Case study

on the restoration

of the

1735 Richard Bridge Organ

at

Christ Church Spitalfields

Playing Action and Stop Action

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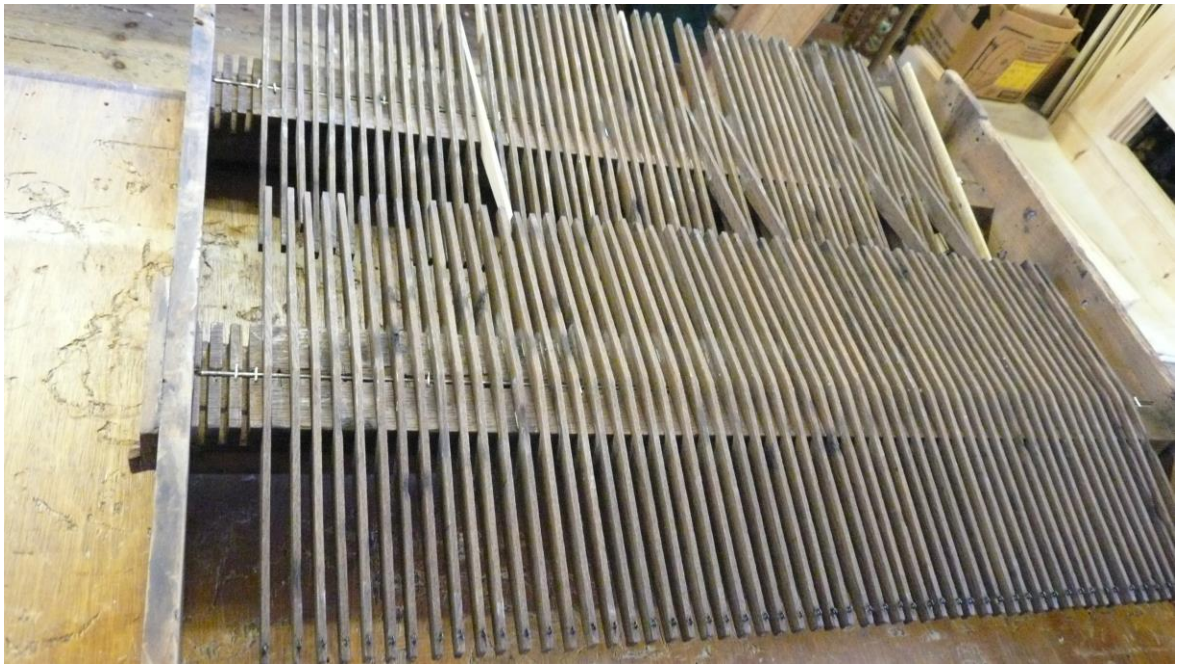
Playing Action and Stop Action

The action as found

Due to several substantial rebuilds the action was no longer representative of what it was like in 1735.

At dismantling the organ in 1997, the rollerboards of the Great and Choir had survived albeit in a somewhat altered state. Also had, from the original Choir action, an assembly of double back-falls survived.

Original double backfall assembly (note the numerous burn marks and three added slots to accommodate a compass change)

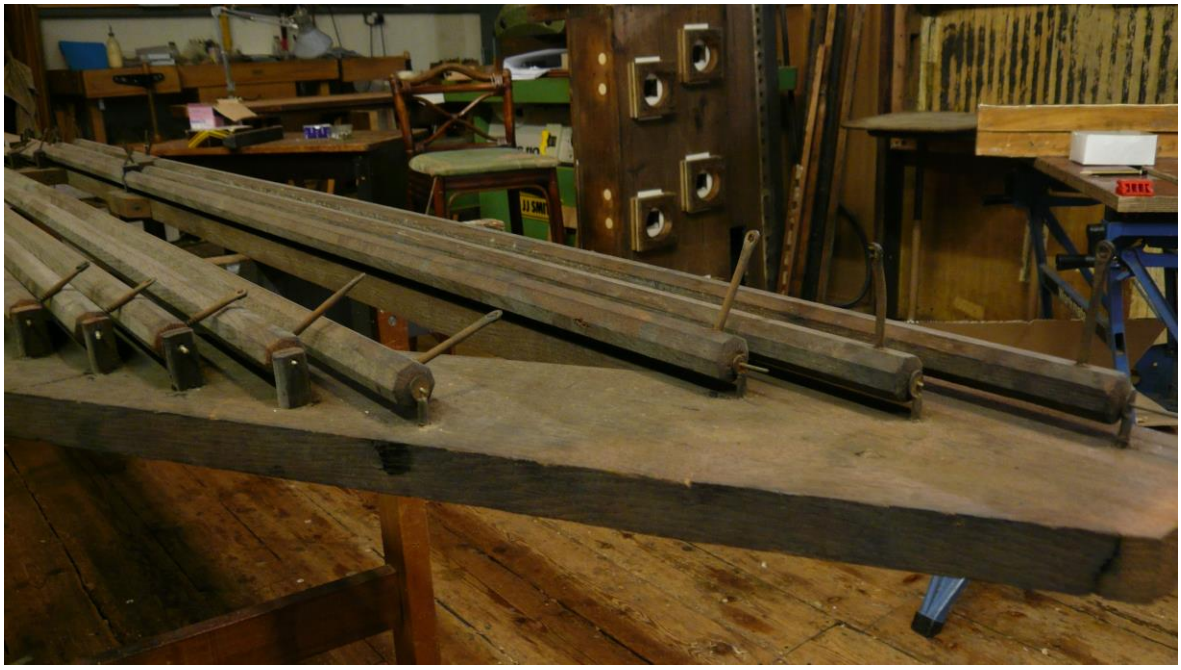


The trackers from these two rollerboards to the soundboards were found to be mainly of Oak. These Oak trackers are very likely to be original but they had been shortened and swapped about, in order to suit rebuilt situations. They were found to be very fragile.

The action to the keyboards and including the keyboards had all been changed, and an entirely new Swell action was made in 1852.

The two original rollerboards had undergone some changes most likely by Lincoln in 1837. The metal roller studs were replaced with wooden ones in the same pattern as those in the Lincoln organ now in the Ballroom of Buckingham Palace. Only the Choir rollerboard was actually removed for this operation, but evidently the Great rollerboard was too much trouble to get out. This prevented a few original roller studs from being removed because of their awkward position facing the Treble Great wind trunk.

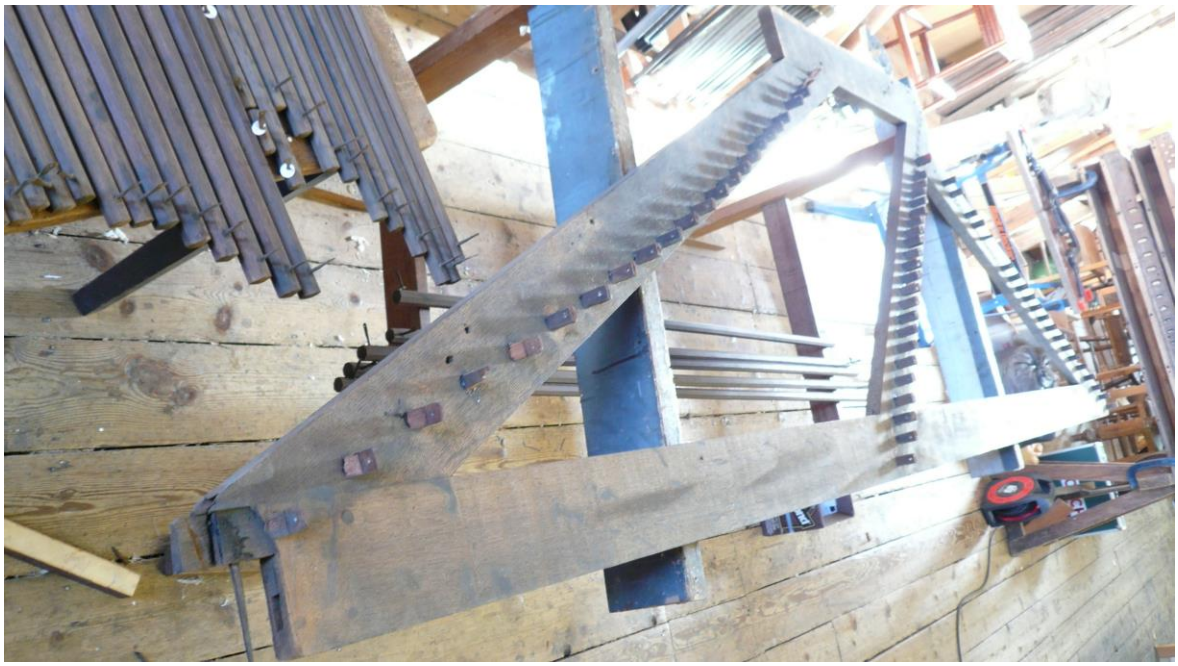
Original metal studs next to 19th century wooden ones before the restoration of the Great rollerboard (note the later longer arms with the bushed holes to increase pallet movement)



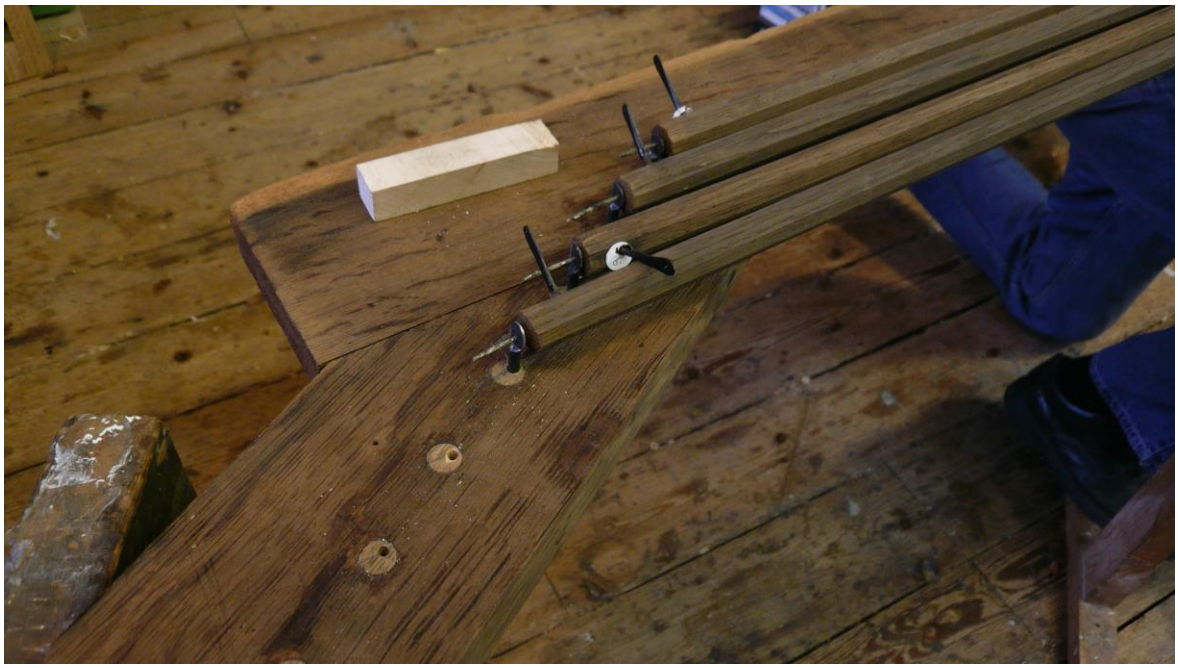
Restoring the action

With the surviving studs as a model, a new set of replica forged studs could be made. Also where the original roller arms had been replaced, new ones of the same steel screwed model were made. The holes drilled into the rollerboard frames for the replacement roller studs where filled in so that the new studs could be positioned in the correct place in relation to the soundboard and keyboard spacing.

Choir rollerboard frame before restoration with the original nail fixing for securing it to the building frame



New forged roller studs being fitted into the restored frame



The trackers were all made of new Oak with brass hook-in, and threaded wires.

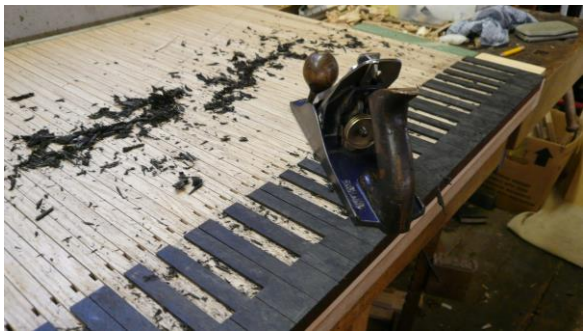
With all the metal to metal connections (the roller pivots have been given a drop of clock-oil), the action runs virtually friction free, with surprisingly little noise.

Reconstructing missing parts

The missing components of the action had to designed / reconstructed to make the organ function both in playability and supplying especially the Great with sufficient wind through the pallets. Given that the pallets are relatively short, and that at some time the roller arm length had been changed, and other ways had been tried to provide more wind (see about widened pallet openings in the soundboard chapter), this had to be approached with much care.

To start with there are the new keyboards, the leverage in these are determined by taking Shoreditch as a model.

Keyboards under construction



Keyboards waiting to be installed

The rollerboards also have longer arms on the keyboard side than the soundboard side (to a ratio of 1.158 or 0.864). This has the effect of reducing the tracker movement. This may have been done in order to reduce the movement, and therefore the wear on the leather pull-down purses and to reduce the inertia and noise of the action.

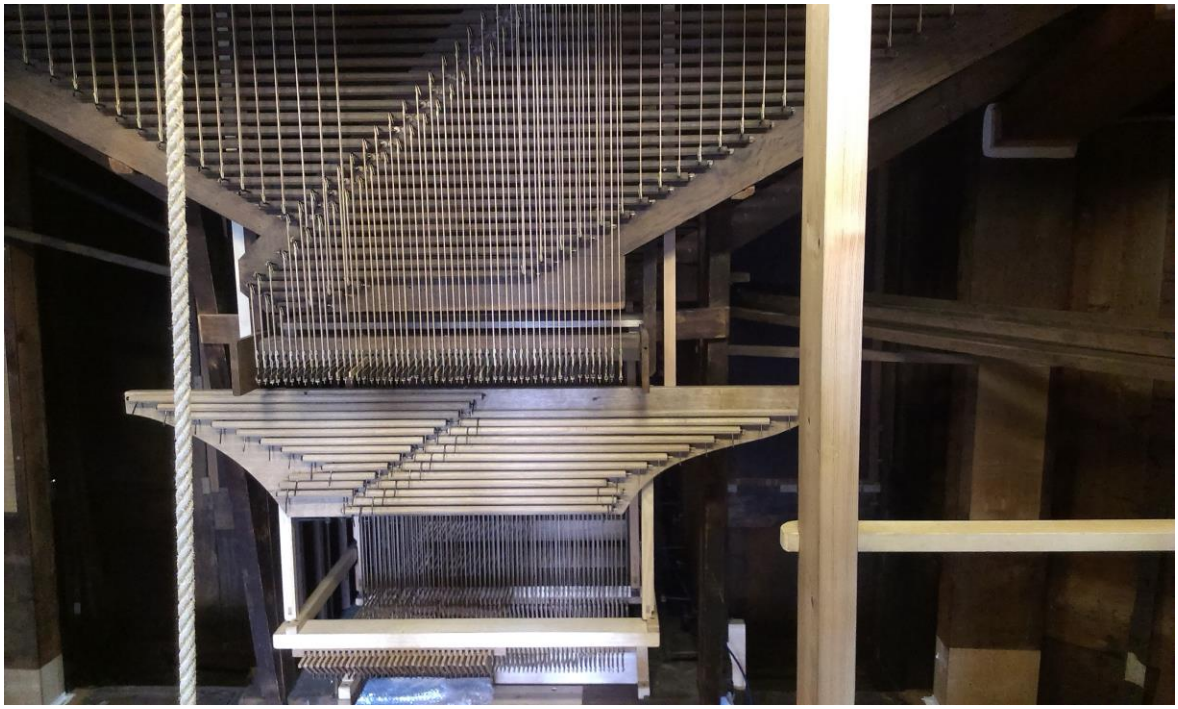
This demonstrates that Richard Bridge was a true master of his craft.

The pallets have their pull-down point very far back (for example 69mm at a total pallet length of 237mm and 260mm with the Choir and 59mm at a total length of 280mm and 241mm with the Great), and this way the movement is geared back up and the pallet is pulled open by the appropriate amount.

With the squares of the horizontal runs to under the rollerboards, the movement ratio could be influenced by choosing the appropriate arm length. The ratios of pallet opening to key fall eventually ended up 0.7 (Swell), 0.72 (Great) and 0.78 (Choir).

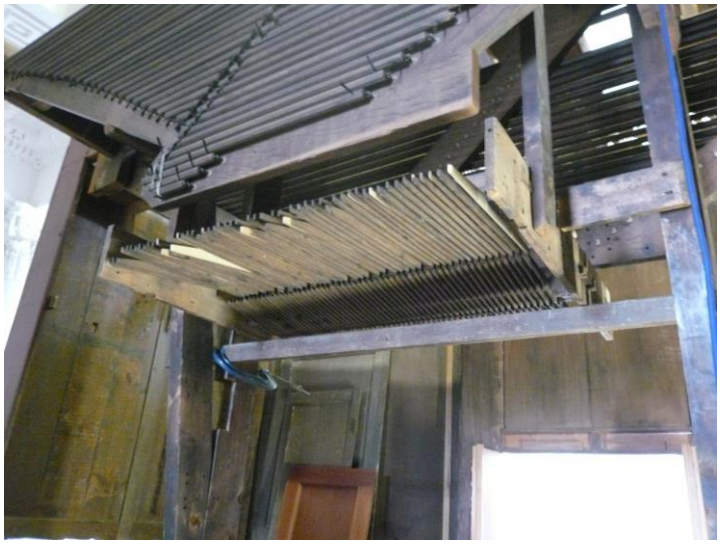
The squares of the Swell and Great actions are at the front pushed up by stickers resting on the back of the key.

Choir rollerboard, new oak trackers with underneath the double-backfall assembly and the new Swell rollerboard and square beam



The floor in the front part of the organ is about a foot lower than the level where the bellows are. In case of the Choir, the squares rest directly on the back of the keys. With these trackers so low down they need to be directed upward before the bellows are reached. The double-backfall assembly takes the action further back at the appropriate height to under the Choir rollerboard. This assembly is evidently part of the original action as there is evidence of an increase of compass from d''' to f'''.

The restored double-backfall assembly put back in its original place



The Swell action is entirely new. The rollerboard construction is principally the same as the Bridge rollerboards. Instead of using a frame construction, a solid board construction was used because of the much smaller dimensions.

The resulting key touch of the organ is firm but flexible and has provoked many a positive comment. The Great organ receives enough wind through the pallets for a full registration, though some selection is advised.

Stop action

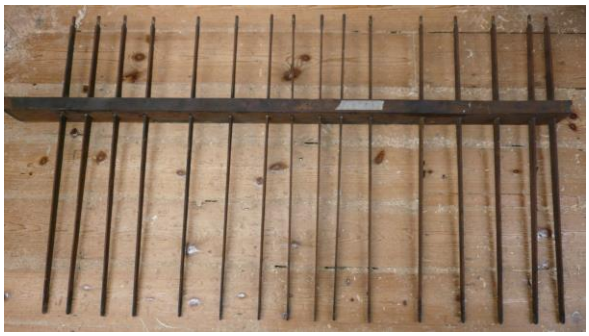
The stop action of both Great and Choir were largely found surviving from1735.

The Great stop action consists of long trundles behind the stop jamb with trace-rods running to long steel swords fitting into holes in the end of the sliders.

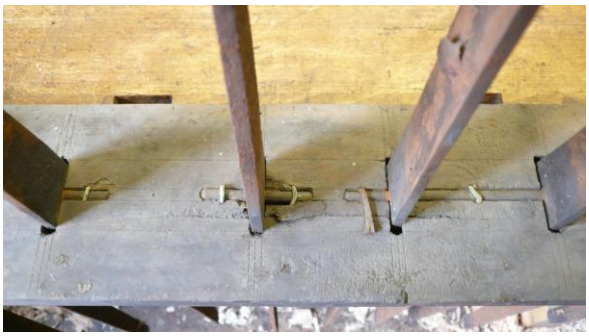
The Choir stop action consists of two sets of trundles one behind the stop jamb and one next to the Choir soundboard. The two sets of trundles are connected via diagonally backwards running trace rods. A set of steel sword brings the action up to slider level.

The restoration of this involved mainly the taking up of excessive wear and re-adjustment.

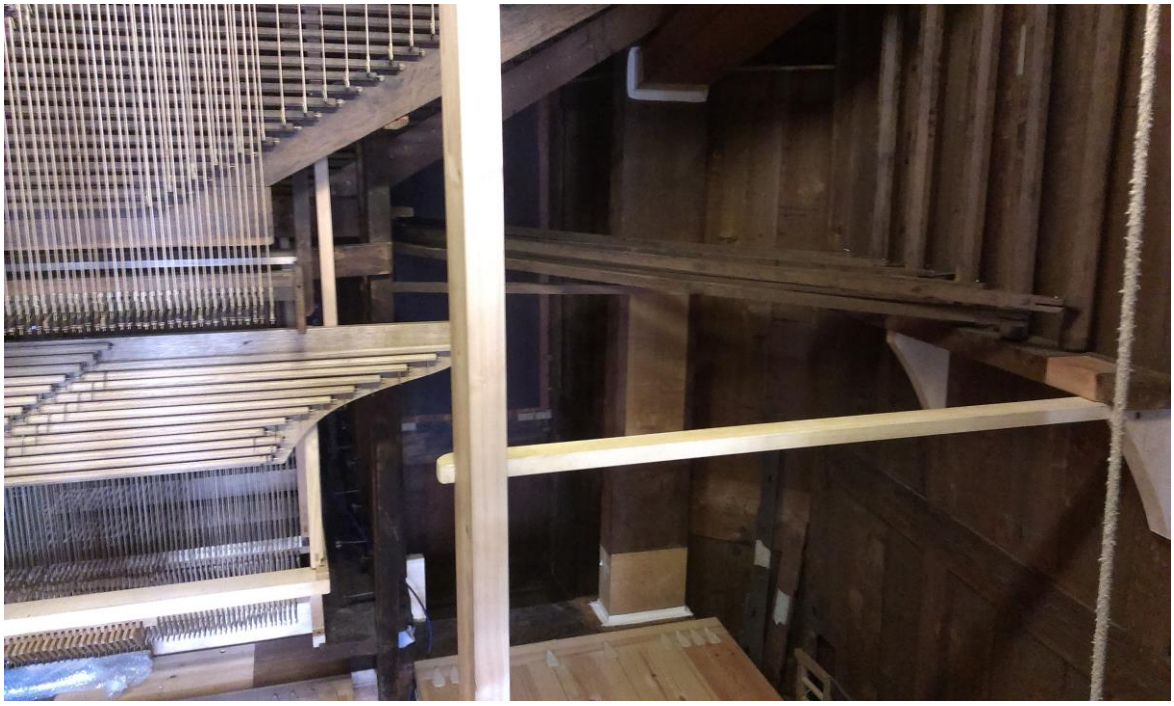
Great sword beam prior to restoration



The pivots are originally fixed using brass bent over wire



The original Choir stop action with angled traces running to the rear trundles next to the Choir soundboard



A point of interest is, that the sliders on the Great move differing amounts, depending on the size of the holes in the soundboard. This is not compensated for in the ratios of the stop action. Therefore stops like Larigot and Furniture have a shorter draw at the console than for example Open Diapason and Trumpet. In the case of the Choir sound board this is not the case as many sliders have been replaced by Gray & Davison in 1852 and slider travel may well have been altered.

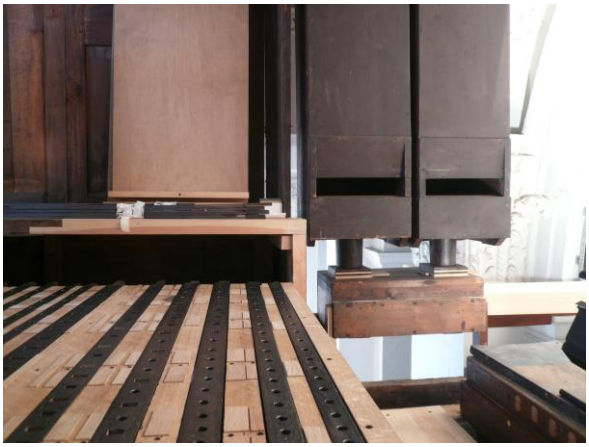
Pedal organ

The pedal action runs from the pedal jacks slightly upwards to the higher floor level. It runs over the floor under the bellows to where the new pedal soundboard is. The position of this is behind the organ and outside the Bridge framework, which also allows enough space for hand-pumping the bellows. Eleven of the largest pipes of the Pedal Open Diapason stand either side next to the organ, seven of them on their original (1837) soundboards. The pallets in these are operated with trackers branching off from the afore-mentioned main action run.

GGG, GGG# and AAA of the Pedal Open next to the bellows.

(BBB and ### behind facing outward)

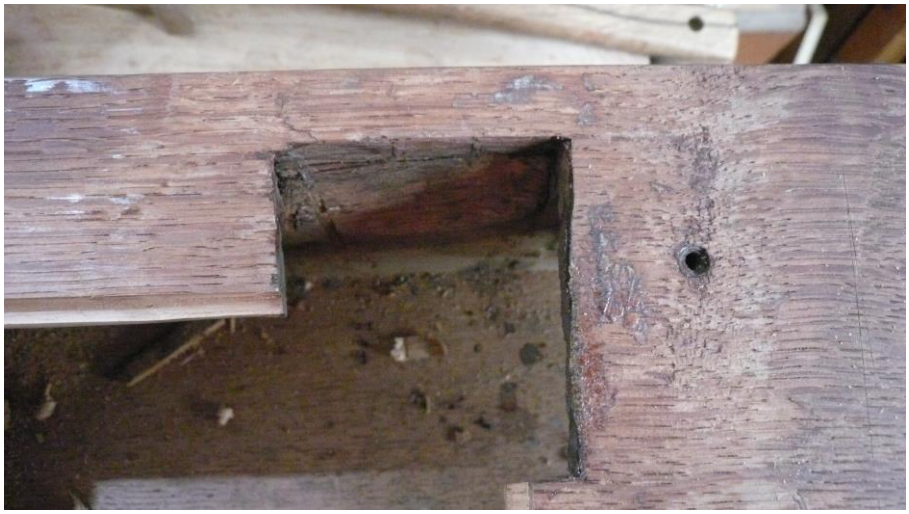
CCC and CCC# positioned next to the Great passage board



Drum pedal

The Drum sounds four wooden pipes (according to historic accounts of the organ) which are fed through an original hole in the Bass trunk to the Great.

The hole in the front of the vertical bass Great trunk (later enlarged for Lincoln Pedal winding)



Two open pipes near 8' pitch (flatter and sharper than CC). The evidence for these was present in the form of a stay with two hook mortices still fixed against the Bass inside of the front case, underneath which is written in chalk Dr1 and Dr2.

The drum stay for two wooden pipes of 8’ length with chalk marks below

To bring the number up to four, there are two more pipes speaking an octave higher. None of these four pipes is in tune with each other. The effect is quite convincing and not too gentle as might have been feared.

Swell pedal

Some of the 1735 Swell pedal mechanism had still survived in 1997. These were: the lever sticking through the console return; a large back-fall taking the movement to behind the Great and finally some lengths of trace-rod.

The newly made nags-head back-fall and an extra length of trace-rod could be linked up without problem, thereby re-establishing the connection between the old Swell pedal at the console and the newly reconstructed sliding Swell front.

New Sliding Swell front in workshop (with an unfinished rollerboard parked on top)