The Monotype System

Until near the end of the nineteenth century, most printing was by letterpress, & that meant that every letter of every word was assembled ('set') by hand—then after printing, was distributed ('dissed') back into the typecases for re-use. In the technological leap forward that happened in the last half of that century, typesetting was the subject of many attempts at mechanisation, using the same principles of interchangeable parts & standardisation that were being applied to other industrial processes. Two machines made the breakthrough almost simultaneously: in 1886 the Linotype, and in 1889 the Monotype, invented by Talbot Lanston. It used a small steel frame about 15cm square to hold 225 brass matrices of a set of alphabets (usually including a matching italic & bold), which was manoeuvred over a rectangular mould into which type metal was pumped, casting one letter at a time.   The mould adjusted by fine steps in width to allow for the designs of the letters; just one of many subtleties that made the resulting letters rival the quality of the type cast in traditional type foundries.

The Monotype was controlled by compressed air passing through holes in a paper roll, similar to the Jacquard loom control (or the pianola). This was produced by a separate keyboard unit, & the separation improved efficiency: several keyboards could feed one caster, since the keyboarding could be very complicated. At the end of each line of characters, the compositor working the keyboard could work out (using a scale) the size needed for each of the spaces in the line to be made to make the line fit exactly to the length required. Each space had already been typed, but now he punched a special code to set their widths. When the paper roll was fed to the caster, it went in in reverse, so the casting machine read the space width numbers first, & thus could set the size to make the spaces.

Many aspects of its design made it very adaptable: it was capable of casting type from 4.5pt (about 1.5mm) to 72pt (25mm), by a simple change of the central mould; the individual character matrices could be changed, allowing for special characters if required; the whole array of matrices could be changed fairly easily, allowing for a change of typeface; the controls allowed for typefaces of great variety of widths & sizes; & the keyboarding allowed sophisticated layouts such as multi-level mathematical formulae, as well as the speed needed for plain columns of text.

Parts of it were manufactured to an accuracy of 1/400th of a millimetre, an amazing feat for the time of its original production, & regarded as precision engineering even 100 years later.

The Monotype's engineering quality & abilities established it as a mainstay of the printing industry by the first World War, but just as important was the phase between the wars, when the company (The Monotype Corporation), produced a series of typefaces (some revisions of classic designs from previous centuries) that rivalled the quality of those from the old-established founders supplying type for hand setting. Many of these faces are so pervasive, that even non-printers know of "Times New Roman" and "Gill Sans", & many Monotype faces are available for use on computers. This text is set in Plantin, a Monotype re-cutting of an old Dutch typeface.

The company developed photo-setting versions of their machines in the 1960s, but these were overtaken by the computer typesetting revolution. Monotype machines are still used all over the world, for old technologies can be useful in places where the support for high-technology systems is less available. They (& indeed letterpress in general) operate by recycling their material to a very high degree—the used type is re-melted, & re-used with only slight loss.

Although the Monotype caster changed very little over the century of its main use, it did evolve in minor ways. There were never many versions available (the main machine being so adaptable), but two major companion machines were made: the Monotype Lead & Rule Caster, which cast long strips of material for spacing (leads), or for printing lines (rules); & the Display Caster which cast "display" (large) sizes of type, but a supply of only one character at a time for setting by hand. A printer with all three machines could produce an infinite supply of all the type they might normally need for printing everything from tickets & leaflets up to books & newspapers, from plain text to complex advertisements.

The Monotype was one of the great achievements of Victorian engineering skill & ingenuity, & produced a world-changing leap in productivity & communications.