J. MILLS.

CONNECTING ROD.

APPLICATION FILED NOV. 29, 1912.

1,102,782. Patented July 7, 1914.

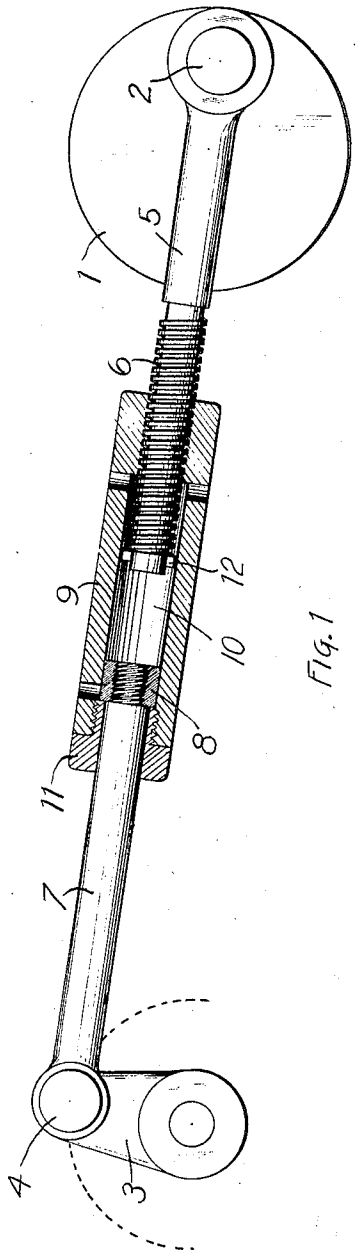

FIG. 1

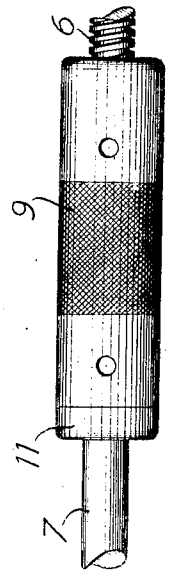

FIG. 2

Witnesses:
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UNITED STATES PATENT OFFICE.

JAMES MILLS, OF CINCINNATI, OHIO, ASSIGNOR TO THE SMITH & MILLS COMPANY, OF CINCINNATI, OHIO.

CONNECTING-ROD.

1,102,782. Specification of Letters Patent. Patented July 7, 1914.

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To all whom it may concern:

Be it known that I, JAMES MILLS, a citizen of the United States, residing at Cincinnati, Hamilton county, Ohio, have invented certain new and useful Improvements in Connecting-Rods, of which the following is a specification.

This invention relates to a connecting-rod adapted to have one of its ends reciprocated a given distance and produce, at the other end of the rod, reciprocations equal in extent to that of the first end or less in extent, to any desired degree, than that of the first end. For instance, in pawl and ratchet motions it is very common in machinery to transmit motion to a vibrating pawl-carrying arm through the medium of a connecting-rod actuated by a crank, each excursion of the arm causing the ratchet to be advanced a certain number of teeth, dependent upon the throw of the crank. To increase or decrease the degree of advance at each excursion, the crank would be adjusted to increase or decrease its stroke. Such adjustment of the crank is not convenient, especially when the machine is in motion. My improved connecting-rod is adapted to such a situation as has been just referred to but no adjustable crank will be needed and the adjustment to vary the extent of the excursions of the pawl-carrying arm may be conveniently made while the machine is in motion.

My invention will be readily understood from the following description taken in connection with the accompanying drawing in which:—

Figure 1 is a side elevation of my improved connecting-rod illustrated as connecting a crank and a vibrating arm, the turnbuckle of the rod appearing in diametrical section; and Fig. 2 a plan of the turnbuckle features of the device.

In the drawing:—1, indicates a crank of constant stroke: 2, the crank-pin: 3, a vibrating arm, which may be assumed as a pawl-carrying arm to be vibrated through arcs of selective extent: 4, the wrist of the arm: 5, a rod having an eye engaging the crank-pin: 6, a thread upon this rod: 7, a rod having an eye engaging the wrist of the vibrating-arm: 8, a collar firmly secured to the end of rod 7, the illustration showing the collar as being screwed upon the rod, the collar having a diameter greater than that of the rod: 9, a hollow turnbuckle having one end threaded upon screw 6: 10, the longitudinal cavity of the turnbuckle, the end of rod 5 projecting into this cavity an adjusted distance, and collar 8 reciprocating endwise in the cavity, if permitted to do so: 11, a plug surrounding rod 7 and screwed firmly into the turnbuckle and closing the otherwise open end of the turnbuckle, the inner face of this plug being adapted to be engaged by the shoulder formed on rod 7 by collar 8: and 12, a pin crossing the inner end of rod 5 and serving to prevent the turnbuckle from being unscrewed too far outwardly on rod 5.

The turnbuckle may, if desired, be knurled to facilitate its being turned by a grasping hand. Radial holes are shown as being provided through the turnbuckle to permit the insertion and removal of pin 12. Assume the turnbuckle to be screwed so far up on rod 5 that the end of that rod engages the inner face of collar 8. The connecting-rod has, under these conditions, become, virtually a solid rod of unvarying length, and the arm will be vibrated to the full extent of the stroke of the crank precisely as though there were no turnbuckle in the rod. If, now, the turnbuckle were screwed out as far as possible upon rod 5 the collar would be at liberty to reciprocate within the turnbuckle. The movement of rod 5 to the right would cause the turnbuckle to drag rod 7 to the right, but when rod 5 and the turnbuckle move to the left, rod 7 instead of being pushed to the left, would remain stationary until the end of rod 5 came in contact with the collar whereupon rod 7 would move to the left with the turnbuckle. The extent of this lost motion during which rod 7 does not partake of the motion of rod 5 may be adjusted at will by simply screwing the turnbuckle farther onto or off of rod 5. If the cavity in the turnbuckle were long enough, as might be desirable in some cases, the collar might be able to play in the cavity for a distance equal to the full stroke of the crank in which case rod 5 would impart no motion whatever to rod 7, under which conditions the degree of reciprocation for rod 7 might be adjusted from zero to the maximum represented by the stroke of the crank.

It will be obvious that the device, even when employed with a crank and a vibrating arm, would have the same performance if

reversed endwise so that rod 5 would connect with the arm and rod 7 with the crank. While I have referred to the end of rod 5 coming in contact with collar 8 the contact is, in effect, with the end of rod 7, the collar being the expedient by means of which the turnbuckle is caused to drag upon rod 7 or, in case the driving power be applied to rod 7, the rod is caused to drag upon the turnbuckle.

I claim:—

A connecting-rod comprising, a sleeve, a rod screwed into one end of the sleeve and adapted to be adjusted for a greater or less projection into the sleeve, a hollow plug screwed into the opposite end of the sleeve and having a bore less in diameter than the interior of the sleeve, a rod adapted to reciprocate in the bore of the plug, and a collar firmly secured to the inner end of the last-mentioned rod and adapted to make contact alternately with the inner end of said plug and the inner end of the first-mentioned rod as one of the rods is reciprocated, whereby the relative degree of reciprocating motion of the two rods may be adjusted. combined substantially as set forth.

JAMES MILLS.

Witnesses:
VERNA CHAMPNEY,
MAX MOSLER.