

Technical history of the Willis pipe organ from St George's Church, Charlotte Square, Edinburgh

This technical history of the Willis Pipe organ now in St Mary & St Giles Church, Stony Stratford relates to the period 1882-1965 when the organ was in Edinburgh.

Compiled by John Page based on Kirk Session Records research 2014-2016 and British Organ Archive evidence provided by Chris Kearn in 2012

1879 – Harrison & Harrison provided two estimates:

4-manual	£1200
3-manual	£900

1882 – Henry Willis provided an estimate for a 2-manual organ for £823, which was accepted. The total cost of £910 was made up as follows:

Basic organ	£823
Double-acting pedal	£7
Combination pedals for Swell	£15
Hydraulic engine	£65

The action for the manual keys and stops was mechanical (tracker), and pedals were tubular pneumatic (mechanical at the pedals and at the pipe chests, but pneumatic tubes in between). Willis used “grooved” boards (laminated with integral channels) for action transmission between sections of the organ, either laid horizontally or mounted vertically within the instrument.

In a diagram of a Willis organ of 1877 (Union Chapel, Islington) published in ‘The Making of the Victorian Organ’ on page 435, the “grooves” for pedal action in the pit below the keyboards can be seen.

Old discarded boards were cut up and used for stays etc, as the example in the photograph (figure 1) – this one is a stay for the case pipes on the Swell side in SMSG, photo taken during dismantling of the organ for restoration by FH Browne & Sons in July 2014.

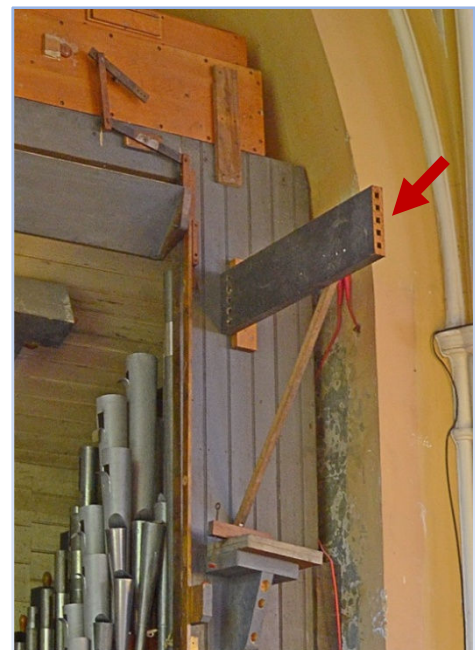


Figure 1 photograph of the Willis organ Swell box during dismantling for restoration in 2014, red arrow showing a Willis grooved pedal action board being used as a support stay (photo John Page)

The hydraulic engine mentioned above was a mechanical means for pumping the wind bellows, replacing hand-pumping, where the engine was connected to the pump-handle and worked it up and down via cranks and levers, utilizing the pressure of the main water supply. The “Joy” engine was invented by David Joy and William Holt in 1856 (figure 2). There is no evidence that the one installed in St George’s was this model; several variations became available (from different manufacturers) during the following years.

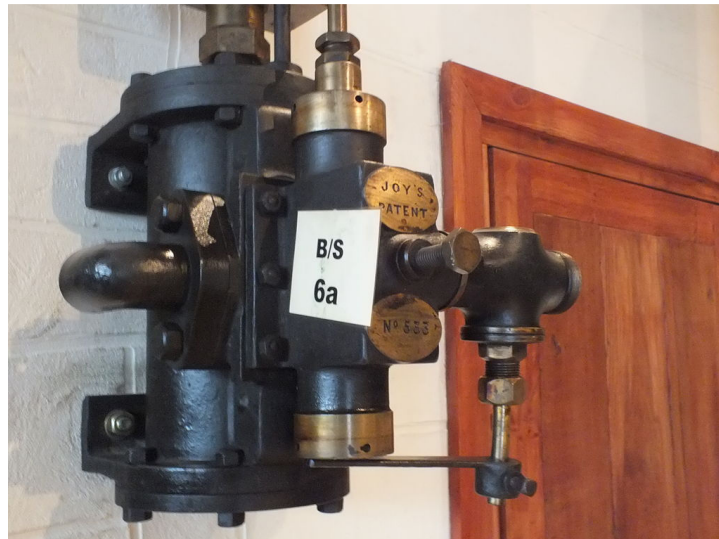


Figure 2 A Joy water engine (photo Clem Rutter)

The double-acting pedal is assumed to be what is now called a “reversible”, possibly acting on the Great to Pedal coupler – pressed once brings the coupler on, pressed again takes it off.

Combination pedals, when pressed down, draw combinations of relevant stops so the organist can select them instantly while playing instead of taking his hands off the keys to operate stop knobs.

1896 – Willis and Sons (Willis II was now in charge, with his father still involved) carried out an enlargement of the organ, utilizing both chambers in the building. That meant supplying a second hydraulic engine to supply wind to the other chamber, and a new pneumatic console – all actions were now tubular-pneumatic.

The cost was £906 divided as follows:

Reconstruction of organ	£850
2nd case with 21 new pipes (non-speaking)	£20
2nd hydraulic engine and fittings	£36

We have a short summary of the alterations of this period supplied by Henry Willis III himself in an article for “The Rotunda” in 1933. In it he stated that in 1896 the organ had been “expanded... including a Great Trumpet and Swell Cornopean on 7in.

wind". As the Cornopean was already there, it is possible his account was somewhat "embellished". To accommodate the Trumpet the Great soundboard needed a high-pressure section with separate pallets, so a new one was made. An extension was made for the Swell soundboard to allow for more stops, and a new deeper shuttered box to match. A new unenclosed Choir division was added incorporating some pipe work taken from the old Great and Swell. The pedal division remained the same.

The double-palletted soundboards mentioned above now operated on the pneumatic principle, with large leathered motors mounted underneath to actuate the pull-down wires. Each was connected to a system of "squares" (bell-cranks) and horizontal trackers to operate the two rows of pallets. The two pallet-boxes were supplied with wind from a double set of reservoirs, one at low pressure (possibly 3½ inches wind gauge) and one at high pressure (7 inches wind gauge). The banks of power pneumatics beneath the three soundboards are those which were installed in 1896. The one under the Swell soundboard still has the tracker connections to the two sets of pallets.

It is also possible that this was the time when "concussion" bellows were fitted to wind trunking. These help steady wind pressures in longer lengths of trunking. The trunking photo (figure 3) shows the Swell low-pressure trunking with a roughly-fitted blanking plate where the concussion bellows would have been. This plate is not to the expected Willis standard, and indicates that the concussion was removed, possibly at the time of installation in the cramped chamber at SMSG by Starmer Shaw organ builders.

The organ's stop sliders were operated by large pneumatic motors mounted at the sides of the soundboards. Inflating the motors pushed the sliders into the "on" position, and springs mounted half-way along the sliders (below the passage-boards) served to return the sliders to the "off" position when no longer needed. The only remaining examples of these motors are on the pedal chests. The others were removed in 1999 and replaced by modern solenoids.

1901 - Enquiries were being made as to the cost of converting the hydraulic power plants for the organ to electric power – there had been several water shortages affecting the use of the organ.



Figure 3 Swell low-pressure trunking with a roughly fitted blanking plate where concussion bellows would have fitted (photo John Page)

1914 – Willis & Sons – organ renovated at a cost of £51 comprising:

Repalleting manual soundboards and inserting new springs in pedal board	£46
Inserting pedal naturals and sharps [replacing worn pedal surfaces]	£5

Plans had begun as early as 1908 for the organ to be cleaned. There must have been some adverse effects noticed as the internal workings of the organ were foreign to Church members.

It is very surprising that the soundboards would need re-palleting after only 18 years unless the leather used in 1896 was of inferior quality. Similarly, the pedal board springs should have lasted far longer.

In 1915 a complaint was raised in a Kirk Session meeting about the noisy bellows during services when the organ wasn't being played. A solution was offered that a "starter" be installed to enable the organist to turn off the hydraulic engines from the console. This would have been a water tap operated by a turn-key on a long arm to reach the tap from the console. That would save about 50% of the water bill. There is no record of a starter being installed.

1919 – The hydraulic engines were replaced by rotary blowers (one for each organ chamber), electrically powered, at a cost of £390. They were not covered by insurance until ten years later. There was no mention in Kirk Session records of the contractor for the work. It was often the responsibility of the supplier of the blowing apparatus, not the organ builder.

1928 – It was decided to pay a salary of £4 to a Mr Bellarthy Snr. for "looking after the engine of the organ". Presumably at that time the blowing equipment comprised a rotary fan belt-driven by an electric motor (possibly DC), both mounted on a common frame, connected by multiple-vee belts. Both motor and fan bearings would need periodic oiling and the belts checked for tightness.

1930 – Discussions were recorded about the possibility of moving the organ console to the side, so the organist would be more in touch with what was going on. The organist stated that "the shifting of the present console would not prove to be satisfactory on account of the type of its machinery, and that a new console costing about £1,800-£1,900 would really be required for the best results to be obtained". This was chiefly because the console had a wind supply connected to it and pneumatic tubing connecting the action from the console to the organ. Another solution was considered – that of electrifying the entire organ, including a new console, which could be placed anywhere. Estimates for the work were received from Rushworth & Dreaper as well as Willis.

1931 – An estimate was requested from a local organ builder, but in May 1932 a firm order was sent to Willis for the electrification work to commence.

1932 – Henry Willis & Sons carried out a comprehensive rebuild, the major part of the work being the incorporation of electric action and a brand new console. The church was closed during August and September for decoration work including the floor. The organ work was done at the same time.

A few minor alterations were made to pipe work, and the Choir division was enclosed in a shuttered box and revoiced to suit the new acoustic environment of the box. Provision was made for three new stops on the Choir, with corresponding stop-knobs on the console, but no space was allowed-for in the new choir-box, which was rather absurd. Similarly, Henry Willis himself stated in his Rotunda article that a 16-foot Waldhorn was added to the Swell on 7 inch wind. So far no evidence of its existence has been found during the 2014-15 restoration – the swell-box was never increased in size to accommodate it - *a blanked wind supply hole in the high-pressure reservoir would show if the stop was ever installed.*

One of the alterations made to the pipe work involved the Double Open Diapason on the Great. This rank is mounted at the front of the chest, and the lowest seven notes have been blocked-off. Those seven pipes would have originally been mounted on boards situated off the chest where there was more room for them (called “off-notes”). For some unknown reason they were taken out altogether and replaced by the lowest seven pipes of the new Pedal Violone, actuated by electrical relays.

The compass of the manuals was increased to 61 (from 56) with the extra pipes for each stop being accommodated on “top-note” chests mounted inside the boxes for the Swell and Choir and alongside the choir-box for the Great. The extra pipes for the pedal ranks were mounted on new chests, along with two (notes 31 and 32 for the 16-foot stop, taken off the original chests so they can be operated electrically – the slider chests have room for only 30 actions.

Finding evidence for work done or not done 80 years ago in a different building is far from easy. It is fortunate that the organ was rebuilt in St Mary & St Giles without alteration apart from fitting it into the small spaces available. The prepared-for Viol (4-foot extension of the Violone rank) appeared as extra space for the pipes on the chest, although there was no action or wiring until the pipes were installed in 2015. Wiring was provided for the three prepared-for Choir ranks, left coiled on the floor beneath the Great soundboard, connected at one end to the electro-pneumatic coupler action box (scrapped in 1999). However if there was ever wiring supplied for the Waldhorn, it didn't exist prior to 2015 when the stop was installed by FH Browne & Sons.

1935 – A cleaning of the organ blowing apparatus was recommended, and Pratt Bros Ltd was engaged on an annual basis. Could it be that the apparatus existing at that

time was supplied and fitted by Pratt Bros? It would be interesting to determine whether the electrical supply was DC or AC at that time. A generator was mentioned in the Kirk Session records. That would have been for generating the low voltage supply for the organ's action (about 12vDC). When the organ was installed in SMSG the blowing was done by a 3HP "Discus" blower by Watkins and Watson, and the action power was supplied by an independent mains-operated transformer-rectifier.

1949 – The organ was cleaned (£235). Suggested improvements (not specified in the records) were rejected on grounds of cost.

1957 – The Kirk Session records of July 1957 include the first mention of "the blower" in the singular, indicating that only one blower was installed in 1919 in "the blower chamber", presumably situated somewhere between the two organ chambers. The concern at that time was the worsening condition of the equipment, and a new one quoted at £347.10.0, was turned down. Only 2 years later the church was discovered to have a bad case of dry rot and in 1962 was closed. The organ was removed in January 1965 by Starmer Shaw.

Updated March 2016 by Anna Page

References

Kirk Session Records of St George's Church, Charlotte Square 1882-1965, held at National Records Office, Edinburgh

Willis Ledgers and Article from The Rotunda magazine 1933 from the British Organ Archive (belonging to the British Institute of Organ Studies), Cadbury Research Library: Special Collections, University of Birmingham

The Making of the Victorian Organ, Nicholas Thistlethwaite, 1990, Cambridge University Press

Figure 2 Photograph by Clem Rutter, Rochester, Kent. (www.clemrutter.net). [CC BY-SA 3.0 (http://creativecommons.org/licenses/by-sa/3.0)], via Wikimedia Commons
https://upload.wikimedia.org/wikipedia/commons/6/6f/Joy_water_engine_for_an_organ_-_Anson_610