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PATENTED JULY 31, 1906.

E. L. HOLMES.
LINOTYPE MACHINE.

APPLICATION FILED MAR. 13, 1905.

2 SHEETS—SHEET 1.

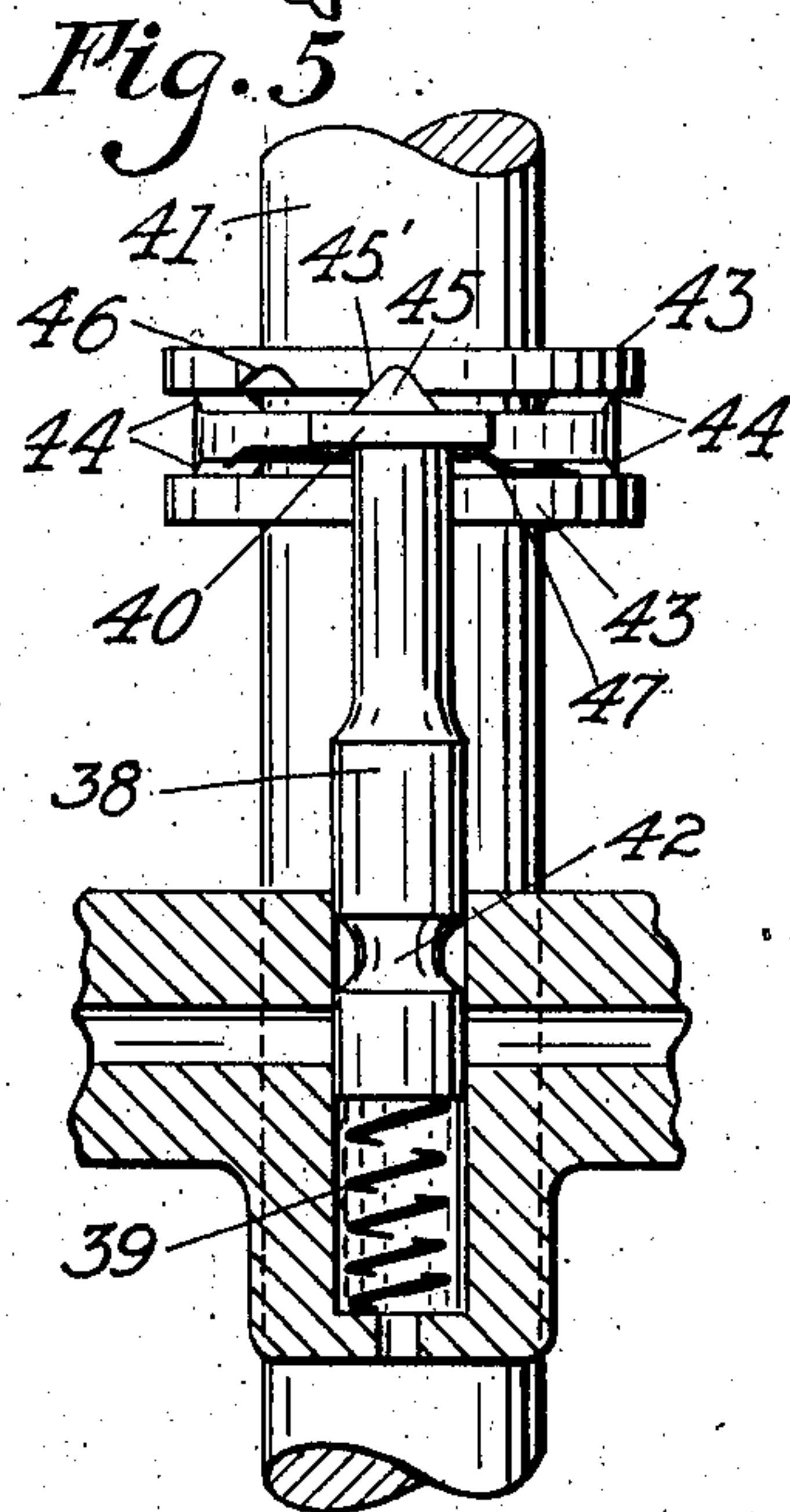
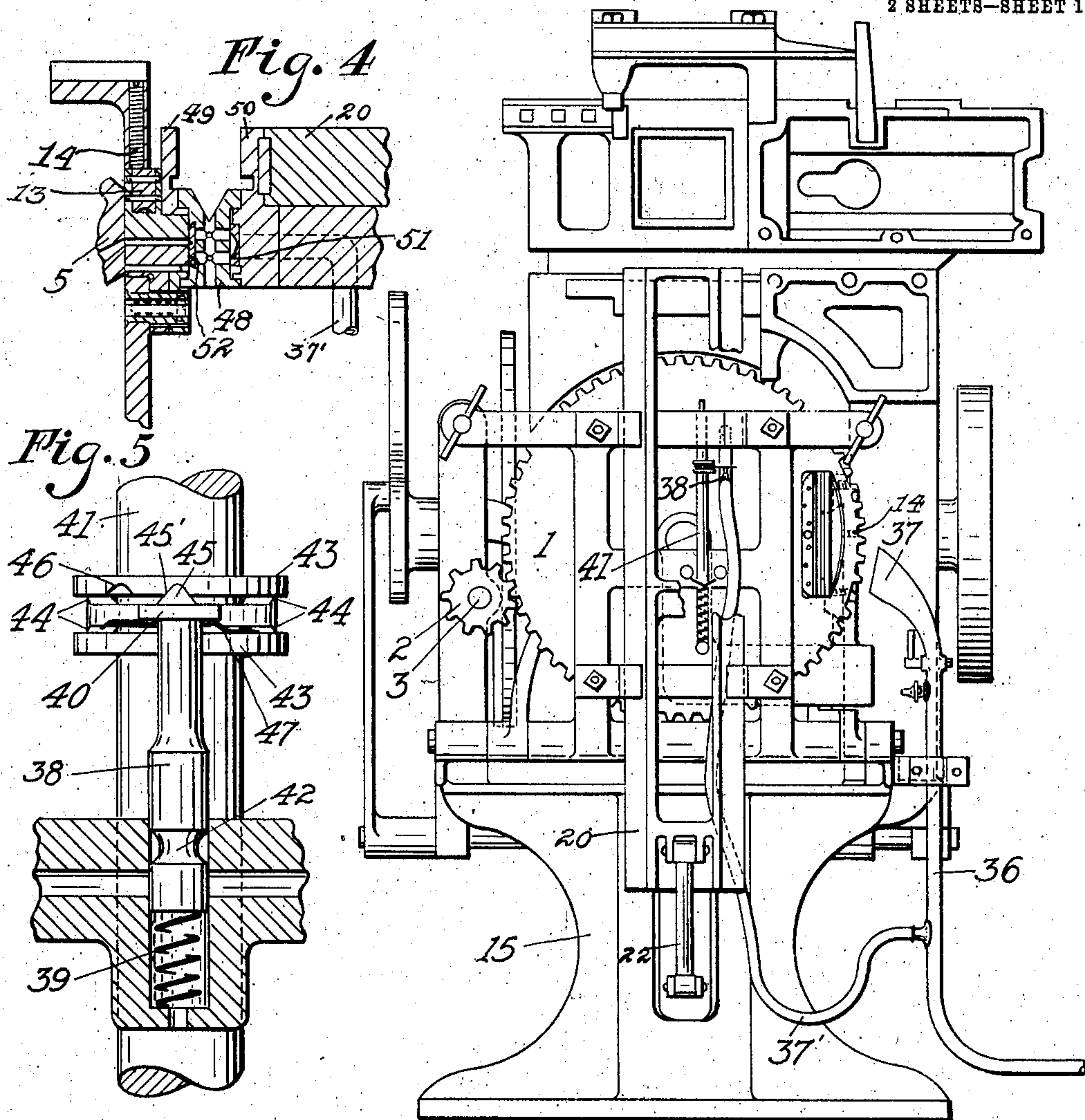


Fig. 6

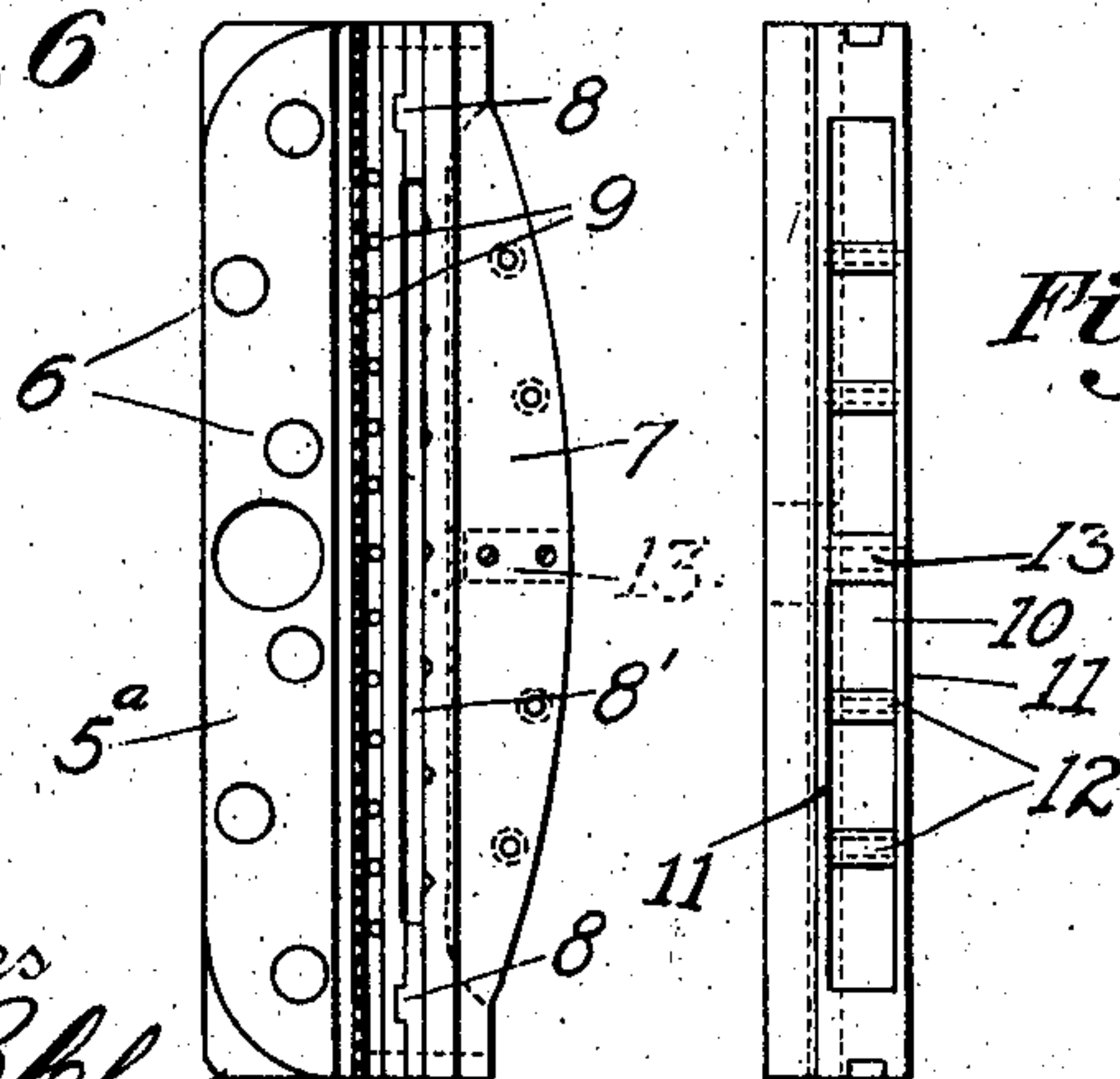


Fig. 1

Fig. 7

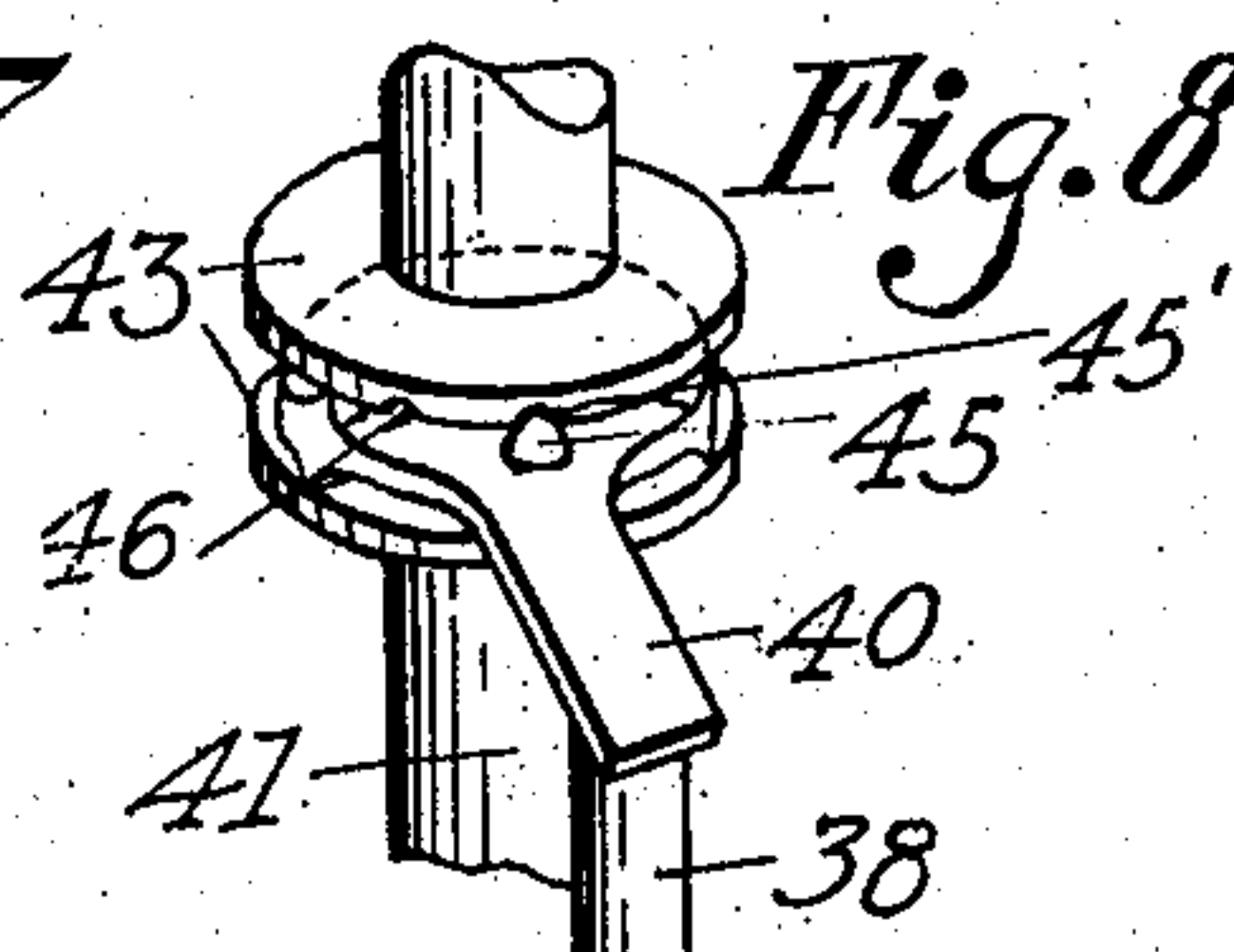


Fig. 8

Witnesses
Rufus B. Clark
Stephen H. Brooks.

By

Inventor
Edward L. Holmes
Attorney
Frank C. Adams.

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2 SHEETS—SHEET 2.

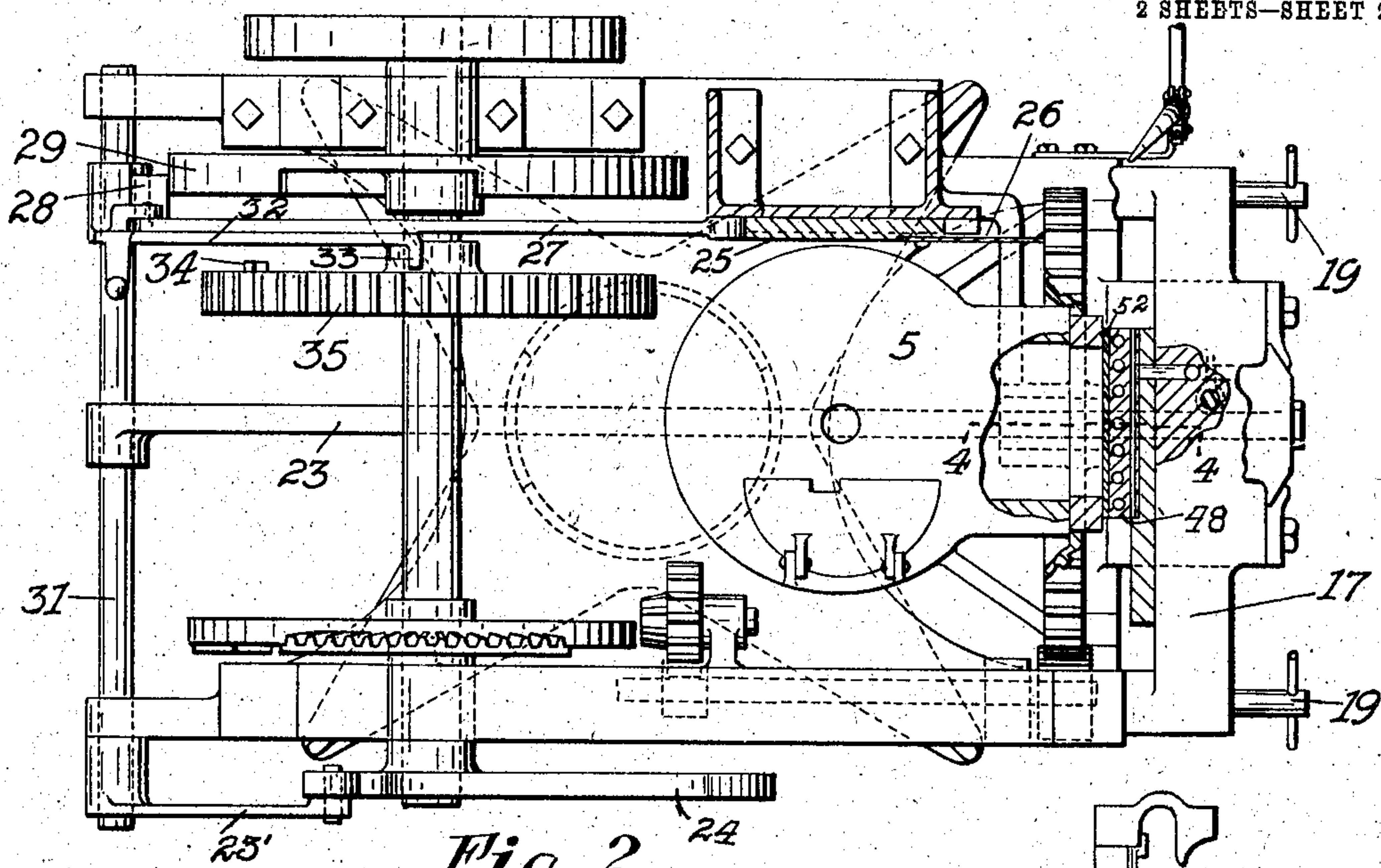


Fig. 2

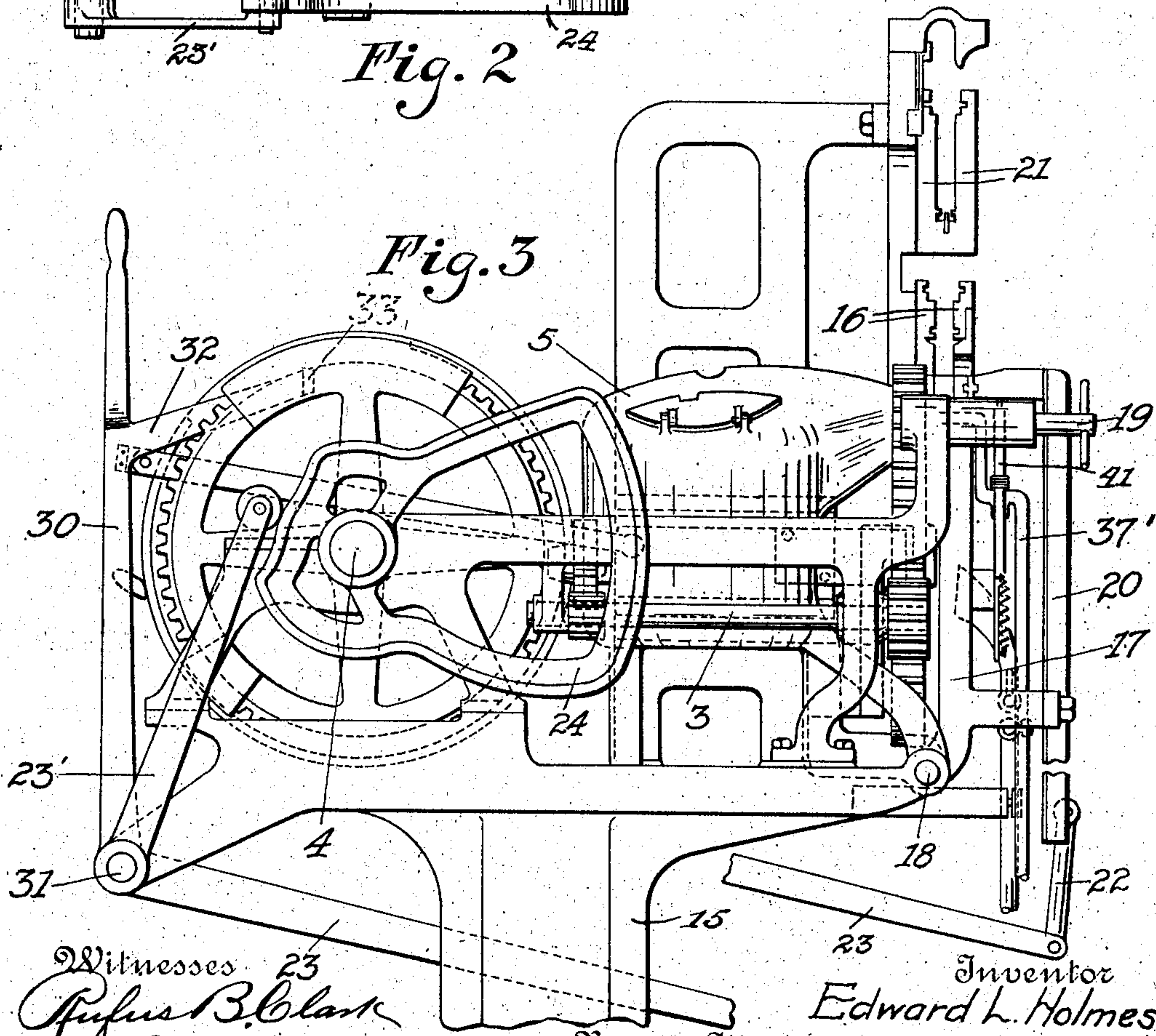


Fig. 3

Witnesses
Refus B. Clark
Stephen H. Brooks.

By

Attorney

Inventor
Edward L. Holmes
Frank E. Adams.

UNITED STATES PATENT OFFICE.

EDWARD L. HOLMES, OF SEATTLE, WASHINGTON.

LINOTYPE-MACHINE.

No. 827,238.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed March 13, 1905. Serial No. 249,945.

To all whom it may concern:

Be it known that I, EDWARD L. HOLMES, a citizen of the United States of America, and a resident of the city of Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Linotype-Machines, of which the following is a specification.

My invention relates to improvements in that type of linotype-machines wherein a series of letter-matrices and spacers are arranged to circulate, passing in a successive manner from the magazines to an assembler, in which they are assembled in line, then to the face of an open mold which is temporarily closed thereby to form the letters or characters in relief on the slug, which is formed of metal forced from the melting-pot into the mold; and the primary object thereof is to provide improvements whereby the casting of the type-bars can be effected with rapidity and which when cast will be perfectly solidified and have a very hard face.

Further objects and advantages will be set forth in the following description and defined in the appended claims.

In the accompanying drawings, in which like numerals of reference indicate like parts through the several views, Figure 1 is a view in front elevation of linotype-machine with parts removed and provided with my improvements. Fig. 2 is a top plan view thereof, parts being broken away. Fig. 3 is a view in side elevation thereof. Fig. 4 is a fragmentary sectional view taken on line 4 4 of Fig. 2. Fig. 5 is a fragmentary detail view of the valve in the air-supply pipe and the controlling means therefor. Figs. 6 and 7 are detail views of the mold, and Fig. 8 is a detail view in perspective of the valve-actuating swing-arm.

In the drawings I have shown for the purposes of illustration a linotype-machine of the well-known Mergenthaler type, the magazine, keys, and other auxiliary parts being removed, however, as they are obviously deemed unnecessary for a proper understanding of my improvements, which consist in the provision of means arranged adjacent the mold-disk and at a point opposite the point of rest of the mold after the ejection of the type-bar therefrom for discharging a continual blast of air on and through the apertures of the mold, and, further, other means which discharge a blast of air intermittently against

the dash-block or matrices when the type-bar is being cast. In conjunction with my improvements, as stated in the foregoing, I provide an improved mold of skeleton form which permits of the air effecting a quick cooling of the metal contained therein. By these improvements the mold is kept cool, and consequently warping thereof is prevented, and when metal of a very high temperature is employed the result will be a very hard face on the slug or type-bar. The intermittent blasts of air to which the dash-block or matrices are subjected during process of casting insures a perfect solidification of the type-bar. The continuous blast, aside from cooling the mold when it is at rest, cools the entire mold-disk and drives away fumes from the metal, which are both disagreeable and injurious to the operator.

The linotype-machine shown embodies a mold-disk 1, which is formed with teeth meshing with pinion 2, secured to a shaft 3, driven intermittently for alternate quarter and three-quarter turns of the said disk from shaft 4 by means, as shown, which is similar in construction to that shown in Patent No. 378,797.

The mold is secured in this disk (see Fig. 4) and is adapted to receive metal from the melting-pot 5, whereby the type-bar is formed. This melting-pot, as in the usual construction, is pivoted for tilting movement and can be operated in any desired manner. This mold is substantially the same in outline as the ordinary mold of this nature and consists of a base part 5^a, having apertures 6, through which screws pass to secure it to the mold-disk. 7 indicates the cap, and between this base and cap liners 8 are placed to form the space 8' for the slug. My improvement in the mold consists in providing air-passages therein, such as apertures 9, which are arranged in proximity to said space 8', and in providing a channel, as 10, along the back of the cap. This channel is conveniently provided on the ordinary mold by cutting away the center portion of the rib longitudinally, so as to leave opposite thin ribs 11, which are strengthened by cross-pieces 12 and 13, the latter being so arranged that one of the clamping-screws 14 will bear thereupon. The mold is thus reduced to skeleton form without sacrificing its stability, and quick cooling thereof is insured, as the air will pass through the apertures and

along the channel thereof when the mold is at the point of ejection, it being understood that this channel is not entirely closed by the adjacent portion of the disk when the mold is secured therein. (See Fig. 4.)

Reference-numeral 15 indicates the rigid main frame, and 16 the matrix-conducting rails between which the type are received from the magazine. (Not shown.) To the left of these rails is the vise-frame 17, which is pivoted, as at 18, to the main frame and normally locked against swinging movement by screws 19. This vise-frame is provided with the elevator 20', the head of which is provided with jaws designed to receive the type from the rails 16 and then lower and hold them in front of the mold until the casting operation is completed and then elevate the line of type to the top of the machine in line with the horizontal overhead rails 21 preparatory to distribution. This vertical movement of the elevator is secured by connecting the lower end of the elevator to link 22, which is connected to a lever 23, fixed to rock-shaft 31, which has an operating-lever 23' fixed thereto. This lever 23' is provided with a roller for engagement with cam 24, whereby said shaft is rocked.

25 indicates the ejector-slide provided with the blade 26 for ejecting the type-bar from the mold, and this slide is connected to link 27. This link is pivoted to lever 30, fixed to shaft 31, and is provided with a branch arm 32, provided with an angular finger 33, adapted to be engaged by lug 34 on gear 35, whereby the slide is moved forward to eject the type-bar. The slide is retracted by pawl 28, fixed to lever 30, which engages the mutilated flange of cam 29, and held retracted thereby until the mold-disk has again passed through a complete revolution, it being understood that when the lug 34 engages finger 33 the pawl 28 has passed into the cut-out portion of the flange of cam 29, so that no resistance is offered thereby to the forward movement of the slide.

The foregoing is a description of one type of Mergenthaler machine, the construction of which is well known in the art, to which my improvements are applicable; but I do not desire myself understood to be limiting the same to the specific application shown.

In Fig. 1 the mold-disk is shown in position to have the type-bar ejected therefrom, its receiving position being at a right angle thereto, and opposite these two points of reception and ejection I provide air-blast means which comprises a supply-pipe 36, having at its upper end the twyer 37, adapted to discharge a continuous blast of air or other cooling agent onto the mold and disk, thereby always tending to cool the mold-disk and expelling injurious fumes from the operator, and when the mold moves to its ejecting position it will be subjected to a direct cooling-

blast. A branch pipe 37', extending from pipe 36, is supported in the vise-head and has its upper end arranged to discharge air intermittently onto a dash-block or onto the backs of the matrices during the casting operation. This branch pipe is provided with a valve 38, which is depressed against tension of spring 39 by an arm 40, supported on the vise automatic stop-rod 41, whereby when the latter is depressed by the elevator, as in usual practice, said arm is also lowered to depress said valve and allow its peripheral groove 42 register with the bore of the pipe, and thereby allow the air to pass freely there-through.

The arm 40 is rigidly connected to a circular open body mounted on the said locking-rod for rotation between collars 43 and is formed on its two faces with opposite bosses 44, on which said body can rock, so as to have its locking-tooth 45 disengaged from a correspondingly-shaped notch 45', formed in the lower face of the upper collar. Thus when it is desired that the valve should not be operated upon reciprocation of locking-rod 41 the outer end of said arm is manually lowered to disengage its tooth from notch 45', as heretofore stated, and then swung to one side of its operative position until its tongue engages in another notch, as 46, wherein it is held by suitable means, as spring 47.

My object in having arm 40 mounted for rotation is to enable the operator to swing the same out of its operative position, if desired, when the matrices are employed, as these in being conveyed back to the magazine ordinarily have ample time to cool; but when a dash-block, as 48, (see Fig. 4,) is used, it being understood that in this type of machine the dash-block is raised and lowered continually by the elevator and not forwarded to a magazine, as is the case with respect to the matrices, the block is given no time for rest, and consequently not allowed to cool sufficiently. Therefore when the dash-block is in use it is desirable that a cooling agent be discharged thereonto when the block moves directly in front of the mold, and the means heretofore described effects this result by operating valve 38 intermittently. This dash-block is supported between the back and front jaws 49 and 50 of the elevator-head and is perforated, as shown, so that air received from pipe 37' and passing along the channel in a face-plate 51 will circulate therethrough and about the rear face of the linotype dash-plate 52.

In operation after the assembled line of type or matrices have been delivered into the jaws of the elevator and the latter lowered, as heretofore described, metal from the melting-pot is forced by a plunger (not shown) into the mold, and during this operation the dash-block or matrices are subjected to a blast of air, the downward movement of

locking-rod 41 having opened valve 38. The ejector moves forward and ejects the type-bar, and, as will be observed, the mold during its rest will be rapidly cooled.

5 Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine of the type set forth, a mold comprising a base part, and a cap secured thereto, said cap being spaced from the base part to form a slug-receiving slot and being formed in its outer face with a channel, and said base part being formed with apertures at a point in proximity to
15 said slot.

2. In a machine of the type set forth, a mold comprising a base part and a cap secured thereto, said cap being formed with a longitudinal channel arranged at one side of the mold-slot, and said base part being
20 formed with apertures on the opposite side of said slot, in combination with means for discharging a cooling agent onto said mold.

3. In a machine of the type set forth, in
25 combination with a movable mold, a reciprocating rod, and means for operating the same, means for discharging a cooling agent onto the mold, a valve for controlling said means, and an adjustable means mounted on

said rod for unseating said valve, substantially as and for the purpose specified. 30

4. In a machine of the type set forth, in combination with the movable mold-carrier, and the mold, a means for discharging a cooling agent toward the mold at the point
35 where the slug is cast, and means discharging a cooling agent onto the mold-carrier, said last means being arranged opposite the point where the slug is ejected from the mold.

5. In a machine of the class described, the
40 combination with a mold-carrier and a mold thereon, of blast apparatus having a branch leading to the molding position of the mold and another branch leading to the discharging position of the mold. 45

6. In a machine of the type set forth, in combination with the mold-carrier, and the mold therein, a vise-head for clamping a matrix-block against the mold, and means for
50 discharging a cooling fluid through the vise-head onto the back of the matrix-block during the casting operation.

Signed at Seattle, Washington, this 28th day of February, 1905.

EDWARD L. HOLMES.

Witnesses:

ROY E. DARLINGTON,
FREDERICK ARTHUR PEASE.