

903,327.

C. H. SHEPARD.
TYPE WRITING MACHINE.
APPLICATION FILED OCT. 19, 1901.

Patented Nov. 10, 1908.
2 SHEETS—SHEET 1.

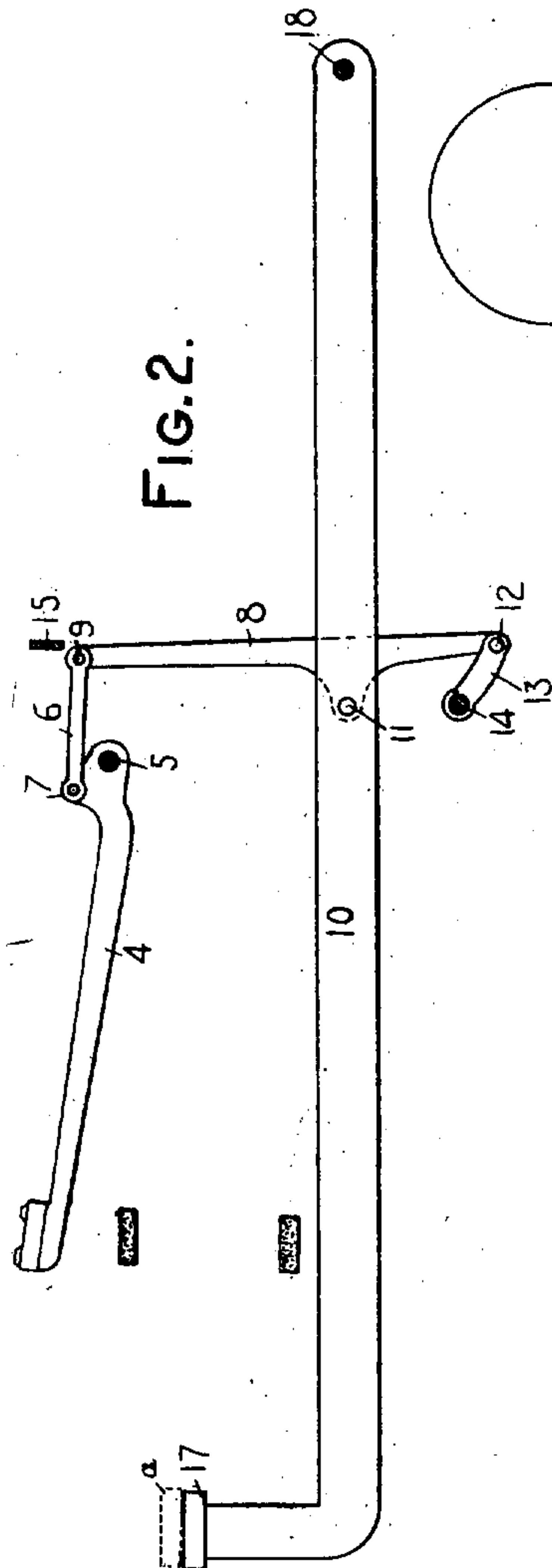


FIG. 2.

WITNESSES:
K. V. Donovan
Charles E. Smith

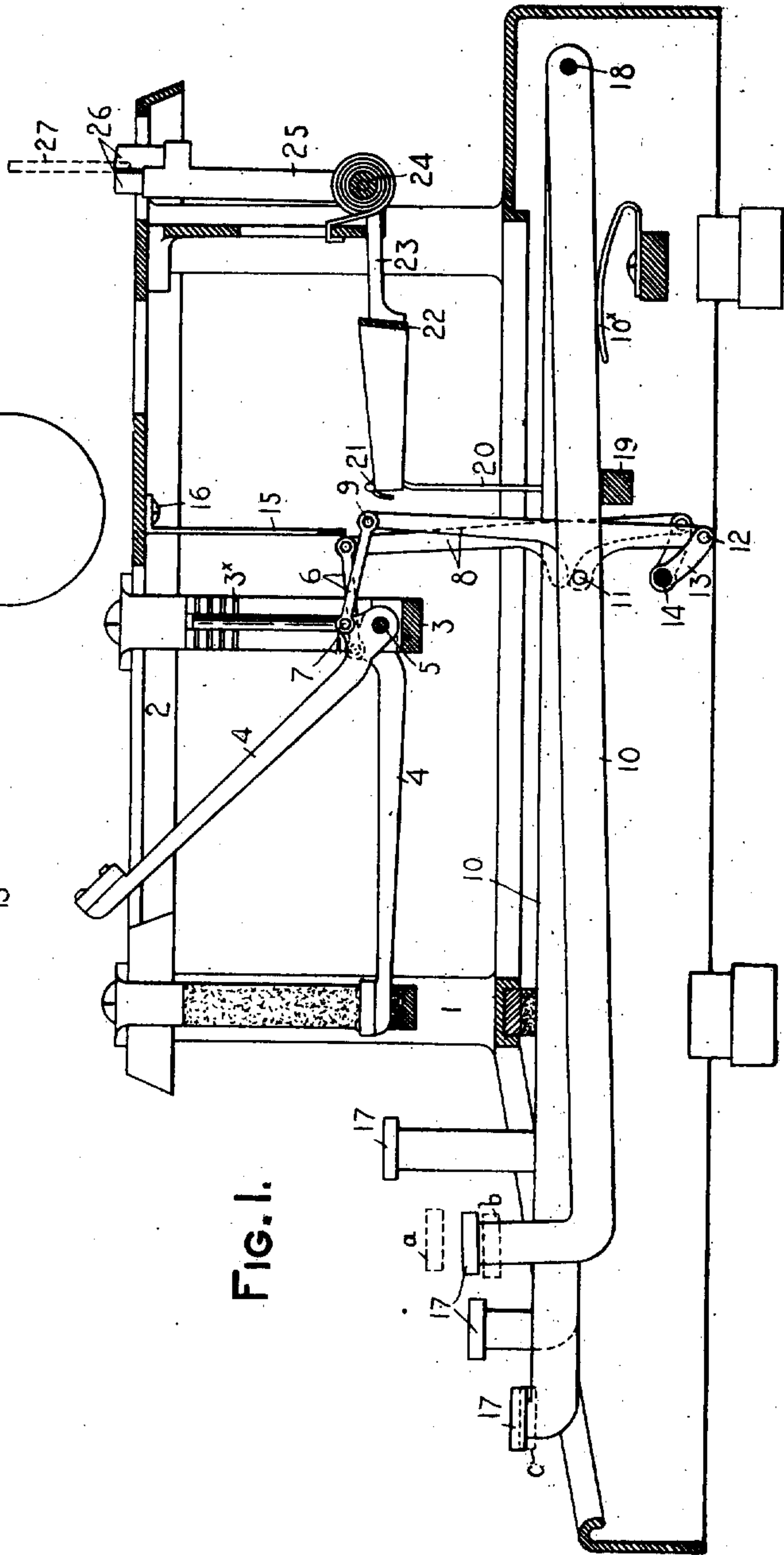


FIG. 1.

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Charles H. Shepard
by Jacob Felbel
HIS ATTORNEY

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C. H. SHEPARD.
TYPE WRITING MACHINE.
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Patented Nov. 10, 1908.
2 SHEETS—SHEET 2.

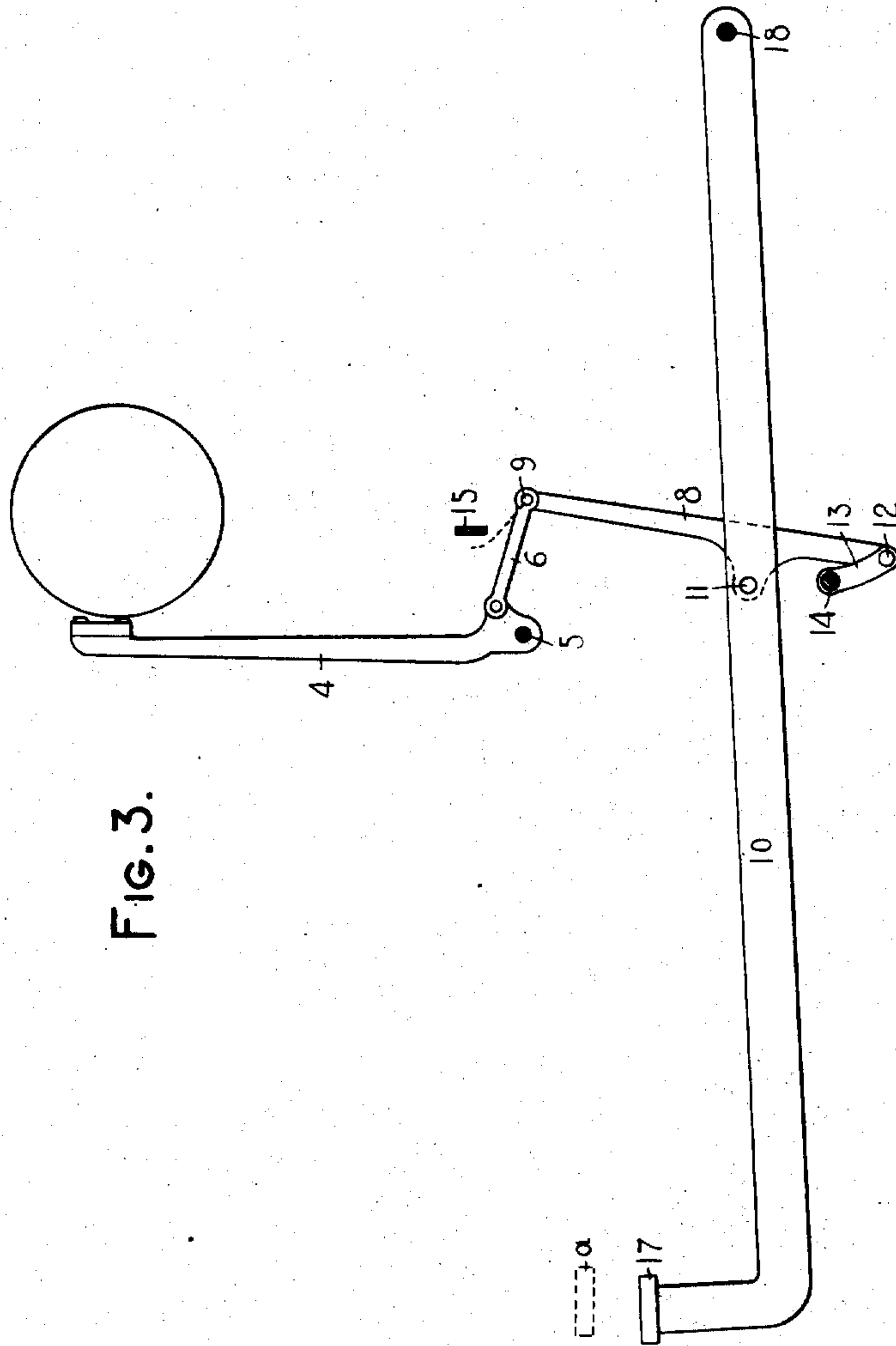


FIG. 3.

WITNESSES.

K. V. Donovan.
Charles E. Smith

INVENTOR

Charles H. Shepard
by *James Felbel*
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UNITED STATES PATENT OFFICE.

CHARLES H. SHEPARD, OF NEW YORK, N. Y., ASSIGNOR TO WYCKOFF, SEAMANS & BENEDICT,
OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

No. 903,327.

Specification of Letters Patent.

Patented Nov. 10, 1908.

Application filed October 19, 1901. Serial No. 79,218.

To all whom it may concern:

Be it known that I, CHARLES H. SHEPARD, citizen of the United States, and resident of the borough of Brooklyn, city of New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

In some typewriting machines heretofore constructed it often occurs that a type bar or carrier will return to the normal position with such force, especially when the machine is rapidly operated, that the carrier will rebound from the normal position, and should the operator depress the key of an adjacent type bar or carrier while this rebound is taking place, the rebounding bar will interfere with the subsequently operated bar in its movement to the printing point. This defect is especially inherent in front strike typewriting machines wherein the type bars are mounted in a segment and wherein it is necessary to mount the type bars in close and compact arrangement, in order to provide a sufficient number of bars in the machine. The arrangement is often such that a bare clearance is provided for each bar in the movement thereof to the printing point and past the adjacent bars. It will be readily understood therefore that unless each bar is in its normal position when the adjacent bar is operated, the previously operated bar is apt to be in the path of the subsequently operated bar and interfere with its movement. Of course, the faster the machine is operated the more pronounced will be this defect.

One object of my present invention is to overcome this defect in existing typewriting machines and to provide a simple and efficient structure wherein it is impossible for the type carriers to rebound to an interfering extent.

A further object of my invention is to provide a simple, efficient, quick and easy type bar action and one wherein a comparatively slight movement is imparted to the type bar or carrier during the first portion of the key depression and in which this movement is accelerated as the bar approaches the platen during the last part of the key depression.

To these ends my invention consists in the novel features of construction and arrangements and combinations of parts hereinafter

described and particularly pointed out in the claims.

In the accompanying drawings wherein like characters represent corresponding parts in the various views:—Figure 1 is a vertical sectional view of sufficient number of parts of a typewriting machine to illustrate my invention, the section being taken from front to rear of the machine. Fig. 2 is a diagrammatic side view of the action. Fig. 3 is a like view of the same, the parts being illustrated in the positions they assume when the type bar is at the printing point.

1 is the framework of the machine, 2 the top plate, and 3 a type bar segment in the radiating slots 3^x of which are mounted the type bars or type carriers 4, the pivot rod of said type bars being indicated at 5. 6 is an actuating link pivoted at 7 to the type bar 4 and the opposite end of this link is pivoted to an actuating lever 8 at the point marked 9. 10 is a horizontal key lever to which the actuating lever 8 is pivoted at 11, and the lower end of each of the actuating levers 8 is pivoted at an unvarying point as at 12 to one end of a guide link 13 that is pivoted to a fixed portion of the machine at 14. When I refer to the actuating levers 8 and guide links 13 as being connected at unvarying points 12 I means that there is no variation in these points of connection during the operation of the machine.

To the rear of the segmentally arranged type bars and their actuating mechanism, is a fixed segmental locking bar or abutment 15, which is secured to the top plate 2 of the machine as indicated at 16. Each of the levers 10 is provided with a finger key 17 and is pivoted at its rear end at 18, and is provided with a suitable spring 10^x that tends to restore each key lever and its cooperating parts to their normal positions. Extending beneath the key levers is a universal bar 19 which is connected to upwardly extending links 20 that are united at 21 to a bar 22, which is carried by an arm 23 projecting from a rock shaft 24 of the dog rocker 25. The dog rocker 25 may be provided with the usual feed dogs 26 that are adapted to cooperate with any suitable cooperating feed rack 27, carried by a suitable platen carriage, not shown.

From an examination of Fig. 1 of the

drawings, it will be observed that the rear end of each actuating link 6 is directly forward of the locking bar or abutment 15, and is maintained in this position when its key lever is in the normal position and the slightest rebounding movement of a type bar from the normal position, indicated by the lowermost bar in Fig. 1, will force the link or the lever 8 to which it is connected, or both back into contact with said locking bar or abutment, thus preventing any rebounding movement of the type bar which would permit it to extend into the path of an adjacent type bar. A depression however, of any of the key levers will cause its associated link 6 first to be moved down sufficiently far to enable it to clear the locking abutment, as indicated at Fig. 2 of the drawings, wherein the amount of depression of the key is indicated by the difference between the full line and dotted line position *a*.

The course of travel of the pivot 9 which unites the actuating lever and its link, is indicated in dotted lines in Fig. 3, which represents the type bar in the printing position. It will be understood that the movement of the parts back to the normal position will cause the actuating link or the lever at the point of its connection with the link, to traverse this same path, so that the parts will clear the locking abutment in this backward movement.

From the foregoing description, it will be seen that the actuating link and lever of each action have one path of movement when they are moved by a key lever, whereas, they follow a different path of movement during the very slight rebound of a type bar and until they reach contact with the locking bar. In practice the actuating lever and link may be brought into actual contact with the locking abutment when the parts are in the normal position so that there can be no rebounding movement whatever of the parts. Notwithstanding the fact that the various portions of each action are positively connected, a slight movement of each key lever and its connected parts takes place at the initial portion of the depression of a key lever without transmitting motion to the type bar. The lost motion thus produced is due to the peculiar disposition of the parts of each action, and is indicated by the dotted line position *c* of the foremost finger key in Fig. 1. A movement of each key from the full line position to the position indicated at *c* takes place before any movement is transmitted to the type bar.

From an examination of Fig. 1 of the drawings, it will be seen that about a two-thirds depression of a key is required to move the type bar from its normal position to about one-half the distance to the printing point. This is clearly indicated by a comparison of the dotted position *a* in Fig.

1, which corresponds to the normal position of the key, with the full line position of the same key. By comparing this dotted line position *a* with the full line position of the same key, it will be seen that the key has traveled about two-thirds of the distance between the initial position and the limit of this movement which is indicated in dotted lines at *b*. It will likewise be seen that it only requires a further depression of this key from the full line position to the dotted line position *b* to move the cooperating type bar one-half the extent of its travel.

In operation, a slight lost motion is produced at the initial portion of the key depression which is followed by a slight movement of the type bar through the first portion of the depression of the key lever, whereas an accelerated or more rapid movement of the type bar is produced as the type bar approaches the printing point. For this reason an easy and quick action is provided.

While I have shown the various features of my invention as embodied in a "front strike" typewriting machine, it should be understood that they may be employed in other styles of writing machines.

It will be seen that the actuating lever 8 extends across its associated key lever 10 and the point of connection 12 between each lever 8 and its guide link 13 moves in a fixed or unvarying arc around the pivot 14. It will likewise be seen that the lever 8 is supported on the swinging fulcra 11 and 12, which move in opposite arcs, the link 13 extending from its pivot in a direction opposite that of the key lever 10 from its pivot. The link 13 extends forwardly from the lever 8, said link standing normally crosswise of and approximately at right angles to a line connecting the ends 9 and 12 of the sub-lever, and the lower end of lever 8 is farthest from the fixed center 14 considered fore and aft of the machine when the parts are in the normal position but when a finger key is depressed the lower end of the lever 8 will be brought nearer to the fixed point 14. At the first part of the key depression, the lever 8 will vibrate slowly but as the type bar continues its movement towards the printing point, the lower end of the lever 8 will be swung with greater rapidity towards the pivot 14, thereby causing the most rapid movement of the type bar just before and at the time it reaches the printing position. On the return movement of the type bar it travels with the greatest speed near the printing point, in order quickly to clear the path of other bars in their approach to the platen, and then gradually slackens its speed as it approaches the normal position.

By connecting the parts as shown and described, the lower end of the lever 8 is drawn forward by an easy action of the parts, during the depression of a key lever, and the up-

per end of said lever 8 is vibrated rearwardly to move the type bar to the printing position, the type bar starting slowly under the best leverage and subsequently increasing in velocity as it approaches the printing point.

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

1. In a typewriting machine, the combination of a type carrier, a key lever, intermediate actuating means between the type carrier and its cooperating key lever, and an abutment against which a part of the intermediate actuating means is adapted to abut when a carrier rebounds from the normal position, the path of movement followed by the said part of the actuating means during the rebound of its carrier being different from its path of movement when operated by its key lever.

2. In a typewriting machine, the combination of a type bar, a cooperating key lever therefor, an actuating link connected to the type bar and operatively connected to the key lever and a cooperating arresting device, the path of movement of the link being in one direction when the type bar rebounds and in another direction when the link is moved by a key lever.

3. In a typewriting machine, the combination of a type bar, a cooperating key lever therefor, an actuating link connected to the type bar and operatively connected to the key lever, and a fixed cooperating arresting device against which the link is adapted to abut when the type bar rebounds from the normal position; the path of movement of the link being in one direction when the type bar rebounds and in another direction when the link is moved by the key lever.

4. In a typewriting machine, the combination of type bars, a cooperating key lever for each bar, an actuating lever operatively connected to each type bar and to its cooperating key lever, and an abutment with which each actuating lever cooperates to limit the rebound of the type bars from the normal position, the path of movement of each actuating lever being in one direction when a type bar rebounds and in another direction when it is moved by its key lever.

5. In a typewriting machine, the combination of type bars, a cooperating key lever for each bar, an actuating link connected to each type bar, an actuating lever connected to each link and operatively connected to its key lever, and an abutment with which each actuating link and lever cooperates to limit the rebound of the type bars from the normal position, the path of movement of each actuating link and lever being in one direction when the type bar rebounds and in another direction when the parts are moved by the key lever.

6. In a typewriting machine, the combination of a type bar, a key lever therefor, an

actuating link connected to the type bar, an actuating lever connected to the key lever and link, a guiding link connected to the actuating lever, and an abutment independent of said parts and which cooperates therewith to limit the rebound of the type bar.

7. In a typewriting machine, the combination of a pivoted type bar, a key lever therefor, an actuating link pivoted to the type bar, an actuating lever pivoted to the key lever and link, a guiding link pivoted to the actuating lever and to a fixed portion of the machine and a fixed bar or abutment which cooperates with the said actuating parts to limit the rebound of the type bar.

8. In a typewriting machine, the combination of a type carrier, means for operating said type carrier, and a fixed abutment with which said operating means for the carrier cooperate when the carrier rebounds from the normal position, the said abutment and type carrier operating means being normally out of engagement.

9. In a typewriting machine, the combination of type carriers, means for operating said carriers, and a fixed abutment with which the operating means for all the carriers are adapted to cooperate when the carriers rebound from the normal position, said operating means and abutment being normally out of engagement, and the said abutment being ineffective to prevent the movement of the type carriers when they are actuated by their operating means.

10. In a typewriting machine, the combination of a type carrier, an actuating link connected to and movable with relation to said carrier, a key lever operatively connected to said link, and a fixed abutment with which the link is normally out of engagement but with which the link abuts in the rebound of the carrier from the normal position.

11. In a typewriting machine, the combination of a type carrier, a key lever, a type carrier actuating lever pivoted to and carried by said key lever, a link which connects the type carrier to its actuating lever, means for operatively connecting the actuating lever to the framing of the machine, and an arresting device which is normally out of engagement with the link but cooperates therewith in its backward movement to limit the rebound of the type carrier from the normal position.

12. In a typewriting machine, the combination of a type bar, a key lever, a link connected to said type bar and operatively connected to the key lever, and a fixed abutment against which the link is adapted to be forced to arrest the rebound of the type bar from the normal position, the said link being normally out of engagement with the fixed abutment but adapted to be moved to clear the same when the key lever is operated.

13. In a typewriting machine, the combination of a type bar, a key lever therefor, an

nation of a type bar, a key lever therefor, a fixed abutment, and a type bar actuating link which is pivoted at one end to the type bar and is at its opposite end operatively connected to the key lever and disposed in front of but out of engaging position with the abutment when the parts are in normal position.

14. In a typewriting machine, the combination of a type bar, a key lever therefor, a fixed abutment, a type bar actuating link which is pivoted at one end to the type bar and is disposed in front of but out of engagement with the abutment when the parts are in normal position and means, controlled by the key lever, for moving the link away from the abutment and for moving the type bar to the printing point when the key lever is depressed.

15. In a typewriting machine, the combination of a type bar, a key lever therefor, a fixed abutment, a type bar actuating link which is pivoted at one end to the type bar and is disposed in front of but out of engagement with the locking abutment when the parts are in normal position and means, controlled by a depression of the key lever, for moving the link away from the abutment, and for moving the type bar to the printing point with an accelerated movement as the type bar approaches the platen.

16. In a typewriting machine, the combination of a type bar, a key lever therefor, an actuating lever operatively connected to the key lever and to the type bar, a guiding link connected to said actuating lever and to a fixed portion of the machine, and means arranged behind the actuating lever for preventing a rebound of the type bar from the normal position.

17. In a typewriting machine, the combination of a type bar, a key lever therefor, an actuating lever pivoted to said key lever, an actuating link pivoted to the type bar and to the actuating lever, and a guide link which is arranged fore and aft of the machine which is fixedly pivoted to the actuating lever and pivoted to a fixed portion of the machine, and all of the parts being so disposed that a lost motion of the key lever is effected before movement is transmitted to the type bar.

18. In a typewriting machine, the combination of a type bar, a key lever therefor, an actuating lever pivoted to said key lever, an actuating link pivoted to the type bar and to the actuating lever and a guide link which is arranged fore and aft of the machine and which is fixedly pivoted to the actuating lever and pivoted to a fixed portion of the machine, said parts being positively connected and so disposed as that a lost motion of the key lever is effected before movement is transmitted to the type bar and an accelerated movement of said type bar is produced as it approaches the printing point.

19. In a typewriting machine, the combination of a key lever, an actuating lever which crosses and is pivoted to the key lever, a type bar operatively connected to said actuating lever, and a fixedly pivoted guide link which is operatively connected to the actuating lever and whose swinging end extends in the general direction of the pivotal end of the key lever.

20. In a typewriting machine, the combination of a key lever, an actuating lever which crosses and is pivoted to the key lever at 11, a type bar operatively connected to said actuating lever, and a guide link which is fixedly pivoted at one end and which is also pivoted at 12 to said actuating lever, the said pivoted portions or fulcrum 11 and 12 vibrating in arcs that are oppositely disposed with reference to their respective centers during a depression of the key lever to effect an acceleration of the type bar in its movement to the printing position.

21. In a typewriting machine, the combination of a type bar, a key lever, an upright actuating lever pivoted to said key lever and having an arm operatively connected to said type bar, and a pivoted guide link pivoted to said actuating lever and arranged crosswise of a straight line drawn between the ends of said actuating lever and operative through the pivotal connection with the actuating lever to guide the actuating lever, the movements of the pivotal points of the actuating lever being on fixed arcs and alone controlling the vibrations of said lever on the key lever as the latter is vibrated.

22. In a typewriting machine, the combination of a series of type bars, a series of key operated levers, a series of sub-levers pivoted to the key operated levers, fulcrum links to which said sub-levers are pivoted, and means for enabling said sub-levers to operate the type bars; said fulcrum links standing normally about at right angles to said sub-levers, and being so proportioned and mounted that during the printing strokes they are vibrated into a position nearly longitudinal of said levers.

23. In a front-strike writing machine, the combination of a series of rearwardly striking type bars, a series of key bearing levers extending forwardly beneath the type bars, a series of sub-levers upstanding in rear of the type bars and pivoted upon said key-bearing levers, fulcrum links to which said sub-levers are pivoted at unvarying points, said fulcrum links extending in a fore and aft direction and being pivoted at one of their ends upon a fixed support, and forwardly extending links connecting the upper ends of said sub-levers to said type bars; said fulcrum links being so pivoted and of such length as to vibrate the sub-levers rearwardly through the pivotal connections at constantly accelerated speed when operated by said key-bearing levers.

24. In a front-strike typewriting machine, the combination of a front-strike type bar, an actuating link connected to said type bar, a sub-lever connected to said actuating link, a fulcrum link pivoted to said sub-lever and to the fixed framework of the machine, and a key lever to which the sub-lever is pivoted, said actuating link, fulcrum link and key lever being out of alinement with one another and approximately parallel when in normal position.

25. In a front-strike typewriting machine the combination of a front-strike type bar, an actuating link pivoted to said type bar, a sub-lever pivoted to said actuating link, a fulcrum link pivoted to said sub-lever and to the fixed framework of the machine, and a key lever to which said sub-lever is pivoted, said actuating link and said fulcrum link being out of alinement with each other and approximately horizontal when in normal position.

26. In a typewriting machine, the combination of a segmentally arranged series of type bars, a series of actuating links pivoted to said type bars, a series of sub-levers pivoted to said actuating links, a series of fulcrum links pivoted to said sub-levers and to the fixed framework of the machine, and a series of key levers to which said sub-levers are pivoted, said actuating links and said fulcrum links connected with the several type bars being out of alinement with each other and each approximately perpendicular to the plane of the type bar segment when in normal position.

27. In a front-strike typewriting machine, the combination of a front-strike type bar, an actuating link pivoted to said type bar, a sub-lever pivoted to said actuating link, a fulcrum link pivoted to said sub-lever and to the framework of the machine, and a key lever to which said sub-lever is pivoted, said actuating link and said fulcrum link when in normal position being out of alinement with each other, approximately parallel to each other, and extending in the same direction from said sub-lever.

28. In a front-strike typewriting machine, the combination of a front-strike type bar, an actuating link pivoted to said type bar, a sub-lever to which said actuating link is pivoted, a fulcrum link pivoted to said sub-lever and to the framework of the machine, and a key lever to which said sub-lever is pivoted, said actuating link, fulcrum link and key lever being pivoted to said sub-lever at different points lengthwise of the latter, and said actuating link and fulcrum link being approximately parallel when in normal positions.

29. In a typewriting machine, the combination of a type bar, a sub-lever, two independently mounted movable members upon which said sub-lever is pivoted at unvarying points, one of said independently mounted members being an unvarying fulcrum for said sub-lever, a key connected to the other of said independently mounted members, and means for connecting said sub-lever at one end to said type bar, each of said independently mounted members extending crosswise of said sub-lever in the same general direction in the normal positions of the parts.

30. In a typewriting machine, the combination of a type bar, a key lever, a sub-lever connected to said type bar and pivoted upon said key lever, and a fulcrum link to which said sub-lever is pivoted at an unvarying point and whereby said sub-lever is given a vibratory movement when actuated by the key lever, the said link being at such an angle to the sub-lever and the latter being so related to the key lever as to enable the sub-lever to have a bodily endwise movement simultaneously with its vibratory movement and to effect a gradual acceleration of the type bar as it approaches the printing position.

31. In a typewriting machine, the combination of a series of type bars, a series of key-operated levers, a series of sub-levers pivoted to the key-operated levers, fulcrum links to which said sub-levers are pivoted at unvarying points, each of said fulcrum links extending about at right angles to a line connecting the ends of its sub-lever, and the latter extending crosswise of said key-operated levers, and links connecting said sub-levers to the type bars.

32. In a front-strike writing machine, the combination of a series of rearwardly striking type bars, a series of key-bearing levers, a series of sub-levers pivoted upon the key-bearing levers and having upstanding arms which are connected to the type bars, and a series of short horizontal fulcrum links upon which said sub-levers are also pivoted, and whereby said sub-levers are vibrated when actuated by said key-bearing levers.

Signed at the borough of Manhattan, city of New York, in the county of New York, and State of New York, this 1st day of October, A. D. 1901.

CHARLES H. SHEPARD.

Witnesses:

CHARLES E. SMITH,
K. V. DONOVAN.