

No. 864,087.

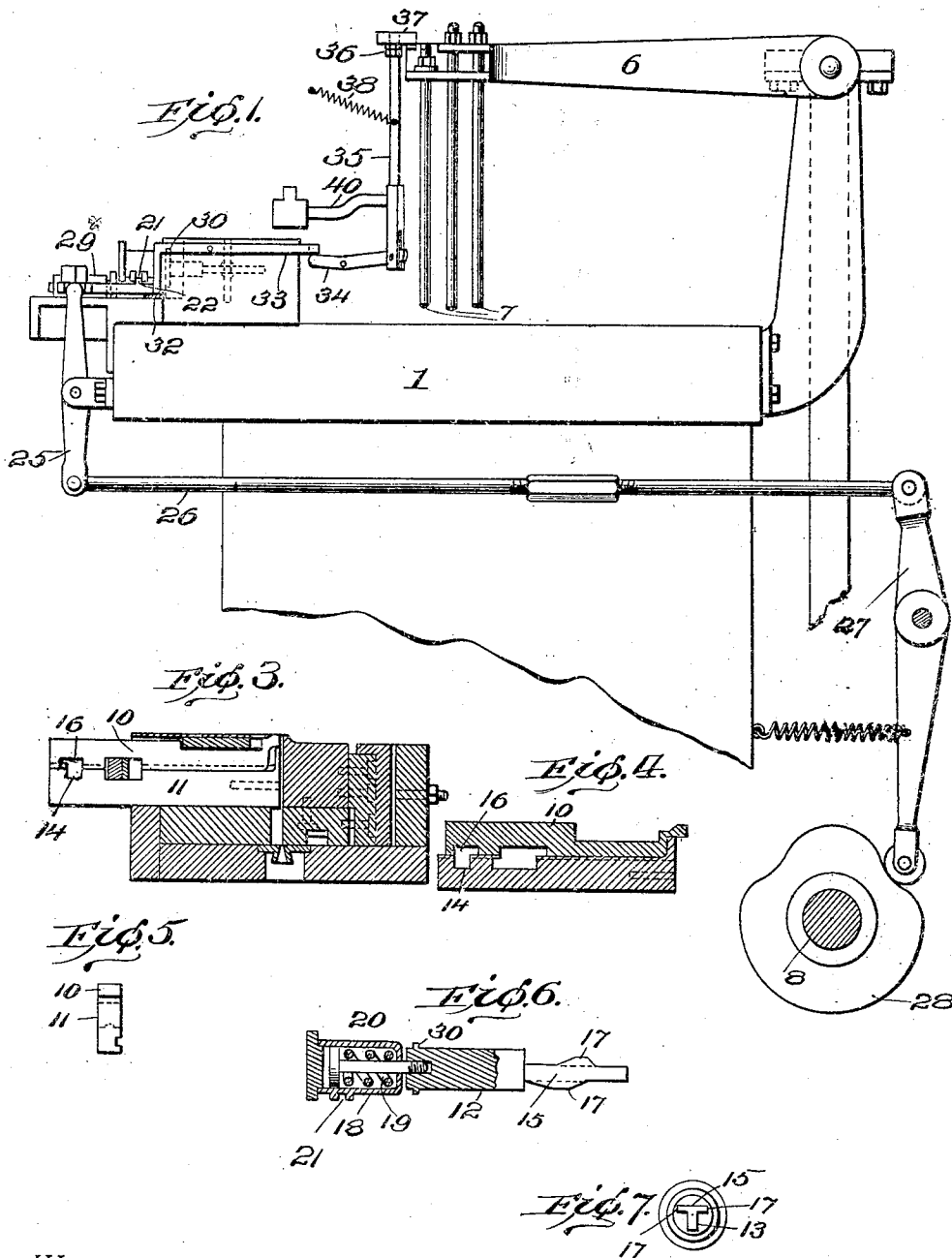
PATENTED AUG. 20, 1907.

H. M. DUNCAN, C. H. PRICHARD & C. R. MACAULEY.

TYPE CASTING MACHINE.

APPLICATION FILED DEC. 17, 1902.

2 SHEETS—SHEET 1.



WITNESSES:

J. M. Fowler
Elizabeth Puppitt

INVENTORS

Harold M. Duncan
Charles H. Prichard
Charles R. Macauley

BY

Church & Church
Attorneys

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WITNESSES:
J. M. Fowler Jr.
Elizabeth Fugget

INVENTORS
Harold M. Dineen
Charles H. Prichard
Charles R. Moserby
By

BY
Church & Church
Their Attorneys

UNITED STATES PATENT OFFICE.

HAROLD MALCOLM DUNCAN, CHARLES HENRY PRICHARD, AND CHARLES RIDGEWAY MACAULEY, OF LONDON, ENGLAND, ASSIGNORS TO LANSTON MONOTYPE MACHINE COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF VIRGINIA.

TYPE-CASTING MACHINE.

No. 864,087.

Specification of Letters Patent.

Patented Aug. 20, 1907.

Application filed December 17, 1902. Serial No. 135,632.

To all whom it may concern:

Be it known that we, HAROLD MALCOLM DUNCAN, a citizen of the United States of America, temporarily residing at London, county of London, England, 5 CHARLES HENRY PRICHARD, of London, county of London, England, and CHARLES RIDGEWAY MACAULEY, of London, county of London, England, both subjects of the King of Great Britain, have invented certain new and useful Improvements in Type-Casting Machines; and we do hereby declare the following to be a full, 10 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.

15 This invention relates to the class of automatic type casting and composing machines wherein individual types are cast in the order of composition and assembled in the form of lines in a galley.

Heretofore in machines of this class the quads have 20 been formed of the same body length as the character type, consequently, when set or assembled for printing or stereotyping, a very slight elevation of the quads will bring their ends or faces nearly or quite into the plane of the printing faces, thus causing an impression 25 to be made where none is desired, and the object of the present invention is to remedy this inconvenience by the provision of means whereby the quads may or shall be cast with bodies considerably shorter than those of the character type.

30 To this end the invention consists in providing the mold with a cut-off adapted to enter the mold cavity and close the same at a point within and at a distance from that end of the mold cavity with which the matrices engage in forming character type, whereby 35 the bodies of type cast against said cut-off will be shorter than those cast against matrices overlying the end of the type cavity.

The invention also consists in the employment of a sectional mold-blade or mold adjusting member and 40 utilizing one section thereof as the cut-off for closing the end of the mold, and in mechanism whereby the insertion and withdrawal of said cut-off can be automatically controlled and effected.

In the accompanying drawings representing the pre- 45 ferred form of embodiment of said invention—Figure 1 is an end view, and Fig. 2 a top plan view of the mold and its attachments for application to a known form of type casting and composing machine. Fig. 3 is a vertical sectional view of the mold. Fig. 4 is a longitudinal 50 sectional view, and Fig. 5 an end view of the sectional or divided mold-blade. Fig. 6 is a top plan view, partly in section, of the cross-pin cam and its connections, and Fig. 7 is an end view of same. Fig. 8 is a diagrammatic plan view of the die-case and cen-

tering pin lever with connections for automatically controlling the mold-blade sections and Fig. 9 is a side elevation of the same.

Similar numerals in the several figures indicate the same parts.

The type casting and composing machine with which 60 the improvements are shown associated is that of Patent No. 625,998, of which only such parts are illustrated as are necessary to a full understanding of the invention. These include a portion of the main frame 1; the slide 2 by which the mold-blade is reciprocated; the adjustable abutment 3 for determining the position of the 65 mold-blade; the side blocks 4 of the mold; the cross-blade 5; the main actuating lever 6 for the centering pin (not shown) and trip rods 7 of the justification adjusting mechanism; and one of the main shafts 8. The 70 adjustable mold-blade employed for varying the width of the mold cavity, instead of being made in one piece, as heretofore, is divided longitudinally into two sections 10 and 11, guided one upon the other in a manner to prevent lateral displacement and permit longitudinal 75 movement. The proximate faces of the two sections, are notched for the reception of the front stop or gage as shown in Fig. 3.

When character type are to be cast the two sections 10 and 11 stand with their front faces in the 80 same plane, as indicated in Fig. 3, but when quads are to be formed the upper section 10 is advanced so as to project beyond the lower and engage the opposite wall of the mold cavity when the lower section 11 is in adjusted position, as seen in Fig. 4, thereby cutting 85 off the upper section of the mold cavity, the under surface of the projecting section in lieu of the usual matrix, forming the end of the mold cavity. The cross pin 12 through which motion is transmitted from slide 2 to the mold-blade, in dimensioning the mold, 90 is utilized for effecting this shifting of the sections one upon the other, to which end said cross-pin is rendered movable in its bearings and caused to act upon the upper section 10, to advance and retract it as desired. In the present embodiment the cross-pin 12 95 is longitudinally movable and is formed in cross-section with a straight section 13 riding in a slot 14 in the lower mold-blade section 11, and a flanged or cam section 15 riding in a slot 16 in the upper section 10. The cam section 15 is furnished with beveled projections 17 on opposite sides and located at different 100 points in its length, so that when the cross-pin is in one position it will, through the engagement of the bevel on shoulder 17 with the front wall of slot 16 cause the advance of the upper section beyond the 105 lower section, and when the cross-pin is retracted it will draw the upper section back and hold it flush with the lower section. The shifting of the upper

upon the lower mold blade section, in either direction, is effected through the medium of the intermediate portion of the cam formed by the two inclined or wedge surfaces extending from the apex of each shoulder or projection 17 to the rear face of the other, and when the cam is shifted so as to bring the rearward projection or shoulder within the slot 16 of the upper mold-blade section the latter is locked and held against motion upon the lower mold-blade section by the engagement of the cam with opposite walls of the slot 16. This portion or section of the cam thus performs the function of a latch or bolt carried by the cross-pin fitted to a groove in the lower mold-blade section and serving, when engaged, to lock the two mold-blade sections together, for simultaneous adjustment, and when withdrawn, to release the upper mold-blade section so that it will be free to respond to the action of the shifting or inclined section of the cam. The front projection or shoulder 17 of the cam fully enters the slot 16 in the upper section of the mold-blade only when the lower section is adjusted to form the maximum size type body, the front incline operating at other times to advance and hold the upper mold blade section beyond the end of the lower and in contact with the opposite wall of the mold. The shifting of the cross-pin when it is desired to produce a short bodied type may be variously effected and controlled, but in the present instance means are shown for automatically controlling the shift through the agency of the die-case movement, as will presently appear.

To one end of the cross-pin is attached a spring or compression devices, comprising, in the present instance, a box or casing 18 inclosing spring 19, and a bolt 20 secured to the head of the cross-pin. The spring 19 is interposed between the end of casing 18 and head of bolt 20 and the inner end of the casing contacts with the head of cross-pin 12 so that when said casing is reciprocated it will operate positively upon the cross-pin in one direction to retract mold blade section 10 and elastically in the other direction, to advance said section. The casing 18 is furnished with a transverse slot or way 21 for the reception of a pin 22 carried by a lever 23 pivotally supported, as at 24, upon the main frame and connected through lever 25 and rod 26 to a lever 27 working upon cam 28 on the main shaft 8. An adjustable stop 29 may be provided to limit the throw of lever 23, the spring of the connections or of a spring box included in the transmitting devices permitting this adjustment. The cam 28 is so shaped and positioned relatively to the rest of the machine that it will operate to shift lever 23 in a direction to cause the compression of spring 19 and a consequent shifting of the cross pin in a direction to advance mold-blade section 10 upon the lower section, just after the cross pin 12 has been moved laterally to press the lower mold blade section against the adjustable abutment to gage the mold and the die-case has been moved to position to bring the selected matrix over the mold-cavity, thereby holding said section under elastic pressure against the opposite wall of the mold cavity. In the absence of additional controlling elements this would result in a cutting out of the upper section of the mold cavity and prevent a cast being made against the selected matrix at the end thereof. In other words the mechanism just de-

scribed is adapted to advance and hold the upper section of the mold-blade against the wall of the mold and thus operate the cut-off each time a cast is to be made, hence means are provided for preventing this action of the cut-off when character type are to be formed, and for permitting it when quads are designated. It is obvious that these conditions might be reversed, that is to say, the action of the shifting devices be suspended for character type and permitted for quads, but the present arrangement is preferred. For normally locking out or suspending the action of the shifting devices described and for designating the times of action, to accord with the production of quads, the following mechanism has been devised:

When in normal position the cross pin occupies its advanced position with the rear shoulder 17 in engagement with the upper section 10 of the mold-blade and locking the two sections together at which time the faces of the two sections are in the same plane and the mold cavity is open. To retain the cross-pin in this position, as against the pressure of spring 19, when acted upon by lever 23, the head of said cross-pin is furnished with a collar or shoulder 30 and the latter is engaged by an off-set 31 carried by a stiff spring 32 mounted upon and secured to the frame. This off-set 31 stands normally in rear of collar 30, and prevents retraction of the cross-pin, the spring 19 yielding under the action of lever 23 and assisting in holding and thereby positioning the cross-pin, the offset 31 constituting an abutment or gage for determining the normal position of the cross-pin and through it the relative positions of the two mold-blade sections.

Pivotally supported upon the frame is a lever 33 one end of which engages spring 32 and the other is engaged by a lever 34. Pivotally supported upon lever 34 is a trip rod 35 provided with adjustable nuts 36 and adapted to be swung into and out of engagement with a plate 37 attached to the main lever 6. A spring 38 connected to trip rod 35 serves to hold the latter normally in tilted position with its upper end free from engagement with plate 37, but when said trip rod is tilted into the path of plate 37 and the latter is depressed (which action takes place after the selected matrix has been brought to position and before the cast is made) said trip-rod will be engaged and carried down, thereby tilting levers 34 and 33, and depressing spring 32 until off-set 31 is withdrawn from engagement with the cross-pin so that the latter is free to reciprocate under the action of lever 23 and spring 19 thereby first unlocking the mold blade sections by withdrawing the locking section of the cam and then engaging the shifting section of the cam to advance the upper section 10 of the mold-blade the lower section being previously or simultaneously adjusted to size the mold for the body width desired. After the cast has been made and before the return motion of lever 6 the return motion of lever 23 restores the cross-pin to normal position so that upon the release of the trip-rod off-set 31 will reengage the cross-pin and lock the latter in position until the trip rod is again tilted and depressed.

Any appropriate means may be employed for tilting trip-rod 35 into actuating position and thereby determining the occasion for producing a low bodied type, but inasmuch as quads only are required to be low and as they have an assigned position in the die-case the

- latter can conveniently be utilized for designating purposes. Thus the quad matrix being located at one corner of the die case as at 39, Fig. 8, corresponding to its extreme movements in two directions, a pin 40 may be attached to the die-case 41 in position to engage and tilt trip rod 35, so that whenever the die-case is brought to position with the point 39 opposite the mold cavity, trip lever 35 will be engaged and the cross-pin subjected to the control of its actuating mechanism.
10. Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:—
1. In a mold for type casting, a cut-off for the mold-cavity adapted to enter and close one end of the latter and form the end wall thereof, substantially as and for the purpose specified.
 2. In a type casting machine, a mold provided with a movable cut-off for intercepting and closing the end of the mold cavity intermediate the matrix and induction ends of said cavity, substantially as and for the purpose specified.
 3. A type mold having one of the side walls of the mold-cavity divided on a line transverse to said cavity with the section remote from the induction end movable, to close said cavity and form the end wall thereof.
 4. A type mold provided with a sectional mold blade normally constituting one wall of the mold cavity, one of the mold blade sections being movable relatively to the other to close the mold cavity and form an end wall thereof.
 5. A type mold provided with an adjustable mold-blade formed in sections movable one with respect to the other in a direction transverse to the mold-cavity, for varying the dimensions of the latter in two directions, substantially as described.
 6. In a type casting machine the combination with a mold provided with a divided or sectional mold-blade, of a cross-pin engaging the sections of the mold-blade and operating to shift their relative positions; substantially as described.
 7. In a type casting machine the combination with the mold, its sectional mold-blade and positioning device or slide for the mold-blade, of a longitudinally movable cross-pin engaging the section of the mold-blade to both adjust and shift the latter, substantially as described.
 8. In a type casting machine the combination with the sectional mold-blade and means for shifting one section longitudinally of the other, of a power mechanism for actuating said shifting means and a lock-out for controlling the action of said power mechanism upon said shifting means, substantially as described.
 9. In a type casting machine the combination with a sectional mold-blade and a longitudinally movable cross-pin for shifting said sections relatively and coincidentally, of power driven actuating devices connected to said cross-pin and including a compression spring, and a lock-out temporarily restraining the movement of said cross-pin, substantially as described.
 10. In a type casting machine, the combination with the sectional mold-blade, a longitudinally movable cross-pin provided with cams engaging one of the mold-blade sections to shift the latter and a lock-out engaging said cross-pin, of an actuating lever connected to the cross-pin through a yielding coupling, substantially as described.
 11. In a type casting machine, the combination with the sectional mold-blade and cross pin, of a power driven actuating lever, a one way yielding coupling intermediate said lever and cross-pin, and a lock-out engaging the cross-pin, to hold it in one position of adjustment and against the pressure of the actuating mechanism until the withdrawal of said lock out, substantially as described.
 12. In a type casting machine the combination with the mold and its relatively movable mold-blade sections of a shifting mechanism controlled by a moving part of the casting machine, substantially as described.
 13. In a type casting machine, the combination with a sectional mold-blade and means for shifting the mold-

blade sections relatively, of actuating devices therefor controlled from a moving part of the casting machine, substantially as described.

14. In a type casting machine, the combination with the die-case, mold, relatively movable mold-blade sections and a shifting device for the latter, of an actuating mechanism for said shifting device controlled as to time of operation by the movements of the die-case, substantially as described.

15. In a type casting machine, the combination with the relatively movable mold-blade sections, and a shifting device engaging said sections, of an actuating mechanism for said shifting device, a lock-out for suspending the action of said actuating mechanism, and a trip for said lock-out; substantially as described.

16. In a type casting machine the combination with the die-case, main lever, and mold, of a sectional mold-blade, a shifting device for changing the relative positions of said mold-blade sections; an actuating mechanism for said shifting device; a lock-out for said actuating mechanism and a trip controlled by the die-case and operated upon by the main lever, for releasing the lock-out, substantially as described.

17. In a type casting machine the combination of the following elements, to wit; a sectional mold-blade; a shifting device for changing the relative positions of the mold-blade sections; a lock-out or retainer for said shifting device; actuating mechanism connected to said shifting devices through a yielding coupling; a reciprocating member; a trip rod normally removed from the path of said reciprocating member and connected to the lock-out; and a movable die-case engaging said-trip rod to move it into the path of said reciprocating member; substantially as described.

18. In a type casting machine the combination with a sectional mold-blade and a double cam cross-pin, of a lock-out for the latter, and mechanism controlled by the movements of the die-case for operating the lock-out; substantially as described.

19. In a type casting machine the combination with the sectional mold-blade, a double cam cross-pin and mechanism to reciprocate the latter, of a lock out for rendering the reciprocating mechanism inoperative on the cross-pin except during one position of the die-case, substantially as described.

20. In a type casting machine, the combination with the sectional mold blade and the shifting device or cross-pin therefor, of a lock-out controlled from the die-case and an independent actuating mechanism for said shifting device deriving motion from the main shaft, substantially as described.

21. In a type casting machine the combination with a mold provided with a sectional mold-blade, of shifting devices for the mold-blade section including a compression spring, to insure the seating of the advanced mold-blade section, substantially as described.

22. A type casting and setting machine provided with mechanism for casting character type having uniform body lengths, and means forming a part of the aforesaid mechanism for casting space type whose body lengths are shorter than the shoulder height of the character type.

23. In a type casting and composing machine the combination with a movable die or matrix case and a mold provided with a sectional mold blade, of means for connecting the mold blade sections for simultaneous adjustment, to vary the width of the mold cavity, and auxiliary means controlled by the die or matrix case for causing the projection of one section of the mold blade beyond the other within the mold cavity.

24. A type casting machine provided with a mold and means coöperating therewith for changing the depth of the mold cavity at predetermined times.

25. In a type casting machine, a mold provided with a mold blade and means coöperating with the latter for changing the depth of the mold cavity.

26. In a type casting machine provided with a sectional mold blade, means for simultaneously actuating the two sections and means for projecting one section beyond the other to form short body length type at predetermined times.

27. In a type casting machine, a mold provided with a sectional mold blade, means for simultaneously actuating the sections, for varying the lateral dimensions of the mold cavity, means to project one section over the other to form short body length type at predetermined times, and an elastic pressure device cooperating with the projected section of the mold blade.

28. In a type casting machine mechanism for casting type of varying widths, means forming part of the casting mechanism for making selected type shorter than others, and mechanism for operating said means.

29. In a type casting machine a mold provided with a mold blade which determines the body width of the mold, means to cause part of said blade to periodically intercept the mold cavity to shorten the body length of selected type.

30. In a type casting machine a mold provided with a mold blade which determines the body width of the mold cavity, means to cause a part of said blade to periodically intercept the mold cavity to shorten the body length of selected type, and a block with means to operate it for causing the blade to intercept the mold cavity.

31. In a type machine, a mold provided with a sectional mold blade, means for connecting the sections for simultaneous movements of adjustment and means to disconnect the sections and advance one beyond the other within the mold cavity, to close the latter and form short body type at predetermined times.

32. In a type casting machine, a matrix, a mold having its slot leading to the face of the matrix, main and auxiliary blades for determining the width of the slot, means for locking the main and auxiliary blades together with their ends in alinement and means for unlocking and moving the auxiliary blade forward to cut off the slot at a distance from the matrix when the blades are disconnected.

33. In a type casting machine, a matrix, a type mold having its slot leading to the face of the matrix, main and auxiliary blades for determining the width of the slot, means for disconnecting the blades and moving the auxiliary blade forward to cut off the slot at a distance from the matrix, and means for moving the main blade forward to eject the quad, connect it with the auxiliary blade and retract the main and auxiliary blades to normal position.

34. In a type casting machine, a matrix, a mold having its slot or cavity leading to the face of the matrix, main and auxiliary blades for determining the width of the slot, a lock for connecting and disconnecting the blades, a cam for moving the auxiliary blade forward to cut off the slot at a distance from the matrix, and a rocking lever arranged to first release the lock and then operate the cam.

35. In a type casting machine, a matrix case, a mold having its slot leading to the face of the matrix case, main and auxiliary blades and means for forming a low quad or space of the predetermined width, comprising means for retracting the blades together to the predetermined point and auxiliary means under the control of the matrix case for moving the auxiliary blade forward to cut off the slot at a distance from the face of the matrix case.

HAROLD MALCOLM DUNCAN.
CHARLES HENRY PRICHARD.
CHARLES RIDGEWAY MACAULEY.

Witnesses:

W. J. BURCH,
W. J. ROGERS.