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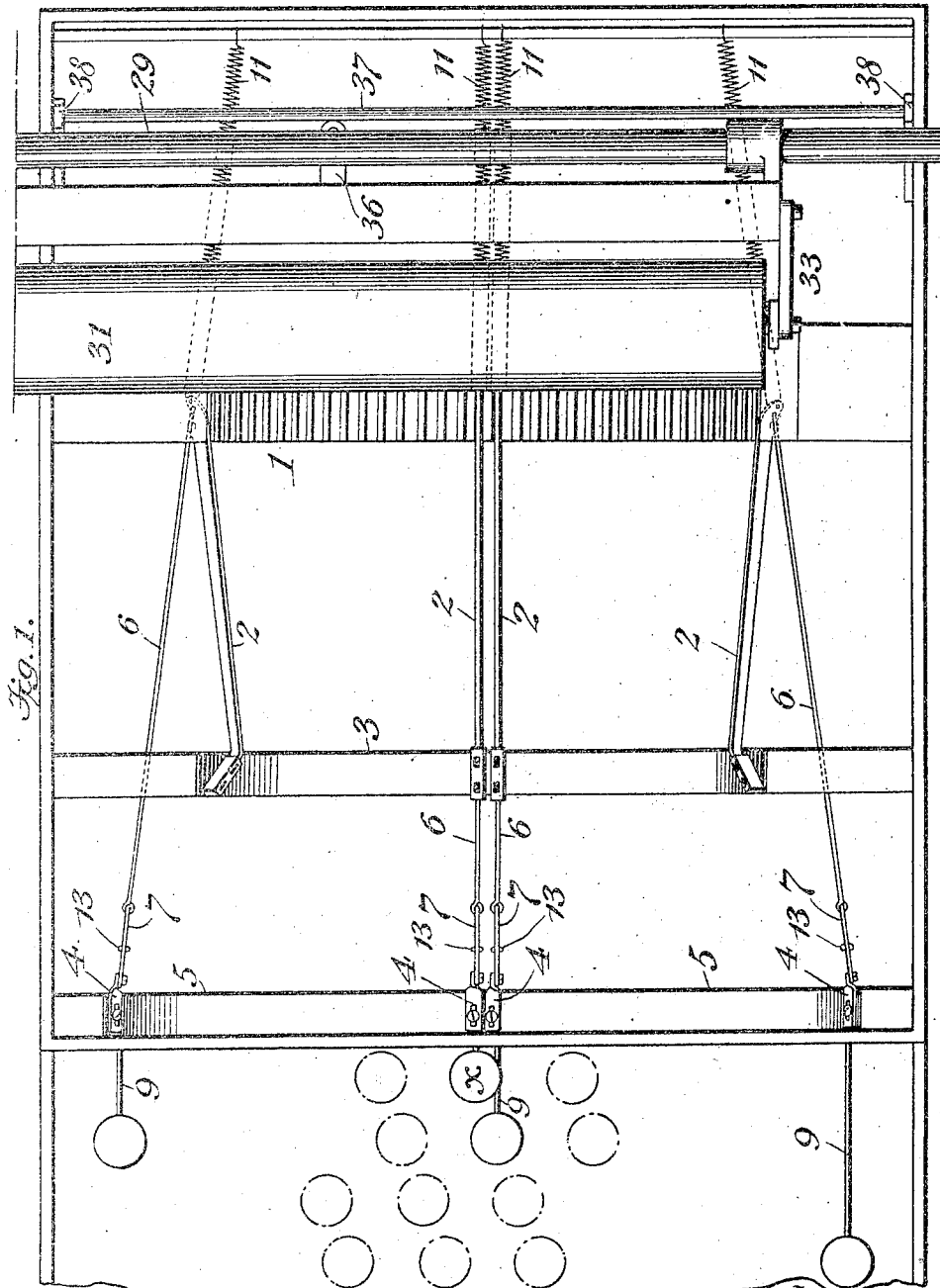
PATENTED MAY 29, 1906.

E. B. HESS.

WRITING MACHINE.

APPLICATION FILED AUG. 1, 1905.

2 SHEETS—SHEET 1.



Witnesses
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L. F. Browning

Inventor
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By his Attorney
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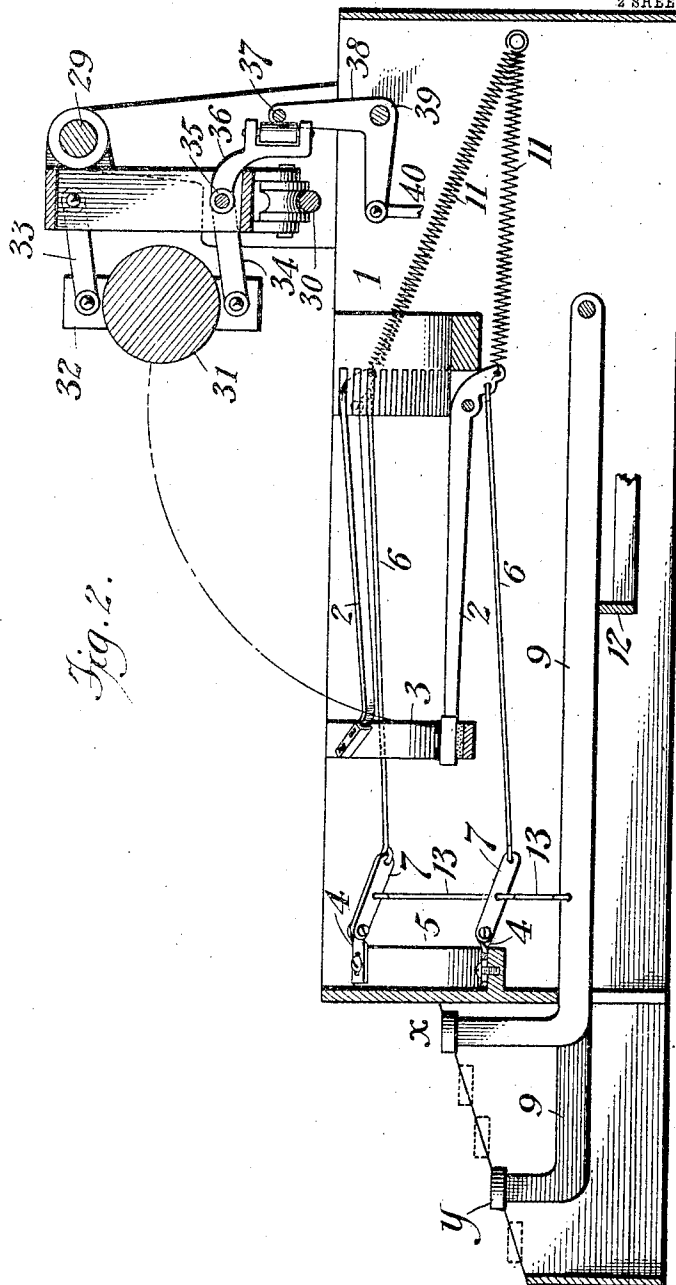


Fig. 2.

Witnesses
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UNITED STATES PATENT OFFICE.

EDWARD B. HESS, OF NEW YORK, N. Y., ASSIGNOR TO ROYAL TYPE-WRITER COMPANY, OF HOBOKEN, NEW JERSEY, A CORPORATION OF NEW JERSEY.

WRITING-MACHINE.

No. 322,208.

Specification of Letters Patent.

Patented May 29, 1906.

Original application filed August 27, 1901, Serial No. 73,460. Divided and this application filed August 1, 1905. Serial No. 272,171.

To all whom it may concern:

Be it known that I, EDWARD B. HESS, a citizen of the United States, residing in the borough of Brooklyn, city of New York, State of New York, have invented certain new and useful Improvements in Writing-Machines, of which the following is a specification:

In my Patent No. 700,687, dated May 20, 1902, application for which was filed April 26, 1901, I have shown and claimed a structure containing flexible type-bar-actuating connections having the general construction and mode of operation of those herein disclosed. That patent shows and claims, however, details of construction not herein disclosed and to which the claims thereof are drawn, the right being reserved therein to make generic claims in my application, Serial No. 73,460, of which this case is a division. The detachable adjustable fixed pieces or anchor-points, hereinafter described, in an organization of the general character herein shown are claimed in my application, Serial No. 73,460.

In the accompanying drawings, Figure 1 is a plan view of so much of a machine as is deemed desirable to illustrate the invention; Fig. 2, a vertical longitudinal section there-through.

The machine herein disclosed is a front-stroke type-bar-writing machine. It is contemplated that each type-bar shall have two characters thereon and that either the type-bar segment or platen shall be shifted to print at will either upper or lower case letters. As shown, provision is made for shifting the platen.

The frame is of any appropriate construction. At a suitable point below the plane in which the platen is located is mounted the type-bar segment 1, in which the type-bars 2 are pivoted on a rod or wire, as usual. They lie toward the front of the machine against a segmental rest 3. To the heel or projection of each type-bar is attached the rear end of a flexing connection, the front end of which is secured to a fixed point or piece 4, adjustably and detachably mounted by a slot-and-screw connection in a segment 5, located toward the front of the machine and in front of the transverse plane in which the heads of the type-bars normally lie. Each connection (in the form in which it is shown) is com-

posed of a rear link 6 and a front link 7, united at their adjacent ends by a hinge-joint formed by interlocking eyes at the ends of the links. Below the flexing connection is a series of key-levers 9, whose upturned ends are equipped with finger-pieces arranged in straight parallel rows. Somewhat in rear of their extreme front ends the key-levers converge toward the rear, so that at a point below the type-bar segment 1 they occupy a space substantially equal in width to the length of its chord. Each key-lever is connected by a link 13 with the front link 7 at a point intermediate the ends of the latter. Springs 11 are shown applied to the type-bars, and springs may be applied to the key-levers. If a universal bar 12 be employed beneath the key-levers it may, as usual, be urged upwardly against the key-levers by spring-pressure. Either or both arrangements may be employed. It is sufficient that the spring reaction, wherever and however applied, shall properly assist in returning the type-bars to their position of rest, and so normally maintain them.

To secure a uniform depth of depression of the finger-pieces, the points of connection of the links 6 with the type-bars, or the angle at which the links 7 are disposed, may be varied. When a finger-piece and its key are depressed, link 13 is drawn down, flexing the connection downward and swinging that part of it in front of the point of flexure—i.e., link 7—around its pivotal connection on the fixed piece 4, thus drawing the rear link 6 toward the front of the machine and actuating the type-bar by a pull. This movement is characterized by a minimum of resistance at the start, with corresponding low velocity of the type-bar and an increase in resistance and type-bar velocity during the downward excursion of the finger-piece.

The links 6 7 are shown as inclined downwardly toward the point of flexure, the angle at which link 7 is set determining the desired depth of depression of the finger-piece required to move the type-bar through an arc of ninety degrees.

The links 7 are shown disposed at such angle as to afford moderate and suitable depth of depression of the finger-pieces, and the construction illustrated contemplates that they may be of uniform length.

Two key-levers only are shown. It is the

center key of the upper row, connected with the central flexing connection, running to the lowest point of the segment 5. 9^r is one of the end keys of the front and is connected with a flexing connection running to the end of the segment.

The construction of the carriage and platen and mechanism for shifting the latter may be of any appropriate character.

As shown, the carriage travels upon rails 29 and 30, mounted in brackets located at the sides of the frame. The platen 31 is mounted in a frame 32, carried in the ends of parallel pivoted arms 33 34, extending horizontally from the carriage. The lower arms 34 are fast to the ends of a rock-shaft 35, from the center of which projects an arm 36, whose end is acted upon by a cross-rod 37, held in the ends of bell-crank levers 38, located at the sides of the machine and fast to a rock-shaft 39. The bell-crank 38 at the left-hand side of the machine has connected to it a link 40, to be suitably actuated on the depression of a shift-key.

The relation of the type-bars and flexing connections is much the same, affording substantial uniformity of behavior. The structure is light, cheap, and simple and affords a marked refinement of "touch" of the finger-pieces.

The point of connection between links 7 and 13 is in front of the hinge-joint connecting the links 6 7 and, as shown in this instance, is about midway between such hinge-joint and the pivotal connection of link 7 with its fixed or anchor piece 4. In this construction the link 6 is subjected to tensile strain only and may therefore be a light wire or cord. The link 7, while subjected to similar tensile strain, is also subjected to lateral strain and is shown as made of stiff flat metal. An organization of this kind affords a good touch and high acceleration of the type-bar. Preferably the joints between the members of the flexing connection and between it and the fixed point and type-bar are such as to allow slight twisting movements. This is particularly desirable at the type-bars near the ends of the segment. Such joints having this capacity may for convenience be called "universal" joints.

The arrangement designated by me a "flexing connection" may have in some forms the full operation of a reverse or accelerating toggle and in all forms is of the nature of such a toggle. As illustrated, application of power thereto is in a line intersecting one drawn between the fixed point and the point of attachment to the type-bar.

I claim as my invention—

1. In a writing-machine, a type-bar-actuating connection capable of flexure intermediate its ends and arranged on opposite sides of the point of flexure so that, when flexed, it has the action of a reverse or accelerating toggle

throughout its flexing movement, a type-bar and a fixed part to which, respectively, the ends of such connection are connected, said connection extending in a straight line from the point of toggle flexure to the point of connection to the type-bar, and means acting upon said connection intermediate its ends to flex it and pull the type-bar to the printing-point with an increasing velocity.

2. In a writing-machine, a connection capable of flexure intermediate its ends and arranged, when flexed, to act similar to a reverse or accelerating toggle, a part to be actuated connected to one end of such connection and a fixed point to which the other end is attached, combined with operating means located below such connection and connected therewith intermediate the ends of the latter.

3. In a writing-machine, a connection capable of flexure intermediate its ends and arranged, when flexed, to act similar to a reverse or accelerating toggle, a part to be actuated connected to one end of such connection and a fixed point to which the other end is attached, combined with a key-lever arranged below such connection and operatively connected to the latter intermediate its ends.

4. In a writing-machine, a flexing connection composed of two links united by a hinge-joint and arranged, when flexed at such joint, to act similar to a reverse or accelerating toggle throughout its entire flexing movement, a part to be actuated connected to one end of such connection and a fixed point to which the other end is attached, combined with a key-lever arranged below the flexing connection and operatively connected thereto intermediate the ends of the latter.

5. In a writing-machine, a flexing connection composed of two links united by a hinge-joint and arranged, when flexed at such joint, to act similar to a reverse or accelerating toggle throughout its entire flexing movement, a part to be actuated connected to one end of such connection and a fixed point to which the other end is attached, combined with operating means applied to the flexing connection intermediate its ends.

6. In a front-strike writing-machine, the combination of a platen, a type-bar support in a plane below the platen, type-bars pivoted in the support and normally lying toward the front of the machine, a flexing type-bar-actuating connection for each type-bar attached at its rear end to its type-bar and at the front to a fixed part of the frame and acting when flexed similar to a reverse or accelerating toggle, and means for flexing the connection by power applied thereto intermediate its ends and in a line intersecting a straight line extending between the front and rear end of the flexing connection.

7. In a front-strike writing-machine, the

combination of a platen, a type-bar support in a plane below the platen, type-bars pivoted in the support and normally lying toward the front of the machine, a flexing type-bar-actuating connection for each type-bar attached at its rear end to its type-bar and at the front to a fixed part of the frame and acting when flexed similar to a reverse or accelerating toggle, and means for flexing the connection by power applied thereto from below it and in a line intersecting a straight line extending between the front and rear ends of the flexing connection.

8. In a front-strike writing-machine, the combination of a platen, a type-bar support in a plane below the platen, type-bars pivoted in the support and normally lying toward the front of the machine, a flexing type-bar-actuating connection for each type-bar attached at its rear end to its type-bar and at the front to a fixed part of the frame and acting when flexed similar to a reverse or accelerating toggle, a key-lever and means which, on depression of the key-lever, acts upon said connection, to flex it, in a line intersecting a straight line extending between the ends of such connection.

9. In a front-strike type-writing machine, the combination of a pivoted type-bar arranged below the platen and normally lying toward the front of the machine; a flexing connection disposed below said type-bar, one end being connected to the type-bar, and the opposite end secured to a point arranged in front of the type-bar pivot, said opposite end being arranged to swing about said fixed point with a movement entirely pivotal when said connection is flexed; and means applied upon the flexing connection intermediate its ends for flexing it to actuate the type-bar, the distance between the point of flexure and connection with the type-bar being greater than the distance between the point of flexure and the fixed point.

10. In a front-strike type-writing machine, the combination of a pivoted type-bar arranged below the platen and normally lying toward the front of the machine; a flexing connection disposed below said type-bar, one end being connected to the type-bar, and the opposite end secured to a point arranged in front of the type-bar pivot, said opposite end being arranged to swing about said fixed point with a movement entirely pivotal when said connection is flexed; and means applied upon said flexing connection intermediate its ends for flexing it to shorten the distance between the ends of the flexing connection and to actuate the type-bar by drawing the part of the bar connected with the flexing connection toward the fixed point the distance between the point of flexure and connection with the type-bar being greater than the distance between the point of flexure and the fixed point.

11. In a front-strike type-writing machine, the combination of a pivoted type-bar, arranged below the platen, and normally lying toward the front of the machine; a flexing connection comprising two links connected at the point of flexure and disposed below the said type-bar, one end of said connection being connected to the type-bar and the opposite end secured to a fixed point arranged in front of the type-bar pivot, said opposite end being arranged to swing about said fixed point with a movement entirely pivotal when said connection is flexed; the length of the link connected with the fixed point being shorter than the link connected to the type-bar; and means acting upon said flexing connection intermediate its ends for actuating the type-bar.

12. In a front-strike type-writing machine the combination of a pivoted type-bar, arranged below the platen, and normally lying toward the front of the machine; a flexing connection comprising two links connected at the point of flexure and disposed below the said type-bar, one end of said connection being connected to the type-bar and the opposite end secured to a fixed point arranged in front of the type-bar pivot, said opposite end being arranged to swing about said fixed point with a movement entirely pivotal when said connection is flexed; and means applied upon said flexing connection intermediate its ends for flexing it to shorten the distance between the ends of the flexing connection and to actuate the type-bar by drawing the part of the bar connecting the flexing connection toward the fixed point, the distance between the point of flexure and connection with the type-bar being greater than the distance between the point of flexure and the fixed point.

13. In a front-strike writing-machine, the combination of a platen, a type-bar segment, type-bars pivoted in the segment and normally lying toward the front of the machine, flexing connections extending fore and aft of the machine between the type-bars and fixed points, key-levers acting upon such flexing connections intermediate their ends to flex them and pull the type-bars to the printing-point with an increasing velocity, and means for changing the relation of the platen and type-bar segment.

14. In a front-stroke writing-machine, the combination of platen; a segmental type-bar support in a plane below the platen; a type-bar pivoted therein and normally lying toward the front of the machine; a flexing type-bar-actuating connection having its rear end connected with the type-bar, extending forward thereunder, and having its front end attached to a fixed point in front of the transverse plane in which the head of the type-bar normally lies; and means applied to the flexing connection between the type-bar and fixed point to flex said connection and pull

the type-bar to the printing-point with an increasing velocity.

15. In a front-stroke writing-machine, the combination of the entire series of pivoted type-bars; flexing actuating connections, one for each type-bar, each acting throughout its movement similar to a reverse or accelerating toggle, and having one end operatively connected to its type-bar and the opposite end attached to a fixed point; finger-pieces, one for each type-bar, and devices which, on the depression of the finger-pieces, act upon the respective flexing connections intermediate their ends to pull the type-bars to the printing-point with an increasing velocity.

16. In a writing-machine, the combination of the entire series of pivoted type-bars; actuating connections, one for each type-bar, each comprising two links united at their adjacent ends by a hinge-joint, the rear end of one link being operatively connected with its type-bar, and the front end of the other link with a fixed point, each link being so disposed that the hinge-joint is in a plane below the horizontal plane in which the fixed point lies; finger-pieces, and devices actuated thereby to further depress the hinge-joints and thereby throw the type-bars to the printing-point with an increasing velocity.

17. In a writing-machine, the combination of a pivoted type-bar; its actuating connection comprising two links united at their adjacent ends by a hinge-joint, the rear end of the link being operatively connected with the type-bar, and the front end of the other link with a fixed point in front of and substantially horizontally opposite the point of connection with the type-bar, the links being so disposed that the hinge-joint is in a plane below a substantially horizontal line extending between the fixed point and the point of connection with the type-bar; a finger-piece, and a device actuated by the finger-piece and applied to the flexing connection intermediate its ends and in rear of the fixed point to further depress the hinge-joint and thereby throw the type-bar to the printing-point with slight initial resistance and increasing velocity.

18. In a front-stroke writing-machine, the combination of a platen, a type-bar segment in a plane below the platen, type-bars pivoted therein and normally lying toward the front of the machine, a series of flexing connections, one for each type-bar, extending from their respective type-bars forward to fixed points in front of the transverse planes in which the heads of the type-bars normally lie and having their front ends arranged in a transverse curved line, and means acting upon the flexing connection between their front ends and the transverse plane in which the heads of the type-bars normally lie to depress or flex the connection and thereby pull the type-bars to the printing-point with an increasing velocity.

19. In a front-stroke writing-machine, the combination of a platen, a type-bar segment in a plane below the platen, type-bars pivoted therein and normally lying toward the front of the machine, a series of flexing connections, one for each type-bar, extending from their respective type-bars forward to fixed points in front of the transverse plane in which the heads of the type-bars normally lie and having their front ends arranged in a transverse curved line, and key-levers, one for each flexing connection, pivoted at their rear ends, extending forward under the respective flexing connections and connected therewith at a point between the front ends of the latter and the transverse plane in which the heads of the type-bars normally lie, whereby when the key-levers are depressed, the corresponding type-bars are thrown to the printing-point with an increasing velocity.

20. In a front-stroke writing-machine, the combination of a platen, a segmental type-bar support in a plane below the platen, type-bars pivoted therein and normally lying toward the front of the machine, flexing connections, one for each type-bar, connected at their rear ends to their respective type-bars, and extending forward thereunder to fixed points in front of the transverse plane in which the heads of the type-bars normally lie, key-levers arranged under the flexing connections and respectively connected therewith intermediate their ends and at substantially uniform distances in rear of said fixed points, whereby when the key-levers are depressed their respective flexing connections are actuated to pull the type-bars to the printing-point with an increasing velocity.

21. In a front-stroke writing-machine, the combination of a platen, a segmental type-bar support in a plane below the platen, type-bars pivoted therein and normally lying toward the front of the machine, flexing connections, one for each type-bar, comprising two links united at their adjacent ends by a hinge-joint, connected at the rear with their respective type-bars and extending forward thereunder to fixed points arranged in a substantially uniform transverse curved line in front of the transverse plane in which the heads of the type-bars normally lie, the distance between such fixed points and hinged joints being substantially uniform, key-levers arranged below the flexing connections, and connections between the key-levers and flexing connections applied to the latter intermediate their ends and in rear of the fixed points, thereby on the depression of a key-lever the corresponding flexing connection is flexed and the type-bar thrown to the printing-point with an increasing velocity.

22. In a front-stroke writing-machine, the combination of a platen, a segmental type-bar support in a plane below the platen, a series of type-bars pivoted therein and normally

lying toward the front of the machine, a series of flexing connections, one for each type-bar, connected at their rear ends to their type-bars and extending forward to fixed points arranged in front of the transverse plane in which the heads of the type-bars normally lie and substantially horizontally opposite or in front of the type-bar segment, finger-pieces and devices, actuated by the finger-pieces, connected with the flexing connections in rear of the fixed points to flex such connections and throw the type-bars to the printing-point with an increasing velocity, the distance between the type-bars and the points of flexure being greater than that between the fixed points and points of flexure.

23. In a front-stroke writing-machine, the combination of a platen, a segmental type-bar support in a plane below the platen, a series of type-bars pivoted therein and normally lying toward the front of the machine, a series of fixed points arranged in front of the type-bar support and in a transverse curved line conforming generally to the curve of the type-bar support but of greater radius, flexing connections extending from the type-bars to such fixed points, and means acting upon the flexing connections intermediate their ends and in rear of the fixed points to flex them and pull the type-bars to the printing-point with an increasing velocity.

24. In a front-stroke writing-machine, the combination of a platen, a type-bar segment in a plane below the platen, type-bars pivoted therein and normally lying toward the front of the machine, flexing connections, one for each type-bar, each acting similar to an accelerating-toggle and composed of two links extending from front to rear of the machine below the type-bars and connected at its rear to the type-bar and at its front to a fixed part of the machine, key-levers, and a connection between each key-lever and the front link of its corresponding flexing connection intermediate the ends of the latter.

25. In a front-stroke writing-machine, the combination of a platen, a type-bar segment in a plane below the platen, type-bars pivoted therein and normally lying toward the front of the machine, flexing connections, one for each type-bar, each acting similar to an accelerating-toggle and composed of a short front link hinged at its front end to a fixed

part of the frame, a longer rear link having its front end connected to the rear of the front link and its rear end attached to its type-bar, key-levers and a connection between each key-lever and the front link, of its corresponding flexing connection, intermediate the ends of the latter.

26. In a front-stroke writing-machine, the combination of a platen, a type-bar segment in a plane below the platen, type-bars pivoted therein and normally lying toward the front of the machine, flexing connections, one for each type-bar, each comprising a short front link and a longer rear link, the front link being attached to a fixed part of the frame and inclined downwardly therefrom and the rear link being attached to its type-bar, and means applied intermediate the ends of the front link for flexing such connection and thereby throwing the type-bars to the printing-point with an increasing velocity.

27. In a writing-machine, a series of pivoted type-bars normally lying in a substantially horizontal position and adapted to be thrown to a substantially vertical printing position, and a series of accelerating-toggle connections for actuating them.

28. A writing-machine comprising a series of accelerating-toggle type-bar-actuating connections arranged in different longitudinal vertical, and different horizontal, planes, a series of type-bars moving with an increasing velocity, and means for actuating the toggle connections to throw the type-bars to the printing-point.

29. In a writing-machine, a series of downwardly-flexing accelerating-toggles, a series of upwardly-moving accelerating type-bars operatively connected thereto, and means applied directly to the toggles intermediate their ends for actuating them to throw the type-bars upwardly to the printing-point.

30. In a type-bar writing-machine, the series of pivoted type-bars, combined with a corresponding series of accelerating-toggle connections for pulling the bars to the printing-point with increasing velocity.

In testimony whereof I have hereunto subscribed my name.

EDWARD B. HESS.

Witnesses:

EDWARD C. DAVIDSON,
LILLIE F. BROWNING.