

No. 703,017.

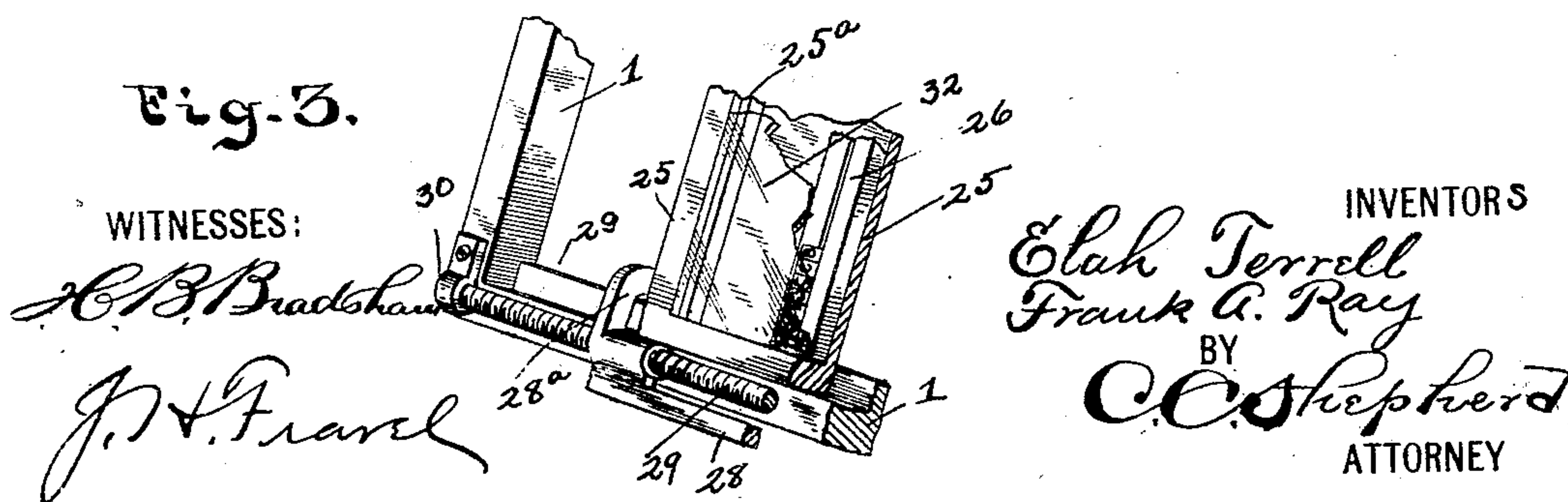
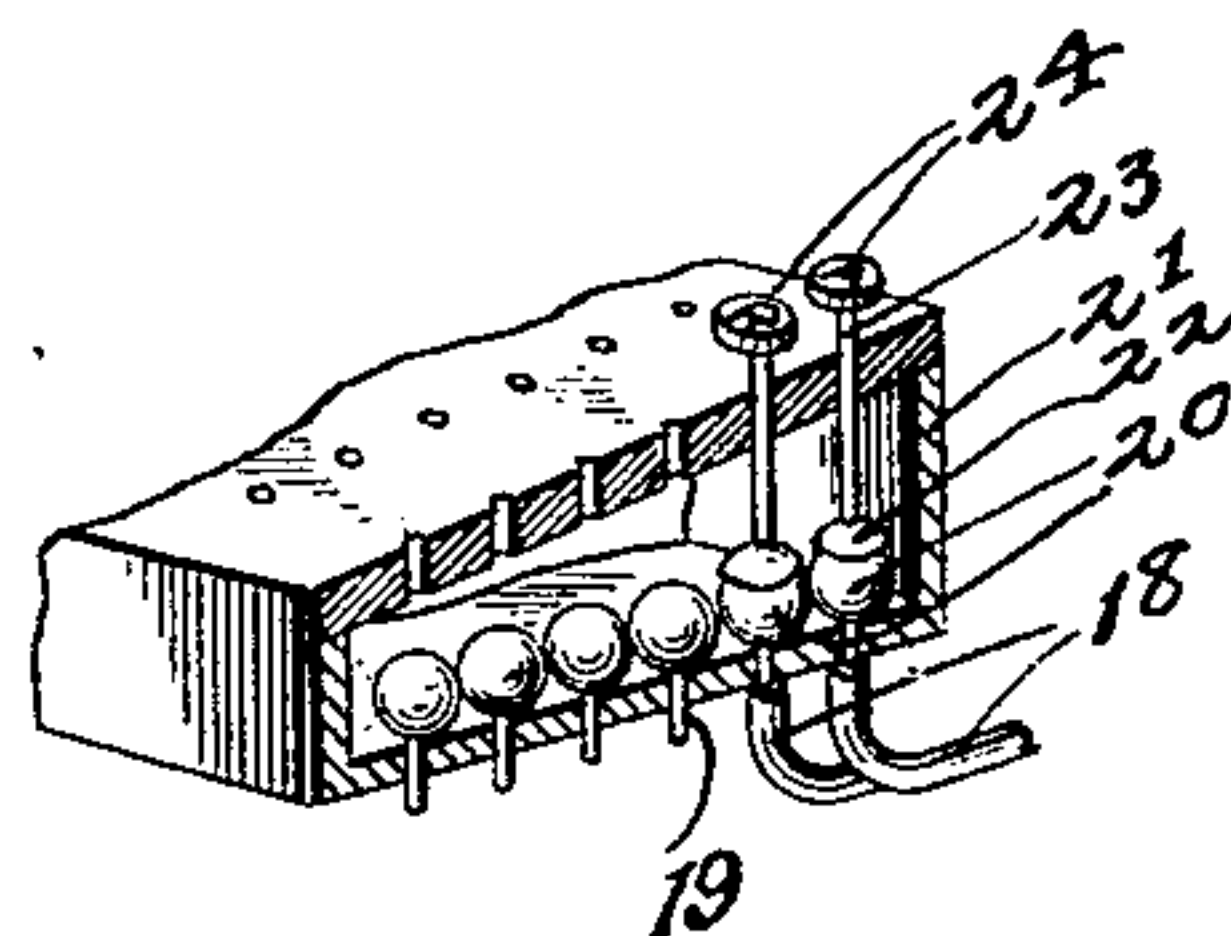
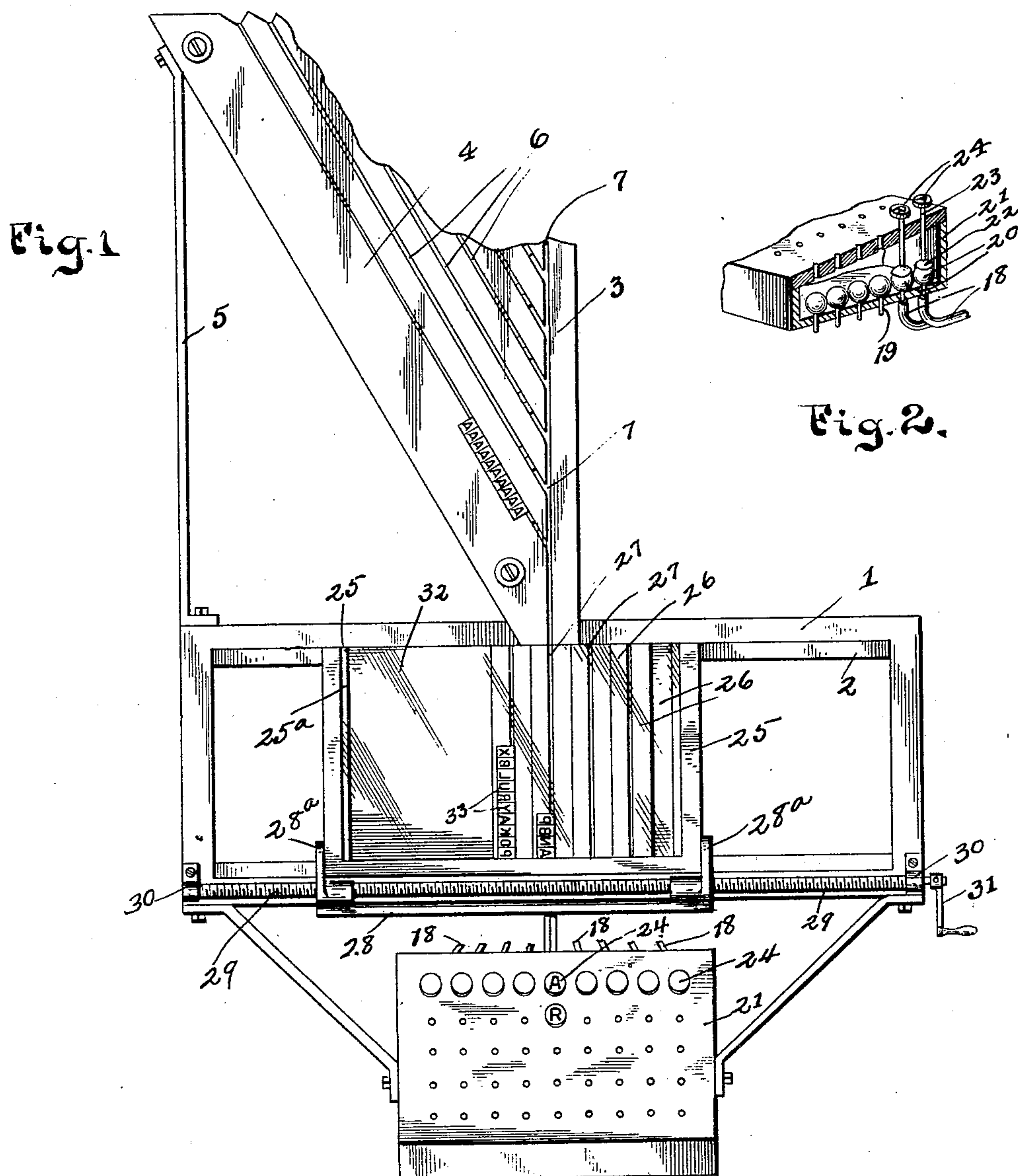
Patented June 24, 1902.

E. TERRELL & F. A. RAY.
TYPE SETTING MACHINE.

(Application filed Feb. 4, 1901. Renewed Nov. 25, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

Fig. 4.

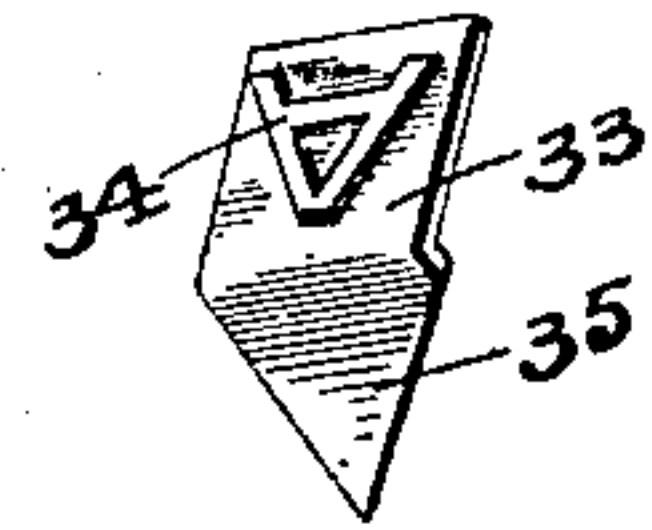
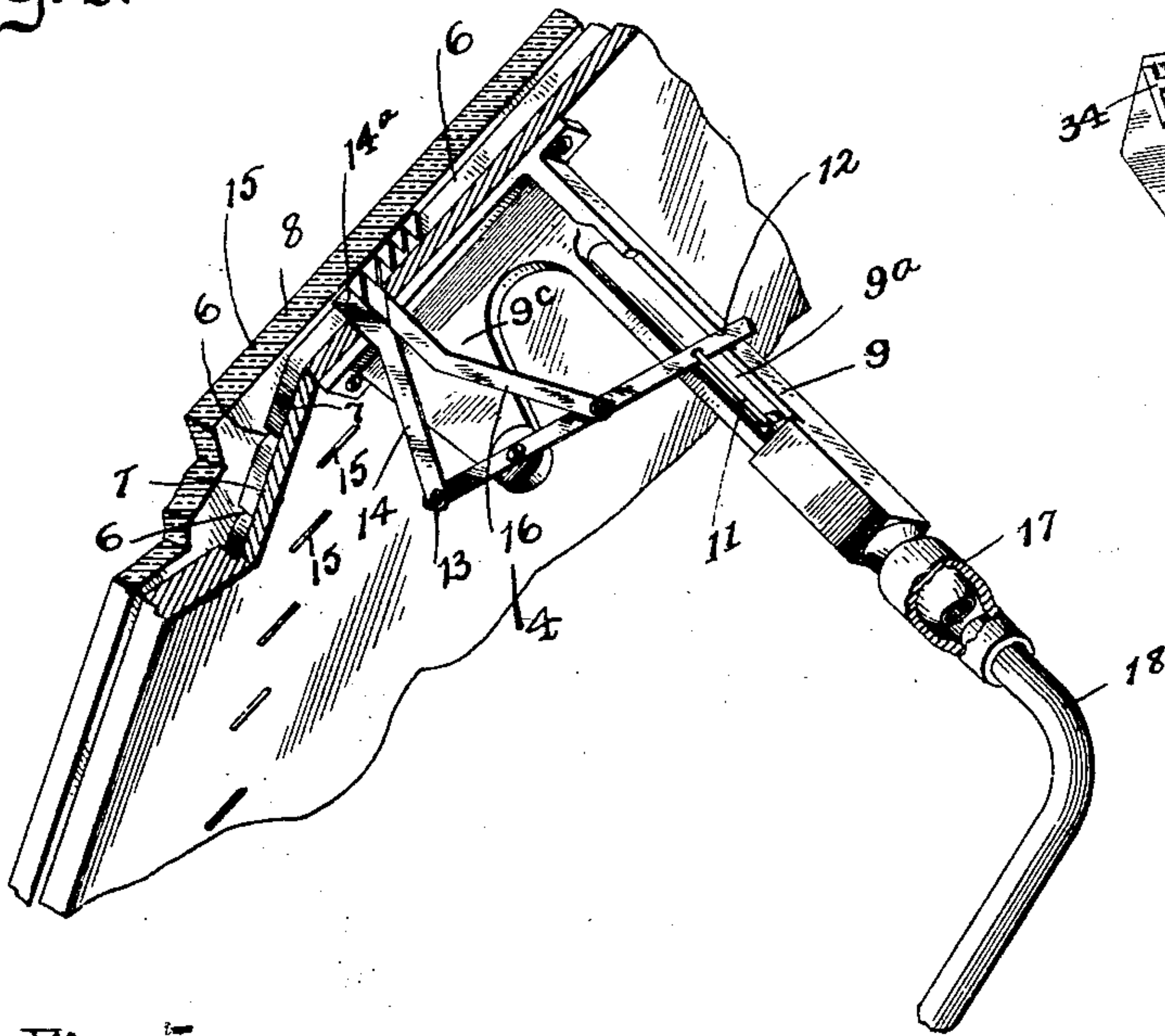


Fig. 6.

Fig. 5.

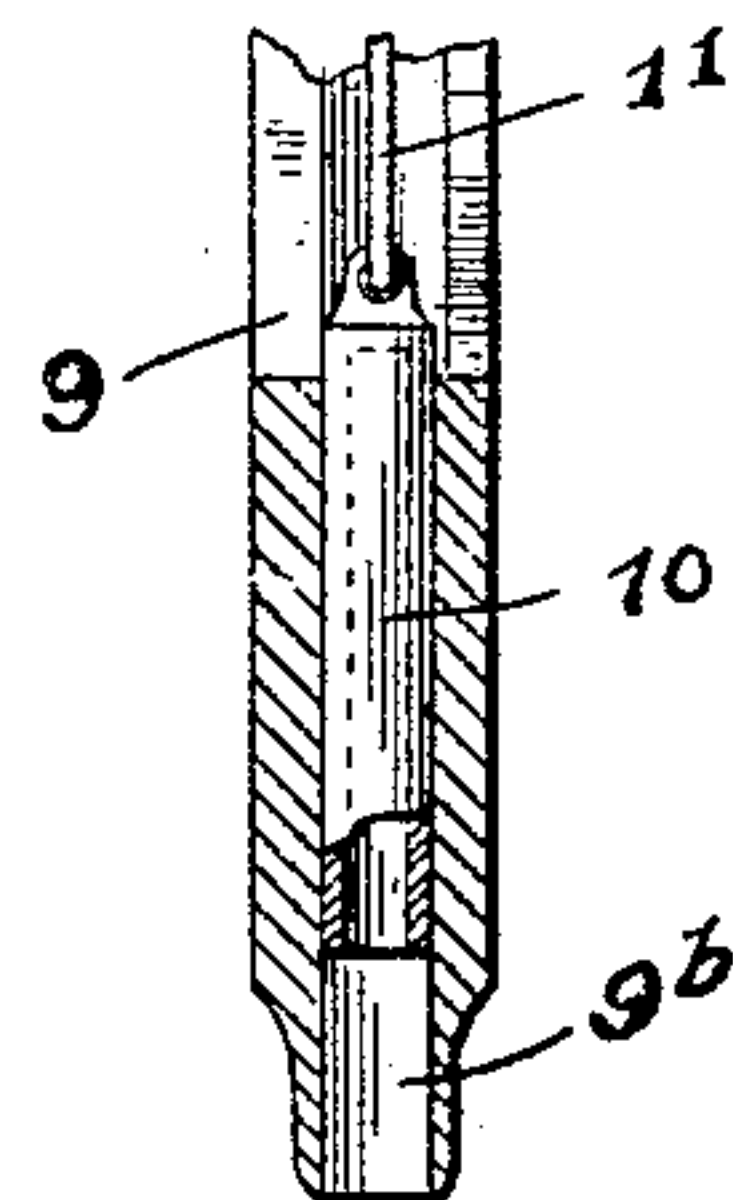
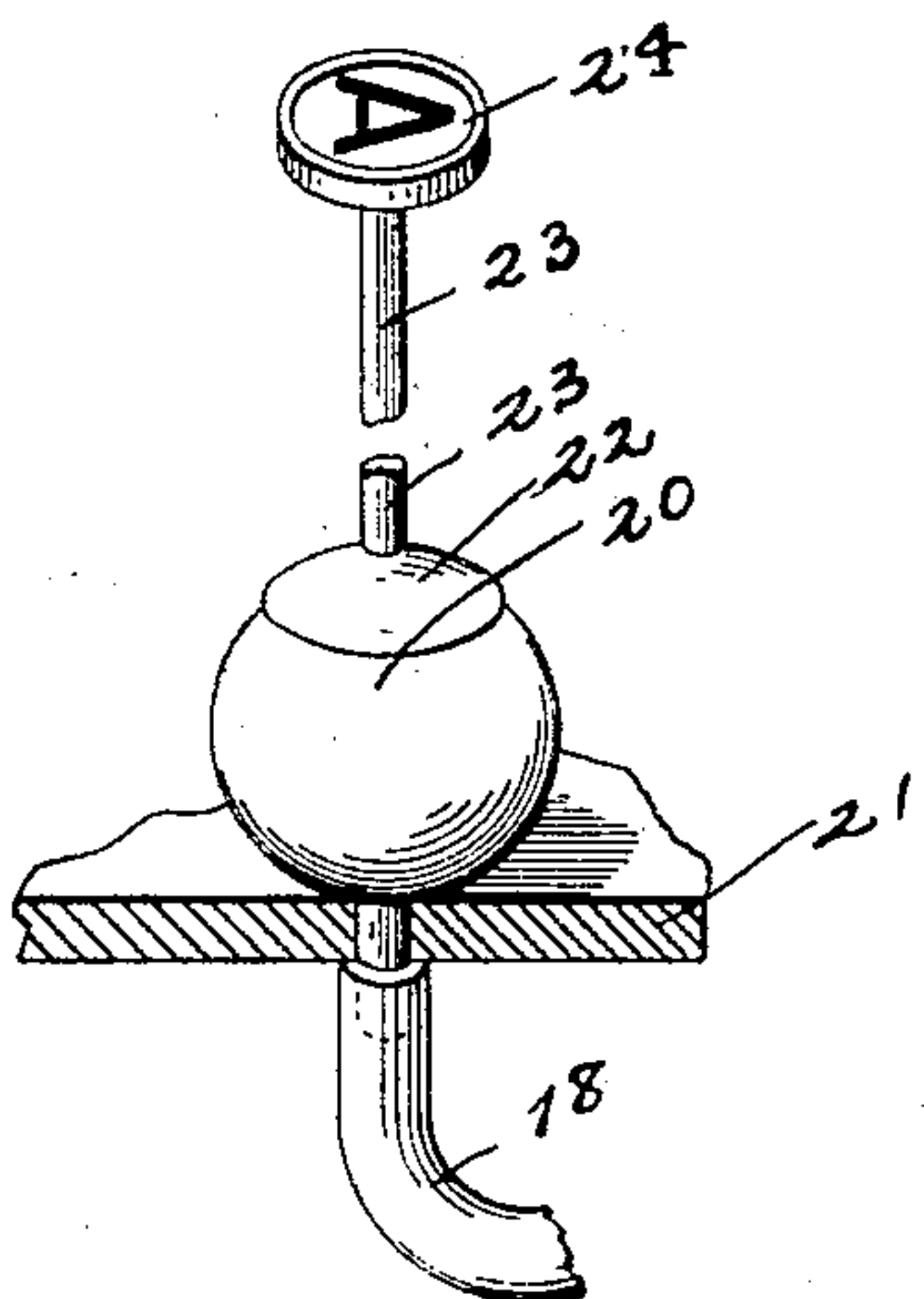


Fig. 7.

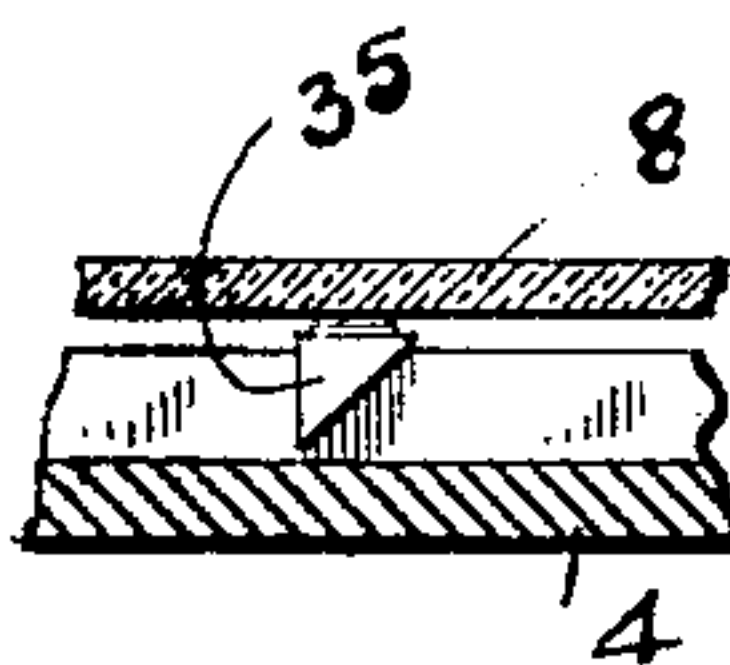


Fig. 8.

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UNITED STATES PATENT OFFICE.

ELAH TERRELL AND FRANK A. RAY, OF COLUMBUS, OHIO.

TYPE-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 703,017, dated June 24, 1902.

Application filed February 4, 1901. Renewed November 25, 1901. Serial No. 83,628. (No model.)

To all whom it may concern:

Be it known that we, ELAH TERRELL and FRANK A. RAY, citizens of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Type-Setting Machines, of which the following is a specification.

Our invention relates to the improvement of type-setting machines, and has for its objects the production of a machine of this class of improved construction and arrangement of parts whereby through the operation of the keys of a keyboard the desired type are successively fed into a type-holding frame or form. These objects we accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a view in elevation of our improved type-setting machine, showing a portion of the same broken away for the sake of clearness and simplicity in illustration. Fig. 2 is a detail view in perspective, the same being shown partly in section, of the keyboard or frame. Fig. 3 is a similar view of a portion of the type-receiving form or frame and its adjustable support. Fig. 4 is a similar view of a portion of the type-supply frame, showing in connection therewith the type releasing and holding mechanism of one section of said frame. Fig. 5 is a view in perspective of one of the type-supply-operating keys. Fig. 6 is a similar view of one of the type employed. Fig. 7 is a central longitudinal section of a portion of one of the plunger-containing arms, which is employed in the manner hereinafter described; and Fig. 8 is a sectional view of a portion of the type-supply plate.

Similar numerals refer to similar parts throughout the several views.

In carrying out our invention we employ a horizontal oblong frame 1 of suitable construction, the upper and lower longer bars of said frame being provided in their rear portions with inwardly-projecting flanges or shoulders 2. This frame 1 has its upper portion inclining rearwardly, as indicated in Fig. 3 of the drawings. Rising from the front and central portion of the frame 1 is a frame-standard 3, with one side of which is connect-

ed or formed a substantially triangular plate 4, portions of which are illustrated in Figs. 1 and 4 of the drawings. This plate 4 is also provided with one or more supporting-standards 5, which rise from the frame 1. As indicated in the drawings, the substantially triangular plate 4 is provided at regular intervals with parallel saw-cuts or grooves 6. These grooves or ways 6 are inclined, as shown, running parallel with the line forming the hypotenuse of the plate 4, and the lower and inner ends of said grooves communicate, as shown, with a vertical passage or groove 7 at the junction of the plate 4 and standard 3. As indicated in Fig. 4 of the drawings, this type-supply frame, formed as above-described and comprising the grooved or channeled plate 4, is preferably covered on its forward side with a correspondingly-shaped glass plate 8. Extending rearwardly from the rear side of the plate 4 and secured adjacent to each of the channels or grooves 6 is a plunger-holding arm 9, but one of these arms being shown in the drawings. The inner portion of each of the arms 9 is channeled or grooved, as indicated at 9^a, while the outer portion thereof, which is provided with a central passage or bore communicating with said channel, terminates in a reduced nipple extension 9^b. Within this tubular outer end portion of the arm 9 is adapted to fit and slide a plunger 10, the outer end of which is open. With the closed inner end of this plunger, which normally projects within the channel 9^a of the arm 9, is connected one end of a short rod 11, the remaining end of which is jointly connected with one end of a downwardly-extending lever-bar 12, said lever-bar being pivoted at a point below the center of its length to a rearwardly-projecting lug 9^c, formed with the inner end of the arm 9. To the lower end of the lever 12 is pivotally connected at 13 the rear end of a forwardly and upwardly extending lever-arm 14, the forward end portion of which is bent to form an outwardly-extending termination 14^a, the latter passing loosely through the lower portion of a slotted opening 15, of which there is one in the plate 4 for each of the channels 6.

16 represents an angular upper lever-arm, the rear end of which is pivotally connected

with the lever 12 at a point above the pivot-point of the latter, while the forward end thereof extends in a direction parallel with and rides upon the upper side of the termination 14^a of the lever-arm 14. The forward end portion of the lever-arm 16 also enters the opening 15. As indicated in the drawings, the forward end portion of the lower lever-arm 14 normally intersects the corresponding groove 6, while the forward end of the lever-arm 16, which is inclined, as shown, is normally at the mouth or entrance of the opening 15.

Connected with the rear end portion 9^b of each of the plunger-containing arms 9 through the medium of a suitable flexible coupling 17 is an air-conducting tube 18. These air-conducting tubes extend downward in rear of the frame 1, thence forward, their upper ends receiving the downwardly-extending tube-like stems 19 of rubber bulbs 20, these bulbs being seated, as indicated more clearly in Figs. 2 and 5 of the drawings, within a key frame or casing 21 and each of said bulbs being capped by the concaved lower end pressure-disk 22 of a vertical key-stem 23, which extends loosely through the upper portion of the key-frame, said key-stem having in its upper end a button or head 24, bearing a letter corresponding with the letters represented by the type to be contained in the supply-channel 6 of the frame 4, with which said key is connected through the medium of one of the tubes 18 and one set of the lever-arms 14 and 16.

25 represents a form-frame, this frame being adapted, as shown in Figs. 1 and 3 of the drawings, to be movably supported within the frame 1, the upper and lower portions of said frame 25 bearing against the flanges 2 of said frame 1. Within this frame are arranged transverse parallel bars 26, the latter being so supported with relation to each other as to result in the formation of a narrow space or passage 27 between said bars or between the pairs of said bars. This space or passage 27 between the bars 26 corresponds in width with the channel 7 of the frame-plate 4, with which channel said spaces 27 are adapted to be made to communicate in the manner hereinafter described. The form-holding frame 25 has the lower portion of its ends embraced by the upwardly-extending and rearwardly-turned end arms or fingers 28^a of a clamping-yoke 28, the latter having the bases of its arms internally threaded to receive a horizontal threaded rod or screw 29, on which said yoke is mounted. This horizontal screw 29 has its ends journaled in bearing-brackets 30 at the ends and on the forward side of the frame 1, and on one end said screw is provided with a crank-handle 31. As partially shown in Fig. 3, the frame 25 is adapted to have its forward side temporarily provided with a glass plate 32, the latter bearing against internal shoulders 25^a of said frame. The form of type which we employ and which are the subject of another application for patent filed of even date herewith is indicated more

clearly at 33 in Fig. 6 of the drawings, each of said type-bodies consisting of an angular plate, the upper horizontal member or arm of which has raised therefrom a type-letter projection 34, while the lower downwardly-extending member of said type is pointed, as indicated at 35.

In practice each of the type-containing channels 6 of the supply-frame is intended to contain type representing corresponding letters or numerals, these types being so inserted or fed into the upper ends of said grooves or channels as to allow the upper or outer horizontal portions thereof to bear and slide against the outer face of the plate 4, while the pointed end portions of the type extend inward within the channel 6.

In order to properly operate our improved type-setting machine, the screw 29 is rotated until the frame 25 is in such position as to bring the lower end of the supply-plate groove 7 into connection with the upper end of one of the spaces between two of the form-bars 26. By then successively depressing the desired key-buttons 24, and consequently compressing the bulbs 20, the air which is forced through the tubes 18 acting on the plungers 10 results in so swinging the levers 12 as to cause the outer end portions of the lever-arms 14 to be drawn rearwardly, thus releasing the type 33, which is immediately above said lever end. As the lever-arm 14 is withdrawn, it is obvious that the lever-arm 16 will be forced forward, engaging temporarily the next succeeding type-body and holding the remaining type from dropping. As the pressure on the bulbs is released it is obvious that the lever-arm 16 will be withdrawn and the lever-arms 14 projected to the positions indicated in Fig. 4 of the drawings. The type, which are thus released one at a time, travel by gravity down their respective channels 6 into the groove or channel 7, from which they are successively discharged into that space 27 between the bars 26, which is in communication with said channel 7. One line of type being thus set between two of the bars 26, the frame 25 is moved in the frame 1 until another of the spaces 27 is in communication with said channel 7, this movement being accomplished by rotating the screw 29. When the desired type-matter has thus been introduced into the form, the glass plate 32 is removed and the form-bars suitably clamped together and removed from the frame 25. In this manner it will be seen that a form is provided with the type-faces displayed from the upper or outer side thereof in position for printing. Although but one of the grooved or channel plates 4 is shown and described herein, it is obvious that a second plate corresponding with the plate 4 might be employed on the opposite side of the groove 7, the channels of said second plate communicating with said last-mentioned groove.

From the construction and operation which we have herein shown and described it will

be seen that simple, reliable, and effective means are provided for setting the desired type in lines or rows.

5 Having now fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a type-setting machine, the combination with a framework, a plate provided with inclined channels 6 and a main discharging-
10 channel with which said channels 6 communicate, of a pivoted lever 12 arranged in rear of each of said channels 6, lever-arms 14 and 16 pivotally connected with each of said levers 12, said lever-arm ends adapted to work
15 in an opening 15 communicating with a channel 6, a plurality of angular type, one arm of each of which extends within said channel and the remaining arm of which bears on the plate adjacent to said channel, the lower type-
20 body normally resting upon the end of the lever-arm 14 and the remaining lever-arm 16 adapted to move into position to engage the next higher type-body when said arm 14 is withdrawn and means for imparting a swinging
25 movement to said lever 12, substantially as specified.

2. In a type-setting machine, the combination with a framework, a plate 4 rising therefrom and having a main channel 7 and diagonally-arranged channels 6 communicating
30 therewith, each of said channels 6 having a slotted opening 15, of an arm 9 for each of said channels 6, a reciprocating plunger in said arm, a pivoted lever 12 connected with said plunger, a pair of lever-arms pivotally
35 connected with said lever on opposite sides of its pivot-point and adapted by movement of the lever 12 to alternately move outward and inward through one of the openings 15, type contained in said channels 6 and adapted
40 to be held against discharge therefrom by that lever-arm which is projected through said opening 15, a depressible bulb for each of the grooves 6 and a tubular connection between each of said bulbs and each of the le-
45 ver-operating plungers, substantially as specified.

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FRANK A. RAY.

In presence of—

C. C. SHEPHERD,
EDWARD M. TAYLOR.