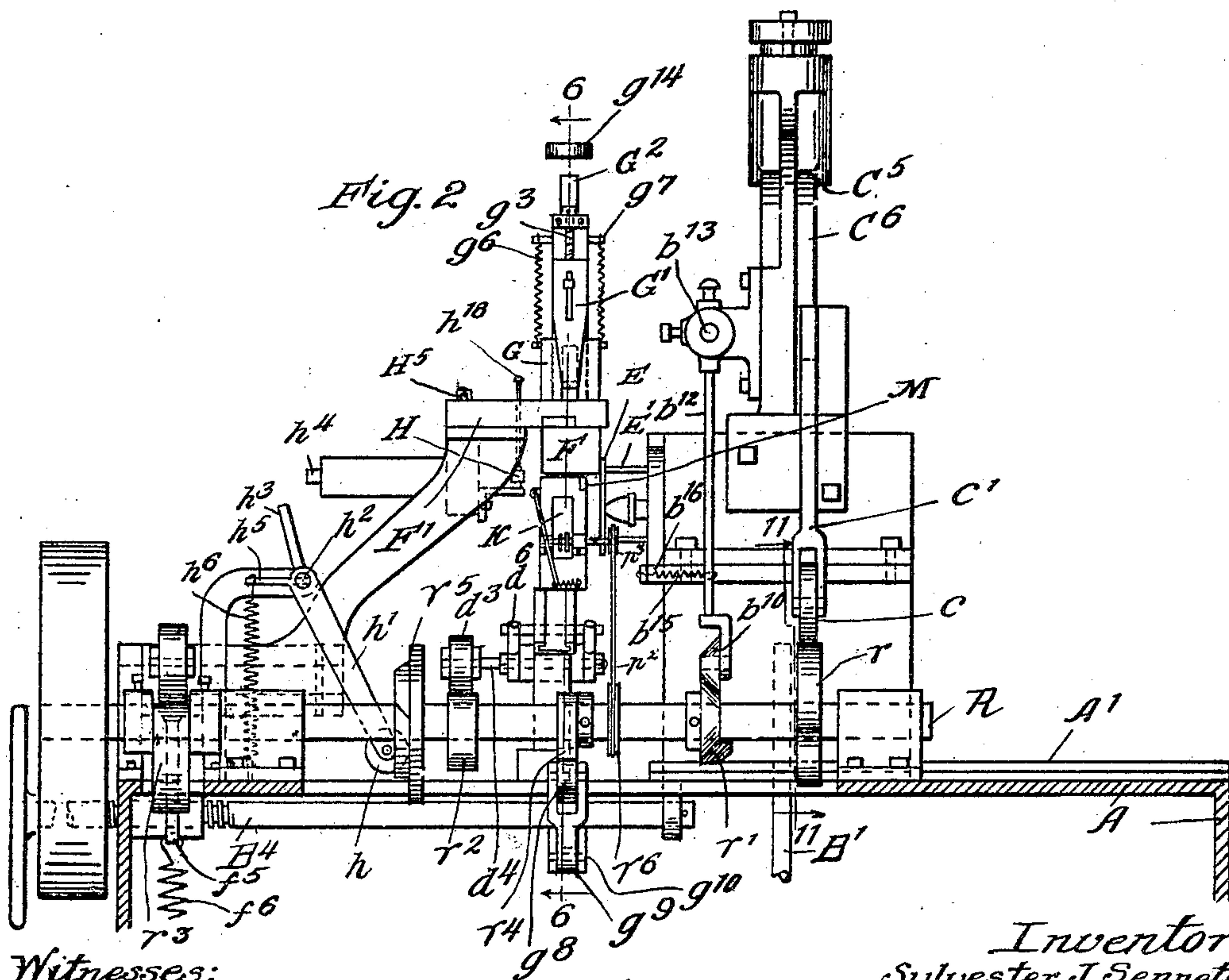
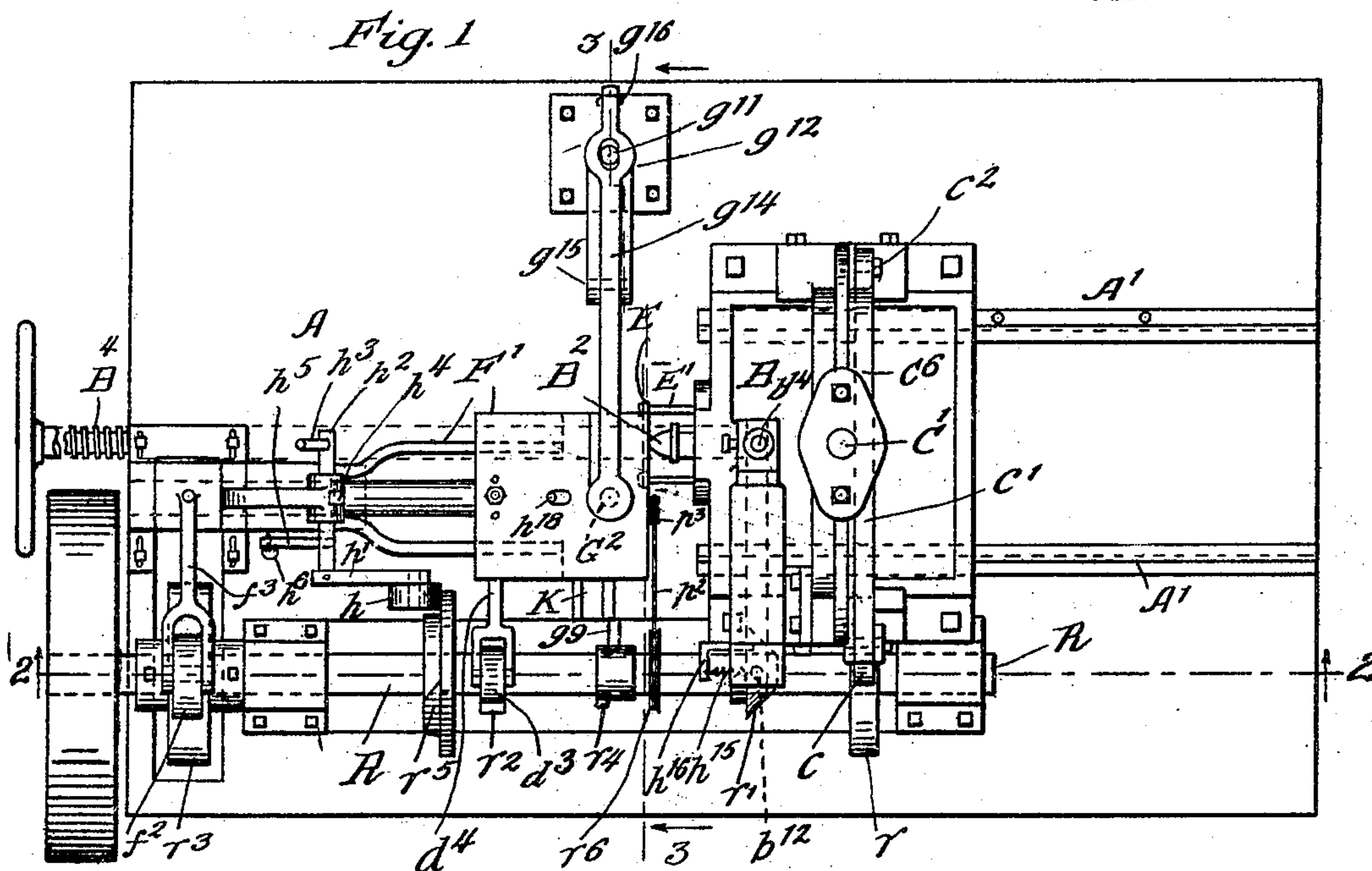


S. J. SENNETT.

AUTOMATIC TYPE CASTING MACHINE.

APPLICATION FILED OCT. 17, 1904.

3 SHEETS--SHEET 1.



Witnesses:

Wm. Geiger
S. W. Whunday

Inventor :
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Attorneys

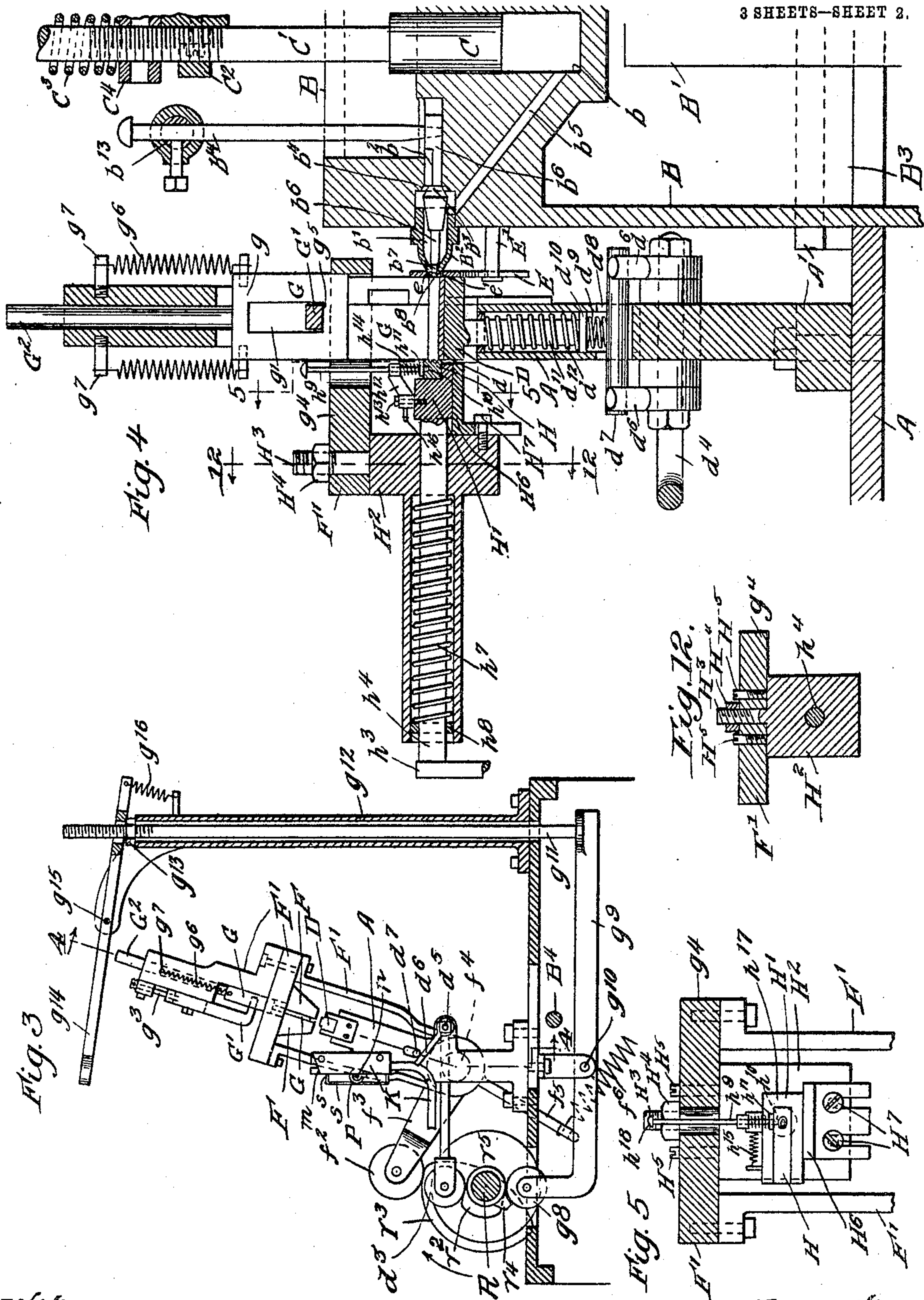
No. 797,980.

PATENTED AUG. 22, 1905.

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3 SHEETS—SHEET 2.



Witnesses:

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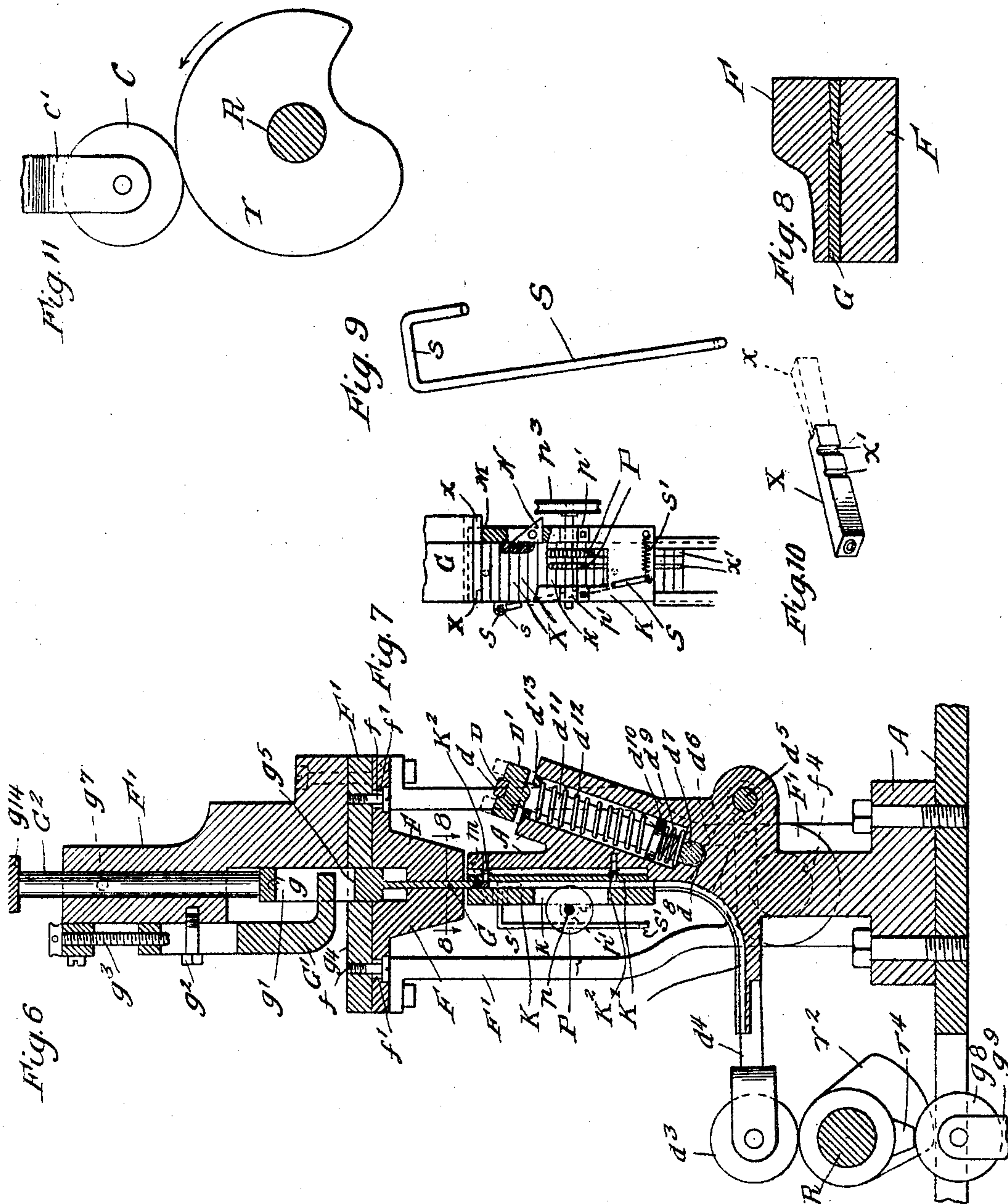
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3 SHEETS—SHEET 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

SYLVESTER J. SENNETT, OF CHICAGO, ILLINOIS, ASSIGNOR OF FIFTY-ONE ONE-HUNDREDTHS TO JAMES A. LONG AND WALTER T. STANTON, OF CHICAGO, ILLINOIS.

AUTOMATIC TYPE-CASTING MACHINE.

No. 797,980.

Specification of Letters Patent.

Patented Aug. 22, 1905.

Application filed October 17, 1904. Serial No. 228,780.

To all whom it may concern:

Be it known that I, SYLVESTER J. SENNETT, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Automatic Type-Casting Machines, of which the following is a specification.

My invention relates to automatic type-casting machines.

The object of my invention is to provide a machine of a simple, efficient, and durable construction by means of which type may be not only rapidly and perfectly cast, but also finished by removing the sprue neck or jet and grooving or finishing the sprue or neck end of the type and also nicking the type with one, two, three, or more nicks, as may be desired.

My invention consists in the means I employ to practically accomplish this object or result, as shown in the accompanying drawings, forming a part of this specification.

The machine embodying my invention comprises in coöperative combination a melting pot or vessel for holding the molten type-metal, a discharge nipple or nozzle for the molten metal, a valve-chamber having a valve or choker, a piston-chamber and piston for forcing the molten metal through the valve-chamber and nozzle into the mold, a lower or bottom mold member having a smooth upper face and mounted on a reciprocating mold-holder to bring the same into close contact with the opposing upper mold members when the same are brought into registry therewith, laterally swinging or movable upper mold members mounted on a laterally-rocking carrier, a reciprocating plunger or blade adapted to slide between and swing laterally with said laterally-swinging mold members and constituting the upper side or face of the mold and serving also by its reciprocating movement to extract or eject the type after it is cast from the upper members of the mold, a matrix and matrix-holder constituting the face end of the mold and adapted to be moved snugly against the end faces of the upper and lower members of the mold, a guide to receive and guide the cast type as they are discharged from the upper members of the mold when the same are moved or swung into registry with said guide, a neck or jet remover or device for breaking off or removing the sprue or neck from the cast type, a knife or grooving-tool

for finishing or grooving the neck or sprue end of the type as the type are forced down the guide by said reciprocating plunger or ejector-blade, one or more rotating nicking wheels or tools for cutting the desired number of nicks in the body-face of the type as the same are pushed along the guide by said reciprocating plunger or ejector-blade, and means or mechanism for communicating the required movements in proper time to the several moving parts or devices of the machine.

My invention also consists in the novel construction of parts and devices and in the novel combinations of parts and devices herein shown or described.

In said drawings, Figure 1 is a plan view of an automatic type casting and finishing machine embodying my invention. Fig. 2 is a vertical cross-section on line 2 2 of Fig. 1. Fig. 3 is a detail elevation showing the laterally swinging or rocking mold-carrier in its inclined position and other parts in vertical section on line 3 3 of Fig. 1. Fig. 4 is a detail cross-section on line 4 4 of Fig. 3. Fig. 5 is a detail section on line 5 5 of Fig. 4. Fig. 6 is a vertical section on line 6 6 of Fig. 2. Fig. 7 is a detail front view of the type-nicking mechanism. Fig. 8 is a detail cross-section on line 8 8 of Fig. 6. Fig. 9 is a detail view of a type-holding device hereinafter described. Fig. 10 is a perspective view of the finished type, and Fig. 11 is a partial vertical section on line 11 11 of Fig. 2. Fig. 12 is a section on line 12 12 of Fig. 4.

In the drawings, A is the frame of the machine, the same being of any suitable form or construction adapted to support the other parts. B is the casting or melting pot for holding the type-metal, and B' is the heater for heating the casting-pot.

The casting-pot B is provided with a piston-chamber *b*, in which reciprocates a piston C, by which the molten type-metal is forced out of the pot into the mold at intervals, as required. The casting-pot B is also provided with a valve-chamber *b'* and a discharge-nozzle B², preferably projecting horizontally. The valve-chamber *b'* communicates by a duct or passage *b²* with the molten metal in the upper portion of the pot B. This duct or passage is closed at intervals as required by a valve *b³*, commonly called a "choker," engaging the valve-seat *b⁴*. The valve-chamber *b'*

also communicates with the piston-chamber b by an inclined duct or passage b^5 . The valve-stem b^6 of the valve b^3 is also furnished with a small or needle valve b^7 , which opens and closes at the required intervals the small discharge-orifice b^8 of the nozzle or nipple B^2 . The nipple B^2 is preferably in a separate piece from the pot B and is secured thereto by screw-threads.

The mold comprises a reciprocating bottom or lower part or member D , having a smooth flat upper face d and carried by a reciprocating holder D' , mounted on the stationary frame A ; two laterally movable or swinging upper parts or members $F F$, which form the sides of the mold; a reciprocating plunger or blade G , which reciprocates between the side parts or members $F F$ of the mold and moves or swings laterally with them and the lower edge of which forms the top face of the mold; a movable or reciprocating matrix H , bearing the letter or character of the type and which forms the end face of the mold, and an end plate E , which is interposed between the mold and the nozzle or nipple B^2 and which has a fine bore or orifice e , registering with the discharge-orifice of the nozzle B^2 , and which is provided with a tapering or conical counter-sink e' , which fits and regulates on the tapering or conical end of the nozzle B^2 . The two side parts or members $F F$ of the mold are mounted upon a laterally swinging or rocking mold-carrier F' , which operates to swing or move the mold members $F F$ and G and matrix H first somewhat to one side into position to register with the lower or bottom mold member D of the mold. Then said bottom mold member D is reciprocated slightly upward to make snug tight close contact with the mold members $F F$, and then the matrix mold member H is moved or reciprocated toward the mold members $F F$ and D to snugly close the end of the mold preparatory to receiving the metal therein. After the molten metal has been forced into the mold by operation of the piston and choker-valve in the pot B the mold member D is by its reciprocating movement slightly withdrawn from the mold members $F F$, and then the mold-carrier F' swings or moves back laterally to bring the side mold members $F F$ and the reciprocating plunger or blade G into registry with the type-receiving guide K , into which the cast type is discharged by the downward sliding or reciprocating movement of the blade or plunger G , which then takes place. As the type are forced down one after another into the guide K by the plunger G the sprue jet or neck x of the type is broken off the type X by the neck or jet remover or device M , the same having an inclined face m , and which is secured to the type-guide K .

N is the finishing or grooving tool for the jet or sprue end of the type, the same pref-

erably consisting of a stationary grooving tool or knife secured to the type-guide K in position to engage and groove the sprue or jet end of the type as the type are forced along the guide one after another by the plunger or ejector-blade G .

$P P$ are rotary nicking tools or cutters for cutting one or more nicks x' in the body-face of the type as the type are forced along the guide K by the plunger or ejector-blade G . These nicking-tools are secured on a rotary shaft p , journaled in suitable bearings p' , attached to the guide K , the guide having a slot or opening k to receive the nicking-tools. One or more nicking-tools P are secured on the shaft p , according as one or more nicks x' are desired in the type.

The required movements may be communicated to the several moving operative parts or devices of my machine by any suitable motion giving or connecting mechanism, the preferred means for the purpose being illustrated in the drawings.

The piston C is operated or reciprocated as required by means of a cam r on the main driving-shaft or cam-shaft R , which engages a roller c on the bent lever c' , which is pivoted to the frame at c^2 and which is adjustably connected to the piston-stem C' of the piston C by a screw-threaded clamp C^2 . The cam r operates to raise the piston, and it is returned by a quick movement by a spring C^3 , interposed between the screw-threaded adjustable collar C^4 on the piston-stem C' and a shoulder C^5 on a bracket C^6 , attached to the frame.

The valves b^3 and b^7 or their valve-stem b^6 is operated or reciprocated as required and in proper time as required by a cam r' on the counter-shaft R , which engages a roller b^{10} , carried on a lever b^{12} , secured to a rock-shaft b^{13} , having an arm b^{14} , which engages the valve-stem b^6 . The cam r' operates to move the valve-stem in one direction—the direction to seat the valve b^3 on the valve-seat b^4 —and it is moved in the opposite direction by a spring b^{15} , connected to the bracket b^{16} , attached to the frame.

The plate E of the mold is supported in position by studs E' , connected to the pot B or other stationary portion of the frame.

The bottom or lower part or member D of the mold or its holder D' is reciprocated slightly up and down as required to close the same snugly against the side members $F F$ of the mold by a cam r^2 on the cam-shaft R , which engages a roller d^3 on a lever d^4 , pivoted at d^5 to the frame and having arms d^6 engaging a cross-pin d^7 , fitting in a slot d^8 in the frame and engaging a spring d^9 , bearing against the head d^{10} of the stem d^{11} of the mold-holder D' . A further spring d^{12} , interposed between the head d^{10} and a shoulder d^{13} on the frame, serves to retract the mold D and holder D' . The spring d^9 , interposed between the cross-pins d^7 and the stem of the

mold, gives a yielding pressure or movement to the mold D against the opposing side molds F F.

The side molds F F are adjustably secured to their laterally movable or swinging carrier F' by set-screws f , which pass through slots f' in the side molds F, so that the side molds can be set closer together or farther apart, as may be required in casting type of different sizes. In casting type of different sizes or dimensions or thicknesses laterally plungers or extractor-blades G of corresponding thicknesses are substituted. The mold-carrier F' is moved or rocked laterally as required to bring it into registry with the guide K and with the bottom mold D by means of a cam r^3 on the cam-shaft R, which engages a roller f^2 on the bent lever f^3 , which is secured to the rock-shaft f^4 , to which the rocking carrier F' is also secured. The lower arm f^5 of the bent lever f^3 is connected to a spring f^6 , which is attached to the frame and which serves to move the rocking carrier F' in the direction opposite to that to which it is moved by the cam r^3 .

The plunger or extractor-blade G is preferably furnished with an integral head g , having a slot g' , and to enable the machine to be quickly and readily set for casting type of different letters, characters of the same font and which require the mold to be of different depths for each different letter and the plunger or extractor-blade G to be stopped or held in different positions for each particular letter being cast, I provide the machine with a type-set finger or stop G', adjustably secured in position by a set-screw g^2 and adjusting-screw g^3 . By interposing a type or templet of the desired thickness between the stop or finger G' and the plate g^4 of the carrier F' the stop or finger G' may be quickly adjusted, so that the plunger G will be held in the right position by the stop during the casting operation for casting the particular type desired. The plunger or extractor-blade G is held in its retracted or casting position with the shoulder g^5 of the head g abutting snugly against the type-set stop or finger G' by means of springs g^6 , connected thereto at one end and at the other end to dowel-pins g^7 , secured in the carrier F'. The plunger or extractor-blade G is operated or moved downward to push the cast type out of the side molds F F into the guide K by means of a cam r^4 on the cam-shaft R engaging a roller g^8 on the lever g^9 , (see Fig. 3,) pivoted to the frame at g^{10} and engaging at its outer end a movable rod g^{11} in the guide g^{12} and which is provided with an adjustable screw-headed nut g^{13} , that engages a lever g^{14} , pivoted to the frame at g^{15} and which engages the stem G^2 of the plunger G. The lever g^{14} is held under tension by a spring g^{16} .

The matrix H or its holder H' is given its slight horizontally-reciprocating movement as required at proper intervals to close the

matrix snugly against the mold by a cam r^5 on the cam-shaft R engaging a roller h on the arm h' of the rock-shaft h^2 , the arm h^3 of which engages the stem h^4 of the matrix-holder H'. The rock-shaft h^2 has a further arm h^5 , connected to a spring h^6 , for holding the lever or its roller h against the face of the cam r^5 . The rock-shaft h^2 is journaled on the stationary frame of the machine. The matrix-holder stem h^4 is surrounded by a spring h^7 , bearing at one end against a collar h^8 on the stem h^4 and at the opposite end against the adjusting-block H² on the carrier F' and serves to retract the matrix and its holder. The matrix-holder H' is adjustably secured in position vertically by an adjustable block H², having a threaded stud H³ and adjusting-nut H⁴, and by the set-screws H⁵.

H⁶ is a guide for the matrix-holder, the same being adjustably secured to the block H² by set-screws H⁷.

The shaft p of the nicking wheels or tools P is rotated continuously by means of a pulley r^6 on the driving-shaft R and a belt p^2 engaging a pulley p^3 on the nicking-tool shaft p .

The type-guide K has a yielding back plate K', supported by springs K², so that the type-guide K will exert a frictional pressure against the type as they move down the guide. To press or hold the type properly against the sprue or jet finishing tool N, the guide K is furnished with a holding-finger S, pivoted to the guide K at s and held in position to engage the type by a spring S', and thus hold or push the cast type endwise against the sprue-finishing tool N as the type is pushed down the guide past said tool.

The matrix H is held in the matrix-holder H' and in proper registry with the other parts of the mold by a clamp-pin h^9 , which enters a registering hole or cavity h^{10} in the matrix. This clamp-pin is furnished with a collar h^{11} , which bears against the upper side of the matrix. The clamping and registering pin h^9 is mounted in a swinging bracket or arm h^{12} , attached to the matrix-holder H' by a pin or bolt h^{13} . A spring h^{14} , interposed between the collar h^{11} and the swinging arm or bracket h^{12} , presses the pin h^9 downward against the matrix, and thus holds the matrix snugly in place in the matrix-holder. A spring h^{15} , (see Fig. 5,) attached to an arm h^{16} on the swinging arm h^{12} , serves to hold or push the matrix lengthwise against the end shoulder h^{17} of the matrix-holder, thus holding the matrix in position in this direction. The matrix-holding pin h^9 is provided with a knob or handle h^{18} to enable this spring-held pin to be readily lifted when changing matrices when casting type of different letters.

The casting-pot B is mounted on a slide or carrier B³, traveling on guides A' on the main frame and furnished with a screw B⁴ for sliding the casting-pot to and from the mold. This enables the hot casting-pot to be readily

separated from the mold and other mechanism when the machine is not in operation.

The operation is as follows: The mold-carrier F' is first moved to bring the side molds $F F$ and the molds G and H into registry with the bottom mold D . The bottom mold D is then moved slightly upward to close the same against the side molds $F F$, and the matrix H is moved horizontally to bring the same snugly against the mold members $F F$ and D . The valve-stem b^6 is then reciprocated to close the valve b^3 against its valve-seat b^4 and open the discharge-orifice of the nozzle. The piston C is then operated to force the molten type-metal through the valve-chamber and discharge-nozzle into the now closed mold. After a brief pause to allow the metal to set, provided for by the cams, the bottom mold D then moves downward slightly to separate it from the cast type and molds $F F$, and then the mold-carrier F' swings or moves laterally into registry with the type-guide K , when the plunger or extractor-blade G is moved downward and pushes the cast type out of the molds $F F$ into the guide K . As the cast type are forced down the guide one after another by the plunger or extractor-blade G , each successive type operating to push those forward ahead of it, the cast type engages the sprue-remover device N , thus breaking off the sprue neck or jet x . As the cast type further advances along the guide K its sprue or jet end engages the neck-finishing tool N , which grooves or finishes the neck end of the type. As the type are further advanced along the guide K by the plunger or extractor-blade G they engage the rotating nicking-wheels P , one or more of which are employed, according to the number of nicks x' desired in the type. After passing the nicking-wheels and being nicked the finished type are discharged from the machine through the curved lower end (not shown) of the guide K into the customary receiving-stick.

I claim—

1. In an automatic type casting and finishing machine, the combination with a casting-pot having a piston-chamber and piston, a discharge-nozzle, a valve-chamber and choker and nozzle valves, of a reciprocating bottom mold member, laterally-movable side mold members, a reciprocating plunger or extractor-blade having a head furnished with a type-set-stop shoulder and adapted to slide between said side mold members and move laterally therewith and forming the upper face of the mold, and an adjustable type-set stop or finger adapted to engage said type-set stop or shoulder on the head of said plunger or extractor-blade a rocking carrier upon which said side mold members and said extractor-blade are mounted, a matrix and matrix-holder mounted on said rocking carrier and independently movable to and from said side and bottom mold members, said matrix form-

ing the face end of the mold, an end plate forming the opposite end of the mold and interposed between said side mold members $F F$ and said nozzle, a guide for the cast type, a sprue or jet removing device, a grooving-tool for the sprue or jet end of the type, and one or more rotary nicking-tools for nicking the body-face of the type as the same are forced along the guide by the extractor plunger or blade, substantially as specified.

2. In a type-casting machine, the combination with a casting-pot and piston and discharge-nozzle, of a reciprocating bottom mold member, laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and a matrix-holder movable to and from said side and bottom mold members, substantially as specified.

3. In a type-casting machine, the combination with a casting-pot and piston and discharge-nozzle, of a reciprocating bottom mold member, laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and a matrix-holder movable to and from said side and bottom mold members, and a type-guide to receive the type as they are discharged from said side mold members by the extractor-blade, substantially as specified.

4. In a type-casting machine, the combination with a casting-pot and piston and discharge-nozzle, of a reciprocating bottom mold member, laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and a matrix-holder movable to and from said side and bottom mold members, a type-guide to receive the type as they are discharged from said side mold members by the extractor-blade, and a sprue or jet removing device, substantially as specified.

5. In a type-casting machine, the combination with a casting-pot and piston and discharge-nozzle, of a reciprocating bottom mold member, laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and a matrix-holder movable to and from said side and bottom members, a type-guide to receive the type as they are discharged from said side mold members by the extractor-blade, a sprue or jet removing device, and a finishing-tool for the sprue or jet end of the type, substantially as specified.

6. In a type-casting machine, the combination with a casting-pot and piston and discharge-nozzle, of a reciprocating bottom mold member, laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and a matrix-holder movable to and from said side and bottom members, a type-guide to receive the type as they are dis-

charged from said side mold members by the extractor-blade, a sprue or jet remover device, a finishing-tool for the sprue or jet end of the type, and a rotary nicking-tool, substantially as specified.

7. In a type-casting machine, the combination with a casting-pot and piston and discharge-nozzle, of a reciprocating bottom mold member, laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and a matrix-holder movable to and from said side and bottom mold members, a type-guide to receive the type as they are discharged from said side mold members by the extractor-blade, and a rocking carrier upon which said side mold members, extractor-blade, matrix and matrix-holder are mounted, substantially as specified.

8. In a type-casting machine, the combination with a casting-pot and piston and discharge-nozzle, of a reciprocating bottom mold member, laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and a matrix-holder movable to and from said side and bottom mold members, a type-guide to receive the type as they are discharged from said side mold members by the extractor-blade, a rocking carrier upon which said side mold members, extractor-blade, matrix and matrix-holder are mounted, and a finishing-tool for the sprue or jet end of the type, substantially as specified.

9. In a type-casting machine, the combination with a casting-pot and piston and discharge-nozzle, of a reciprocating bottom mold member, laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and matrix-holder movable to and from said side and bottom mold members, a type-guide to receive the type as they are discharged from said side mold members by the extractor-blade, a rocking carrier upon which said side molds, extractor-blade, matrix and matrix-holder are mounted, and a rotary nicking-tool, substantially as specified.

10. In a type-casting machine, the combination with a casting-pot and piston and discharge-nozzle, of a reciprocating bottom mold member, laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and a matrix-holder movable to and from said side and bottom mold members, a movable carrier on which said side mold members, plunger or extractor-blade, matrix and matrix-holder are mounted, and an end plate interposed between said discharge-nozzle and said side and bottom mold members, substantially as specified.

11. In a type-casting machine, the combination with a casting-pot and piston and discharge-nozzle, of a reciprocating bottom mold

member, laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and a matrix-holder movable to and from said side and bottom mold members, a movable carrier on which said side mold members, plunger or extractor-blade, matrix and matrix-holder are mounted, an end plate interposed between said discharge-nozzle and said side and bottom mold members, and a type-guide to receive the type as they are discharged from said side mold members, substantially as specified.

12. In a type-casting machine, the combination with a casting-pot and piston and discharge-nozzle, of a reciprocating bottom mold member, laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, and a type-set finger or stop, said plunger or extractor-blade having a head furnished with a stop-shoulder to engage said type-set stop or finger a matrix and a matrix-holder movable to and from said side and bottom mold members, a movable carrier on which said side mold members, plunger or extractor-blade, matrix and matrix-holder are mounted, an end plate interposed between said discharge-nozzle and said side and bottom mold members, a type-guide to receive the type as they are discharged from said side mold members, substantially as specified.

13. In a type-casting machine, the combination with a casting-pot and piston and discharge-nozzle, of a reciprocating bottom mold member, laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and a matrix-holder movable to and from said side and bottom mold members, a movable carrier on which said side mold members, plunger or extractor-blade, matrix and matrix-holder are mounted, an end plate interposed between said discharge-nozzle and said side and bottom mold members, a type-guide to receive the type as they are discharged from said side mold members, and nicking-tools engaging the type as they are pushed along the type-guide by said plunger or extractor-blade, substantially as specified.

14. In a type-casting machine, the combination with a casting-pot and piston and discharge-nozzle, of a reciprocating bottom mold member, laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and a matrix-holder movable to and from said side and bottom mold members, a movable carrier on which said side mold members, plunger or extractor-blade, matrix and matrix-holder are mounted, an end plate interposed between said discharge-nozzle and said side and bottom mold members, a type-guide to receive the type as they are discharged from said side mold members, and a finishing-

tool for the sprue or neck end of the type engaging the type as they are pushed along said guide by said plunger or extractor-blade, substantially as specified.

15. In a type-casting machine, the combination with a casting-pot and piston and discharge-nozzle, of a reciprocating bottom mold member, laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and a matrix-holder movable to and from said side and bottom mold members, a movable carrier on which said side mold members, plunger or extractor-blade, matrix and matrix-holder are mounted, an end plate interposed between said discharge-nozzle and said side and bottom mold members, a type-guide to receive the type as they are discharged from said side mold members, a grooving-tool for the sprue or neck end of the type engaging the type as they are pushed along the type-guide by said plunger or extractor-blade, and a spring-actuated type-holding finger or device for pressing or holding the type endwise against said grooving-tool, substantially as specified.

16. In a type-casting machine, the combination with a casting-pot and piston and discharge-nozzle, of a reciprocating bottom mold member, laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and a matrix-holder movable to and from said side and bottom mold members, a movable carrier on which said side mold members, plunger or extractor-blade, matrix and matrix-holder are mounted, an end plate interposed between said discharge-nozzle and said side and bottom mold members, a type-guide to receive the type as they are discharged from said side mold members, nicking-tools engaging the type as they are pushed along the type-guide by said plunger or extractor-blade, said type-guide having a spring-pressed back plate, substantially as specified.

17. In a type-casting machine, the combination with a casting-pot and piston and discharge-nozzle, of a reciprocating bottom mold member, laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and a matrix-holder movable to and from said side and bottom mold members, a movable carrier on which said side mold members, plunger or extractor-blade, matrix and matrix-holder are mounted, an end plate interposed between said discharge-nozzle and said side and bottom mold members, a type-guide to receive the type as they are discharged from said side mold members, and a sprue or jet removing device, substantially as specified.

18. In a type-casting machine, the combination with a casting-pot and piston and dis-

charge-nozzle, of a reciprocating bottom mold member, laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and a matrix-holder movable to and from said side and bottom mold members, a movable carrier on which said side mold members, plunger or extractor-blade, matrix and matrix-holder are mounted, an end plate interposed between said discharge-nozzle and said side and bottom mold members, a type-guide to receive the type as they are discharged from said side mold members, a sprue or jet removing device, and a finishing-tool for the sprue or jet end of the type, substantially as specified.

19. In a type-casting machine, the combination with a casting-pot and piston and discharge-nozzle, of a reciprocating bottom mold member, laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and a matrix-holder moving to and from said side and bottom mold members, a movable carrier on which said side mold members, plunger or extractor-blade, matrix and matrix-holder are mounted, an end plate interposed between said discharge-nozzle and said side and bottom mold members, a type-guide to receive the type as they are discharged from said side mold members, a sprue or jet removing device, a finishing-tool for the sprue or jet end of the type, and a spring-actuated type holding or pressing device for pushing the type endwise against said finishing-tool, substantially as specified.

20. In a type-casting machine, the combination with a casting-pot and piston and discharge-nozzle, of a reciprocating bottom mold member, laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and a matrix-holder movable to and from said side and bottom mold members, a movable carrier on which said side mold members, plunger or extractor-blade, matrix and matrix-holder are mounted, an end plate interposed between said discharge-nozzle and said side and bottom mold members, a type-guide to receive the type as they are discharged from said side mold members, a sprue or jet removing device, a finishing-tool for the sprue or jet end of the type, and a rotary nicking-tool, substantially as specified.

21. In a type-casting machine, the combination with a casting-pot and piston and discharge-nozzle, of a reciprocating bottom mold member, laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and a matrix-holder movable to and from said side and bottom mold members, a movable carrier on which said side mold members, plunger or extractor-blade,

matrix and matrix-holder are mounted, an end plate interposed between said discharge-nozzle and said side and bottom mold members, a type-guide to receive the type as they are discharged from said side mold members, a sprue or jet removing device, a finishing-tool for the sprue or jet end of the type, a spring-actuated type holding or pressing device for pushing the type endwise against said finishing-tool, and a rotary nicking-tool, substantially as specified.

22. In a type-casting machine, the combination with a casting-pot and piston and discharge-nozzle, of a reciprocating bottom mold member, laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and a matrix-holder movable to and from said side and bottom mold members, a movable carrier on which said side mold members, plunger or extractor-blade, matrix and matrix-holder are mounted, an end plate interposed between said discharge-nozzle and said side and bottom mold members, a type-guide to receive the type as they are discharged from said side mold members and provided with a spring-held back plate, a sprue or jet removing device, a finishing or grooving tool for the sprue or jet end of the type, a spring-actuated type holding or pressing device for pushing the type endwise against said grooving or finishing tool, a rotary-nicking tool, substantially as specified.

23. In a type-casting machine, the combination with a reciprocating bottom mold member, of laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and an independently-movable matrix-holder, and a movable carrier upon which said side mold members, extractor-blade and matrix and matrix-holder are mounted, substantially as specified.

24. In a type-casting machine, the combination with a reciprocating bottom mold member, of laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and an independently-movable matrix-holder, a movable carrier upon which said side mold members, extractor-blade and matrix and matrix-holder are mounted, and a type-guide, substantially as specified.

25. In a type-casting machine, the combination with a reciprocating bottom mold member, of laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and an independently-movable matrix-holder, a movable carrier upon which said side mold members, extractor-blade and matrix and matrix-holder are mounted, a type-guide, and means for operating said carrier, substantially as specified.

26. In a type-casting machine, the combina-

tion with a reciprocating bottom mold member, of laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and matrix-holder movable independently of said side mold members, a movable carrier upon which said side mold members, extractor-blade and matrix and matrix-holder are mounted, means for operating said carrier, means for moving said bottom mold member to and from said side mold members, and a type-guide, substantially as specified.

27. In a type-casting machine, the combination with a reciprocating bottom mold member, of laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and matrix-holder movable independently of said side mold members, a movable carrier upon which said side mold members, extractor-blade and matrix and matrix-holder are mounted, means for operating said carrier, means for moving said bottom mold member to and from said side mold members, means for moving said matrix and matrix-holder to and from said side mold members, and a type-guide, substantially as specified.

28. In a type-casting machine, the combination with a reciprocating bottom mold member, of laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and matrix-holder movable independently of said side mold members, a movable carrier upon which said side mold members, extractor-blade and matrix and matrix-holder are mounted, means for operating said carrier, means for moving said bottom mold member to and from said side mold members, means for moving said matrix-holder to and from said side mold members, means for operating said plunger or extractor-blade to discharge the cast type, and a type-guide, substantially as specified.

29. In a type-casting machine, the combination with a reciprocating bottom mold member, of laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, an adjustable type-set finger or stop, said plunger or extractor-blade having a type-set shoulder engaging said adjustable type-set finger or stop, a matrix and matrix-holder movable independently of said side mold members, a movable carrier upon which said side mold members, extractor-blade and matrix and matrix-holder are mounted, means for operating said carrier, means for moving said bottom mold member to and from said side mold members, means for moving said matrix and matrix-holder to and from said side mold members, means for operating said plunger or extractor-blade to discharge the cast type into a type-guide, and a type-guide, substantially as specified.

30. In a type-casting machine, the combination with a reciprocating bottom mold member, of laterally-movable side mold members, a reciprocating plunger or extractor-blade sliding between said side mold members, a matrix and matrix-holder movable independently of said side mold members, a movable carrier upon which said side mold members, extractor-blade and matrix and matrix-holder are mounted, means for operating said carrier, means for moving said bottom mold member to and from said side mold members, means for moving said matrix and matrix-holder to and from said side mold members, means for operating said plunger or extractor-blade to discharge the cast type into a type-guide, a casting-pot having a piston-chamber, discharge-nozzle and valve-chamber, a piston and a valve, means for operating said piston, means for operating said valve, and a type-guide, substantially as specified.

31. The combination with a type-casting mechanism having an ejector-blade or plunger, of a laterally-movable carrier on which said casting mechanism is mounted, a stationary guide for the cast type, and a device for removing or breaking off the sprue as the type are forced along the type-guide by said ejector-blade or plunger, substantially as specified.

32. The combination with a type-casting mechanism having an ejector-blade or plunger, of a laterally-movable carrier upon which said casting mechanism is mounted, a stationary guide for the cast type, a device for removing or breaking off the sprue as the type are forced along the type-guide by said ejector-blade or plunger, and a finishing-tool for finishing the sprue or jet end of the type, substantially as specified.

33. The combination with a type-casting mechanism having an ejector-blade or plunger, a laterally-movable carrier upon which said casting mechanism is mounted, a stationary guide for the cast type, a device for removing or breaking off the sprue as the type are forced along the type-guide by said ejector-blade or plunger, a finishing-tool for finishing the sprue or jet end of the type, and a spring-actuated device for pushing the type endwise against said tool, substantially as specified.

34. The combination with a type-casting mechanism having an ejector-blade or plunger, of a laterally-movable carrier upon which said casting mechanism is mounted, a guide for the cast type, a device for removing or breaking off the sprue as the type are forced along the type-guide by said ejector-blade or plunger, a grooving-tool for grooving the sprue or jet end of the type, a spring-actuated device for pushing the type endwise against said tool, and a rotary nicking-tool, substantially as specified.

35. The combination with a type-casting mechanism having an ejector-blade or plunger, of a laterally-movable carrier upon which said casting mechanism is mounted, a stationary guide for the cast type, a device for removing or breaking off the sprue as the type are forced along the type-guide by said ejector-blade or plunger, a grooving-tool for grooving the sprue or jet end of the type, a spring-actuated device for pushing the type endwise against said tool, a rotary nicking-tool, and a spring-pressed plate for said type guide, substantially as specified.

36. The combination with a type-casting mechanism having an ejector-blade or plunger, of a guide for the cast type, a rotary nicking-tool for nicking the type as they are forced along the guide by said ejector-blade or plunger, and a spring-pressed back for said guide, substantially as specified.

37. In a type-casting machine, the combination with a bottom mold member, of a reciprocating holder for said bottom mold member, a rocking carrier, mold members mounted thereon, a matrix and a movable matrix-holder mounted on said rocking carrier, substantially as specified.

38. In a type-casting machine, the combination with a bottom mold member, of a reciprocating holder for said bottom mold member, a rocking carrier, mold members mounted thereon, a matrix, a movable matrix-holder mounted on said rocking carrier, and an extractor-blade or plunger forming the top face of the mold, substantially as specified.

SYLVESTER J. SENNETT.

Witnesses:

H. M. MUNDAY,
EDMUND ADCOCK.