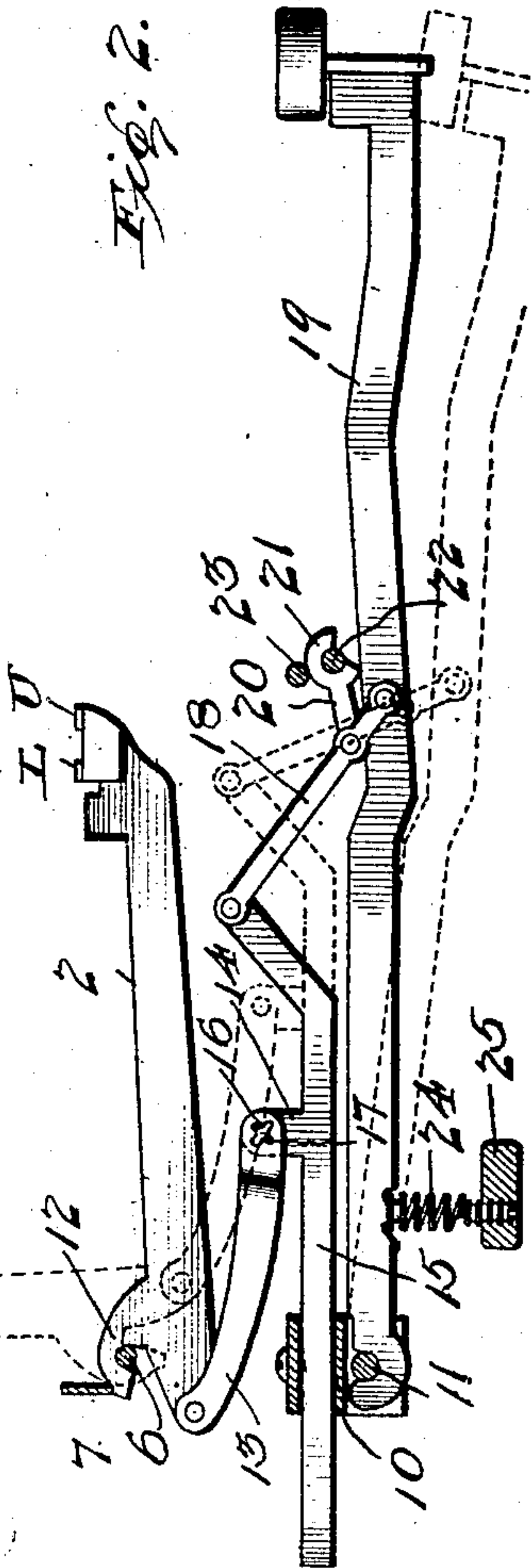
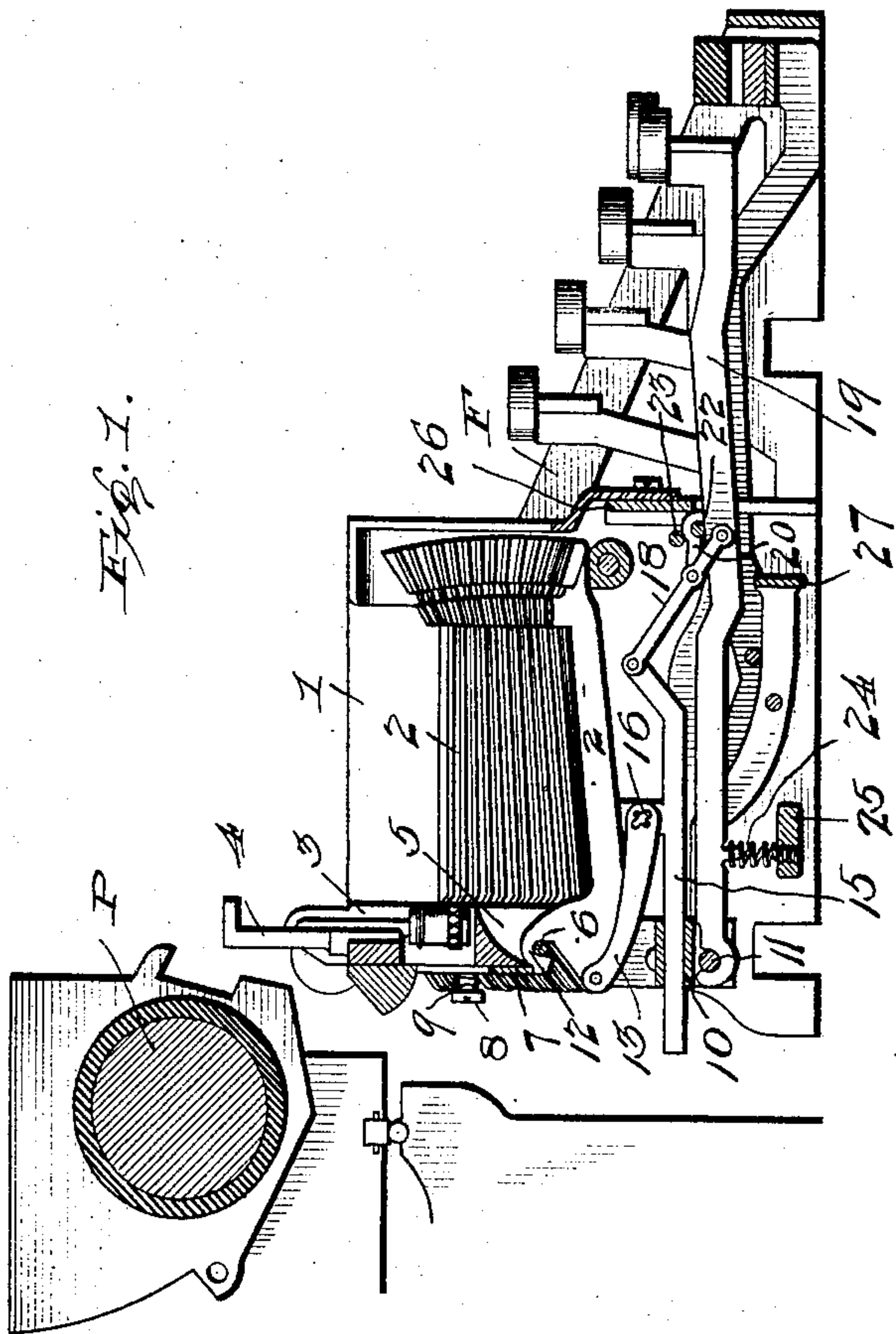


903,810.

H. A. BRIGGS.  
TYPE WRITING MACHINE.  
APPLICATION FILED MAY 6, 1905.

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



Witnesses  
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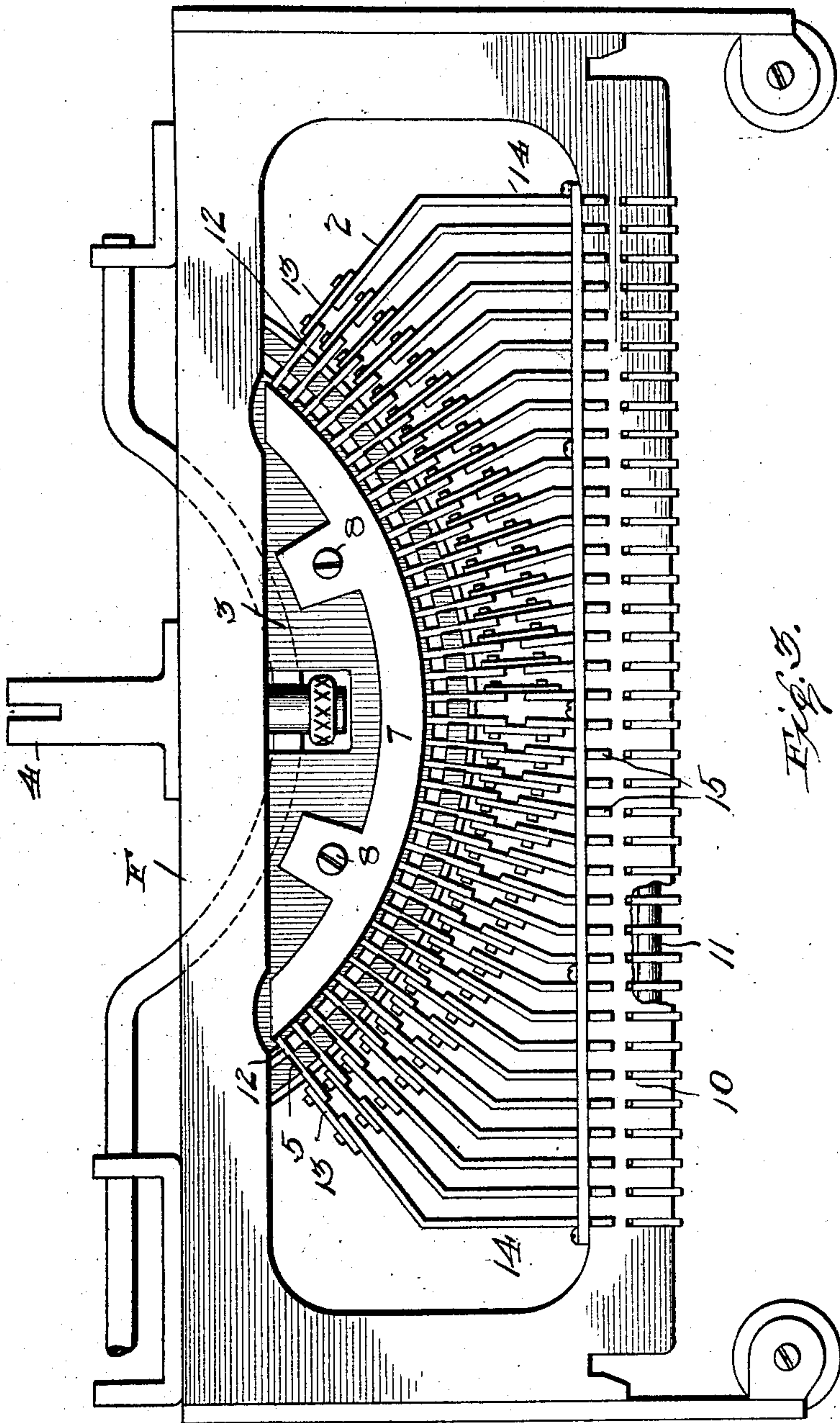
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TYPE WRITING MACHINE.  
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# UNITED STATES PATENT OFFICE.

HERBERT A. BRIGGS, OF NEW YORK, N. Y.

## TYPE-WRITING MACHINE.

No. 903,810.

Specification of Letters Patent.

Patented Nov. 10, 1908.

Original application filed August 22, 1904, Serial No. 221,756. Divided and this application filed May 6, 1905.  
Serial No. 259,228.

*To all whom it may concern:*

Be it known that I, HERBERT A. BRIGGS, a citizen of the United States, and a resident of the borough of Manhattan, city, county, and State of New York, have made certain new and useful Improvements in Type-Writing Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to typewriting machines and has special reference to an improved construction of type action of the type-bar class.

The invention contemplates a type action capable of general application to type-bar writing machines, though possessing many special and practical advantages in connection with a writing machine of the visible front-strike type.

Aside from the special adaptation of the type action to provide for absolute visibility of writing in the front-strike type of machine, the invention has in view a construction wherein torsional pull upon the type bars is obviated and provision is made whereby there is maintained a uniform tension of all the keys throughout the keyboard.

Another object in view is to provide a construction of type action wherein each set of type-bar connections is individually removable and replaceable, while at the same time means are provided for securing a direct pull upon each type-bar through the medium of an easy and quick acting leverage.

With these and other objects in view which will more readily appear as the nature of the invention is better understood, the same consists in the novel combination of parts as hereinafter fully described, illustrated and claimed.

The essential features of the invention, involved in the carrying out of the above objects, are necessarily susceptible to structural change without departing from the scope of the invention, but a preferred embodiment thereof is shown in the accompanying drawings, in which—

Figure 1 is a general sectional view of a type carriage equipped with a type-bar action embodying the present invention; Fig. 2 is a skeleton view of the type action; Fig.

3 is a detail elevation of the rear part of the type hanger showing more clearly the pivotal mounting of the type-bars thereon.

Like reference numerals designate corresponding parts in the several figures of the drawings.

For illustrative purposes the improved type action is shown in the drawings in its operative relation to a type carriage frame F and a platen P. The other parts and mechanisms of the writing machine are not illustrated as they form no part of this application, and the description and claims herein are restricted exclusively to the type action *per se*.

Referring generally to the relative arrangement of the parts it will be observed by reference to the drawings that the type carriage frame F is provided at the top with a horizontal type basket opening 1, which is open throughout at the front, rear, and top, whereby absolute visibility of writing may be provided for, and hence said type basket opening 1 provides for the arrangement therein of a horizontal type basket made up of a semi-circular series of type bars 2, normally lying in substantially horizontal positions, and striking against the front side of the platen in the manner that is commonly known in the art as characterizing front-strike writing-in-sight machines. The individual type bars 2 carry a plurality of type faces U and L, representing the upper and lower case characters, and are associated with a hanger ring, or segment 3 mounted in an upright position within the rear of the type basket opening 1 of the type carriage frame. The hanger ring 3 has extended from the top side thereof a bifurcated finder guide 4, within which each type bar passes so that it is brought with accuracy to the common printing point.

To provide for the hanging of the series of type bars 2, the upright segment hanger ring 3 is provided in the peripheral edge thereof with a plurality of radial type bar slits 5, and a pivot wire or rod 6 suitably fitted within the body of the ring and intersecting the several slits 5. At its rear side the hanger ring or segment 3 has yieldingly mounted thereon a retaining plate 7 of a segmental form (Fig. 3) and preferably supported on stud-screws 8, between the heads of which and plate 7 are interposed the coil



springs 9, which permit the plate to yield outwardly when the type bars are inserted or removed. The function of this yieldingly mounted plate 7 is that of a retainer for keeping the type bars in operative position within the slits 5, upon the pivot wire or rod 6, while, when it is desired to remove or to replace any one of the type bars, the plate will yield sufficiently to permit the type bar to be lifted off or placed in position on the pivot rod 6.

Below the horizontal plane of the ring 3 is arranged a slotted guide bar 10, and below the plane of the slots of the latter is arranged a stationary fulcrum rod 11, the function of which parts will be apparent in connection with the mounting of the type action parts.

The type action *per se* includes the swinging type bar 2 provided at its heel with an open pivot hook 12 detachably engaging the pivot wire 6 of the hanger ring and working in a radial slit 5 (Fig. 1). To the heel of the type bar, behind the pivotal point 6, there is pivoted one end of a forwardly extending intermediate link 13. The opposite end of this link has a detachable pivotal connection with an arm 14 on a reciprocatory pull bar 15. This detachable connection may be of any suitable character providing for the ready disconnection of the link 13 while at the same time maintaining the said parts pivotally connected in their normal relation; but, a preferred construction is shown in the drawings and consists in providing the arm on the pull rod 15 with a pivot key 16, adapted to cooperate with a correspondingly shaped key-hole slot 17 in one end of the link 13. In positioning the parts of the key-hole slot 17 in the link 13 is brought into registration with the key 16 and then passed over the key, after which a partial turn of the link 13 causes the key-hole slot to be thrown out of alignment with the key 16, and hence serves to maintain the parts in interlocked relation, though readily detachable. The arms 14 are preferably formed with the pull bars 15 as an integral part thereof.

In Fig. 2 is illustrated one of the central type bars and operating keys. The pull bars and key levers are arranged in horizontal planes, and as the type bars are segmentally mounted, provision must be made for the varying distance between the pull bars and type bars. This is accomplished by increasing the length of the arm 14 as their positions approach the sides of the machine, and in order to avoid any torsional pull upon the type bars each arm is projected vertically until it intersects the plane in which its type bar swings, and is then offset or bent into that plane, so that the pull on each type bar is even and true. This construction is illustrated most clearly in Fig. 3.

The rear end of the pull bar 15 loosely works through one of the guide openings of the slotted guide bar 10, and the front end of the pull bar, is pivotally connected to one end of a swinging toggle link 18, the other end of which is pivoted to a key lever 19 intermediate the ends of the latter. Intermediate its ends, the said swinging toggle lever 18 has pivotally connected thereto one end of a short fulcrum link 20, having at its opposite end an open hook 21 engaging a stationary pivot rod 22 which extends across the type carriage frame, the hook 21 being held in operative engagement with said rod 22 by the retaining rod 23. The point of connection between the toggle links 18 and the fulcrum links 20, and the length of the fulcrum links, as will be understood, will vary slightly to compensate for the varying lengths of the key levers for the different banks of keys, the length of the fulcrum links being less and their point of connection lower for the longer key levers.

The rear end of the key lever is removably hooked, under the stationary fulcrum rod 11, and adjacent to the latter an adjustable tension spring 24 is placed beneath the key lever and is supported upon the supporting bar 25. By reason of this construction a convenient individual tension adjustment is provided for each key lever, in order that the tension of all keys may be made alike throughout the key board, and each key lever of course carries its individual key disposed within the key-board at the front of the type carriage. Furthermore, it will be observed that by reason of the construction and mounting of parts, as described, the individual removal of the entire key or type bar action is permitted, inasmuch as each type bar can be readily unhooked from its pivot 6, and likewise each key lever and each fulcrum link 20 disengaged from their pivotal points 11 and 22 respectively. Also, a type bar and its link 13 can be removed alone by simply unhooking the type bar from the pivot 6, and disconnecting the link 13 from the pivot key 16 which is carried with the pull rod 15.

In connection with the mounting of the short fulcrum links 20 of the type action, it is to be observed that the forward ends of these several links are arranged to extend slightly between the teeth of a guiding comb 26, on the type carriage which prevents lateral movement of the said fulcrum links, while the latter are otherwise properly retained in place through the medium of the pivot rod 22 and the retaining rod 23.

Referring particularly to Fig. 2 illustrating the type action, it will be observed that upon the depression of an individual key lever, the toggle 18—20 is straightened out, thereby providing an easy leverage upon the pull bar 15 which is drawn straight forward



ward. The forward pull on the bar 15 pulls upon the intermediate link 13 with the consequence of sharply throwing the type bar upward and rearward against the front of the platen. The arrangement described provides for a direct pull upon each type bar, and the motion starts with the longest and the easiest leverage upon the heel of the type bar, and a corresponding leverage upon the pull rod, thus securing the most desirable feature of a type action, *i. e.*, a straight pull upon each type bar through the medium of an easy and quick acting leverage.

A universal bar 27, lying beneath all of the key levers 19 coöperates with a suitable letter-spacing mechanism (not shown).

The present application is a division of my pending application filed August 22, 1904, Serial No. 221,756.

Having thus described the invention, what I claim and desire to secure by Letters Patent, is—

1. In a typewriting machine, a type action comprising a swinging type bar, a swinging key lever, a movable member interposed between the key lever and type bar and having a straight-pull connection with the latter, and a toggle connection between said member and the key lever, said toggle connection having a swinging fulcrum at a point intermediate the said member and the key lever.

2. In a typewriting machine, a type action comprising a swinging type bar, a swinging key lever, a reciprocal member arranged to exert a straight-pull upon the type bar, and a toggle lever connection between said member and the key lever, said toggle connection having a swinging fulcrum at a point intermediate the said member and the key lever.

3. In a typewriting machine, a type action comprising a swinging type bar, a swinging key lever, a reciprocal member arranged to exert a straight-pull upon the type bar, a fixed bearing forming a guide for said member, and a toggle lever connection between said member and the key lever, said connection comprising a link which is pivoted at one end directly to said reciprocal member and at the opposite end directly to the key lever.

4. In a typewriting machine, a type action having a type bar and key lever pivotally connected to the type carriage, a reciprocatory pull bar having a link connection with the type bar, and an operating connection between the key lever and said pull bar, said operating mechanism having a swinging fulcrum intermediate the key lever and pull bar.

5. In a typewriting machine, a type action comprising a swinging type bar, a swinging key lever, a reciprocal member having a straight-pull connection with the type bar and arranged approximately parallel with the key lever, and an operating connection

between said reciprocal member and the key lever, said operating connection having a swinging fulcrum intermediate its point of attachment to the reciprocal member and the key lever.

6. In a typewriting machine, a type action comprising a swinging type bar, a swinging key lever, a reciprocal member having a straight-pull connection with the type bar and lying approximately parallel with said link connection and with the key lever, and an operating connection between said member and the key lever, said operating connection having a swinging fulcrum intermediate its point of attachment to the reciprocal member and the key lever.

7. In a typewriting machine, the type action comprising a rearwardly striking and swinging type bar, a vertically movable key lever, a reciprocatory pull bar, a link connection between said pull bar and the heel of the type bar, a toggle link pivotally connected with the pull bar and the key lever, and a short fulcrum link having a fixed pivotal support at one end and at its other end pivoted to the toggle link.

8. In a typewriting machine, the combination with the carriage frame having an upright hanger ring carrying a pivot wire, a slotted guide bar below the hanger ring, and a stationary fulcrum bar below the guide bar, and the type action comprising a swinging type bar having at its heel an open pivot hook engaging said pivot wire, a vertically movable key lever having at one end a hook loosely engaged beneath the stationary fulcrum rod, an adjustable tension spring arranged beneath the key lever, a reciprocatory pull bar working in the guide bar, an intermediate link pivotally connected with the pull bar and with the type bar below the pivot for the latter, a toggle lever including a link pivoted to the pull bar and the key lever, and a fulcrum link pivoted at one end to said other link and having a fixed pivotal support at its opposite end.

9. In a typewriting machine, the type action comprising a type bar having an open pivotal connection with the type carriage, a key lever having an open pivotal connection with the type carriage, a reciprocatory pull bar working in a fixed bearing, a toggle connection for said pull bar comprising a lever pivotally secured to the same and to the key lever, and a link connected with said lever and having an open hook connection with the type carriage, and a link pivotally connected to the heel of the type bar and to the pull bar.

10. In a typewriting machine, the type action comprising a type bar having a detachable pivot connection with the type carriage, a key lever connection including a reciprocatory pull bar, and a toggle connection with said pull bar having a swinging fulcrum



and a link pivoted to the heel of the type bar and having a detachable pivotal connection with the pull bar.

11. In a typewriting machine, the type action comprising a type bar having a detachable pivotal support, a key lever having a detachable pivotal support, a pull bar, a toggle connection between the pull bar and the key lever, said toggle connection having a detachable pivotal support, and a link pivotally connected to the type bar and having a detachable pivotal connection with the pull bar.

12. In a typewriting machine, a type action having a type bar and key lever pivotally connected to the type carriage, a reciprocatory pull bar working in a fixed bearing, a link connecting the type bar and pull bar, and a toggle lever connection between the key lever and the pull bar for actuating the latter.

13. In a typewriting machine, the combination of a reciprocatory pull bar having an arm provided with an offset portion which reciprocates in the plane of movement of its type bar, and connections between the offset portion of the arm and its type bar and

a toggle connection having a swinging fulcrum between the pull bar and its operating key.

14. In a typewriting machine; the type action comprising a type bar having a detachable pivot connection with the type carriage, a key lever connection including a reciprocal pull bar having a member provided with a pivot key, and a link pivotally connected to the type bar and having a key-hole slot detachably interlocking with the said key.

15. In a typewriting machine, the type action comprising a swinging type bar, a swinging key lever, a reciprocatory pull bar, a link connecting the type bar and the pull bar, and a toggle connection for operating said pull bar comprising two links, one of which is pivoted to the pull bar and to the key lever, and the other of which is pivoted at one end to the first mentioned link and has a fixed pivotal support at its opposite end.

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F. H. WIMMEL.