils this could lead on to an introduction to Moments. The pupils may observe that to lift heavier loads a stronger magnet is required which can lead on to an electric circuits project to investigate the relationship between voltage, current, and resistance, and also energy and power.



The basic toy was submitted by ICASE and was included in a publication *A Collection of Apparatus Assignments* by TSM 104 Course Participants, RECSAM, Glugor, Malaysia.