W. A. READE.

TYPOGRAPH.

APPLICATION FILED AUG. 15, 1910.

1,069,176.

Patented Aug. 5, 1913.

2 SHEETS—SHEET 1.

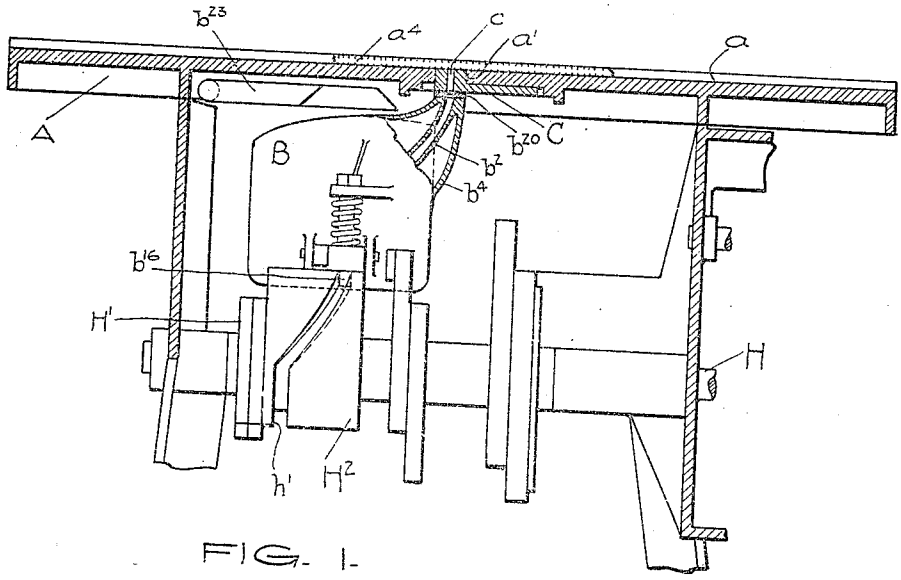


FIG. 1.

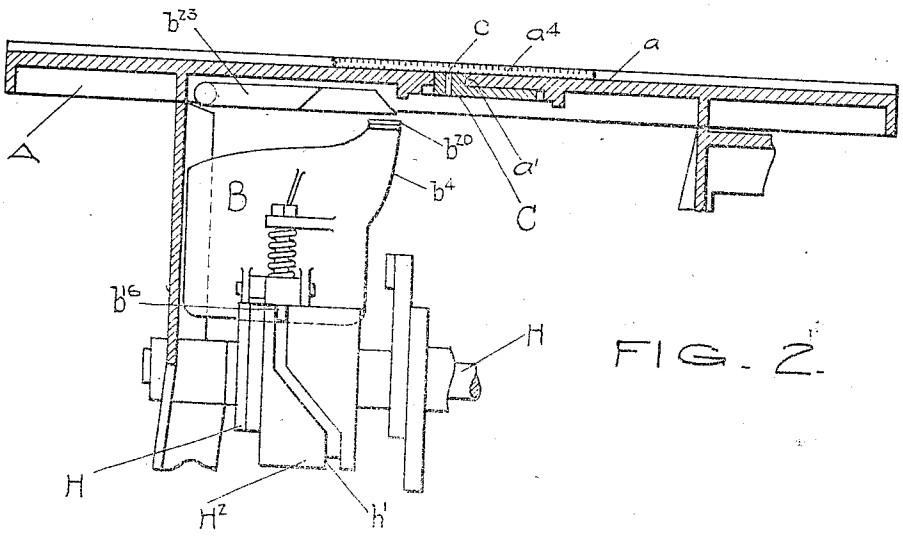
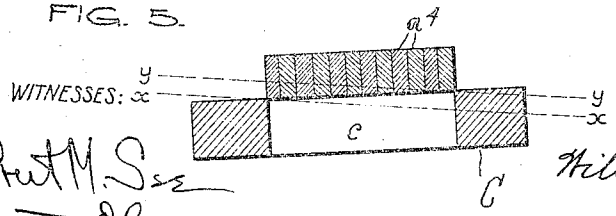


FIG. 2.

FIG. 5.



WITNESSES:

Robert M. See

Jno. F. Dhulin

INVENTOR

William A. Reade

BY J. B. Fay

ATTORNEY

W. A. READE.

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2 SHEETS—SHEET 2.

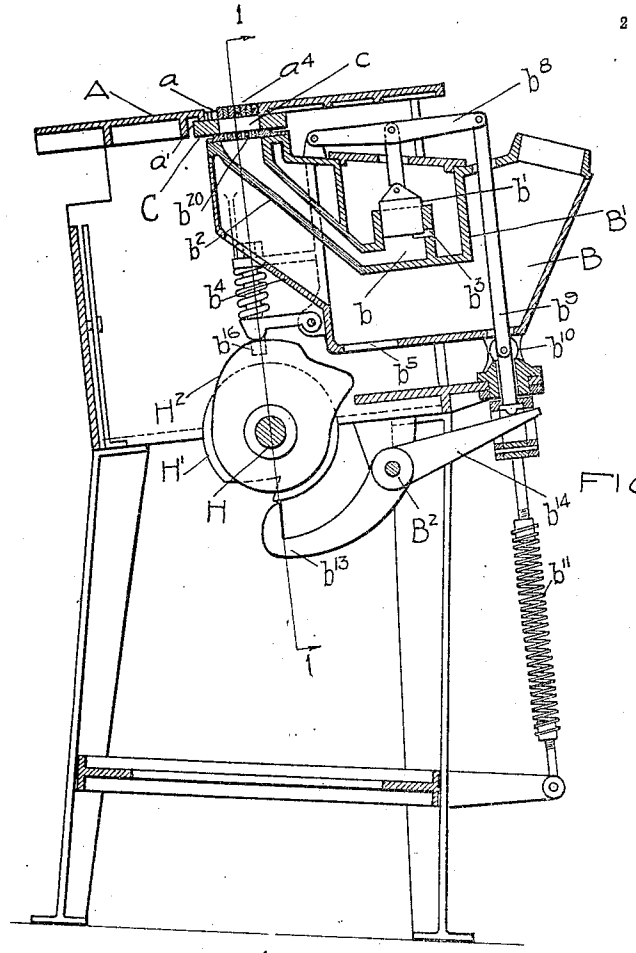

FIG. 3.

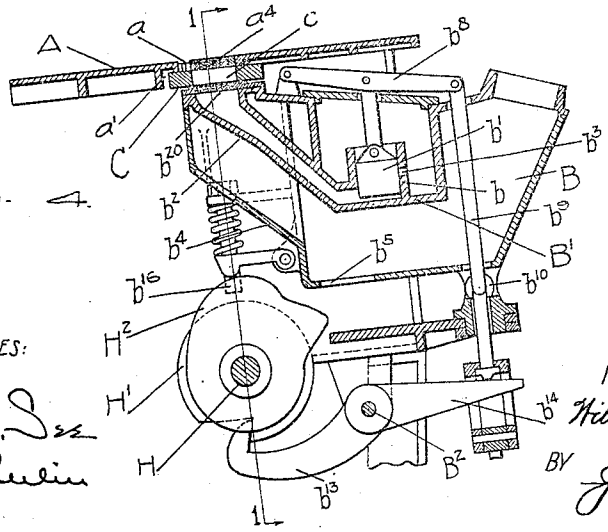

FIG. 4.

WITNESSES:

Robert M. Sessions

Jno. F. Oberlin

INVENTOR

William A. Reade

BY J. B. Fay

ATTORNEY

UNITED STATES PATENT OFFICE.

WILLIAM A. READE, OF CLEVELAND, OHIO, ASSIGNOR TO THE LUDLOW TYPOGRAPH COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF MAINE.

TYPOGRAPH.

1,069,176. Specification of Letters Patent. Patented Aug. 5, 1913.

Application filed August 15, 1910. Serial No. 577,304.

To all whom it may concern:

Be it known that I, WILLIAM A. READE, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Typographs, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

The present improvements relate more particularly to the "Ludlow" typograph, one form of which will be found described in U. S. Patent No. 856,539, issued to Washington I. Ludlow, June 11, 1907. In such Ludlow typograph a plurality of matrix bars are employed, such bars being longitudinally arranged in a trough and normally freely movable over a casting slot in such trough so that by suitably composing, or collecting, said bars so as to bring over said slot any desired series of characters, a matrix for a type line of the width of a column of printed matter is formed.

The object of the present invention is the provision of a casting mechanism in conjunction with such typograph, proper, that will be convenient in use and at the same time embody various operative features conducing to the production of slugs or lines of type of superior quality.

To the accomplishment of the foregoing and related ends, said invention then consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:—Figure 1 is a part front elevation and part section of my improved typograph and slug casting mechanism, the plane of the section being indicated by the line 1—1, Figs. 3 and 4; Fig. 2 is a similar view but showing the parts in different operative position; Fig. 3 is a transverse vertical section of such mechanism; Fig. 4 is a similar transverse section, but showing certain parts in a different operative position; and Fig. 5 is a section of a detail taken on the same plane as Figs. 3 and 4, but on a larger scale.

It has already been indicated that the matrix bars, by means of which the matrix for the type-line or slug that the machine is designed to cast is formed, are supported on a bed plate or top. This top A is movably secured to the frame proper of the machine, being preferably hinged thereto along its rear edge, so that it can be turned back along with the parts supported thereon. Such top, furthermore, inclines downwardly and forwardly at an angle approximately that shown in Figs. 3 and 4, so as to place the aforesaid bars in position for convenient inspection and manipulation on the part of the operator.

A trough-like depression a is formed in the top for the reception of the bars, such trough having a transverse opening or slot a' into which a mold C is adapted to project, so that its upper surface will lie flush with the bottom of the trough and not interfere with the free movement of the bars a^4 across the same. The various movements of the mold whereby a slug, after being formed therein, is removed, trimmed and discharged, are not of present interest and so will not be described. Such mold, however, will obviously conform with the inclination of the top A or rather of trough a therein, which holds the bars; that is the slot c in the mold will incline forwardly and downwardly.

The casting pot B, which is designed to coöperate with such slot c in order to supply thereto the molten metal for forming the slug, comprises an inner chamber B′ adapted to contain the molten metal, such chamber being of general cylindrical form and including a sub-chamber b adapted to receive a piston or plunger b'. From such sub-chamber a spout b^2 extends forwardly and upwardly, it being through this spout that the metal is forced into the mold in the actual operation of casting. Communication between the chamber and the sub-chamber, holding the plunger, is furnished by a series of apertures b^3 in the walls of such latter chamber, which apertures are closed as the plunger descends. Substantially entirely surrounding the inner chamber, and preferably cast integral therewith, are the walls of the pot proper, which thus provide

an outer heating chamber. The latter has an extension b^4 that laterally surrounds the spout, just described as leading from the inner chamber, while an inlet opening b^5 into such outer chamber provides for the introduction of the gas burners or of a suitable heating medium, whereby the inner chamber of the pot may be maintained at the proper temperature.

Means are provided for periodically actuating the plunger b' to force molten metal up through the spout, such means consisting of a tension spring b^{11} that is connected through a rod b^9 and lever b^8 with said plunger to depress the same, but normally held from such actuation of the plunger by means of a cam H′ on the cam or main drive shaft H. Said cam operates through a rock-shaft B^2 and suitable levers b^{13} b^{14} respectively coöperative with said cam and connected with the rod b^9, as need not be further explained.

The casting pot is furthermore supported upon a universal joint b^{10}, about which it is movable so as to periodically bring the outer end of the casting spout b^2 into register with the under side of the mold when the latter is supported in operative position in the slot of the matrix trough. Such movement of the pot involves the shifting of the spout into alinement with the mold, raising the same thereagainst, then lowering the spout and shifting the same aside, these several movements being accomplished through the agency of a drum H^2 carried by the cam shaft H, the outer surface of which drum is of varying radius and bears a groove h' differently located axially of the cam shaft in different parts of the drum. The casting pot is connected with said drum by means of a pin b^{15} suitably attached to the front face of the pot. Accordingly as the drum rotates, not only will the casting pot be swung horizontally through an arc corresponding to the lateral displacement of the groove on the drum's face, but also be tilted up and down to correspond with the differences in radius between the different parts of said drum's surface. Such groove and surface are conformed to produce the desired lateral shifting and up-and-down movement of the spout of the pot, as will be readily understood.

The discharge end of the spout carries a squirt plate b^{20} of usual construction, which directly contacts with the mold and has a finished surface for the purpose of making the joint with the mold metal-tight, being provided with a series of apertures through which the metal is forced into the mold.

Not only is the machine top with the body of bars carried thereon and the mold that coöperates with said bars inclined in a forward and downward direction, as hereinbefore described, but the axis, about which the casting pot is swung to laterally shift its spout, is inclined from the vertical to correspond. As a result the end of such spout is not appreciably raised in being swung from its normal position, that of Fig. 2, to its operative position shown in Fig. 1. Indeed, by a proper arrangement of this axis and of the angle of inclination of the top, it is possible to have the end of the nozzle b^2 lower when in its discharge position than when in its inoperative position. The effect of such lowering will obviously be to cause the molten metal of itself to flow toward the discharge end of the spout and thus require a correspondingly less plunger movement in order to fill the casting slot in the mold.

A further result, obtained by the foregoing construction, is that the metal, since it preserves a level surface, as it rises through the squirt plate b^{20} into such slot in the mold, will first strike the lower and forward end of the composite matrix provided by the assembled bars, (see line x—x, Fig. 5), and then as such level of the metal rises, the point of contact will travel upwardly and so progressively along the matrix until its entire face is covered and the mold filled, as indicated by the line y—y on the same figure. Any possibility of air bubbles or any foreign matter being caught on the face of the matrix, is thus practically eliminated and a clear, clean cut impression assured. Aside from the advantage thus obtained in the handling of the metal and its introduction into the casting slot, attention has already been called to the convenience in operation gained by having the top of the machine inclined so as to render the bars, and such other parts (not shown) as are required to compose and lock them in assembled position, readily accessible and easily manipulated. At the same time, too, the heat and objectionable vapors that rise from the casting pot, are caused to flow to the rear and so a thorough ventilation of the machine is assured. In other words, any tendency such as is apt to be present, where the top is strictly horizontal, for such vapors to rise directly upwardly, or even to escape by the front edge of the top, is avoided, and a natural course to the rear provided instead. Thus the flue b^{26}, conforming with the general inclination of parts previously mentioned, provides a natural way of escape for the gases from the open nozzle-end of the pot in its inoperative position.

All the foregoing advantages contribute to rendering my improved typograph and casting mechanism therefor efficient and convenient in use.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as re-

gards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. In mechanism of the class described, the combination of a slug casting mold having a face adapted to contact with a matrix; and means adapted to supply molten metal to said mold, the latter's matrix-contacting face being disposed with its longitudinal axis inclined to the horizontal, whereby such metal is brought into progressive contact with such face.

2. In mechanism of the class described, the combination of a mold having a face adapted to contact with a matrix for casting a line of type; and means adapted to supply molten metal to said mold from below, said mold's matrix contacting face having its longitudinal axis inclined to the horizontal, whereby such metal is brought into progressive contact with such face.

3. In mechanism of the class described, the combination of matrix-bearing members adapted to be assembled to form a composite matrix for a line of type, such composite matrix being directed downwardly and being disposed with its longitudinal axis inclining in a vertical plane; a slug casting mold coöperative with such composite matrix; and means adapted to supply molten metal to said mold, such metal being brought into progressive contact with said matrix by reason of the latter's inclination.

4. In mechanism of the class described, and the combination of matrix-bearing members adapted to be assembled to form a composite matrix for a line of type, such composite matrix being directed downwardly and being disposed with its longitudinal axis inclining in a vertical plane; a slug casting mold having a vertical slot adapted to register at its upper end with such composite matrix; and means adapted to supply molten metal to such mold-slot from below, such metal being brought into progressive contact with said matrix by reason of the latter's inclination.

5. In mechanism of the class described, the combination of a support lying in a plane inclined from the horizontal; bars longitudinally movable in a horizontal direction on said support and having matrices on their lower edges adapted to form a transversely disposed, composite matrix for a line of type, such composite matrix being disposed with its longitudinal axis inclining to correspond with such support; a slug casting mold coöperative with such composite matrix; and means adapted to supply molten metal to said mold, such metal being brought into progressive contact with said matrix by reason of the latter's inclination.

6. In mechanism of the class described, the combination of a table having a longitudinally extending trough, said table inclining from the horizontal in a direction transverse of such trough; bars longitudinally movable in such trough and having matrices on their lower edges adapted to form a transversely disposed, composite matrix for a line of type, such composite matrix being disposed with its longitudinal axis inclining to correspond with said table; a slug casting mold having a vertical slot adapted to register at its upper end with such composite matrix; and means adapted to supply molten metal to such mold-slot from below, such metal being brought into progressive contact with said matrix by reason of the latter's inclination.

7. In mechanism of the class described, the combination of a slug-casting mold having its matrix-contacting face disposed with its longitudinal axis inclined to the horizontal; a pot for molten metal movably mounted below and to the rear of the elevated end of said mold, and having a spout adapted, in one position of said pot, to register with said mold from below; and means for forcing metal from said pot into said mold, such metal being brought into progressive contact with the matrix, by reason of the inclination of such matrix-contacting face.

8. In mechanism of the class described, the combination of a slug-casting mold having its matrix-contacting face disposed with its longitudinal axis inclined to the horizontal; a pot for molten metal mounted on a universal joint below and to the rear of the elevational end of said mold, and having a spout, adapted in one position of said pot, to register with said mold from below; and means for forcing metal from said pot into said mold, such metal being brought into progressive contact with the matrix, by reason of the inclination of such matrix-contacting face.

9. In mechanism of the class described, the combination of matrix-bearing members adapted to be assembled to form a composite matrix for a line of type, such composite matrix being directed downwardly with its longitudinal axis inclining in a vertical plane; a slug casting mold coöperative with such composite matrix; and a pot for molten metal movably mounted below and to the rear of said mold, and having a spout adapted in one position of said pot to register with said mold from below; and means for forcing metal from said pot into the mold, such metal being brought into progressive contact with said matrix, by reason of the latter's inclination.

10. In mechanism of the class described, the combination of matrix-bearing members adapted to be assembled to form a composite

matrix, such composite matrix being directed downwardly with its longitudinal axis inclining in a vertical plane; a slug casting mold having a vertical slot adapted to register at its upper end with such composite matrix; and a pot for molten metal mounted on a universal joint below and to the rear of the elevated end of said mold and having a spout adapted in one position of said pot to register with said mold-slot from below; and means for forcing metal from said pot into said mold-slot, such metal being brought into progressive contact with said matrix by reason of the latter's inclination.

11. In mechanism of the class described, the combination of a support lying in a plane inclined from the horizontal; bars longitudinally movable in a horizontal direction on said support and having matrices on their lower edges adapted to form a transversely disposed, composite matrix for a line of type, such composite matrix being disposed with its longitudinal axis inclining to correspond with such support: a slug casting mold coöperative with such composite matrix; and a pot for molten metal movably mounted below and to the rear of said mold, and having a spout adapted in one position of said pot to register with said mold from below; and means for forcing metal from said pot into said mold, such metal being brought into progressive contact with said matrix, by reason of the latter's inclination.

12. In mechanism of the class described, the combination of a table having a longitudinally extending trough, said table inclining from the horizontal in a direction transverse of such trough; bars longitudinally movable in such trough and having matrices on their lower edges adapted to form a transversely disposed, composite matrix for a line of type, such composite matrix being disposed with its longitudinal axis inclining to correspond with said table; a slug casting mold having a vertical slot adapted to register at its upper end with such composite matrix; and a pot for molten metal mounted on a universal joint below and to the rear of said mold and having a spout adapted in one position of said pot to register with said mold-slot from below; and means for forcing metal from said pot into said mold-slot, such metal being brought into progressive contact with said matrix by reason of the latter's inclination.

Signed by me this 12th day of August, 1910.

WILLIAM A. READE.

Attested by—

ANNA L. GILL,

JNO. F. OBERLIN.