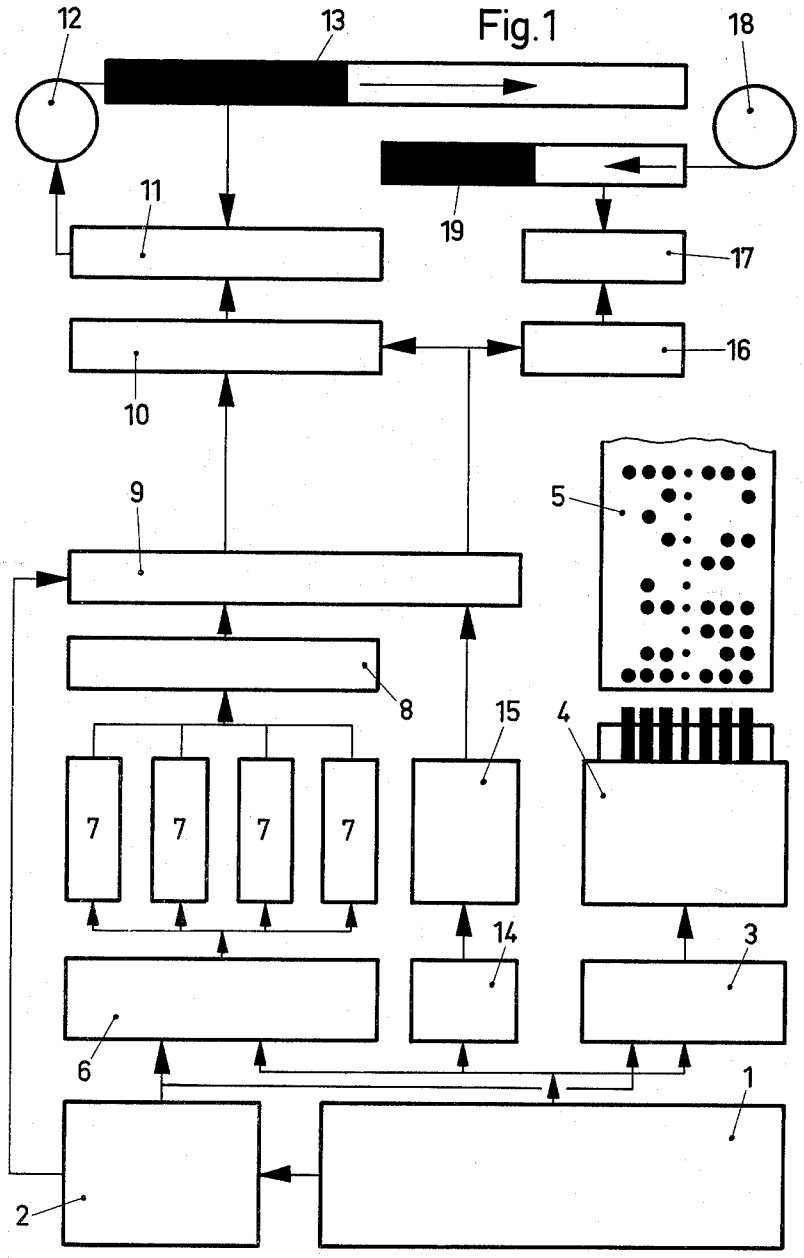
Oct. 5, 1965 F. KRAUSE ETAL 3,209,901

INDICATOR APPARATUS FOR LINE CASTING MACHINES

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Fig. 1

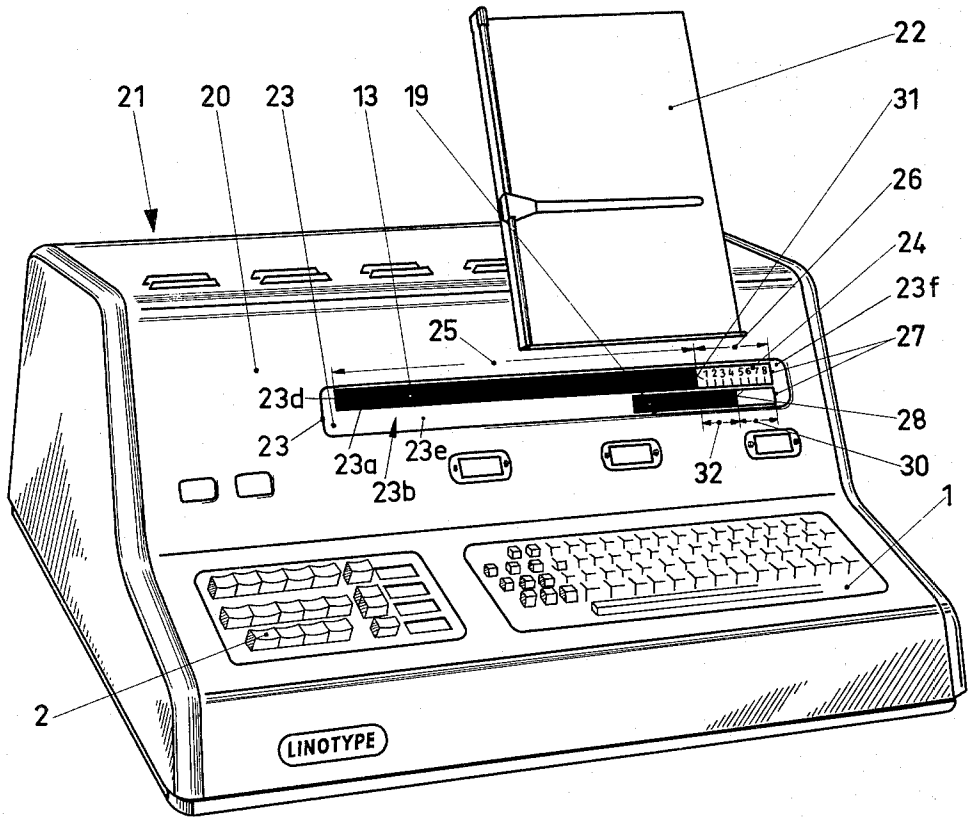


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INDICATOR APPARATUS FOR LINE CASTING MACHINES

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Fig.2



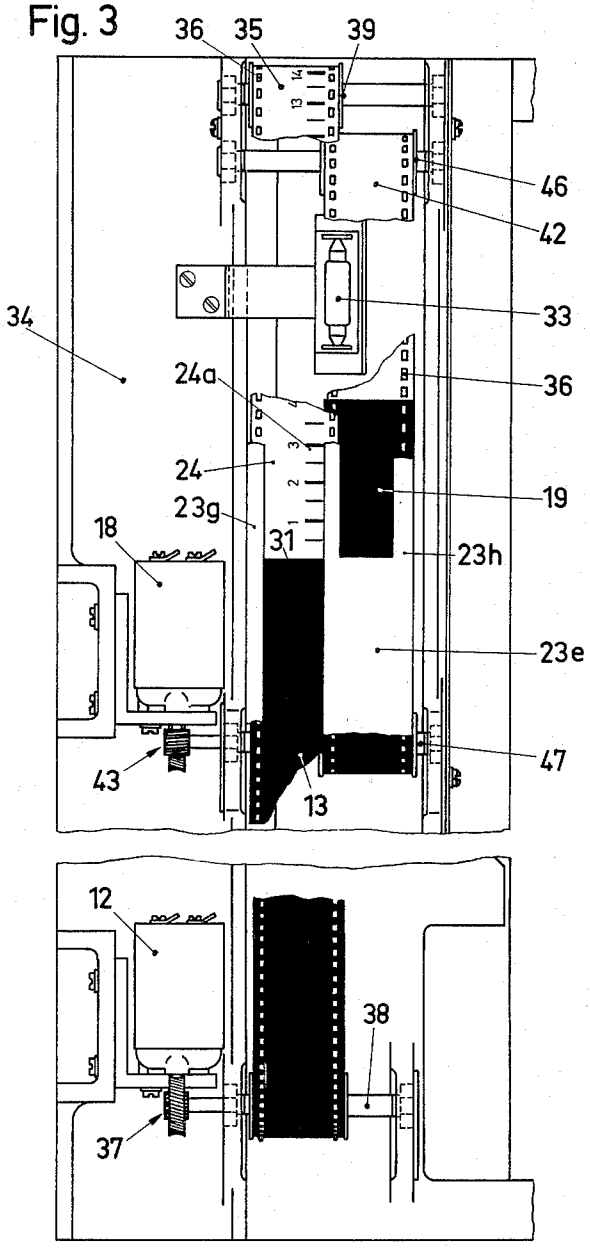
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INDICATOR APPARATUS FOR LINE CASTING MACHINES

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Fig. 3

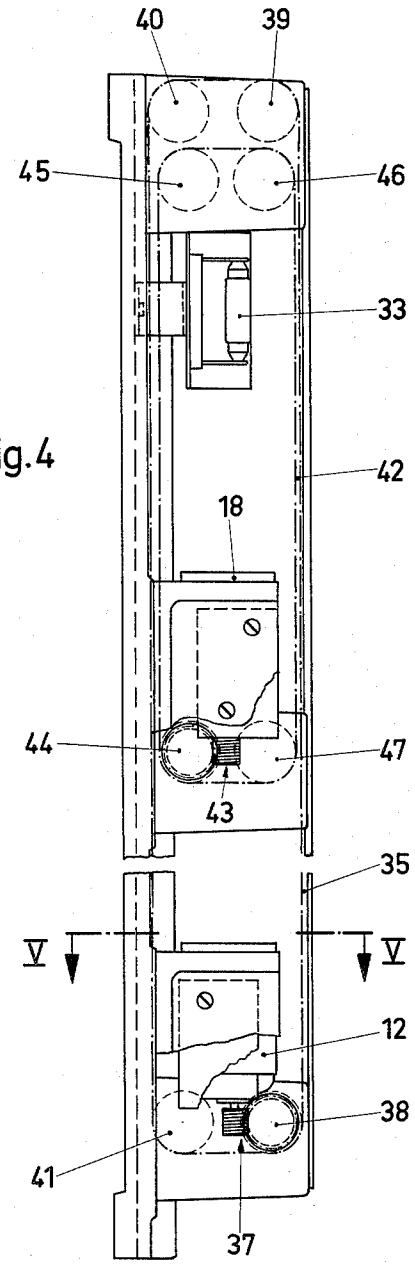


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INDICATOR APPARATUS FOR LINE CASTING MACHINES

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Fig.4



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Fig. 10

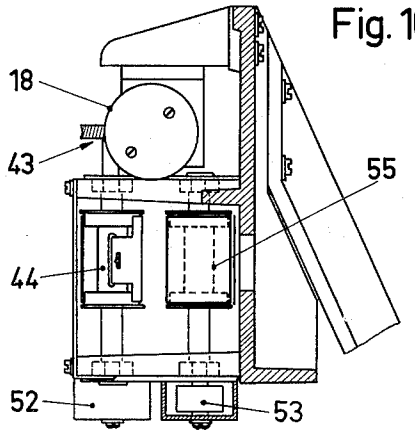
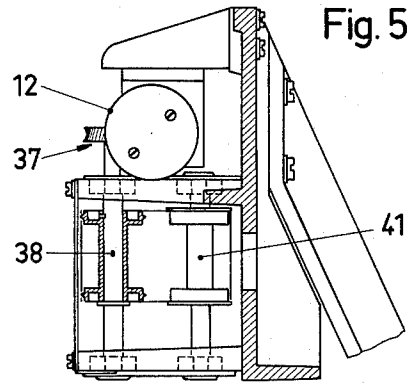


Fig. 5

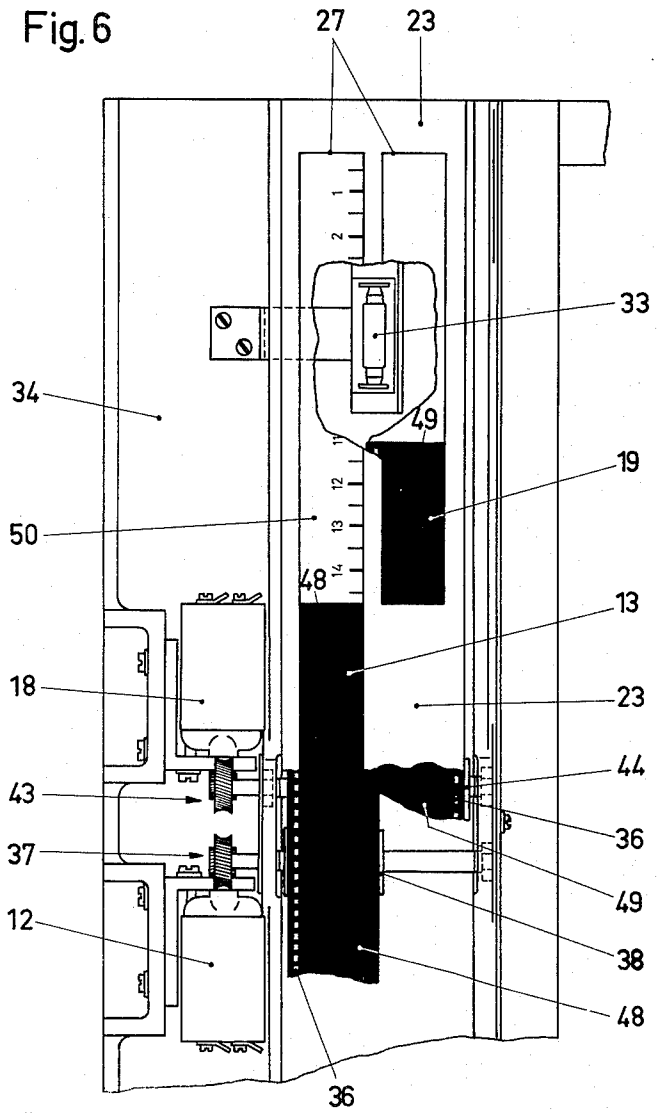


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Fig. 6

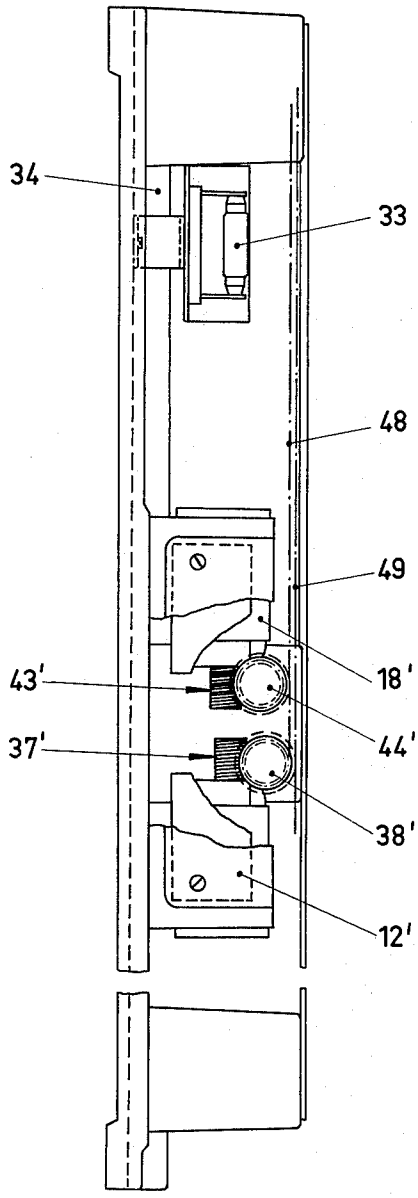


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INDICATOR APPARATUS FOR LINE CASTING MACHINES

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Fig. 7



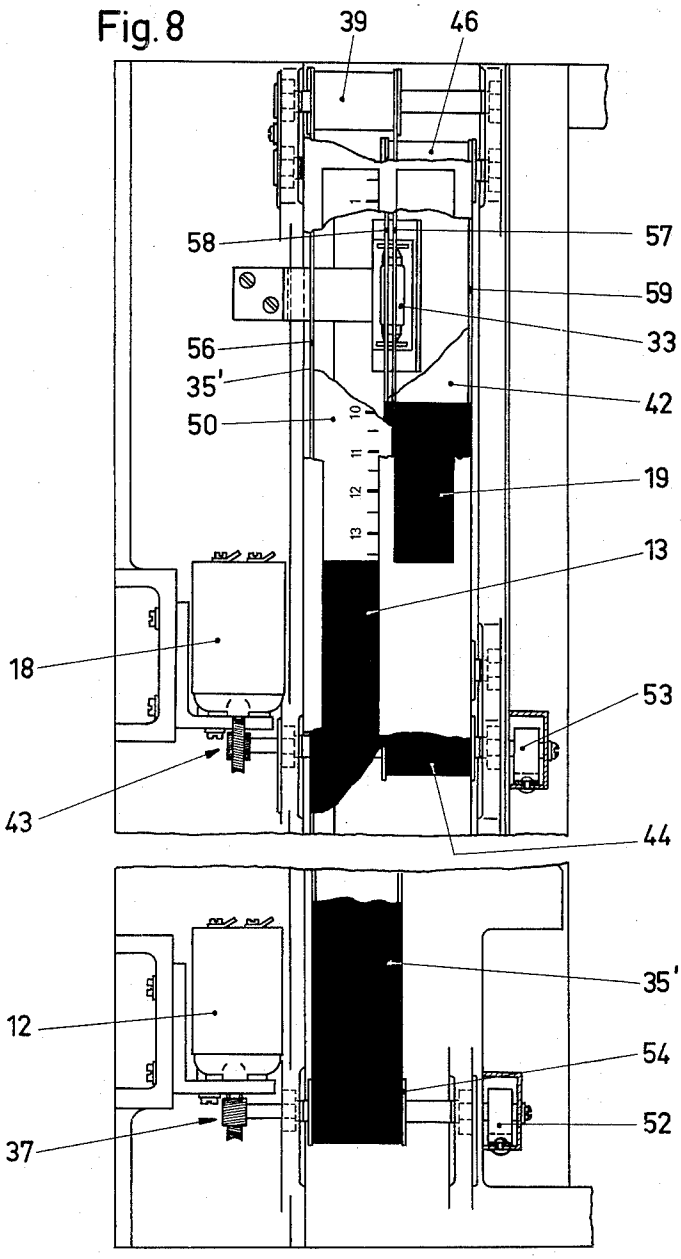
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Fig. 8



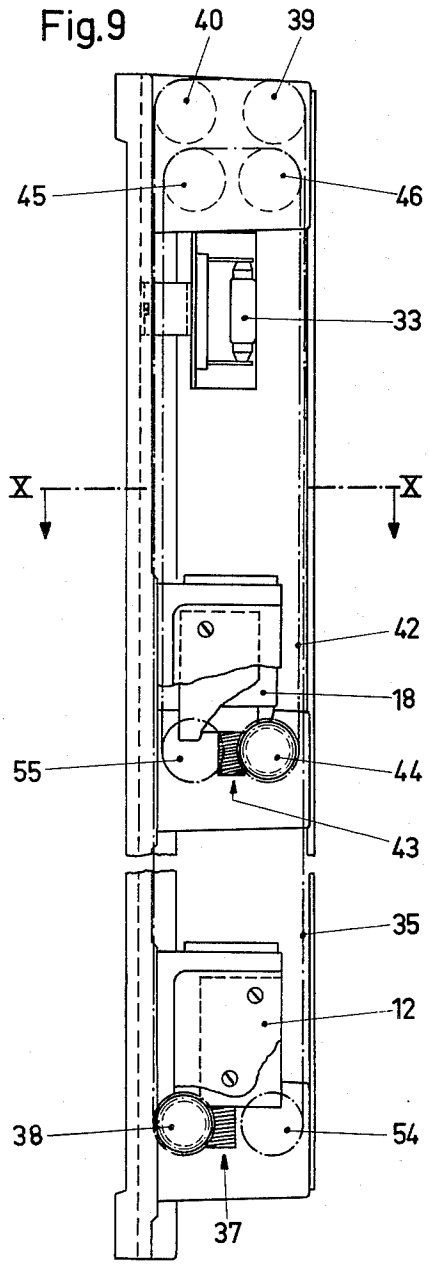
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Fig.9



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INDICATOR APPARATUS FOR LINE CASTING MACHINES

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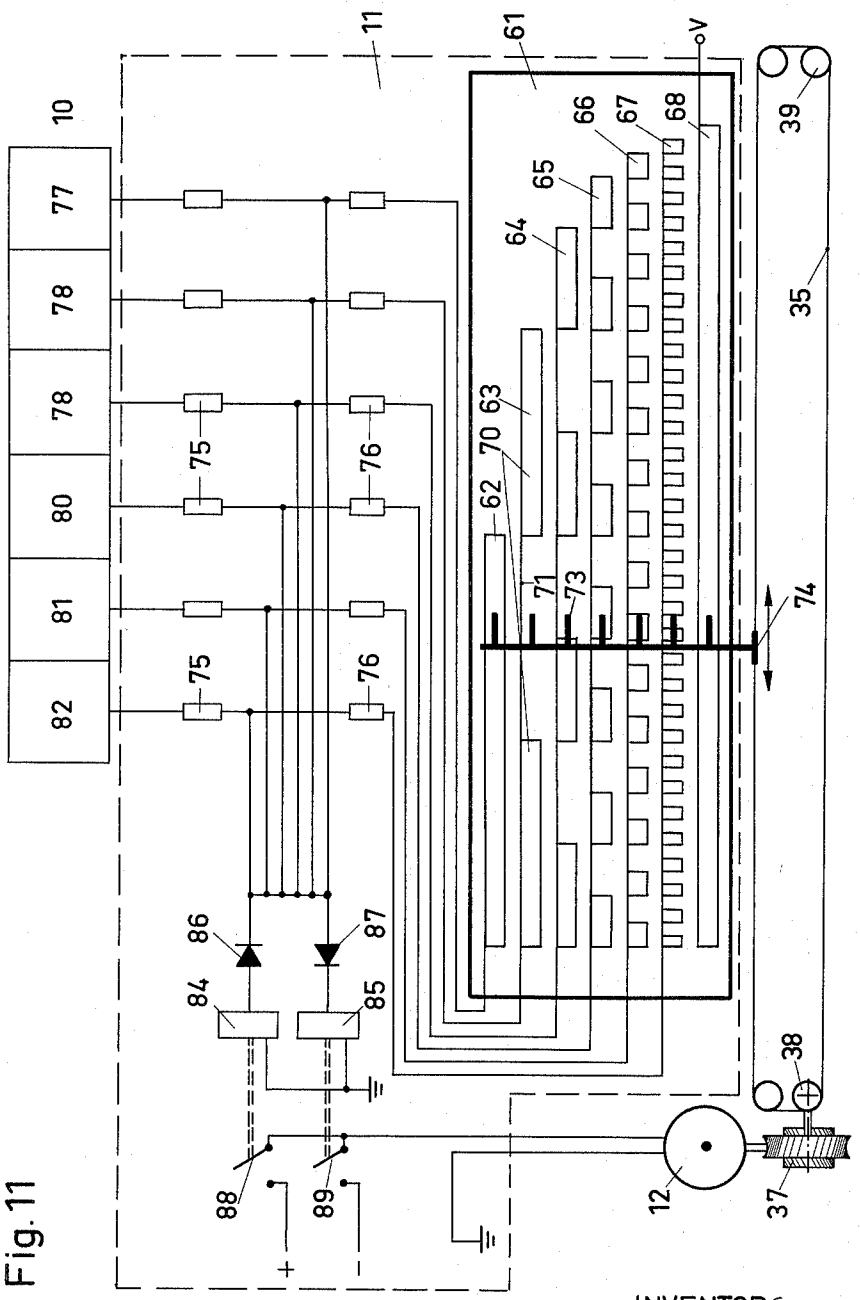


Fig. 11

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United States Patent Office

3,209,901

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3,209,901

INDICATOR APPARATUS FOR LINE CASTING MACHINES

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Claims priority, application Germany, Nov. 15, 1961, L 40,481
18 Claims. (Cl. 199—18)

The present invention relates to line casting machines, and more particularly to an indicator apparatus for a line casting machine which is associated with the perforator by which a tape is provided with coded information representing selected matrices and space bands.

Indicating apparatus serving this purpose is known, and includes three pointers cooperating with a scale. Two pointers indicate the minimum and maximum wedge thicknesses of the composed space bands, and a third pointer indicates the total of the matrix thicknesses of the already assembled matrices. It is difficult to observe the three moving pointers, and to conclude from their relative positions the space still available in the line, and the moment in which justification is possible, or desirable.

The several pointers are incapable of producing in the mind of the operator an image of the partly composed line, and of the space still available for composing and justification, and consequently the observation of indicator apparatus according to the prior art requires particular concentration and attention of the operator who is involved with the important task of composing the line.

It is one object of the present invention to overcome the disadvantages of known indicator apparatus for composing operations related to line casting machines, and to provide an indicator apparatus for this purpose which is of simple construction, and clearly and reliably indicates the conditions prevailing during the composition of a line.

Another object of the invention is to provide an indicating apparatus of such appearance that the indication thereof can be easily associated with a partly or fully composed line.

Another object of the present invention is to provide an indicating apparatus which clearly indicates when the composed space bands permit the justification of a line.

Another object of the invention is to provide an indicator apparatus which indicates how many additional matrices and space bands can be added in a line after the already composed matrices and space bands permit the justifiction of the line.

Another object of the invention is to provide an indicator means which by its position represents the matrix thicknesses and minimum wedge thicknesses in the composed part of a line.

Another object of the invention is to move such an indicator means along a stationary member which has the shape of a completed line, so that the position of the indicator means indicates the minimum length of the composed part of the line so that the appearance of the indicator apparatus suggests to the operator the appearance of a progressively composed line.

With these objects in view, one embodiment of the invention comprises a stationary member having first and second fixed points spaced corresponding to the length of a line to be cast in a line casting machine, first indicator means movable from the first point toward the second point, and second indicator means movable from the second point toward the first point.

The first indicator means is driven by drive means which moves analog to the total of the matrix thicknesses and the minimum wedge thicknesses of space bands which are

successively selected during the composing of the line whose matrices and space bands may be represented by coded perforations of a tape, or directly assembly in the line casting machine. Consequently, the distance of the first indicator means from the first point represents the matrix thicknesses and the minimum wedge thicknesses, and thereby the length of the assembled part of the line. The distance between the first indicator means and the second point indicates the available space in the line.

The second indicator means is driven by second drive means which move analog to the total spaceband drive which is the difference between the maximum and minimum wedge thicknesses of the selected and assembled space bands. Consequently, the distance between the second indicator means and the second point indicates the space which can be filled by justification.

As long as the first and second indicating means move toward each other, the distance between the same is a measure of the space which has yet to be filled in the line by matrices and space bands to obtain a justifiable line. When the first and second indicator means coincide, the line can be justified by an operation of the space bands, the maximum wedge thicknesses of the space bands being effective. During the following movement of the first and second indicating means away from each other, the line can be justified at any time before the first indicating means reaches the second point representing the end of the line.

In the preferred embodiment of the invention, the stationary member is a casing, which is advantageously mounted in or on the perforator housing of the perforator which produces a program tape for the line casting machine. The housing has an elongated, preferably rectangular window. The window is shaped in such a manner and has such length, as to represent the space available for a composed line. The indicator means includes cover elements of corresponding elongated shape. The cover element of the first indicator means progressively covers a part of the window corresponding to the length of the composed part of the line, while the uncovered part of the window corresponds to the space available for further matrices and space bands. The cover element of the second indicator means moves in opposite direction in a second part of the window, and the uncovered portion of the second part of the window represents the space band drive of the composed space bands so that equal lengths of the two uncovered portions of the window indicate the moment in which justification can be obtained by expansion of the space bands.

A scale provided with typographical units extends in the first part of the window, so that the first cover element indicates on the scale how many typographical units are still available for the composing of the line. Furthermore, the distance between the first and second cover elements can also be read on the scale, and indicates the number of typographical units of the matrices and space bands which still have to be composed to obtain a justifiable line.

In one embodiment of the invention, the cover elements are part of flexible bands, and the cover elements may be dark areas on the flexible band applied by a photographic process.

The scale member may be either stationary, or part of a flexible band to which the scale is apppied by photographic process.

Another embodiment uses rigid plates as cover elements, and in this embodiment the scale is stationary.

A third embodiment of the invention uses a flexible cover element which is wound up on a take-up reel, and wound off a let-off reel. A motor drives the take-up reel against the action of spring means which act on the let-off reel.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompany drawings in which:

FIG. 1 is a diagram illustrating the perforator arrangement of a type setting machine in combination with an indicator apparatus according to the invention;

FIG. 2 is a perspective front view of a perforator provided with the indicator apparatus;

FIG. 3 is a fragmentary front view of an indicator apparatus according to a first embodiment of the invention, the front wall of the casing being omitted for the sake of clarity;

FIG. 4 is a fragmentary plan view of the apparatus illustrated in FIG. 3;

FIG. 5 is a cross sectional view taken on line V—V in FIG. 4;

FIG. 6 is a fragmentary front view of an indicator apparatus according to a second embodiment of the invention, the front wall of the casing being omitted for the sake of clarity;

FIG. 7 is a fragmentary plan view of the embodiment of FIG. 6;

FIG. 8 is a fragmentary front view illustrating a third embodiment of the invention, the front wall of the casing being omitted for the sake of clarity;

FIG. 9 is a fragmentary plan view of the embodiment of FIG. 8;

FIG. 10 is a cross-sectional view taken on line X—X in FIG. 9; and

FIG. 11 is a diagram illustrating the circuit of control apparatus by which the position of the indicator means is controlled.

Referring now to the drawings, and more particularly to FIG. 1, the perforator key board **1**, and the control key board **2**, also shown in FIG. 2, control the coding device **3** of the perforator **4** by which a tape **5** is provided with coded perforations composed of perforations located in six different positions of successive lines.

The key board **1** has the keys representing matrices and space bands, and additional keys related to other functions, and the control key board **2** has the main switch, an addition-subtraction switch, switches for connecting different magazines, and other occasionally used swithes whose functions are not related to the objects of the invention.

It is known to those skilled in the art that the perforated tape **5** contains all the information necessary for composing a line, and is used for controlling the martix and space band selecting operations of a line casting machine.

The key boards **1** and **2** are also connected to a selector device **6** by which counter registers **7** can be selected. Counter registers **7** may be multiple plugging units having input terminals connected to the input switches of the key board **1** and output terminals which represent predetermined selected matrix thicknesses. Other program carriers may be used instead of the registers **7**, for example magnetic record carriers, punched cards or punched tape.

The signals created at the output terminals of the registers **7** and representing matrix thicknesses in numerical values are supplied to a coding device **8** where they are coded and supplied through an addition-substraction switching device **9** to a totalizer **10**.

The main key board **1** is also connected to a storage device **14** containing information regarding the space bands and connected to a register **15** in which numerical values related to the thickness of the space bands are counted. The output of the device **15** is connected through the addition-subtraction switching device **9** with the totalizer **10** and with a second totalizer **16**.

Totalizer **10** is connected to the control apparatus **11**, and totalizer **16** is connected to the control apparatus **17** which are of corresponding construction, control apparatus **11** being illustrated in FIG. 11.

Control apparatus **11** controls a drive motor **12**, and control apparatus **17** controls a drive motor **18**. Motors **12** and **18** drive indicator means **13** and **19**, and information regarding the position of the indicator means **13** and **19** is fed back to the control apparatus **11** and **17**. The indicator means **13** and **19** assume positions representing the total of the totalizers **10** and **16**.

When a key of key board **1** representing a space band, or a matrix representing a character or symbol, is actuated, a corresponding coded perforation is produced in tape **5** which can be used for controlling the assembly of matrices and space bands in the line casting machine.

At the same time, the registers **7** and **15** effect in totalizer **10** the addition of numerical values representing the thicknesses of matrices selected by operation of keys of the key board **1**, and the minimum wedge thicknesses of space bands selected by operation of a corresponding key of the key board **1**.

The totalizer **16** is controlled only by the key representing the space bands, and is supplied with numerical information representing the spaceband drive of space bands selected by operation of a key in key board **1**. Consequently, whenever a key of key board **1** associated with space bands is actuated, a numerical value representing the minimum wedge thickness of a space band is entered into totalizer **10**, and a numerical value representing the spaceband drive of the space band is entered in totalizer **16**.

It is well known in the typographical art that the amount of possible justification in any assembled line of matrices is determined by the number of space bands contained in it. A space band comprises a matrix-shaped portion in which is slidably carried a wedge portion. The expansibility or so called drive of the space band is determined by the difference between the thin end and the thick end of the wedge portion. The difference between the total of the thicknesses of the matrices in an assembled line and the predetermined length of the line must be equal to or less than the expansibility of the assembled space bands which corresponds to the difference between the total of all minimum wedge thicknesses and the total of all maximum wedge thicknesses of the space bands. When the wedge portions of assembled space bands, or of at least one space band, are slidably moved along the matrix-shaped portion of the space band which is in alignment with the rest of the assembled matrices, it will spread the matrices to fill the available space between the last matrix and the limiting gauge representing the length of the line. The indicator means **13** is driven by motor **12** to indicate the total of the thicknesses of the assembled matrices and of the minimum wedge thicknesses of the assembled space bands. The indicator means **19** moves in the opposite direction and indicates the expansibility or drive of the assembled space bands. Consequently, as soon as in a line the free available space, indicated by the white portion of member **13** is shorter than the expansibility of the space bands indicated by the white portion of indicator means **19**, the line can be justified.

Referring now to FIG. 2, the front wall **20** of a perforator housing **21** has a rectangular window **23** which has an upper rectangular part **23***a*, and a lower rectangular part **23***b*. A shield is arranged behind the window, and has an edge **23***d* defining a fixed point at one end of the upper part of the window **23**, and an elongated part **23***e* extending through a major portion of the lower rectangular part of the window **23**. Another shield **27'** is arranged at the other end of the window, and forms a reference edge **27** defining a fixed point at the other end of the window **23**. Consequently, the open area of the window **23** is bounded by the edges **23***d*, **27**, by the upper longitudinal edge of the window, by the edges of the shield portion **23***e* and by the lower edge of the window

extending between shield portion 23*e* and the reference edge 27.

A scale member 24 is located adjacent the reference edge 27 in the upper part 23*a* of window 23, and has a scale indicating typographical units. The indicator means 13 is constructed as a rectangular cover element located in the upper rectangular part of the window, and being preferably of dark color in contrast to the scale member 24. The second indicator means 19 is constructed as a dark cover element which moves to the left in FIG. 2, so that its trailing edge 28 moves away from the reference edge 27.

As explained with reference to FIG. 1, the cover element 13 covers a portion of the upper part of the window whose length 25 corresponds to the length of the assembled portion of a line for the minimum thicknesses of the space bands. This distance between the points or edges 23*d* and 27 represents the length of a line. Consequently, the distance 26 between the leading edge 31 of cover element 13 and the reference edge 27 represents the space still available in the line, so that the upper portion of window 23 represents a line during the composing operation in a manner which can be understood and evaluated at a glance by the operator whereby the type setting operation is substantially facilitated.

As explained with reference to FIG. 1, the cover element 19 moves to the left in FIG. 2 so that the distance 30 between its trailing edge and the reference edge 27 represents the spaceband drive of the space bands.

As soon as leading edge 31 coincides with the trailing edge 28, the line can be justified since expansion of the assembled space bands will add to the length 25 the length 30 so that the total corresponds to the entire length of the line between edges 23*d* and 27. When the trailing edge 28 has moved to the left beyond the point of coincidence with the leading edge 31, adjustment of the line is still possible, but it will not be necessary to fully expand the assembled space bands.

In the position illustrated in FIG. 2, scale 24 indicates between the leading edge 31 and the trailing edge 28 the number of typographical units which have to be provided by additionally assembled matrices and space bands before the line can be justified. Scale member 24 indicates between edges 31 and 24 the maximum number of typographical units corresponding to which matrices and space bands can still be assembled in the line.

From the above description of the diagram of FIG. 1, it will be understood that every time a character symbol or space band is selected by operation of the key board 1, indicator means 13 will move stepwise to the right in accordance with the number of typographical units represented by the respective selected matrix or the minimum wedge thickness of a space band, and that indicator means 28 will move stepwise to the left corresponding to the typographical units of the spaceband drive or expansibility of a space band.

In the position illustrated in FIG. 2, the expansibility of the space bands is about five picas about four picas must be filled with additional matrices and space bands before the line can be justified, and no more than about nine picas can be filled with additional matrices and space bands before the end of the line is reached.

While the line can be justified upon coincidence of edges 31 and 28, a better typographical appearance is obtained by justifying the line when edges 31 and 28 move in opposite direction after coincidence, and when the distance 26 is shorter than illustrated in FIG. 2.

A lamp 33, see FIG. 3, is provided at the right end of window 23, and is energized when the leading edge 31 reaches a predetermined distance from the reference edge 27, so that the operator is warned of the approaching end of the line which necessitates the observation of the movement of the leading edge 31 relative to the edge 28 and to the reference edge 27.

The indicator window 23 is arranged directly below the holder 22 for the text to be printed, and above the key board 1 so that the operator while reading the text notices the progression of the assembled line without being required to pay any special attention to it until the lamp 33 lights up.

FIGS. 3, 4 and 5 illustrate a first embodiment of the invention. The cover element 13, and the scale member 24 are portions of an endless flexible band 35 which has perforated edges 36. The endless band 35 is guided over sprocket rollers 38, 39, 40 and 41 of which roller 38 is driven through a worm gear transmission 37 from the drive motor 12. The cover element 13 and the scale 24 may be printed on the flexible band 35, or band 35 may be a transparent film material on which dark area of the cover element 13, and scale 24*a* are applied by a photographic process.

Underneath band 35, and in the region of the lower part of window 23, another endless band 42 is arranged which runs over four sprocket rollers 44, 45, 46 and 47, of which roller 44 is driven through a worm gear transmission 43 from the direct current motor 18. The shafts of the rollers which support the endless band are mounted in the frame portion 34 of the perforator housing.

Direct current motors 12 and 18 drive bands 35 and 42 in opposite directions so that the visible portion of band 35 moves to the right, and the visible portion of band 42 moves to the left as viewed in FIGS. 2 and 3. The cover element 19 of band 42 may be printed or photographically applied, and is of a contrasting color with respect to the other portions of band 42. Shield portion 23*e* which covers the greater part of cover element 19 in the lower portion of the window, has a narrow shield portion 23*f* extending in the center region of the window between the upper and lower parts thereof, and covering the perforated portions of bands 35 and 34. Other shield portions 23*g* and 23*h* cover the upper and lower perforated portions of bands 35 and 42.

As explained with reference to FIGS. 1 and 2, the leading edge 31 of cover portion 13 represents the total of the thicknesses of the assembled matrices and of the minimum wedge thicknesses of the assembled spacebands.

FIG. 11 illustrates the control device 11 by which the desired position of cover element 13 is assured. An analog-digital converter 61 has a set of contact tracks 62 to 67 consisting of contacts 70 arranged in accordance with the binary system. The contacts 70 of each contact track are connected by conductors 71. Parallel to the contact tracks 63 to 67 extends a continuous contact 68. All contact tracks are engaged by slide brushes 73 secured to an arm 74 which is connected to band 35 for movement therewith. A source of a comparison voltage V is connected to the slide contact 68, and each of the contact tracks 62 to 67 is connected by a pair of comparison resistors 75, 76 to one of six stages 77 to 82 of the binary totalizer 10, see also FIG. 1.

Relays 84, 85 are connected through opposing diodes 86, 87 to the connecting points of the pairs of resistors 75, 76, and control relay contacts 88 and 89, respectively which can be connected to a positive or negative source of voltage, respectively, to supply the same to direct current motor 12 by which the endless band 35 is driven. The other terminal of motor 12 is connected to ground.

During the operation of the apparatus, motor 12 is connected to the positive voltage to drive the endless band 35 so that the arm 74 with brushes 73 moves along the contact tracks 62 to 67. Corresponding to the position of arm 74, and to the position of the indicator means 13, a voltage applied to terminal 68*a* of slide contact 68 is applied through brushes 73 and contact 70 of the contact tracks 62 to 67 to one or several of the resistors 76. Consequently, analog to the position of the indicator means 13, binary signals are produced at the output of the contact tracks 62 to 67 which are compared through the pairs of comparison resistors 75, 76 with the voltage

signals at the outputs of the stages 77 to 82 of the binary adder 10, and which correspond to the total of numerical values representing the matrix thicknesses and the minimum wedge thicknesses of assembled space bands.

When the output signals of the analog-digital converter 61 no longer correspond to the signals at the output of the binary adder 10, a positive or negative voltage is applied by relay 84 or by relay 85 to the motor 12 so that the same rotates in one or the other direction of rotation until the signals balance at the comparison resistors 75 and 76 whereupon the motor is disconnected from the voltage and band 35 with the indicator means 13 stops until by selection of another matrix or spaceband the total of the binary adder 10 is changed so that one of the relays is energized and effects rotation of motor 12 and movement of band 35 with indicator means 13 to the right as viewed in FIG. 2.

The arrangement of the control apparatus 17 corresponds to the circuit illustrated in FIG. 11, but it will be understood that instead of the binary adder 10, the binary adder 16 is used which forms the total of the space band drive of the spacebands, and that instead of motor 12, motor 18 is controlled to move the band 42 with the indicating cover portion 19.

The second embodiment of the invention illustrated in FIGS. 6 and 7 has cover elements in the form of rectangular plates 48 and 49 provided with perforations 36 along the edges thereof, so that they can be transported by drive sprockets 38' and 44' which are respectively driven through worm gear transmissions 37' and 43' from motors 12' and 18'. Straight guide means, not shown, are secured to the casing along the window to guide the rectangular cover plates 48 and 49. While it is possible to extend the cover plates by a scale portion similar to the arrangement of FIG. 3, in the embodiment of FIG. 6, the scale member 50 is fixedly secured to the frame portion 34 and projects behind the window 23 from the reference edge 27 toward the other end of the window, so that cover plate 48 passes in front of the scale member when moving to the right as viewed in FIG. 6 toward the reference edge 27. Accordingly, the graduated scale on scale member 50 indicates typographical units starting with zero at the reference edge 27 and being progressively numbered toward the cover plate 48. When the cover plate is displaced, the leading edge thereof indicates the number of typographical units still available in the line for matrices and space bands.

As in the embodiment of FIG. 3, the lamp 33 is energized when the leading edge of cover plate 48 reaches a predetermined position spaced a selected number of typographical units from the reference edge 27 which indicates the end of the line. In this manner, the operator is warned to observe the progress of the leading edge of plate member 48 as compared with the movement of the trailing edge of plate member 49 which responds to the total of the maximum wedge thicknesses of the assembled space bands.

In the third embodiment illustrated in FIGS. 8, 9 and 10, elongated flexible members 35' and 42' include elongated flexible cover portions 13 and 19, and pairs of flexible cords 56, 57, 58, 59 also extending along the edges of portions 13 and 19 to reinforce the same. The flexible member 35' is wound on a let-off roller 54 which is loaded by spring 52. A take-up roller 39' is driven through a worm gear transmission 37 by motor 12 to wind up the flexible member 35' so that the cover portion 13 moves in accordance with the total of the assembled matrices and minimum wedge thicknesses of the assembled space bands. A stationary scale member 50 is secured to the casing and is progressively numbered from the reference edge 27 so that the leading edge of the cover portion 13 indicates the number of typographical units still available in the line.

The flexible member 42' is wound on a let-off roller 55 which is loaded by a spring 53, and is wound up on a take-up roller 44 which is driven through the worm gear transmission 43 by motor 18. Guide rollers 49', 40', 45' and 46' guide the flexible members between the let-off and take-up rollers.

The motors 12 and 18 turn to positions analog to the totals arrived at in the totalizers 10 and 16.

As is clearly apparent from the drawings, and particularly from FIG. 2, the upper rectangular portion of window 23 has an elongated narrow shape corresponding to the shape of the space available for a line, and the cover element 13 represents the partly assembled line consisting of matrices and unexpanded space bands and has a corresponding shape. Consequently, it is easy for the operator to associate the indication with the actual conditions so that the attention of the operator can be concentrated on the task of selecting the matrices in accordance with the text.

The above described embodiments of the invention may be modified. For example, cover elements corresponding to cover elements 13 and 19 may be superimposed in a narrower window, and at least one of the cover elements made transparent so that the observation of the movements of the indicating edge of the respective other cover element is possible. Two flexible bands may be superimposed of which the forwardly located band has a darker but transparent cover portion and a lighter fully transparent portion which may be either the scale portion 24, or the portion representing the spaceband drive of the space bands adjacent edge 27.

The indicator apparatus of the invention may be constructed as a complete unit which can be built into the perforator casing behind a removable cover.

According to another construction, the indicator apparatus has its own casing, which can be mounted on the housing of the perforator. This arrangement permits the independent manufacture of the indicator apparatus, and the attachment of the indicator apparatus to existent perforators.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of perforator arrangements differing from the types described above.

While the invention has been illustrated and described as embodied in an indicator apparatus simulating the assembled portion of a line and the space available for a line during operation of the perforator of a line casting machine, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. In a composing apparatus for a line casting machine, in combination, an indicator apparatus comprising a stationary member formed with an elongated straight window having at the ends thereof first and second reference edges, said reference edges being spaced a distance corresponding to the length of a justified line of matrices and space bands, said window having a narrow rectangular shape corresponding to the shape of the space available for said justified line, means for totalizing the matrix thicknesses and the minimum wedge thicknesses of space bands successively selected during the composing of a line; drive means moving analog to the total found by said totalizing means; and a cover element driven by said drive means along said window in the reading direction from the first

reference edge toward the second reference edge so that said cover element progressively covers said window while the length of the covered portion of the window from said first reference edge to the leading edge of said cover element represents the total of the matrix thicknesses and the minimum wedge thicknesses of said space bands and thereby the minimum length of the composed portion of a line, while the length of the uncovered portion of said window between said leading edge and said second reference edge represents the space still available in the line for additional matrices and space bands, and for justification.

2. An apparatus as set forth in claim 1 including an illuminating lamp for illuminating said uncovered portion of said window; and means for energizing said lamp when said leading edge of said cover element is spaced a selected distance from said reference edge whereby the operator is warned of the approaching end of the line.

3. In a composing apparatus for a line casting machine, in combination, a stationary member formed with an elongated window having first and second ends spaced a distance corresponding to the length of a justified line of matrices and space bands, said window having a narrow rectangular shape corresponding to the shape of the space available for said justified line, said second end forming a reference edge; first indicator means including a first cover element located in said window and being movable toward said second end for progressively covering said window so that its leading edge moves toward said reference edge for representing by the covered portion of said window between said leading edge and said first end the matrix thicknesses and the minimum wedge thicknesses of space bands successively selected during the composing of the line and thereby the minimum length of the composed portion of a line, and for representing by the uncovered portion of said window between said leading edge and said reference edge the available space in said line; and second indicator means including a second cover element located in said window and being movable in a direction opposite to the movement of said first indicator means for progressively uncovering said window so that its trailing edge moves away from said reference edge for representing by the thus uncovered portion of said window between said trailing edge and said reference edge the expansibility of said selected space bands and the space which can be filled by justification whereby the distance between said leading edge of said first cover element and the trailing edge of said second cover element while moving toward each other is a measure of the space to be filled in the line by matrices and space bands, and whereby coincidence of said leading and trailing edges and following movement of said leading edge away from said trailing edge indicates a justifiable line until said leading edge coincides with said reference edge.

4. In a composing apparatus for a line casting machine, in combination, a stationary member formed with an elongated straight window having first and second ends spaced a distance corresponding to the length of a justified line of matrices and space bands, said window having a narrow rectangular shape corresponding to the shape of the space available for said justified line, said second end forming a reference edge; first indicator means including a first rectangular cover element located in a first rectangular part of said window and being movable toward said second end for progressively covering said first part so that its leading edge moves toward said reference edge for representing by the covered portion of said first part between said leading edge and said first end the matrix thicknesses and the minimum wedge thicknesses of space bands successively selected during the composing of the line and thereby the minimum length of the composed portion of a line, and for representing by the uncovered portion of said first part of said window between said leading edge and said reference edge the available space in said line; and second indicator means including a second rectangular cover element located in a second rectangular part of said window extending parallel to and adjacent said first rectangular part, said second rectangular cover element being movable in a direction opposite to the movement of said first indicator means for progressively uncovering said second part so that its trailing edge moves away from said reference edge for representing by the uncovered portion of said second part of said window between said trailing edge and said reference edge the space band drive of said selected space bands and the space which can be filled by justification whereby the distance between said leading edge of said first cover element and the trailing edge of said second cover element while moving toward each other is a measure of the space to be filled in the line by matrices and space bands, and whereby coincidence of said leading and trailing edges and following movement of said leading edge into the region of said uncovered portion of said second part of said window between said trailing edge and said reference edge indicates a justifiable line.

5. In a composing apparatus for a line casting machine, in combination, an indicator apparatus comprising a stationary member formed with an elongated straight window having at the ends thereof first and second reference edges, said reference edges being spaced a distance corresponding to the length of a justified line of matrices and space bands, said window having a narrow rectangular shape corresponding to the shape of the space available for said justified line, means for totalizing the matrix thicknesses and the minimum wedge thicknesses of space bands successively selected during the composing of a line; drive means moving analog to the total found by said totalizing means; a cover element driven by said drive means along said window in the reading direction from the first reference edge toward the second reference edge so that said cover element progressively covers said window while the length of the covered portion of the window from said first reference edge to the leading edge of said cover element represents the total of the matrix thicknesses and the minimum wedge thicknesses of said space bands and thereby the minimum length of the composed portion of a line, while the length of the uncovered portion of said window between said leading edge and said second reference edge represents the space still available in the line for additional matrices and space bands, and for justification; and a scale member visible only between said second reference edge and said cover element and having a scale indicating typrographical units so that the available space is indicated in typographical units.

6. In a composing apparatus for a line casting machine, in combination, a stationary member formed with an elongated window having first and second ends spaced a distance corresponding to the length of a justified line of matrices and space bands, said window having a narrow rectangular shape corresponding to the shape of the space available for said justified line, said second end forming a reference edge; first indicator means including a first cover element located in a first part of said window and being movable toward said second end for progressively covering said first part so that its leading edge moves toward said reference edge for representing by the covered portion of said first part between said leading edge and said first end the matrix thicknesses and the minimum wedge thicknesses of space bands successively selected during the composing of the line and thereby the minimum length of the composed portion of a line, and for representing by the uncovered portion of said first part of said window between said leading edge and said reference edge the available space in said line, said first indicator means including a scale member having a scale indicating typographical units, and being secured to said first cover element for movement with the same in said first part of said window and extending in said uncovered portion of

said first part of said window from said leading edge to said reference edge and being visible only in said uncovered portion, said scale being progressively numbered away from said leading edge so that said reference edge indicates on said scale the units of the available space in the line; and second indicator means including a second cover element located in a second part of said window and being movable in a direction opposite to the movement of said first indicator means for progressively uncovering said second part so that its trail edge moves away from said reference edge for representing by the uncovered portion of said second part of said window between said trailing edge and said reference edge the space band drive of said selected space bands and the space which can be filled by justification whereby the distance between said leading edge of said first cover element and the trailing edge of said second cover element while moving toward each other is a measure of the space to be filled in the line by matrices and space bands, and whereby coincidence of said leading and trailing edges and following movement of said leading edge into the region of said uncovered portion of said second part of said window between said trailing edge and said reference edge indicates a justifiable line until said leading edge coincides with said reference edge.

7. In a composing apparatus for a line casting machine, in combination, a stationary member formed with an elongated window having first and second ends spaced a distance corresponding to the length a justified line of matrires and space bands, said window having a narrow rectangular shape corresopnding to the shape of the space available for said justified line, said second end forming a reference edge; first indicator means including a first dark cover element located in a first part of said window and being movable toward said second end for progressively covering said first part so that its leading edge moves toward said reference edge for representing by the cover portion of said first part between said leading edge and said first end the matrix thicknesses and the minimum wedge thicknesses of space bands successively selected during the composing of the line and thereby the minimum length of the composed portion of a line, and for representing by the uncovered portion of said first of said window between said leading edge and said reference edge the available space in said line, said first indicator means including a light-colored scale member secured to said cover element and extending in said uncovered portion from said leading edge at least to said reference edge, said scale being progressively numbered from said leading edge so that said reference edge indicates on said scale the units of available space in the line; second indicator means including a second cover element located in a second part of said window and being movable in a direction opposite to the movement of said first indicator means for progressively uncovering said second part so that its trailing edge moves away from reference edge for representing by the uncovered portion of said second part of said window between said trailing edge and said reference edge the spaceband drive of said selected space bands and the space which can be filled by justification whereby the distance between said leading edge of said first cover element and the trailing edge of said second cover element while moving toward each other is a measure of the space to be filled in the line by matrices and space bands, and whereby coincidence of said leading and trailing edges and following movement of said leading edge into the region of said uncovered portion of said second part of said window between said trailing edge and said reference edge indicates a justifiable line until said leading edge coincides with said reference edge; and a stationary light-colored shield covering a portion of said second part of said window extending adjacent said first end of said window so that a major part of said second cover element is covered whereby the visible length of said second cover element between said trailing edge and said shield is substantially shorter than the visible length of said first cover element between said first end of said window and said leading edge thereof.

8. In a composing apparatus for a line casting machine, in combination, an indicator apparatus comprising, a stationary casing formed with an elongated window having first and second ends spaced a distance corresponding to the length of a justified line of matrices and space bands, said window having a narrow rectangular shape corresponding to the shape of the space available for said justified line, said second end forming a transverse edge; first drive means moving analog to the total of the matrix thicknesses and the minimum wedge thicknesses of space bands successively selected during the composing of a line; a first elongated cover element located in a first elongated rectangular part of said window and being driven by said first drive means to move toward said reference edge for progressively covering said first part so that the cover portion of said first part of said window between said leading edge and said first end represents the minimum length of the assembled part of the line, and so that the uncovered portion of said first part of said window between said leading edge and said reference edge represents the space still available in the line, said first rectangular part of said window and said covered portion representing a line being composed; a scale member having a scale indicating typographical units and visible only between said leading edges and said reference edge in said uncovered portion in said first units and visible only between said leading edge and said part of said window so that the number of typographical units still available in the line is indicated by said scale between said leading edge and said reference edge; second drive means moving analog to the total of the spaceband drive of said selected spacebands; a second elongated cover element extending parallel to said first cover element and being located in a second elongated part of said window which extends parallel to said first part, said second cover element being driven by said second drive means to move in a direction opposite to the movement of said first cover element for progressively uncovering said second part of said window so that the length of the uncovered portion of said second part of said window between said trailing edge and said reference edge represents spaceband drive of said selected space bands and the space which can be filled by justification whereby the distance indicated by said scale between said leading edge of said first cover element and the trailing edge of said second cover element while the same move toward each other is a measure of the space still to be filled in the line by matrices and space bands, and whereby coincidence of said leading and trailing edges, and following movement of said leading edge into the region of said uncovered portion of said second part of said window indicates a justifiable line.

9. An indicator apparatus as set forth in claim 8 wherein said first cover element and said scale member are portions of a first endless band, said portions of said endless band being visible through said first part of said window; wherein said second cover element is a first portion of a second endless band having a second adjacent portion different in transparency or color from said first portion; wherein said second part of said window is rectangular so that said first and second portions of said second endless band are partially visible through said second part of said window; wherein said first and second drive means are electric motors; and including roller means supporting said endless bands, and transmission means connecting, respecitvely, said motors with said roller means for driving said endless bands.

10. An indicator apparatus as set forth in claim 9 wherein said endless bands are photographic films, and wherein said cover elements are dark areas on said films, and wherein said scale is photographically applied to said first endless band.

11. An indicator apparatus as set forth in claim 8 wherein said scale member is secured to said casing and has a scale numbered from said reference edge toward said first cover element so that said leading edge indicates the typographical units available in the line; wherein said first and second cover elements are rectangular portions of flexible elongated members; wherein both said first and second parts of said window ars rectangular and adjacent so that said rectangular portions are visible in said window together with said scale member; wherein said first and second drive means are electric motors; and including spring means for urging said flexible elongated members to move in opposite directions and take-up means for winding up said flexible members against the action of said spring means; and transmission means connecting, respectively, said motors with said take-up means for driving said cover elements to move in said window.

12. An indicator apparatus as set forth in claim 11 wherein said flexible elongated members include cords forming longitudinal edges thereof; and including let-off means on which said cords are wound by said spring means when said motors are de-energized; and shielding means in said window for covering a portion of said second cover elements between said first end of said window and said trailing edge, and for covering a portion of said window between said first and second parts of said window and those cords which are located in said window adjacent each other.

13. In an apparatus for preparing a record to be used to control line casting machines, in combination, an indicator apparatus comprising an elongated window, having one end forming a fixed transverse reference edge; first drive means moving analog to the total of the matrix thicknesses and the minimum wedge thicknesses of space bands successively selected during the composing of a line to be cast; first indicator means including a first cover element and a scale member, said first indicator means being located in a first elongated part of said window and being driven by said first drive means to move said scale member past said reference edge so that only the portion of said scale member which is visible through said first part of said window between said first cover element and said reference edge represents the space still available for said line; second drive means moving analog to the total of the space band drive of said selected space bands; and second indicator means including a second elongated cover element extending parallel to said first cover element and being located in a second elongated part of said window which extends parallel to said first part, said second indicator means being driven by said second drive means in a direction opposite to the movement of said first indicator means to move said second cover element so that the length of the uncovered portion of said second part of said window between the trailing edge of said second cover element and said reference edge represents the space band drive of said selected space bands.

14. In an apparatus for preparing a record to be used to control line casting machines, in combination, an indicator apparatus comprising an elongated narrow rectangular window, having one end forming a fixed transverse reference edge; first drive means moving analog to the total of the matrix thicknesses and the minimum wedge thicknesses of space bands successively selected during the composing of a line to be cast; first endless indicator band means including a first cover element and a scale member, said first indicator band means being located in a first elongated part of said window and being driven by said first drive means to move said scale member past said reference edge so that only the portion of said scale member which is visible through said first part of said window between said first cover element and said reference edge represents the space still available for said line; second drive means moving analog to the total of the space band drive of said selected space bands; and second endless indicator band means including a second elongated cover element extending parallel to said first cover element and being located in a second elongated part of said window which extends parallel to said first part, said second indicator band beans being driven by said second drive means in a direction opposite to the movement of said first indicator means to move said second cover element so that the length of the uncovered portion of said second part of said window between the trailing edge of said second cover element and said reference edge represents the space band drive of said selected space bands.

15. In an apparatus for preparing a record to be used to control line casting machines, in combination, an indicator apparatus comprising an elongated window, having one end forming a fixed transverse reference edge; first drive means moving analog to the total of the matrix thicknesses and the minimum wedge thicknesses of space bands successively selected during the composing of a line to be cast; first indicator means including a first cover element and a scale member, said first indicator means being located in a first elongated part of said window and being driven by said first drive means to move said scale member past said reference edge so that the portion of said scale member which is visible through said first part of said window between said first cover element and said reference edge represents the space still available for said line; second drive means moving analog to the total of the space band drive of said selected space bands; and second indicator means including a second elongated cover element extending parallel to said first cover element and being located in a second elongated part of said window which extends parallel to said first part, said second indicator means being driven by said second drive means in a direction opposite to the movement of said first indicator means to move said second cover element so that the length of the uncovered portion of said second part of said window between the trailing edge of said second cover element and said reference edge represents the space band drive of said selected space bands, said cover elements on one hand, and said scale member and uncovered portion of said second part on the other hand having contrasting colors.

16. In an apparatus for preparing a record to be used to control line casting machines, in combination, an indicator apparatus comprising an elongated narrow rectangular window, having one end forming a fixed transverse reference edge; first drive means moving analog to the total of the matrix thicknesses and the minimum wedge thicknesses of space bands successively selected during the composing of a line to be cast; first endless indicator band means including a first cover element and a scale member, said first indicator band means being located in a first elongated part of said window and being driven by said first drive means to move said scale member past said reference edge so that only the portion of said scale member which is visible through said first part of said window between said first cover element and said reference edge represents the space still available for said line, said scale member having a scale progressively numbered with typographical units from said cover element toward said reference edge; second drive means moving analog to the total of the space band drive of said selected space bands; and second endless indicator band means including a second elongated cover element extending parallel to said first cover element and being located in a second elongated part of said window which extends parallel to said first part, said second indicator band means being driven by said second drive means in a direction opposite to the movement of said first indicator means to move said second cover element so that the length of the uncovered portion of said second part of said window between the trailing edge of said second cover element and said reference edge represents the space band drive of said selected space bands, said cover elements on one hand, and

said scale member and uncovered portion of said second part on the other hand having contrasting colors.

17. In an apparatus for determining the number of typographical units used in a line casting machine for casting a line, in combination, an indicator apparatus comprising an elongated window, having one end forming a fixed transverse reference edge; totalizing means for totalizing the matrix thicknesses and the minimum wedge thicknesses of space bands of successively selected matrices and space bands; drive means moving analog to the total found by said totalizing means; an indicator means including a cover element and a scale member, said indicator means being located in said window and being driven by said drive means to move said scale member past said reference edge so that only the portion of said scale member which is located in, and visible through said window between said cover element and said reference edge represents the space still available for the line to be cast, and so that the portion of said cover element located in, and visible through said window represents the composed portion of the line.

18. In an apparatus for determining the number of typographical units used in a line casting machine for casting a line, in combination, an indicator apparatus comprising an elongated narrow rectangular window, having one end forming a fixed transverse reference edge; totalizing means for totalizing the matrix thicknesses and the minimum wedge thicknesses of space bands of successively selected matrices and space bands; drive means moving analog to the total found by said totalizing means; and endless indicator band means including a cover element and a scale member, said indicator band means being located in said window and being driven by said drive means to move said scale member past said reference edge so that only the portion of said scale member which is located in, and visible through said window between said cover element and said reference edge represents the space still available for the line to be cast, said scale member having a scale progressively numbered with typographical units from said cover element toward said reference edge, and so that the portion of said cover element located in, and visible through said window represents the composed portion of the line.

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