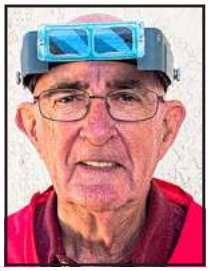


a PART of the story

Sticking together

Technology:
Neodymium magnets
Purpose:
An exceptional alternative to screwing, nailing, or gluing

by Jim Coffee • San Diego, California, USA • Photos by the author

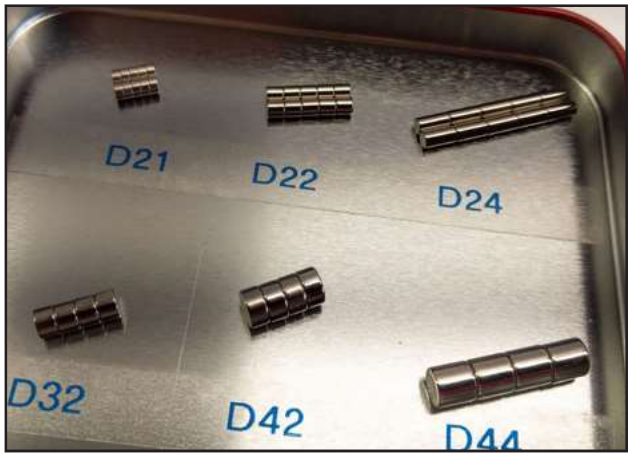
I frequently find myself fastening parts with magnets. Because of that, I keep an assortment on hand and ready for use. I use neodymium magnets for reasons that include convenience, safety, reliability, or cosmetics. If you equip yourself with a basic stock of magnets, you will find yourself using them too.

Photo 1 shows the magnets with which I suggest you start your set:

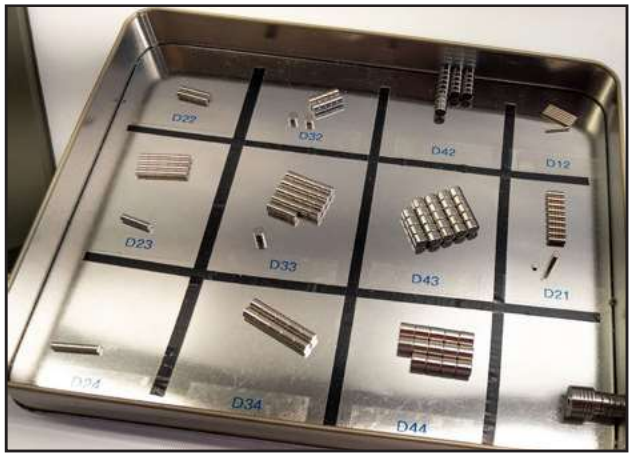
- 10 each No. D21 ⅛" x 1⁄16" (3.18mm x 1.6mm) $1.10 per pack of 10
- 10 each No. D22 ⅛" x ⅛" (3.18mm x 3.18mm) $.16 each
- 10 each No. D24 ⅛" x ¼" (3.18mm x 6.35mm) $.27 each.
- 4 each No. D32 3⁄16" x ⅛" (4.76mm x 3.18mm) $.25 each.
- 4 each No. D42 ¼" x ⅛" (6.35mm x 3.18mm) $.34 each
- 4 each No. D44 ¼" X ¼" (6.35mm x 6.35mm) $.56 each

The magnets will total approximately $10.00 + shipping. The prices above are from *https://www.kjmagnetics.com/*, effective Nov. 2023. The D-numbers (D21, etc.) refer to KJ's stock codes. I have no affiliation with this company other than being a satisfied customer.

I'm 78 years old. Neodymium magnets were



1. The selection of neodymium magnets recommended by the author.



2. Magnets are easily stored in a small metal box.

3. *The Pianist* and *The Clarinetist* are held in place magnetically.

4. *The Pianist* was easily removed from the scene.

5. The airship has built-in magnets to hold the top in place.

6. Figures within the airship are held to their seats magnetically.

7. The undersides of the pilot and copilot show their magnets next to dowel-alignment holes.

not invented until 40 years after my birth. As I was growing up, my experience with magnets was not that great. The magnets were weak and often lost their magnetism. Things have changed. Neodymium magnets (often called "neo magnets") are the undisputed kings of the magnetic world. These tiny powerhouses pack a wallop, offering unmatched strength for their size compared to traditional ferrite or ceramic magnets.

But their magic doesn't stop there. Neodymium magnets retain their strength for decades—possibly even centuries—with proper care. Unlike other magnets that weaken over time, neos hold on tight, making them a reliable choice for countless applications.

As I think back on the automata I've created in the last seven years, all use magnets somewhere. I suggest that you put a set together for yourself, then learn to use them. They fasten beautifully. They will give you more options as you create your automata.

Editor's note

Magnets are graded by an "N" value that refers to the strength of the magnet: N2 (the weakest) to around N52 (the strongest). Also, you should be aware that magnets—especially small, powerful ones—can be extremely dangerous if swallowed and can lead to serious illness, including intestinal perforation or blockage. Keep them shut away, well out of reach of any young, curious children who might visit the workshop.

8. This propeller is magnetically held in place via an infirm connection.

9. Should small fingers get in the way, the propeller is quickly released.

I suggest that you start your set with the above-mentioned sizes. Obtain a small metal box in which to store them. **Photo 2** shows my current set of magnets, which I need to restock once every nine months or so. I use the smaller magnets most frequently.

The Pianist and *The Clarinetist* (**photo 3**) are held in place with neodymium magnets, which are hidden and reliable. *The Pianist's* arms are also fastened on with magnets. *The Pianist* has been removed for service in **photo 4**. With magnets, this is easy—I just disconnected the belt and lifted off the piano.

The top of the airship is reliably and invisibly secured to the bottom with neodymium magnets (**photo 5**). All of the figures in the airship (**photo 6**) are magnetically held in place.

In **photo 7** you can see the neodymium magnets that fasten the pilot and copilot into their cockpit, as well as the holes into which alignment dowels fit. The dowels keep these mechanized figures from moving out of position.

For safety reasons, the propeller shown in **photo 8** is *infirmly* held in place by a neodymium magnet. This allows young fingers to be where they shouldn't be without being damaged. The magnet is located in the propeller assembly, which is held to the motor shaft by the magnet (**photo 9**). It is an infirm coupling that permits propeller rotation to be interrupted without damage. AM