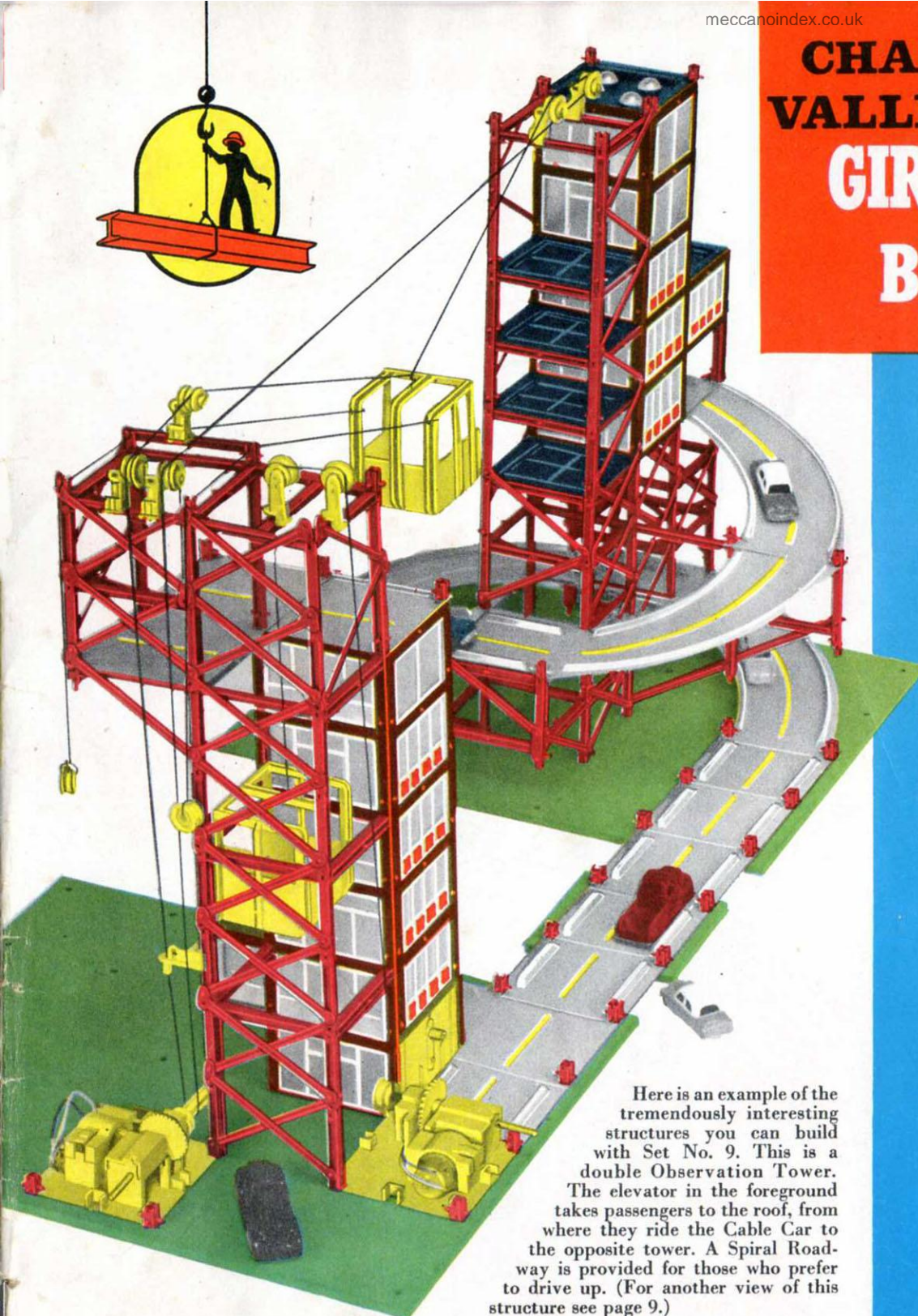


# CHAD VALLEY **MOTORIZED** GIRDER & PANEL *and* BRIDGE & ROADWAYS

## BUILDING SET

**SPECIAL PROJECT BOOK**  
for Set No. 8 and Set No. 9



Here is an example of the tremendously interesting structures you can build with Set No. 9. This is a double Observation Tower. The elevator in the foreground takes passengers to the roof, from where they ride the Cable Car to the opposite tower. A Spiral Roadway is provided for those who prefer to drive up. (For another view of this structure see page 9.)

## BUILD IT...RUN IT..

This book shows actual photos of 30 structures built with Chad Valley Motorized Building Sets, with a number of detail photos and diagrams to aid you in building them. Set No. 9 will build everything shown in this book; Set No. 8 will build everything on pages 2 through 7.

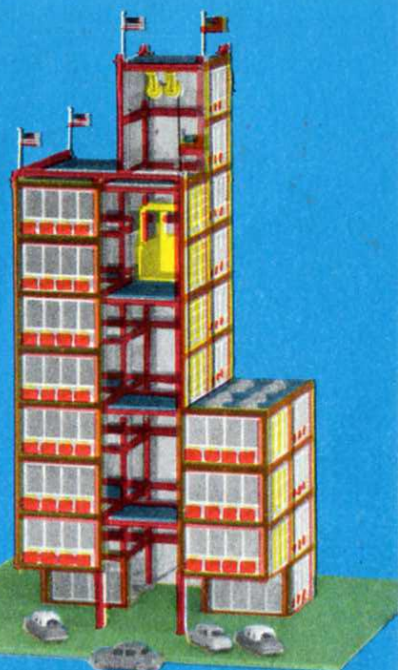
In addition, you can build any of the structures shown in the Girder & Panel and Bridge & Roadway Planning Books and make them come to life with the battery-operated mechanized parts.



This Elevator Building is easy to build with Set No. 8. You may want to try it as your first project with this set.



# HERE ARE SOME EASY STARTERS FOR YOUR No. 8 SET — "THE CONSTRUCTIONER"

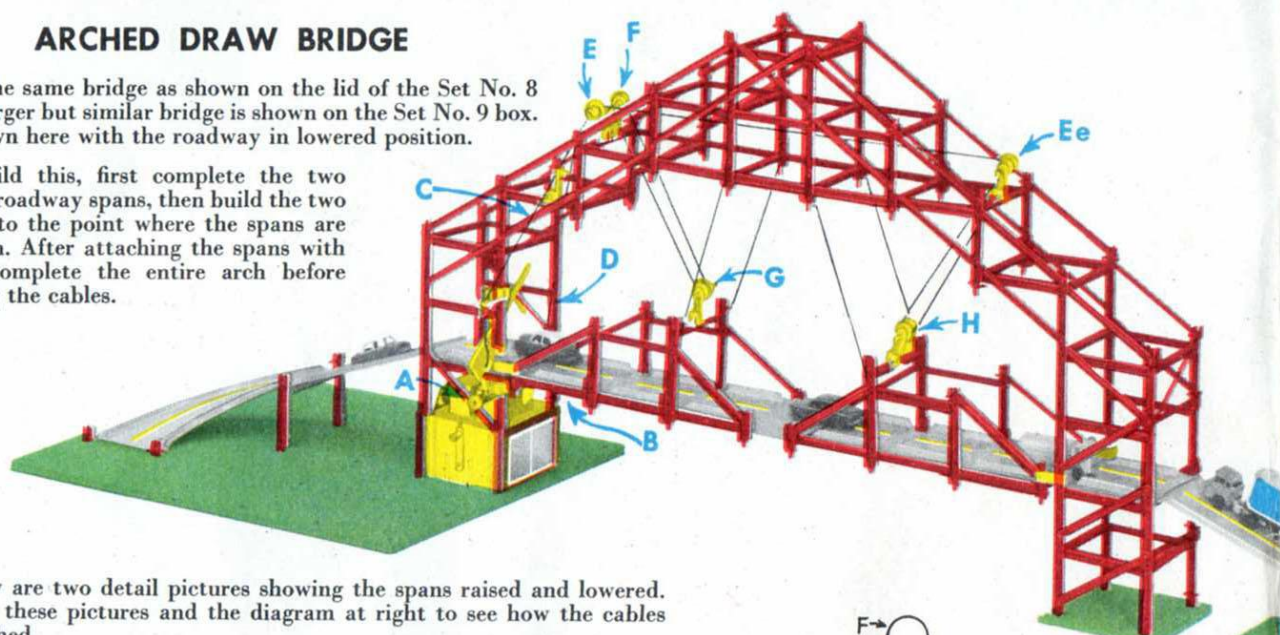


This is another view of the building on the cover of this book. It shows how you may use flat roof panels as floors. Note that the second pulley at the top of the elevator shaft holds the cable over to the left side so it can run down inside the elevator shaft without interfering with the cab.

## ARCHED DRAW BRIDGE

This is the same bridge as shown on the lid of the Set No. 8 box. A larger but similar bridge is shown on the Set No. 9 box. It is shown here with the roadway in lowered position.

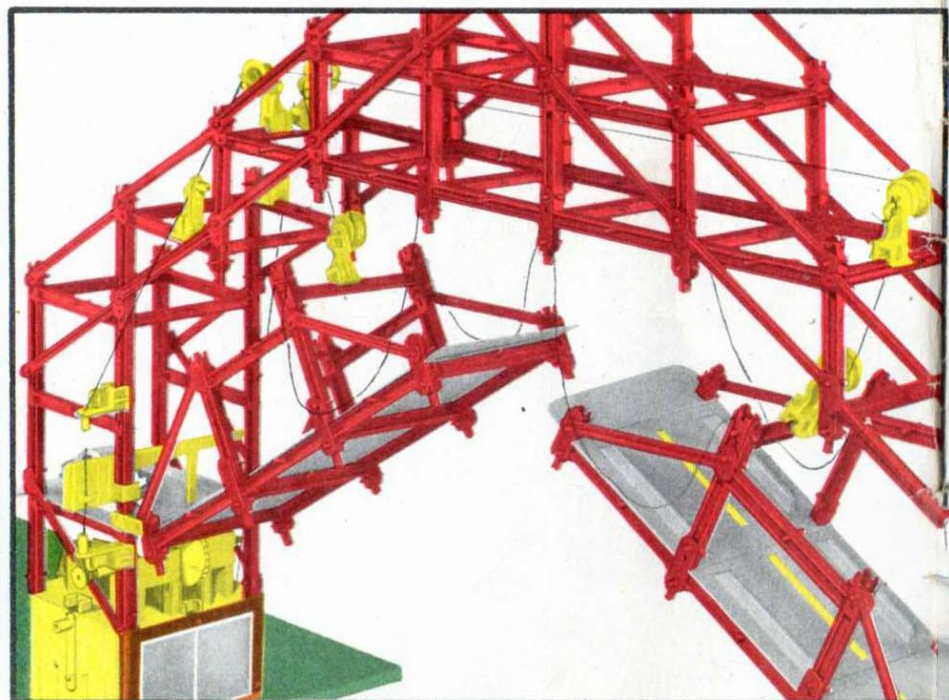
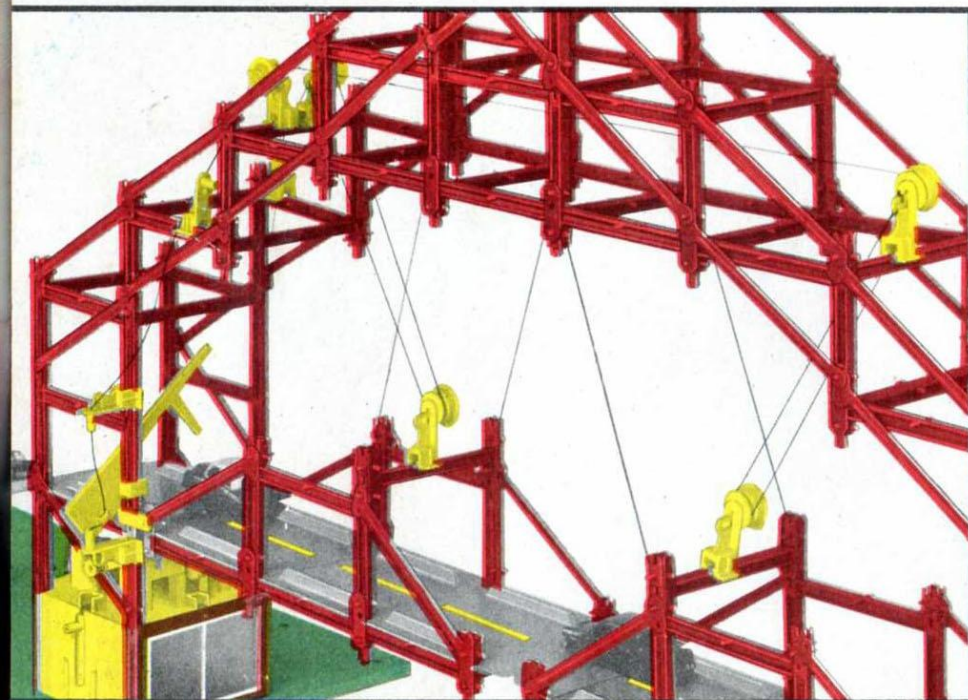
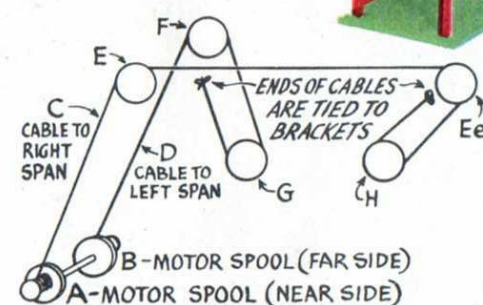
To build this, first complete the two movable roadway spans, then build the two piers up to the point where the spans are hinged on. After attaching the spans with hinges, complete the entire arch before attaching the cables.



Below are two detail pictures showing the spans raised and lowered. Examine these pictures and the diagram at right to see how the cables are attached.

Both halves of the roadway raise or lower together. The cable that lifts the right half is wound on the spool at the near side of the motor (that is, the side facing you in the picture), and the cable for the left side is wound on the spool at the far side. The four cords, which are attached to girders at the top of the arch, support the spans in their lowered position, holding them level when the cables are slack.

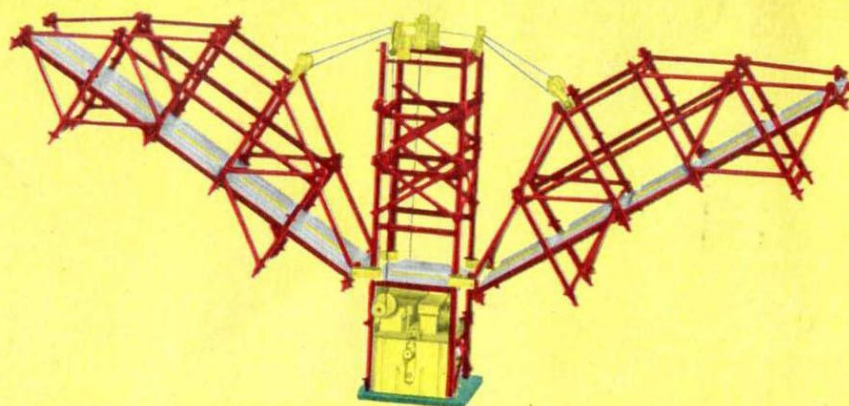
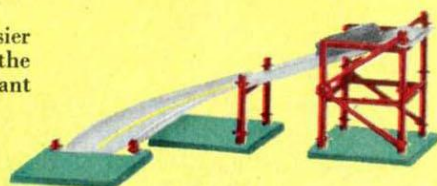
The gate is shown in two positions in the detail pictures below. When the bridge is lowered and the cable is slack, the gate, being counter-balanced, raises of its own accord. When the cable tightens the span, it causes the gate to close, and it stays closed as long as the cable is pulled tight.



## Another type of DOUBLE DRAW BRIDGE

On this bridge, both movable spans are attached to the center pier rather than being attached to opposite ends of the bridge as in the Arched Draw Bridge shown above. Again, the two spans are operated together by the same motor, one motor spool for each span.

This bridge is somewhat easier to build and operate than the Arched Bridge; you may want to try this one first.

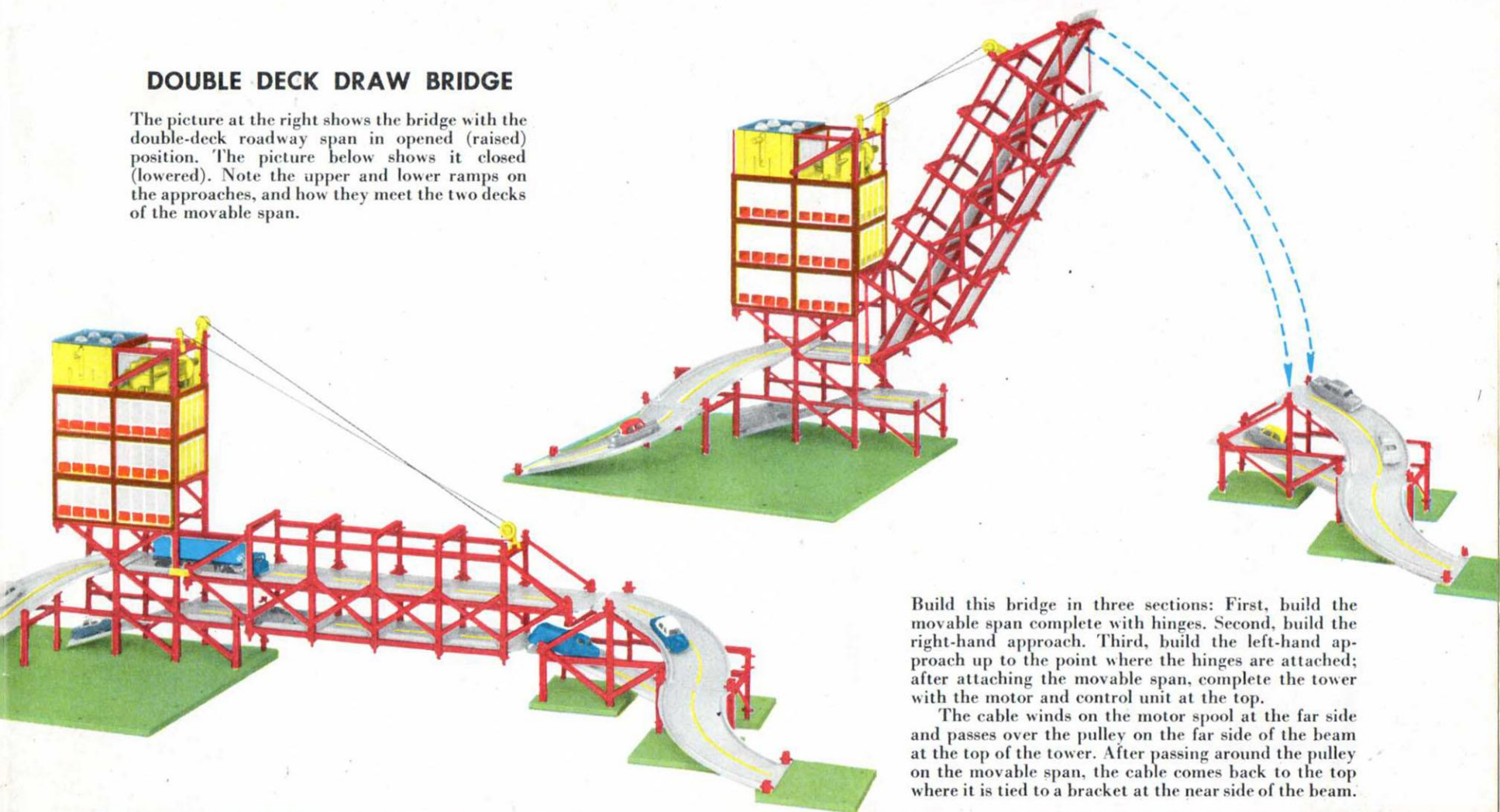




# THESE TWO PAGES SHOW FOUR DIFFERENT TYPES OF MOTORIZED LIFT BRIDGES

## DOUBLE DECK DRAW BRIDGE

The picture at the right shows the bridge with the double-deck roadway span in opened (raised) position. The picture below shows it closed (lowered). Note the upper and lower ramps on the approaches, and how they meet the two decks of the movable span.

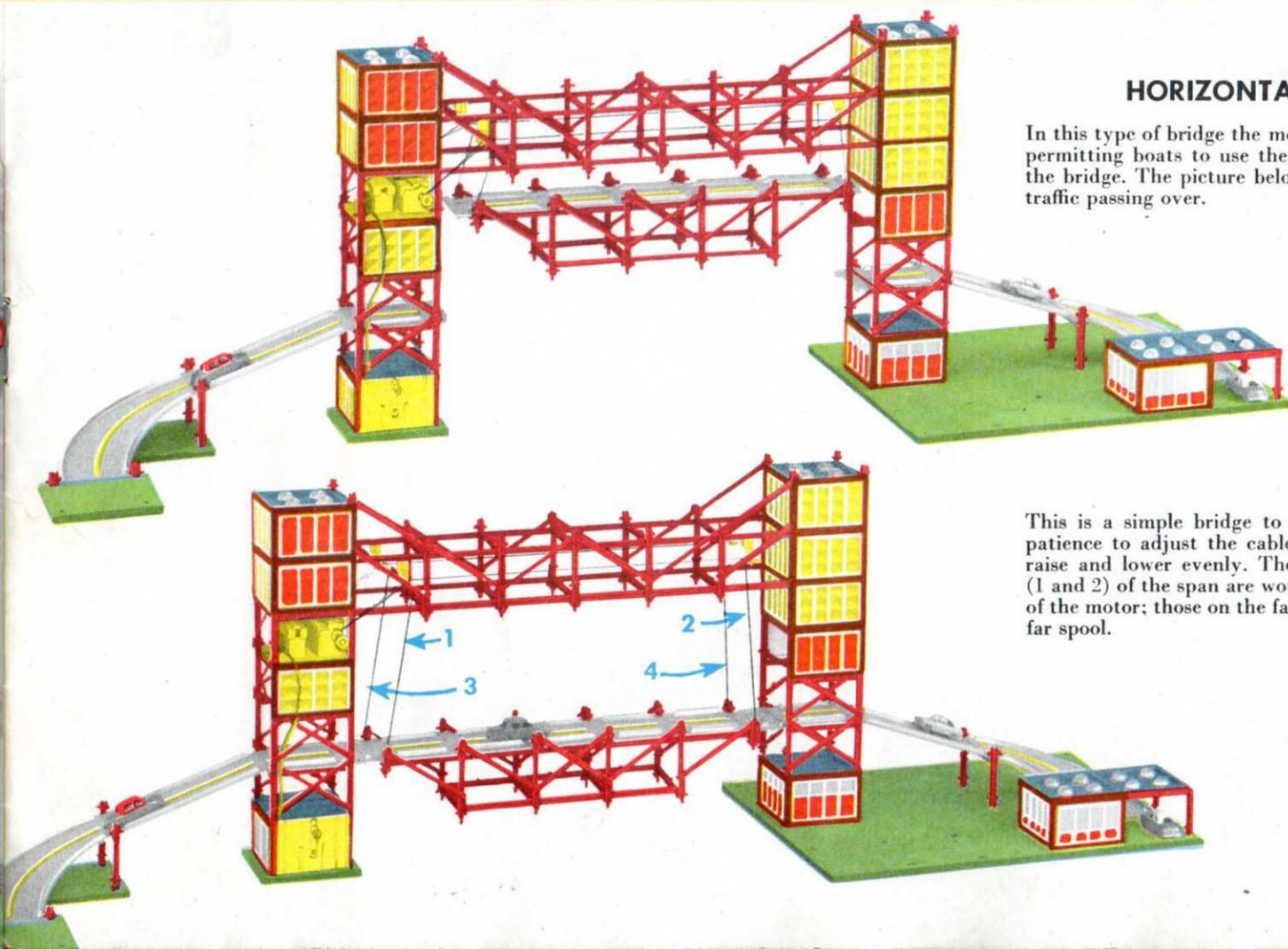


Build this bridge in three sections: First, build the movable span complete with hinges. Second, build the right-hand approach. Third, build the left-hand approach up to the point where the hinges are attached; after attaching the movable span, complete the tower with the motor and control unit at the top.

The cable winds on the motor spool at the far side and passes over the pulley on the far side of the beam at the top of the tower. After passing around the pulley on the movable span, the cable comes back to the top where it is tied to a bracket at the near side of the beam.

## HORIZONTAL LIFT BRIDGE

In this type of bridge the movable span is lifted straight up, permitting boats to use the entire width of the river under the bridge. The picture below shows the span lowered, with traffic passing over.



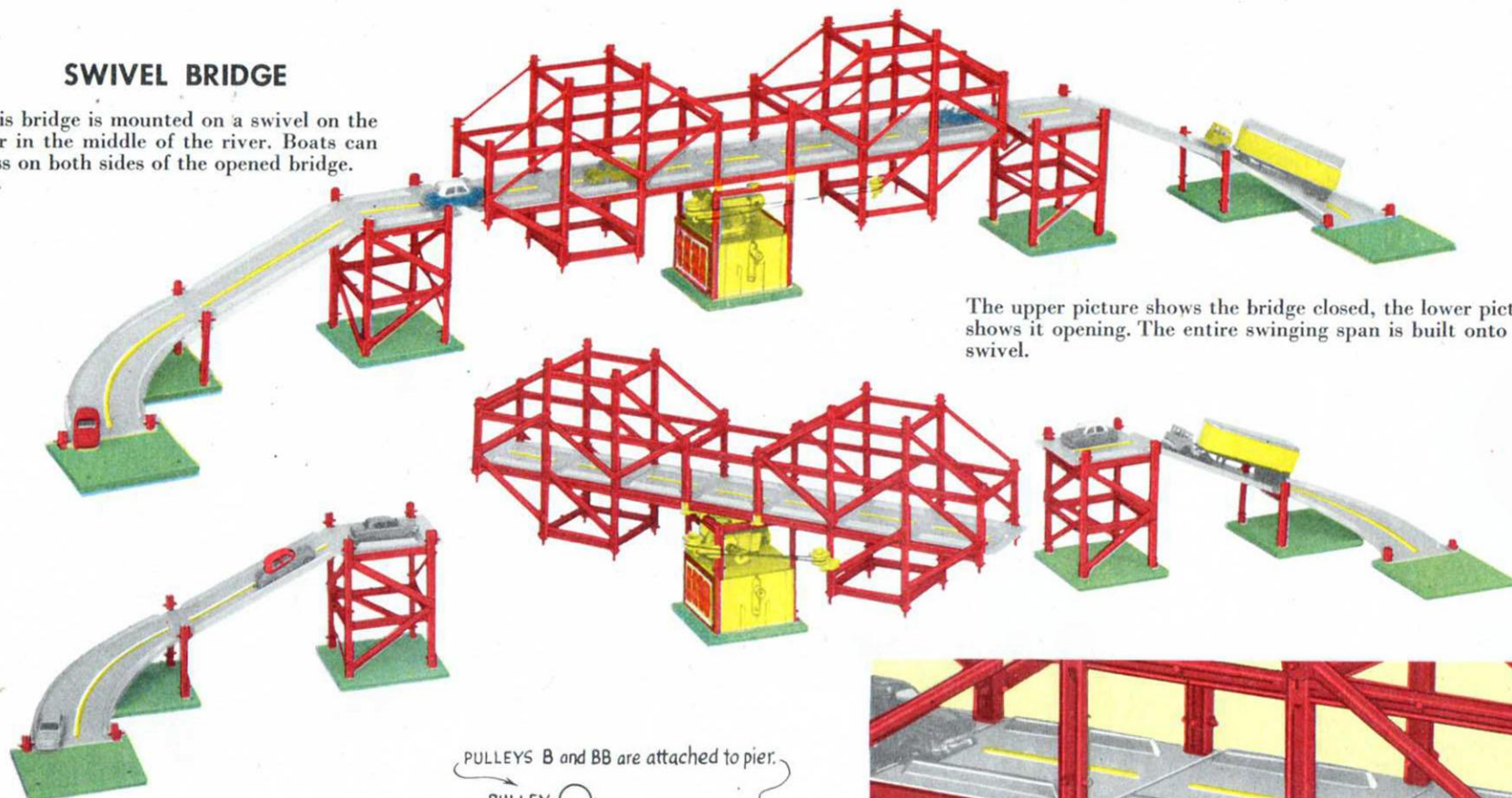
This is a simple bridge to construct, but it requires some patience to adjust the cables because all four corners must raise and lower evenly. The two cables from the near side (1 and 2) of the span are wound on the spool on the near side of the motor; those on the far side (3 and 4) are wound on the far spool.



# HERE ARE TWO UNUSUAL TYPES OF MOVABLE BRIDGES TO BUILD WITH SET No. 8

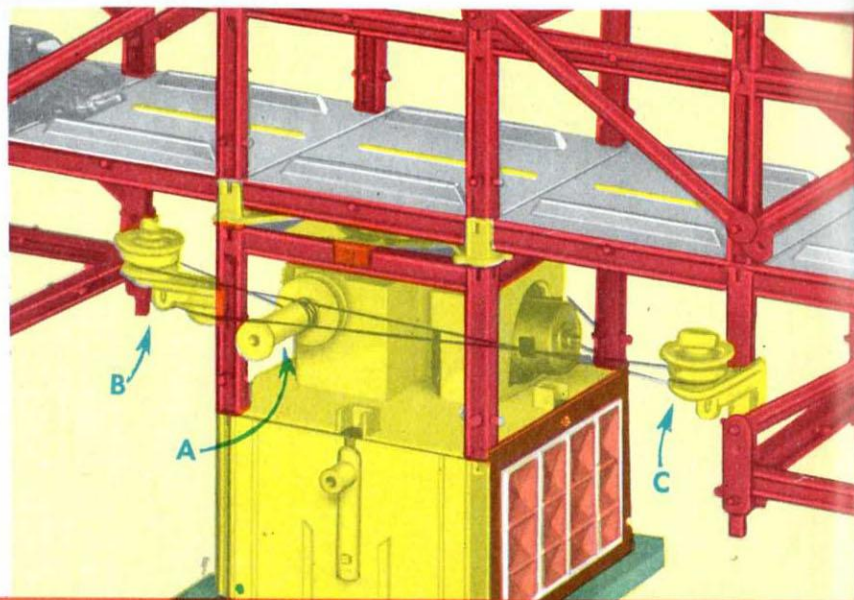
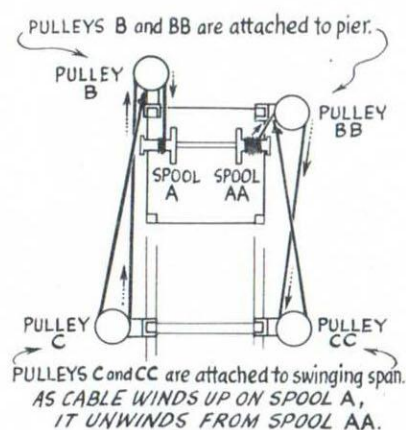
## SWIVEL BRIDGE

This bridge is mounted on a swivel on the pier in the middle of the river. Boats can pass on both sides of the opened bridge.



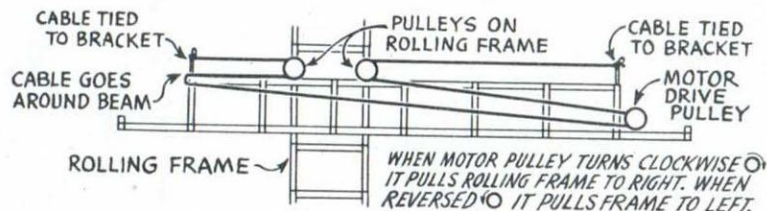
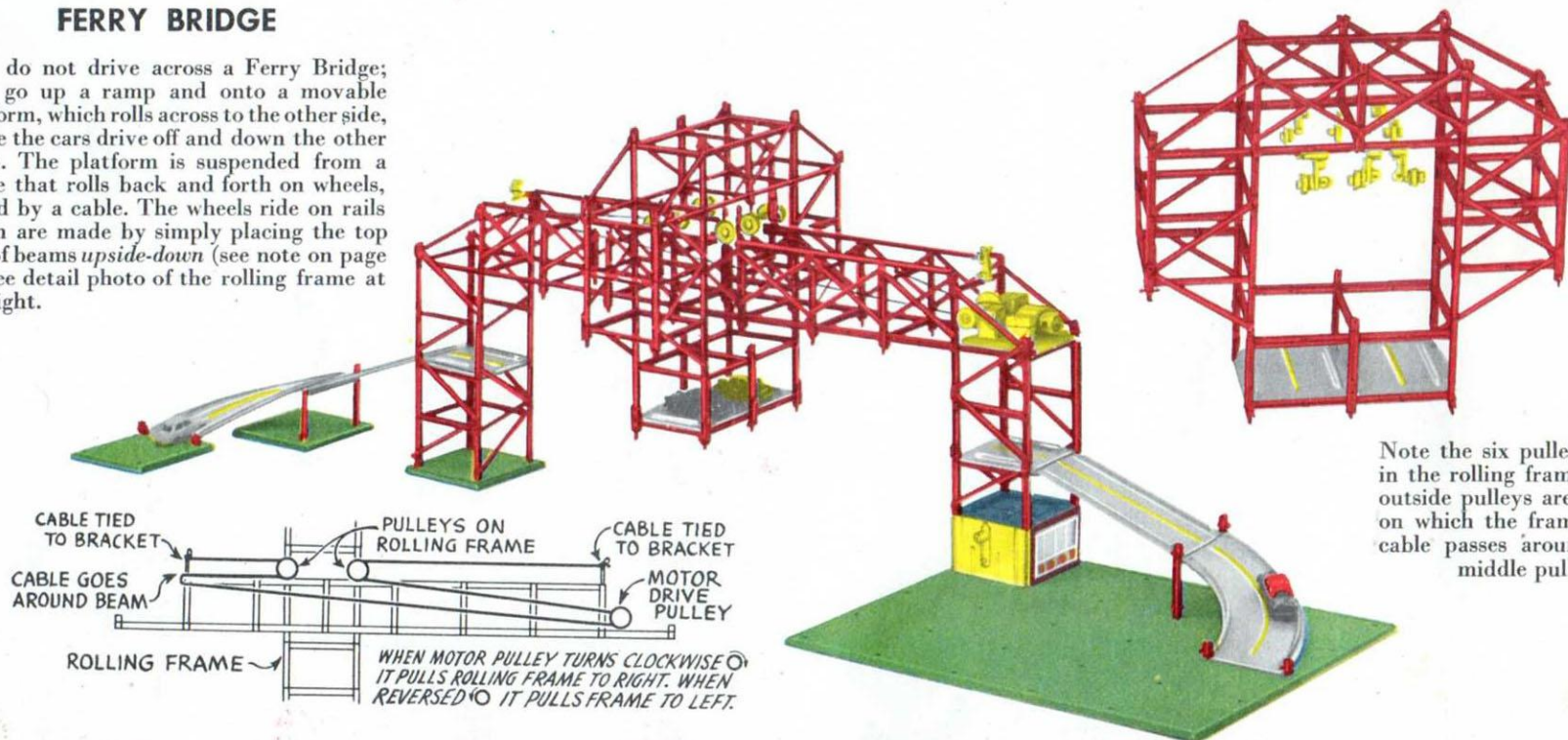
The upper picture shows the bridge closed, the lower picture shows it opening. The entire swinging span is built onto the swivel.

The detail photo at the right shows the pulley arrangement on one side of the bridge. As the cable is wound up on the spool it pulls the two pulleys toward each other, causing the bridge to swing open. A similar arrangement on the other side pulls the bridge back to closed position when the motor is reversed, as shown in the diagram.



## FERRY BRIDGE

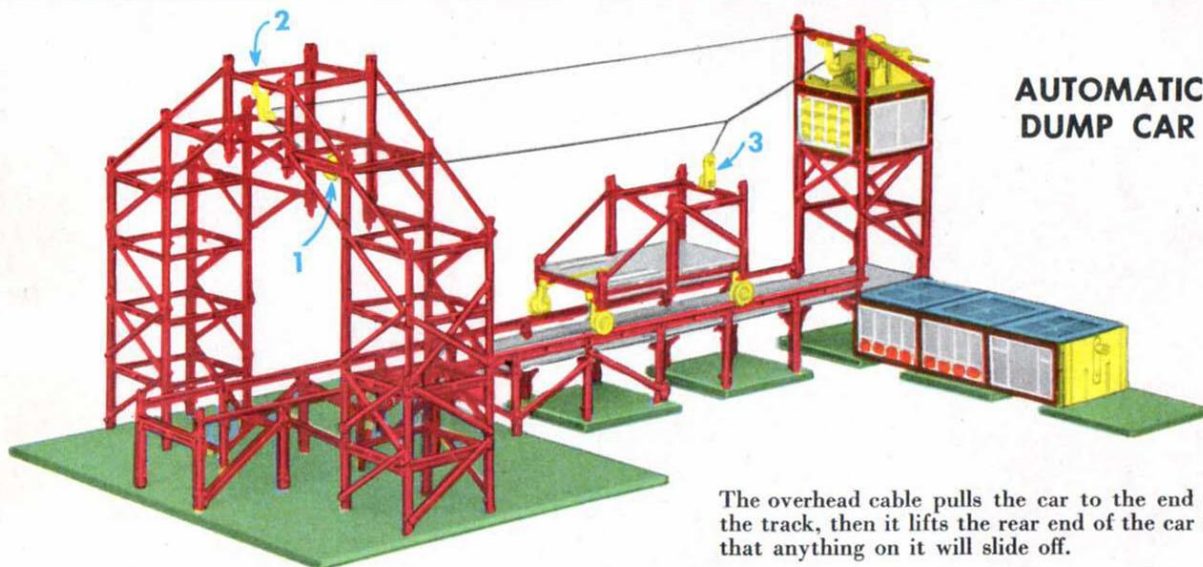
Cars do not drive across a Ferry Bridge; they go up a ramp and onto a movable platform, which rolls across to the other side, where the cars drive off and down the other ramp. The platform is suspended from a frame that rolls back and forth on wheels, pulled by a cable. The wheels ride on rails which are made by simply placing the top row of beams upside-down (see note on page 5). See detail photo of the rolling frame at the right.



Note the six pulleys mounted in the rolling frame. The four outside pulleys are the wheels on which the frame rolls; the cable passes around the two middle pulleys.



# HERE ARE THREE REALISTIC STRUCTURES THAT MOVE MATERIALS



**AUTOMATIC  
DUMP CAR**

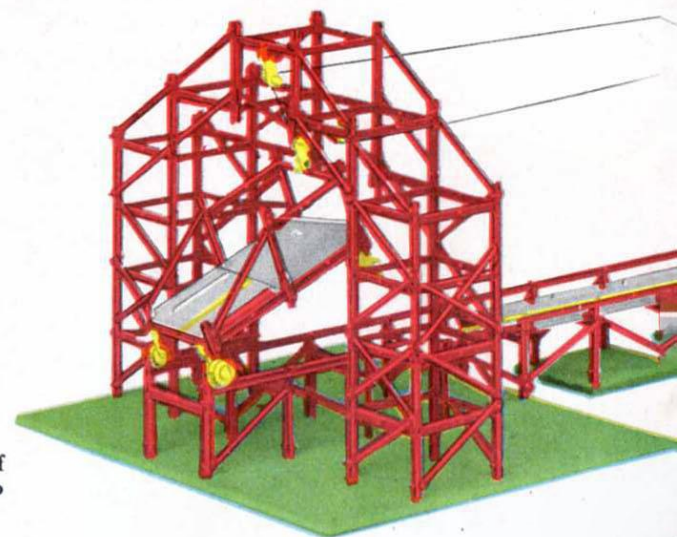
The overhead cable pulls the car to the end of the track, then it lifts the rear end of the car so that anything on it will slide off.

Note the pulley (No. 1) fastened beneath the middle beam of the arch. The cable is arranged so that it runs under this pulley, then goes sharply upward and through a bracket (No. 2) before turning back toward the motor pulley. It is this upward pull that dumps the car.

Be sure to mount the pulley, and also the bracket (No. 3) that holds the cable onto the car, in exact center of the beam; this is necessary so that the back wheels of the car will come down straight onto the rails when the motor is reversed to pull the car back.

## NOTE ON CONSTRUCTING THE RAILS:

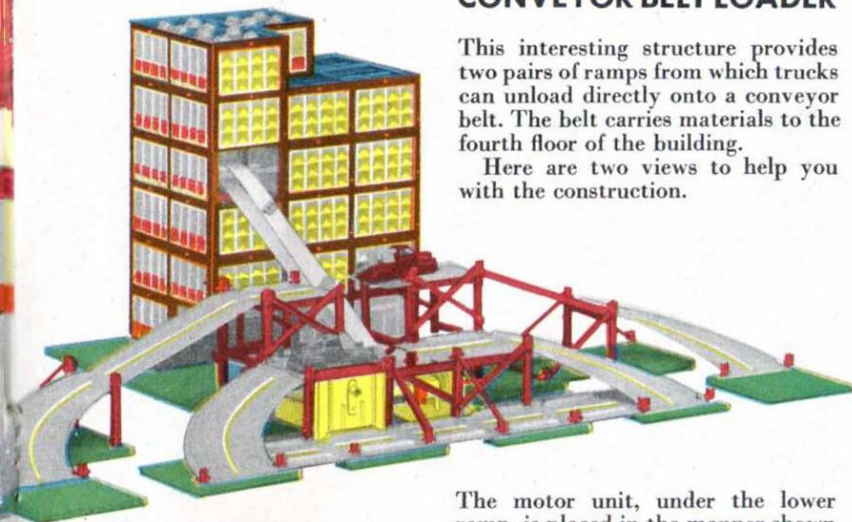
Rails consist of rows of beams placed *upside-down* in stubs at the tops of the columns. Two other examples of rails can be seen in the pictures of cranes at the bottom of the next page.



## WAREHOUSE WITH CONVEYOR BELT LOADER

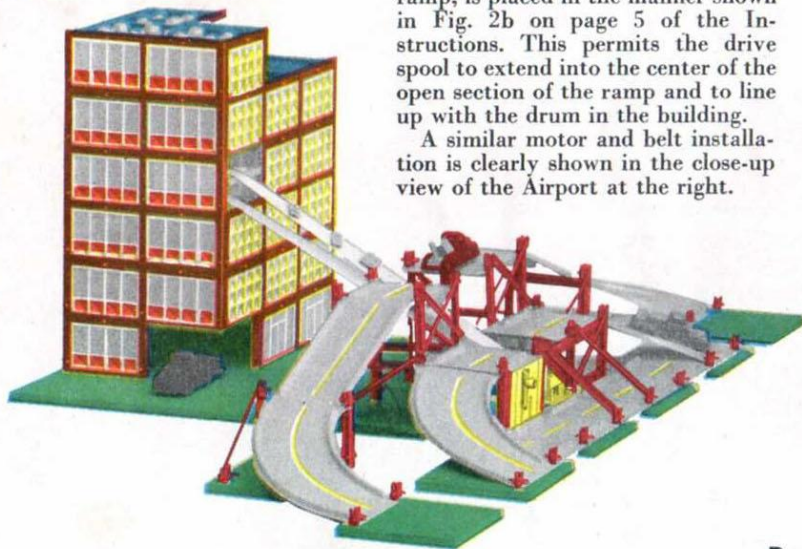
This interesting structure provides two pairs of ramps from which trucks can unload directly onto a conveyor belt. The belt carries materials to the fourth floor of the building.

Here are two views to help you with the construction.

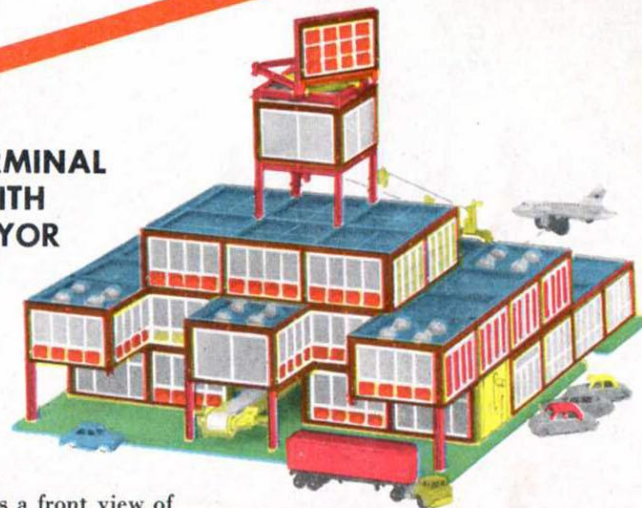


The motor unit, under the lower ramp, is placed in the manner shown in Fig. 2b on page 5 of the Instructions. This permits the drive spool to extend into the center of the open section of the ramp and to line up with the drum in the building.

A similar motor and belt installation is clearly shown in the close-up view of the Airport at the right.



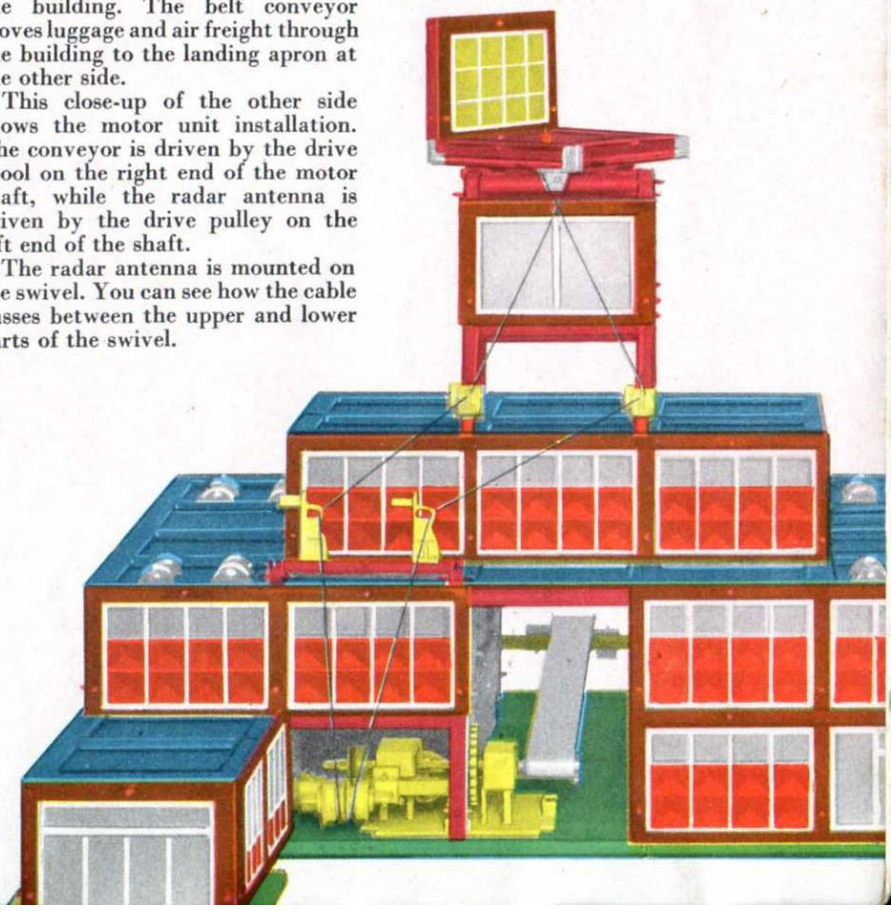
## AIRPORT TERMINAL BUILDING WITH BELT CONVEYOR AND REVOLVING RADAR ANTENNA



The upper picture is a front view of the building. The belt conveyor moves luggage and air freight through the building to the landing apron at the other side.

This close-up of the other side shows the motor unit installation. The conveyor is driven by the drive spool on the right end of the motor shaft, while the radar antenna is driven by the drive pulley on the left end of the shaft.

The radar antenna is mounted on the swivel. You can see how the cable passes between the upper and lower parts of the swivel.

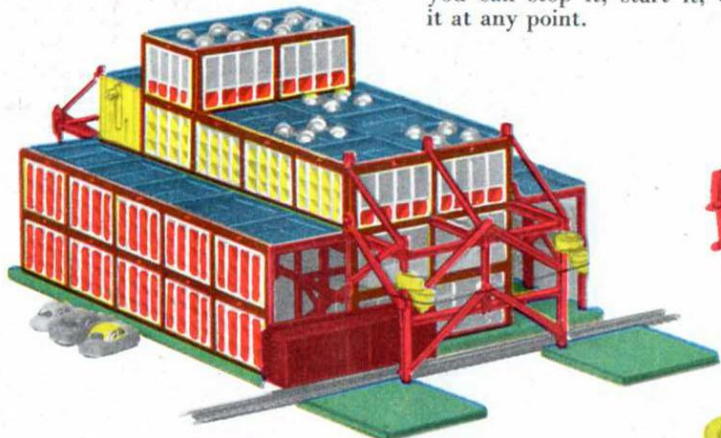




# THE No. 8 "CONSTRUCTIONER" ALSO BUILDS CRANES, CONVEYORS, ELEVATORS

## FACTORY BUILDING WITH HOOK CONVEYOR

The hook conveyor runs from the railroad siding through the building to the truck loading area, then returns through the other side of the building to make a complete circuit. It can carry small items from freight car to truck or from truck to freight car, and you can stop it, start it, or reverse it at any point.

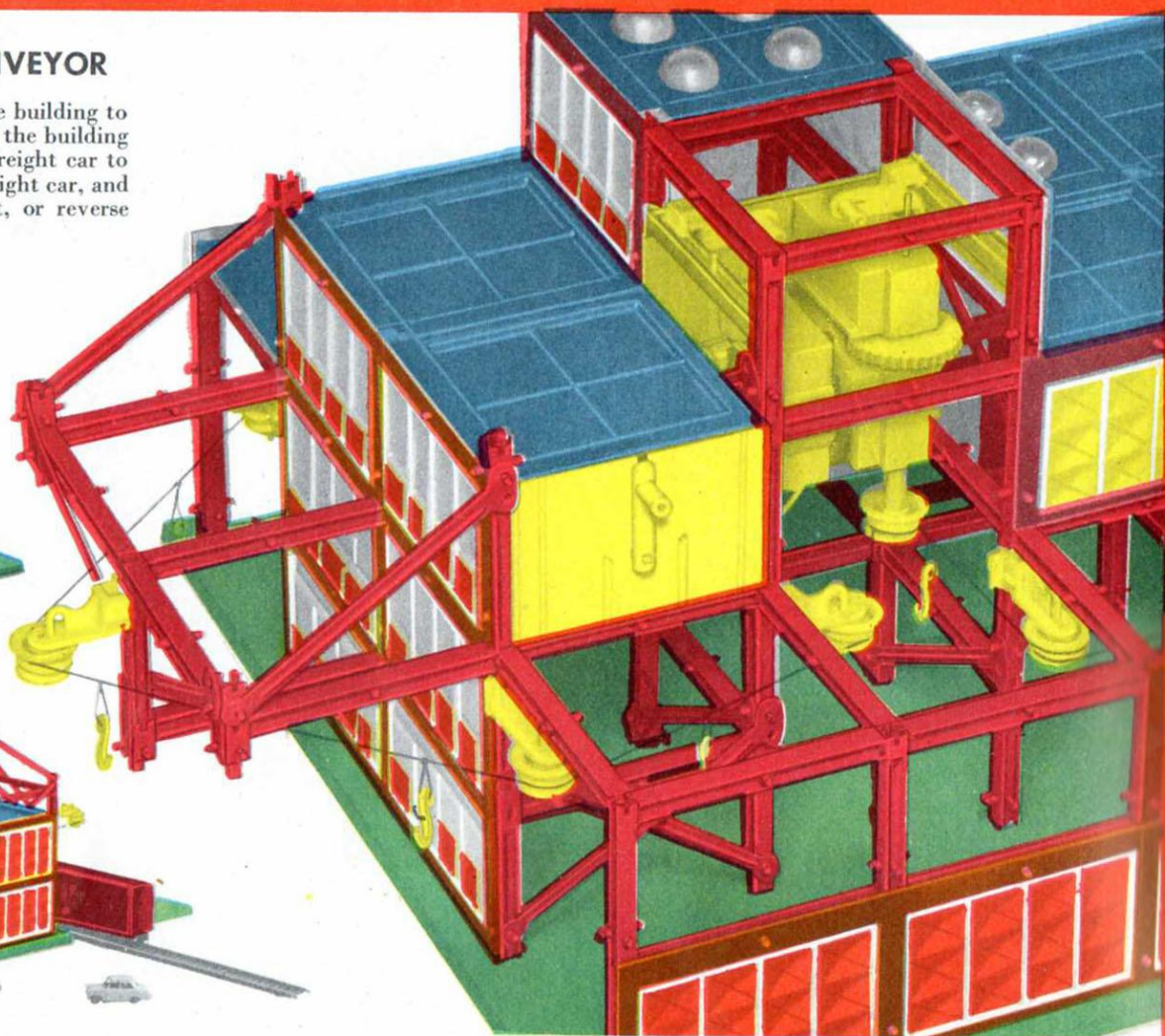


The above two views show the building from the railroad siding and the truck loading ends. Compare the lower picture with the detail at the right, which is an enlarged view of the front corner of the building. Several roof and wall panels are removed to show details of the motor and pulley

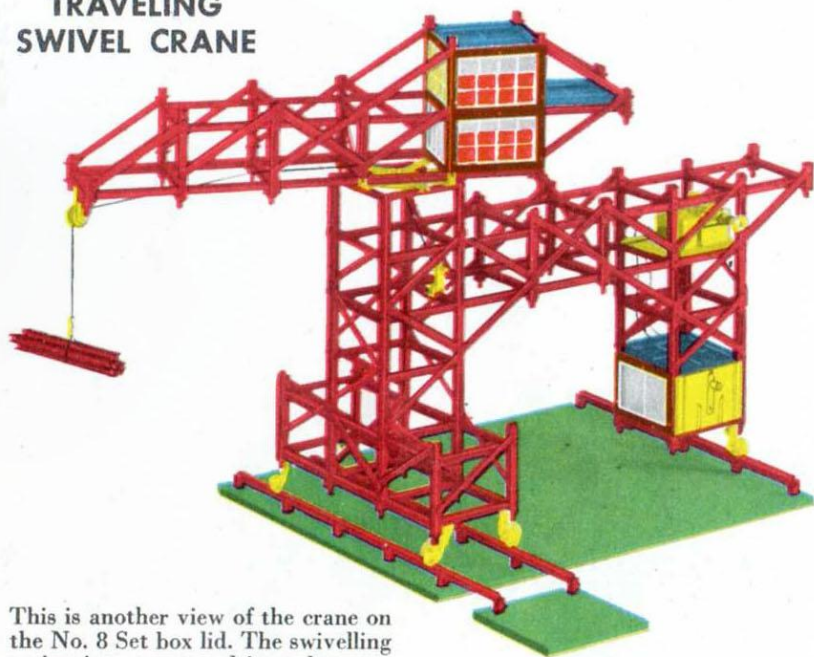
arrangement. This is the photo referred to in item 11 on page 7 of the Instructions.

The motor is mounted vertically, but *not* as in Fig. 2d on page 5 of the Instructions. In that instance the *middle* notches in the motor base fit onto two beams, whereas here the *lower corner*

*notches* fit onto the beams and a pair of middle beams are fitted into the *upper corner* notches. The two pulley brackets (one on each middle beam) serve as clamps to hold the base of the motor unit snug against the columns behind the unit.



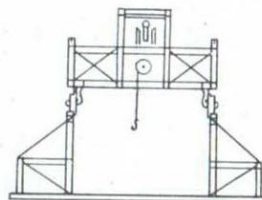
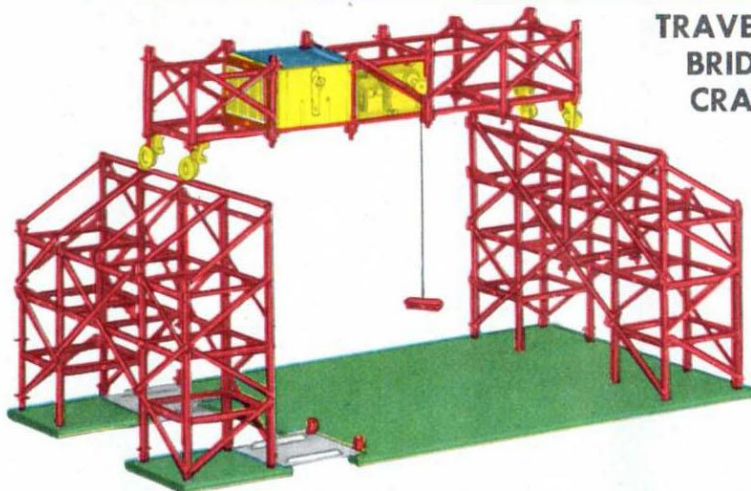
## TRAVELING SWIVEL CRANE



This is another view of the crane on the No. 8 Set box lid. The swivelling action is *not* motor driven, but you can swing the boom by hand in a complete circle. The cable, which is motor driven, runs from the motor spool through the loop of a bracket located below the swivel, then *up through the hole in the center bearing of the swivel*. Thus the cable will not bind or tangle when the swivel is turned.

The rails are beams placed *upside-down* on stub girders.

## TRAVELING BRIDGE CRANE



This type of crane is used in factories, steel mills, and docks. The rails run the length of the structure, and the crane moves from one end to the other, carrying heavy loads to any part of the working area.

If you want to build a crane like this with longer rails, you can cut down the height and width (like this diagram) and use the parts thus saved to make the supporting structure and rails longer.



### MODERN PARKING GARAGE WITH ELEVATOR



This is a new garage design, planned for efficient operation. During the morning rush, when many cars are arriving and only a few are leaving, the elevator is used to bring down the cars that are going out, so the ramps are kept free for up-traffic only. In the late afternoon when the situation is reversed, cars can leave in an uninterrupted flow down the ramps while incoming cars go up in the elevator.

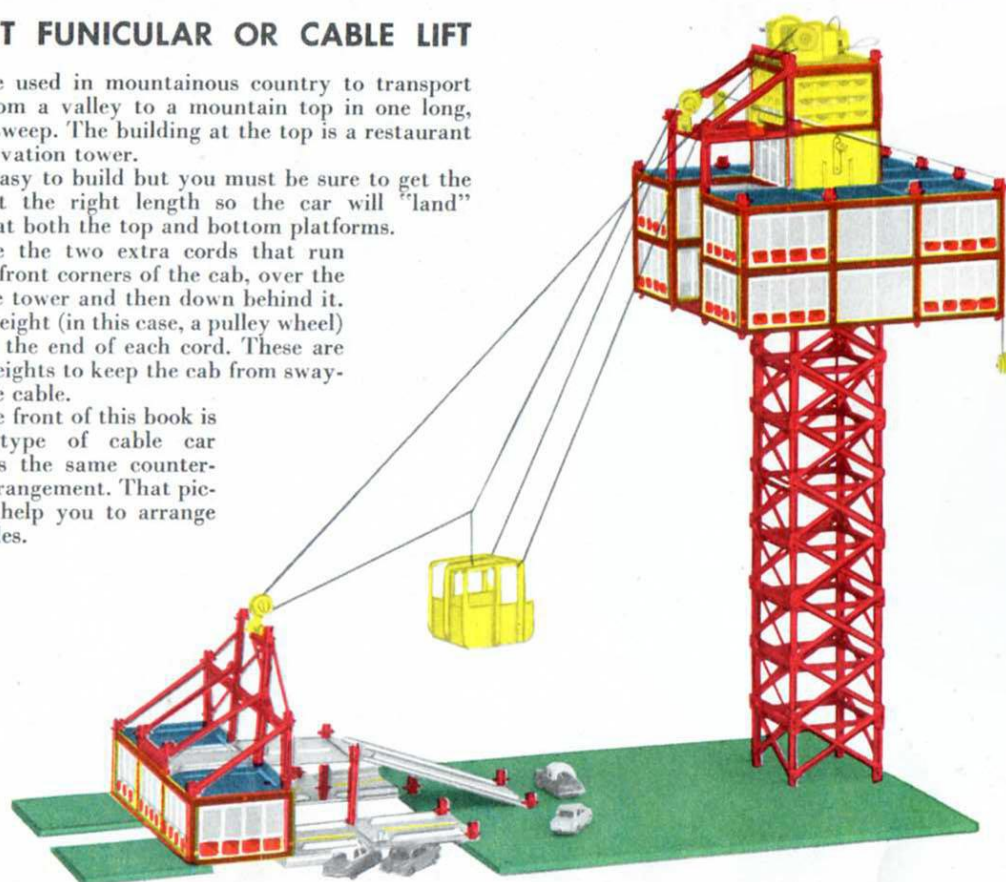
### RESORT FUNICULAR OR CABLE LIFT

These are used in mountainous country to transport people from a valley to a mountain top in one long, thrilling sweep. The building at the top is a restaurant and observation tower.

It is easy to build but you must be sure to get the cable just the right length so the car will "land" properly at both the top and bottom platforms.

Notice the two extra cords that run from the front corners of the cab, over the top of the tower and then down behind it. A small weight (in this case, a pulley wheel) is tied to the end of each cord. These are counterweights to keep the cab from swaying on the cable.

On the front of this book is another type of cable car which has the same counterweight arrangement. That picture will help you to arrange these cables.

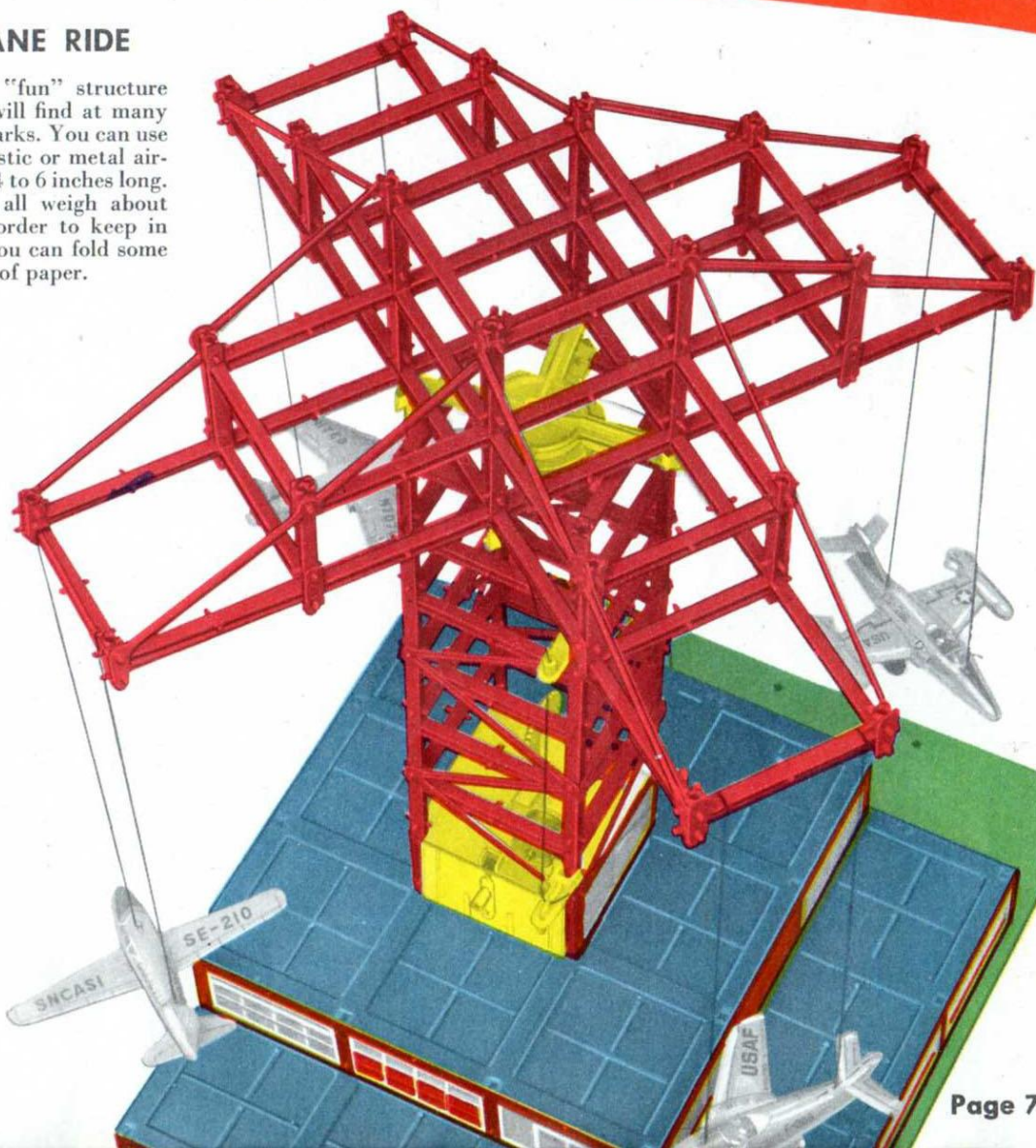


### AIRPLANE RIDE

A wonderful "fun" structure such as you will find at many amusement parks. You can use any small plastic or metal airplanes about 4 to 6 inches long. They should all weigh about the same in order to keep in balance. Or you can fold some airplanes out of paper.



The enlarged view at the right shows in detail the construction of the rotating top section, which is built onto a swivel. The cable passes around a drive pulley on the motor shaft and is guided through pulley brackets to the top of the tower. There it goes around the swivel pulley and back down to the drive pulley. The enclosed area at the base is used for lunch counters and amusement concessions.



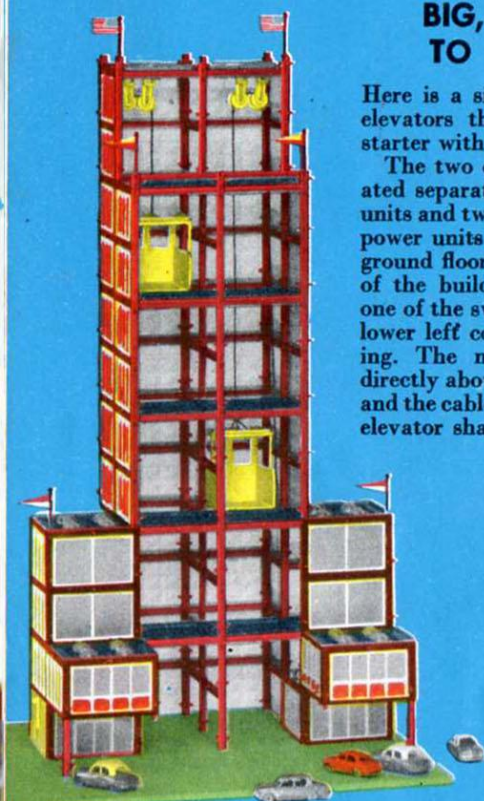


# THE No. 9 "De Luxe CONSTRUCTIONEER" BUILDS DOUBLE-MOTORIZED STRUCTURES

## BIG, BUT SIMPLE TO CONSTRUCT

Here is a simple building with two elevators that you may use for a starter with your No. 9 Set.

The two elevators are operated separately by two motor units and two power units. The power units are placed on the ground floor, one on each side of the building—you can see one of the switch panels at the lower left corner of the building. The motors are placed directly above the power units, and the cables run up inside the elevator shafts to the pulleys.

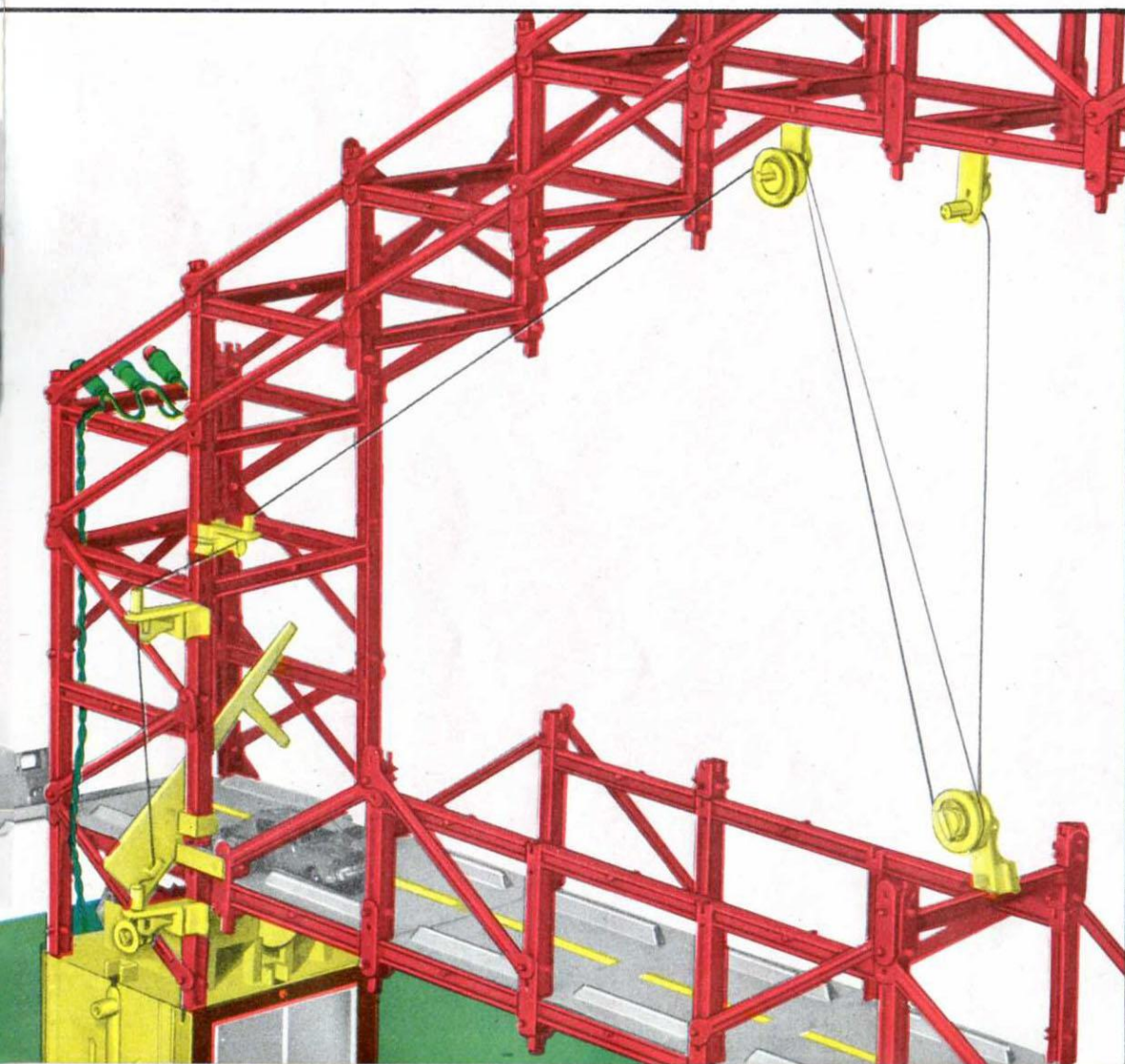
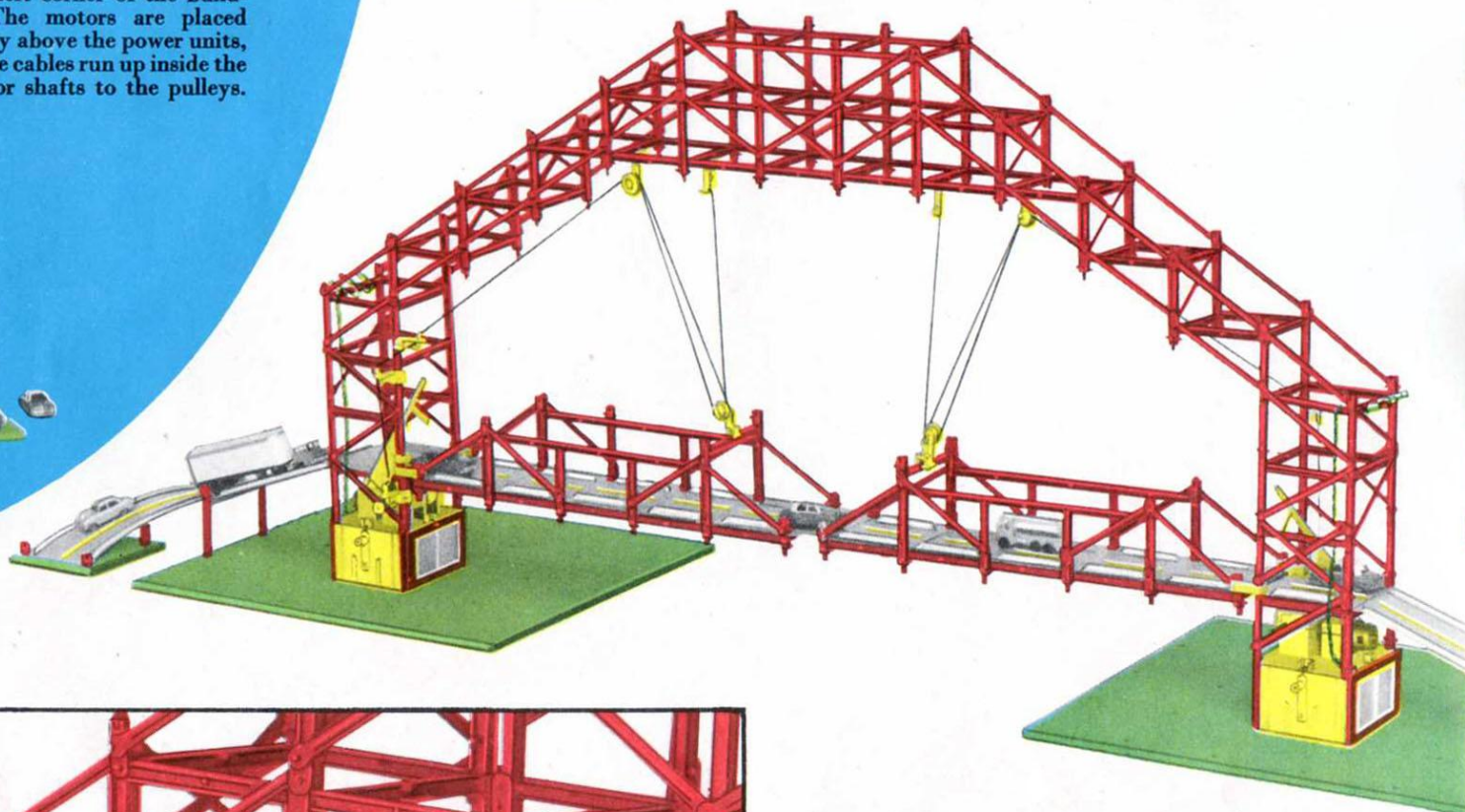


**No. 9 Set gives double fun. Two-at-a-time can operate these wonderful, realistic models. There are two separate Motor Units, each with its own Power Unit to operate independently.**

## A MASTERPIECE OF MODEL BRIDGE CONSTRUCTION

This graceful Arched Draw Bridge is over five feet long, including approaches. This is the same bridge which is shown, with the spans raised, on the lid of the Set No. 9 box.

To build this bridge you should first construct the two roadway spans and build the two piers, with approaches, up to the point where the spans are hinged on. The power units and motor units are built into the piers. Then attach the spans with hinges (see item 7 of the Instructions) and complete the upper structure and attach the cables.



The large photo at the left shows the cable arrangement at one end of the bridge. The cable is wound on the motor spool, then passes first through the lower bracket, second through the "cable eye" in the gate, and third through another bracket directly above the first one. From there it angles over to another bracket which guides it toward the pulley in the arch. After going around the pulley on the cross beam near the end of the movable span, the cable is tied into the loop of the pulley bracket in the arch.

The extra cord, which runs straight up from the bracket of the pulley on the cross beam of the movable span to a separate bracket in the arch, holds the span in horizontal position when it is lowered and the drive cables are slack. The other end of the bridge is arranged in exactly the same way.

### TO ATTACH THE LIGHTS:

Set No. 9 contains two strings of miniature electric lights which can be used in one of two ways:

1—A string of lights can be connected to a switch right along with a motor, by fastening the wires from lights, motor, and switch together, three wires in each wire nut. When you do this, the lights go on when the motor is running but they cannot be switched on independently of the motor.

2—In a structure which requires only one motor to operate it, the second power unit may be used for the lights alone; the lights can then be switched on or off at will. Both strings of lights can be connected to the same switch.

If you use the lights as traffic lights you can turn off any of the bulbs by unscrewing them part way out of their sockets. For instance, if the lights are used on a draw bridge, the green light will be unscrewed and the red light left burning when the span is to be raised. When the span is lowered, the red light bulb is loosened and the green one screwed back in.



# YOU CAN BUILD BIG STRUCTURES THAT OPERATE WITH TWO SEPARATE ACTIONS

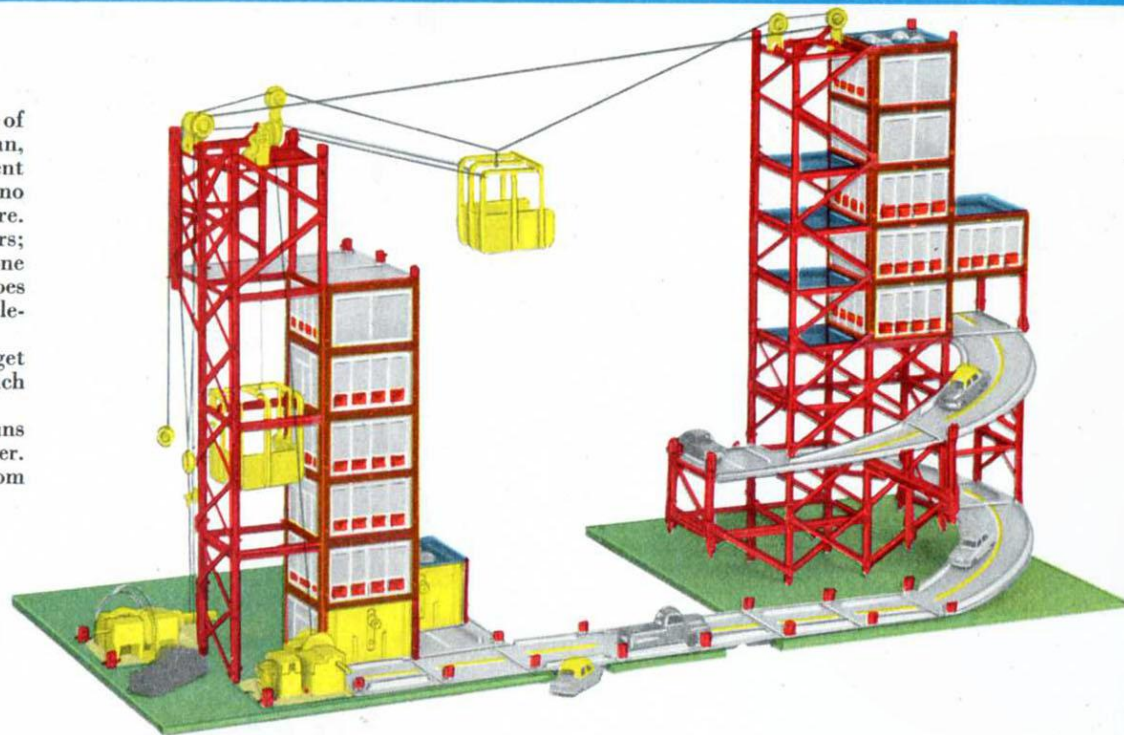
## DOUBLE OBSERVATION TOWER

This is a different view of the big structure on the cover of this book. This view shows clearly the general structural plan, while the cover picture shows more detail of the arrangement of the cables. Between the two pictures you should have no difficulty in building and operating this very unusual structure.

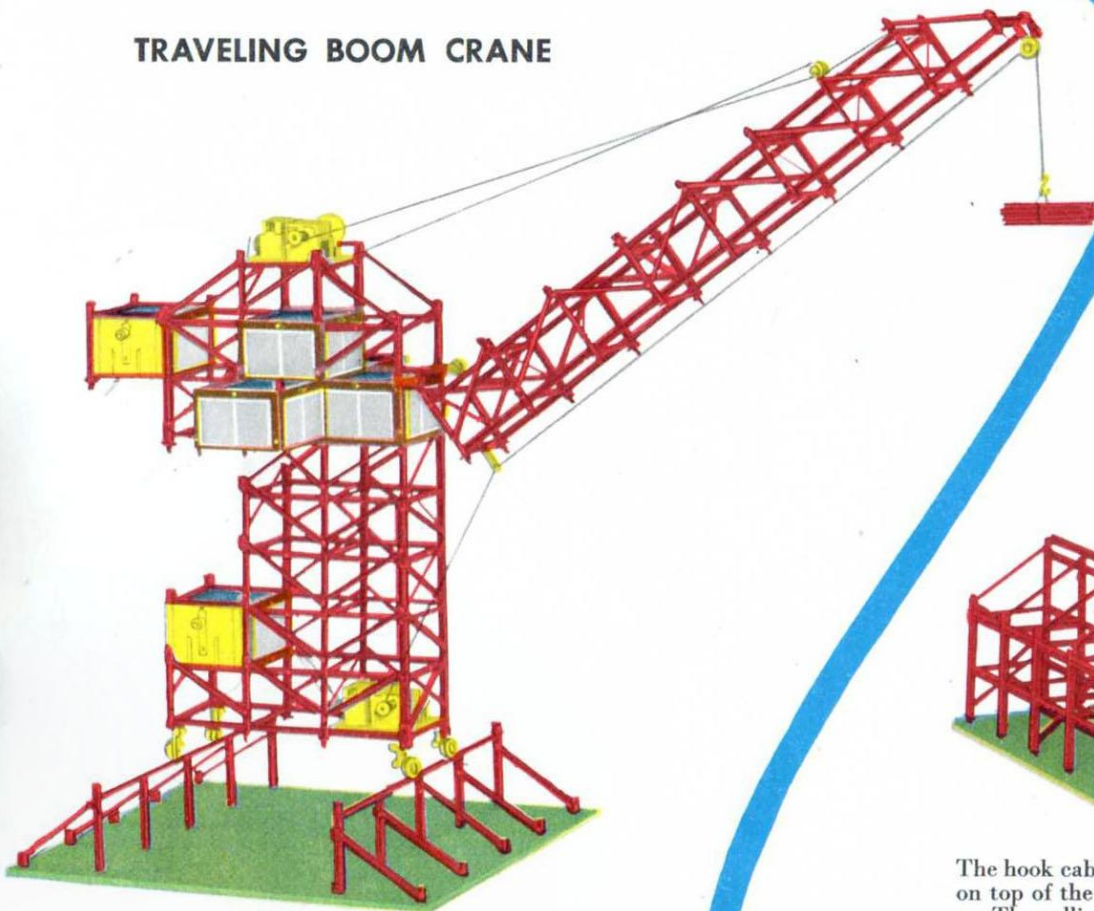
Shown at the bottom left of this picture are two motors; the one farther to the left runs the cable car, the other one operates the elevator. The cable for the elevator simply goes from the motor spool over the two pulleys on top of the elevator shaft.

The cable car also is easy to arrange; just be sure to get the length of the cable correct so that the car will approach the two landings at the proper height.

Here, as on the cable car on page 7, a pair of cords runs from the two corners of the car over the top of the tower. These cords, which are counterweighted, keep the cab from swinging around on its cable.



## TRAVELING BOOM CRANE



The long arm that extends out on hinges from the main structure is called the "boom." By means of the motor on top of the framework, the boom can be raised or lowered—raised up until it stands almost vertically, or lowered until it extends straight out. In this way it can reach far out to pick up an object and then, by raising up, it can set the object down close to the rails.

The motor in the bottom of the framework operates the cable with the hook. The two motors work independently, so you can operate the hook and the boom either separately or at the same time.

The entire crane can be rolled along the rails.

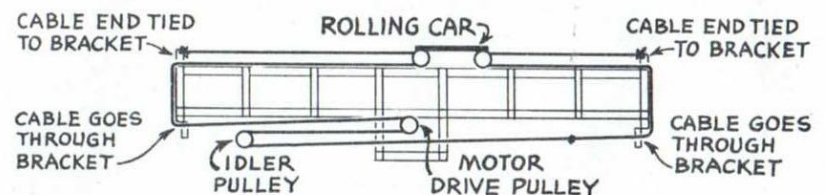
## TRAVELING BRIDGE CRANE

This is much like the Bridge Crane shown and described on page 6 except that it is longer and is operated by two motors. Because the rolling car that carries the hook cable can travel from side to side as well as from end to end of the supports, this crane can pick up and place objects at any spot on the floor between the side structures.



The hook cable is operated by the motor in the car which rolls on the rails on top of the bridge section.

The rolling car that carries the hook cable and its operating units is propelled back and forth by the other motor, which is located in the center of the bridge section. This rolling car works similarly to the Ferry Bridge you have seen on page 4, that is, it is equipped with six pulleys; four of those pulleys act as wheels while the other two are used for the cable that moves the car. Here is a diagram to show how this cable is attached.

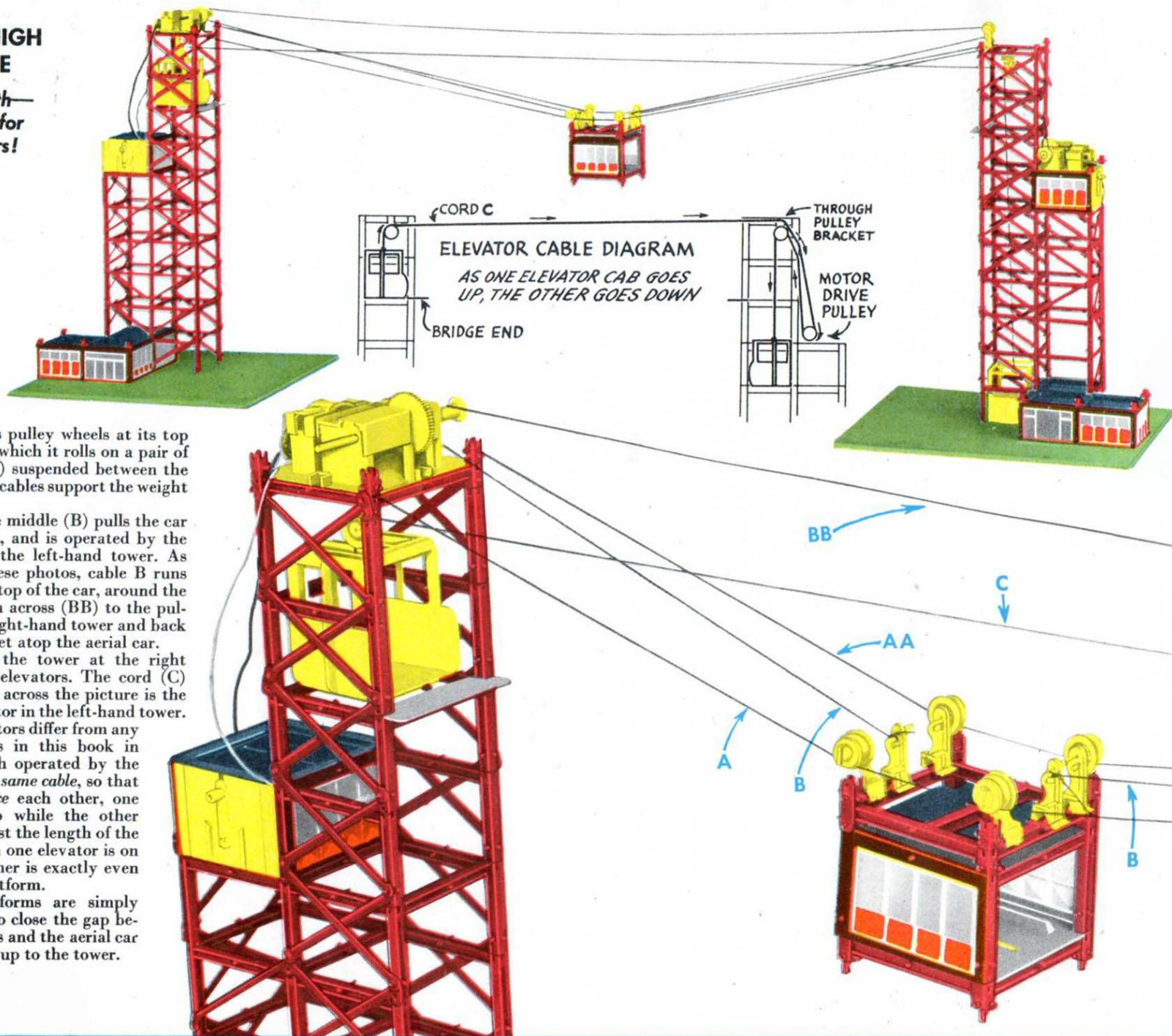




# HAVE FUN WHILE YOU DEVELOP ENGINEERING TALENT

## A LONG, HIGH AERIAL RIDE

Unlimited length—  
unlimited fun for  
two operators!



The aerial car has pulley wheels at its top four corners with which it rolls on a pair of cables (A and AA) suspended between the two towers. These cables support the weight of the car.

The cable in the middle (B) pulls the car in either direction, and is operated by the motor on top of the left-hand tower. As you can see in these photos, cable B runs from a bracket on top of the car, around the motor pulley, then across (BB) to the pulley on top of the right-hand tower and back to the other bracket atop the aerial car.

The motor on the tower at the right operates the two elevators. The cord (C) that runs straight across the picture is the cable for the elevator in the left-hand tower.

These two elevators differ from any previous examples in this book in that they are both operated by the same motor on the same cable, so that they counterbalance each other, one elevator going up while the other comes down. Adjust the length of the cable so that when one elevator is on the ground the other is exactly even with the small platform.

The small platforms are simply bridge ends used to close the gap between the elevators and the aerial car when the car pulls up to the tower.

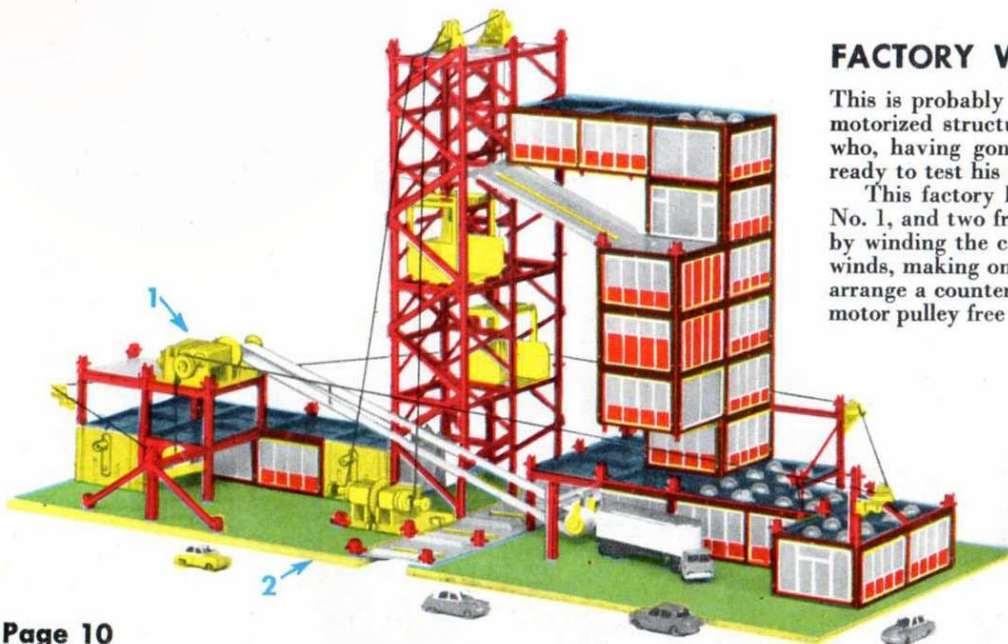
## FACTORY WITH MULTIPLE OPERATIONS

This is probably the most complicated (and the most satisfying to build) of all the motorized structures in this book. It is intended to offer a challenge to the builder who, having gone through most of the simpler structures on preceding pages, is ready to test his ability and possibly do some re-designing.

This factory has a belt conveyor and a hook conveyor, both operated by motor No. 1, and two freight elevators operated by motor No. 2. The elevators are operated by winding the cables on the two drive spools so that one winds while the other unwinds, making one cab go up as the other goes down. (Suggestion: You might wish to arrange a counterbalanced elevator system as explained above. That would leave one motor pulley free to drive another piece of equipment while the elevators are running.)

The belt conveyor is very much like those shown elsewhere in this book, but the hook conveyor is different from that described on page 6 because its motor is mounted horizontally. As you can see in this picture, the hook conveyor goes all around the structure but the drive arrangement does not permit the hooks to carry materials past the motor pulley. (Suggestion: You could mount this motor vertically, then arrange the other motor to drive the belt conveyor as well as the two elevators.)

There are so many variations you can build with your No. 9 Set that it is impossible to describe them all.





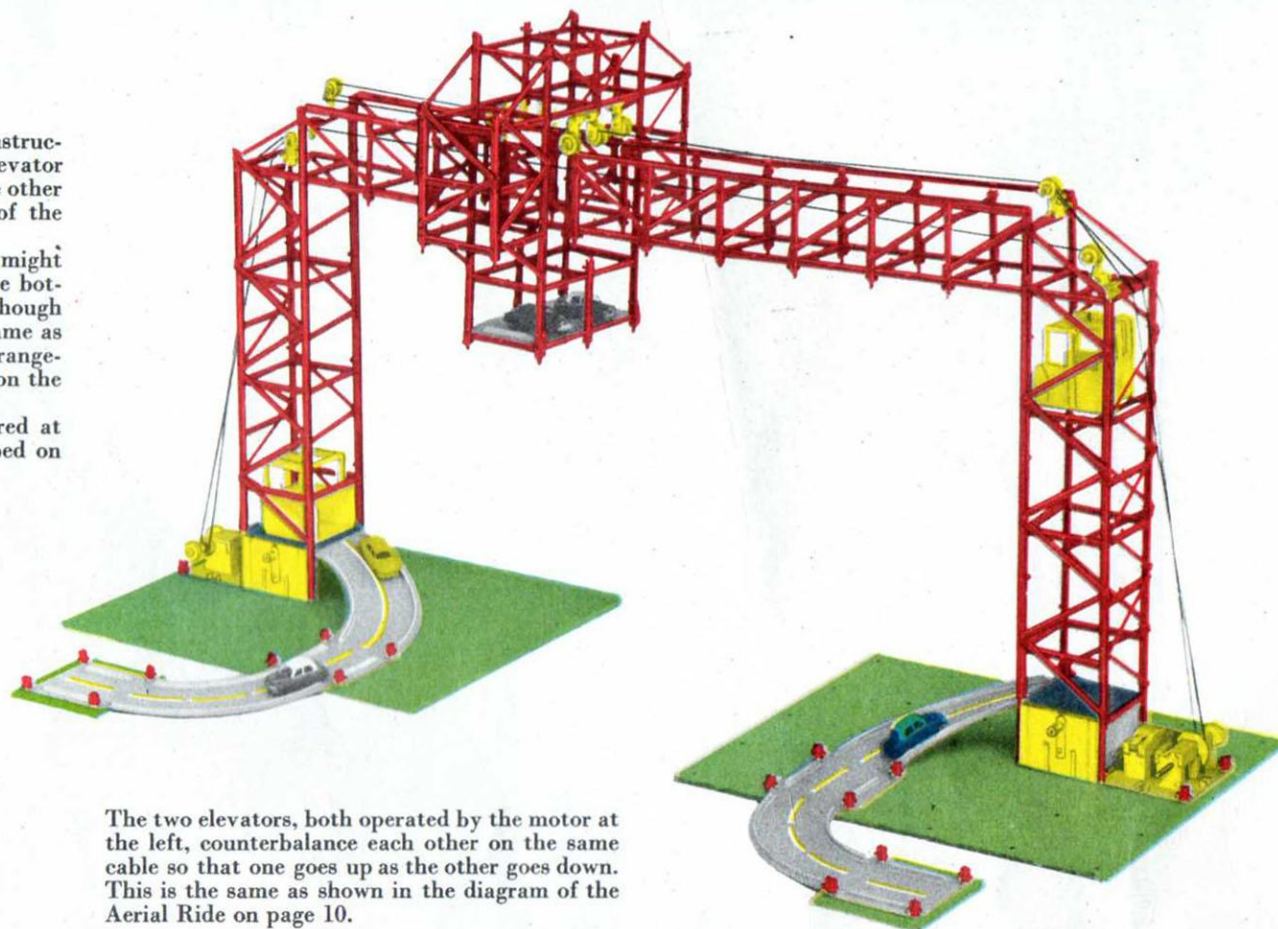
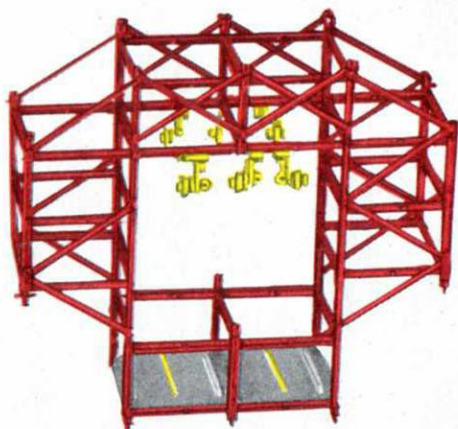
# BIG STRUCTURES OR SMALL, THE No. 9 "De Luxe CONSTRUCTIONER" IS VERSATILE

## LARGE FERRY BRIDGE with TWIN ELEVATORS

This is an excellent project for two "constructioners" to operate—one can handle the elevator control at the base of the left-hand pier, the other can run the rolling platform by means of the control at the bottom right.

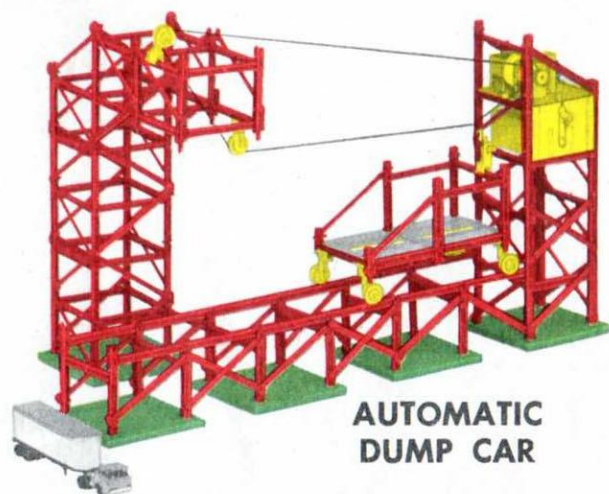
To construct this Ferry Bridge you might refer to the description and diagram at the bottom of page 4. The supporting structure, although of greater height and length, is built the same as that Set No. 8 example. Also the cable arrangement is identical except that the motor is on the ground instead of at the top of the pier.

The rolling frame and platform, pictured at the left, is also identical with that described on page 4.



The two elevators, both operated by the motor at the left, counterbalance each other on the same cable so that one goes up as the other goes down. This is the same as shown in the diagram of the Aerial Ride on page 10.

## TWO-AT-A-TIME STRUCTURES



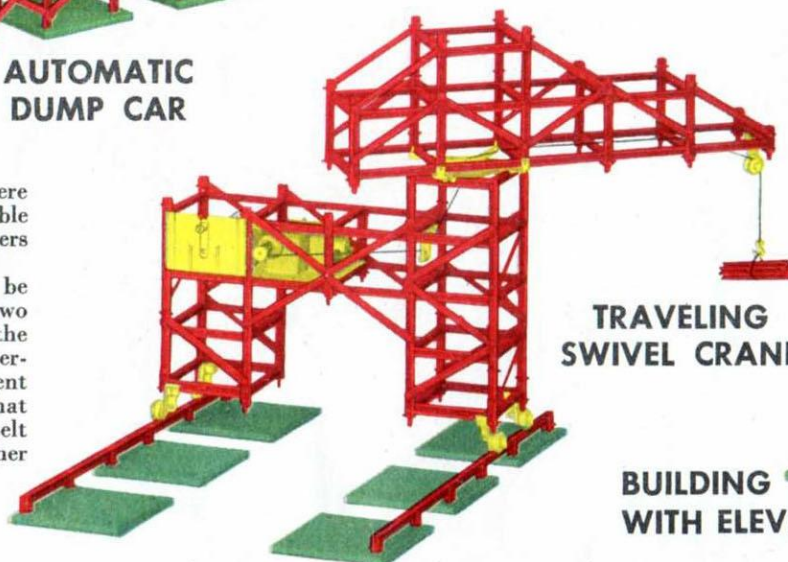
**AUTOMATIC  
DUMP CAR**

These smaller structures are pictured here to show the diversification that is possible with Set No. 9 when two or more builders want to work independently.

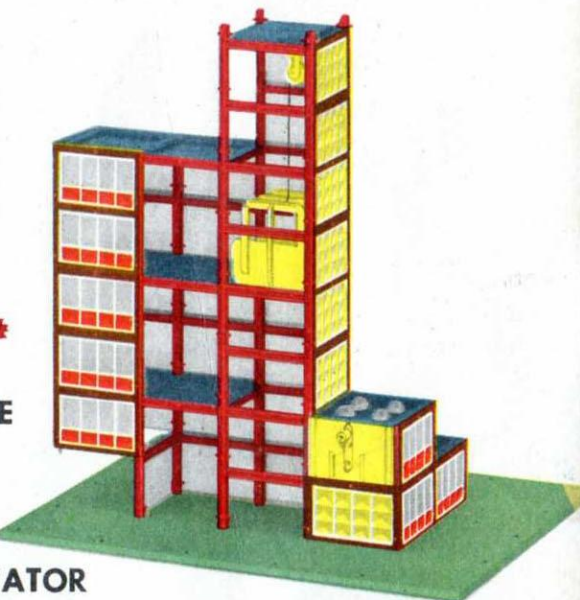
Any two structures like these can be built at the same time with Set No. 9, so two youngsters with different ideas can use the set together. They can also build and operate two structures that will supplement each other, such as a hook conveyor that will take objects from one end of a belt conveyor and carry them back to the other end.



**AIRPORT BUILDING  
WITH RADAR ANTENNA**



**TRAVELING  
SWIVEL CRANE**



**BUILDING  
WITH ELEVATOR**



## AMUSEMENT PARK RIDES

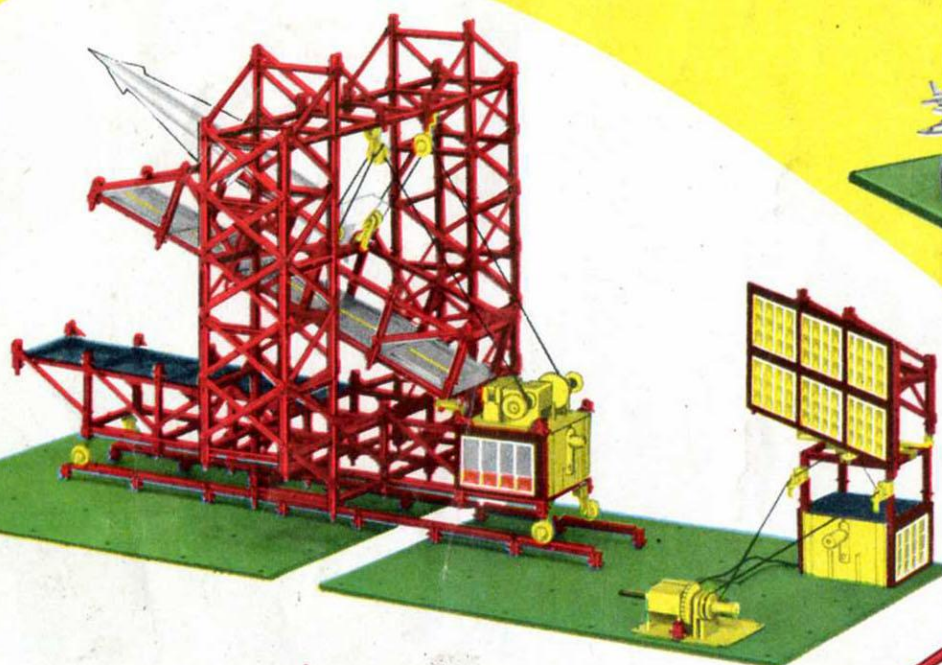
This Double Airplane Swing is one example of the wonderful "fun" structures you can design, build, and operate with the De Luxe Constructioner No. 9.

The big 8-page Instruction folder shows clearly how all parts fit together, so that anyone can build big, exciting structures like these.

The colored lights burn as long as the swings are rotating. For complete instructions for attaching the lights, see page 8.



This double thrill ride is operated by two separate motors and controls. You can run the two rides one at a time or both together—you can run them both in the same direction or in opposite directions to one another. See page 7 for more complete instructions for building an airplane swing.

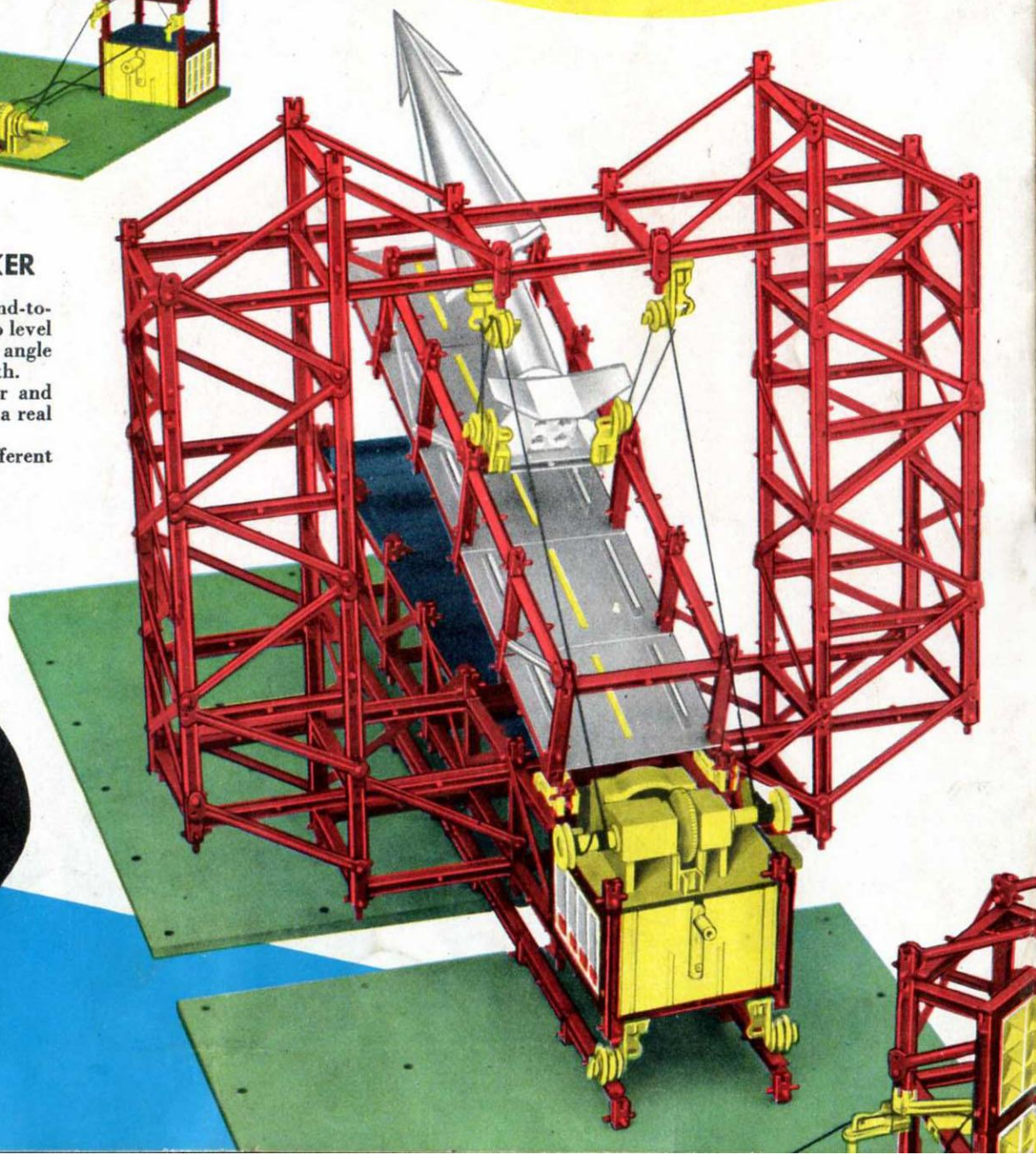


## ROCKET LAUNCHER with RADAR TRACKER

This big, thrilling, realistic model is a launching site for ground-to-ground or ground-to-air missiles. The firing platform lowers to level position for loading of the rocket, then raises to any desired angle for firing. You can use any rocket model up to a foot in length.

The rotating radar screen is driven by a separate motor and control unit. It turns on a swivel and keeps circling just like a real radar antenna tracking the flight of the rocket.

The detail picture at the right is an enlargement of a different view. It shows the motor and cable arrangement.



Don't forget—any other Chad Valley Girder & Panel or Bridge & Roadway Set that you may already have can be used in combination with these MOTORIZED SETS because **ALL PARTS ARE INTERCHANGEABLE.**

**CHAD VALLEY**  
 HARBORNE, ENGLAND