Color and Supplemental Figures for

John Koster

“Among Mozart’s spättischen Clavier; a Pandaleon-Clavecin by Frantz Jacob Spath, Regensburg, 1767?”

2. Spath & Schmahl Tangentenflügel action.  
(The author’s modification of a drawing in Rosamund Harding, The Piano-Forte, 1933.)

3. Typical dampers in a Spath & Schmahl Tangentenflügel (NMM 4145), wedge-shaped in the bass (a), blocks of soft leather in the treble (b). Although the leathers have been replaced, they accurately reflect the originals. (Photo by the author.)

4. Diagram of Christoph Gottlieb Schröter’s tangent action, as published in Friedrich Wilhelm Marpurg, Kritische Briefe über die Tonkunst, vol. 3 (Berlin, 1764). 
The tangent with its damper is labeled H.
5. *Grand piano labeled* Frantz Jacob Spath / Regenspurg 1767. *National Music Museum, Vermillion, South Dakota, cat. no. 13010; Board of Trustees, 2006.* (Photo by the author.)
6. Plan view of NMM 13010. (Photo by the author.)
7. Label on the front edge of the wrest plank of NMM 13010. (Photo by the author.)

8. Interior view of NMM 13010 showing the upper and lower liners at the bent side, two posts between them, and the upper end of a diagonal strut. (Photo by the author.)
9. Interior view of NMM 13010 showing the full-depth liner at the tail; the upper and lower liners along the spine and the bent side; a post at the spine; and, at the extreme right, kerfs for bending the bent side. (Photo by the author.)

10. Interior view of NMM 13010 showing the hole burnt through the belly rail and the lower end of a diagonal strut. (Photo by the author.)
11. Interior view of NMM 13010 showing the corner of the belly rail and spine, at which is the back end of the full-depth liner into the front end of which the wrest plank is tenoned. Also visible are the ends of two ribs, the lower end of a diagonal strut, and the liners along the tail. (Photo by the author.)

12. NMM 13010: tenoning at the bass end of the wrest plank. There is similar tenoning at the treble end. The construction of the wrest plank from four separate pieces (oak at the upper front; the three others of fir) veneered with a layer of pearwood is also indicated. (Drawing by the author.)
13. View of the tail end of NMM 13010 showing kerfs on the interior of the bent side; also the bass end of the bridge with its double pinning. (Photo by the author.)

14. Interior view of NMM 13010 towards the corner where the bent side and belly rail meet the cheek piece. The horizontal strut between the upper bent-side liner and the belly rail can be seen; also the upper end of a diagonal strut; the ending of cutoff bar over the upper edge of the belly rail; and the end of a rib let into the cutoff bar. (Photo by the author.)
15. NMM 13010: close-up view of the bridge showing its molded front edge. (Photo by the author.)

16. Interior view of NMM 13010 showing the shortest rib and the end of the cutoff bar let into the spine liner. (Photo by the author.)
17. Altered plan view of NMM 13010 showing the positions of the cutoff bar and ribs, the original position of the bridge in the treble, and the keyboard returned to its original compass. (Photo, alterations, and additions by the author.)
18. NMM 13010: the key frame. The section for the last three keys at the treble end was originally at the bass end. The stop rail over the back guide rail has temporarily been removed. (Photo by the author.)

19. NMM 13010: the keyboard with the present compass of C to g³. (Photo by the author.)
20. The keys of NMM 13010 in their original order. (Photo by the author.)

21. NMM 13010 with lid closed. (Photo by the author.)
22. NMM 13010: detail of the paper on the front of the nameboard. The numbered divisions of the measure are in centimeters. (Photo by the author.)

23. The underside of NMM 13010 showing the lighter bands along the perimeter where the wood was protected by the frame of the original stand. (Photo by the author.)
24. NMM 13010: close-up view of the nut showing the fillet at its rear edge.  
(Photo by the author.)

25. NMM 13010: bass end of the nut with line added to show the direction of the wood grain.  
(Photo by the author.)
26. For measuring the original string lengths of NMM 13010, a strip marked with the original positions of the pins in the treble section of the bridge was held in the original position of the bridge. (Photo by the author.)
27. **NMM 13010**: several of the non-original hammers, one being pushed up by the jack in the key below. The others rest on a cloth tape, also not original. (Photo by the author.)

28. **NMM 13010**: a key with its attached jack. (Photo by the author.)
29. NMM 13010: remains of the original hammer hinges on the front surface of the batten at the front edge of the soundboard. (Photo by the author.)
30. NMM 13010 with the batten crudely added over the bass end of the wrest plank and extending a short distance along the spine. A similar batten was added in the treble. (Photo by the author.)

31. With the batten in Figure 30 removed, one can see the bare wood left by the removal of a block surrounded by the original paint on the interior of the spine at the bass end of the gap between the wrest plank and soundboard. This block held the bass end of a rail over the strings, presumably to cover the dampers. (The was another block at the treble end.) The pattern left by the decoratively curved end of the block is preserved at the right. (Photo by the author.)
32. Detail of a grand piano by Pascal Taskin, Paris, 1787 (Musikinstrumenten-Museum, Berlin), showing hammers with shanks holding the stems of the dampers. (Photo by the author.)

33. A reconstruction of the original action in NMM 13010. (Drawing by the author.)
34. A schematic reconstruction of the moderator added to NMM 13010, now missing.  
(Photo by the author.)

35. a) Tangentenflügel by Spath & Schmahl about 1785 (Sheridan Germann collection, Boston; “Boston-SG”): the treble end of the wrest plank with tenoning into the block inside the cheekpiece; and (b) similar tenoning at the treble end of the wrest plank removed from a grand piano by J.A. Stein (Museum of Fine Arts, Boston). (Photos by the author.)
36. NMM 13010 (above) and the Spath & Schmahl Tangentenflügel NMM 4145 (below), both with the molding along the lower edge of the spine displaced to show the diagonal joint of the breadboarding at the front end of the bottom board. (Photos by the author.)
37. Tenoning of the keycheeks through the bottom board in NMM 13010 (above; the upper side to the left, the underside to the right) and (below) in the Spath & Schmahl Tangentenflügel Boston-SG (the underside). (Photos by the author.)
38. Typical leather hinging of action elements: (a) the hammers of a square piano by Johannes Zumpe & Gabriel Buntebart, London, 1776 (National Music Museum, Vermillion, South Dakota, cat. no. 13010; Rawlins fund, 1985) – the batten screwed over the hinges has been removed so they can be seen; and (b) the Auslöser in a grand piano by Ferdinand Hofmann, Vienna, about 1795 (National Music Museum, cat. no. 5657; Rawlins fund, 1993).

(Photos by the author.)

39. Typical doubled parchment hinges of the intermediate levers in a Spath & Schmahl Tangentenflügel (Boston-SG). (Photo by the author.)
Graphs (with logarithmic Y-axes) of the scalings of a clavichord by C.F. Schmahl, 1794 (in the Museum Carolino Augusteum, Salzburg; data from Huber, “Dokumentation über die Restaurierung”), indicated by square markers, and a typical Spath & Schmahl Tangentenflügel (NMM 4145) indicated by triangular markers along the upper black line, together with NMM 13010, indicated by the lower black line without markers. Up to about tenor f, the scalings of the clavichord and NMM 13010 coincide. In the first graph (a), the Tangentenflügel is longer than the others throughout the compass (the kink in its line between c₁ and c♯ reflects the break in the scale caused by the extra set of non-sounding strings over the gap spacer), but if, as in the second graph (b), its scaling is shifted one semitone towards the bass, as if the instrument were transposed a semitone higher, the treble coincides with NMM 13010.
From Joseph Büttner and Ernst Nachersberg’s Stimmbuch (Wrocław and Leipzig, 1801):
“Stringing of a Fortepiano which is six feet long on the outside. (From A[A] to d₃.)”

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