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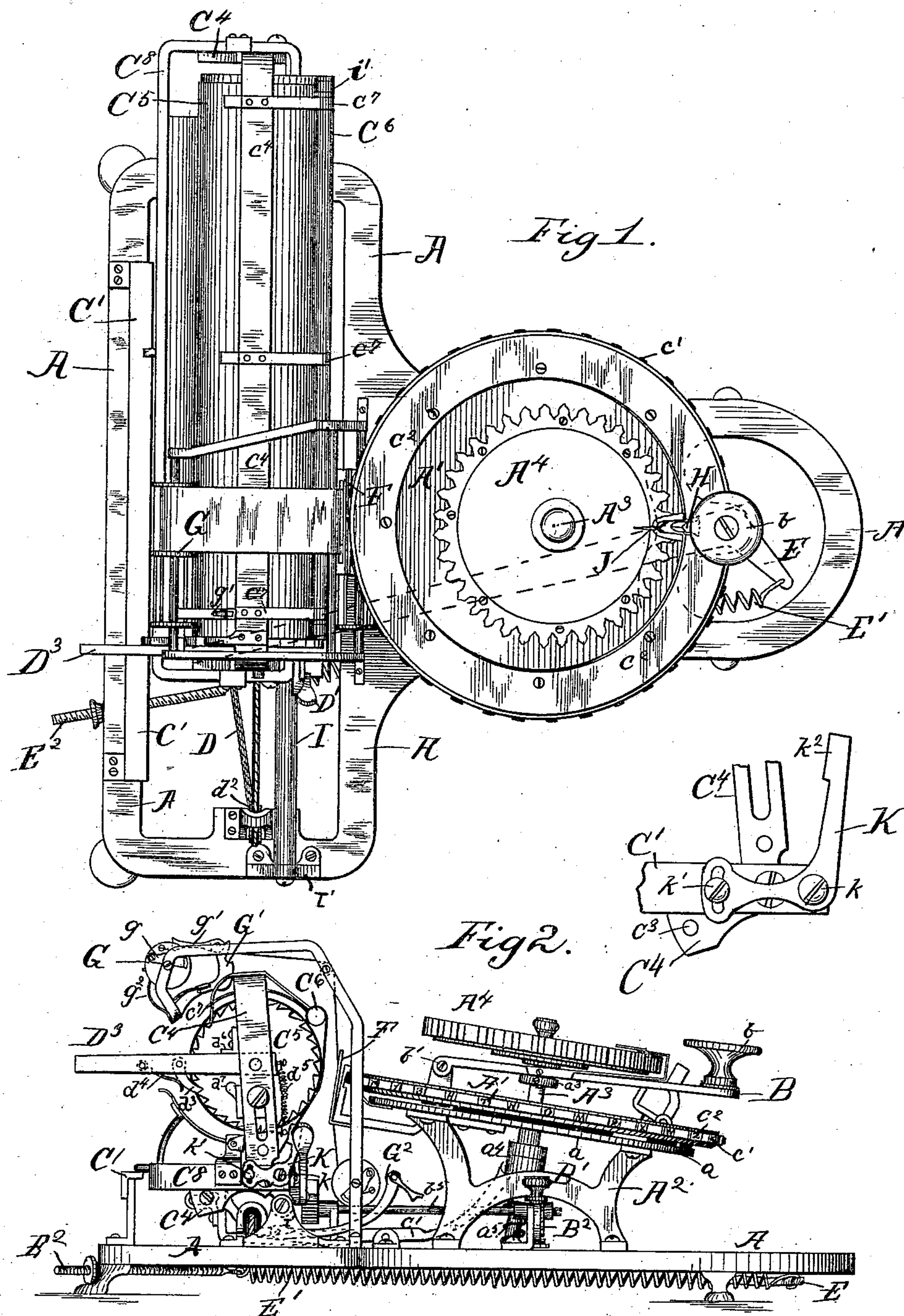
2 Sheets—Sheet 1.

N. G. MOORE.

TYPE WRITING MACHINE.

No. 357,090.

Patented Feb. 1, 1887.



Witnesses:
John W. Munday;
Lea. G. Curtis.

Inventor:
N. Grier Moore,
By Taylor & Brown,
his Attorney

(No Model.)

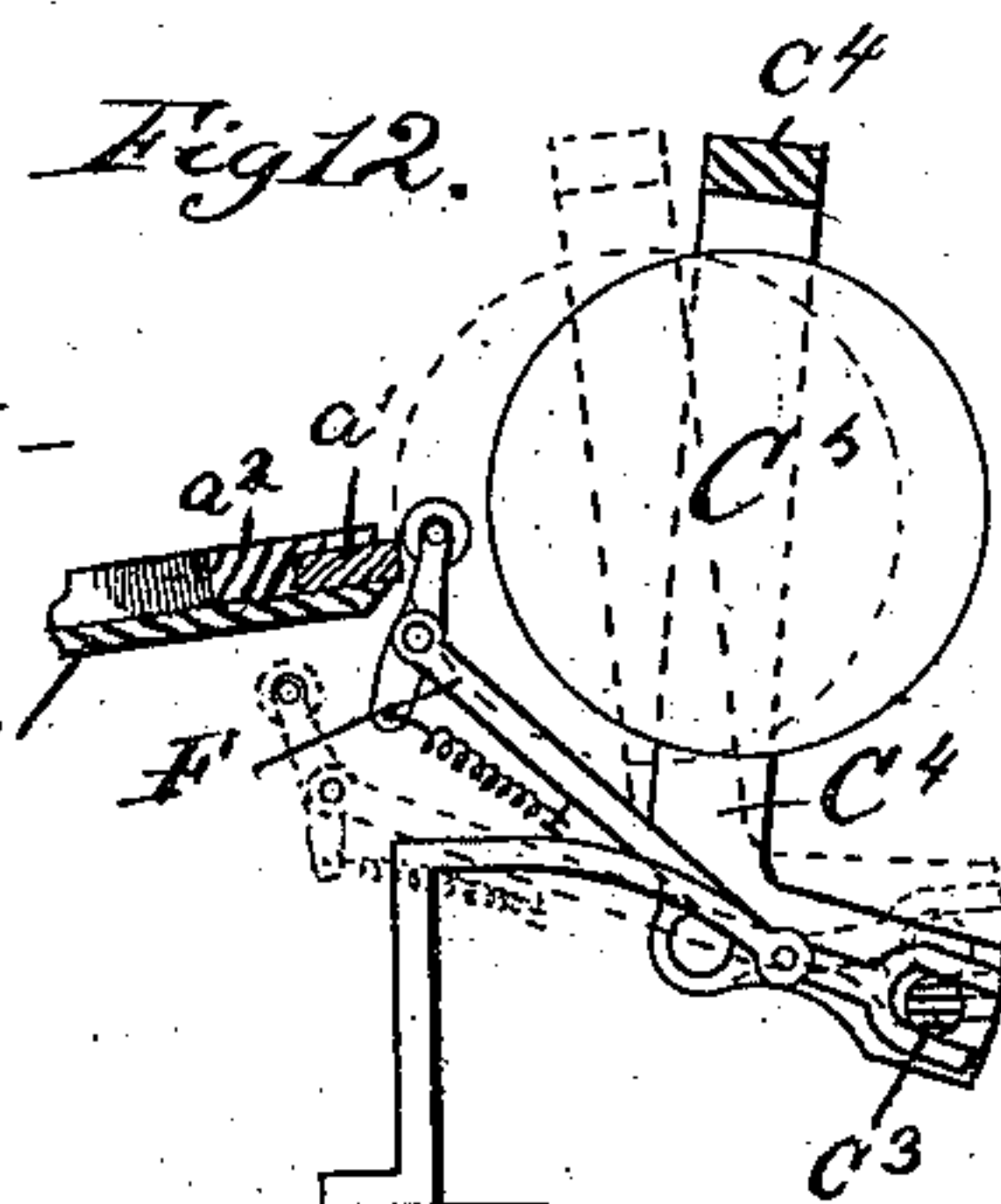
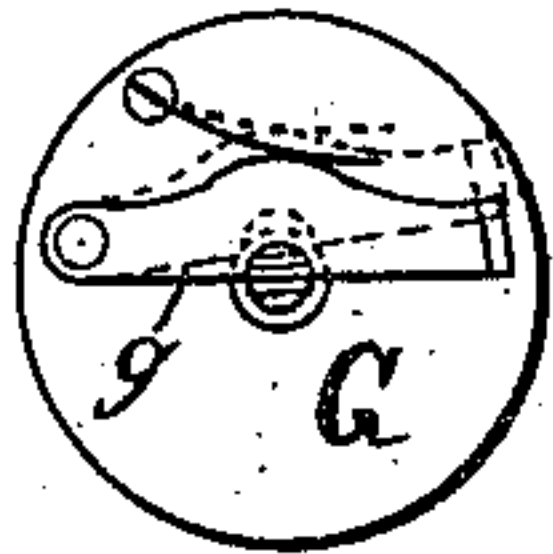
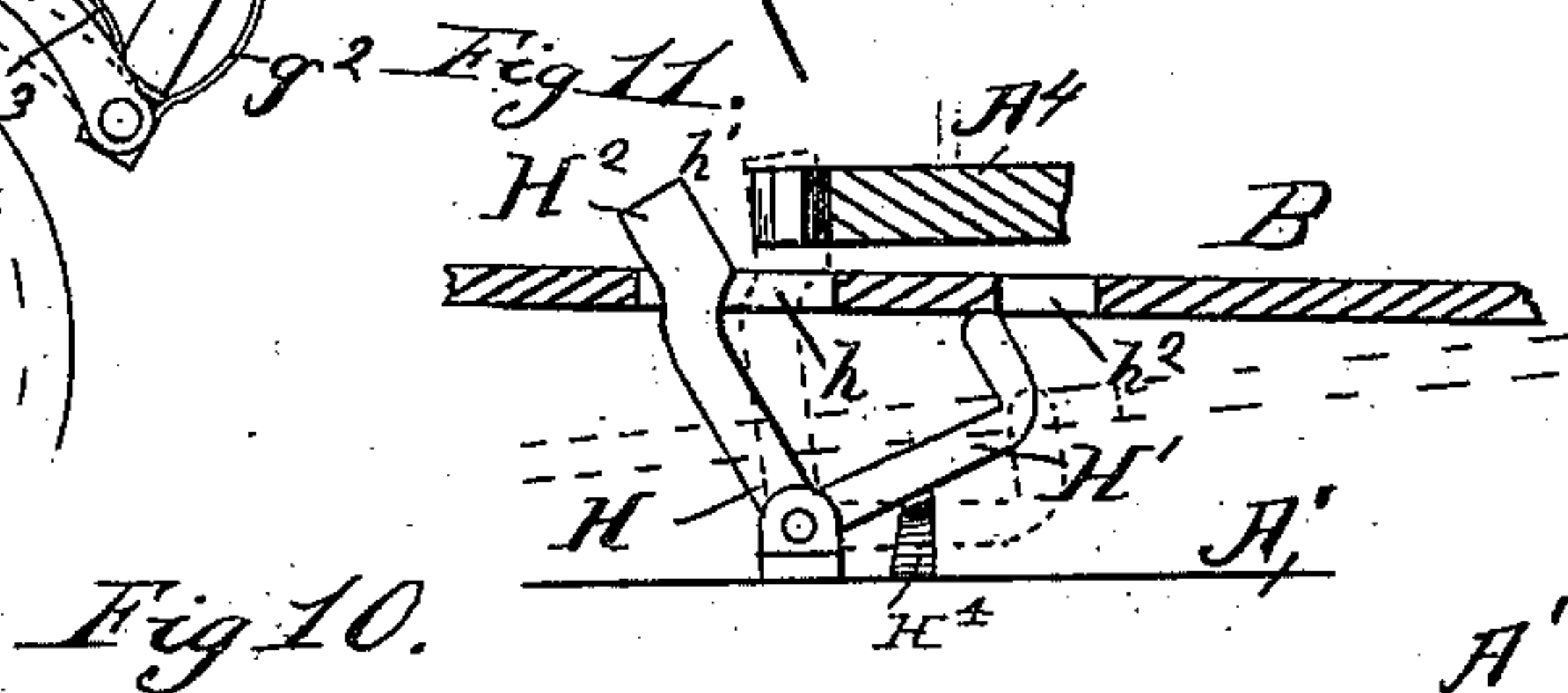
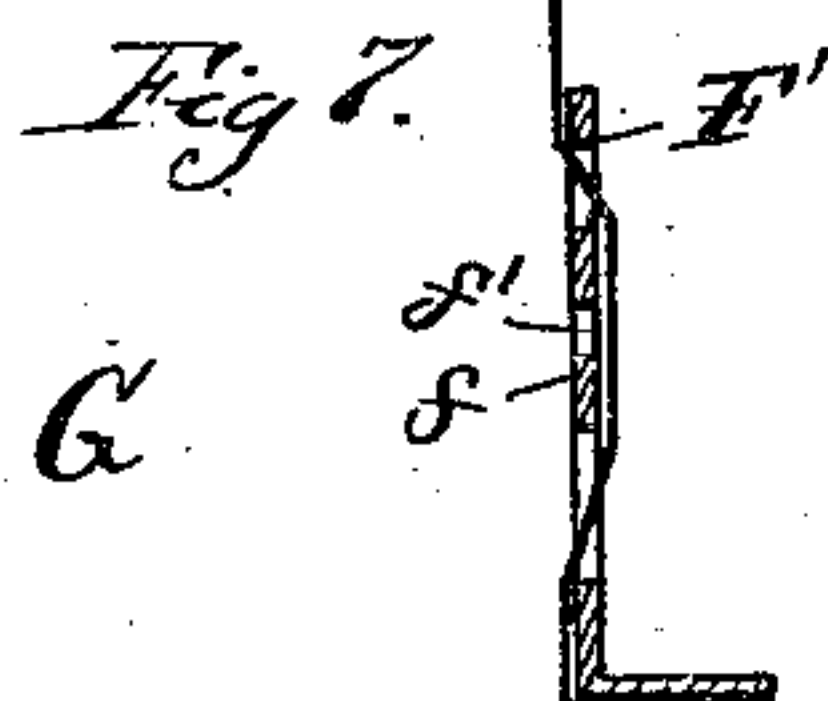
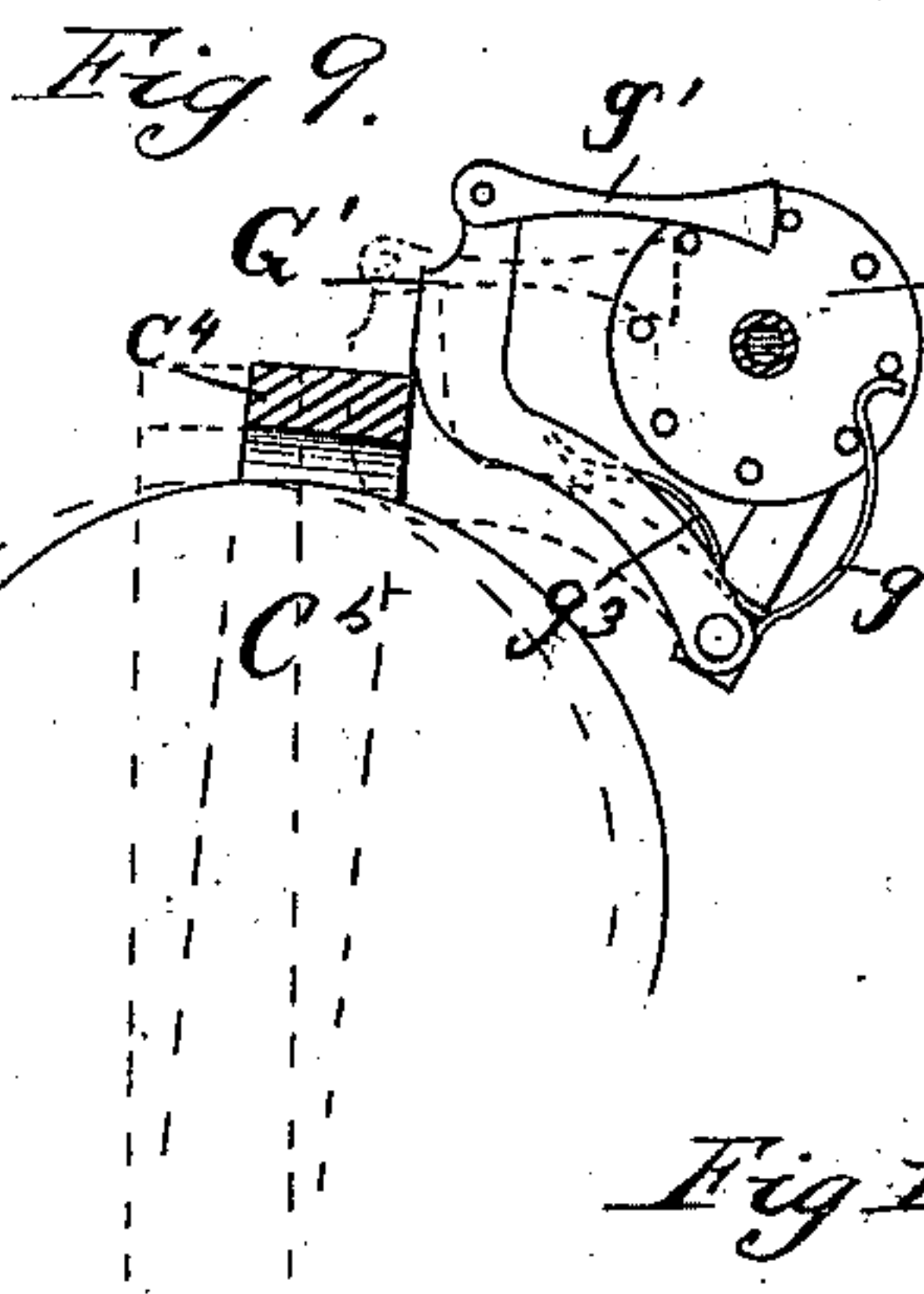
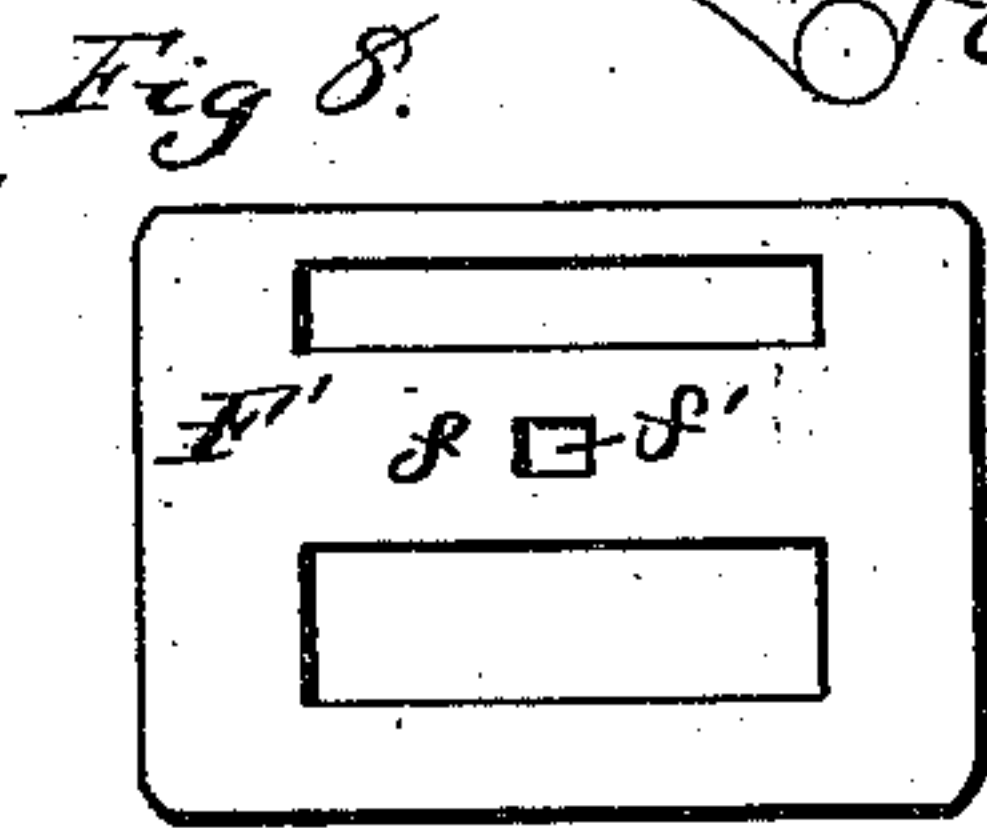
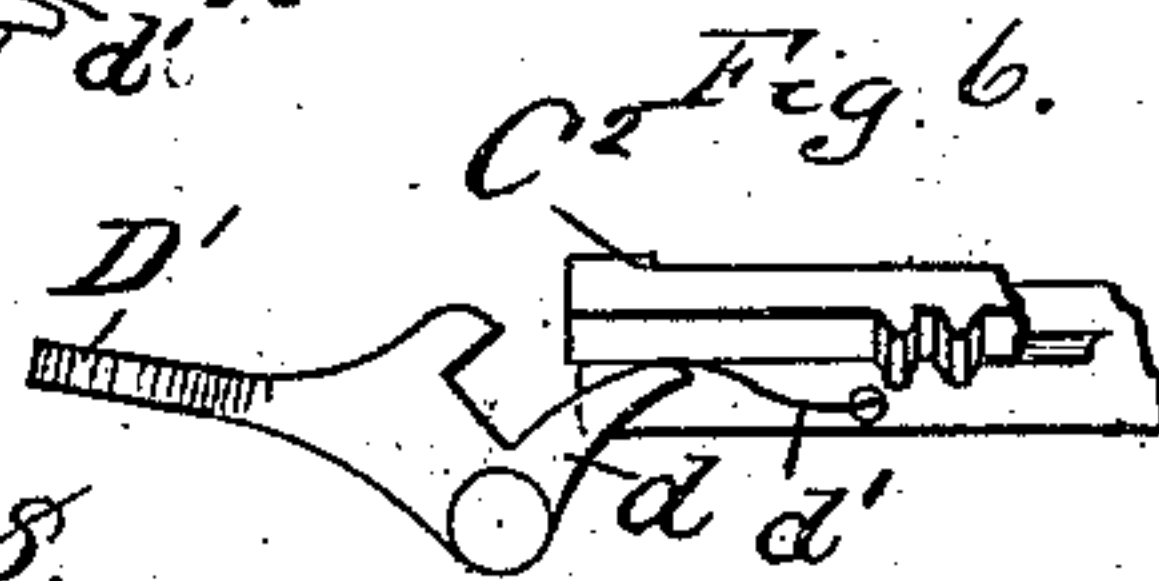
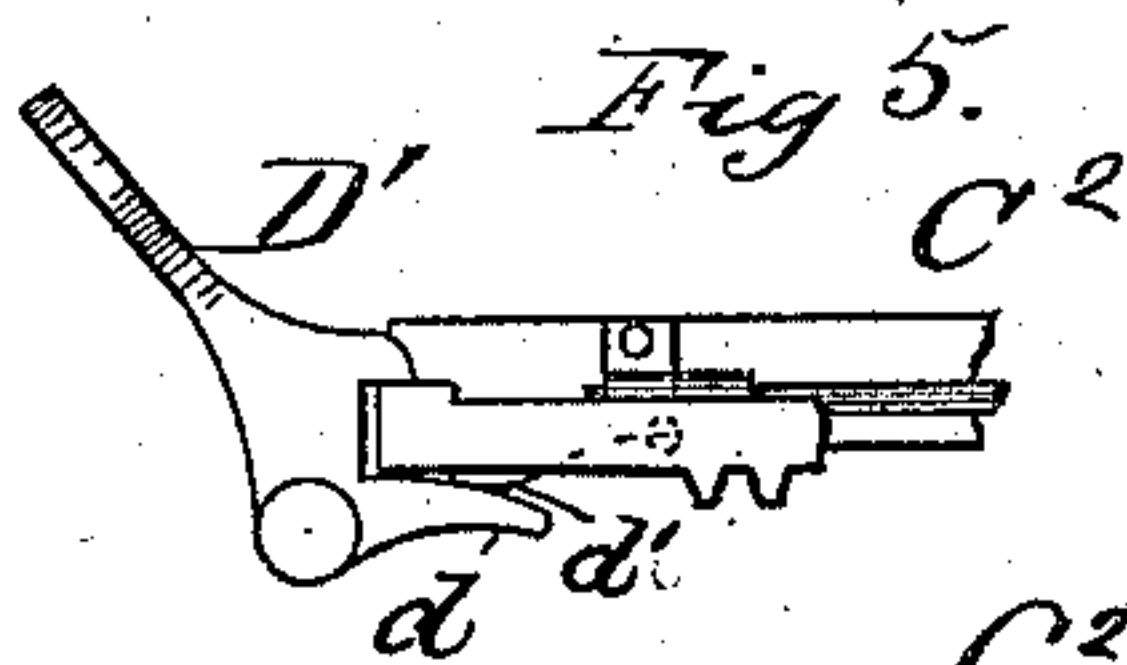
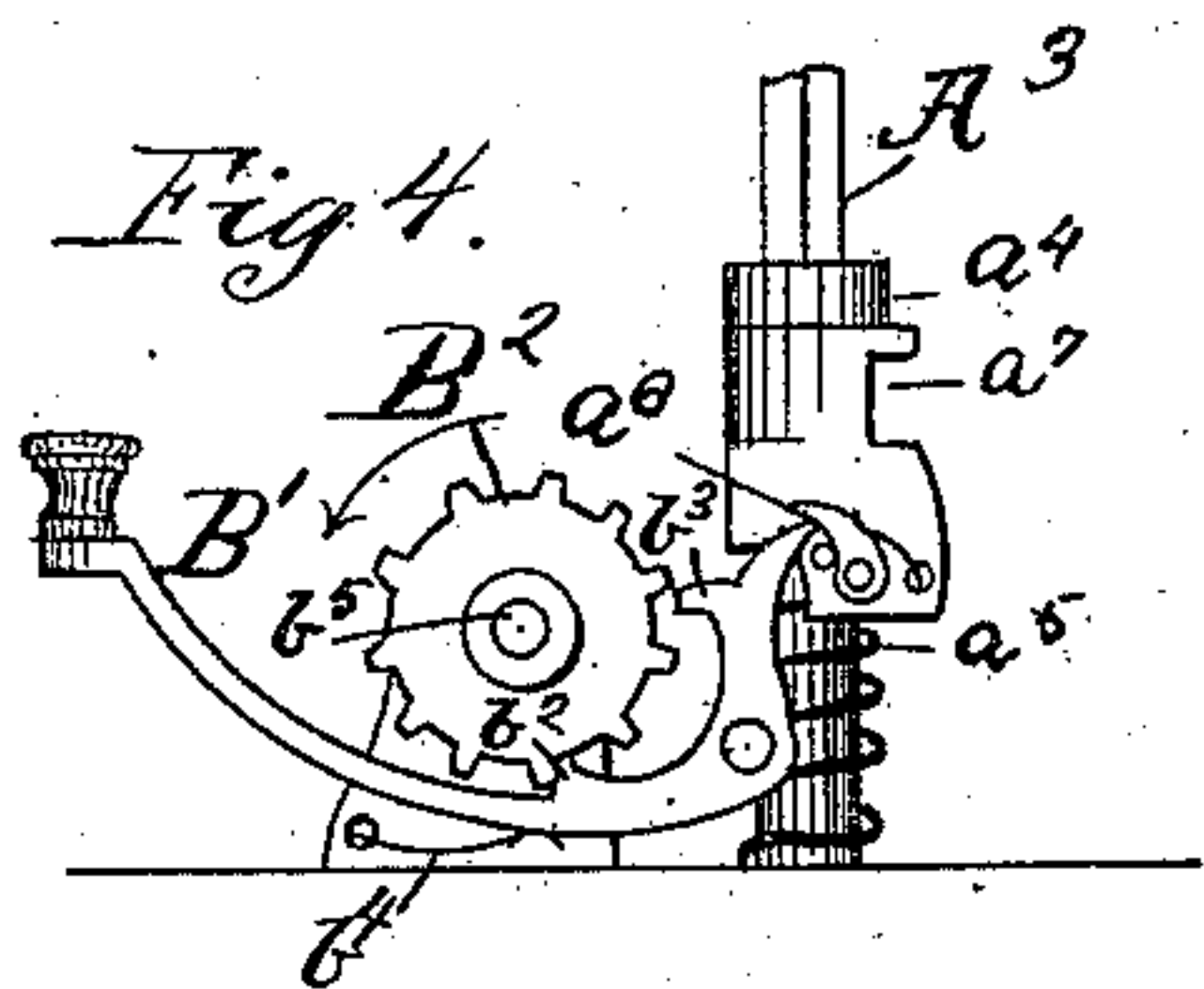
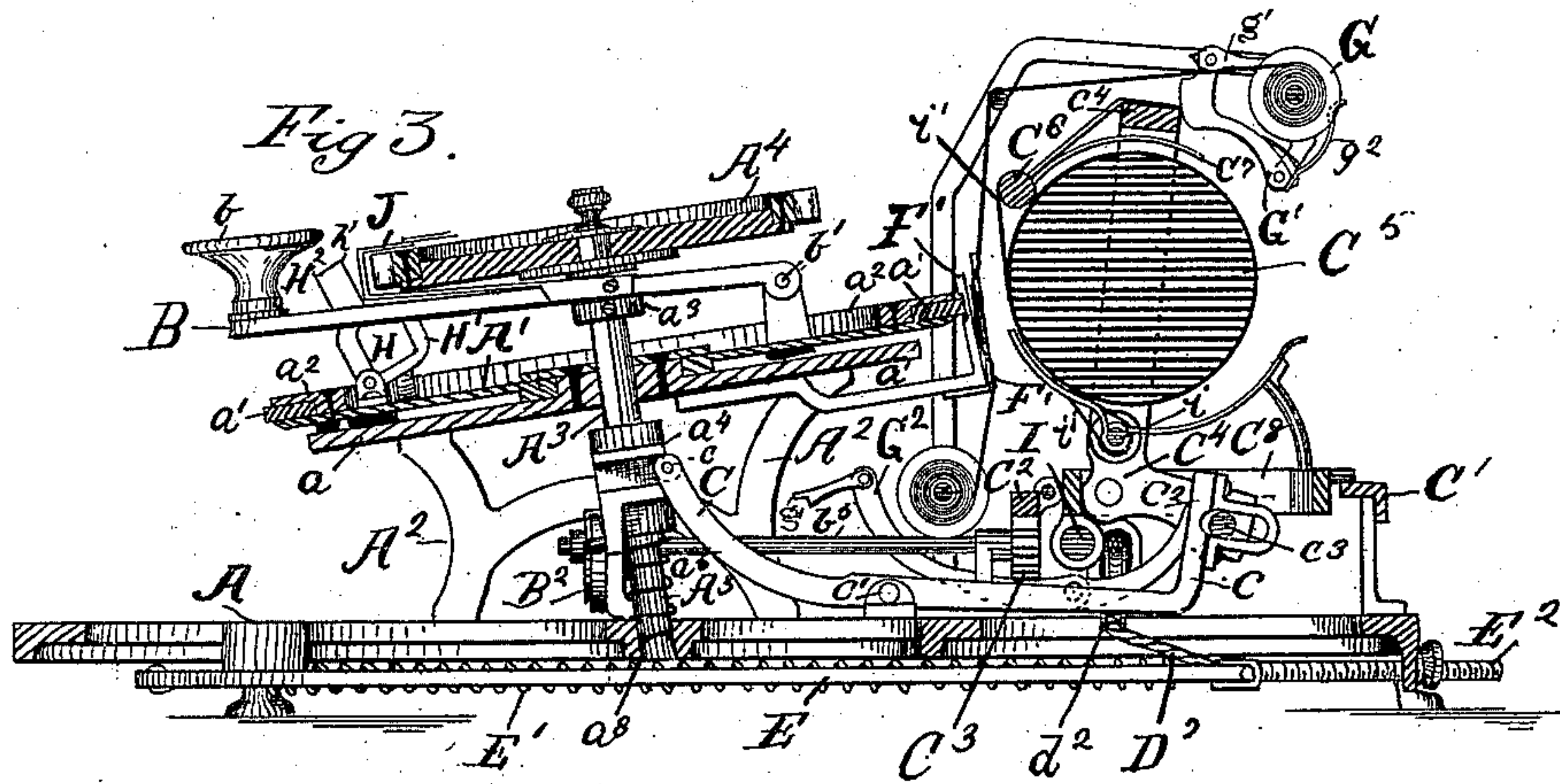
2 Sheets—Sheet 2.

N. G. MOORE.

TYPE WRITING MACHINE.

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Lew B. Curtis

Inventor:
N. Grier Moore,
By Taylor & Brown
his Attorney.

UNITED STATES PATENT OFFICE.

N. GRIER MOORE, OF CHICAGO, ILLINOIS.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 357,090, dated February 1, 1887.

Application filed August 19, 1885. Serial No. 174,819. (No model.)

To all whom it may concern:

Be it known that I, N. GRIER MOORE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Type-Writing Machines; and I do hereby declare the following to be such a full, clear, and exact description of the invention as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to that class of type-writing machines in which the type or letters are secured to the periphery of a disk and the paper-roller is caused by a movement of a hand-lever to oscillate and impinge against said type, and has for its object the simplification of the various parts, hereinafter mentioned, so as to insure a more perfect machine, exact in its every movement, producing as little friction as possible, and requiring the minimum of power by the operator.

My invention will be more fully understood by reference to the accompanying drawings, forming a part of this specification, and in which similar letters of reference indicate like parts throughout the several figures.

In said drawings I have illustrated, in Figure 1, a plan view of a machine embodying my invention, at Fig. 2 a side elevation of the same, and at Fig. 3 a central vertical section thereof. At Fig. 4 I have illustrated the spacing device, at Figs. 5 and 6 the disengaging-latch to permit the return of the carriage, at Figs. 7 and 8 the plate through which the ink-ribbon is laced, at Fig. 9 the device for revolving the upper ribbon-reel, at Fig. 10 the end of said reel, showing the locking-catch, at Fig. 11 a sectional view of the operating-lever and latch for the index-wheel, and at Fig. 12 the manner of inking the types when no ribbon is employed.

In said drawings, the letter A represents the frame of the machine, and A' the type disk or wheel loosely mounted on the hub of an inclined table, a, so as to easily revolve thereon. This table is rigidly supported above and on the frame A by the supports or legs A².

The type are secured to the edge of a ring, a', which ring is placed on the type-disk A', and securely held in position by an annular ring, a², secured by screws or other suitable means to

said disk, and having a flange thereon which projects partially over said type-ring a'.

The type may be secured in any convenient manner to the type-ring a'; but I prefer to make an electrotpe strip containing all the required letters, numerals, &c., and secure said strip to the periphery of the said ring a'. Each machine may be provided with several such rings having different styles of type thereon, and the change from one style of type to another may be very quickly accomplished by simply removing the flange-ring a².

The inclined shaft A³ is round at the lower end and square at the upper end. The lower end is stepped in a bearing, a⁸, in the frame of the machine, so as to move or slide therein. The upper square portion passes through an opening in the table a and projects above it so as to permit the non-revolving index or disk A⁴ to be secured thereon. On the upper face of this disk or index A⁴, I make the same number of letters, numerals, &c., as there are type on the type-ring a'. These characters may be indicated on the disk or may be printed on a removable paper or metal ring, which could fit in an annular recess in said disk, the number of index rings corresponding with the different type-rings. On the periphery of the index-disk A⁴, I provide a number of notches, equal to the greatest number of type or characters which any one type-ring a' may contain. These notches are made of peculiar shape, as illustrated in Fig. 1, for the purpose hereinafter mentioned.

The shaft A³ is provided on its square portion below the disk A⁴ with a collar, a³, having a flange at its lower edge. The operating-lever B straddles this collar, rests on the flange, and is provided at one end with the button b, while its other end is hinged at b' to the revolving disk A'. This shaft is also provided, near the upper part of its round end, with a collar, a⁴. Both collars a³ and a⁴ are rigidly secured on said shaft A³. Below the collar a⁴ is the spring a⁵, surrounding the shaft, one end thereof resting on the frame A and the other pressing against the under side of the collar, thus always keeping the parts in the position shown in Figs. 2 and 3, except as hereinafter set forth.

The collar a⁴ is provided with a spring-actu-

ated pawl, a^6 , which engages with one end of the spacing-lever B' . This lever is pivoted, as shown in Fig. 4, so as to permit the pins b^2 and b^3 , with which it is provided, to engage the pinion B^2 . A spring, b^4 , tends to keep the pin b^2 in engagement, as shown. The collar a^4 is also provided with a groove or slot, a^7 , wherein the roller e , secured to one end of the carriage oscillating lever C , may travel. This lever C is pivoted at c' to the frame, and at c^2 it engages the rod c^3 of the carriage. The end of the lever C may be bifurcated so as to straddle the rod c^3 ; or it may be provided with a yoke or clip, as shown. The carriage-frame is supported by friction-rollers at the rear on the guideway C' , supported on the frame A by means of brackets, and its front end is supported on the rod I , which is secured to the frame by standards I' . At the front end of the carriage is hinged the rack-bar C^2 , which meshes with the spacing-wheel C^3 . The wheel C^3 is only revolved one notch or tooth at a time, as will hereinafter more fully appear, and causes the rack-bar C^2 and carriage C^3 to travel longitudinally across the machine, as desired.

The pinion B^2 and spacing-wheel C^3 are mounted on opposite ends of the shaft b^5 , as shown in Figs. 2 and 3, at right angles to the path of the carriage. As the spacing-lever B' is moved either by the operator or by the upward movement of the collar a^4 the pin b^2 thereon disengages from the pinion B^2 , while the pin b^3 enters a space between two of the teeth of said pinion. A tension device causes the rack-bar C^2 to revolve the spacing-wheel C^3 , thus communicating motion to the pinion B^2 through the shaft b^5 . As the operator releases the lever B' the spring underneath the same raises the lever and forces the pin b^2 into the next space on the pinion B^2 as the latter is revolving. This will lock the pinion again. When the shaft A^3 is raised, the pawl a^6 on the collar a^4 is forced by its spring to and against the curved arm of the spacing-lever, and thereby forces said end over in the direction indicated by the arrow, engaging the pin b^3 and disengaging the pin b^2 . The lever is returned, as previously explained.

At each end of the carriage I pivot a bell-crank lever, C^4 , between the short arms of which is mounted the rod c^3 , hereinbefore mentioned. The other arms of the levers support the paper-roll C^5 and are connected by the bar c^4 . The paper is fed by hand to the roller in the usual manner from the bottom, and soon engages with the friction-roller C^6 . This roller C^6 is as long as the paper-roller, and is held so as to easily revolve by flat spring-arms C^7 parallel to and against the paper-roller, as shown. To move the carriage rapidly or to return the carriage to the point of beginning, it is only necessary to disengage the rack-bar C^2 from the wheel C^3 . This is accomplished by means of the thumb-latch or lever D' , pivoted to the carriage and having a tongue or lip, d , beneath the end of said bar C^2 .

A spring, d' , pressing on the lip d , may assist to keep the latch in its normal position, as illustrated in Fig. 5.

Beneath the carriage, at about the center, I secure one end of the cord D^2 . This cord after passing over a pulley, d^2 , secured to the frame A , is secured to the long end of the lever E . This lever is pivoted beneath the frame near the front end, and the short arm is attached to one end of a tension-spring, E' , while the other end of said spring is secured to the adjusting-screw E^2 . The lengths of the arms of this lever E and the position of the spring with relation thereto are illustrated substantially in the drawings in Fig. 1, and are such as to cause a steady tension on the carriage through the length of its travel. In the position illustrated the spring is extended and exerts its maximum of strain, and when the carriage is moved farther to the left of the operator the spring contracts, and the loss of its tension is compensated by the gain in leverage.

The paper-roll is turned so as to present a new line to the type by the following means: A trip-lever, D^3 , is pivoted to one of the levers C^4 , preferably at the left-hand side, so as to be near the thumb-latch D' , and carries on its long arm a pawl, d^3 , and spring. The spring d^4 keeps the pawl d^3 in engagement with circumferential ratchet-teeth on the end on the paper-roll C^5 . Stops d^6 d^7 are provided on the lever-arm C^4 above and below the trip-lever D^3 , the lower one being made adjustable, so as to regulate the throw of the trip-lever D^3 . A spring, d^5 , tends to keep the trip-lever in position, as shown in Fig. 2.

The type are inked in the usual manner either by an ink-ribbon or by an ink-roller. When the roller is used, I prefer to employ the mechanism illustrated in Fig. 12. This consists in mounting the ink-roller movably in the end of a lever, F , which lever F is operated from the rod c^3 of the carriage, as shown in dotted lines in said figure. The lever F is supported from the main frame A by a proper bracket. When the ink-ribbon is used, I prefer to lace the ribbon through slots in a plate, F' , to secure proper tension on the ribbon. This plate F' is held in front of the type about to be used and between it and the paper-roll, and may be supported from the frame, or, as I have shown, from the table a by means of brackets.

In order to prevent more than one type from impinging against the paper when the paper-roll is brought up against the type-wheel, I provide said plate F' with a cross-bar, f , having an opening, f' , which is only large enough to permit one type to pass through it. The ribbon-spools are mounted on shafts secured in a frame and supported from the main frame A . The ribbon is automatically passed from one spool to the other, as follows: Integral with or secured to each ribbon-spool is a barrel-pinion, G , as long as the ink-ribbon is wide. These pinions, as well as the spools, are loose

on their shafts so as to be moved lengthwise thereon. The shafts are provided with a number of annular notches or grooves, into which fit the spring-dogs *g*, pivoted on the end of the spool or pinion.

The ribbon may be moved from side to side, so as to use every portion thereof by simply lifting the dogs *g* from the notches and sliding the spool and pinion longitudinally on the shaft and then dropping the dogs *g* again into another notch. Pivoted to the spool-holding frame and below the spool is the arm *G'*, which carries the pawl *g'*. The pawl engages with the teeth of the barrel-pinion *G* on one side, while the spring *g''*, secured to the frame, is provided with a curved end, so as to engage two teeth of said pinion at the same time, as shown in Fig. 9. When the paper-roller is tilted forward, as shown in dotted lines in said figure, a spring, *g'''*, pressing on the arm *G'*, forces said arm downward and carries the hinged pawl *g'* away from one tooth of the pinion over against another tooth, the spring *g''* preventing any tendency of the pinion to revolve. As the paper-roller returns after striking the type, the cross-bar *c'* engages the arm *G'* and forces it back to its normal position, as shown in full lines in said Fig. 9, and at the same time the pawl *g'* revolves the barrel-pinion against the pressure of the spring *g''*. Thus the ribbon is automatically wound around the upper spool, presenting a fresh ink-surface to the type at each stroke. The lower ribbon-spool is precisely the same in construction as the upper one, but the operating-pawl is hinged to one end of the lever *G''*, which is pivoted to a bracket secured on the main frame *A*. The other end of this lever *G''* engages the rod *c''*. When the ribbon is being wound on the upper spool I throw the lower pawl out of engagement, as indicated in Figs. 2 and 3, and when the ribbon is to be wound on the lower spool I engage the lower pawl and disengage the upper pawl. Then each movement forward of the paper-roller lowers, through the rod *c''*, the forward or pawl end of the lever *G''*, and the ribbon-spool is revolved on the return movement thereof.

The device illustrated in Fig. 11 is for the purpose of locking the type-disk in position during the printing of the letter or character, and consists of a bent locking-lever, *H*, pivoted to the revolving type-disk. A spring, *H'*, on said disk tends to keep one arm, *H'*, of said lever up against the under side of the operating-lever *B*. The other arm, *H''*, extends through a slot, *h*, in said lever, and is provided with a straight portion, *h'*, having a pointed edge next to the index-disk *A'*, so as to correspond with and fit in the space between the teeth of said disk, to secure said disk and the type-wheel together, and thereby prevent the latter from turning or moving while the paper-carrying roller is being oscillated so as to impinge against the type. Each tooth of this disk is shaped as shown in Fig. 1, so as to present an inclined portion on either side. When

the operator presses downward the hand-lever *B*, the bent lever *H* is moved, the arm *H'* being pressed downward against the spring, and the arm *H''* is brought up to the index-disk, the portion *h'* entering said disk between two teeth, thus locking the type-disk to the index-disk. When the operating-lever is moved farther downward, in order to make an impression, the index-disk is of course moved downward with the shaft, the portion *h'* being now parallel to the sides of the teeth of said wheel, and permitting the wheel to slide thereon while remaining locked with the type-disk. A slot or opening, *h''*, is made in the operating-lever, to permit the bent end of the lever *H* to enter at this time. Pulleys *i* on each end and beneath the roller *C'* are secured to the arms *C''*, and running from these pulleys *i*, over pulleys on the ends of the friction-roller *C''*, are tapes or endless bands *i'*.

The operation of my invention is as follows: The carriage being at the right-hand side of the machine, as shown in Fig. 1, and the ink-ribbon and device for operating the same being placed in position, I take a sheet of paper to be printed upon and feed the same in beneath the roller *C'* until the paper is caught by the roller *C''*. I then take hold of the operating-lever *B* and turn it around until the index-point is opposite the letter indicated on the index-disk which I desire to print on the paper. The operating-lever, being hinged to the type-disk, as explained, causes the said disk to revolve with it. The index-disk, the type-disk, and the operating-lever are so arranged and adjusted with relation to each other and to the shaft *A'* that whenever said lever is revolved around the circumference of the non-rotating index disk to any point the same movement also causes the type-wheel to revolve, so as to present to the opening the type which is indicated or marked on the index-disk at the point where the operating-lever is brought to a halt. By pressing down on the lever the shaft *A'* is moved downward, and thus the paper-roller is oscillated by means of the lever *C* and connections heretofore pointed out, and before the paper-roll strikes the type the arm or dog *H''* has securely locked the type-disk. It will be observed that the power applied by the operator to the lever is only such as is required to overcome the force of the spring *a'* and to tilt the paper-roller forward to impinge against the type to make an impression.

Now the operator may relax his pressure on the lever and the rest of the work is performed automatically—that is to say, on the return movement of the shaft caused by the spring *a'*, the entire carriage is caused to move longitudinally the space of one type through the medium of the rack *C''*, spacing-wheel *B''*, pinion *C''*, lever *B'*, and pawl *a'* on the collar *a'* on the shaft *A'*. The spring *H'* beneath the arm *H'* forces the dog or latch *H''* out of engagement with the index-disk, and the ribbon-spool is revolved a short distance, as explained.

The operating-lever is then swung around the index-wheel to the next letter pressed down, and so on, till the end of the line has been reached on the paper. The thumb-latch D' is then pressed downward, the rack-bar C' disengaged thereby from the spacing-wheel C', and the carriage moved back to the right-hand side of the machine against the pressure of the spring E'; also at the same time the lever D' may be pressed downward and the paper-roller revolved so as to present a new line opposite the type-disk A', the friction-roller C' holding the paper closely to the roller C'. By pressing on the spacing-lever B' the carriage is moved to the left one space with each pressure of the lever.

I make the teeth of the index-disk A' of the form shown in Fig. 1, for the purpose of insuring the perfect working of the locking-lever H. The sides of the teeth of the disk are beveled and the front of the lever H being pointed, it will be seen that the lever will enter between two of the teeth of the disk A' and bring the type-disk A' to the proper position thereby.

The index or pointer J is pivoted to the operating-lever at a point where the lever is connected with the collar a', so that it will move up or down with the index-disk A', and at the same time when the lever is revolved on the collar a' the pointer J will also revolve with it. The end of the index J is slotted, so as to permit the locking-lever H to pass through it and enter between two of the teeth of the index-disk A'. If the pointer J is rigidly secured to the lever B, the bent portion which passes around the edge of the disk A' should be extended above said disk sufficiently to clear it when the lever is pressed downward; but I prefer to pivot or hinge the pointer, as shown.

For the purpose of ready adjustment the pawl a' may be attached to an independent collar, so that the throw of the paper-roller may be altered without altering the spacing device.

For the purpose of regulating the blow of the paper roller or platen against the types and to make the impression even, I attach buffers K, with cushions or springs k' at the faces in such a position as to receive a portion of the blow when the roller is oscillated for the purpose of printing. In a former application for patent upon improvements in the same class of machines in which the type are inked only by a roller, I showed buffers for a like purpose attached to the stationary hub of the type-disk. The present improvement contemplates especially the use of ribbon-inkers, one of the objects being to enable it to manifold in printing. In the position shown in the former application the buffers impress themselves through the carbon-paper used in manifolding, and make the duplicates illegible. For this purpose I attach the buffers K to the carriage, and in two forms, one attached so as to receive the stroke of the long arms C' of the bell-crank levers carrying the paper-roller,

and the other receiving the upward stroke of the short arm.

The buffers are made adjustable by a slot in the short arm, set in position by a thumb or set screw, the buffers being pivoted loosely to the frame. I do not wish to limit myself, however, to such construction, as other modifications for producing the same result will readily suggest themselves to those skilled in the art to which this invention relates, and which may be used without departing from the spirit of my invention.

The inking device illustrated in Fig. 12 may be used with great advantage in this class of type-writing machines; but I do not herein claim such device, and any claim or claims thereon to which I may be entitled are hereby expressly reserved for another application.

The type-ring a', it will be observed, is made so as to be easily removed when it is desired to change the style of type used. The type may be of any suitable metal or hard rubber that will permit of its being bent around the periphery of the ring a'. This ring may be secured in place on the disk A by the flange-ring a'', or may be retained in position by simply fitting snugly over a shoulder or recess formed or turned on the disk, and perhaps a pin holding it in place, so as to prevent its being turned around on the disk A'.

What I claim as my invention, and desire to secure by Letters Patent, is as follows:

1. In a type-writing machine, a disk movably secured to the frame of the machine and provided on its periphery with type, an index-disk rigidly secured above said type-disk to a non-rotating shaft, and a lever hinged at one end to the type-disk and loosely encircling said shaft between the index-disk and the type-disk, whereby the latter may be revolved by said lever, substantially as and for the purpose specified.

2. In a type-writing machine, the combination of a rotating or oscillating type disk or segment with a sliding non-rotating shaft having an index-disk rigidly secured thereto above the type-disk, an operating-lever hinged at one end to the type-disk, and mechanism for locking said disks or segments together, consisting of a bent lever hinged to said revolving disk and having its vertical arm projecting through a slot in the operating-lever, the other arm operating by the downward pressure of the operating-lever to engage the vertical arm with teeth on the periphery of the index-disk, substantially as shown.

3. In a type-writer having its characters on an oscillating or rotating segment or disk, an operating-lever turning on a sliding non-rotating shaft and hinged at one end to said segment or disk, an index-disk rigidly secured to said shaft above said lever, and an index or pointer pivotally secured to the operating-lever at or near its point of contact with said shaft, combined and operating substantially as described.

4. In a type-writer, a paper-carrying roller

held between two crank-levers connected at the ends of their respective arms, a sliding shaft provided with a spool, and a tilting-lever pivoted to the frame, one end of which lever carries a friction-roller which works in a groove in said spool, and the other end secured to a rod connecting the short arms of said crank-levers, whereby by the downward thrust of the shaft and spool thereon the short arms of the crank-levers are moved upward and cause the paper-carrying roller to impinge against the printing-type, substantially as specified.

5. In a type-writing machine, a disk, A', removably secured to a hub so as to revolve thereon and provided on its periphery with an annular type-ring, a', secured to said disk by the flanged ring a'', whereby by removing said ring a'' the type may be removed and altered without removing the disk A' or otherwise moving or disturbing the machine, substantially as set forth.

6. In a type-writing machine in which the paper-carrying roller is oscillated to impinge against the type, mechanism for revolving the ribbon-reel by the return motion of the paper-roller, consisting of the spool and barrel pinion G above and similar pinion below, the arm G', and pawl g', springs g² g³, cross-bar c⁴, lever G² and pawl carried thereon, and the rod c³, arranged and operating substantially as specified.

7. In a type-writing machine, mechanism for revolving the ribbon-reel, consisting of the spools and barrel-pinions G above and like below, as shown, the arm G', pawl g', the

spring g², cross-bar c⁴, lever G² and pawl thereon, rod c³, and means, substantially as described, to tilt or oscillate said cross-bar and lever by the blow of the printing key or lever.

8. In a type-writing machine, the combination, with the ink-ribbon spool-axles, of ink-ribbon spools mounted on said axles so as to slide thereon and to turn with said axles, the pinions G, secured to said spools and similarly mounted on said axles, and the spring-actuated dogs g, pivotally secured to said pinions and engaging in annular slots or depressions in said axles to prevent the longitudinal movement of the spools and pinions thereon, substantially as shown and described.

9. In a type-writing machine, the combination of a rotating disk, a type-ring removably secured to said disk at or near its periphery, and a series of types or characters of thin metal, hard rubber, or other suitable material rigidly secured to the outer edge or periphery of said type-ring, substantially as specified.

10. In a type-writer, the combination of the paper-roll and arms supporting the same, and mechanism, substantially as described, for oscillating said roll to impinge against the type, with adjustable buffers attached to the roller-carriage, and provided with springs or elastic faces to cushion and regulate the impact of the roller against the types, substantially as specified.

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Witnesses:

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