No. 754,614. PATENTED MAR. 15, 1904.

W. S. SCUDDER.

LINE CASTING MACHINE.

APPLICATION FILED AUG. 17, 1903.

NO MODEL. 6 SHEETS—SHEET 1.

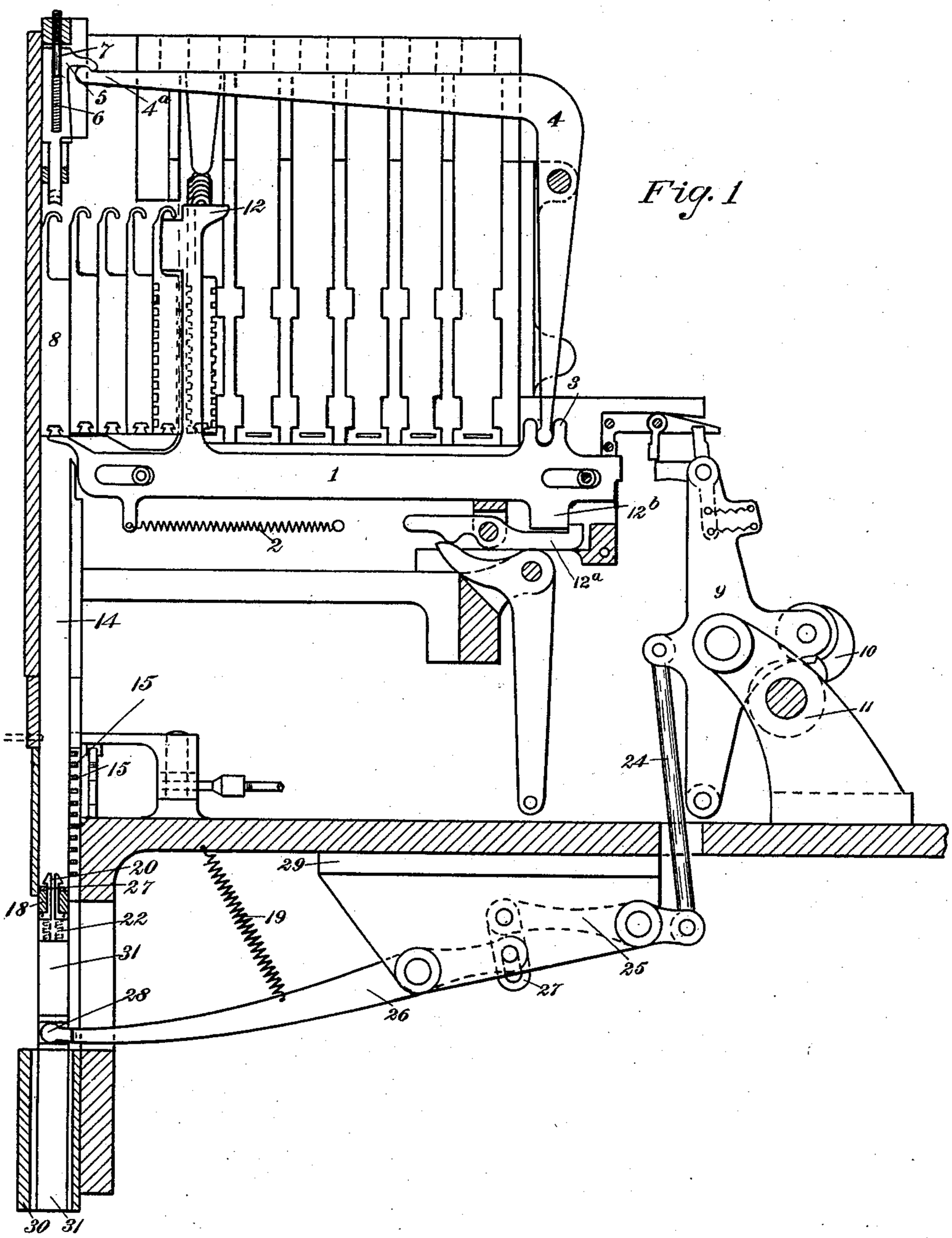

Fig. 1

Witnesses
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J. R. Anderson

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his attorney

No. 754,614. PATENTED MAR. 15, 1904.

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LINE CASTING MACHINE.

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NO MODEL. 6 SHEETS—SHEET 2.

Fig. 2

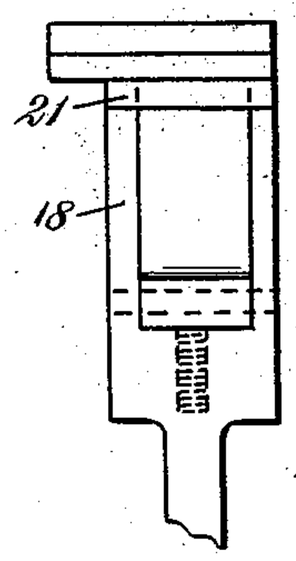


Fig. 3

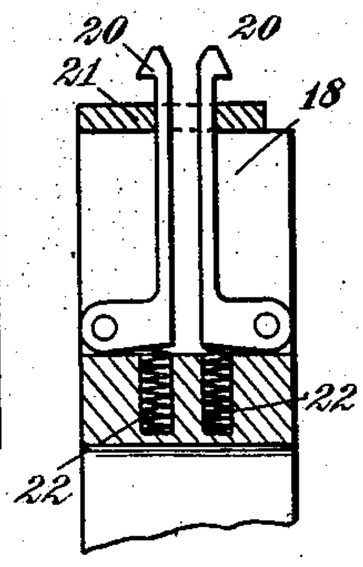


Fig. 4

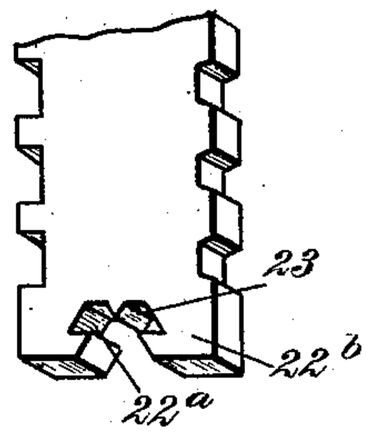


Fig. 5

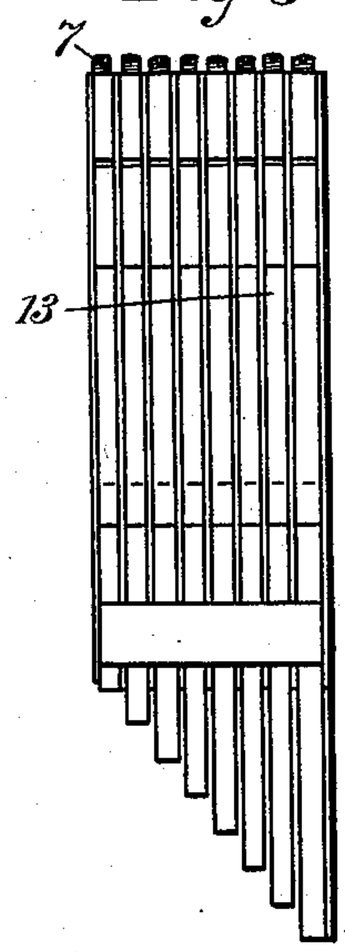
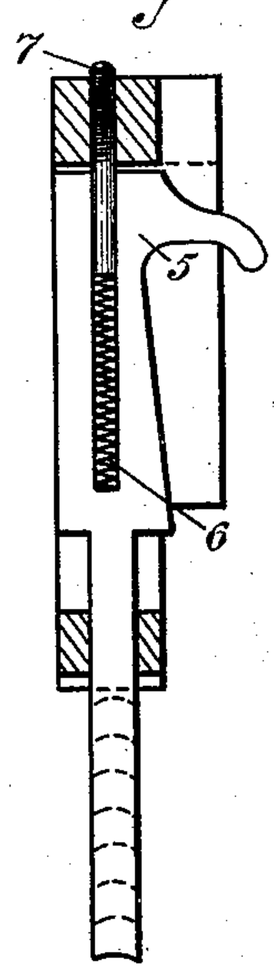


Fig. 6



Witnesses
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No. 754,614. PATENTED MAR. 15, 1904.

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LINE CASTING MACHINE.

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NO MODEL. 6 SHEETS—SHEET 3.

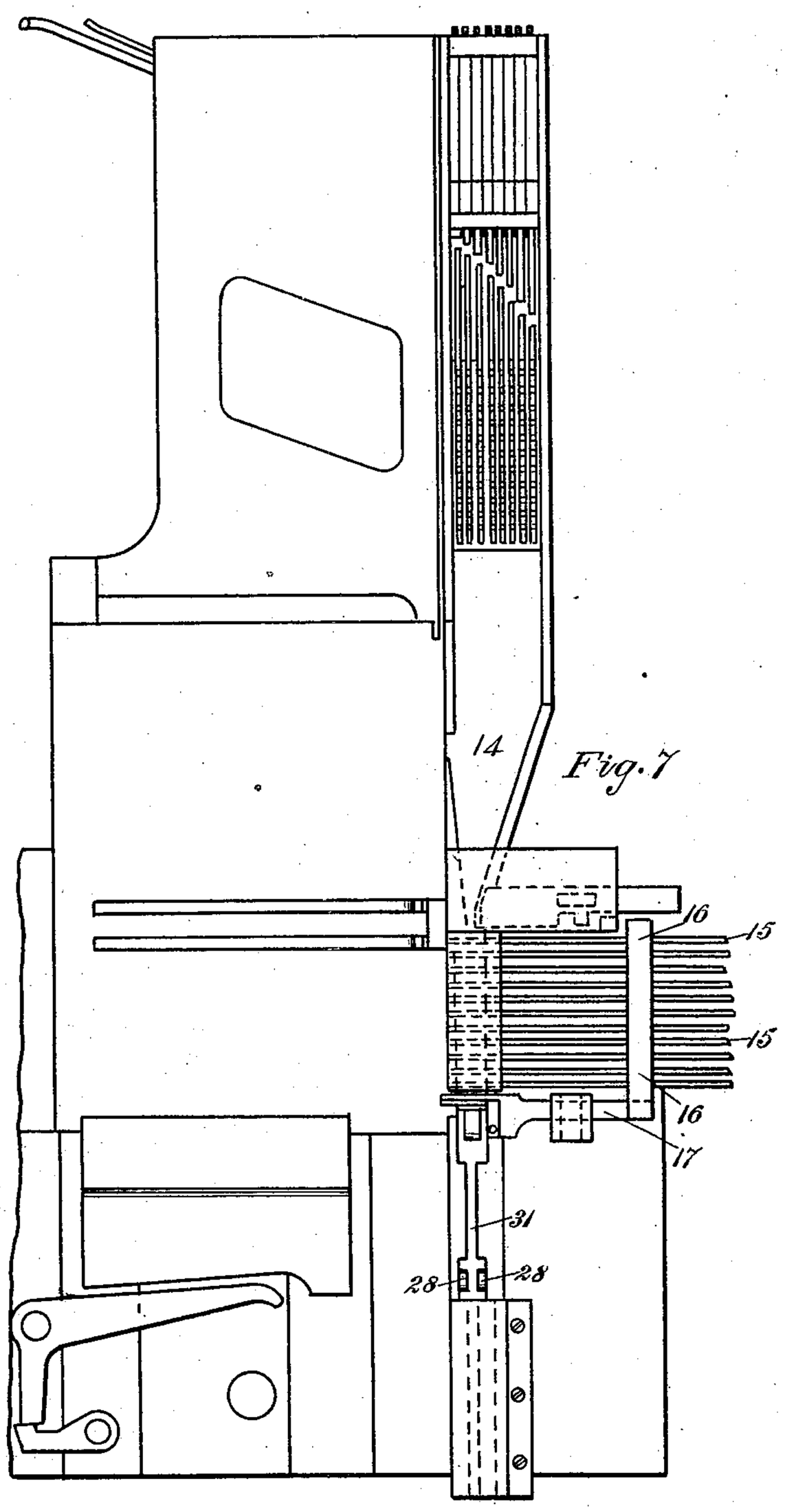

Fig. 7

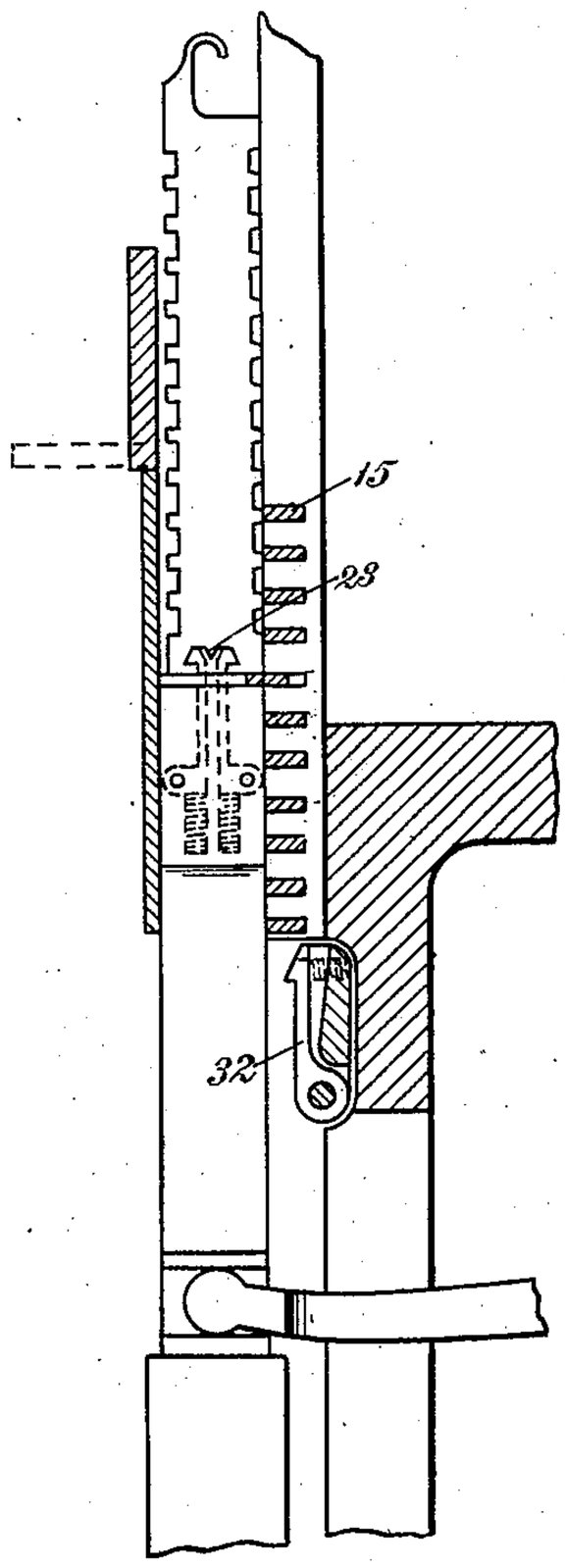

Fig. 8

Witnesses
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No. 754,614. PATENTED MAR. 15, 1904.

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LINE CASTING MACHINE.

APPLICATION FILED AUG. 17, 1903.

NO MODEL. 6 SHEETS—SHEET 4.

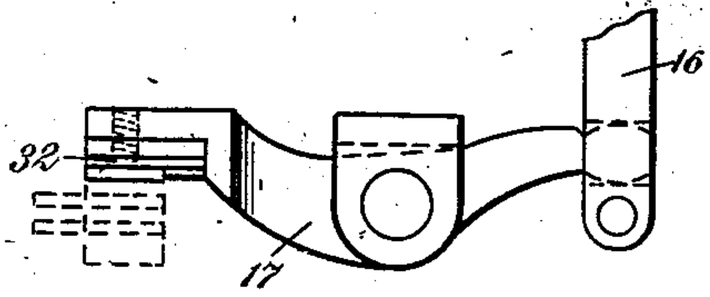

Fig. 9

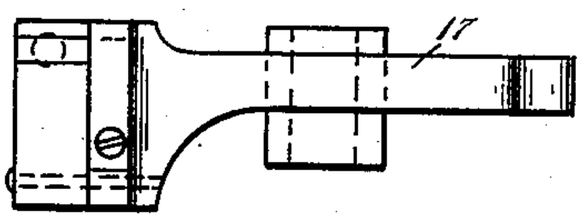

Fig. 10

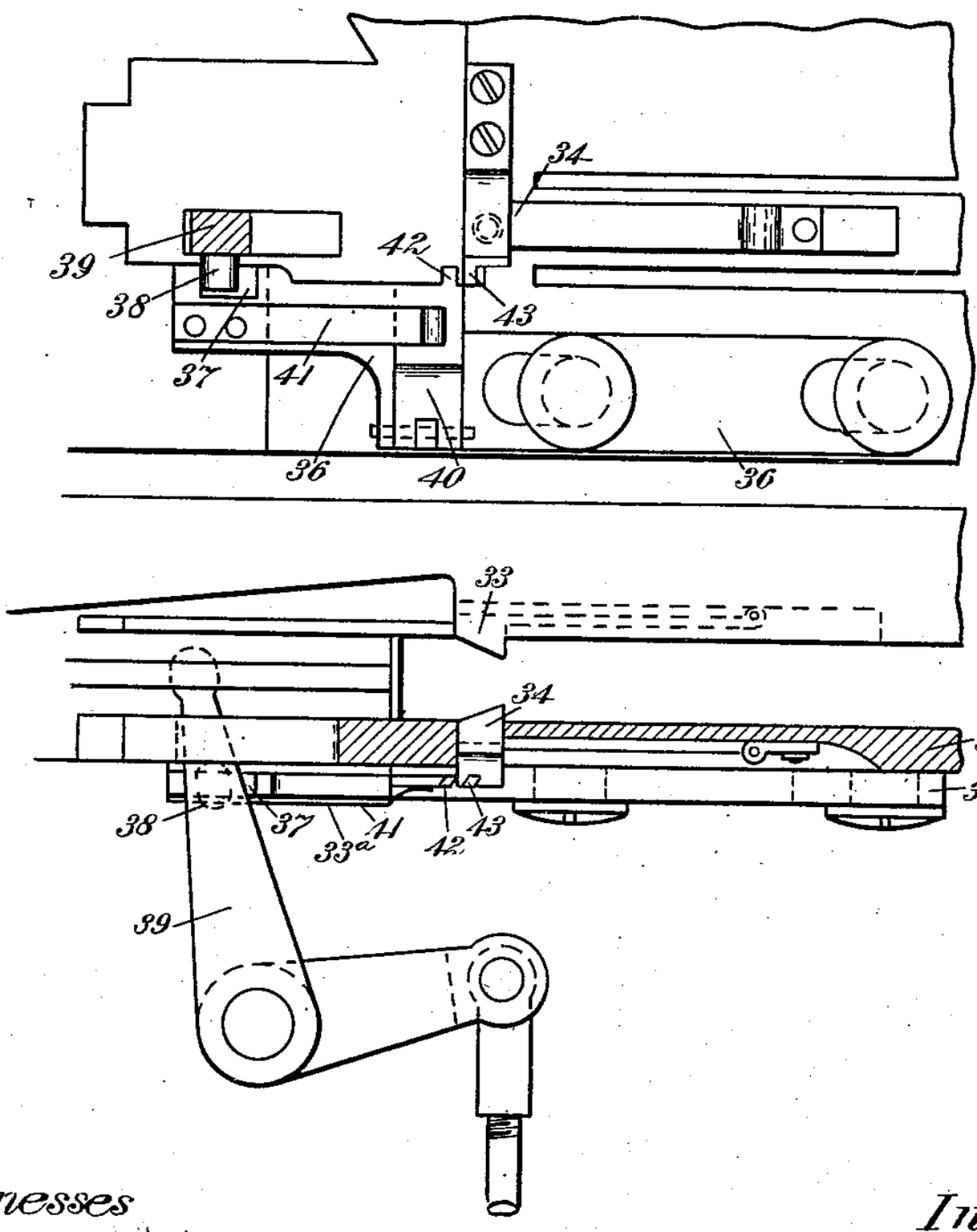

Fig. 11

Fig. 12

Witnesses

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No. 754,614. PATENTED MAR. 15, 1904.

W. S. SCUDDER.

LINE CASTING MACHINE.

APPLICATION FILED AUG. 17, 1903.

NO MODEL. 6 SHEETS—SHEET 5.

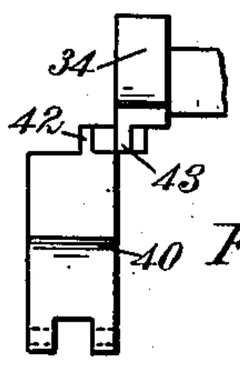

Fig. 13

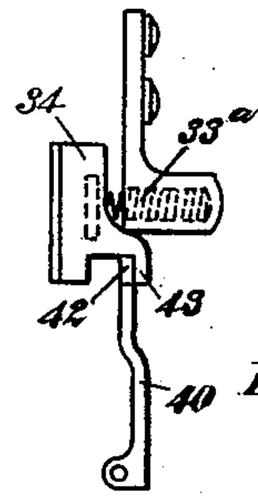

Fig. 14

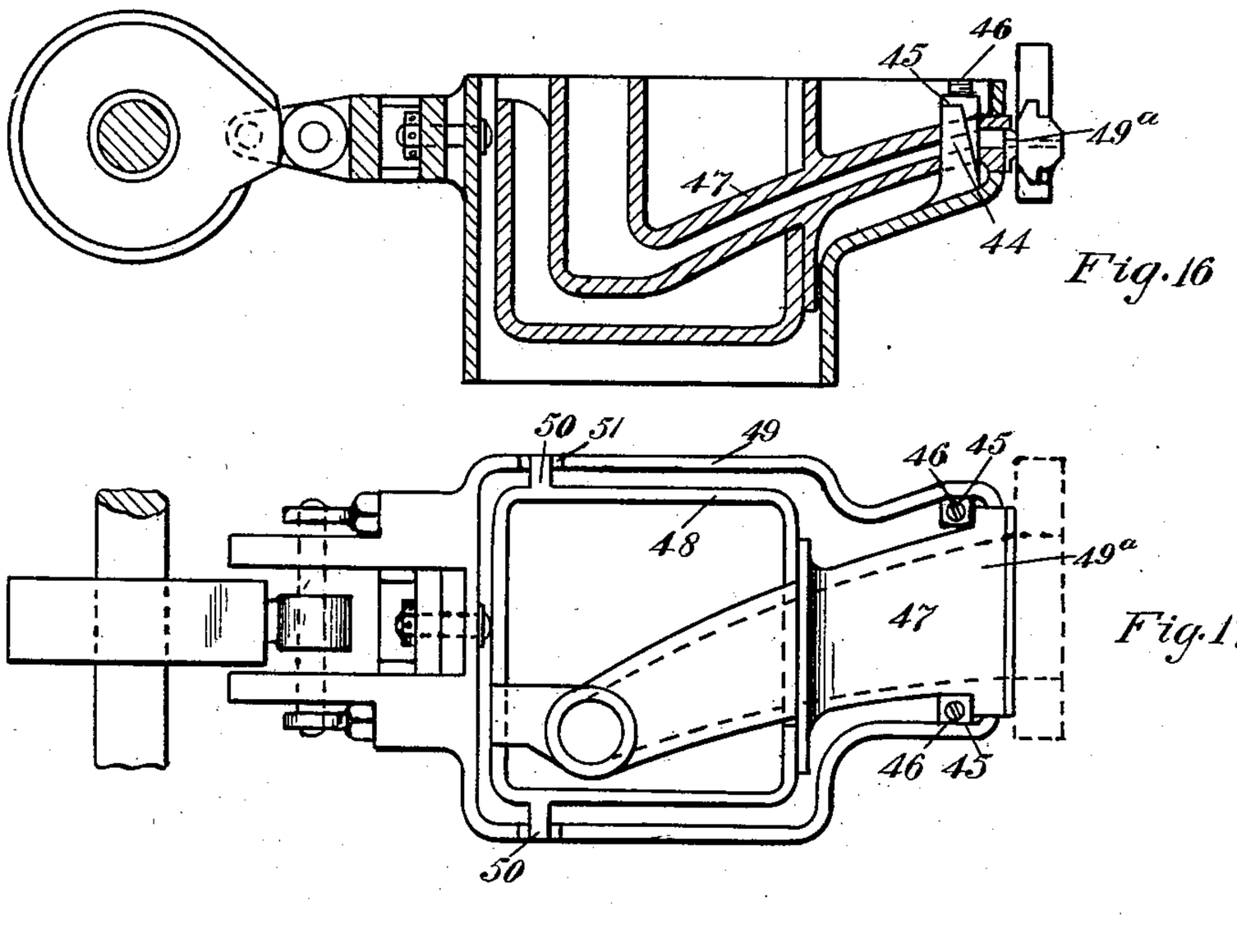

Fig. 16

Fig. 17

Witnesses
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No. 754,614. PATENTED MAR. 15, 1904.

W. S. SCUDDER.

LINE CASTING MACHINE.

APPLICATION FILED AUG. 17, 1903.

NO MODEL. 6 SHEETS—SHEET 6.

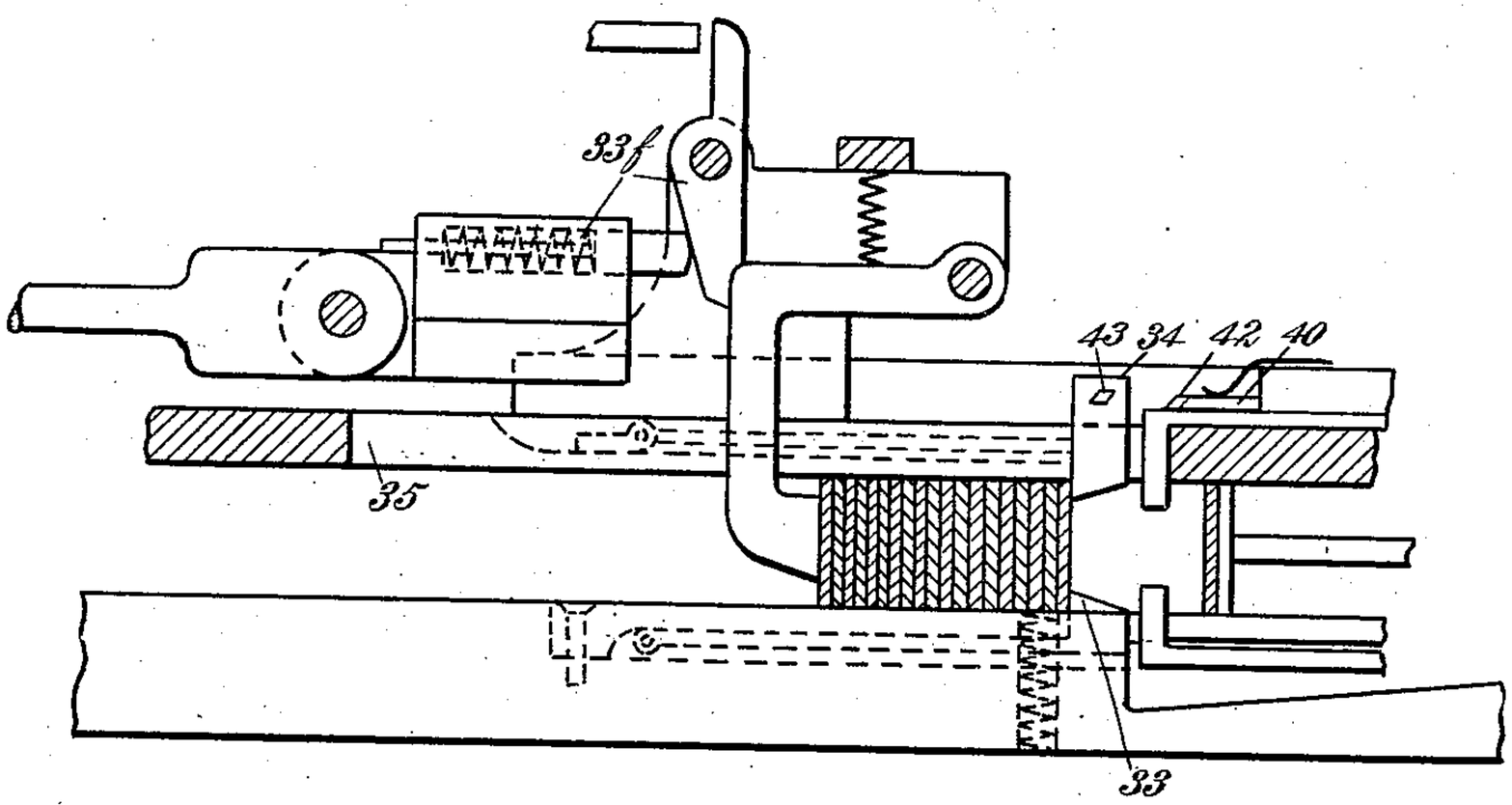

Fig. 18

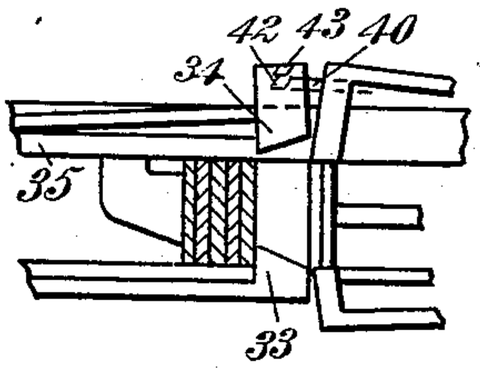

Fig. 15

Witnesses
W. S. Guest
J. C. Anderson

Inventor
W. S. Scudder
by Cross & Miles
his attorneys

No. 754,614. Patented March 15, 1904.

UNITED STATES PATENT OFFICE.

WILBUR STEPHEN SCUDDER, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE MONOLINE COMPOSING COMPANY, OF WASHINGTON, DISTRICT OF COLUMBIA, A CORPORATION OF WEST VIRGINIA.

LINE-CASTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 754,614, dated March 15, 1904.

Application filed August 17, 1903. Serial No. 169,837. (No model.)

To all whom it may concern:

Be it known that I, WILBUR STEPHEN SCUDDER, a citizen of the United States, and a resident of Brooklyn borough, New York, State of New York, temporarily residing in Montreal, Province of Quebec, Dominion of Canada, have invented certain new and useful Improvements in Line-Casting Machines; and I hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to that class of line-casting machines commonly known as the "Monoline composing-machine," for which I obtained Letters Patent of the United States, No. 506,198, dated October 3, 1893, and No. 605,141, dated June 7, 1898.

The chief features of my present invention are as follows:

Matrix-bar-accelerating device.—The circular action of the accelerator-levers now used on the monoline-machine have a tendency to draw the top or head of the matrix-bar into the channels of the magazine, thus frequently interfering with the prompt delivery demanded in machines of such precision as line-casting machines. I have therefore redesigned this feature and have made the accelerator in a straight line with the delivery of the matrix-bar from the magazine.

Matrix-bar stopping and retaining mechanism.—The character of the matrix-bar used in the monoline is such that it demands a mechanism that will work with absolute accuracy in the stopping of the matrix-bar in its descent at the proper designated character and, what is more important, hold the matrix-bar which comes to it with accelerated force until the proper assembling mechanism will have had time to eject it upon the alining-bar. It also follows that such a mechanism as will least interfere with the downward flight of the matrix-bar will enhance the rapidity of action, and thereby increase the working capacity of the machine. It is to secure such desirable results that I have changed the entire construction of the stopping and retaining devices now used on the monoline-machine, and my present invention is so arranged as to provide, first, a non-metallic surface to stop the matrix-bar; second, a certain means of stopping and retaining the matrix-bar whether coming fast or slow; third, a clear smooth pathway until the actual stop desired is reached by the descending matrix-bar; fourth, a mechanism of such a substantial character as to provide the greatest security against derangement in the operation of the machine.

Line-detaining-pawl release.—As the matrix-bar is ejected from the assembling-box to a place with its fellows on the alining-bar it passes by the line-detaining pawls, which are to prevent the assembled matrix-bars from being pushed back into the box under the tension of the auxiliary line-carriage. In order that the rapidly-assembled matrix-bars shall not jump about and lose their position on the alining-bar, considerable pressure is exerted by the auxiliary carriage upon the matrix-bars and through them against the line-detaining pawls, thus requiring that they shall on their part be also tensioned to withstand the pressure. This pressure on the line-detaining pawls, especially on the rear one, is of such a character that the matrix-bars as they are thrust by the pawls suffer from attrition and become defective. My invention is to provide a release of such a nature that while all the conditions may remain as they now are it will operate to withdraw the line-detaining pawl at the instant of the passing of the matrix-bar and lock it after it has entered its place in the line.

Metal-pot adjustment.—Nothing in a line-casting machine is so erratic as the metal-pot. This is largely due to the constant variations of the temperatures to which it is subjected and which cause greater or less expansion, contraction, and finally contortion. In my Letters Patent No. 605,141, dated June 7, 1898, I provided means to adjust the metal-pot within the jacket to conform to such variations as may be required from time to time. In the present invention I have devised a simpler and more desirable arrangement for adjusting the face of the metal-pot to close against the mold properly, which leaves the

pot itself free to move about as it may under its usual working conditions and brings the points of adjustment to a point where it is easily comprehended.

For full comprehension of my invention reference must be had to the accompanying drawings, forming a part of this specification, in which like symbols indicate the same parts, and wherein—

Figure 1 is a side view of the magazine, oscillator, accelerator, and assembling mechanism. Fig. 2 is a front view of the stopping-head of the assembler mechanism. Fig. 3 is a sectional side view of the stopping-head. Fig. 4 is a perspective view of the bottom of the matrix-bar, showing the manner in which it is cut to meet and connect itself to the stopping-head. Fig. 5 is a front view of the accelerator-comb. Fig. 6 is a sectional view of the side of the accelerator-comb. Fig. 7 is a front view of the magazine and assembler mechanism. Fig. 8 is a side sectional view showing the actual operation of the stopping-head and matrix-bar. Fig. 9 is a plan view of the detent which releases the stopping-head. Fig. 10 is a front view of the same. Fig. 11 is a front elevation of the line-detaining-pawl-releasing mechanism. Fig. 12 is a plan view of the line-detaining-pawl-releasing mechanism. Fig. 13 is a detail of the line-detaining pawl and the releasing-plate. Fig. 14 is a side view of the same, showing the spring-holder of the line-detaining pawl. Fig. 15 is a plan view showing the introduction of a matrix-bar into the line being assembled. Fig. 16 is a side sectional view of the metal-pot and jacket. Fig. 17 is a plan view of the metal-pot and jacket. Fig. 18 is a front view of the auxiliary line-carriage.

As the general arrangement and construction of the machine is the same as that shown and described in the above-mentioned patents, I have illustrated and described only those parts of a line-casting machine to which my invention relates, the parts illustrated combining with and coacting with the machines described in the Letters Patent heretofore mentioned.

The manipulation of the matrix-bar in the magazine-chambers and through its proper delivery-channel to the front of the magazine for delivery to the assembling-box is identical to that in the above patents, the only change being in the actual act of delivering the matrix-bar from its forward position in the magazine to the assembling-box. As has been shown and described in the above patents, the movement of a key-lever operates, through its connections, to release the horizontal delivery-gate 1, which delivery-gate on being retracted, by means of its spring 2, carries with it in a yoke or fork 3 an accelerator-lever 4. The free end 4^a of the accelerator-lever is rounded and engages with the accelerator-plate 5, which is under the pressure or tension of a spring 6, adjusted by a screw 7. The screw 7 is contained in a longitudinal bore formed in the upper end of the accelerator-plate 5, and the blank or lower end of the screw serves to guide the accelerator-plate in its movements when impelling the delivery of the matrix-bar and when returning to its normal position.

As the delivery-gate 1 retreats, carrying with it the accelerator-lever 4, it is obvious that the free end 4^a of the accelerator-lever will pass from under the accelerator-plate 5 and allow the accelerator-plate under the influence of the spring 6 to descend and rest upon the top or head of the matrix-bar 8. A further retreat of the delivery-gate 1 will remove its support from the lower end of the matrix-bar 8, and the accelerator-plate 5, under the pressure of the spring 6, will impel the matrix-bar downward in a straight line. As the delivery-gate completes its rearward movement it brings the oscillator into action and through the agency of the cam 10 of the oscillator coming into contact with the rapidly-revolving roller 11 is returned to its normal position. As the delivery-gate 1 is urged forward to its normal position it carries with it the accelerator-lever 4 and causes the free end of the accelerator-lever to lift the accelerator-plate 5 from the path of the matrix-bar being pushed forward to replace the one delivered by the feed-finger 12, attached to and made a part of the delivery-gate 1.

As the several parts reach the proscribed limit of motion they are held in place by a locking-detent 12^a, engaging a lug 12^b, formed on the delivery-gate 1. In addition to securing a direct motion for accelerating the matrix-bar I am by means of the adjustment of the spring-pressure for the accelerator-plate 5 able to easily govern the delivery of the heavier matrix-bars, which require only a slight impulse, and the lighter bars, which require a greater impulse. The front of the magazine is cut away to receive the comb 13, which contains the necessary number of accelerator-plates to correspond with the number of different species of matrix-bars in use. For each accelerator-plate 5 used there is also an accelerator-lever 4, connected, as described, to the different delivery-gates 1.

Matrix-bar-stopping device.—As the matrix-bar 8 is delivered from the magazine it descends downward into a converging assembling-box 14, wherein it is stopped and alined. The instant the operator of the machine touches a key-lever a stopping-bar 15 is interposed in the path of the descending matrix-bar 8. Of these stops there is one for each character represented on the matrix-bar less the top character of the bar, which is allowed to go to the bottom of the box, which is arranged to aline that character. In the monoline-machine there are twelve characters on the bar, thus necessitating eleven stops, that are movable, and a twelfth stop, which may be called "per-

manent." The machine is provided with a stop-return 16, which, as the different stopping-bars 15 are actuated in the operation of the machine, acts to return the stopping-bars 15 to their normal position. It follows, therefore, that as a stopping-bar is pushed out into the path of the descending matrix-bar the stop-return 16 must be actuated with it and as the matrix-bar is alined return with it.

The operation of my movement for stopping and retaining the matrix-bar is as follows: As the key-lever is touched and the matrix-bar is released a stopping-bar 15 is projected into the path of the matrix-bar and simultaneously with the projection of the stopping-bar the stop-return 16 is actuated. A detent-lever 17 is connected to and moves with the base of the stop-return 16. The movement of the detent-lever 17 releases the stopping-head, which under the influence of a spring 19 moves upward toward the descending matrix-bar. As it reaches the point at which the stopping-bar 15 has been projected it stops and awaits the contact of the descending matrix-bar, which being provided with a recess 22^a in the base 22^b (shown in Fig. 4) engages the pawls 20 of the stopping-head 18 and becomes attached thereto. The stopping-head 18 is provided at its top end with a buffer-plate 21, preferably made of rawhide, hard rubber, or some other suitable cushioning material, to receive the blow of the accelerated matrix-bar as it is stopped. Springs 22 under the pawls 20 cause them to act promptly in gripping the matrix-bar, and to further insure their engagement with the matrix I have provided a teat 23 within the recess 22^a, so that as it engages with the pawls it will act to distend them outwardly into the sides of the recess 22^a, provided for them in the base of the matrix-bar. The matrix-bar is then ejected from the assembling-box to the alining-bar by the regular operation of the machine. As the oscillator 9, which is put into motion each time a matrix is delivered, commences its movement to return all the parts to their normal positions it actuates a link 24, which in turn operates an intermediate lever 25, connected to a long lever 26 through the medium of a slotted link 27 to return the long lever to its normal position. The free end of the long lever 26 is slotted and curved to form a ball-joint 28, so it will act easily in any position upon the stem or guided portion 31 of the stopping-head 18. The lower part of the stopping-head 18, with its stem or guide 31, moves freely in the guiding-block 30 provided for it. As the oscillator 9 continues its return motion it through the medium of the link 24, intermediate lever 25, slotted link 27, and the long lever 26 will return the stopping-head 18 to its normal position. As was previously described, coincident with the vibration of the oscillator 9 is the return of the stopping-bars 15 through the medium of the stop-return 16, and connected to the stop-return 16 is the detent 17, by which the stopping-head 18 is held in place. This action occurring at the same time as the retraction of the stopping-head 18 places the detent-lever 17 in position to hold and retain the stopping-head 18 in its normal position under the pressure of its spring 19 to be again released in the regular operation of the machine. To provide against any variation in the timing of the several movements, I have placed in the free end of the detent-lever 17 a spring-pressed pawl 32 to engage the stopping-head 18 upon its return movement. While I have thus described a stopping device having a cushioned head and reliable means for stopping and engaging matrix-bars at designated points, I do not confine myself to the exact mechanism as shown. It is obvious that different-shaped pawls in the stopping-head may be made, and other mechanical means may be used for releasing and returning the stopping-head to its normal position, my general claim being, however, an engaging device for matrix-bars and the like which operates and coacts with the machine.

Line-detaining-pawl release.—To retain the matrix-bars as they are assembled into line, line-detaining pawls 33 and 34 are placed in the raceway of the machine, as is more fully described in the above-mentioned Letters Patent. The primary object of these pawls is to prevent the return of the assembled line of matrix-bars from their place on the alining-bar to the assembling-box from which they were ejected and also to hold the asembling line firmly in place between themselves and the auxiliary line-carriage 33^f (shown in Fig. 31 of Patent No. 605,141) until the line shall have been completed. A line of the matrix-bars as composed on the monoline machine presents a considerable weight irregularly disposed, and in order to keep such a line in place the line-detaining pawls are subjected to a correspondingly heavy tension by strong springs 33^a, placed back of them. The pawl 33 at the rear of the matrix-bar strikes the back of the matrix as it is ejected from the assembling-box. As it is not necessary for this side of the matrix-bar to be metal-tight, but little harm is done by the impact of the pawl as the matrix passes by it. The line-detaining pawl 34 at the front of the matrix-bar 8 passes across the face of each matrix-bar as it is ejected from the assembling-box, and the pawl 34 is under a similar spring tension to the pawl 33 it would gradually abrade the front of the matrix. As this is on the casting side of the matrix, it follows that as the abrasion continued the front of the matrix-bar would become "leaky," and consequently defective. To obviate this, I place back of the face-plate 35 a reciprocating plate 36, having at its left end an opening 37, in which a lug 38 operates. The lug 38 is cast on the assembling-box lever 39 and is adapted

to engage the sides of the opening 37. As this lever operates with the delivery and assembling of each matrix-bar, it follows that the reciprocating plate 36 will have a movement imparted to it each time the assembling-lever 39 operates. Upon this plate 36, hinged in a suitable position, I place the releasing-plate 40, backed by a flat spring 41. The top of the releasing-plate 40 has a diamond-shaped teat 42 cut upon it to engage a similar-shaped teat 43 on the rear of the line-detaining pawl 34. After the delivery of a matrix-bar to the assembling-box the operation of the ejection commences to pass a matrix-bar out upon the alinement-bar, and motion is simultaneously imparted by the lever 39 to the reciprocating plate 36, and consequently to the releasing-plate 40, which is hinged therein. Continued motion brings the diamond-shaped teat 42 into contact with the teat 43 of the line-detaining pawl 34, and the angles of the teats forcing each other lifts the line-detaining pawl 34 out and away from the incoming matrix-bar. As, however, the bar reaches its destined place in the line the teat 42 on the releasing-plate 40 passes beyond that of the line-detaining pawl, and the line-detaining pawl drops into its original place behind the assembled matrix-bars, and the reciprocating plate 36, returning to its place by the return of the assembling-box lever 39, returns the releasing-plate 40 to its original position. The releasing-plate 40 passes, however, on the outside of the teat 43 of the line-detaining pawl 34, and after passing resumes its position in front of the teat of the pawl through its own spring 41. In this manner the matrix-bar is passed from the assembling-box to its place in the line without coming in contact with the heavy-tensioned pawl, which is only released as the matrix is passing by.

Metal-pot adjustment.—In previous Letters Patent No. 605,141, issued to me June 7, 1898, I have described a horizontal adjustment of the metal-pot within the jacket. While the adjustment I now offer has a somewhat similar action, it is much simpler and provides a more easily operated arrangement for bringing the face of the metal-pot into close and even contact with the back face of the mold. To this end I have provided within the jacket 49 of the pot and close behind the outlet 49ª of the metal-pot upright lugs 44, having their front faces tapered. Corresponding with this taper I provide wedges 45, held in their places by screws 46 and so arranged that by turning either screw down the wedges under the same will, acting upon the tapered surface, force that side of the metal-pot ahead and in contact with the back of the mold 48. The jacket, as has been described in the above patent, moves horizontally back and forth in a fixed channel, and at present the force exerted in locking up the pot 47 against the mold 48 is conveyed through the medium of the metal-pot jacket 49. Near the rear of the metal-pot 47 on either side are supporting-lugs 50, resting on the frame of the jacket in recesses 51, large enough to compensate for any distortion that might take place in the natural use of the machine. By this means I leave the entire metal-pot within the jacket free to move about and yet keep the face of the pot in close metal-tight contact with the opening of the mold.

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

1. In a line-casting machine the combination, with the delivery-gate, accelerator-lever and mechanism for actuating the same, of an accelerator-plate coacting with accelerator-lever to impel the delivery of the matrix-bar to the assembling-box, substantially as specified.

2. In a line-casting machine the combination with the delivery-gate, accelerator-lever, and mechanism for actuating the same, of a spring-actuated accelerator-plate coacting with the accelerator-lever to impel the delivery of the matrix-bar to the assembling-box, substantially as specified.

3. In a line-casting machine the combination with the delivery-gate, accelerator-lever, and mechanism for actuating the same, of an accelerator-plate coacting with the accelerator-lever to impel the delivery of the matrix-bar to the assembling-box, a spring actuating the impulse of the accelerator-plate and a screw to adjust the pressure of the spring and guide the movement of the accelerator-plate, substantially as specified.

4. In a line-casting machine the combination with the assembling-box, stopping-bar, stop-return coacting with the stopping-bars, and mechanism for actuating the same, of a movable stopping-head in the path of the matrix-bar, and pawls carried by the stopping-head to engage the base of the delivered matrix-bar, substantially as specified.

5. In a line-casting machine the combination with the assembling-box, stopping-bar, stop-return coacting with the stopping-bar and mechanism for actuating the same, of a stopping-head in the path of the matrix-bar and spring-actuated pawls carried by the stopping-head to engage the base of the delivered matrix-bar, substantially as specified.

6. In a line-casting machine, the combination with the assembling-box, stopping-bar, stop-return coacting with the stopping-bar, and mechanism for actuating the same, of a stopping-head in the path of the matrix-bar, spring-actuated pawls carried by the stopping-head to engage the base of the matrix-bar and a buffer-plate to cushion the blow of the matrix-bar as it is stopped, substantially as specified.

7. In a line-casting machine the combination with the assembling-box, stopping-bar, stop-return coacting with the stopping-bar, stopping-head and pawls carried by the stopping-head, of a matrix-bar, a recess in the base of

the matrix-bar in which register the pawls and a teat in the recess to spread the pawls asunder to engage the sides of the recess, substantially as specified.

8. In a line-casting machine the combination with the assembling-box, stopping-bar, stop-return coacting with the stopping-head, and spring-actuated pawls carried by the stopping-head, of a matrix-bar, a recess in the base of the matrix-bar, in which register the pawls, and a teat in the recess to spread the pawls to engage the sides of the recess, substantially as specified.

9. In a line-casting machine the combination with the assembling-box, stopping-bar, stop-return, stopping-head, spring-actuated pawls carried by the stopping-head, a buffer-plate for the stopping-head, of a matrix-bar, a recess in the base of the matrix-bar in which register the pawls, and a teat in the recess to spread the pawls to engage the sides of the recess, substantially as specified.

10. In a line-casting machine the combination with the assembling-box, alining-bar, and auxiliary line-carriage, and the spring-actuated line-detaining pawls, of a reciprocating plate actuated by the assembling-box lever, substantially as specified.

11. In a line-casting machine the combination with the assembling-box, alining-bar and auxiliary line-carriage and the spring-actuated line-detaining pawls, of a reciprocating plate actuated by the lug on the assembling-box lever, and a spring-actuated releasing-plate having a lug to engage the line-detaining pawl at the front of the matrix-bar to lift the line-detaining pawl out of the path of the incoming matrix-bar, substantially as specified.

12. In a line-casting machine the combination of the metal-pot, a jacket for the metal-pot, upright lugs secured to the jacket having their front faces tapered, adjustable wedges engaging the tapering faces of the lugs to force the metal-pot into contact with the back of the mold, substantially as specified.

Glasgow, Scotland, July 28, A. D. 1903.

WILBUR STEPHEN SCUDDER.

In presence of—

JOHN WM. COLL,

HENRY LAING.