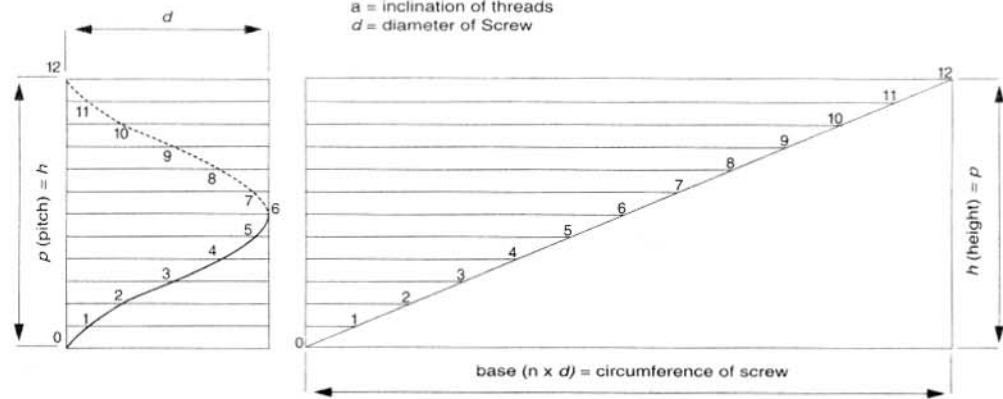


WINK'S WORDS

NEWS & VIEWS ABOUT NUTS AND BOLTS



The Screw Thread and the Inclined Plane — Close Relatives



Who hasn't applied the concept of the inclined plane to move a heavy object to a higher position? You make a ramp and slide the object up the ramp. You actually perform the same amount of work but it takes less force because you move it over a longer distance. Did you know that the screw thread is basically an inclined plane? As shown above, if you draw an inclined plane in which the height or vertical distance is equal to the pitch of the thread and the base of the triangle is equal to the diameter of the thread, the inclined

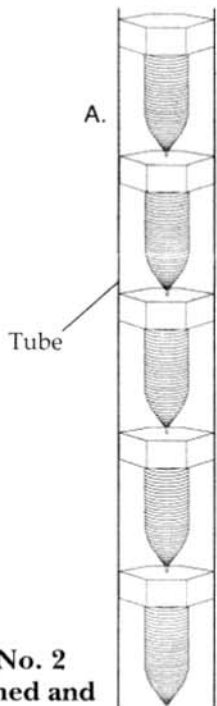
plane is equal to the length of the thread for one circumference of the screw. In other words, a screw thread is an *inclined plane wrapped around a cylinder*. You can prove it by cutting out the right hand part of the diagram and bringing the left and right ends together to form a cylinder.

Maybe the similarity between a screw thread and an inclined plane is the reason the fastener business is such an uphill battle.

Fastener Ingenuity

We never cease to be amazed at the ingenuity of American fastener manufacturers. From self-locking to self-sealing to self-torque sensing nuts and bolts, the variations in design to meet specific joint characteristics and assembly requirements seem endless. But, one that captured our imagination recently was what is called "The Stick Screw" which is used for semi-automatic assembly operations. Instead of individual small hex-head screws that must be handled and fed one at a time, this system uses solid "sticks" of screws which may contain from 30 to 110 individual screws. These "sticks" are machined from hex bar stock, as illustrated at the left.

Operators insert a "stick" of screws through a tube in a companion pneumatic driver. The connection between each screw ("A" in the drawing) is designed to snap off cleanly when the desired torque is attained. Bang – bang – bang – you're done. No doubt these "stick screws" are more costly than the equivalent number of individual screws, but this cost is minimal compared with the savings that result from drastically reduced assembly time. They're really thinking out there!



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Picking on the Little Guys Again...

Here's an interesting headline out of Washington: "Loss of 77 Million Dollar Satellite Blamed on Tiny Screw." It refers to the findings of a 12 member board that investigated the failure and ultimate loss of the NOAA-13 satellite. The theory is that a 1¼ inch screw had extended too far below an aluminum plate designed to dissipate heat, penetrated a layer of insulation and made contact with a radiation plate. This caused a short circuit that prevented solar arrays from powering the spacecraft.

Why blame the screw? It was only doing its job. Blame the screwball who designed the thing, or the nut who selected the wrong size screw. We feel the Fasteners Institute should demand an apology!

Answer to "Washer" Puzzle!

In our last issue of "Wink's Words" we posed the question: "What is the origin of the term 'washer'?" Mr. Lance M. Tittle of Fabricated Alloy Products, East Greenville, PA, informs us that it is a German word meaning "surface bearing." Makes sense! Thank you Mr. Tittle.