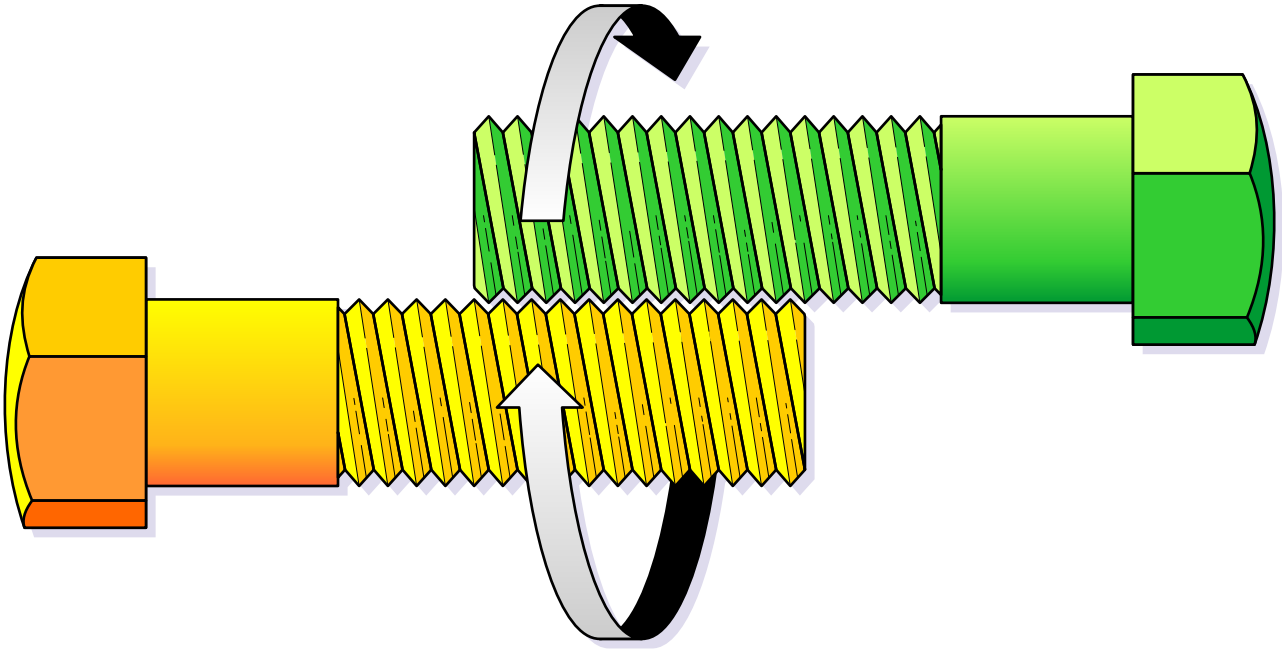
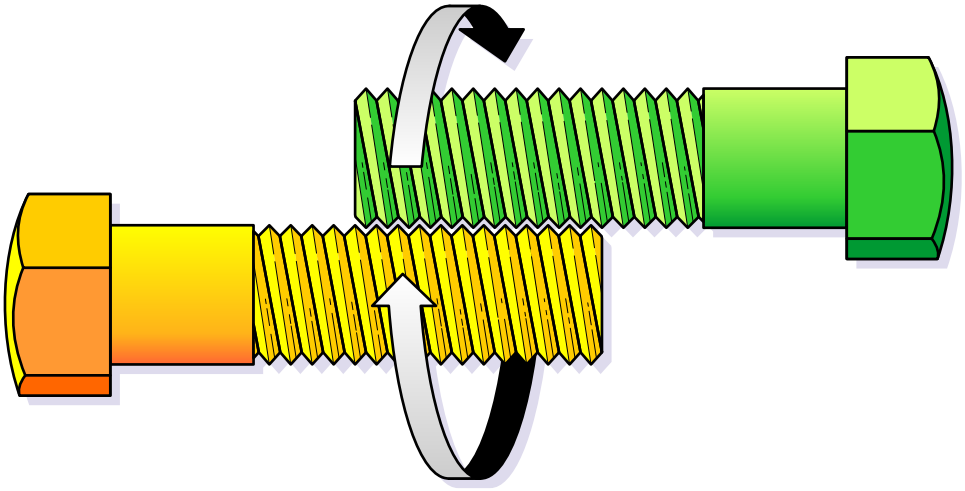
The Twiddled Bolts

after Martin Gardner



Two identical bolts are placed together so that their helical grooves intermesh as shown in the illustration. If you move the bolts around each other as you would twiddle your thumbs, holding each bolt firmly by the head so that it does not rotate and twiddling them in the direction shown, will the heads (a) move inward, (b) move outward, or (c) remain the same distance from each other?



The heads of the twiddled bolts move neither inward nor outward. The situation is comparable to that of a person walking up an escalator at the same rate that it is moving down.

The problem has been brought to Martin Gardner's attention by Theodore A. Kalin.