Aug. 2, 1949. D. H. CHASON 2,478,041

CONNECTING ROD

Filed Sept. 21, 1945 2 Sheets-Sheet 1

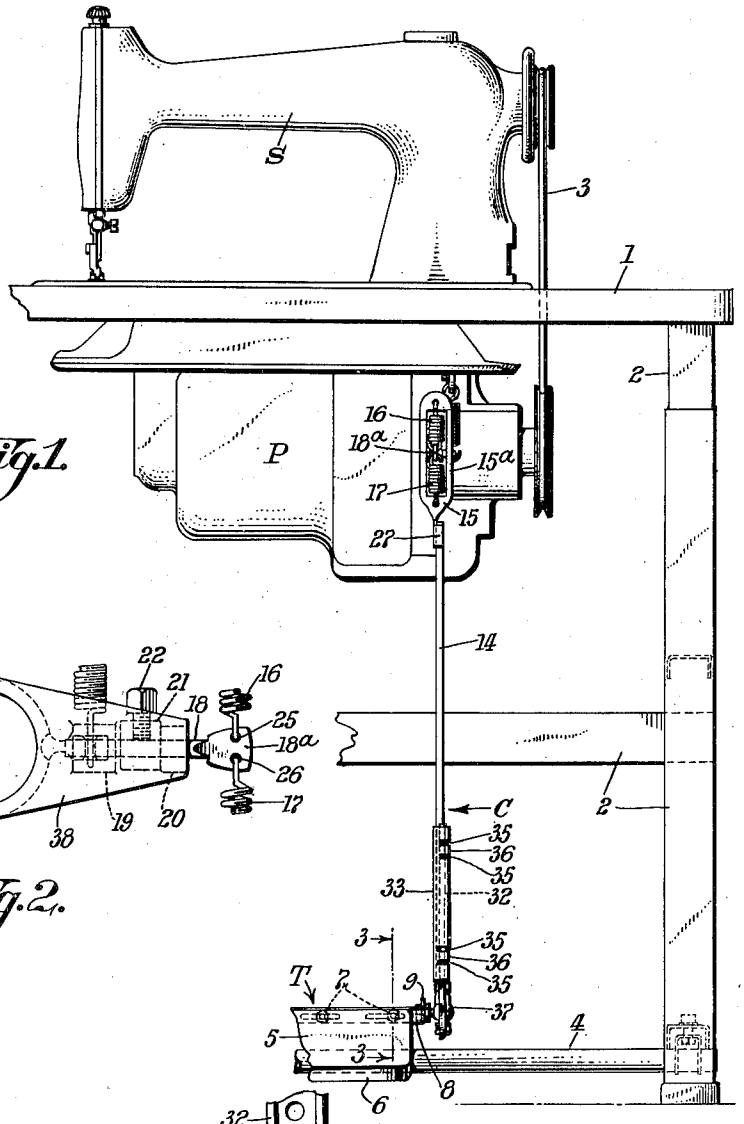


Fig. 1.

Fig. 2.

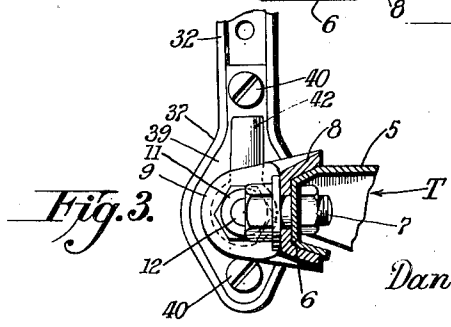


Fig. 3.

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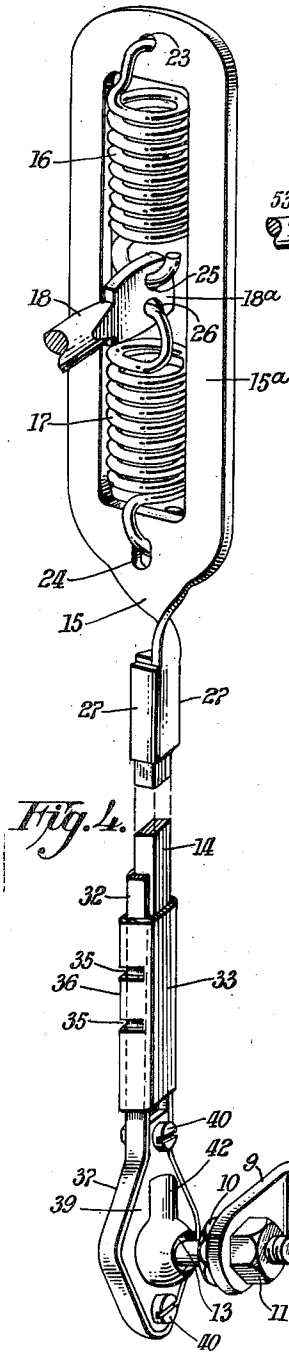


Fig. 4.

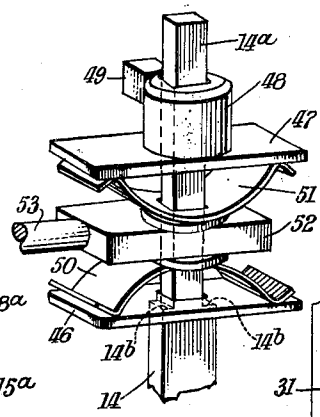


Fig. 10.

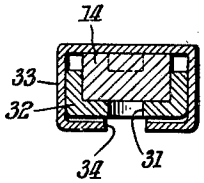


Fig. 8.

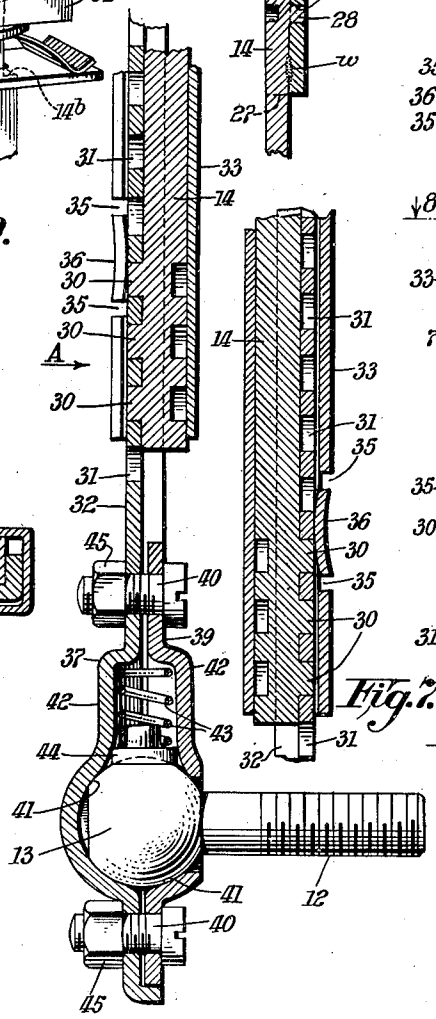


Fig. 5.

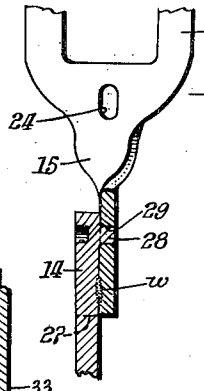


Fig. 9.

Fig. 7.

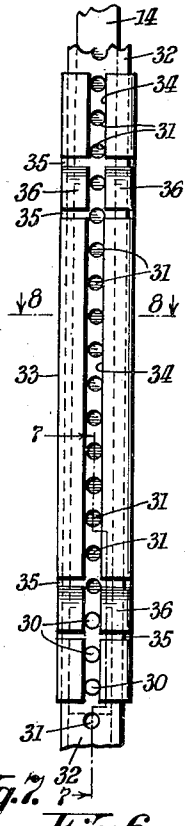


Fig. 6.

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2,478,041

CONNECTING ROD

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Application September 21, 1945, Serial No. 617,808

15 Claims. (Cl. 74—582)

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This invention relates to connecting rods such as are used, for example, between a sewing machine foot-treadle and a power transmitter which drives the sewing machines.

The invention has as an object to provide an improved connecting rod which is readily adjustable as to length; which is rattle proof; which does not transmit objectional vibrations from the power transmitter to the foot-treadle; and which affords a limited amount of resiliency between the treadle and the actuating arm of the power transmitter.

With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, combinations and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

In the drawings, Fig. 1 is a front side elevation of a portion of a sewing machine table having secured thereto a sewing machine and a power transmitter and showing also a portion of a foot-treadle and my improved adjustable connecting rod between the treadle and the power transmitter.

Fig. 2 is a detail view of a power transmitter actuating lever to which my improved connecting rod is adapted to be attached.

Fig. 3 is an enlarged sectional view taken substantially on the line 3—3 of Fig. 1, showing the connection between the foot-treadle and my improved connecting rod.

Fig. 4 is an enlarged perspective view, partly broken away, of the improved connecting rod.

Fig. 5 is an enlarged vertical sectional view of a portion of the improved connecting rod.

Fig. 6 is a face view, looking in the direction indicated by the arrow A in Fig. 5, of portions of the adjustable connecting rod.

Fig. 7 is an enlarged longitudinal sectional view taken substantially on the line 7—7 of Fig. 6.

Fig. 8 is an enlarged transverse sectional view taken substantially on the line 8—8 of Fig. 6.

Fig. 9 is a detail view, partly in section, showing the means for connecting together two parts of the improved connecting rod.

Fig. 10 is a detail perspective view of a modified form of yielding connection between the improved connecting rod and the actuating lever of the power transmitter.

Referring more specifically to the drawings,

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and first to Fig. 1 thereof, the invention is disclosed as comprising a composite connecting element C between a sewing machine foot-treadle T and a power transmitter P. The power transmitter is shown as secured to the under side of a table top 1 which is supported upon a suitable metal framework 2 and carries a sewing machine S which is driven from the power transmitter by a belt 3. The treadle T is mounted for oscillation on a rod 4 supported by the framework 2.

The framework, treadle, table-top, power transmitter and sewing machine are of conventional form and constitute no part of the present invention. The power transmitter may be of the type shown in United States patent to Peets et al., No. 2,004,055, June 4, 1935, and has a clutch-operating arm 38 (Fig. 2) the oscillatory motions of which, under the action of the foot-treadle, effect, alternately, driving and stopping of the sewing machine.

The foot-treadle T is preferably of the type having a sheet metal foot-plate 5, formed with a downturned marginal flange 6, to which is adjustably secured, by bolts 7, a channel-like extension bar 8. This extension bar has a laterally offset portion 9 to which is secured, by nuts 10 and 11, the shank 12 of a ball-stud 13 to which the lower end of the connecting rod C is attached, as hereinafter will be described.

The composite connecting rod C comprises a bar 14 to the upper end of which is secured a flat sheet metal member 15 shaped to provide a loop 15a in which is supported, by opposed coil-springs 16 and 17, one end of a transversely projecting power transmitting pin 18. This pin is fitted into bores formed in lugs 19 and 20 projecting laterally from the clutch operating arm 38 of the power transmitter. A collar 21, secured upon the pin 18, between the lugs 19 and 20, by a set screw 22, prevents withdrawal of the pin from said bores but permits a slight axial movement of the pin relative to the arm 38. As shown most clearly in Fig. 4, the outer or relatively remote ends of the coil springs 16 and 17 are engaged, respectively, in apertures 23 and 24 in the loop portion 15a, while the inner or relatively proximate ends thereof engage in apertures 25 and 26, respectively, formed in the flattened end portion 18a of the pin 18. Thus the bar 14 is yieldingly connected to the pin 18 in such a manner that vibrations caused by the sewing machine or by the power transmitter are not transmitted to the connecting rod and to the foot-treadle. While the springs 16 and 17

also provide the desired amount of resiliency between the treadle and the actuating arm of the power transmitter, the opposed action of the springs is such as to reduce lost motion to a minimum in bringing the sewing machine into operation.

The bar 14 and the member 15 are joined together, as shown most clearly in Figs. 4 and 9, by fitting the upper end portion of the bar between laterally spaced flanges or wings 27 provided on the member 15; fitting a stud 28, punched from the bar 14, into an aperture 29 formed in the member 15, and finally spot-welding the parts together as indicated at *w*.

At its lower portion, the bar 14 is provided with one or more projecting studs 30, punched outwardly from the bar stock. Preferably three studs are provided and these studs are adapted to be fitted selectively into any three adjacent and similarly spaced apertures 31 formed in a channel bar 32 which is fitted upon the bar 14. The channel bar 32 constitutes the lower element of the composite rod C. By thus inserting the stud or studs 30 into any selected one or more of the apertures 31, the over-all length of the rod may be varied considerably, as may be required by different installations and operating conditions.

To maintain the studs 30 in the selected apertures 31, there is slidingly mounted, on the bar 14 and the channel member 32, a sheet metal retaining element, or sleeve 33 which is substantially rectangular in cross-section and is provided, in one wall, with a slot 34. The relative lengths of the bar 14, channel member 32 and sleeve 33 are such that the sleeve may be slid upwardly on the bar to completely uncover the channel member 34, even when that member is in its uppermost position on the bar. With the parts thus separated, the member 34 may be repositioned on the bar with the studs 30 fitting into any selected apertures 31, after which the sleeve is slid downwardly to embrace the member 34 and hold the parts in adjusted position. Thus the over-all length of the connecting rod C may be readily varied at will, with the composite parts securely locked against relative movement.

The face and side walls of the sleeve 33 are notched, as indicated at 35, to provide inwardly pressed resilient flat fingers 36 which bear upon the back wall of the channel-bar 32, as shown most clearly in Fig. 7, thereby to compensate for variations in the thickness of the materials from which the parts are made, as well as frictionally to maintain the sleeve 33 against accidental endwise movement and hold it against rattling. The fingers 36 are preferably curved in cross-section (see Fig. 7) to avoid interference between the parts and thereby facilitate sliding of the fingers over the upper end of the channel member 32 when the parts are assembled.

The lower end of the channel bar 32 is formed with an enlarged flat hollow head 37 which cooperates with a similarly shaped cap 39, secured thereto by screws 40 threaded into the bar 32, to provide a socket 41 adapted to receive the ball-stud 13, and a substantially cylindrical portion 42 adapted to house a coil spring 43. One end of the spring 43 bears against the upper inner wall of the housing 42, while the other end thereof bears against a friction shoe 44 which, in turn, bears upon the surface of the ball 13. Lock nuts 45, threaded upon the screws 40, prevent accidental loosening of the screws.

In Fig. 10, there is illustrated a modified form of yielding connection between the bar 14 and the transmitter actuating arm. In this form, the bar 14 has a reduced upper end portion 14a and affords shoulders 14b adapted to support a plate-like washer 46. A similar plate-like washer 47 is fitted upon the reduced portion 14a and is held against outward movement thereon by a collar 48, secured to the bar by a set screw 49. Supported intermediate the washers 46, 47 between oppositely bowed leaf-springs 50, 51 is a suitably apertured block 52 carrying a projecting pin 53, adapted to be held in the bores in the lugs 19 and 20 on the clutch operating arm of the power transmitter, as hereinbefore described with respect to the pin 18. The springs 50, 51 yieldingly support the bar 14 from the pin 53 and prevent vibrations being transmitted to the bar as do the coil-springs 16 and 17.

Having thus set forth the nature of the invention, what I claim herein is:

1. An adjustable connecting rod comprising a channel member; a bar member having one end portion fitted into said channel member, one of said members having therein a plurality of apertures arranged lengthwise thereof and the other of said members having a stud projecting therefrom and adapted to be fitted into any one of said apertures, thereby to lock said members against relative endwise movement; a slidable sleeve embracing said members to prevent lateral separation thereof; and friction means acting on said sleeve to maintain it against accidental endwise movement.

2. An adjustable connecting rod comprising a channel member having in the back wall thereof a plurality of equally spaced apertures arranged lengthwise of said member; a bar having one end portion fitted into said channel member; a plurality of spaced studs projecting from said bar and less in number than said apertures, the size and spacing of said studs being equal to the size and spacing of said apertures, whereby the studs are adapted to be fitted selectively into any successive like number of said apertures, for varying the over-all length of said member and bar and to hold them against relative endwise movement; a slidable sleeve embracing said member and bar to prevent lateral separation thereof; and friction means acting on said sleeve to maintain it against accidental endwise movement.

3. An adjustable connecting rod comprising a channel member having in one wall thereof a plurality of apertures arranged lengthwise of said member; a bar member having one end portion fitted into said channel member; a stud projecting from said bar member and adapted to be fitted into any one of said apertures, thereby to vary the over-all length of said members and to hold them against relative endwise movement; a slidable sleeve embracing said members to prevent lateral separation thereof; and friction elements provided by said sleeve and bearing against one of said members to prevent accidental endwise movement of said sleeve.

4. An adjustable connecting rod comprising a channel member having in one wall thereof a plurality of apertures arranged lengthwise of said member; a bar member having one end portion fitted into said channel member; a stud projecting from said bar member and adapted to be fitted into any one of said apertures, thereby to vary the over-all length of said members and to hold them against relative endwise movement; a slidable sleeve embracing said member and bar to

prevent lateral separation thereof; and spring fingers provided by said sleeve and bearing on one of said members to prevent accidental endwise movement of said sleeve.

5. An adjustable connecting rod as set forth in claim 4 in which the spring fingers provided by the sleeve have their central portions in engagement with one of said members and their edge portions slightly spaced therefrom to facilitate assembling of the parts.

6. A lengthwise adjustable connecting rod, comprising upper and lower complemental sections having overlapping portions adapted to be secured together in any one of a plurality of axially adjusted positions; means, including a slidable sleeve mounted on said sections to lock said sections together in their various positions of adjustment; means carried by said lower section to connect the rod to an actuator; means carried by said upper section yieldingly to connect the rod to a member to be actuated, said last named means comprising a plurality of opposed springs carried by said upper section; and a transversely disposed pin supported by and between said springs.

7. A lengthwise adjustable connecting rod, comprising an upper section having, adjacent its upper end, a loop-portion; a complemental lower section, said sections having overlapping portions adapted to be secured together in any one of a plurality of axially adjusted positions; means, including a slidable sleeve mounted on said sections, to lock said sections together in their various positions of adjustment; means to connect the lower section to an actuator; means yieldingly to connect the upper section to a member to be actuated, said last named means comprising a pair of aligned and opposed coil springs having their outer ends connected to the loop portion of said upper section; and a transversely disposed actuating pin connected to and supported by the inner ends of said springs.

8. A lengthwise adjustable connecting rod, comprising upper and lower complemental sections having overlapping portions adapted to be secured together in any one of a plurality of axially adjusted positions; means, including a slidable sleeve mounted on said sections, to lock said sections together in their various positions of adjustment; means to connect the lower section to an actuator; means yieldingly to connect the upper section to a member to be actuated, said last named means comprising a pair of oppositely bowed leaf springs carried by said upper section with their convex faces adjacent and opposed to each other, washers carried by said upper section and taking the thrust of said leaf springs; and an actuating pin supported between the convex faces of said leaf springs.

9. A lengthwise adjustable connecting rod comprising a channel member; means carried by one end of said channel member for operatively connecting it to a foot-treadle; a bar having one end portion fitted into said channel member and its other end portion formed as a loop; a pair of aligned coil springs mounted in said loop and having their outer ends connected thereto; a transversely projecting power transmitting pin connected to the inner ends of said springs; interlocking connections between said channel member and said bar whereby they may be secured together in various positions of axial adjustment; and a sleeve slidingly mounted on said member and bar and adapted, in one position, to prevent accidental separation of said interlocking connections.

10. A lengthwise adjustable connecting rod comprising a channel member; means carried by one end of said channel member for operatively connecting it to a foot-treadle; a bar having one end portion fitted into said channel member and its other end yieldingly supporting a transversely projecting power transmitting pin; interlocking connections between said channel member and said bar whereby they may be secured together in various positions of axial adjustment; and a sleeve slidingly mounted on said member and bar and adapted, in an advanced position, to prevent accidental separation of said interlocking connections, said channel member, bar and sleeve being of such relative lengths that the sleeve may be slid to a retracted position in which it completely uncovers said channel member in all of its positions.

11. A lengthwise adjustable connecting rod comprising first and second members having contacting and overlapping portions of substantially uniform thickness one of which is provided with a projecting stud and the other of which is provided with a plurality of sockets arranged lengthwise thereof and adapted selectively to receive said stud, thereby to secure said members together in various positions of axial adjustment; a slidable sheet metal sleeve embracing said overlapping portions substantially throughout their length to prevent lateral separation thereof and to hold said projecting element in the selected socket; and resilient friction elements forming parts of said sleeve and bearing against one of said portions to hold said sleeve against accidental endwise movement.

12. A connecting-rod comprising, a relatively narrow actuating bar carrying at one end a relatively wide and flat loop portion; a pair of opposed and aligned coil-springs located in said loop portion and having their relatively remote ends anchored to the opposite ends of the loop portion; and a connector-element anchored to and projecting laterally from the relatively proximate ends of and distending said springs.

13. An adjustable connecting rod comprising a first member having a plurality of apertures arranged lengthwise thereof; a second member having a portion thereof arranged in side-by-side relation with a portion of said first member; a stud projecting from said second member and adapted to be fitted selectively into any one of the apertures in said first member, thereby to lock said members against relative endwise movement; a clamping element surrounding said members in the region of said stud to prevent lateral separation of the two members; and a friction device carried by said clamping element and movable relatively thereto, said friction device engaging one of said members to prevent accidental shifting of said clamping element lengthwise of said rod.

14. An adjustable connecting rod comprising a channel member; a bar member having one end portion fitted into said channel member, one of said members having therein a plurality of apertures arranged lengthwise thereof and the other of said members having a stud projecting therefrom and adapted to be fitted into any one of said apertures, thereby to lock said members against relative endwise movement; a slidable retaining element embracing said members to prevent lateral separation thereof; and friction

means acting on said retaining element to maintain it against accidental endwise movement.

15. An adjustable connecting rod comprising a channel member having in the back wall thereof a plurality of equally spaced apertures arranged lengthwise of said member; a bar having one end portion fitted into said channel member; a plurality of spaced studs projecting from said bar and less in number than said apertures, the size and spacing of said studs being equal to the size and spacing of said apertures, whereby the studs are adapted to be fitted selectively into any successive like number of said apertures, for varying the over-all length of said member and bar and to hold them against relative endwise movement; a slidable retaining element embracing said member and bar to prevent lateral separation thereof; and friction means acting on said retaining element to maintain it against accidental endwise movement.

DANIEL H. CHASON.

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