

How Components Go Together

The fischertechnik modeling system is a modularized system. This means that a reference dimension is used and then all the components are based upon the same dimension. With this building system 15mm is the base measurement. This makes them easier to assemble. The components fit together in a variety of ways depending on the design and what we want the parts to do when they are actually assembled.

Pin and Groove

The basic assembly is done with what is known as pin and groove. The pin (shown in the close-up below is wider at the end with a narrow neck.



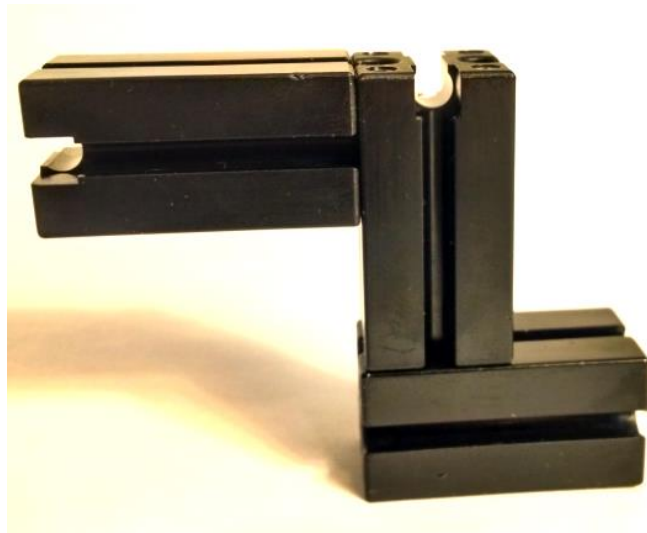
The Groove is shaped to accommodate the pin. It might appear as a circular path (left) or on some parts it might resemble a dovetail shape (right).



These fit snugly together. The pins are designed to enter at a 90 degree angle and not allow the part to rotate.

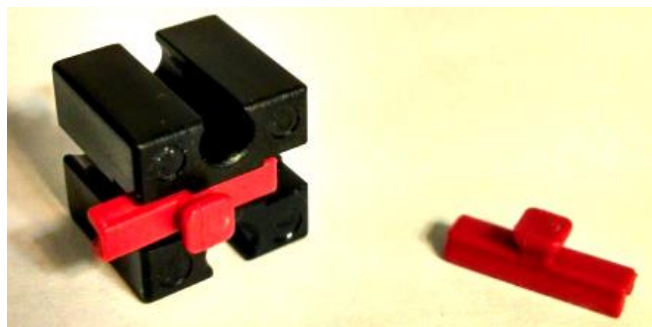


The parts need to slide in from the end and then down the groove until the desired position is reached.

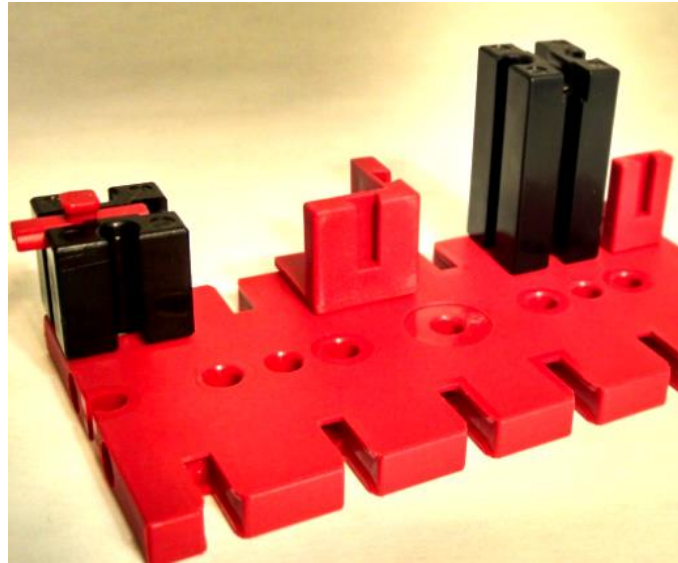


To remove the components they must be slid apart in the same manner they were put together with the part sliding to the end where the pin releases from the groove. Pulling straight out will damage the pin.

When a pin is needed on a component a part known as a spring cam is used. The spring cam is red and shown in the photo below. It is slid into the selected groove and positioned where needed. This allows you to place a pin anywhere in a groove.



The picture below shows several different types of components that have been slid into the grooves of the baseplate.



Girders and Rivets

When building larger structure; girders, beams and struts are utilized to create the structure and add support to resist tension and compression forces. Rivets are used join the struts to the girders and to align the components. The ends of the girders and beams have the pin and groove system and the centers have a different type of shape.



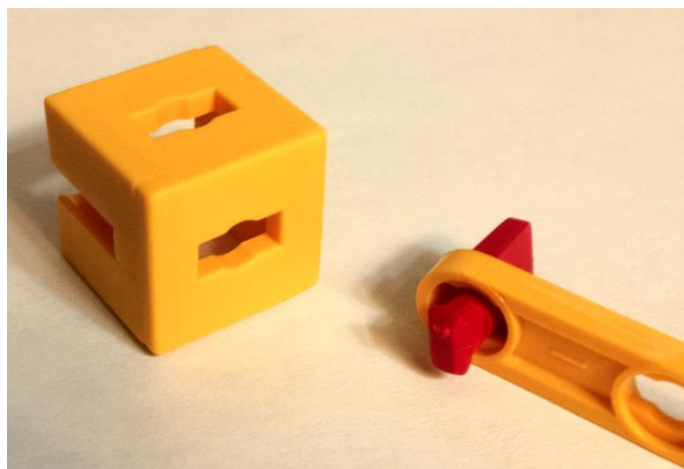
There are two sizes of rivets. The most common is the 4 mm rivet that is shown in the upper position. The 6mm rivet is used to join three components all together.



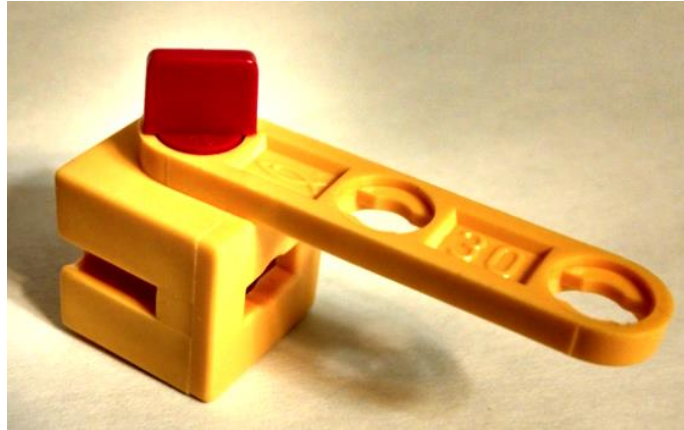
The rivets are shaped so they only pass through the shape in one position and then are rotated to make removing the rivet difficult.



The rivet passes through a bore in a strut and then into the desired location on a girder of beam.

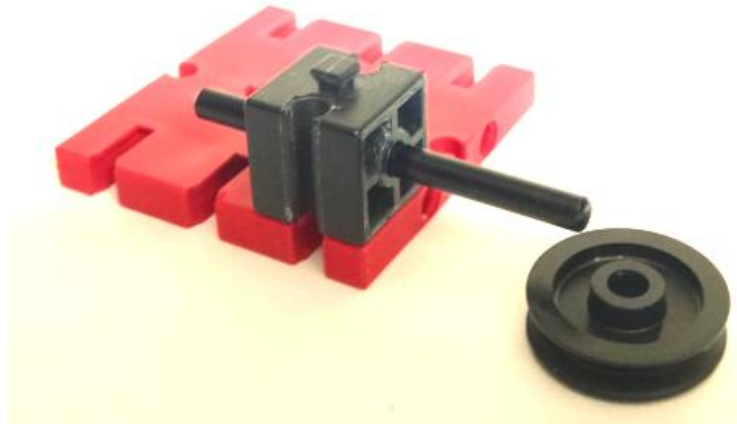


Once they are in the desired position the rivet is rotated 90 degrees to tighten the joint and to hold it in position.



Axles

When parts need to rotate axles are used. The axles need to be supported so special blocks are used. In the picture below the axle is passing through a 15mm building block with two pins and bore.



There are also times when we want to use objects besides a pulley on an axle. Hubs are used to allow soft objects such as tires to be utilized with the specially sized axles. The hubs are designed to push into the center of the tire and the friction fit keeps them aligned.



Clip Axles

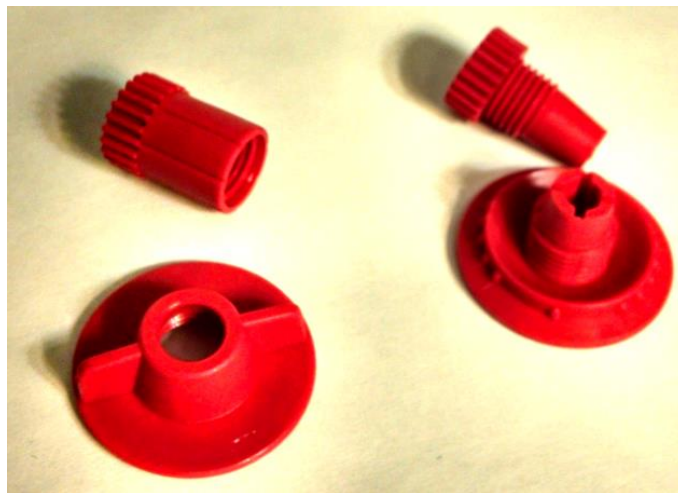
There are two major types of axles in use with the system. The smooth axle is shown in use above. Below is a picture of many of the clip axle components. These axles have a specially shaped end that makes joining components together much easier.



The special shape on the end allows the part to compress when entering the other component and then expand holding it firmly in place. The picture below shows the clip axle end on the bevel gear and the clip axle receptor on the cog wheel. The bevel gear is aligned and then slowly inserted into the cog wheel until a small click is heard. To remove the parts the force is directly reversed with a smooth pulling action to separate the components.



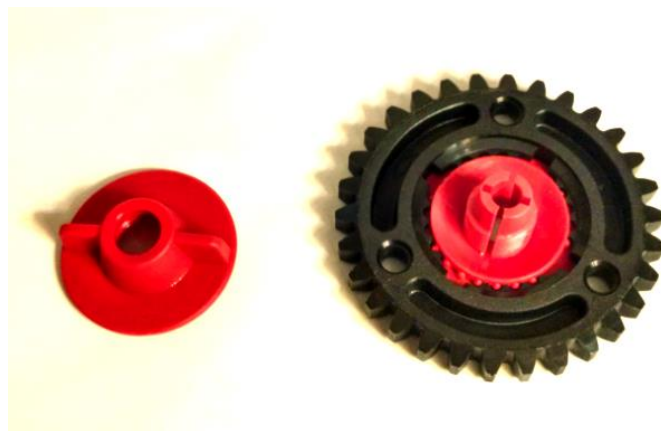
If we need to attach a component to an axle or make the system adjustable we utilize a component known as a collet. A collet is a type of chuck or clamp that forms a collar around the shaft. Pictured below are two different collet systems.



They consist of a threaded part that has separations in it. As the tapered cap is threaded onto the collet the sections of the collet squeeze together and clamp onto the shaft passing through the center. When the collet is loose the shaft is free to pass in and out. When the cap is tightened the movement ends and the shaft is caught in position. In the example below a collet is used to hold a gear in position on a shaft.



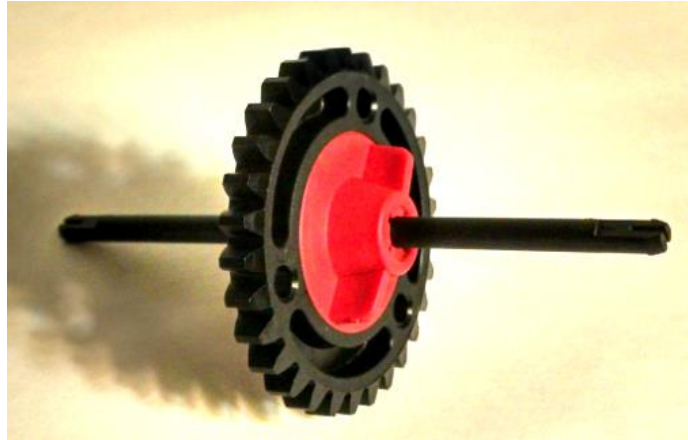
The gear is place upon the collet.



Notice the collet has notches on the outside to help the gear connect with the collet.



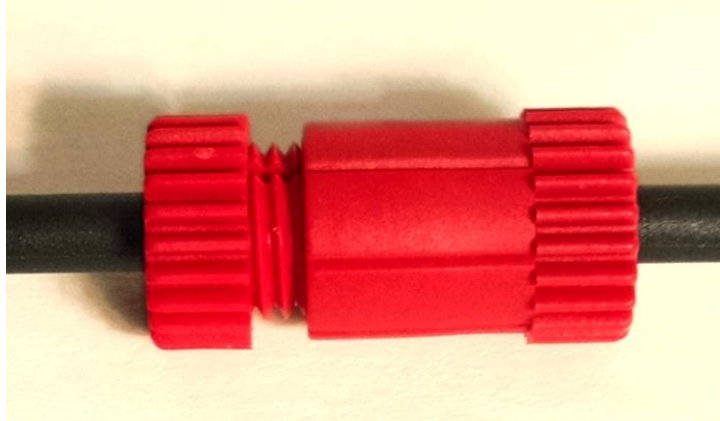
The cap is lightly placed on the axle and the entire assemble is slid into position and tightened. To adjust you will need to loosen the nut and then retighten the cap when it is exactly where you want it.



There are a number of gears, cams, pulleys, tires and other components that can be placed upon shafts in this way.



Below is pictured a different type of collet that is attached to a shaft.



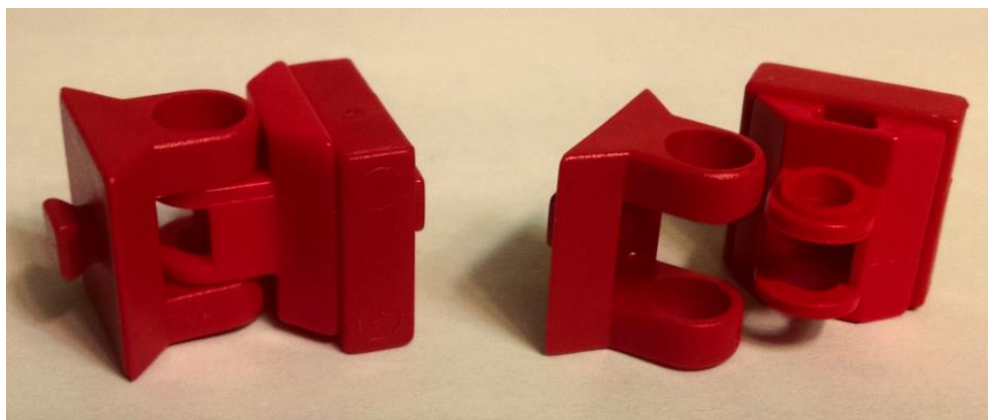
Snap Fit Parts

There are some components that are just snapped together. The shape of the parts allows them to be pushed together and once together remain in position. If they are not needed separately anywhere else you might consider leaving them together.

Below is the cable winch drum and cable winch frame.



Hinge block and claw are commonly used together to allow movement in assemblies. Generally they are only used together.

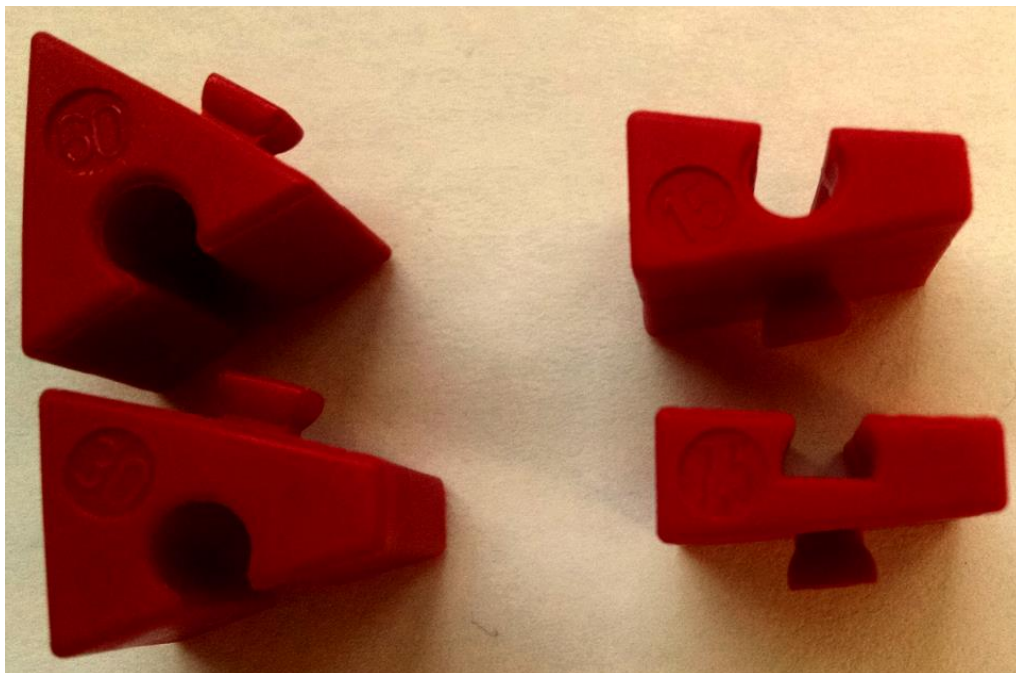


Another component that is joined in this way is the chain link. The links are set up so they are in the same position and then the long link is snapped into the shorter link. The chain is then used with gears for making drive trains. It is also commonly used with track links to make conveyor belts or caterpillar tracks.



Angle Pieces

In addition to square blocks the kit comes with angle blocks. There are four sizes 7.5, 15, 30 and 60 degree blocks. There is a number on one side of the block. This way you can visually check to see the angle of the block.



[Back](#)