

Mechanics . . .

. . . Made Easy.

PRELIMINARY MODELS for YOUNG CHILDREN.

A Constructional Mechanical Toy.

THIS INVENTION HAS FOR ITS OBJECT THE
TRAINING OF THE YOUNG IN MECHANICAL
CONSTRUCTION.

Patented in England and Abroad.

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AND TOY DEALERS.

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It is believed that not only is the knowledge gained in this way useful, but that educationally the training thus afforded is most valuable in developing the reasoning faculties, and tending in quite a pleasurable way to cultivate ingenuity, resourcefulness and method.


All parts are made to gauge, and the necessity for accuracy of work is clearly taught.

An almost endless variety of models may be built; the parts are of metal and almost unbreakable; and when one structure is finished the same parts can be used repeatedly for different structures.

Parents will find co-operation with the children an interesting and stimulating exercise, and in many instances a pleasant mode of exercising their own inventive faculties.

11
SEPARATE PARTS.

 12 1/2 inch Perforated Strips

 5 1/2 inch Perforated Strips

 2 1/2 inch Perforated Strips

 Angle Pieces

 12 inch Grooved Rod


6  5 inch Grooved Rod

 3 inch Grooved Rod


8  Crank Handle

9  Flanged and Grooved Wheel


10  1 inch Pulley Wheel

11  1 1/2 inch Pulley Wheel


12  Bush Wheel

13  1/4 inch Pinion Wheel
1/2 " " "

14  Gear Wheel

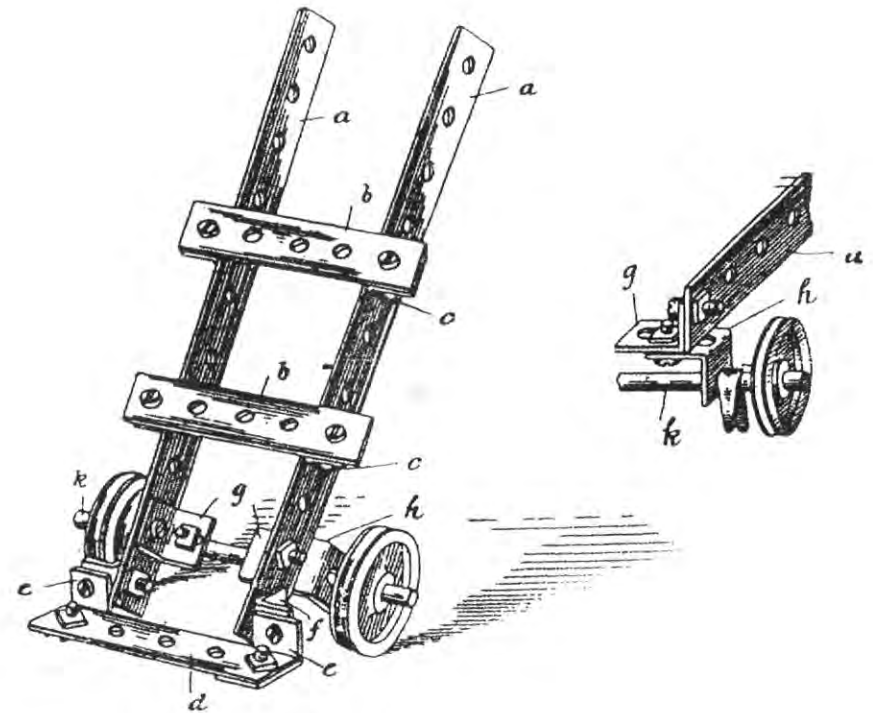
15  1 1/2 inch Contrite Wheel
3/4 " " "

16  Worm Wheel

17  Pawl
Keys, Nuts, Screws and Hook

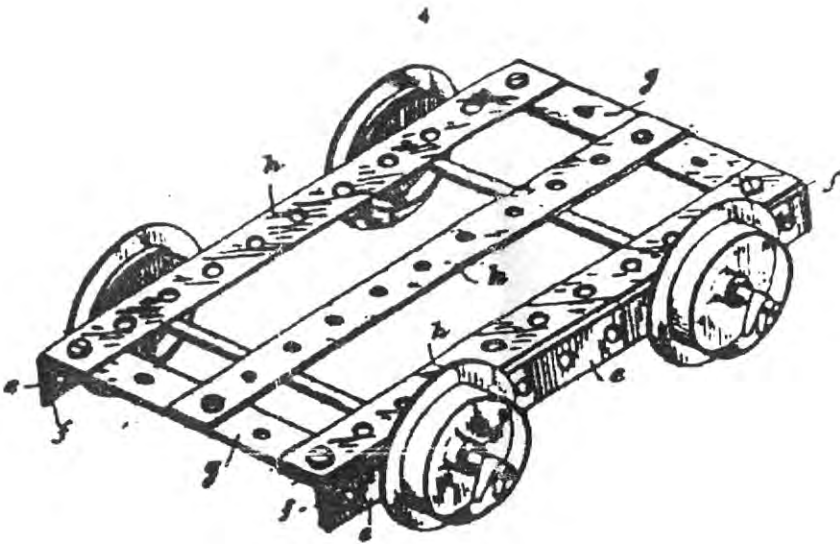
GENERAL.

It will be seen from the foregoing models that a great variety of models may be made by combining the strips, levers, wheels, and spindles in different ways, and that most of the models may be made to work, and may be driven by hand engines or motors if these are available; for instance, a windmill may be worked from an engine if a straight axle be used instead of the cranked one, and a grooved wheel be used, and connected by an endless string band to a motor.



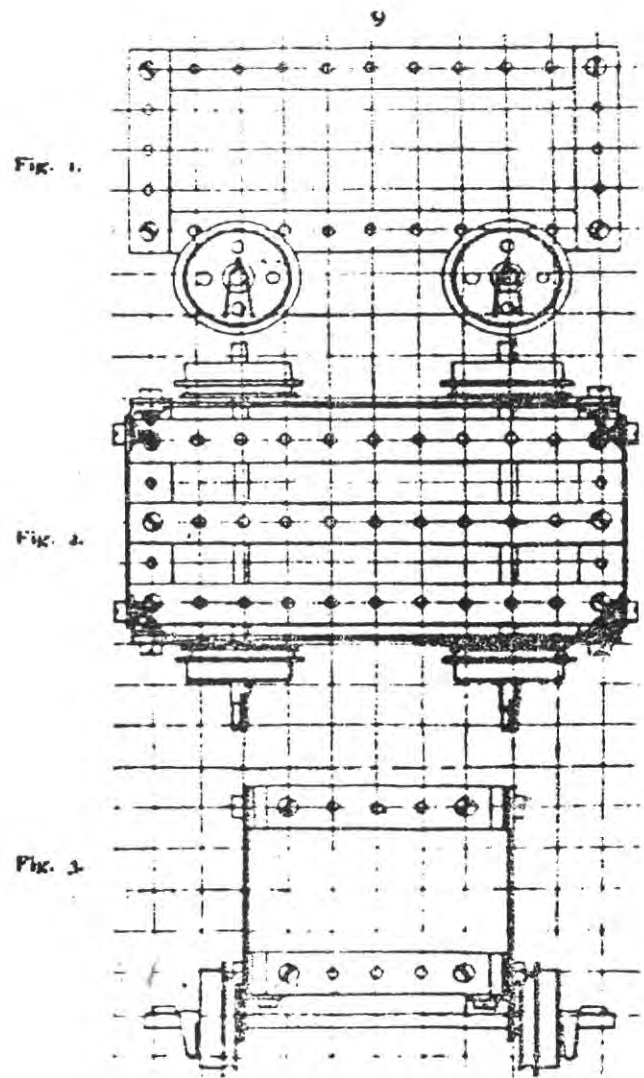
No. 1. LUGGAGE TRUCK.

In constructing this example, the two side frames *a* should, in the first place, be connected to the cross pieces *b* by means of four angle pieces *c*, advantage being taken of the slots in the latter to give a slight splay to the frames as indicated in the drawing. The lowest cross piece *d* may then be carried from the end holes of the frames *a* by a combination of the two angle pieces *e f* at each end, and the bearings for the wheel axle are each somewhat similarly constructed of two angle pieces *g h*, as will be readily understood by referring to the small detail view. When these are in place the axle *k* is inserted, keys *l* put over the ends, and the wheels secured thereon.



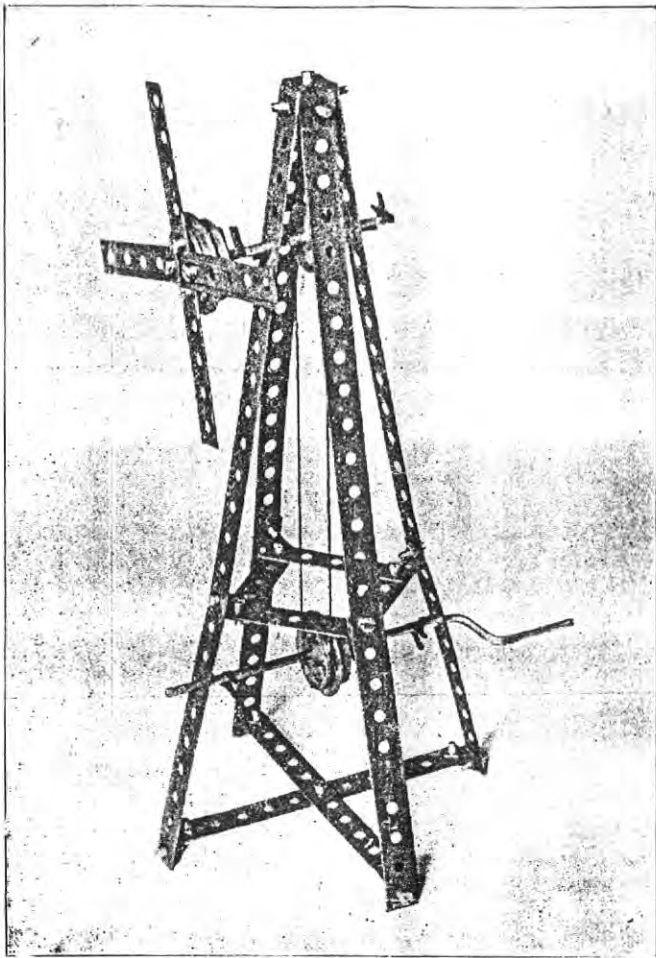
No. 2. TRUCK.

To construct this design, take a $5\frac{1}{2}$ in. strip *e* and attach, by means of screws and nuts, an angle piece *f* at each end. Then take a second $5\frac{1}{2}$ in. strip, and in the same way attach angle pieces at each end of it. These strips are to form the sides of the truck in which the axes of the wheels run. Now connect each end pair of angle pieces with two $2\frac{1}{2}$ in. strips *g* at right angles to the $5\frac{1}{2}$ in. strips forming the sides, and over these short strips *g* lay two $5\frac{1}{2}$ in. strips *h*, fastening each corner of the truck, where the ends of the strips *h* and *g* overlap the angle pieces *f*, by means of screws and nuts. Now attach the $5\frac{1}{2}$ in. piece *k* at each end to the centre hole of the strips *g*. This, with the two pieces *h*, forms the bottom of the truck. Next insert two axles, as shown, through the third holes from the ends of the side pieces *e*. Then push on the four wheels, and secure them in position by the keys by pushing the feather of the key along the groove in the axle and through the key-way in the wheels. These feathers serve to keep the wheels in position.



No. 6. TRUCK.

This illustration is of a truck constructed in a similar manner to the foregoing models. It is intended in this to give an example of the actual kind of drawing that an engineer would make to represent such a model. Fig. 1 would be called an elevation, Fig. 2 a plan, and Fig. 3 an end view of the truck. It will be noticed that the views are on squared paper, and the elevation and plan are projected from each other, as should be the case with all views in an engineering drawing.

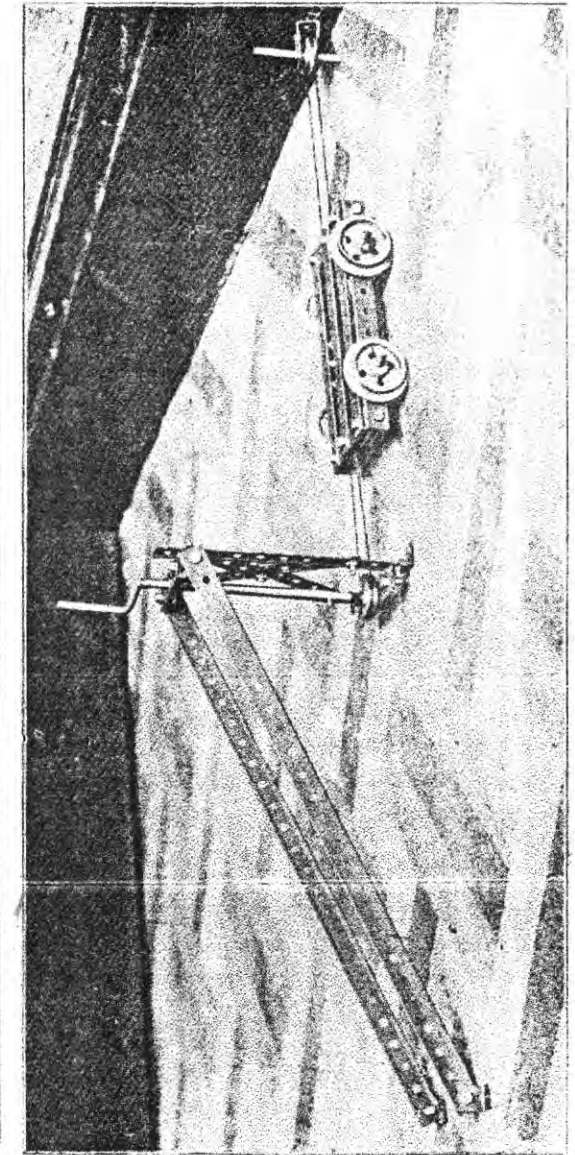


No. 5. WINDMILL.

This model will not be described quite so fully as the preceding ones, in order that its construction may be a test for the young model-maker, and be of use in developing his faculties for constructional work.

It will suffice to say that the four $1\frac{1}{2}$ in. strips are formed at the top by four angle pieces, and are stiffened lower down by the four $2\frac{1}{2}$ in. strips formed into a square, the corners of which are connected by angle pieces to the $1\frac{1}{2}$ in. strips.

The wind sails are made by attaching four $2\frac{1}{2}$ in. strips to the flanged wheel, and keying the latter to the spindle. Note.—This spindle has a second pulley on the frame connected by the string band to the pulley on the spindle below.



No. 3. ENDLESS ROPE RAILWAY.

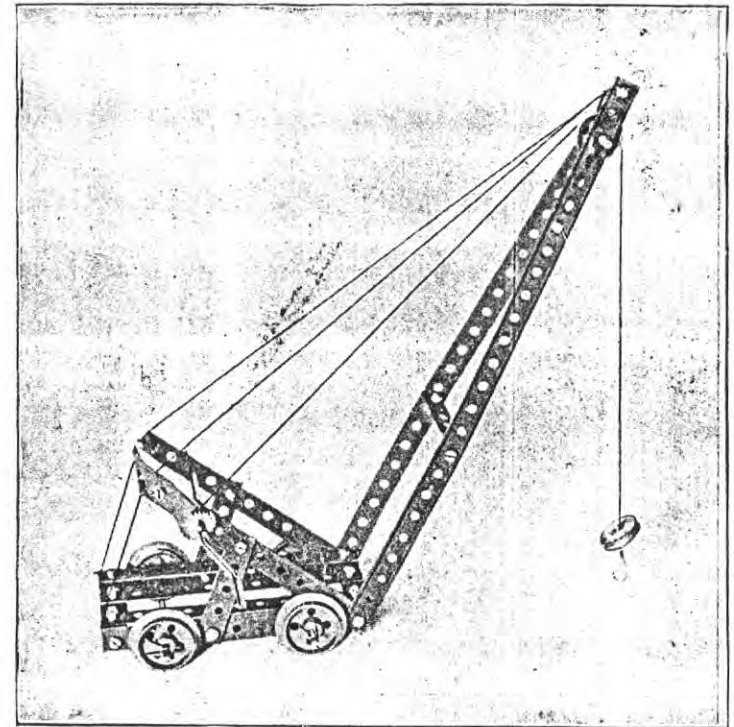
In this example, the truck made according to the previous design is used, and it is connected to an endless cord which passes from a pulley attached to the skirting board to another

No. 3—continued.

pulley and shaft carried on the bracket shown. In the illustration, this bracket is shown close to the skirting board to save space, but it may, of course, be placed at any distance desired.

The bracket is constructed as follows:—Two vertical $5\frac{1}{2}$ in. side pieces are connected together at the top and bottom by $2\frac{1}{2}$ in. pieces attached by angle pieces as shown, and the two $5\frac{1}{2}$ in. side pieces are braced together by two diagonal $5\frac{1}{2}$ in. pieces as shown. From the angle pieces at the top, two $12\frac{1}{2}$ in. pieces are carried down to two angle pieces screwed to the floor as shown, and angle pieces are placed at the feet of the uprights, which are also screwed to the floor. The pulley is keyed to the vertical spindle, which is threaded through the central holes of the two $2\frac{1}{2}$ in. cross pieces, and a second pulley, attached to a U shaped piece as shown, is screwed to the skirting.

A piece of string is then formed into an endless rope running over the two pulleys, and the truck is attached to one side of the string, so that by rotating the handle in one direction or another, the truck is moved as desired.



No. 4. TRAVELLING JIB CRANE.

The truck of Example 3 is used in the construction of the crane, with the following additions:—

Two $5\frac{1}{2}$ in. strips sloping back to carry the spindle, and two $12\frac{1}{2}$ in. strips to form the jib, are attached by the same screws to the end holes of the truck; the two $5\frac{1}{2}$ in. strips being braced to the truck by the two $2\frac{1}{2}$ in. strips as shown, and being connected together at their ends by a $2\frac{1}{2}$ in. strip and angle pieces.

The spindle, to which the pinion is keyed, is carried in the third pair of holes in the $5\frac{1}{2}$ in. strips as shown, and the pawl is pivoted on the screw which holds the angle piece in position.

The jib is braced by a $2\frac{1}{2}$ in. strip and angles at the ninth hole from the end, and the two sides are bolted together at the top hole, and the short spindle carrying the pulley is carried in the third hole from the top, over which pulley the string is passed and tied to the pinion spindle; the whole structure is braced by tie rods formed of strings attached to the ends of the truck, the $2\frac{1}{2}$ in. strips, and the jib