



THE hard(ware) facts

BY CHRIS A. PASCHKE

Whether you frame and hang your own art or just want to communicate more effectively with your framer, knowing these hardware basics is essential.

HARDWARE MAY NOT SEEM exciting, but understanding the function and limitations of various types of screws, hangers, and wires will ensure that your framed drawings and paintings are properly supported when displayed. Take a little time to tackle the terminology and technicalities. Your art deserves nothing less.

The Skinny on Screws

The most basic piece of picture-hanging hardware is the screw, the size of which is based on shaft dimensions (gauge) and threading. To simplify the identification of smaller, more commonly used screw gauges, a numeral designation preceded by a crosshatch symbol (#) has been adopted, with #0 being the

RIGHT: Two types of screws: Wood screws (A1) have an unthreaded shank just below the head. Metal screws (A2) are threaded, tip to head.



ABOVE: Screw head styles and drives: (left to right) pan head with a straight-slotted drive; flat head with a Phillips drive; pan head with a combination straight-slotted and Phillips drive

smallest and #15 the largest. The most commonly used screw gauges in framing are #4, #6, and #8.

Wood screws (A-1) have a coarser pitch (fewer threads per inch) than sheet metal screws, and often wood screws have an unthreaded shank just below the head. Because there are no threads to catch the wood along the smooth portion of the shaft, a wood screw can pull one piece of wood flush against another. Metal screws (A-2) have sharp threads that cut into materials such as sheet metal, plastic, or wood. They make excellent fasteners for attaching metal hardware to wood and are preferred for this use because of their fully threaded shafts.

There are many head styles for screws, with flat head, pan head, and round head being the most common for framing. When countersinking (inserting a screw so the

head is flush with the wood surface), choose flat-head screws. Round-head screws have a domed shape, and pan-head screws have a slightly rounded head with short vertical sides. There are also many drive configurations, but straight-slotted, Phillips, and a combination of these two are most common (B).

Why all this talk about screws? For one thing, you generally need them to fasten picture-hanging hardware to a frame, which leads us to our next topic.

Dependability of D-Rings

D-rings, both the single-hole and strap-hanger varieties, are an excellent choice of picture hanger (see Put It All Together: D-Rings, page ••). When installed with #4, #6, or #8 pan- or round-head screws, D-rings lie flatter against the wall than screw eyes (a popular but poor choice of hanger; see Hazardous Hardware!,

Comparative Strengths of Picture Wires

BRAIDED GALVANIZED STEEL			COATED STAINLESS STEEL			COATED COPPER/GOLD		
wire size	max frame weight	wire break weight	wire size	max frame weight	wire break weight	wire size	max frame weight	wire break weight
#2	12 lbs.	50 lbs.	#2	15 lbs.	40 lbs.	#2	15 lbs.	37 lbs.
#3	16 lbs.	68 lbs.	#3	20 lbs.	68 lbs.	#3	20 lbs.	50 lbs.
#4	20 lbs.	85 lbs.	#4	25 lbs.	75 lbs.	#4	25 lbs.	62 lbs.
#5	24 lbs.	98 lbs.	#5	43 lbs.	105 lbs.	#5	30 lbs.	85 lbs.
#6	28 lbs.	115 lbs.	#6	50 lbs.	150 lbs.	#6	45 lbs.	170 lbs.
#7	32 lbs.	130 lbs.						
#8	36 lbs.	145 lbs.	#8	60 lbs.	170 lbs.			
			#9	90 lbs.	250 lbs.			

Maximum frame weights vary not only with the style and coating of the wire, but also with the manufacturer. This chart reflects an average of the maximum frame weights given by wire manufacturers for a wire of a particular size. As a rule of thumb, the break weight for braided galvanized steel wire is four times the frame weight, and the break weight for stainless steel wire is three times the frame weight. Hence, stainless steel wire can accommodate heavier frames than braided galvanized steel wire.



Hazardous Hardware!

Sadly, the two most popular types of picture-hanging hardware aren't the strongest or most effective. Consider the following cautionary advice before grabbing a sawtooth hanger or a screw eye.

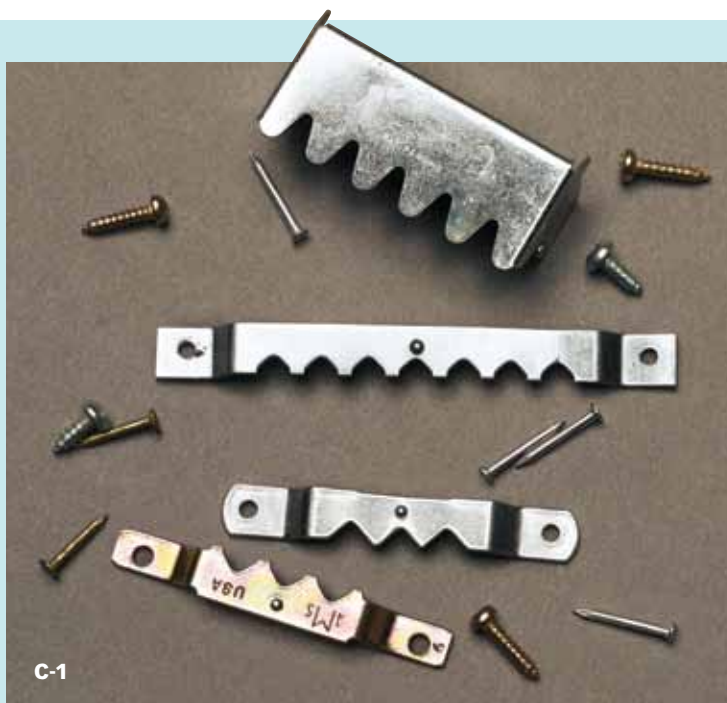
Sawtooth Hanger Hang-Ups

A sawtooth hanger is a jagged-edged, metal strip, 1 to 2 inches long (C-1). It's popular because of its simplicity and the ease with which it can be installed, but it has a high failure rate. This is not the result of weakness of the metal strip, but rather of the softness of the frame moulding and selected fastener. Most sawtooth hardware comes with short $\frac{3}{8}$ - to $\frac{1}{2}$ -inch tacks that press into the wood of a painted panel or frame. If the wood is soft—like pine—nails can pull out of the frame due to the weight of the framed work and the pull of gravity. Substituting small #3 screws for the tacks greatly improves the holding strength. Snap-in sawtooth hangers, used with metal frames, require no screws and won't pull out. Even at their best, however, sawtooth hangers should never be used for hanging fine art because a picture can easily be knocked from the sawtooth. Galleries generally don't accept framed art with sawtooth hangers of any kind.

Screw Eye Screw-Ups

A screw with an eye (looped head) and screw shank is called an *eye screw*, *eye hook*, or *screw eye*. It's designed to be an all-in-one piece of hardware, one end of which you screw into the back of a frame and the other end to which you attach the hanging wire. Screw eyes are the most popular type of picture-hanging hardware; however, they create problems.

Installing screw eyes into hardwoods such as maple, oak, or walnut creates stress at the point where the screw meets the eye, thus weakening



C-1



C-2

the hardware (C-2). If you select a screw with too small an eye for the hardwood of your frame, the eye can break from the shaft

during installation. What's more, when inserting a screw eye into soft or reconstituted wood, such as medium density fiberboard (MDF), the threading, rather than grabbing onto the wood grain, can create sawdust. This allows the screw to pull out.

Large eyes may force the frame away from the wall, which may be visually unappealing and may leave marks where the eyes contact the wall. Screw eyes also create stress on the sides of the frame at the point of insertion, which weakens the wood of narrow frames and can easily split dry wood. The logical replacement is the D-ring.

ABOVE: Sawtooth hangers: Snap-in sawtooth hanger designed for metal frames (top) and sawtooth hangers designed for wood frames, along with tacks and screws—no sawtooth hanger can hold a pictures securely!

ABOVE LEFT: Screw eyes: A screw eye is only as strong as its neck, the area between the threads and the eye, and therefore creates problems.

above). You may position single-hole D-rings to match the 60-degree angle recommended for hanging wire; D-ring strap hangers usually end up at an angle more vertically oriented.

Heavy-duty D-rings and strap hangers, constructed of doubled steel, are intended for hanging heavy wood frames, large gallery wraps, or cradled boxes, and you can use them with or without picture wire. When using them without wire, align the D-rings or strap hangers vertically at the upper corners on the back of the frame. Then suspend the picture

directly on substantial picture hooks or screws anchored into the wall.

Strengths of Steel Plates

Another excellent choice of picture hanger is the Super Steel Hanger (see Put It All Together: Steel Plates, page ••). These are steel plates with either two or four screw holes located both above and below a ring, to which you attach the picture wire. A four-hole, steel-plate hanger easily supports a frame of up to 100 pounds, while the shorter two-hole style holds up to 50

Put It All Together: D-Rings

Choose a D-ring strap hanger in a size (small, medium, or large) and width (narrow- or wide-based) suitable to the moulding of your frame. Also choose a hardware strength (heavy-, medium-, or light-weight) suitable to the weight of your framed picture.

D-1: Heavy-weight strap hangers,

left to right: small, narrow-based; small, wide-based; medium, narrow-based; medium, wide-based; large, wide-based.

[Chris P.: HELP!!!!!! I have no idea whether this is correct!]



D-2: Here you see a medium-weight, single-hole D-ring with a #4 pan-head combination screw and #3 coated stainless steel wire. The wire is twisted tightly and compressed where it attaches to the D-ring to prevent the wire from slipping from the ring.



D-3: Pictured are medium-weight, single-hole D-rings with #2 coated stainless steel wire. Set the straps one-quarter of the way down from the top edge of the frame and position the straps so the wire will slant 60 degrees when the picture is set on two wall hooks. Make the wire slack enough to reach halfway between the straps and the top of the frame.

pounds. Mount the center of this hardware one-quarter of the way down from the top edge of the frame, either centered on a narrow moulding or about ½ inch from the inner edge of a wider moulding. Use #4 or #6 screws.

Wire Wisdom

Picture wire threads through D-rings or the eyes of steel plates so that you can suspend the picture. Like screws, picture wire comes in different sizes (also referred to as *weights*), as indicated by a crosshatch (#) followed by a number. In addition, there are many types of wire, some of the more common being twisted stainless steel, plastic-coated stainless steel, multistrand braided galvanized steel, and plastic-coated copper (F). Galvanized-steel wire is the most frequently used but also the least effective. Plastic-coated stainless-steel wire won't hurt your hands during installation, mar walls, rust, or discolor. Coated copper is softer and easier to work with but doesn't have the strength of stainless steel.

As multistrand braided galvanized steel wire increases in diameter, the strands remain constant in size, with additional strands being added to the braid. For example, a #2 braided wire has 12 strands while a #8 braided wire has 36 strands. In contrast, all stainless steel wire contains seven strands that have been tension-twisted, like cable, and as the wire gets larger, the strands increase in diameter. This makes twisted wires (stainless steel) comparatively stronger than braided wires (galvanized steel), but also less flexible.

Determining the correct size of wire is dependent upon the type of wire you're using. The break weight (also called *break strength* or *break point*) of braided galvanized wire should be approximately four times the weight of

Resources for Professional Framing Hardware

ArtRight.com: www.artright.com

Framework Inc: www.frameworkinc.com/store/

FramingSupplies.com: www.framingsupplies.com

Jerry's Artarama: www.jerrysartarama.com

M&M Distributors/Omega Moulding: www.mmdistributors.com

PictureFrames.com: www.pictureframes.com

United Manufacturers: www.unitedmfrs.com

the frame, while the break strength of coated stainless wire should be approximately three times the weight of the frame. Hence, for a 10-lb. painting, you could use a stainless steel wire with a break weight of 30 lbs., but if you used braided galvanized wire, the break weight would have to be 40 lbs.

The table Comparative Strengths of Picture Wires (page ••) gives a more complete idea of the capabilities of different types of picture wire. By consulting this table you can see, for example, that a #3 braided galvanized wire is recommended for a maximum frame weight of 16 lbs. while a #3 coated stainless steel wire is recommended for a maximum frame weight of 20 lbs., even though both wires have the same break weight of 68 lbs.

The larger/heavier the wire, the more the variance between the braided (galvanized steel) and cabled (stainless steel) structures. Accordingly, #8 braided wire is rated at 36 lbs. with a 145-lb. break weight, while #8 stainless steel wire is rated at 60 lbs. with a 170-lb. break weight. Note that the softer, coated-copper wire also has a break weight of 170 lbs., but a maximum frame weight of only 40 lbs.

As an artist, you'll most likely need wire in two or three different sizes to accommodate all your picture-hanging needs. Most likely, a coated stainless-steel wire would be your best choice, and probably #3 and #5 will handle most of your demands. Keep in mind that it's better to select a wire that's too heavy than too light.

Off to a Good Start

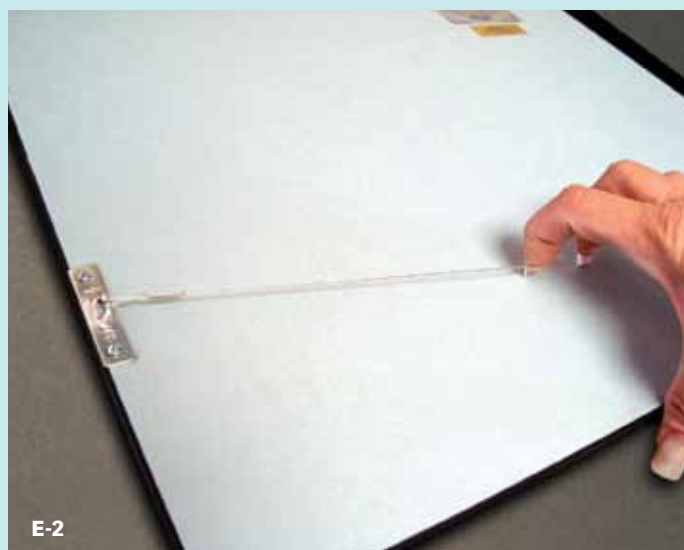
There's much more to framing and displaying your artwork than hardware, but to a large extent, the success of your presentation literally hangs on the hardware you choose. A little knowledge could save your art! ■

CHRIS A. PASCHKE received Certified Picture Framer (CPF) status in 1986 from the Professional Picture Framers Association (PPFA) and Guild Commended Framer (GCF) status in 1997 from the Fine Art Trade Guild (FATG), based in London. She was awarded the 2008 PPFA Award of Distinction for Leadership, the 2010 PPFA Vivian Kistler Recognition for Innovation Award and the 2012 Photo Marketing Association (PMA) Distinguished Service Award for her ongoing research on framing giclées and digital art. As a specialist, educator, and columnist to the framing industry, Paschke has written the books *Creative Mounting, Wrapping and Laminating* and *The Mounting and Laminating Handbook, Third Edition*, both available at her website, www.designsinkart.com.

Put It All Together: Steel Plates

E-1: Super Steel Hangers are extremely strong.

On the left is a two-hole hanger, which can hold up to 50 lbs; on the right is a four-hole hanger, which can hold up to 100 lbs. When the hangers are mounted on the frame, the arrows stamped into the metal should point toward the center of the picture.



E-2: Here you can see the steel plate hanger properly positioned one-quarter of the way down from the top of the frame and centered on a thin moulding (partially covered with a preservation dust cover). The plate is held with pan-head combination-drive #4 screws, and the slack of the wire (in this case, #2 coated stainless steel) is set so that it reaches halfway between the plate and the top of the picture.



LEFT: Picture wires: (left to right) #5 twisted stainless steel, #9 coated copper, #6 plastic-coated stainless steel, #6 multistrand braided galvanized steel, #4 plastic-coated twisted stainless steel