

Thomas Machell and Sons, dulcitone, c.1910

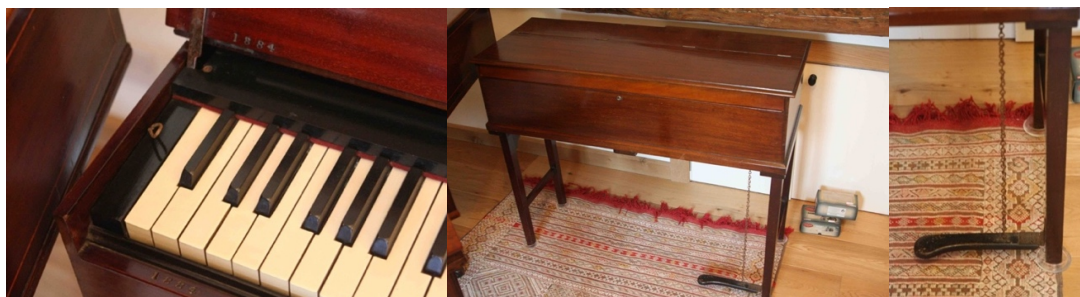
Made by Thomas Machell and Sons, Glasgow and stamped number 1884, c.1910. 'Style F', with five-octave keyboard (A-a⁴, sounding an octave higher) in a polished mahogany case, with a sustain pedal attached to mechanism by a chain, the instrument sitting on an integral foldable stand with leather strap and sprung wooden strut. The script for 'dulcitone' is cut out from the back panel, and the legs are straight rather than curved or turned, marking the later period of production. Some 2000 dulcitones were produced between the 1880s and 1920s; it is unknown how many survive, although texts seem to suggest fewer than appear at auction (one site about Rhodes keyboards (<http://www.alphaentek.com/rhodes.htm>) suggests just six are known; Susannah Mo in the same year suggested around 20 and possibly many more; auctions and private sales would suggest there are more). Machell was born in Edinburgh in 1842, became a piano tuner while still a teenager, and by the 1881 census was working as a pianoforte and music seller at 12 Arlington Street, Barony (Edinburgh). Note that in the 1871 census, he is merely listed as a tuner. By the 1891 census he was trading from Napiershall Street, Kelvin (Glasgow), and thereafter lived in Glasgow, where he died in 1915. Manufacture appears to have continued for some years after his death, taken over by his sons Edward and Leonard – who the 1911 census reports were trading with him as musical instrument dealers.

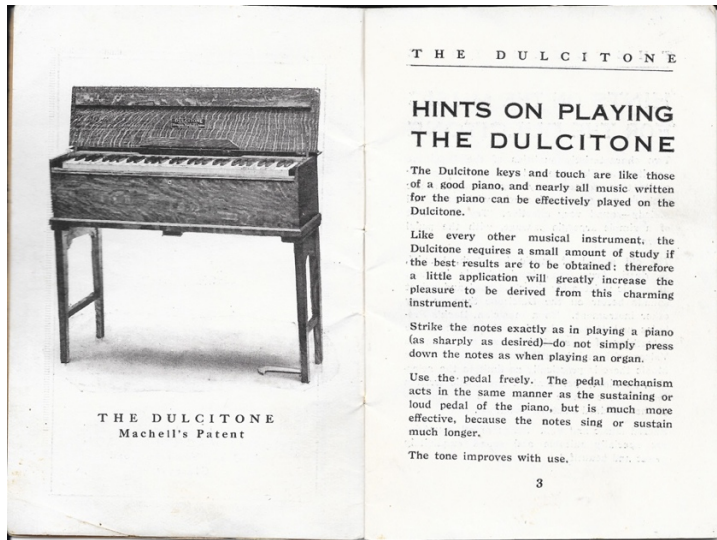
A booklet was supplied with new instruments that detailed maintenance and included notes on tuning. It shows the internal mechanism (as below). The dulcitone uses U-shaped metal bars (like tuning forks) of different total lengths (to give pitch). The bars are tuned to a normal organ diapason (around A=430Hz). They are held in place with a piece of leather at the bar's bend attached to a strip of wood. Thin U-shaped metal springs bolt to their base, which in turn is screwed to the case to amplify the sound. The bolt is generally considered the weak point, as it is difficult to repair. The hammers strike from above. The dulcitone uses a simple striking mechanism: when a key is pressed it lowers a jack onto the hammer shaft causing the felt hammer to fall and strike a bar. At the same time, pressing a key presses down on a felt damper button, raising a damper from the bar; releasing a key raises the hammer and the damper button, causing the damper to drop to the metal bar. Much the same system survives in the Fender Rhodes electric piano (the connection being made in the website cited above). The sustain pedal acts on a long strip of wood running along all the dampers. The keyboard lifts off by means of a string hook to the left, although there are screws to secure it in place.

The dulcitone was designed by Machell, but he may have been at least partially inspired by an instrument known as the 'typophone' invented by the Mustel family of harmonium makers in Paris. The 'typophone' is usually attributed to Auguste Mustel, but was quite possibly developed by his father, Charles Victor Mustel. It dates to 1865, and Mustel registered the instrument in Britain in 1866; later, he would discard forks in favour of bars in his 1886 invention, the celesta, which still survives in use. The 'typophone' is used in Vincent D'Indy's *Le Chant de la Cloche* (1884) and in Henri Duparc's *L'inviation du voyage* (orig. 1870, rev. 1892). Mustel's influence on Machell is made explicit by James Blades, who in the *New Grove* catalogues the dulcitone under 'celesta' and regards it as the same as the 'typophone'. However, the influence is disputed, and Machell is said to have begun experimenting in the early 1860s. Indeed, the invention of the dulcitone is routinely backdated to this time, although I note it is only in the 1881 census that he began to be listed as an instrument maker/seller. Other comparable instruments also exist. Keyed glockenspiels, for example, were known in the 18th century, the first known appearance being in Handel's oratorio *Saul* (1839) although the use of such an instrument for Papageno's magic bells in Mozart's *The Magic Flute* (1791) is more celebrated. Again, tuning forks date back to the mid-18th century, and the Irishman Charles Claggert suggested an instrument using tuning forks, the 'aiuton' ever-tuned organ, in 1788, although this used a rotating wheel to bow a row of forks. In 1956, Hermann von Helmholtz used eight tuning forks with an oscillating electromagnetic circuit to recreate sustained vowel sounds; the number later increased to 12 forks. Two other forgotten similar instruments are mentioned by Curt Sachs, in his *Das Lexikon der Musikinstrumente* (as expanded by Farmer and Davies in *New Grove*), the Leipzig-based W. Fischer &

E.W. Fritsch's 'adiaphon' developed in 1882, and Hanau-based G.A.I. Appunn's five-octave 'euphonium' of 1885.

Although the dulcitone produces soft tones that get lost in ensembles, Percy Grainger included parts for it in five works, including *The Warriors* (completed in 1916) and – but after production had certainly ceased – in *The Power of Rome and the Christian Heart* (1943). More recently, it was used by Yes/Rick Wakeman, by Arthur Jeffes in the Penguin Café Orchestra, and in Vagabond's 2012 album *Town and Country*. Curiously, samples are available for purchase online, supposedly from a dulcitone stamped '1884' – as if my instrument – at <http://dulcitone1884.virb.com/dulcitone-1884>, although the instrument shown on the site is oak-framed and in poor condition. This instrument came to the Keith Howard collection in 2013.





THE DULCITONE
Machell's Patent

THE DULCITONE

HINTS ON PLAYING THE DULCITONE

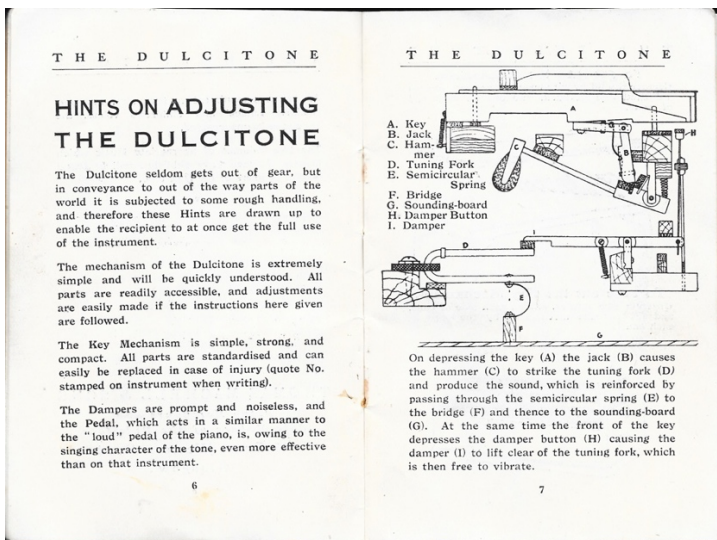
The Dulcitone keys and touch are like those of a good piano, and nearly all music written for the piano can be effectively played on the Dulcitone.

Like every other musical instrument, the Dulcitone requires a small amount of study if the best results are to be obtained: therefore a little application will greatly increase the pleasure to be derived from this charming instrument.

Strike the notes exactly as in playing a piano (as sharply as desired)—do not simply press down the notes as when playing an organ.

Use the pedal freely. The pedal mechanism acts in the same manner as the sustaining or loud pedal of the piano, but is much more effective, because the notes sing or sustain much longer.

The tone improves with use.



- A. Key
- B. Jack
- C. Hammer
- D. Tuning Fork
- E. Semicircular Spring
- F. Bridge
- G. Sounding-board
- H. Damper Button
- I. Damper

THE DULCITONE

HINTS ON ADJUSTING THE DULCITONE

The Dulcitone seldom gets out of gear, but in conveyance to out of the way parts of the world it is subjected to some rough handling, and therefore these Hints are drawn up to enable the recipient to at once get the full use of the instrument.

The mechanism of the Dulcitone is extremely simple and will be quickly understood. All parts are readily accessible, and adjustments are easily made if the instructions here given are followed.

The Key Mechanism is simple, strong, and compact. All parts are standardised and can easily be replaced in case of injury (quote No. stamped on instrument when writing).

The Dampers are prompt and noiseless, and the Pedal, which acts in a similar manner to the "loud" pedal of the piano, is, owing to the singing character of the tone, even more effective than on that instrument.

THE DULCITONE

On depressing the key (A) the jack (B) causes the hammer (C) to strike the tuning fork (D) and produce the sound, which is reinforced by passing through the semicircular spring (E) to the bridge (F) and thence to the sounding-board (G). At the same time the front of the key depresses the damper button (H) causing the damper (I) to lift clear of the tuning fork, which is then free to vibrate.