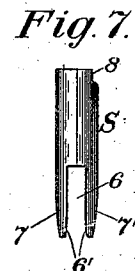
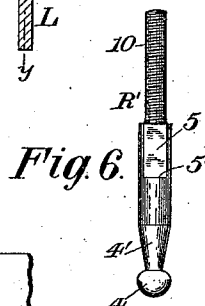
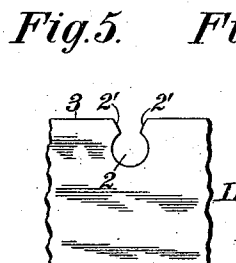
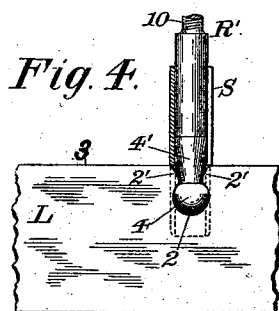
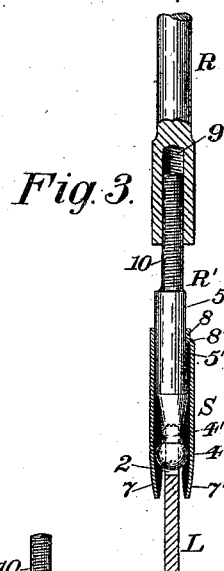
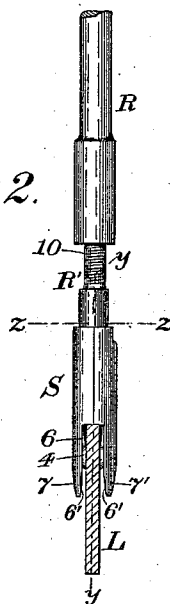
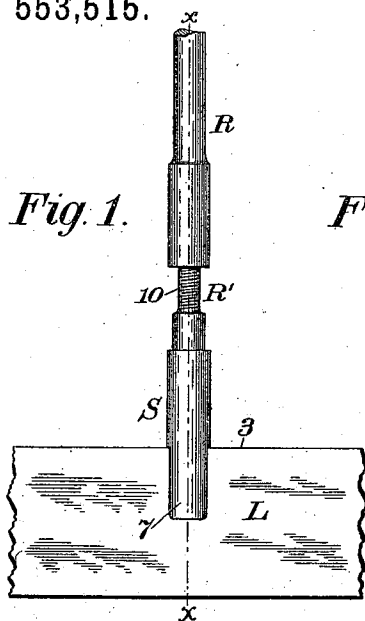


(No Model.)

E. H. DODGE.
LEVER AND ROD CONNECTION.

No. 553,515.

Patented Jan. 28, 1896.



Witnesses:
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Inventor:
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By his Attorney,
F. A. Richards

UNITED STATES PATENT OFFICE.

EDWIN H. DODGE, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE
HARTFORD TYPEWRITER COMPANY, OF SAME PLACE.

LEVER AND ROD CONNECTION.

SPECIFICATION forming part of Letters Patent No. 553,515, dated January 28, 1896.

Application filed January 21, 1895. Serial No. 535,592. (No model.)

To all whom it may concern:

Be it known that I, EDWIN H. DODGE, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Lever and Rod Connections, of which the following is a specification.

This invention relates to lever and rod connections, the object being to provide an improved connecting device of this class especially adapted for use in type-writers, and which shall be readily assembled and disassembled, self-adjusting in its alignment, simple in construction, efficient in its action, and of low cost to manufacture.

In the drawings accompanying and forming a part of this specification, Figure 1 is a side elevation of a connecting device embodying my present invention. Fig. 2 is an end elevation of the same as seen from the right hand in Fig. 1. Fig. 3 is a central longitudinal sectional end elevation, the section being taken in line *x x*, Fig. 1. Fig. 4 is a central longitudinal sectional side elevation of the same with a portion of the connecting-rod removed, the section being taken in line *y y*, Fig. 2. Fig. 5 is a side elevation of a portion of the member or lever of the connecting device having the holding-socket therein for the reception of the bearing of the other member or rod. Fig. 6 is a side elevation of the member or rod end having the ball-joint or similar bearing. Fig. 7 is an elevation of the locking-sleeve for connecting the two co-operating members of the connecting device. Fig. 8 is a transverse section in line *z z*, Fig. 2, showing the holding-faces of the connecting-rod and the locking-sleeve for preventing rotation of the connected members relatively to one another.

Similar characters designate like parts in all of the figures.

My present invention comprises, in combination with a member having a holding-socket extending transversely through the same and intersecting one edge thereof, a co-operating member having a bearing engaged by the socket and of greater diameter than the co-operating portion of said socket and adapted to be held against longitudinal movement

by the walls of and relatively to the socket, and a locking member carried by one of said connected members and adapted to engage the projecting faces of the bearing and also the holding-socket member and thereby maintain the parts in interlocked engagement.

My invention also contemplates the provision of means carried by the locking-sleeve and the bearing-carrying member for positively holding the parts against rotation relatively to one another.

In the preferred embodiment of my invention, herein shown and described, 1 designates, in a general way, a socket-carrying member, shown herein as a key-lever of a typewriter, and 2 designates a recess extending transversely through the upper edge of the lever and forming a holding-socket for the reception of a ball or other bearing carried by the member or rod to be connected therewith. This recess or socket is shown herein as having a substantially circular main or bearing portion intersected by a recess having walls 2' diverging from the main socket and also intersecting the upper edge 3 of the lever. In the term "holding-socket" I include any socket having a recess and having also a socket portion intersecting the walls of said recess and undercut relatively to the recess, so that the diameter of the socket will be greater than the width of the recess at the point of intersection.

The co-operating member to be engaged by the socket of the lever 1 is shown herein as a connecting-rod, preferably formed in two parts for the purpose of permitting longitudinal adjustment of the one relatively to the other. The main portion of the rod is designated by R, while the rod end, which co-operates directly with the lever 1, is designated by R'. At its lower end the rod end R' is shown as having a bearing substantially filling the main portion of the socket 2 in the lever 1 and having opposite lateral faces extending beyond the sides of said lever. This bearing is preferably in the form of a substantially spherical bearing or ball-joint 4, in order that the rod end carrying the same may be capable of free rotary movement within the socket until the locking device is placed in position. In order to permit the oscillation of the connecting-rod longitudinally relatively to the key-lever, the

bearing 4 is connected with the body of the rod end by a reduced portion, as shown at 4', so that said rod end will have an ample, though limited, range of movement in this direction.

5 It will be apparent that a substantially cylindrical or ellipsoidal end might be substituted for the ball-joint or bearing 4 so long as it has a substantially circular bearing-face which will co-operate with the circular portion
10 of the holding-socket. This ball-carrying member or rod end is also preferably provided with means for engaging the locking-sleeve to prevent relative rotation of the parts. Such means is herein shown as a cut-away or flat-
15 tened face 5, traversing said rod end for a short distance in longitudinal direction.

As a means for securing the bearing 4 positively in position against lateral disconnection with respect to the lever L, I have provided a locking device in connection with
20 one of the aforesaid co-operating parts forming the joint and adapted to engage the projecting faces of the bearing which co-operates with the circular portion of the socket 2. I
25 preferably form this locking device as a substantially tubular member or sleeve, (designated in a general way by S,) and adapted to reciprocate freely upon the member carrying
30 said bearing, in the present case the rod end R'. This sleeve is shown herein as bifurcated for some distance from one end thereof—in this case the lower end—the bifurcation, which is designated by 6, being preferably of
35 greater width than the thickness of the adjacent portion of the lever L, so that when said sleeve is slid down the rod R' and brought into position, with its arms 7 and 7' engaging
40 by their inner preferably rounded faces the remotely disposed projecting faces of the bearing 4 at diametrically-opposite points, there will be a sufficient space left to permit
45 free oscillatory movement of the sleeve and connecting-rod as a whole in lateral direction about the pivotal point formed by the connection of the rod and the lever and relatively to such lever. The bifurcation also
50 preferably widens out at the extreme lower end of the sleeve, the walls 6' thereof sloping outward, as shown, to thereby permit a greater range of lateral oscillation. As the
55 diverging walls 2' of the holding-socket also permit oscillatory movement of the connecting-rod and sleeve as a whole in longitudinal direction relatively to the lever L, it will be
60 apparent that the described connection constitutes a universal joint, in which the connecting-rod is capable of a considerable, though limited, amount of swinging movement in all directions about the pivotal point
65 formed by the engagement of the bearing 4 with the journal-walls of the socket 2.

As a means for preventing rotation of the rod and sleeve relatively to the lever L, the sleeve S is shown herein as having at its upper end the longitudinally-extending wall 8,
65 corresponding to the flat face 5 of the rod end R', so that when the sleeve is brought

down into position, as shown best in Figs. 3 and 8, the contiguous plane faces will prevent rotation of said sleeve and rod end relatively to each other. The inwardly-projecting
70 portions 5' and 8' of the rod end and the sleeve, respectively, which portions determine the lengths of the plane faces 5 and 8, constitute stops for limiting the downward movement of the sleeve with respect to the rod
75 end, and hence positively determine the positioning of the sleeve, so that its depending arms 7 and 7' will come to the proper points adjacent to the projecting faces of the bearing 4. It is obvious, however, that any other
80 means might be employed for attaining this result without departing from the invention.

As a means for obtaining a longitudinal adjustment of the connecting-rod, said rod, as
85 before stated, is formed in two parts. One of these parts, preferably the main rod R, is shown herein as having an enlarged end longitudinally bored and threaded, as shown at 9, for the reception of a correspondingly-reduced and threaded portion 10 of the rod end,
90 which portion is the upper end of said member R'. As the upper end of the main rod, when operatively connected with a type-bar, will be fixed against rotation, and as the engaging faces 5 and 8 prevent rotation of the
95 rod end relatively to the key-lever, it will be evident that any adjustment of the parts R and R', which may be effected, will be positively maintained.

The holding-socket in the lever is readily formed by means of suitable punch and die, and the bearing or ball-joint upon the connecting-rod is readily formed in a swaging-machine without any loss of metal. The locking-sleeve is simple in character and of a small
105 size, and can be readily produced from sheet metal by dies, as in automatically-operated forming-presses.

I do not wish to be understood as limiting myself to the exact construction herein shown and particularly described, as I consider within the scope of my invention any member having a holding-socket extending transversely
110 through the same and intersecting one edge thereof when combined with a co-operating member having a bearing engaging the journal-surface of said holding-socket and held by the walls of said socket against longitudinal movement relatively thereto, which bearing has remotely-disposed faces projecting
115 beyond the walls of said socket and a locking device carried by one of said members and adapted to engage the projecting faces of said bearing and the holding-socket member, whereby, by means of the latter engagement, lateral disconnection of the bearing is prevented.

Having thus described my invention, I claim—

1. The combination with a member having a holding-socket extending transversely through the same and intersecting one edge thereof; of a co-operating member having a

bearing engaging the journal-surface of said socket, and adapted to be held against longitudinal movement by the walls of the socket, said bearing having faces projecting beyond the walls of the socket; and a locking device carried by one of said members, and adapted to engage the projecting-faces of said bearing at diametrically-opposite points, and also adapted to engage the holding-socket member, substantially as described.

2. The combination with a member having a holding-socket extending transversely through the same and intersecting one edge thereof; of a co-operating member having a substantially-spherical bearing engaging the journal-surface of said socket, and adapted to be held against longitudinal movement by the walls of the socket, said bearing having faces projecting beyond the walls of the socket; and a locking device carried by one of said members, and adapted to engage the projecting-faces of said bearing at diametrically-opposite points, and also adapted to engage the holding-socket member, and said locking device being movable into and out of engagement with the other of said members, and into and out of engagement with the projecting-faces of said bearing, substantially as described.

3. The combination with a member having a holding-socket extending transversely through the same and intersecting one edge thereof; of a co-operating connecting-rod having a substantially-spherical bearing engaging the journal-surface of said socket, and adapted to be held against longitudinal movement by the walls of the socket, said bearing having faces projecting beyond the walls of the socket; and a reciprocatory locking-sleeve carried by the connecting-rod, and having oppositely-disposed arms in position and adapted to engage the projecting-faces of the bearing upon opposite sides of the socket-carrying member, and also adapted to engage said socket-holding member, substantially as described.

4. The combination with a member having a holding-socket extending transversely through the same and intersecting one edge thereof; of a co-operating connecting-rod having a substantially-spherical bearing engaging the journal-surface of said socket, and adapted to be held against longitudinal move-

ment by the walls of the socket, said bearing having faces projecting beyond the walls of the socket; and a reciprocatory locking-sleeve carried by the connecting-rod, and having oppositely-disposed arms in position and adapted to engage the projecting-faces of the bearing upon opposite sides of the socket-carrying member, and also adapted to engage the socket-holding member; and co-operating means carried by the connecting-rod and the locking-sleeve for preventing rotation of said parts relatively to each other, substantially as described.

5. The combination with a lever having a holding-socket intersecting the upper edge thereof, and extending transversely through the same; of a connecting-rod having a substantially-spherical bearing at its lower end engaging the journal-surface of said socket, and adapted to be held against longitudinal movement by the walls of the socket, said bearing faces projecting beyond the walls of the socket, and said rod having a longitudinally-flattened face; and a reciprocatory locking-sleeve carried by the connecting-rod having a longitudinally-flattened inner face in position and adapted to engage the corresponding face of the connecting-rod, and thereby prevent rotation of said rod and sleeve relatively to each other, and said sleeve having also oppositely-disposed depending-arms in position and adapted to engage the projecting-faces of the bearing upon opposite sides of the lever and also engage the socket-holding member, substantially as described.

6. The combination with a member having a holding-socket extending transversely through the same and intersecting one edge thereof; of a co-operating member having a substantially-spherical bearing engaging the journal-surface of said socket, and adapted to be held against longitudinal movement by the walls of the socket; and a locking device carried by one of said members and adapted to engage the socket-holding member, and thereby prevent lateral displacement of the bearing, and to permit rotatable movement of said bearing with relation to said socket in all directions, substantially as described.

EDWIN H. DODGE.

Witnesses:

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