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Wallpaper Rings by Doug Engel Reprinted 1-2019 Wallpaper Rings are now known as EC Curves
here is a link http://www.puzzleatomic.com/EC%20CURVE%20SYSTEM.htm

Think of any pattern to follow as an interference pattern of "discrete waves" where the "waves" might be line segments or polygons. It is the interference patterns that must be investigated and understood.

In Figure 1 discrete modules of lines interfere to create three distinct rings. The rings are all complimentary to one another in this case. Simpler rings can be made by letting modules intersect a "parity" background as in Figure 2. The maximum length of a loop or ring formed by the interfering patterns is some product of the length of the modules. The length of a module is given by the number of x or y grid points for x or y directed modules.

It is very simple to couple small modules together and create ring patterns of any desired complexity. One could let modules represent relations such as 3 brothers, 4 uncles, 3 aunts, and so on, and create a wallpaper pattern of his own kinship. Anyone else would be hard pressed to try and figure out what it meant if it were left in a dying relatives will.

Perhaps a more interesting module to investigate is· gotten by connecting pairs of points in a n(m) = nm grid area. This keypattern can then be turned at right angles and intersected with itself by repeating in the grid. At least one of the integers, n, or m must be even or there will be an odd number of points .

Figure 3 shows some of the couplings possible with 3 X 4 key patterns. It is particularly interesting to try to find a key pattern that will produce a single ring on intersection with itself. This was the goal of the ancient Celtic artists, but the techniques they used to make their patterns were quite different than those described here. Key patterns*(now known as factor patterns 1,2019)* of this kind may be called complete or referred to as a *Hamiltonion circuit*. It took: a little time to discover the complete key pattern shown in Figure 4. A generalized set of complete(*Hamiltonion circuit)* keypatterns is known for 2 X 2n + 1 key patterns. Perhaps you, the reader, would like to discover them for yourself.

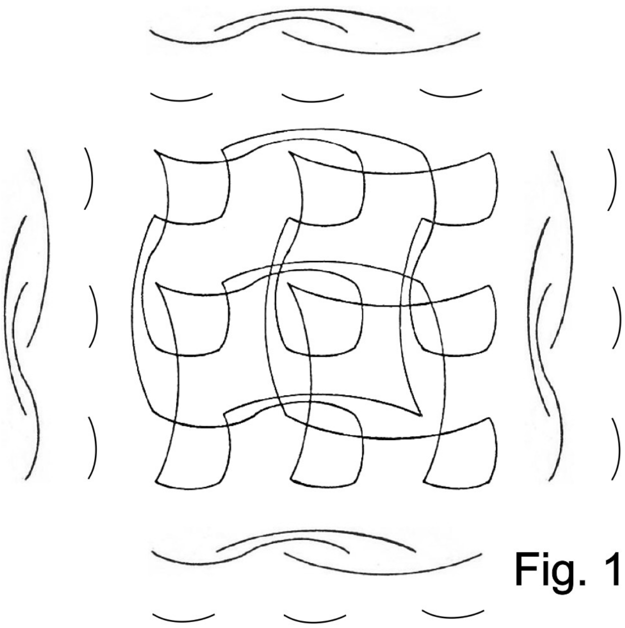

Fig. 1

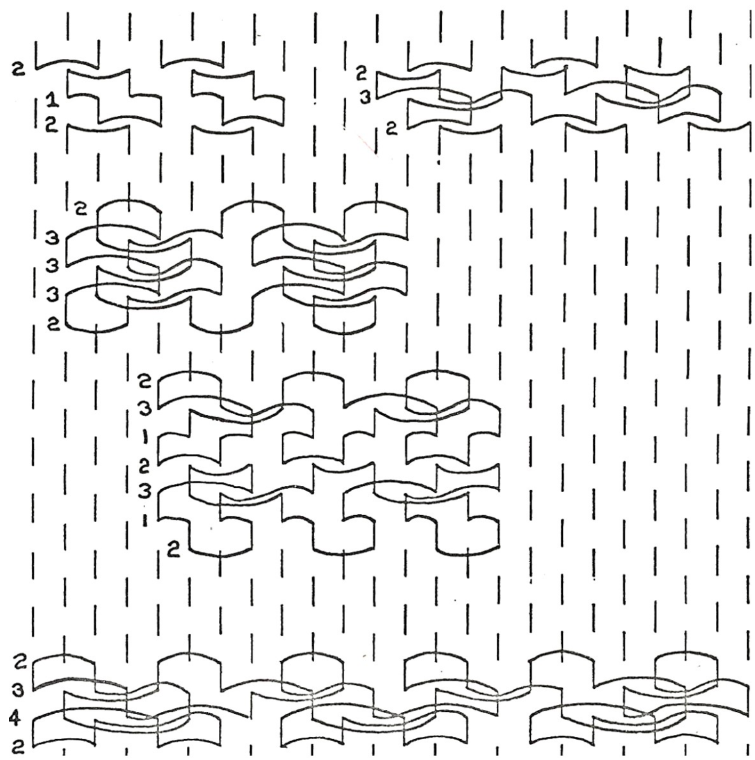

Fig. 2

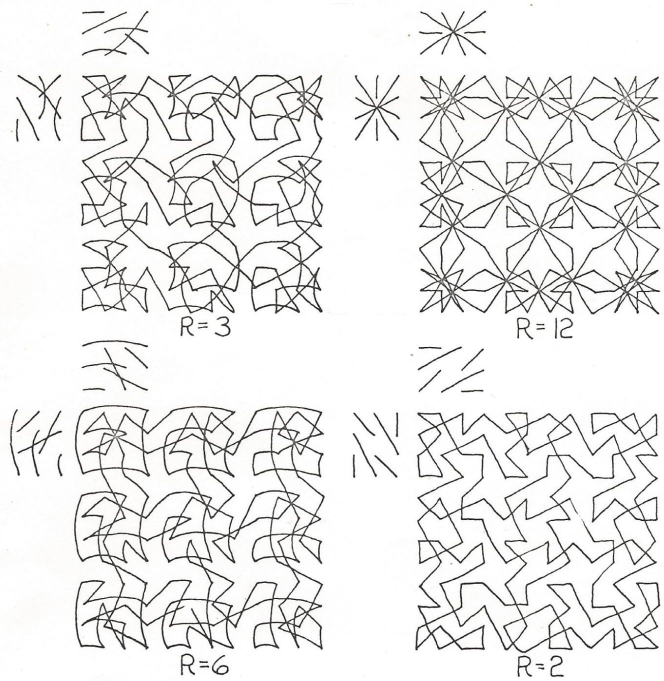

Figure 3.

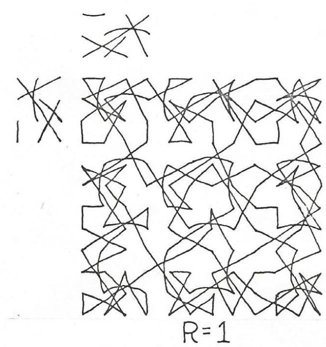

Figure 4.