

No. 618,926.

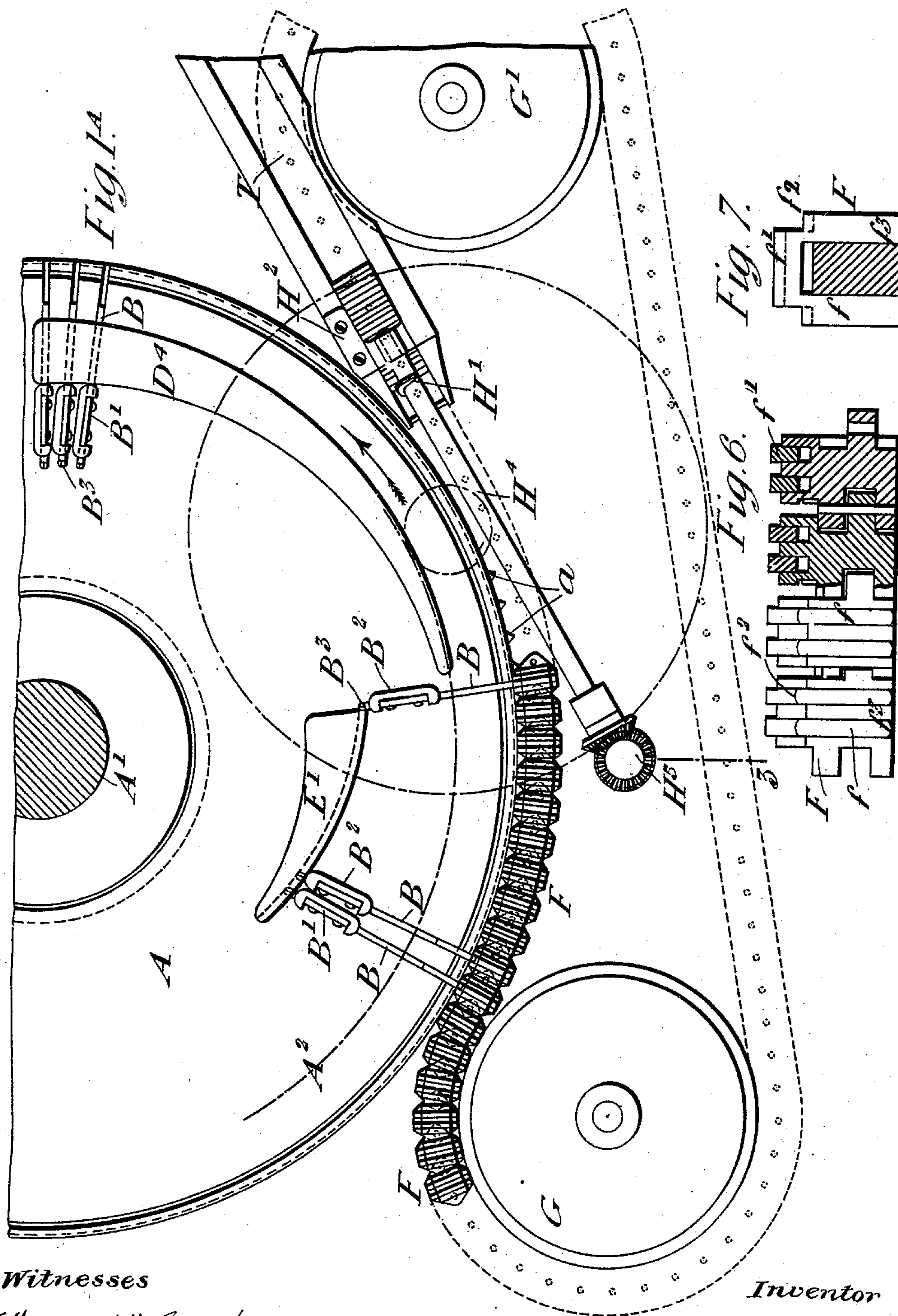
Patented Feb. 7, 1899.

F. WICKS.
TYPE FOUNDRY APPARATUS.

(Application filed Aug. 10, 1897.)

(No Model.)

4 Sheets—Sheet 2.



Witnesses

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Inventor

F. Wicks
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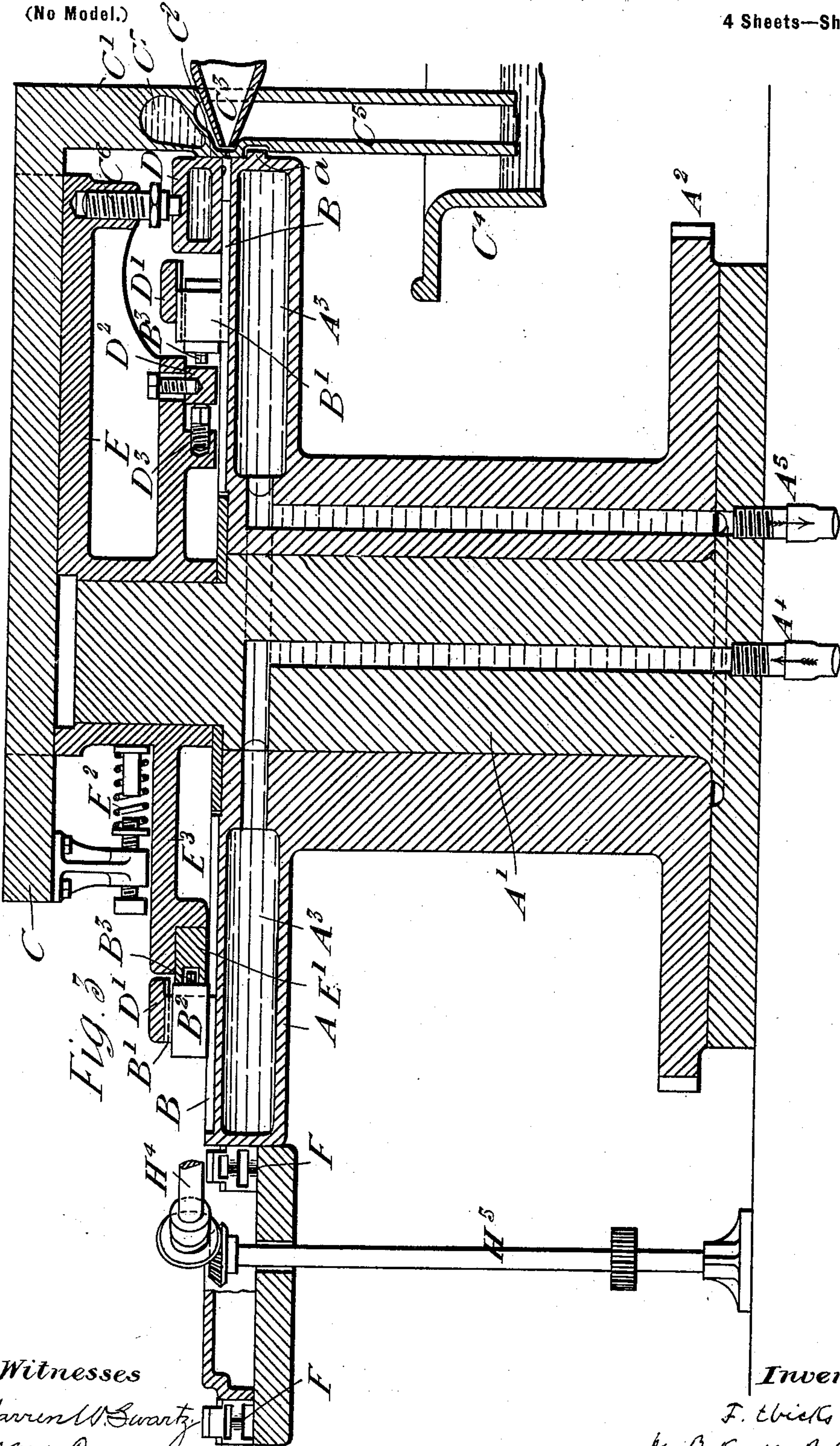
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UNITED STATES PATENT OFFICE.

FREDERICK WICKS, OF ESHER, ENGLAND.

TYPE-FOUNDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 618,926, dated February 7, 1899.

Application filed August 10, 1897. Serial No. 647,697. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK WICKS, a citizen of England, residing at Halfway Lodge, Esher, in the county of Surrey, England, have
5 invented new and useful Improvements in Type-Founding Apparatus, of which the following is a specification.

In my specification to United States Patent No. 565,820, dated August 11, 1896, I have
10 described type-founding apparatus comprising a rotating disk having radial grooves, in which matrices in the form of plungers slide to and fro, these grooves at one part of the revolution when the plungers are retracted
15 presenting themselves successively to a nozzle, whence they receive jets of molten metal forming types, which at other parts of the revolution are extended onto a carrying-chain. My invention relates to improvements in apparatus of this kind; but in order that these
20 improvements may be clearly understood I shall describe, referring to the accompanying drawings, the whole apparatus, the improvements forming the subject of my present invention being distinguished by the claims at the end of the specification.

Figures 1 and 1^a together represent a plan of the rotating disk and the cams fixed above it. Fig. 2 is an elevation of the side where
30 the types are discharged. Fig. 3 is a vertical section on the line 3 3 of Fig. 1. Figs. 3^A, 4, 5, 6, 7, and 8 are drawn to an enlarged scale, showing, respectively, Fig. 3^A, a part section of the nozzle-shield and cover; Fig. 4, a side
35 elevation of part of the chain for delivering the type and accessory parts; Fig. 5, a part section on the line 5 5 of Fig. 4; Fig. 6, several links of the chain, partly in side elevation, partly in longitudinal section; Fig. 7, a
40 transverse section of one of the links, and Fig. 8 a part section of the nozzle-shield and matrix modified for casting a compressible space-type. Fig. 9 is a longitudinal section of the compressible space-type; and Figs. 10,
45 11, and 12 are front, side, and plan views, respectively, of the plunger.

The disk A is mounted on a stationary vertical axis A' and is caused to revolve by a pinion in any convenient position, gearing with
50 teeth A² on the flange at the base. In the disk are cavities A³, through which, for the purpose of cooling, water circulates, ascend-

ing and descending by passages A⁴ A⁵, bored up the axis and the boss, respectively. The upper face of the disk has numerous radial
55 grooves, in each of which is fitted to slide a plunger B. The outer end of this plunger has a character engraved or impressed upon it, so that it forms the matrix for a type. The inner end B' of the plunger is made of con-
60 siderable height and is held by small screws between shoulders of a guide-piece B², having at its inner end an adjusting-screw B³.

Above the disk A there is fixed on the upper part of the axis A' a bracket-piece E, hav-
65 ing a dovetail groove, in which slides an arm C. On the axis A' is also fixed a flange E³, carrying a cam E' and other cams D² D⁴ for determining the movements of the plungers B. The arm C has a part C' turned down-
70 ward and forming a shield C², which by means of an adjustable spring E² is made to bear closely against the edge of the disk A where it is grooved, and there it has a projecting
75 rib with a small hole, through which jets of molten metal are discharged from the nozzle C³ into the grooves of the disk A as they successively pass the hole. The surplus metal runs down into the pot C⁴ by a conduit C⁵,
80 which dips into the fluid metal, so that the metal as it descends is not oxidized by exposure to the air. The nozzle C³ is supplied with molten metal from the pot C⁴ in the usual way by a suitable pump, which forms no
85 part of my invention. The small hole through which the metal is sent as a jet is situated in the rib projecting from the shield C², this rib being of approximately semicircular section, and the edge of the disk A has a groove
90 all around the periphery suited to this projecting rib, which forms the nick in the foot of the type. Spaces C⁷ for circulation of cooling-water are provided in C', these spaces being so formed that the water is as near as possible to the hole through which the metal is
95 discharged.

Above the disk A is a cover-piece D, which is cooled by circulation of water and which bears against the face of the shield C² and is kept down by screws C⁶, that can be accurately
100 adjusted to press it down upon the face of A at the place where the metal is injected into the molds formed in those parts of the grooves of A which are left vacant by the withdrawal

of the matrix-plungers. The cover-piece D has on its under side a projecting rib which forms the nick in the side of the type, and the disk A has a corresponding circular groove on its face. There may be several of such ribs and grooves when the types are to have several nicks. A ring D', rotating with A, has on its under side grooves corresponding to those in A, which serve as guides to the rear parts of the matrix-plungers. A cam D², which can be accurately adjusted in position by a screw D³, determines the position of the matrix-plungers at the time when the mold is receiving metal, each plunger being individually adjusted to extend more or less forward by its screw B³. The inner face of a cam D⁴ retracts the plungers as they are approaching the nozzle, this cam being shaped so as to retract them a little farther than required, so that the cam D² afterward acting on them has to push them a little outward. By means of the cam E' the matrix-plungers are pushed forward, so as to extend the types from the grooves. This cam is grooved, so that it does not act on the small adjusting-screws B³, but on the ends of the pieces B² attached to the plungers. In like manner the cam D⁴ acts on the front of those pieces. The ring D' is supported by studs at intervals projecting up from the disk A, and the cams D² and D⁴ are supported independently of A from the piece E.

As shown in Fig. 8, a special disk and set of matrix-plungers and a special shield are employed to cast space-types S of the shape shown in Fig. 9, so that they can be compressed, the line of type in which they occur being composed a little longer than required and then justified by compressing it. The shield C² has a projecting rib C⁸, with a central hole, through which the molten metal is injected, and the matrix-plunger B terminates in a nose of similar section B⁴, the space-type being formed by the metal between and on each side of the rib C⁸ and the nose B⁴. The disk A has in this case a groove all around its edge corresponding to the rib C⁸. Obviously by altering the forms of the parts C⁸ and B⁴ the form of the space may be more or less varied.

The types are extruded from the molds by the advance of the matrix-plungers, caused by the cam E', and as they are extruded they are received in channels in the upper faces of links F of a chain. These links are connected together by pins which allow it to bend freely in one plane and which are somewhat loose, so as to give the chain a little flexibility transversely. Each link of the chain is made with two vertical grooves, on each side of which grooves is fitted to slide a piece f. When the chain is on a level bed, the upper parts f' of the two pieces f project above the upper face of the link, forming between them the channel in which a type is received; but when these pieces are depressed by their shoulders f² passing under an inclined rib, while their

lower ends f³ descend an incline into a groove, then their heads f' are lowered down to the level of the upper surface of the link, leaving the type free to be moved onward. The chain F, formed of a number of these links, passes for some distance along with the periphery of A, which has teeth a engaging in the spaces between the links of the chain, then it passes down a slight incline, around a guide-roller G', again up a slight incline, and around a horizontal roller G. As the chain travels along with the periphery of the disk A each successive groove of the disk has presented to it the channel formed between the two pieces f' of each successive link to receive a type from each successive groove of the disk, and when a type is quite extruded it is still carried on some distance by the link which has received it. In this part of its course the chain travels over a level table F' till it reaches a point where it travels down a slight incline F², so as to pass under a table T on which the types are collected. At the point where the incline F² begins there begin also, but with a rapid slope, two grooves F³, which receive the lower ends f³ of the sliding pieces f. In the same vertical line with the rapid slope of the grooves F³ there are rapid downward slopes of two ribs T', projecting down from the table T, so as to bear upon the shoulders f² of the sliding pieces f. The effect of the sudden slope of these ribs is to depress the pieces f as they pass under them, leaving the type free on the upper surface of the link and resting on the projecting ends of the ribs T'. The chain in returning from the pulley G' to G meets with a corresponding upward incline and corresponding upward slopes terminating its grooves F³, so that the chain is raised again to its proper level in passing around the pulley G, and the pieces f are again raised so as to form the type-channel.

At the point where a type is about to be quite clear from the channel of a link, the front side of which channel first descends, a revolving approximately semicircular helical blade H', passing behind the type as the rear side of the channel is descending, urges the type forward along the table T and under a covering-piece H², causing it to push onward the row of types already collected on the table T. The helical blade H' is fixed on a horizontal spindle H⁴, driven by bevel-gear from a vertical spindle H⁵, worked by suitable gear from the teeth A² on the lower flange of the disk A—that is to say, the teeth A² intermesh with a pinion a', having secured to its shaft a toothed wheel a², which drives a pinion a³ on the vertical shaft H⁵, and this shaft actuates the shaft H⁴ by the bevel-gear a⁴.

When the compressible space-types are formed in the machine, the parts are arranged so that the cam E' thrusts the type entirely out of the groove in the wheel and into one of the grooves of the chain, the nose B⁴ being

projected beyond the rim of the wheel, but not so far as to enter the chain-groove, the chain as it advances drawing the type side-wise from the nose B⁴.

5 Although in what precedes I have described the construction and operation of the whole type-founding apparatus, it is to be understood that no general claim is made to apparatus of this kind, but only to the im-
10 provements in details as set forth in the following claiming clauses.

Having thus described the nature of my invention and the best means I know for carrying the same into practical effect, I claim—

15 1. In a type-casting machine the combination of a revolving wheel, having radially-extending type-forming recesses, matrix-plungers within the recesses, a nozzle, a shield extending between the edge of the wheel and
20 the nozzle, said shield having a radially-extending arm moving in suitable guides, and a spring arranged to yieldingly press the shield against the edge of the wheel; substantially as described.

25 2. A type-delivery chain having links provided with vertically-movable bars forming a type-receiving recess between them when in their raised position, and mechanism for

lowering the bars to allow removal of the type; substantially as described.

30 3. A type-delivery chain having links provided with vertically-movable bars forming a type-receiving recess between them in their raised position, a table having grooves receiving the ends of the bars and arranged to
35 move the same vertically, and a helical blade arranged to remove the type from the chain; substantially as described.

4. A type-delivery chain having links provided with a pair of vertically-movable bars
40 forming a type-receiving recess between them in their raised position, a table having grooves with inclined ends to receive the lower ends of the bars, a cover-plate having ribs with
45 inclined ends arranged to bear upon the upper ends of the bars, and a blade arranged to move the type from the chain when the bars are lowered; substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of
50 two subscribing witnesses, this 20th day of July, A. D. 1897.

FREDERICK WICKS.

Witnesses:

OLIVER IMRAY,

JNO. P. M. MILLARD.