Introducing Mechanical Puzzles – Part 3
by Jerry Slocum © 2001

The introductory article in this series appeared in the Spring 2001 issue of GPCQ. Put Together and Take Apart puzzles were covered in the last issue, Summer 2001. This article describes Interlocking and Disentanglement puzzles.

Interlocking Puzzles

You take them apart and then put them back together. This is the challenge with interlocking puzzles. Often they are ingeniously interlocked so that their separation is quite difficult, but usually the greater challenge lies in reassembling the interlocking puzzle.

At some time or other most of us have been baffled by one of those puzzles made of pieces so cleverly interlocked that they almost seem impossible to separate. And once they have been taken apart they are even more difficult to put back together again. There is usually a single piece, called the key, which must be removed first in order to disassemble the puzzle. In many such puzzles the pieces must be replaced in a certain sequence and the key is always inserted last to lock the other pieces in place.

Little is known about the early history of these puzzles, but they were certainly being produced in both Asian and European countries by the eighteenth century. Recently David Singmaster, a British historian of mathematical recreations, has found an example of a six-piece burr described in a 1733 Spanish book by Pablo Minguet E Irol.

The 1785 catalog of Peter Friedrich Catei, a German toy manufacturer, included illustrations of two interlocking puzzles, the six-piece burr Small Devil’s Hoof and the twenty-four piece burr Large Devil’s Hoof. (Figure 31 - Burrs in Catei’s Catalog)

Puzzles of this type used to be known as “Chinese” puzzles, and it is possible that they were invented by the Chinese, who used elaborate wooden joints in early earthquake resistant wooden buildings held together without nails.

Edwin Wyatt was the author of Puzzles in Wood, a book devoted to many interlocking puzzles which was published in 1928. In the book Wyatt applied the term burr to the interlocking puzzles that resemble a seed burr. Now the name is commonly applied to almost all interlocking puzzles. The most common burr puzzle uses six pieces, although some have as few as three and others exceed one hundred pieces. Made of wood, metal, plastic, and even ivory, many interlocking puzzles form complex geometric shapes. They use square, round, hexagonal, and triangular pieces, in either orthogonal or diagonal forms. Martin Gardner feels the polyhedral burrs “because of their symmetries, are always pleasing to look at.”

During the nineteenth century the six-piece burr evolved into solid, interlocking puzzles such as cubes, balls and barrels. (Figure 32 – German Barrel Puzzle) How this transition came about is not known for sure, but a puzzle discovered several years ago in the Netherlands may provide a clue. This spherical puzzle used eight notched corner pieces. By 1870 these pieces were glued to other pieces to make solid interlocking puzzles like the barrel. Puzzles of this type were initially produced in Germany, but by the late 1930’s the market had largely been captured by Japanese manufacturers. The Japanese not only produced traditional burrs at much lower cost, but designed many new interlocking puzzles in the form of whimsical animals, vehicles and weapons. (Figure 33 - Japanese Wooden Interlocking Puzzles)

Keychain puzzles started in 1939 as a souvenir of the New York World’s Fair. The theme of The World of Tomorrow had as it’s symbol, a 700 ft. high obelisk, named the Trylon, and a 200 ft. ball-like structure called a Perisphere. Irving Steinhardt patented a small plastic interlocking puzzle which represented the Perisphere with the Trylon sticking out of it. When the Trylon piece was replaced by a keychain, it became the first keychain puzzle. By the mid 1950s dozens of different keychain puzzles were on the market, and they are still being made in Europe. (Figure 34 – Keychain Puzzles)

Stewart Coffin has created over a hundred new and complex burr puzzles based on polyhedral geometric forms. (Figure 35 – Stewart Coffin puzzles) When making his puzzles, he selects the finest woods to show off the geometric features, cuts, glues and assembles the pieces with extreme precision and a adds a perfect finish, making his beautiful puzzles unique works of art. Coffin, who lives near Boston, is the most outstanding designer and maker of interlocking puzzles the world has ever seen. In the last few years, Stewart has designed numerous two dimensional put together puzzles and these too have startled puzzle collectors everywhere with their amazing new features. One of his best he named Few Tiles. Although it looks easy and includes only four similarly shaped pieces which are to be put into a rectangular tray, many puzzle experts have spent hours un...(Continued on page 15)

Jerry Slocum at 2001 Convention.

Figures for this article are in the separate insert to allow printing in color.
successfully trying to solve it!

**Disentanglement Puzzles**

Disentanglement puzzles involve the problem of freeing and attaching a part of a puzzle, often a ring, loop of string or handle. They are made of various materials such as cast iron and sheet metal, wire and string.

One of the earliest puzzles found in America is a beautiful mother-of-pearl and string puzzle, known as Solomon's Seal. It was owned by John Hancock (1737–1793). American statesman and first signer of the Declaration of Independence. The lotus flowers carved into the mother of pearl indicate that the puzzle was made in China. The puzzle is to put the two “buttons” that are on separate loops of the string on the same side. It is a very difficult puzzle, for the ends of the string are tied to the bar. (Figure 36 – Solomon’s Seal Puzzle) A political version of the same puzzle is the Irish Question Puzzle. (Figure 37 – Irish Question Puzzle) It challenges you to achieve a diplomatic coup by bringing together two political opponents, represented by two separate miniature busts, on one loop of the string. Martin Gardner believes that the version of this puzzle with the ends tied is the best of all the string puzzles. He also points out that string and ring puzzles “often have close links with topological-knot theory.”

The earliest reference to string puzzles, where a string is passed through holes and around some object, is in John Wecker's *Secrets of Art and Nature*, published in 1660. Merchants have recognized the appeal of these ingenious puzzles and used them as an advertising medium. (Figure 38 - Jaynes Advertising Puzzle) They are usually made of cardboard and contain clever and often beautiful color lithographs. The Edison Mazda Lamp Puzzle, (Figure 39 – Edison Light Bulb Puzzle) where the Sun is his “only rival”..., is a typical example. Their enduring popularity may be based on the fact that the string puzzle does not look solvable.

In the year 1550, Geronimo Cardan described a wire and ring puzzle known as Chinese Rings, Cardan’s Rings, and various other titles. (Figure 40 – Chinese Rings Puzzle) Although that makes it the earliest known disentanglement puzzle, other references have claimed that the puzzle was well known in China during the Sung Dynasty (A.D.960 – 1280). There is a Chinese legend that it was invented in China in the second century by Hung Ming, a famous Chinese hero. In China the puzzle is viewed as a kind of wisdom game, useful in increasing one’s intelligence.

The Canoe string puzzle is mathematically related to the Chinese Rings. (Figure 41 – Canoe Puzzle) Versions of the puzzle come in a variety of forms with as few as two to as many as six loops. They all present the same difficult challenge: remove the string from the canoe.

Metal puzzles have been made for a long time, at least since the seventeenth century. In the early part of the 20th century, cast iron, (Figure 42 – Lucky Star) sheet metal (Figure 43 – Puzzle Pup) and boxed sets of wire puzzles (Figure 44 – Super Puzzles) have been popular. Recently new, and much more difficult wire puzzles have been invented and produced. The Puzzle hobble is a disentanglement puzzle with a very practical use. (Figure 45 – Puzzle Horse Hobble) It was used by cowboys in the early settlement of the Western United States to tie the front feet of their horses together so they could graze at night, but could not run away or be stolen by Indians.

Figures for this article are in the separate insert to allow printing in color.

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**Collect it! Magazine Offers Special Introductory Rate.**

The British based *Collect it!* magazine is offering a special introductory rate for AGPC members, £53 (or 35 pounds sterling) for twelve monthly issues. The magazine carries regular sections on dolls, teddy bears, fast food news, and U.S. collectibles, as well as coverage of other collectibles and antiques. To subscribe, use the secure website [www.collectit.co.uk](http://www.collectit.co.uk) and mention the "Club2" special offer. You can also send credit card details to: Unit 11, Weller Drive, Hogwood Lane Industrial Estate, Finchampstead, Berkshire, RG40 4QZ, England. Telephone 0118-973-7888.

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Figure 31 Burrs in Catel's 1785 Catalog.

Figure 32 German Barrel Puzzle, circa 1890.

Figure 33 Japanese Wooden Interlocking Puzzles, 1930s to 1960s.

Figure 34 Keychain Puzzles, 1930s to 1940s.

Figure 35 A few of Stewart Coffin's polyhedral puzzles.

Figure 36 Ivory Solomon's Seal Puzzle, circa 1840.

Figure 37 The Irish Question Puzzle, circa 1890.
Figure 38
Jaynes
Expectorant
advertising
Puzzle, circa
1905.

Figure 39
Edison Mazda
light bulb
advertising
puzzle,
circa 1912.

Figure 40
Ivory Nine Ring Chinese Rings Puzzle, circa 1840.

Figure 41
The Canoe Puzzle made of tortoise shell, circa 1840.

Figure 42
Cast Iron
Lucky Star
Puzzle –
remove the
star, 1914.

Figure 43
Puzzle Pup –
remove the
dog’s collar,
1920.

Figure 44
Super Puzzles
box of ass-
sorted wire
puzzles,
1940s.

Figure 45
Puzzle Horse Hobble, circa 1880.