GILBERT

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YEAR BOOK

1924
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Gilbert Annual Year Book

1924 Edition

CONTAINING:

Useful Articles That Any Boy can Build with a Few Tools.
Engineering Masterpieces of the World and Men Who Accomplished Them.
Chemistry Experiments and How to Perform Them.
How To Build an Electric Car.
How To Hurdle.
Mechanical Card Tricks.
Young People Who Have Made History In Sports.
The Story of Gilbert Toys.
Complete Catalog of Gilbert Toys.
Catalog of Gilbert Radio Apparatus.

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Before you start reading this little book I would like to talk with you for a minute just as I would do if I could have the fun of meeting you face to face.

You know I have a great many boy friends, so many that perhaps you feel that I do not take much interest in each particular boy. If so you are wrong. If you could see how interested I am in the letters that come in here from boys all over the world you would soon change your opinion.

There are good reasons for this. In the first place I was a boy myself not many years ago. And I was a regular boy, too, you can be sure of that. I liked to do the very things that now give you fun and I often wish I were not so busy and could play the games I used to play a few years ago.

I liked athletics and I believe in getting in them not merely as a means of keeping healthy and strong but because there is no better way for a fellow to learn some of the fundamental lessons of life. A chap who goes into athletics will soon learn to be a generous victor and a good loser. He will not let a defeat discourage him and he will not let victory swell his head.

There is another reason. Every one of you boys who have enjoyed the toys that are described in the back part of this book have helped me. Some of you have given me fine ideas for new toys, all of you have helped to spread them all over the world so fast that sometimes the factory has to work overtime to keep up with the demand.

For these reasons and many others I want you to feel that I am,

Your friend,

A. C. Gilbert

President

THE A. C. GILBERT CO., NEW HAVEN, CONN.

Useful Articles That Any Boy Can Build With A Few Tools.

WORK-BENCH

A work-bench is a thing every boy should have, but in these days when the price of labor is so high, the average boy cannot afford to buy a bench, and, if he has one, he must make it himself.

Any scrap lumber that is at hand may be used for making the parts with the exception of the top and the vise. The top should be made of

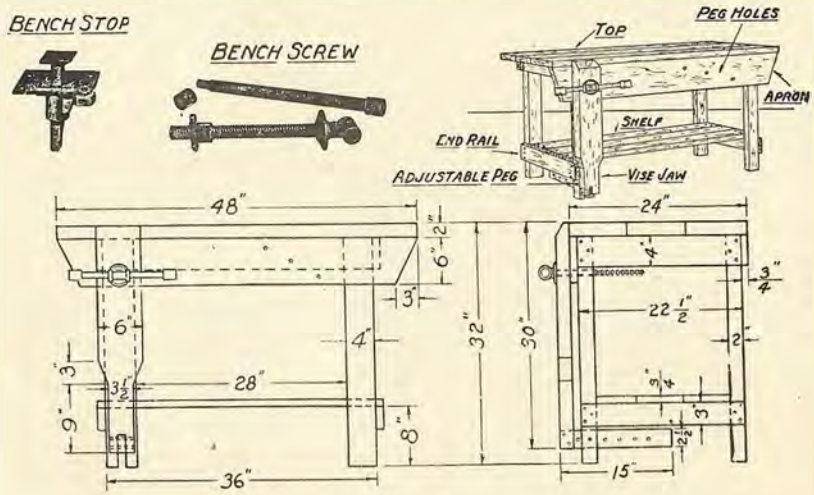


Fig 60

thick lumber making the bench more solid. The vise should be made of two-inch hard wood if possible, so it will not bend under pressure.

First make the legs of pieces of 2" x 4". Then make the top and bottom rails and nail them to the legs. Next, the back rail, and the apron for the front, and also fasten them to the legs with nails. The shelf which is fastened to the bottom rails is for the purpose of storing stock and unfinished work and also making the bench more rigid.

Make the cutout in one of the front legs for the sliding part of the vise and bore a hole through the leg for the adjusting peg

Next make the vise, which consists of two parts. The part that slides through the cutout in the leg, is pinned in a slot cut in the bottom end of the vise. An iron bench screw can be purchased at any hardware store. The screws come in different lengths; of course the longer the screw the wider the vise can be opened. For the screw, bore a hole through the vise, apron and leg. Gouge out a place around the hole in the front of the vise so the round plate will fit up against the vise, fasten it to the vise jaw with screws. The nut is to be fastened to the inside of the leg with screws also. For ordinary work the peg can be left in the first or second hole in the sliding part of the vise, but for holding wide pieces, open the vise and adjust the peg to some other hole.

If you desire a bench stop one can also be purchased and fitted in a hole made in the top of the bench, about six inches in from the front edge, and five or six inches back of the vise so it will not strike the rail.

ANIMAL TRAP Fig. 61

As shown in the drawing, the trap is ready for trapping rabbits, etc., but for use in catching rats and mice, it should be lined with tin to prevent the animals from gnawing out.

Make the box first. Next build the door **H** and the slides for it. See top view for corner of door and slides at **M**. Be sure to allow a little play to insure the parts working easily. On the back of the door brad a small block **Z**. This is the catch which holds the door open when supported on end of part **B**. Part **A** is next fastened to top with nails three inches back from door as shown in the section view. Part **B** is nailed to the long arm **O**. The latter is pivoted in **A** by a nail. Be sure that **O** works freely on the nail.

Part **C** is not fastened to arm **O**, its purpose being to act as a guide. Part **D** is pinned as indicated to arm **O** and to **F**, which supports the platform **K** at the end inside the box. **F** is pinned to **E**, which is to be

nailed over a hole cut in back of box as indicated by dotted lines in the sectional view.

To set the trap, the bait is suspended above the small platform. A fish-hook is useful for this as it holds the bait securely. When

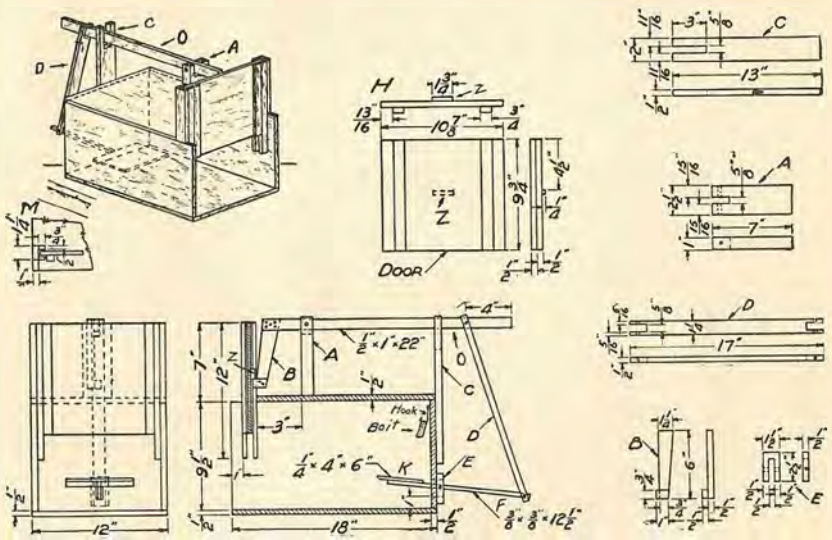


Fig. 61

the animal steps on the platform to secure the bait, the downward motion is transferred through the arms to the trigger, which is drawn back from the door. The latter is released and the animal imprisoned.

KNIFE, FORK AND SPOON BOX Fig. 62

Pine lumber from a good shoe box makes excellent material for this box, as it will take a good shellac or varnish finish.

First get out the sides, ends and partitions. The ends must all be sawed perfectly square, as a butt joint, such as this construction is, never looks well when the fit is not almost perfect.

Next make the handle. Make the finger holes by boring five three-quarter-inch holes on a line one and one-eighth inches from the top edge. Hold the piece in a vise while the boring is done, with the pressure of a vise across the grain. Bore the two outside holes first, working toward the center. Smooth the sides of the finger holes so it will be comfortable to hold. A long brad driven into the handle on each side of the finger hole will add a great deal of strength to it.

Sand all the pieces well, then assemble. Begin by fastening the partition and one end piece to the handle with inch or inch-and-a-

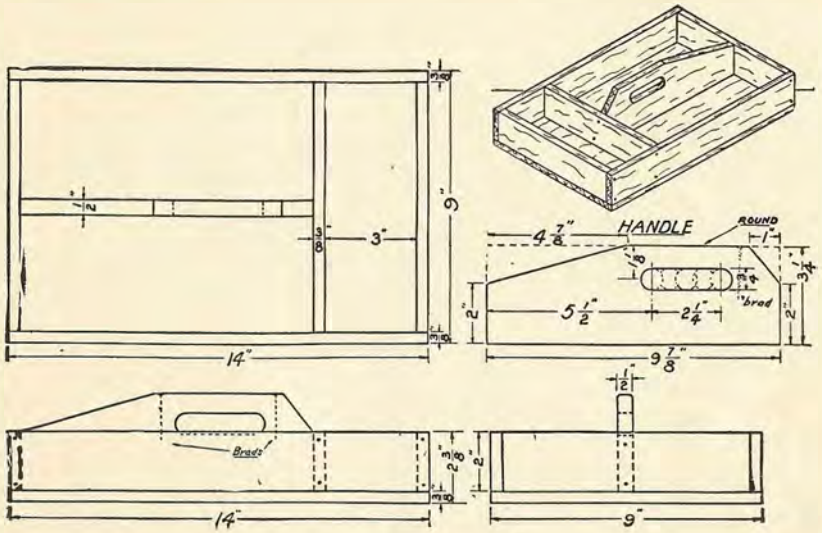


Fig. 62

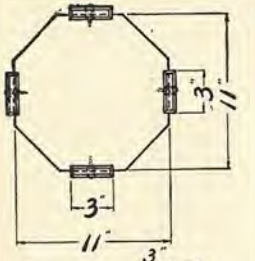
quarter brads. Then fasten the sides and other end to the partition and end in a similar manner. The bottom should then be fitted to the box.

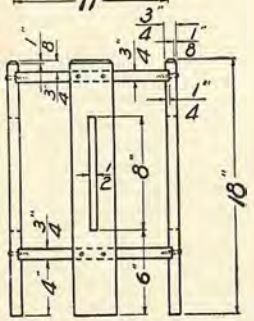
The box should be finished with white shellac, varnish or enamel It should be treated in some way as it will be much easier to keep clean than if left natural.

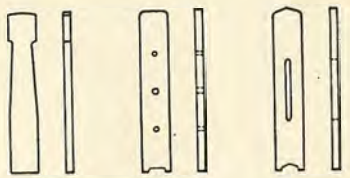
TABORETS Fig. 63

The top and bottom pieces are octagonal shaped, that is, eight sided. The method of laying out is clearly indicated and no difficulty should be experienced.

Lay out the grooves in one leg first, then place all the pieces flat on your bench with the bottoms exactly even, then lay out the grooves







SUGGESTIVE DESIGNS FOR LEGS.

Fig. 63

on the other three by scoring across from the first leg. In this way the grooves will have the same location on each leg, and should the legs vary a trifle in length, the error will be at the top. If at the bottom, the taboret will not set evenly.

Gauge the depth of the grooves, cut sides with back-saw and remove stock with a sharp chisel. Be sure the grooves are the same thickness as top and bottom pieces. If you should have made a mistake in getting these pieces to size, be sure then to cut the grooves to correspond to the thickness you have.

The legs are fastened to the upper and lower parts of the taboret with one-and-a-half-inch round-head screws. In the legs, bore holes seven thirty-

seconds of an inch in diameter. Bore smaller holes in the upper and lower pieces.

To get the legs located uniformly, have the center of each one exactly coincide with the diagonal lines drawn across the top and bottom pieces. If this is not done, the legs might not occupy the same relative position and the taboret might be twisted out of shape.

Very good wood will likely be chosen for this article and it can therefore be stained. This adds greatly to the appearance by "bringing out the grain." It is understood, of course, that all parts should be thoroughly sanded before the assembling is done.

SELF-FEEDING MATCH-BOX Fig. 64

This box may be made from any kind of wood and finished in a variety of ways. It will be well to consider the woodwork in the house, and make the box to match, if you can.

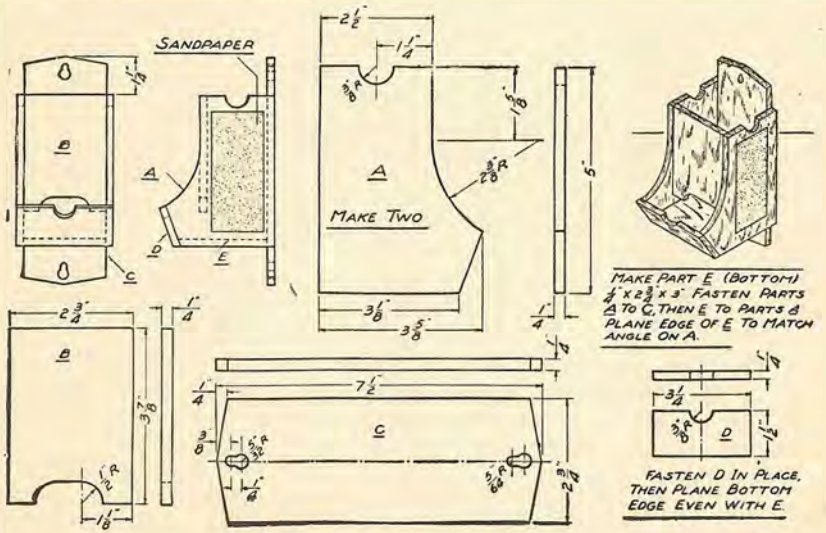


Fig. 64

Make a stock list. Combine pieces if possible in getting out the rough stock. Note that two pieces of **A** will be required. Lay out in one piece and at the center bore the hole indicated in the top, afterwards sawing in two.

The main caution in this construction is in regard to the boring of the various holes. The stock is all rather thin and of course is easily split. Hold all the pieces across the grain where it is possible to do so. To form the rounded portion in **B** and **D**, it is well to bore them. To do this, it will be necessary to place a piece of stock next to each piece in order to hold the bit in place while boring.

The side pieces can be easily sawed to shape with the coping saw. Sand all the pieces well, then assemble with brads, taking great care not to split the stock.

Finish the box to suit.

Chemistry Experiments You Will Enjoy.

Experiment 1. Making Soap. Make a solution of caustic soda or lye by putting 3 measures of Sodium Carbonate and 4 measures of Calcium Oxide into a test tube ½ full of water and boil for 2 or 3 minutes. Allow the tube to cool and when the liquid has settled pour the clear liquid into another test tube. Now add a piece of lard or butter about the size of a marble and boil the liquid again for a few minutes, being careful that the liquid does not bump out of the test tube. You can prevent this by shaking the tube in the flame while heating. Notice that the lard or butter dissolves very readily in the hot alkali.

Now add 3 measures of common salt and heat the mixture again for 2 or 3 minutes. Allow the contents of the tube to cool and notice that the soap separates out as the upper layer. The liquid layer below contains glycerine, salt and impurities. Try washing your hands with the soap you have made.

Experiment 2. How to make Borax Soap. Borax is often put into soap as a mild antiseptic. Melt together in a baking powder cover a piece of soap about one inch square and 6 measures of Borax. Allow the contents to cool. This will give you a borax soap.

Experiment 3. Making Perfumed Soap. Melt together in a baking powder cover a piece of soap about one inch square together with 8 or 10 drops of some perfume. Smell of the soap on cooling. Do you recognize the odor of the perfume? This is the way perfumed soaps are manufactured.

Experiment 4. Making Laundry Soap. Melt together in a baking powder cover a piece of soap about one inch square together with a half spoonful of Water Glass. Allow the contents to harden. In addition to water glass or sodium silicate laundry soaps contain sodium carbonate.

Experiment 5. How to Make Black Writing Ink. Dissolve 1 measure of Tannic Acid in a test tube 1/3 full of water. Then in another test tube 1/3 full of water dissolve 1 measure of Ferric Ammonium Sulphate. Now mix the two solutions and notice the intense dark black color formed by the reaction of the two substances. The black color and precipitate is due to the formation of iron tannate. Try writing with this ink, using a clean pen.

If you wish to make up a bottle of black ink to use permanently proceed as follows: Dissolve 4 measures of Tannic Acid in a test tube ¾ full of water. Pour this solution into a glass containing 6 test tubes full of water. In another test tube ¾ full of water dissolve 4 measures of Ferric Ammonium Sulphate and 1 measure of Gum Arabic. Heat the test tube in order to dissolve these substances. Then pour the contents of this tube into the glass and stir well with a stirring rod. Add 1 or 2 drops of oil of wintergreen to keep the ink from moulding and pour the ink into a bottle. This will give a black writing ink that can be used from time to time.

Experiment 6. How to Make Brown Ink. Dissolve 1 measure of Potassium Permanganate in a test tube ¼ full of water. Write with this ink and notice that when the ink dries it is brown. This ink will not fade for a long time and is hard to erase.

Experiment 7. How to Make Blue Ink. Prussian Blue ink may be made by dissolving 2 measures of Ferric Ammonium Sulphate in a test tube 1/3 full of water and adding this solution to a solution of Sodium Ferrocyanide made by dissolving 2 measures Sodium Ferrocyanide in a test tube ¼ full of water. The blue precipitate formed in the reaction is a compound of ferro-ferricyanide. Write with the ink.

Experiment 8. How to Make Purple Ink. Put 3 measures of Logwood into a test tube 1/3 full of water and boil for several minutes until the solution is deeply colored. Then add 1 measure of Aluminum Sulphate and heat to boiling again. Notice the beautiful dark colored purple ink which is formed. Write with the ink, using a clean pen.

Experiment 9. How to Make Red Ink. Repeat Experiment 264, adding 1 measure of Sodium Bisulphate in addition to the other compounds. This gives a red ink. Write with this ink, using a clean pen

Experiment 10. How to Make Rag Paper. Fill a test tube about half full of rags which have been cut up into very small pieces. Then add 5 measures of Sodium Carbonate and 4 measures of Calcium Oxide. Now add water until the test tube is a little more than half full. Heat the test tube cautiously with constant shaking over an alcohol lamp, holding the mouth of the test tube away from everybody so that no one will be burned if the contents of the tube should suddenly boil over. Boil the mixture for 10 minutes. Then pour it into your mortar and grind it until you have a pulpy mass. Add a test tube full of water and stir the mixture with a stirring rod. Allow the solid material to settle and pour off the liquid. Add some more water, stir once more and after allowing the mixture to stand for a few minutes again pour off the liquid. The water removes the compounds which were in solution.

Examine the rags and notice that you now have a spongy pulp. Remove this from the mortar and press it out smooth on a plate or tin pan to dry. When dry notice that it resembles rough porous paper. This material on a manufacturing scale is made smooth and thin by pressing between huge steel rollers.

Experiment 11. How to Dye Cloth Red. Put 2 measures of Ferric Ammonium Sulphate in a test tube 1/3 full of water and shake the tube until all the solid is dissolved. Now place a small piece of cloth to be dyed in this solution and after it is thoroughly wet, remove the cloth and allow it to dry.

Now dissolve 2 measures of Sodium Sulphocyanate in a test tube 1/3 full of water and place in this solution the dry cloth which was treated with the ferric ammonium sulphate solution. Notice that the cloth is dyed red. Remove the cloth from the solution and allow it to dry.

Experiment 12. How to Dye Cloth Black. Dissolve 2 measures of Ferric Ammonium Sulphate in a test tube 1/3 full of water and place in this solution a small piece of cloth to be dyed. When the cloth is thoroughly wet, remove it and allow it to dry.

Now dissolve 2 measures of Tannic Acid in a test tube 1/3 full of water. Place the dry cloth in this solution and after shaking the test tube a few times, remove the cloth and allow it to dry. This time the cloth is dyed a black color.

Experiment 13. Testing Cloth for Cotton, Wool and Silk. Obtain a few small pieces of cloth and burn the different samples by heating slowly on the spoon over a flame. If the sample gives off an odor like burning hair, it contains wool or silk. If it burns giving off an odor like burning paper and leaves a white ash it is cotton. This is the burning test which is applied to fabrics.

Experment 14. To Determine the Composition of Fabrics. If a textile expert wishes to know what percentage of wool or cotton there is in a sample of cloth containing both of these fibers, he simply dries the sample, weighs it accurately and then treats it with a boiling solution of caustic soda. The caustic soda dissolves out the woolen fibers leaving the cotton fibers unchanged. He then removes the cloth, washes it with water and dries it. By weighing again and getting the difference in weight, he can easily calculate what part of the cloth is cotton and what part is wool.

Put 3 measures of Calcium Oxide and 3 measures of Sodium Carbonate in a test tube half full of water. Boil the solution for several minutes and when the solution settles somewhat pour the clear liquid into another test tube. This is sodium hydroxide solution. To this solution add a piece of wool yarn and boil for 2 or 3 minutes. Notice that the wool dissolves. Put in a small piece of silk and boil again. Notice that the silk dissolves also. Now put in a small piece of cotton cloth and notice, on boiling, it will not dissolve, proving that the cotton fiber is not attacked by alkalies. Artificial silk is not attacked by alkalies and can be distinguished from true silk in this way.

Experiment 15. How to Test for Linen in Cloth. Put a small piece of linen in a test tube half full of water and add 1 measure of Sodium Bisulphate. Heat the solution to boiling. Then take out the linen, wash it two or three times with water and then dry it. After it is dry, loosen several of the fibers with a pin or needle and moisten them with a drop or two of Glycerine. Press the cloth between two blotting papers and then examine very carefully the fibers which were moistened with glycerine. The linen fibers will be semi-transparent while the cotton fibers will be dark or opaque.

World Famous Engineering Masterpieces And Engineers Who Were Responsible For Them.

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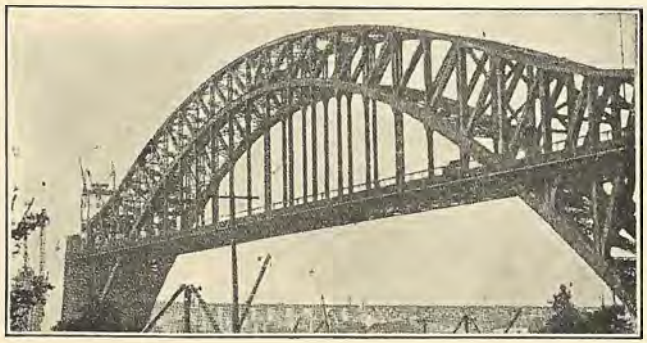
THE EIFFEL TOWER

Courtesy of Scientific American

Erected in Paris by Alexandra Eiffel for the exposition of 1889. Work was started in 1887 and completed two years later. The tower is 984 feet in height, by far the loftiest artificial structure in the world. At its base it covers nearly two and one-half acres. The tower contains several observation platforms stationed at various heights from which on clear days a remarkable panoramic view of Paris can be obtained.

THE HELL GATE BRIDGE

This marvelous example of engineering skill connects Long Island with New York. It is the longest four-track bridge in existence. It saves the expense of many thousands of dollars to the railroads, and greatly reduces the traveling time of numerous trains running to and from New York The engineer of this remarkable structure is Gustav Lindenthal.



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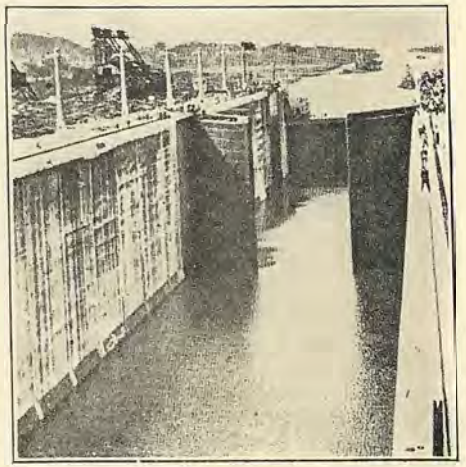
THE BROOKLYN BRIDGE

Courtesy of John A. Roebling's Sons' Co. Trenton, N. J.

On June 3, 1870, work started on the bridge that was destined to be in its time, the largest bridge in America. On May 24, 1883, thirteen years later, the mighty work was complete. Every day hundreds of thousands of people, miles of automobiles and street cars swarm over its mighty span, while below tugs, battle craft, steamers and barges move past on the waters of the East River. The bridge is 86 feet wide, 7,580 feet in length, and cost $23,200,000 to build. John A. Roebling was the engineer of this great bridge.



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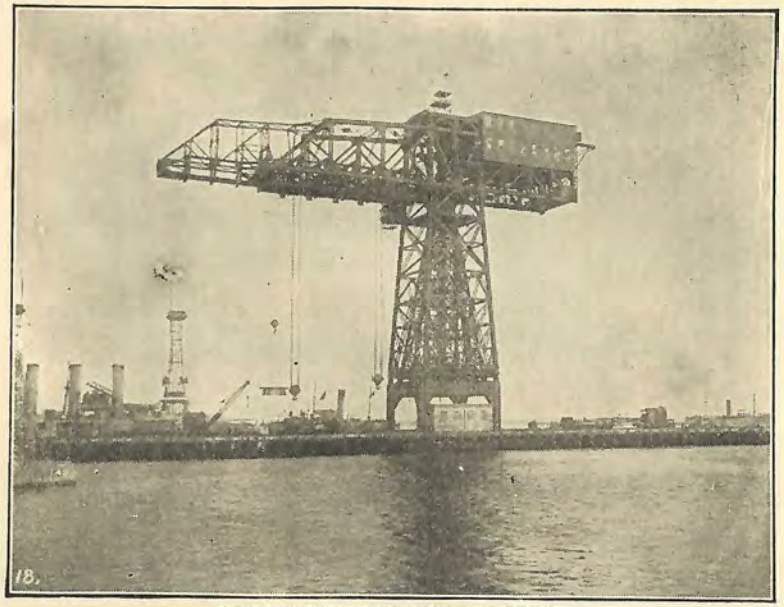
THE PANAMA CANAL

Copyrt. C.V. Buck Washington, D. C.

Where the French DeLessips was balked by Nature and lack of system at Panama, Colonel Goethals came with his staff of thousands of trained engineers, armies of laborers, battalions of machinery, and won a battle in the hills that at last resulted in joining the Atlantic to the Pacific. American ingenuity, long years of engineering training, and a vivid imagination made this victory possible.



LARGEST CRANE IN THE WORLD

League Island Navy Yard, Philadelphia, Pa Will lift 350 tons, equivalent to about 35 road rollers

John A. Roebling, designer of the Brooklyn Suspension Bridge surveyed the line of the Pennsylvania Railroad over the Alleghany Mountains. He was the first man to manufacture wire and wire cables in America, and great factories in Trenton still bear his name.

He designed a number of bridges to carry water pipes across rivers, and in 1851 began the famous Niagara Suspension Bridge, the first railroad suspension bridge in this country. In 1868 he designed the Brooklyn Bridge. While superintending the building of some of the first stonework his foot was crushed and he died of the injury.

His son, W A. Roebling, returned from Europe, where he had been studying methods of putting in foundations under compressed air, to take charge of the work. In 1871 he was prostrated with a caisson disease caused by working in compressed air. Determined to finish the work, he hired a house from the windows of which he could see the bridge, and retained full charge until the bridge was completed in 1883.

Look at the picture of Brooklyn Bridge and think of Mr. Roebling living in some house along the water front towards which you are looking. At

QUEBEC BRIDGE (1917)

The Quebec Bridge has the longest span of any bridge in the world. The two piers which come in the river are 1800 feet from center to center.

that time the Woolworth building and various others which you see had not been built. The four large cables which you see in the foreground of the picture are each made up of a number of smaller wire cables. These smaller cables, each made up of a number of small wires, were securely tied together and then covered with several covers so that no water could leak in to rust them. In the picture each cable looks like a single strand. When the first wire had been carried across the river in a boat and hoisted over the towers, Mr. Roebling insisted on being hauled across the river in a basket to test the wire before he asked any of his men to go across.

A cantilever bridge is similar to two see-saws, one on each side of a stream. If you could put enough boys on the sides of the see-saws towards the shore to hold them to the ground, you could build out the other ends till they met over the center of the stream. If it were not done this way a temporary wooden bridge would have to be built across the stream under the steel bridge to hold it up while it was being built. This is very often impossible on account of the cost and difficulty of putting in the middle of a river anything which the current might easily sweep away during a flood.

Build An Electric Car That Will Operate.

A Miniature Electric Car That You Can Build Very Easily With Any Small Electric Toy Motor.

Get the largest cigar box that is used, that is one with square ends, and cut a hole in the bottom ½ an inch wide and 2 inches long, as shown at

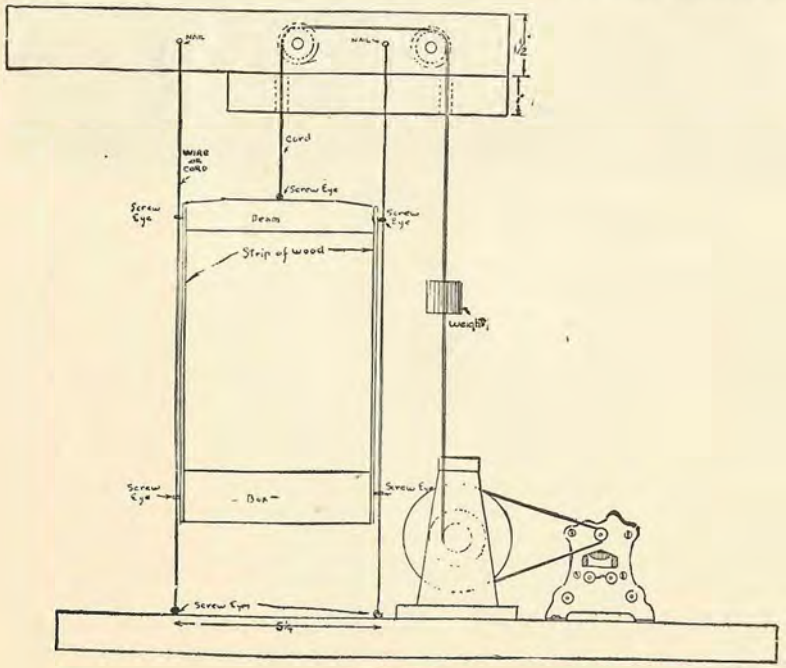


Fig. 57

A in Fig. 58. Then make four supports for the car wheels ½ an inch thick, 1 inch wide at the top, and ½ an inch wide at the bottom, and 1 inch high, and bore a ¼-inch hole in the small end of each one, as shown at **B**, and nail them on the outside of the bottom of the box, as at **C**. Screw a screw eye into the end of each support, run a dowel 5 inches long through one of the eyes, then through a spool in which you have smeared some glue and on through the other screw eye; run another dowel through the other pair of screw eyes and glue a half spool on each end of each dowel with the flanges inside, as at **C**.

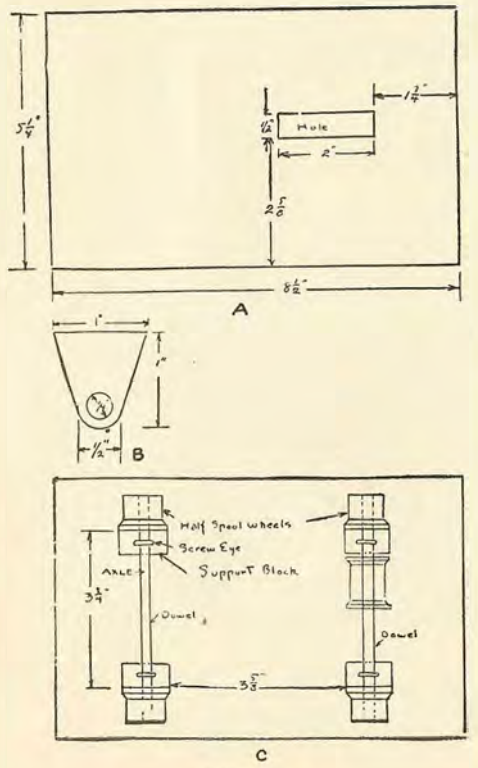


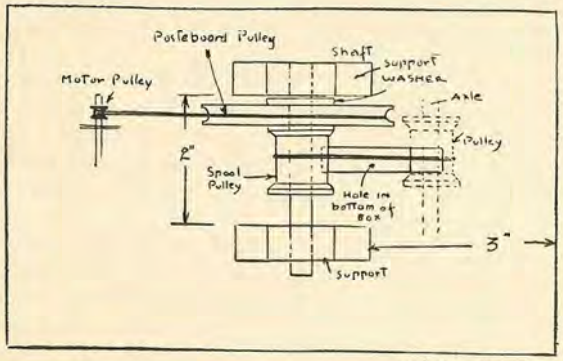
Fig. 58

Next make two supports 1 inch thick, 1 inch wide at the top, 2 inches wide at the bottom, and 2½ inches high; nail these on the inside of the bottom of the box, as shown at **E**. Make a grooved pasteboard pulley ¼ inch thick and 3 inches in diameter with a ¼-inch hole in it for the shaft and glue it to a spool; smear some glue in the pulley and spool and slip a dowel 3¼ inches long through the screw eyes, pulley, spool, and washers, as at **D**.

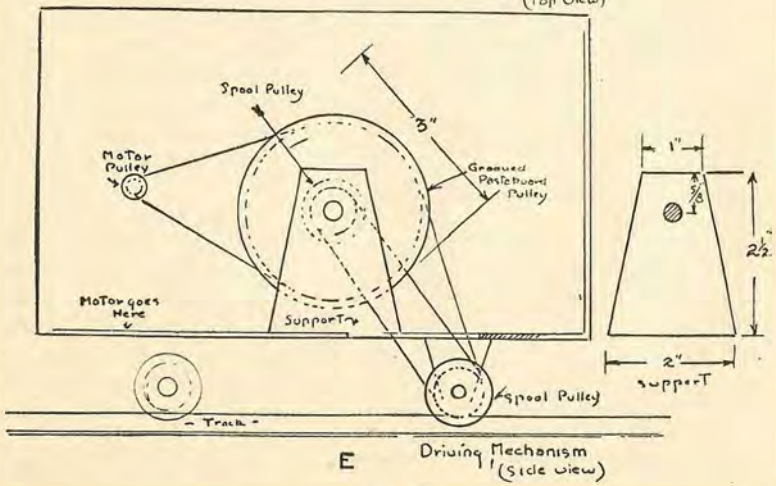
This done, screw down the motor to the middle of the box at one end, then belt the motor pulley to the pasteboard pulley and the spool on the motor-driven shaft to the spool on the axle, as at **D-1**.

Now make a trolley pole of a strip of wood

⅛ inch thick, ⅜ inch wide, and 2½ inches long, as at F. Take two pieces of No. 16 or 18 bare copper wire, bend them into a pair of contact forks and fasten them to one end of the trolley pole; solder two pieces of No. 18 insulated copper wire about a foot long to the forks



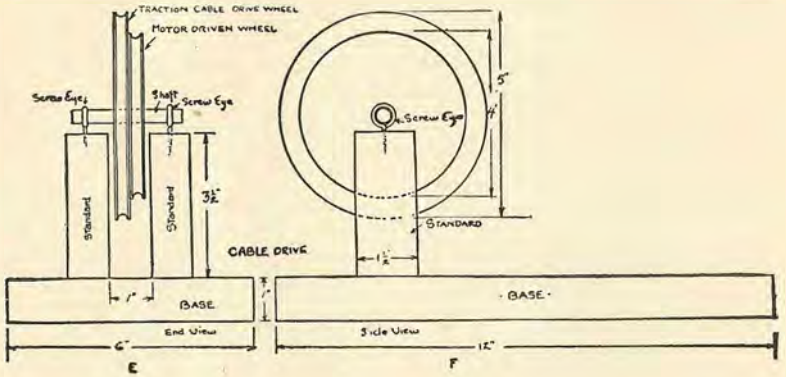
D Driving Mechanism (Top View)

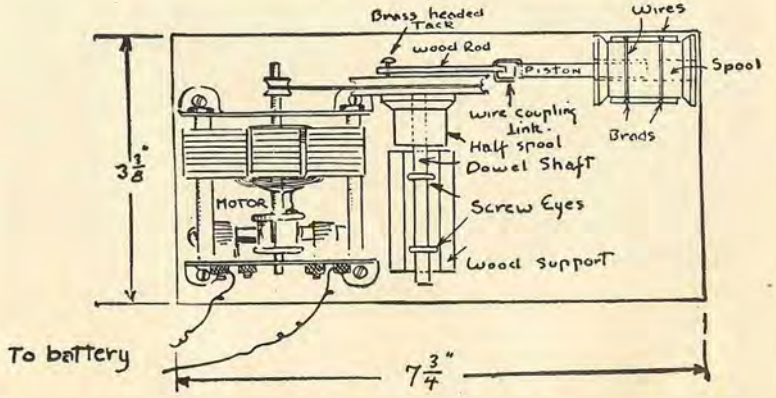


E Driving Mechanism (Side view)

Fig. 58

and fasten them to the lower end of the pole. Fix a little brass hinge to the lower end of the pole and to the end of the cigar box, and then bring the wires into the box and connect them to the motor, as at G. Screw a screw eye into the trolley pole and another one in the front





D-1

Fig. 58

end of the car and tie a rubber band to them when your car is ready to run.

For the trolley line fasten the ends of two No. 12 or 14 bare copper wires to a piece of hard fiber ¾ inch apart and support these 10 inches above the track. Solder a pair of wires to the trolley wires at one end and connect them with your reversing switch and a battery of six dry cells, or better, a Gilbert transformer. Finally, make a track of wood strips that are ⅜ inch wide, ½ inch high, and as long as you want it, and space them 3⅞ inches apart on ties. Turn on the current and your trolley car will pull out at a lively rate of speed. You can make a real Toonerville car by building up the body of the car of pasteboard on the cigar box.

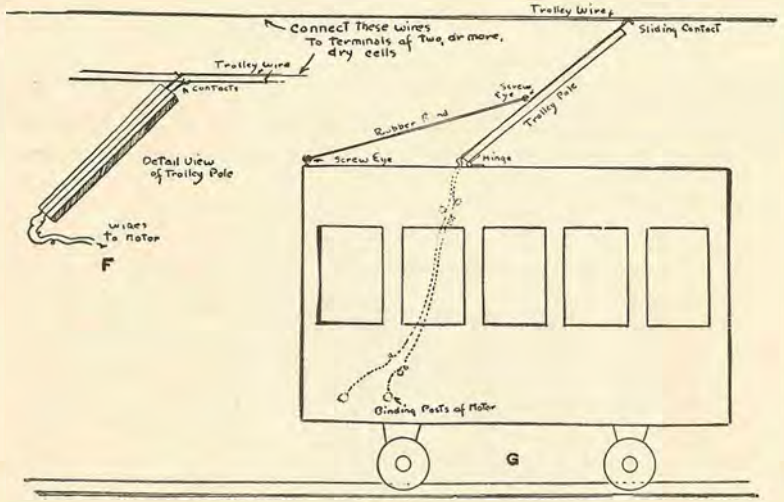


Fig. 58

The Science of Hurdling

BY HARRY HILLMAN

Track Coach, Dartmouth College

Photos of Earl J. Thomson, Holder of World's Record 120 High Hurdles.

We will in the following article, endeavor to tell you "How to Hurdle" and we will take as our subject Earl J. Thomson, internationally known as the World's Greatest Hurdler. One of the interesting, if not the most interesting information relative to a champion, is to trace his youthful days up to the time said athlete becomes a champion. Before we go into the details of the technic and training of hurdling, let us follow Thomson's career from his boyhood days up to the time he excelled in athletics.

EARL J. THOMSON
Dartmouth College
Holder World's Record 120 High Hurdles, 14 2-5 seconds

HARRY HILLMAN
Coach at Dartmouth College

Earl J. Thomson was born at Prince Albert, Saskatchewan, Canada, February 15, 1895. His youthful days were about the same as any other red-blooded youth. At 12 years of age he won his first athletic event, winning a high jump at Pasadena, Cal. with jump of 4 feet 4 inches.

He did very little in track athletics from that period until 1914 but participated in the regular boy sports. Entering high school in 1911 Thomson witnessed his first hurdle race. Altho very much interested in track, he was too young to actively engage in the sport.

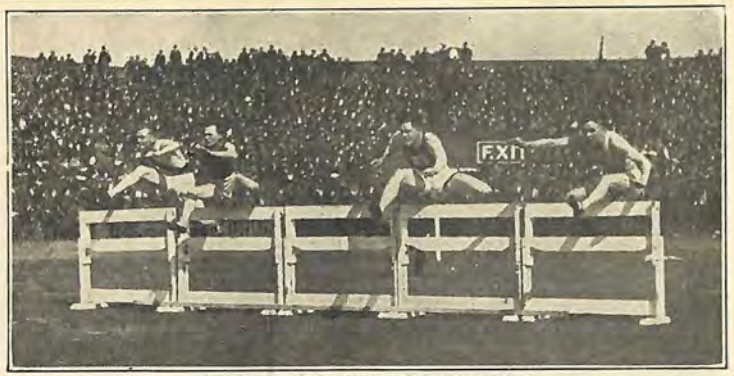
Entering his junior year at high school in 1914, Thomson decided to try for some athletic team, so chose football, playing on his school team as an end. Later when the track season came along, he was a candidate for the team. You will notice that Thomson did no real track work until he reached the age of nineteen. He was then mature enough to start in earnestly. An interscholastic meet was held, Thomson winning seven firsts, and immediately he started to climb the ladder of success. He was heralded as a coming athlete.

The next year he received some instruction in hurdling and during the season won all the interscholastic high hurdle races Altho he was timed 15 1-5 seconds for the 120 yd. high hurdle, which eclipsed the interscholastic record, the time was not officially allowed due to a slight wind. The same summer Thomson represented the Los Angeles Athletic Club, at the National Amateur Athletic Championship meet, held at San Francisco, Cal., winning a third place in the high jump. The following year Thomson entered the University of Southern California. Fred Kelly, at that time was one of the star hurdlers of the country and Thomson faithfully watched Kelly in his training and in his races. Kelly was interested in young Thomson and gave him a lot of information about hurdling. At the end of the season Thomson surprised the coast authorities by defeating Kelly in several races. Besides competing in hurdle races, Thomson entered many competitions in throwing the discus, high jumping and broad jumping. His early training was an all-round one.

In the fall of 1916, Thomson came East and entered Dartmouth College. He was then one of the best hurdlers in the country. He competed some during his first year at Dartmouth, winning several races of note. Having some difficulty with his scholastic work, he spent most of his time on his studies.

About this time the war broke out and Thomson, being a Canadian joined the Royal Flying Corps, serving throughout the war in that organization. While in the service, Thomson finished third in the American All-round Championship with little or no preparation. This competition is one of, if not the stiffest competition in athletics, as it necessitates an athlete competing in ten events during an afternoon. He also won the 120 yd. American High Hurdle Championship during the war period, besides winning many competitions in the Canadian Army.

At the conclusion of the war, Thomson returned to Dartmouth and immediately began



THOMSON OVER THE HURDLE.
Note the arm action. Thomson is second from the right with a D on Shirt.

to rise high in the athletic world. He won innumerable championships, incidentally establishing many records.

Some of his important records are as follows:

120 Yd. High Hurdle, 14 2-5 seconds—World's Record.

120 Yd. High Hurdle (on grass) 14 4-5 Sec., made in England.

75 Yd. High Hurdle; 45 Yd. High Hurdle; 70 Yd. Low Hurdle; and the 110 Meter High Hurdle, World's Olympic Championship, making a new record for this distance of 14 4-5 Seconds. Thomson holds the 120 Yd. High Hurdle Records as follows:

Pacific Coast Record,
College Record,
Intercollegiate Record,
Canadian Record,
English Record,
American Record,
Olympic Record,
World's Record.

His two most noteworthy performances were the 110 meter High Hurdle Olympic Championship, won at Antwerp, Belgium in 1920; and the Intercollegiate 120 Yd. High Hurdle Championship won at Philadelphia in 1920. In both of these performances, Thomson established World's records. His Olympic Record as stated above was 14 4-5 seconds and the World's 120 Yd. Record was 14 2-5 Seconds. This latter event is no doubt his most noteworthy performance and a remarkable record.

When one considers running 120 yards over ten flights of three feet six inches in height in 14 2-5 seconds, it is time for some reflection. A sprinter, running 100 yards in ten seconds is considered a very good man, in fact there are very few consistent ten second athletes in the country to-day. Running 120 yards on the flat in twelve seconds would be a very good performance. Clearing ten high hurdles in 2 2-5 seconds together with the twelve seconds for the 120 yds, will total 14 2-5

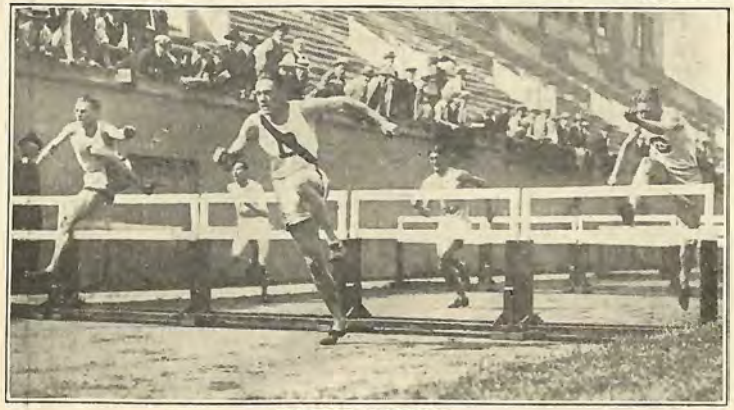
NEARING THE GROUND

Note the difference in arm position from photo No. 3 Right arm is coming forward and left going back. This is part of the double right arm drive

seconds. This more in detail shows that Thomson's above race was exceptional.

What were the requirements necessary to make it possible for such a performance: Speed, Form, Strength, Height, Fast competition, Good Weather, Good track, Good physical condition and a whole lot of nerve and fighting instinct. Thomson had all these qualities, besides the finest details of the hurdling game, which took him years to master.

Now we will go back to the details of the "Science of Hurdling." A high hurdler needs speed and height to be capable of real good performances. Most all of the real top notchers have been tall, rangy and fast athletes with one or two exceptions. Kraenzelin, Shaw, Smithson, Garrels, Murray, Kelly, Nicholson, Barron, Smith, Simpson and Thomson were six footers or over. Erdman, the recent Princeton hurdler was one of the real good small



ON THE GROUND

Notice Thomson is not landing on his heel. Left leg has come over bar with a swift though not jerky drive and is in position for the next stride. Body is forward.

THOMSON WINS FOR DARTMOUTH IN 120 YARD HURDLES

Thomson's form is not so good in this photo due to the heavy turf course. He is too high over the hurdle and his arm action is not what it should be. The hurdler on the left has very good leg action, but his arm action is faulty. Hurdler on the right—left arm action too high.

timber toppers On account of his size he was a great performer.

Height permits an athlete to step over and not jump the hurdles This to-gether with the technic, consisting of the front stab with both arms, the quick tho not jerky snap with the rear leg and the quick getaway on landing and SPEED are the essential points in high hurdling

Supposing a young fellow has tried his luck at sprinting and altho fairly tall and possessing some speed, but not enough to ever be a real sprinter. This is the type of athlete who should start right in and master the details of hurdling If he has enough perserverance, is willing to learn and attempts to help himself by reading everything he can about hurdling, asks every coach or hurdler he knows or meets, all the points he does not understand and then when he gets so he knows he is on the right track, keeps at it, gradually he will become a hurdler.

As a starter take one low hurdle (2 ft. 6 in.) decide which foot should go over first, you can tell by using the one feeling most natural. Have someone who knows something about hurdling watch you, but always have in mind what you are after yourself as to form etc. Stride easily to the hurdle and step over, without any rise in the air, similar to stepping over a fence, but with the use of your arms, body and legs in unison as is explained with the aid of the action photographs. Later substitute the high hurdle (3 ft. 6 in.) and do the same. This will be somewhat more difficult, but obtain a light hurdle and keep at it. For indoor practice use a thin gym mat.

Exercises as stepping over a chair top 3 ft. 6 in. high or

thereabouts, in your room morning and evening, will develop muscles necessary to a hurdler. If you have a large looking glass handy, watch yourself in the several exercises. Another exercise: Raise the front leg as in hurdling and bring your rear leg to the clearing position. Practise to keep your rear inside ankle bone parallel with your rear inside knee. Bend the body forward in these movements. Thomson's favorite exercise was to sit on the ground, or on the floor of his room, with his right leg stretched out in front, and his left leg drawn up at his side, in the position of going over the top of the hurdle. From this position lean forward, stretching the left arm forward and parallel with the right leg. Force the upper part of the body forward and backward several times, keeping the chest to the front and the upper part of the body from leaning to the right side.

Do not take off too far from the hurdle; you should be in a position for the hurdle without reaching for it. The knee should be lifted up—not in a stiff forward motion, but a bent knee action as in stepping over an obstacle. As the front leg swings up, the opposite arm goes forward as far as possible the other arm about half the forward distance of the first arm. Both arms assist the balance, and the shorter arm assists the hurdler in getting to the ground, with the help of the down thrust of the front leg. As the top of the hurdle is reached the upper part of the front leg (thigh) and the chest very nearly meet each other, both arms at this point being extended as before. As the back leg nears the top of the hurdle, the shorter arm gives a quick short snap back and then partially forward again, and as the ground is neared, it snaps back and forward again as in sprinting. The rear leg drives forward simultaneously with the last thrust of the right arm in making the drive for the next hurdle. This double "shorter" arm action was first seen in Thomson's hurdling. It may be difficult to master this arm action, but if once acquired is bound to be of great help.

In coming down from the hurdle, the tall hurdler attempts to get down to the ground as soon as possible, landing about three feet beyond the hurdle. The average take off for a big man is about 6 feet, with a landing of about three feet as stated on the further side of the hurdle. Do not straighten up going over the hurdle. The head really should be lower on top of the hurdle than in the natural flat running position.

If you can acquire the above principles, or most of them, you should develop into a good hurdler.

The low hurdling principles in a way, are similar to the high hurdles, but speed in this event is more important than form a: a fast poor hurdler will beat a slow good hurdler. the combination of the two being advisable. The average size man has more of an opportunity of defeating the taller man in this event than in the high hurdles. The regulation seven strides are used between the hurdles, not counting the stride over the hurdle. Some good hurdlers have alternated and taken 8 strides between the obstacles, but the 9 striding hurdler is lost in fast competition. This does not necessarily mean that a schoolboy should not hurdle if he must take 9 strides, as eventually he, no doubt will lengthen his stride as he develops. When once in college ranks or "big" competition make use of the seven strides if possible.

A good even fast gait is the one usually most successful in the low hurdles. An even stride thru the race is necessary. Keep the chest always in front, slightly bent body going over the hurdles, and if you have difficulty in getting close enough to your next hurdle sacrifice getting to the ground too quickly and make your leap more of a stab forward to make up ground. The use of the arms is about the same as in high hurdling, with the exception the arms are usually spread more and not so much time need be put on the arm shift or double shift of the shorter arm. The straight shoot forward in going over the bar is the necessary asset to a low hurdler. Keep fairly close to the hurdle, but not as close as in the high hurdle. There should be no hestitation. The rear leg should be drawn up as in the high hurdle, but not nearly so high, and this particular leg should be in a position for an immediate quick thrust for the next stride, there should be no delay or dragging action.

THIS IS THE WAY THOMSON HURDLES

Study closely this combination of photographs. These were taken individually and pasted together. It is not a movie although next to it. The photographer, a college student, made a very good series of photographs. Notice the bent front knee rise; The arm action all the way through the flight; Bent body action; Straightening some of the right leg in reaching the top of hurdle; Double hitch or drive of right arm can be followed; Position of right arm in landing; The take-off and landing; Forward position of body and arm drive in starting for next hurdle.

In running the low hurdles around the turn, keep close the inside of your hurdle, as the curve has a tendency to throw you to the outside of the lane. It usually is necessary to lengthen your stride in circular hurdle races, particulary on the turn.

In all hurdle races an athlete must allow for weather and track conditions. With a wind behind your back it may be necessary to "chop" your stride between hurdles. With a helpful wind and a poor track this may be neutralized. A cross wind may throw you off your balance. A head wind may compel you to reach for the hurdle in order to keep your stride.

A close study of the details, by the hurdler is advisable. If practising on the cinders, rake up the ground for two or three hurdles, and as you run thru these few flights note your position in taking off, landing and the stride between. Measure these distances and keep a record for future use. In the low hurdles find out just where you are losing out in the regulation seven strides. It may be that your first stride after the landing, is too short, which is invariably the case, attempt by practise to lengthen this stride. It may be that you are taking off too far away, in which case you are liable to "anchor" yourself on the further side, that is land "dead" rather than in the forward position necessary for a quick getaway.

In closing you will note a few pointers:—

Always wear running shoes in hurdle races, as the jumping shoe has a tendency to slow one up. Practically none of the top notchers use jumping or hurdling shoes for their races.

Do not practise form on a hard ground or a hard floor as shin slints (sore shins) will result. Get a good level stretch of turf. A piece of sponge rubber cut to fit the inside of the shoe at the heel will greatly lessen the shock of continual landing. Later on you will seldom land hard on the heel. Practise fast starting and do not confine yourself entirely to hurdling. Sprinting will develop your speed.

Attempt to get over the first hurdle first. This has a tendency to worry your opponents. Never look around and do not watch your competitors in your races. You will have all you can do to take care of yourself.

Watch every hurdle race you can, especially when a good hurdler is performing and study his form. Never hesitate to ask a real hurdler how he does it. Few will turn you down. I have seen many of the champions spend as much as 30 minutes explaining form to a beginner. A few years ago at the Pennsylvania Relay Carnival, some of the hurdlers asked Thomson to explain his arm action. He gladly took them to one corner of the field and told them what they wanted to know.

For schoolboys it is not advisable to hurdle or run every day. About three easy "work outs" a week in the season is sufficient. Save yourself for college, as one college letter is worth a dozen preparatory school letters.

Obtain action photographs of every hurdler you can. Occasionally a slow movie of athletes in action may be seen. This is a great help if closely studied.

Do not rely too much on a coach. You alone, with his assistance, can make a success if you will stick at it long enough. Do not expect to be a champion in a year, or two or three. A winner of an Olympic Championship has not won this classic, without having spent considerable time developing.

A Good Mechanical Card Trick

THE CLUBS TO SPADES SLIP CARDS. The Effect. Here is another good changing card. In the course of a trick you produce the Seven of Clubs whereas you should have produced the Seven of Spades. "It really doesn't matter," you say, "for as they are both black cards it is easy to change one into the other," and even as you are saying it the Seven of Spades changes to the Seven of Clubs, or the Seven of Clubs changes to the Seven of Spades.

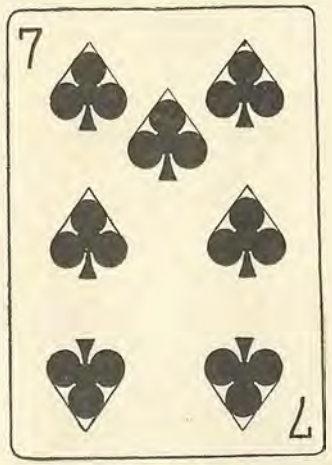


Fig. 75

Fig. 76

Construction. Take a Seven of Clubs and rub out the little clubs on the index corners but leave the figures on them. Then with the point of a sharp knife cut out triangular bits around the Club pips, as shown in Fig. 75, so that when a card that is painted or printed black is placed back of them they will look like Spade pips. Next, cut the inside out of another card as shown in Fig. 76. This is to be glued between the front and back cards to separate them so that the slip piece can slide to and fro freely when the card is done. The back card with the separator glued to it is shown in Fig. 77. In this card is cut a slot 1/16 inch wide and ¾ inches long for the stud which is fastened on to the slip piece to pass through. Finally, on the lower end of this card is painted, or printed, two black triangles.

The slip-piece that slides up and down in the card is made of a piece of white card 1⅞ inches wide and 2½ inches long as shown in Fig. 78. On one side of the slip piece is painted, or printed, five black triangles in the positions shown, also in Fig. 78, while on the back of it is fastened a projecting stud as shown in Fig. 79. The stud is made of a

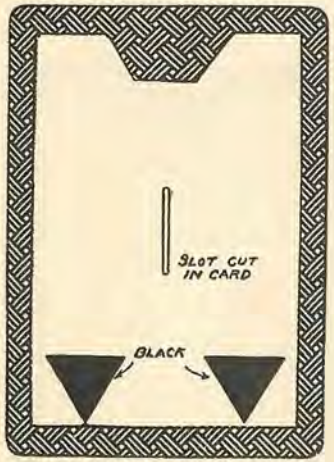


Fig. 77

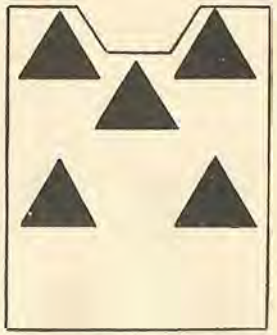


Fig. 78

Fig. 80

Fig. 79

bit of pin, or wire, whose thickness is about that of a pin and ¼ inch long and one end of it is soldered to a bit of tin about ¼ inch on the sides, as shown in Fig. 80. To make the stud stick to the card, glue a disc of paper, about ⅝ inch in diameter over the tin as shown by the dotted lines in Fig. 79.

Fig. 81

Now place the slip-piece on the back-card with the stud through the slot and glue the front card to the separator which you have already glued to the back card. This operation completes the Club to Spade Slip Card and you are ready for the presentation.

Presentation. When you want to change the Seven of Clubs to the Seven of Spades, hold the card with the stud up at the back and with your forefinger on it as shown in Fig. 81. When the stud is up and consequently the slip-piece only the white parts of it and of the back card will show through the triangular openings in the front card and it then becomes the Seven of Clubs. When you push down on the stud it carries the slip-piece down with it and then the black spots on it and those on the back card are behind the triangular openings when the pips will appear as Spades.

Young People Who Have Made History in Sports.

The most striking fact in the sporting world today is the number of boys—and girls too—who have won championships. In the water, on the links, the diamond, the tennis court and the track, the story is the same. Everywhere the folks under

HELEN WILLS
Runner Up Womens National Lawn Tennis Tourney.

twenty-one are forging to the front.

In swimming there has never been anyone as fast as Johnny Weismuller. He has smashed nearly every record that can be broken. We used to think of Kahamoka as perfect—a sort of human fish. But Weismuller broke his records easily and now holds no less than 36. And just to keep the boys from getting their heads too swelled along came Gertrude Ederle, only nineteen, and Helen Wainwright, still younger both of them in the champion swimmer class.

Now turn to tennis. Still you find youth triumphant. Vincent Richards, at nineteen, is one of the highest ranking players. At fifteen he was a national champion. And this thin, almost frail, flaxon-haired youngster won his first tournament at thirteen, was junior champion at fifteen and at nineteen played in the Davis Cup contest. Nor can we forget Helen Wills, a fifteen year old California girl who has made an astonishing record.

GENE SARAZEN
Golf Champion of America.

HELEN WAINWRIGHT
Champion Swimmer & Fancy Diver.

In golf its the same story. Among the girls, Glenna Collett won out while Jesse Sweetzer, only twenty, defeated both Bobby Jones and Chick Evans. Jesse started playing when he was only eleven years old and by the time he was fifteen was playing an astonishingly good game.

WALTER HOOVER (Right)
Champion Sculler & Jack Kelley, Olympic Hero.

In baseball Benson Brillheart of Washington, a most promising pitcher is only eighteen. And Waite Hoyt, the marvel of the Giants, came into the big league at seventeen. And no one forgets Ty Cobb, the greatest baseball player that ever lived, was only nineteen when he entered the big league.

There is a reason for these achievements. People have come to realize the healthful recreation and good fun to be had from entering into sport, whether it be on land or water.

One authority speaking of our athletics has said: "Modern sport has so trained men that our Marathon runners need not die in announcing victory."

In addition to those mentioned above the noteworthy figures in the athletic world include,

VINCENT RICHARDS.

GLENNA COLLETT.

JOHNNY WEISMULLER
World's Greatest Swimmer.

William T. Tilden III, tennis champion of the whole world. The most stirring match of the season was the final five set affair between Tilden and Johnston for the National Singles crown. Johnston at the top of his fine game went to the task of mastering his opponent with all the excellent stroking at his command. He fairly beat back the defending champion through two sets. No one could see how Tilden was to overcome the tennis he was meeting. But Tilden was but waiting his turn. Johnston weakened under the pace he was setting and from that moment on Tilden drove his attack at top speed. Tilden retains his title not because of any superiority of play over Johnston, but because of a far keener tennis mind.

GERTRUDE EDERLE.

Henri Oochet of the French Davis Cup Tennis Team.

JESSE SWEETSER.

Walter Hoover of Detroit Michigan designed his own shell and oars and with them paddled himself to victory in the great English regatta at Henley.

In yachting the most remarkable feature was the comeback of the small sail-boat. Among these are the little O boats desined by John Alden which are in use principally on the New England coast. These boats are only nineteen feet over all and very popular. The great regattas commanded greater interest than ever before and the yachting season was, from first to last, a huge success.

The list of all the sporting events is too long for this brief article. The main thing and the most interesting fact is boys and girls once regarded as too young to participate in great championship contests have acquitted themselves so well. All over the world they made a record of real achievement of which many older folks would have been mightily proud.

THE STORY OF GILBERT TOYS.

You boys are looking forward to the time when you will all be men, playing your part in the business world. Because of that, and because the boys of America have had so much to do with their growth, you will, I am sure, like to hear the story of Gilbert Toys.

This whole book shows that I was always interested in athletics as every healthy boy should be, but I had another hobby—magic. I was always interested in it and had some wonderful opportunities to learn its mysteries from the great magicians. So it was natural for me to turn to magic when I found it necessary to earn money to complete my college course. And as I went about giving magic exhibitions, it occurred to me that other young fellows would like tricks that they could use in a similar way.

So almost before I was out of college I had started my little factory in a small building not far from New Haven. You can be sure I had to work hard. There was no time to sit around and tell others what to do, for there weren't any others. I made my own tricks, then went out and got orders for them, came back and packed them up and shipped them.

But now the boys of that day did like those tricks! I soon found that I had to have help, then more and more, until now the company has a thousand folks working for it in one way or another. You cannot put a thousand people in the little building in which I began, so from time to time we have moved to bigger and yet bigger buildings until now we occupy a great plant with one very large building four hundred feet long, and many smaller ones.

Of course, magic alone did not build up this business to its present size. Very early I learned that there must be other toys. I hunted and experimented many months and then one day riding on a train and noting the big steel bridges, I conceived the idea of ERECTOR. It was a hit from the first, today it is sold in every country of the globe and is the best known toy that is made. The success of ERECTOR showed me the way for I knew that both boys and parents were waiting for worth-while toys. So as rapidly as possible, others were added until today there is hardly a scientific subject that a boy cannot learn with a Gilbert Toy.

And all of this has been built because one young fellow was determined to succeed, determined that every toy with the Gilbert name on it should be worth while. The boys from 1909 to this year have given me the support I knew they would, for they and their parents will always do that for any concern that tries to do business on the level.

So this story is, after all, a word of appreciation as much as a personal story. But it should inspire every boy with the knowledge that success is waiting for every man who works with head and heart and hand.

You can see the big factory when you ride on the main line of the New York, New Haven & Hartford Railroad, for it looms up near the tracks. You can't miss it and the front door is always open to my boy friends when they visit New Haven.

Home of The A. C. Gilbert Co., New Haven, Conn.

ERECTOR

"The Toy Like Structural Steel"

Join the big family of American boys—hundreds of thousands of them—who play with Erector, the wonderful Engineering toy.

The big reason why Erector is the choice of so many thousands and thousands of boys is because it's genuine. It guess I've never gotten over being a boy myself. I know the importance to you boys of having things genuine. So I have studied and worked as hard to make Erector mechanically true as other men do to make a bridge strong or a building architecturally correct.

You can build toy steel bridges, skyscrapers, battleships, machines with Erector and never lose interest in them because they are true. They are exactly like the real thing. Erector girders have lapped interlocking edges (a patented exclusive feature all my own) so you can build with square, four-sided columns, and your models are "strong as a horse."

No. 4

Get These Big Exclusive Advantages In Erector.

The only actual structural steel toy.
The lapped, interlocking edges of Erector Girder, (an exclusive patented feature) enable you to build four-sided and square columns.
Each piece is stamped accurately out of steel.
Each part is scientifically made; correct in design and proportion.
More parts for building strongest and largest model.
Every essential engineering part.
Anything mechanical can be duplicated with the Erector.
Big, reinforced steel wheels, grooved and hubbed for every engineering purpose.

BIG NEW MANUAL, showing exceptional mechanical models. In addition to those illustrated, thousands of other models can be built.

No. 4 Erector.

Here's the famous No. 4 Erector. I call it the famous No. 4 for it has always been the choice among boys.

THE STURDY SQUARE GIRDER BUILT ONLY WITH ERECTOR

This set contains the powerful Erector Electric motor with which you can make your models actually run. It also has a big assortment of parts to build models with and the big Erector Manual showing many models you can build. Motor comes knocked down. Full directions are given in the manual for assembling it. This is the kind of set you'll be proud of. Packed in great big wooden box with pasteboard cover, four color label, size 22 x 8½ x 2¼ inches. Approximate weight: 6 lbs. Price $5.00 (Canada, 7.50).

NO. 1 ERECTOR.

Here's an Erector Set that you'll enjoy. This one includes an assortment of girders, shaftings, angle irons, base plate, bolts, nuts, screws, etc. With this outfit you can build any number of unique and modern models. The book of instruction included gives complete

No. 1

directions and shows pictures of many fine models. Packed in a Gilbert Toy carton with four color label, size 12¼ x 8¾ x 1¼ inches. Approximate weight, 1 lb., 10 ounces. Price $1.00. (Canada $1.50.) West of Rockies $1.10

No. 3

NO. 3 ERECTOR.

Here's a dandy set. Contains just the right number of parts for building some great models. There's standard Erector girders, angle irons, shaftings, wheels, pulleys, nuts and many other parts that come only in Erector Sets. There's no end to the pleasure you can get from this set. Packed in a Gilbert Toy carton with four color label. Size 19 x 10 x 1¼ inches. Approximate weight, 4 lbs. Price $3.00. (Canada $4.50.) West of Rockies $3.15

ERECTOR MACHINERY. NO. 5.

Here's a special Erector outfit that will give you lots of fun and make your Erector Models more realistic than ever. It's a complete set of parts for building a Machine Shop Model, including a lathe, emery and buffing wheel, and drill press with standard Erector girders, angles, nuts, etc., with which to make the frame work for a shop. The machine parts are made of cast iron and they look just like the parts in real machines and are all to be fastened on shaftings and pulleys so that the whole shop can actually be made to run.

Of course, these machinery parts can be used with any other Erector Set you have, in building any factory models, but the set is complete in itself with parts enough to build an Erector Machine Shop Model.

It is packed in hardwood cabinet size 20 x 12 x 3¼ inches with directions for building the model. Approximate weight 12 lbs., 12 ozs. Price $10.00. West of Rockies $10.50. (Canada $15.00.)

ERECTOR NO. 7

Quite a complete set for the boy who is old enough to make difficult models. It contains many parts for building most of the models shown in the book of instructions which comes with the outfit. There is included a motor and a reverse base to operate the crane, derrick or elevator that you make. The fact that you use motive power in your work adds to the reality of it. All the parts of the standard Erector equipment packed in hardwood cabinet with steel cover. Weight approximately 18 lbs. Price $12.00. (Canada $18.00.) West of Rockies $12.60.

ERECTOR NO. 8.

An advanced set containing a sufficient number of parts to do most any kind of building. You can build some wonderful models with this outfit, such as locomotives and things requiring care and study. You will not be limited in your work; you can build some very big models requiring a whole lot of girders, angle irons, shaftings, nuts, bolts, etc. Of course, the powerful Erector motor is included, together with reverse base and control switch. Packed in hardwood cabinet size, 12¼ x 20¼ x 4¼ inches. Weight approximately 32 pounds. Price $20.00. (Canada $30.00. West of Rockies $21.00

No. 8

ERECTOR NO. 10.

No. 10

The largest and most complete Erector set made. You can be sure that with the assortment of parts in this outfit you will have no trouble in setting up models of the most difficult machines. There's the crackerjack Erector motor and a 110 volt universal motor, for operating direct from house current, reverse base, control switch, girders, angle irons, shaftings, nuts, bolts and everything you could wish. Packed in hardwood cabinet with trays to hold the different pieces in the right place, size 12 x 20 x 3½ inches. Price $30.00. (In Canada $45.00.) West of Rockies $32.00.

No. 3

Erector Parts Cabinets

One of Erector's biggest features is the fact that every part is standard. No matter what number set you buy, extra parts can always be obtained that will fit in exactly with the parts you already have.

Remember too, it isn't necessary to buy a whole set of extra parts. You can buy as few or as many of each part as you want. There's a big advantage in this, for if you were forced to get another part set, you would undoubtedly be duplicating on a number of parts you didn't need. Most dealers who sell Erector have in stock one of the Parts Cabinets illustrated on this page. They are chock full of Erector girders in all sizes, right angles, obtuse angles, straight angles, pulleys, wheels, nuts, bolts, washers, base plates and all the standard Erector Parts. Whenever you want extra parts, look for one of these cabinets. You can buy one of these cabinets complete from your dealer if you want one.

No. 2 Cabinet

Size 17¼ x 25½ x 10½ inches.
Approximate weight: 50 lbs.
Wooden cabinet with glass top, with sample of all parts fastened to board underneath. Two drawers of parts. Price $45.00. (Canada $67.50.)

No. 3 Cabinet

Size 12¼ x 20¼ x 3¼ inches.
Approximate weight: 20 lbs.
Wooden cabinet with hinged cover. Two layers of parts. Price $22.50. (Canada $33.75.) Boxes separate.

No. 2

Magnetic Fun And Facts No. 6506

Gilbert Magnetic Fun and Facts explain all about the compass and many other things besides. It shows you how to build a magnetic tight rope walker, magnetic jack straws, a magnetic navy and any number of electrical tricks with which you can surprise your friends.

Contains parts for building simple magnetic motor, iron filings, etc., for performing experiments in big book of instructions, also included.

Packed in Gilbert Toy carton with four color label, size 8¾ x 12¼ x 1¼ inches. Approximate weight: 2 lbs. Price $3.00. (Canada $4.50.) West of Rockies $3.15.

No. 6506

Erector Senior

POWERFUL—STURDY AND LIFE SIZED WHEEL TOY AND MACHINERY MODELS

Here's the greatest toy of all, boys—a regular humdinger. With this New Erector Senior in addition to the splendid toy which you see set up you can make many fine things easy as rolling off a log—a glider that is better than the regular ones, a wheel-barrow, a baggage truck that's the real thing—big machinery models like cranes, derricks, swings—something new every week.

These toys are not models or flimsy affairs. They are honest-to-goodness ones, exceptionally strong and sturdy—toys that you can get on and ride yourself. All you need is a screw-driver and wrench and the parts in the outfit. With them you can build real life-sized models in no time at all.

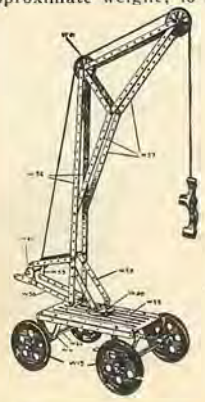
No. 15 Set $5.00

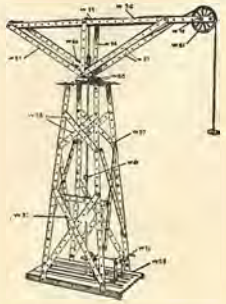
The set comes partially assembled as a four-wheel Coaster. It is only necessary to fasten the axles and wheels. Besides, there are extra parts enough in the box to build many other life-size models. Many of these are wheel toy models, such as wheel barrow, high truck, low truck, barrel truck, wagon, tip cart, high factory truck, barrel truck with supports, low factory truck, and big machinery models almost without limit. Manual of Instructions which comes with each set illustrates windmill, lawn seat, ladder, trolley repairer, stationary crane, wheel derrick, movable hoist and movable crane.

Built almost entirely of metal, it is a toy that will stand the hardest abuse. Braces, angle irons, supports, etc., are of heavy band iron. The wheels are disc type of heavy gauge steel, 5 inches in diameter, put together with special riveting and locking hub device.

Packed in strong corrugated container with three color descriptive label. Size of box 28 x 8⅝ x 3⅞ in. Approximate weight; 16 lbs. Price **$5.00** **(Canada $7.50)**

Life Size Wheel Toy and Machinery Models

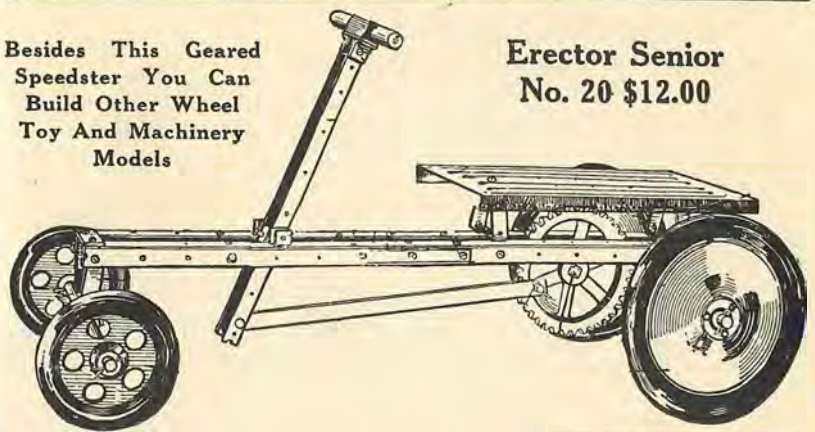




West of Rockies add 5% to U. S. A. Price.

Besides This Geared Speedster You Can Build Other Wheel Toy And Machinery Models

Erector Senior No. 20 $12.00



With this outfit you can build many more wheel toy and machinery models, the adding of the heavy sprocket gears enable you to make accurate and highly detailed machinery of all kinds.

This set comes assembled as a geared speedster four feet long— a speedster that you can operate yourself—get on and ride to your heart's content. Then you can build the models which can be built with Erector Senior No. 15, using two of the 8 in. diameter wheels and two 5 in. diameter wheels in place of the four 5 in. wheels furnished with Erector Senior No. 15.

Remember the models that can be built with it are life size, big enough for you to use yourself. Set is packed in heavy corrugated carton with three color label. Size of box: 32¼ x 12¼ x 9⅛ in. Approximate weight: 26 lbs. Price $12.00. (Canada $18.00.)

Think what fun you can have building yourself a different toy every day or every week or as often as you like. There's no end to the sport this New Erector Senior will give you. Read over carefully the description of each outfit.

You cannot imagine what real fun is until you have learned to build these wheel toys and machinery models.

An Erector Senior outfit means that you will have bully times—indoors and out—that you will get real enjoyment from your play. Get one of these sets and learn what fun it is to build your own toys.

A New Toy For Every Day in the Week

West of Rockies add 5% to U. S. A. Price.

Gilbert Electrical Sets

66 Stunts With an Electric Motor
No. 3005

Until you have this set you'll never know the amount of fun you can have with an electric motor, or the great number of things you can do with one.

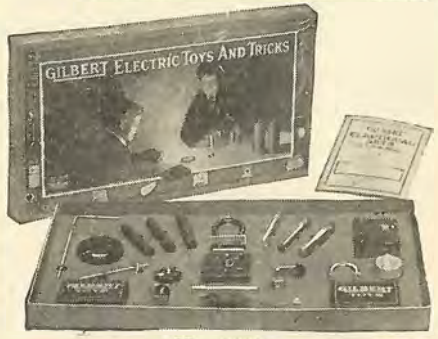
The apparatus is included in the set and the big book with it tells you all about a motor and shows you, among a great many other things, how to make a water rheostat, the song of the siren, the spinning chain, how many colors make white, how a steam engine governor works, how to make black lines appear to be white, three good optical illusions, etc. Packed in Gilbert Toy carton 18 x 10 x 1¼ inches. Approximate weight 2 lbs. Price $3.00 (Canada, $4.50)

No. 3005

75 Electrical Toys and Tricks
No. 3003.

Here you are boys! The kind of an electrical set you've always wanted. Nothing complicated about this or hard to understand. A dandy set with which you can perform 75 crackerjack electrical tricks, and make some fine electrical toys.

Find out how to generate electric current; how to "taste" electricity; how to make an electro-magnetic gun; how to make an electro-magnetic pile driver; what the earth has to say and many other intensely interesting things. In Gilbert Toy carton 18 x 10 x 1¼ inches. Approximate weight 2 lbs. Price $3.00 (Canada $4.50)



No. 3003

West of Rockies add 5% to U. S. A. Price.

Gilbert Tele-Set

No. 3502

No. 3502

This outfit works just like the instruments in the telegraph stations where communications between distant points take place every day, and is just the outfit you want.

In the book of instructions included with the set everything is explained very simply so that it will be easy for you to understand how every part works. After you have used your set and know the code, it will be very interesting for you when in a telegraph office to listen to the instruments they have there. It is well, too, that you become familiar with the code used in Wireless. Then you will be in a position to understand the transmission of messages by this system as well as by telegraphy. This is the game for you—the kind of play that gives you plenty of fun and at the same time teaches you things every boy is eager to know. Packed in Gilbert Toy carton, 12⅛ x 8⅜ x 1¼ in. Approximate weight: 12 ozs. Price $1.25 (Canada, $1.90

PHOTO PHADS

No. 2024

Gee! It's great to have a Photo-Phad set and transfer photographs and pictures to cloth, glass and paper. The boy or girl who sees a picture of a pretty landscape or other design can easily decorate a sofa pillow, a glass window, a cloth hanging, etc., with this new method. Then, too, it's possible, to print your own photograph on your letter paper. And best yet, is for the boy who wants to put his favorite photo on his watch. This can be done easily. The material in your outfit will make all your prints permanent, so you need not be afraid they will rub off.

Don't think you have to own a camera to enjoy this outfit. You can transfer photographs your friends have given you, or make copies from pictures in magazines and books. Packed in new Gilbert Toy carton, size, 18 x 10 x 1¼ inches. Approximate weight: 2 lbs., 12 ozs. Price $1.00 (Canada **$1.50**).

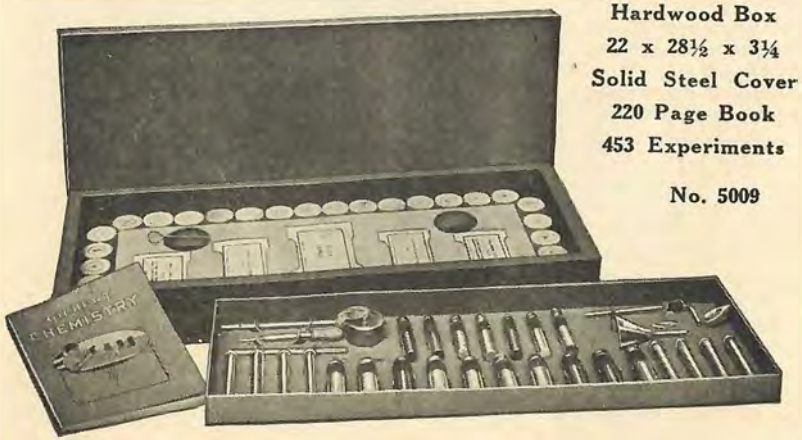
West of Rockies add 5% to U. S. A. Price.

Chemistry.

Of all the big sciences there are two which I think are the most interesting. One is Electricity, which I told you about, the other is Chemistry—and the two sciences are worked together in a great many cases. If you know Chemistry, you will know how a great many of the things which are so necessary to your every day life, are manufactured or grown. Chemistry tells you how dye is made for the clothes you wear. What the substance you call "lead" in the pencil you are writing with really is. How soap is made. How your mother's silver-ware is plated—and any number of interesting things like that. Wouldn't you like to be able to make ammonia for your mother—or a bar of soap—do chemical magic tricks—or make a wet cell to operate your door bell? You can do these things with Gilbert Chemistry Outfits. They are chock full of chemicals, glass bottles sealed with wax, for the liquids and wooden boxes for those in powder form.

The Leader of Them All
No. 5009 $6.00

Here's a Chemistry set you will be proud of. It is a complete chemical laboratory in itself, packed full of harmless chemicals of all kinds, as well as test tubes, funnel, glass tubes, alcohol lamp, filter paper and many other things to perform the hundreds of experiments told about in the big book that comes with the set. Just think there are 453 different experiments in the big book. It all comes in great big stained hardwood cabinet, size 22 x 8½ x 3¼ inches, with solid steel cover. Approximate weight: 5 lbs., 8 ozs. Price $6.00. (Canada, $9.00.) West of Rockies $6.30.



Hardwood Box
22 x 28½ x 3¼
Solid Steel Cover
220 Page Book
453 Experiments

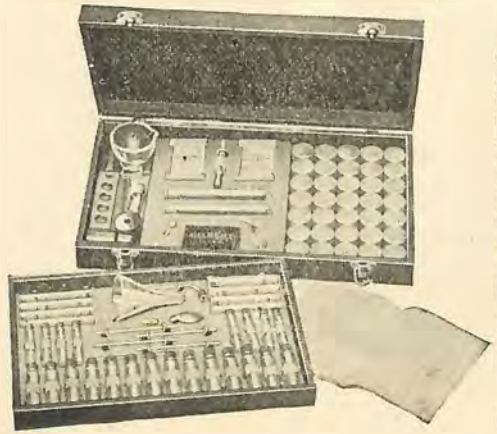
No. 5009

Gilbert Chemistry
No. 5007

With the harmless solutions that come in this set you can prepare many substances used in every day life. Produce startling effects by placing one ingredient with another. Learn the method of making cloth fire-proof. How to pass an egg through the neck of a bottle and manufacture disappearing ink. Packed in the Gilbert Toy carton, with four color label, size 8¾ x 12¼ x 1¼ inches. Approximate weight: 1 lb. Price $1.25. (Canada $1.90

No. 5008

With this set you can find out how dye is made for the clothes you wear; what the substance you call "lead" in the pencil you are writing with really is; how soap is made; how your mother's silver-ware is plated — and any number of interesting things like that. Here's a corking chemistry outfit. In addition to the many acids and alkalis included, this outfit has a test tube rack, filter paper, alcohol lamps, etc. Book of Instructions gives complete directions for the many experiments you can do with this set. Packed in Gilbert Toy carton with four color label, size 18 x 10 x 1¾ inches. Approximate weight: 1 lb., 10 ozs. Price, 3.00. (Canada, $4.50.)



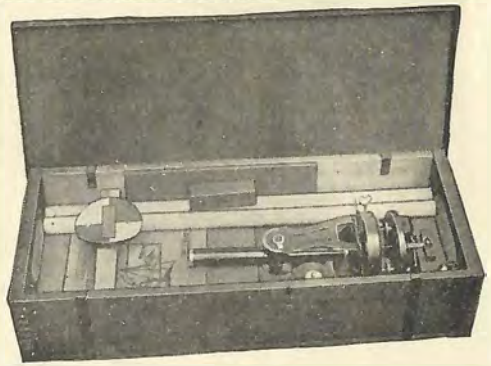
No. 5010

With a set of this size—the largest in the Chemistry Outfits—you can learn the elementary facts of this science and make your play both fascinating and beneficial. Do electrotyping—make tests of metals. It will be a very easy matter for you to plate old metals, etc., with a finish resembling gold. All this is explained in a book of instructions which covers every detail and is included in each set. There are a great many tricks that you can do with your solutions. With this larger set you can do many of them. Packed in hardwood cabinet, this set is very convenient to carry about. Size, 18¾ x 10¾ x 3 inches. Approximate weight; 6 lbs., 8 ozs. Price $10.00. (Canada, $15.00).

West of Rockies add 5% to U. S. A. Price.

Gilbert Civil Engineering No. 6525

With the Gilbert Civil Engineering No. 6525 you will be able to lay out your playing field accurately. You can measure distances, make a map of your backyard, putting in the trees, fences, sheds, etc. You can use your apparatus anywhere—at the camp, where it is necessary to get information about the land on which the camp will be located. Find out what the grade of your street is. Do many things that the civil engineer does when he is completing a great piece of construction work.



With the set comes a fully illustrated book on surveying from which you can obtain a knowledge of how to use your equipment, how to survey, and of the work great engineers have done. The outfit contains all parts necessary for building your own transit. Packed in hardwood box with solid steel cover. Approximate weight, 6 lbs. Price $10.00. (Canada $15.00.) West of Rockies $10.50.

Hydraulic And Pneumatic Engineering No. 6502

Think what it means to you to be able to construct models of water systems—to make trench guns with which you and your chum can have a real battle! Learn how ships that have been sunk are raised—interesting facts about the submarine, the depth bomb, and torpedo.

No. 6502

A Gilbert Hydraulic and Pneumatic Outfit is an equipment you can use as often as you like and never grow tired of it. You can make models of big construction work, build a miniature water supply system of your own, etc. All the necessary apparatus with big book is included in this outfit. Price $3.50. (Canada $5.25.) West of Rockies $3.75.

Gilbert Glass Blowing

No. 6545

You can have all kinds of fun with this set making many attractive and useful articles for yourself—besides it will be a big help to you if you have the Gilbert Hydraulic and Pneumatic Engineering Outfit, Chemistry, etc.

It contains glass tubing in various lengths, blow pipe, Alcohol lamp and complete apparatus for performing a number of experiments illustrated and described in the big book on glass blowing written by Prof. C. J. Linde of MacDonald University, Quebec.

Packed in Gilbert Toy carton with four color label size, 18 x 10 x 1¼ inches. Approximate weight: 2 lbs. Price, $2.50. (Canada, $3.75).

Mineralogy

DO YOU KNOW WHAT COAL IS?

Do you know how it is mined? Where they get diamonds? How to tell a good one? If you'd like to know these things and lots of others just as interesting, you surely want one of these new Gilbert Outfits on Mineralogy. It comprises a complete assortment of minerals and metals for you to practice with, as well as a boy's book on Mineralogy, prepared by Mr. William J. Horn, our Research Chemist. There are many fascinating experiments included that you will surely be pleased with. No. 6550 Mineralogy, is packed in Gilbert Toy carton with four color label, size 18 x 10 x 1¼ inches. Approximate weight. 1 lb., 9 ozs. Price $3.00 (Canada, $4.50)

No. 6550

West of Rockies add 5% to U. S. A. Price.

Gilbert Mysto Magic Series

As you boys probably know, I first started this big Gilbert Toy business by making Magic tricks, but long before that I was practicing Magic professionally, giving entertainments for lodges, clubs, churches and other organizations, and in this way earned practically my entire expenses for college. For this reason I am in a very good position to appreciate what it means to boys to have something of this kind that they can fall back upon. Something that will help them work their way through school, or give them additional spending money. By no means is it the money alone that you derive from this that makes it enjoyable. It's one of the greatest ways to amuse yourself and your friends that I know of. Best of all, it trains your eyes, fingers and hands. You probably don't believe that, but after you have practiced Magic for a while you'll soon see that it is entirely true.

No. 2001

No. 2001 Mysto Magic

Contains Multiplying Billiard Balls, Cigarette Vanisher, Disappearing Coins and Many others. The Magic Wand and show poster come with this outfit. Also a big book of instructions telling just how to do each trick.

Packed in Gilbert Toy carton, 12¼ x 8¾ x 1¼ inches. Weight approximately 1 lb. Price, $1.00. (Canada $1.50). West of Rockies, $1.10

No. 2005 Mysto Magic

No. 2005

Just think of the fun you can have making dollar bills appear in your coat sleeve or making cigarettes and handkerchiefs vanish. This outfit contains a very good assortment of famous tricks, like the Drumhead Tube, Linking Rings, Handkerchief Cassette and many others. The book of instructions tells you how to perform each trick and lists many you can do with apparatus you have in your own home. Packed in Gilbert Toy carton size 18 x 10 x 1¼ inches. Weight approximately 1 lb., 8 ozs. Price $3.00. (Canada $4.50) West of Rockies $3.15.

No. 2006 MYSTO MAGIC

One of the best collections of amateur magic for giving complete entertainments; containing Magician's Nickel-Tipped Wand, Show Poster, and illustrated Manual giving complete instructions how to give a performance, including "patter," etc. Some of the tricks included are: Spirit Slate, Siberian Transport Chain, Drumhead Tube, Handkerchief Cassette, Passe-Passe Coin Trick, etc.

Comes in stained hardwood cabinet with tray, size 13 x 9 x 3 inches. Approximate Weight: 6 lbs. Price $5.00 (Canada $7.50)

No. 2006

THE PROFESSIONAL SET.

This outfit is really a semi-professional set. It is one of the best collections of amateur magic and intended for the boy who, after practicing Magic for some time, desires to equip himself with an outfit he can use to give shows, not only to his friends, but for church, lodges, and Y. M. C. A.'s as well. It contains a splendid assortment of the leading tricks that are practiced by the foremost magicians today. Such as Large Wand, Show Poster, Phantom Card Trick, Vanishing Coin from Glass, Drumhead Tube, Magic Slates, Phantom Ring, Ching Ling Soo, Okeito Coin Box, Mysto Coin Shells, Disappearing Handkerchief, Princess Card Trick, Pick-it-Out, Sphinx, Papel Blanco, Rice to Water, Chinese Linking Rings, Cigarette Vanisher, etc.

Box: Stained hardwood compact chest with suit case clasps size 16¾ x 10¼ x 2¾ inches. Approximate Weight, 4 lbs., 12 ozs. Price $10.00. (Canada $15.00).

No. 2009

West of Rockies add 5% to U. S. A. Price.

Gilbert Coin Tricks

No. 2020

Just think! You can give shows and mystify your friends with the same fascinating coin tricks that are used on the stage today by many of the professional magicians. You can learn all sorts of palming and sleight-of-hand tricks—feats of magic that are very interesting and mystifying.

You can make a coin vanish from a newspaper—vanish a coin from your closed hand—make coins appear out of the air—pass a coin through a table—vanish a coin from a glass, and many other tricks that will make your friends' eyes open in wonder.

With a Gilbert Coin Trick Outfit all of these things are simple. There is a big book comes with each set explaining how each trick is performed, just how to hold your hands when giving shows on the stage, how to talk so that you will divert the attention of your audience, in fact all the information you need to to give Magic Coin Trick entertainments.

No. 2020

The Outfit contains a complete assortment of magic coins for all the different tricks, together with other apparatus necessary. Packed in the distinctive Gilbert Toy sealed carton, size 18 x 10 x 1¼ inches. Price $1.25. (Canada $1.90

Gilbert Knots and Splices

No. 2021

They thought the rope was tied tightly and in a way that would make it impossible for you to escape. From all appearances they were right, but they did not know that for you it was a very easy matter to escape. You had an outfit of Gilbert Knots and Splices from which you had learned how to make various kinds of rope ties, and how to get out of them. There was hardly a knot that any one could show you that you wouldn't know how to tie and untie.

If you haven't already one of these sets, you certainly want to get one, for with it you will learn how to splice rope; how to tie useful knots; and how to do many tricks that are now being performed on the stage by famous magicians. You can give shows for your church or club. Your boy friends will admire you for being clever and will want to join in the fun.

For real pleasure—for a crackerjack way of entertaining your friends, get a set of this kind. You will be pleased with it all right. Outfit contains a complete assortment of sample knots, with a quantity of rope to practice with, as well as a complete book on knots, telling how to tie them and how to perform many startling experiments. Packed in the Gilbert Toy sealed carton, 18 x 10 x 1¼ inches. Price $1.00. (Canada $1.50).

No. 2021

West of Rockies add 5% to U. S. A. Price.

Card Tricks

No. 2000.

Boys, when you have watched magicians perform their mystifying card tricks, haven't you had the desire to perform those very same stunts yourself?

It is a great sport and live-wire boys can easily become masters in this line of entertainment by closely following directions given in the Book of Instructions which comes with every Gilbert Magic Card Trick Outfit.

The outfit contains eight mysterious card stunts that are used by the foremost magicians. Set packed in special Gilbert Toy sealed carton. Size 12¼ x 8¾ x 1¼ inches. Price $1.00. (Canada $1.50.) West of Rockies $1.10.

No. 2000

Weather Bureau No. 6534

If you are interested in having a weather bureau station of your own, I can tell you now that it will be one of the most interesting things you ever had in your life You will have a knowledge of a subject on which most people are quite ignorant, and if you are a boy you will stand for leadership among boys for knowing about things that to most people are mysterious and magical.

This outfit enables you to study the first principles of the weather. It contains an anemometer for determining the velocity of the wind; a wind vane for wind direction; 2 thermometers; a dandy boy's book on weather, explains all about how to set up the outfit and operate it.

Comes in Gilbert Toy Carton with four color label, size 18 x 10 x 2½ inches. Approximate weight, 1 lb. Price 2.00. (Canada $3.00.) West of Rockies $2.25.

No. 6534

Puzzle Parties

No one really seems to know when, where or how puzzles originated. In fact, the greatest puzzle in all puzzledom is in regard to their origin. It is known however, that a good puzzle to solve—one that is a corker and will test your thinking power to the limit is about the most fun you could wish for.

No. 1029

No. 1030

These Gilbert Puzzles are fascinating. They are just hard enough to solve to be intensely interesting. You will like too, the handy way in which they are packed. Each outfit is complete enough to make a Puzzle Party, where each one attending can be given a puzzle to solve and in that way spend a very pleasant time. With each set comes explicit directions for solving all of the puzzles included.

No. 1031

No. 1032

	U. S.	Canada
No. 1029	.....25c	40c
No. 1030	.....50c	75c
No. 1031	.....$1.00	$1.50
No 1032	....$2.00	$3.00

Gilbert Carpentry Outfits

Every boy interested in Carpentry knows well enough the value of a good set of tools. There isn't a workman in any trade who doesn't regard his tools with great pride. He keeps them intact and ready for use always. When you decide to make a workshop of your own at your home; be sure in acquiring a set of tools that you get those of good quality.

Have your folks ever said about you, "He's a handy boy about the house?" If not you surely want to show them that you are just as handy with tools as any other boy. Show them that you can put up new pantry shelves or build a chicken coop or anything else they want built. Get one of these dandy Gilbert sets. You'll like any one of them. The sets contain liberal assortments of tools in each different size.

No. 701

No. 702

No. 701

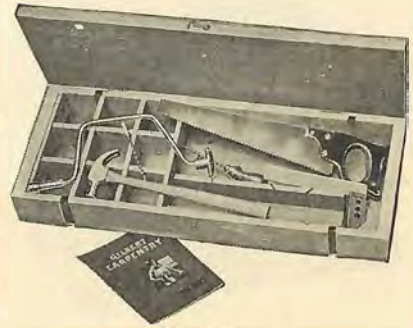
Cabinet :—Stained hardwood, size 12½ x 8¾ x 3¼".
Approximate Weight :—4 lbs.
Price, $1.50. West of Rockies, $1.60. Canada, $2.25.

No. 702.

Cabinet :—Stained hardwood, size 14⅞ x 8⅞ x 2⅝".
Approximate Weight :—5 lbs.
Price, $2.50. West of Rockies, $2.65. Canada, $3.75.

No. 706

Cabinet :—Hardwood, size 22 x 8½ x 3" with compartments for nails, screws, nuts, etc.
Approximate Weight :—7 lbs.
Price, $3.00. West of Rockies, $3.15. Canada, $4.50.



No. 706

No. 707

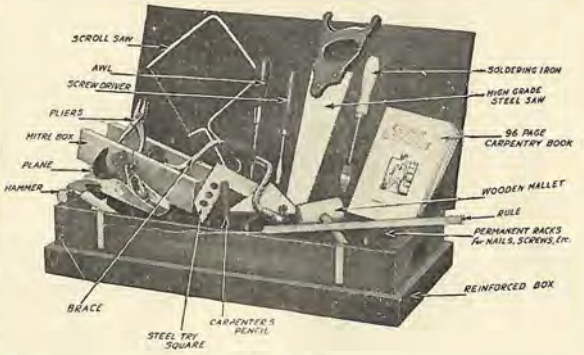
No. 707

Cabinet:— Stained hardwood with solid steel cover, size 22 x 8½ x 3 inches, with compartments for nails, screws, nuts, etc.

Approximate weight:—9 lbs. Price, $3.50. West of Rockies $3.70. Canada, $5.25.

No. 765

Special outfit in expeditionary cabinet of stained hardwood, size 22¾ x 11 x 4¾". Compartments for nails, screws, nuts, etc. and a splendid assortment of tools most commonly used in the home. Approximate Weight:—12 lbs. Price $6.00. West of Rockies, $6.30. Canada, $9.00.



No. 765

No. 726

No. 726

1 Gimlet Bit	1 Carpentry Book
2 Bits	1 Scroll Saw
3 Chisels	1 Saw
1 Nail Set	1 Plane
1 Try Square	1 Hammer
1 Awl	1 2-ft. Riveted Rule
1 Screw Driver	1 Brace

Cabinet:—Special compact chest, stained wood, fitted with strap hinges and suit case catches, size 18¾ x 10¾ x 3¼ inches.

Approximate Weight:—8 lbs. Price $10.00 West of Rockies $10.50. (Canada $15.00).

No. 741

1 Brace	1 Draw Shave
1 Plane	1 Hammer
1 Nail Set	Chisels
4 Bits	1 Screw Driver
1 Rule	1 Awl
1 Gimlet Bit	and 3 Saws
1 Try Square	Saw Set With Handle

1 Carpentry Book

Cabinet:—Stained hardwood, fitted with suit case clasps and strap hinges, size 20 x 12 x 3¾ inches.

Approximate Weight:—11 lbs., 8 ozs. Price $25.00 Canada $37.50.) West of Rockies, $26.25.

No. 741

No. 750

No. 750

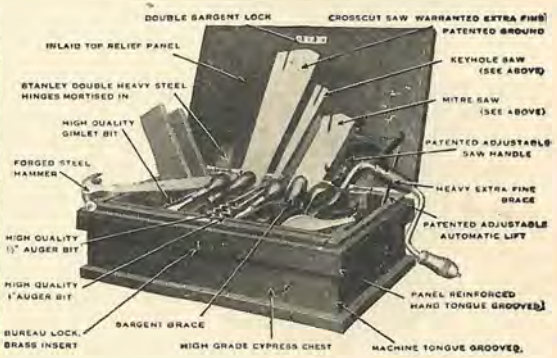
1 Screw Driver Bit	1 Nail Set
1 Brace	1 Rule
1 Small Screw Driver	1 Plane
1 Large Screw Driver	1 Combination Set of Tools
7 Bits	1 Try Square
1 Gimlet Bit	2 Hammers
1 Glass Cutter	1 Saw Set with handle and 3 Saws
1 Draw Shave	1 Carpentry Book
3 Chisels	
1 Countersink	

Cabinet:—Stained hardwood, fitted with suit clasps and brass corners, size 21 x 14 x 4 inches.

Approximate Weight:—18 lbs., 8 ozs. Price $35.00 (Canada, $52.50.) West of Rockies $36.75.

No. 770

This big chest is made of the best grade cypress, free from knots, hand tongued, grooved, adjustable lift, heavy steel hinges Could not be duplicated today for the price we are charging for the complete chest with tools in this special bargain offer There are 12 extremely high grade tools including extra fine steel cross-cut saw, mitre saw, key-hole saw with patent adjustable handle, extra fine brace, etc., all the best quality possible. Price $12.00 (Canada, $18.00.) West of Rockies $12.60.

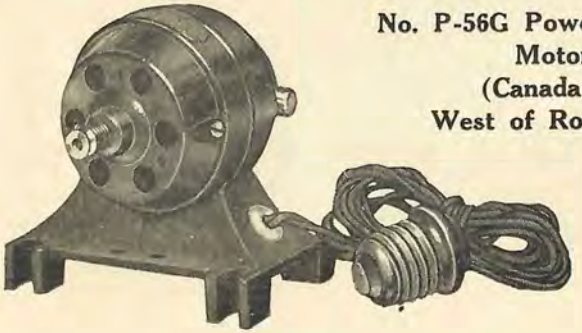


No. 770

Toy Motors And Electrical Accessories

You know that unless a motor works when you want it to, it is more trouble than it's worth. And I can tell you, boys, these Gilbert Toy Motors work. They are strong and powerful and will surprise you with the way they stand up. Of course, besides motors, I make lots of electrical toys to be used with them, such as control switches, reverse bases, and transformers. You can be sure you can depend on all of them to do the things you want to have them do. They are great to use with your Erector Models. Your regular toy dealer sells them.

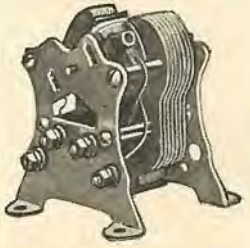
THE TWO MOST POPULAR MOTORS.



No. P-56G Powerful Universal Motor $5 (Canada $7.50) West of Rockies $5.25

No. P-58 Four Terminal Battery Motor. Strongest Battery Motor Of Its Size $1.50

I made this motor especially for operating Erector and other Mechanical Toy models. Can be used with P-59 Reverse Base or P-61 Control Switch. You won't find a better motor for the price anywhere. Height, 2¾ inches. Weight, 12 ozs. Price $1.50. (Canada $2.25.) West of Rockies $1.60.



No. P-53

P-53 Motor. This motor has two terminals, pressed steel base, latest type tubular holders with copper gauze brushes. Works great. Height 3¾ inches. Weight 14 ozs. Price $1.50. (Canada $2.25. West of Rockies, $1.60.

P-54

P-54 Motor. This is the same as P-53 Motor mounted on a reverse base, so that you can run it either backwards or forwards. Fine for running elevator models. Height 3¾ inches. Weight 14 ozs. Price $2.00. (Canada, $3.00.) West of Rockies, $2.10.

No. P-59

P-59 Reverse Base. This is used to operate four terminal toy motors either backward or forward. Can be directly attached to motor P-58 or at a distance with longer wire. Size, 4 x 4 inches. Weight 7 ozs. Price 75c. (Canada, $1.15.) West of Rockies, 80c.

P-60-C Transformer. This transformer saves the use of batteries. Attach it to your electric light socket (alternating current only) and run your motor direct from it. Comes with 5 ft. cord and plug. Size, 3½ x 3¾ x 2½ inches. Weight: 2 lbs., 12 ozs. Price $5.00. (Canada $7.50). West of Rockis, $5.25.

No. P-60-C

P-73-B Motor. Cast iron motor shell and base. Looks very much like big commercial motors. Can be used on batteries or from house current through a transformer. Height, 4¾ inches. Price, $2.50. (In Canada, $3.75.) West of Rockies, $2.65.

No. P-73-B

Gilbert Master Hand Library of Boys' Books

Science--Engineering--Manual Training--Athletics

Books in Cloth Covers, 50c (Canada, 75c)

No. 2140
GILBERT CARPENTRY

No. 2141
GILBERT CHEMICAL MAGIC

No. 2142
GILBERT CIVIL ENGINEERING

No. 2143
GILBERT HYDRAULIC and PNEUMATIC ENGINEERING

No. 2144
GILBERT KNOTS AND SPLICES

No. 2145
GILBERT LIGHT EXPERIMENTS

No. 2146
GILBERT COIN TRICKS

No. 2147
GILBERT HANDKERCHIEF TRICKS

No. 2148
GILBERT MAGNETIC FUN AND FACTS

No. 2149
GILBERT SIGNALLING

No. 2150
GILBERT SOUND EXPERIMENTS

No. 2151
GILBERT WEATHER BUREAU

Books in Paper Covers, 25c (Canada, 40c)

No. 2153
GILBERT GLASS BLOWING

No. 2154
GILBERT MINERALOGY

No. 2155
GILBERT CHEMISTRY

No. 2156
GILBERT RADIO TELEPHONE AND BROADCASTING

No. 2157
GILBERT BOY ATHLETICS

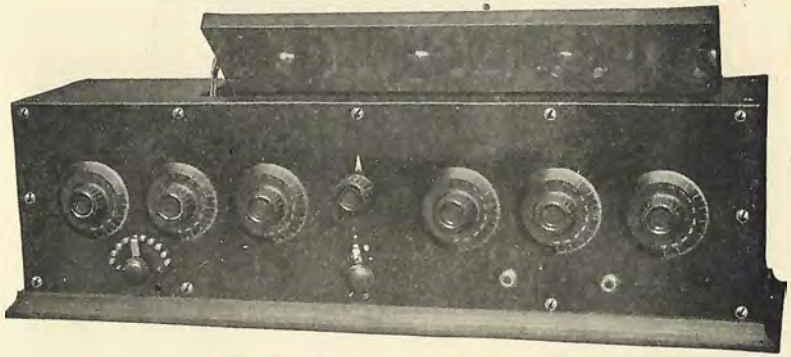
No. 2158
FUN WITH YOUR ELECTRIC MOTOR

No. 2159
ELECTRICAL TOYS AND TRICKS

No. 2160
GILBERT DESIGNER AND TOYMAKER

Gilbert Radio Apparatus.

Extremely High Grade Efficient Apparatus



Radio Frequency No. 4023

This set, as its name implies, is based on the wonderful principle of Radio Frequency Amplification, making the highest type of receiving instrument yet invented, for long distance and receiving.

General Description.

No. 4023 Gilbert Radio Frequency Outfit consist of two stages of Radio frequency amplification, a detector and one stage of audio frequency amplification. Jacks are provided so two stages of Radio frequency amplification and detector may be used on the whole set, including the audio amplifier. The audio amplifier will be found particularly useful in the event that a loud speaker is attached but practically unnecessary at any other time.

Tuning is arranged for with Variocoupler No. 4085, the last word in tuning devices and a variable condenser.

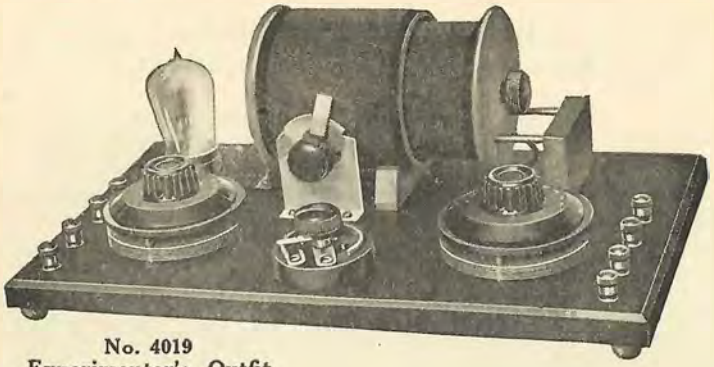
The panel is genuine bakelite, 7½ x 27 x 3-16 inches. Cabinet is highly polished mahogany stained, size over all 8⅛ x 28¼ x 7⅝ inches, fitted with adjustable mirror panel in top which can be raised to any desired position giving a perfect view of the vacuum tubes and interior of set.

Brass binding posts are located at back of cabinet on a special bakelite strip running across the length of the cabinet. By removing a few screws the cabinet may be easily removed, leaving the entire set, panel, and binding posts in one unit on the base.

The finest possible materials and expert workmanship are used throughout in the construction of this set. It is without doubt the highest type of radio receiving instrument on the market but notwithstanding can be bought for a surprisingly low figure. It is the outfit for those persons wishing the acme in radio. Price $125.00 (Canada $187.50) West of Rockies, $131.25

Set is furnished without tubes and needs to complete ready for operation:

3 V. T. 1 Tubes or 3 U. V. 201 Tubes.
1 U. V. 200 or any good detector tube.
6-Volt Storage Battery.
2 22½-volt B. Batteries with taps to vary voltage on detector tube.
1 Pair Gilbert No. 4055 Head Phones. Aerial equipment: 1 Plug.



No. 4019
Experimenter's Outfit

Set is combination of a detector and tuning coils with two variable condensers. Waves from 200 to 800 meters may be readily received. Coils are wound on strong forms impregnated and baked. They slide freely on two brass rods. Set is mounted on highly polished mahogany finished wooden base 14¾ x 8½ inches and stands on four rubber feet. The knobs are made from specially prepared black composition, and the binding posts, switch levers, screws, nuts and wiring clasps are all of brass.

Wiring diagrams for a variety of hook-ups are furnished with each set, as well as the book "Radio Telephone and Broadcasting", a 116 page authoritative book on the theory of Radio and its practical application. Price, $25.00. (Canada, $37.50.) West of Rockies $26.25.

Set is sold without tubes and needs to complete ready for operation as wired:—1 each U. V. 200 Tube, 22½ volt B. battery, 6 volt Storage battery, Head Phones, No. 4055 and sufficient wire and insulators for aerial.

Mineral Detector Set.
No. 4025

The outfit consists of a tuning coil, and crystal detector in very compact stained hardwood cabinet. No batteries are required. It will receive waves varying in length from 200 to 600 meters. The receiving range is approximately 300 miles for wireless telegraph signals and 10 to 15 miles for wireless telephone and much greater distance can be heard under favorable atmospheric conditions.

The 112 page book "Radio Telephone and Broadcasting" is furnished with every one of these sets giving practical instruction to every purchaser and adding a selling argument that few other radio sets have.

The set is furnished with single head phone and is arranged very compactly in a stained hardwood cabinet, 6¼ x 7¼ x 5½ inches. Price $6.95 (Canada, $10.40.) West of Rockies, $7.30.