Sept. 26, 1933. E. SELLBERG ET AL 1,928,506

CRANK SHAFT GRINDER

Filed March 13, 1931 2 Sheets-Sheet 1

Fig. 1.

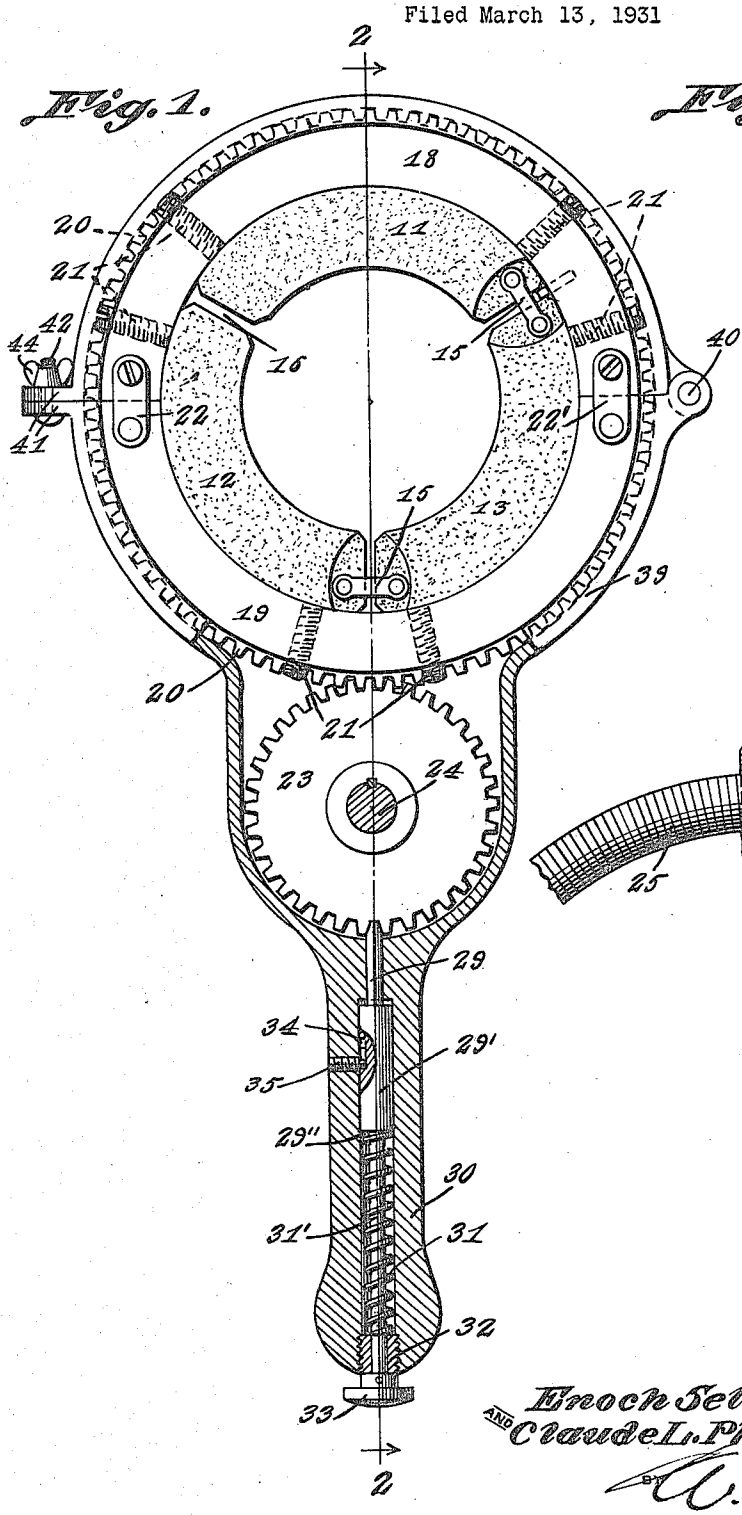
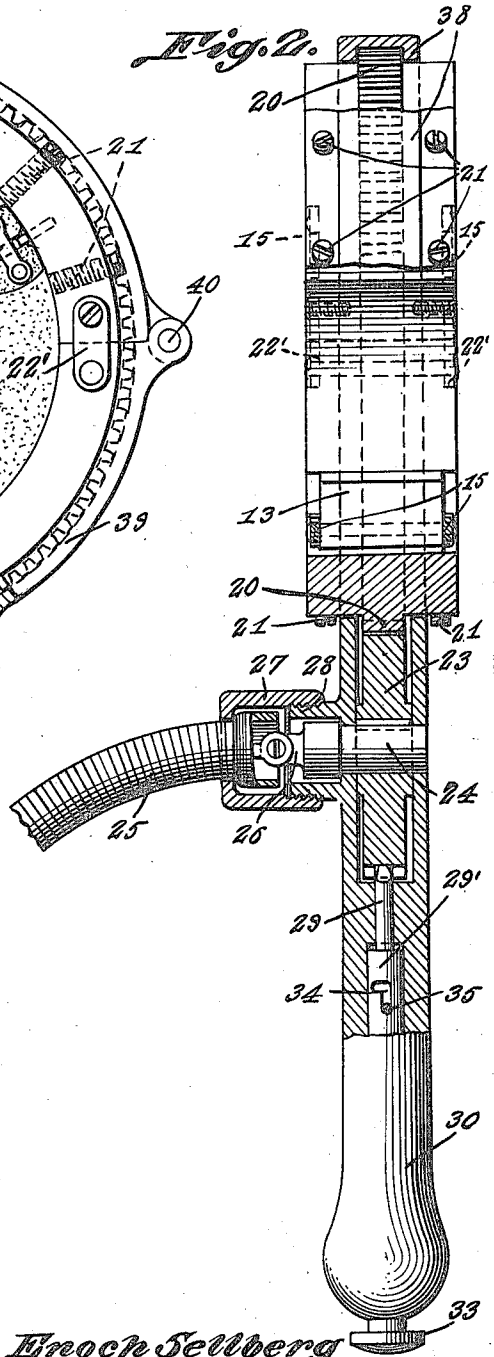


Fig. 2.



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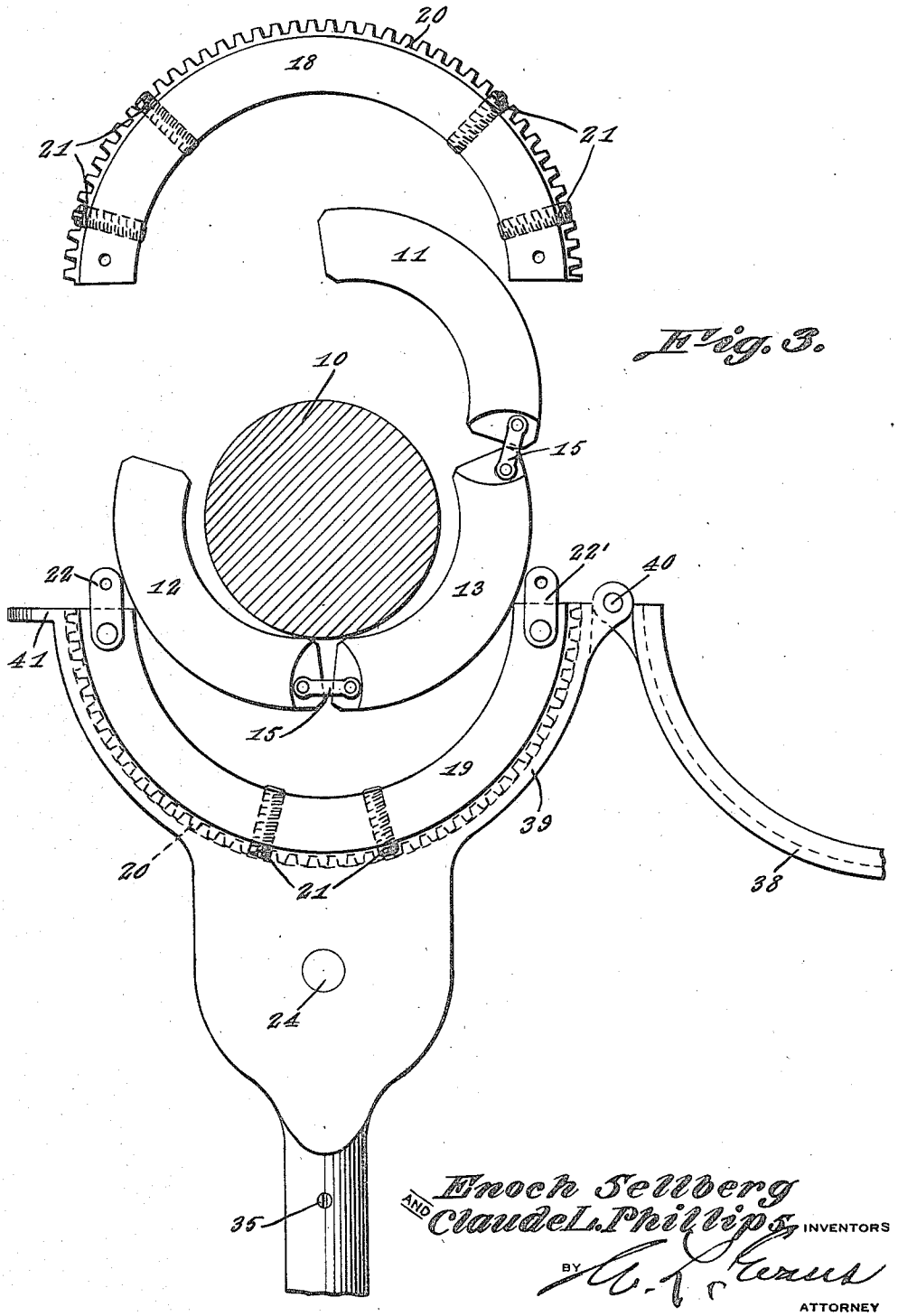


Fig. 3.

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CRANK SHAFT GRINDER

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Application March 13, 1931. Serial No. 522,406

2 Claims. (Cl. 51—73)

The object of this invention is to provide means for grinding a crank shaft, portions of which are "flat", or which depart from true cylindrical contour by reason of wear or other causes, and especially to effect this operation without removing the shaft from the engine.

A further object is to provide a device in which the grinding elements shall be in segmental form, with means for retaining them, or clamping them, around a shaft to be ground, so that with an abrasive material properly applied, a complete grinding operation may be produced within a short period of time and at minimum cost.

A further object is to provide special power driven means and devices for connecting these means with the grinding elements, and to provide temporary locking means aiding in determining the accuracy of the position of the grinding elements before the operation is begun.

With the foregoing and other objects in view, the invention consists in the novel features of construction and in the novel arrangement of the elements herein disclosed, it being understood that modifications, alterations or changes may be made within the scope of the claims without departing from the spirit of the invention.

In the drawings forming part of this application:—

Figure 1 is a view in section and elevation, showing the principal elements, and showing the casing therefor.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is chiefly in elevation, the shaft to be ground being shown in transverse section, and the view illustrates the housing in open position and the elements in the upper portion of the figure in position for the assembly of the apparatus in operative relation with reference to the shaft.

A shaft to be ground is shown conventionally and in section and is designated 10, and the grinding elements comprise the segments 11, 12, 13, any suitable number being provided. The segments are to be connected in a suitable manner, as by means of links or other devices 15, and the end portions of segments 11 and 12 approach each other at the point 16. No retaining means are necessarily provided at the end portions thus positioned, but an annular retaining device, also formed in segments, is provided. An abrasive will be applied between the segments 11, 12, 13, and the shaft 10, and the grinding operation will be produced in an obvious manner, after the shaft is enclosed, and the parts of the device under consideration are assembled. Figure 3 shows the open position, and Figure 1 shows the device in condition for operation.

The annular retaining member, which may be termed a tension ring or compression ring, includes a plurality of segments, here illustrated as two in number, and designated respectively 18 and 19. These segments are provided on the outer portions thereof with gear teeth 20, and radial screws 21 are threaded through the elements 18 and 19 and effect the required adjustment, depending upon the exact conditions encountered.

The elements 18 and 19 are to be connected by means of devices, such as 22 and 22', and the equivalent of a gear ring is thus provided.

A gear wheel 23 is keyed upon a short axial member 24, and this gear wheel 23 meshes with the gear ring or annular element comprising the portions 18 and 19. Power is applied by means of flexible shaft 25 connected by a universal joint or the like, shown at 26, with the short shaft 24. Complementary threaded members 27 and 28, the latter being formed with the housing of the device, enclose the connecting devices between the flexible shaft 25 and the shaft 24 of gear wheel 23.

The geared elements might tbe locked temporarily by means of a pin 29 having an enlarged portion 29', operating within a bore extending longitudinally of handle 30. The latter is formed with, or connected with, a housing constructed as indicated below. A coiled spring 31, surrounding the portion 31' of the locking pin, abuts a shoulder at 29'', and abuts a threaded device 32 at the other end, the latter being adjustable by means of a knob or the like 33. A bayonet slot is provided at 34, and a pin 35 enters this slot, and passes through the body of the handle 30, whereby the inner end of the pin 29 may be retained in locking position.

This locking operation just referred to is provided in order that the accuracy of the position of the grinding elements 11, 12, and 13 may be determined before the actual operation of the apparatus, under power, is begun.

The casing includes an upper approximately segmental portion 38, and a lower segmental portion 39, these being pivotally connected at 40, and a retaining device on the opposite side of the housing passing through apertured ears, such as 41, and thereafter secured. The locking pin or screw 42 is provided with a head on one end and is engaged by a wing nut 44, as shown at the left of Figure 1.

In the use of the device, the elements are as-

sumed to be in approximately the position of Figure 3, that is, in open position, so that the segmental devices may be passed around the shaft, and may then be moved to the position desired, which is that of Figure 1. Adjustment having been effected as nearly as can be determined, the locking device, including the pin 29, is brought into use, and it may readily be determined by the workman whether the parts are in position for effecting the exact result desired. If not so positioned, further adjustment may be effected by setting up the radial elements 21, or any one or more of these devices.

What is claimed is:—

1. In a device of the class described, a plurality of segmental grinding elements, devices for connecting said elements, means for retaining the segmental elements in position around an element to be ground, individually adjustable radial members engaging the segmental grinding elements, mechanism for imparting rotary movement to the retaining means and segmental elements, and channeled devices guiding the ends of the radial members, these devices surrounding and contacting with the means retaining the segmental grinding elements.

2. In a device of the class described, a plurality of segmental grinding elements, means for connecting the latter in annular form upon application, by enclosing movement to an element to be ground, an annular member, channel inclosed gearing for driving said member, devices each having an end portion guided by the channel and mechanically connecting the annular member with the grinding elements.

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