No. 771,854. PATENTED OCT. 11, 1904.

W. ACKERMAN.

MATRIX LOCATING MECHANISM FOR TYPE CASTING MACHINES.

APPLICATION FILED JAN. 29, 1904.

NO MODEL. 4 SHEETS—SHEET 1.

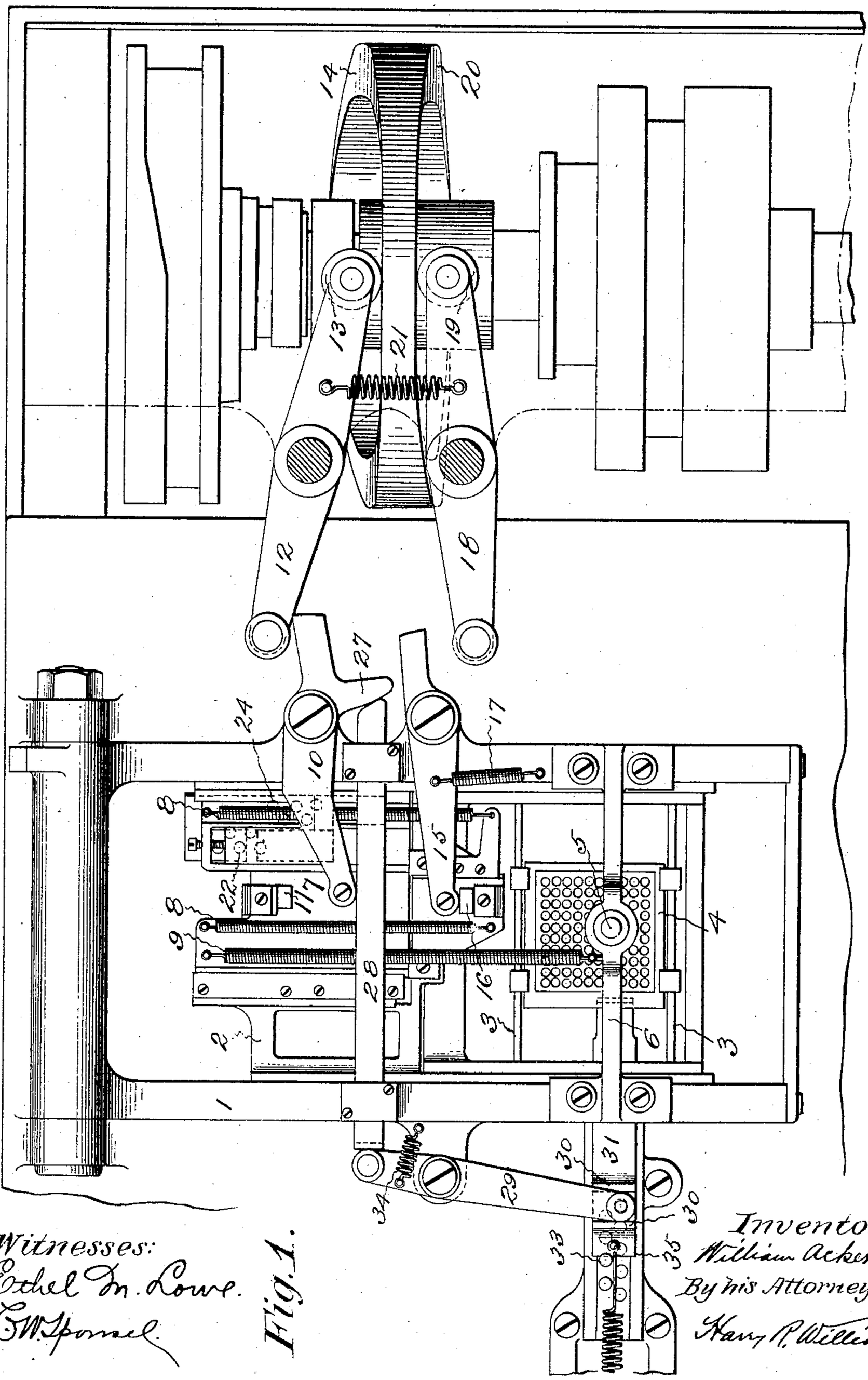

Fig. 1.

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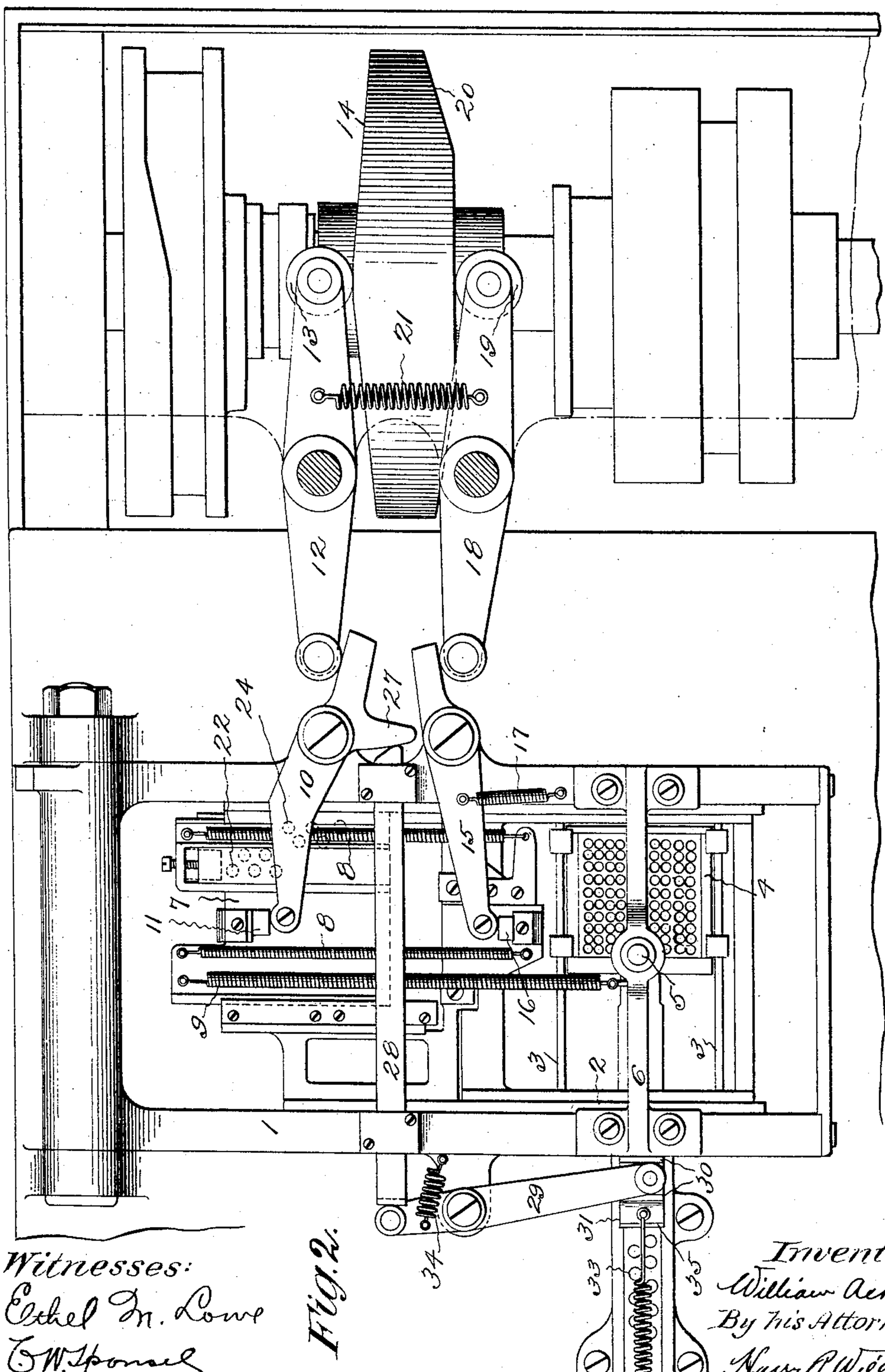

Fig. 2.

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NO MODEL. 4 SHEETS—SHEET 3.

Fig. 3.

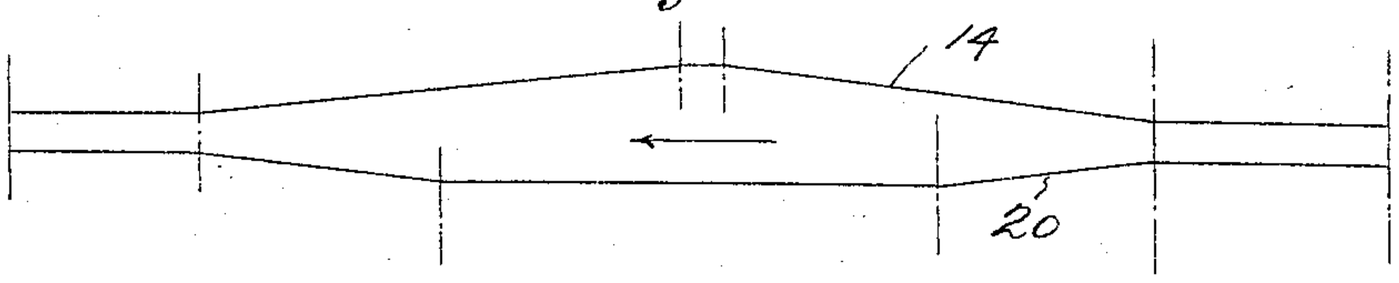
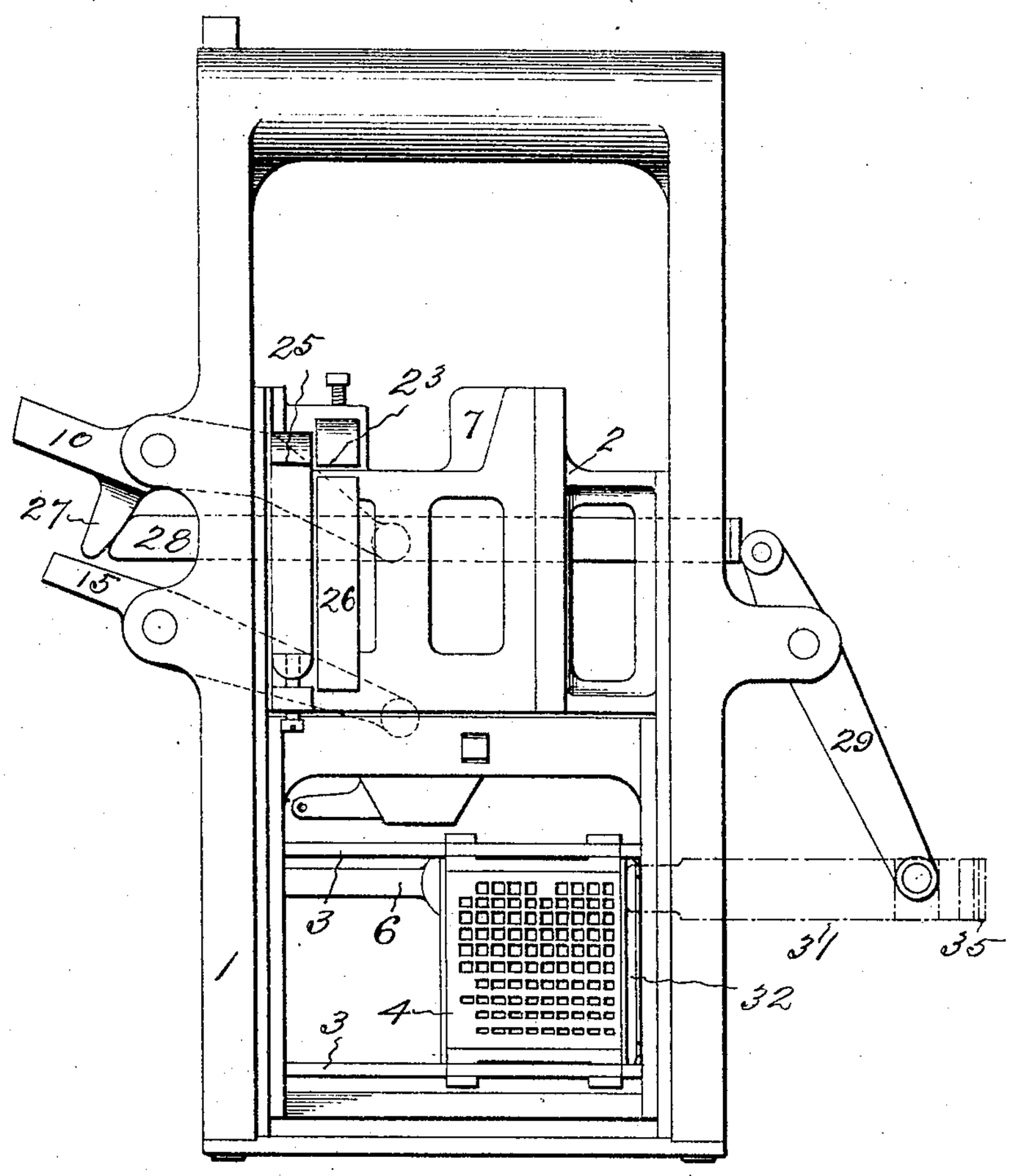


Fig. 4.



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NO MODEL. 4 SHEETS—SHEET 4.

Fig. 5.

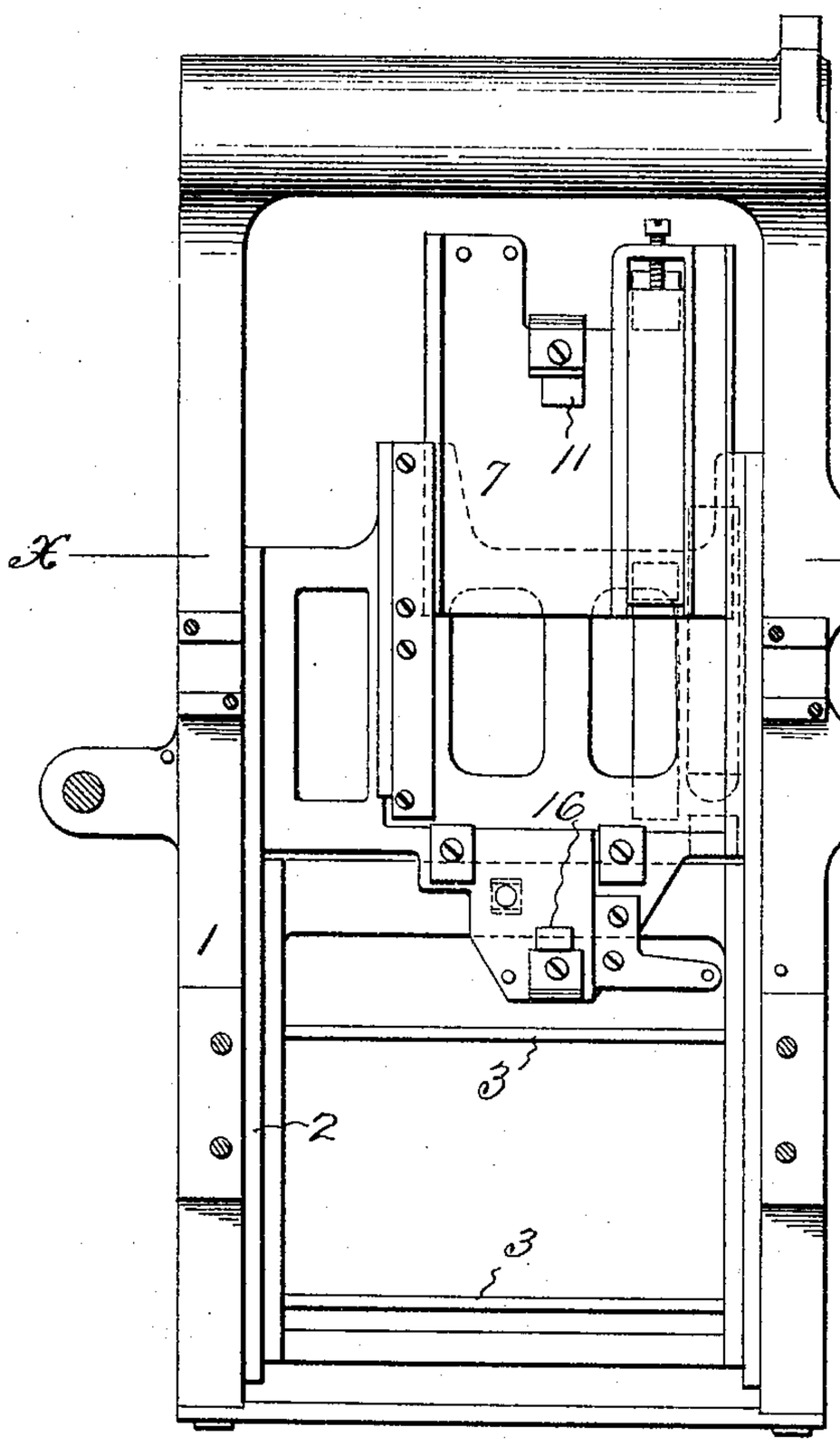


Fig. 6.

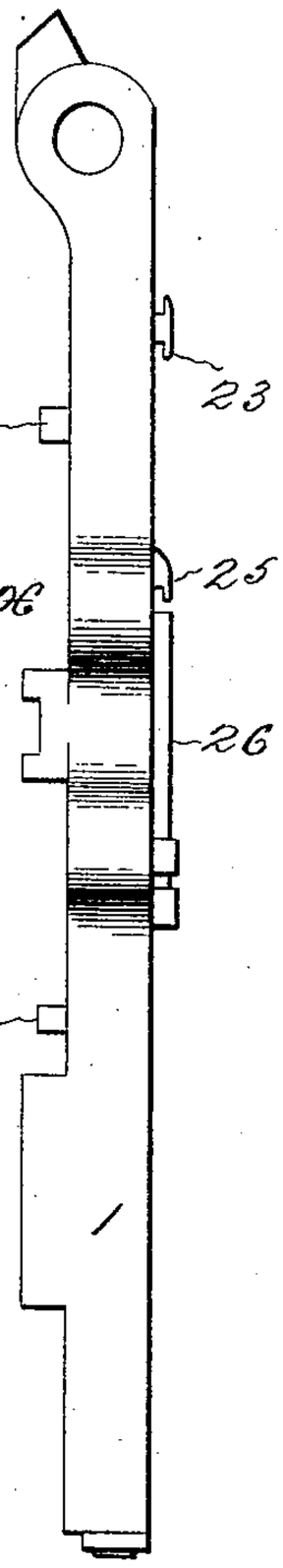
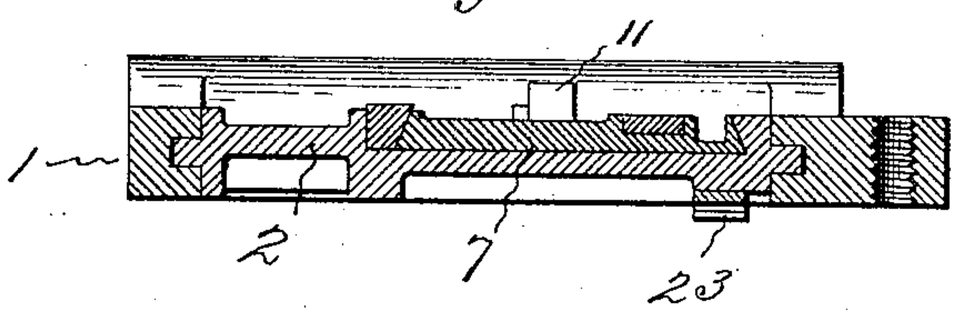


Fig. 7.



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No. 771,854. Patented October 11, 1904.

UNITED STATES PATENT OFFICE.

WILLIAM ACKERMAN, OF NEW YORK, N. Y., ASSIGNOR TO THE UNITED STATES GRAPHOTYPE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

MATRIX-LOCATING MECHANISM FOR TYPE-CASTING MACHINES.

SPECIFICATION forming part of Letters Patent No. 771,854, dated October 11, 1904.

Application filed January 29, 1904. Serial No. 191,169. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM ACKERMAN, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Matrix-Locating Mechanism for Type-Casting Machines, of which the following is a specification.

This invention relates to a mechanism for locating the matrix with the desired character-cavity over the mold of a machine which automatically casts, sets, and justifies individual type.

The object of the invention is to minimize the movements of the matrix, and thereby reduce the wear of the parts, allow an increased speed, and eliminate most of the noise and shock incident to the movements of the matrix and its carriage.

The invention is illustrated as embodied in a mechanism which is especially designed for carrying and locating the matrix of a graphotype machine of the character of that illustrated and described in United States Letters Patent No. 609,098, issued to G. A. Goodson August 16, 1898. Previously the matrix of such a machine has always been carried back to the same extreme position for relocation after each type has been cast, entailing much movement for the entire carriage and the consequent wear, noise, and shock incident to the long movement of the heavy carriage mechanisms. In the present instance the matrix-carriage is constructed in two parts. The heavier, which carries the matrix, at first moves only a part of the distance back, and the lighter, which is elastically connected with the heavier, only travels the entire distance back after every type has been cast, and then the two parts come together after the pins have been raised for stopping the carriage and locating the matrix.

In the views, Figure 1 shows a plan of a carriage and matrix of a machine of the type illustrated in the Goodson patent mentioned, with the carriage parts, the matrix, and operating mechanisms in the positions which they would occupy when a type is being cast. Fig. 2 is a similar view showing the carriage parts separated and in such positions as they would occupy just before the matrix is located. Fig. 3 shows a development of the carriage-operating cam. Fig. 4 shows a bottom view of the carriage and matrix. Fig. 5 shows a plan of the frame and the carriage parts, the matrix and the operating mechanisms being omitted. Fig. 6 shows an edge view of the frame with the carriage, and Fig. 7 shows a section of the frame and carriage on the plane indicated by $x\ x$ on Fig. 5.

The rectangular frame 1 may be attached to the machine-bed in any suitable manner. It is preferably hinged at the back end, so that the matrix may be swung down close to the mold or may be lifted away from the mold.

The side edges of the main carriage 2, which is made as light as possible, are fitted into ways formed in the inside edges of the frame, Figs. 5 and 7, so the carriage is free to move back and forth. Extending across the carriage near one end are a pair of bars 3, and supported by and movable transversely of the frame on these bars is the matrix 4, which has in its under face the cavities, Fig. 4, in which the characters are cast, and in its upper face the perforations, Fig. 1, in which the centering-pin 5, held by the yoke 6, that is fastened to the frame, is thrust to insure the exact location of the matrix-cavities.

The supplementary carriage 7 is mounted on the main carriage with its edges fitted into ways, so it may have an independent movement longitudinally of the main carriage. Two springs 8 elastically connect and draw together the main and supplementary carriages. The supplementary carriage is also connected by a spring 9 with the yoke. The springs 8 tend to keep the main and supplementary carriages together, and the spring 9 tends to draw both carriages and the matrix to the forward limit of their movements.

A lever 10, pivoted upon one side of the frame, has an end adapted to engage the front side of a block 11, that projects upwardly from

the supplementary carriage. The other end of this supplementary-carriage lever is engaged by the end of the lever 12, which has an antifriction-roll 13 in engagement with the cam 14 on the main cam-shaft of the machine. A lever 15, pivoted to the same side of the frame, has an end held in engagement with the rear side of a block 16, that projects upwardly from the main carriage by a spring 17. The other end of this main-carriage lever is engaged by a lever 18, which has an antifriction-roll 19 in engagement with the cam 20 on the main cam-shaft of the machine. A spring 21 between the cam-levers holds the rolls against the cams.

The cam 14 is so timed that after each type is cast the lever 10 pushes the supplementary carriage back to the limit of movement of the carriage, and the two springs 8, which connect the supplementary carriage with the main carriage, tend to draw the main carriage back with the supplementary carriage. The cam 20 is so timed that the lever 15 is allowed to oscillate and the main carriage move back until approximately half of the movement of the supplementary carriage has been made. Then the cam 20 causes the lever 15 to stop and temporarily hold the main carriage from further backward movement, while the supplementary carriage completes its backward movement. Then after the desired stop-pin has been raised in the usual manner by the operation of the machine the cams release the levers, so that the carriage will be drawn forward until it is stopped by the pin that has been raised.

In the organization shown if one of the first series of pins 22 has been raised the supplementary carriage is held by the engagement of the hook 23, Figs. 4 and 6, attached to its under side, with the rear edge of the pin that is raised. Then when the lever 15 is freed by its cam the main carriage is drawn backwardly by the pull of the springs 8 until it closes against the supplementary carriage. This of course locates the matrix in the desired position. If one of the second series of pins 24 has been raised, the supplementary carriage, when the cam 14 releases the lever 10, is not held, but is drawn forwardly by the spring 8 against the main carriage. Then both carriages move forwardly together until stopped by the engagement of the hook 25, Figs. 4 and 6, attached to the under side of the main carriage, with the rear edge of the pin that has been raised. On the under side of the main carriage in front of the hook 23 on the supplementary carriage is a plate 26, Figs. 4 and 6, which prevents any of the supplementary hook-holding pins from rising up and preventing the movements of the carriage after one pin has engaged a hook. If the supplementary carriage is stopped by one of the first series of pins when the main carriage is drawn backwardly by the springs against the supplementary carriage, the rear edge of the plate 26 engages the front side of the holding-pin and positively stops the main carriage in its backward movement.

The matrix is carried longitudinally of the frame into position by the main carriage; but the main carriage may be stopped by either of the pins which engage it or may be stopped by either of the pins which engage the supplementary carriage. If a main-carriage stopping-pin is raised, the supplementary carriage when released by its lever is drawn forwardly to the main carriage by the springs. If a pin stops the supplementary carriage, the main carriage when released by its lever is drawn backwardly to the supplementary carriage by the springs. The main carriage at first makes only half a movement, it being held by the lever 15 until a pin has been raised into proper position to stop either the main carriage or the supplementary carriage at the correct longitudinal position, and then under the influence of the springs the main carriage moves backwardly or the supplementary carriage moves forwardly until the two carriages come together and are held by the raised pin with the matrix in the proper longitudinal position.

The lever 10 has a finger 27, which engages the end of a sliding bar 28, that at its opposite end engages a friction-roll on the end of the lever 29, pivoted to the side of the frame. This latter lever has a friction-roll that lies between a pair of lugs 30 on a slide 31, that has a hook which engages a groove 32 in one edge of the matrix. This lever and slide move the matrix transversely of the carriage.

The series of pins 33 are raised by the usual mechanism of the machine for stopping the slide and holding the matrix in the proper transverse position. A spring 34 draws an end of the lever against the end of the bar. The pins 33 when raised engage the hook 35 on the under side of the slide, as in the old machine. The matrix is moved transversely of the carriage at the same time that it is being moved longitudinally of the frame with the carriage.

By making the matrix-cavities of the characters most commonly used near the center of the matrix the motion of the matrix is very little after each type is cast, for with most of the characters it would only be moved back a slight distance, if any, before being located for the casting of the next type.

With the prior machines the matrix as each type has been cast has been drawn back to its full extremity and then moved forwardly until stopped in the proper location to form the character desired. With the present construction, the matrix being on the main carriage is only moved back half of the regular distance, and then if it is necessary to bring the proper character into position it is moved still farther back; but if it is back far enough then it only moves forward a slight distance.

The invention claimed is

1. A matrix-locating mechanism for type-casting machine, having a main carriage, a matrix supported by the main carriage, a supplemental carriage, mechanism for moving the supplemental carriage, and elastic means connecting the main carriage and the supplemental carriage, substantially as specified.

2. A matrix-locating mechanism for type-casting machine, having a main carriage, a matrix movable in one direction with the main carriage and movable in another direction independently of the main carriage, a supplemental carriage, mechanism for moving the supplemental carriage in the same direction as but independently of the main carriage, means connecting the main carriage and the supplemental carriage, and mechanism for moving the matrix independently of the main carriage, substantially as specified.

3. A matrix-locating mechanism for type-casting machine, having a main carriage, a matrix movable in one direction with the main carriage and movable in another direction independently of the main carriage, a supplemental carriage borne by and movable in the same direction independently of the main carriage, mechanism for moving the supplemental carriage, means connecting the main carriage and the supplemental carriage, and mechanism for moving the matrix independently of the main carriage, substantially as specified.

4. A matrix-locating mechanism for type-casting machine, having a frame adapted to be connected with the machine, a main carriage movably supported by the frame, a supplemental carriage movably supported by the main carriage, mechanism for moving the supplemental carriage in the same direction independently of the main carriage, and means connecting the main carriage and the supplemental carriage, substantially as specified.

5. In combination with a type-casting machine, a matrix-support consisting of a frame, a main carriage movable along the frame, a supplemental carriage movable on the main carriage, and means elastically connecting the main carriage and the supplemental carriage, substantially as specified.

6. A matrix-locating mechanism for type-casting machine, having a main carriage, a matrix supported by and movable in one direction with the main carriage and movable in another direction independently thereof, a supplemental carriage, springs connecting the main carriage and the supplemental carriage, a lever adapted to move the supplemental carriage in one direction, and a spring adapted to move the supplemental carriage in the opposite direction, substantially as specified.

7. A matrix-locating mechanism for type-casting machine, having a main carriage, a matrix supported by and movable in one direction with the main carriage and movable in another direction independently thereof, a supplemental carriage, a lever adapted to move the supplemental carriage in one direction, a spring adapted to move the supplemental carriage in the opposite direction, a spring connecting the main carriage and the supplemental carriage, and a lever adapted to hold the main carriage stationary during a part of the movement of the supplemental carriage, substantially as specified.

8. A matrix-locating mechanism for type-casting machine, having a main carriage, a matrix supported by and movable with the main carriage, a supplemental carriage, a lever adapted to move the supplemental carriage in one direction, a spring adapted to move the supplemental carriage in the opposite direction, and a lever adapted to hold the main carriage stationary during a part of the movement of the supplemental carriage, substantially as specified.

9. A matrix-locating mechanism for type-casting machine, having a main carriage, a matrix supported by the main carriage, a supplemental carriage, springs connecting the main carriage and the supplemental carriage, a lever adapted to move the supplemental carriage backwardly, a spring adapted to move the supplemental carriage forwardly, a lever adapted to hold the main carriage during a part of the backward movement of the supplemental carriage, and hooks extending from the main and supplemental carriages and adapted to be temporarily engaged with locating-pins, substantially as specified.

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