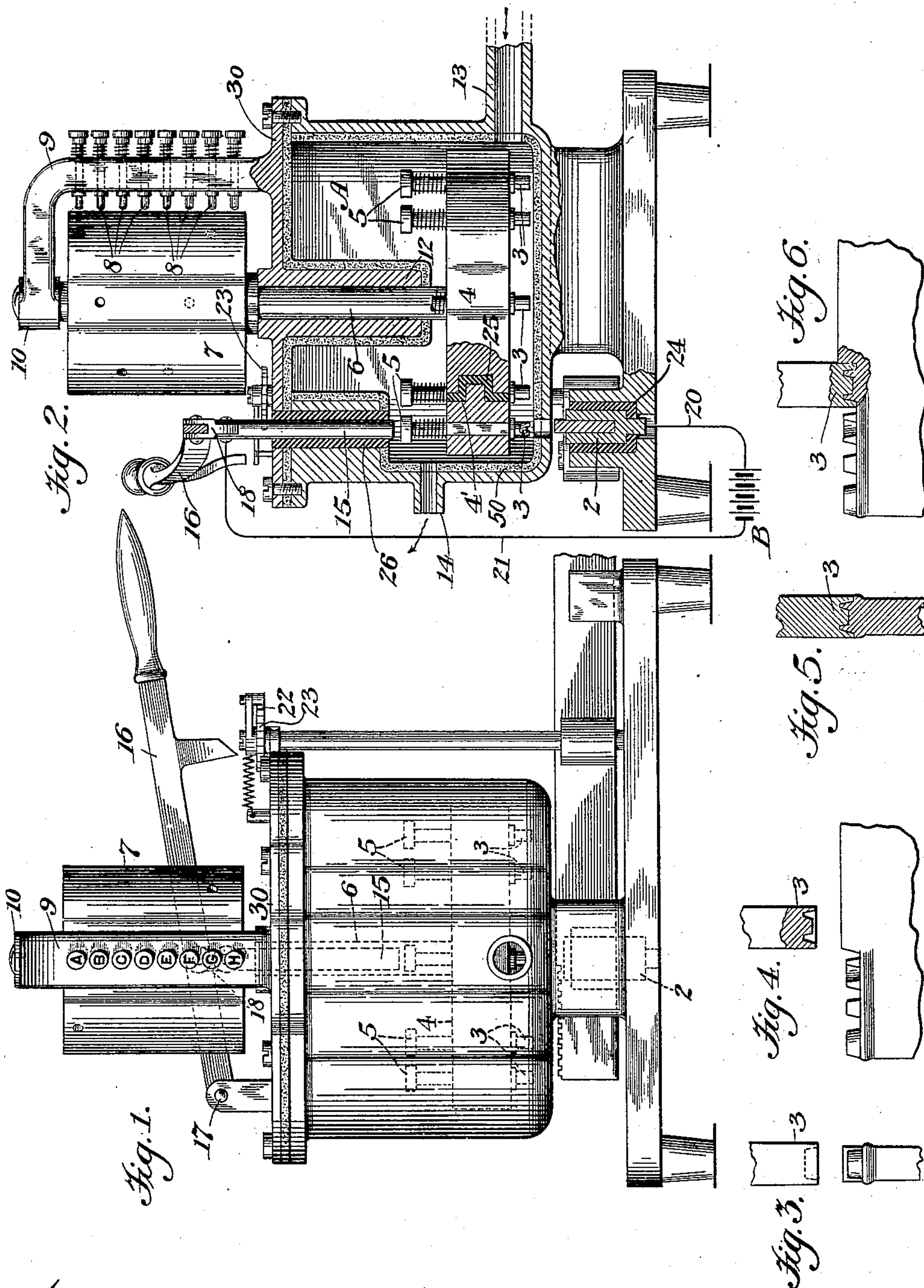


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F. H. RICHARDS.
MECHANISM FOR MAKING TYPES.
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MECHANISM FOR MAKING TYPES.

No. 886,327.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Mechanism for Making Types, of which the following is a specification.

This invention relates to mechanism for making types, and more especially for making these types on the edges of typebars or linotypes.

The present application is a division of that filed by me July 29, 1899, Serial No. 725,456.

In the drawings accompanying this specification and forming part of the present application, Figure 1 is a side elevation, partly in section, of an improved mechanism for making types in accordance with my present invention. Fig. 2 is an end elevation of the apparatus as seen from the left hand in Fig. 1. Fig. 3 is an enlarged view illustrating the mode of operation of the apparatus and the manner of practicing the invention. Fig. 4 is a view looking toward the right in Fig. 3. Fig. 5 is a view similar to Fig. 3 but showing the typebar in section and an advance step in the operation of forming a type; and Fig. 6 is a side view thereof.

Similar characters designate like parts in the different figures of the drawings.

In accordance with my present improvements each type may be formed on the edge of a type body or typebar, and when the types to be made are formed on the edge of a typebar, successive portions of the edge of the typebar are respectively subjected to the operation of type-forming dies or matrices, which dies or matrices, by means of some suitable apparatus for carrying and operating the same, are brought to bear one after another in any order desired upon the edge of the typebar. For the purpose of holding the typebar in position when the types thereon are to be formed in a machine, the bar is held by a support 2, which preferably consists of a guide or carrier. The bar is fed along in the machine by some suitable mechanism. The several dies (herein designated without choice by the reference character 3) are supported or mounted in such a manner that they may

be brought to and moved from the working point in the machine. One manner of so mounting the dies is illustrated in the drawings. According to this particular organization of the mechanism, said dies are carried in a revolving carrier 4, each die being shown provided with a spring which operates to normally hold the die in a retracted position, the spring bearing against the head 5 on the top of the die.

The die-carrier 4 is shown fixed on the lower end of the carrier-shaft 6, which shaft is to be rotated to bring any required die into position for use. For this purpose, and to properly control the operation of the die-carrier, said carrier-shaft is shown provided with a stop-wheel 7, which wheel is furnished with a series of stops either in the form of perforations, as shown in the present case, or it may be of pins instead of perforations, thus following an ordinary mode of making stop-cylinders. For operating in connection with the cylinder-stops a series of stop-pins (designated without choice by the character 8) are shown mounted in an upright 9 of the framework of the machine, which upright may also carry a bearing 10 for the carrier-shaft.

The carrier-shaft 6 is shown mounted in the bearing 12, which bearing in the particular form of apparatus herein illustrated extends downwardly from the top-plate 30 of the chamber or oven A within which the carrier and the dies or matrices carried thereby are shown inclosed. Said oven is for the purpose of keeping the dies at the proper temperature, and for this purpose a current of air or other gas or fluid may be circulated through the chamber A by means of the inlet-pipe 13 and the discharge-pipe 14, the air or gas being supplied from a furnace and the current being maintained by suitable blast apparatus. (Not shown.) For this purpose an ordinary air-pump or a rotary blower may be employed. The oven is shown as provided with a lining 50 of refractory material for conserving the heat of the oven and preventing radiation from the outer surface of its walls. The die-carrier having been revolved to the proper position to bring the selected die to the working point in the machine, the corresponding stop-pin, as 8, will

be brought into engagement with the corresponding cylinder-stop, as 7, and the die or matrix will be forced down through its working stroke and thus (or otherwise) brought into forcible contact with the type-body or type-bar, as the case may be, for making the type thereon. In practice this operation may be carried out in either one of several ways. According to one way, the die or matrix may be forced down to a fixed position, and afterward the type body or bar be forced upwardly against the die or matrix through the working stroke required for finishing the type. According to another plan, the stroke of the die or matrix will be continued downwardly against the typebar sufficiently far to complete the forming of the type; this mode of operation is shown in this case. For so operating the die, I have shown the apparatus provided with a die-actuating slide 15, which slide or pusher may be conveniently operated by means of a hand-lever 16, shown pivotally supported at 17 on the framework of the machine, being connected by a link 18 with the upper end of said slide.

In the apparatus here described the bar is shown mounted in the carrier 2, and this is connected by an electric conductor 20 to a source of electrical current, indicated at B, from which another conductor 21 leads to the die mechanism, so that on the operation of the die to form a type an electric heating current is made to flow through the die or matrix and that portion of the bar subjected to the action of the die, thus heating and softening the metal which is being acted upon by the die. The die, when this is heated in the oven or chamber, is thereby prevented from so readily chilling the metal of the type, and at the same time a less quantity of the electric current will be required. One character having been formed, as set forth, the hand-lever 16 is raised, thereby lifting the plunger 15 and preferably cutting off the electric current. This is accomplished by connecting the conductor 21 to the slide 15, but in some cases the current may be carried through the conductor-shaft, it being immaterial to some features of my present invention how the current is supplied to the type-forming die. On returning the die-actuating blade, this, by means of a pawl 22 or like device, operates the ratchet wheel 23 for feeding forward the typebar ready for the next type-forming operation. For the purpose of controlling the electric current, one portion of the parts inserted should be insulated from the rest so as to direct the current through the metal being operated upon by the die. For this purpose I prefer to insulate the carrier 2 in which the type body or bar is directly supported. The insulating material employed in this instance is shown at 24, Fig. 2. The die-carrier 4 may be formed in two parts, as indicated at 4', Fig. 2, the parts being sepa-

rated by insulating material 25, and similarly the die-actuating plunger may be operated through a tubular non-conducting guide 26.

The means for making and breaking the electrical circuit may consist of the type-die or matrix and type body or blank in connection with any suitable appliances or means for operating these one toward and from the other. In this case the circuit is made by the contact of the die or matrix with the metal when beginning the type-forming operation; and, vice versa, the circuit is broken by the withdrawal of the die from the type. But by employing a separate circuit maker and breaker at some other point in the electrical circuit the advantage is obtained of being able to hold the type-forming die in contact with the type for a longer period than would otherwise (in some cases) be practicable.

In some cases my invention will be employed without the electric current, in which case the dies should be heated to a temperature about equal to or a little less than the melting point of the type-metal. When the electric current is employed in connection with the means for maintaining the dies normally in a heated condition, the electric current coöperates with the previously heated die in forming the type. In some cases, however, the dies may be used cold, except as they are heated during the use of the die by the heating current passing between the type metal and the die. In connection with this feature of my present improvements reference is made to another application Serial No. 167,947, refiled August 1, 1903, originally filed July 29, 1899.

One means for supplying heat to the metal being operated upon by the die consists in the die-stem or shank through which the heat will be conducted to the metal from the interior of the oven or heating chamber in which the dies are carried. The major portion of the stem of the active die will for this purpose remain in the oven during the die action.

Having thus described my invention, I claim—

1. As an improvement in type-forming mechanism, means for supporting the type body; means for bringing successive type-forming dies to the working point; means for bringing the type and a selected die into engagement one with the other; and means for supplying heat during the operation of the die to the metal being operated upon by the die.

2. In a machine for forming raised metal types on the edges of typebars, the combination with means for holding the typebar; of a series of selective dies, means for heating the dies; and means for bringing the typebar and a selected die into typeforming engagement.

3. The combination, with means for supporting a type body or typebar, of a series of dies; means for bringing a selected die to a working point; means for actuating the selected die; and means for heating the die to thereby heat the metal operated upon and so bring such metal to a plastic condition.

4. In a machine of the class specified, the combination with a series of typeforming dies, of an oven surrounding said dies, and means for supplying heat to the oven and directly to the dies.

5. In a machine of the class specified, the combination, with means for holding and feeding a type body or blank, of a series of type-forming dies; means for carrying said dies; an actuator for a selected die; and electrical apparatus for subjecting the metal being operated upon to the action of an electric heating current.

6. The combination, with carrying and feeding appliances for holding and feeding a type body or blank, of type-forming mechanism embodying type-forming dies; means for bringing any selected type to a common working point; and means for locally heating the type body or blank at such working point during the operation of forming a type at said point.

7. The combination, with means for supporting a type body or blank, of type-forming mechanism embodying a type-forming die; means for operating said support and the die, the one relatively to the other, to bring the die into engagement with the type body; and an electrical circuit including therein the type body and the type-forming die.

8. In a machine of the class specified, the combination, with means for holding a type-blank, of type-forming apparatus embodying a type-forming die; means for operating the holder and the die, the one relatively to the other, for bringing the die into working engagement with a type-blank supported in the holder; an electrical circuit including the type-blank and the type-die; and means for making and breaking the electrical circuit.

9. In an apparatus for forming character faces on type bodies, a matrix, means for holding said matrix and a type body in contact, and an electric circuit, including said matrix and type body, for heating said body to facilitate the formation of the character faces thereon.

10. In an apparatus for forming character faces on type bodies, a matrix, and means for simultaneously moving the matrix and type body into contact and establishing an electric current therethrough, whereby said body will be heated to facilitate the formation of the character face thereon.

11. In an apparatus for forming character faces on type bodies, a matrix, forming one terminal of an electric circuit, a pusher for

moving into contact the matrix and a type body forming the other terminal of said circuit and establishing an electric circuit there-through, whereby the body will be heated to facilitate the formation of the character faces thereon.

12. In a machine for making lines of type, the combination with a holder for a blank, of a series of selective dies adapted to be successively applied to successive portions of a blank in the blank holder and form types thereon, and means for heating the dies.

13. In a machine for making lines of type, the combination with a holder for a blank, of a series of selective dies adapted to be successively applied to successive portions of a blank in the blank holder and form types thereon, means for heating the dies, and a feed device for imparting a step by step movement to the blank in the holder.

14. In a machine organized for making impressions in succession, the combination with a carrier, of a plurality of selective impression devices mounted thereon and adapted to be selectively brought in succession to the working point of the machine, means for heating the dies, and a feed device for feeding the blank during the period between the making of successive impressions thereon.

15. In a machine organized for making impressions in succession, the combination with a carrier, of a plurality of selective impression devices mounted thereon and adapted to be selectively brought in succession to the working point of the machine, means for heating the dies, a feed device for feeding the blank and an electrical apparatus for subjecting the metal being operated upon to the action of a heating current.

16. In a machine organized for making impressions in succession, the combination with a carrier of a plurality of selective impression devices mounted thereon and adapted to be selectively brought in succession to the working point of the machine, means for heating the dies, a feed device for feeding the blank during the period between the making of successive impressions thereon, and an electrical circuit including therein the blank and the working die.

17. In a machine organized for making impressions in succession, the combination with a carrier, of a plurality of selective impression devices mounted thereon and adapted to be selectively brought in succession to the working point of the machine, means for heating the dies, a feed device for feeding the blank, an electric circuit including therein the blank and the working die, and means for making and breaking the circuit.

18. In a machine for making lines of type, the combination with a holder for a blank, of a series of selective dies, means for pressing them in determinate succession against the successive type blank portions of the blank

in the holder means for heating the dies, and means separate from the die heating means for heating the upper projecting edge of the blank.

5 19. In a machine for making lines of type, the combination with a holder for a blank, of a series of selective dies, means for pressing them in determinate succession against the successive type blank portions of the blank
10 in the holder means for heating the dies, and means for heating each such type blank portion during the subjection of the same to the type making operation.

20. In a machine for making lines of type, 15 the combination with a holder for a blank, of a series of selective dies, means for pressing them in determinate succession against the successive type blank portion of the blank in the holder, means for heating the dies, means
20 for heating each such type blank portion, and a feed device for imparting a step by step movement to the blank.

21. In a machine for making lines of type the combination with a holder for a blank, of
25 a series of selective dies, means for pressing them in determinate succession against the successive type blank portions of the blank in the holder means for heating the dies, means for heating such type blank portions,
30 and a feed device for feeding the blank during the period between the making of successive impressions thereon.

22. In a machine for making lines of type, the combination with a holder for a blank, of
35 a series of selective dies means for heating the dies, and means for heating the type blank portions of the blank in the holder.

23. In a machine for making lines of type, the combination with a holder for a blank, of
40 a series of selective dies, a chamber in which said dies are contained, means to supply heat to the chamber for heating the dies and means for heating the type blank portions of the blank in the holder.

45 24. In a machine for making lines of type, the combination with a holder for a blank, of a series of selective dies, a chamber in which said dies are contained, means to supply heat to the chamber for heating the dies and
50 means separate from the die heating means for heating the blank.

25. In a machine for making type bars, the combination of a rotative die-head, dies in the die-head, a blank holder and means to
55 heat the blank during the operation of the dies.

26. In a machine for making lines of type, the combination with a series of selective dies, of means for uniformly heating all the
60 dies, and means for augmenting the heat of the selected die.

27. In a machine for making lines of type, the combination with a series of selective dies, of means for uniformly heating all the
65 dies, and means for augmenting the heat of

the selected die during its engagement with the work.

28. In a machine for making lines of type, the combination with a holder for a blank, of a series of selective dies maintained in a
70 region of uniform heat, and means for augmenting the heat of the selected die.

29. In a machine for making lines of type, the combination with a series of selective dies of an oven having a lining of refractory
75 material surrounding said dies, means for heating the oven, and means for augmenting the heat of the selected die.

30. As an improvement in type forming mechanism, means for supporting the type
80 body, means for bringing successive pre-heated type forming dies to the working point means for bringing the type and a selected die into engagement one with the other, and means for supplying heat during
85 the operation of the die to the material being operated upon by the die.

31. The combination with means for supporting a type body or type bar, of a series of dies means for bringing a selected die to the
90 working point, means for actuating the selected die, means for uniformly heating all the dies, means for individually heating the selected die and thereby heat the metal operated upon and so bring such metal to a plastic
95 condition.

32. The combination with carrying and feeding appliances for holding and feeding a type body or blank, of type forming mechanism embodying type forming dies, means
100 for bringing any selected type to a common working point, and means for electrically locally heating the type body or blank at such working point during the operation of forming a type at said point.
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33. In a machine for making lines of type, the combination with a holder for a blank, of a series of selective dies, means for pressing them in determinate succession against the successive type blank portions of the blank
110 in the holder, means for heating the dies and maintaining them at a uniform temperature, and means separate from the die heating means for heating the upper projecting edge of the blank.
115

34. In a machine for making lines of type, the combination with a holder for the blank, of a series of selective dies, means for pressing them in determinate succession against the successive type blank portions of the blank
120 in the holder, means for heating the dies, means for supplying a blast of hot air to all said dies for maintaining them at a uniform temperature, and means for electrically heating each of such type blank portions during
125 the subjection of the same to the type making operation.

35. In a machine for making lines of type, the combination with a holder for a blank, of means for bringing each of a series of pre-
130

heated selective dies against determinate successive portions of a type blank in the holder, and means for individually augmenting the heat of the active die.

5 36. In a machine of the class specified, the combination with a series of typeforming dies, of an oven surrounding said dies, means for supplying heat to the oven and directly to the dies, and means for projecting the
10 working portion of the die out of the oven.

37. The combination with a blank holder, of an oven adjacent to the holder and provided with a die opening in line with the blank holding portion of said holder, a die
15 carrier within said oven, a series of dies, stems rigid with said dies and reciprocally mounted on said carrier, each of said stems being adapted on reciprocation to project the die carried thereby through said opening
20 and the body of said stem to remain within said oven.

38. The combination with a blank holder, of an oven adjacent to the holder and provided with a die opening in line with the blank holding portion of said holder, a die carrier 25 within said oven, a series of reciprocating die-stems carried by said carrier, a die mounted on each of said stems, and means for reciprocating a selected die-stem for projecting the die carried thereby through said 30 opening and toward the said holder.

39. The combination with an oven, of a series of selective dies, die stems rigid with said dies and located within said oven.

40. The combination with an oven, of a 35 series of selective dies, die stems having heat conducting connection with said dies and located within said oven.

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