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JUSTIFICATION MECHANISM FOR TYPE COMPOSING MACHINES

Original Filed Sept. 20, 1922

3 Sheets-Sheet 1

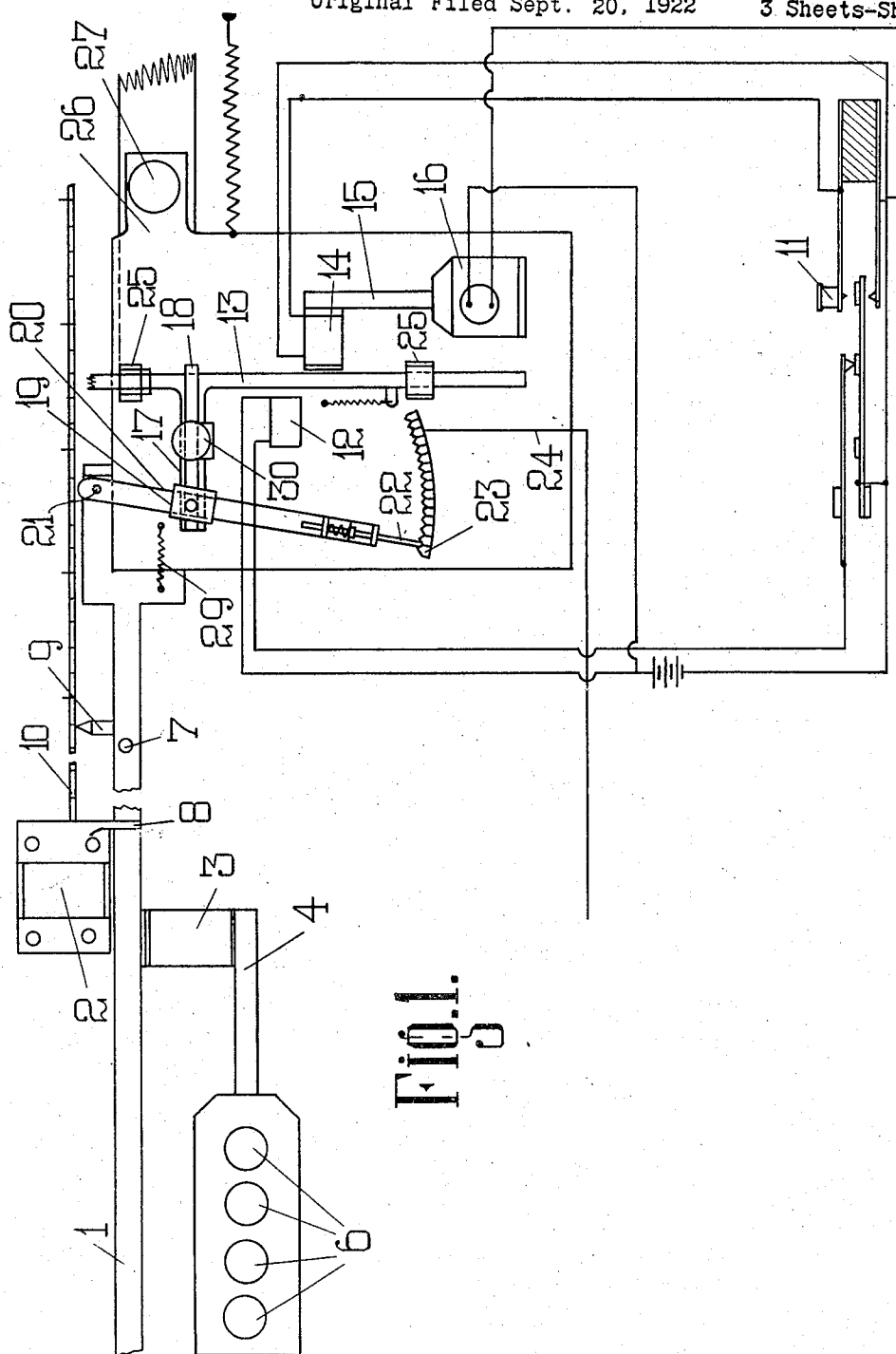


Fig. 1.

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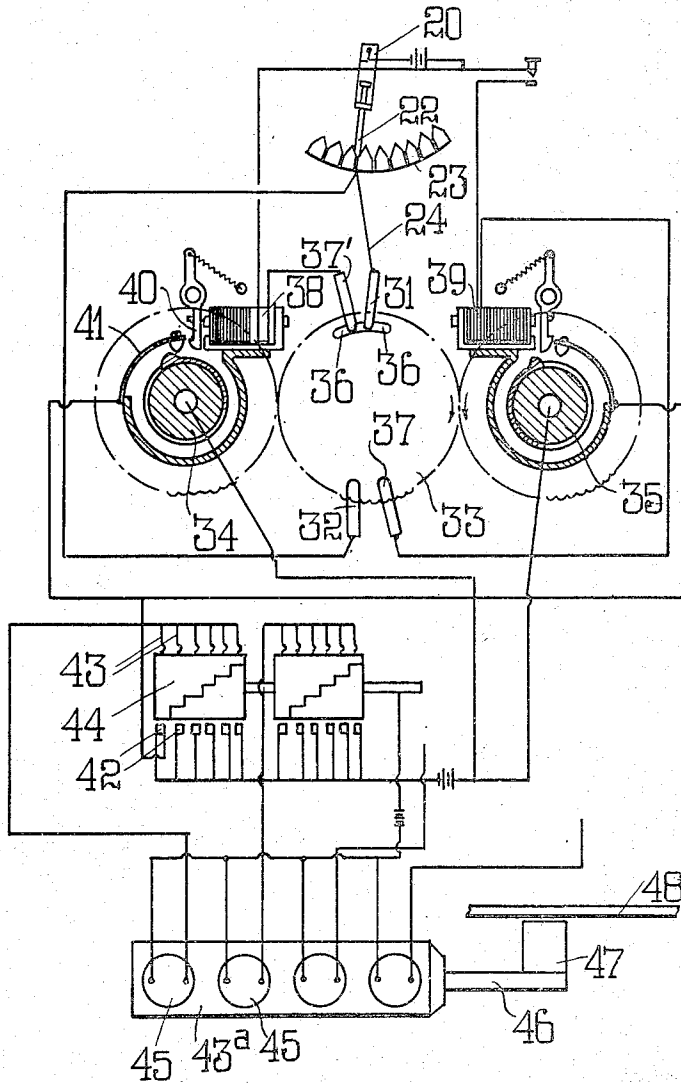


FIG. 4.

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JUSTIFICATION MECHANISM FOR TYPE-COMPOSING MACHINES.

Original application filed September 20, 1922, Serial No. 589,365, and in Great Britain September 21, 1921.
Divided and this application filed December 18, 1925. Serial No. 76,289.

The present invention relates to improvements in justification mechanism for machines for the composing of letter press and the like matter that is to say, in which characters are set up individually in sequence to form successive lines of letter press.

It will be obvious that where, as is usual, a line of letter press is of constant length and words of varying length and number are set up in successive lines, in order that such lines when set up in print will present a pleasing effect to the eye, it is desirable that the spacing between successive words of any individual line should be constant; the operation of estimating this word spacing value for each line is usually termed justification.

The justification for any line can obviously be determined by deducting the integrated character spacings from the total length of line and dividing this result by the number of words in the line, less one, the quotient then being the length of word space, which in the printing of the line must be present between each successive word.

Certain proportional divider mechanisms have been proposed for effecting this in which as the sequence of each character is determined, an element is displaced by an amount equal to or a function of the letter spacing and on completion of each word a second element is displaced, the position of which elements relative to one another determines the displacement of a third element by an amount which will be equal to or a function of the justified amount of word spacing.

According to this invention a pair of alternately-acting sets of relays is provided upon which is ultimately set up or registered the justified word space amount for a line of composed matter at a time, whereby as the said line of matter is being composed at some time subsequent to the determination of the sequence of letters in the line, the correctly justified word space can be composed in sequence after each word has been composed.

The invention will be more particularly described with reference to a photographic composing machine for letter press and the like matter, taken by way of example.

It is obvious that the improvements are equally applicable to the justification in other kinds of composing machines.

In the drawings:—

Figure 1 is a diagrammatic view of justification mechanism according to the present invention.

Figure 2 is a similar view showing the parts in a different position.

Figure 3 is also a similar view showing the parts in another position of adjustment.

Figure 4 is a diagrammatic view showing the arrangement controlled from the justification mechanism of Figures 1 to 3.

As the sequence of each individual character is determined and registered for instance on the perforated strip according to my copending application No. 76,286 a bar 1 of a justification mechanism will be accordingly displaced by the predetermined width of the selected character in that the circuit of a coil 2 normally locking the bar 1 rigid to the frame of the machine is broken slightly subsequent to the locking of this bar to the coils 3 mounted on the spindle 4 of a setting mechanism 5 which is preferably of the type according to my specification Serial No. 602,475. This setting mechanism 5 includes coils 6, one or more of which are energized according to the spacing width peculiar to the character selected, so that the operation of selection of a character will first cause the energizing of coil 3, then the de-energizing of coil 2, then the displacement of the spindle 4 from left to right by an amount equal to or a function of the width of character spacing desired, then the energizing of coil 2 to lock the bar 1 in the new adjusted position, then the subsequent de-energizing of coil 3 allowing the spindle 4 to return to its initial zero position under spring or other influence.

The position of the bar 1 corresponding to the end of the line is determined by a stop 7 upon it contacting with a fixed stop 8. If desired, an index 9 may be mounted on the bar 1 travelling along a visible scale 10, so that the operator may have some means of knowing as to how much of the predetermined length of line has been already occupied by the words already composed for that line.

At the completion of each word the pressing of a word spacing key 11 by the operator completes the circuit of an electro-magnet 12. This frees a sliding bar 13 which thereupon immediately becomes locked to an electro-magnet 14 by further depression of the key 11. This electromagnet 14 is mounted on the spindle 15 of a setting mechanism 16, which may be similar to the setting mechanism 5, but will only be arranged to displace the bar 13 by one unit displacement at a time. This bar 13 has an arm 17 upon it having a rod 18 sliding in it having universally mounted upon it a sleeve 19 through which slides a lever 20, pivoted at 21 to the bar 1. The lever 20 at its lower end has a spring contact 22 adapted to make contact with one of a number of contact pieces 23, each connected by wire 24 (one only is shown for the sake of clearness) to means for the setting up of justified value, as will be hereinafter described. It will be seen therefore, that the lever 20 will be supported upon two pivots, one the pivotal mounting for the sleeve 19 and one the pivot 21. One of these pivots 21 is displaced as an integrated function of the word spacings of the line, whilst the sleeve 19 is displaced in a direction at right angles to it, as a function of the number of words in the line.

The bar 13 is supported in guides 25 carried on a plate 26 which can be locked by an electro-magnet 27 to the frame 28 of the machine when desired. Normally, it will however, follow the movement of the bar 1 by reason of the spring 29.

A magnet 30 may be provided to lock rigidly the slide 18 in any desired position of adjustment against the effects of vibration or the like, during such times as it is not desired to displace the slide 18 into a new position of adjustment.

At the beginning of a line therefore, the parts will be in the position, shown for instance, in Figure 1, as the characters of a word are composed, so as the bar 1 shifts from right to left and the index 9 moves along the scale 10, and as each word is completed the sleeve 19 is moved down the lever 20, so that at the end of a line the position of the parts will be as shown in Figure 2, in which there will still be a space between the stop 7 on the bar 1 and the stop 8. It will be seen that during the letter spacing of the bar 1 the plate 26 has followed the movement of the bar 1 so that the fulcrum 21 of the lever 20 is not altered relatively to the plate 26 and mechanism upon it. By pressure of a justification key, the electro-magnet 27 is energized locking the plate 26 to the fixed casing 28. The bar 1 is then displaced to the left to the full possible distance until the stop 7 contacts with the stop 8, whereupon the circuit of the electro-magnet 2 is energized to lock the bar 1 in this

position, whilst the circuit of the electro-magnet 3 is broken to allow the spindle 4 of the setting mechanism 5 to return to its zero position.

This movement of the stop 7 from the position shown in Figure 2 to the position shown in Figure 3 will cause the lower end of the arm 20 to sweep over the range of contacts 23 to an extent which will obviously be a function, firstly, of the distance between the stop 7 and the stop 8 left at the end of a line, and secondly, of the number of words in the line, proportionate to the downward displacement of the fulcrum on the sleeve 19.

The contacts 23 which are connected by wires 24, one only of which is shown in the example indicated, to each of a pair of brushes 31, 32, Figure 4 on a commutator disc 33 rotated through half a revolution of each successive line and in geared connection with a pair of commutator drums 34, 35. Either one or other of the brushes 31, 32 is at a time in contact with a contact strip 36 on the disc 33, which bridges connection in the case of the brush 31 with the brush 37', and in the case of the brush 32 with the brush 37, which brush 37' is connected with a coil 38 of a bank of coils lying above a commutator drum 34, whilst the brush 37 is connected with a coil 39 of a bank of coils over the commutator drum 35. It will be seen that for the first line therefore, say for instance, the commutator drum 34 with a bank of coils 38 will be in operation, whilst a bank of coils 39 will be out of operation, but for the second line the bank of coils 38 with commutator drum 34 will be out of operation, whilst however, the commutator drum 35 with bank of coils 39 will be in operation and so on.

It will be seen that the closing of the circuit of a particular contact segment 23 will operate the closing of one or more of the coils 38 or 39, as the case may be. This will cause the attraction of one or more of the catches 40 releasing one or more spring brushes 41 upon a contact drum 34 taken by way of example, completing the circuit through one or more coils 42 in a duration control for a setting mechanism 43^a, which duration control of setting mechanism may be similar to that described with reference to Figures 5 and 8 in patent application Serial No. 602,475. According to the number of coils 42 energized so will a number of brushes 43 be dropped upon commutator drums 44, usually four in number, but two only of which are shown, to cause the energizing of electro-magnets 45 on the setting mechanism 43^a, which will operate the displacement of the spindle 46 of the mechanism during the time when the electro-magnet 47 on the spindle 46 is coupled to a bar 48 connected to the mechanism,

which operatively controls the punch mechanism for punching the justification perforations.

I declare that what I claim is:—

5 1. A justification mechanism for composing machines comprising a pair of sets of relays, means to set up a justified word space upon one set of relays at a time, and means to operate displacement of an element by
10 said justified amount at the end of each composed word and prior to the commencement of composition of the next word in the line.

2. A justification mechanism for composing machines comprising a pair of sets of relays, means to set up a justified word space
15 upon one set of relays at a time, and means to operate displacement of an element by said justified amount at the end of each composed word and prior to the commencement
20 of composition of the next word in the line, switch mechanism controlled at the end of each line setting one set of relays into operation and the other out of operation.

3. A justification mechanism for composing machines comprising a pair of sets of
25 relays, means to alternately set one of said

sets of relays to the justified word space value, being the difference between the total line length and the length of composed letters in the line divided by the number of
30 words less one, and means to operate the displacement of spacing mechanism from said relay a number of consecutive times whilst holding the second set of relays out of action.

4. A justification mechanism for composing machines comprising a lever, a pair of
35 displaceable pivots for said levers, means to rotate said lever about said pivots, electric contacts controlled by said lever in its motion and a pair of sets of relays one at a
40 time of which is controlled from said lever to be set corresponding to the justified word space value being the difference between the total line length and the length of com-
45 posed letters in a line divided by the number of words less one in the line.

In witness whereof, I have hereunto signed my name this 4th day of December, 1925.

EDGAR KENNETH HUNTER.