F. H. PIERPONT.

TYPE CASTING MACHINE.

APPLICATION FILED JULY 26, 1909.

1,008,364. **Patented Nov. 14, 1911.**

2 SHEETS—SHEET 1.

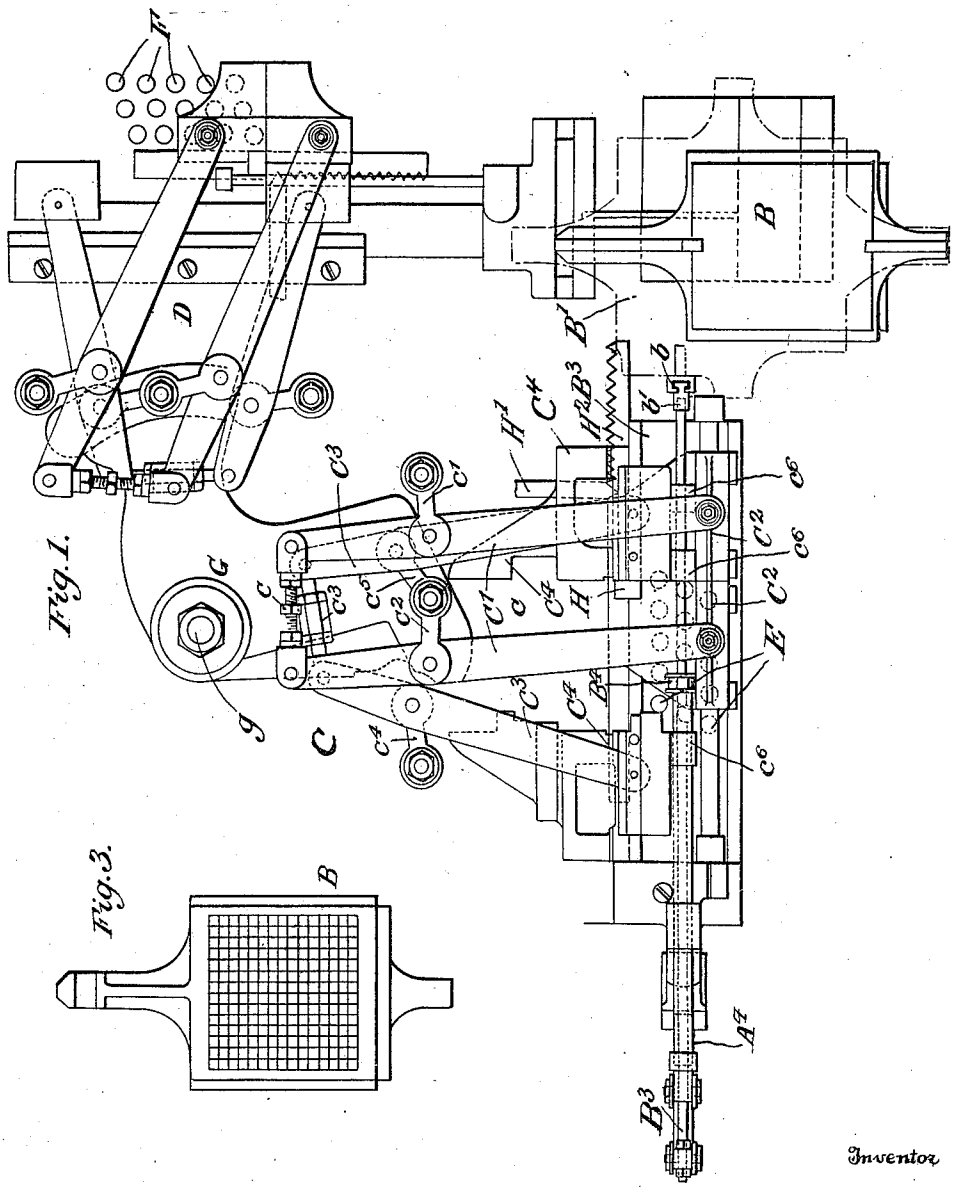


Fig. 1.

Fig. 3.

Witnesses

Thomas Durant

Inventor

Frank H Pierpont

By Church & Church

Attorneys

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

F. H. PIERPONT.

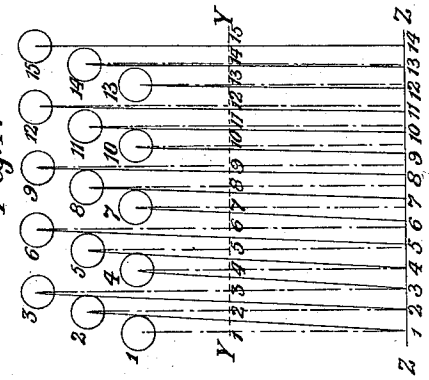
TYPE CASTING MACHINE.

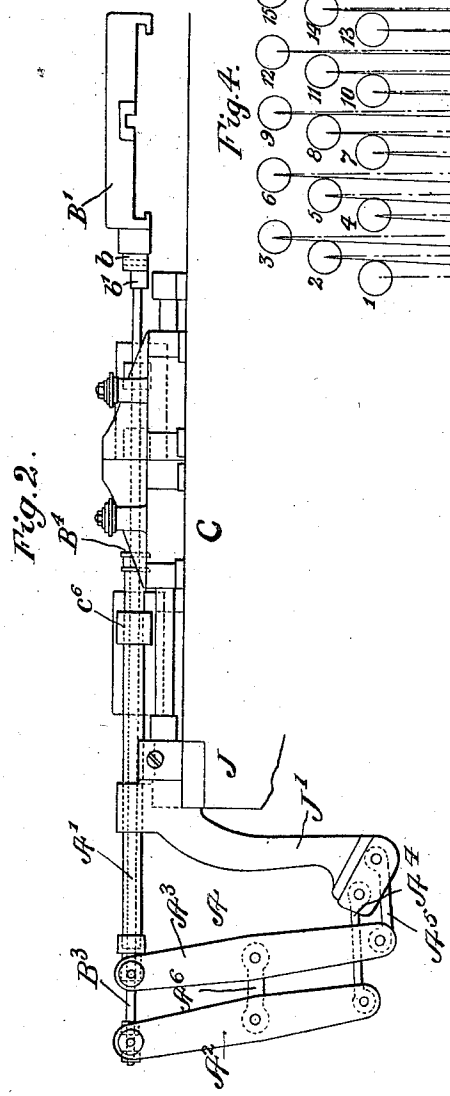
APPLICATION FILED JULY 26, 1909.

1,008,364.

Patented Nov. 14, 1911.

2 SHEETS—SHEET 2.





Witnesses

Inventor

Frank H Pierpont

By Church & Church

his Attorneys

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANK HINMAN PIERPONT, OF HORLEY, ENGLAND, ASSIGNOR TO LANSTON MONOTYPE MACHINE COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF VIRGINIA.

TYPE-CASTING MACHINE.

1,008,364. Specification of Letters Patent. Patented Nov. 14, 1911.

Application filed July 26, 1909. Serial No. 509,587.

To all whom it may concern:

Be it known that I, FRANK HINMAN PIERPONT, a citizen of the United States, temporarily residing at Horley, county of Surrey, England, have invented a certain new and useful Improvement in or Relating to Type-Casting 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 machines for casting single types wherein there is employed a die case or matrix-carrier, the individual dies or matrices in which are centered over the mold by a two-way movement of the die-case or matrix-carrier, the extent of movement in each of the two directions being determined and controlled by gages, stops or other controlling mechanism rendered operative, as required, to act upon or in conjunction with a positioning mechanism operatively connected with the die-case or carrier.

In the matrix carrier or die-case, which generally or usually comprises a frame wherein the type character or other matrices are arranged or assembled in rows, the distances between the centers or centering positions of the matrices are all equal to one another and proportional to the distances between the individual gages, or the members of a series of gages or controllers, so that while the same gaging members may serve for different die-cases, or die-cases each having matrices for characters of a "point" or "body" value different from another yet hitherto it has been necessary that the distances between the centering positions of the matrices in all die-cases which can be used on the machine be always equal or a constant, otherwise the matrices in the die-case or die-cases wherein the centering distance differed from the normal, could not be accurately centered over the mold by the gaging and positioning mechanism; thus, by limiting the size of matrix, a limit is put on the "point" or "body" dimension or size of type which the machine is capable of casting.

Machines such as referred to are designed to take die-cases for matrices up to the largest "point" or "body" size or dimension in common or general use, and while a machine could be constructed for use with larger matrices or with matrices for producing what may be called an odd size of type, yet such machines would have a limited general use, and if capable of being used with ordinary matrices would not be commercially satisfactory or practicable on account of extra cost in running and upkeep, not to mention other obvious drawbacks. Theoretically, of course, the size or matrix-carrying capacity of the die-case or carrier may be indefinite, but in practice it has been found desirable or necessary to limit the size with due reference to the questions of inertia and momentum, otherwise the life of the die-case and its coöperating mechanism is greatly shortened, and, in addition, a detrimental load or strain is placed upon the operating parts of the machine. Whatever size of matrix these machines have hitherto been, or can be, constructed to take they have been and are capable of use only with die-cases wherein the distance between centering positions of the matrices in all the different die-cases is always the same or a constant. Such limitations in the size of the die case accordingly put a limit on the size of the individual matrices, and, therefore, the size of the type which the machine is capable of casting, since there is always a limit to maximum size of character that can be satisfactorily placed upon a particular sized matrix. Hitherto, therefore, in machines of this class, for example that of Patent No. 625,998, dated May 30, 1899, the maximum number of characters in a die-case of a particular lay-out deemed necessary for ordinary printing purposes has limited the size of type that a machine is capable of producing to 12-point, that being the largest "point" or "body" size that can be placed with safety upon the matrix body, and any "point" or "body" size below that, of course, can be accommodated comfortably on the matrix.

It is the chief object of this invention to overcome the above mentioned drawbacks, limitations and objections, and to render it practicable to employ on a casting machine, die-cases wherein the distances between the centering positions of the matrices in one die-case are different from those in another die-case.

To this end the invention consists in providing a die-case positioning mechanism, acting automatically and in conjunction, with a series of gages, or controllers, of mechanism operative upon the die-case to determine the matrix from which a cast is to be made, whereby the amount of movement designated or determined by such gaging mechanism to be imparted to the die-case is varied, augmented, or multiplied at each centering position thereby enabling a die-case to be employed wherein the distance between the centering positions of the matrices in the various die-cases differs from one another or from the normal and or wherein such distance differs from the distance between the gages or controllers.

More particularly considered, the invention comprises a plurality of levers of unequal effective length or throw linked together and each fulcrumed to a stationary support and interposed to act automatically between the die-case and the gaging devices or controllers, one of the levers being controlled by the gaging mechanism and the other connected to or controlling the movements of the die-case or its carrier.

Although the invention is more particularly adapted for application to the machine of Patent No. 625,998, it is not intended to limit it for use with this or any other particular machine, as, in its broad aspect, the invention can be applied equally well to other machines for augmenting, varying or multiplying, for the purpose stated, the movement determined or designated to be imparted to the die-case or carrier by controllers or by gaging or main positioning mechanism.

A matrix-carrier or die-case as employed in the above named machine is adjusted or positioned to bring the required matrix over the mold cavity by two movements at right angles to one another, the extent of movement in each direction being determined by a series of gaging devices or controllers preferably in the form of pins that can be projected when required to engage and determine the movement of main positioning mechanism connected with the die-case. The gaging devices are arranged in two sets, one set for selecting the particular column or row in the die-case and the other set for determining the particular matrix in that column. Coöperating with the gaging devices are positioning mechanisms comprising floating levers or tongs which engage the pins and operate upon the die-case or its carrier.

In its present embodiment the invention is applied as a supplementary positioning mechanism acting automatically to vary the travel determined by the gaging devices to be imparted to the die-case by the said positioning mechanism.

Referring to the drawings—Figure 1 is a plan view of the mechanism in its preferred embodiment and applied to the die-case positioning mechanism of the type-casting machine according to the aforesaid patent. Fig. 2 is a side elevation of the mechanism shown in Fig. 1, and Fig. 3 is a face plan of the die-case. Fig. 4 is a diagram illustrating the effect of the mechanism according to the present invention in varying or augmenting the movement applied to the die-case by its main positioning mechanism under the action of the gaging devices.

The same letters of reference wherever repeated indicate the same parts in all the figures of the drawings.

A is the positioning mechanism forming the subject of the present invention and comprising levers A^2 A^3 connected by a link A^6.

It is not deemed necessary to give a detailed description of the construction and operation of the machine according to the aforesaid Letters Patent; it will be sufficient to briefly refer to parts more intimately connected or coacting with the mechanism which forms the subject of the present invention.

B is the die-case (see Fig. 3) which comprises a frame wherein the matrices are suspended in parallel rows running in two directions, each matrix being capable of slight movement relatively to the others to insure accurate centering of the selected matrix over the mold cavity under the action of a matrix centering and clamping plunger or mechanism (not shown.) The die-case is mounted to slide in a carrier B′ shown in broken lines in Fig. 1, and the holder is mounted to slide at right angles to the movement of the die-case on a stationary support (not shown).

C and D are the die-case translating devices or positioning mechanisms adapted to act upon the die-case and its carrier to translate the die-case from one matrix-centering position to another, and while according in principle with the mechanism described in the specification of the aforesaid patent, are constructed according to the specification of Letters Patent No. 749,149, of January 12, 1904. The two mechanisms work on intersecting lines and each determines position in one direction only. These mechanisms are respectively controlled by a series of gage pins E, F, constituting primary controllers under the action of a perforated record strip, and each positioning mechanism comprises two pairs of floating levers. Of the mechanism C, one pair of levers C′ linked together at c at their outer or free ends, are provided with oppositely movable jaws C^2 forming primary positioning devices by closing upon whichever pin of the series E is projected. The right hand lever C′ is connected by a link c' to a stationary support on the ma-

chine, and the left hand lever C′ is connected by a link at c^2 to an arm of a bellcrank G. The second pair of levers C^3 of the positioning mechanism C are linked together at c^3 and the left hand lever is connected by a link c^4 to a stationary support on the machine, while the right hand lever C^3 like the left hand lever C′ is connected by a link c^5 to the same point of the bell-crank G as the left hand lever C′.

In operation, by the oscillation of the bellcrank G, one or the other of the levers C′ first engages through its jaw with the projected pin of the series E, and by engaging it transfers the fulcrum of the two levers so that the jaw of the second lever C′ is brought against the opposite jaw and the jaws by their combined action adjust to a position in line with the selected pin, a stop H constituting a secondary controller, and this stop after being positioned by the jaws C^2, is locked by the engagement of a pin H′ with a rack H^2 carried by the stop. Following the movement of the lever C′, the levers C^3, the jaws C^4 of which constitute secondary positioning mechanism, are similarly controlled by the oscillating bellcrank G so that the jaws C^4 carried on the outer ends of the levers C^3 are caused to close upon the stop or secondary controller H. Hitherto, these jaws C^4 by engaging the stop H, have been caused (in order to bring the die-case to the position designed by the stop H) to engage a stop B^4 carried by and rigidly secured to, the draw-rod B^3 connected to the die-case carrier, and according to the present invention these jaws still position the stop B^4, but it is not now connected directly to the draw-rod, but through the intermediary of the supplementary positioning mechanism A.

As the positioning mechanism D is similarly constructed and operates in a similar manner to the mechanism C and operates to position the die-case set-wise of the matrices or in a direction at right angles to that effected by the mechanism C, it is not necessary to enter into details of construction or operation of mechanism D as it is not directly concerned with the present embodiment of the invention although the mechanism herein described may be duplicated in connection with the positioning mechanism D. The mechanism C is attached to the die-case carrier and the mechanism D to the die-case itself.

The drawrod B^3 attached to the die-case carrier B′ and hitherto acted upon by the mechanism C is, in accordance with the present invention, extended clear of this normal or main positioning mechanism C, and for convenience in supporting it, the jaws C^4 are provided with bearings c^6 through which the draw-rod B^3 passes freely. The die-case is raised and lowered relatively to the mold, and the draw-rod B^3 connected to the die-case carrier does not follow this motion; a sliding connection is therefore placed between them. The carrier shown in broken lines (Fig. 1) is provided with a vertical T-shaped socket b within which is disposed a T-shaped head or projection b' on the end of the draw-rod. The stop B^4 is now carried by a tubular rod A′ which surrounds the draw-rod B^3 and is connected to a terminal or member of the mechanism A while the outer end of the draw-rod is connected to another terminal or member of the mechanism A.

The supplementary mechanism A comprises conveniently a pair of duplicated levers A^2 A^3 of different effective lengths or having different effective throws. The lever A^2 is at its lower end connected, preferably by a link A^4, to a bracket J′ on the machine frame J and similarly the lever A^3 is connected to the same bracket by a link A^5. Intermediate of their ends the two levers are connected together by a link A^6. The upper end of the lever A^2 is connected to the draw-rod B^3 while the similar end of the lever A^3 is connected to the tubular rod A′ carrying the stop B^4.

In the present embodiment the mechanism is designed to multiply or augment the amount of movement determined by the pins of the series E to be imparted to the die-case by the positioning mechanism C and in the example illustrated the die-case B (see Fig. 3) is provided with matrices the distances between the centering positions of which in the direction of its movement controlled by the mechanism C are greater than the distances between the stop-pins E. There are, as shown, fifteen pins in the series E, each pin denoting a centering position of the die-case which heretofore has been, as already stated, adapted to have fifteen matrices in a row. The die-case (see Fig. 3) has fourteen matrices in the horizontal rows, or in the "point" or "body" dimension of the characters which is in the direction of movement controlled by the mechanism A, while the positioning mechanism D and the controlling or gaging mechanisms C and E are contrived for fifteen positions or matrices. Since there are now only fourteen centering positions in each horizontal row of matrices only fourteen pins are required in the gaging mechanism E. It is not, however, a question of merely deleting a matrix from a row and one pin from the series E since the fourteen matrices occupy the same amount of space in a row as do the fifteen normal matrices, but the distance between the centering positions is increased and is no longer equal to the distances between the pins of the series E. Thus while one pin, say the first, of the series is no longer necessary and the perforation controlling it will

no longer find a place in the record strip controlling the pins, the distance between the extreme ends of travel of the die-case remains the same, and although there are now fourteen pins to give fourteen positions of centering yet these positions will not correspond with the positions of the die-case determined by the same fourteen pins hitherto, as the fourteen centering positions are distributed over the same space hitherto occupied by fifteen and thus each successive position throughout the row will be farther and farther removed from its original position. The effect of the mechanism according to the present invention is shown on the diagram Fig. 4 where 1 to 15 indicate the pins of the series E to control the mechanism C for the centering positions of the matrices; the broken lines extending from the pins E to the line Y—Y denote the centering positions when the pins control fifteen positions, the distance between which corresponds to the distance between the pins. The full lines from the pins onto the line Z—Z denote the new positions effected by the mechanism A and identify each position with the pin of the series E by which the positioning is controlled, and the dot and dash lines projected from the old centering positions in line Y—Y to the new positions in line Z—Z, show the difference between old and new positions. Pin 1 shown in broken lines is the pin selected to be deleted; pin 2 now the first of the series centers the die-case in practically the same position as pin 1 did formerly. Pin 3 places the die-case in its second position slightly in advance of the former second position by the additional amount of one increment of the space to be absorbed; the fourth pin advances the die-case by twice the additional increment and so on, increasing one increment with each position until the fourteenth position coincides with the previous fifteenth. No change is made in the set-wise dimension of the matrices, so that in place of being square in cross-section, as hitherto, the matrices, being slightly increased in the "point" or "body" dimension, will be oblong in cross section.

Although the invention has been described as applied as a supplementary positioning mechanism, it is not to be limited to such use; neither is it to be understood as limited for use in increasing or augmenting the amount of movement determined by gaging or controlling mechanism, as it can equally well be applied for decreasing the movement indicated or designated by the controllers by a proper proportioning of the levers. Also by making the fulcrums of the levers adjustable, the amount of movement for each centering position of the die-case can be varied.

In the machine with which the improvements are herein shown associated the mold is adjusted to the set or unit value of each character as it is to be cast, and at the beginning of each line justification devices are set. These adjustments are controlled by movable wedges, and advantage is taken of the die-case positioning mechanism to effect the movements of the wedges. In the positioning mechanism C already referred to, the jaws C^4 are employed to engage the justifying wedges and move them. Further, the wedges which are moved one after the other are each adjustable to fifteen positions each position being determined by the pins E. As now only fourteen positions are available (one of the pins E having been discarded) the justification wedges of the existing machine will require to be modified accordingly, as in the composing machine for perforating the record strip controlling the operations of the casting machine herein described, the justification indicator will also be based upon fourteen positions instead of fifteen. This is only incidental to the embodiment herein described since in machines where the actuation of the mold adjusting wedges or devices is independent of the die-case positioning mechanism, such modification as above referred to is not called for. For example, in the machine according to Patent No. 770,253 of Sept. 20, 1904, the wedges in use ordinarily will be employed with the mechanism forming the subject of the present invention.

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

1. In a type-casting machine the combination with a movable matrix-carrier or die-case and a plurality of stops or gages or controllers serially arranged, of a positioning mechanism which automatically augments, varies or multiplies at each centering position the extent of movement-determined by the stops, gages or controllers, to be imparted to the die-case.

2. In a type casting machine provided with a movable die case and a series of gaging members for determining successive positions of the die case and, in combination therewith, a translating or positioning mechanism adapted to automatically and progressively vary, multiply or augment the movement imparted to the die case when acted upon by successive gaging members.

3. In a type-casting machine the combination with a movable die-case or matrix-carrier and mechanism for translating the case or carrier from one centering position to another, of automatically operating supplementary translating mechanism disposed for the purpose described between the main translating or positioning mechanism and the case or carrier.

4. In a type-casting machine having a

movable die-case and a plurality of gages or controlling devices serially arranged the combination with main translating mechanism controlled by the gages or controllers, of mechanism operatively connected to the translating mechanism and to the die-case to automatically vary at each centering position the amount of movement determined by the gages or controllers to be imparted to the die-case or carrier by the translating mechanism.

5. In a type-casting machine the combination with a movable die-case and a translating mechanism acting in conjunction with serially arranged stops or controllers, of a pair of levers having different effective throws or lengths connected one to a head acted upon by the translating mechanism and the other to the die-case or its carrier with a link connecting the levers intermediate of their ends.

6. In a type-casting machine the combination with a plurality of gages or controllers serially arranged and a head B^4 the stopping positions of which are controlled by the gages of a pair of levers such as A^2 A^3 connected together intermediate of their ends attached to a stationary support at one of their ends and at their other ends connected for the purpose described one to the die-case and the other to the head B^4.

7. In a die case positioning mechanism such as described, provided with a movable die case, primary and secondary controllers and primary and secondary positioning mechanism, and in combination therewith, a pair of connected levers mounted on a stationary support, a rod connecting one of said levers and the die case, and a rod coupled with the other of said levers and provided with a head within the sphere of action of the secondary positioning mechanism.

8. In a positioning mechanism for a die-case or matrix carrier of a type casting machine, the combination with a plurality of gages or stops arranged serially at equal and fixed distances for all die cases and translating devices for moving the die case or carrier accordingly from one centering position to another, of a die-case wherein the centering distances between the matrices differ from those of the gages, and variable translating mechanism whereby the amount of movement determined by the selected stop or gage to be imparted to the die-case or carrier is multiplied, augmented or varied progressively for each successive position in the series.

9. In a type casting machine provided with a movable die-case and a positioning mechanism therefor controlled by a plurality of gages or pins serially arranged and in combination therewith translating devices intermediate said positioning mechanism and die-case for varying the measure indicated by the spacing of the gages.

10. In a type casting machine including a movable die-case and a positioning mechanism therefor controlled from a pattern through a series of equally spaced gages and in combination therewith variable translating devices intermediate said die-case and positioning mechanism and operated upon by the latter to vary the measure indicated by the spacing of the gages.

11. In a type casting machine equipped with a movable die-case and a positioning mechanism therefor provided with oppositely movable jaws whose closed position is variably determined by a series of equally spaced gages or pins, and in combination therewith variable translating or transmitting devices intermediate said die-case and positioning jaws and operated upon by the latter to change the effective measure indicated by the intervals between successive gages of the series.

FRANK HINMAN PIERPONT.

Witnesses:
R. WESTACOTT,
H. D. JAMESON.