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21M.735 Tech Note 3: Stairs

Squeaky Stairs

Technical theater is in large part the art of building and creating to achieve exactly the right effect on the audience. Unwanted features detract significantly from the theatrical performance, and can be distracting or annoying to the audience. Stairs are a common theatrical element of scenery, but also one prone to malfunction in the form of squeaking.

Stairs are composed of three elements: treads, risers, and stringers. The first two are more or less self explanatory: the treads are the horizontal pieces of wood on which one treads, and the risers are the vertical pieces of wood that rise from tread to tread. The stringers are what hold it all together – they are the pieces with zigzag patterns cut out that the risers and treads are attached to. From the business end of the stair, where one walks, the stringers aren't visible in a normal staircase. For many staircases, theatrical ones in particular, it is possible to get access to the underside of the staircase, and this can be very helpful in addressing squeaking.

Squeaking is caused by the wood of the stairs shrinking or warping over time, by the strains of use, or poor original construction. Seasonal contraction and expansion of the wood can also play a part in causing the structure to loosen up. Stairs constructed of glue in addition to metal fasteners (screws and nails) are less prone to squeaking. The squeaking sound comes from the rubbing of wood against wood. This occurs when the tread comes loose from stringer, or the tread rubs or knocks against the riser.

There are methods of stair repair that can be applied from both the top and the bottom. The advantage of going at the stair from the bottom is that the fix doesn't have

to be as aesthetically pleasing, and can indeed leave material below the step, like blocks or wedges. However, in some cases, the bottom of the stair is inaccessible; in that case repairing from the top is the only option barring ripping out an existing wall. It can also be easier to work from the top, as it doesn't involve inserting screws upwards above your head.

When repairing any stair, it usually helps to have a helper stand on the step to push it closer to the stringer or riser, so that the repair will involve fastening the two parts together, not trying to use the power of the fastener to pull the parts together.

Options for stair repair from the top involve nailing the tread into the part it has come loose from, screwing the tread in, or inserting small wooden wedges in between the tread and riser, coated with glue. After the glue dries on the wedge, the exposed portion should be cut away with a knife. As referred to above, it is important to remember that above-the-stairs repairs should be finished with appearance in mind: countersink and putty over nail and screw heads, and make sure wedges are discreet. To this end, molding can occasionally be used on stairs where the wood is exposed to act as a block to fasten the tread to the riser.

Options for below-the-stairs repair include basically everything that can be done above, as well as using metal brackets between the treads and stringers and gluing blocks from below and then nailing them into place. Whenever nailing a tread to a stringer, it is good to use two nails at opposing 45 degree angles (pre-drill to get the angle right). This way, they act as a clamp, and are much less likely to work themselves out. And for a quick fix, joints can also be lubricated with graphite powder, but this won't solve the problem forever.

Given this knowledge of the anatomy of stairs, and the solutions proposed, almost any squeaky stair should be manageable.

On a final note, it is conceivable that a squeaky stair could be a design parameter for a piece of scenery, for example if a set was to be of an old or spooky house. Though none of the literature covered this particular issue, I feel that here too, the knowledge of the dynamics of squeak are very useful. Basically, one could try to implement the reverse of some of the fixes, for example, while still maintaining structural integrity, removing some of the fasteners, or perhaps adding more wood loosely fitted together, to encourage rubbing and squeaking. This would likely require some experimentation and tweaking, but is theoretically possible.

Resources:

<http://www.oldhouseweb.com/stories/Detailed/218.shtml>

<http://www.thisoldhouse.com/toh/print/0,17071,229734,00.html>

<http://www.bhg.com/bhg/printableStory.jhtml?storyid=/templatedata/bhg/how-to/data/14883.xml>

http://www.bhg.com/bhg/printableStory.jhtml?storyid=/templatedata/bhg/step-by-step/data/hie_1158.xml

http://www.homedepot.com/prel80/HDUS/EN_US/projects/pg_project.jsp?CNTTYPE=PROJ_META&CNTKEY=Know+How%2fproject&BV_SessionID=@@ @0204379298.1077595044@@ @&BV_EngineID=ccchadckkifmmkhcgeffdfgidgm.0&MID=9876&projectKey=Floors%2fStopping+Squeaks%2fStopping+Squeaks

http://www.repair-home.com/Fixing_a_Squeaky_Stair_From_the_Underside

http://www.repair-home.com/Fixing_Squeaky_Stairs_at_Stair_Level

<http://www.handymanusa.com/questions/floorsqueaksq.html>