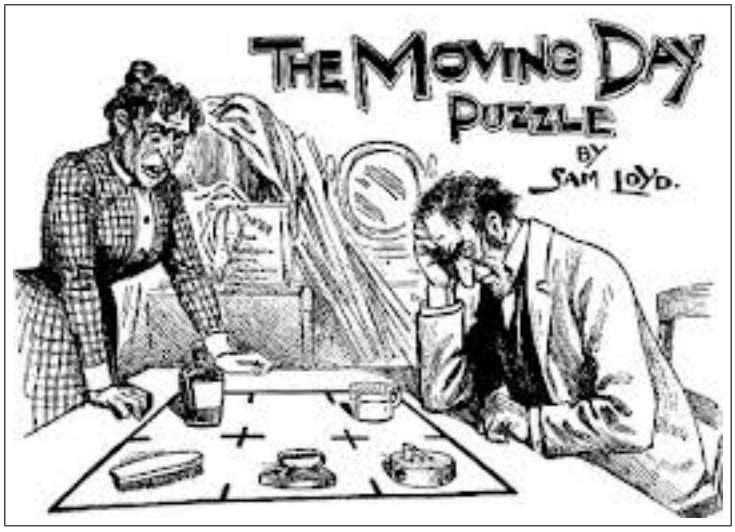
Problem of the Week
Number Two
September 9, 2013

Adding to the interest of Sam Loyd's puzzles was his knack for embedding them within stories, and illustrating them with amusing diagrams. A representative example is this, presented precisely as Loyd did in his newspaper column:



The sketch shows a migratory couple who have just moved into a cozy little six-room flat. They have five large pieces of furniture: bed, table, sofa, icebox and bureau. The pieces are so bulky that no two can be placed at one time in any one room. It happened, however, that the furniture movers placed the icebox and bed in the wrong rooms. The couple has been trying for several hours to figure out an efficient plan for transposing them.

Being a systematic sort of fellow, the man marked out a diagram of his flat on the table, then placed five small articles on the squares to represent the pieces of furniture that are to be shifted. The whisky flask represents the bed, and the scrubbing brush is the icebox. (The two corners farthest from the man, in the diagram.) **You are asked to transpose these two pieces by moving one piece at a time into a vacant room.**

Actually, that's not really so difficult. I thought I was pretty clever for quickly finding a 21 move solution. The hard part is to do it in the fewest number of moves, which is 17. Since there is only

one room to which a piece of furniture can possibly move on any turn, you may write down your solution simply by providing a list of which piece of furniture to move at each step.

This little teaser might remind you of the classic 15-puzzle. That's the one where you have a small, 4×4 grid, with fifteen numbered tiles and one blank space. If you don't know what I'm talking about, just type "fifteen puzzle" into Google. Anyway, Sam Loyd is the one who first marketed and popularized that puzzle. (He actually claimed to have invented it, but that turns out not to be true.)

Solutions are due to Jason Rosenhouse by 5:00 on Friday, September 13. Please write your solution clearly somewhere on an official POTW problem sheet. Be sure to explain your answer! Place your name, e-mail address, and the section numbers and professors of any math courses you are taking, in the upper right corner of the page. One weekly winner will receive a five-dollar gift card from Starbucks. Winners will be drawn randomly from among the correct answers. Problems are available at the bulletin board outside Roop 119, and also at the website:

http://educ.jmu.edu/$\sim$rosenhjd/POTW/Fall13/homepage.html