Opposites Attract: Magnets in Mounts

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This presentation evolved out of mentorship and friendship, of personal connection, and the connection we all have as friends of books. We have in common the attraction for problem solving and invention—not to build a better mousetrap, but to build a device that is neither book trap nor time trap.

There are wonderful contributions to the field about the use of magnets, though more so in the realms of objects, oversize works on paper, and textiles. My initial proposal was to present the simple ways in which our lab has been experimenting and implementing use of rare earth magnets in exhibitions, and to challenge the book community to do the same. We had recently started using them as preventative conservation both in exhibition and for display housings (Glaser, 2013; Bennett, 2015), and significant to this publication, to reduce the use of exposed double-sided adhesive—an ever-present risk—in strapping books open (Fig. 1).

Around the same time, Mindell Dubansky posted on social media about the brilliance of an antique carved wooden book box which incorporated a hinged rehal type support in the top cover, and asked her readers if that

Figure 1. Adjustable page straps, made with embedded magnet and steel washer (inset detail), paper and polyethylene styles shown.

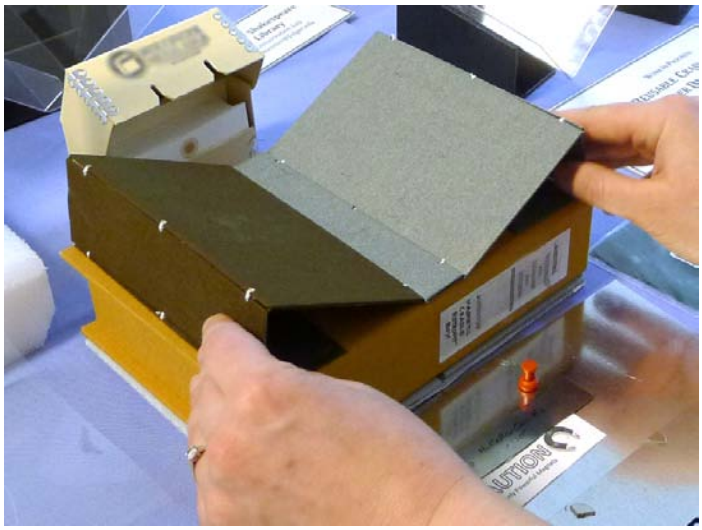

Figure 2. A conference attendee manipulates the retrofit cradle, wire-edge binding style shown.

space-saving, at-the-ready cradle could not be done for today's book boxes? Something clicked, and I became positively charged with ideas. Within days, I had mocked up variations on rehals and Roubo book stands, modifying carved hinges to flat-opening, wire-edge and hinged variants. Knowing the significant expense invested in extant custom drop-spine boxes, my intent was to provide Mindy and all shelf- and table-space conscious librarians a reasonable retrofit for extant boxes, which would be simple, reusable and require a minimum set up for a quick pop-up "treasures" display for visitors which is becoming ever more common use of staff time (Fig. 2).

THE RETROFIT A+B=CRADLE

Two parts, A plus B make a C, a (collapsible) Cradle. For retrofitting a box top, simply stated, the actions are to excise bookcloth and inlay a receiving steel shim in the extant box top (Fig. 3). This may be covered with bookcloth to match or not; alternately, a very thin stock may be used with inlaid metal strip, covered and stuck whole to the box top. A six or seven (if spine piece is wanted) piece cradle is formed from boards and hinge material, with

magnets sunk into the feet (and spine) and secured with paper tape. This may be left uncovered or covered with bookcloth of the same color as the box. Due to the difference in distance from the steel shim, it is important that the spine magnet be a degree more powerful (by thickness, dimensions or higher N-strength) than the ones used for the legs; this difference keeps the whole assembly from deflecting away from the box in the center if it is shelved upright. Since the cradle is magnetized, it should stick nicely to the box when collapsed. However, in the case of multiply stacked boxes, and dim stack lighting, the discreet appearance of this add-on may be missed by staff who are unfamiliar with the added component. In this case, a polyester or folder stock wrapper may be added to be sure the cradle parts are pulled from the shelves with the box (Fig. 4).

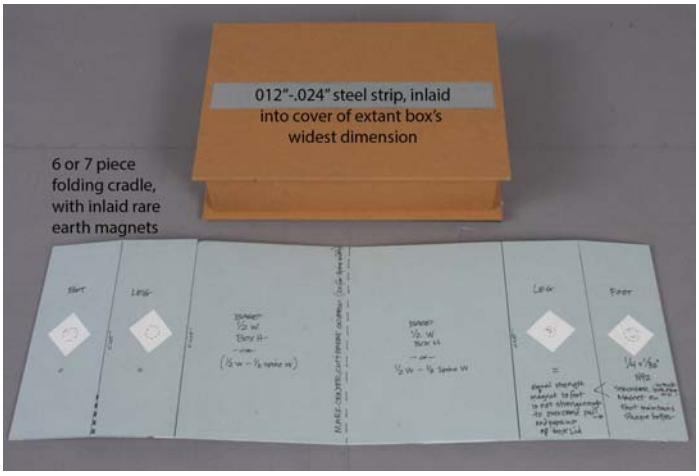

Figure 3. The retrofit box, upper cover showing inlaid steel shim, and its cradle, corrugated style, showing magnet placement in underside of cradle.

Figure 4. The retrofit book box shelved upright, showing relative thickness of wire-edge, bookcloth covered cradle (left) and corrugated cradle (right) options, secured with Melinex wrapper.

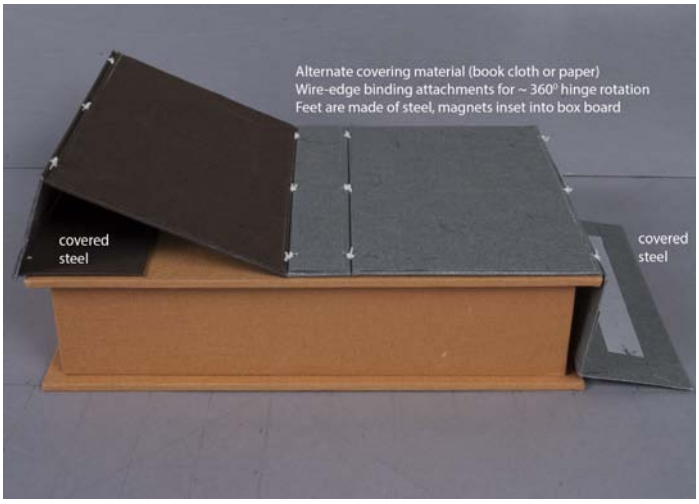

Figure 5. The wire-edge binding style, with steel feet, and magnets sunk into the book box. The sample is covered with bookcloth and paper variant sides.

Nota bene: An opposite configuration was also prototyped following Dan Kelm's wire-edge binding style, with magnets set into the lid of the box and steel shims used as the cradle parts (Fig. 5). While more elegant, and with its own advantages, this approach proved less suitable for library use for a few reasons. It is more difficult to excise the dense bookboard typically used for a box to the correct depth for the magnet, as opposed to the easier and neater trimming out of a layer of bookcloth and inlay of a single steel shim as shown above. It is more expensive, in labor and steel, with multiple sharp edges to cover; the prototype was made of seven pieces of board and metal, with bookcloth and paper variant coverings, adhered with fusible polyethylene web. Most importantly, there is a risk of exposed magnets sticking to powder-coated metal library shelving, or an unshielded electronic device being unfortunately placed upon them, should the box somehow be separated from its paired cradle. The advantages, however, include better force of attraction, as the magnets are centered on individual feet of steel, as opposed to multiple, equally spaced, opposing magnets both landing on the one shim of steel (version above), which sets up a magnetic field in the steel. Also, steel plates could be put to use to support heavier books; a compound hinged metal cradle could have steel feet (and spine) and aluminum angle boards, to reduce weight without compromising rigidity.

There is a growing body of literature on use of magnets in conservation. There are variables to consider such as magnetic strength (N) and types, research on more or less successful uses in treatment or exhibition, and guidelines for health and safety, sustainability, troubleshooting and unexpected consequences. For more on this, see suggestions for Further Reading.

MATERIAL AND SUPPLY

Options are indicated in grey, in illustration (Fig. 6):

- Ferrous galvanized steel plate or shim (gauges between .012-.024" are easily cut with a board shear, sheet metal cutter, or tin snips—snips however, tend to torque the metal.)
- book board and (bookcloth or durable or decorative paper) (or) corrugated 1/8-1/16" board and a hinge material (gummed hinge tape, Tyvek tape, or other, glued)
- box cutting blades, or metal punches for excising material
- paper to cover exposed magnets, pre-printed with a magnet icon & warning
- rare earth magnets, zinc-coated (1/32"-1/16" thick; in a variety of X,Y sizes and N-strengths; squared shapes are easier to excise from boards with a knife than circular, if you don't have punches)
- PVA glue or epoxy to adhere magnets (hot glue can deactivate magnets)
- PVA, brushes, for adhering bookcloth or hinges.
- Safety equipment: safety goggles, multiple compartment boxes to keep magnets separated; puncture-proof gloves

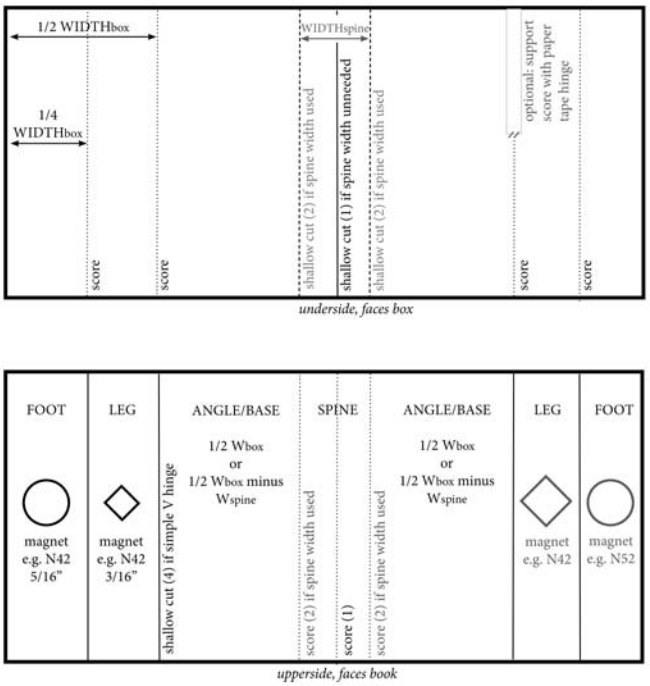

Figure 6. Line drawing of cradle configuration, magnet placement, scores & hinges, for corrugated board version. Options are presented in grey.

FURTHER READING

Bennett, William. 2015. "Home Sweet Housing: Creating a Unique Enclosure for a Historic Photograph." *Smithsonian Institution Archives—The Bigger Picture*. November 24. http://siarchives.si.edu/blog/historic-photograph-enclosure.

Glaser, Greta. 2013. "Mounting Photographs with Earth Magnets." *Smithsonian Institution Archives—The Bigger Picture*. May 7. http://siarchives.si.edu/blog/mounting-photographs-earth-magnets.

Kelm, Daniel E. 2017. "The Book Restructured: Wire Edge Binding." *Wide Awake Garage*. Accessed July 27. http://www.danielkelm.com/core/galleryfullsize/86/1.

Multiple. 2015. "Magnet Mounts." *AIC Wiki. Objects Specialty Group of the American Institute for Conservation of Historic and Artistic Works*. Accessed March 25. http://www.conservation-wiki.com/wiki/ Magnet_Mounts.

Spicer, Gwen. 2017. "Magnets." *Spicer Art Conservation*. Accessed July 27. http://spicerart.com/magnets/.

Nora Lockshin is Senior Paper Conservator for the Smithsonian Institution Archives' Conservation Lab. She provides treatment, guidance, research, training and advocacy for caregivers of collections, including the Smithsonian Archives, its allied archival units and special collections throughout the Smithsonian's 19 museums, 9 research centers and the National Zoo, and the general public. Her lifelong study and practice in the arts motivates her support of access for all. She is an alumna of both the Rhode Island School of Design (BFA) and University of Texas at Austin (MSLIS, Certificate of Advanced Studies in Preservation and Conservation). She is a Professional Associate of the American Institute for Conservation, contributing member of the Guild of Book Workers, and the Washington Conservation Guild. Contact: lockshinn@si.edu.