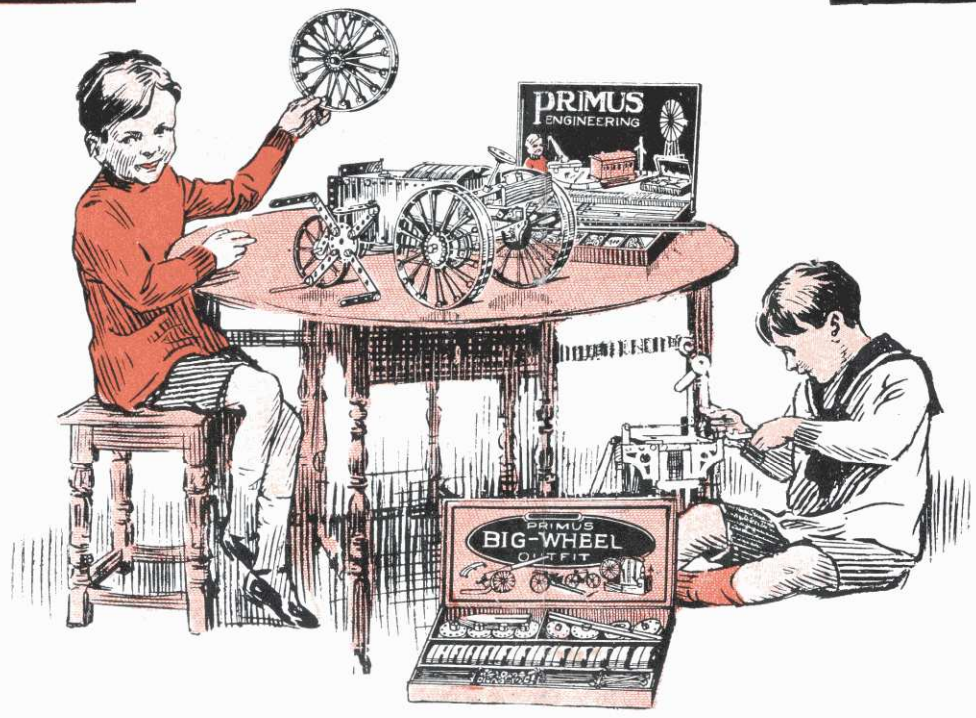
"PRIMUS"

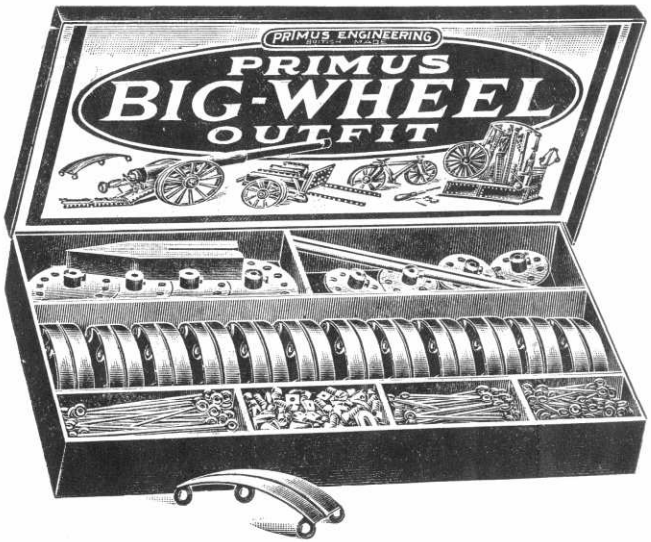
ENGINEERING



BIG WHEEL

OUTFIT

Patent No. 3479—1916



PRIMUS BIG-WHEEL OUTFIT

CONTENTS

Part No.	Description.	Quantity.
150	Wheel Sections	24
151	8 hole Hub for 4-in. wheel ...	4
152	12 ,, ,, ,, 6-in. ,, ...	2
153	16 ,, ,, ,, 8-in. ,, ...	2
154	Wire Stays $1\frac{5}{8}$-in.	32
155	,, ,, $2\frac{1}{2}$-in.	48
156	,, ,, $3\frac{1}{4}$-in.	32
50/51	Nuts and Bolts	72
165	$6\frac{1}{2}$-in. Axles	2
66	Brackets	12
110	Bending Bolster...	1

Complete with Instruction Manual.

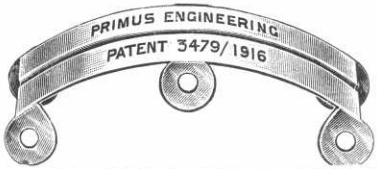
THE BIG WHEEL OUTFIT consists of a series of new and ingenious parts with which "Primus Engineers" can build wheels of 4-in., 6-in. and 8-in. diameter, to be used in connection with many of the Models shown in the Primus Manual, or for other special Models.

The wheels are built up in sections, and when made are suitable for Cart Wheels, Fly Wheels, Pulley Wheels, Traction Wheels, Paddle Wheels, in fact Wheels for every conceivable purpose. In addition composite Wheels for Steam Rollers, sectional parts for Towers, Lighthouses and Roundabouts can be made. The Big Wheel Outfit has been designed specially for use in conjunction with regular Primus parts as contained in the Standard Primus Sets, and its introduction enables more varied and attractive Models to be built.

The Wheel sections are fully patented and in themselves are strikingly novel. They may be easily bent to almost any curve or they can be made straight. It would therefore at once be evident how useful they will prove in the building of Models. The Spokes are of three different sizes and may be used as Stays, Supports, Levers, etc., and while their introduction makes Models look more real they also offer a pleasing alternative to the use of perforated strips.

The Hubs also contained in the Big Wheel Set can be put to many uses.

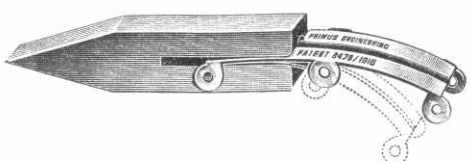
INSTRUCTIONS FOR BUILDING WHEELS



FITTING THE RIM SECTION

If you will examine the sections carefully you will observe that the two ends are slightly different. Place a section in front of you with the inscription in the proper position for reading, and you will see that the pair of lugs at the end on the right are set a trifle wider apart than those on the left. This is intended to facilitate the joining up of the sections, for the left-hand pair of lugs of one section will fit snugly into the right-hand pair of lugs of another. Great care should be taken to place each section in its proper relative position.

The Patent Wheel sections as delivered in the outfits are bent to a curve necessary to make four section wheels of



BENDING THE RIM SECTIONS

4in. in diameter; to adapt to the larger wheels the curve of each section has to be slightly reduced. This should by done by placing the wheel section in the mouth of the bolster block and gently bending upwards, then push section further in the block and repeat the process until desired alteration in curve is attained. To bring the section back to its original curve repeat the operation

Do not bend the sections roughly, or you will make a sharp kink, which besides being ugly will entirely destroy the symmetry of the section and make it impossible to properly fit.

BUILDING 4-in. DOUBLE HUB WHEELS

It is best to commence building the easiest wheel, which is known as the double hub, where the spokes have a rake sideways and are not bent. In this model the spokes are all screwed on to the hubs and then the screws are just turned back a trifle so as to leave them loose until the wheel is finished, one side being dealt with at a time. Then screw one of them to a pair of sections, afterwards screw each alternative spoke to the other pair at the lugs where they join. The central lugs should be screwed up to the alternative spokes last, finally all the screws should be tightened up. In fitting the second series of spokes on hub, see that the rake taken by the spokes is in the same direction as the first series.

The accompanying illustration, together with these instructions, should make it easy for anyone to build a 4-in. double hub wheel.

FIG. 1—SPOKES ATTACHED TO HUB

BUILDING 4-in. SINGLE HUB WHEELS

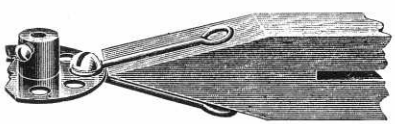


FIG. 3—SPOKES SPREAD BY WEDGE.

FIG. 2—READY FOR FIXING TO RIM.

To make up the four section single Hub pattern, commence by fixing the spokes on to the Hub in pairs, each pair held on by one bolt and nut. When they are all on if looked at sideways they will present this appearance. See Fig. 1.

Each of the spokes must then be bent slightly outwards to give them sufficient rake to fit the lug on the wheel sections, and they should then appear as nearly as possible like Fig. 2.

The spokes can then be easily fitted by taking two of the sections and screwing one eye of a spoke through the lugs that form the joint. Follow up with the other sections, and when the fourth is screwed into its place the remaining spokes may be screwed on to the central lug and the whole series will form a perfect wheel, with a channel for a driving band in the centre.

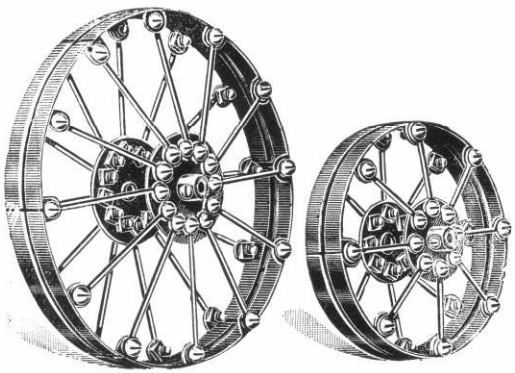
The Wedge end of the Bolster is for spreading open spokes on single Hub Wheels after being bolted on to Hub, Fig. 3.

BUILDING 4, 6 & 8-in. STANDARD WHEELS with DOUBLE HUBS

This is the Standard form of Wheel and suitable for most purposes. After the spokes are screwed to the Hubs, they are given a slight rake by bending them inwards, as shown in the drawing, Fig. 4. They will then be found to fit the section perfectly. The wheels have a handsome appearance, and are perfectly balanced.

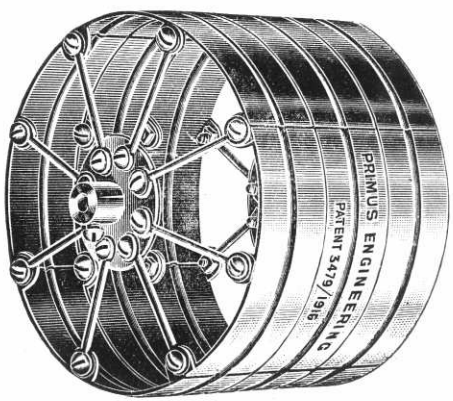
The 6 and 8-in. wheels are built up in exactly the same manner as the smaller one, and once the system is mastered, there is no difficulty.

8-IN. WHEEL.



6-IN. WHEEL. 4-IN. WHEEL.

FIG. 4
SPOKES BENT FOR STANDARD WHEEL.



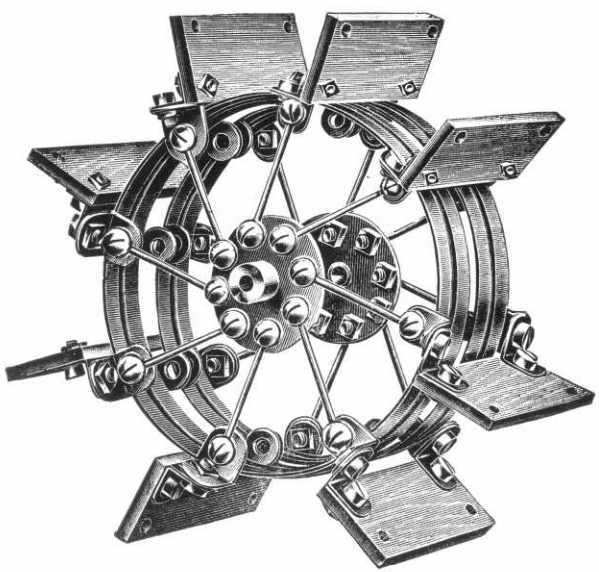
COMPOSITE WHEEL FOR STEAM ROLLER, ETC.

To make composite wheels the same general plan must be followed as for the simple ones.

After one of the Hubs with its set of spokes has been fitted to the set of wheel sections on one side only, the side sections should be screwed together, and lastly the second Hub with its set of spokes should be screwed on.

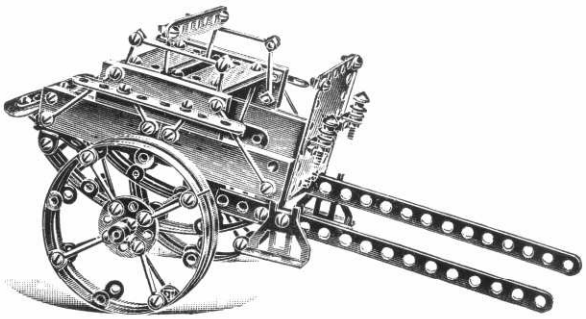
With this plan one side is always open, which makes it more convenient to adjust the screws and nuts.

BUILDING COMPOSITE WHEELS

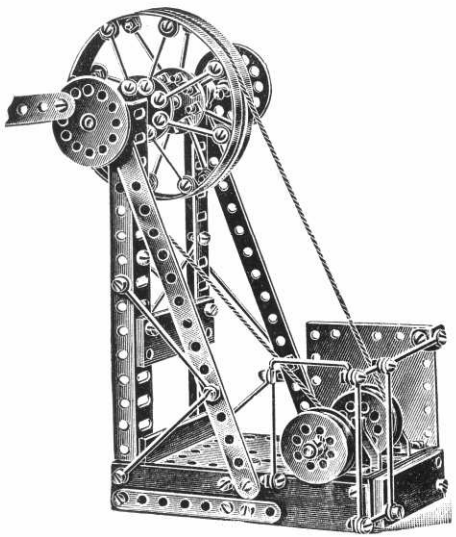


PADDLE OR MILL WHEEL.

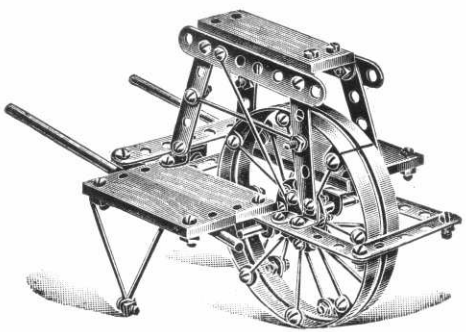
Models made with BIG WHEEL and PRIMUS No. 1 Outfit



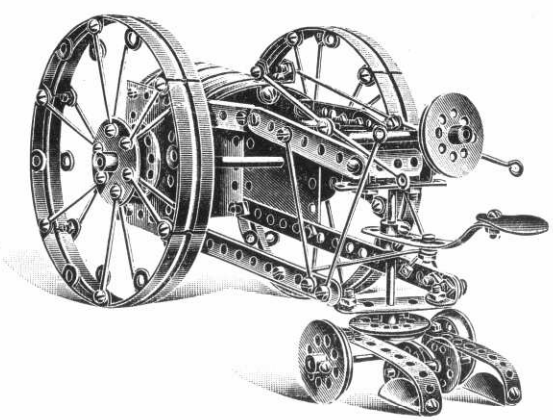
No. 1000—Dog Cart.



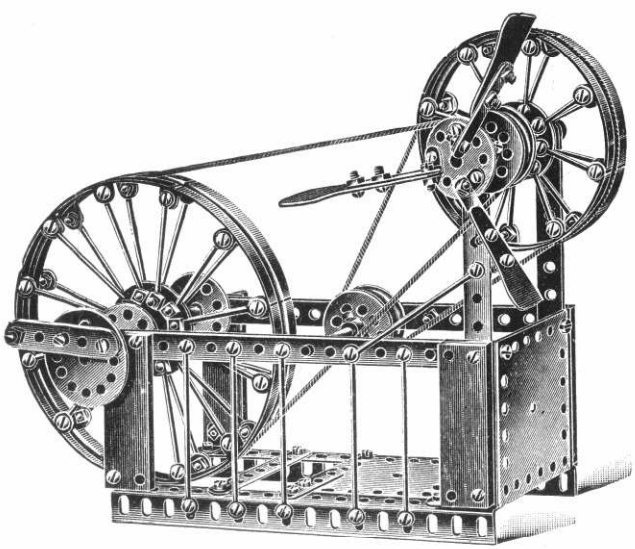
No. 1005—Power Wheel and Counter Shafting.



No. 1004—Chinese Luggage Barrow.

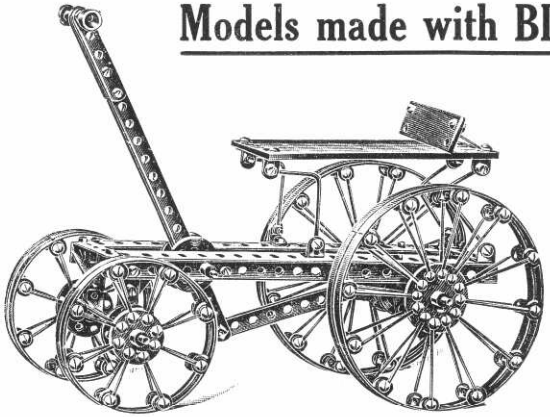


No. 1001—Tractor Plough.



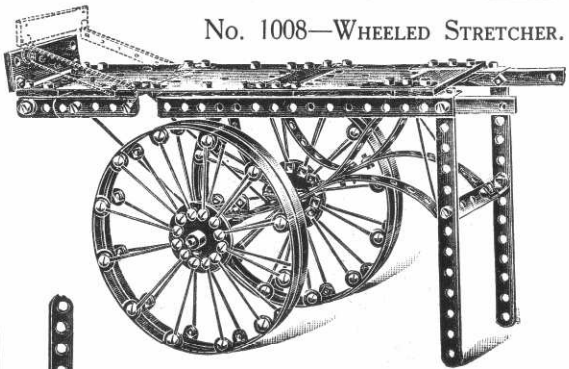
No. 1003—Power Driving Wheel and Fan.

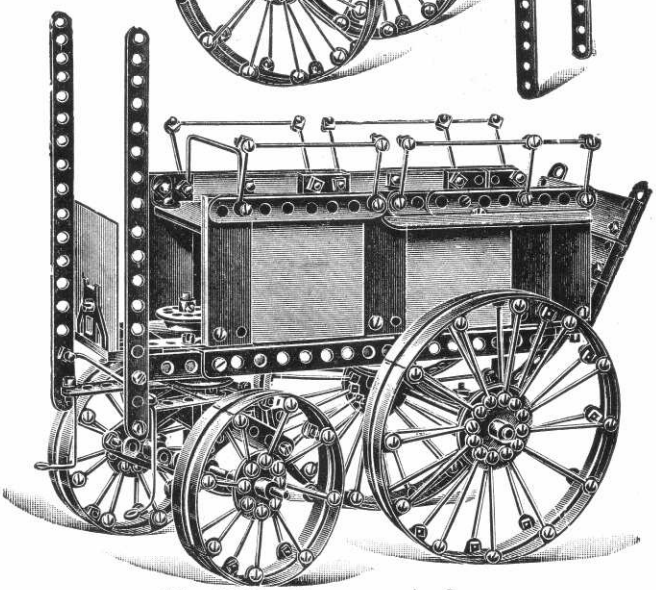
Models made with BIG WHEEL and PRIMUS No. 2 Outfit



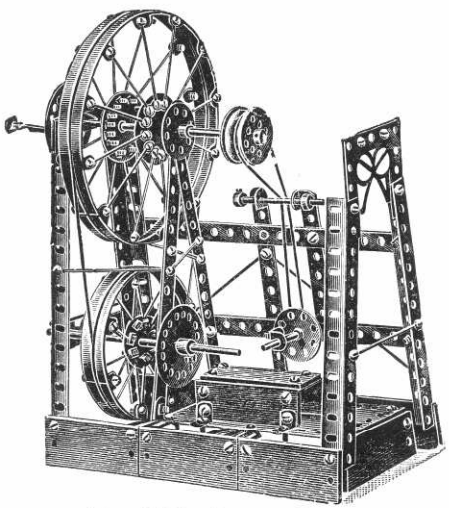
No. 1010—Boy's Scooter Cart.

No. 1008—Wheeled Stretcher.

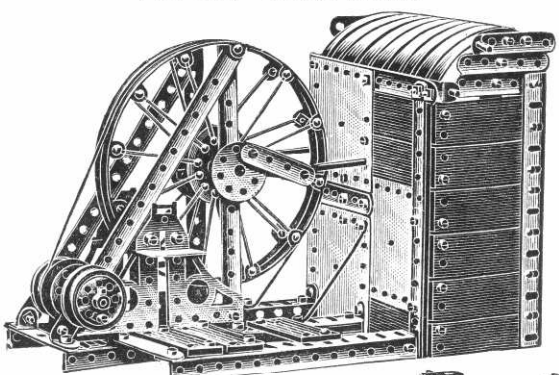




No. 1012—Tradesman's Cart.



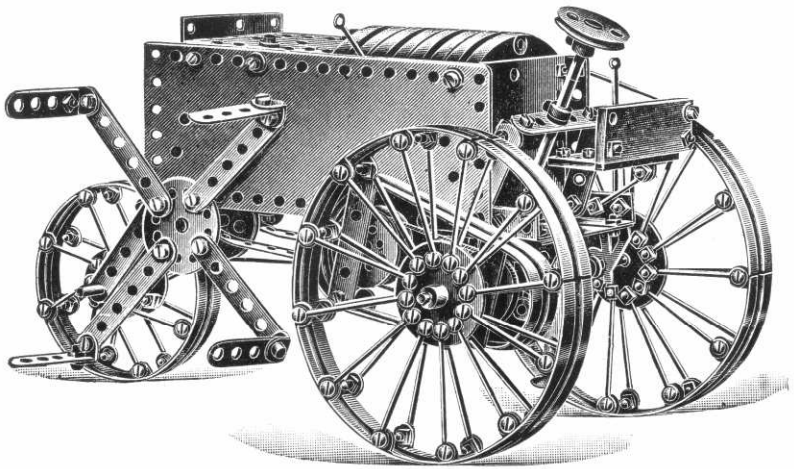
No. 1006—Power Drill.



No. 1009—Power House and Wheel.

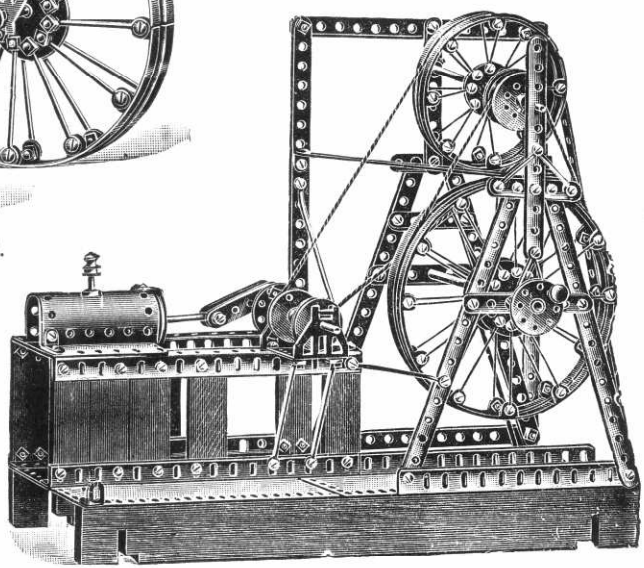
No. 1011—Model of 6-in. Quick Firer.

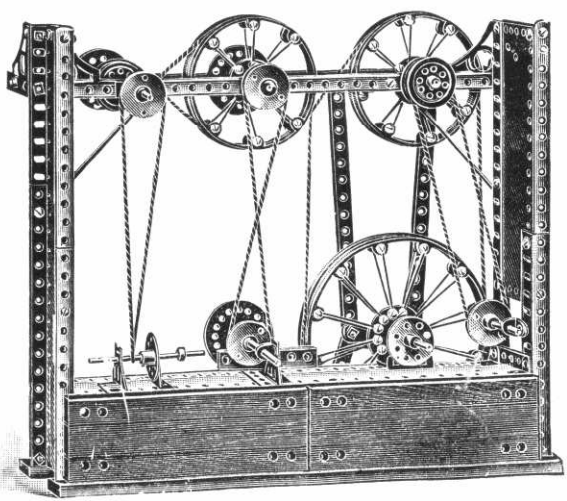
Models made with BIG WHEEL and PRIMUS No. 3 Outfit.



No. 1015—Motor Reaping Machine.

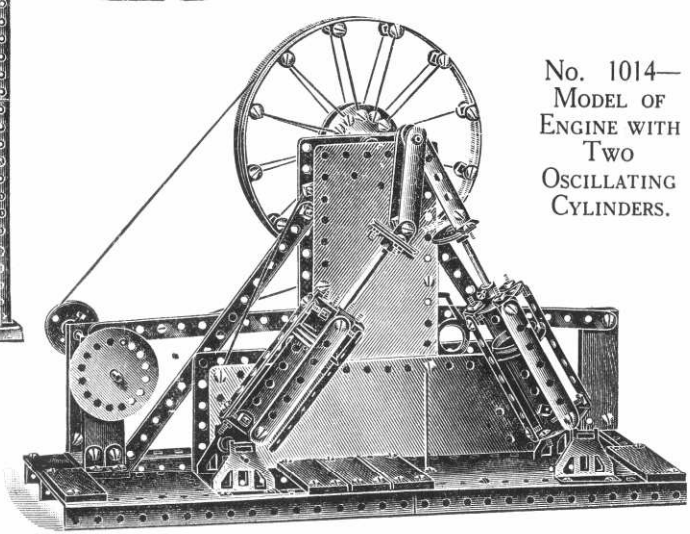
No. 1013—Power Plant With Cylinder.



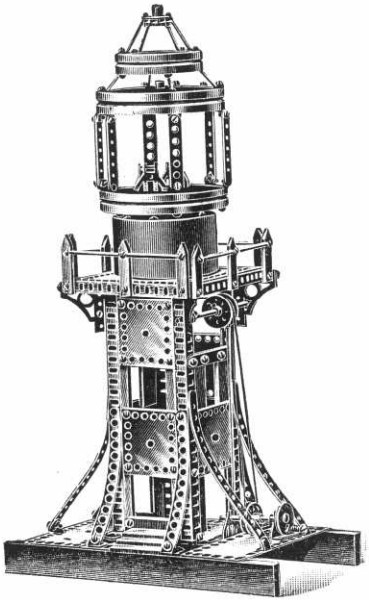


No. 1016—Bench with lathe and Drill—Overhead Pulleys.

No. 1014—Model of Engine with Two Oscillating Cylinders.

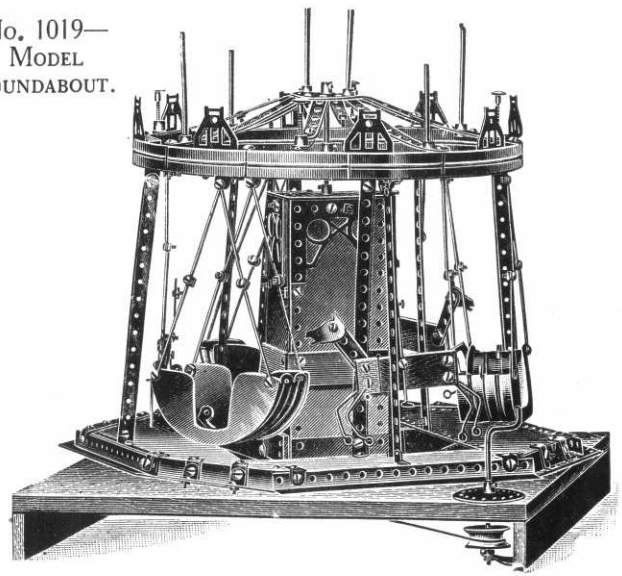


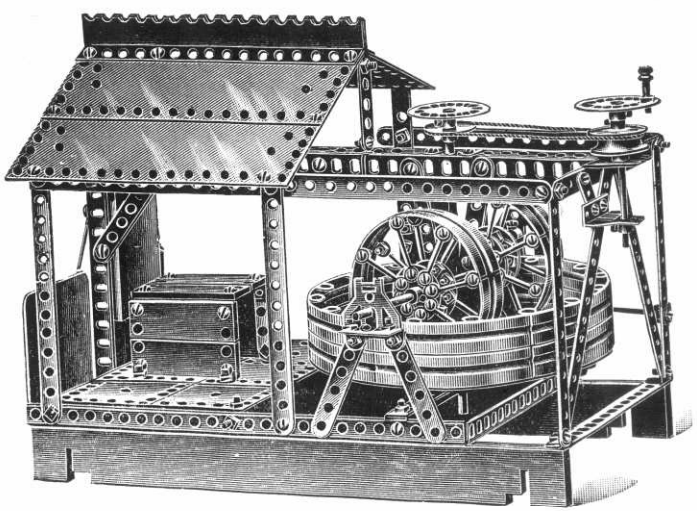
Models made with BIG WHEEL and PRIMUS No. 4 Outfit



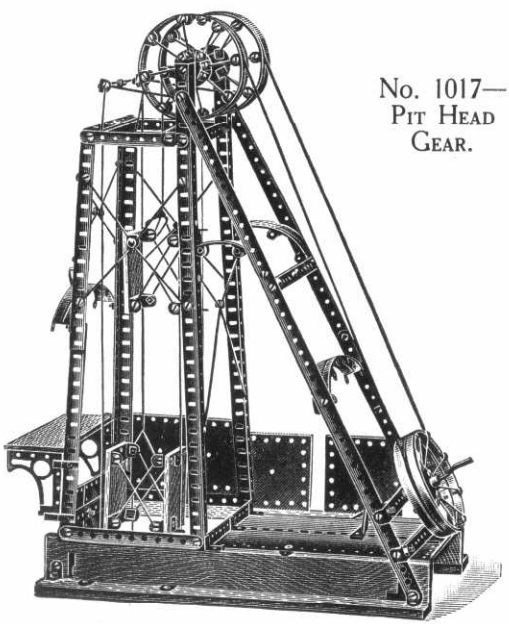
No. 1018—LIGHTHOUSE.

No. 1019—
MODEL
ROUNDABOUT.



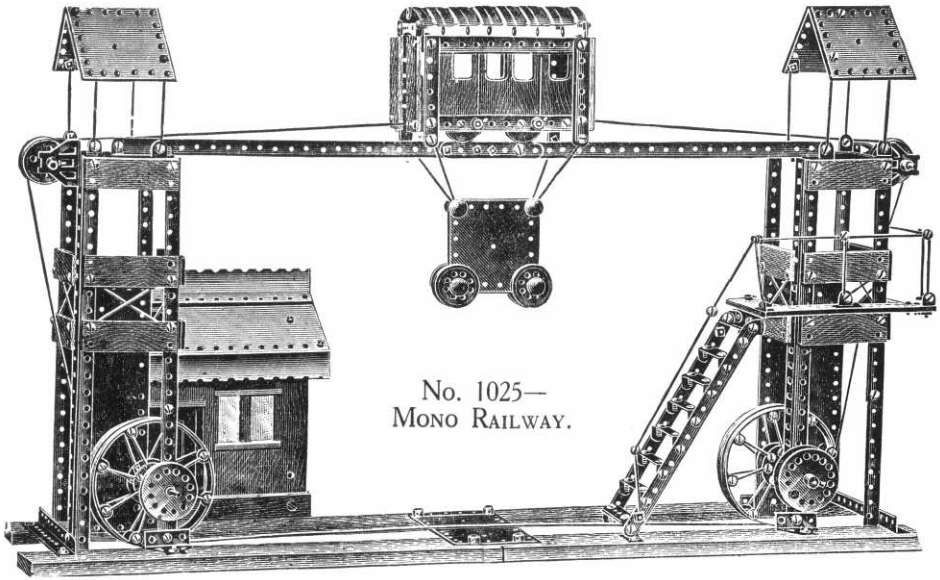


No. 1021—CRUSHING MACHINE

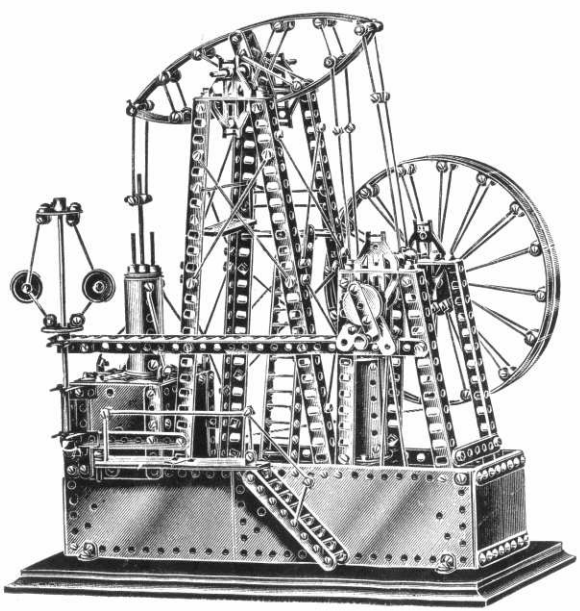


No. 1017—
PIT HEAD
GEAR.

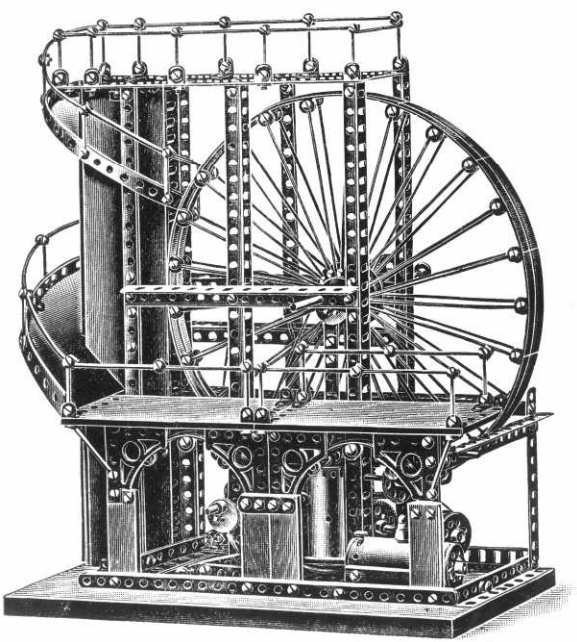
Models made with BIG WHEEL and PRIMUS No. 5 Outfit



No. 1025—
MONO RAILWAY.

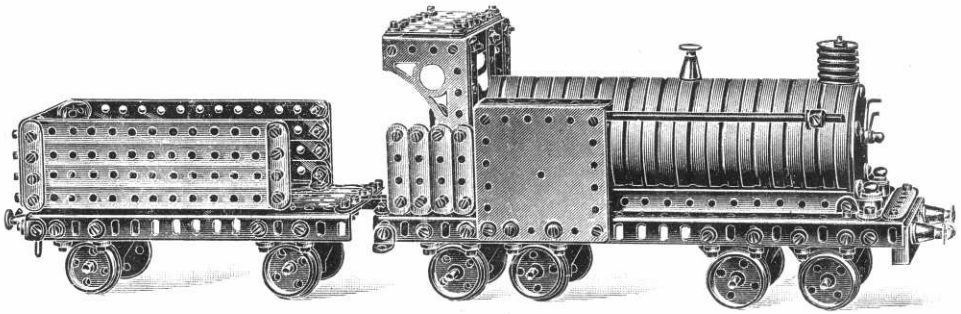


No. 1023—BEAM ENGINE.

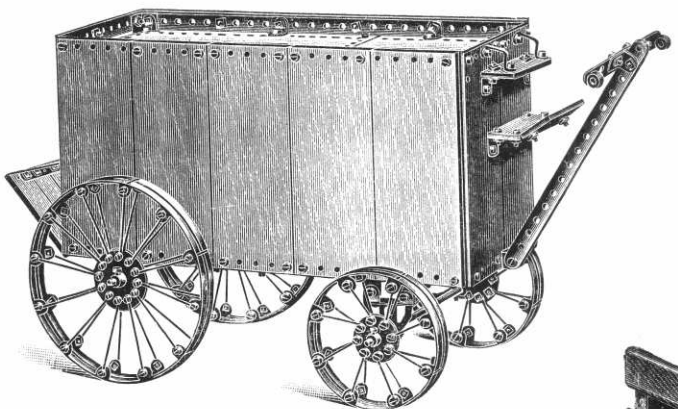


No. 1024—LAXEY WHEEL (12-in. WHEEL).

Special models made with BIG WHEEL and Standard PRIMUS



No. 1027—Express Locomotive and Tender.



No. 1028—Two-horse Pantechnicon.

Primus Engineering has always been famous for the excellence of the models which it enables boys to build. The introduction of the Big Wheel Outfit, however, has made it possible to build models of a much greater variety than heretofore, and those shown in this book are sufficiently interesting to demonstrate the possibilities of a combined Standard Primus and Big Wheel Set.

The models shown in this Instruction Book represent but a few examples of what can be made with Primus Engineering and the Big Wheel Outfit, and boys are urged to bring their own ingenuity to play in designing new models based upon what they have learnt by making the models shown here.

No. 1026—General Omnibus.

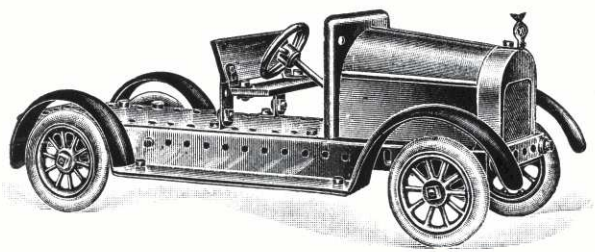
PRIMUS ENGINEERING

Motor Chassis Outfit

Here is something new and good—an instructional Toy which is entirely different from anything else on the market, well made, handsomely boxed, and fascinating to a degree which so far has not been reached by any other Educational Toy. No expense has been spared in the manufacture of the various parts which comprise this Motor Chassis Outfit, and as a result the Model when finished is absolutely correct in the essential and fundamental principles of Motor Car construction, each part having been carefully thought out and developed by Motor Car experts.

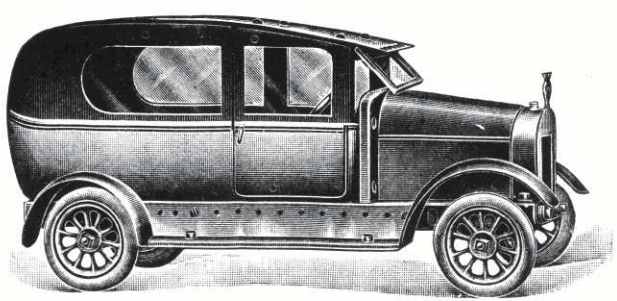
Price 27/6

This outfit enables Boys to build a Motor Chassis, and with Standard Primus Engineering and home-made parts, dozens of complete models



THE PRIMUS MOTOR CHASSIS.

This is the excellent Motor Chassis which the Motor Chassis Outfit enables boys to build.



FOUR-SEATER COUPÉ (MODEL M 2).

The above is one of numerous models which can be built on a Standard Motor Chassis.

Each Motor Chassis Outfit consists of 145 parts, which enables a child to build a magnificent and most realistic model of a Standard Motor Car Chassis.

With the aid of a regular Primus Engineering Outfit, or separate Primus parts, a boy can build really beautiful Touring Cars, Motor Buses, Roadsweepers, Lorries, Caravans, etc., as indicated by the accompanying illustration of a four seater Coupé.

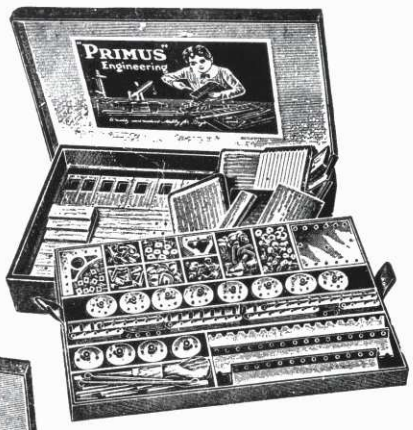
With each outfit a handsome manual of instruction is supplied, which contains full particulars and illustrations of dozens of different models which can be built on this Chassis.

PRIMUS
ENGINEERING
STANDARD PRIMUS OUTFITS

TO-DAY boys are not satisfied with "make believe" Toys. They want to build Models just like the real thing. They want to use Wood for the Wooden parts and Metal for the Metal construction, and it is for this reason that you should stipulate "Primus" when asking for a Constructional Toy.

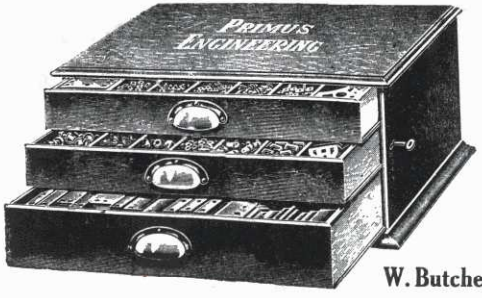
Primus Engineering is the only Toy of its kind which consists of both wood and metal parts.

Primus enables boys to build Railway Carriages, Trucks that run on rails, Windmills, Cranes, and endless models which are a perfect reproduction in miniature of the real thing. When a boy has built a Primus Model it immediately gives him ideas for the construction of others. For the sake of a boy's future as well as his present happiness he should be made the proud possessor of a Primus Outfit.



Standard Primus Outfits

"Junior" contains 57 parts of wood and metal			5/-
No. 0	122		7/6
No. 1	140		10/6
No. 2	267		25/-
No. 3	473		45/-
No. 4	649		65/-
No. 5	1131		105/-
No. 6	1189		
in polished oak 3-drawer cabinet			210/-



Primus Supplementary Outfits.

The object of these outfits is to enable owners of Standard Primus Sets of small capacity to enlarge them, and make them equal in the number of parts to that of the next higher price.

No. 1S converts	No. 1 into the	No. 2	14/6
No. 2S "	No. 2 "	No. 3	22/6
No. 3S "	No. 3 "	No. 4	22/6
No. 4S "	No. 4 "	No. 5	45/-

A Supplementary Wood Parts Outfit has been designed, with the idea of enabling boys owning Standard Primus Sets from No. 2 upwards, to build some of the very advanced models which ordinarily cannot be made without an outfit costing less than five guineas. Furthermore, it should make a strong appeal to boys possessing Constructional Outfits of other manufacture.

PRICE.....37/6

W. Butcher & Sons Ltd., "Camera House," Farringdon Avenue, London, E.C.4.