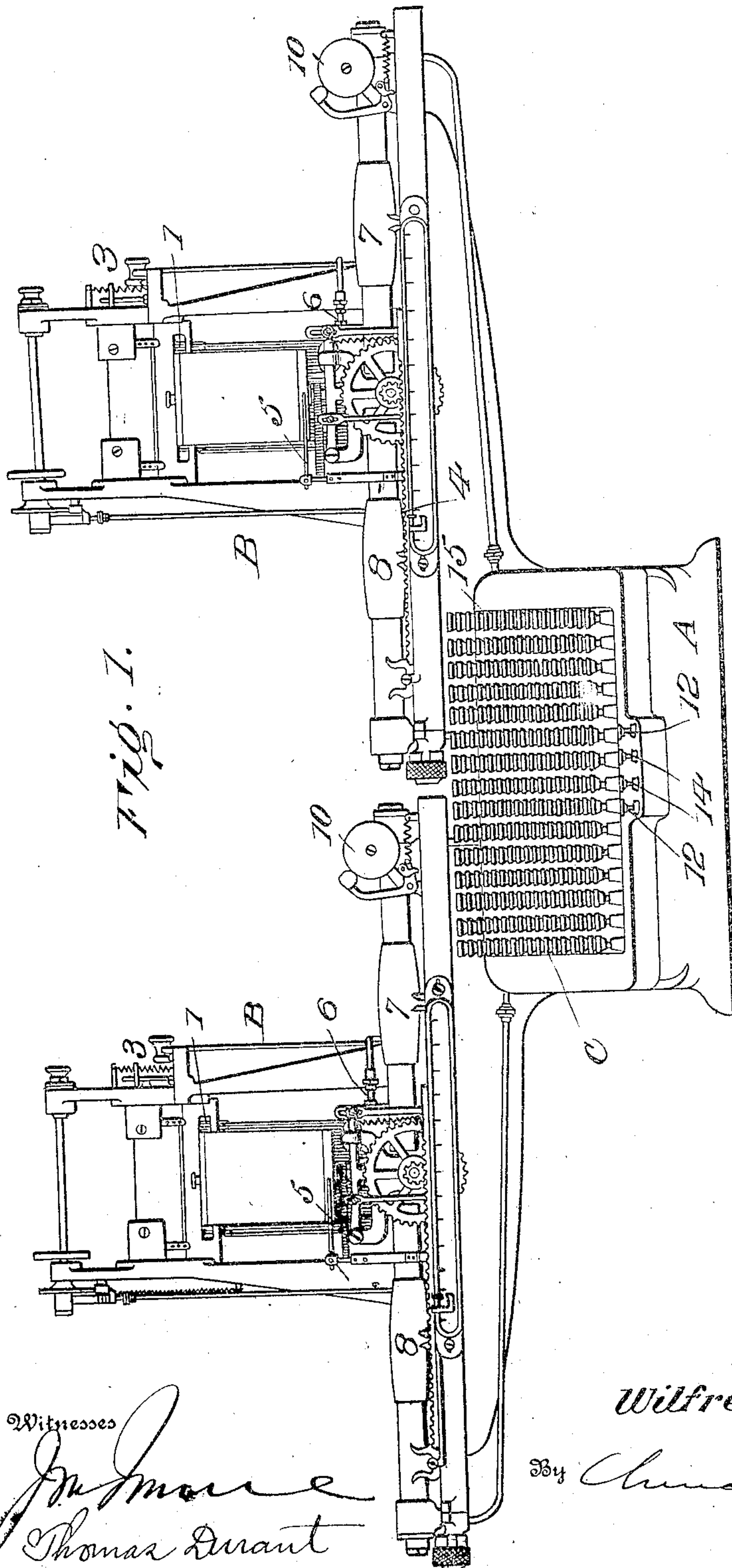


925,073.

W. BANCROFT.  
MULTIPLEX COMPOSING MECHANISM.  
APPLICATION FILED MAR. 5, 1908.

Patented June 15, 1909.  
4 SHEETS—SHEET 1.



Witnesses

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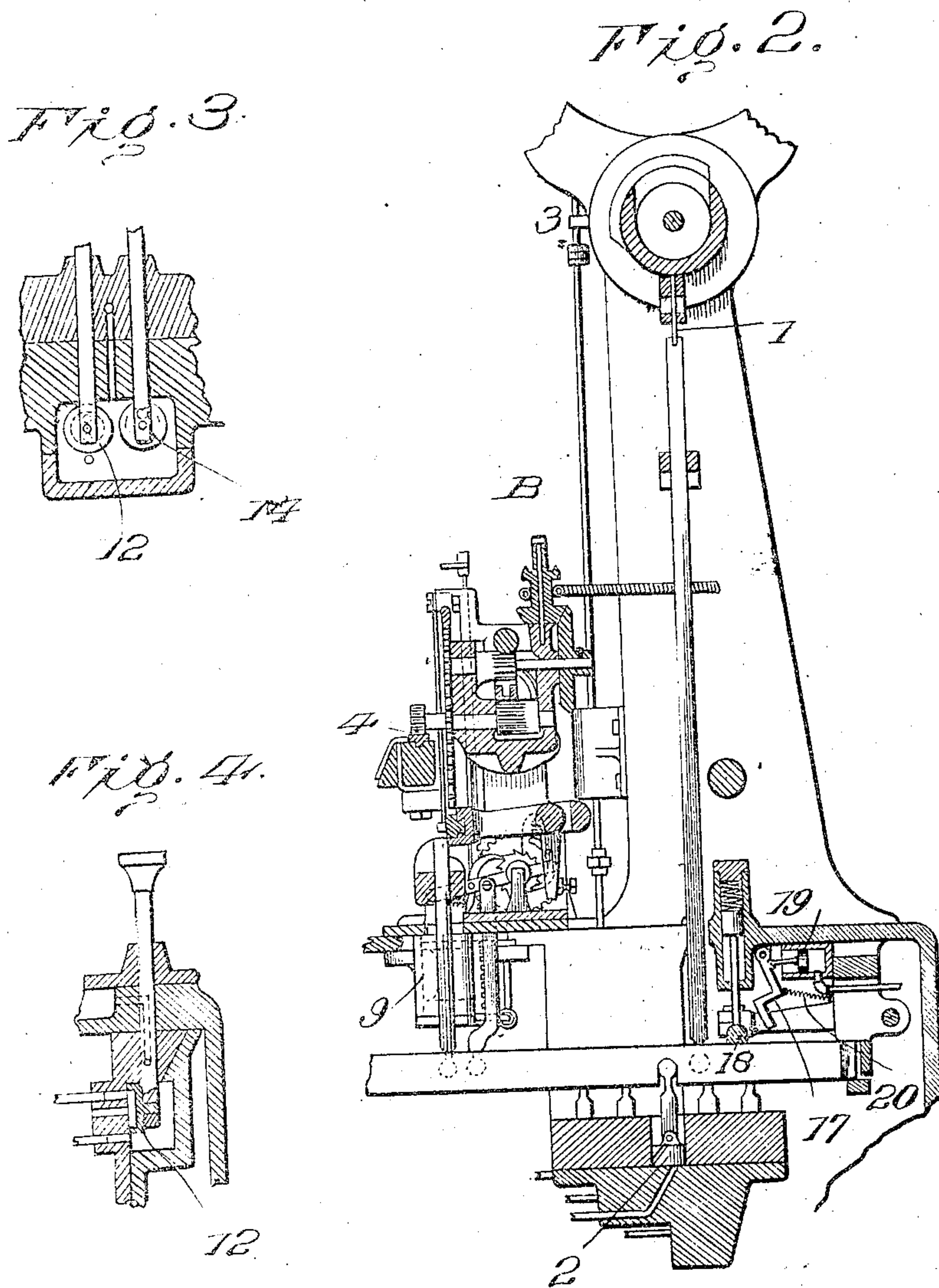
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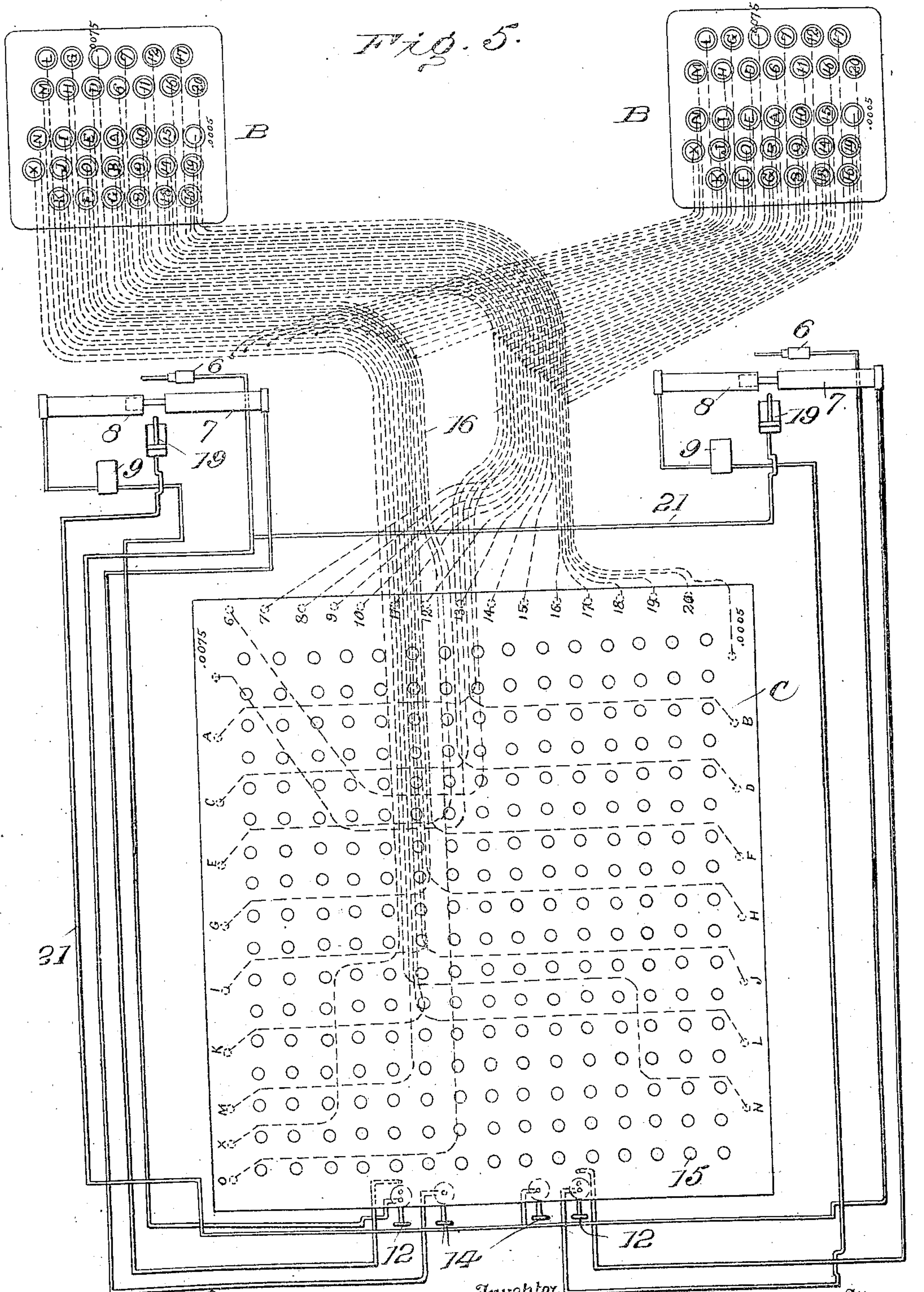


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4 SHEETS—SHEET 3.

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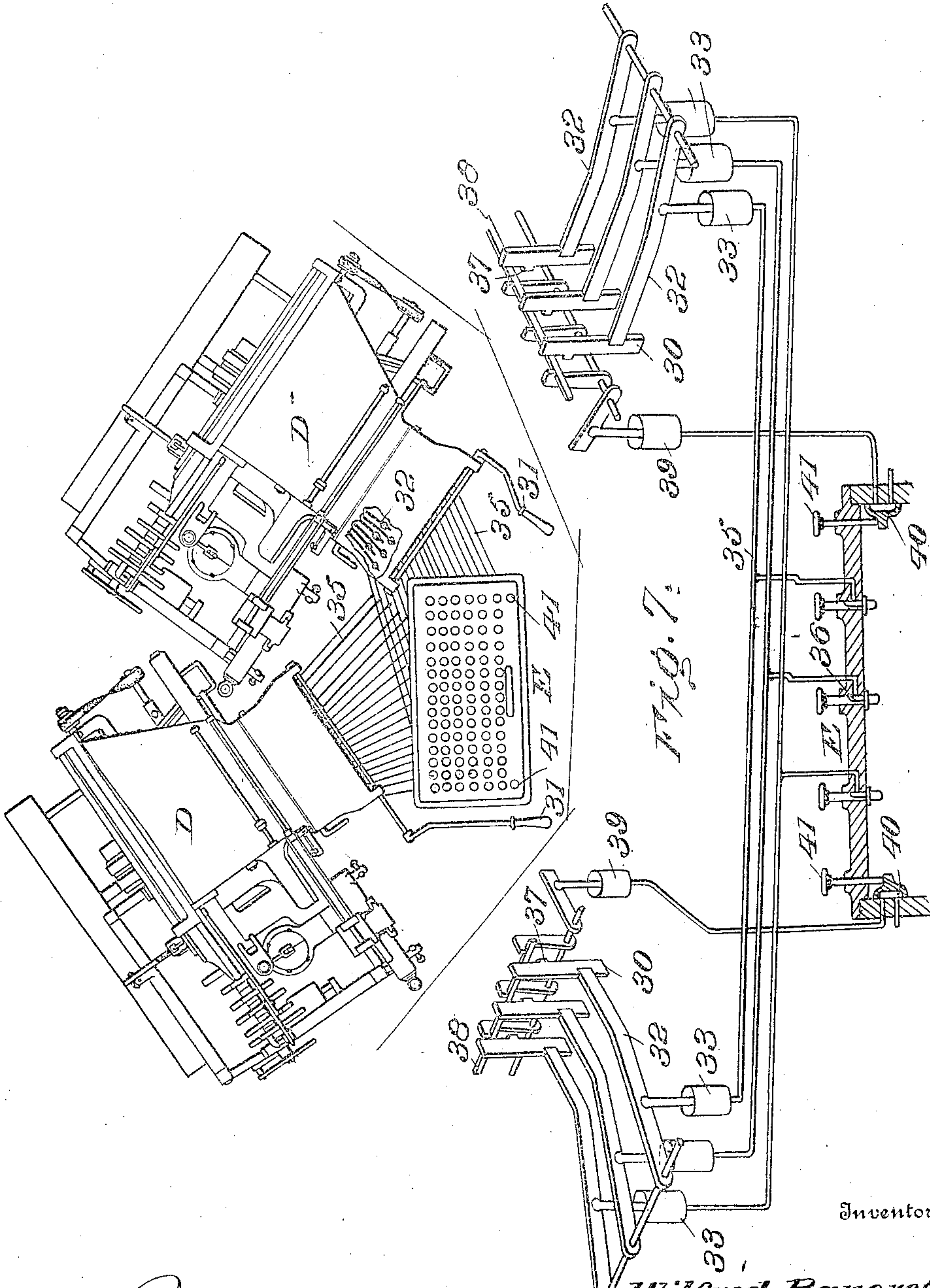
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4 SHEETS—SHEET 4.

FIG. 6.



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# UNITED STATES PATENT OFFICE.

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## MULTIPLEX COMPOSING MECHANISM.

No. 925,073.

Specification of Letters Patent.

Patented June 15, 1909.

Application filed March 5, 1908. Serial No. 419,346.

*To all whom it may concern:*

Be it known that I, WILFRED BANCROFT, of Philadelphia, in the county of Philadelphia, State of Pennsylvania, have invented a certain new and useful Improvement in Multiplex Composing Mechanisms: and I 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 has for its object the simultaneous composition or setting up of plural representations or copies of matter in lines justified to different measure or in characters of different setwise dimensions or both.

It is well known that in composing matter in justified lines regard must be had for the set size of the faces as well as the measure, for while the latter determines the space available for each line of type, the former affects the number of characters or type and of justifying spaces or word intervals hence the division of characters at the end of the line and the dimensions of the justifying fractions.

For example, matter set or composed in pica or 12 point and justified to a measure of say 30 ems, if set in agate or 5½ point will but partially fill the measure, requiring that a portion of the next succeeding pica line be included therein, thus establishing not only a different ending for the line, but a different justification fraction; and the same is true if two lines are composed in the same type but to different measure, the longer line will admit more characters and spaces, and include matter carried over into the succeeding shorter line. And in either case where one of the lines of duplicated matter ends in the middle of a word it becomes necessary to add a hyphen which does not appear at all in the complementary line composed in different face or to a different measure. Because of this lack of correspondence in the two products, it has heretofore been deemed impracticable to simultaneously compose or set up duplicate copies of the same matter in justified lines where the setwise dimensions of the font or the measure differed in the two copies, notwithstanding the desirability of so doing on the score of economy. These difficulties have, however, been removed or overcome by the present invention which, in its broader aspects, is applicable alike to the various

classes and kinds of composing machines equipped with competent means for effecting justification and operating either directly, as in the linotype, type setting, typewriting, matrix making and like machines, to produce a printing, printed or impressed surface, or, indirectly, as in the monotype and like systems, to produce a preliminary representation or pattern which in turn controls automatic mechanism for the production of the printing or impressed surface so impressed upon said pattern.

In addition to the special form of embodiment illustrated herein the invention consists, broadly, in the employment in connection with a plurality of composing units each equipped with character designating and line justifying devices or mechanisms, of a selecting mechanism, such as a keyboard, whose selective members or keys are connected in multiple with corresponding character designating devices of the several units, so that corresponding characters may be simultaneously selected, together with controllable means whereby the character selecting devices, or some of them, pertaining to the individual composing units may be cut out or their action temporarily suspended while those of one or more units are free to respond to the selecting devices, so that composition at the several units can be simultaneously performed and proceeded with until the line at one or more units is completed to measure, and, if necessary, a hyphen added, whereupon the justification devices pertaining to that unit are brought into action, without interference with or from those pertaining to the other composing units, after which multiple composition may be resumed upon all the units and continued until another line arrives at the justification stage, the additional matter being incorporated in and forming part of the next succeeding line at the unit where justification was first performed.

In the accompanying drawings, illustrating a preferred form of embodiment—Figure 1 is a front elevation of a multiplex controller composing machine. Fig. 2 is a vertical section through one of the composing units with a lock-out applied thereto. Fig. 3 is a face view and Fig. 4 a section through the resetting and justification indicator valves. Fig. 5 is a diagrammatic view showing the control connections. Fig. 6 is a top plan view of a multiplex linotype machine embodying the



invention. Fig. 7 is a diagrammatic view showing the lock-out equipment and actuators for the multiple composing units.

Similar letters and figures in the several figures designate like parts.

In order the better to illustrate the nature and scope of the present invention, it is shown as applied in connection with two known but dissimilar forms of composing units representative of the indirect and direct classes mentioned, to wit, a monotype record strip composing machine and a linotype matrix composing and slug casting machine; but it is to be understood that these are but typical illustrations and that other and different forms may be employed providing they embody character designating devices and means for justifying the lines as composed.

Referring first to the monotype or preferred form of embodiment illustrated in Figs. 1 to 5 inclusive, A designates a base or frame upon which are mounted two composing units B, located side by side, and a selecting unit or keyboard C, the latter arranged in front of and between the composing units so that the operator may readily observe the progress made at either or both composing units.

The essential elements of each composing unit are a series of character and space designating members and a justification mechanism including means for indicating the amount of space remaining to be filled by justification, together with means for effecting a proportionate variation in the dimensions of the justification spaces contained in the line.

The composing units B are substantially identical with those of Patents 654,115, dated July 17, 1900 and 828,449 dated August 14, 1906, omitting the keyboard. Each unit contains a series of character and space designating members in the form of punches 1, and a justification mechanism represented by line measuring mechanism 4, signal 10, justification indicator 5 and certain of the series of punches 1. In addition, each is provided with a record strip feeding mechanism 3; an actuating or setting motor 6 for the justification indicator 5; motor and motor-return cylinders 7 and 8 pertaining to the line measuring and justification indicator mechanisms; a release motor 9 for the justification indicator mechanism; a resetting valve 12 controlling the motor and motor-return cylinder and release motor 9, for returning the line measuring and justification indicator devices to zero position when a line of composition is completed and justified; and a justification indicator valve 14 controlling motor 6 for advancing the justification indicator, as fully described in the aforesaid Patent 828,449.

The selecting unit C, whose characteristic feature is a series of selective keys, is similar

to that of the keyboard element of Patent 654,115, and includes a series of keys 15 separated in two groups, the one representing the characters, spaces, etc. which enter into the composition, while the other represents various justification fractions. Instead, however, of coupling up the keys with the punches of a single composing unit B, each key is coupled in multiple with and controls corresponding designating elements of two or more units, which is accomplished by providing each of the pipes or lines of communication 16 with branch connections leading to the corresponding designating devices of the several units as indicated, diagrammatically, in Fig. 5.

To enable the character designating devices of any composing unit to be separately operated, as where it is desired to interpolate matter, change the face or font, or add a hyphen in one copy to the exclusion of the other or others, each composing unit B is provided with an independent lockout in the form of a movable member 17, Fig. 2, supported in position to be interposed between the rocking frame 18 overlying the punch actuating levers and a fixed bearing on the frame, so that when said member 17 is in its advanced or active position it will intercept and prevent the advance of the punches 1 when pressure is applied to their motors 2 through the action of the keys of the selecting member C.

Each lockout is provided with appropriate actuating devices such as a piston 19 and retracting spring 20, and in order to insure the cutting out or suppression of the justification punches of one composing unit while the justification signals or perforations are being applied at another unit, the cylinder containing lockout piston 19 pertaining to the right hand unit B is coupled, as by pipe 21, with the pipe controlled by justification indicator valve 14 of the left hand unit B, while the cylinder of the left hand lockout is in like manner coupled with the justification valve of the right hand unit. It results from this arrangement that whenever the key of the justification valve of one composing unit is acted upon, both the character designating and justification punches of the companion unit will be locked out or rendered non-responsive to the keys of the selecting unit C, without, however, interfering with the latter's control over the character designating and justifying devices of the unit whose justification indicator key is at the time acted upon, hence any characters may be added to the line or justification be performed at one composing unit without the same being carried over into the composition at the other unit.

It may here be remarked that the justification indicator key has been selected to perform this lockout function for two reasons;



first, because its operation does not in any respect interfere with the action of the composing unit with which it is associated, inasmuch as it merely operates to effect the advance of the justification scale to the position determined by the line measuring devices without, however, arresting the latter, hence it can be operated at any stage in the composition of a line; and, second, because said key is normally actuated preliminary to the formation of the justification signal, hence at a time when it is necessary to cut out the punches of the companion unit B, in order that the justification signals may not be reproduced at the last named unit.

The manner of using the duplex machine described is as follows: Assuming that two copies of the same matter are to be composed either in type of different set-wise dimensions and to the same line measure, in type of the same set-wise dimensions but to different line measures, or in type of different set-wise dimensions and to different line measures. The line measuring devices of the two composing units B are first set for lines of the required length, and composition is proceeded with as usual by striking in succession the keys of the selecting unit C, representing the characters, spaces etc. until the signal devices at one of the composing units advises the operator that the line on the corresponding unit is nearly or quite completed, whereupon he depresses the justification indicator key pertaining to that unit, thereby advancing the justification indicator to registering position, at the same time locking out the punches of the other unit B whose line is as yet incomplete. While holding the justification indicator key depressed he ascertains the keys required for justifying that line, depresses the indicated keys, to produce the justification signal perforations, releases the justification indicator key and depresses the restoring key of the unit whose line is thus justified. Thus the line at one composing unit is completed and justified while that at the other unit is only partly composed. Multiple composition is now resumed and continued until the signal devices indicate that the line at the second unit is completed, the added matter being composed as part of the next succeeding line at the first unit, whereupon the justifying and restoring operations are repeated, but this time with reference to the second unit alone.

Referring to the alternative form of embodiment of the principle as illustrated in Figs. 6 and 7, the composing units D are linotype machines of well known construction, such, for example, as that illustrated in Patent No. 436,532, dated Sept. 16, 1890, minus the usual key bank, each equipped with a series of character and space designating members, represented by the series of rods 30 through which the matrix and space escape-

ments are actuated, and provided with the usual justification mechanism, of which the starting or assembly block lifting lever 31, line scale and signal bell are constituent elements. As in the case of the duplex monotype composing machine hereinbefore described the two composing units D are so disposed with relation to each other and the selecting unit or keyboard E that the line measuring devices and justifying levers 31 of both shall be readily accessible to the operator. Each key of the composing unit is coupled in multiple with corresponding designating members or rods 30 of the two composing units D in a manner to produce simultaneous action and a consequent delivery of similar characters or spacers in the two lines, and, in addition, each series of rods 30 is provided with a lockout by which one series may be thrown out of action while the other is free to respond to the keys. A competent connecting mechanism or system for this purpose is illustrated, wherein each designating rod 30 is provided with a lever 32 and motor 33. Corresponding motors 33 of the two units are connected through a pipe or pipes 35 with a valve 36 controlled by the key representing the character or space assigned to the designating rod 30. Located in proximity to each series of designating rods 30 in position to engage shoulders or projections 37 thereon is a bar 38 pivotally supported and provided with a motor 39, the latter coupled with a valve 40 connected to a lockout key 41, there being a key 41 for each composing unit. The mode of operation is similar to that hereinbefore described with reference to the monotype composing machine. Composition is simultaneously performed on the two units until the operator observes that one line is completed and ready for justification, whereupon he depresses the justifying lever pertaining to the unit whose line is shown to be complete, thereby automatically justifying said line and restoring the line measuring devices to initial position for the reception of a new line; after which multiple composition is resumed and continued until the line of the second unit is completed when the process is repeated with relation to said second composing unit.

I am aware that it has heretofore been proposed to actuate a plurality of composing units from a single keyboard for the production of duplicate copies of the same matter, as illustrated in Patents 663,971 of Dec. 18, 1900, and 279,790 of June 19, 1883, but they differ essentially from my present invention, in that but a single justification mechanism common to the several composing units is employed instead of a separate justification mechanism for each of said units hence the several lines produced, if justified at all, must be identical both in the matter and in measure.



I believe myself to be the first to devise and produce a mechanism whereby duplicate copies of the same matter can be simultaneously composed, or set up and justified in lines differing in measure or in type of different set-wise dimensions.

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

1. A multiplex composing mechanism such as described including in combination, a plurality of composing units each provided with means for justifying the lines as composed thereon, and a selecting unit common to all the composing units.

2. In a multiplex composing mechanism such as described the combination of the following elements, to wit; a plurality of composing units each equipped with character designating and line justifying devices, including means for measuring the line as composed; and a selecting unit provided with a series of selecting members or keys each of the latter coupled in multiple with corresponding designating devices of the composing units.

3. In a multiplex composing mechanism such as described, the combination of a plurality of composing units each containing means for justifying the lines composed thereon, and a selecting unit provided with a series of selecting members each coupled with corresponding designating devices of the several composing units and located in such relation and proximity to said composing units that the justification devices thereof will be under the direct observation and control of the operator at said selecting unit.

4. In a multiplex composing mechanism such as described the combination of the following elements, to wit; a plurality of composing units each provided with a series of designating members, means for measuring and justifying the line, and a lockout for its designating members; a selecting unit provided with selecting members, each coupled with corresponding designation members of the several composing units; and means for separately actuating said lockouts.

5. In a multiplex composing mechanism such as described, the combination with a plurality of composing units each provided with a series of character designating mem-

bers, a justifying mechanism and a lockout for said character designating members, of a selecting unit provided with a series of selecting keys each coupled with corresponding designating members of the several composing units and with a plurality of keys, one for each composing unit, coupled with said lockouts.

6. In a multiplex composing mechanism such as described, provided with a plurality of composing and justifying units each equipped with a lockout for its designating members, and in combination therewith, a keyboard or selecting unit common to the several composing units provided with means for separately controlling the lockouts and restoring the line measuring devices of the several composing and justifying units.

7. In a multiplex composing mechanism such as described, the combination of the following elements, to wit; a plurality of composing and justifying units each provided with a series of character designating members and line justifying devices including line measuring mechanism and resetting or restoring devices; a plurality of lockouts, one for each series of character designating members; and a selecting unit or keyboard whose selecting members or keys are each coupled in multiple with the corresponding character designating devices of the several composing units, and provided in addition with a plurality of keys, two for each composing and justifying unit, the one controlling the resetting devices and the other the lockout.

8. In a multiplex composing mechanism such as described, the combination with a plurality of composing and justifying units each provided with a series of designating members, a lockout therefor, a justification indicator and means for positioning the latter, of a selecting unit common to the designating members of the composing units, and a plurality of justification indicator keys, one for each composing unit, the justification indicator key of each composing unit controlling the lockout of the companion composing unit.

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