No. 792,472. PATENTED JUNE 13, 1905.

O. SOUTHWELL.

LINOTYPE MACHINE.

APPLICATION FILED OCT. 19, 1904.

3 SHEETS—SHEET 1.

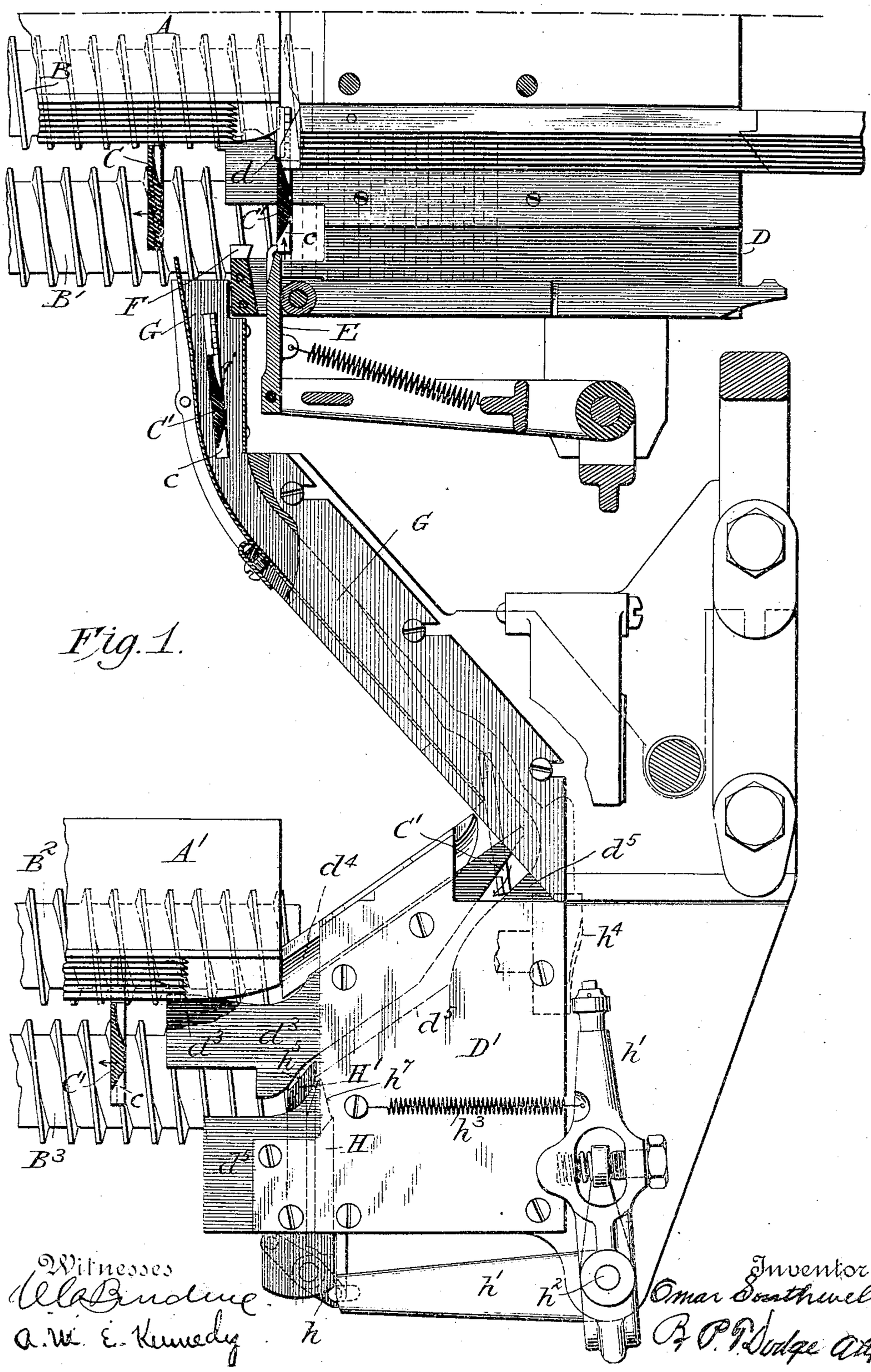

Fig. 1.

Witnesses
W. L. Boudinot
A. W. E. Kennedy

Inventor
Omar Southwell
By P. J. Dodge Atty

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3 SHEETS—SHEET 2.

Fig. 3.

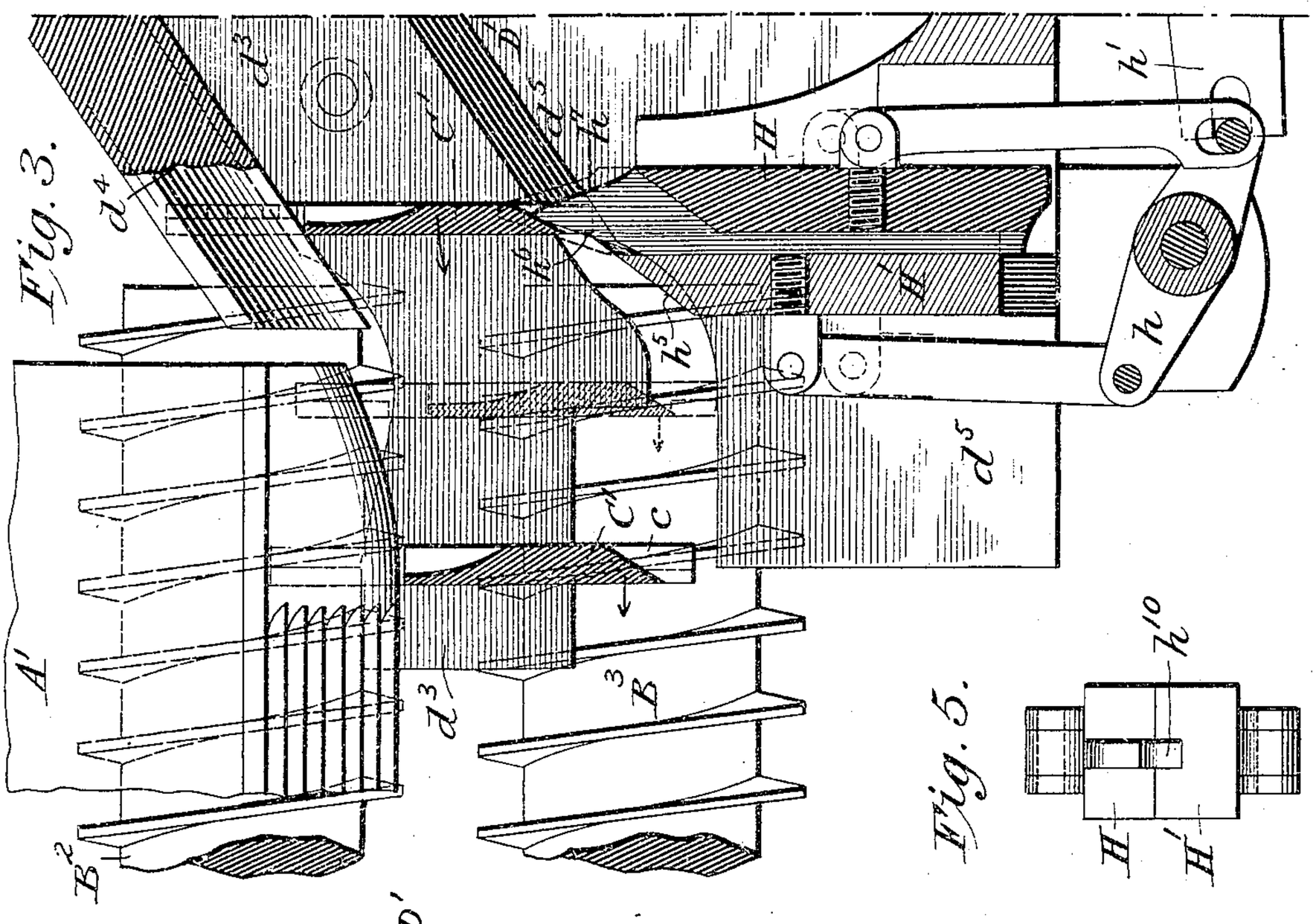

Fig. 5.

Fig. 2.

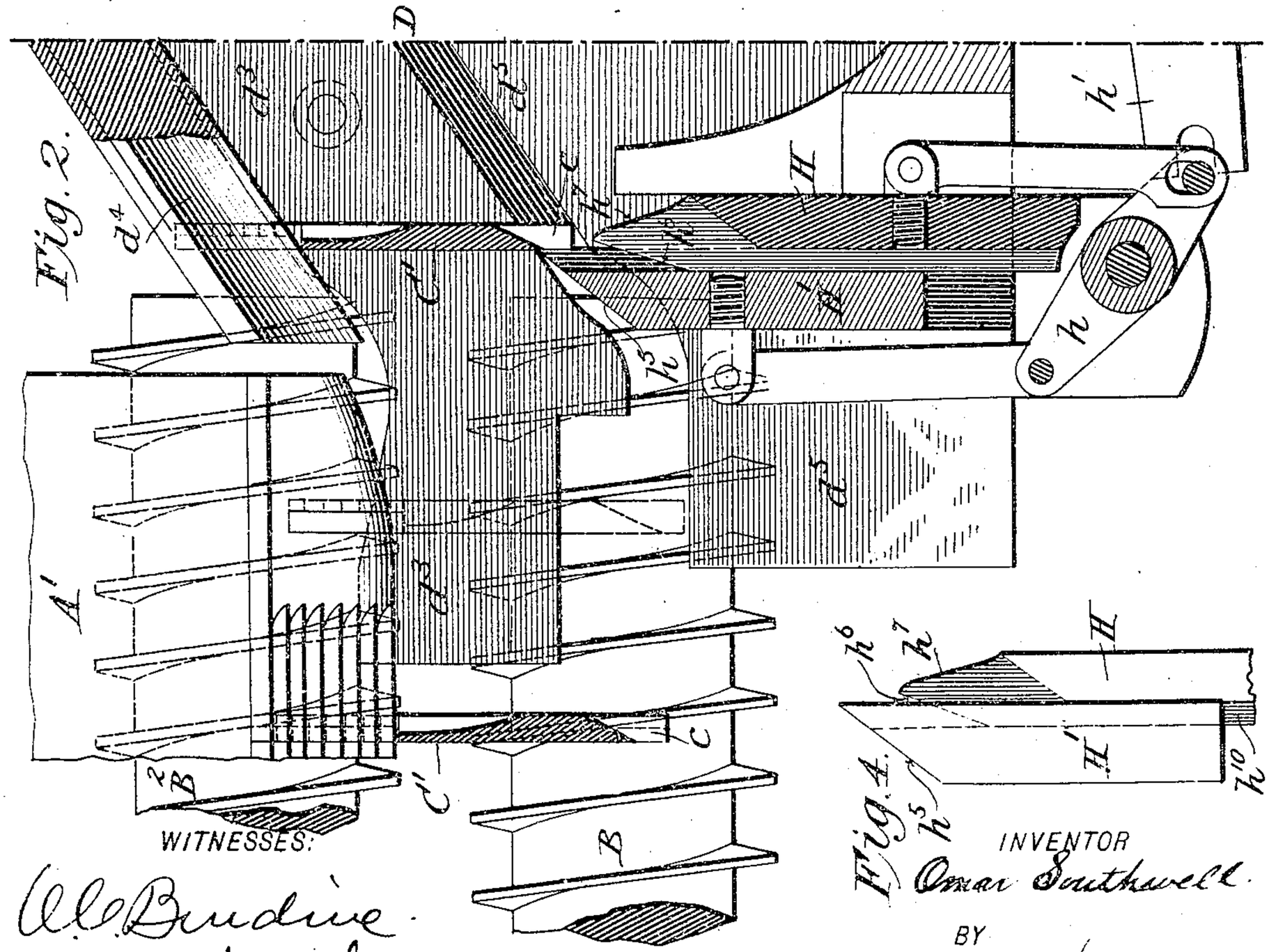

Fig. 4.

WITNESSES:

W. C. Burdine.

A. W. E. Kennedy

INVENTOR

Oscar Southwell.

BY

P. P. Dodge

ATTORNEY

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3 SHEETS—SHEET 3.

Fig. 7.

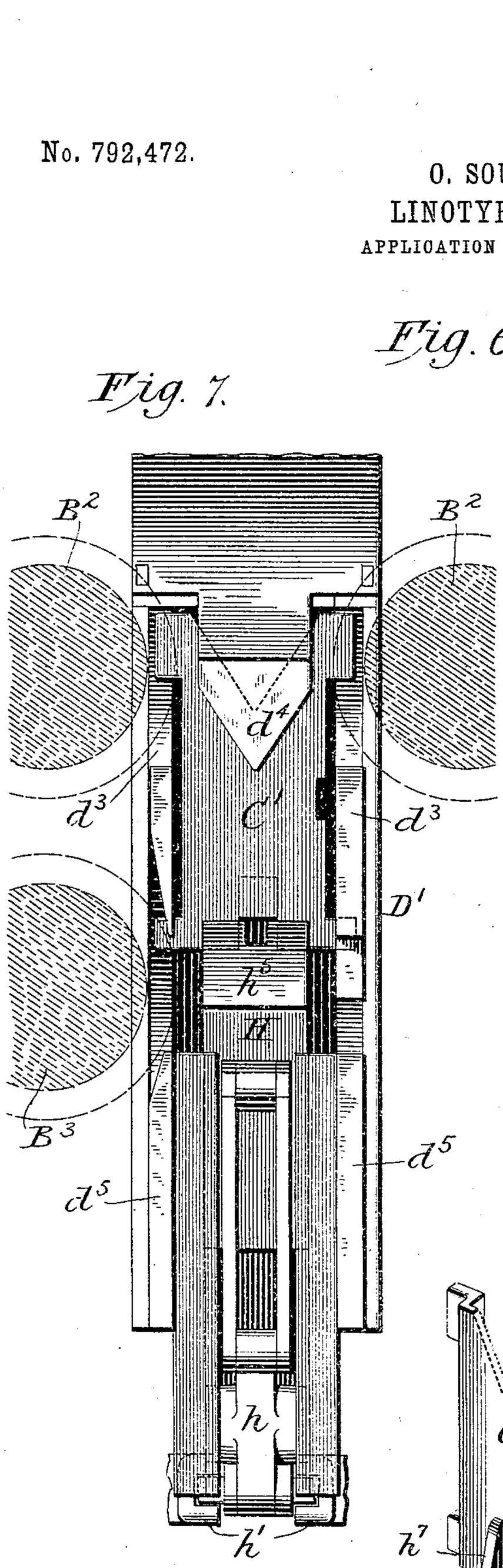


Fig. 6.

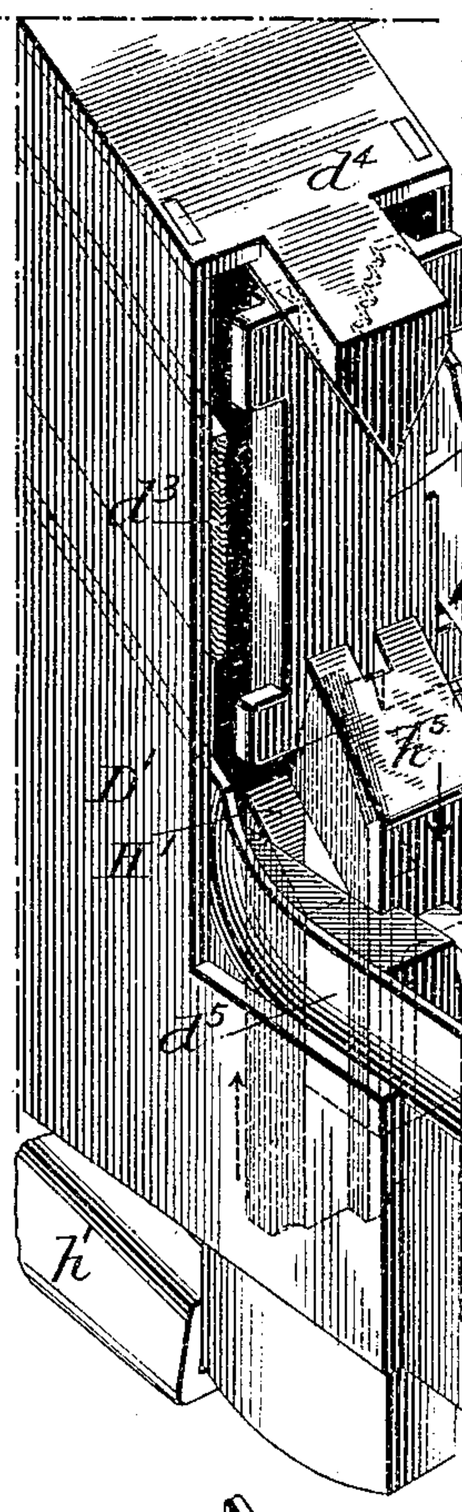


Fig. 10.

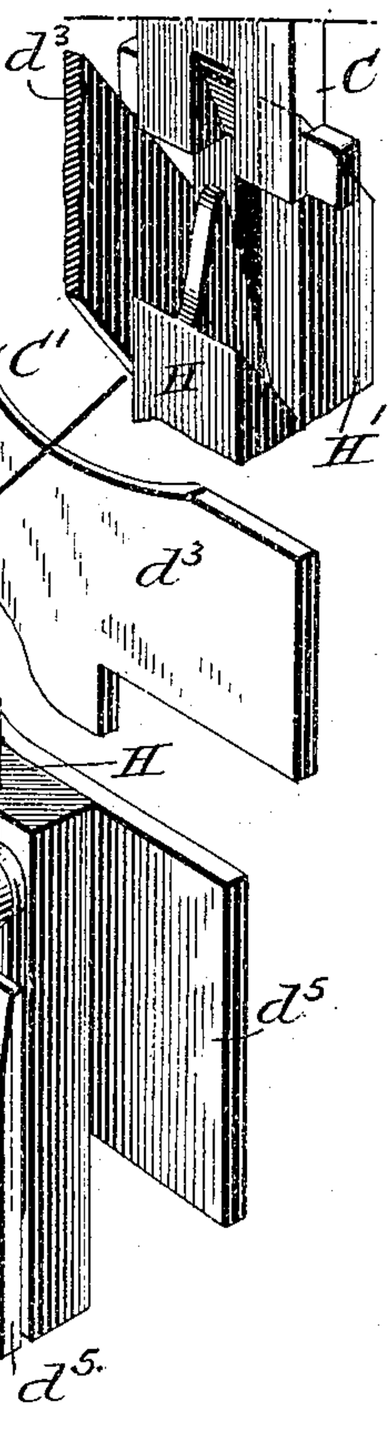


Fig. 8.

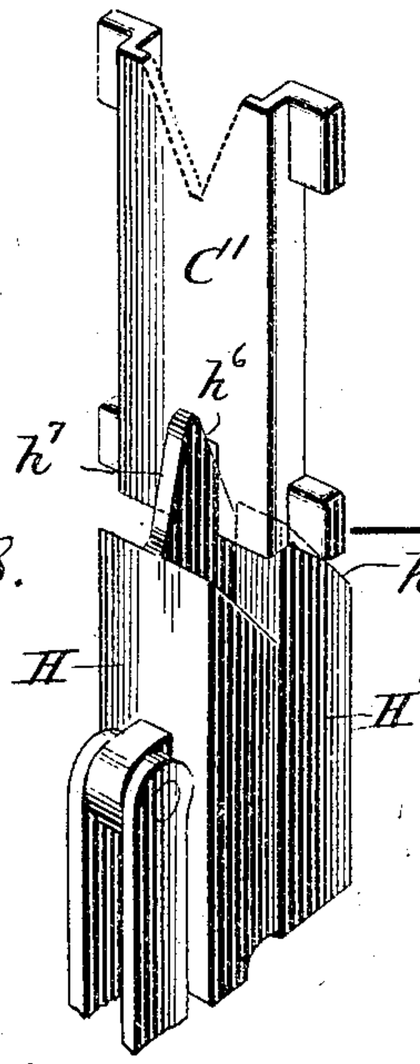
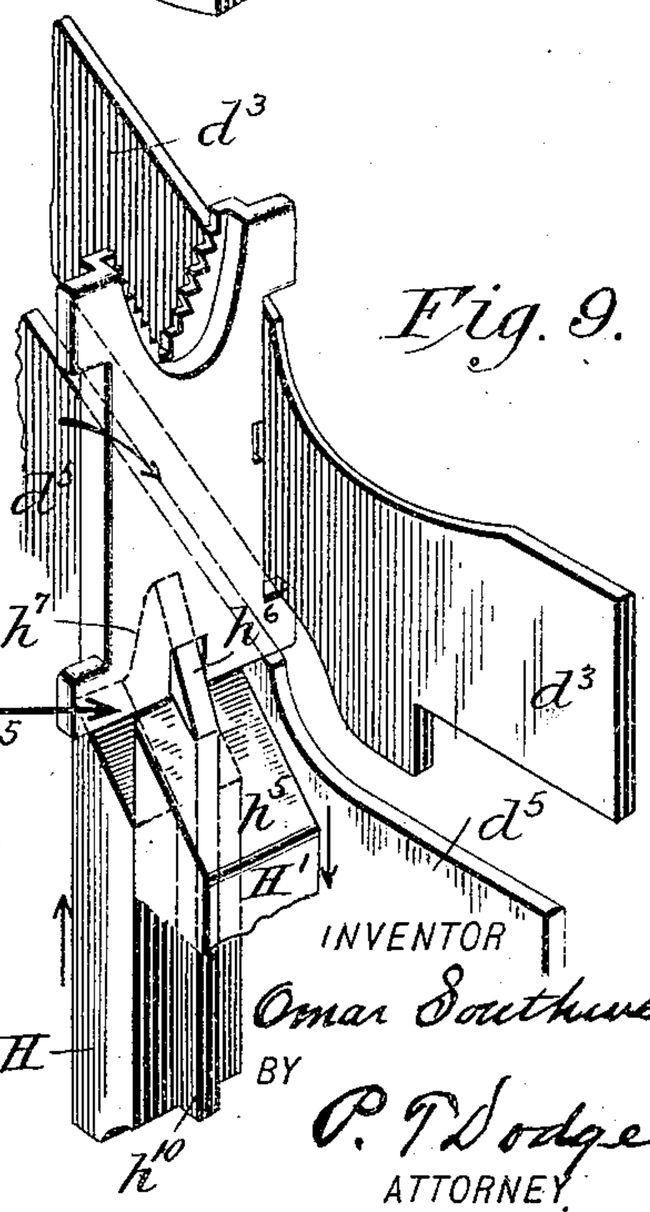


Fig. 9.



WITNESSES:

W. C. Brudenell

A. M. E. Kennedy

INVENTOR

Omar Southwell

BY

P. T. Dodge

ATTORNEY.

No. 792,472. Patented June 13, 1905.

UNITED STATES PATENT OFFICE.

OMAR SOUTHWELL, OF BROOKLYN, NEW YORK, ASSIGNOR TO MERGENTHALER LINOTYPE COMPANY, A CORPORATION OF NEW YORK.

LINOTYPE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 792,472, dated June 13, 1905.

Application filed October 19, 1904. Serial No. 229,166.

To all whom it may concern:

Be it known that I, OMAR SOUTHWELL, of Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Linotype-Machines, of which the following is a specification.

My invention relates more particularly to linotype-machines of that class represented in Letters Patent of the United States to J. R. Rogers, No. 640,033. These machines include two matrix-magazines, one overlying the other and each provided at the upper end with a distributing mechanism for delivering the individual matrices to their proper channels therein. The composed lines of matrices which have been used at the casting mechanism and which may consist of matrices from either or both magazines are presented to preliminary devices whereby matrices belonging in the upper magazine are directed to the upper distributer and those belonging to the lower magazine are directed to the lower distributer. It is to this part of the mechanism that my invention has reference; and it relates more particularly to means for presenting the individual matrices belonging to the lower magazine to the lower distributing devices after they have been detached or separated from the composed line, this part of the machine being commercially known as the "lower" distributer-box.

The improvement consists more particularly in the employment of two alternating dogs or pawls arranged in the path of the gravitating matrices for the purpose of releasing one matrix at a time and permitting it to pass forward to the devices for carrying them upon the distributer-bar.

Referring to the accompanying drawings, Figure 1 is a side elevation of my improved mechanism with portions broken away at the top and bottom to expose internal parts, which are shown partly in section. Figs. 2 and 3 are longitudinal vertical sections through the lower part of the mechanism shown in Fig. 1, showing the escapement in its different positions. Fig. 4 is a side view of the escapement-pawls. Fig. 5 is a top plan view of the same. Fig. 6 is a perspective view looking into the lower end of the distributer-box. Fig. 7 is an end view of the same looking toward the incoming matrices. Fig. 8 is a perspective view illustrating the action of the escapement-pawls on a matrix. Fig. 9 is a similar view of the same looking from the opposite side. Fig. 10 is a perspective view showing the upper ends of the two dogs looking in the same direction as in Fig. 8, but with the forward dog uppermost, as in Figs. 4 and 6.

Each of the distributers consists, as usual, of a fixed horizontal bar having a lower V-shaped edge with longitudinal teeth to engage corresponding teeth in the upper notched ends of the matrices in order to hold the latter in suspension as they are carried along the bar until they arrive over their proper magazine-channels, the movement being effected by screws lying parallel with the distributer, as usual.

Referring to the drawings, A represents the distributer-bar for the upper magazine, and A′ the distributer-bar for the lower magazine.

B and B′ represent the screws lying adjacent to the upper distributer-bar for the purpose of carrying the suspended matrices C of the upper magazine along the same. B^2 and B^3 represent the corresponding feed-screws of the lower distributer.

D represents the upper "distributer-box," so called, into which the composed lines of matrices to be distributed are advanced horizontally by the usual pressure-slide. The inward advance of the line is arrested by upright shoulders *d* at the end of side rails in the box, as usual.

E represents a vertically-reciprocating shouldered lifting-finger by which the foremost matrices of the line are lifted successively clear of the shoulders *d* and into engagement with the feed-screws, by which they are carried forward horizontally.

The matrices C′ for the lower magazine have a central notch *c* and an oblique surface in the lower end, as shown in Figs. 1, 2, 3, 10, &c., and described in United States Letters Patent No. 740,470, but the matrices C for the upper magazine are without this notch, this difference in form being utilized for the

purpose of separating the matrices of the upper and lower magazines that they may pass to their respective distributers. The separation is effected, as set forth in Letters Patent of the United States, No. 767,169, to J. R. Rogers, by the following devices:

F is a narrow bridge or plate fixed in position in the path of the matrices beyond the lifting-finger E. As the matrices are moved forward their lower ends pass over this bridge, which serves to sustain the matrices C of the upper magazine at such elevation that their teeth will engage the teeth of the upper distributer-bar B, while the notched matrices of the lower magazine will, on the other hand, in advancing straddle the bridge F and fall to a lower level. The teeth of the matrices of the lower magazine consequently fail to engage the upper distributer-bar, and as soon as the matrices have been carried forward by the screws past the ends of the rails d to the bridge F they are released and descend by gravity one after another through the fixed chute or conductor G, in the manner described in Patents Nos. 640,033 and 767,169. The present invention has to do with the parts for delivering the matrices from the chute G to the lower distributer-bar A′ and its feed-screws.

D′ represents the lower "distributer-box," so called, into and through which the matrices pass by gravity. It consists mainly of parallel side plates secured to intermediate spacing-blocks and provided with internal rails to guide the matrices as they descend sidewise toward the feed-screws and distributer-rails. In each side of the box, near the top, is secured an inclined rail d^3, upon which the upper ears of the matrices ride, so that the matrices are maintained in an upright or substantially upright position as they pass downward through the box. Near their lower ends the rails d^3 are extended forward to the left in a substantially horizontal position. There is a slight rise toward the delivery end, so that the matrices passing forward with their ears resting in these notches will be slightly raised and guided forward, so that their distributing-teeth will engage the teeth of the rail A′. It will be observed that the inclined rails are continued forward at the delivery end between the distributer-bar and the adjacent screws, so that they serve the double purpose of directing the matrices between the threads of the screws and of sustaining them so that their teeth will engage the teeth of the distributer-bar as they are advanced horizontally by the action of the screws.

A fixed bar d^4 of V form in cross-section is attached to the top of the distributer-box D′ and enters the usual notches in the upper ends of the matrices to assist in properly guiding them, so that they will not twist out of position and escape from the rails. Below the rails d^3 the box is provided in each side with a fixed plate or rail d^5, having an inclined upper edge. The middle portion of this rail d^5 is straight in the upper edge and parallel with the upper edge of the rails d^3; but near the upper end the rail d^5 has an upward curvature whereby it is adapted the better to sustain the lower ears of the descending matrices and direct them forward, as indicated in Fig. 1. Near the lower ends the rails d^5 have a sudden drop or downward curvature, after which they are carried forward in a horizontal or substantially horizontal direction to their ends. As the chute G inclines to the right, while the rails in the box D′ incline to the left, the descending matrices must be turned or tipped to a practically upright position as they enter the box D′, and this is the principal function of the lower rails d^5, which act for this purpose in the manner shown in Fig. 1. As the matrices descend through the box D′ the rails guide them to such position that they will be engaged by the distributer feed-screws B^2 and B^3 and moved forward horizontally into engagement with the distributer-bar. It is necessary that the matrices shall be separated at this point and only one matrix at a time permitted to enter between the threads of the carrier-screws, and this to the end that the matrices may be held a proper distance apart as they pass along the distributer-bar in the ordinary manner. To effect this separation of the matrices, the two coöperating vertically-reciprocating dogs H and H′ are provided. They are mounted to slide vertically in guides in the box and are connected by links to opposite ends of a centrally-pivoted lever h, which is acted upon at one end by an elbow-lever h', pivoted to the box or frame at h^2. This lever is moved in one direction by a spring h^3 and in the opposite direction by a cam h^4 on one of the distributer-screws. The upper ends of both dogs are beveled on the left or delivery side, as shown at h^5 and h^6, and the dog H is also inclined or beveled on the opposite side, as shown at h^7. The dog H is reduced in width at the top and on the side next to the dog H′, so as to leave only a narrow rib h^{10}, which travels in a vertical groove in the face of dog H′, so that one dog, in effect, overlaps the other for a portion of its thickness. The ends of the two dogs are lifted alternately into the path of the matrices and so as to engage the lower ends of the latter just before they reach the downward curvature in the lower ends of the rails d^5. The foremost of the matrices descending through the box is arrested by the engagement of the dog H′ with its lower end in the manner shown in Figs. 2, 4, 6, and 10. As the dog H′ descends the dog H is lifted and its point enters the beveled notch in the lower end of the matrix in front of the next succeeding matrix in the manner shown in Figs. 3, 8, and 9, whereby the second ma-

trix is held in check, while the continued descent of the dog H′ releases the first matrix and permits it to descend by gravity to the lower ends of the rails in position to be engaged by the feed-screws and carried forward. When the position of the dogs is reversed, the second matrix, which has now become the first, is arrested and held momentarily by the dog H, while the next or third matrix is permitted to pass forward into position to be engaged and held in its turn by the dog H′. Thus it will be seen that the matrices are released one after another and permitted to pass forward to the distributer. The distributer-screws and the dogs are so timed in relation to each other that each matrix drops forward at the proper time and in the proper position to have its ears engaged and carried forward by the feed-screws.

The essence of the invention resides in the use of two alternately-acting dogs or detents in connection with inclined rails or guides to effect the separation of the matrices and their delivery one at a time to the distributing devices. The parts may be modified in form and in detail and actuated by any suitable driving mechanism, providing a mode of action substantially such as herein described is retained.

It is to be observed that in the organization herein shown gravity is utilized to deliver the matrices laterally to the feed-screws of the lower distributer, subject to the support and guidance of the rails d^3. The rails shown are essentially different in form and action from the shouldered rails commonly used in the distributer-box of the linotype-machine, which require the employment of a dog or other lifting device to raise the matrices into engagement with the screws. No lifting devices are required in the present structure.

Having thus described my invention, what I claim is—

1. In a matrix-distributer, mechanism for effecting a preliminary separation of the matrices, comprising inclined guides upon which the matrices descend, and two alternately-rising dogs, adapted to engage and release the matrices successively.

2. In a distributing mechanism, the combination of the toothed distributer-bar, screws for feeding the matrices along said bar, inclined guides to sustain the matrices and direct them into position to be engaged by the screws, and alternately-acting dogs to separate the advancing matrices.

3. In a matrix-distributing mechanism, inclined matrix-sustaining rails d^3 and d^5, in combination with alternately-rising dogs H H′, having their ends beveled and arranged to overlap.

4. In a linotype-machine and in combination with a distributing mechanism, inclined guides for delivering matrices by gravity to the distributing mechanism, matrices having oblique notches in their lower ends, and alternately-acting dogs H and H′, the former having a tongue h^{10} arranged to enter the groove in the latter.

5. In a matrix-distributing mechanism, the rails d^3 to sustain the upper ends of the matrices, the underlying rails d^5 to act upon the lower ends of the matrices, and the top rail d^4, in combination with an escapement mechanism in position to act upon the lower ends of the matrices and effect their separation.

6. In a matrix-distributing mechanism, the matrices having an oblique surface at the lower end, in combination with alternately-acting dogs, one of which is adapted to enter between the oblique surface of one matrix and the front surface of the next.

7. In combination with the rails d^3, the top rail d^4, and the dogs H and H′, the inclined rail d^5 having an abrupt drop or depression adjacent to the dogs.

8. In a distributing mechanism, the combination of the toothed distributer-rail to suspend the matrices, the adjacent feed-screws and matrix-supporting rails d^3, inclined and extended between the screws and the distributer-rail, substantially as described, whereby they are adapted to direct the gravitating matrices between the threads of the screws and also guide them upon the distributer-bar.

9. In a matrix-distributing mechanism, the combination of the toothed distributer-bar to suspend the matrices, the adjacent feed-screws for moving the matrices along the bar, the inclined guide-rails adapted to deliver the gravitating matrices laterally into engagement with the feed-screws, and means, timed in relation to the screws, for delivering the matrices one at a time, whereby the matrices are separated and entrance between the successive turns of the screw-thread insured.

10. In a linotype-machine, the distributer-rail in combination with an inclined guide for delivering matrices downward thereto, and alternating dogs arranged in the path of the matrices to effect the separation of the matrices and their delivery one at a time.

11. The inclined matrix-guides, having an abrupt fall near the lower ends, in combination with the vertically and alternately acting dogs.

In testimony whereof I hereunto set my hand, this 12th day of October, 1904, in the presence of two attesting witnesses.

OMAR SOUTHWELL.

Witnesses:
W. H. RANDALL,
L. B. MOREHOUSE.