



STRUCTO

ENGINEERING FOR BOYS

DRAWINGS *and* SUGGESTIONS

FOR STRUCTO MODELS MADE WITH

CADET OUTFIT

Price 15c

STRUCTO MANUFACTURING CO.

FREEPORT, ILLINOIS, U. S. A.



FORM 539

STRUCTO

CADET OUTFIT and MODEL DESIGNS

JUNIOR ENGINEERING *for* BOYS



STRUCTO for youths of all ages is again emphasized in the CADET Outfit which is herein illustrated.

As the large and complete No. 6 Structo Outfit embodies all the standard principles of Mechanics and enables the STRUCTO Engineer to thoroughly illustrate mechanical theories by building actual Models, so the CADET Outfit, prefixing the regular STRUCTO line, is especially adapted to the youngest or embryo mechanic as an outlet to his unfolding mechanical traits.



This new Outfit has been designed especially for the benefit of boys whose mechanical genius begins to develop at the early age of six or seven years and the large number of attractive and instructive models herein shown, leads up to the more intricate and larger models of the No. 1 Structo Outfit in our large Instruction Book,

All the material in the CADET Outfit is interchangeable with that of the larger Structo Outfits which may be obtained at any time as the ability of the student develops.

Structo Suggestions

THE models shown in this Booklet are so clear that it is unnecessary to explain every detail of parts used, or how they are put together.

One of the principal 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.



LOCK NUT

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

BEAMS AND BRACKETS

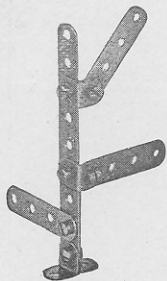


Fig. 1

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.)

BOLTS AND NUTS

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.

ANGLE PLATES



Fig. 2

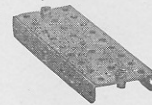


Fig. 3

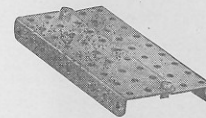


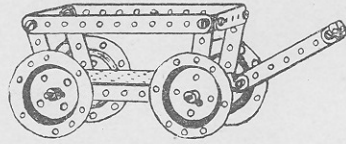
Fig. 4



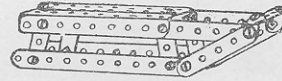
Fig. 5

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

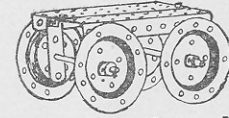
FAMILIARIZE yourself with every individual part of Structo; bolt the parts together and note how perfectly they fit, every part being interchangeable without being forced to position.



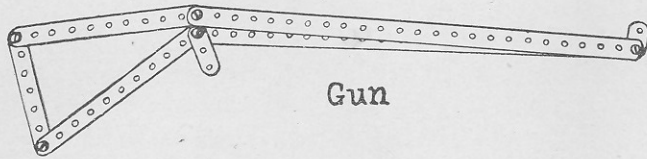
Factory Truck



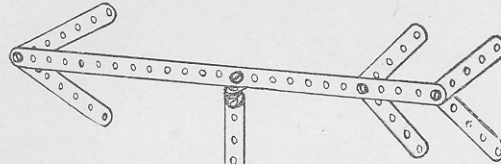
Sled



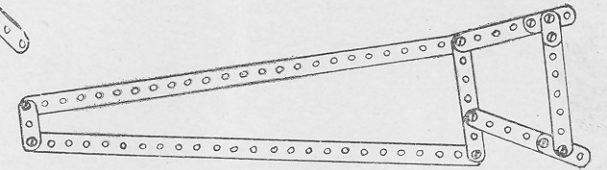
Flat Truck



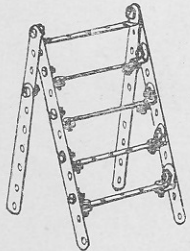
Gun



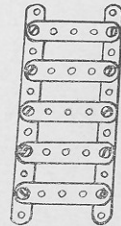
Weather Vane



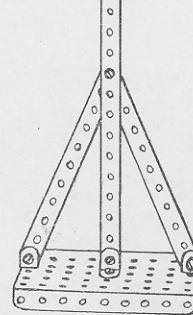
Hand Saw



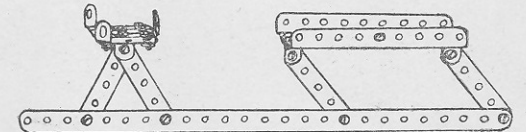
Step Ladder



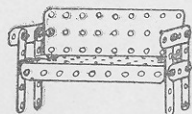
Ladder



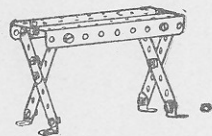
Wrench



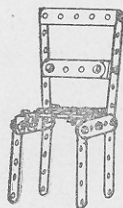
Skate



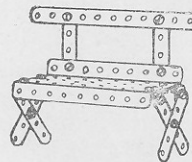
Davenport



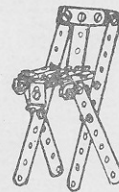
Camp Table



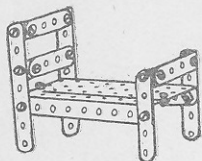
Large Chair



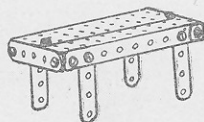
Park Bench



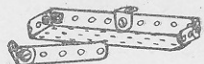
High Chair



Bed



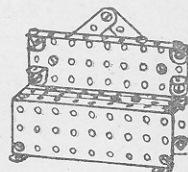
Library Table



Crumb Tray



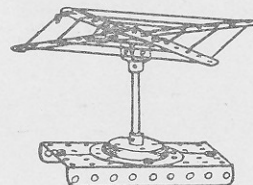
Music Stand



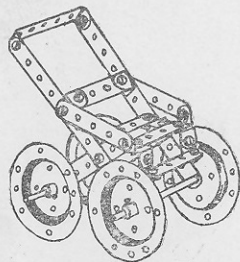
Sideboard



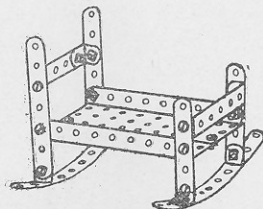
Chair



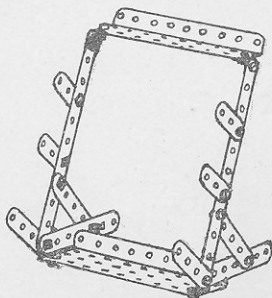
Clothes Reel



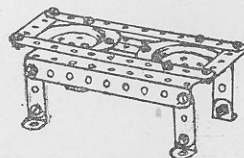
Go-Cart



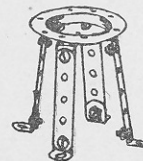
Cradle



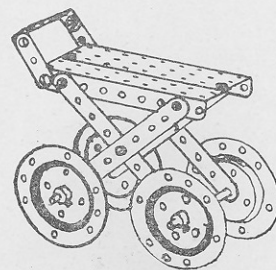
Pen Rack



Gas Plate



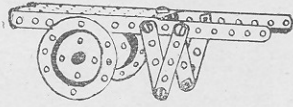
Taboret



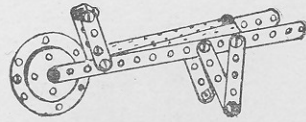
Tea Wagon

In copying the Models in this Booklet, try and improve them.

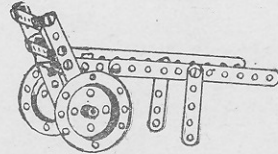
WE invite all STRUCTO Model Builders to feel free to write us at any time for suggestions in overcoming any difficulties they may encounter, either in copying designs in this booklet or in their efforts to design new models.



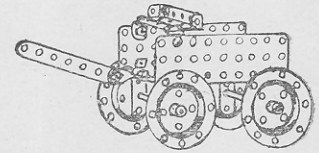
Push Cart



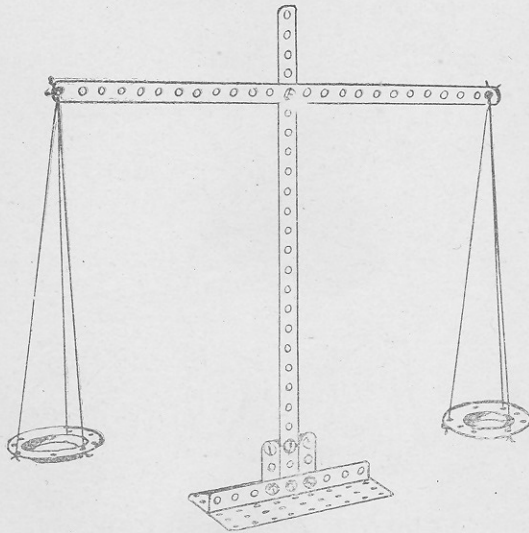
Wheelbarrow



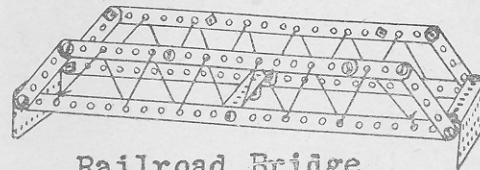
Baggage Truck



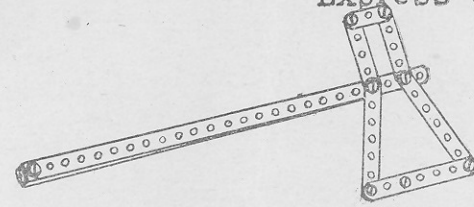
Express Wagon



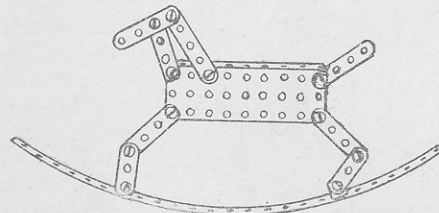
Druggists Scale



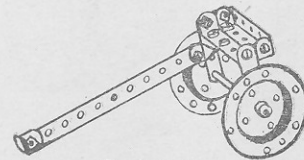
Railroad Bridge



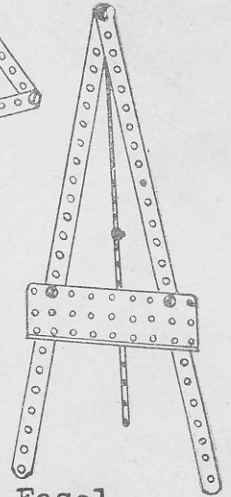
Hatchet



Rocking Horse



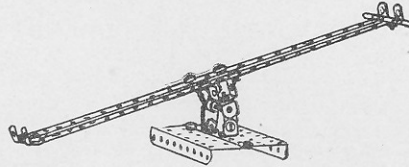
Sulky



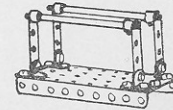
Easel



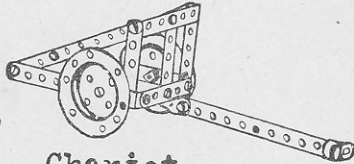
Saw Horse



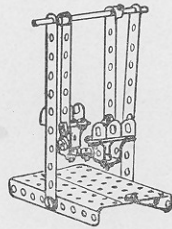
See-Saw



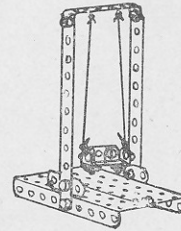
Parallel Bars



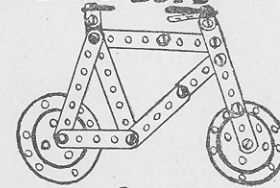
Chariot



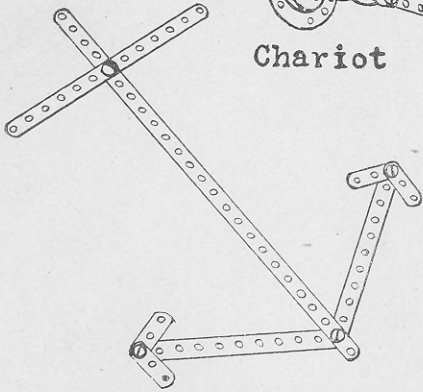
Lawn Swing



Swing



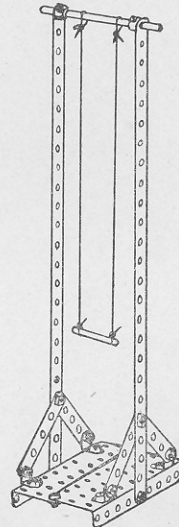
Bicycle



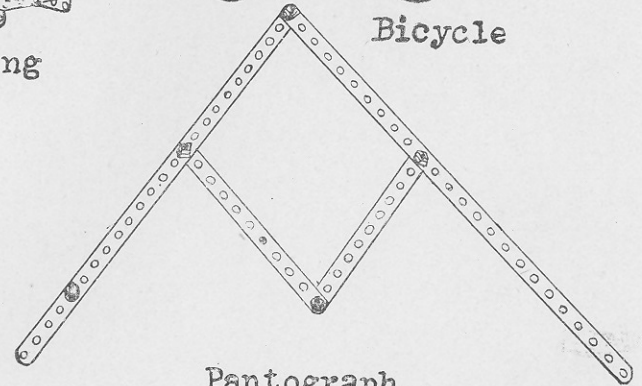
Boat Anchor



Saw-Buck



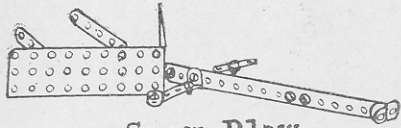
Trapeze



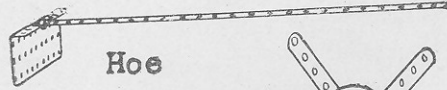
Pantograph

"If at first you don't succeed, try again", well applies to Model Building and our young friends must not be discouraged if they are not successful the first time.

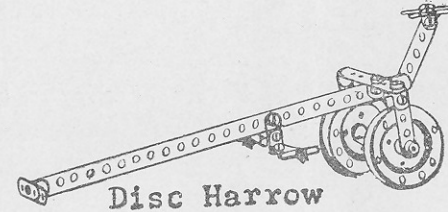
SIGN and mail the card found in your CADET Outfit and become a Member of the STRUCTO ENGINEERING CORPS.
Your name will also be placed on our mailing list.



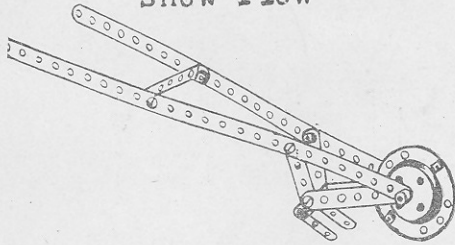
Snow Plow



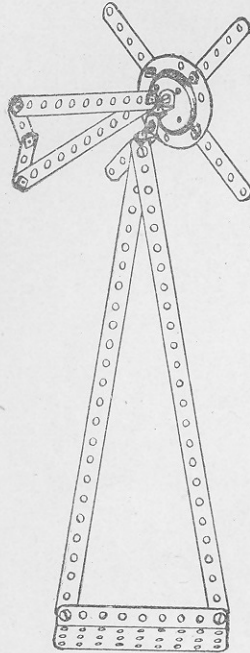
Hoe



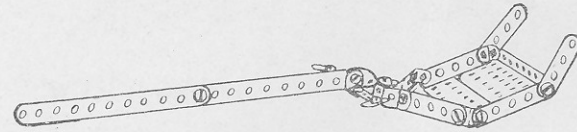
Disc Harrow



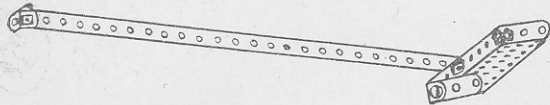
Hand Cultivator



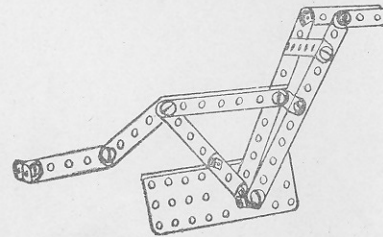
Wind Engine



Road Scraper



Shovel

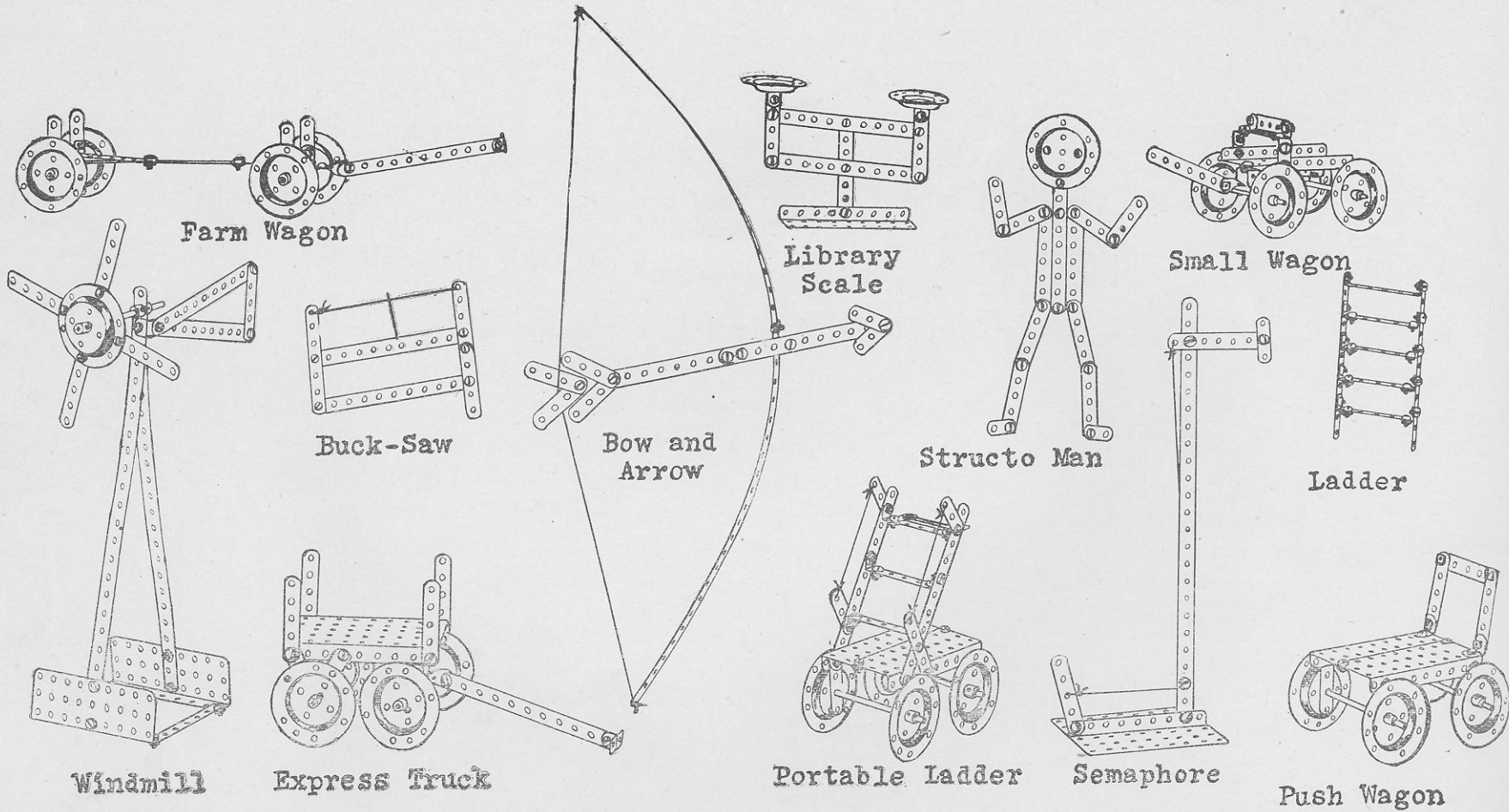


Plow



Hand Rake

Any member sending us drawing or kodak picture of a new Model, will be sent a Structo Engineer's Button.



The models shown in this Booklet are only a few of the many that may be built with the CADET Outfit. The young Engineer should go on and design many original Models that even exceed those shown.

Combine the Structo Cadet Outfit with the Other Regular Structo Outfits
and Build Models that are Giants for Size, Mechanically
Correct and Absolutely Complete

THERE is a constant demand by the Members of the STRUCTO ENGINEERING CORPS, as well as others, for Structo Outfits, Structo Parts and Accessories. This combination forms one of the broadest and most complete lines ever placed before the inventive mind of the youth, for with the large amount and variety of Structural Material included in the realm of STRUCTO, the boy is placed in a position to create and build wonderful life-like Models of Structures and Machinery.

In the following pages, therefore, we give prices on all regular Structo-Outfits, Structo Parts and Accessories, and the Structo Company pays the postage to any point in the United States.



PRICE PER SET.....\$1.00

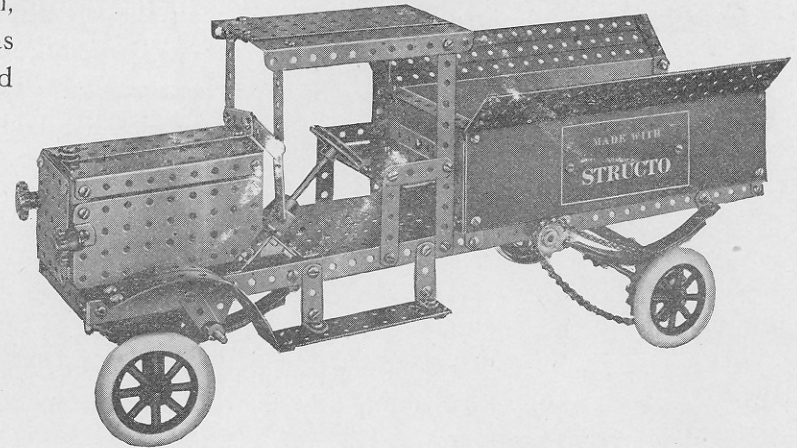
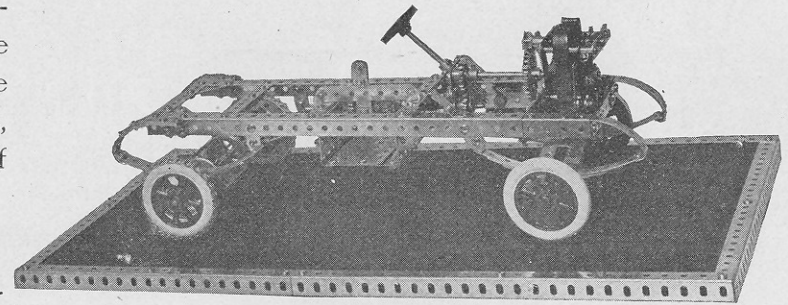
finished in two-color enamel and of the same high grade as STRUCTO QUALITY Gears, Wheels and Pulleys contained in Structo Outfits.

These Automobile Wheels are provided with set-screw in hubs for firmly attaching to Structo key-seated shafts or axles. In Auto Model Building they give the finished touch of completeness to the design and in connection with the large and complete assortment of Structo Material, perfect working automobile construction may be obtained as illustrated in the accompanying picture of Automobile Chassis.

STRUCTO AUTOMOBILE WHEELS

WE have received numerous requests for special Automobile Wheels from Members of the Structo Engineering Corps and others, for use in building Structo Models of Automobiles, Trucks, Chassis, Etc.

In response to this increasing demand we have originated and constructed in cast metal a set of Wheels, perfect in appearance and design,



STRUCTO MODEL BUILDING OUTFITS

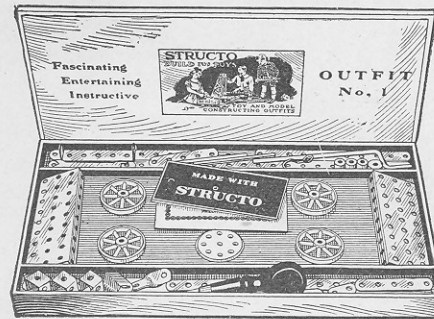
STRUCTO Model Building Material is assembled into ten progressive Outfits and thus the young student of Mechanical Engineering is led up by easy steps, from simple models that any boy can build, to Models of complicated machines that test the ingenuity of the most expert engineers.

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 Key-seated Shafting, practical working models of durable construction are easily made.



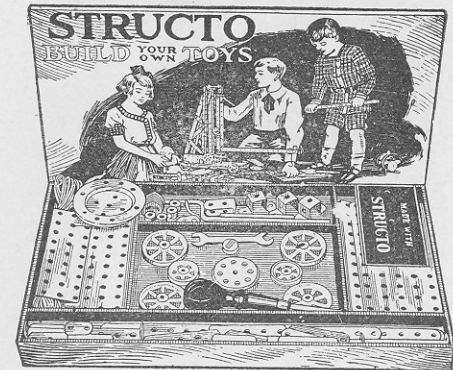
CADET OUTFIT

There are more than 65 Models shown in the Booklet enclosed with this Outfit. Many more may be made.



OUTFIT No. 1

No. 1 Structo Outfit contains sufficient material to build 41 of the Models shown in Instruction Book.



OUTFIT No. 2

No. 2 Structo Outfit contains material to build 69 of the Models shown in Instruction Book.

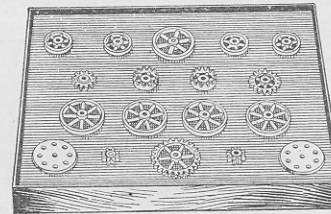
An ingenious boy will never lack for "something to do" if he possesses one of these Outfits. The more Models he makes the greater his ability for building and he will find the capacity of the Outfits unlimited. Do not stop at "41" or "69"; you can build double that number.

STRUCTO MODEL BUILDING OUTFITS--Continued



OUTFIT No. 3

No. 3 Structo Outfit contains material to build 94 of the Models shown in Instruction Book.



No. 4 TRAY

THE WONDERFUL STRUCTO ELECTRIC MOTOR is given FREE with Outfit No. 4.



No. 4 OUTFIT

No. 4 Structo Outfit builds 114 of the Models shown in the Instruction Book, including the "Shelf Clock."

The real fun commences when you are building Models of your own design. The Models shown in this Instruction Book are only suggestions; with patience and a little perseverance you will be able to accomplish wonderful mechanical and structural feats with STRUCTO—the Building Material of Quality.

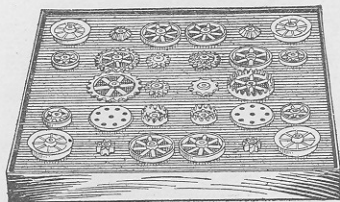
STRUCTO MODEL BUILDING OUTFITS--Continued



No 5 OUTFIT

No. 5 Structo Outfit builds 127 of the Models shown in Instruction Book, including Battleship, Automobiles, Etc. The No. 4 Structo Motor is included in this Outfit.

When you have become sufficiently expert with Structo to develop all the possibilities of these large Outfits, you will have acquired sufficient engineering knowledge to be classed as a Structo Chief Engineer.

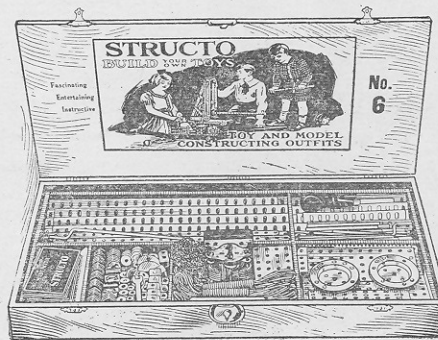


No. 5 TRAY

NOTE the large number and variety of Die-cast Gears, Pulleys and Wheels in this tray



No. 6 TRAY



No. 6 OUTFIT

No. 6 Structo Outfit is neatly packed in a strong, substantial and highly-finished Oak Box fitted with Lock and Key.

The Outfit contains a large quantity of "Structo Quality" material sufficient to build all the Models shown in the Instruction Book, including the master piece of all Structural Models—"THE HALL CLOCK."

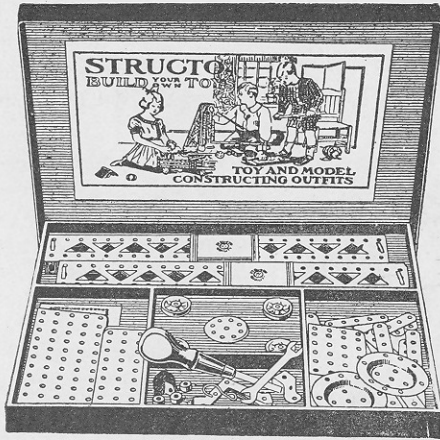
The Structo No. 4 Electric Motor is furnished FREE with this Outfit.

STRUCTO Building Outfits form the climax in present day Construction Material.



No. 6 TRAY

STRUCTO ENGINEERING OUTFITS



JUNIOR ENGINEER

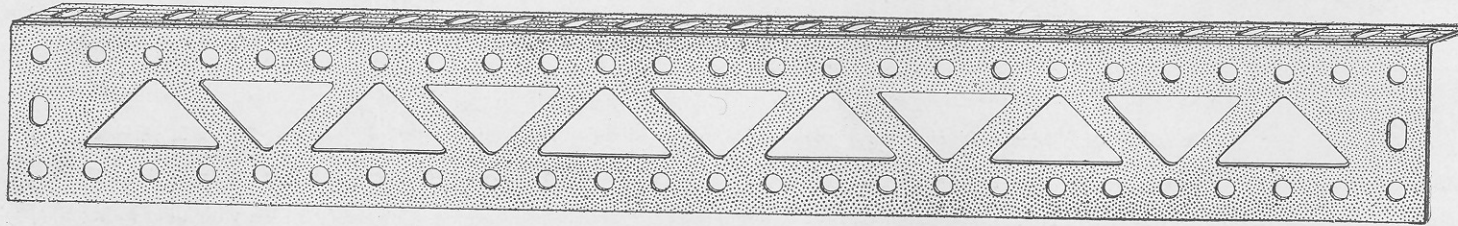


STRUCTO ENGINEER



CHIEF ENGINEER

The Structo Multi-Unit Girder—A GIANT IN SIZE, STRENGTH AND BUILDING COMBINATIONS



No. 78 Girder
12½ in. long,
Doz. - \$1.00

No. 78 Girder
Half Doz. .60

No. 79 Girder
5½ in. long,
Doz. - \$.75

No. 79 Girder
Half Doz. .40

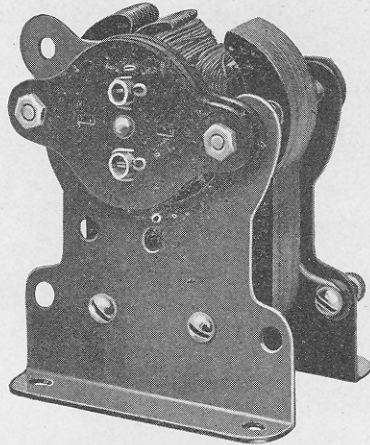
After a careful investigation by our Engineering Department of the various types of beams used in structural work, they find that the channel girder is the most popular among Building Contractors. The channel girder may be duplicated by simply using two Multi-Unit Girders and two bolts.

While the work of model construction has been greatly simplified by the introduction of the Multi-Unit Girder, the possibilities of Structo Engineering Outfits—the new Outfits containing this wonderful Girder and the regular line of Structo Outfits in use so extensively—have greatly increased.

The Construction System now offered by STRUCTO, gives the widest range in Junior Engineering, and the owner of a full complement of this material requires nothing further to complete his greatest construction ideas.

Motors and Accessories

STRUCTO MOTORS OPERATE ON BATTERIES OR ON ALTERNATING CURRENT WITH TRANSFORMER



**Structo Geared Electric Motor
No. 3**

Same type of general construction as No. 4, but also provided with worm speed reducer.

Price complete.....\$2.25

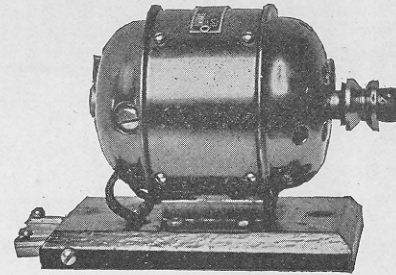
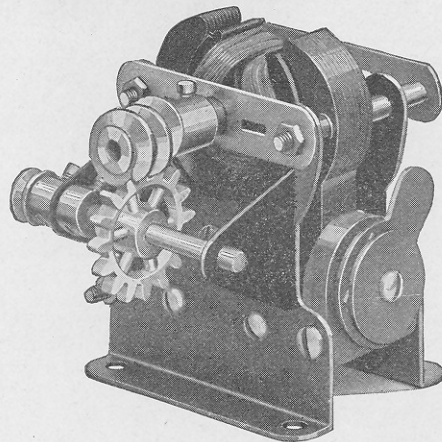
Bracket only..... .10

Structo Electric Motor No. 4

This Motor is provided with reverse switch and gauze brushes in tubular holders; same type of Motor as is included in Outfits 3A, 4, 5, and 6.

Price\$2.00

Structo Gears and Shafting are interchangeable with this Motor.



**Universal Current Motor
NO TRANSFORMER REQUIRED**

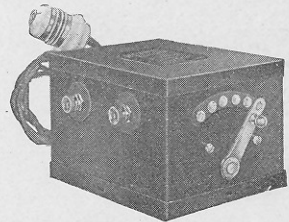
Size $3\frac{3}{4} \times 5$ inches over all, including base. We furnish this Motor with wood base $2\frac{1}{2} \times 4\frac{1}{2}$ inches.

Price on application.

**Flexible Toy Transformer
No. 21**

Price on Application.

Toy Transformers directly connected to lamp socket on A. C. current will reduce voltage to operate Structo Motors successfully.

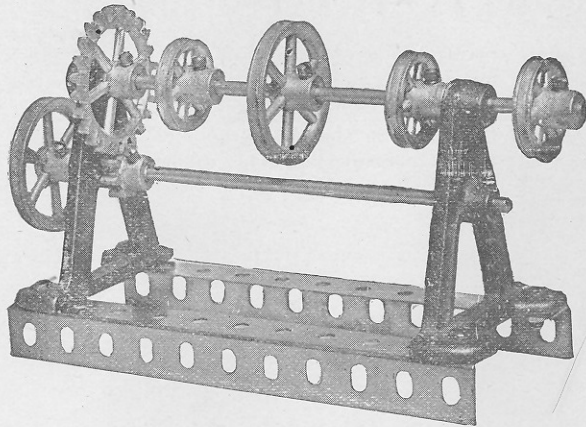


**Toy Transformer with
Rheostat
No. 21**

This is a high speed Motor and should be used only for driving models in connection with our Type "B" Speed Reducer. It is designed for operating Structo models and other mechanical devices requiring greater power than is provided with battery motors. It is well and thoroughly made, operates on both direct and alternating current, 100 to 120 volts.

Structo Speed Reducers

GEARED SPEED REDUCER, Type A

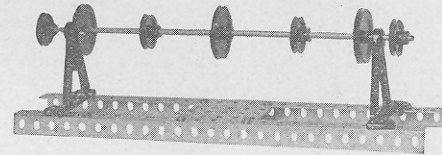


This countershaft made with Structo, serves as a Speed Regulator between motor and Structo models.

One to four models may be driven at one time.

Price, complete, \$1.00

COUNTERSHAFT AND PULLEYS



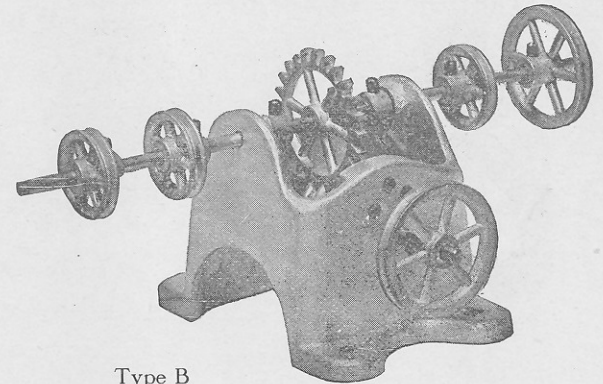
Price, complete... \$1.00

WORM SPEED REDUCER

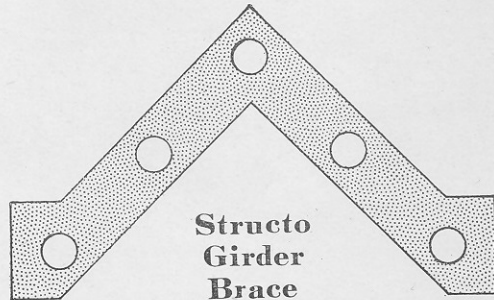
Used to regulate speed of Models. A very flexible and practical unit.

Four speeds may be obtained by shifting worm shaft into the four bearings shown in housing and using Structo spur gears 1/2-inch, 3/4-inch, 1-inch or 1 1/2-inch to engage worm.

Price, complete, \$1.50

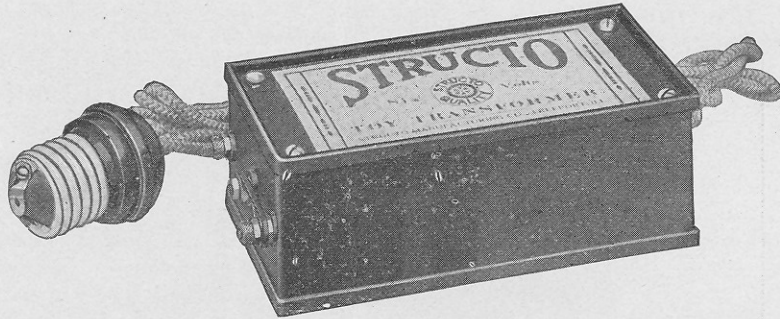


Type B



Structo Girder Brace

Price.....15c per doz



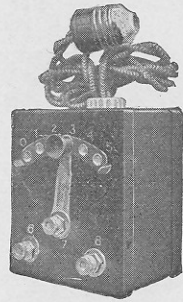
No. 1 Structo Transformer

This Toy Transformer is built exclusively for use in connection with the Structo Electric Motors. It is designed to be used on 110-volt alternating current, reducing the current to six volts, this being the voltage upon which Structo Motors are to be operated with best results.

These Transformers are provided with removable fuse links to guard against damage caused by short-circuiting.

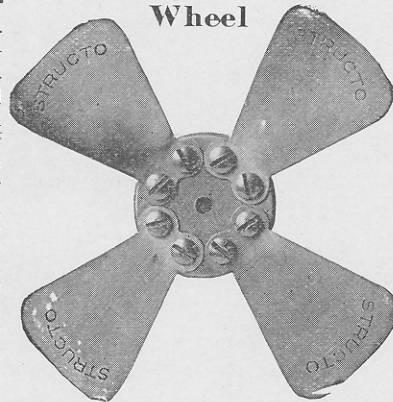
Price complete (with Cord and Plug).....\$2.00
 Extra Fuse Links, each......05

Danditoy Transformer



This Transformer is strongly made, conveniently small and low in price. A leading feature of its design is the voltage regulator switch, which gives a complete range of secondary voltages from two and one-half to twenty-seven and one-half

volts, in steps of two and one-half volts each. Price complete..\$2.85.
 (With Cord and Plug)



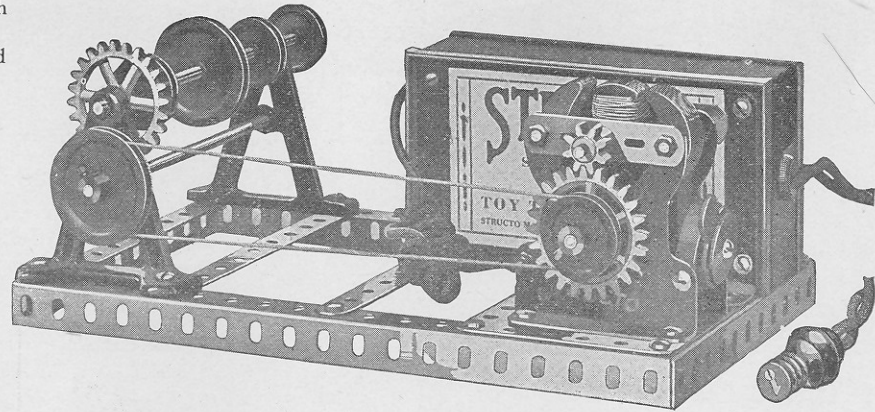
Wheel

THE STRUCTO SYSTEM of steel construction now embraces the field of Electrical Equipment which can be applied practically to Mechanical and Structural Models.

Structo Power Plant

This wonderful Power Plant consists of high grade reversible Electric Motor, a very efficient Transformer, also the Structo speed-reducing Countershaft. These three units are mounted on a substantial base, the Motor being connected to speed-reducing Countershaft by belt with wire connections between Motor and Transformer. This little Power Plant is all ready for use by connecting to electric light socket.

Price complete, packed in box, with Cord and Plug..... \$5.00



This wheel is made up of propeller blades bolted on spider wheel, therefore may be used on armature shaft of Structo Motors for fan.

Price complete.....25c. Blades per set.....10c.

STRUCTO PARTS AND PRICE LIST

STEEL BEAMS



No. 1 Steel Beams, 25 holes.....	.06 each	.60 per doz.
No. 2 Steel Beams, 19 holes.....	.06 each	.60 per doz.
No. 3 Steel Beams, 15 holes.....	.06 each	.50 per doz.
No. 4 Steel Beams, 11 holes.....	.05 each	.45 per doz.
No. 5 Steel Beams, 9 holes.....	.05 each	.40 per doz.
No. 6 Steel Beams, 7 holes.....	.05 each	.30 per doz.
No. 7 Steel Beams, 6 holes.....	.05 each	.30 per doz.
No. 8 Steel Beams, 5 holes.....	.04 each	.30 per doz.
No. 9 Steel Beams, 4 holes.....	.04 each	.25 per doz.
No. 10 Steel Beams, 3 holes.....	.03 each	.20 per doz.
No. 11 Steel Beams, 2 holes.....	.03 each	.20 per doz.

ANGLE GIRDERS



No. 62 Angle Girder, 12½ inches long....	.10 each	.90 per doz.
No. 63 Angle Girder, 5½ inches long....	.07 each	.60 per doz.

CORNER BEAM



No. 51 Corner Beam....	.05 a pair
------------------------	------------

BENT BEAMS



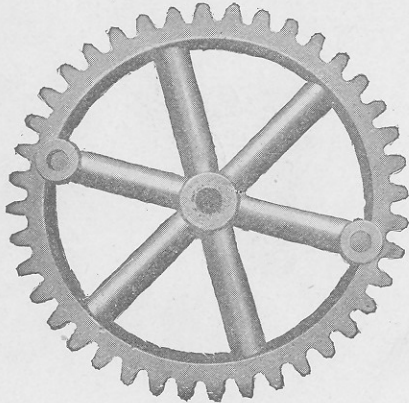
No. 42 Bent Beam 5 holes.....	.06 each
No. 43 Bent Beam 7 holes.....	.07 each

TWIST BEAM

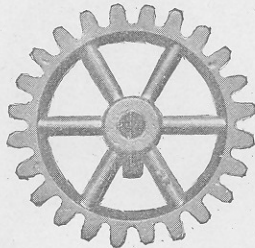


No. 54 Twist Beam....	.05 a pair
-----------------------	------------

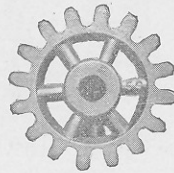
SPUR GEARS



No. 75
2½ inch, .35 each



No. 26
1½ inch, .25 each



No. 59
1 inch, .20 each

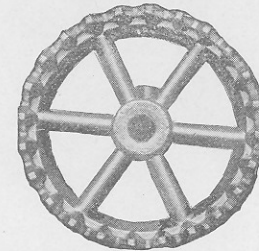


No. 27
¾ inch, .15 ea.

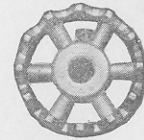


No. 28
½ in., .10 ea.

CROWN GEARS



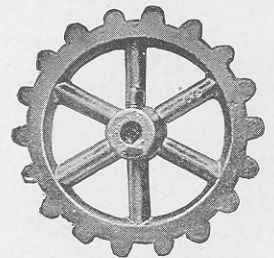
No. 32
1¾ inch, .25 each



No. 33
¾ inch, .15 each

GEARS AND WHEELS—Continued

SPROCKET WHEELS



No. 30
2 inch.....25 each



No. 31
1 inch.. 15 each

BEVEL GEAR



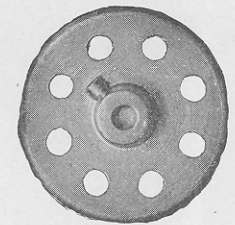
Order in pairs
No. 74.....15 each

WORM GEAR



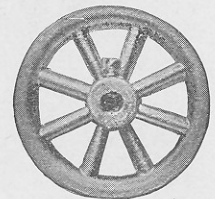
No. 29.....20 each

SPIDER WHEEL



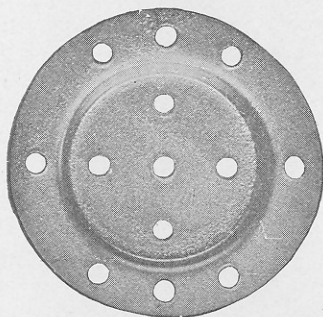
No. 25.....10 each

WAGON WHEEL



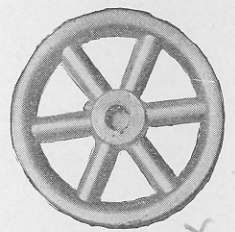
No. 20.....10 each

DISCS



No. 41.....05 each

PULLEYS



No. 22
1½ inch..15 each

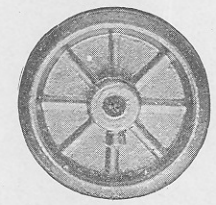


No. 24
½ inch, .95 ea.



No. 23
1 inch.. 10 each

CAR WHEEL



No. 21.... 15 each

PROPELLER BLADE



No. 76

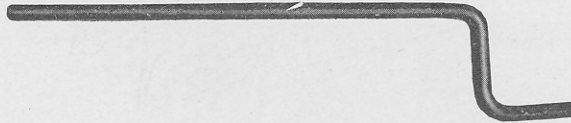
Set of four blades.....10

Ask you dealer for Outfits or Parts wanted. If he cannot supply you, send Postal Order or Stamps direct to Structo Mfg. Co., Freeport, Illinois, and we will ship, POSTAGE PREPAID.

STRUCTO SHAFTING



- No. 58 Key Seated Shaft, 11 1/2 inches long..... .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, 4 3/4 inches long..... .05 each
- No. 53 Key Seated Shaft, 3 3/4 inches long..... .05 each
- No. 55 Key Seated Shaft, 2 1/2 inches long..... .04 each
- No. 56 Key Seated Shaft, 1 1/2 inches long02 each



- No. 57 Key Seated Crank Shaft, 4 inches..... .10 each
- No. 61 Key Seated Crank Shaft, 6 inches..... .10 each



No. 71 Engine Crank.....10 each



No. 72 Shaft Couplings.. 10 each



No. 60 Shafting Collars..... .05 each X

BOLTS AND NUTS



No. 39 Long Bolt with Nut..... .10 per doz



No. 40 Short Bolt with Nut..... .10 per doz. X
Per Gross..... 1.00

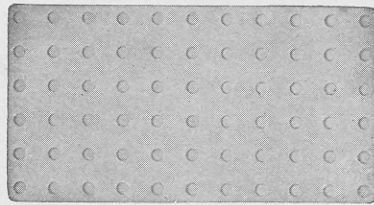


No. 65 Set Screws.... .10 per doz.

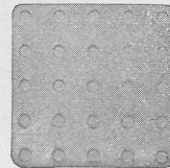
PERFORATED STEEL PLATES



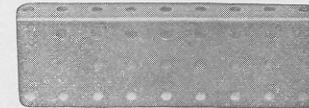
No. 12 Flat Plate, 4x9 holes.. .05 each



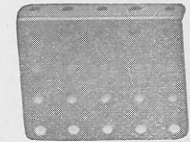
No. 13 Flat Plate, 6x11 holes..... .07 each



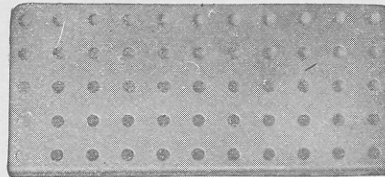
No. 66 Flat Plate 5x5 holes..... .05 each



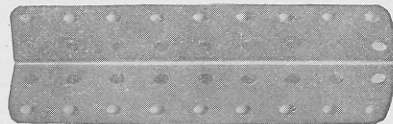
No. 15 Angle Plate, 1x3x9 holes..... .07 each



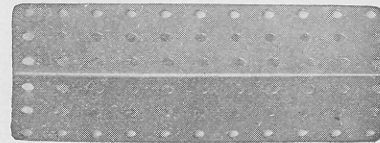
No. 67 Angle Plate 1x4x5 holes.....05. each



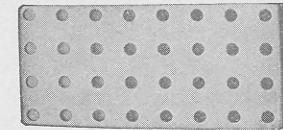
No. 18 Angle Plate, 1x5x11 holes.. .10 each



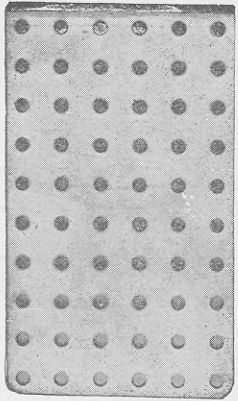
No. 14 Angle Plate, 2x2x9 holes.... .07 each



No. 17 Angle Plate, 3x3x11 holes.. .10 each



No. 16 Angle Plate, 1x8x4 holes.. .07 each



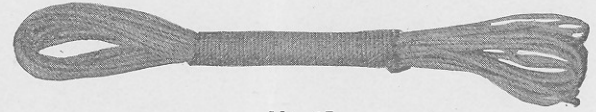
No. 19
Angle Plate
1x10x6 holes.....10 each



No. 68
Flexible Shaft
Coupling.....05 each



No. 70
Gear Rack.....10 each



No. 45
Cable Cord.....05 per hank



No. 44
Sprocket Chain.....25 per yard



No. 69
Rack Guide...05 ea.



No. 34
Hanger...05 ea.



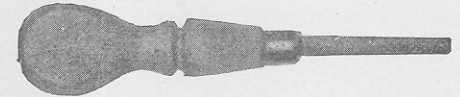
No. 36
Clevis...05 each



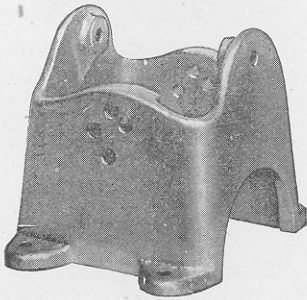
No. 37
Pawl....05 each



No. 47
Steel Wrench.....05 each



No. 46
Screw Driver.....10 each



No. 100
Gear Housing.....50 each



No. 48
Brackets .10 per doz.

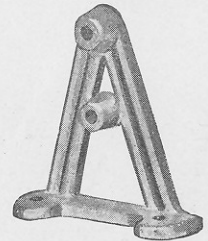
IF YOUR DEALER
CANNOT SUPPLY YOU
WRITE TO THE
STRUCTO MFG. CO.
Parts will be shipped to
you direct.
Postage prepaid to all points in
United States.
Order must amount to 25c
or over.



No. 64
Coiled Spring.....05 each

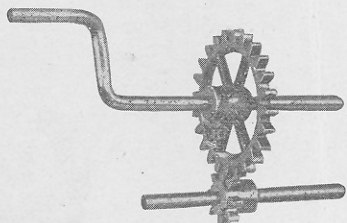


No. 38
Hook.....02 each



No. 73
Hanger for Shafting
.10 each

The Following are a Few of the Special Features of Progressive Structo Outfits



SPUR GEARS

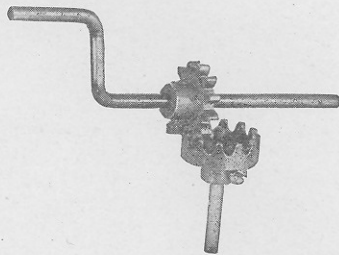
The material used in making our Die Castings is white brass, tough, hard and very durable. All Structo Die Castings are equipped with set-screws for fastening to Key-Seated Shafting.

With STRUCTO you can do real things that big men do in real life; it is the mechanical world in miniature.

You may have a great deal of natural ability that will tend to the making of an architect, civil engineer, mechanical engineer or a railroad man. Structo will bring it out and fit you for an interesting and profitable calling when you have grown to be a man.

IN all the Structo Outfits following the "CADET," will be found, to a greater or less extent, the celebrated STRUCTO DIE CASTINGS, consisting of Gears, Pulleys, Wheels, Etc.

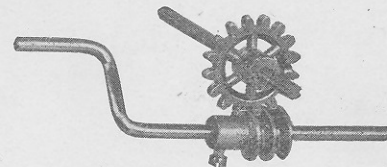
Casting each Gear, Sprocket, etc., from dies, results in complete interchangeability, perfect alignment of parts and units, perfect harmony in their separate relations with each other and the entire absence of flimsy and non-mechanical parts. Every Gear, Pulley, Etc., is an exact duplicate of the other, therefore interchangeable.



APPLICATION OF SPUR AND CROWN GEARS

The accompanying cuts show how large and strong Structo Gears are; the teeth are deep cut, accurate and mesh perfectly.

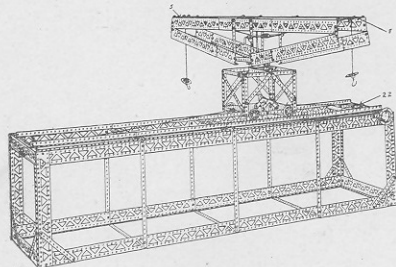
STRUCTO Machinery works easily and smoothly.



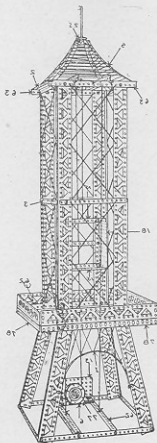
WORM GEAR

Some of the Models Built from Larger Structo Outfits

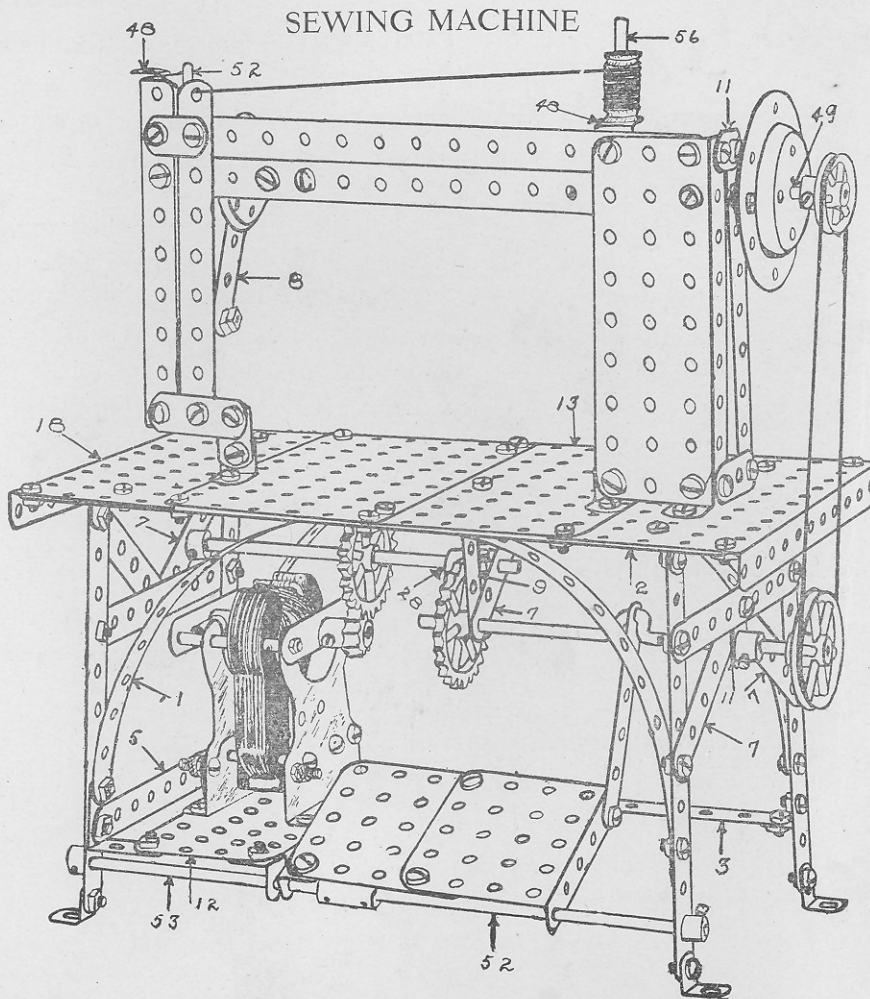
Models made with New Girder



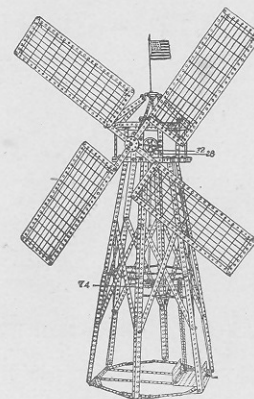
SHIP CRANE



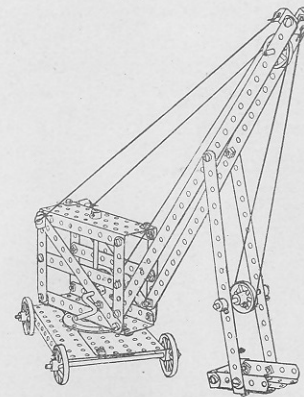
TOWER



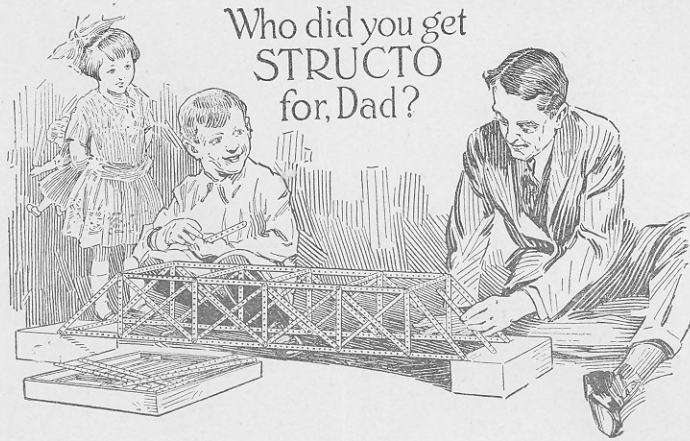
SEWING MACHINE



DUTCH WIND MILL



STEAM SHOVEL



Structo Makes Men of Boys--Makes Boys of Men

FATHERS cannot resist the fascination of Structo because it does the real things that big men do in real life, and father knows. It is not a toy, else father would care nothing about building large bridges, machinery, etc., with it.

The big Model-building book which accompanies the larger Outfits from Nos. 1 to 6, shows a wonderful assortment of models for you to make, but they are just hints of what you are to do. Turn your imagination loose and with the great assortment of material of different shapes and sizes, gear wheels, shaft pulleys, sprockets, etc., you can make nearly everything you can think of. In fact **STRUCTO** helps boys' dreams come true as shown in the accompanying picture;

while the young fellow is thinking of the big Brooklyn Bridge he saw while in New York City last summer on his vacation, his hands are building it out of **STRUCTO**.

Now look at the sensational new Multi-Unit Girder shown on page 14 of this Booklet. It is supplied only in Structo and helps you make structures strong enough to carry you. You can make T-beams, channel-beams, Z-beams, etc., exactly like those used in sky-scrapers and bridges. This Girder adds many new possibilities to Structo and is one of the chief elements entering into the **STRUCTO QUALITY** material of the three Engineering Outfits shown on page 14.

