

Feb. 23, 1932.

W. V. ORR

1,847,048

ADJUSTABLE CRANK PIN

Filed May 12, 1930

2 Sheets-Sheet 1

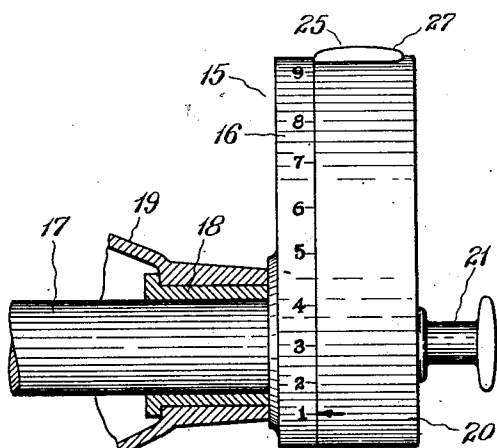


FIG. 1.

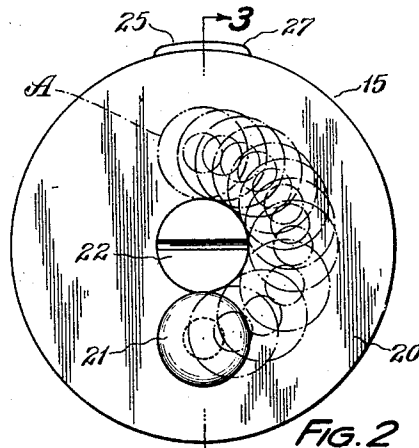


FIG. 2

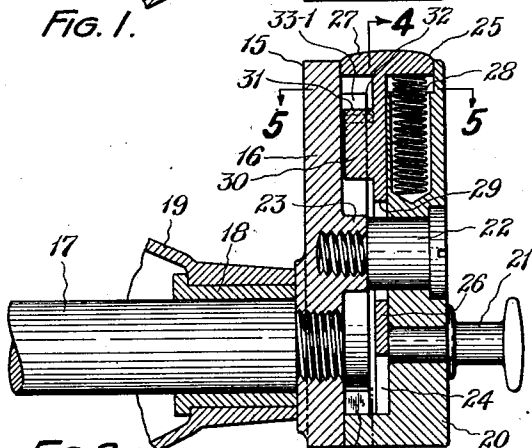


FIG. 3

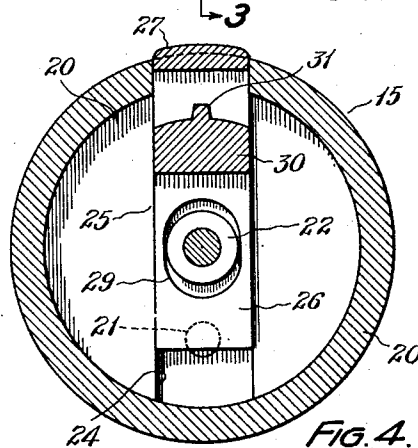


FIG. 4.

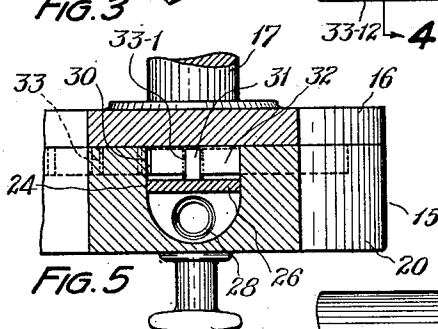


FIG. 5

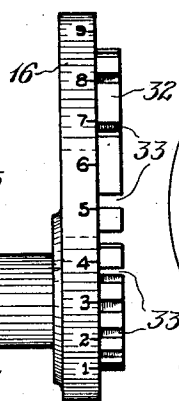


FIG. 6.

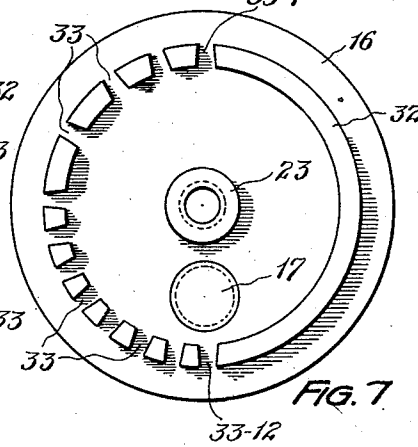


FIG. 7

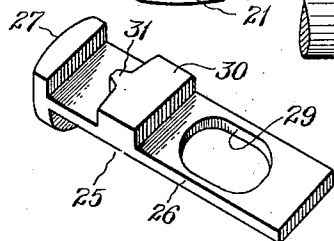


FIG. 8

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Feb. 23, 1932.

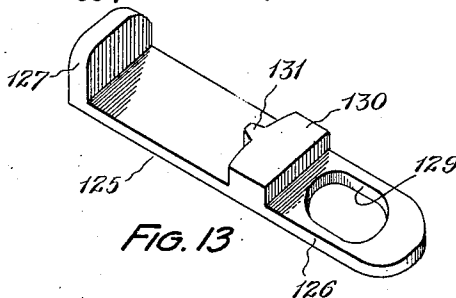
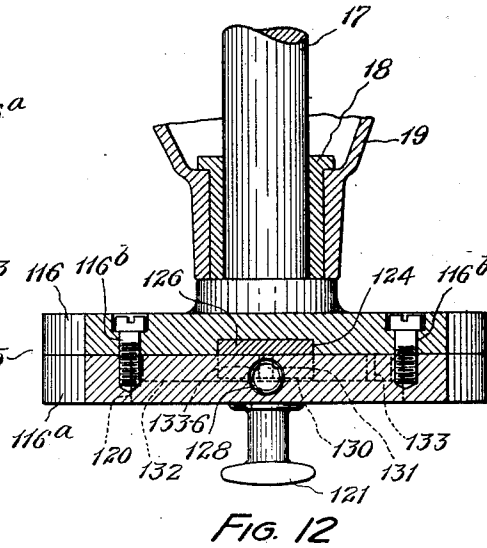
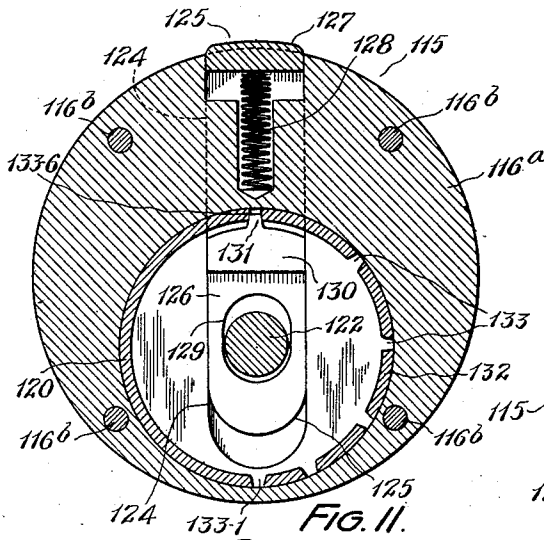
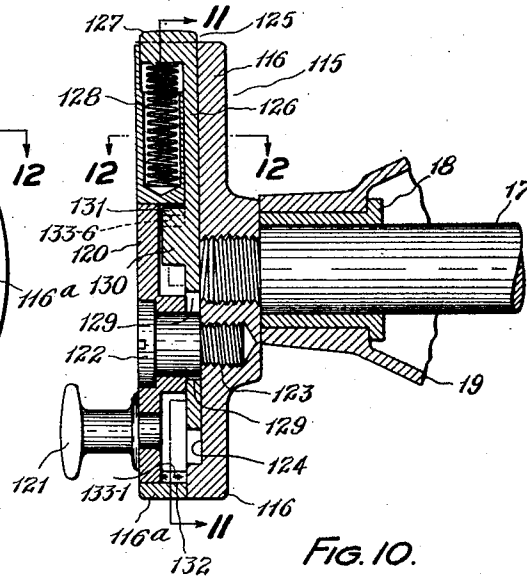
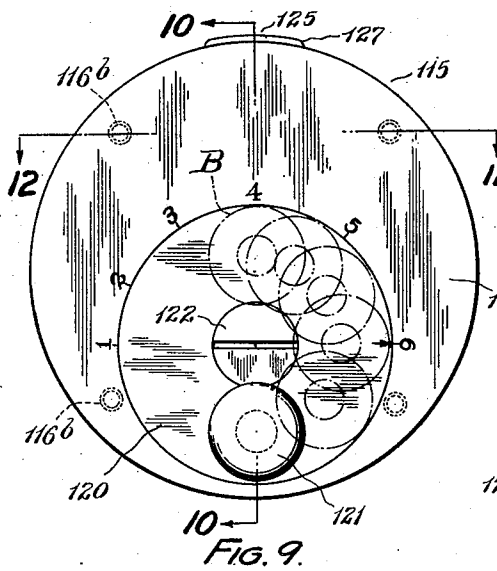
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ADJUSTABLE CRANK PIN

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2 Sheets-Sheet 2



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## UNITED STATES PATENT OFFICE

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## ADJUSTABLE CRANK PIN

Application filed May 12, 1930. Serial No. 451,807.

The invention relates to adjustable crank pins, and more particularly to adjustable crank pins adapted for use in connection with any standard type of exercising or massaging machines, such as shown in the Daley Patent No. 1,713,499, dated May 14, 1929.

Machines of this character include a strap applicator, or other form of massaging appliance, for massaging and exercising body parts by imparting a massaging or rubbing movement to the strap through the medium of pins eccentrically mounted on a rotating shaft, the ends of the strap applicator being connected with the pins.

In use, the strap applicator engages the portion of the body desired to be massaged, and the shaft is rotated at desired speeds of from 250 to 1200 R. P. M., thereby imparting a massaging movement to the body part.

It has been found desirable, to meet the tastes and requirements of different persons, and to meet the physical characteristics of the body parts being massaged, to change the length of throw or eccentricity of the crank pins to which the strap applicator is connected, in order to increase or decrease the length of movement of the applicator in carrying out the massaging operation.

Accordingly, adjustable crank pins have been provided on the rotatable shaft, which have included set screws for maintaining the crank pins in adjusted position; or which have included parts incident to the adjusting mechanism which project a substantial distance from the crank pin or from the member to which the crank pin is attached.

The mechanisms including set screw adjusting means have been found to be very difficult for the average person to adjust, to require some special tool for use in making the required adjustment, and to be with difficulty adjusted to predetermined places. Moreover, vibrations set up due to the movement of rotary parts frequently loosen the screw adjusting means so as to render them inoperative and useless for the purpose for which they are intended.

Those prior types of crank pin adjusting means which have included projecting parts cause the operation of the exerciser to be haz-

ardous because of liability of the projecting parts to become engaged or entangled with the clothing of the person using the exerciser. Likewise, such parts that may project from the swiftly moving rotary members of the exercising appliance may frequently cause injury to the person of the user.

An object of the present invention is therefore to provide a crank pin for an exercising or massaging machine in which the throw or eccentricity of the crank pin is adjustable.

A further object of the invention is to provide means which may be manipulated by the most unskilled operator or user for accomplishing the adjustment.

A further object of the invention is to provide crank pin adjusting means which may be readily and quickly adjusted to any one of a plurality of desired predetermined positions without the use of special tools for accomplishing the adjustment.

A further object of the present invention is to provide an adjustable crank pin which does not include any projecting parts other than the crank pin per se.

A further object of the invention is to provide adjusting means for a crank pin which will not become loosened, with a resulting change in adjustment, due to vibrations set up by movement of rotary parts.

A further object of the present invention is to provide plunger detent means, operative by applying pressure thereto at the periphery of the disk on which the crank pin is mounted, for adjusting the crank pin so that the same may be released, or held in any desired position of adjustment.

And finally, it is an object of the present invention to provide an adjustable crank pin device in which there are relatively few constituent parts, each of which have a very simplified design.

These and other objects may be obtained by utilizing an adjustable crank pin construction, preferred embodiments of which are hereinafter set forth in detail, which may be stated in general terms as including in connection with a rotatable shaft, a disk on the shaft, a disk having an eccentric pin mounted thereon, means connecting the disks

for relative rotary movement, a catch ring on one of the disks, and a spring pressed detent mounted on the other disk for selective engagement with the recesses of the catch ring for maintaining the disks at selective predetermined positions of adjustment relative to one another.

Several embodiments of the improved device are illustrated in the accompanying drawings forming part hereof, in which

Figure 1 is a side elevation of the improved device showing the same mounted on a rotatable exercising machine shaft;

Fig. 2 is an end elevation of the device shown in Fig. 1;

Fig. 3 is an elevation section taken on the line 3—3, Fig. 2;

Fig. 4 is an elevation section looking in the direction of the arrows of the line 4—4, Fig. 3;

Fig. 5 is a plan section taken on the line 5—5, Fig. 3;

Fig. 6 is a side elevation of the disk provided with an internal gear;

Fig. 7 is an end elevation of the disk shown in Fig. 6;

Fig. 8 is a perspective view of the plunger detent forming part of the construction shown in Figs. 1 to 5, inclusive;

Fig. 9 is an end elevation of a modified form of adjustable crank pin device;

Fig. 10 is an elevation section taken on the line 10—10, Fig. 9;

Fig. 11 is an elevation section looking in the direction of the arrows of the line 11—11, Fig. 10;

Fig. 12 is a plan section taken on the line 12—12, Figs. 9 and 10; and

Fig. 13 is a perspective view of the plunger detent forming part of the construction shown in Figs. 9 to 12, inclusive.

Similar numerals refer to corresponding parts throughout the various figures of the drawings.

One form of the improved adjustable crank pin device is indicated generally at 15 in Figs. 1 and 2, which may include a disk 16 eccentrically threaded on an end of the rotatable exercising machine shaft 17, which is preferably journaled in a bearing 18 mounted in the exercising machine casing 19. The other end of the shaft 17 (not shown) may be journaled in a similar bearing, and any suitable means may be provided for rotating the shaft 17.

The device may likewise include another disk 20 which is provided with a crank pin 21. The disk 20 may be journaled on the threaded cap screw 22 which engages the internally threaded boss 23, of the disk 16, for mounting the disk 20 for rotary movement relative to the disk 16.

The inner face of the disk 20 is provided with a diametrically disposed recessed slot 24 in which is slidably mounted the plunger

detent generally indicated at 25 and shown in Fig. 8.

The plunger detent includes a mounting portion 26, slidably located in the recessed slot or groove 24, and a flanged operating end piece 27.

A coil spring 28 is mounted within the disk 20 for pressing against the flanged end piece 27 of the plunger detent for normally urging the plunger detent 25 radially outward of the disk 20.

The mounting portion 26 of the plunger detent is provided with a slot 29 for receiving the cap screw 22, which passes therethrough, and the slot is preferably elongated as shown for permitting radial movement of the plunger detent.

The inner face of the mounting portion of the plunger detent 25 is provided with a projecting block 30 having a single tooth 31 projecting therefrom, radially of the disk 20.

The inner surface of the disk 16 is provided with a catch ring 32 comprising a plurality of unequally spaced recesses 33. When the various parts are assembled together, the single tooth 31 normally engages one of the recesses 33, because of the action of the spring 28, to hold the disks 16 and 20 in the desired position of adjustment relative to one another.

As shown in Fig. 1, the disks 16 and 20 are adjusted relative to one another so that the pin 21 is concentric with the shaft 17, in order that no massaging movement will be imparted to a belt applicator attached to the pin 21, upon rotation of the shaft 17. This position of adjustment may be designated as adjusted position (1) and is indicated by the arrow on the periphery of the disk 20 pointing to the numeral 1 appearing on the periphery of the disk 16.

The various parts of the device in adjusted position (1) are shown in full lines in Figs. 1 to 7 inclusive, in which the single tooth 31 engages the recess 33—1.

When it is desired to change the location of the crank pin 21 relative to the rotatable shaft 17, the flanged end piece 27 of the plunger detent is depressed for releasing the single tooth 31 from engagement with the recess 33—1, whereupon the disk 20 may be rotated on the cap screw 22 so that the single tooth 31 may engage any one of the remaining eleven recesses 33, best shown in Fig. 7, for rotating the crank pin 21 at any one of the desired eleven adjusted positions such as shown in dot-dash lines in Fig. 2.

The extreme position of adjustment of the crank pin 21, for locating the same to have the greatest throw with respect to the shaft 17 is indicated at A in Fig. 2, and occurs when the single tooth 31 engages the recess 33—12 indicated in Fig. 7.

Any intermediate position of adjustment of the eccentric pin 21, between the position

shown in full lines in Fig. 2 and the position indicated at A therein, may be quickly located by bringing the arrow shown in Fig. 1 into alignment with any of the twelve designating numerals appearing on the periphery of the disk 16.

It is pointed out that in the form of device shown in Figs. 1 to 8, inclusive, the shaft 17 and the pin 21 are both eccentric with respect to the disks 16 and 20, and the disks 16 and 20 are concentrically arranged.

A modified form of the improved adjustable crank pin device is indicated generally at 115 in Fig. 9, which may include a disk 116 concentrically threaded on an end of the rotatable exercising machine shaft 17, which is preferably journaled in a bearing 18 mounted in the exercising machine casing 19. The other end of the shaft 17 (not shown) may be journaled in a similar bearing, and any suitable means may be provided for rotating the shaft 17.

The modified form of the device may include another disk 120 which is provided with a crank pin 121. The disk 120 may be journaled on the threaded cap screw 122 which engages the internally threaded boss 123, on the disk 116, for mounting the disk 120 for rotary movement relative to the disk 116.

The inner face of the disk 116 is provided with a diametrically disposed recessed slot 124 in which is slidably mounted the plunger detent generally indicated at 125 and shown in Fig. 13.

The plunger detent includes a mounting portion 126, slidably located in the recessed slot 124, and a flanged operating end piece 127.

A coil spring 128 is mounted within the supplementary disk 116a which is carried by the disk 116, by screws 116b, and the spring 128 presses against the flanged end piece 127 of the plunger detent for normally urging the plunger detent radially outward of the disk 120. The mounting portion 126 of the plunger detent is provided with a slot 129 for receiving the cap screw 122, which passes therethrough, and the slot is preferably elongated as shown for permitting radial movement of the plunger detent.

The inner face of the mounting portion of the plunger detent 125 is provided with a projecting block 130, having a single tooth 131 projecting therefrom, radially of the disk 120.

The inner surface of the disk 120 is provided with a catch ring 132, comprising a plurality of unequally spaced recesses 133. When the various parts are assembled together, the single tooth 131 normally engages one of the recesses 133, because of the action of the spring 128, to hold the disks 116 and 120 in the desired position of adjustment relative to one another.

As shown in Fig. 10, the disks 116 and 120 are adjusted relative to one another so that the pin 121 is eccentric with the shaft 17 in order that the greatest amount of the massaging movement will be imparted to a belt applicator attached to the pin 121 upon rotation of the shaft 17. This position of adjustment may be designated as adjusted position (6), as is indicated by the arrow on the disk 120 pointing to the numeral 6 appearing on the periphery of the supplementary disk 116a.

The various parts of the modified device in adjusted positions (6) are shown in full lines in Figs. 9 to 12 inclusive, in which the single tooth 131 engages the recess 133—6.

When it is desired to change the location of the crank pin 121 relative to the rotatable shaft 17, the flanged end piece 127 of the plunger detent is depressed, for releasing the single tooth 131 from engagement with the recess 133—6, whereupon the disk 120 may be rotated on the cap screw 122 so that the single tooth 131 may engage any one of the remaining five recesses 133, best shown in Fig. 11, for rotating the crank pin 121 to any one of the desired five adjusted positions such as shown in dot-dash lines in Fig. 9.

The position of adjustment of the crank pin 121, for locating the same to be concentric with the shaft 17 is indicated at B in Fig. 9, and occurs when the single tooth 131 engages the recess 133—1 indicated in Fig. 11.

Any intermediate position of adjustment of the eccentric pin 121, between the position shown in full lines in Fig. 9 and the position indicated at B therein, may be quickly located by bringing the arrow shown in Fig. 9 into alignment with any of the six designating numerals appearing on the supplementary disk 116a.

It is pointed out that in the form of device shown in Figs. 9 to 13, inclusive, the shaft 17 is concentric with the disk 116 and to the supplementary disk 116a, and the shaft 17 is eccentric with respect to the disk 120; while the pin 121 is eccentric relative to the disk 120. Moreover, the disk 120 is mounted eccentrically with respect to the disk 116.

I claim:

1. An adjustable crank pin device for a rotatable shaft, including a disk mounted on the shaft, another disk having a pin mounted eccentrically thereon, means spaced from said pin located concentrically of one of the disks connecting the disks for rotary movement one relative to the other, a catch ring projecting from one of the disks having a plurality of spaced recesses, and a spring pressed plunger detent mounted on the other disk for selective engagement with the recesses of the catch ring.

2. An adjustable crank pin device for a ro-

tatable shaft, including a disk mounted on the shaft, another disk having a pin mounted eccentrically thereon, means spaced from said pin located concentrically of one of the disks connecting the disks for rotary movement one relative to the other, a catch ring projecting from one of the disks having a plurality of spaced recesses, and a spring pressed plunger detent slidably mounted between the two disks for selective engagement with the recesses of the catch ring.

3. An adjustable crank pin device for a rotatable shaft, including a disk mounted on the shaft, another disk having a pin mounted eccentrically thereon, means connecting the disks for rotary movement one relative to the other, a catch ring concentrically located on one of the disks having a plurality of spaced recesses, there being a radial groove in a surface of the other disk, and a spring pressed plunger detent slidably mounted in the groove for selective engagement with the recesses of the catch ring.

4. An adjustable crank pin device for a rotatable shaft, including a disk mounted on the shaft, another disk having a pin mounted eccentrically thereon, means connecting the disks for rotary movement one relative to the other, a catch ring concentrically located on one of the disks having a plurality of spaced recesses, there being a radial groove in a surface of the other disk, and a spring pressed plunger detent having a mounting portion slidably mounted in the groove and having a single tooth projecting from the mounting portion for selective engagement with the recesses of the catch ring.

5. An adjustable crank pin device for a rotatable shaft, including a disk eccentrically mounted on the shaft, another disk having a pin eccentrically mounted thereon, means concentrically connecting the two disks for rotary movement one relative to the other, a catch ring on one of the disks, and a detent slidably mounted for radial movement on the other disk for cooperative selective locking engagement with the catch ring for selectively maintaining the same at various positions of relative rotary adjustment to vary the adjusted position of the pin relative to the shaft.

In testimony that I claim the above, I have hereunto subscribed my name.

WILLIAM V. ORR.

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