R. C. ELLIOTT.

PATTERN CONTROLLED COMPOSING MACHINE.

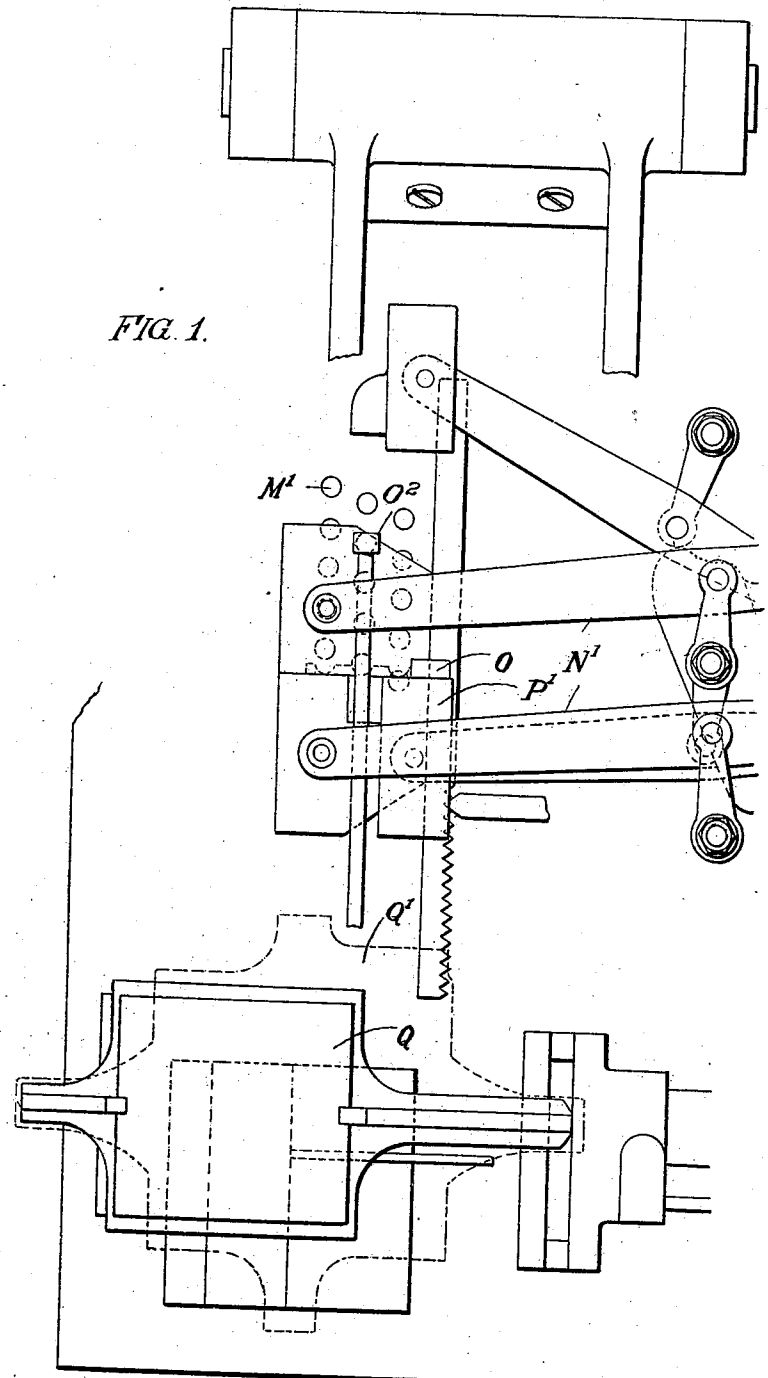
APPLICATION FILED JAN. 4, 1910.

980,933.

Patented Jan. 10, 1911.

7 SHEETS—SHEET 1.

FIG. 1.



Witnesses

Thomas Durant

Inventor

R. C. Elliott

by Church & Church

his Attorneys

R. C. ELLIOTT.

PATTERN CONTROLLED COMPOSING MACHINE.

APPLICATION FILED JAN. 4, 1910.

980,933. Patented Jan. 10, 1911.

7 SHEETS-SHEET 2.

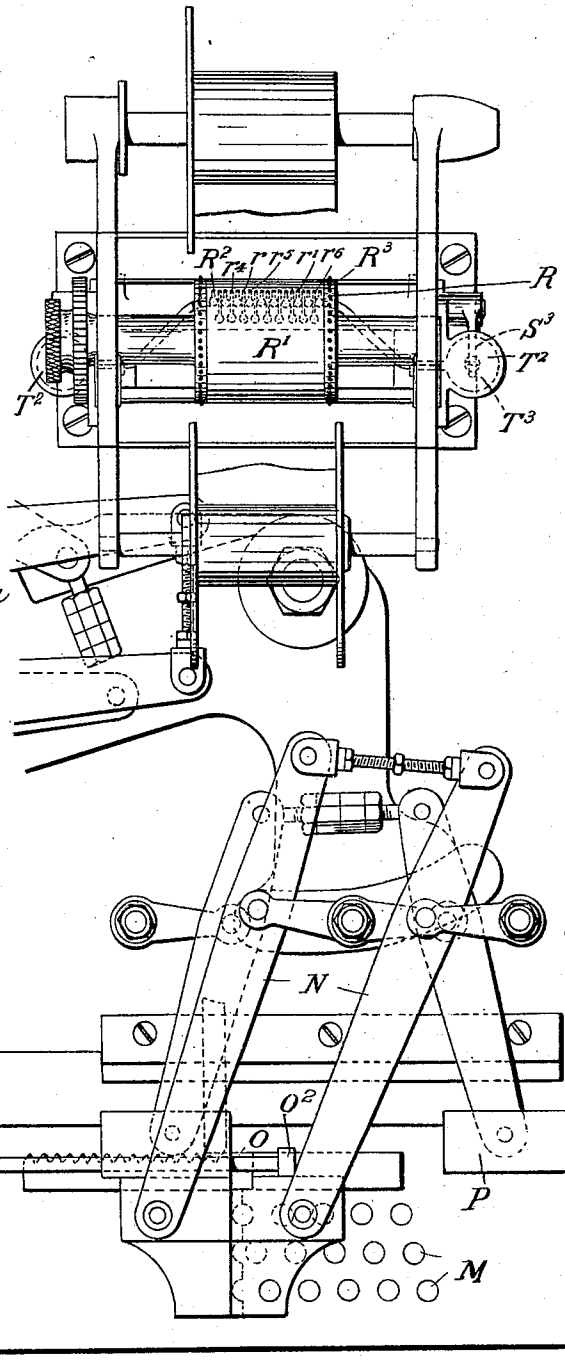


Fig. 1a

Witnesses

Thomas Durant

Inventor

R. C. Elliott

by Church & Church

his Attorneys

R. C. ELLIOTT.

PATTERN CONTROLLED COMPOSING MACHINE.

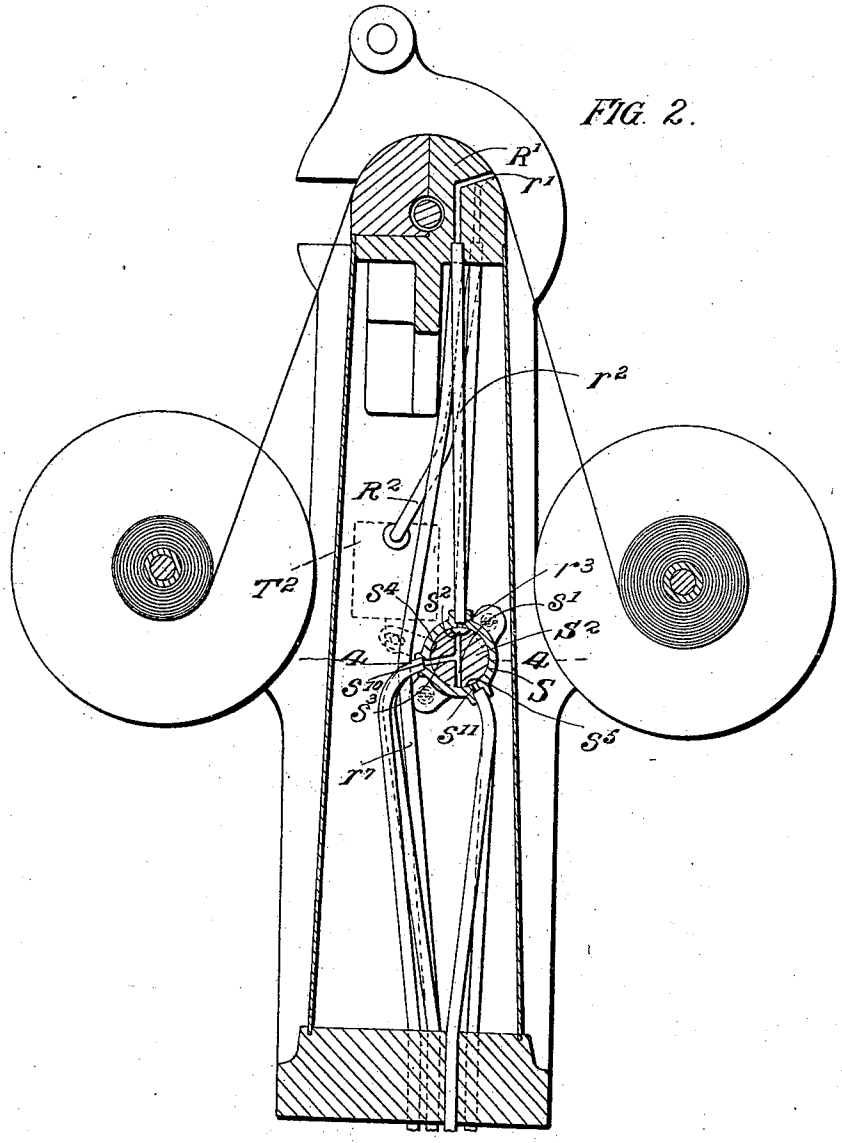
APPLICATION FILED JAN. 4, 1910.

980,933.

Patented Jan. 10, 1911.

7 SHEETS—SHEET 3.

FIG. 2.



Witnesses

Thomas Durant

Inventor

R. C. Elliott

by Church & Church

his Attorneys

R. C. ELLIOTT.

PATTERN CONTROLLED COMPOSING MACHINE.

APPLICATION FILED JAN. 4, 1910.

980,933.

Patented Jan. 10, 1911.

7 SHEETS—SHEET 4.

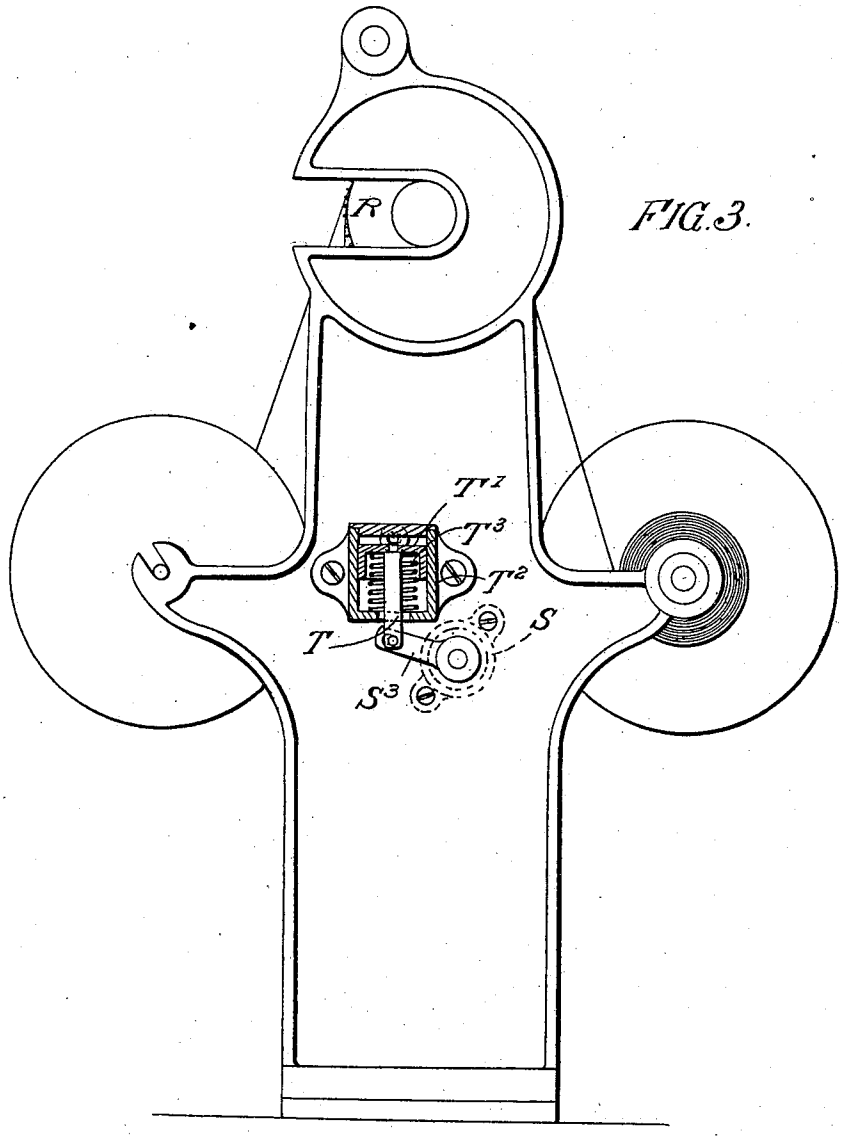


FIG. 3.

Witnesses

Thomas Durant

Inventor
R. C. Elliott

by Church & Church

his Attorneys

R. C. ELLIOTT.

PATTERN CONTROLLED COMPOSING MACHINE.

APPLICATION FILED JAN. 4, 1910.

980,933. Patented Jan. 10, 1911.

7 SHEETS—SHEET 5.

FIG 4.

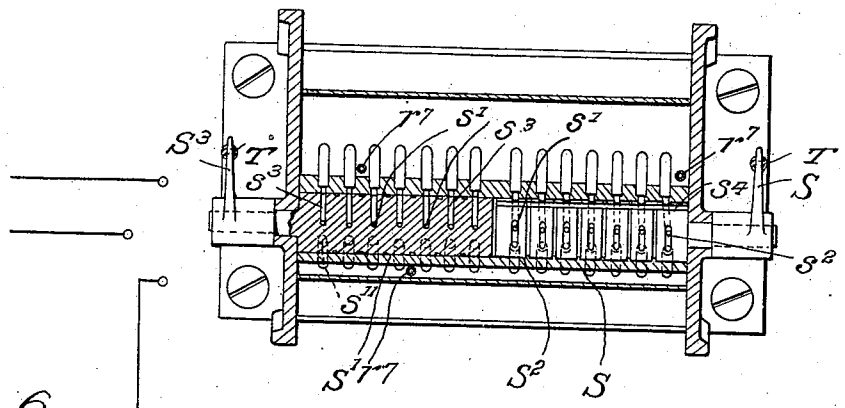


FIG. 6.

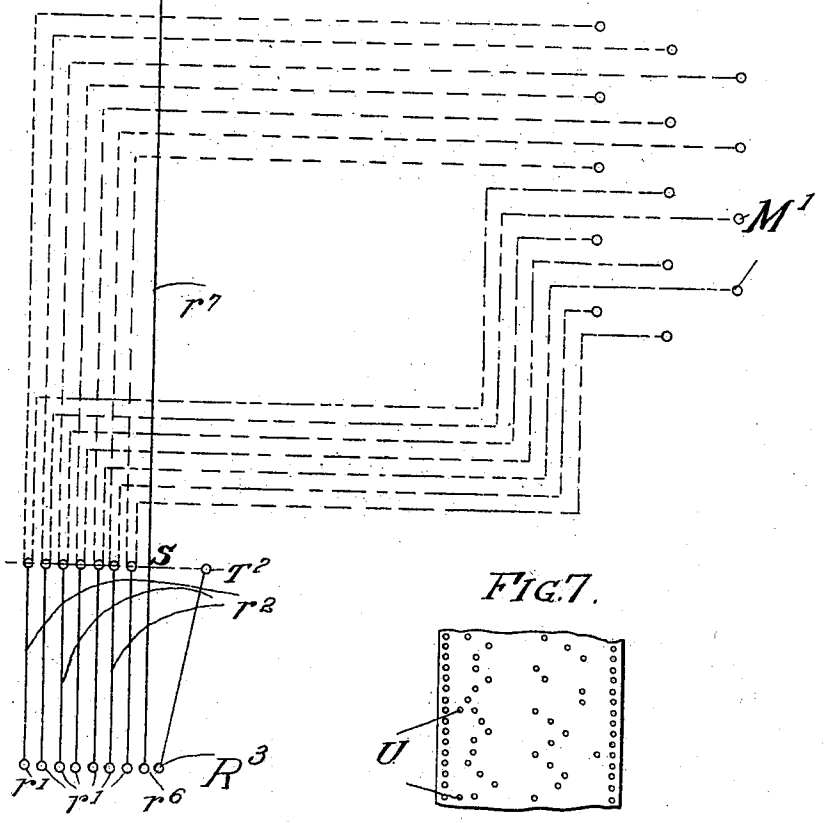


FIG. 7.

Witnesses

Thomas Durant

Inventor

R. C. Elliott

by Church & Church

his Attorneys.

R. C. ELLIOTT.

PATTERN CONTROLLED COMPOSING MACHINE.

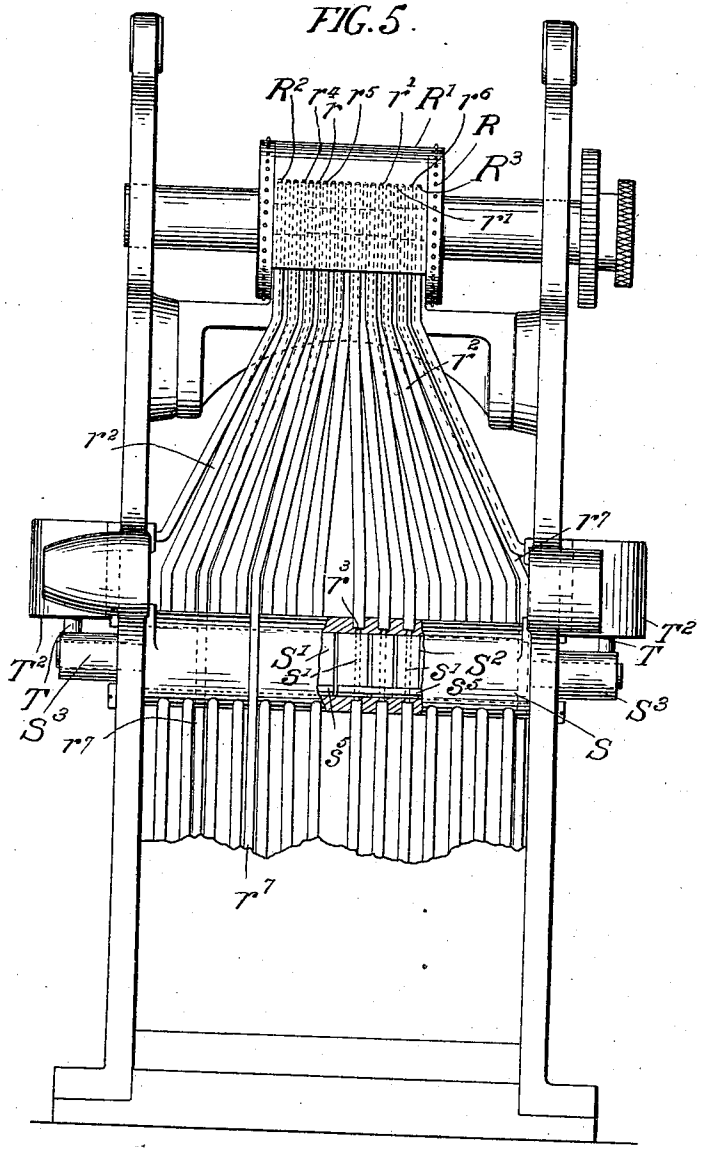
APPLICATION FILED JAN. 4, 1910.

980,933.

Patented Jan. 10, 1911.

7 SHEETS—SHEET 6.

FIG. 5.



Witnesses

Thomas Durant

Inventor

R. C. Elliott

by Church & Church

his Attorneys.

R. C. ELLIOTT.

PATTERN CONTROLLED COMPOSING MACHINE.

APPLICATION FILED JAN. 4, 1910.

980,933. **Patented Jan. 10, 1911.**

7 SHEETS—SHEET 7.

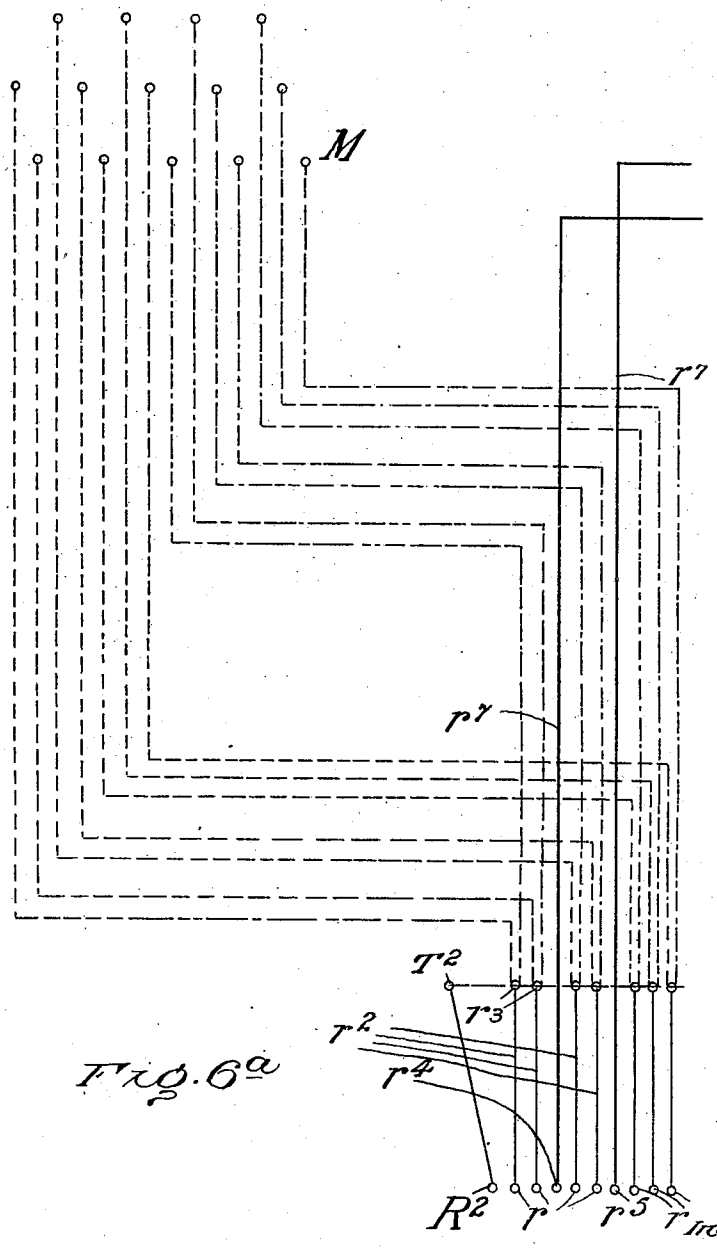


Fig. 6a

Witnesses

Thomas Durant

R. C. Elliott

by Church & Church

his Attorneys.

UNITED STATES PATENT OFFICE.

RICHARD CORNELIUS ELLIOTT, OF LONDON, ENGLAND, ASSIGNOR TO LANSTON MONOTYPE MACHINE COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF VIRGINIA.

PATTERN-CONTROLLED COMPOSING-MACHINE.

980,933. Specification of Letters Patent. Patented Jan. 10, 1911.

Application filed January 4, 1910. Serial No. 536,314.

To all whom it may concern:

Be it known that I, RICHARD CORNELIUS ELLIOTT, a subject of the King of Great Britain, residing at 18ª Cato road, Clapham, London, England, have invented a certain new and useful Improvement in Pattern-Controlled Composing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

This invention relates to improvements in the class of automatic composing machines wherein the selective action or mechanism is governed by a pattern, record strip or controller. The variety of pattern, record-strip or controller (hereinafter designated "pattern") most commonly employed for this purpose is in the form of a strip or ribbon of flexible material, usually paper, containing a succession of signals, such as perforations variously arranged and combined to produce a series of individual signals, each denoting a character, space, sign or special operation to be produced or performed by the automatic composing machine. A familiar example of such a system will be found illustrated and described in Patents No. 625,998 of May 30, 1899, and No. 654,115 of July 17, 1900, the first representing the automatic composing machine and the second the manually controlled pattern composing machine. According to said system each character designating signal comprises one or more perforations, and the automatic composing machine is equipped with a two way movable die case and two sets of positioning and gaging devices each of the latter responding to a component of the signal for any given character.

The characters are arranged in the die case in column and row series, and each set of gaging devices contains a member corresponding in position with each row or column. In the example given the die case is equipped to deal with a total of two hundred and twenty five characters or matrices arranged in fifteen columns of fifteen rows each, and with the exception of the characters located in one marginal row and one marginal column each represented by a fixed gaging member, the signal for each character contains at least two components, the one designating column and controlling the corresponding gage and the other designating row and controlling the complemental gage therefor. The signals for the characters in the marginal column and row each contain but one of these components, *i. e.*, that designating position in the row or column. Each of the twenty-eight controllable gaging members referred to (fourteen for the columns and a like number for the rows of characters) is in communication with one of a series of signal transmitting members or ports, the latter registering with and being controlled by the components of the signals as the latter are successively presented. The pattern is dimensioned to correspond with the space occupied by the series of signal transmitting members or ports, the latter including, in addition to those for the die case positioning gages, three or more members controlling special operations, such as the justification.

Now the principal object of the present invention is to effect a material reduction in the size of the pattern strip, and a consequent saving of material, without a corresponding diminution in the number of available signal components and die-case gaging members or otherwise reducing the capacity of the automatic composing machine or the equipment of the die case.

To this end the invention consists, broadly, in providing an automatic composing machine with translating devices or means, under the control of a special designating or pilot signal, for establishing communication between individual signal transmitting members or ports and any one of a plurality of gaging devices, so that the same signal component may be made operative upon either of two gaging devices, for designating different degrees of motion or positions of the die case.

The invention also consists in subordinate features relating to the construction and adaptation of the mechanism, all as hereinafter fully described, the novel feature being specified in the claims.

In the accompanying drawings illustrating a preferred form of embodiment of the said invention, Figure 1 is a more or less diagrammatic top plan view of the left section, and Fig. 1ª is a corresponding view of the right section of an automatic type casting and composing machine with the improvements shown applied thereto. Fig. 2 is a

sectional elevation of a portion of the paper tower. Fig. 3 is an end view of a portion of the paper tower with the added motor in section. Fig. 4 is a partial section on the line 4—4, Fig. 2, one of the switch members or valves being shown in full and the other in section. Fig. 5 is a front elevation of Fig. 2. Figs. 6 and 6A, together constitute a diagrammatic view showing the arrangement of air conduits, the left margin of Fig. 6 matching the right margin of Fig. 6A. Fig. 7 is a diagrammatic view of a section of the pattern.

Similar letters of reference designate like parts in the several views.

The invention is illustrated in connection with the automatic type casting and composing machine of Patent No. 625,998, and it will be sufficient, for present purposes to designate some of the principal elements most nearly associated therewith, such as the two series of primary gages each comprising a plurality of stop pins M or M′ serially arranged and individually controlled by the signal components; the two primary positioning mechanisms N N′ each comprising a pair of oppositely movable tongs or levers carrying jaws adapted to close upon a projected stop pin; two movable secondary gages or stop bars O, each engaged and moved to position by the jaws of the corresponding primary positioning mechanism; two secondary positioning mechanisms P P′ each comprising a pair of oppositely movable tongs or levers carrying jaws adapted to close upon the corresponding stop bar O and upon one of two heads O^2 the latter coupled respectively with die case Q and its carrier Q′ for shifting the die case to bring the matrix designated by the signal components acting through stop pins M M′ to the centering position opposite the mold; and the paper feed mechanism R with its tracker bar R′ containing a longitudinal series of transmitting members in the form of open ports.

In the machine of the patent referred to each of the twenty eight movable stop pins M M′ is provided with a controlling port in the tracker bar, and feeding mechanism is provided for presenting successive signal sections of the pattern to the series of ports so that each component of a signal will admit pressure through such of the ports as are at the time uncovered by the perforation or perforations composing the signal pertaining to such section. Now according to the present invention at least twelve of the ports heretofore employed are dispensed with, reducing the total number from thirty one to nineteen, without in any degree interfering with the action or diminishing the capacity of the machine as a whole, thereby correspondingly reducing the dimensions of the pattern strip and effecting a large saving in material. In carrying this plan into operation the three ports r^4, r^5, and r^6, pertaining to the transfer and justification operations remain as before, each port being directly connected to its piston or performing device, through a conduit r^7, while a series of eight ports $R^2 + r$ and $R^3 + r'$ is assigned to each series of stops M M′. The ports r r' of each series are individually connected by conduits r^2 with corresponding ports r^3 in a casing S, the latter containing two independent valves S′, S^2, one for each series of ports r^3.

Obviously separate casings may be furnished for the valves if desired, but the arrangement illustrated is preferred on account of its simplicity. Each valve section of casing S is further provided with two series of ports s^{10} s^{11}, whereof those pertaining to valve S′ are each connected by a conduit to one of the stop pins M, and those pertaining to valve S^3 are in like manner connected to stop pins M′. The ports s^{10}, s^{11} of each valve equal in number the movable stop pins pertaining thereto, and in the example given there are seven ports s^{10} connected with the first seven stop pins and a like number of ports S^{11} connected with the seven remaining stop pins of the corresponding series M or M′.

Each valve S′, S^2 is provided with a series of passages each terminating at one end in an enlargement or lateral extension s^2; a series of lateral passages s^3 each communicating with one of the passages s'; and two longitudinal exhaust grooves s^4, s^5. These members are so related to each other and the ports r^3, s^{10} and s^{11}, that when the valve is in its retracted or normal position, as indicated in Fig. 2, each passage s' will register with and establish communication between the corresponding port r^3 and s^{10} through branch s^3, one end of passage s' being at the time closed by the casing, and ports s^{11} uncovered by exhaust passage s^5. In this position pressure admitted through any port r (or r') will pass through the corresponding port s^{10} to its gage pin M (or M′) and project the latter. When, however, said valve is turned to its next position communication will be established between ports s^{11} and r^3 through passage s' and its lateral extension s^2, and at the same time branch s^3 will be closed by the casing, and ports s^{10} uncovered by exhaust groove s^4. In this position pressure admitted through any port r (or r') will be caused to act upon the stop pin corresponding with the complemental port s^{11}. Otherwise stated, when the valves are in one position ports r r' are placed in communication with and control part of the stop pins of their respective series M M′, and when said valves are shifted, the control of ports r r' is transferred to the different stop pins M M′, hence the signal valve

of each port r r' is determined by the position of the valve at the time pressure is admitted to said port.

Although, for purposes of illustration, the stop pins are shown divided into two groups provided with a separate series of ports s^{10} s^{11}, it is obvious that the number of groups may be increased and the number and the relative disposition of the individuals comprising each group may be varied without departing from the spirit of the invention.

To each valve S′ S² is coupled a motor under the control of one of the so-called pilot ports R², R³. In the preferred form illustrated each valve is provided with an arm S³ to which is coupled a piston rod T, the latter attached to a piston T′ working in a cylinder T² on the frame. A retracting spring T³ operating upon piston T′ serves to hold the valve under elastic pressure in its normal position with the ports r (or r') controlled thereby in open communication with one group of stop pins, and pressure admitted through the pilot port R² (or R³) will move the corresponding valve to its second position, thereby transferring the control of ports r (or r') from the first to the second group in each series of stop pins M (or M′).

From the foregoing it is clear that each of the series of ports r (or r') is adapted to control a plurality of stop pins differing in value, and that the signal valve of each port is dependent upon the position of its pilot valve S′ (or S²) and inasmuch as said valve when in normal position establishes one of the values of each port by maintaining it in communication with one of the value designating stop pins, it is only necessary, when the alternative value of the port is to be designated, to shift the valve and thus establish communication with another designating stop pin of different value. This is accomplished by associating with the signal or perforation designating any one of the ports of series r (or r') a component, such as a pilot perforation U, Fig. 7, adapted to register with the pilot port R² or R³, pertaining to the series to be brought into action.

With the exception of the corner position at the intersection of the marginal column and row (determined by the fixed stop pins of series M and M′ acting in conjunction, when no signal perforation is presented) each of the two hundred and twenty-four positions of the die case can be designated by from one to four perforations variously distributed over sixteen spaces, as compared with from one to two perforations distributed over twenty-eight spaces, thus effecting a saving of approximately one third the width of the record strip or pattern. A manually operated composing machine specially adapted for the production of the controlling pattern for the machine herein described, forms the subject of an application Serial No. 536,315, filed concurrently herewith.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a composing machine provided with a series of gaging members and a series of signal transmitting members controlled by a pattern, and in combination therewith, translating means intermediate said gaging and transmitting members for variously establishing communication between a transmitting member and a plurality of gaging members.

2. In a composing machine, the combination of the following elements, to wit; a plurality of gaging members; a signal transmitting member; a pattern controlling said transmitting member; and controllable means for coupling the transmitting member with a plurality of gaging members.

3. In a pattern controlled automatic composing machine, the combination of the following elements, to wit; a plurality of gaging members; a plurality of signal transmitting members; a pattern provided with signals each component whereof registers with or controls a separate signal transmitting member; and translating means intermediate the gaging and transmitting members for selectively establishing communication between individual signal transmitting members and any one of a plurality of gaging members.

4. In a pattern controlled composing machine, the combination of the following elements, to wit; a plurality of gaging members; a plurality of signal transmitting members; a pattern provided with signals the components whereof each registers with or controls a separate transmitting member; and a translating device under the control of the pattern for selectively coupling a signal transmitting member with a plurality of gaging members.

5. In a pattern controlled composing machine provided with a two-way movable die case, two series of gaging members, two series of signal transmitting members, and a pattern provided with controlling signals for said gaging members the components whereof control individual transmitting members, and in combination therewith, translating devices interposed between each series of transmitting members, and its complemental gaging members for coupling an individual transmitting member of the series with a plurality of gaging members, said translating devices being in turn controlled by the pattern.

6. In a pattern controlled composing machine provided with a movable die case, a series of gaging members therefor, a series

of signal transmitting members, and a pattern provided with signals the components whereof control individual transmitting members, and in combination therewith, translating devices or means under control of the pattern and operating to selectively couple individual transmitting members with any one of a plurality of gaging members common thereto.

7. In an automatic composing machine provided with a plurality of gaging members, a plurality of transmitting members, a pattern containing a series of signals the components of which register with separate transmitting members to control the latter, and in combination therewith, translating means for selectively coupling one of a plurality of gaging members with a transmitting member, the same including a switch controlled by a component of the pattern signal through one of the transmitting members.

8. In an automatic or pattern controlled composing machine, the combination of the following elements, to wit; a plurality of gaging members; a plurality of transmitting members each responsive to the complemental component of a pattern signal; and selective means including a switch member for coupling either of a plurality of gaging members with a transmitting member.

9. In an automatic or pattern controlled composing machine, the combination of the following elements, to wit; a plurality of gaging or positioning members; a plurality of transmitting members each responsive to a pattern signal component; and selective translating means for coupling a plurality of said gaging or positioning members with each transmitting member, the same including a switch member and control means therefor connected to a transmitting member.

10. In a composing machine provided with a series of gaging members, a tracker bar provided with a series of ports, and a perforated pattern containing a series of signals the components whereof register with complemental ports in the tracker bar, and in combination therewith, a switch or pilot valve controlling communication between a port in the tracker bar and a plurality of said gaging members for selectively actuating the latter from said port.

11. In a composing machine equipped with a series of gaging members and a tracker bar provided with a series of ports registering with the complemental signal components of a pattern, and in combination therewith, a valve controlling communication between each of said ports, and a plurality of said gaging members for selectively actuating the latter.

12. In a composing machine equipped with a series of gaging members, a pattern, and a series of transmitting members registering with the complemental signal components of the pattern, and in combination therewith, translating devices controlling communication between a transmitting member and a plurality of said gaging members for selectively coupling the latter with said transmitting member.

13. In a composing machine equipped with a series of gaging members, a pattern containing signal perforations, and a tracker bar provided with transmitting ports complemental to the signal components of the pattern, and in combination therewith, a pilot valve controlling lines of communication between each of said transmitting ports and a plurality of the gaging members, and means controlled by the pattern for actuating said valve, to selectively couple any one of said gaging members with its transmitting port.

14. In a composing machine equipped with a series of pattern-controlled transmitting ports and a series of gaging members, and in combination therewith a pilot valve under control of the pattern and in turn controlling lines of communication between each transmitting port and a plurality of said gaging members, to selectively actuate the latter.

15. In a composing machine equipped with a series of pattern controlled transmitting ports and a series of gaging members, and in combination therewith, a pilot valve under control of the pattern and controlling lines of communication between each transmitting port and a plurality of gaging members, the same including a valve casing provided with three sets of ports, those of one set communicating with the transmitting ports, another with a group of gaging members, and the third with a separate group of said gaging members, and a valve controlling said ports and operating to selectively couple the first set with either the second or third set of ports.

16. In an automatic composing machine, the combination of the following elements, to wit; a series of pattern controlled ports; a series of gaging members divided into groups; a valve casing provided with three sets of ports or passages, one set communicating with the pattern controlled ports, the second set with one group of gaging members, and the third set with the remaining group of gaging members; a pilot valve controlling the ports in the casing and operating to couple the first with the second and third sets of ports alternately; and a motor coupled with one of the pattern controlled ports for actuating said pilot valve.

17. In an automatic composing machine provided with two series of gaging members, and a series of pattern controlled transmitting members divided into two

groups, each of the latter apportioned to a series of gaging members, and in combination therewith, a translating means for each group of transmitting members adapted to couple each transmitting member with a plurality of the gaging members common thereto for selective action, and means controlled by the pattern for actuating said translating means to selectively couple the transmitting members of each group with either of the complemental gaging members connected therewith.

RICHARD CORNELIUS ELLIOTT.

Witnesses:
F. L. RAND,
H. D. JAMESON.