

No. 667,790.

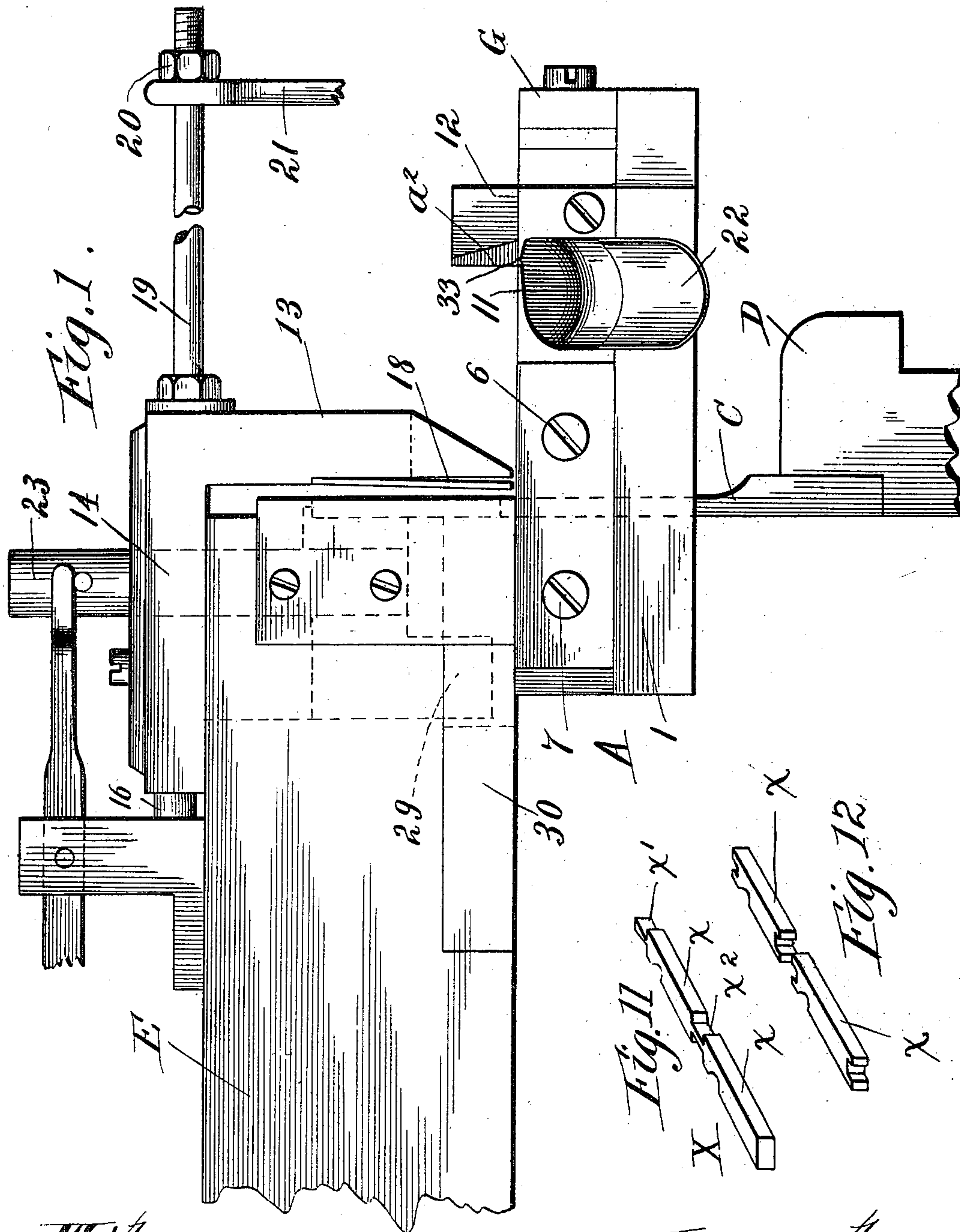
Patented Feb. 12, 1901.

P. G. NUERNBERGER.  
TYPE MAKING MACHINE.

(Application filed Sept. 12, 1900.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses:  
A. F. DuRand  
Harvey L. Hanson.

Inventor:  
Philip G. Nuernberger.  
by Charles A. Brown & Co.  
Atys.

No. 667,790.

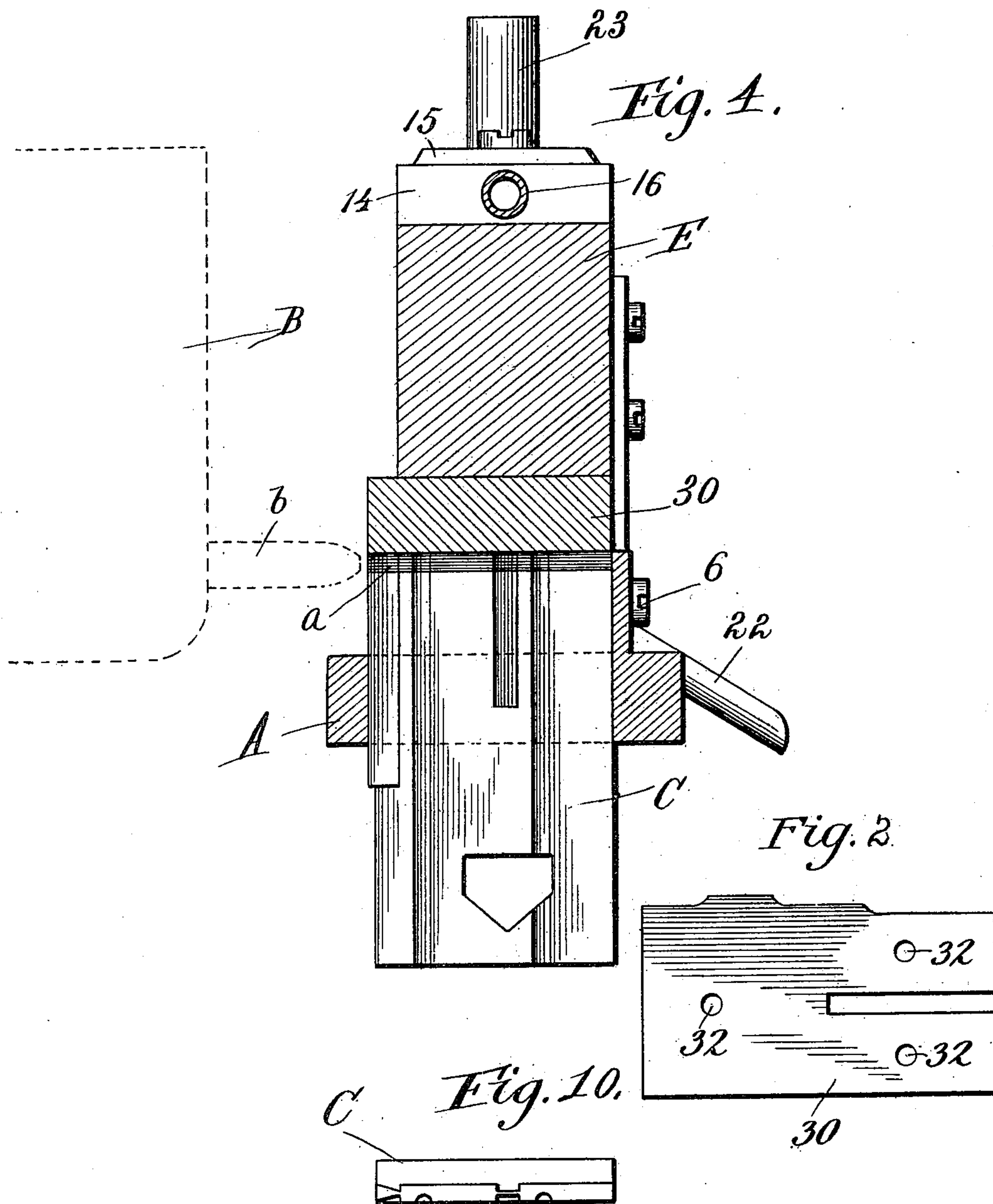
Patented Feb. 12, 1901.

P. G. NUERNBERGER.  
TYPE MAKING MACHINE.

(Application filed Sept. 12, 1900.)

(No Model.)

4 Sheets—Sheet 2.



Witnesses:

A. F. Duand

Harvey L. Hanson.

Inventor:

Philip G. Nuernberger.

by Charles A. Brown & Cragg  
Atty's.



No. 667,790.

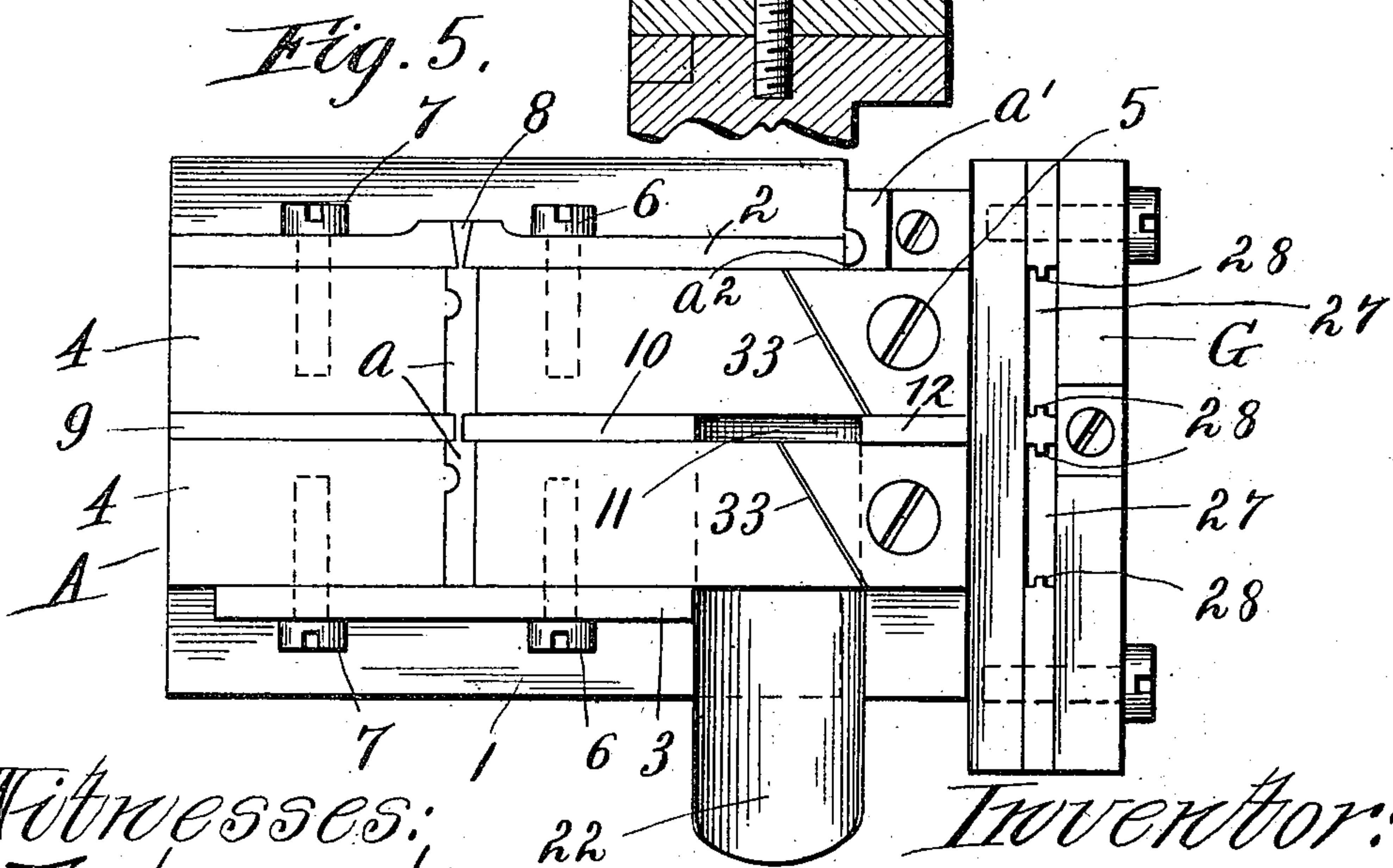
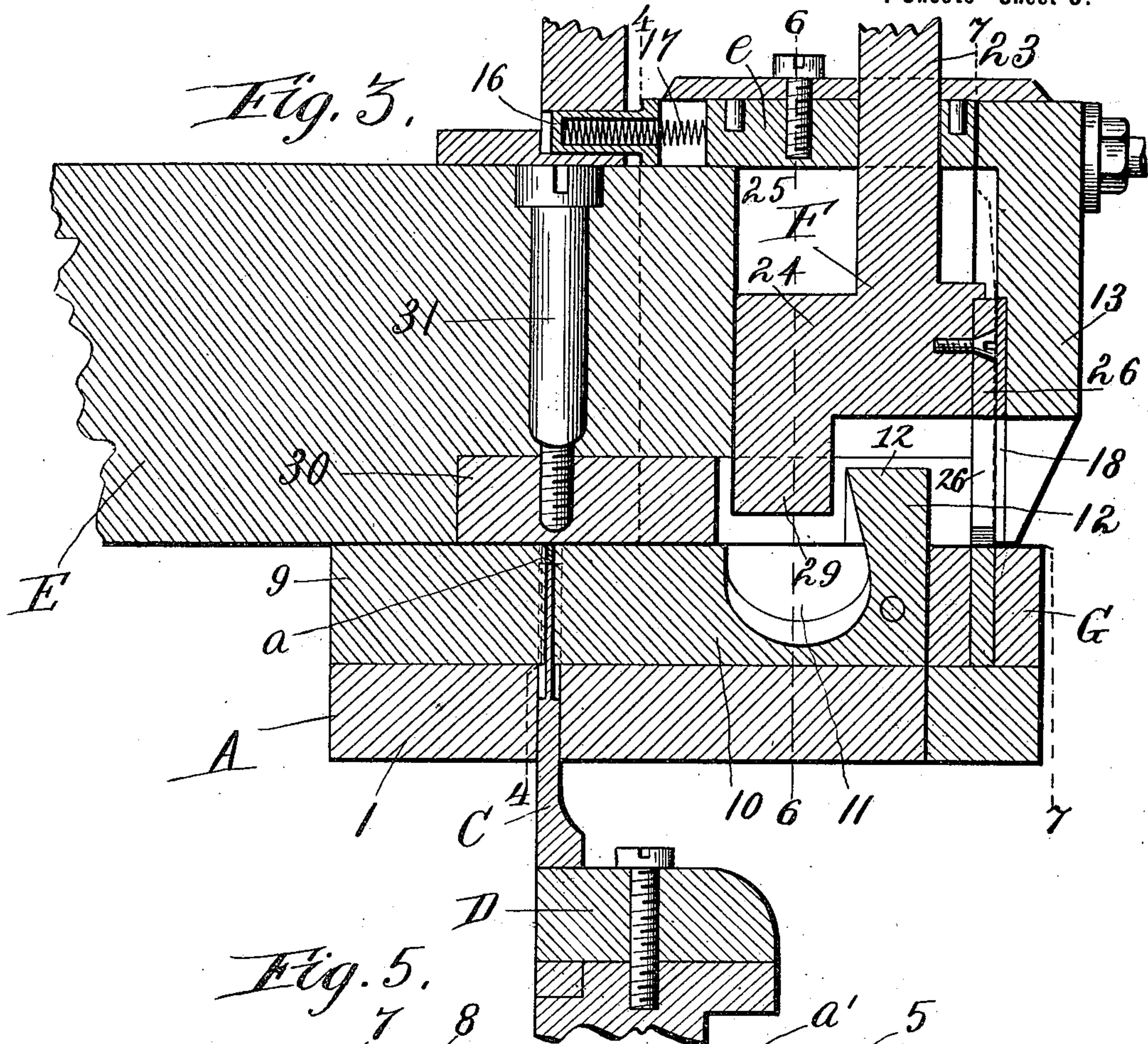
Patented Feb. 12, 1901.

P. G. NUERNBERGER.  
TYPE MAKING MACHINE.

(Application filed Sept. 12, 1900.)

(No Model.)

4 Sheets—Sheet 3.



Witnesses:  
A. F. Dm and

Harvey L. Hanson.

Inventor:  
Philip G. Nuernberger.

by Charles A. Brown & Co. Attys.



No. 667,790.

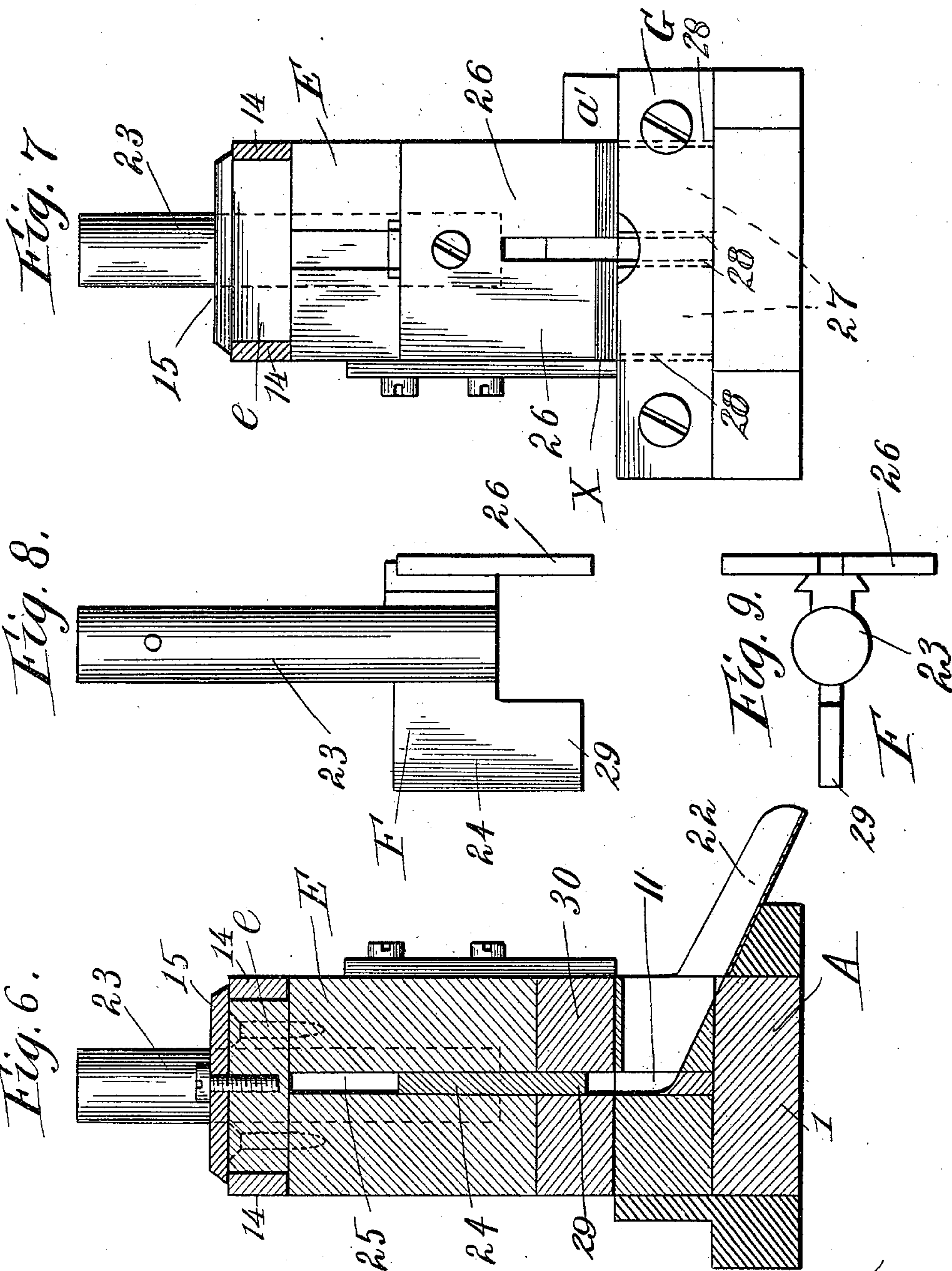
Patented Feb. 12, 1901.

P. G. NUERNBERGER.  
TYPE MAKING MACHINE.

(Application filed Sept. 12, 1900.)

(No Model.)

4 Sheets—Sheet 4.



Witnesses:  
A. F. Durand  
Harvey L. Hanson.

Inventor:  
Philip G. Nuernberger.  
by Charles A. Brown *Cragg*  
Attys



# UNITED STATES PATENT OFFICE.

PHILIP G. NUERNBERGER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE  
BARNHART BROTHERS & SPINDLER, OF SAME PLACE.

## TYPE-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 667,790, dated February 12, 1901.

Application filed September 12, 1900. Serial No. 29,757. (No model.)

*To all whom it may concern:*

Be it known that I, PHILIP G. NUERNBERGER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Type-Making Machines, (Case No. 1,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to type-making machines by which type-forms, slugs, and the like are manufactured.

The principal objects of my invention are to permit the construction of two slugs or forms simultaneously in a single machine and to accomplish this result by simple, practical, and expedient means.

In machines for making type as at present constructed it is common to first cast the slug or form in a suitable mold and then finish the type or form when in a hardened condition. In one form of machine of this character the type after being cast by an injection of molten metal into the mold is ejected from the mold by a suitable ejector. It is then grasped by an engaging or grasping device and carried forward. It is then depressed or thrust downwardly by a reciprocating plunger, which forces it into a channel or groove having its opposite ends provided with projections which cut recesses at the opposite ends of the slug, and thereby form the feet thereon. In being carried forward one side is shaved by suitable knives arranged on one side of its path of travel. The slug is thus finished by having its side properly shaved and the feet formed at its ends. In this application for a patent I have shown my invention applied to a machine of this character, although it will be obvious that the invention can be embodied in other machines as well. When it is thus applied, I arrange the mold so that it will cast two slugs, which are connected with one another by an intermediate web. This double slug in being carried forward after ejection from the mold passes against a knife or cutting edge, which severs the web, and thereby separates the two slugs from each other. Each slug is then forced

into a separate channel, which cuts recesses in its ends, so as to form the feet, as before.

As a matter of further improvement I arrange for the removal of the webs which are cut from between the two slugs.

I will now refer more particularly to the drawings, in which portions of a machine embodying my invention are illustrated.

In the drawings, Figure 1 is a side elevation of a portion of such a machine with the operating mechanism in one position. Fig. 2 is a plan view of a shoe forming a part of a traveling head embodied in the machine shown in Fig. 1. Fig. 3 is a vertical elevation of the parts of the machine in a position different from the position in which they are shown in Fig. 1. Fig. 4 is a vertical section taken on line 4 4 in Fig. 3. Fig. 5 is a plan view of the structure in which the mold is formed. Fig. 6 is a vertical section taken on the line 6 6 in Fig. 3. Fig. 7 is a vertical section taken on the line 7 7 in Fig. 3. Figs. 8, 9, and 10 are views of details of construction. Fig. 11 is a view of the double slug as cast in the mold, and Fig. 12 is a view of the two slugs cut apart from each other and finished.

In the drawings I have shown only so much of a type-making machine as is necessary to illustrate the application of my invention to a machine of the above-specified general character now in use and well known to the art. In this machine a mold A is suitably supported by the machine-framework, (not shown,) so as to maintain a fixed position. This mold A is provided with a mold-cell *a*, which in the case of my present invention is adapted to form a casting having a plurality of slugs, in this case two. The mold-cell *a* is shown in Figs. 3 and 5, and the double slug which it casts is illustrated in Fig. 11. The mold-cell, it will be seen, is composed of two compartments, each shaped to form a slug, and a small channel connecting these two compartments, which channel casts a web connecting the two slugs. The mold-cell is also provided with a small side extension 8, into which the molten metal is injected. This side extension 8 of course forms a small ear or projection on one of the slugs.

The mold A is conveniently constructed of



a base-piece 1, having two upwardly-extending flanges 2 and 3 and a pair of upper strips 4 4, arranged lengthwise upon the base-piece 1 and between the flanges 2 and 3 thereof.

5 The strips 4 4 are separated a slight distance from each other, and each of them is composed of two longitudinal sections, whose ends are separated a distance sufficient to form a cavity for one of the slug portions of the casting and are shaped so as to give the

10 the sides of these slug portions the proper form. The forward sections of the strips 4 4 are secured to the base-piece 1 by screws 5 5 and to the flanges 2 and 3 by screws 6 6. The

15 rear sections are screwed to the flanges 2 and 3 by screws 7 7. The flange 2 is provided with an aperture 8, which forms the metal-inlet. Between the strips 4 4 are arranged intermediate pieces or strips 9 and 10. The

20 piece 9 has a substantially rectangular form, as well shown in Fig. 3, and the piece 10 has a cavity 11 and an upwardly-extending projection 12 in advance of the cavity 11. The adjacent ends of the pieces 9 and 10 are separated slightly, so as to form a channel by

25 which metal can flow from one slug-cavity to the other. The whole mold thus constructed is a simple and practical construction and provides a mold-cell having two cavities for

30 two slugs, an inlet to one of these cavities, and a channel connecting them. Consequently the slug X produced by the mold has two slug portions  $x x$ , a projection  $x'$  extending from one of the slug portions, and a connecting-web  $x^2$  connecting the two portions,

35 as well shown in Fig. 11.

In Fig. 4 is illustrated in dotted lines a metal-pot B, which is understood to contain molten metal and to be suitably supported

40 in the machine in such position that its spout  $b$  will be located opposite the inlet 8 to the mold-cell.

In the machine there is also a reciprocating ejector C, which forms the bottom of the

45 mold-cell and also serves as a means for ejecting the casting. This ejector C comprises a plate-like structure having a transverse section corresponding to the shape of the mold-cell, as well shown in Fig. 10. It moves vertically in the channel formed by the sections

50 of the strips 4 4 and the intermediate pieces 9 and 10 and also formed in the base-piece 1, as shown in Fig. 3. It is mounted upon a reciprocating head D, which is understood to

55 be arranged in the machine and connected with suitable power devices, whereby the ejector C is at the proper time given a sufficient extent of vertical reciprocation to eject the casting from the mold-cell. As mechanism

60 for inducing such a reciprocal motion is now in use in similar machines and is well known in the art and also as it forms no part of my present invention, it has not been shown herein.

65 The machine illustrated also contains a reciprocating head E, which is arranged above the mold A and slides horizontally back and

forth upon the same. This reciprocating head E carries a gripping or engaging device by which the casting when ejected from the

70 mold is caught or grasped. The form of device illustrated comprises a bifurcated finger 13, arranged at the forward end of the reciprocating head and extending down so as to form

75 between itself and the bottom of the front end of the head a space capable of receiving the casting. The front end of the head is likewise bifurcated, the bifurcations of the head and of the engaging finger being adapted

80 to engage the two slug portions of the casting. The finger 13 is constructed with a horizontally-extending slide 14, which slides upon the top of the reciprocating head E, so as to permit the finger 13 to be adjusted relatively

85 to the front face of the head so as to in effect open and close the engaging device. The slide 14 is conveniently composed of a couple of side strips, Fig. 7, and a rear cross-piece, Figs. 3 and 4, connecting and formed integrally with the side pieces. The latter are

90 arranged to slide on opposite sides of a plate  $e$ , secured to the top of the head E. A plate 15 is arranged above and secured to the portion  $e$  and overlaps the side pieces comprising the slide 14, so as to form an effectual

95 guideway therefor. The rear end of the slide 14 is provided with a thimble or shell 16, and this incloses one end of an expansive spring 17, which acts against the rear end of the

100 plate  $e$ , and thereby tends to draw the finger 13 rearwardly and in effect close the engaging device. The inner side of the finger 13 is desirably provided with a flat bifurcated spring 18, so as to better grasp the casting.

105 The engaging finger 13 is provided with a stop by which its motion is arrested shortly before the reciprocating head arrives at the end of its rearward stroke. This opens the engaging device sufficiently to insure the introduction

110 of the casting without possibility of interference with the members of the device. The form of stop shown comprises a rod 19, extending from the forward end of the finger and having an adjustable nut 20 and an abutment 21, against which the nut 20 will strike.

115 The nut 20 can be adjusted so as to provide the proper size of opening between the head and the finger when the head is at the rear end of its stroke.

The reciprocating head E is connected with

120 suitable mechanism in the machine by which it is properly reciprocated. As mechanism of this kind is old in the art and forms no part of my present invention, it has not been shown herein. The arrangement, however,

125 is such that when the ejector C is actuated, so as to eject the casting from the mold-cell, the reciprocating head is at the rear end of its stroke, as shown in Fig. 1, at which time

130 the front of the head is immediately in the rear of the casting, and the finger 13 is held so as to provide a wide space for the introduction of the casting between the jaws formed by the finger and the head. The re-



reciprocating head then advances, forcing the casting along in front of it until it reaches the spring 18 on the finger 13. This finger 13 and the head thus grasp the casting and carry it forward, the springs 16 and 18 serving to insure a tight hold on the casting. As the casting X is carried forward by the reciprocating head E its web  $x^2$  strikes against the knife or edge formed by the abutment 12, Fig. 3, and is thereby severed, so as to separate the two slug portions of the casting. These two portions are carried forward in a separated condition to the forward end of the stroke of the head by being grasped by the bifurcated portions of the finger 13 and of the head. The webs cut from between the slug portions fall into the recess or cavity 11 and thence downwardly and out by the way of a chute 22. The mold A is provided with a block  $a'$ , having a cutting edge  $a^2$ , which cuts off the end  $x'$  of the casting as the latter advances. The mold-strips 4 4 are desirably provided with knives 33 33, by which the two slug portions are trimmed or shaved as they advance in the way in which a single slug portion is trimmed or shaved in machines of this character. The reciprocating head E also carries a plunger F, which is arranged to reciprocate vertically in a recess formed in the forward portion of the head. This plunger F is constructed, Figs. 3, 7, 8, and 9, with a cylindrical stem 23 and with a flat portion 24 below the stem 23. The stem 23 works in a suitable aperture formed in an upper piece  $e$ , which is secured to the top of the head E. The flat portion 24 works in a recess 25, formed in the front portion of the head, Figs. 3 and 6. In this way the plunger F can reciprocate vertically with reference to the head E while being carried backward and forward by it. The plunger F is provided at its forward end with a punch 26, bifurcated at its lower end, so that the flat ends of the two bifurcations correspond with the length and width of the separated slugs, and the space between them corresponds with the space between the ends of the slugs. The plunger F is reciprocated by suitable reciprocating mechanism. As such mechanism is well known in the art and forms no part of my present invention, it has not been illustrated herein. The mechanism is such that the plunger F is lowered at a time when the head E is at the forward end of its stroke. In front of the mold A is arranged a channel-piece G, Fig. 5, having a couple of channels 27 27 positioned below the two ends of the punch 26 when the head is in its foremost position. These channels 27 27 are provided with vertically-extending end projections 28 28. When the plunger F descends, the punch 26 forces the slug portions downwardly from between the spring 18 and the forward end of the head and into and through the channels 27 27 in the channel-piece G. In this way notches or recesses are cut in the

ends of both slugs, so as to form the feet thereon.

The flat portion 24 of the plunger F is desirably extended downwardly, Fig. 3, so as to form a punch 29, which reciprocates above and in the recess 11 when the head E is in its foremost position. In this way the webs cut by the abutment 12 are forced downwardly and their proper exit from the machine assured.

As a desired construction of the head E a wearing-shoe 30 is secured at the bottom of the forward portion of the head, so as to form the upper wall of the mold. This shoe 30 is shown alone in Fig. 2. It is bifurcated at its forward end, so as to form a portion of the channel 25, in which the abutment 12 and the flat portion 24 of the plunger F work. The wearing-shoe 30 is secured to the head by large screws 31 31 31, one of which is shown in Fig. 3. These screws extend downwardly through the head and fit into the holes 32 32 32 in the shoe 30.

From the foregoing it will be seen that by the operation of the machine a casting having two slug portions is first cast, the connection between such plug portions is then severed and both of such portions are trimmed or shaved, and finally the feet are cut on both of the slug portions simultaneously.

It will be observed that the structure hereinbefore referred to as a "slug" is in reality a type-form, and it will therefore be seen that the invention can be employed in casting structures involving a plurality of type-forms different from the slugs herein shown. It will also be seen that the plurality of type-forms could be simultaneously finished in ways other than the cutting of the feet herein shown in accordance with the invention herein set forth.

In the appended claims I shall employ the term "type-form" covering any style of structure of the general character of the slugs herein shown.

What I claim as my invention is—

1. The combination with a mold for casting a structure involving a plurality of connected type-forms, of means for ejecting the casting from said mold, a gripping device adapted and arranged to grasp the casting when it is ejected from the mold, means for advancing said gripping device, and a cutting device arranged in the path of travel of the gripping device and adapted to cut the connection between said type-forms, substantially as set forth.

2. The combination with a mold for casting a structure involving a plurality of connected type-forms, of an ejector arranged to form the bottom of said mold and to slide therein so as to eject the casting therefrom, a gripping device adapted and arranged to grip the casting when it is ejected from the mold, the said gripping device being adapted to grip the type-form portions of the casting with-



out gripping the connecting portions, means for advancing the gripping device and a cutting device arranged in the path of travel of the gripping device so as to cut the connection between the type-forms, substantially as set forth.

3. The combination with means for casting a structure having a plurality of type-forms, of means for finishing such forms separately, means for advancing the cast structure from the casting means to the finishing means, and a cutting device disposed in the path of travel of the advancing means and arranged to cut the type-forms from one another as they are advanced, substantially as set forth.

4. The combination with a mold adapted to form a casting consisting of a plurality of connected type-forms, of means for ejecting such casting from the mold, a gripping device adapted to grasp the casting and means for advancing the gripping device, a cutting device arranged in the path of travel of the casting and adapted to cut the type-forms from one another as the casting is advanced, and means for simultaneously finishing all of these separated type-forms consisting of a channel-piece having channels situated at the end of the path of travel of the means for advancing the gripping device, and a plunger adapted to force the type-forms from the gripping device into said channels, substantially as set forth.

5. The combination with a mold having two cells and a channel connecting said cells, of an ejector for ejecting the casting formed by said mold therefrom, a gripping device for grasping the casting as it is ejected from the mold, a reciprocating head carrying said gripping device and adapted to advance the same as it grips the casting, and a cutting device arranged in the path of travel of the web connecting the portions of the casting cast by the two cells of the mold, whereby when the reciprocating head advances the gripping device, the web will be cut by the cutting device.

6. The combination with a mold having two cells and a channel connecting said cells, of an ejector for ejecting the casting formed by said mold therefrom, a gripping device for grasping the casting as it is ejected from the mold, a reciprocating head carrying said gripping device and adapted to advance the same as it grips the casting, a cutting device arranged in the path of travel of the web connecting the portions of the casting cast by the two cells of the mold, whereby when the reciprocating head advances the gripping device, the web will be cut by the cutting device, and means for finishing the two separated forms simultaneously.

7. The combination of a mold having a mold-cell provided with a plurality of compartments, each adapted to produce a type-form and having a channel connection with one another, an ejector arranged to reciprocate in a groove or guide, having the configuration of the mold-cell, a gripping device

having gripping portions corresponding in number to the forms cast by the mold-cell and adapted to engage such forms, a reciprocating head carrying said gripping device and arranged to advance the same after the casting has been engaged by the gripping device, and a cutting device arranged in the path of travel of the connecting portion of the casting, whereby said connecting portion will be severed as the gripping device is advanced by the reciprocating head.

8. The combination with a mold having a mold-cell containing two compartments, each adapted to cast a type-form and having a channel connecting said compartments, an ejector arranged to reciprocate below the mold-cell and to eject the casting therefrom, a gripping device having a bifurcated end whose bifurcations are respectively adapted to engage the type-form portions of the casting, means for reciprocating the gripping device, and a cutting device arranged between the paths of travel of the bifurcations of the gripping device, whereby, as the casting is advanced by the gripping device, the connecting portion thereof will strike against the cutting device and be severed thereby.

9. The combination with a mold-cell having two connected compartments, each for casting the type-forms, of an ejecting device for ejecting the casting from the mold-cell, a gripping device for gripping the casting after it has been ejected from the cell, the said gripping device comprising gripping portions, each capable of independently engaging one of the type-form portions of the casting, means for reciprocating the gripping device, and a cutting device consisting of a vertically-arranged abutment or edge located between the paths of travel of the said portions of the gripping device.

10. In a device of the class specified, a gripping device comprising a pair of oppositely-arranged jaws, having their end portions correspondingly bifurcated, substantially as set forth.

11. In a device of the class specified, a gripping device comprising a pair of oppositely-arranged jaws, each having its lower or end portion bifurcated in combination with a cutting device adapted and arranged to act between the bifurcated portions of said jaws.

12. In a device of the class specified, a mold comprising a base-plate having a couple of upwardly-extending flanges, a pair of strips arranged side by side lengthwise between the said flanges on the base-piece and separated a slight distance from one another, each of said strips being composed of two sections having their ends separated from one another a distance sufficient to afford a compartment for a type-form, and a couple of intermediate pieces arranged between said strips and separated from one another sufficiently to afford between their ends a channel connecting said compartments formed by the side strips.



13. In a device of the class specified, the combination of a mold having a mold-cell containing a plurality of chambers or compartments, each adapted to cast a type-form, and  
 5 a connection between said chambers or compartments, the said mold comprising a base-piece provided with a couple of flanges extended upwardly therefrom, one of said flanges being laterally perforated so as to provide a  
 10 metal inlet for the mold-cell, a pair of strips arranged side by side between the said flanges, and situated with a small space between them, each of the said side strips being composed of two sections arranged end to end with sufficient space between the ends to provide one  
 15 chamber or compartment of the mold-cell, said chambers or compartments being arranged in line with the perforation in the said flange, a couple of intermediate pieces arranged between said side strips and having their ends separated sufficiently to form a channel connecting the said chambers or compartments one of said intermediate pieces having its end extended upwardly so as to  
 20 form a cutting edge or abutment in line with the connecting-channel of the mold-cell.

14. The combination with means for casting a structure having a plurality of type-forms, of means for separating said forms from one another, a channel-piece having a plurality of channels into which the said type-forms can be forced, the walls of said channels being adapted to cut the type-forms and means for forcing the same thereinto simultaneously.  
 35

15. The combination with means for casting a structure involving a plurality of type-forms, of mechanism for separating said forms from one another, a channel-piece having  
 40 channels capable of receiving the separated type-forms for finishing the same, and a plunger adapted to force all of said type-forms into said channels at the same time.

16. The combination with means for casting a structure having a plurality of type-forms, of an ejector for ejecting the casting from the mold, a gripping device adapted to grip the casting as it is ejected, and constructed so as to engage the type-form portions independently, means for reciprocating the gripping device, a cutting device adapted to sever the type-forms from one another, a channel-piece having channels capable of receiving the different type-forms and cutting  
 50 recesses in the same, and a plunger having a plurality of portions, each adapted to force one of the type-forms into its corresponding channel.

17. The combination with means for casting a structure having a plurality of type-

forms, of a gripping device capable of engaging the different type-form portions of the casting, means for reciprocating the gripping device, a cutting device arranged to sever the connection between the type-form  
 65 portions, a recess in front of the cutting device, the said recess having an outlet from the machine, and a plunger having a portion adapted to reciprocate in said recess and thereby remove the cut portions therefrom. 70

18. The combination of a mold having a mold-cell adapted to cast a structure involving a plurality of connected type-form portions, an ejector arranged to eject the casting from said mold-cell, a gripping device  
 75 adapted to grip said casting and composed of gripping portions, each capable of engaging one of the type-form portions of the casting, a reciprocating head carrying said gripping device and arranged to reciprocate the same, 80  
 a cutting device arranged to cut the connection between the type-form portions of the casting as the latter is advanced by the gripping device, a channel-piece having channels adapted to receive the separated type-forms 85  
 and to cut notches or recesses therein, and a plunger having separated portions adapted to force the type-forms into the said channels, and also having a portion adapted to reciprocate in front of the cutting device and thereby 90  
 cause the removal of the portions cut thereby.

19. The combination with a double mold and the ejector therefor, of a reciprocating head having its forward end provided with a gripping-finger, the front of the mold and the  
 95 lower end of the gripping-finger being correspondingly bifurcated so that the bifurcations engage independently the type-form portions of the casting, a cutting device consisting of an abutment or edge arranged between the 100  
 paths of travel of the bifurcated portions of the head, a gripping-finger, a reciprocating plunger carried by the head and having a bifurcated portion adapted to reciprocate between the finger and the bifurcated end of the 105  
 head, and also having a portion adapted to reciprocate in front of the cutting device, and a channel-piece arranged below the forward end of the path of travel of the gripping device formed by the finger and head end and 110  
 constructed with channels capable of receiving the type-forms and cutting the same when they are forced downwardly by the reciprocating plunger.

In witness whereof I hereunto subscribe my name this 8th day of September, A. D. 1900. 115

PHILIP G. NUERNBERGER.

Witnesses:

A. MILLER BELFIELD,  
 HARVEY L. HANSON.