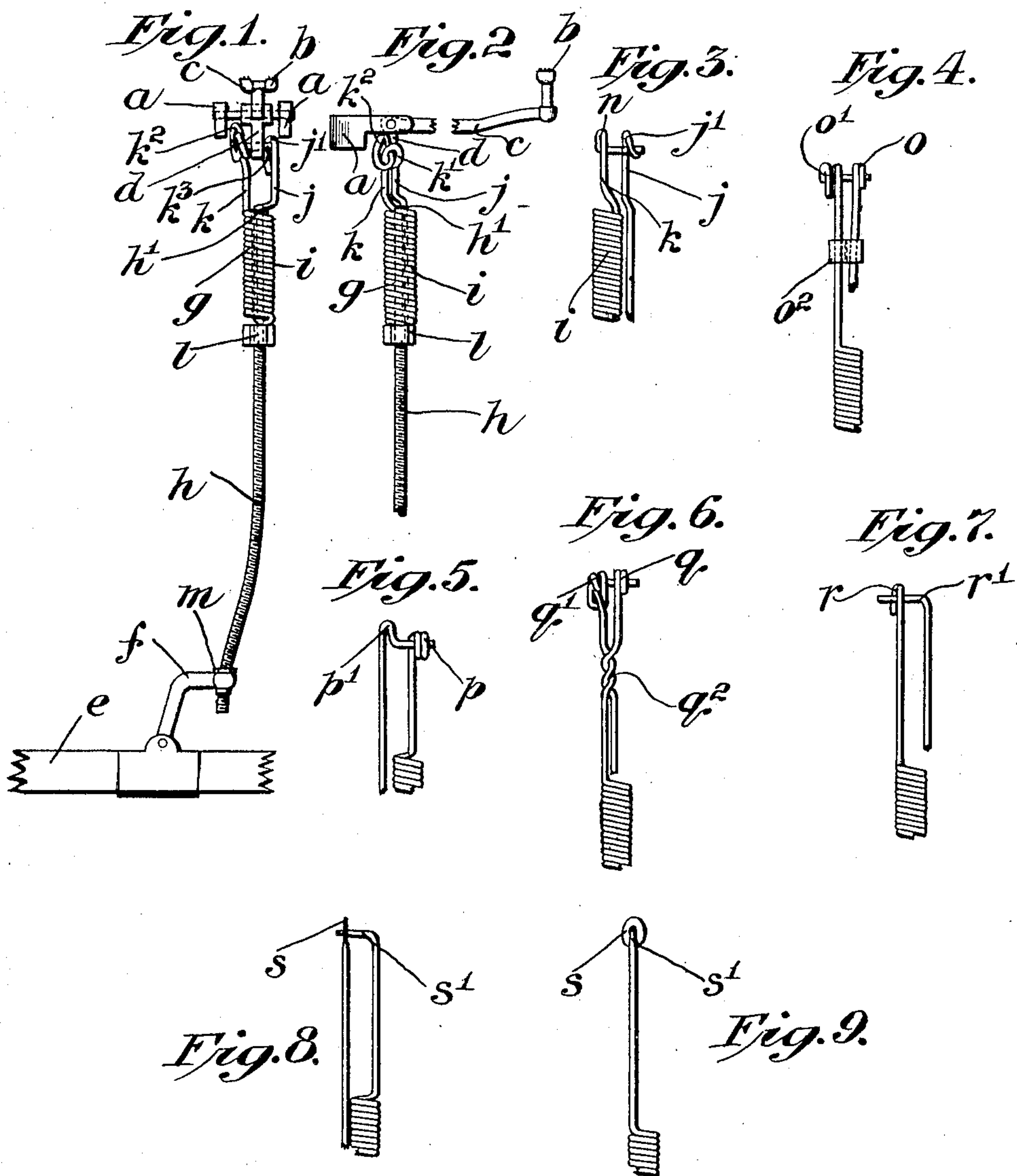


E. S. MORGAN.
TYPE WRITING MACHINE.
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UNITED STATES PATENT OFFICE.

EDMUND S. MORGAN, OF JACKSONS MILLS, NEW JERSEY.

TYPE-WRITING MACHINE.

No. 912,710.

Specification of Letters Patent.

Patented Feb. 16, 1909.

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To all whom it may concern:

Be it known that I, EDMUND S. MORGAN, a citizen of the United States, residing at Jacksons Mills, in the county of Ocean and State of New Jersey, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification, reference being had therein to the accompanying drawings, which form a part thereof.

My invention relates to type writing machines, and more particularly to the connecting link between the type bars and the key levers.

In type writing machines, it is not only essential that the connecting link between the key lever and the type bar be free from characteristics permitting substantial elongation under the stress of use, but it is reasonably necessary that the said link be capable of longitudinal adjustment to take up lost motion due to wear, or to facilitate adjusting the key levers and type bars, and be provided with means whereby the link may be conveniently attached to and removed from the type bar to facilitate assembling and repairs. Considerable difficulty has been encountered heretofore in producing a link possessing these characteristics which has the desired strength to withstand the stress upon the coupling between the type bar and the link, the lack of space in the basket necessitating a compactness of structure which has resulted in a weakness in the coupling structure, or the abandonment of a coupling at this point with resultant difficulty in the assembling and repair of the printing mechanism of the machine.

The main object of the invention is to provide a one piece coupling for the connecting links or wires, which will be so constructed and arranged as to fit compactly in the type basket, and which may be readily connected to, and disconnected from the heel of the type bar.

A further object is to provide a connecting link the coupling of which may be rigidly attached to the shank by a union which will not only impart strength and rigidity to the link at the point of union, but one which will permit the rapid, accurate and inexpensive assembling of the links.

A still further object is to provide a link which may be made of wire throughout, including the jaws of the coupling, thus affording a structure which may be made on inex-

pensive automatic machines, and insuring uniformity in strength, and design in the links throughout a machine.

A still further object is to provide a link which may be repeatedly coupled to or disconnected from the type bar without weakening the union between the coupling and the shank.

A still further object is to provide a connecting link having a coupling member, the jaws of which are both formed from a continuous strand of wire, and rigidly connected to the shank of the link; and said shank is adjustable relative to the key levers, thus preserving the desirable characteristics above referred to while affording a coupling which can not be readily broken or weakened through the stresses of use. And a still further object is to provide a connecting link for typewriters which will be durable and inexpensive to produce and which will embody therein a compact coupling so constructed and arranged as to withstand all the stresses of use, reasonable wear excepted.

The invention consists in a connecting link for typewriters comprising a coupling member formed of a continuous strand of wire formed into a coil and having its opposite ends formed into cooperating jaws adapted to engage a type bar, a shank adapted to pass through said coil and engage the end thereof adjacent to said jaws, and means whereby said shank may be attached to a key lever; and in such other novel features of construction and combination of parts as are hereinafter set forth and described and more particularly pointed out in the claims hereto appended.

Referring to the drawings,—Figure 1 is a front elevation of a connecting link embodying the preferred form of my invention, a type bar and its bearings, and a portion of a standard type of key lever being shown in connection therewith. Fig. 2 is a front elevation of the upper portion thereof; Figs. 3, 4, 5, 6, 7 and 8 are modified forms of the invention showing different manners of forming the coupling jaws; and Fig. 9 is a side view of the modification shown in Fig. 8.

Like letters refer to like parts throughout the several views.

In the embodiment of my invention shown as the preferred form in the accompanying drawings, I have illustrated it as being applied to the well-known Remington type of machine, the same being a down-pull

machine having a plurality of housings *a*, disposed about the basket in which are mounted the type bars *b* having a type head *c* and a heel *d* having an opening therein by means of which the connecting link or wire is attached thereto. The bar *c* and heel *d* constitute a bell crank lever. Below the basket are a plurality of key levers *e* carrying a pivoted bracket *f* to which the connecting link or wire is adapted to be connected. I have shown this construction merely by way of illustration, my invention being applicable to any machine of the same type. My invention, however, relates to the connecting link proper. To enable me to make the coupling member of one piece, and thus avoid the necessity for soldered joints or complicated locking jaws, I make the link of two members,—a coupling member *g* and a shank *h*,—providing suitable means for rigidly connecting these members and connecting the latter to the key lever *e* by means of the bracket *f*. This construction broadly is common to all forms of the invention shown, the various modifications relating more particularly to the manner of forming the coupling jaws.

In the preferred form of the invention, the coupling *d* is made of a continuous strand of round spring wire formed intermediate its ends into a coil *i*, and the opposite ends thereof brought to one end of the coil and formed into the coupling jaws. The coil *i*, in the preferred form of the invention, is of a size to permit one end of the wire *j* to be passed upwardly through the coil with the extreme end thereof projecting above the coil to an extent to bring the coil well below the housing *a*. This end is formed into an eyelet *j'*, the eye of which is of a size slightly in excess of the gage of the wire used. The other end *k* of the wire forming the coupling is extended upwardly from the top of said coupling in a plane substantially parallel to the end *j* and a hook or tongue is formed thereof by bending in a manner to obviate as much as possible a tendency of said hook to give under the stresses of use. I also so bend the end *k* as to form a tongue conveniently accessible to facilitate the disconnection of the coupling jaws from the eyelet *d*. In forming this jaw of the coupling, I bend the end *k* in a ring *k'* directly opposite the eyelet *j'*, extending the wire in an upwardly loop to form the tongue *k³* and bring the wire, after forming said tongue, downwardly and through the ring *k'* and projecting beyond same to an extent which will permit it to pass through and engage the eyelet *j'*. This end, which I have designated at *k³*, constitutes the other coupling jaw by means of which the link may be pivotally connected to the type bar. For the convenience of this description, I shall designate the jaw *k³* as the pivot-jaw and the

eyelet *j'* as the keeper-jaw. It will be observed that the manner of bending the end of the wire to form the pivot-jaw is such that the ring *k'* will serve as a reinforcement to the jaw, and thus minimize any tendency of the said jaw to straighten out and cause its disengagement from the type bar, or an elongation of the connecting link. The keeper-jaw *j'* will, also, serve to prevent the downward strains from springing the free end of the said jaw *k³*.

The shank *h* is provided with a head *h'*, adapted to engage the top strand of the coil *i* so that the pull exerted through said shank will have no tendency to elongate said coil through the separation of the strands thereof. To avoid any possibility of elongation, however, I form a screw thread on said shank and mount a jam-nut thereon, by means of which the coil is held firmly between the head *h'* and the nut *l*. This arrangement insures absolute rigidity of structure and prevents any elongation except through that of the metal itself. The lower end of the shank *h* is adjustably connected to the bracket *f* in the usual and well-known manner, a lock nut *m* being used to secure permanency of the adjustment.

In the modification shown in Fig. 3, the structure is substantially the same as in the preferred form of the invention, the sole difference being that the end *j*, instead of being inside of the coil, is brought up on the outside and the other end is formed into a tongue *n* by being turned upon itself, and is turned at directly right angles without the formation of the ring, as in the preferred form.

In the modification shown in Fig. 4, the construction is substantially the same as that shown in Fig. 3, except that the keeper-jaw *o* is formed by a double eyelet and the pivot-jaw *o'* is formed by forming a double eyelet and passing the end of the wire therethrough. In addition to these modifications, I provide a sleeve *o²* encircling the stem of the jaws so as to limit the extent of lateral movement of the said jaws. This form of the invention is adapted for use in machines wherein the space is insufficient to permit the use of short stems formed by the ends of the wire, which necessitates the coil being closed to the jaws.

In the modification shown in Fig. 5, the construction is substantially the same as that shown in Fig. 3, the keeper-jaw *p* being formed, as in Fig. 4, and the pivot-jaw *p'* being formed similarly to the said jaw shown in Fig. 3.

In the modification shown in Fig. 6, the construction of the keeper-jaw *q* is similar to that shown in Figs. 4 and 5, and the pivot-jaw *q'* is formed by making two loops in the end of the wire and bringing said end downwardly about the stem, upwardly and through said loops. In this form of the invention, which is designed for use similar to

that of Fig. 4, I twist the stems q^2 for the purpose of limiting the elasticity of said stems.

In the modification shown in Fig. 7, the keeper-jaw r is substantially the same as in the preferred form, and the pivot-jaw r' is formed by merely bending the end of the wire at right angles without the formation of loops or reinforcements of any character.

In the modification shown in Figs. 8 and 9, the construction is the same as in Fig. 7, except that the keeper-jaw s is formed by flattening the end of the wire and drilling a hole therein adapted to receive the pivotal jaw s' .

It will be observed that in all forms of the invention shown, the stems of the jaws are so offset relative to the axis of the coil as to properly center the strains relative to the shank h and thus relieve both jaws from any lateral strains which would tend to disconnect the coupling from the heel of the type bar. It will also be observed, by reference to the various modifications shown, that various methods of forming and reinforcing the pivot-jaws may be employed, the showing of the drawings being merely for the purpose of illustrating some of the ways of accomplishing the desired result.

In use, the coupling g and shank h are assembled by passing the latter through the coil i of the former, and screwing the jam-nut l to place, so as to firmly compress the said coils and rigidly connect the shank to the coupling head. The link being thus assembled is attached to the key lever in the usual and well known manner, and is adjusted by bending, or by means of the screw thread thereon of the bracket f to the desired length and position. When it is desired to connect the link to the type bar, it is merely necessary to raise the said bar so as to project the heel downwardly and spread the ends of the wire, or stems j, k , until the end of the pivot-jaw is beyond the said heel and alined with the opening therein. By merely releasing said stems, the spring inherent to the material, of which said jaws and said stem are formed, will cause them to snap to place, the end of the pivot-jaw k^3 passing through said opening and seating itself in the keeper-jaw j' . When so positioned, the jaws are so compact as to readily pass within the brackets of the journal housing a and as the type bar is lowered by the release of the key lever e said jaws will pass between said brackets with the tongue k^2 projecting slightly above the bearings. If it is desired to disconnect the link, such may be accomplished by spreading the stems by means of any desired instrument inserted between them, or by forcing the pivot-jaw forwardly by means of the said tongue k^2 .

The operation of all of the modifications shown in Figs. 3 to 9, inclusive, is substantially the same as that heretofore described, each of these forms having characteristics

essential to the invention, to wit,—a coil adapted to be engaged by the shank of the link, the opposite ends of which are projected upwardly forming substantially parallel stems of spring metal having, respectively, cooperating coupling jaws integral therewith and adapted to be closed and to be held closed through the spring inherent to the wire, of which the stems are formed.

It is not my intention to limit the invention to the precise manner of bending the free ends of the coil to bring the coupling stems into the desired position, nor to form the pivot-jaws and the keeper-jaws, such being largely a matter of mechanical detail for the purpose of adapting the invention to different types of machines and type bars.

Having described the invention, what I claim as new and desire to have protected by Letters-Patent, is:

1. In a type writing machine, a connecting link comprising a coupling member made of a continuous strand of wire formed into a coil and having its ends formed into cooperating jaws adapted to engage a type bar, a shank adapted to pass through said coil and engage the end thereof adjacent to said jaws, and means whereby said shank may be attached to a key lever.

2. In a type writing machine, a connecting link comprising a coupling member made of a continuous strand of wire formed into a coil and having its ends extended beyond said coil so as to constitute spring stems and formed beyond said stems into cooperating jaws adapted to engage a type bar, a shank adapted to pass through said coil and engage the end thereof adjacent to said stems and means whereby said shank may be attached to a key lever.

3. In a type writing machine, a connecting link comprising a coupling member made of a continuous strand of wire formed into a coil and having its opposite ends extended beyond said coil, said ends respectively being looped to form a keeper-jaw and turned at an angle to form a pivot-jaw adapted to engage said keeper-jaw, a shank adapted to pass through said coil and engage the end of said coil adjacent to said jaws, and means whereby said shank may be attached to a key lever.

4. In a type writing machine, a connecting link comprising a coupling member made of a continuous strand of wire formed into a coil, and having its ends extended beyond said coil, said ends respectively being looped to form a keeper-jaw, and looped and passed at an angle through the loop to form a pivot-jaw, adapted to enter said keeper-jaw, a shank adapted to pass through said coil and engage the end thereof adjacent to said jaws and means whereby said shank may be attached to a key lever.

5. In a type writing machine, a connect-

ing link comprising a coupling member made of a continuous strand of wire formed into a coil, and having its ends extended beyond said coil, said ends respectively being looped 5 to form a keeper-jaw and looped, extended upwardly, and bent upon itself to form a tongue, and then passed at an angle through said loop to form a pivot-jaw adapted to enter said keeper-jaw, a shank adapted to 10 pass through said coil and engage the end thereof adjacent to said stem, and means whereby said jaws may be attached to a key lever.

6. In a type writing machine, a connecting link comprising a coupling member made 15 of a continuous strand of wire formed into a coil and having its ends formed into co-operating jaws adapted to engage a type bar, a screw threaded headed shank adapted 20 to pass through said coil, the head thereof being adapted to engage the end of said coil adjacent to said jaws, a nut mounted upon said shank and adapted to compress said coil between it and the head of said shank, and

means whereby said shank may be attached 25 to a key lever.

7. In a type writing machine, a connecting link comprising a coupling member made of a continuous strand of wire formed into a coil and having its ends extending beyond 30 said coil, said ends, respectively, being looped to form a keeper-jaw, and looped and passed at an angle through the loop to form a pivot-jaw adapted to engage said keeper-jaw, a screw threaded, headed shank adapted 35 to pass through said coil, the head thereof being adapted to engage the end of the coil adjacent to said jaws, a nut on said shank adapted to compress said coil between it and said head, and means whereby said shank 40 may be adjustably attached to a key lever.

In witness whereof, I have hereunto affixed my signature this third day of October, 1908.

EDMUND S. MORGAN.

Witnesses:

JOHN J. SPROUL,

LUKE BRANNING, Jr.