

No. 685,987.

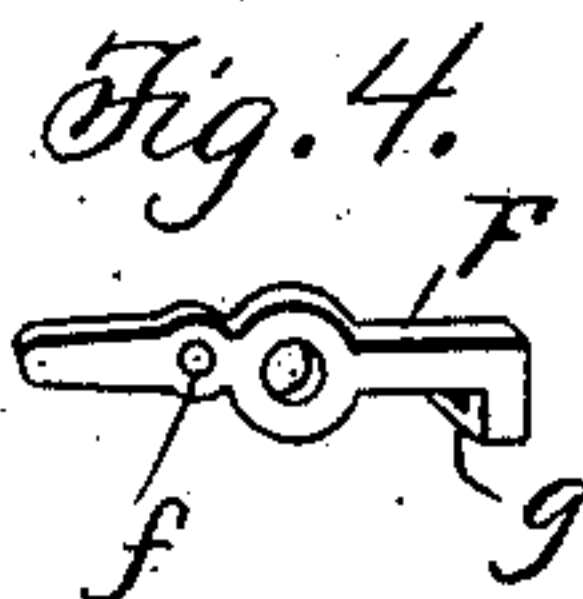
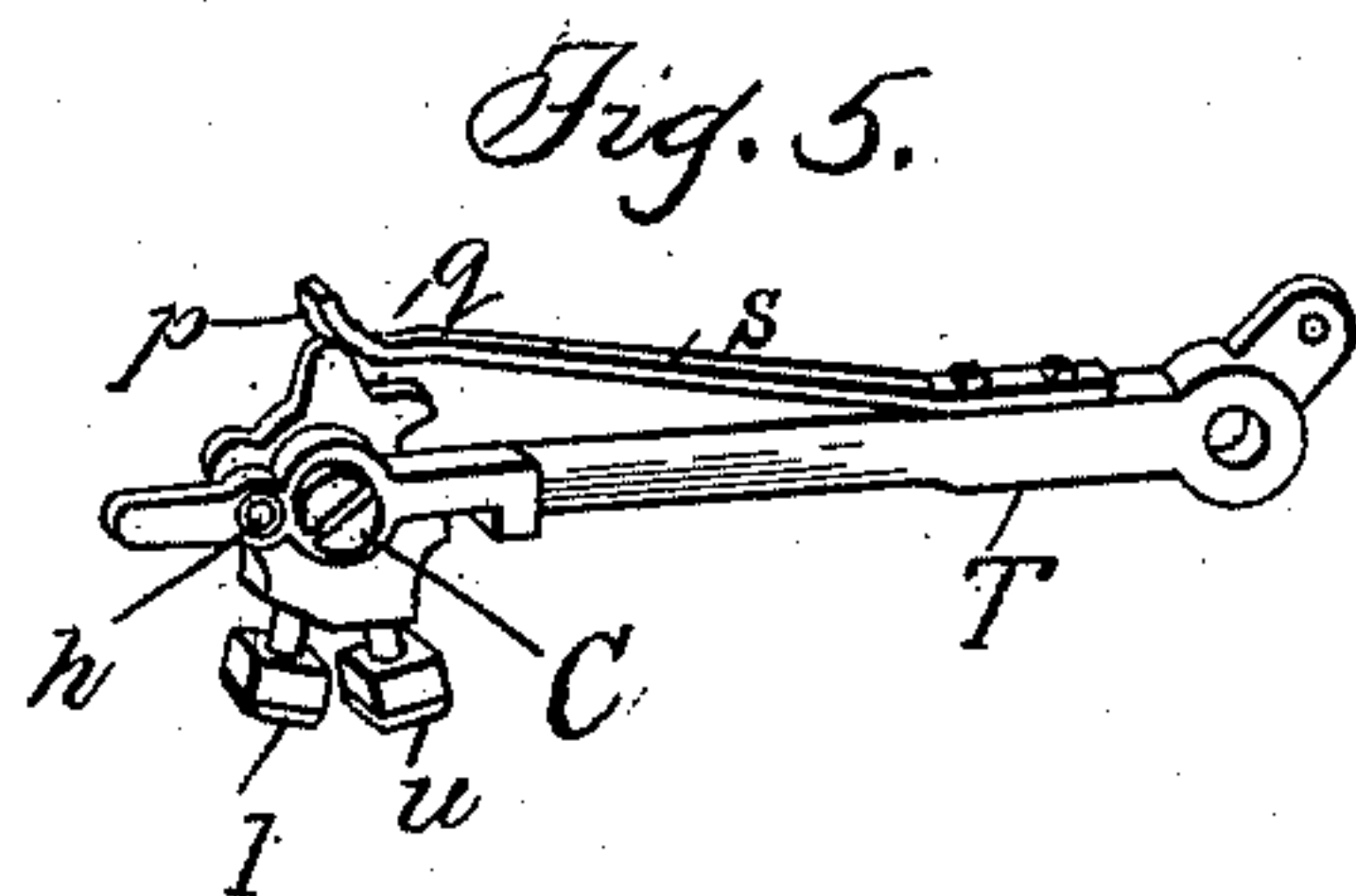
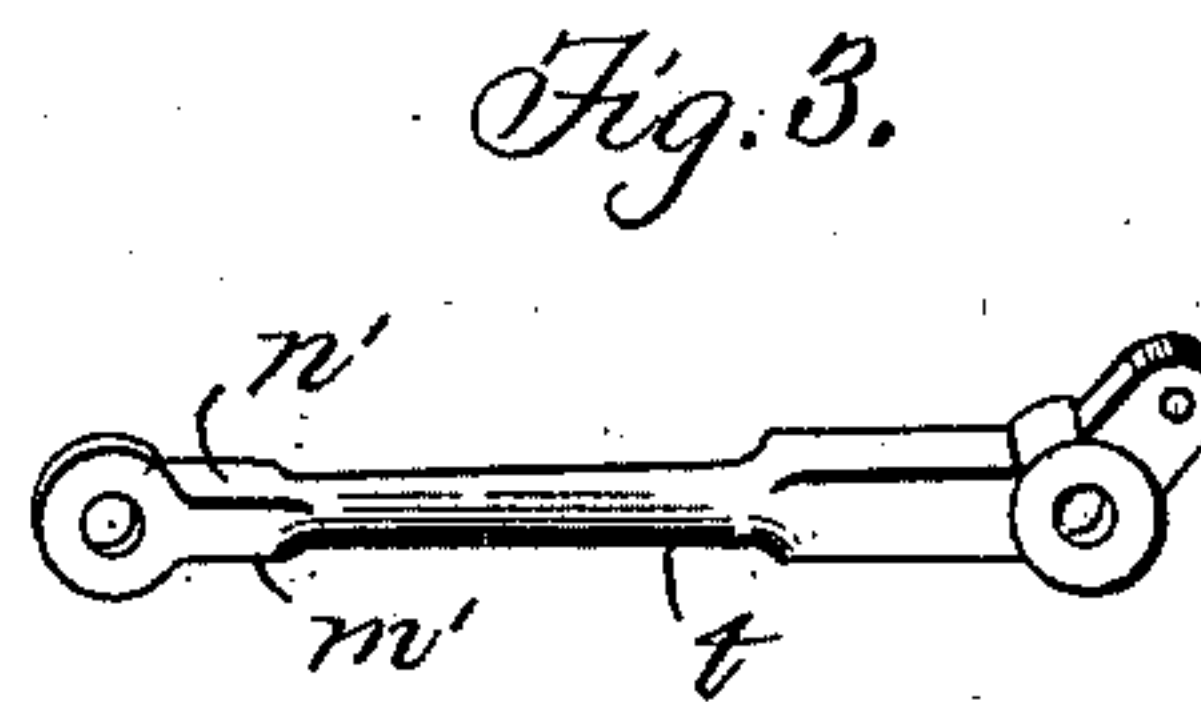
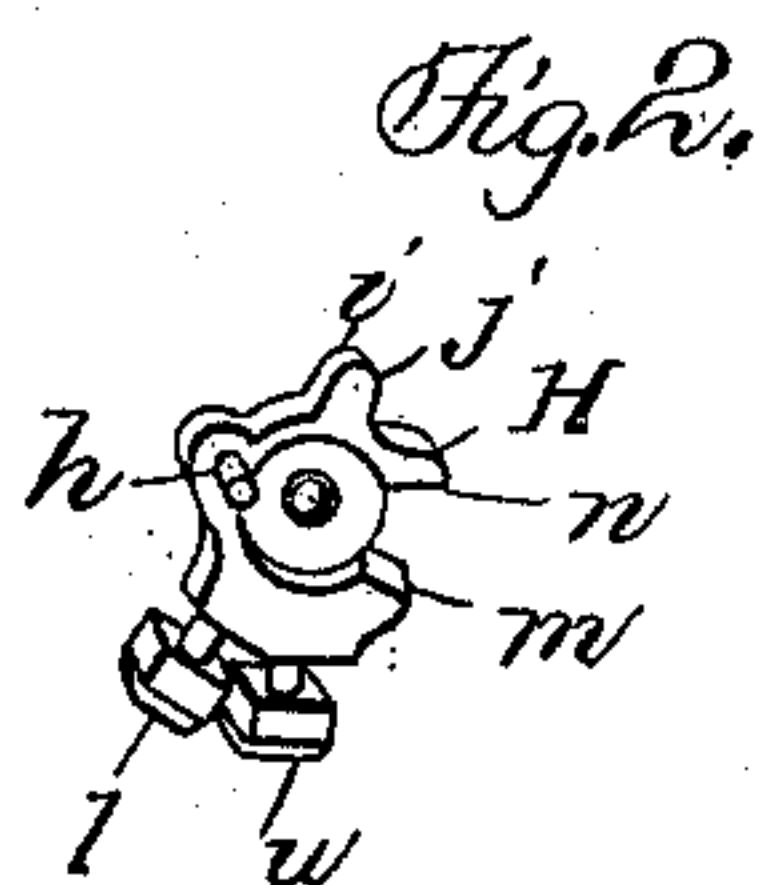
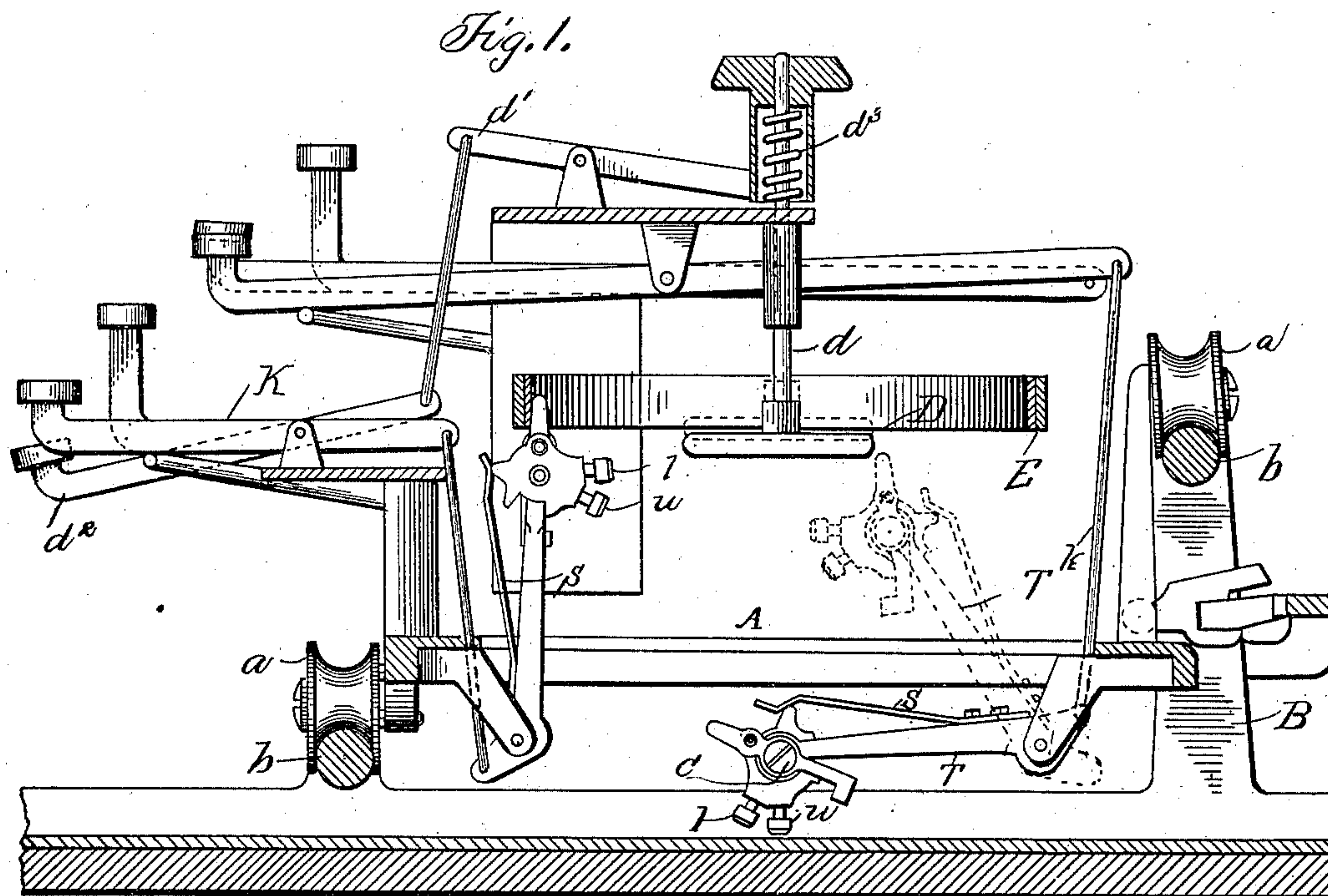
Patented Nov. 5, 1901.

F. W. HILLARD.
TYPE WRITING MACHINE.

(Application filed Aug. 4, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

Fig. 6.

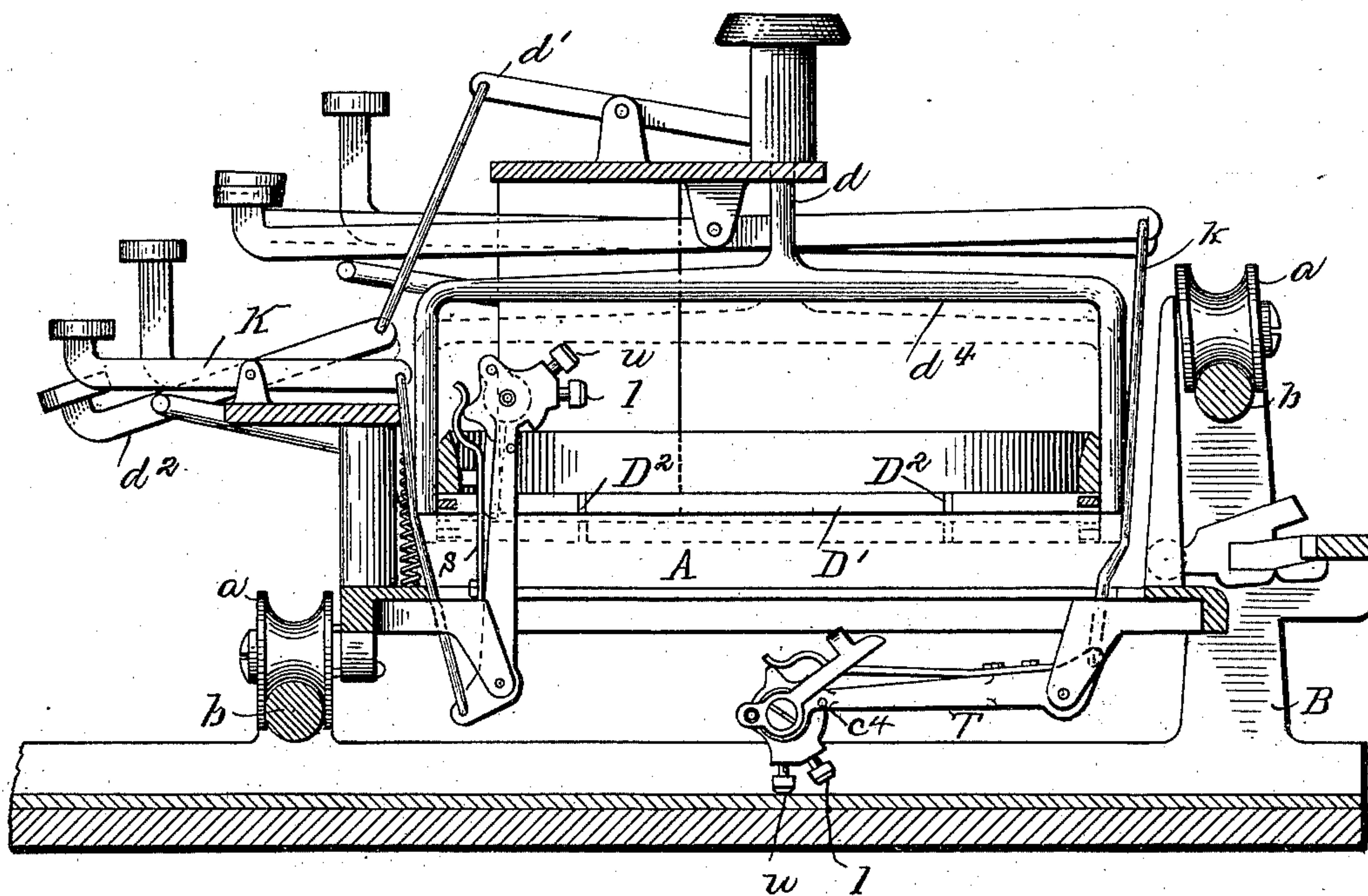
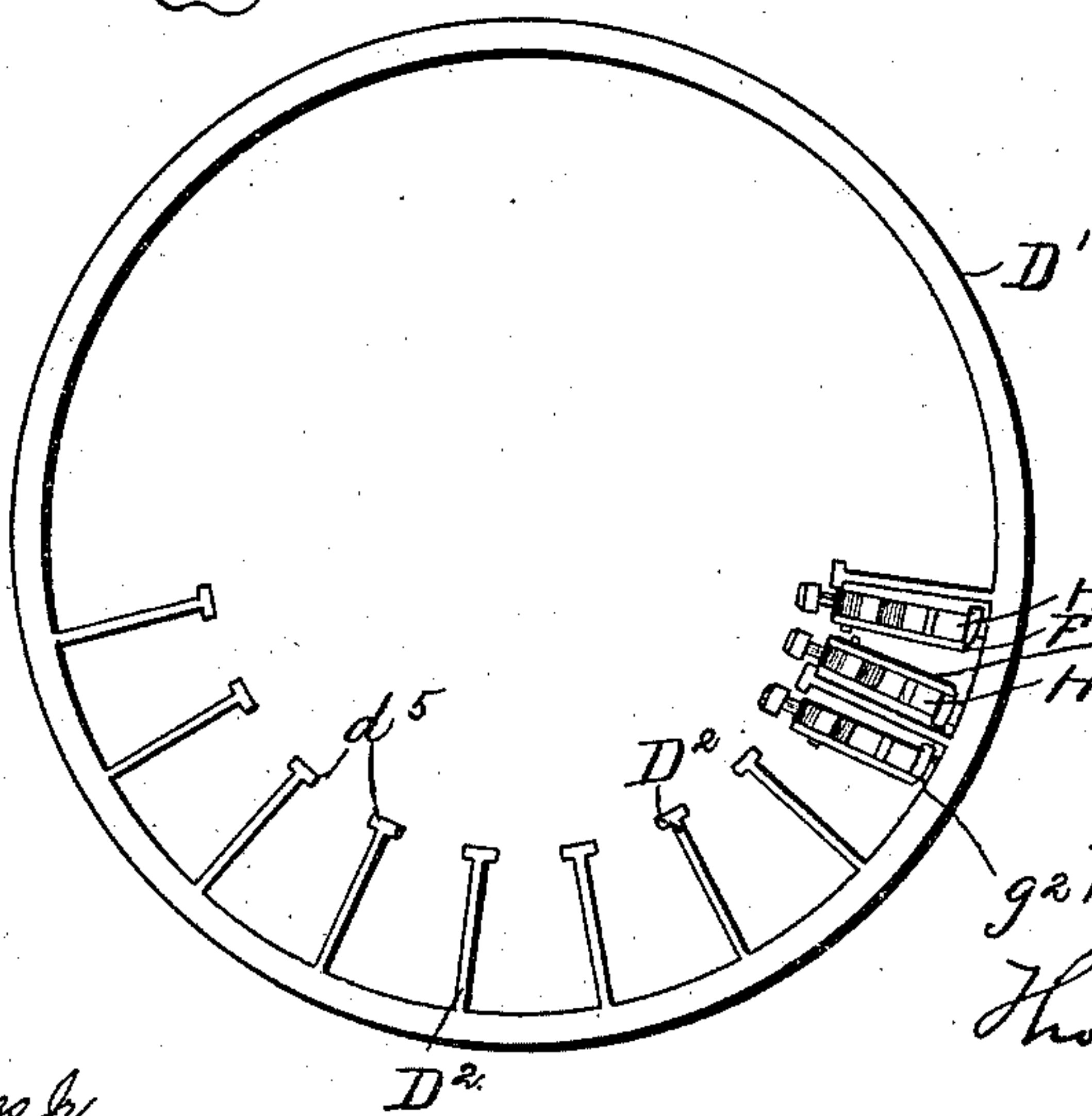
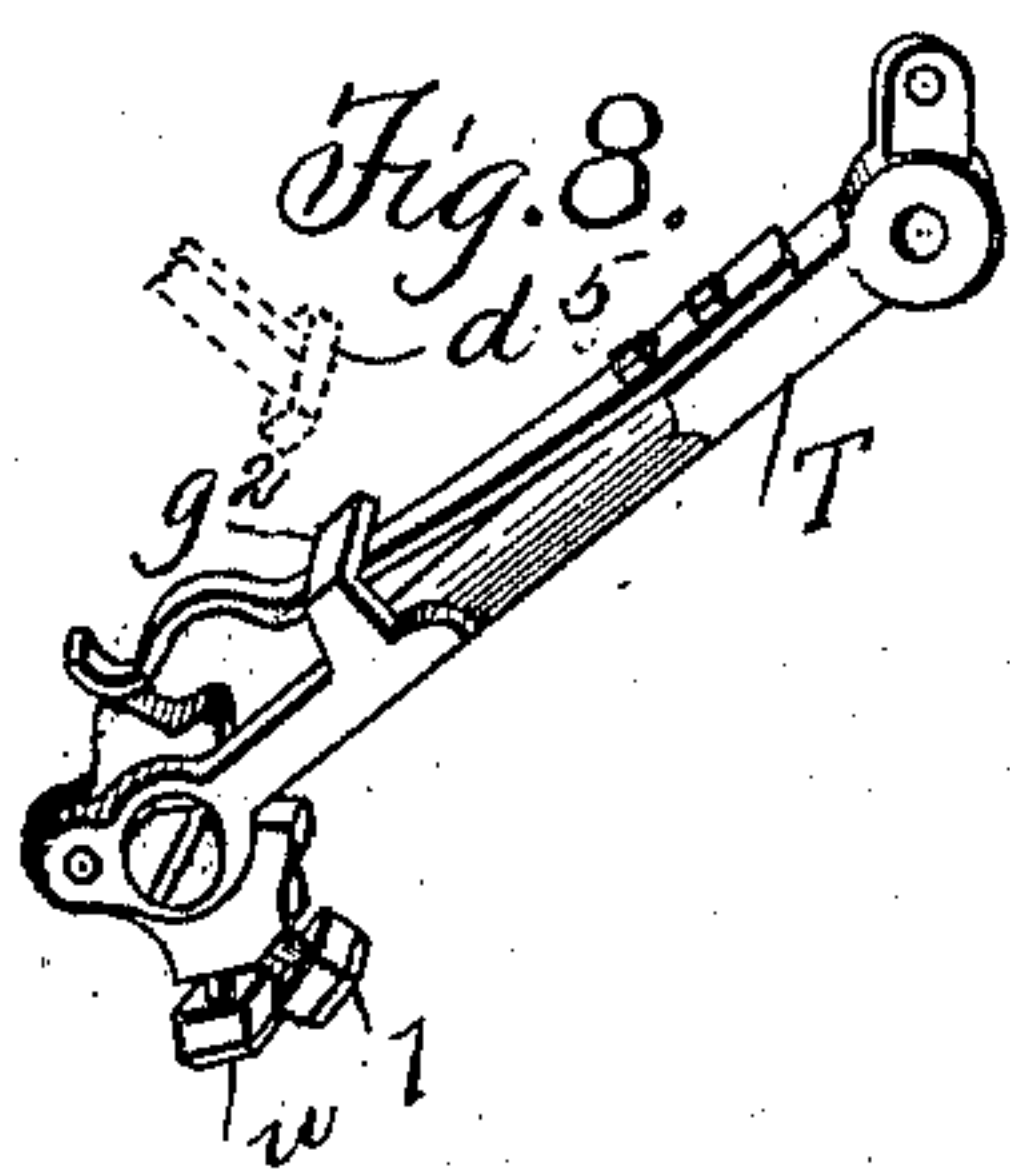


Fig. 9. ^{g²}
Fig. 7. ^{g'}
F'



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UNITED STATES PATENT OFFICE.

FREDERIC W. HILLARD, OF TOTTENVILLE, NEW YORK, ASSIGNOR TO THE ELLIOTT & HATCH BOOK TYPEWRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 685,987, dated November 5, 1901.

Original application filed May 25, 1897. Serial No. 638,007. Renewed July 31, 1900. Serial No. 25,454. Divided and this application filed August 4, 1900. Serial No. 25,928. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC W. HILLARD, a resident of Tottenville, in the county of Richmond and city and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This application, which is a division of my former application, filed in the United States Patent Office on the 25th day of May, 1897, and serially numbered 638,007, allowed September 3, 1898, and renewed July 31, 1900, as Serial No. 25,454, relates to certain improvements in type-shifting mechanism for printing any one of a plurality of characters carried on the same type-bar. The type are mounted on a head pivoted on the end of a type-bar, and the several type are brought into position by swinging the head upon the bar, this arrangement of type being especially applicable to machines adapted to write on flat surfaces—such, for instance, as machines now known in the art as “book type-writers.”

The several novel features which I claim in this application will be hereinafter more fully described and claimed.

Referring to the accompanying drawings, in which like parts are designated by similar marks of reference, Figure 1 is a transverse vertical section of a type-writing machine, showing so much thereof as is necessary to illustrate my present invention, the section being taken from front to rear. Fig. 2 is a perspective view of a type-head. Fig. 3 is a perspective view of a type-bar. Fig. 4 is a perspective view of the tripping member. Fig. 5 is a perspective view of a type-bar and the parts carried thereon constructed in accordance with my present invention. Fig. 6 is a view similar to Fig. 1, but showing another form of type-shifting mechanism. Fig. 7 is a detail plan view of the bracket-basket of a machine such as that shown in Fig. 6. Fig. 8 is a perspective view of the type-bar used in the machine shown in Fig. 6 with the parts carried thereon and showing in dotted lines the tripping-bracket. Fig. 9 is the tripping member.

Referring to Figs. 1 and 6, the carriage A

rides on a frame B, which rests upon the book or sheet to be printed. The frame is provided with guide-rails *b*, and the carriage has rollers *a*, which run upon these rails, so that the carriage may be shifted across the paper to provide for letter-spacing. The type-bars T are pivoted around a circular opening in the base of the carriage and are operated through connecting-rods *k* by keys K in the usual way, the type-bars in their normal position being substantially vertical over their pivots. No claim is here made to novelty in the construction of these parts.

Each type-bar T has pivoted on its end a type-head H, provided with two or more type *u l*—as, for example, the upper and lower case representations of the same letter. Only two type on a type-head are shown, as it is ordinarily not convenient to have more than two printing positions. The type-head is movably mounted on the end of the type-bar, so that it can be rocked from one printing position to another printing position. The type-bar is broadened and flattened at the end to afford a suitable mounting for the type-head. The type-head is flat, and the type project therefrom, being substantially radial to its pivotal point. A screw C joins the type-head and type-bar. Its shank passes through the tripping member F of the type-head and the flat end of the type-bar, and its threaded end is screwed into the type-head. The type-head has a certain range of movement about the axis of the screw by which it is attached to the head of the type-bar. This range of movement is limited by two banking-faces *m n*, which engage the banking-stops *m' n'* on the front and rear of the shank *t* of the type-bar T when the type-head is moved the desired distance to bring one or the other of the two type thereon into proper position for printing. On the edge of the type-head are two inclined surfaces *i j*, which meet and form an apex. A flat spring S is attached to the type-bar and extends along its length. At the end of the spring are two inclined surfaces *p q*, meeting at an apex. This apex and the apex on the type-head are so posi-

tioned relatively to each other that the latter will pass the former when the type-head is shifted from one printing position to the other. Whenever the type-head is moved far enough either way to bring the apex between *i* and *j* past the apex formed at the end of the spring, the pressure of the spring will be transferred from one of the inclined surfaces on the type-head to the other and the type-head will be forced around the balance of the distance until one of the banking-faces on the type-head engages with the corresponding banking-stop on the shank of the type-bar, the type-head being held in its shifted position by the spring S until moved to another position.

Referring now to Figs. 1 to 5, the type-head is provided with a tripping member F, which, as before stated, is pivoted on the screw C. There is an aperture *f* therein to receive a pin *h*, projecting from the side of the type-head, whereby the said parts are caused to move together and which at the same time permits them to be readily disconnected. The tripping member has two oppositely-extending arms, the upper arm projecting beyond the end of the type-bar and type-head mounted thereon and the lower arm projecting downwardly along the side of the shank *t* of type-bar and provided at its lower end with a finger contacting with the front face of the shank, thus limiting the movement of the tripping member in one direction.

The type-head and its tripping member are shifted from one printing position to the other by means of a tripper, consisting of two parts D and E, the part D consisting of a disk carried on the lower end of a rod *d*, vertically movable to the frame B concentric with and above the pivotal points of the type-bars. The rod and disk may be depressed by means of a lever *d'* and shift *d''*. The said disk is normally held by the spring *d'''* out of the path of the type-bars and type-heads and tripping members carried thereon, but is depressed by the shift-key *d''* to bring it into the path of the tripping member upon the type-bars. The tripper part E consists of a basket or buffer-ring concentric with the ring in which the type-bars are hung and so located as to be directly behind the upper ends of the type-heads and tripping members F thereon when the type-bars are in their normal position.

The action of the tripper in shifting the type-head will now be described.

In the ordinary operation of the machine in printing lower-case characters the disk D will be in the position shown in the dotted lines in Fig. 1, in which it is out of the path of the tripping members on the type-bars. As the type-heads are normally in the position shown upon the front type-bar in Fig. 1, a type-head moving from its normal position in the basket to the printing-point will not be shifted, and thus a lower-case character will be printed. If, however, the shift-key be depressed prior to or simultaneous with

the depression of a type-key, the disk D will be brought into the path of the tripping member upon the type-head upon the descending type-bar and the upper end of the tripping member will contact with the edge of the disk, being thrown rearwardly on the pivot-screw C and through its attachment by the pin *h* and perforation *f* to the type-head throwing the latter rearwardly on its pivot to a position (see rear type-bar in Fig. 1) to print an upper-case character when brought against the paper. This movement of the tripping member by the disk throws the former into such position that it clears the edge of the latter, as shown in dotted lines at the rear of Fig. 1, and thus if the disk be held depressed during the return of the type-bar to normal position the tripping member will clear the disk and will when the type-bar is completing its return movement contact with the buffer-ring E, whereby its upper end will be thrown forwardly in respect to the type-bar and in a direction opposite to that in which it was tripped by the disk D, thus returning the type-head to the position shown on the front type-bar of Fig. 1, which corresponds to lower-case printing.

It will be noted that by the construction above specified the type-heads when the type-bars are in their normal position are similarly disposed thereon and that if the tripping member D is not depressed the type-bars may move to the printing-point and return without causing relative movement of the type-heads carried thereon, and for the purpose of avoiding unnecessary wear and strain in tripping the type-heads the normal position of the type-heads upon the type-bars should correspond to that series of characters thereon which are the most often used—i. e., the lower-case characters. By so disposing the type a type-head is only shifted when it is desired to use an upper-case character, and in such event the type-head is shifted from its normal position on the printing stroke of its type-bar by the disk member D and is re-shifted to its normal position by the basket member E during or upon the completion of the return movement of the type-bar.

To insure the return of the type-head to normal position by the basket member, it is desirable to bring the type-bars back to their normal position with a spring and to cause the basket to act as a stop for such return movement of the type-bars. The finger *g* upon the tripping member F by contacting with the shank of the bar takes the blow and strain caused by the pressure of the tripping member against the basket, all of which would otherwise be transferred through the banking faces and stops *m* and *m'*. As the banking-stops define the position of the type-head in printing, it will be obvious that it is of importance to prevent wear thereof, which would impair the alinement, &c. Thus in addition to the faces and stops for defining the position of the type-head I have additional faces

and stops in the form of the finger g and the bar against which it abuts for taking up the jar produced on tripping the head.

In order to provide for a slight motion of the type-head and tripping member in relation to each other, I form the aperture f of slightly-greater diameter than the diameter of the pin h , which engages therein, whereby a motion of the tripping member is permitted after the faces and banking-stops m and m' or n and n' on the type-bar and type-head have been brought into contact, thus relieving the stops of any strain that might be occasioned by a movement of the tripping member after the type-head had been fully thrown from one printing position to another.

In Figs. 6 to 9 I have shown a somewhat different arrangement of the parts. In these figures a ring D' is located below and concentric with the buffer and around the type-bars when they are in their normal position, the ring being mounted for vertical movement and hung by the bail d^4 from the rod d , by which it may be raised and lowered. The disk D of Fig. 1 is dispensed with, and a series of inwardly-projecting brackets D^2 , with hooks d^5 on each side of their inner ends, are supported from the ring D' , each bracket projecting between the shanks of two adjacent type-bars and being when the ring is in its lowered position out of the path of the tripping members upon the type-bars. The adjacent type-bars are made right and left to permit the engagement of the tripping members thereon by the hooked ends d^5 of the intermediate bracket—that is to say, the tripping member F' of one bar is located to the right thereof and the tripping member of an adjacent bar on the left thereof, the type-bars being thus arranged in groups of two, as shown in Fig. 7. The tripping member F' has no upper extension, but instead has an ear g' upon the rear side of its lower end, the ear projecting rearwardly to behind the spring S upon the type-bar, where it is bent across behind the bar in the form of a finger g^2 . In the normal position of the parts the ear g' contacts with the basket-ring and the type is in its normal position, which is the position of the type-head upon the bar at the front of the machine in Fig. 6, that position corresponding to lower-case printing. If the shift-key d^2 is not actuated, the type-heads upon the several bars may be moved to and from the printing-point without shifting the type-head; but should the shift-key be depressed the bracket-ring will be raised, bringing the hooked ends of the brackets D^2 into position to engage the fingers g^2 on the type-bars as the latter move to printing position, and thus throw the type-head to the position shown upon the rear bar of Fig. 6. During the return of the type-bar to normal position the finger g' contacts with the buffer-basket and throws the type-head back to normal position, the tripping member F' being forced against the banking-pin c^4 on the shank of the type-

bar, which pin thus serves to take up the shock. It will be noted that the points of contact between the tripping member and the tripper are reversed in Fig. 6 from the position shown in Fig. 1, in the former the point of contact being above the pivot and in the latter below it. To provide for the printing of the more-used characters in the normal position of the type-head, it is therefore necessary to reverse the arrangement of the upper and lower case characters thereon; but it will be noted that the same general arrangement is preserved in both constructions—that is to say, the lower-case character is located between the upper-case character and the point moving where the contact occurs by which the type-head is thrown.

It will be noted that my tripping mechanism in each of the forms of invention herein shown comprises a movable member for shifting the type-head from one printing position to another printing position during the printing stroke of a type-bar, such part being the disk (shown in Fig. 1) or the bracket-ring D' , (shown in Fig. 6,) and a part for reshifting the type-head during the return of the type-bar to normal position, this part being the basket-ring. In the embodiment of my invention shown this basket-ring is fixed in the frame of the machine; but this is not necessary, it only being requisite that at all times it be in a position to reshift the type-head during the return stroke of the type-bar, and thus I term the tripper formed by the basket-ring a "fixed buffer" to distinguish it from a part which moves into and out of position for shifting the type-head. In a similar manner I have shown the tripper as being a separate and independent piece from the type-head; but as it partakes of the general movement of the type-head in both directions it is obvious that it may be regarded as a part of the type-head.

It will be noted that the type-head is shifted from its normal position upon the printing stroke of a key and is reshifted to its normal position during the return of the type-bar to normal position, and I will in the claims use the term "shifted" and "reshifted" as designating this movement of the type-head from and to normal position.

In the renewal of my original application above named, which application is held in the United States Patent Office in view of a probable interference, I have shown and described a type-writing machine in which the type-bar carries a pivoted type-head, having the banking-stops and the controlling-spring for positioning the type-head, all as herein shown, together with a tripping member pivoted on the type-bar and connected by a loose connection with the type-head to shift it and reshift it with a limited relative movement between the said parts, means contacting with the tripping member to shift and reshift it on the type-bar during the printing and return stroke of the type-bar, the trip-

ping member having a banking-stop contacting with the type-bar and limiting its movement, and a series of brackets between the type-bars, each provided with projecting parts for tripping the type-heads of the adjoining type-bars, and I do not, therefore, in this application make any claim thereon, as such matter is claimed in my said renewal application, Serial No. 25,454, of which application this is a division; but

What I here claim is—

1. In a type-writer, the combination of a movable type-bar, a type-head pivotally mounted thereon and provided with a plurality of type, a tripper movable into and from the path of the type-head which, when in the path thereof, shifts the type-head on the type-bar during a printing stroke of the type-bar, and a fixed buffer for reshifting the type-head on the type-bar during the return of the type-bar to normal position, substantially as described.

2. In a type-writer, the combination of a movable type-bar, a type-head pivotally mounted thereon and provided with a plurality of type, a tripper movable into the path of the type-head to shift the type-head on the type-bar during the printing stroke of the type-bar, and a fixed buffer for reshifting the type-head during the return of the type-bar to normal position, and limiting the return movement of the type-bar, substantially as described.

3. In a type-writer, the combination of a movable type-bar, a type-head pivotally mounted thereon, a tripping member mounted upon the type-bar and engaging with and moving the type-head to shift it in opposite directions, the tripping member and type-head being free for limited relative movement, a tripper movable into and from the path of the tripping member to shift the type-head on the type-bar during a printing stroke of the type-bar, and a fixed buffer for contacting with the tripping member to reshift the type-head on the type-bar during the return of the type-bar to normal position, substantially as described.

4. In a type-writer, the combination of a movable type-bar, a type-head pivotally mounted thereon and provided with a plurality of type, a tripping member mounted upon the type-bar and connected with the type-head to shift it in both directions, the type-head and tripping member having a slight relative movement, a banking-face on the tripping member a banking-face on the type-head and a tripper movable into and from the path of the tripping member to shift the type-head on the type-bar during a printing stroke of the type-bar, and a fixed buffer for contacting with the tripping member to reshift the type-head on the type-bar during the return of the type-bar to normal position, substantially as described.

5. In a type-writer, the combination of a movable type-bar, a type-head pivotally

mounted thereon and provided with a plurality of type, a tripping member mounted on the type-bar and connected with the type-head to shift it in two directions, the type-head and tripping member being free for a limited relative movement, a tripper movable from and into the path of the tripping member to shift the type-head on the type-bar, and a fixed buffer for contacting with the tripping member to reshift the type-head on the type-bar during the return of the type-bar to normal position, and limiting the return movement of the type-bar, a banking-face upon the tripping member, engaging the type-bar to limit the movement of the tripping member by the fixed buffer, and banking-faces between the type-head and type-bar, substantially as described.

6. In a type-writer, the combination of a movable type-bar, a type-head pivotally mounted thereon and provided with a plurality of type, a tripping member mounted on the type-bar and connected with the type-head to shift it during the return movement of the type-bar from the printing position, the type-head and tripping member being free for limited relative movement, means contacting with the tripping member to shift and reshift it on the type-bar during the printing and returning stroke of the type-bar, a banking-face between the tripping member and type-bar and a banking-face between the type-head and type-bar, substantially as described.

7. In a type-writing machine, the combination of a type-bar, a type-head on the type-bar, and a tripping member on the type-bar connected with the type-head to shift the type-head in two directions, the type-head and tripping member being free for limited relative movement, and the tripping member having a banking-face contacting with the type-bar and limiting its movement, substantially as described.

8. In a type-writing machine, the combination of a type-bar, a type-head pivoted thereon, a tripping member pivoted on said bar to move the type-head in one direction and means for imparting said movement to the tripping member during the return of the type-bar from the printing position.

9. In a type-writing machine, the combination of a type-bar, a type-head pivoted thereon, a tripping member pivoted on said bar to move the type-head in one direction, and a fixed buffer contacting with said tripping member for imparting said movement thereto during the return of the type-bar from the printing position.

10. In a type-writing machine, the combination of a type-bar, a type-head pivoted thereon, a tripping member pivoted on said bar to move the type-head in one direction, means for imparting said movement to the tripping member during the return of the type-bar from the printing position, and a buffer to limit the return movement of the type-bar,

said buffer being arranged to contact with the tripping member and said member banking against the bar to relieve the type-head from the shock of the stopping impact.

5 11. In a type-writer, the combination with a movable type-bar, a type-head pivotally mounted thereon, and provided with a plurality of type, a tripping member mounted on the type-bar, means contacting with the tripping member to move it and the type-head on the type-bar during the return of the type-bar from the printing position, and banking-faces between the tripping member and type-bar and between the type-head and type-bar 10 for arresting the tripping member and type-head when shifted on the type-bar during the return of the type-bar from the printing position, substantially as described.

12. In a type-writer, the combination with 20 a movable type-bar, a type-head pivotally mounted thereon, and provided with a plurality of type, a tripping member mounted on the type-bar, means contacting with the tripping member to move it and the type-head on 25 the type-bar during the return of the type-

bar from the printing position, and banking-faces between the tripping member and type-bar, for arresting the tripping member when shifted on the type-bar during the return of the type-bar from printing position, substantially as described. 30

13. In a type-writer, the combination with a movable type-bar, a type-head pivotally mounted thereon, and provided with a plurality of type, a tripping member mounted on 35 the type-bar, means contacting with the tripping member to move it and the type-head on the type-bar during the return of the type-bar from the printing position, and banking-faces between the type-head and type-bar for 40 arresting the type-head when shifted on the type-bar during the return of the type-bar from printing position, substantially as described.

Signed by me in New York city this 30th 45 day of July, 1900.

FREDERIC W. HILLARD.

Witnesses:

THOMAS EWING, Jr.,

CHARLES F. BISHOP.