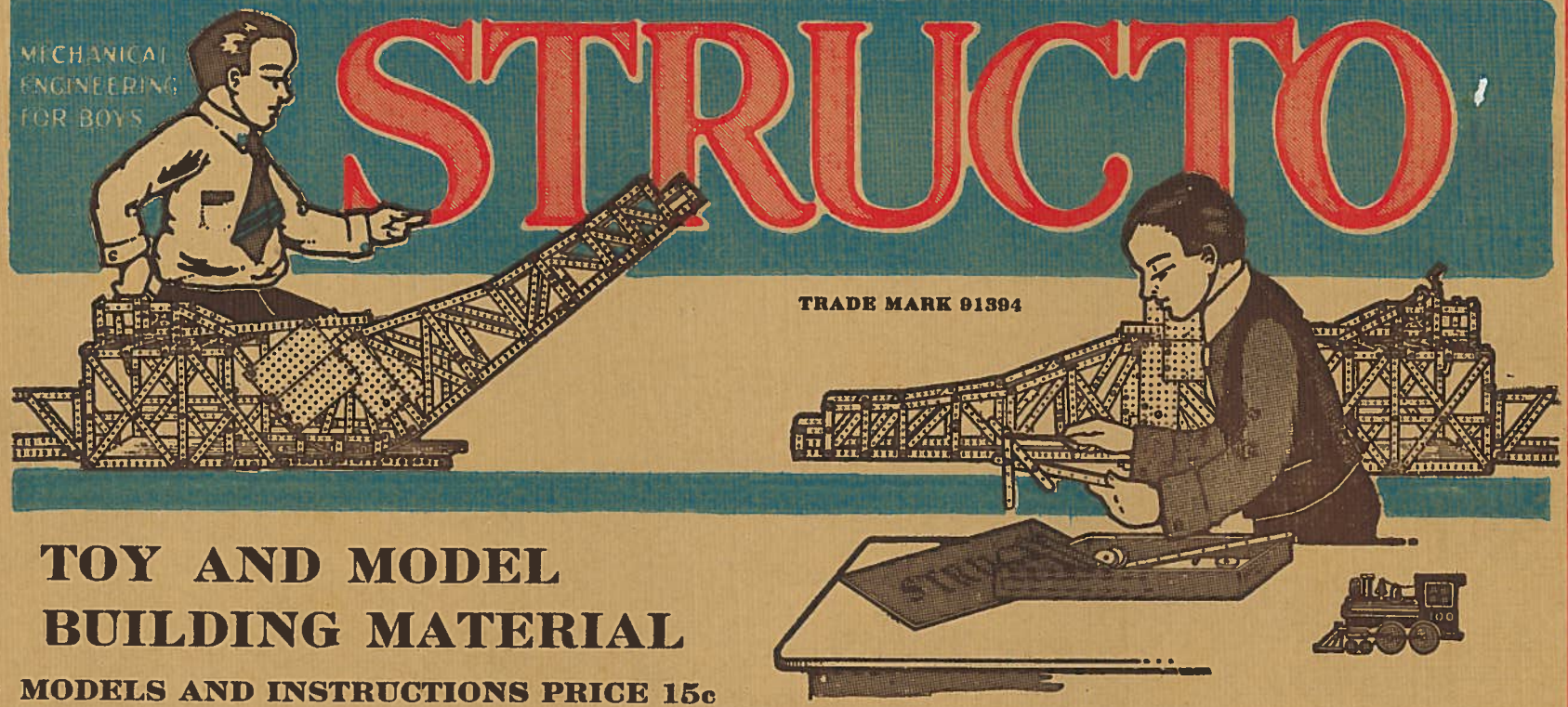
MECHANICAL ENGINEERING FOR BOYS

STRUCTO

TRADE MARK 91394



TOY AND MODEL BUILDING MATERIAL

MODELS AND INSTRUCTIONS PRICE 15c

STRUCTO MANUFACTURING CO.

FREEPORT, ILLINOIS, U. S. A.

FIFTH ADDITION

To Michael from Grandpa Ike.
Take good care of it. It was mine when I was a boy.
(Christmas 1956)

STRUCTO BUILDING MATERIAL

FOR

TOYS, MODELS, MECHANICAL DEMONSTRATIONS AND MANUAL TRAINING

THIS ingenious material gives the boy the foundation for a practical engineering education while at play. STRUCTO materials embody all the fundamental principles of Mechanical Engineering—Beams, Bolts, Wheels, Axles, Pulleys, Gears, etc., all made to gauge, and interchangeable. The possibilities of STRUCTO are practically unlimited, and with it any one can build wagons, cars, derricks, bridges, mills and mechanical conveyors, etc., in almost any design that may suit his fancy.

STRUCTO quickens the ingenuity, and the boys' interest in it never ceases, for to-day the parts may be used to construct a wagon, a derrick or mill, and to-morrow the same parts may be assembled in something entirely different and of his own design.

Boys are not *destructive* unless you burden them with fragile toys that they cannot take apart and then put together again. Watch any boy, who destroys things, and you will observe that he tries still harder to put them together again, and is deeply distressed if he finds he cannot do so.

Building with STRUCTO *teaches observation*, because a boy or man, after building with it a simple wagon, such as he passes on the street every day, will begin to notice points about wagons that he never saw or thought of before.

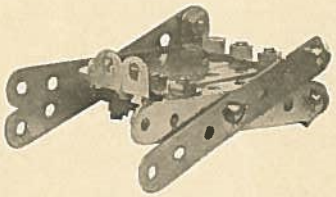
STRUCTO will increase the value of any toys a boy now has, because he can build with it many things that can be used with the old playthings, and thus interest in them is renewed.

Give the boys the happiness of production, which is the greatest pleasure of the human being. With STRUCTO a boy will study with intense eagerness and happiness, because it appeals to the muscles, the hands, the eyes, and *the child's real understanding.*

An hour spent *happily and willingly absorbing knowledge* is of more value to a child than weeks and months of forcing against the grain.

MODELS MADE WITH STRUCTO OUTFIT No. 1

Structo Models are Realistic in Appearance



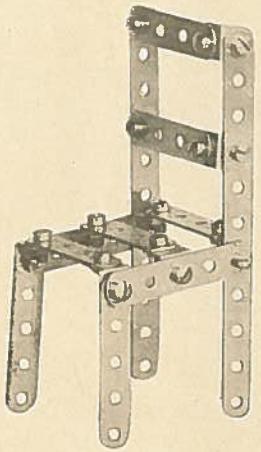
Camp Stool, Outfit No. 1

MATERIAL

4 Steel Beams, 7 holes
4 Steel Beams, 5 holes
3 Steel Beams, 4 holes
6 Brackets
16 Bolts and Nuts

EXTRA MATERIAL

2 Steel Beams, 7 holes



Chair, Outfit No. 1

MATERIAL

2 Steel Beams, 11 holes
4 Steel Beams, 5 holes
5 Steel Beams, 4 holes
10 Brackets
20 Bolts and Nuts

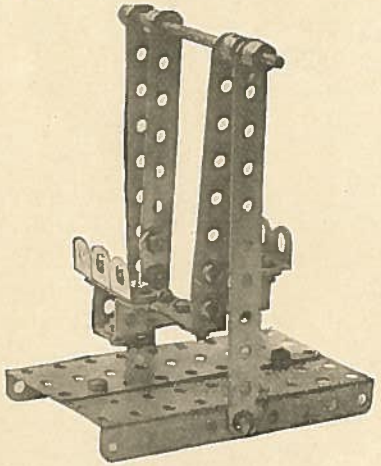
Camp Stool, Outfit No. 1

MATERIAL

4 Steel Beams, 7 holes
4 Steel Beams, 5 holes
3 Steel Beams, 4 holes
6 Brackets
16 Bolts and Nuts

EXTRA MATERIAL

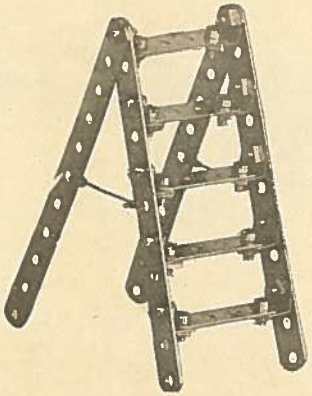
2 Steel Beams, 7 holes



Lawn Swing, Outfit No. 1

MATERIAL

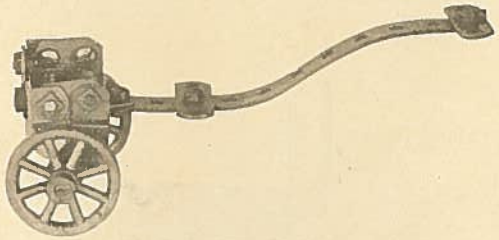
2 Steel Beams, 11 holes
2 Steel Beams, 7 holes
1 Steel Beam, 5 holes
3 Steel Beams, 3 holes
2 Steel Beams, 2 holes
2 Angle Plates, 1x3x9 holes
1 Shaft, 3¼ in.
2 Hangers
19 Bolts and Nuts
8 Brackets
4 Collars



Folding Step Ladder Outfit No. 1

MATERIAL

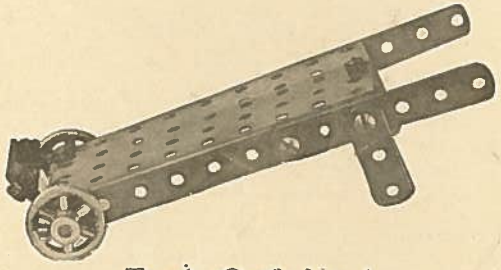
2 Steel Beams, 11 holes
5 Steel Beams, 5 holes
2 Steel Beams, 4 holes
2 Steel Beams, 7 holes
12 Brackets
22 Bolts and Nuts



Sulky, Outfit No 1

MATERIAL

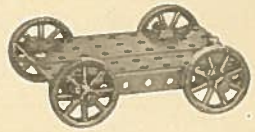
1 Steel Beam, 11 holes
3 Steel Beams, 5 holes
3 Steel Beams, 3 holes
2 Steel Beams, 2 holes
6 Brackets
2 Wagon Wheels
13 Bolts and Nuts
1 Shaft, 3¼ in.



Truck, Outfit No. 1

MATERIAL

2 Angle Plates, 1x3x9 holes
2 Steel Beams, 7 holes
1 Steel Beam, 4 holes
2 Brackets
9 Bolts and Nuts
1 Shaft, 3¼ in.
2 Wagon Wheels



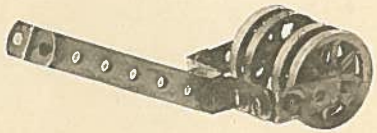
Flat Truck, Outfit No. 1

MATERIAL

2 Angle Plates, 1x3x9 holes
2 Shafts, 3¼ in.
4 Wagon Wheels
2 Bolts and Nuts

Engineering Knowledge Is a Valuable Acquisition

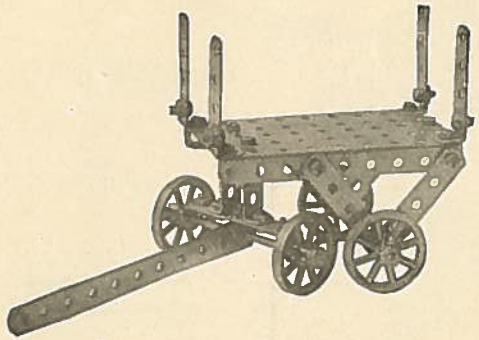
Structural Construction is as Essential as Mechanical



Lawn Roller, Outfit No. 1

MATERIAL

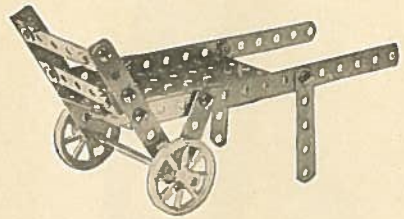
2 Steel Beams, 7 holes
2 Steel Beams, 3 holes
2 Steel Beams, 2 holes
1 Shaft 2½ in.
4 Wagon Wheels
8 Bolts and Nuts
6 Brackets



Express Truck (Wagon) Outfit No. 1

MATERIAL

2 Steel Beams, 11 holes
5 Steel Beams, 5 holes
4 Steel Beams, 4 holes
2 Angle Plates, 1x3x9 holes
2 Shafts, 3¾ in.
4 Wagon Wheels
2 Hangers
22 Bolts and Nuts
6 Brackets



Baggage Truck Outfit No. 1

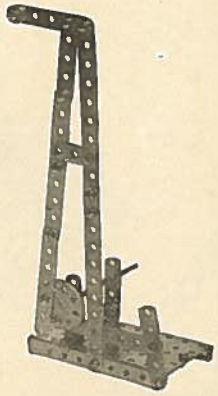
MATERIAL

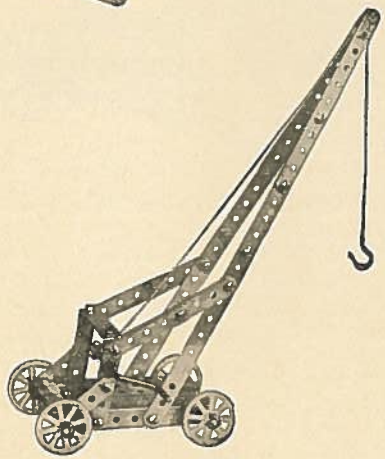
2 Steel Beams, 11 holes
2 Steel Beams, 7 holes
4 Steel Beams, 5 holes
2 Steel Beams, 4 holes
2 Angle Plates, 1x3x9 holes
1 Shaft, 3¾ in.
2 Wagon Wheels
16 Bolts and Nuts
4 Brackets

Rail Road Semaphore Outfit No. 1

MATERIAL

2 Steel Beams, 11 holes
2 Steel Beams, 7 holes
5 Steel Beams, 5 holes
2 Steel Beams, 4 holes
7 Steel Beams, 3 holes
2 Angle Brackets
1 Pulley, ½ in.
1 Spider Wheel
1 Angle Plate, 1x3x9 holes
1 Shaft, 3¾ in.
18 Steel Bolts and Nuts
2 Long Bolts and Nuts





Small Derrick, Outfit No. 1

MATERIAL

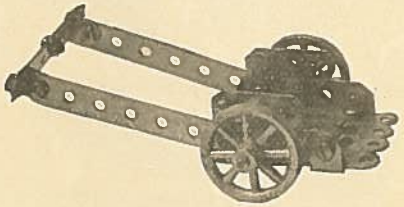
20 Short Bolts and Nuts
2 Steel Beams, 11 holes
2 Steel Beams, 7 holes
4 Steel Beams, 5 holes
4 Steel Beams, 4 holes
3 Steel Beams, 3 holes
2 Angle Plates, 1x3x9 holes
1 Crank Shaft
2 Shafts, 3¾ in.
1 Shaft, 1½ in.
2 Collars
1 Spider Wheel
1 Pulley, ½ in.
4 Wagon Wheels
1 Hanger
1 Hook

Portable Serving Table Outfit No. 1

MATERIAL

2 Angle Plates, 1x3x9 holes
2 Steel Beams, 11 holes
2 Steel Beams, 7 holes
2 Steel Beams, 5 holes
2 Shafts, 3¾ in.
4 Wagon Wheels
10 Short Bolts and Nuts

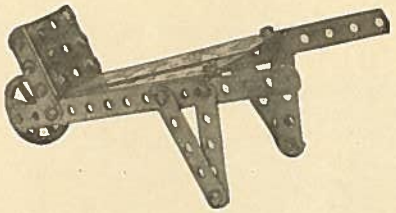
Your Boy Can Improve on these Designs



Road Scraper, Outfit No. 1

MATERIAL

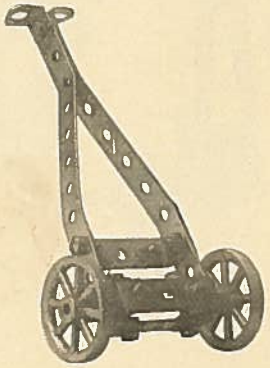
2 Steel Beams, 7 holes
5 Steel Beams, 5 holes
4 Steel Beams, 4 holes
3 Steel Beams, 3 holes
2 Steel Beams, 2 holes
1 Shaft, 3¾ in.
2 Wagon Wheels
21 Bolts and Nuts
10 Brackets
2 Collars



Wheel Barrow, Outfit No. 1

MATERIAL

2 Steel Beams, 11 holes
2 Steel Beams, 7 holes
2 Steel Beams, 4 holes
5 Steel Beams, 5 holes
3 Steel Beams, 3 holes
6 Brackets
2 Angle Plates, 1x3x9 holes
22 Bolts and Nuts
2 Collars
1 Shaft, 1½ in.
1 Wagon Wheel



Lawn Mower Outfit No. 1

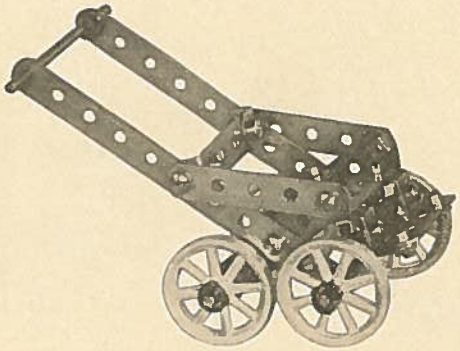
MATERIAL

2 Steel Beams, 11 holes
4 Steel Beams, 3 holes
1 Shaft, 2½ in.
2 Wagon Wheels
11 Bolts and Nuts
10 Brackets

Boston Wheel Barrow Outfit No. 1

MATERIAL

2 Steel Beams, 11 holes
2 Steel Beams, 7 holes
4 Steel Beams, 4 holes
3 Steel Beams, 5 holes
3 Steel Beams, 3 holes
2 Angle Plates, 1x3x9 holes
3 Wagon Wheels
2 Collars
6 Brackets
1 Shaft, 3¾ in.
1 Shaft, 1½ in.
22 Bolts and Nuts



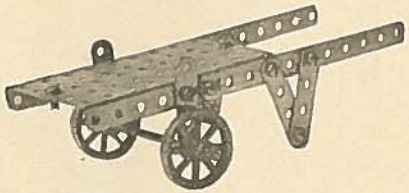
Go Cart Outfit No. 1

MATERIAL

2 Steel Beams, 11 holes
5 Steel Beams, 5 holes
4 Steel Beams, 4 holes
10 Brackets
1 Shaft, 2½ in.
4 Wagon Wheels
2 Collars
2 Shafts, 3¾ in.
16 Bolts and Nuts

For handle use 5 hole beam in place of 2½ in. shaft as shown.

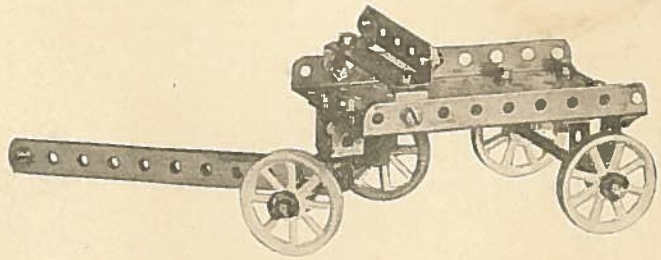
SIGN AND MAIL THE POSTAL CARD ENCLOSED IN EACH OUTFIT. YOU WILL RECEIVE ILLUSTRATIONS OF THE NEW MODELS THAT OUR EXPERIMENTAL DEPARTMENT IS CONSTANTLY TURNING OUT.



Push Cart Outfit No. 1

MATERIAL

2 Steel Beams, 11 holes
6 Steel Beams, 4 holes
2 Angle Plates, 1x3x9 holes
1 Shaft, 3¾ in.
2 Wagon Wheels
12 Bolts and Nuts



Small Wagon, Outfit No. 1

MATERIAL

2 Steel Beams, 11 holes
4 Steel Beams, 5 holes
2 Angle Plates, 1x3x9 holes
2 Shafts, 3¾ in.
4 Wagon Wheels
11 Brackets
1 Long Bolt — 3 Hangers
20 Short Bolts — 22 Nuts

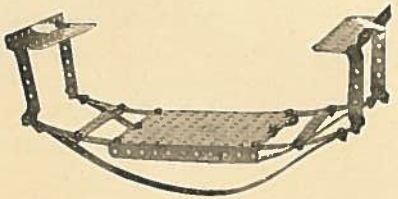
Structo is the Last Word in "Real Toys"

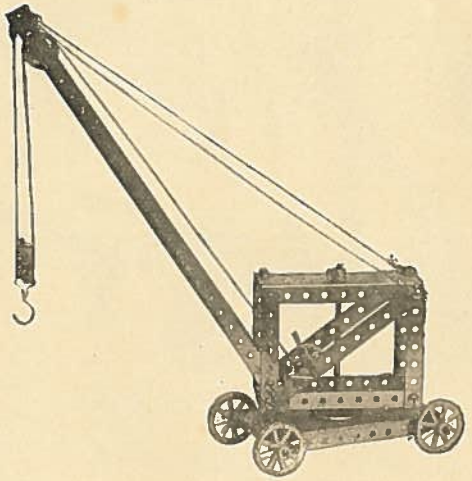
Join the Structo Engineering Corps

Rocking Seats, Outfit No. 2

MATERIAL

4 Steel Beams, 25 holes
2 Steel Beams, 9 holes
4 Steel Beams, 5 holes
2 Angle Plates, 1x3x9 holes
2 Angle Plates, 1x5x11 holes
8 Angle Brackets
28 Short Bolts and Nuts

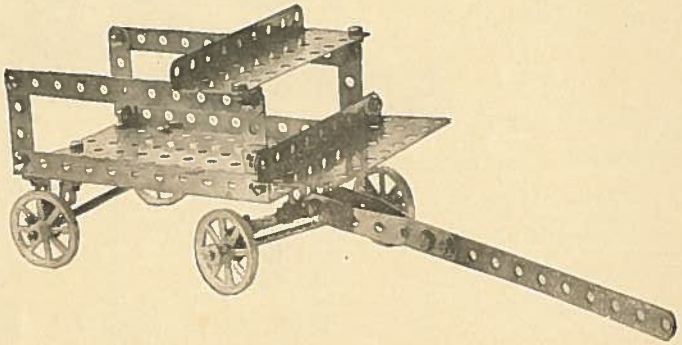




Derrick Outfit No. 2

MATERIAL

2 Steel Beams, 25 holes
2 Steel Beams, 11 holes
2 Steel Beams, 9 holes
4 Steel Beams, 7 holes
2 Angle Plates, 1x3x9 holes
2 Angle Plates, 1x5x11 holes
4 Collars
1 Clevis
1 Hook
2 Pulleys, 1 in.
1 Pulley, ½ in.
1 Shaft, 4¾ in.
2 Shafts, 3¾ in.
1 Shaft, 1½ in.
6 Angle Brackets
1 Hank Cord
16 Short Bolts and Nuts
1 Spider Wheel
4 Wagon Wheels
1 Crank Shaft
1 Hanger



Express Wagon, Outfit No. 2.

MATERIAL

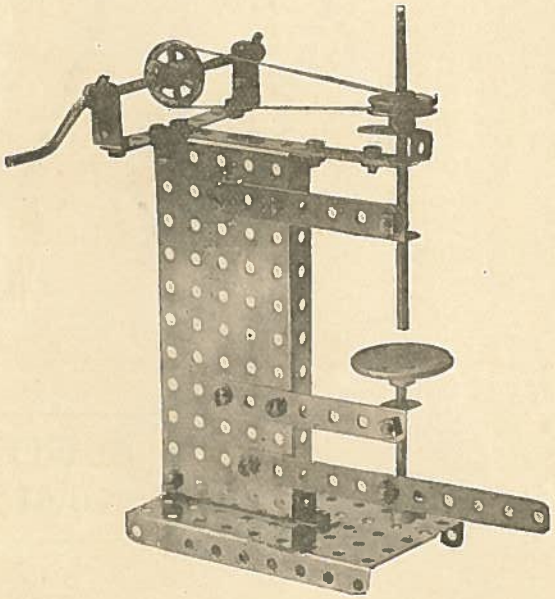
2 Steel Beams, 11 holes	2 Angle Plates, 1x5x11 holes
1 Steel Beam, 9 holes	3 Hangers
3 Steel Beams, 7 holes	10 Brackets
4 Steel Beams, 4 holes	2 Shafts, 4¾ in.
1 Steel Beam, 2 holes	4 Wagon Wheels
2 Angle Plates, 1x3x9 holes	32 Bolts and Nuts

Swing, Outfit No. 2

MATERIAL

4 Steel Beams, 25 holes
4 Steel Beams, 7 holes
4 Steel Beams, 5 holes
2 Steel Beams, 11 holes
2 Steel Beams, 9 holes
2 Angle Plates, 1x3x9 holes
1 Angle Plate, 1x5x11 holes
5 Angle Brackets
1 Hank Cord
30 Short Bolts and Nuts
2 Long Bolts and Nuts

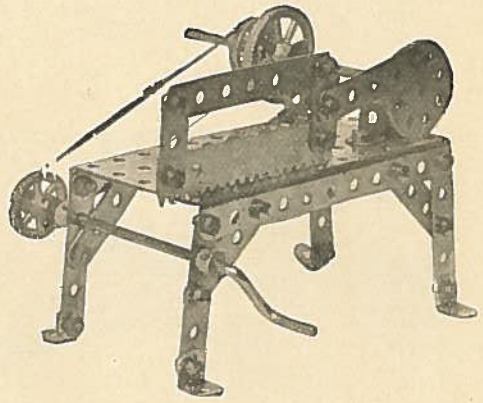
Structo Suggests Practical Thought in Mechanism



Drill Press, Outfit No. 2

MATERIAL

1 Steel Beam, 11 holes
1 Steel Beam, 9 holes
3 Steel Beams, 7 holes
2 Steel Beams, 2 holes
1 Angle Plate, 1x5x11 holes
2 Angle Plates, 1x3x9 holes
2 Pulleys, 1 in.
1 Spider Wheel
4 Collars
1 Clevis
10 Angle Brackets
1 Shaft, 4¾ in.
1 Shaft, 2½ in.
1 Crank Shaft, 4 in.
1 Long Bolt and Nut
21 Short Bolts and Nuts

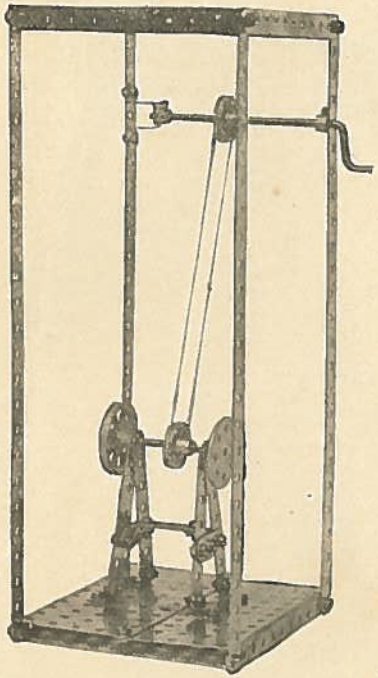


Power Hack Saw, Outfit No. 2

MATERIAL

1 Steel Beam, 7 holes
5 Steel Beams, 5 holes
4 Steel Beams, 4 holes
2 Steel Beams, 3 holes
2 Angle Plates, 1x5x11 holes
1 Shaft, 4¾ in.
1 Crank Shaft, 4 in.
1 Spider Wheel
2 Pulleys, 1 in.
1 Wagon Wheel
8 Angle Brackets
2 Collars
2 Hangers
2 Long Bolts and Nuts
29 Short Bolts and Nuts

USE 7 HOLE BEAM FOR SAW BLADE OR MAKE SAW BLADE OF CARD BOARD



Emery Grinder
Outfit No. 2

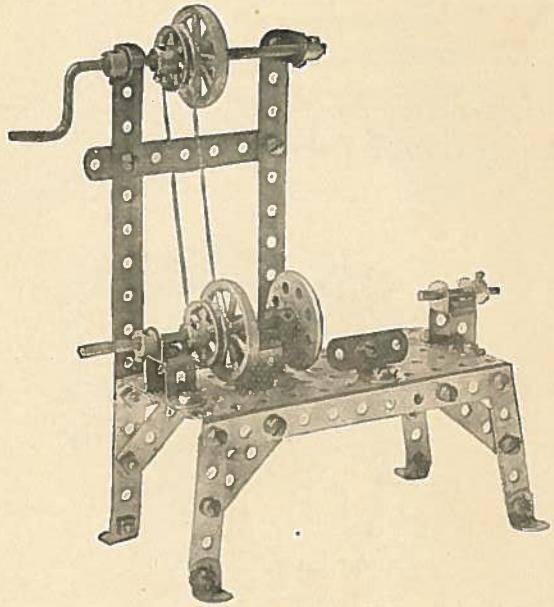
MATERIAL

4 Steel Beams, 25 holes
2 Steel Beams, 11 holes
2 Steel Beams, 9 holes
4 Steel Beams, 7 holes
3 Steel Beams, 3 holes
2 Angle Plates, 1x5x11 holes
1 Spider Wheel
1 Wagon Wheel
2 Pulleys, 1 in.
2 Collars
1 Shaft, 2½ in.
1 Crank Shaft
1 Hanger
10 Angle Brackets
2 Long Bolts and Nuts
30 Short Bolts and Nuts

Speed Lathe
Outfit No. 2

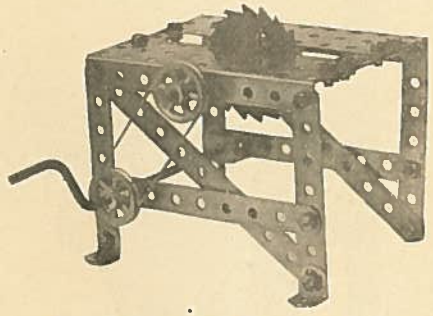
MATERIAL

2 Steel Beams, 11 holes
1 Steel Beam, 7 holes
4 Steel Beams, 5 holes
4 Steel Beams, 4 holes
1 Steel Beam, 3 holes
1 Spider Wheel
2 Wagon Wheels
2 Pulleys, 1 in
4 Collars
3 Hangers
11 Angle Brackets
2 Angle Plates, 1x5x11 holes
1 Shaft, 4¾ in.
1 Shaft, 1½ in.
1 Crank Shaft, 4 in.
2 Long Bolts and Nuts
30 Short Bolts and Nuts



Structo Illustrates Perfect Rules for All Mechanics

Structo Material Builds Real Machines in Miniature

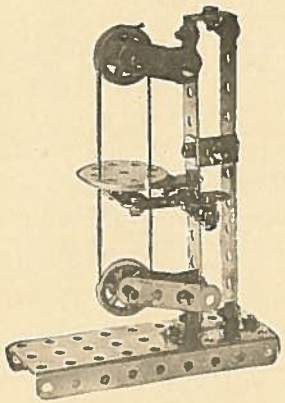


Circular Saw, Outfit No. 2

MATERIAL

2 Steel Beams, 11 holes
2 Steel Beams, 9 holes
4 Steel Beams, 7 holes
2 Steel Beams, 5 holes
2 Angle Plates, 1x3x9 holes
1 Spider Wheel
2 Collars
1 Crank Shaft, 4 in.
21 Short Bolts and Nuts
2 Pulleys, 1 in.
1 Shaft 4¾ in.
1 Hanger
4 Angle Brackets

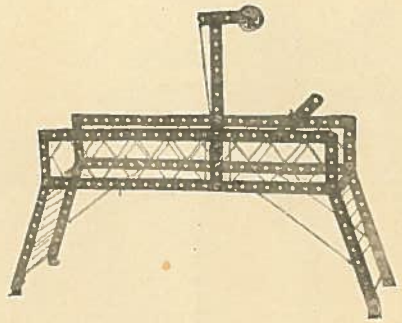
MAKE CIRCULAR SAW OF CARDBOARD



Band Saw Model Outfit No. 2

MATERIAL

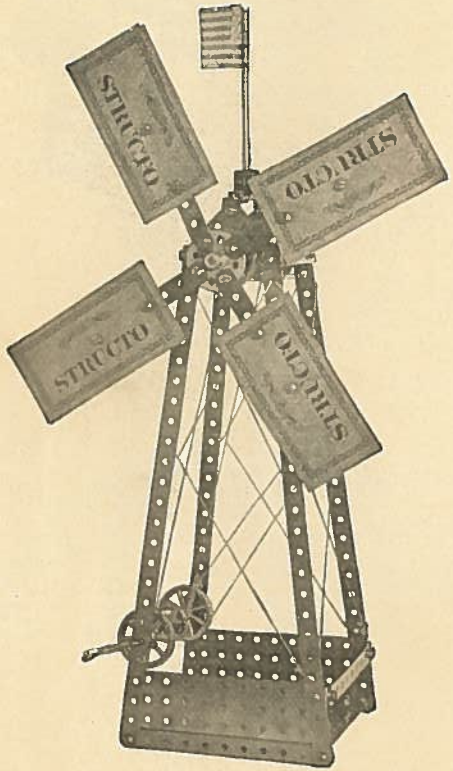
4 Steel Beams, 4 holes
4 Steel Beams, 3 holes
2 Steel Beams, 11 holes
2 Plates, 3x9 holes
12 Brackets
2 Pulleys, 1 in.
1 Shaft 1½ in.
1 Shaft 2½ in.
1 Spider Wheel
24 Bolts and Nuts



Railway Signal Bridge Outfit No. 2

MATERIAL

4 Steel Beams, 25 holes
2 Steel Beams, 11 holes
2 Steel Beams, 9 holes
4 Steel Beams, 7 holes
6 Steel Beams, 5 holes
3 Steel Beams, 4 holes
2 Shafts, 4¾ in.
4 Collars
1 Pulley, 1 in.
1 Pulley, ½ in.
1 Cable Cord
8 Angle Brackets
2 Long Bolts and Nuts
28 Short Bolts and Nuts

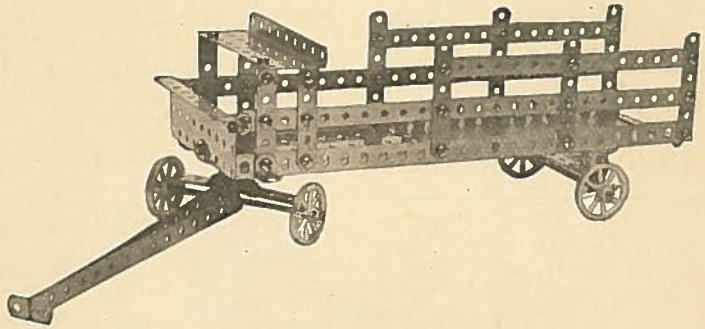


WINDMILL BLADES CAN BE MADE OF PASTEBOARD OR CARDBOARD

Windmill, Outfit No. 2

MATERIAL

4 Steel Beams, 25 holes
1 Steel Beam, 9 holes
4 Steel Beams, 7 holes
5 Steel Beams, 5 holes
4 Steel Beams, 4 holes
2 Angle Plates, 1x3x9 holes
2 Angle Plates, 1x5x11 holes
4 Wagon Wheels
2 Pulleys, 1 in.
1 Spider Wheel
1 Collar
2 Hangers
2 Shafts, 4¾ in.
1 Crank Shaft
8 Brackets
1 Cable Cord
2 Long Bolts
30 Short Bolts
32 Nuts



Freight Truck, Outfit No. 3

MATERIAL

1 Steel Beam, 3 holes
2 Steel Beams, 25 holes
4 Steel Beams, 15 holes
2 Steel Beams, 7 holes
6 Steel Beams, 6 holes
4 Steel Beams, 5 holes
2 Angle Girders, 12½ in.
2 Angle Plates, 1x3x9 holes
2 Angle Plates, 1x5x11 holes
3 Hangers
19 Brackets
2 Shafts, 4¾ in.
4 Wagon Wheels
4 Long Bolts
50 Short Bolts
55 Nuts

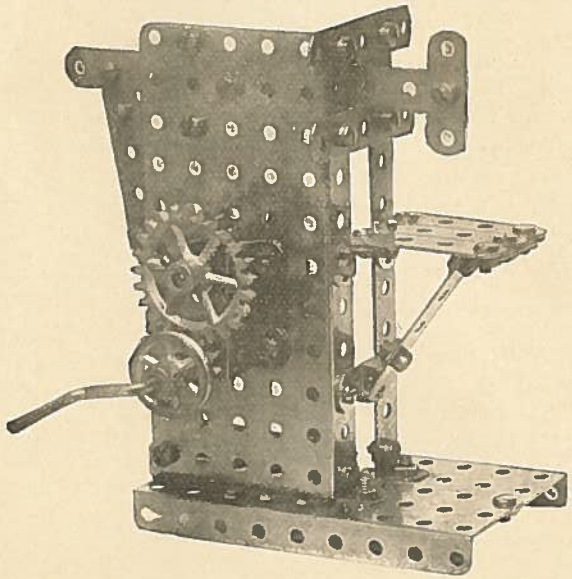
Originality and Inventiveness,
The Highest Qualities of a Human Mind

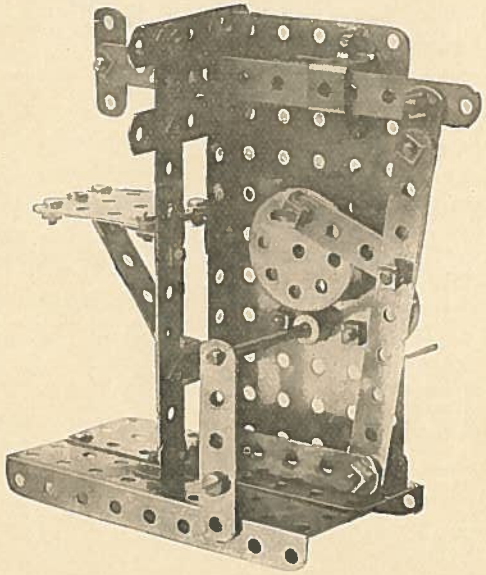
Structo Leads the Mind to New Inventions

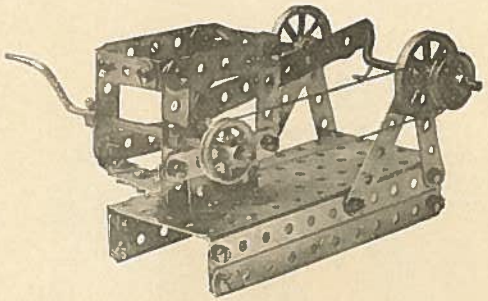
Shaper, Outfit No. 3

MATERIAL

1 Angle Plate, 1x5x11 holes
2 Angle Plates, 1x3x9 holes
2 Steel Beams, 11 holes
1 Steel Beam, 9 holes
4 Steel Beams, 5 holes
4 Steel Beams, 4 holes
4 Steel Beams, 3 holes
1 Steel Beam, 2 holes
3 Hangers
1 Clevis
9 Angle Brackets
1 Crank Shaft, 4 in.
1 Shaft, 1½ in.
1 Spider Wheel
1 Pulley, 1 in.
1 Spur Gear, 1½ in.
1 Spur Gear, ½ in.
1 Collar
40 Short Bolts and Nuts
2 Long Bolts and Nuts





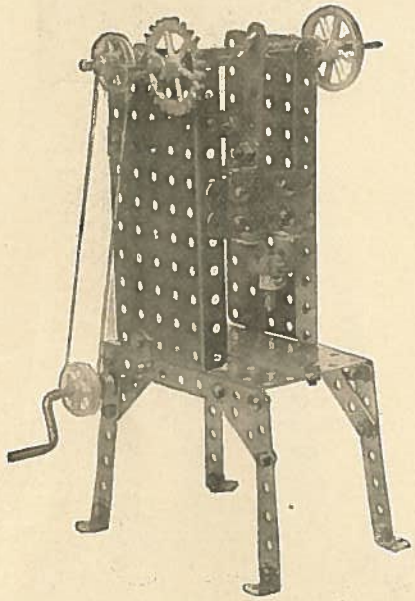


Gas Engine, Outfit No. 3

MATERIAL

2 Steel Beams, 11 holes
1 Steel Beam, 9 holes
2 Steel Beams, 6 holes
7 Steel Beams, 5 holes
4 Steel Beams, 4 holes
4 Steel Beams, 3 holes
4 Steel Beams, 2 holes
2 Wagon Wheels
2 Pulleys, 1 in.
2 Hangers
2 Collars
8 Angle Brackets
1 Crank Shaft, 4 in.
34 Bolts and Nuts
2 Angle Plates 1x5x11 holes
1 Engine Crank Shaft

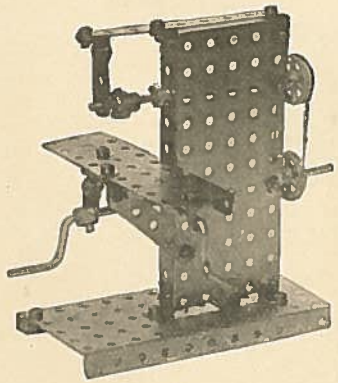
USE HAIR PIN OR WIRE TO SUPPORT CONNECTING ROD



Geared Punch Press
Outfit No. 3

MATERIAL

4 Steel Beams, 7 holes
6 Steel Beams, 5 holes
4 Steel Beams, 4 holes
4 Steel Beams, 2 holes
2 Angle Plates, 1x3x9 holes
2 Angle Plates, 1x5x11 holes
1 Hanger
10 Angle Brackets
4 Collars
2 Pulleys, 1 in.
1 Pulley, ½ in.
1 Wagon Wheel
1 Spur Gear, 1½ in.
1 Spur Gear, ½ in.
1 Shaft, 4¾ in.
1 Shaft, 1½ in.
1 Crank Shaft, 4 in.
2 Long Bolts and Nuts
30 Short Bolts and Nuts
1 Engine Crank Shaft

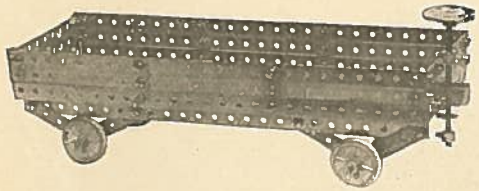


Milling Machine
Outfit No. 3

MATERIAL

1 Steel Beam, 11 holes
1 Steel Beam, 9 holes
1 Steel Beam, 5 holes
1 Steel Beam, 3 holes
1 Steel Beam, 2 holes
1 Plate, 1x3x9 holes
2 Plates, 1x5x11 holes
14 Angle Brackets
1 Shaft, 4¾ in.
1 Crank Shaft, 4 in.
1 Crank Shaft, 6 in.
2 Pulleys, 1 in.
1 Spur Gear, ½ in.
3 Collars
27 Short Bolts and Nuts

Endless Varieties of Toys Can Be Built with Structo



Coal Car, Outfit No. 3

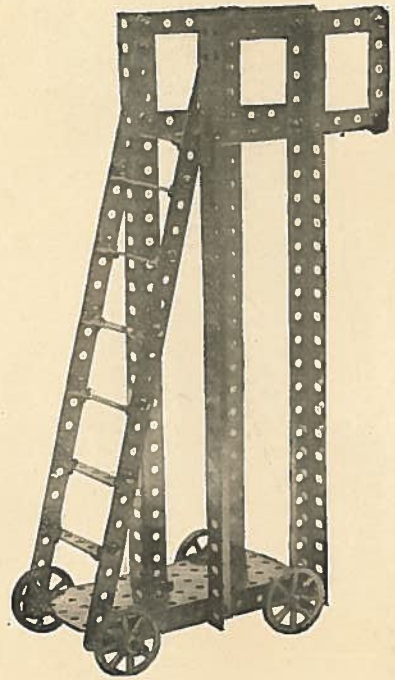
MATERIAL

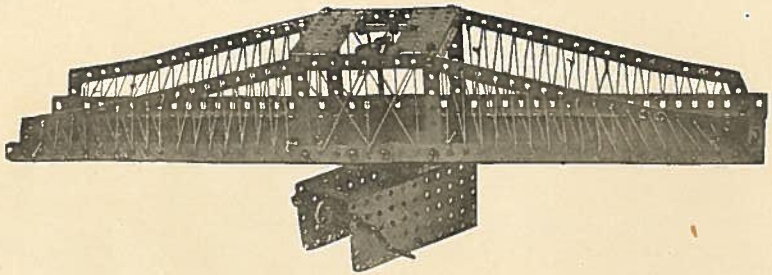
4 Angle Girders
4 Steel Beams, 25 holes
8 Steel Beams, 5 holes
4 Steel Beams, 3 holes
2 Plates 1x3x9 holes
10 Angle Brackets
2 Hangers
2 Shafts, 4¾ in.
1 Shaft, 3¾ in.
2 Collars
1 Spider Wheel
4 Wagon Wheels or Car Wheels
50 Bolts and Nuts

Portable Ladder Outfit No. 3

MATERIAL

4 Angle Girders, 12½ in.
2 Steel Beams, 25 holes
2 Steel Beams, 9 holes
8 Steel Beams, 5 holes
2 Angle Plates, 1x3x9 holes
2 Angle Plates, 1x5x11 holes
4 Wagon Wheels
4 Collars
2 Shafts, 4¾ in.
12 Angle Brackets
47 Bolts and Nuts

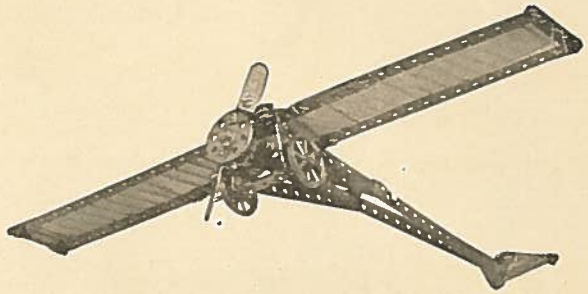




Swinging Bridge, Outfit No. 3

MATERIAL

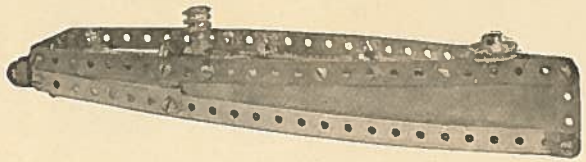
1 Cable Cord	2 Hangers
4 Angle Girders, 12½ in.	1 Spider Wheel
4 Steel Beams, 15 holes	2 Pulleys, 1 in.
4 Steel Beams, 9 holes	1 Crank Shaft
4 Steel Beams, 7 holes	1 Crank Shaft, 4¾ in.
6 Steel Beams, 5 holes	4 Collars
4 Steel Beams, 3 holes	6 Brackets
2 Angle Plates, 1x3x9 holes	54 Bolts and Nuts
2 Angle Plates, 1x5x11 holes	4 Steel Beams, 6 holes



Monoplane, Outfit No. 3

MATERIAL

4 Steel Beams, 25 holes	2 Wagon Wheels
2 Steel Beams, 15 holes	17 Brackets
2 Steel Beams, 11 holes	44 Short Bolts and Nuts
6 Steel Beams, 5 holes	1 Shaft, 3¾ in.
4 Steel Beams, 3 holes	4 Collars
3 Steel Beams, 2 holes	1 Grooved Pulley
1 Spider Wheel	1 Cable Cord



WORK CARD BOARD INTO MODELS, IT IMPROVES THEIR APPEARANCE

Motor Boat, Outfit No. 3

MATERIAL

4 Steel Beams, 25 holes	1 Hanger
2 Steel Beams, 7 holes	1 Shaft, 4¾ in.
4 Steel Beams, 6 holes	4 Collars
1 Steel Beam, 5 holes	2 Grooved Pulleys, 1 in
2 Steel Beams, 4 holes	20 Brackets
4 Steel Beams, 3 holes	36 Bolts and Nuts

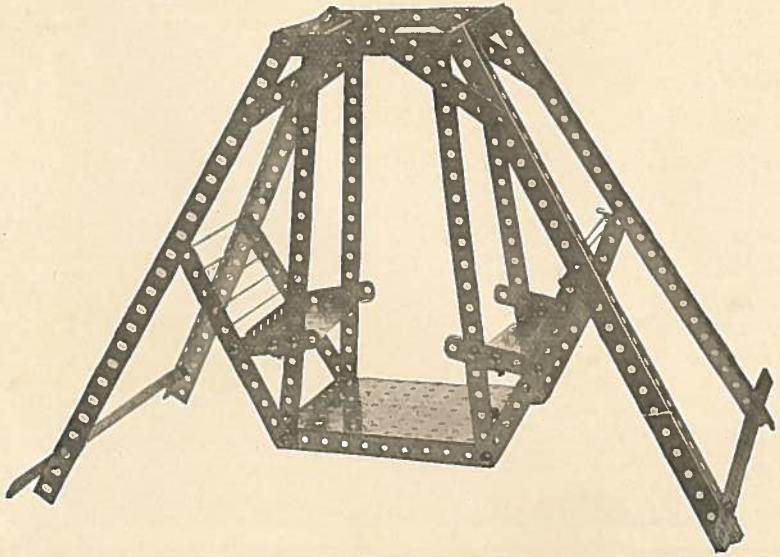
A Structo Oufit for a Child Means Its Industrial Success

STRUCTO
Is a Real Entertainer

Lawn Swing, Outfit No. 3

MATERIAL

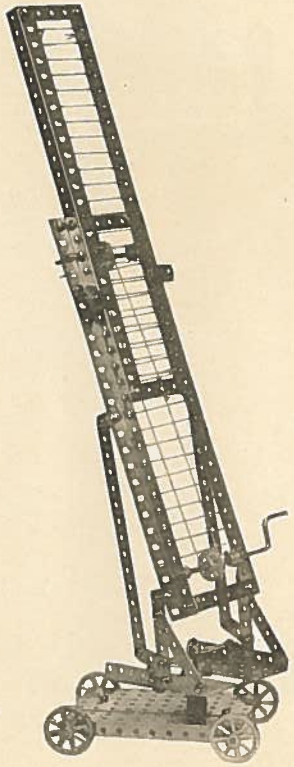
4 Angle Girders, 12½ in.
2 Steel Beams, 25 holes
4 Steel Beams, 15 holes
2 Steel Beams, 11 holes
4 Steel Beams, 9 holes
4 Steel Beams, 7 holes
6 Steel Beams, 6 holes
8 Steel Beams, 5 holes
4 Collars
2 Angle Plates, 1x5x11 holes
2 Angle Plates, 1x3x9 holes
4 Brackets
42 Short Bolts and Nuts
4 Long Bolts and Nuts
2 Shafts, 4¾ in.

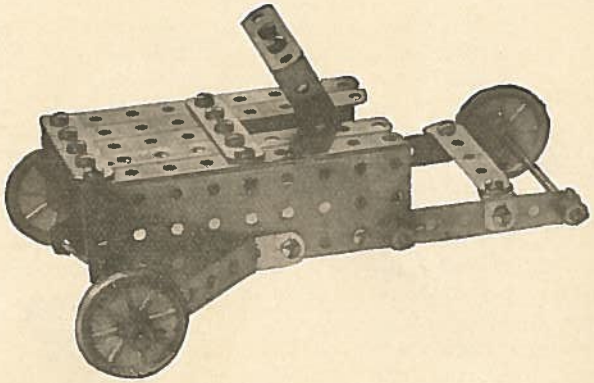


Portable Revolving Fire Escape Outfit No. 3

MATERIAL

4 Angle Girders, 12½ in.
2 Steel Beams, 25 holes
3 Steel Beams, 7 holes
4 Steel Beams, 6 holes
3 Steel Beams, 5 holes
2 Steel Beams, 3 holes
4 Collars
10 Brackets
1 Spider Wheel
4 Wagon Wheels
1 Shaft, 3¾ in.
2 Shafts, 4¾ in.
1 Crank Shaft
2 Pulleys, 1 in.
1 Spur Gear, ½ in.
2 Angle Plates, 1x3x9 holes
2 Angle Plates, 1x5x11 holes
3 Hangers
1 Hank Cord
50 Short Bolts and Nuts
4 Long Bolts and Nuts





Railroad Velocipede Outfit No. 3

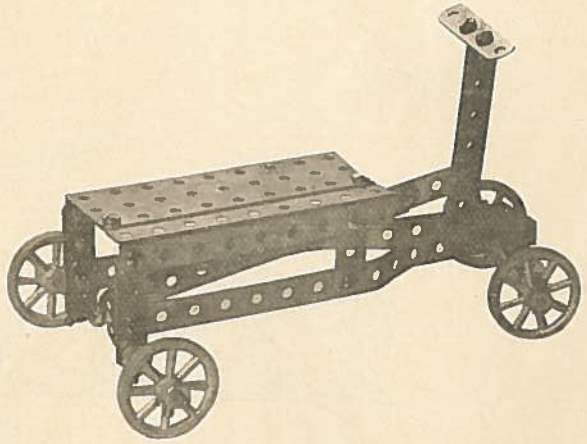
MATERIAL

4 Steel Beams, 9 holes
2 Steel Beams, 7 holes
2 Steel Beams, 6 holes
4 Steel Beams, 5 holes
1 Steel Beam, 4 holes
2 Angle Plates, 1x3x9 holes
4 Angle Brackets
1 Engine Shaft
2 Shafts, 3¾ in.
4 Collars
1 Spur Gear, ½ in.
3 Wagon or Car Wheels
20 Short Bolts and Nuts
1 Long Bolt and Nut

Irish Mail, Outfit No.3

MATERIAL

2 Steel Beams, 15 holes
1 Steel Beam, 9 holes
3 Steel Beams, 7 holes
1 Steel Beam, 5 holes
3 Steel Beams, 4 holes
2 Steel Beams, 3 holes
6 Angle Brackets
2 Angle Plates, 1x3x9 holes
1 Engine Shaft
1 Shaft, 3¾ in.
1 Shaft, 1½ in.
4 Wagon Wheels
18 Short Bolts and Nuts
2 Long Bolts and Nuts
4 Collars

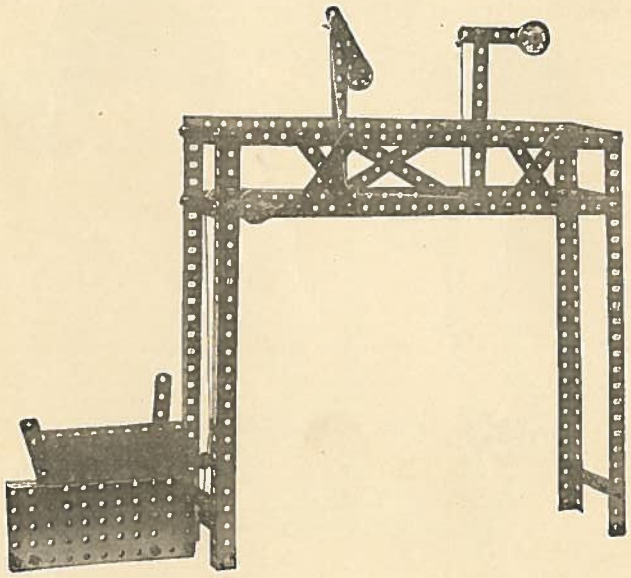


Our Experimental Department Will Keep You Posted

STRUCTO
Is a Real Instructor

Railroad Semaphore

Outfit No. 3



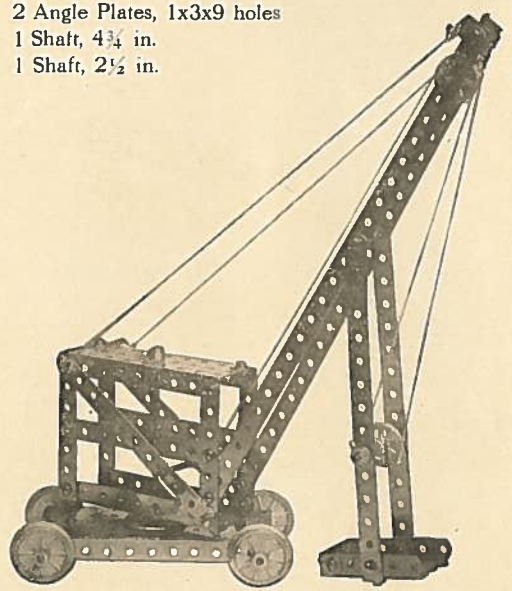
MATERIAL

4 Angle Girders, 12½ in.
4 Steel Beams, 25 holes
2 Steel Beams, 11 holes
4 Steel Beams, 9 holes
4 Steel Beams, 7 holes
8 Steel Beams, 5 holes
2 Steel Beams, 3 holes
6 Steel Beams, 6 holes
4 Steel Beams, 2 holes
3 Hangers
2 Angle Plates, 1x5x11 holes
2 Angle Plates, 1x3x9 holes
1 Shaft, 3¾ in.
1 Shaft, 2½ in.
1 Shaft, 1½ in.
2 Pulleys, 1 in.
1 Pulley, ½ in.
4 Collars
1 Hank Cord
50 Short Bolts and Nuts
4 Long Bolts and Nuts

Steam Shovel, Outfit No. 3

MATERIAL

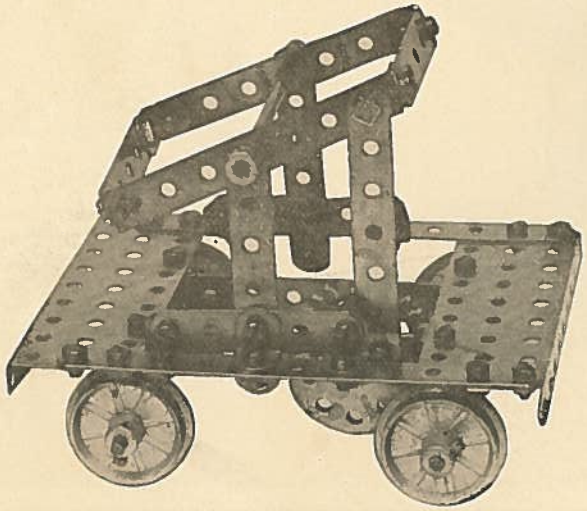
2 Steel Beams, 25 holes
2 Steel Beams, 15 holes
2 Steel Beams, 11 holes
4 Steel Beams, 9 holes
4 Steel Beams, 7 holes
5 Steel Beams, 5 holes
2 Steel Beams, 3 holes
1 Hanger
10 Brackets
2 Angle Plates, 1x5x11 holes
2 Angle Plates, 1x3x9 holes
1 Shaft, 4¾ in.
1 Shaft, 2½ in.
1 Shaft, 1½ in.
2 Shafts, 3¾ in.
1 Crank Shaft
1 Spur Gear, ½ in.
4 Collars
2 Pulleys, 1 in.
4 Wagon Wheels
1 Spider Wheel
1 Hank Cord
34 Short Bolts and Nuts

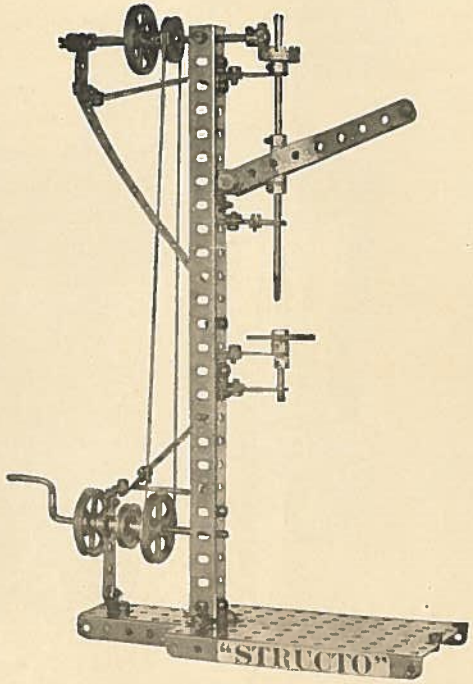


Hand Car, Outfit No. 4

MATERIAL

2 Steel Beams, 11 holes
2 Steel Beams, 9 holes
3 Steel Beams, 7 holes
2 Steel Beams, 6 holes
4 Steel Beams, 5 holes
4 Steel Beams, 2 holes
2 Angle Plates, 1x3x9 holes
1 Spider Wheel
1 Spur Gear, ¾ in.
1 Spur Gear, 1½ in.
6 Collars
16 Brackets
2 Shafts, 4¾ in.
1 Shaft, 3¾ in.
1 Shaft, 2½ in.
4 Car or Wagon Wheels
38 Short Bolts and Nuts
1 Long Bolt and Nut





Drill Press, Outfit No. 4

MATERIAL

2 Angle Plates, 1x5x11 holes
1 Angle Plate, 1x3x9 holes
1 Angle Girder, 12½ in.
1 Steel Beam, 15 holes
2 Steel Beams, 9 holes
1 Steel Beam, 6 holes
4 Steel Beams, 5 holes
4 Steel Beams, 3 holes
19 Brackets
1 Shaft, 6 in.
1 Shaft, 4¾ in.
2 Shafts, 1½ in.
1 Crank Shaft
12 Collars
1 Spider Wheel
3 Pulleys, 1½ in.
2 Pulleys, 1 in.
1 Spur Gear, ½ in.
1 Crown Gear, ¾ in.
34 Bolts and Nuts

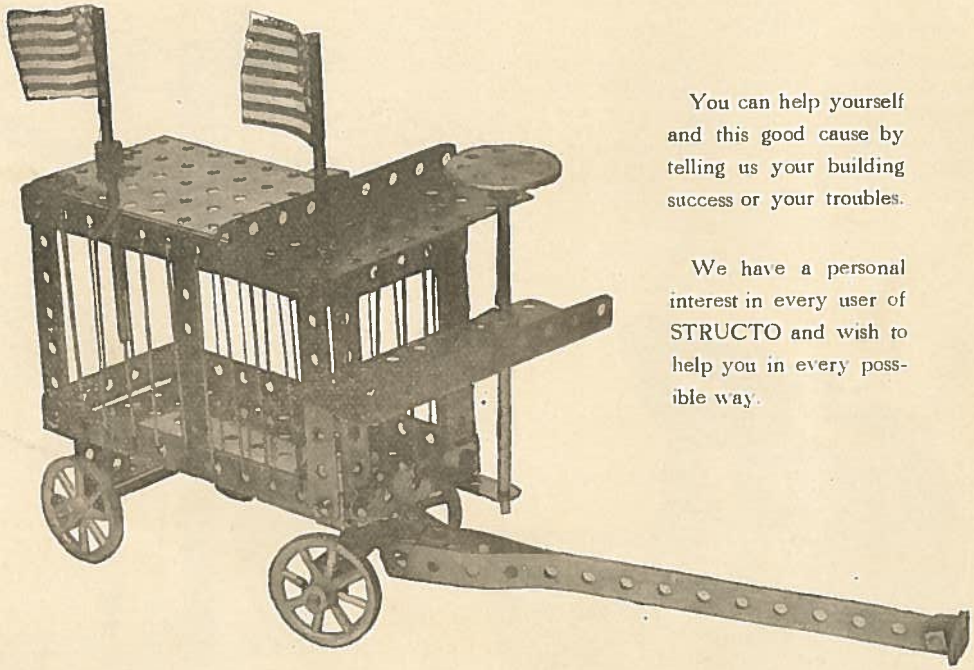
Machinery Built with Structo Will Operate

Do not Copy Models
If you Can Improve Them

Circus Wagon, Outfit No. 4

MATERIAL

- 2 Steel Beams, 15 holes
- 2 Steel Beams, 11 holes
- 6 Steel Beams, 7 holes
- 6 Steel Beams, 5 holes
- 2 Steel Beams, 3 holes
- 2 Angle Plates, 1x3x9 holes
- 2 Angle Plates, 1x5x11 holes
- 3 Hangers
- 22 Brackets
- 2 Shafts, 3¾ in.
- 2 Shafts, 4¾ in.
- 1 Shaft, 2½ in.
- 1 Spider Wheel
- 4 Wagon Wheels
- 4 Collars
- 39 Short Bolts and Nuts
- 1 Long Bolt and Nut
- 7 ft. Cable Cord



You can help yourself and this good cause by telling us your building success or your troubles.

We have a personal interest in every user of STRUCTO and wish to help you in every possible way.

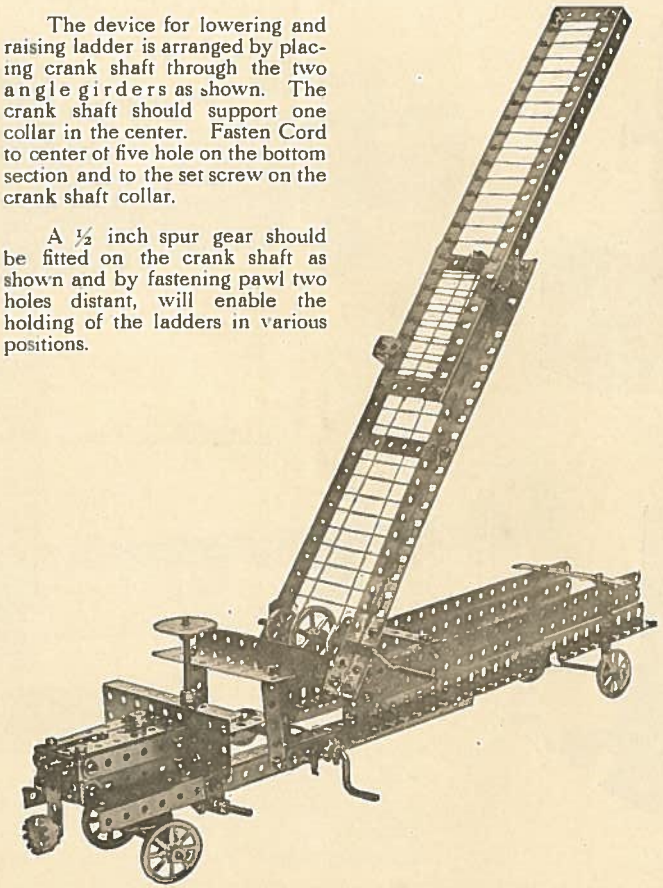
Aerial Fire Truck Outfit No. 4

MATERIAL

8 Angle Girders 12½ in.
4 Steel Beams, 25 holes
1 Steel Beam, 9 holes
6 Steel Beams, 7 holes
6 Steel Beams, 6 holes
8 Steel Beams, 5 holes
6 Steel Beams, 4 holes
4 Steel Beams, 2 holes
3 Steel Beams, 3 holes
2 Angle Plates, 1x3x9 holes
2 Shafts, 4¾ in.
2 Shafts, 3¾ in.
1 Shaft, 2½ in.
2 Crank Shafts
1 Pawl
2 Spur Gears, ½ in.
3 Pulleys, 1 in.
1 Pulley, 1½ in.
1 Pulley, ½ in.
1 Spur Gear, 1½ in.
2 Grown Gears
1 Worm
6 Collars
2 Spider Wheels
4 Wagon Wheels
20 Angle Brackets
1 Hank Cord
2 Hangers
70 Short Bolts and Nuts
5 Long Bolts and Nuts

The device for lowering and raising ladder is arranged by placing crank shaft through the two angle girders as shown. The crank shaft should support one collar in the center. Fasten Cord to center of five hole on the bottom section and to the set screw on the crank shaft collar.

A ½ inch spur gear should be fitted on the crank shaft as shown and by fastening pawl two holes distant, will enable the holding of the ladders in various positions.

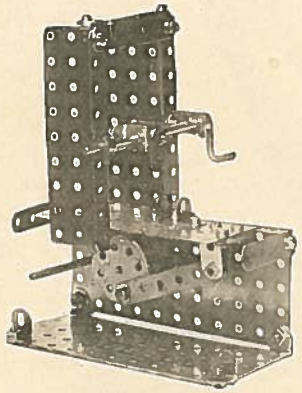


The body of this model is composed of 4 Angle Girders, 4 Beams, 26 holes, 4 Beams 7 holes. Bolt 2 Beams, 7 holes, in virtical position on the 25 hole beams, letting the 7 hole beams extend below 4 holes. Then insert 3¾ inch shaft into the second hole from the bottom of the 7 hole beam; slip on wagon wheels and the rear trucks are completed.

To construct auto worm steering device refer to page 34 for details.

The sectional aerial ladders are constructed with 4 Angle Girders as shown. The upper section is bolted together on top with two 5 hole beams; the lower section on the back with two 7 hole beams. On the top of the bottom ladder bolt two Angle Brackets in the center of the 5 hole beam, leaving one hole between Brackets. Insert long bolt through ½ in. pulley for bearing. After constructing Crank Shaft with two 1 in. pulleys for collars, and 1½ in. pulley for drive, fasten one end of string to 5 hole beam on bottom of top ladder, running string around ½ in. pulley and 1½ in. pulley and fasten to 5 hole beam on top section.

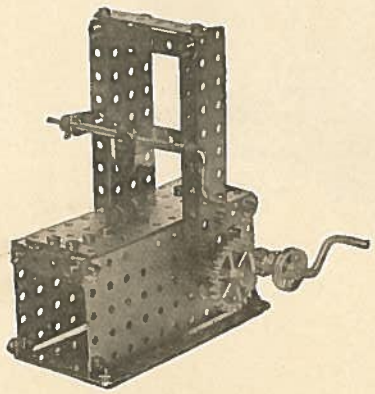
Structo Material is Most Comprehensive

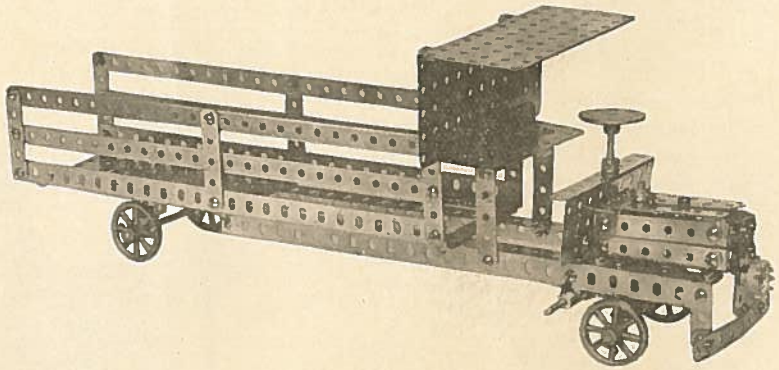


Metal Planer
Outfit No. 4

MATERIAL

4 Steel Beams, 6 holes
2 Steel Beams, 4 holes
5 Steel Beams, 2 holes
1 Flat Plate, 4x9 holes
1 Flat Plate, 6x11 holes
2 Angle Plates, 1x3x9 holes
2 Angle Plates, 1x5x11 holes
1 Clevis
3 Hangers
14 Angle Brackets
1 Spur Gear, ½ in.
1 Spur Gear, 1½ in.
1 Spider Wheel
4 Collars
1 Shaft, 2½ in.
1 Crank Shaft, 4 in.
1 Crank Shaft, 6 in.
40 Short Bolts and Nuts
2 Long Bolts and Nuts

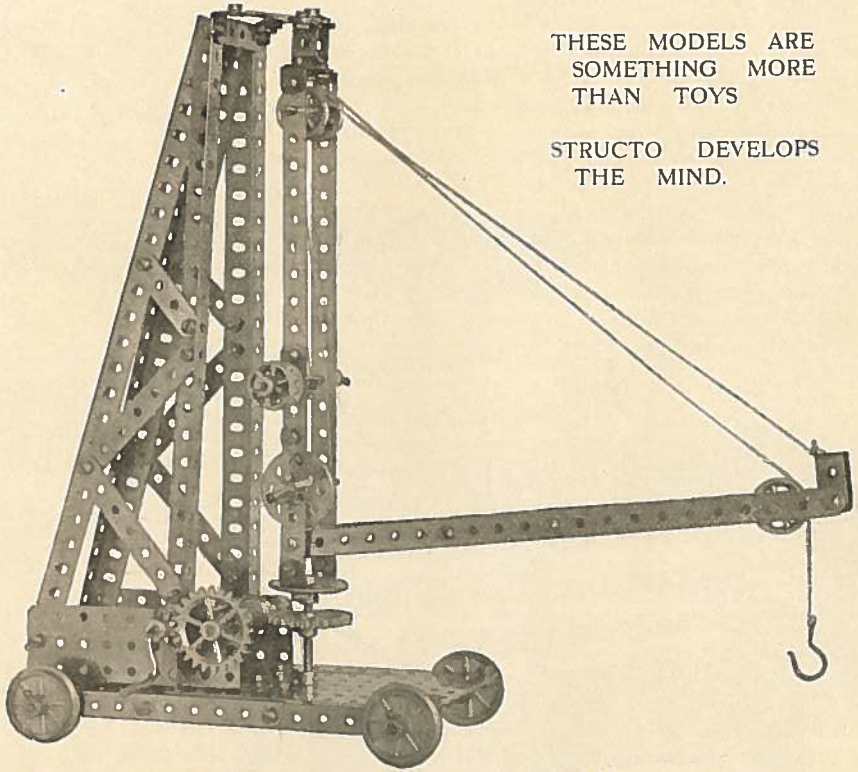




Automobile Truck, Outfit No. 4

MATERIAL

4 Angle Girders, 12½ in.
4 Steel Beams, 25 holes
3 Steel Beams, 9 holes
3 Steel Beams, 7 holes
6 Steel Beams, 6 holes
8 Steel Beams, 5 holes
3 Steel Beams, 4 holes
4 Steel Beams, 3 holes
4 Steel Beams, 2 holes
2 Angle Plates, 1x3x9 holes
2 Angle Plates, 1x5x11 holes
2 Hangers
2 Shafts, 3¾ in.
2 Shafts, 4¾ in.
1 Shaft, 2½ in.
1 Spur Gear, 1½ In.
1 Spur Gear, ½ in.
2 Crown Gears, ¾ in.
1 Worm
1 Spider Wheel
4 Wagon Wheels
22 Angle Brackets
5 Collars
70 Short Bolts and Nuts
2 Long Bolts and Nuts



THESE MODELS ARE SOMETHING MORE THAN TOYS

STRUCTO DEVELOPS THE MIND.

NOTE—The base of this model is constructed with two Angle Plates, 1x5x11 holes; one Flat Plate 6x11 holes; one Steel Beam, 9 holes; bolted together to form a base 16 holes long and 7 holes wide.

TO CONSTRUCT THIS DERRICK WITHOUT EXTRA PARTS USE CRANK SHAFT TO SUPPORT WORM.

Railway Derrick, Outfit No. 4

MATERIAL

2 Steel Beams, 19 holes	5 Steel Beams, 7 holes
2 Steel Beams, 15 holes	3 Steel Beams, 5 holes
4 Steel Beams, 11 holes	2 Steel Beams, 4 holes
1 Steel Beam, 9 holes	2 Steel Beams, 3 holes
4 Angle Girders, 12½ in.	
1 Flat Plate, 6x11 holes	
2 Angle Plates, 1x3x9 holes	
2 Angle Plates, 1x5x11 holes	
4 Car or Wagon Wheels	
2 Shafts, 4¾ in.	1 Hanger
2 Shafts, 3¾ in.	1 Clevis
2 Shafts, 2½ in.	1 Pawl
1 Shaft, 1½ in.	6 Collars
2 Crank Shafts	7 Brackets
3 Pulleys, 1 in.	1 Cable Cord
2 Spider Wheels	3 Long Bolts
2 Spur Gears, 1½ in.	53 Short Bolts
2 Spur Gears, ½ in.	60 Nuts
2 Crown Gears, ¾ in.	1 Hook 1 Worm

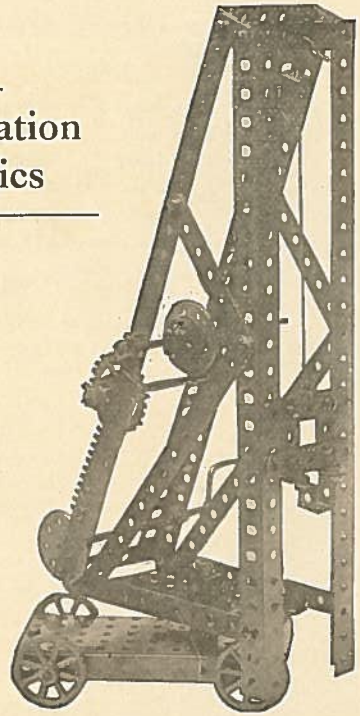
Railway Equipment Offers Vast Field for Improvement

Structo is the Culmination of Universal Mechanics

Pile Driver Outfit No. 4

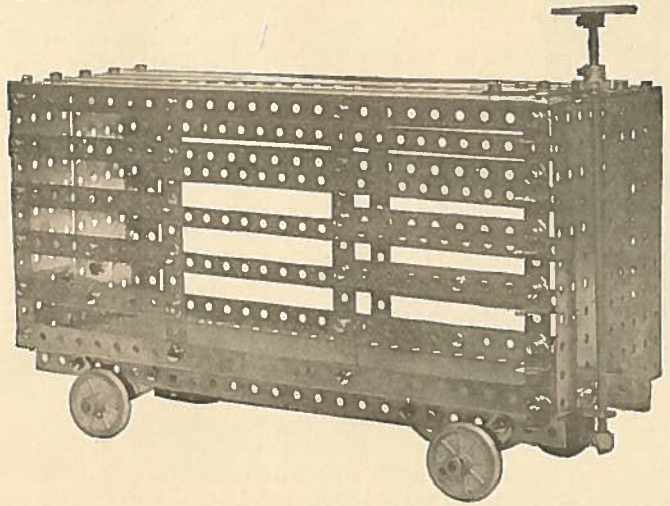
MATERIAL

4 Angle Girders, 12½ in.
2 Steel Beams, 15 holes
2 Steal Beams, 7 holes
2 Steel Beams, 11 holes
8 Steel Beams, 5 holes
4 Steel Beams, 3 holes
2 Steel Beams, 2 holes
2 Plates, 1x5x11 holes
2 Plates, 1x3x9 holes
3 Hangers
2 Shafts, 3¾ in.
2 Shafts, 4¾ in.
1 Shaft, 2½ in.
1 Crank Shaft, 4 in.
1 Clevis 1 Hook
4 Wagon Wheels
2 Spider Wheels
1 Spur Gear, 1½ in.
2 Spur Gears, ½ in.



1 Pulley, ½ in. 1 Cable Cord
1 Gear Rack 2 Brackets
1 Rack Guide 6 Collars
1 Crown Gear, ¾ in.
4 Long Bolts and Nuts
34 Short Bolts and Nuts

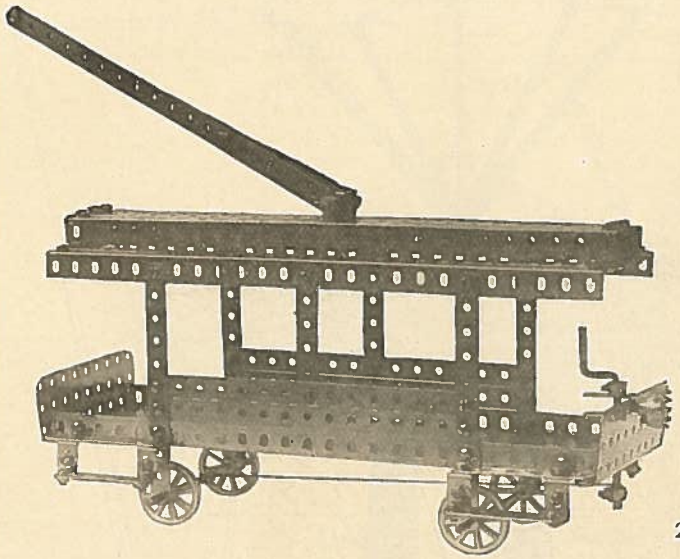
The construction of this car is simple. The length of the car is 25 holes, and the width is 9 holes. The ends of the car are made by bolting 1 Angle Plate, 1x5x11, to 1 Angle Plate, 1x3x9, and 1 Flat Plate, 1x4x10, to form a rectangular, 9x11 holes, as shown. The brake is made by inserting 1 Shaft, 8 in. through Angle Bracket and 5 hole Beam, located on end of car. This forms the brake rod. Fasten the lower end of brake rod to Collar. On the rear axle of the car fasten one end of Cord, and the other end to the collar on the brake rod. On top of car, in line with the brake rod fasten 1 Steel Beam, 5 holes, letting 1 hole extend beyond end of car. Fasten to top of beam 1 Pawl. After fitting on the brake rod 1 Spur Gear, ½ in., let the same engage the Pawl. Fit on top of brake rod, 1 Spider Wheel. By turning spider wheel the tension of the cord is increased forming brake.



Stock Car Outfit No. 4

MATERIAL

6 Angle Girders, 12½ in.
8 Steel Beams, 25 holes
4 Steel Beams, 11 holes
4 Steel Beams, 9 holes
2 Steel Beams, 7 holes
4 Steel Beams, 6 holes
6 Steel Beams, 5 holes
6 Steel Beams, 4 holes
4 Steel Beams, 3 holes
1 Plate, 4x9 holes
1 Plate, 6x11 holes
2 Plates, 1x5x11 holes
2 Plates, 1x3x9 holes
2 Hangers
1 Pawl
10 Brackets
1 Shaft, 8 in.
2 Shafts, 4¾ in.
1 Spider Wheel
1 Spur Gear, ½ in.
4 Wagon or Car Wheels
1 Collar
1 Clevis
75 Bolts and Nuts

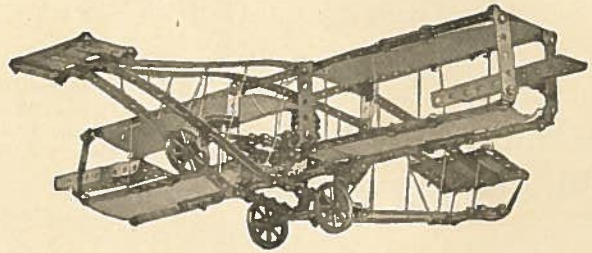


This model is 7 holes wide and 25 holes in length. The deck of the car is made with 2 Angle Girders, 12½ in., connected at each end with 7 hole beams. Upon the center of the 7 hole beam, bolt 1 Hanger, then fasten one 3 hole beam flatwise on top of hanger crosswise of car. This forms support for the top of car which consists of 2 Angle Girders and 1 Steel Beam, 25 holes, arranged, as shown. The principle of the brake is the same as shown on stock car on page 26.

Street Car
Outfit No. 4

MATERIAL

6 Angle Girders, 12½ in.
3 Steel Beams, 25 holes
2 Steel Beams, 19 holes
4 Steel Beams, 15 holes
4 Steel Beams, 11 holes
2 Steel Beams, 7 holes
6 Steel Beams, 6 holes
4 Steel Beams, 5 holes
2 Steel Beams, 3 holes
3 Hangers
24 Angle Brackets
1 Clevis
4 Collars
1 Crown Gear, ¾ in.
1 Shaft, 1½ in.
2 Shafts, 4¾ in.
1 Crank Shaft
1 Pulley, ½ in.
4 Wagon Wheels or Car Wheels
75 Bolts and Nuts



Biplane, Outfit No. 5

MATERIAL

4 Steel Beams, 25 holes
2 Steel Beams, 19 holes
4 Steel Beams, 15 holes
2 Steel Beams, 11 holes
8 Steel Beams, 9 holes
4 Steel Beams, 7 holes
2 Steel Beams, 6 holes
10 Steel Beams, 5 holes
9 Steel Beams, 4 holes
8 Steel Beams, 3 holes
4 Steel Beams, 2 holes
2 Angle Plates, 1x3x9 holes
1 Grooved Pulley
3 Wagon Wheels
2 Hangers
2 Shafts, 3¾ in.
2 Shafts, 1½ in.
1 Worm
6 Collars
36 Angle Brackets
110 Short Bolts and Nuts
1 Cable Cord

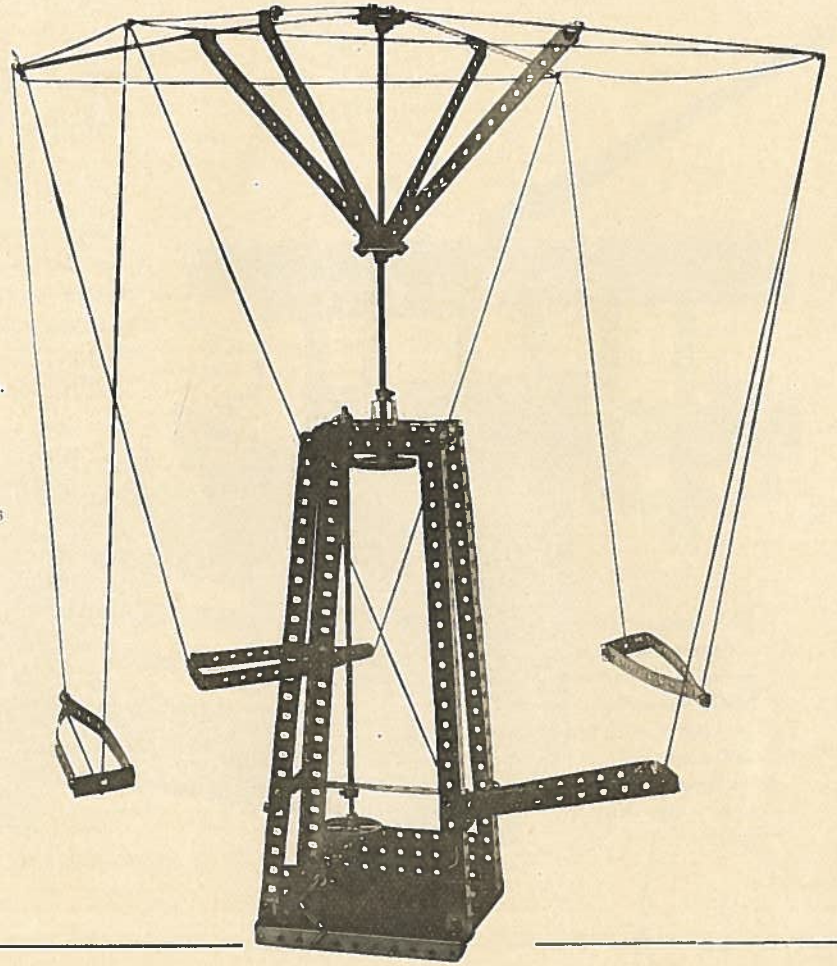
Structo Material Embodies Highest Degree of Accuracy

Structo Stimulates Thought and Observation

Flying Swing, Outfit No. 5

MATERIAL

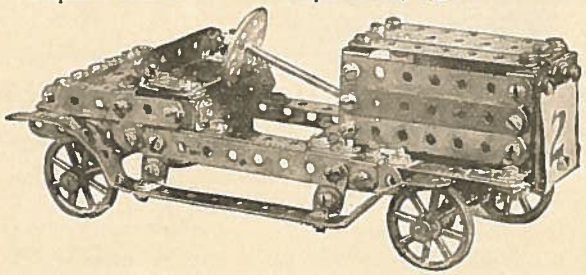
2 Angle Plates, 1x3x9 holes
2 Angle Plates, 1x5x11 holes
4 Angle Girders, 12½ in.
4 Steel Beams, 25 holes
4 Steel Beams, 15 holes
9 Steel Beams, 11 holes
5 Steel Beams, 7 holes
2 Steel Beams, 6 holes
3 Steel Beams, 5 holes
4 Steel Beams, 3 holes
2 Shafts 11½ in.
1 Crank Shaft
1 Spur Gear, 1½ in.
1 Spur Gear, 1 in.
1 Spur Gear, ½ in.
1 Crown Gear, 1⅝ in.
2 Spider Wheels
5 Collars
24 Brackets
2 Hangers
1 Hank Cord
85 Short Bolts and Nuts

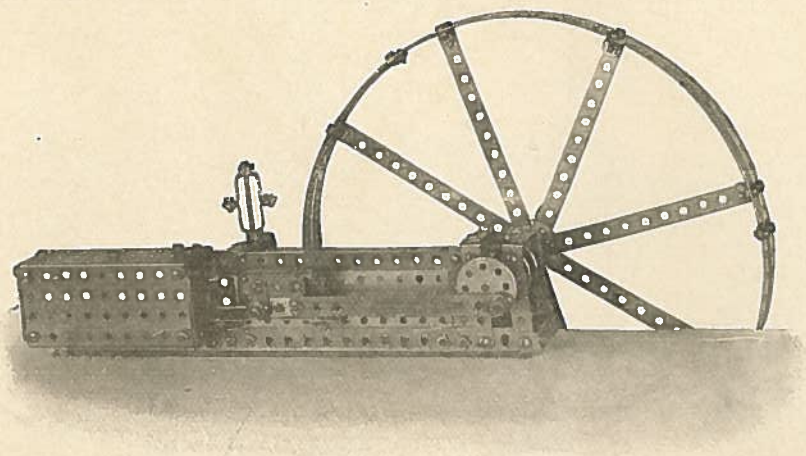


Racing Automobile, Outfit No. 5

MATERIAL

4 Steel Beams, 19 holes
2 Steel Beams, 15 holes
9 Steel Beams, 7 holes
2 Steel Beams, 6 holes
10 Steel Beams, 5 holes
10 Steel Beams, 4 holes
7 Steel Beams, 3 holes
8 Steel Beams, 2 holes
4 Wagon Wheels
1 Spider Wheel
1 Spur Gear, ¾ in.
1 Worm
1 Crown Gear, ¾ in.
8 Collars
2 Hangers
82 Bolts and Nuts
32 Brackets
2 Shafts, 3¾ in.
1 Shaft, 2½ in.
1 Spur Gear, 1½ in.



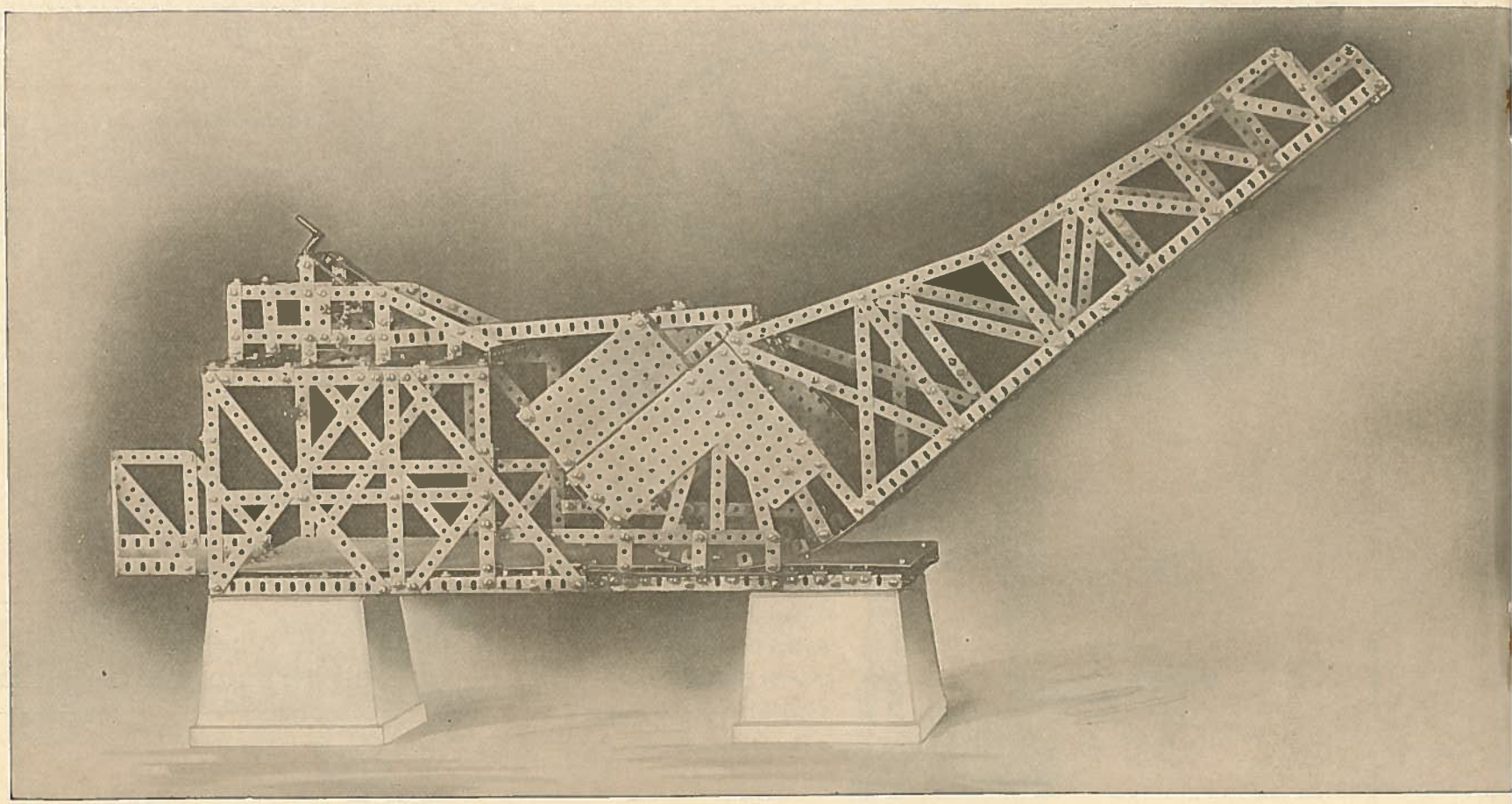


Horizontal Engine, Outfit No. 5

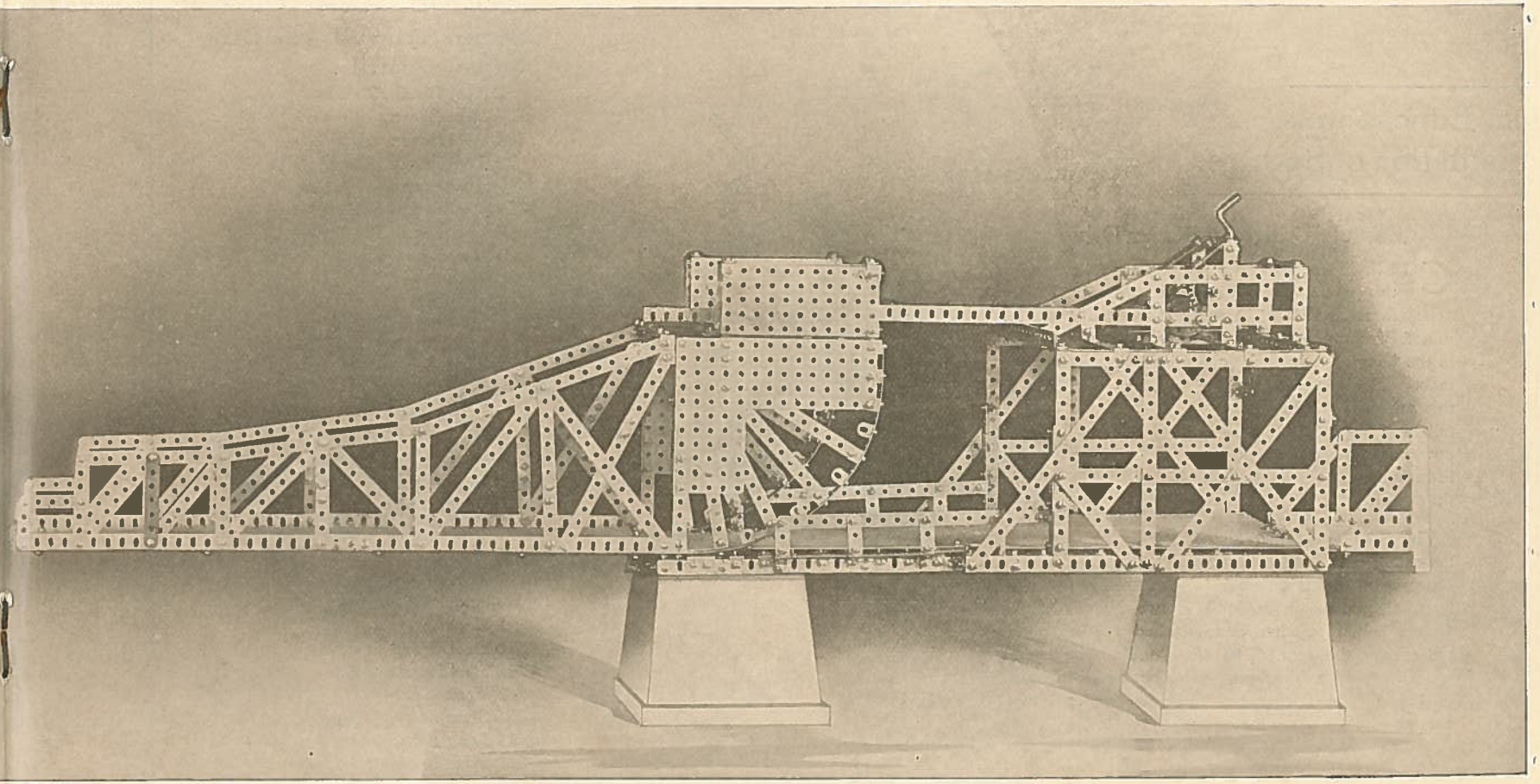
MATERIAL

2 Angle Girders, 12½ in.
6 Steel Beams, 25 holes
1 Steel Beam, 15 holes
9 Steel Beams, 11 holes
2 Steel Beams, 6 holes
6 Steel Beams, 5 holes
9 Steel Beams, 4 holes
8 Steel Beams, 3 holes
4 Steel Beams, 2 holes
2 Angle Plates, 1x3x9 holes
1 Angle Plate; 1x5x11 holes
1 Flat Plate, 4x9 holes
2 Spider Wheels
1 Grooved Pulley, 1½ in.
1 Grooved Pulley, 1 in.
2 Grooved Pulleys, ½ in
2 Hangers
1 Crank Shaft
1 Shaft, 6 in.
1 Shaft, 3¾ in.
1 Shaft, 1½ in.
8 Collars
40 Brackets
105 Short Bolts and Nuts
2 Long Bolts and Nuts

Production is the Greatest Pleasure and Structo Provides the Means



Page 30 Complete Working Model of a Bascule Bridge, Known as the Scherzer Rolling Lift Bridge



Details of Power Mechanism Shown on Page Thirty-two

Practical Education is The Foundation of Success

Bascule Bridge and Gear Drive

CORRECT mechanical principles are followed in this model and it operates perfectly. The dimensions of this model can be easily determined by any one, simply by counting the holes in the beams used, each hole representing one-half inch. The gear operating this bridge is shown in detail in figure 17. The power is connected to the lifting span by a cable from the winding drum.

The cable is attached to the center of the top of the lifting span and is covered by U-shaped beam made from two No. 62 angle girders bolted together and attached to the frame work near the gear. The other end of the beam is not fastened to the lifting span, but slides forward on the guide rail when the bridge is open, as shown on page 30.

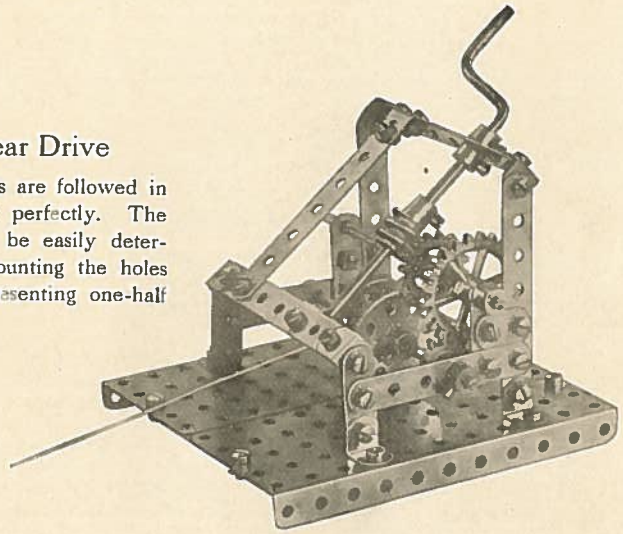
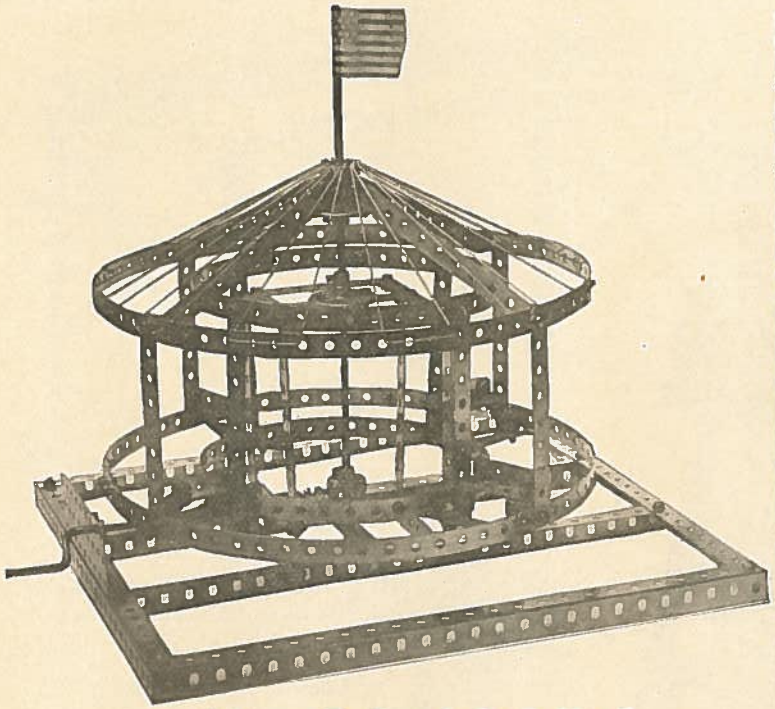


Fig. 17

One-Half Section, Bascule Bridge

MATERIAL

2 Steel Beams, 25 holes
24 Steel Beams, 19 holes
34 Steel Beams, 15 holes
79 Steel Beams, 11 holes
17 Steel Beams, 9 holes
17 Steel Beams, 7 holes
7 Steel Beams, 6 holes
9 Steel Beams, 5 holes
10 Steel Beams, 4 holes
14 Angle Girders, 12½ in.
2 Angle Girders, 5½ in.
8 Angle Plates, 1x5x11 holes
100 Brackets
12 Collars
2 Shafts, 4¾ in.
1 Shaft, 2½ in.
4 Shafts, 1½ in.
1 Crank Shaft
1 Spur Gear, 1 in.
1 Spur Gear, 1½ in.
1 Spur Gear, ¾ in.
1 Worm
2 Spider Wheels
1 Hook
16 Steel Beams ,3 holes
16 Steel Beams, 2 holes
1 Hank Cord
388 Short Bolts
11 Long Bolts
399 Nuts



Small Merry-Go-Round, Outfit No. 5

MATERIAL

6 Angle Girders, 12½ in.	10 Steel Beams, 7 holes	1 Crown Gear, ¾ in.
1 Shaft, 11½ in.	4 Steel Beams, 5 holes	1 Spur Gear, ½ in.
1 Crank Shaft, 6 in.	8 Steel Beams, 4 holes,	3 Collars
10 Steel Beams, 25 holes	2 Spider Wheels	48 Brackets
8 Steel Beams, 11 holes	1 Hanger	108 Bolts and Nuts
8 Steel Beams, 9 holes	1 Angle Plate, 1x3x9 holes	

Illustration shows the general construction of this model. First construct the base by bolting together 6 Angle Girders, 12½ in. as shown. On outer end of base at right angles with the two center angle girders bolt 1 Angle Plate, 1x3x9 holes. The angle plate forms the outer bearing for the crank shaft. Next construct the inner frame. Locate on the two center angle girders 12 holes from angle plate 1 Steel Beam, 9 holes. This forms the bearing for the center pole. This Angle Plate also forms the center line of the inner frame. From this center line count each way 5 holes and fasten to inside of center angle girders 4 angle brackets and connect them with two 7 hole beams. Then bolt 4 steel beams, 11 holes in vertical position as shown and tie them together at the top with 4 steel beams, 7 holes. To form the upper bearing for the center pole, bolt 1 steel beam, 7 holes across top of frame and fasten to this 7 hole beam, 1 spider wheel as shown. Care should be taken that the set screw of the spider wheel is removed as the center pole revolves within it. After constructing the base and inner frame, the bearing supporting the crank shaft should be made by bolting across the inner frame, one 7 hole beam and attaching it two holes from the base. On the 7 hole beam bolt one hanger. · Insert one long crank shaft through angle plate, 1x3x9 holes and through 7 hole beam and hanger with collars located on each side of hanger and 1 spur gear, ½ in., fitted on to the end of crank shaft. On the center pole of the merry-go-round fit 1 crown gear, ¾ in.. and have it mesh with 1 gear, ½ in. This forms the driving gear for the revolving platform. To construct the revolving platform proceed as follows: The upper and lower inner circles are made by bending two 25 hole beams and bolting them together lapping them 5 holes, tie them together with 4 steel beams, 9 holes as shown. The upper and lower outer circles are made by bolting together three 25 hole beams, lapping two ends 3 holes and one end 2 holes. Tie the two outer circles together with 4 steel beams, 9 holes. The top of the revolving platform is formed by bolting four 11 hole beams edgewise unto 4 angle brackets that in turn should be bolted to flat side of spider wheel. Fit this spider wheel with the beams attached onto the center pole and connect outer ends of beams to the inside of the upper outer circle. If the builder wishes to lace up the top of this machine, locate on the center pole, 1 crown gear, ¾ in., with the teeth up and lace back and forth from the upper outside circle through the crown gear. Seats are made with two steel beams. 4 holes, six angle brackets and one 6 hole beam.

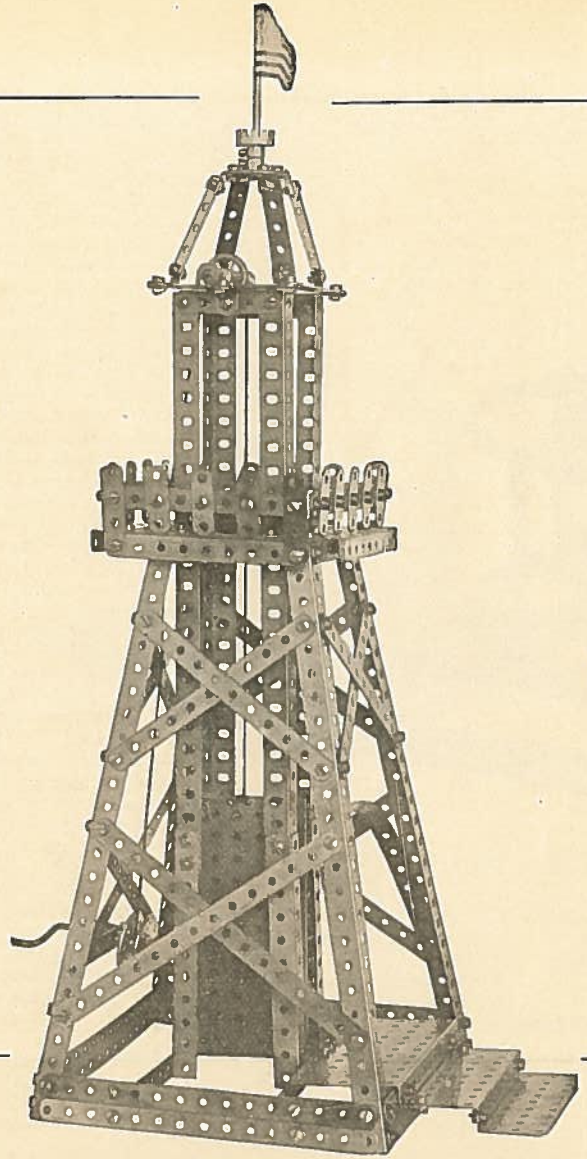
The 6 hole beam forms the foot rest and the two 4 hole beams forms the seat and the back.

The Possibilities of Structo Are Almost Unlimited

Observation Tower
Outfit No. 5

MATERIAL

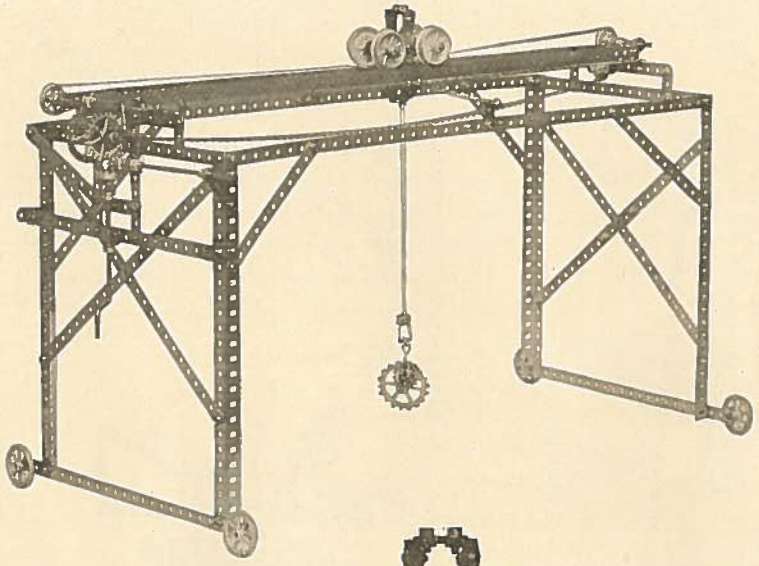
1 Steel Beam, 25 holes
16 Steel Beams, 15 holes
13 Steel Beams, 11 holes
3 Steel Beams, 9 holes
10 Steel Beams, 7 holes
6 Steel Beams, 5 holes
6 Steel Beams, 4 holes
16 Steel Beams, 3 holes
6 Steel Beams, 2 holes
3 Angle Plates, 1x5x11 holes
6 Angle Plates, 1x3x9 holes



8 Angle Girders, 12½ in.
4 Angle Girders, 5½ in.
1 Hanger
36 Brackets
1 Shaft, 3¾ in.
1 Shaft, 2½ in.
1 Shaft, 1½ in.
1 Crank Shaft
3 Spider Wheels
1 Crown Gear, ¾ in
5 Collars
177 Bolts and Nuts

EXTRA MATERIAL

10 Steel Beams, 15 holes
3 Steel Beams, 11 holes
8 Steel Beams, 3 holes
1 Angle Plate, 1x5x11 holes
4 Angle Plates, 1x3x9 holes
4 Angle Girders, 5½ in.
1 Spider Wheel
47 Bolts and Nuts



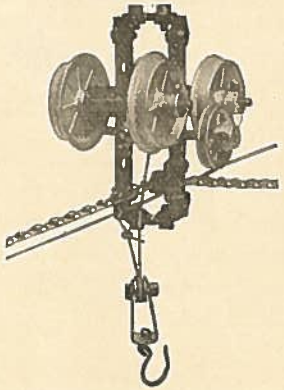
Traveling Crane Outfit No. 5

MATERIAL

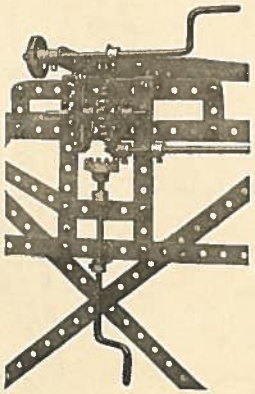
8 Angle Girders, 12½ in.	1 Spur Gear, ½ in.
10 Steel Beams, 25 holes	1 Sprocket, 2 in.
3 Steel Beams, 19 holes	1 Sprocket, 1 in.
2 Steel Beams, 15 holes	1 Crown Gear, ¾ in.
4 Steel Beams, 11 holes	8 Collars
5 Steel Beams, 9 holes	1 Clevis
2 Steel Beams, 6 holes	1 Hook
5 Steel Beams, 5 holes	2 ft. Sprocket chain
1 Steel Beam, 4 holes	1 Cable Cord
7 Steel Beams, 3 holes	19 Brackets
8 Steel Beams, 2 holes	1 Shaft, 6 in.
4 Wagon Wheels	2 Shafts, 3¾ in.
4 Car Wheels	2 Shafts, 2½ in.
3 Grooved Pulleys, 1 in.	2 Crank Shafts
1 Grooved Pulley, ½ in	5 Long Bolts
1 Spur Gear, 1½ in	98 Short Bolts

EXTRA PARTS

4 Collars 1 ft. Sprocket Chain



Crane Carriage



Showing Controlling Gears and Sprocket Wheels

STRUCTO
Shafting is Key Seated

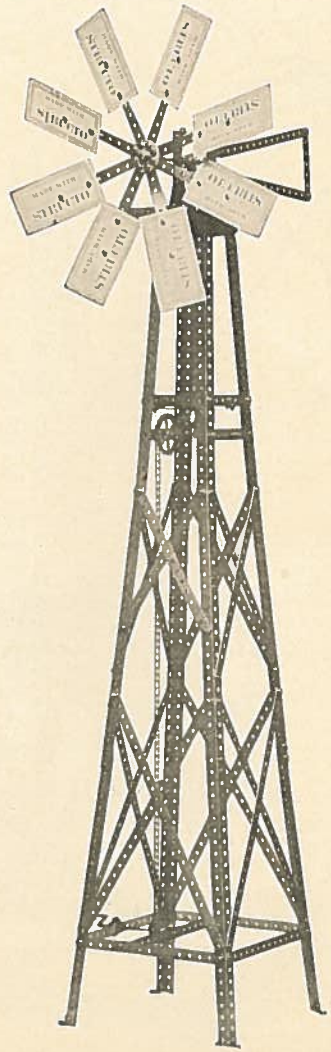
A Structo Outfit is the Alphabet of All Mechanical Arts

Large Windmill
Outfit No. 6

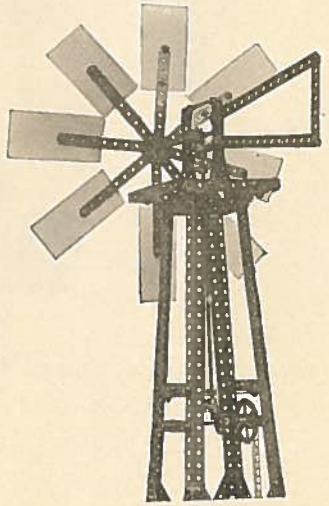
MATERIAL

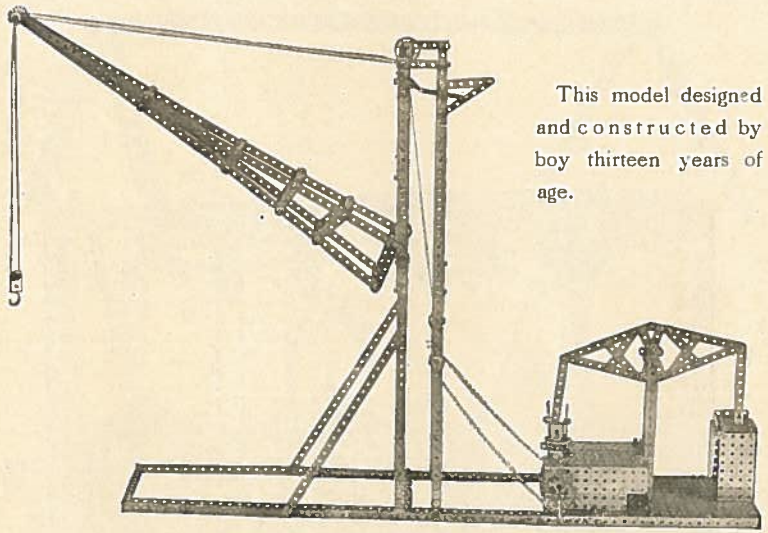
12 Angle Girders, 12½ in.	1 Crank Shaft
8 Steel Beams, 25 holes	1 Spur Gear, 1 in.
8 Steel Beams, 19 holes	1 Spur Gear, ¾ in.
7 Steel Beams, 15 holes	1 Sprocket, 1 in.
12 Steel Beams, 9 holes	1 Sprocket, 2 in.
5 Steel Beams, 7 holes	4 ft. Chain
12 Steel Beams, 5 holes	1 Grooved Pulley, 1½ in.
8 Steel Beams, 2 holes	1 Spider Wheel
1 Shaft, 11½ in.	9 Collars
1 Shaft. 6 in.	26 Angle Brackets
1 Shaft, 3¾ in	145 Short Bolts and Nuts

MAKE WINDMILL BLADES OF CARDBOARD



The frame work of this windmill is constructed of twelve Angle Girders, 12½ in. The height is measured by bolting three Angle Girders, 12½ in., together, allowing each girder to lap the other 2 holes. Lateral braces consist of eight 25 hole beams, eight 19 hole beams and four 15 hole beams, bolted as shown. The base of the frame is determined by bolting four 15 hole beams to angle girders 8 holes from the base.





This model designed and constructed by boy thirteen years of age.

Derrick with Walking Beam Engine
Outfit No. 6

MATERIAL

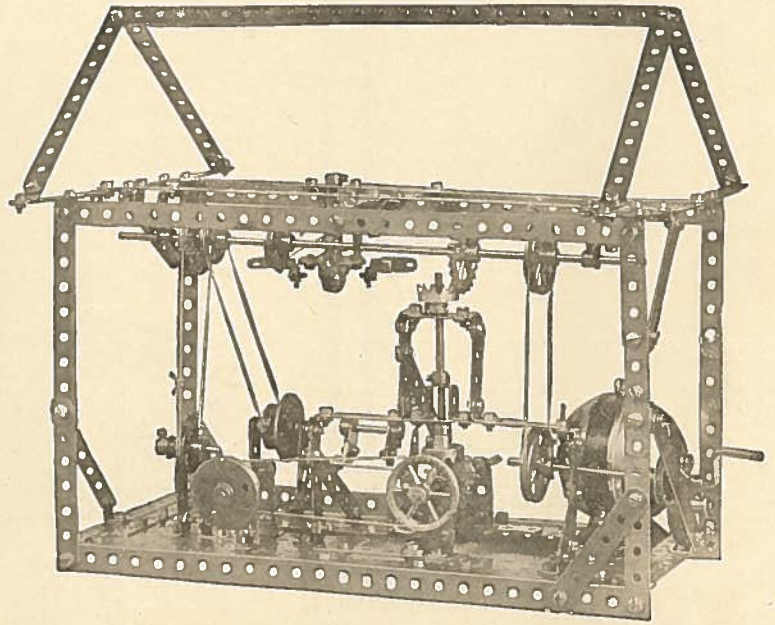
1 Angle Girder, 5½ in.
14 Angle Girders, 12½ in.
10 Steel Beams, 25 holes
6 Steel Beams, 15 holes
9 Steel Beams, 11 holes
3 Steel Beams, 7 holes
7 Steel Beams, 6 holes
6 Steel Beams, 5 holes
10 Steel Beams, 4 holes
10 Steel Beams, 3 holes
5 Steel Beams, 2 holes
2 Flat Plates, 6x11 holes
2 Flat Plates, 4x9 holes
2 Angle Plates, 1x3x9 holes
1 Angle Plate, 3x3x11 holes
2 Angle Plates, 1x8x4 holes
1 Angle Plate, 1x5x11 holes
2 Shafts, 1½ in.
2 Shafts, 3¾ in.
1 Shaft, 4¾ in.
1 Shaft, 6 in.
2 Shafts, 8 in.
1 Crank Shaft
1 Sprocket, 2 in.
1 Sprocket, 1 in.
2 Spider Wheels
2 Crown Gears, ¾ in.
1 Spur Gear, ½ in.
2 Spur Gears, ¾ in.
1 Spur Gear, 1 in.
1 Wagon Wheel
1 Grooved Pulley
15 Collars
1 Coil Spring
1 Cable Cord
1 Pawl
1 Clevis
1 Hook
31 Brackets
174 Bolts and Nuts

EXTRA MATERIAL

1 Flat Plate, 6x11 holes
2 Flat Plates, 4x9 holes
1 Crown Gear, ¾ in.

Structo Supplies the Greatest Quantity of Material

This model shows the possibilities of the transmission of power with Structo Die Cast Gears and Keyseated Shafting.



MOTOR OR HAND DRIVEN

Machine Shop, Outfit No. 6

MATERIAL

3 Angle Girders, 12½ in.
4 Steel Beams, 25 holes
2 Steel Beams, 19 holes
2 Steel Beams, 15 holes
10 Steel Beams, 11 holes
6 Steel Beams, 9 holes
4 Steel Beams, 7 holes
5 Steel Beams, 6 holes
5 Steel Beams, 5 holes
10 Steel Beams, 4 holes
7 Steel Beams, 3 holes
6 Steel Beams, 2 holes
3 Shafts, 1½ in.
3 Shafts, 2½ in.
1 Shaft, 3¾ in.
1 Shaft, 4¾ in.
1 Shaft, 11½ in.
1 Crank Shaft
2 Grooved Pulleys, ½ in.
2 Grooved Pulleys, 1½ in.
4 Grooved Pulleys, 1 in.
1 Spur Gear, 1½ in.
1 Spur Gear, 1 in.
1 Spur Gear, ¾ in.
1 Spur Gear, ½ in.
2 Crown Gears, ¾ in.
3 Spider Wheels
5 Hangers
15 Collars
48 Brackets
139 Short Bolts and Nuts

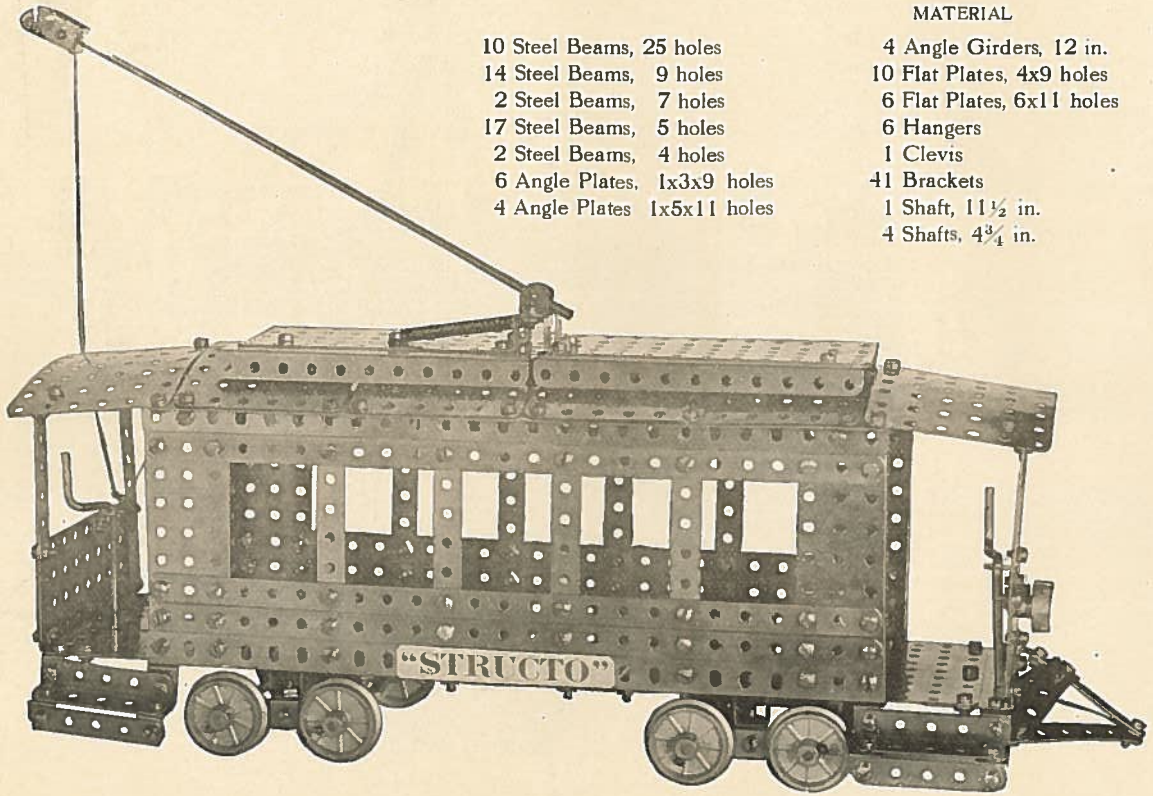
EXTRA MATERIAL

2 Grooved Pulleys, 1½ in.
3 Grooved Pulleys, 1 in.

Street Car, Outfit No. 6

MATERIAL

10 Steel Beams, 25 holes
14 Steel Beams, 9 holes
2 Steel Beams, 7 holes
17 Steel Beams, 5 holes
2 Steel Beams, 4 holes
6 Angle Plates, 1x3x9 holes
4 Angle Plates 1x5x11 holes
4 Angle Girders, 12 in.
10 Flat Plates, 4x9 holes
6 Flat Plates, 6x11 holes
6 Hangers
1 Clevis
41 Brackets
1 Shaft, 11½ in.
4 Shafts, 4¾ in.
1 Shaft, 1½ in.
2 Crank Shafts
6 Collars
1 Spur Gear
1 Pulley, ½ in.
8 Car Wheels
1 Coil Spring
188 Bolts and Nuts



EXTRA PARTS

8 Flat Plates, 4x9 holes
4 Flat Plates, 6x11 holes
2 Angle Plates, 1x3x9 holes
4 Car Wheels

Inventors find Structo convenient for Building Models

Large Merry-Go-Round, Outfit No. 6

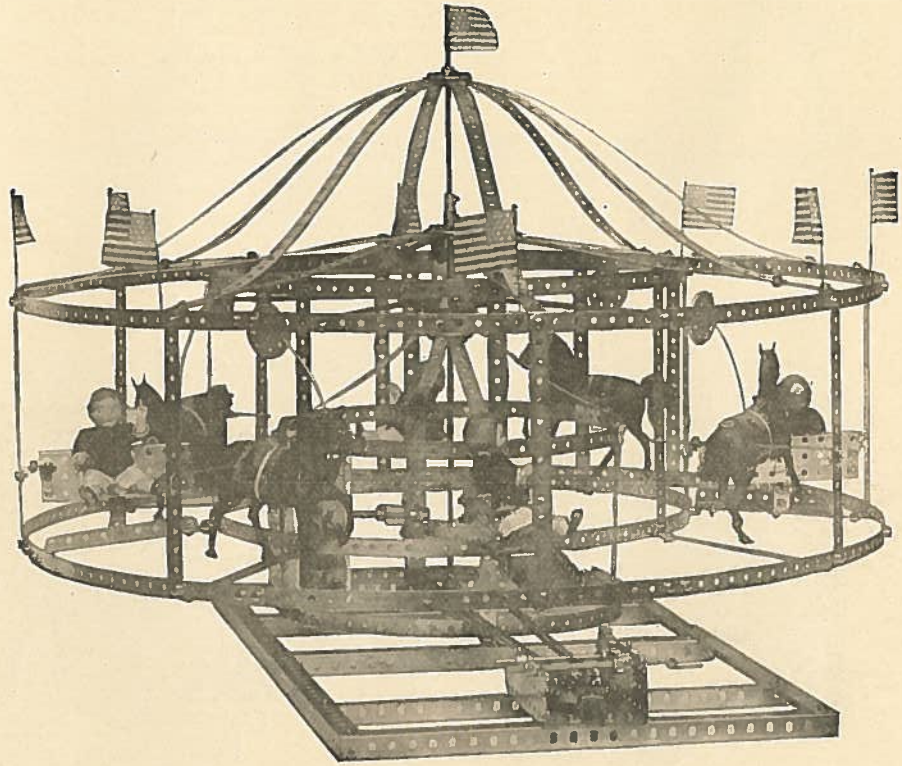
MATERIAL

9 Angle Girders, 12½ in.	4 Steel Beams, 2 holes
1 Crank Shaft	4 Hangers
1 Shaft, 3¾ in.	16 Collars
1 Shaft, 6 in.	3 Crown Gears, 1⅝ in.
4 Shafts, 8 in.	1 Sprocket, 2 in.
2 Shafts, 1½ in.	1 Sprocket, 1 in.
1 Shaft, 11½ in.	1 Spur Gear, 1½ in.
1 Shaft Coupling	6 Spur Gears, ½ in.
39 Steel Beams, 25 holes	7 Spider Wheels
9 Steel Beams, 19 holes	3 ft. Sprocket Chain
8 Steel Beams, 15 holes	15 Angle Plates, 1x3x9 holes
16 Steel Beams, 11 holes	1 Angle Plate, 4x9 holes
2 Steel Beams, 9 holes	254 Bolts and Nuts
1 Steel Beam, 7 holes	76 Angle Brackets
4 Steel Beams, 4 holes	1 Coil Spring
8 Steel Beams 3 holes	

EXTRA MATERIAL

2 Shafts, 8 in.	@ 8¢ - -	$ .16
23 Steel Beams, 25 holes	@ 50¢ per dozen	1.00
1 Steel Beam, 19 holes	@ 5¢ - -	.05
1 Crown Gear, 1⅝ in.	@ 25¢ - -	.25
4 Spur Gears, 1 in.	@ 20¢ - -	.80
4 Spider Wheels	@ 10¢ - -	.40
11 Angle Plates, 1x3x9 holes	@ 7¢ - -	.77
16 Angle Brackets	@ 10¢ per dozen	.20
1 Shaft Coupling	@ 10¢ - -	.10
		$3.73

HORSES AND DOLLS NOT FURNISHED WITH OUTFITS



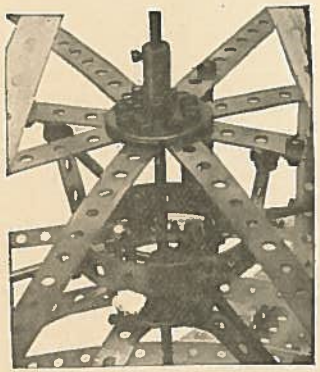
Page 40

LARGE MERRY-GO-ROUND, OUTFIT No. 6

THE INSIDE FRAME The inside frame is stationary and assists in supporting the revolving platform. The material required to construct this part of the merry-go-round consists of four 19 hole beams, upper circle and four 19 hole beams, lower circle. The circumference of these circles are determined as follows: At the point on the supporting frame where the 25 hole beam intersects the third girder, count 9 holes out on the girder and beam and bolt angle brackets with vertical bracket outside. Bend 19 hole beams around angle brackets at the same time bolt four beams 11 holes to brackets forming vertical supports for upper circle. The top inside of frame is made by bolting four beams 11 holes to flat surface of spider. Bend beams downward so that after they are fastened to upper circle spider wheel will be 2¼ inches above top circle.

REVOLVING PLATFORM We would suggest that the revolving platform can be made without the top truss as this is not necessary, only adds to the appearance. However, if the builder wishes to incorporate this into the model, he will proceed as follows: Bolt eight 25 hole beams to flat surface of spider wheel, and after the lower truss is constructed bend down to lower truss and fasten four holes from outside end. A duplicate of the upper truss forms the lower truss. Bolt angle brackets alternately on the under side of 25 hole beams, 4 holes from center spider wheel. These brackets form the circumference of the small gear housing. To form the circumference for inside circle of revolving platform count 15 holes out from center on 25 hole beams, and bolt angle brackets with the vertical bracket inside.

Then bolt four 25 hole beams bending them around and fastening to inside of angle brackets. The lower circle consists of the same number of 25 hole beams bent around and fastened to inside of vertical supports. The vertical supports for the inside circle consists of eight 15 hole beams bolted to upper and lower circles as shown in illustration. To form the outside circumference of the revolving platform, bolt angle brackets on outer end of the 25 hole beams as shown, then bend and fasten seven 25 hole beams to the angle brackets. This forms the upper outside circumference. The lower outside circumference is formed by bolting eight 11 hole beams horizontally to angle brackets located on the lower inner circle as shown. Angle brackets should then be bolted to outer end of the 11 hole beams and seven 25 hole beams bent and fastened to angle brackets. The upper and lower circles should be tied together with eight 15 hole beams bolted in position as shown in illustration.



CENTER POLE GEAR HOUSING

SUPPORTING FRAME To construct frame work that forms the base proceed as follows: Nine angle girders should be bolted together to form a rectangle 46 holes long, and 25 holes wide, three angle girders should then be bolted across base placed as follows: Girder No. 1, seven holes from end. This girder together with the end girder support for driving gear. Girder No. 2, twenty-two holes from the end. Girder No. 3, thirty-four holes from end.

One 25 hole beam can then be bolted lengthwise in the center of the frame from the center hole upon Girder No. 2 to the end girder opposite driving gear.

DRIVING GEAR Bolt three angle plates, 1x3x9 holes, to flat plate, 4x9 holes, in position as shown, forming housing, 5 holes wide. Care should be taken that the flat plate is under angle plates. The bearing for the 1 inch sprocket consists of two hangers bolted together with 7 hole beam. The 7 hole beam should be under top of hangers. Bolt this bearing lengthwise in the center of housing as shown. Underneath this bearing place one crown gear, 1⅝ in., hub down. In the center hole of housing and bearing insert key seated shaft, 1½ in., vertically. On the top of this shaft fit one sprocket, 1 in., hub down, tighten set screws on sprocket and crown gear and be sure that the set screws engage the key seat. In the top hole of housing insert one shaft, 3¾ in. On this shaft fit one spur gear, 1½ in. This shaft must be located at right angles with the 1 in. shaft and the spur gear 1½ in. must engage the crown gear, 1⅝ in. Insert crank shaft as shown with one gear, ½ in., let this gear mesh with spur gear, 1½ in. Tighten all set screws and driving mechanism is completed.

MERRY-GO-ROUND SEATS Very little instruction is needed in making the seats. The material required consists of three angle plates, 1x3x9 holes, bolted together and fastened to vertical supports as shown. The center pole of the merry-go-round is formed by inserting one shaft, 11½ in., to center spider on top of merry-go-round through center spider on top of inside frame and through the intersection of the 25 hole beam and the third girder upon the base. On the shaft at the bottom should be fitted one sprocket, 2 in., and at the top of the shaft directly over top of inside frame should be fitted one crown gear, 1⅝ in. Care should be taken that the set screw in the spider on top of the inside frame is not fastened to shafting. The shaft must be allowed to revolve freely in this spider wheel.

THE CENTER POLE GEAR HOUSING If the builder uesires to make card board horses or buy miniature horses and mount them upon the revolving platform with oscillating device for rocking them, proceed as follows: First construct the center pole housing and observe carefully the illustration—to the angle brackets bolted 4 holes out from the center of the 25 hole beams forming top of revolving platform, fasten to each angle bracket, one 4 hole beam vertically, then bend one 19 hole beam into a circle lapping it three holes and fastening it to the inside of the vertical 4 hole beams. This completes the housing, and the builder is now ready to make the oscillating device. By observing the illustration the builder will note that the oscillating device is built with four shafts, 8 in. These shafts are inserted through the second hole from top of vertical support on inner circle of revolving platform. The other end of shaft is inserted through center hole on center pole gear housing and on this end of shaft fit one gear, ½ in. Collars should be placed on this shaft—one on the outside of gear housing and the other on the inside of the vertical support. This holds the shaft in position. Upon the outer end of the four shafts fit spider wheel with the flat surface outside, then mount horses on revolving platform as shown, and connect them to spider wheel on oscillating device with fine wire or sister's hairpins. Merry-go-round is now complete, ready for operation, with the exception of mounting the driving chain from the 2 in. sprocket located up on the center pole of merry-go-round to 1 in. sprocket located in the driving gear. After this is done, by turning the crank, the merry-go-round will revolve. This is a model that is really worth while constructing even though the builder does not want to mount horses, he will find the model worth attempting.

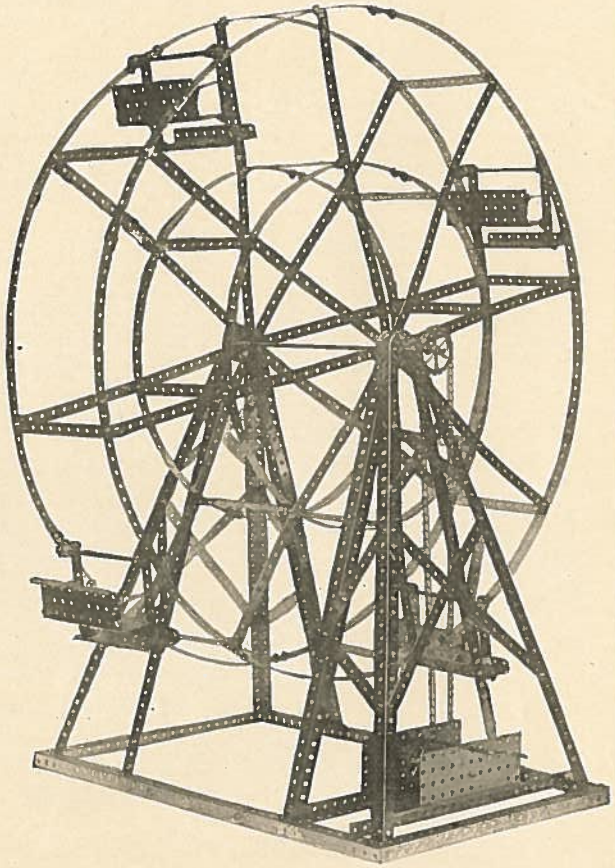
Ferris Wheel, Outfit No. 6, with Structo Chain Drive

To construct this model build supporting frames first. These frames are made of eight Angle Girders; 12½ in. long. The vertical angle girders near the wheel are lapped together making one angle girder, 36 holes long. The inclined angle girders forming the outside of the frame should be lapped together making one angle girder, 37 holes long. The two supporting frames should be bolted to the base as shown in illustration. The base is composed of two angle girders lapped together making the length 39 holes. The width of the base is the length of our regular angle girder, 12½ in. The top of the supporting frames should be bolted to the spider wheel with 4 long bolts as shown in illustration. The wheel is easily constructed by proceeding as follows: Bolt eight 25 hole beams to the inside of spider wheel. In the 15th hole from the spider wheel on the 25 hole beam, bolt an angle bracket, also fasten an angle bracket in the top hole of the 25 hole beam. This forms the circumference for the outside diameter of the wheel, and the inside angle brackets form the circumference for the inside wheel. Make duplicate of this side and fasten the two wheels together with eight 11 hole beams. The wheel is mounted on frame by inserting into spider wheel key seated shaft, 11½ in., upon the end of this shaft fit one sprocket wheel, 2 in. in diameter.

The cars are made of three angle plates, 1x3x9 holes. Two 7 hole beams are bolted flatwise at right angles with the plate that forms the seat. Two angle brackets are then bolted to the upper end of the 7 hole beams through which shaft is inserted with collars forming the support of the car. The housing supporting the driving mechanism is composed of two angle girders, 12½ in. long bolted across base. This forms the support for housing which is composed of two angle plates, 1x5x11 holes, and one flat plate, 6x11 holes. Builder can then arrange the gears by inserting 1 shaft, 3¾ in., with gear 1½ in., three holes from top, directly over this shaft insert crank shaft supporting ½ in. gear that should engage the 1½ in. gear. Also fit on this shaft one sprocket, 1 in.

Builder is now ready to fit the chain upon the sprocket, and after this is done and all set screws are securely fastened by turning the crank, the model will operate.

This model may also be driven by an electric motor.



MATERIAL

24 Angle Girders, 12½ in.
38 Steel Beams, 25 holes
4 Steel Beams, 19 holes
16 Steel Beams, 11 holes
8 Steel Beams, 9 holes
12 Steel Beams, 7 holes
4 Steel Beams, 5 holes
8 Steel Beams, 3 holes
1 Shaft, 11½ in.
4 Shafts, 4¾ in.
1 Shaft, 3¾ in.
1 Crank Shaft, 4 in.
4 Spider Wheels
1 Sprocket, 2 in.
2 Sprockets, 1 in.
1 Spur Gear, 1½ in.
1 Spur Gear, ½ in.
2 Angle Plates, 1x5x11 holes
1 Angle Plate, 6x11 holes
12 Angle Plates, 1x3x9 holes
3 ft. Sprocket Chain
280 Bolts and Nuts
80 Angle Brackets
10 Collars

EXTRA MATERIAL

10 Angle Girders, 12½ in.	@ 7¢	- -	$ .70
22 Steel Beams, 25 holes	@ 50¢	per dozen	1.00
1 Spider Wheel	@ 10¢	- -	.10
8 Angle Plates, 1x3x9	@ 7¢	- -	.56
26 Bolts and Nuts	@ 10¢	per dozen	.25
20 Angle Brackets	@ 10¢	per dozen	.20
			$2.81

Eiffel Tower, Outfit No. 6

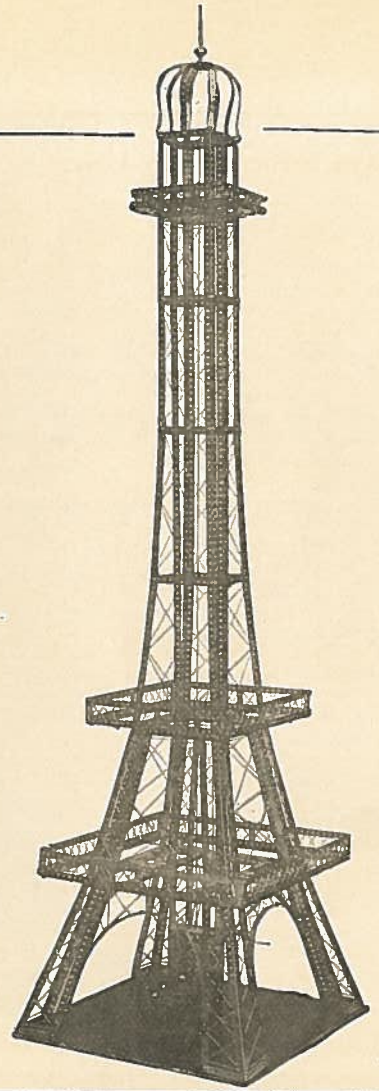
MATERIAL

64 Angle Girders, 12½ in.	1 Sprocket, 2 in.
14 Angle Girders, 5½ in,	1 Sprocket, 1 in.
16 Steel Beams, 25 holes	3 Spider Wheels
24 Steel Beams, 15 holes	3 Angle Plates, 1x5x11 holes
4 Steel Beams, 11 holes	1 Shaft, 3¾ in.
20 Steel Beams, 9 holes	2 Shafts, 6 in.
8 Steel Beams, 7 holes	1 Shaft, 11½ in.
2 Steel Beams, 6 holes	1 Crank Shaft
18 Steel Beams, 5 holes	8 Collars
36 Steel Beams, 4 holes	2 ft. Sprocket Chain
20 Steel Beams, 3 holes	54 Angle Brackets
10 Steel Beams, 2 holes	2 Cable Cords
1 Crown Gear, ¾ in.	287 Bolts and Nuts
2 Pulleys, 1 in.	

EXTRA MATERIAL

50 Angle Girders, 12½ in.	@ 7¢ - -	$3.50
10 Angle Girders, 5½ in.	@ 5¢ - -	.50
14 Steel Beams, 15 holes	@ 5¢ - -	.70
4 Steel Beams, 9 holes	@ 5¢ - -	.20
16 Steel Beams, 4 holes	@ 5¢ - -	.80
4 Steel Beams, 3 holes	@ 2 for 5c -	.10
33 Bolts and Nuts	@ 10¢ per dozen	.30
		$6.10

The arrangement of detail regarding lowering and raising device we will leave to the ingenuity of the builder.



The supporting frame, or the four vertical supports below the second landing, or platform, should be constructed first. Each of the supporting frames are made by bolting 6 Angle Girders, 12½ in., lapping them 2 holes into position, as shown, connecting them together at the base, with two 7 hole beams. Tie the four supporting frames together at the top with Angle Girders, 5½ in., there should be two Angle Girders, 5½ in. lapped seven holes between each supporting frame. This makes the top of the supporting frame 15 holes wide. Proceed with the erection of the tower by bolting four Angle Girders end to end, lapping them two holes. Duplicate with three more and mount collar on the top of supporting frame. The tower should be tied together with four 11 hole beams nearest the base and then 9 hole beams bolted in position as shown. The crown of the tower is composed of eight 15 hole beams bolted to the spider wheel, bent and fastened to top of tower as shown. The construction of the platform is simple and they are fastened to the tower by means of angle brackets bolted to the verticle ribs. The elevator for this tower may be constructed from two flat plates, 6x11 holes, two angle girders 5½ in., bolted together at back with one flat plate, 6x11 holes. Elevator guide consists of angle girders, 12½ in., bolted vertically inside of tower. Raising and lowering device may be constructed with pulleys located on shafting at the top of the tower, as shown—sprocket and chain drive at base of tower. The winding drum located at base of tower should be in line with the pulleys located at the top.

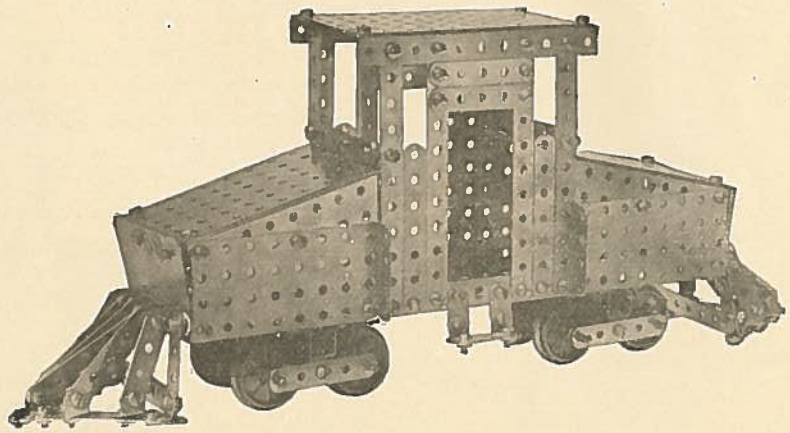
Structo Blazes the Way From Toy Wagon to Battleship

Electric Locomotive, Outfit No. 6

MATERIAL

4 Long Bolts and Nuts	2 Angle Girders, 5½ in.
154 Short Bolts and Nuts	8 Steel Beams, 11 holes
4 Hangers	10 Steel Beams, 7 holes
44 Angle Brackets	8 Steel Beams, 6 holes
8 Car Wheels	16 Steel Beams, 5 holes
4 Shafts, 3¾ in.	10 Steel Beams, 4 holes
2 Angle Plates, 1x10x6 holes	4 Steel Beams, 3 holes
4 Angle Plates, 1x3x9 holes	4 Steel Beams, 2 holes
2 Flat Plates, 6x11 holes	2 Angle Girders, 12½ in
2 Flat Plates, 4x9 holes	EXTRA PARTS
2 Angle Plates, 1x8x4 holes	4 Car Wheels

First construct the base which consists of Two Angle Girders, 12½ in., connected with one Flat Plate, 6x11 holes. The flat plate should be bolted in the center of the angle girders lengthwise forming the floor for the engine. Next construct the vertical housing as shown, and on each side of the vertical housing fasten the inclined housing. The inclined housings are formed by bolting one Angle plate, 1x10x6 holes, two Angle Plates, 1x3x9 holes, as shown. Make a duplicate of this and bolt them into position on each side of vertical housing. The balance of the model may be easily constructed by noting carefully the illustration. This model may be constructed without extra car wheels by fitting axles with four wagon wheels and four car wheels.



STANDARD PRINCIPLES OF ENGINEERING TAUGHT BY STRUCTO

ONE of the principle factors of STRUCTO is that the parts are duplicates in miniature of the standard principles used in every day construction. From a practical viewpoint STRUCTO builds models "not toys"—although the models may be used to serve the purpose of "toys" after they are completed. The art of building Structo Models conveys to the builder the correct principles that are applied to the various wagons, autos, windmills, cranes, derricks, etc., which are duplicates in miniature—therefore he becomes familiar with mechanical engineering principles as applied in actual practice.

Building with STRUCTO creates observation and initiative, developing new interest in structural and mechanical engineering principles. STRUCTO often influences boys to take up the study of structural and mechanical engineering seriously.

The High Class Educational Toy

STRUCTO

E HAVE many good treats in store for our engineering corps and friends. In this booklet we have shown but the beginning.

When we say that *the possibilities of* STRUCTO *are practically unlimited,* we believe it thoroughly and we have put it to some very hard tests.

Give us your name and address so that we can show you the new models and designs when published.

Each purchaser of STRUCTO is entitled to one membership in our STRUCTO ENGINEERING CORPS.

Sign and mail the postal card which we pack with each set and we will keep you advised of the new designs and models that our Experimental Department is constantly turning out.

IMPORTANT

STRUCTO WHEELS AND GEARS will work with all other makes of perforated metal beams. If you have such sets we would suggest that you purchase a few pieces of STRUCTO *Key-seated Shafting and Gears,* as these will greatly increase the value of your old material and *models will operate.*

The Models Shown in this Booklet are so clear in Detail that it is Not Necessary to Explain What Parts are Used, or How They are Put Together

ONE of the principle factors of STRUCTO is that it creates observation and initiative, and we suggest that you follow the models shown only so far as necessary to become familiar with the various parts and dexterous in handling them.

BOLTS AND NUTS

Fig. 1

As building with STRUCTO consists mainly of bolting parts together, the best way to handle these small bolts should be considered.

To Place a Bolt. See that the holes to be used register—that is, that you can see through the hole into which the bolt is to be placed; then hold the nut over this hole with the tip of the forefinger and insert the bolt and turn it until it engages the thread. In other words, place the nut over the hole and turn the bolt into it, instead of putting the bolt through the hole and then trying to screw the nut on to the bolt. For the sake of appearance have the heads of the bolts on the outside of the model so far as possible.

BEAMS AND BRACKETS

The holes in the beams are spaced exactly one-half inch from center to center, and by using Bracket No. 48 they may be attached to each other at any angle desired. (See Fig. 1)

ANGLE PLATES

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 2 shows a pair of No. 15 Angle Plates which may be bolted together to form a small rectangular (Fig. 3), a large rectangular (Fig. 4), or a sector plate as shown in Fig. 5.

These are made with the No. 15 Angle Plate and the same possibilities are true of the large Angle Plate No. 18.

FIG. 6 shows rear axle construction of small wagon, page 7. Two No. 34 hangers, with a bracket, No. 48, attached to the center of each, are fastened under the angle plates as shown, and these provide the bolster support for the rear axle.

Toys Built with Structo are Indestructible

The front axle is more difficult as it must turn on a kingbolt in the center. Use a long bolt, No. 39, for the kingbolt and with it attach a hanger, No. 34, to the front end of bedplate as seen in Fig 6. The kingbolt should have two nuts on it, turned tightly together (locknuts), otherwise the turning motion of the vehicle will loosen the bolt.

Next select a beam of desired length and attach to each end a bracket, No. 48, and these brackets provide the bearings for the axle which is passed through them (see Fig. 7), and the wheels put on as usual.

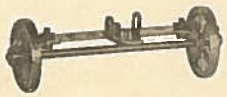


Fig. 7

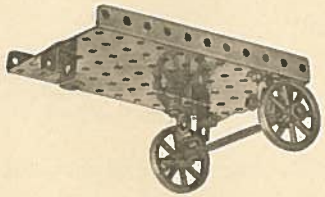


Fig. 6

Fig. 8

A three-hole beam, fitted with two brackets, No. 48, in the center (see Fig. 8), provides a means for attaching a tongue to the center of the front axle. Note that the brackets clamp under the beam and thus provide rigid supporting ears for the tongue.

A good wagon tongue can be constructed by using two beams and bolting to the outer end two No. 48 Brackets for a finish, as shown in Fig 8. Spring the rear ends of the beams apart and attach on the outside of the ears mentioned above.

Now attach the front axle to the main bedplate by bolting the No. 34 Hanger, held by the kingbolt, on to the beam over the axle, and you have the "running gears" of a vehicle as substantial as the famous "One Hoss Shay."

The building of the superstructure for this type of vehicle we will leave to your imagination, as it consists simply of bolting together any arrangement of beams and plates that may suit your fancy, and the parts shown are suggestive of the greater possibilities.

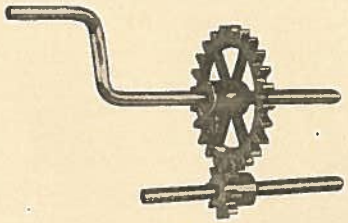


Fig. 14

SPUR GEAR

Speed increased three times
Power decreased three times.
Use this combination where high speed instead of power is needed.

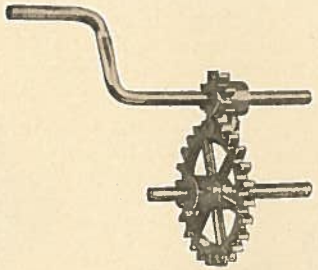


Fig. 13

SPUR GEAR

Speed decreased three times.
Power increased three times.
Use this combination for models designed to lift heavy weights.

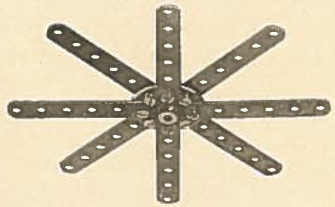


Fig. 12

WHEEL OF LARGE DIAMETER

Rim made by bending long beams flatwise into required circle, attaching to each spoke with Bracket No. 48.

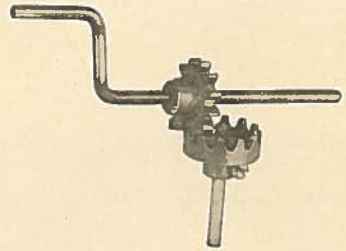


Fig. 16

Neither speed or power is increased or diminished.

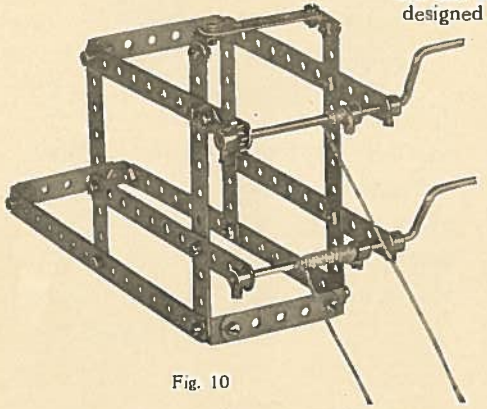


Fig. 10

WINDING DRUM OR WINDLASS

Upper Crank shows Winding Drum with Pawl.
Lower Crank shows Simple Windlass.

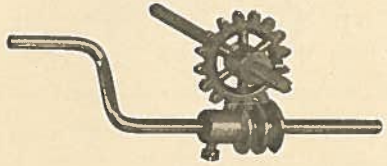


Fig. 15

WORM GEAR

Greatly increases power but reduces speed

Fig. 11

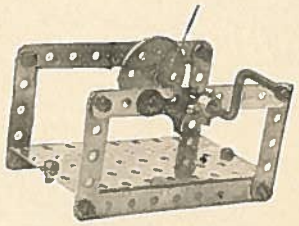
A WINDLASS OF LARGE CAPACITY

Structo Gears, Pulleys and Wheels are Die-Castings

Teachers of Manual Training use Structo

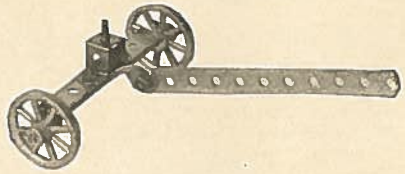
LOCK NUT

This is the method used for locking swivelling connections. One nut locks the other, making it impossible for either nut to come off the bolt.



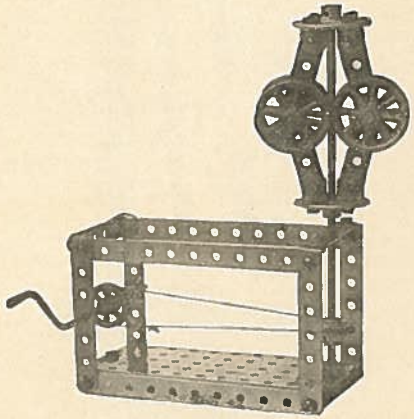
RATCHET GEAR

This illustration shows how to arrange the pawl to work in conjunction with ½ inch spur gear. This is the arrangement used for holding in place the ladder on the aerial truck.



TWIST BEAM.

One of the new parts not included in Structo outfits. May be purchased by the piece. This facilitates the fastening of wagon tongue to axle supports.

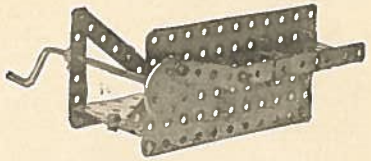


GOVERNOR

This device is used to govern engines. By constructing this model and rotating crank the principle is clearly illustrated.

WAGON TRUCKS

Showing the construction of the axle supports and wagon tongues.

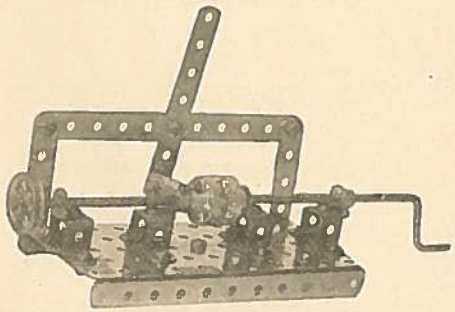


RECIPROCATING MOTION

This device is used for the purpose of transmitting the power from cylinders to shafting.

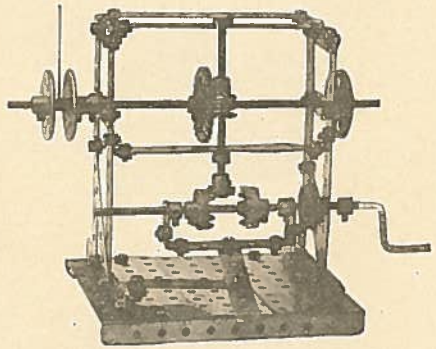
The Art of Making and Building Is Childhood's First Instinct

Structo Educates and Trains the Hand and Eye



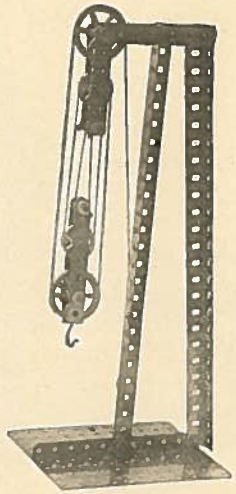
GEAR CLUTCH

This device is used as an intermediate unit, for throwing various machines or models in and out of motion.



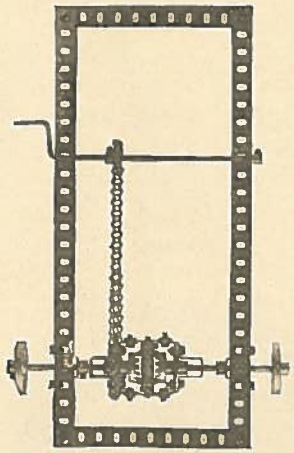
REVERSE MOTION

By throwing the lever back and forth the motion of the windlass is reversed.



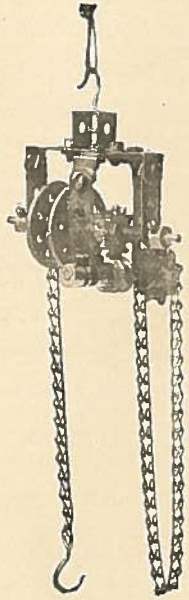
BLOCK AND TACKLE

This device is very much in use in the engineering world. Heavy weights may be easily handled owing to the multiplication of pulleys, which reduce the speed of the operation, but increases the power.



DIFFERENTIAL GEAR

This gear is located upon rear axle of automobiles. Each wheel operates independently of the other, enabling the car to turn sharp corners by allowing one wheel to make more revolutions than the other.

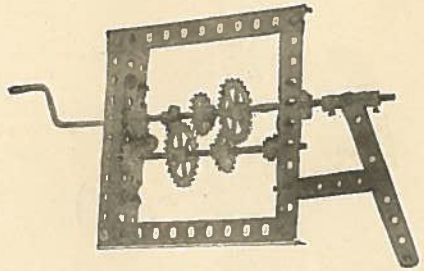


YALE & TOWNE HOIST

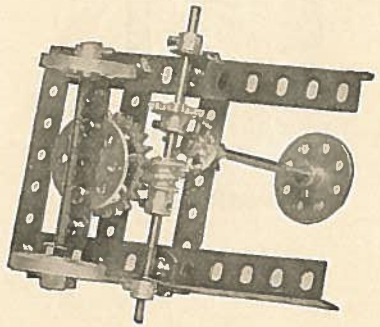
This model represents in miniature the device used in machine shops for the handling of large pieces. The piece is fastened to lower hook and by pulling the chain operating the worm, heavy weights are easily handled.

SPEED CHANGES ON AUTO.

Are clearly illustrated here. By rotating crank and working lever the three speeds are made or the car reversed.



Remember Structo Shafting Is Key Seated



THIS ILLUSTRATION SHOWS IN PRINCIPLE THE DETAIL ARRANGEMENT USED ON STRUCTO AUTOMOBILES

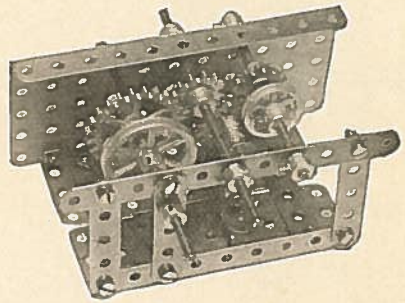
Auto Worm Steering Gear

MATERIAL

2 Angle Girders, 5½ in.
2 Steel Beams, 7 holes
1 Steel Beam, 5 holes
1 Shaft, 3¾ in.
2 Shafts, 4¾ in.
1 Crown Gear, ¾ in.
1 Spur Gear, 1½ in.
1 Spur Gear, ¾ in.
1 Worm
2 Spider Wheels
4 Collars
14 Bolts and Nuts

Structo Speed Multiplier and Reducer

1 Steel Beam, 11 holes
2 Steel Beams, 6 holes
5 Steel Beams, 5 holes
2 Steel Beams, 3 holes
2 Angle Plates, 1x3x9 holes
2 Angle Plates, 1x5x11 holes
2 Shafts, 4¾ in.
1 Shaft, 3¾ in.
1 Shaft, 1½ in.
1 Spur Gear, 1½ in.
1 Spur Gear, 1 in.
2 Spur Gears, ¾ in.
1 Pulley, 1 in.
1 Pulley, 1½ in.
8 Collars
20 Short Bolts and Nuts



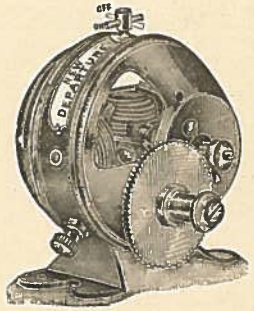
TO USE WHEN OPERATING MODEL

STRUCTO DIE CAST SPUR GEARS ARRANGED AS ILLUSTRATED TRANSMIT POWER AT ALMOST ANY SPEED DESIRED, BY CONNECTING MOTOR CORD TO SMALL PULLEY SPEED OF MODELS IS REDUCED. SPEED OF MODELS IS INCREASED BY CONNECTING MOTOR TO LARGE PULLEY.

Electric Motors

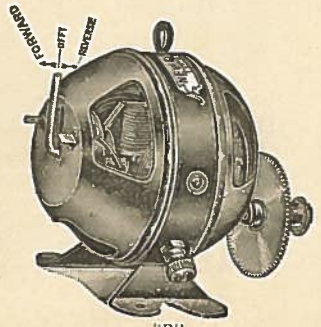
OWING TO THE FACT that driven models are in demand, miniature motors, as per cuts, are furnished. These motors are well built, semi-enclosed, variable speed, and are equipped with gears converting excessive speed to power. At the same time, by use of the pulley located upon the armature shaft, the highest speed may be obtained. The gear is equipped with drum pulley from which several articles may be operated at once. Motor operates on a single battery, but greater power and speed can be obtained by the use of two cells. Motor shown in cut "A" should be used for operating continuous running machinery.

Page 55



"A"

MOTOR shown in cut "B" is also semi-enclosed, is equipped with controller which stops, starts and reverses motor. The rapid reverse of the motor may also be used as a brake. This motor should be connected to such models as Derricks, Cranes, Bascule Bridges, Hoisting Engines—in fact all models requiring reverse operation.



"B"

Price of Motor, Type "A" $2.00

Price of Motor, Type "B"—Reversible $2.50

Drive your Models by Electric Motors

Price List of Additional Parts

STEEL BEAMS

No. 1	Steel Beams, 25 holes	$0.05 each	$0.50 per doz.
No. 2	Steel Beams, 19 holes	.05 each	.44 per doz.
No. 3	Steel Beams, 15 holes	.05 each	.40 per doz.
No. 4	Steel Beams, 11 holes	.05 each	.35 per doz.
No. 5	Steel Beams, 9 holes	.05 each	.30 per doz.
No. 6	Steel Beams, 7 holes	.05 each	.25 per doz.
No. 7	Steel Beams, 6 holes	.05 each	.20 per doz.
No. 8	Steel Beams, 5 holes	.05 each	.20 per doz.
No. 9	Steel Beams, 4 holes	.05 each	.18 per doz
No. 10	Steel Beams, 3 holes		.16 per doz.
No. 11	Steel Beams, 2 holes		.14 per doz.
No. 62	Angle Girder, 12½ inches long	.07 each	.60 per doz.
No. 63	Angle Girder, 5½ inches long	.05 each	.40 per doz.

PERFORATED STEEL PLATES

No. 12	Flat Plate, 4 x 9 holes	$0.05 each
No. 13	Flat Plate, 6 x 11 holes	.07 each
No. 15	Angle Plates, 1 x 3 x 9 holes	.07 each
No. 18	Angle Plates, 1 x 5 x 11 holes	.10 each
No. 14	Angle Plates, 2 x 2 x 9 holes	.07 each
No. 17	Angle Plates, 3 x 3 x 11 holes	.10 each
No. 16	Angle Plates, 1 x 8 x 4 holes	.07 each
No. 19	Angle Plates, 1 x 10 x 6 holes	.10 each

GEARS AND WHEELS

No. 20	Wagon Wheel	$0.10 each
No. 21	Car Wheel	.15 each
No. 22	Pulley, 1½ inch diameter	.15 each
No. 23	Pulley, 1 inch diameter	.10 each
No. 24	Pulley, ½ inch diameter	.05 each
No. 25	Spider Wheel	.10 each
No. 26	Spur Gear, 1½ inch diameter	.25 each
No. 59	Spur Gear, 1 inch diameter	.20 each
No. 27	Spur Gear, ¾ inch diameter	.15 each
No. 28	Spur Gear, ½ inch diameter	.10 each
No. 29	Worm	.20 each
No. 30	Sprocket Wheel, 2 inch diameter	.25 each
No. 31	Sprocket Wheel, 1 inch diameter	.15 each
No. 32	Crown Gear, 1⅝ inch diameter	.25 each
No. 33	Crown Gear, ¾ inch diameter	.15 each

SHAFTING

No. 58	Key Seated Shaft, 11½ inches long	$0.10 each
No. 49	Key Seated Shaft, 8 inches long	.08 each
No. 50	Key Seated Shaft, 6 inches long	.06 each
No. 52	Key Seated Shaft, 4¾ inches long	.05 each
No. 53	Key Seated Shaft, 3¾ inches long	.05 each
No. 55	Key Seated Shaft, 2½ inches long	.04 each
No. 56	Key Seated Shaft, 1½ inches long	.02 each
No. 57	Key Seated Crank Shaft	.10 each

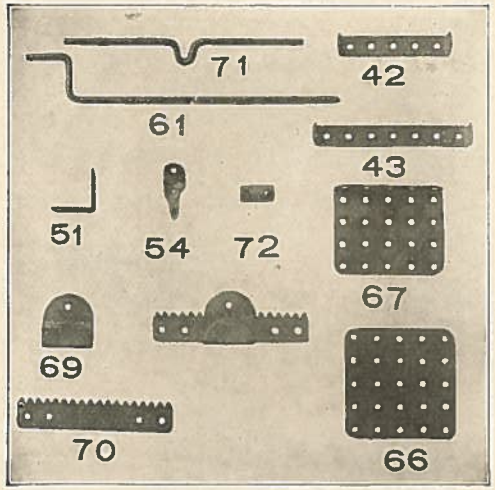
Price List of Additional Parts

MISCELLANEOUS PARTS

No. 34	Hanger	$0.05 each
No. 36	Clevis	.05 each
No. 37	Pawl	.05 each
No. 38	Hook	.05 each
No. 39	Long Bolt with nut	.10 per doz.
No. 40	Short Bolt with nut	.10 per doz.
No. 44	Sprocket Chain	.05 per foot
No. 45	Cable Cord	.05 per hank
No. 46	Screw Driver	.10 each
No. 47	Steel Wrench	.10 each
No. 48	Brackets	.10 per doz.
No. 60	Shafting Collars	.05 each
No. 64	Coiled Spring	.05 each
No. 65	Set Screws	.10 per doz.

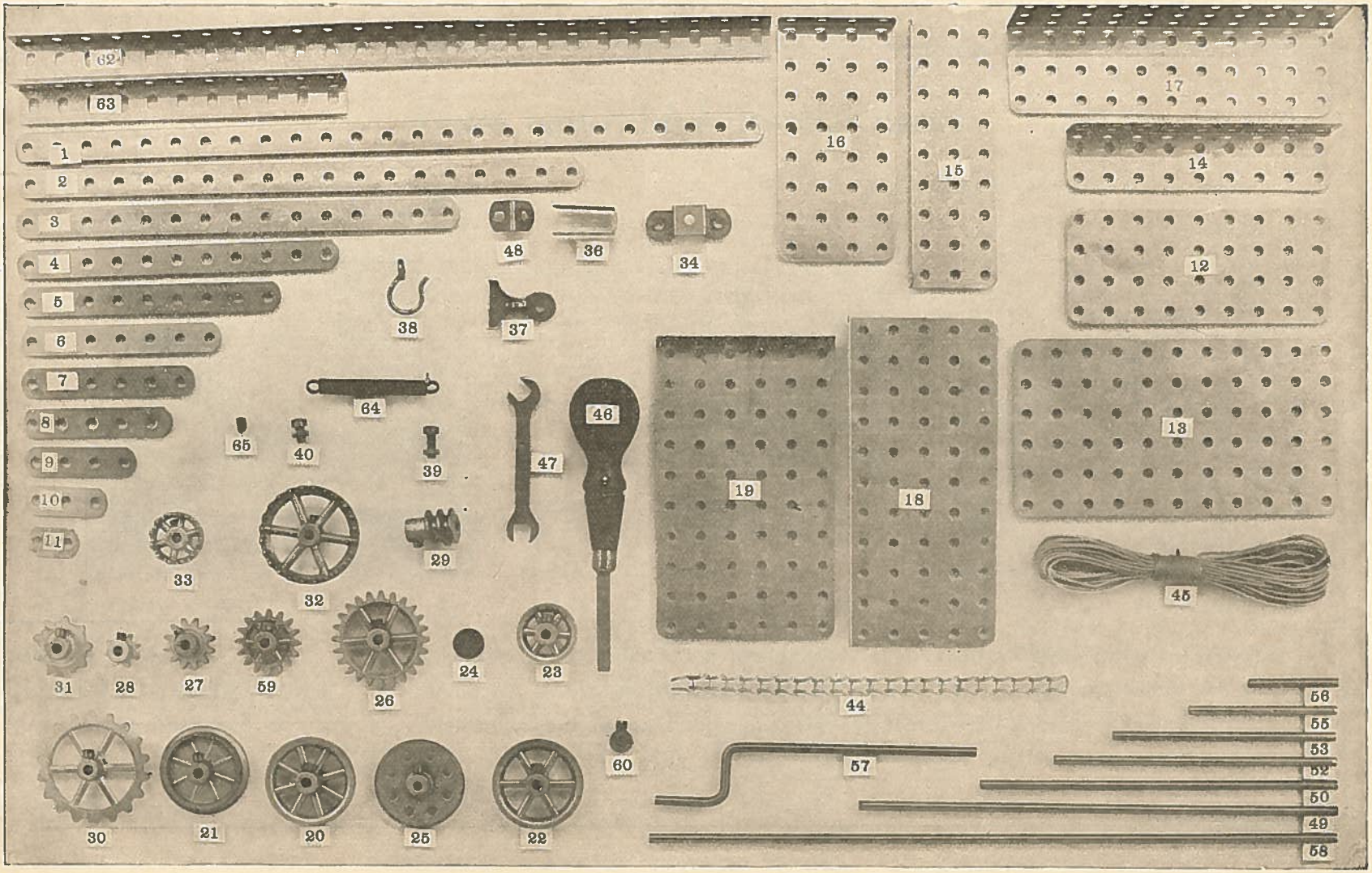
(ILLUSTRATED)

No. 42	Bent Beams, 5 holes	$0.05 each
No. 43	Bent Beams, 7 holes	.05 each
No. 51	Corner Beams 2 for	.05
No. 54	Twist Beams 2 for	.05
No. 61	Crank Shafts, 6 ins.	.10 each
No. 66	Flat Plates, 5x5 holes	.05 each
No. 67	Angle Plates, 1x4x5 holes	.05 each
No. 69	Rack Guide	.05 each
No. 70	Gear Rack	.10 each
No. 71	Engine Crank Shaft	.10 each
No. 72	Shaft Couplings	.10 each
	Book of Instructions	.15 each



STRUCTO is the only Constructing Outfit that contains *White Brass* Die Cast Gears, Wheels, Pulleys, Sprockets and Pinions. All equipped with set screws, the points of which engage the *Key-seated* Shafting—this eliminates slippage and assures the positive operation of models.

Structo Increases The Value of Other Toys



Standard STRUCTO Parts

Contents of Outfits

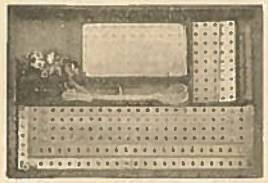
		1	1A	2	2A	3	3A	4	4A	5	5A	6
No. 62	Angle Girder 12½ in.				4	4	4	8		8	6	14
No. 63	Angle Girder 5½ in.										4	4
No. 1	Steel Beam, 25 holes		4	4	4	8		8	4	12	4	16
No. 2	Steel Beam, 19 holes						2	2	2	4	4	8
No. 3	Steel Beam, 15 holes				4	4		4	2	6	4	10
No. 4	Steel Beam, 11 holes	2		2		2	2	4	6	10	6	16
No. 5	Steel Beam, 9 holes		2	2	2	4		4	4	8	8	16
No. 6	Steel Beam, 7 holes	2	2	4		4	2	6	6	12	8	20
No. 7	Steel Beam, 6 holes				6	6		6		6	2	8
No. 8	Steel Beam, 5 holes	5	1	6	2	8		8	4	12	8	20
No. 9	Steel Beam, 4 holes	4		4		4	2	6	4	10	10	20
No. 10	Steel Beam, 3 holes	3	1	4		4		4	4	8	8	16
No. 11	Steel Beam, 2 holes	2		2	2	4		4	4	8	4	12
No. 12	Flat Plate 4x9 holes						1	1		1	1	2
No. 13	Flat Plate, 6x11 holes						1	1		1	1	2
No. 14	Angle Plate, 2-|-2x9 holes										2	2
No. 15	Angle Plate, 1-|-3x9 holes	2		2		2		2		2	2	4
No. 16	Angle Plate, 1-|-8x4 holes										2	2
No. 17	Angle Plate, 3-|-3x11 holes										2	2
No. 18	Angle Plate, 1-|-5x11 holes		2	2		2		2		2	2	4
No. 19	Angle Plate, 1-|-10x6 holes										2	2
No. 20	Wagon Wheel	4		4		4		4		4		4
No. 21	Car Wheel								4	4		4
No. 22	Grooved Pulley 1½ inch						1	1		1	1	2
No. 23	Grooved Pulley 1 inch		2	2		2	2	4		4		4
No. 24	Grooved Pulley ½ inch	1		1		1		1	1	2	4	6
No. 25	Spider Wheel	1		1		1	1	2		2	1	3
No. 26	Spur Gear 1½ inch						1	1		1	1	2
No. 59	Spur Gear 1 inch								1	1	1	2
No. 27	Spur Gear ¾ inch						1	1	1	2		2
No. 28	Spur Gear ½ inch				1	1	1	2		2	2	4
No. 29	Worm						1	1		1	1	2
No. 30	Sprocket 2 inch								1	1	1	2
No. 31	Sprocket 1 inch								1	1	1	2
No. 32	Crown Gear 1⅝ inch								1	1	1	2
No. 33	Crown Gear ¾ inch						2	2		2		2
No. 60	Collars	2	2	4		4	2	6	2	8	8	16
No. 34	Hanger	3		3		3		3		3	3	6
No. 36	Clevis				1	1		1		1	1	2
No. 37	Pawl				1	1	1	2		2	2	4
No. 38	Hook	1		1		1		1		1	1	2
No. 39	Long Bolt with Nut	2		2	2	4	1	5	5	10	14	24
No. 40	Short Bolt with Nut	20	10	30	20	50	20	70	50	120	110	230
No. 44	Sprocket Chain 1 ft. long								2	2	4	6
No. 45	Cable Cord		1	1		1		1	1	2	2	4
No. 46	Screw Driver	1		1		1		1		1		1
No. 47	Steel Wrench		1	1		1		1	1	2		2
No. 48	Bracket	12		12	12	24		24	24	48	12	60
No. 58	Shaft 11½ in. long Key Seated								2	2		2
No. 49	Shaft 8 in. long Key Seated						1	1	1	2		2
No. 50	Shaft 6 in. long Key Seated								2	2		2
No. 52	Shaft 4¾ in. long Key Seated		2	2		2		2		2	2	4
No. 53	Shaft 3¾ in. long Key Seated	2			2	2		2		2	2	4
No. 55	Shaft 2½ in. long Key Seated		1	1		1		1	1	2	2	4
No. 56	Shaft 1½ in. long Key Seated	1		1		1		1	1	2	2	4
No. 57	Crank Shaft—Key Seated	1		1		1	1	2	1	3	1	4
No. 64	Coil Spring								1	1	1	2
	Book of Instructions	1		1		1		1		1		1

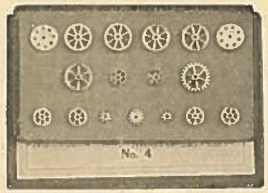
Structo Toy Model Building Outfits

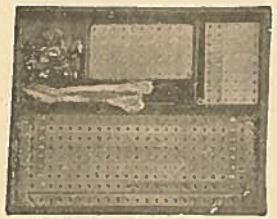
STRUCTO OUTFITS are arranged in eleven progressive numbers and after you have exhausted the possibilities of STRUCTO Outfit No. 1 by purchasing STRUCTO Outfit No. 1A you will obtain STRUCTO Outfit No. 2. You may continually add to your outfits in this manner until you have secured STRUCTO Outfit No. 6, the possibilities of this outfit being practically unlimited.

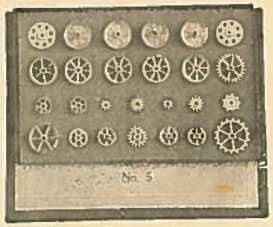
The STRUCTO gears contained in these outfits are as accurate and substantial as those used in the best and latest heavy machinery and with STRUCTO Keyseated Shaftings practical working models of durable construction are easily made.

STRUCTO Building Material is the last word in present day building toys.









Price List of Outfits

No. 1	STRUCTO Outfit	$ 1.00
No. 2	" "	2.00
No. 3	" "	3.50
No. 4	" "	5.00
No. 5	" "	10.00
No. 6	" " (Highly Finished Wood Box, with Lock and Key)	20.00

Accessory Outfits

No. 1A	Containing sufficient parts to convert a No. 1 into a No. 2 Outfit	$ 1.00
No. 2A	" " " " a No. 2 into a No. 3 Outfit	1.50
No. 3A	" " " " a No. 3 into a No. 4 Outfit	1.50
No. 4A	" " " " a No. 4 into a No. 5 Outfit	5.00
No. 5A	" " " " a No. 5 into a No. 6 Outfit	10.00