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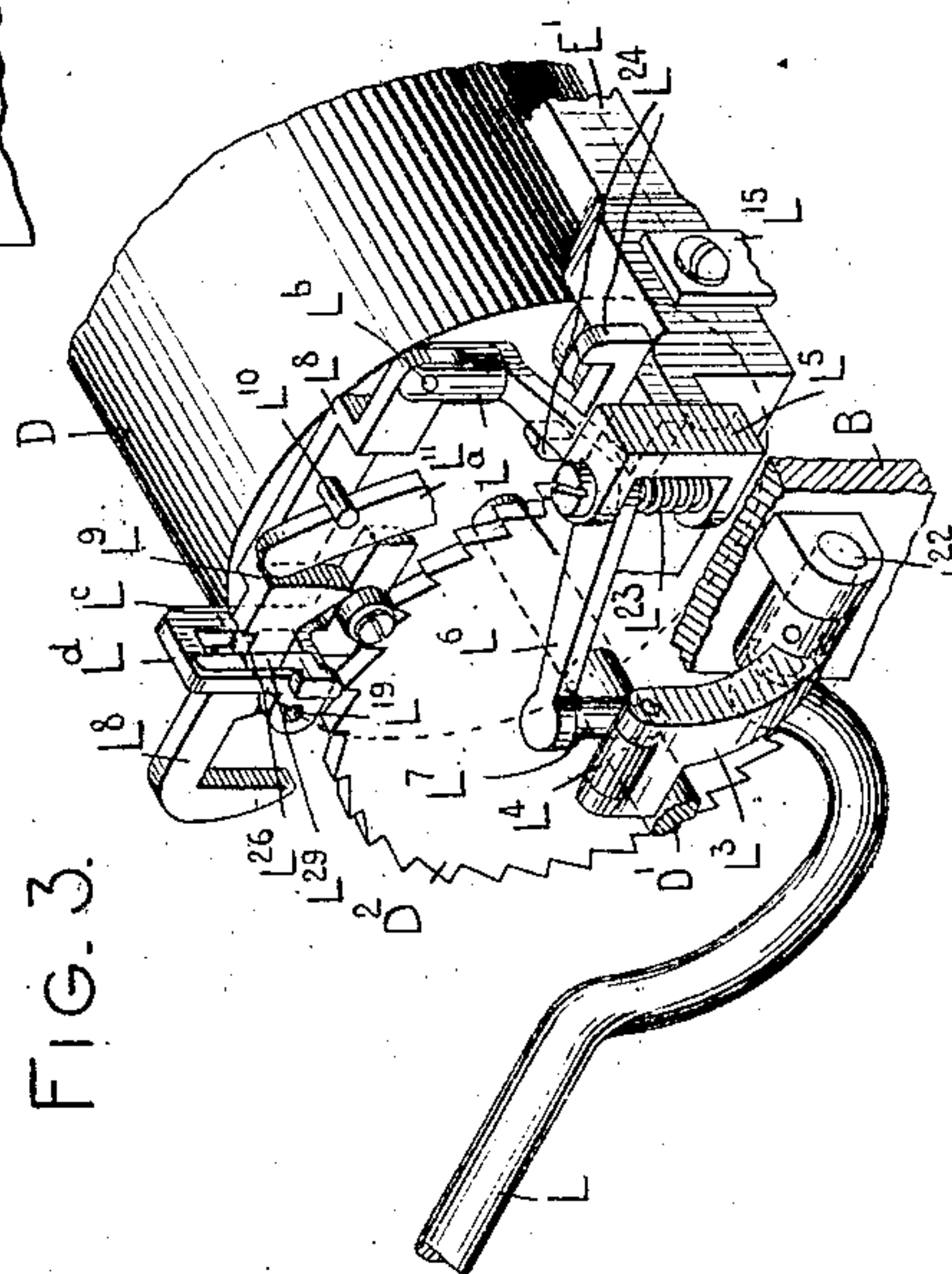
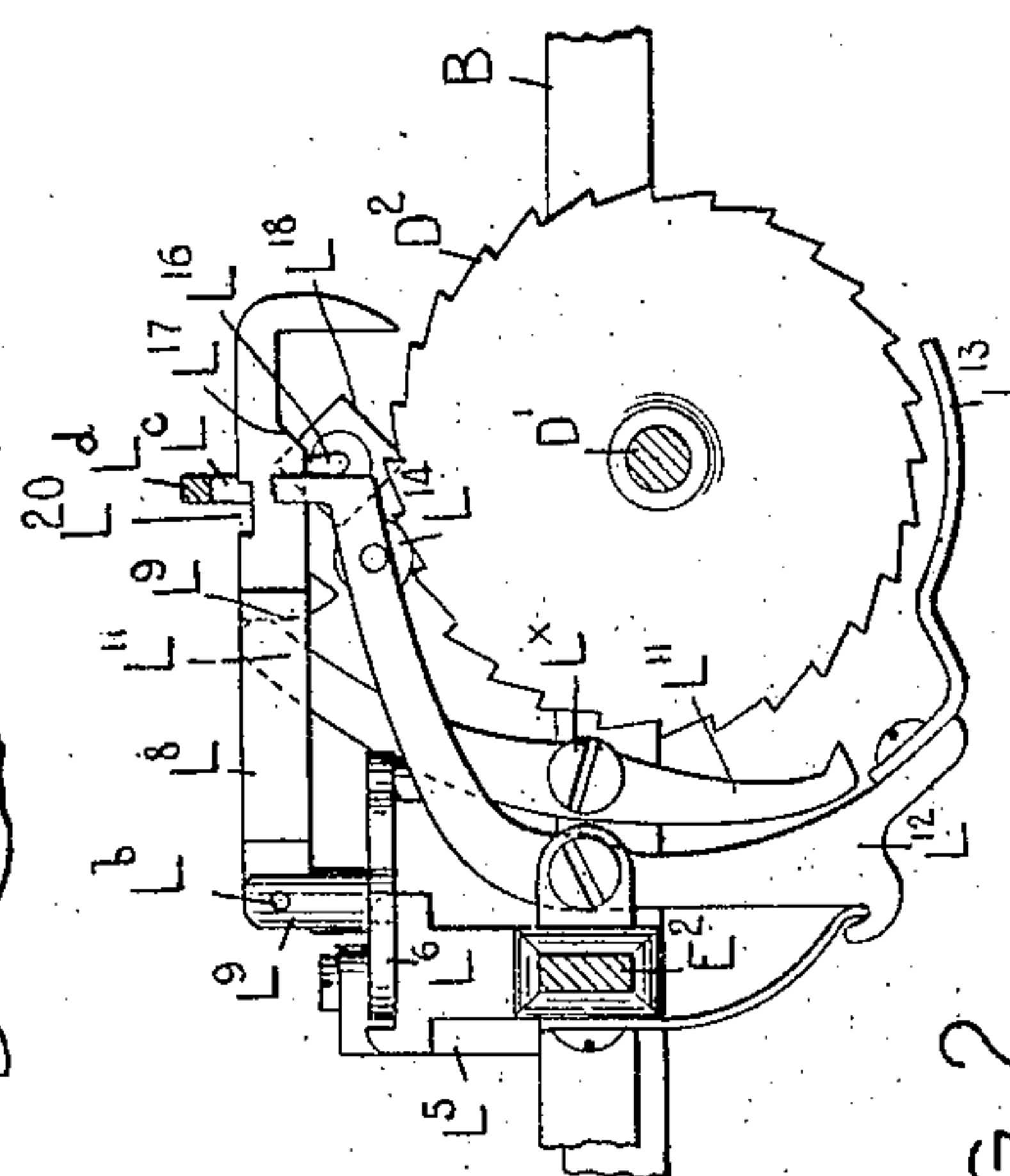


FIG. 3.



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by Jacob Felber

HIS ATTORNEY

G. H. SMITH.
TYPE WRITING MACHINE.
APPLICATION FILED JAN. 26, 1906.

912,193.

Patented Feb. 9, 1909.

2 SHEETS—SHEET 2.

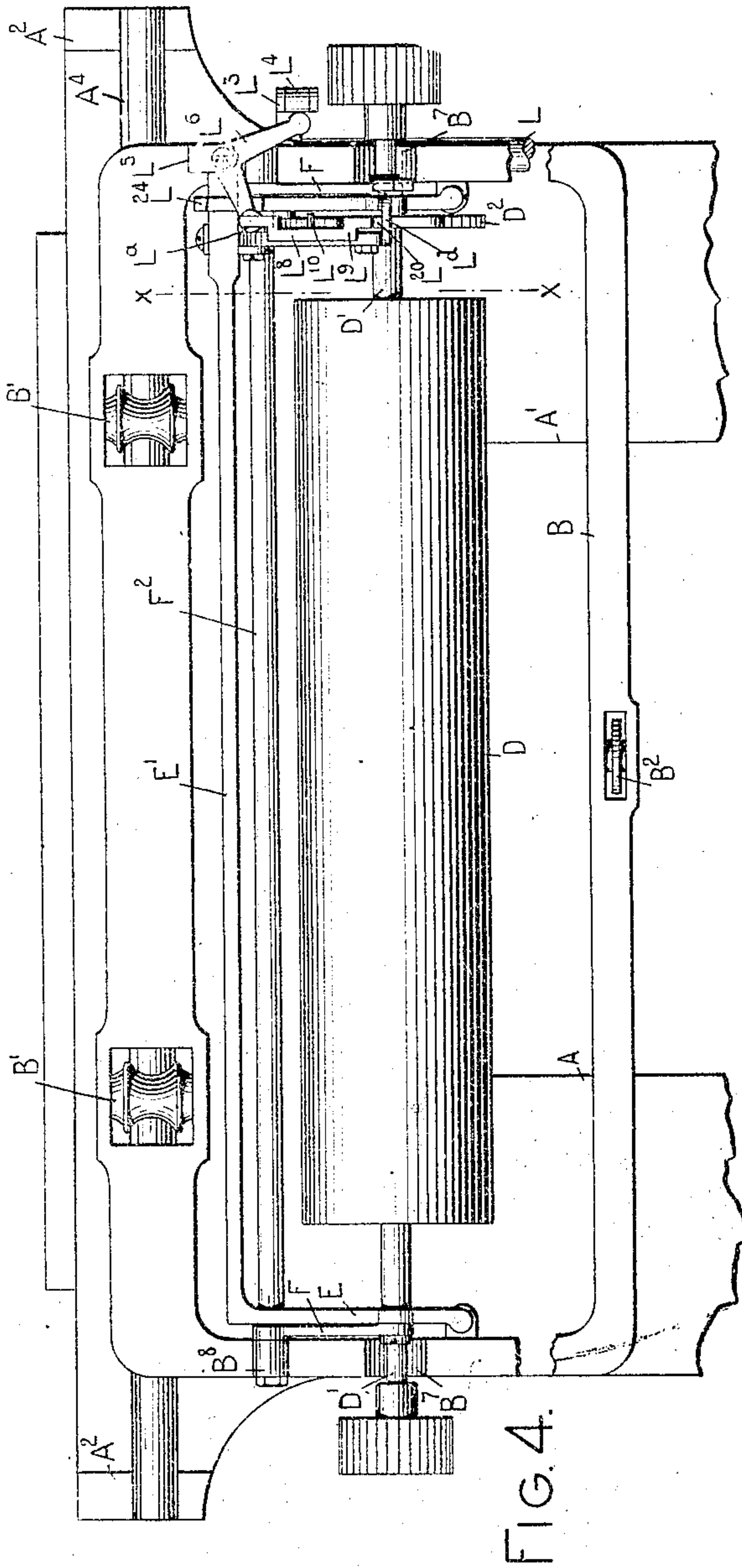


FIG. 4.

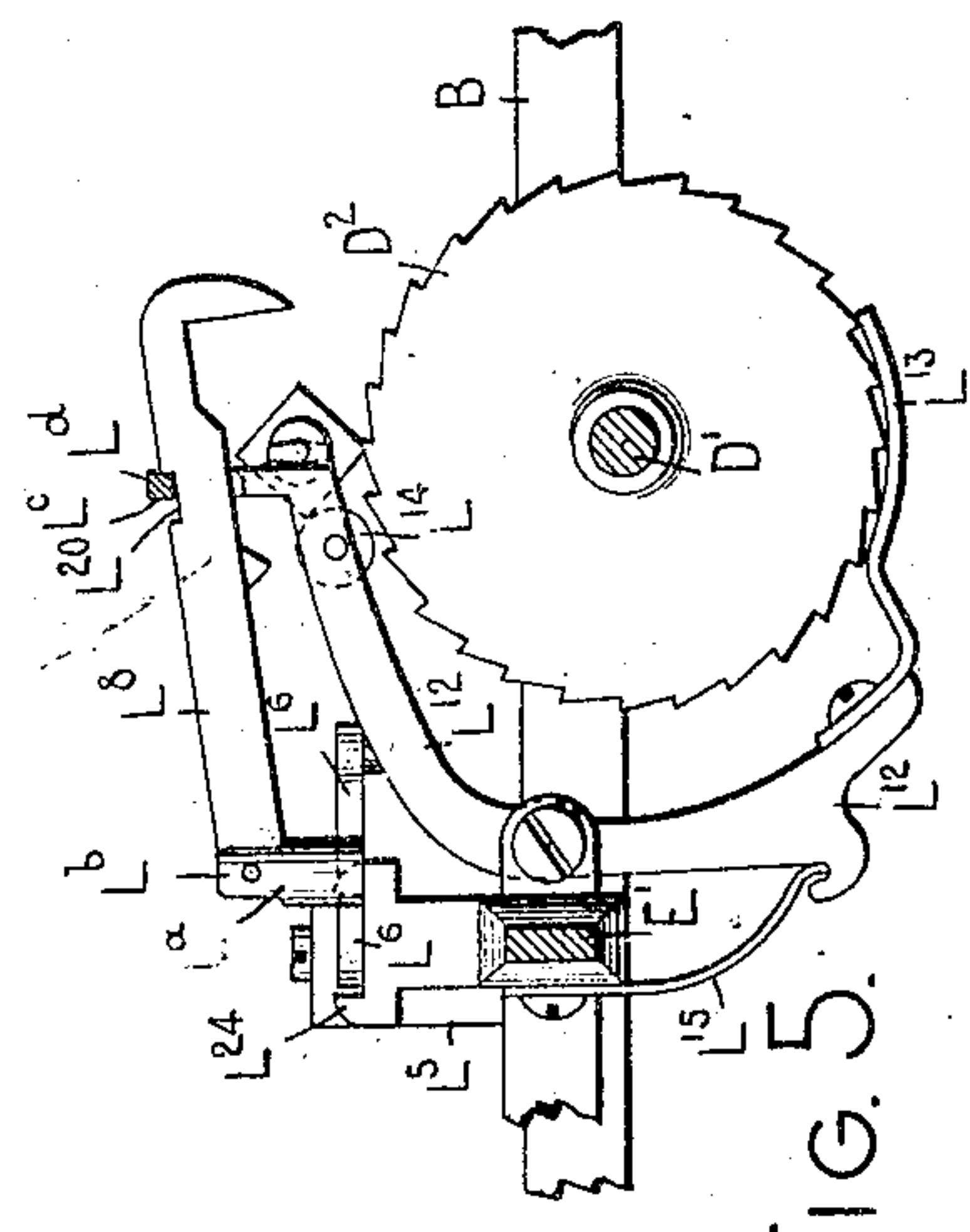
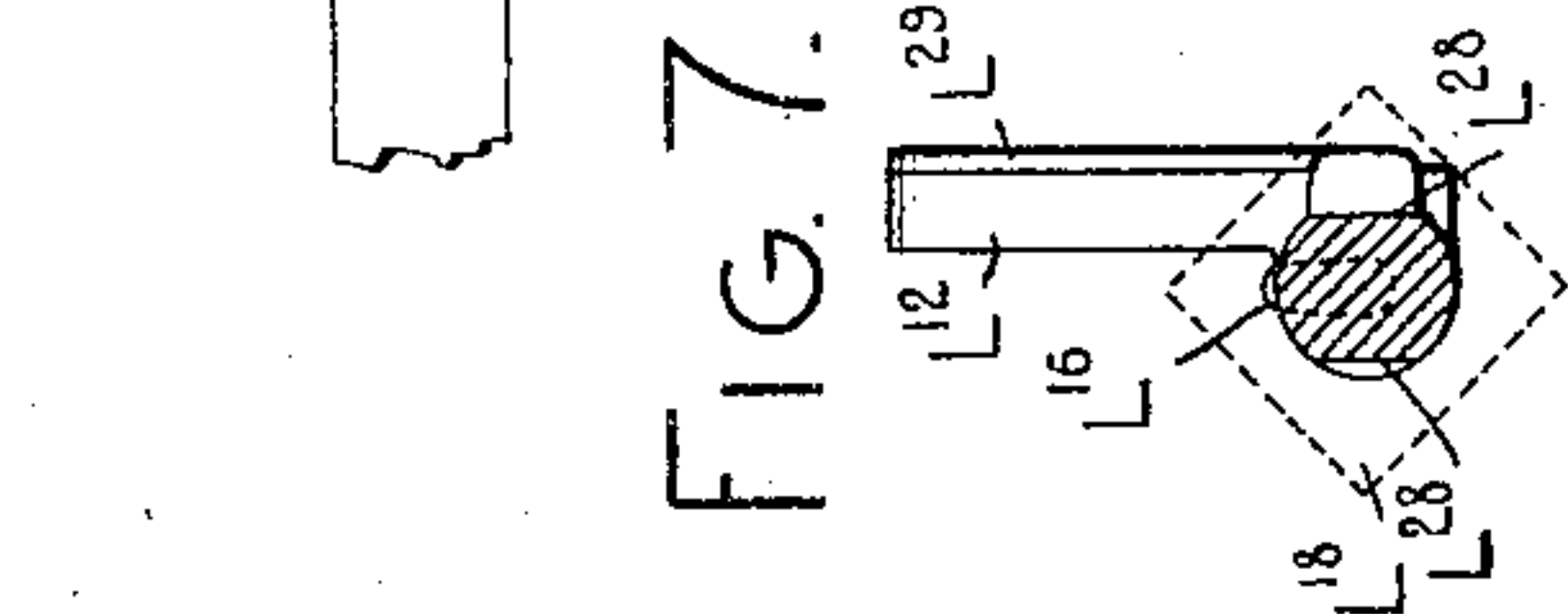
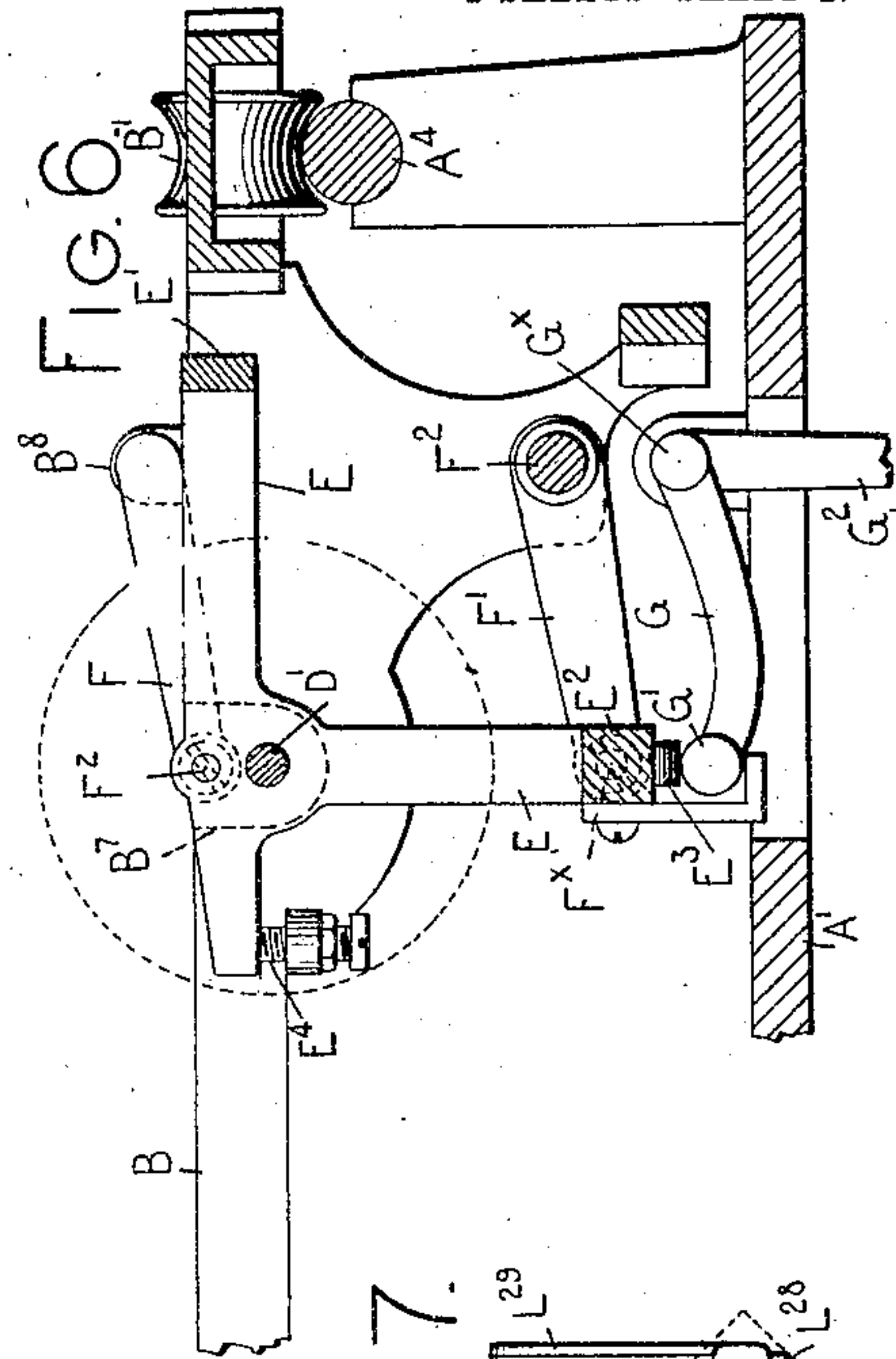


FIG. 5.

WITNESSES.

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UNITED STATES PATENT OFFICE.

GEORGE H. SMITH, OF FOREST HILL, NEW JERSEY, ASSIGNOR TO UNION TYPEWRITER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

No. 812,193.

Specification of Letters Patent.

Patented Feb. 9, 1909.

Original application filed August 27, 1900, Serial No. 28,142. Divided and this application filed January 26, 1906. Serial No. 297,963.

To all whom it may concern:

Be it known that I, GEORGE H. SMITH, citizen of the United States, and resident of Forest Hill, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to typewriting machines and has for its object to provide improved line spacing mechanism for such machines.

My invention consists in certain combinations which will be fully set forth herein and particularly pointed out in the claims.

This application is a division of my application for Letters Patent for improvements in typewriters, Serial No. 28,142, filed August 27, 1900.

In the accompanying drawings, Figure 1 is a side view of the upper part of a typewriting machine having my improvements. Fig. 2 is a detail vertical sectional view of the line spacing mechanism, the view being taken on the line $x-x$ of Fig. 4, and looking toward the right in said figure. Fig. 3 is a perspective view of the same with parts broken away. Fig. 4 is a plan view of a portion of a typewriting machine having my improvements. Fig. 5 is a view similar to Fig. 2 but with the parts in a different position. Fig. 6 is an irregular vertical sectional view illustrating the mode of shifting the platen. Fig. 7 is a fragmentary sectional detail of a portion of the line spacing mechanism.

The typewriting machine to which I have shown my invention applied, has a top plate A^1 supported by posts A^{10} ; and posts A^2 and A^3 rising from said top plate, support rails A^4 and A^5 on which a carriage B is adapted to move back and forth across the machine, supported by rollers B^1 and B^2 . In such back and forth motion the carriage may be actuated by a spring drum and controlled by an escapement mechanism in the usual or any suitable manner. The carriage B comprises a rectangular frame, the end pieces of which are formed with depressions B^7 in which the shaft D^1 of the platen D is adapted to move up and down for upper and lower case printing, the types being mounted on type bars in pairs in the usual manner and adapted to strike the platen

approximately on the front face thereof. 55 The shaft D^1 of the platen is journaled in bearings formed in a platen frame E having longitudinal connecting bars E^1 at the rear and E^2 at the bottom. This platen frame is pivotally connected at the lower portion, 60 as at F^x , thereof to crank arms F^1 that are secured to a rock shaft F^2 mounted to turn in bearings in the end plates of the carriage B; whereas the upper portion of said platen frame is pivoted at F^z to the forward ends 65 of links F, the other ends of which are pivoted at B^8 to the carriage, the crank arms F^1 and the links F together constituting in effect parallel links on which the platen frame is adapted to be shifted up and down 70 to change the printing position. The shifting mechanism is not fully shown herein as it constitutes no part of the present invention, but it includes a shift rail G^1 which supports a roller E^3 journaled in the lower 75 longitudinal bar E^2 of the platen frame. Said shift rail G^1 is mounted on the ends of crank arms G secured to a rock shaft G^x journaled in lugs rising from the top plate A^1 , as shown in Fig. 6. The platen frame 80 is normally held by gravity in its lower position, in which position it rests on adjustable screws E^4 threaded into lugs projecting from the carriage B. The shaft G^x may be oscillated to raise the platen to upper case 85 position by hand operated means which are not shown but which are connected to an arm G^2 depending from said shaft G^x .

To the shaft D^1 of the platen is attached the usual ratchet or line spacing wheel D^2 and 90 this is actuated to give the desired single or double line spacing by means of mechanism which will now be described.

At the right-hand end of the carriage a rock shaft L terminating in a downwardly 95 extending finger piece L^1 , is pivoted in lugs L^{22} projecting from said carriage B. A spring L^2 , coiled about said rock shaft, serves to restore it to normal position after it has been rocked by the finger piece L^1 . 100 At its rear end the rock shaft has fixed thereto an upwardly extending crank arm L^3 provided with a small anti-friction roller L^4 . On a bracket L^5 connected to the platen frame E is mounted a bell crank or 105 angular lever L^6 provided with a depending vertical stud L^7 to engage the anti-friction roller L^4 above described. The lever L^6 is

returned to normal position by a spring L^{13} coiled about the pivot of the lever, and its motion is limited in either direction by lugs L^{14} connected to the platen frame E. The other arm of the lever L^6 carries a post L^7 connected thereto by a vertical pivot, and the rear end of a horizontally movable dog L^8 is connected to said post L^7 by a horizontal pivot L^9 . It will be observed that if the shaft L be oscillated by the finger piece L^1 , the dog L^8 will be moved rearwardly and in the same plane as the line spacing ratchet wheel and will engage one of the teeth of the ratchet D^2 and impart a line space feed to the platen. The dog L^8 has a shoulder L^9 (Fig. 3) and a pin L^{10} which engage the opposite sides of the tail of a pawl L^{11} which is independent of the dog L^8 and its actuating means, and is pivoted at L^2 to the platen frame (see Fig. 2). The engaging nose of said pawl L^{11} engages the teeth of the ratchet wheel D^2 and serves to lock the same against movement in either direction when the dog L^8 completes its feed stroke and thus prevents overthrow of the platen when the line spacing mechanism is violently actuated; and this is true whether the line spacing dog be employed for half spacing or for full spacing, as will hereinafter more clearly appear. It will thus be seen that the locking pawl extends into the path of the line spacing dog and is positively moved thereby to effect a locking of the platen against overthrow of the platen or against rotation in either direction when the dog has about completed its line spacing movement.

To the rear of the ratchet wheel D^2 is an independently actuated hand operated angular lever L^{12} that is pivoted to ears extending forwardly from the platen frame and the upper part of which forms a guide L^c for the space dog, and to the lower part of which is connected an elastic or resilient brake-shoe L^{13} that is preferably made of a strip of sheet metal. In the upper part of this lever is mounted a roller or detent L^{14} which in the normal position of the lever L^{12} is adapted to engage the ratchet and to hold it against accidental displacement but so that the platen may be turned one or more line space distances in either direction. This lever is under tension of a spring L^{15} attached to the platen frame E at one end and bearing at its free end against the lever and exerting a pressure thereon that tends to maintain the detent roller in engagement with the ratchet wheel and to maintain the brake spring out of contact therewith. The guide L^c on the lever L^{12} has a cross-bar or locking abutment L^d that is adapted to cooperate with a transverse locking notch L^{20} in the upper edge of the line space dog where it extends through the guide so that when the operator desires to write on lines or in spaces of a blank or

sheet that cannot ordinarily be brought to the printing line, it is merely necessary to raise the free end of the line spacing dog, thereby turning it around the pivot L^9 . The effect of this movement is to turn the lever L^{12} on its pivot against the tension of the spring L^{15} until the brake spring L^{13} is forced against the teeth of the line spacing ratchet wheel and the detent roller L^{14} will, by the same movement, be moved out of contact with the teeth of the wheel. By this time a slight relative movement of the line space dog and the guide L^c will have been effected and which is sufficient to bring the locking notch L^{20} into register with the cross-bar L^d of the guide and the cross-bar will be seated in said notch and will bear against the forward end thereof, as shown in Fig. 5, thus maintaining the parts in the positions to which they have been moved, with the brake spring bearing against the teeth of the line spacing wheel and the detent roller maintained away therefrom. At the same time the line spacing mechanism is locked against movement and the platen is free to be rotated by either finger wheel of the platen to the desired extent, and it will be retained in the position to which it is rotated by the brake spring L^{13} . By locking the line spacing mechanism out of actuation when the brake is applied for differential spacing, the hand lever L^1 may continue to be used to restore the carriage to the right without, however, at this time actuating the line spacing mechanism. A slight downward pressure exerted upon the forward or free end of the line spacing dog will release the parts from their locked positions and they will be restored to their normal positions with the detent roller bearing on the ratchet wheel, the brake spring moved away therefrom, the spacing dog in a position to cooperate with the ratchet wheel and the line spacing mechanism as a whole free to be actuated. While I prefer to employ a locking notch in the dog to cooperate with the guide in the manner specified, it should be understood that any suitable means may be employed for this purpose.

It will be seen that the actuation of either the locking lever L^{11} or the detent or braking lever L^{12} is entirely independent of the other, thus the movement of the locking lever in no way affects the detent lever, whereas when the braking lever is moved to a position where the brake spring is applied, any movement that may be transmitted to the locking lever is insufficient to bring the nose thereof into engagement with the teeth of the ratchet wheel.

In the forward portion of the lever L^{12} there is journaled a short shaft L^{16} (Fig. 3) having fixed thereto a cam L^{16} extending beneath the line spacing dog L^8 , which cam is adapted to be turned into a lower or

higher position by a head or finger piece L^{13} . The line spacing dog L^8 has on the underside thereof an inclined shoulder L^{17} which is engaged by the cam L^{16} when the same is turned to its higher position in which it is shown, for example, in Fig. 2. When the cam L^{16} is in said higher position, the dog L^8 as it is reciprocated by the handle L^1 engages every tooth of the ratchet D^2 for single spacing; but when said cam L^{16} is in its lower position the dog L^8 also drops to a lower position and engages every other tooth of the ratchet for double spacing. It will be seen that the throw of the dog L^8 is the same, whether it be employed for single or double spacing and that therefore the locking lever will be actuated to lock the ratchet wheel at the end of the stroke irrespective of the extent of line spacing movement transmitted to the platen. The cam L^{16} may be retained in either of its positions by a spring piece L^{29} engaging the hub of the finger piece L^{18} , a portion of which hub may be flattened for the purpose as indicated at L^{28} in Fig. 7. It is to be further noted that the construction is such that the same movement is imparted to the spacing mechanism whether the platen is lifted for upper case writing or is in the lowermost position for lower case writing, the depending stud L^7 being adapted to engage with the roller L^4 when the platen is in either of said positions. It will likewise be noted that the single movement of the finger piece is effective to produce the line spacing movement of the platen and to simultaneously move the carriage back to the right to begin a new line. It will also be seen that the horizontally disposed pivot L^5 and the vertically disposed pivot which connects the post L^2 to the angular lever are at right angles to each other, and that the construction embodies a universal joint between the rock-shaft and the line spacing pawl for transmitting motion from the rock shaft to the line spacing pawl which has a movement in the general direction of the rock shaft.

While I have shown my invention applied to a front strike typewriting machine, it will be understood that it is not limited to such use, but may be applied to any style of typewriting machine.

What I claim as new and desire to secure by Letters Patent, is:—

1. In a typewriting machine, the combination of a platen, a line spacing ratchet wheel therefor, a cooperating line spacing dog, a detent that is adapted to bear upon said line spacing wheel, a brake to retard the rotation of the platen, and means controlled by the line spacing dog for throwing and maintaining said detent out of engagement with the ratchet wheel and for applying said brake.

2. In a typewriting machine, the combination of a platen, a line spacing ratchet

wheel therefor, a pivoted lever having a resilient brake-spring at one end thereof and a detent at the other end, which detent is adapted to be normally maintained in contact with the ratchet wheel, and means for turning said lever on its pivot to throw the detent out of contact with the ratchet wheel and the brake spring into contact therewith.

3. In a typewriting machine, the combination of a platen, a line spacing ratchet wheel therefor, a pivoted lever having a resilient brake-spring at one end thereof and a detent at the other end, which detent is adapted to be normally maintained in contact with the ratchet wheel, and a line spacing dog that is adapted to turn said lever on its pivot to throw the detent out of contact with the ratchet wheel and to throw the brake-spring into contact therewith.

4. In a typewriting machine, the combination of a platen, a line spacing ratchet wheel therefor, a cooperating line spacing dog, a pivoted spring pressed lever that has a guide in which said dog is adapted to vibrate, and a brake and a detent carried by said lever.

5. In a typewriting machine, the combination of a platen frame, a platen, a line spacing ratchet wheel therefor, a cooperating pivoted line spacing dog, a spring-pressed angular lever pivoted to the platen frame, a brake and a detent carried by said lever, and means controlled by a movement of the line spacing dog for moving and maintaining the lever in such position that the detent will be thrown out of cooperation with the teeth of the ratchet wheel and the brake will be applied to retard the rotation of the platen.

6. In a typewriting machine, the combination of a platen, a line spacing ratchet wheel therefor, a cooperating pivoted reciprocating line spacing dog, means for reciprocating said dog, a spring-pressed pivoted lever, a brake and a detent carried by said lever, and means controlled by a movement of the line spacing dog around its pivot for moving and maintaining the lever in such position that the detent will be thrown out of cooperation with the teeth of the ratchet wheel and the brake will be applied to retard the rotation of the platen and the means for reciprocating the dog will be locked against movement.

7. In a typewriting machine, the combination of a platen, line spacing mechanism therefor, a brake to retard the rotation of the platen, and means for automatically locking the line spacing mechanism against operation when the brake is applied.

8. In a typewriting machine, the combination of a platen, a line spacing ratchet wheel therefor, line spacing devices cooperating therewith, a detent that is adapted to cooperate with said line spacing wheel, a brake to retard the rotation of the platen,

and means for automatically throwing the line spacing devices out of operation when the detent is thrown out of cooperation with the ratchet wheel and the brake is applied.

5 9. In a typewriting machine, the combination of a carriage, a platen, a line spacing ratchet wheel therefor, a line spacing device cooperating therewith, a hand lever for actuating said line spacing device and for moving the carriage from left to right, a detent
10 that is adapted to cooperate with said line spacing wheel, a brake to retard the rotation of the platen, and means for automatically locking the hand lever against line spacing
15 movement when the detent is thrown out of cooperation with the ratchet wheel and the brake is applied.

10. In a typewriting machine, the combination of a carriage, a platen, a line spacing
20 ratchet wheel therefor, a cooperating line spacing dog, a pivoted spring-pressed lever that has a guide in which said dog is adapted to vibrate, a brake and a detent carried by said lever, a hand lever that is connected to
25 said line spacing dog and which is effective to move the carriage from left to right, and means for throwing off the detent, applying the brake and locking said lever against line spacing movement.

30 11. In a typewriting machine, the combination of a carriage, a platen frame, a platen, a line spacing ratchet wheel therefor, a cooperating pivoted line spacing dog, a hand lever therefor, and which is likewise effective
35 to move the carriage from left to right, a spring pressed angular lever pivoted to the platen frame, a brake and a detent carried by said angular lever, and means controlled by a movement of the line spacing dog for moving
40 ing and maintaining the angular lever in such position that the detent will be thrown out of cooperation with the teeth of the ratchet wheel, the brake will be applied to retard the rotation of the platen and the
45 hand lever will be locked against line spacing movement.

12. In a typewriting machine, the combination with a platen and its attached line-spacing ratchet, of a dog adapted to engage
50 therewith, a bell-crank connecting with said dog and having a downwardly extending stud connecting with its free arm, a rock shaft having an arm adapted to engage said stud, and a thumb lever at its opposite forward end, whereby the line spacer may be
55 operated by the thumb of the operator as the carriage is moved to the right.

13. In a typewriting machine, the combination of a platen, an actuating device for
60 imparting step-by-step line spacing movements to the platen, a resilient brake which is normally out of braking action and means for applying said brake to the platen by a movement of said actuating device.

14. In a typewriting machine, the combination of a platen, a line spacing ratchet
65 wheel connected thereto, line spacing mechanism cooperating with said ratchet wheel, a locking pawl which is normally out of engagement but which cooperates with said
70 ratchet wheel, means controlled by the movement of the line spacing mechanism for forcing the locking pawl by a positive pressure into engagement with the ratchet wheel, and a resilient brake which is normally out of
75 braking engagement and which is forced into such engagement by the movement of a part of the line spacing mechanism.

15. In a typewriting machine, the combination of a platen, a line spacing ratchet
80 wheel connected thereto, an actuating device cooperating with said ratchet wheel to impart step-by-step movements thereto, a bearing roller which normally bears upon the teeth of said ratchet wheel, means for moving
85 said roller away from the teeth by a movement of said actuating device, and a resilient brake which is normally out of braking engagement and which is automatically forced into such engagement when the said
90 roller is forced away from the teeth of the ratchet wheel.

16. In a typewriting machine, the combination of a platen, a line spacing ratchet
95 wheel connected thereto, line spacing mechanism cooperating with said ratchet wheel, a locking pawl which is normally out of engagement but which cooperates with said ratchet wheel, means controlled by the movement of the line spacing mechanism for forcing
100 ing the locking pawl by a positive pressure into engagement with the ratchet wheel, and a resilient brake which is normally out of braking engagement and which is forced into such engagement by a movement of a part of
105 the line spacing mechanism.

17. In a typewriting machine, the combination of a platen, a line spacing ratchet
110 wheel connected thereto, line spacing mechanism cooperating with said ratchet wheel, an angular lever carrying a bearing roller on one arm thereof and a resilient brake on the other arm thereof, said brake being normally out of engagement and the bearing roller normally in engagement with the teeth of the
115 ratchet wheel, and means controlled by said line spacing mechanism for effecting a movement of said angular lever to withdraw the roller from engagement and to force the brake into engagement.
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18. In a typewriting machine, the combination with a carriage and a platen carried thereby and shiftable for upper and lower case printing, of a ratchet wheel for said
12 platen; a dog for operating said ratchet wheel; means situated behind said ratchet wheel for operating said dog; and a rock shaft extending from front to rear of said

carriage for operating said dog operating means in either of the positions to which said platen is shiftable.

19. In a typewriting machine, the combination of a carriage; a platen frame and platen mounted on said carriage and shiftable for upper and lower case printing; a ratchet wheel connected to said platen; a line space dog for actuating said ratchet wheel; and a rock shaft journaled in said carriage and extending from front to rear thereof and arranged to operate said line space dog, whether the platen is in upper or lower case position.

20. In a typewriting machine, the combination of a platen, a line spacing wheel, a line spacing pawl, a rock shaft having a crank arm that carries an anti-friction roller, and an angular lever with which said anti-friction roller coöperates and which coöperates with said pawl.

21. In a typewriting machine, the combination of a platen, a line spacing wheel, a line spacing pawl, a rock-shaft having a crank arm that carries an anti-friction roller, said rock shaft extending fore and aft of the machine, an angular lever with which said anti-friction roller coöperates and which coöperates with said pawl, and a finger piece on said rock-shaft which transmits line spacing movements to the parts by a swinging movement of the finger piece from left to right, whereby a single-movement of the finger piece is effective to line space and to move the carriage to the right to begin a new line.

22. In a typewriting machine, the combination of a platen, a vertically movable platen frame, a carriage, a line spacing ratchet wheel connected with the platen, a line spacing pawl, an angular lever for actuating said pawl, a hand actuated rock-shaft, and a sliding connection between said rock-shaft and angular lever.

23. In a typewriting machine, the combination of a platen, a vertically movable platen frame, a carriage, a line spacing ratchet wheel connected with the platen, a line spacing pawl, a lever coöperating there-

with, and a rock-shaft carried by the carriage and having a crank arm which carries an anti-friction roller, said anti-friction roller coöperating with said lever.

24. In a typewriting machine, the combination of a carriage, a platen, a line spacing wheel connected therewith, a line spacing pawl that moves fore and aft of the machine in the same plane as the line spacing wheel, an angular lever pivoted to the carriage and to which said pawl is pivoted, a rock shaft that extends fore and aft of the machine and is mounted in a bearing on the carriage, connections from said rock shaft to said angular lever, and a finger piece on the rock shaft and which effects a line spacing movement of the pawl by a swinging movement of the finger piece from left to right, whereby a single movement of the finger piece will effect a line spacing of the platen and a movement of the carriage to the right to begin a new line of writing.

25. In a typewriting machine, the combination of a platen, a line spacing ratchet wheel connected therewith, a line spacing pawl that coöperates with said ratchet wheel for actuating said wheel, a finger piece for actuating said rock shaft, a crank arm on the rock shaft, a lever actuated by said crank arm, a roller bearing between said crank arm and lever, and operative connections between said lever and line spacing pawl.

26. In a typewriting machine, the combination of a platen, a line spacing wheel connected therewith, a line spacing pawl, a rock shaft that extends fore and aft of the machine, a finger piece for turning said shaft, an angular lever, a roller bearing connection between the rock shaft and angular lever, and operative connections between the angular lever and pawl.

Signed at the borough of Manhattan, city of New York, in the county of New York, and State of New York, this 25th day of January, A. D. 1906.

GEORGE H. SMITH.

Witnesses:

E. M. WELLS,

M. F. HANNWEBER.