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Reuter Swell Motors

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One of the main questions asked about Reuter swell motors is "which stage is #1?" The old motors, pre mid-'70s, run right to left. The first and second stages have helper springs on the valves. This should help figure it out. In adjusting the valves, be aware that there is a valve on the other end of that wire which requires an act of congress to get at, so don't start trying to turn the nut, it may be unscrewing the other end. Hold the tip of the wire with pliers and pull it out as the nut is turned. Also, almost all of the older ones have nuts on the wire on both sides of the valve, even though the inside nut really isn't needed. This is a serious problem when trying to reduce the speed of a given stage. The outside nut must be removed, keeping careful hold of the wire, and removing the valve. The inside nut may be removed and discarded while the valve and outside nut are reinstalled. It will then be possible to adjust valve travel without trouble.

There were two sizes of swell motor for quite a while. The small one is quite similar to the old large, except that the valve train is on top of the motor, not the front.

The newer model has a one stage primary and not nearly as much confusion. The firing order is left to right. There are two ways to control the speed of a stage. First, adjust the regulating screw with a large screwdriver. Second, adjust the valve motion by moving the outer valve in or out. The wire needs to be held with pliers while the nut is adjusted. There is no inside nut.

The motor should be adjusted to operate slowly enough to avoid slamming the shades. This is done with small valve travel, especially with #1 and #8. #1 is a large stage so it can pull against the shades to keep them tightly closed and still has enough travel to be the first stage. Remember that the swell motor closes the shutters and the spring opens them. The swell motor acts as a brake when they are opening. The motor energizes to close. With #1 stage exhausted, adjust the turnbuckle so that the shades just close. Then test to see if they open a small amount when stage #1 is fired. If they open correctly, lock the turnbuckle; otherwise fine tune the adjustment.

It is possible to re-leather old Reuter swell motors. The most difficult part is cleaning out the groove in the base and the leaves that the hinges are glued into. They were usually nailed in place, and the nails have to be gotten rid of. Many of the older motors have leaves made of masonite or worse. Figure on replacing the leaves. A comb-like device made of scrap plywood is very helpful for holding the leaves in position as the leather is being glued.

For a short time, Reuter built whiffle-tree motors. They are similar to other motors of this type.

Individual Shade Actions:

The Reuter individual action swell motor works well. When the old model fails for some reason, it is almost necessary to remove the motor from its place in the chamber, because it can't be gotten into except from the front, and that side is up against the shutters. Some of the old ones have dual pneumatics on stage 1. This means two chambers in one pneumatic. The extra action is tubed. Two of the pneumatic screws are outside the chest and two are inside the chest.

The new model can be accessed from the back, but it will likely have access problems due to the layout of the chamber. All of the screws in the pneumatic are accessible from the outside. The speed of the action can be varied from some sort of gate; it may be a dowel or a large machine screw. The motor closes the shutters and springs open them. There is some bumper/retarder mechanism on all individual actions. The type varies according to the time period they were built.

Rod Seals:

When an action rod passes out of a pressurized chamber, some sort of seal has to be used. Several used by Reuter are detailed below.

The oldest ones were apparently fiber disks fitted tightly on the rod, held in place by some form of block designed to seal the disk, but still allow it to move. They have to be graphited thoroughly to work. They greatly resemble the seal currently in use, which consists of a fiber disk, a leather disk, a 1/4" felt disk, another fiber, and another leather disk which is glued to the inside of the block. The order of the list above is from the bung surface outwards. These also have to be graphited. The seal is provided by the compression of the felt layer against the rest of the disks.

Two of the models in between are famous for the unfortunate noises they make when they rupture. One is a three or four inch long cone of leather. The cone is glued together and to the inside of a block that is screwed to the bung. The outer end is glued and tied to a piece of dowel. The dowel is drilled to fit the rod. Many move with the rod, flexing the leather. The sound produced when the leather fails resembles a loud Halloween horn (or worse). The baby bottle nipple model has the very tip of the teat cut off so that a drilled dowel can be inserted. The rod slides in the dowel. The rubber allows the rod to move sideways as it operates. Rupture of the rubber produces rude noises at high volume levels. This particular design and size of nipple is no longer made, so conversion is necessary.

Conversion of any older style to the current model requires that a hole in the bung be reduced to 9/16", if necessary. Made a 2 1/4" square block of 1/2" plywood with a 9/16" hole in the center and screw holes in the corners. Gasket this block and screw it down over the existing 1 3/8" hole. Then, attach a standard rod seal.