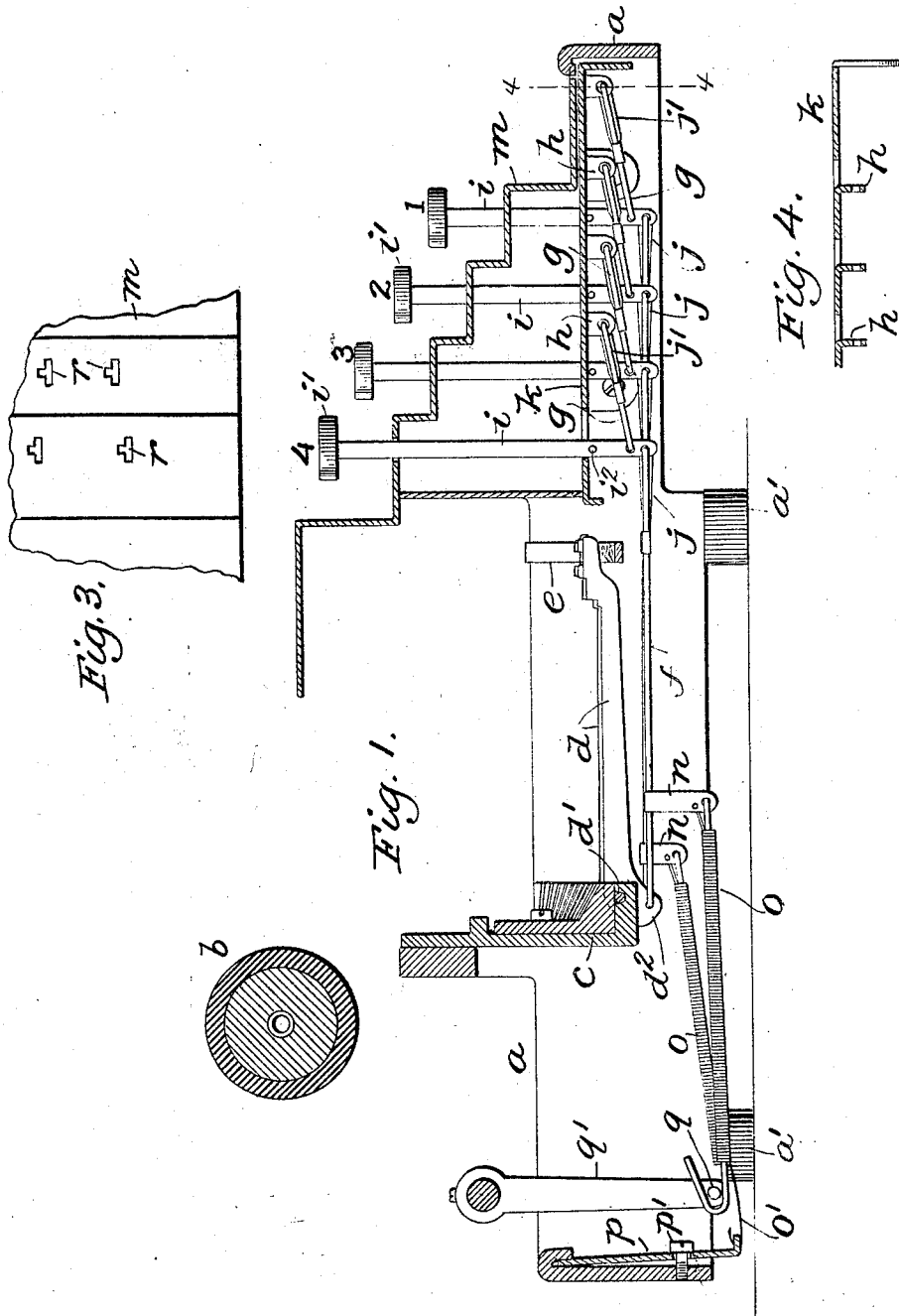


E. B. HESS & J. M. STOUGHTON.
 WRITING MACHINE.
 APPLICATION FILED MAR. 30, 1905.

967,915.

Patented Aug. 23, 1910.

2 SHEETS—SHEET 1.



Witnesses
 James F. Duhamel
 L. E. Browning

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 Joseph M. Stoughton
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E. B. HESS & J. M. STOUGHTON.

WRITING MACHINE.

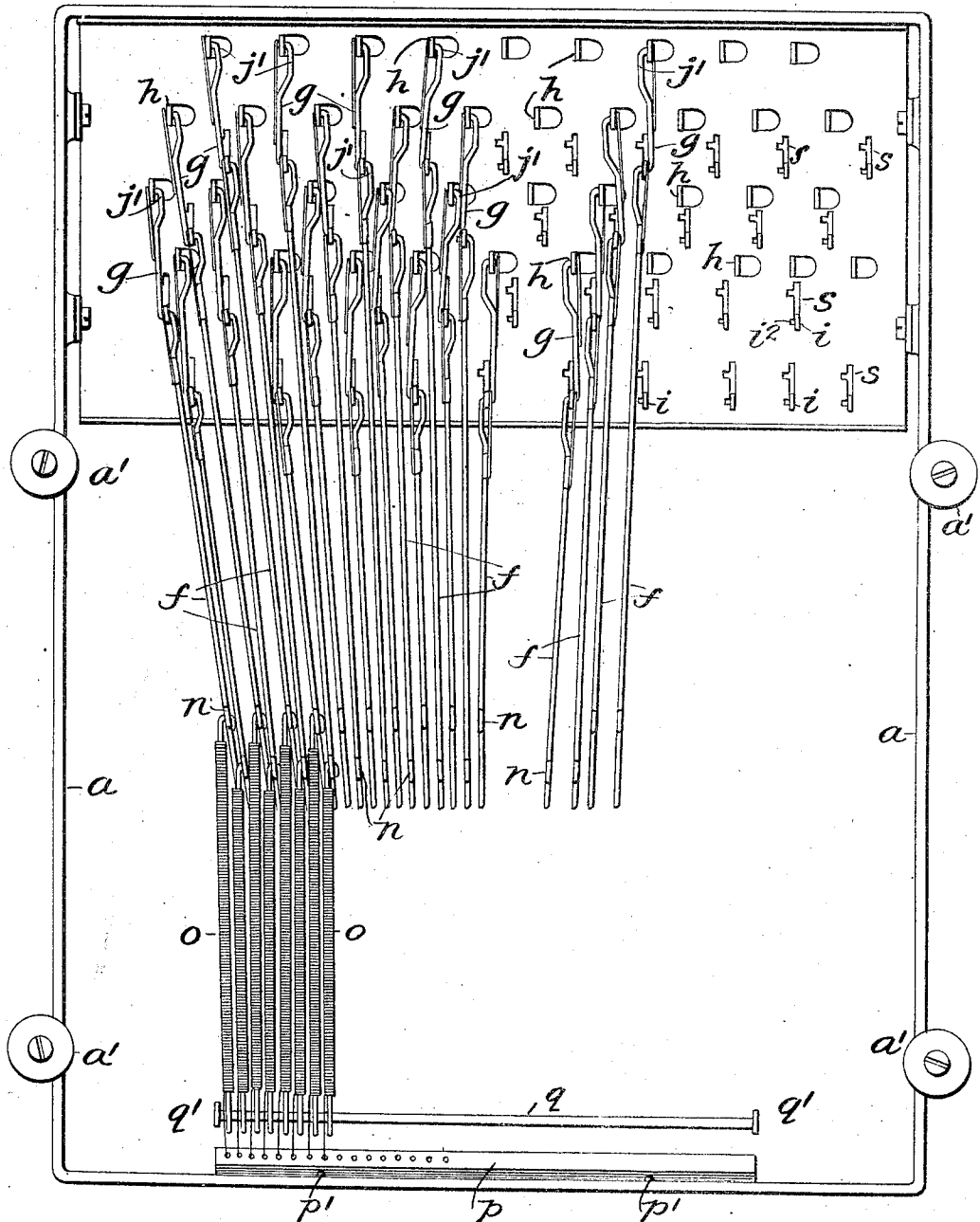
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2 SHEETS—SHEET 2.

Fig. 2.



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EDWARD B. HESS, OF NEW YORK, AND JOSEPH M. STOUGHTON, OF YONKERS, NEW YORK, ASSIGNORS TO ROYAL TYPEWRITER COMPANY, OF HOBOKEN, NEW JERSEY, A CORPORATION OF NEW JERSEY.

WRITING-MACHINE.

967,915.

Specification of Letters Patent.

Patented Aug. 23, 1910.

Application filed March 30, 1905. Serial No. 252,818.

To all whom it may concern:

Be it known that we, EDWARD B. HESS, of the borough of Brooklyn, city and State of New York, and JOSEPH M. STOUGHTON, of the city of Yonkers, county of Westchester, and State of New York, citizens of the United States of America, have invented certain new and useful Improvements in Writing-Machines, of which the following is a specification.

This invention relates to typewriting machines of the general character disclosed in U. S. Patent No. 700687 granted May 20, 1902 to Edward B. Hess; and comprises a novel, efficient and economical construction of the type bar actuating devices.

In the accompanying drawings which show so much only of a typewriting machine as will serve to illustrate the invention, Figure 1, is a vertical longitudinal section; Fig. 2, a bottom plan omitting the platen, type bar segment and type bars, and showing the type-bar operating links broken away in front of their points of connection with the type-bars; Fig. 3, a detail plan of part of the stepped keyboard plate; and Fig. 4, a vertical transverse section on line 4, 4 through part of the bottom horizontal key-board plate.

The main frame is shown, in this instance, as composed of an open rectangular casting *a* provided on the bottom at each side with two cushion-feet *a'* of rubber or other suitable material. A front strike machine is shown, of which *b* is the platen, *c* the slotted type-bar segment; and *d* type-bars, two only being shown. The type-bars extend from the segment toward the front of the machine, and, as usual, rest normally upon a segmental rest *e*.

The construction of the type-bar segment and pivoting of the bars therein may be of any appropriate character. As shown, *d'* is a pivot rod or wire common to the entire series of type bars. The heel *d''* of each type bar, below the segment, has connected to it an operating link *f* which extends under the assemblage of type bars toward the front of the machine and is flexibly connected to the rear end of a shorter link whose front end is pivotally connected to a fixed piece *h*, on the frame. In the construction illustrated the joint between the

links *f*, *g*, is made by means of the end of the vertical stem *i* of a push pin finger piece *i'* in the key-board. The rear end of link *f* is formed with a hook or eye that engages in an aperture in the heel of the type-bar, such joint permitting, to the required extent, a universal movement. The front end of this link is provided with a snap hook *j*, by means of which it is engaged with the aperture nearest the end of the stem *i*. The rear end of the front link *g* is formed with a hook or eye which engages the upper aperture in the finger piece stem *i*, and the front end of this link is formed with a snap hook *j*, that engages an aperture in a lug or ear *h* punched on three sides from the horizontal bottom plate *k* of the key-board and turned down at right angles.

m is the stepped top plate of the key-board, there being four steps for the four series of finger pieces 1, 2, 3, 4, arranged as usual in lines transverse to the machine. There is, of course, for each type-bar a link *f*, a link *g*, and finger piece and stem. The lugs or ears *h* are arranged in a plane horizontal, or substantially so, in four transverse series corresponding to the transverse rows in the bank of finger pieces. The links *f* will, of course, extend rearwardly at varying angles from the horizontal depending upon the position of the corresponding type bar in the type bar segment. The arrangement of the lugs or fixed pieces or anchor points for the front ends of the front links in a horizontal plane, or substantially so, but in separate transverse rows corresponding with the rows of the finger pieces, constitutes one of the leading features of this invention quite irrespective of any particular mode of hinging the pairs of links together at their adjacent ends or of operating the flexing connections formed by the links. The arrangement is one that permits of a low key-board, and the construction is simple and economical because all of the anchor points may be conveniently and cheaply formed from a single piece of sheet metal. All of the parts may be held in the normal position indicated in Fig. 1 by means of suitably applied springs.

In the present construction each link *f* has clamped, or otherwise rigidly attached to it, at a suitable point in front of the heel

of the type-bar, a downwardly extending arm n . The entire series of such arms may be arranged in two transverse rows, those in the front row being preferably made somewhat longer than those in the rear row to afford proper clearance for all necessary movements. A coiled spring o having one end attached to the arm n extends rearwardly and has its rear end o' hooked into an aperture in the lower edge of a transverse vertically disposed plate p , the upper edge of which fits in a groove in the transverse rear frame plate and is supported by two adjusting screws p' passing loosely through apertures in the plate and working in threaded sockets in the frame plate. By manipulation of these screws, the tension of the entire series of springs for all the type-bars may be simultaneously adjusted.

q is the universal bar extending between the rocking pendent arms q' and actuated as follows: From each arm n , a link extends through the coiled spring o and has its rear end formed with a hook of sufficient dimensions that embraces the universal bar, such degree of lost motion being provided as to effect actuation of the universal bar at the proper point in the traverse of the type-bars to the printing point on the platen.

This arrangement of springs, the mode of adjusting them, and of the universal bar devices have been shown by experience to be practicable and efficient. Moreover, it is economical in construction and convenient to assemble. As seen in Fig. 3, the apertures r in the top plate of the key board for the passage of the finger piece stems are formed with lateral enlargements to permit the passage of lateral pins i^2 on the stems, which constitute stops acting against the bottom of the bottom plate k to limit the upward movement of the stems. The slots in this bottom plate k , through which the stems of the finger pieces pass, are elongated, as shown, to provide for the angular movement of the stems when the finger piece is depressed, and are also formed with lateral enlargements to permit passage of the stop pins i^2 . The lateral enlargements in the slots in the stepped top plate m and in the bottom plate k are, of course, in corresponding sides of the slots, and the greater length of the slots in the bottom plate not only permits the angular movements of the stems in the operation of the machine, but also allows manipulation of the stems in assembling. When the stems are in position they occupy the rear ends of the slots in the bottom plate and the stop pins i^2 are in rear of the lateral enlargements of such slots. The arrangement of slotted top plate m and slotted bottom plate k is such as to afford accurate guidance of the upper and lower portions of the flat finger piece stems during their vertical movements.

The type-bar actuating connection f, g , has the action of a breaking toggle and when the joint between the adjacent ends of the two links is moved downwardly the type-bar is thrown to the printing point with an increasing velocity. The particular angle at which the link g extends forwardly to its fixed anchor point may be varied as desired. The one shown affords highly satisfactory results.

The keyboard construction herein disclosed is claimed in a divisional application filed June 18, 1910, No. 567,567. The type bar actuating devices herein claimed may be used with other keyboard constructions.

We claim as our invention:

1. In a front stroke machine, the combination with a platen, type bar segment and type bars mounted therein and normally extending toward the front of the machine, of type bar actuating connections each extending in a horizontal direction toward the front of the machine and each composed of two links operatively connected at their adjacent ends and having the rear end of the rear longer link operatively connected with the heel of the type bar and the front end of the shorter link connected to a fixed piece on the frame, the points of connection between the shorter links and said fixed pieces being arranged in a horizontal plane and in different transverse lines, and means for depressing the several joints of the type bar actuating connections to throw the corresponding type bars to the printing point with an increasing velocity.

2. In a front stroke writing machine, the combination with a platen, type bar segment and type bars, type bar operating connections jointed at their rear ends to their respective type bars and connected at their front ends to fixed pieces on the frame, the points of connection to said fixed pieces being in a horizontal plane and in different transverse lines, and means for operating upon said type bar operating connections intermediate their ends to move them forwardly to pull the corresponding type bars to the printing point.

3. In a front stroke writing machine, the combination with a platen, type bar segment and type bars, of a flat horizontally disposed key board plate having projecting from the lower surface thereof a series of lugs of substantially uniform length arranged in different transverse rows, a link connected to each lug, a second link having its front end operatively connected to the rear end of the first named link and its rear end operatively connected with its type bar and means for depressing the joint between the two links, to thereby throw the type bar to the printing point with an increasing velocity.

4. In a front stroke machine, the combination with a platen, type bar segment and

type bars, of a series of push pins having finger pieces arranged in a bank in different transverse lines, a plate through which the push pins or stems pass, downward projections of substantially uniform length on the under surface of said plate arranged in a substantially horizontal plane but in different transverse rows corresponding with the rows of the finger pieces and an operative connection for each type bar composed of two links, a longer link connected at its rear end to the heel of the type bar and at its front end to the finger piece stem and a shorter link connected at its rear end to the finger piece stem and at its front end to one of said projections.

5. A front stroke writing machine, comprising type bar actuating links each connected with the heel of its type bar and extending forward to the front of the machine, a downward projection from each link located in front of the heel of its type bar, and a coiled spring connected at its front end to said projection and at its rear end to a point in rear of the type bar segment.

6. A front stroke writing machine, comprising an operating link for each type bar extending forwardly under the type bars and acting to pull the type bar to the printing point, a coiled spring applied to the link and extending rearwardly and means for simultaneously adjusting a plurality of such springs.

7. In a writing machine, type bars, horizontally disposed operating links located under the type bars and connected thereto, coiled springs extending from the links rearwardly, a plate to which the rear ends of the springs are attached and means for adjusting the plate to regulate the tension of the springs.

8. In a writing machine, type bars, operating links connected with the heels thereof and extending forward under the type bars, springs connected to such links and extending rearwardly, a universal bar and rods for operating said bar connected at their forward ends to the type bar operating links and disposed within the coiled springs thereof.

9. In a front stroke writing machine, the combination of type bars, operating links connected to the heels thereof and extending forwardly under the type bars, downward projections from said links arranged in different transverse rows, *i. e.* at different distances from the heel of the type bar, those farthest from the heel of the type bar being of greater length than those nearest the heel of the type bar, and coiled springs connected with such projections and extending rearwardly therefrom.

10. In a front stroke writing machine the combination of type bars, operating links connected to the heels thereof and extend-

ing forwardly under the type bars, downward projections from said links arranged in different transverse rows, *i. e.* at different distances from the heel of the type bar, and coiled springs connected with such projections and extending rearwardly therefrom.

11. A front strike writing machine, comprising a pivoted type bar, an endwise movable link adapted to pull the type bar to the printing point, a lateral projection on the link in front of the type bar pivot, and a coiled spring, applied to said projection, extending rearwardly beneath the link and tending to return the type bar to normal position.

12. In a front strike machine, the combination of a pivoted type bar, an endwise movable link adapted to pull the type bar to the printing point, a projection on the link in front of the type bar pivot, a universal bar and a link connecting it and said projection.

13. A front strike typewriting machine, comprising a platen, type-bars normally lying with their heads toward the front of the machine, segmentally arranged type-bar pivotal mountings, type-bar-operating push-pins arranged in a plurality of transverse rows and having their lower ends terminating in substantially the same horizontal plane, and type-bar-operating connections by which the power exerted on depression of the respective push-pins is caused to pull their respective type-bars to the printing point, each such connection comprising two links flexibly connected, one link being pivotally connected with its type bar and the other rocking about a fixed point, the two links constituting a flexing link connection intermediate the ends of which is applied the power exerted on depression of the corresponding push-pin.

14. A front strike typewriting machine, comprising a platen, type-bars normally lying with their heads toward the front of the machine, segmentally arranged type-bar pivotal mountings, type-bar-operating push-pins arranged in a plurality of transverse rows those in each row having their lower ends terminating in substantially the same horizontal plane, and type-bar-operating connections by which the power exerted on depression of the respective push-pins is caused to pull their respective type-bars to the printing point, each such connection comprising two links flexibly connected, one link being pivotally connected with its type bar and the other rocking about a fixed point, the two links constituting a flexing link connection intermediate the ends of which is applied the power exerted on depression of the corresponding push-pin.

15. A front strike typewriting machine, comprising a pivoted type bars formally lying with its head toward the frist of the 1

1 machine, a universal bar in rear of the type bar pivot, a link located below the type bar and adapted to draw the latter to the printing point, a universal bar operating link
5 attached to the first named link and extending rearwardly to the universal bar and a coiled reaction spring surrounding the universal bar link.

In testimony whereof, we have hereunto subscribed our names.

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JOSEPH M. STOUGHTON.

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