

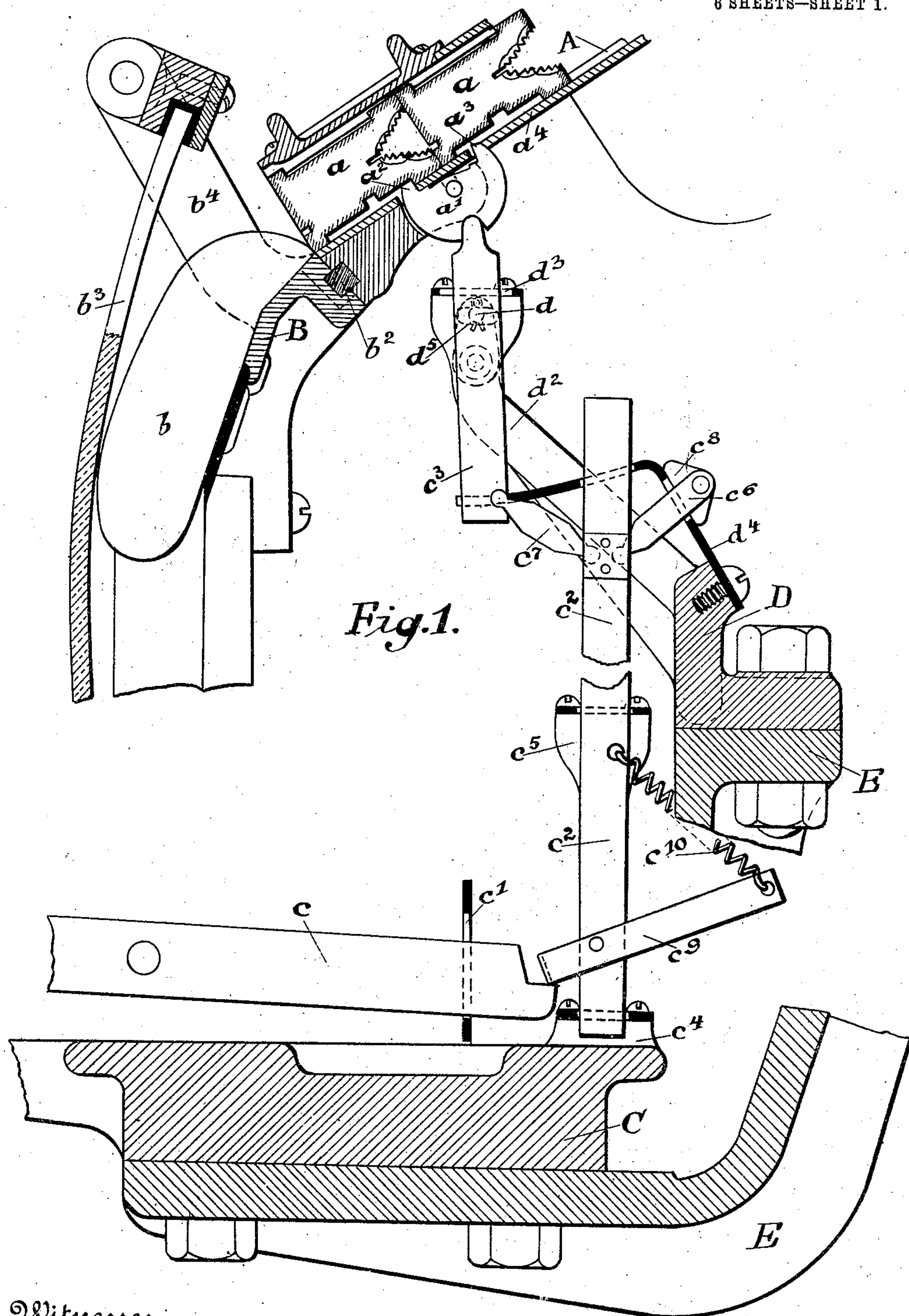
No. 889,552.

PATENTED JUNE 2, 1908.

W. H. SCHARF.
LINO TYPE MACHINE.

APPLICATION FILED SEPT. 13, 1905.

6 SHEETS—SHEET 1.



Witnesses
Lucius E. Varney
Ray Knorr.

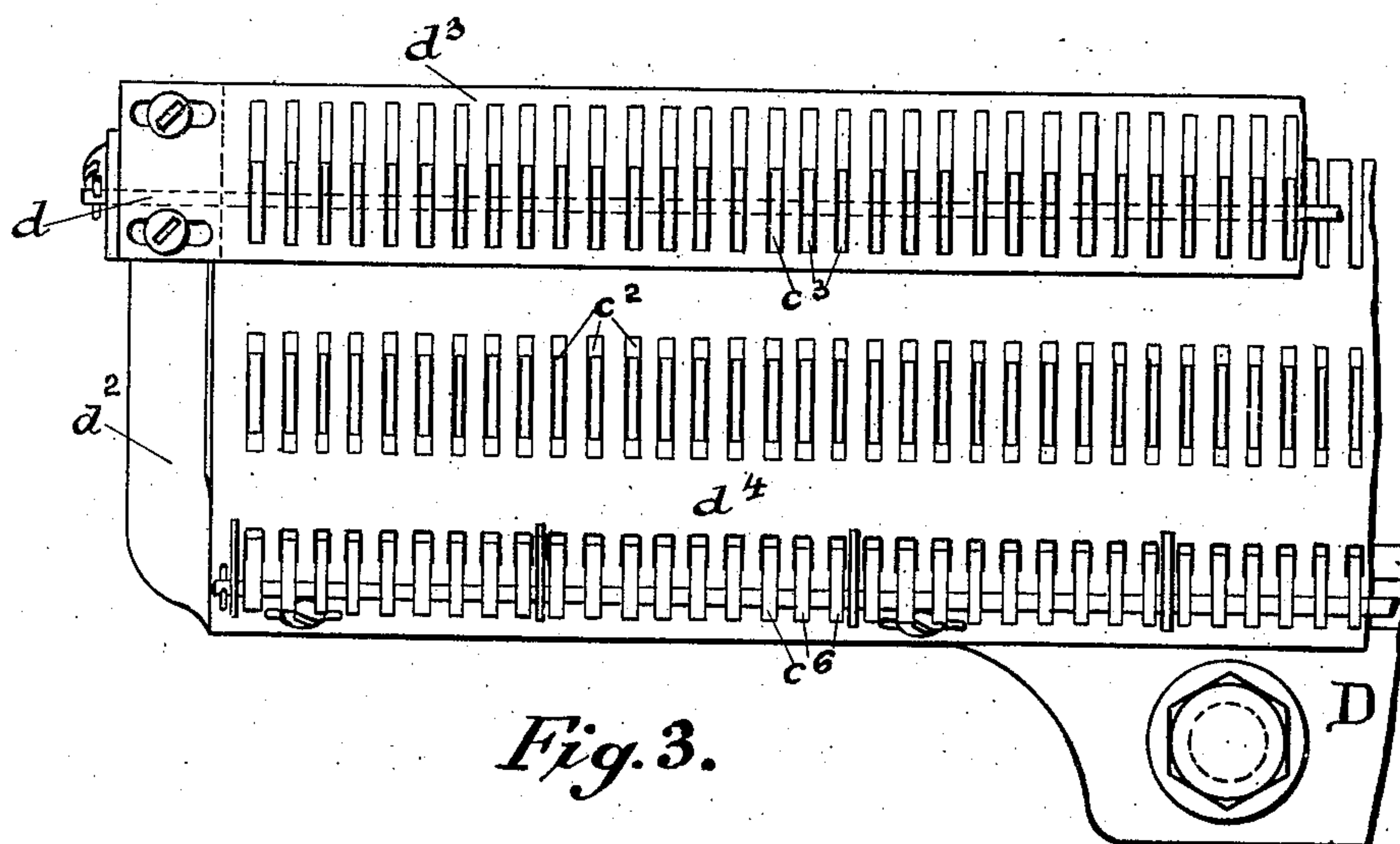
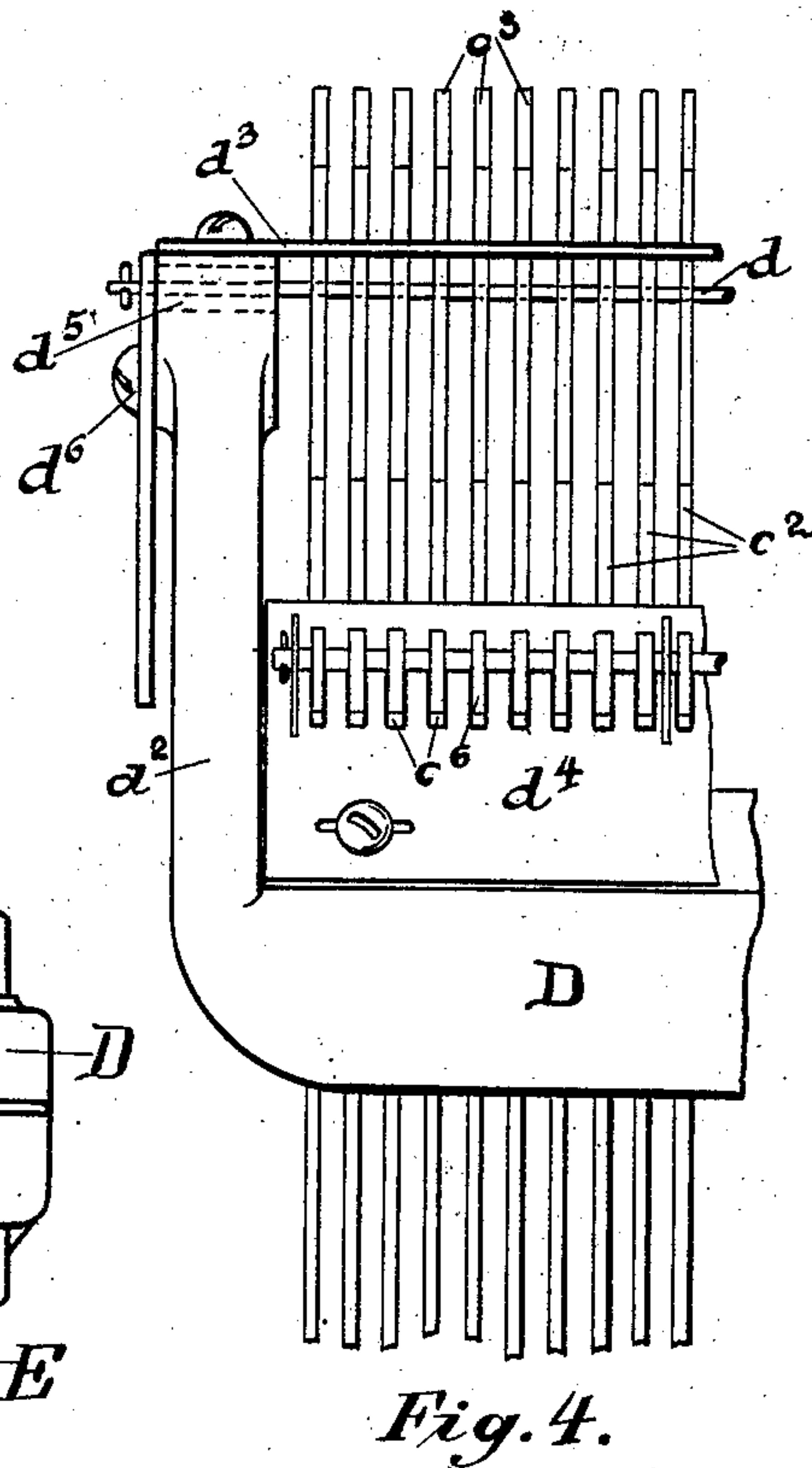
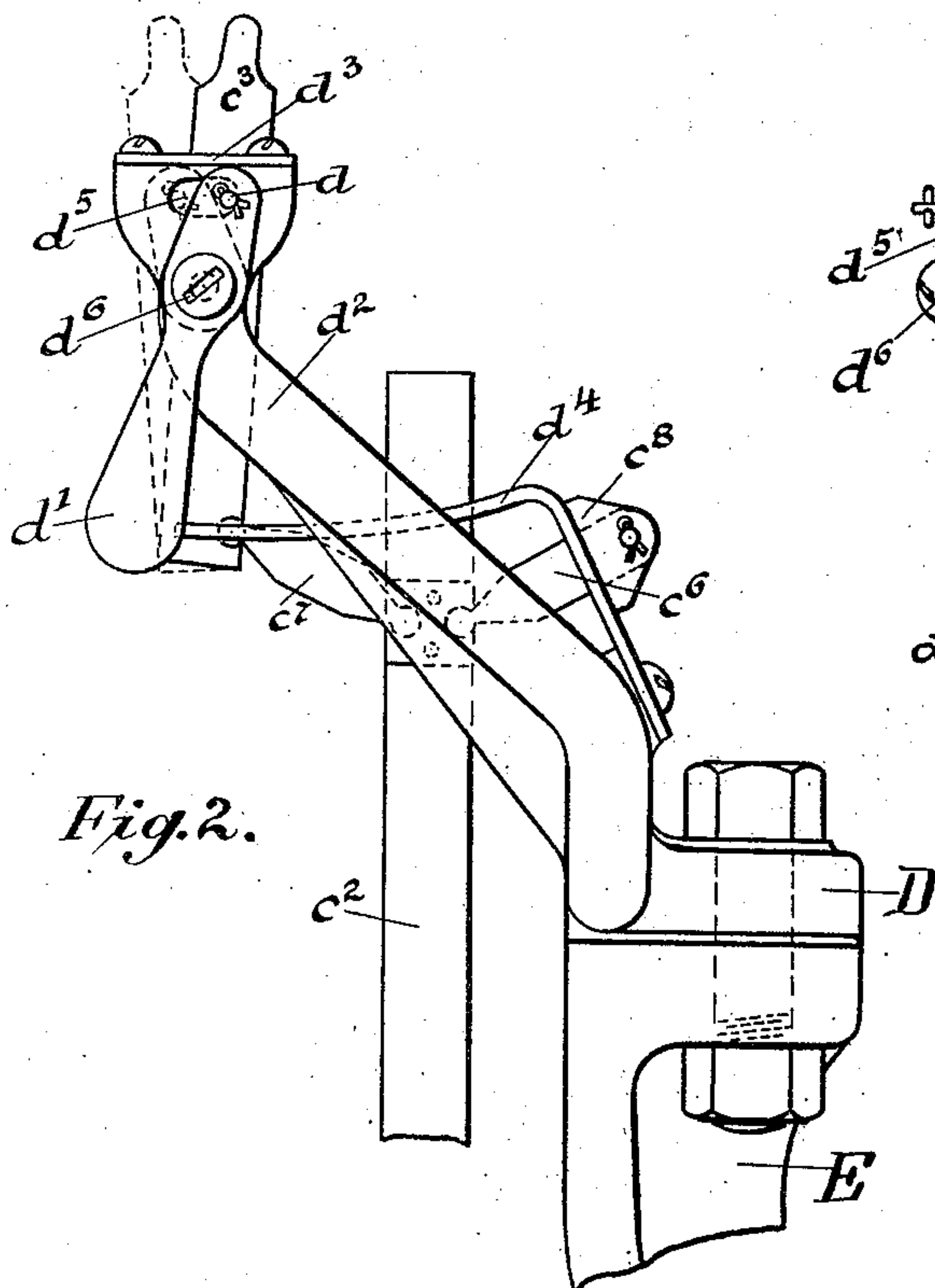
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6 SHEETS—SHEET 2.



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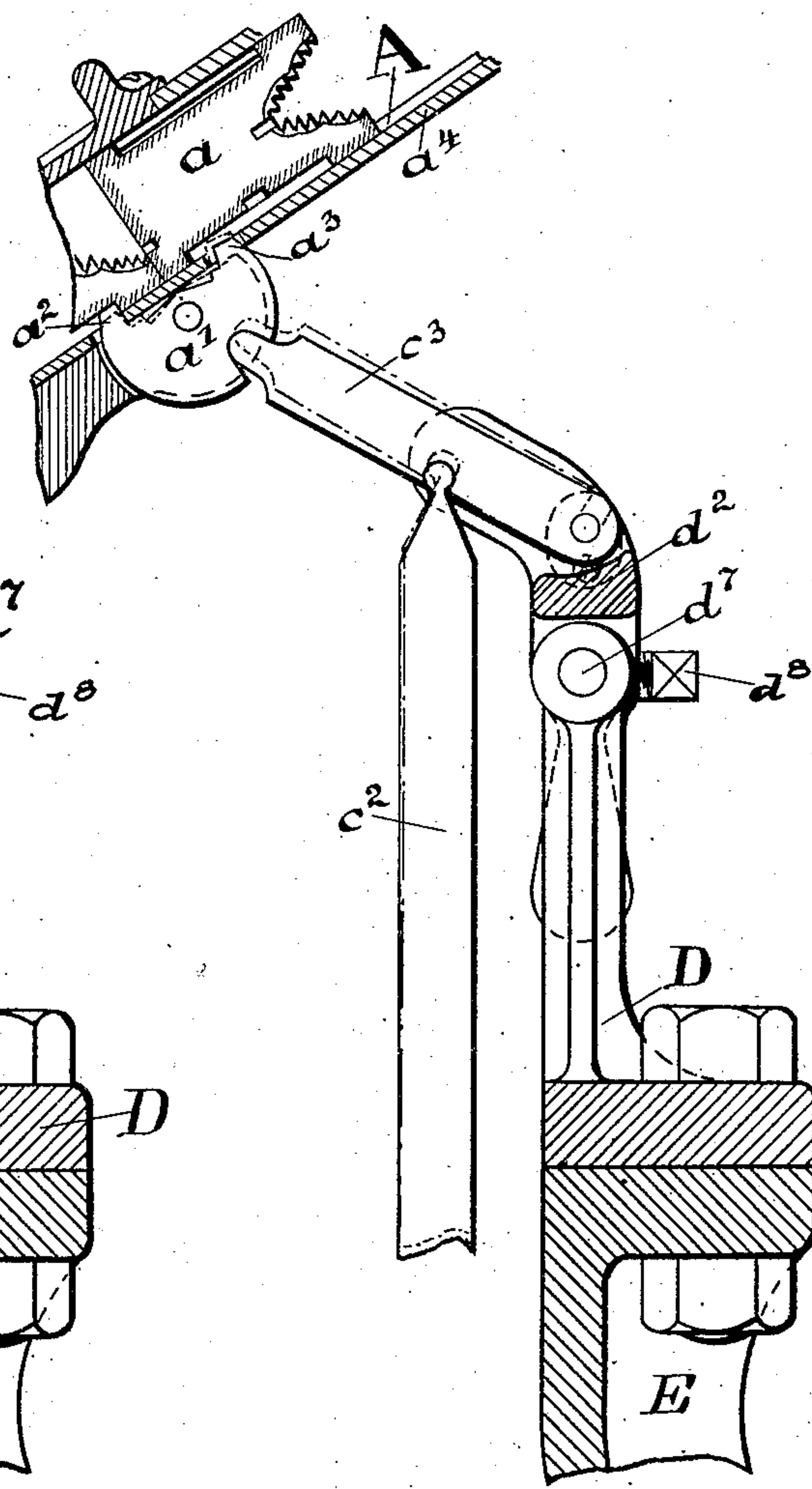
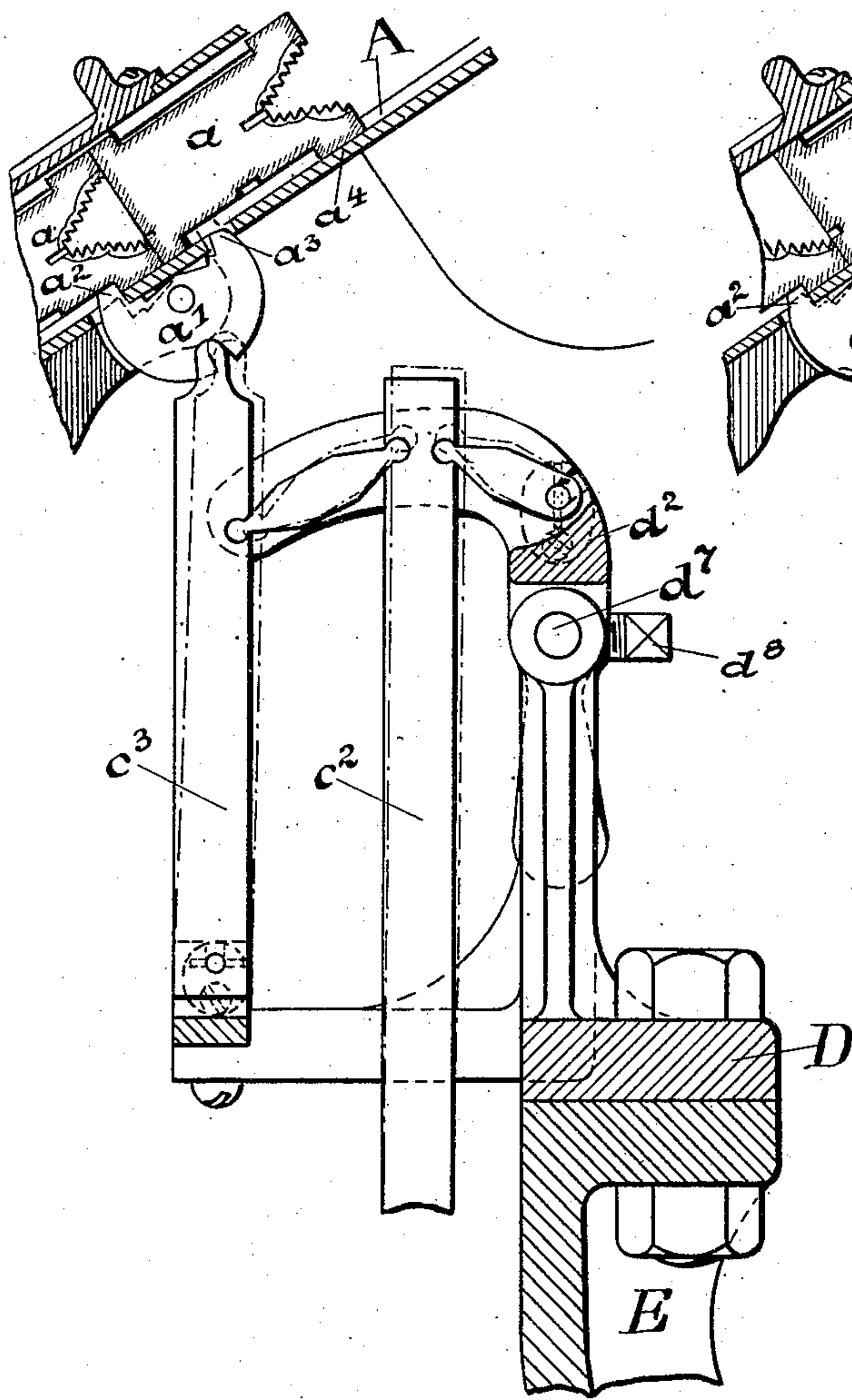
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6 SHEETS—SHEET 3.



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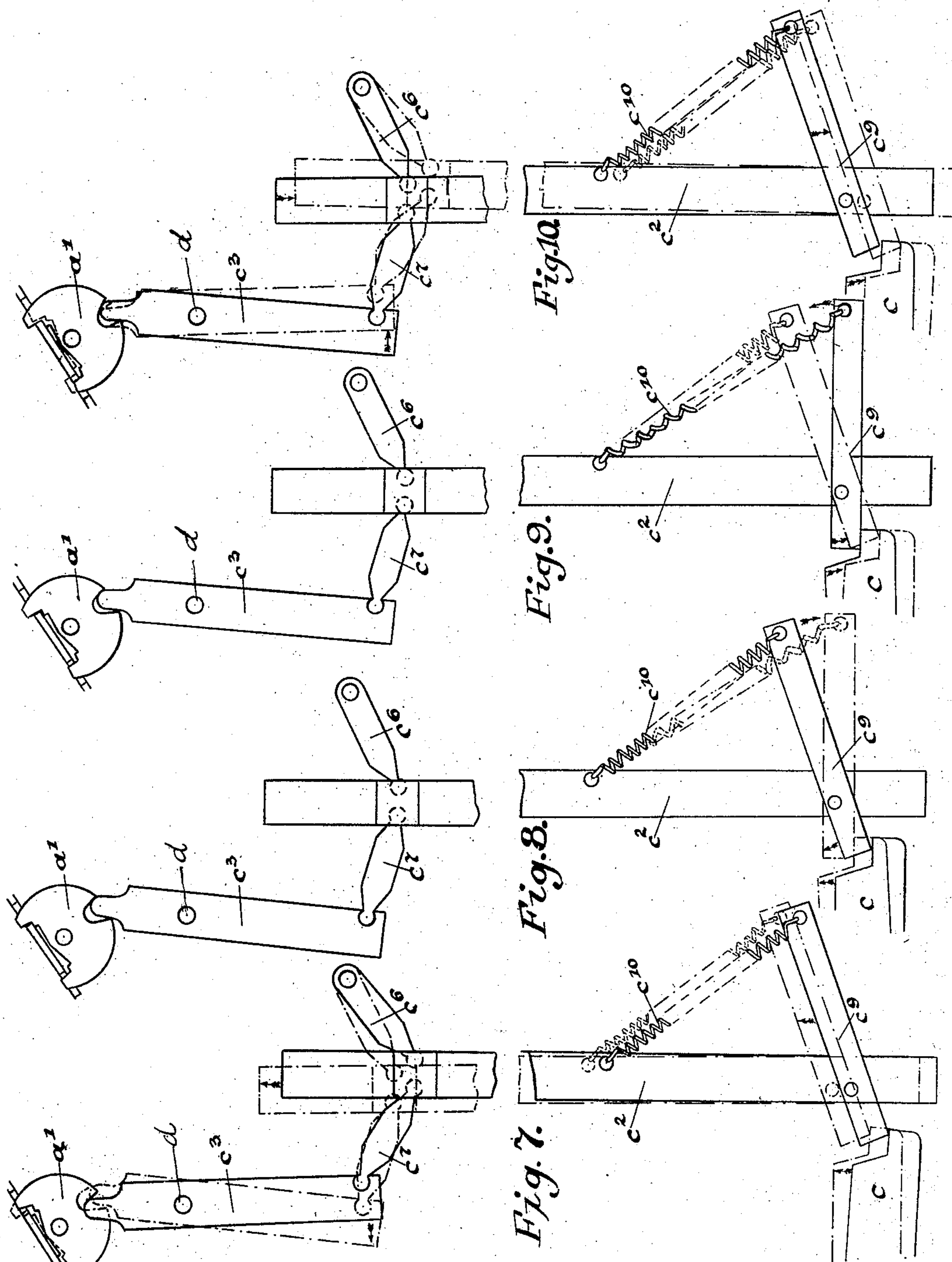
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6 SHEETS—SHEET 4.



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6 SHEETS—SHEET 5.

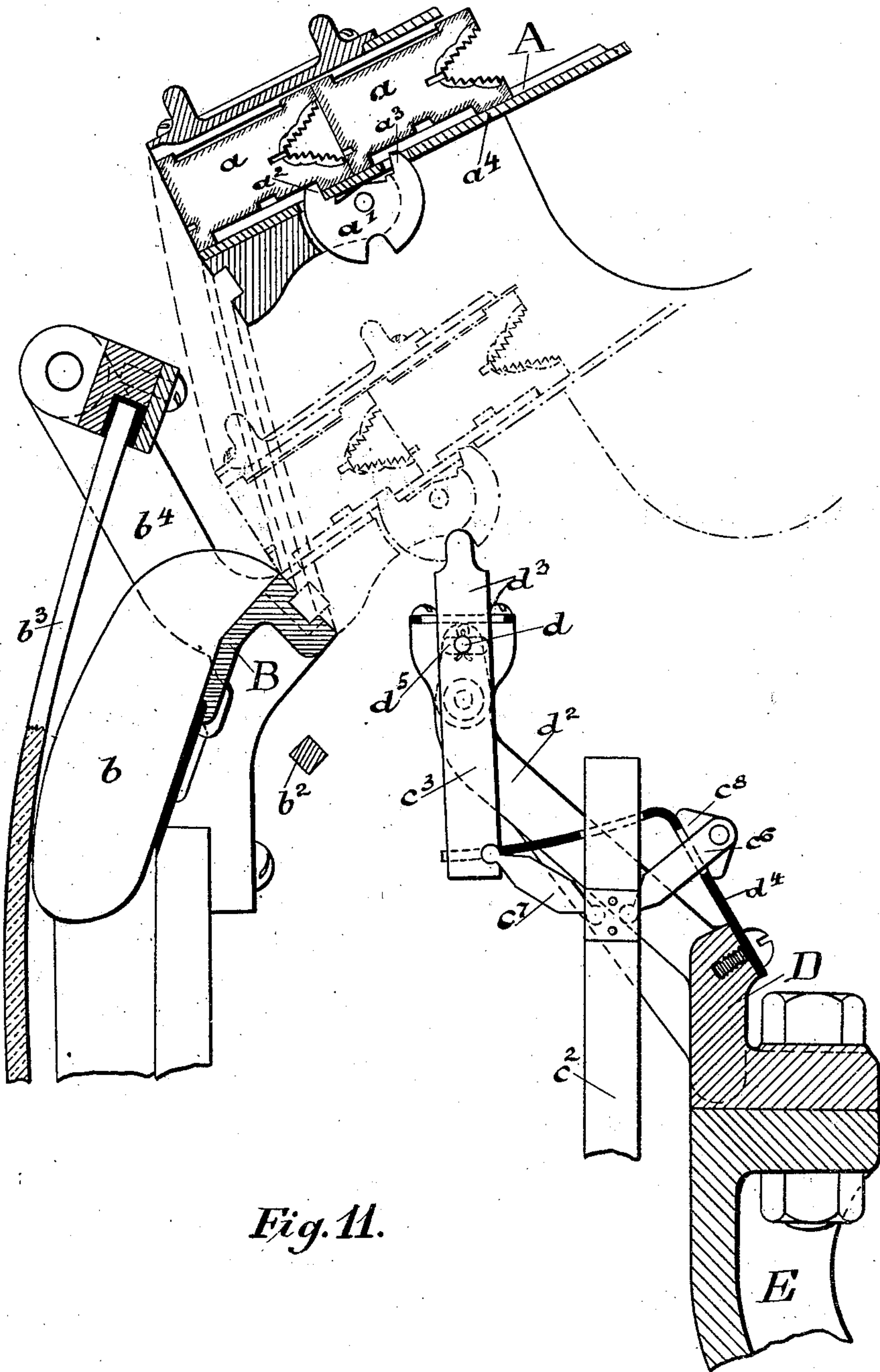


Fig. 11.

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6 SHEETS—SHEET 6.

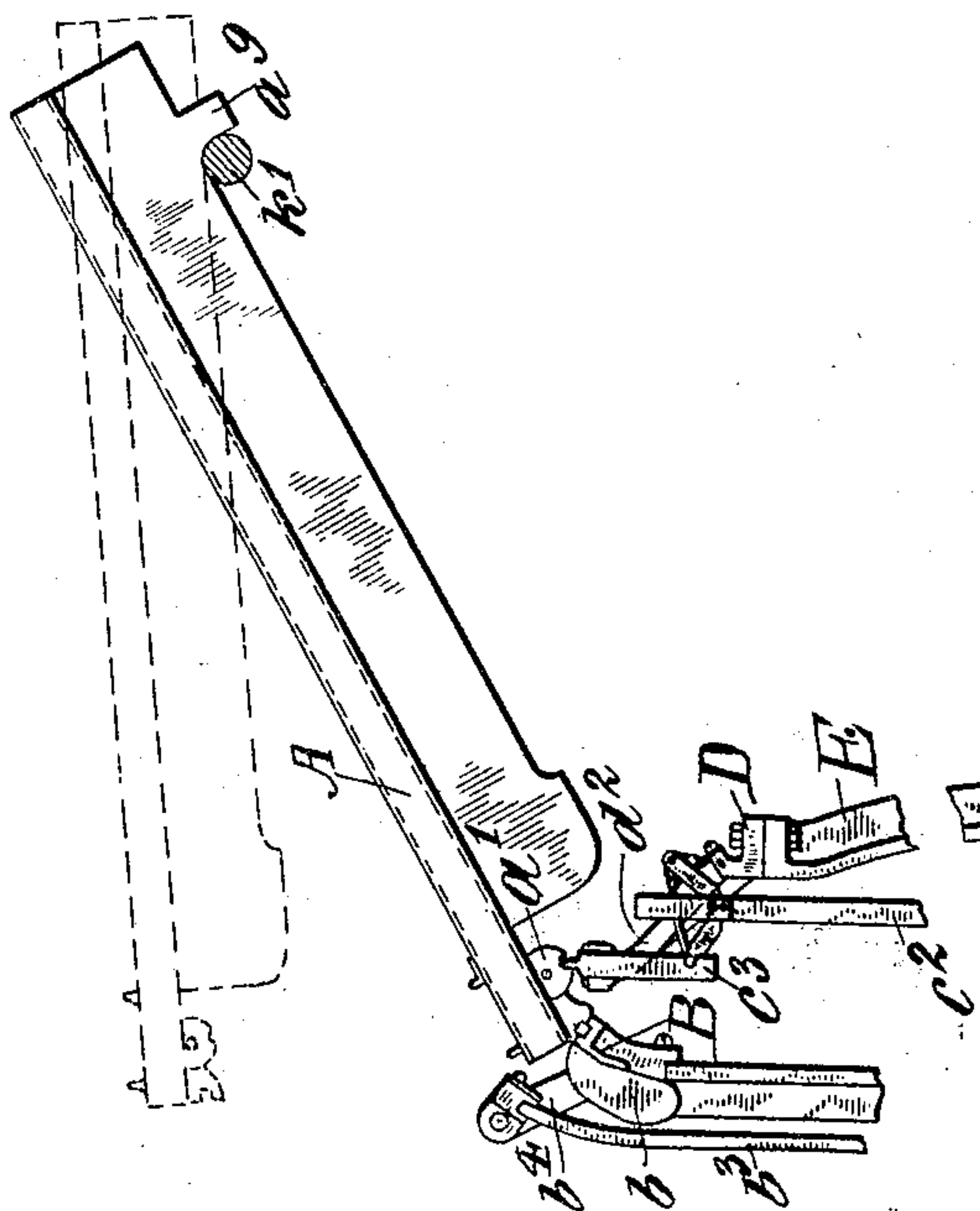


Fig. 12.

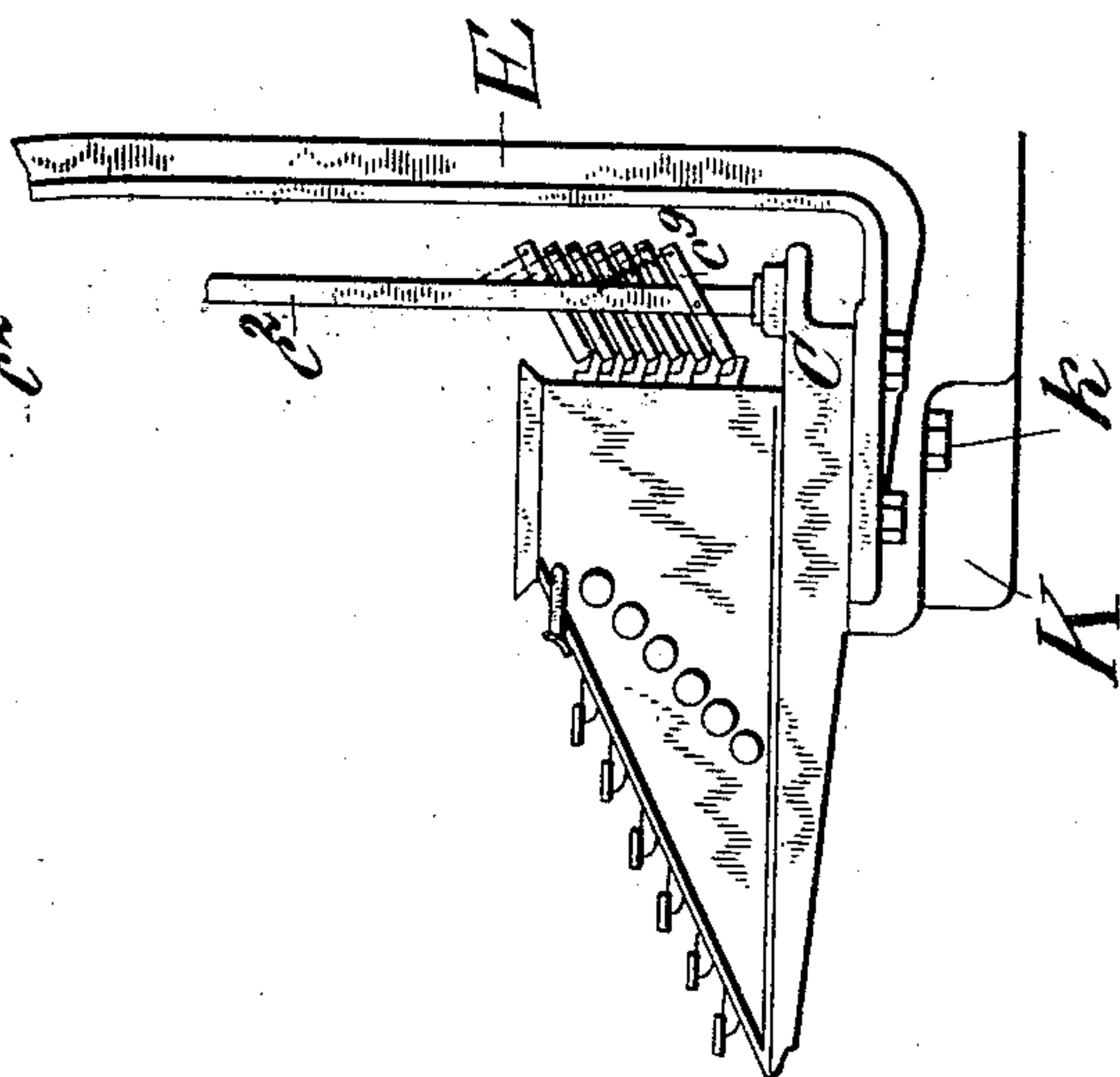
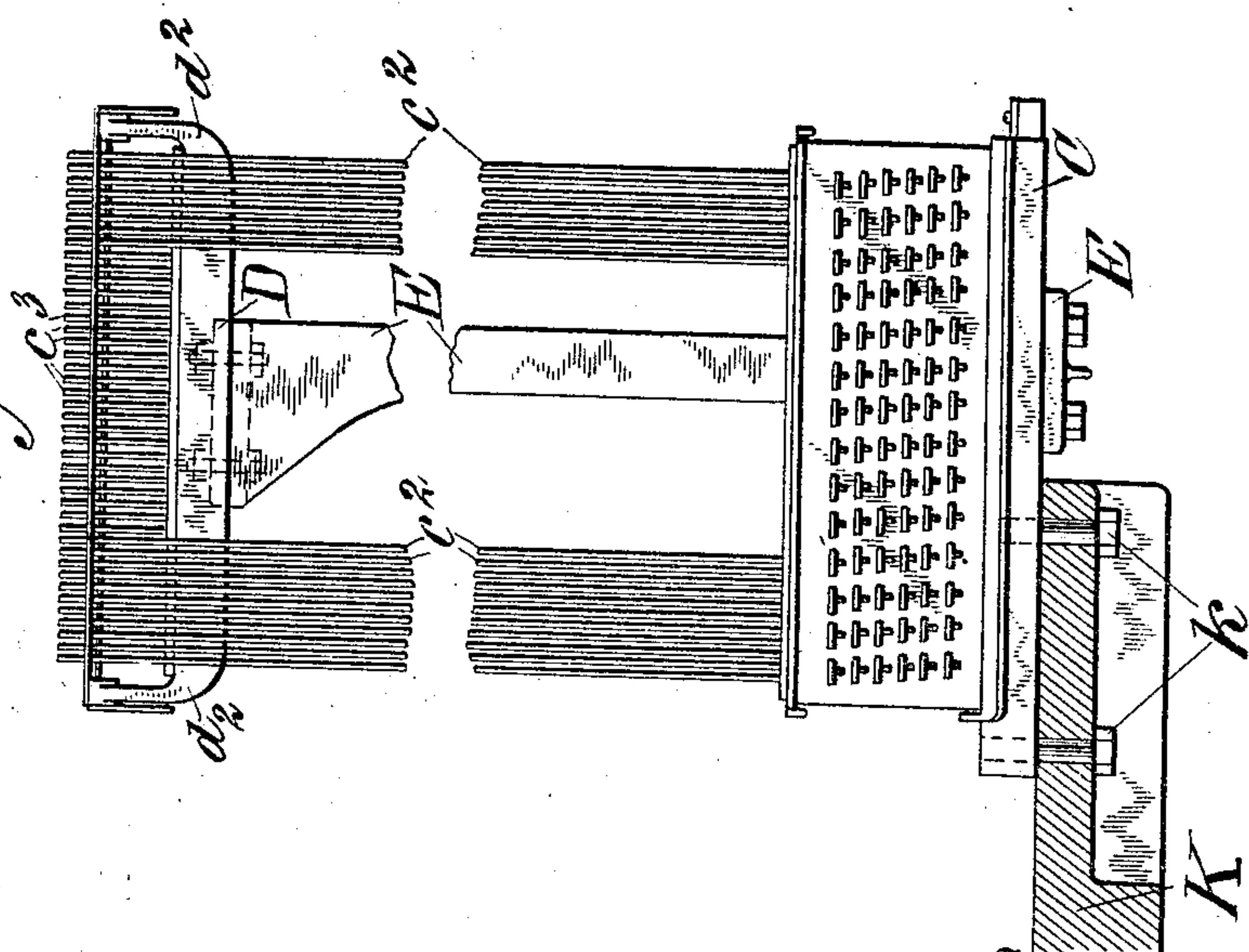


Fig. 13.



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UNITED STATES PATENT OFFICE.

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LINOTYPE-MACHINE.

No. 889,552.

Specification of Letters Patent.

Patented June 2, 1908.

Application filed September 13, 1905. Serial No. 278,239.

To all whom it may concern:

Be it known that I, WILLIAM HERMANN SCHARF, a subject of the King of Great Britain, residing in Montreal, Province of Quebec, Dominion of Canada, manager, have invented certain new and useful Improvements in Linotype-Machines, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

The general object of this invention is to simplify the construction of linotype machines with a view toward reducing the number of parts required, avoiding the necessity, where it is possible, of using such parts as are expensive to manufacture or assemble and thereby effecting a great saving in the construction of these machines; and furthermore, with a view toward making different members of the machine more conveniently separable and removable from the rest of the machine.

The present improvements have to do particularly with the composing mechanism. The matrix releasing mechanism which forms a part of the composing mechanism generally includes power supplying devices for actuating the same, the finger keys merely serving to place the mechanism under the control of the power supplying devices. For this purpose it has been customary to employ a continuously rotating drum to cooperate with cams corresponding with the different matrices, which cams were released by the keys so as to come in contact with the drum and be rotated thereby. The provision of all of the cams required for this purpose and of the continuously rotating drum and power connections therefor not only renders the assembly of the machine expensive and difficult in the first instance and the separation and removal of the key-board and adjacent parts from time to time inconvenient, but increases to a very great extent the cost of construction.

The objection to operating the matrix releasing mechanism directly from the key has not been due so much to a hard key action as to the difficulty of positively releasing the matrices when the keys are operated very quickly. By providing the cams and the continuously operating drum, it mattered not how quickly the keys were operated, since the regular and pre-determined interval of time taken up in the revolution of the cams always insured the positive release of the

matrices. In accordance with the present invention, means are provided to overcome this objection to the operation of the matrix releasing mechanism directly from the keys, and these means comprise devices to arrest momentarily the action of the escapements for the matrices. In this way the matrices are always released properly while the construction of the matrix releasing mechanism is thereby greatly simplified. Furthermore, new and improved escapements for the matrices are provided and the connections between the escapements and the escapement rods are such that they can be readily separated at any time, as when it is desired to renew the magazine for the purpose of replacing it by another containing matrices bearing characters of a different face. Moreover the escapement rods, key rods and their connections, guides and supports all form, with the key-board, a distinct compact and separable member which can be easily and quickly removed from the rest of the machine.

The invention will be more fully described hereinafter in connection with the accompanying drawings in which a convenient and practical embodiment of the same is illustrated and in which,

Figure 1 is a view in vertical section taken through the composing mechanism portion of a linotype machine, showing the matrices and matrix releasing mechanism in elevation. Fig. 2 is a view in side elevation of the upper part of the matrix releasing mechanism and showing particularly the mechanism for supporting the escapement rods. Figs. 3 and 4 are respectively a plan view and a view in front elevation of a portion of a guide plate for the key and escapement rods, showing the rods projecting therethrough. Figs. 5 and 6 are detail views, partly in elevation and partly in section, showing the different ways of connecting the key rods to the escapement rods or escapements. Figs. 7, 8, 9 and 10 are diagrammatic views of the releasing mechanism for a matrix illustrating the operation thereof by showing the successive positions which the parts assume during the releasing of a matrix. Fig. 11 is a detail view in elevation showing the forward, lower portion of the magazine swung up from the delivery mouth ready to be removed from the machine. Fig. 12 is a view in front elevation of the key-board and key-

rod system partly broken away to show the rear bracket, the portion of the machine to which it is connected being shown in section, and, Fig. 13 is a view of the same in side elevation, with a portion of the front of the machine shown in section, a magazine being shown in position and indicated as swung up from position.

The magazine A may be constructed in the usual manner to contain the matrices a , the lower end of the magazine being the only part thereof which is shown in the drawing. From this end of the magazine the matrices a are delivered between guiding pieces one of which is indicated at b , these guiding pieces being formed in or secured to a fixed casting B and leading to the assembling mechanism, (not shown) to which the matrices are delivered.

For each line of matrices in the magazine there corresponds, as usual, a key c pivotally mounted upon a suitable key-board C and the inner end of which preferably extends through a slotted guide c' . The matrix releasing mechanism has a plurality of vertical key-rods c^2 and a like number of escapement rods c^3 operated by the key rods and engaging the escapement pawls a' which release the matrices.

The escapement pawls a' are preferably made in one piece, as shown, being substantially a semi-disk and having two projections a^2 and a^3 , one on each side, which extend through the bottom plate a^4 of the magazine to engage the shoulders upon the matrices in the usual manner. These pawls are pivoted to oscillate in the bottom plate of the magazine and are actuated by the escapement rods c^3 which have a free connection therewith. Heretofore, the escapements have consisted of more than one part and the bottom plate of the magazine has generally included two or more castings in order to furnish bearings for the escapements. The provision of such bearings has been absolutely necessary in some forms of escapements and, therefore, the escapements themselves have not only been difficult and expensive to construct, but the bot-

tom plate of the magazine has had to be made in two or three parts and has thus been an item of considerable expense. In the present case by providing an escapement pawl with all parts integral, it has not been necessary to provide any bearings therefor other than its own pivot and consequently the bottom plate of the magazine does not have to be provided with bearing pieces and may accordingly be constructed of sheet brass throughout its entire length, suitable holes being punched therein to permit the projections upon the escapements to work through into the magazine. The connection between each escapement rod and its corresponding escapement pawl is such that

the magazine with the escapements secured thereto may be readily removed without first having to unfasten the connections between the escapement rods and escapement pawls. For this purpose each one of these connections comprises a projection and recess, the one on the rod and the other in the pawl, and the direction in which the escapement pawls are removed when the magazine is taken off the machine is the direction in which the projection extends.

The escapement rods c^3 are preferably mounted to oscillate on a bar d which is secured to arms d' pivoted upon brackets d^2 which are fastened upon or integral with a frame piece D.

Extending across the top of and screwed to the brackets d^2 is a slotted guide d^3 through which the escapement rods c^3 may extend and, by moving this guide d^3 toward one side or the other, the screw holes therein being elongated in order to permit this movement, the positions of the rods may be adjusted sidewise to the precise extent, with reference to the escapement pawls; as is desired. The lower ends of these rods also preferably extend through another guide plate d^4 screwed upon the frame piece D in such a way as to be adjustable sidewise as the guide plate d^3 just described. The bar d extends through slots d^5 in the brackets d^2 and clamps d^6 are provided for the arms d' , whereby said arms may be moved together with the bar d to further adjust the position of the escapement rods with respect to the escapement pawls. By means of these adjustments the variations in the location of the escapement pawls upon different magazines can be compensated for and the proper alinement between the escapement rods and the pawls can be maintained at all times.

The key rods c^2 are mounted for vertical motion in suitable guides c^4 and c^5 and their upper ends preferably extend through the guide plate d^4 , as shown. They may be adapted to impart an oscillating motion to the escapement rods c^3 in different ways but preferably, as shown in Fig. 1, by means of links c^6 and c^7 . The links c^6 are pivoted to brackets c^8 secured upon a fixed part such as the plate d^4 . The links c^7 are pivoted in the lower ends of the escapement rods. These links being normally at an angle to each other (Fig. 1), it is obvious that upon the reciprocating movement of a key rod, the oscillation of the corresponding escapement pawl will be effected through this connection. Of course, there are other ways in which the connections between the escapement rods and key-rods may be arranged. For purposes of illustration and explanation, two other arrangements are presented in this case. In Fig. 5 the link connections between the escapement rods and the key rods are above the fulcrums of the escapement rods, where-

as, in Fig. 1, they are below the fulcrums of the escapement rods. The adjustment of the escapement rods is effected in the construction shown in Fig. 5, by turning the
 5 slotted casting d^4 upon the bar d^7 , a set screw d^8 being provided to hold the casting in the desired position. In Fig. 6 the key rods are shown as directly connected to the escapement rods, while the adjusting mechanism is
 10 similar to that shown in Fig. 5.

In order to provide means for arresting momentarily the return movement of the escapement pawls to permit the matrices to be released properly and in the proper order
 15 while at the same time the release of the matrices is effected directly from the keys, a yielding connection is provided between each key and the corresponding key rod. In the present case each of the key rods is provided
 20 with a lever c^9 which is pivoted thereon near the lower end, a spring c^{10} connecting the longer arm of this lever with a point higher up on the rod, while the shorter arm of the lever is arranged in the path of the corresponding
 25 key, or may be otherwise operatively connected with the end of the key.

Before the key is depressed, the matrix releasing mechanism is in the position shown in Fig. 1 and in the full lines of Fig. 7. Upon
 30 the depression of the key, the mechanism is moved from the position shown in full lines in Fig. 7 to that shown in broken lines in said figure, thus releasing the forward matrix in the corresponding groove in the magazine,
 35 which matrix drops down into its channel b from the mouth of the magazine. With the matrix releasing mechanism now in the position shown in full lines in Fig. 8, further depression of the key by the operator will cause
 40 the movement of the lever c^9 upon its pivot in the rod c^2 and the extension of the spring c^{10} will occur, while both the rods c^2 and c^3 and the escapement pawl retain the same position. As soon as the operator releases the
 45 key, the spring immediately contracts to its normal length with the rods c^2 and c^3 and the escapement pawl still in their same positions. This, as will be obvious, will cause a momentary delay or dwell in the return movement
 50 of the pawl after the operator has released the key, this movement being shown in Fig. 9, and said movement being from the position indicated in solid lines to that indicated in broken lines. Finally the rods c^2 and c^3 and
 55 the escapement pawl return to their original positions, this movement being similarly indicated in Fig. 10.

The frame piece D is secured to a frame piece E which in turn is secured to the key-
 60 board C. It will be clear, therefore that the key rods and escapement rods, and their connections, guides and supports, form one complete member of the machine which may therefore be conveniently separated and re-
 65 moved therefrom in one piece when desired.

This complete member is illustrated particularly in Figs. 12 and 13. It is shown in these figures as secured to the machine by means of suitable fastenings, such as two
 70 screws k , a portion of the machine being indicated at K. It will also be clear from the nature of the free connection or engagement between the escapement pawls, which are pivoted to the magazine and the escapement
 75 rods, that the magazine may be freely lifted away from the rods and that the combined key-board and key rod system is also free of the magazine and may be removed without first unfastening connections to the pawls,
 80 just as conveniently.

The magazine is preferably secured to the magazine delivery mouth B of the machine by such means as to permit it to be readily detached and removed therefrom. For this
 85 purpose the magazine and the magazine delivery mouth may be provided with registering grooves in which a removable key b^2 may be inserted to lock the same together. In front of the magazine delivery mouth is a transparent face b^3 , the upper part of which
 90 is secured in a stationary bracket b^4 which is out of the range of movement of the magazine when it is swung up to be removed (Fig. 11).

The magazine itself, as shown in Fig. 13, 95 may be provided with a projection or flange or the like indicated at a^9 so that in placing the magazine in position all that is necessary to be done is to bring the magazine down upon the machine with the projection or
 100 flange k resting upon a fixed part such as a bar k^1 , (indicated in Fig. 13). As the projection or flange a^9 is preferably provided near the upper end of the magazine, the latter may, when it has been placed upon the
 105 bar k^1 , be swung around upon the same so that its forward end is brought down adjacent to the magazine delivery mouth.

It will be clear that many changes in the construction of the mechanism shown and
 110 described may be made without departing from the spirit of the invention and the improvements are not limited accordingly to the embodiment herein specifically referred to.

Having now particularly described and as-
 115 certain the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. In a linotype machine, the combination of the keys, the escapements, and an operative connection between each key and the corresponding escapement consisting of two members and means to preserve a fixed relation between said members until the matrix is released and to permit relative movement
 120 between said members after the matrix is released.

2. In a linotype machine, the combination of the keys, the escapements, and an operative connection between each key and its
 130

corresponding escapement consisting of a two-part key rod and means between the two parts of the key rod to hold said parts in a substantially fixed relation to each other as they move to release the matrix and to permit relative movement of the same after the release of the matrix.

3. In a linotype machine, the combination of the keys, the escapements, and an operative connection between each key and its corresponding escapement consisting of two members and a spring connecting said members to preserve a fixed relation between said members during the release of the matrix and then to permit the relative movement of said members.

4. In a linotype machine, the combination of the keys, the escapements, and an operative connection between each key and its corresponding escapement consisting of two members and a yielding connection between said members, said yielding connection being stiff enough to hold said members in a fixed relation to each other during the release of the matrix and then yielding to permit relative movement between said members.

5. In a linotype machine, the combination with a key, of mechanism for releasing a matrix, said mechanism including a spring interposed between two members thereof adapted to hold said members in a substantially fixed relation to each other during the release of the matrix.

6. In a linotype machine, the combination with escapement pawls for the matrices, of a two-part key rod for each escapement pawl, and a spring operatively connecting the two parts of each key rod and adapted to hold the two parts relatively fixed during the first movement of the key rod to release the matrix and then to yield during the further movement of the key rod to give the corresponding pawl a moment of dwell.

7. In a linotype machine, the combination with the escapement pawls for the matrices, of a key rod for each pawl, a key for each key rod, a member between each key rod and key to transmit the power from the key to the key rod, and a yielding connection between said member and key rod, said connection being adapted to hold said member and key rod in a substantially fixed relation to each other during the movement of the pawl to release the matrix and then to yield to permit said member to move with respect to the key rod to give the pawl a moment of dwell.

8. In a linotype machine, the combination with the keys and with escapement pawls for the matrices, of an actuating rod for each pawl, a key rod for each actuating rod, a le-

ver pivoted upon each key rod, and a spring for each actuating rod connecting one end of the corresponding lever with said rod, the other end of the lever being adapted to be engaged by the corresponding key.

9. In a linotype machine, the combination with the keys, and with oscillating escapement pawls for the matrices, of a pivoted actuating rod for each pawl, a key rod for each actuating rod, a link connection between each key rod and a fixed part of the machine, and a link connection between each key rod and the corresponding actuating rod.

10. In a linotype machine, the combination with the keys and oscillating pawls for the matrices, of a pivoted actuating rod for each pawl, a key rod for each actuating rod, a connection between each key rod and the corresponding actuating rod whereby the key rod may move the actuating rod on its pivot to actuate the corresponding pawl, and means to arrest momentarily the return movement of each pawl.

11. In a linotype machine, the combination with the keys and with escapement pawls for the matrices, of actuating rods pivoted to oscillate and formed with projections to engage the pawls, said pawls being removable from the machine and being mounted so that the direction of their removal as they are disengaged from the projections is substantially the direction in which the projections extend so that the separation of the pawls and rods does not require the unfastening of any connections between them.

12. In a linotype machine, the combination with the keys and with escapement pawls for the matrices, of actuating rods freely engaging the pawls, a bar upon which said rods are pivoted, arms movable upon a fixed part of the frame upon which the bar is secured, means to clamp said arms in the desired position, and operative connections between the rods and keys.

13. In a linotype machine, the combination with the keys and with escapement pawls for the matrices, of actuating rods engaging the pawls, a slotted plate to guide the rods and longitudinally adjustable upon a fixed part of the machine to aline said rods with the pawls, and operative connections between the rods and keys.

This specification signed and witnessed this 8th day of Sept., A. D., 1905.

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