The Space-Sizing Mechanism

"As the paper is perforated at the Keyboard, it is wound on a Spool from which the paper unwinds when it is placed in the Casting Machine; thus, the last perforations made at the Keyboard are the first perforations presented to the Casting Machine. But the last perforations in a line are produced by the Justifying Keys, therefore, before the Casting Machine makes the first type in a line, it sets its space-sizing mechanism, so that the spaces it makes for this line will be of the size required to justify the line exactly.',

Before considering the details of the space-sizing mechanism, turn to the description of the type-sizing mechanism, for the Normal Wedge regulates the size of both type-bodies and justifying spaces. This Wedge moves from right to left with the Matrix Case and, when a justifying space is required, the Casting Machine positions these two parts as follows: Normal Wedge in second position from the right (Locking Pin in second notch from left end), Matrix-Case with blank Matrix 0-2 in casting position; in short, Wedge & Case are set to produce a six-unit space, for the Space Bars of the Keyboard operate the six-unit Punch exactly as it is operated by the six-unit space Key. The Normal Wedge is used in casting justifying spaces just as it is used in casting a six-unit space or character.

But, in addition to the six-unit row Punch, the Space Bars operate the Justifying Space Punch, and it is the Bar carrying this Punch that causes the counting mechanism of the Keyboard to register the first twenty justifying spaces in a line as **four** units instead of **six.** When the Space Bar is struck for the twenty-first time in the same line, this special Punch does not operate, and the Board registers, and the Caster casts, a six-unit space.

Consider now the action of the Casting Machine when this special perforation (produced by the Space Bar and registered as four units) is presented to it; that is, before considering how the Casting Machine adjusts its space-sizing mechanism, at the beginning of a line, let us see how it produces a justifying space after the sizing mechanism has been adjusted. For full details and illustrations of the space sizing mechanism see our book on the Casting Machine.

The Type Transfer Wedge lies just behind the Normal Wedge at the Casting Machine, and, after the Normal Wedge is positioned, to determine the width of the next type to be cast, the Type Transfer Wedge moves to the left until it comes in contact with an adjustable stop called the Micrometer Wedge, the object of which is to determine accurately the stopping point of the Transfer Wedge. When both the Normal Wedge and the Transfer Wedge are in casting position, the Mold Blade is pulled back; its motion is stopped by the Normal Wedge, which in turn is stopped by the Type Transfer Wedge, and this in its turn is supported by a fixed Abutment that never moves. Summary: In casting a six-unit (or any other size) character, or fixed space, the Normal Wedge is backed up by the Type Transfer Wedge which is supported by the fixed Abutment.

The Space Transfer Wedge rests upon the Type Transfer Wedge and operates in exactly the same manner to support the Normal Wedge, except that the Space Transfer Wedge is backed up not by a fixed but by an "adjustable abutment;" that is, two Justifying Wedges that rest upon the Abutment for the Type Transfer Wedge and are, in their turn, supported by their own fixed Abutment. These two Justifying Wedges are set by the Casting Machine for each line, so that the justifying spaces cast in the line will be of the proper size to justify it. Summary: In casting a justifying space, the Normal Wedge (in its six-unit position) is backed by the Space Transfer Wedge, which is supported by the two Justifying Wedges, which in turn are backed up by their own fixed Abutment.

Whether the Normal Wedge is backed up by the Type or the Space Transfer Wedge is determined by the special perforation produced by the Space Bars. When casting characters and spaces of fixed size (everything but justifying spaces*), the Space Transfer Wedge remains at the right and may be considered not to exist, for it has no effect whatever on the Normal Wedge. Consequently if only the six-unit perforation is presented, the Type Transfer Wedge moves to the right (while the Normal Wedge is brought to its 6-unit position), and, this done, the Type Transfer Wedge then moves to the left to support the Normal Wedge. If, however, the six-unit and the justifying space perforations are presented together, the Type Transfer Wedge moves to the right as described, and stays there while this justifying space is cast. In its place the Space Transfer Wedge moves to the left into position to support the Normal Wedge, in its six-unit position; therefore, the width of the type cast is no longer six units, but is determined by the position of the Justifying Wedges which lie behind and support the Space Transfer Wedge.

The Justifying Wedges of the Casting Machine are similar to the Normal Wedge; like it, they have teeth to hold them after they are set in any one of their fifteen positions, but, unlike the Normal Wedge, they are not "stepped," but are of uniform taper. Their thin ends are to the right (like the Normal Wedge) so that the further to the left they are placed, the larger is the size of the justifying space. These two Wedges are controlled by the Justifying Keys as follows:

The Justifying Keys are the thirty red Keys at the top of the Board, arranged in two horizontal rows and numbered, from left to right, one to fifteen inclusive. As already described, the Justifying Scale automatically revolves at the end of the line and stops with the Scale Pointer indicating two numbers on the Scale, the upper one of these is the Justifying Key in the top row, the lower one the Key in the bottom row to be struck to justify the line. Each row of Justifying Keys has its own punch (these two Justification Punches are larger than the other twenty-nine Punches so that the larger perforations in the ribbon may show where the lines end), and these Keys, in addition to their own Punches, also operate the unit-row Punches; therefore, the same mechanism at the Casting Machine that moves the Matrix Case and the Normal Wedge also moves the Justifying Wedges. The Justifying Wedges do not move, however, unless Justifying Key perforations are presented to the Caster, causing it to lift the left end of the Wedge up into position to be engaged by the mechanism that moves the Normal Wedge. Thus the Keyboard operator may, by striking the Justifying Keys, set the Justifying Wedges for any justification desired; once set, they remain set until new perforations made by the Justifying Keys cause the Caster to re-position these Wedges.

What becomes of the two characters cast while the Justification Wedges are being set? A most appropriate question that shows that the reader has grasped the relation between the Matrix Case, Normal Wedge, and Justifying Wedges. However, no characters are cast while the Justifying Wedges are being positioned, because the same perforations that cause the Caster to lift these Wedges (to be engaged by the mechanism that moves the Matrix Case from left to right) also operate the Pump Lock, so that, while these Wedges are being set, the Casting Machine goes through its cycle of making a type, but none is produced because the Pump is locked out and delivers no metal to the mold. Note: In addition to controlling the Pump Lock, these perforations govern the Galley Mechanism and, while the Wedges are being set for the next line to be cast, the line just completed is removed from the type channel and placed on the galley.

***Everything but justifying spaces** is strictly correct, for, in casting characters, the Normal Wedge may be supported by the Space Transfer Wedge, provided these characters are struck with the Space-Punch Key, to increase their width by casting them with justification added. This method of using the Space Wedge is fully explained later, but for the sake of simplicity it is assumed in this chapter that this Wedge is used only for justifying spaces.