

Nov. 14, 1939.

L. SMITH

2,179,602

CENTERING DEVICE

Filed Nov. 23, 1938

2 Sheets-Sheet 1

Fig. 1.

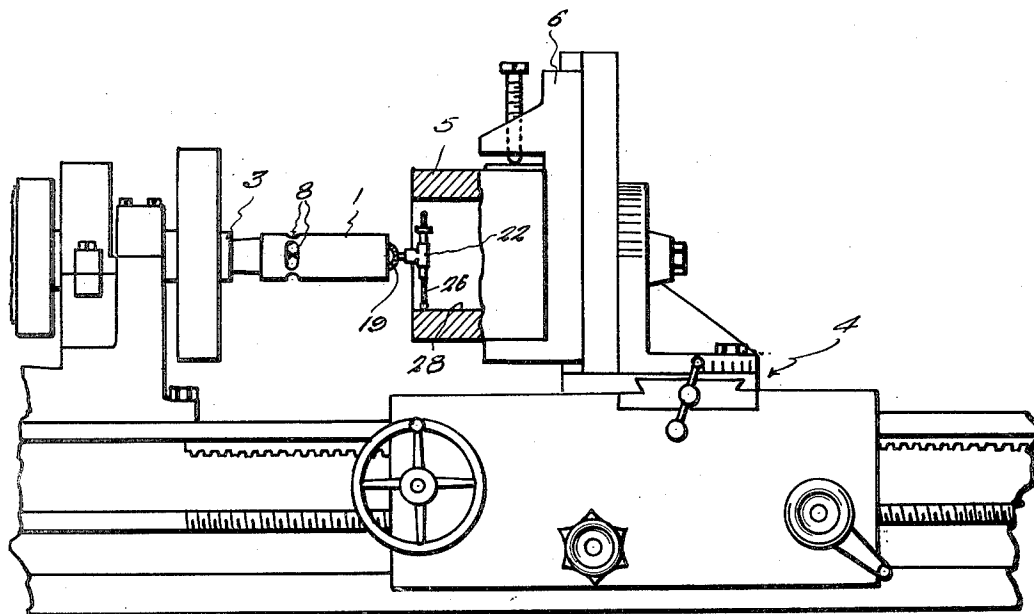


Fig. 2.

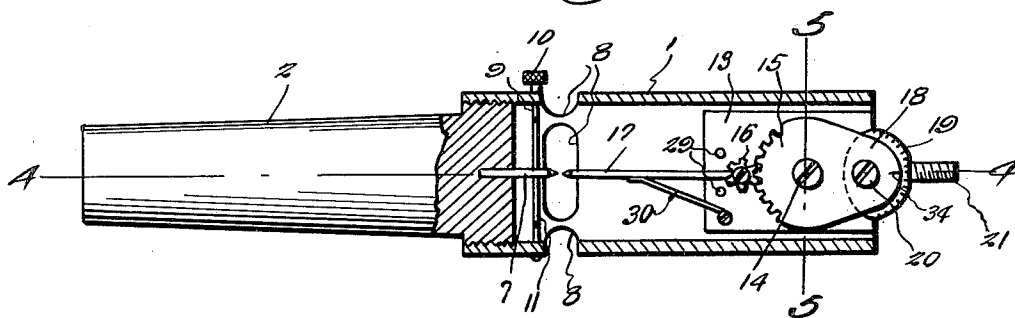
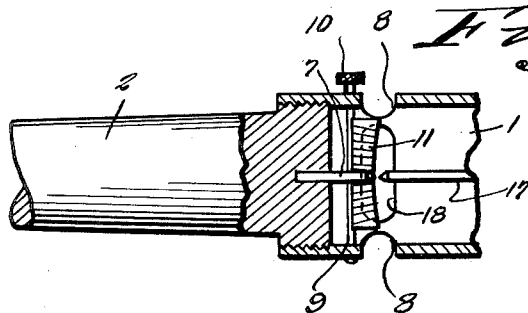


Fig. 3.



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Fig. 4.

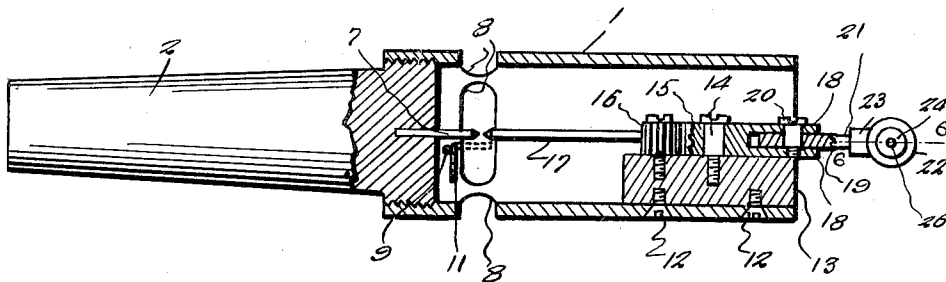


Fig. 7.

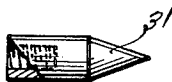


Fig. 5.

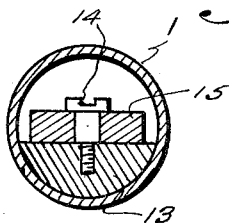


Fig. 9.

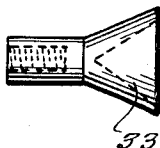


Fig. 8.



Fig. 6.

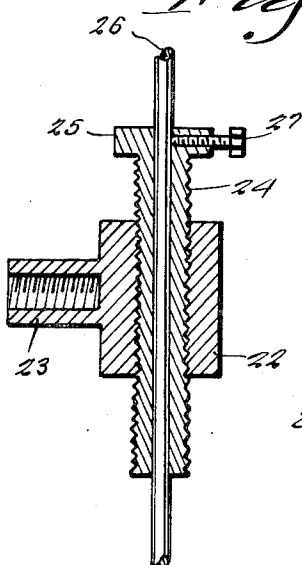


Fig. 11.

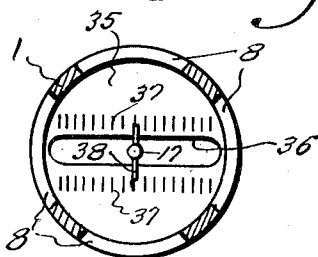
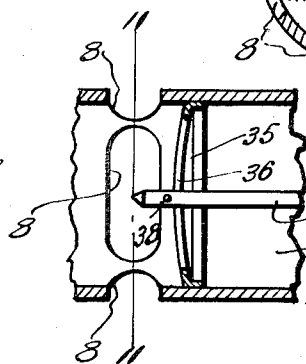


Fig. 10.



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UNITED STATES PATENT OFFICE

2,179,602

CENTERING DEVICE

Lowell Smith, Dixon, Ill.

Application November 23, 1938, Serial No. 242,062

2 Claims. (Cl. 33—172)

The present invention relates to new and useful improvements in centering devices for use on lathes, milling machines, drill presses and other machines of the type comprising a rotary spindle or boring head and has for its primary object to provide, in a manner as hereinafter set forth, an instrument of this character comprising novel means engageable with the work for accurately indicating how much said work may be out of alignment with the spindle, thus facilitating the making of proper adjustments for centering said work.

Another very important object of the invention is to provide a centering device of the aforementioned character which is adapted for use on many different kinds or types of work.

Other objects of the invention are to provide a centering device or instrument of the character described which will be comparatively simple in construction, strong, durable, highly efficient and reliable in use, compact and which may be manufactured at low cost.

All of the foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in connection with the accompanying drawings wherein like characters of reference designate corresponding parts throughout the several views, and wherein:

Figure 1 is a view in side elevation, showing an embodiment of the present invention mounted in position for operation on a lathe.

Figure 2 is a view principally in vertical longitudinal section through the device.

Figure 3 is a view principally in vertical longitudinal section through an intermediate portion of the device, showing the swinging scale in operative position.

Figure 4 is a view principally in longitudinal section through the device, taken substantially on the line 4—4 of Fig. 2.

Figure 5 is a cross sectional view, taken substantially on the line 5—5 of Fig. 2.

Figure 6 is a sectional view through an end portion of the device, taken substantially on the line 6—6 of Fig. 4.

Figures 7, 8 and 9 are detail views in elevation, showing several of a number of attachments which are used on the device for different kinds of work.

Figure 10 is a view in vertical longitudinal section through an intermediate portion, showing a slight modification.

Figure 11 is a cross sectional view, taken substantially on the line 11—11 of Fig. 10.

Referring to the drawings in detail, it will be seen that the reference numeral 1 designates a tubular housing of suitable material, preferably metal, said housing being open at both ends. Of course, the housing 1 may be of any desired length and diameter. Threadedly mounted in one end portion of the tubular housing 1 is a tapered shank 2 of metal which is adapted to be secured in the usual spindle 3 of a conventional lathe or other machine 4. The reference numeral 5 designates a piece of work to be centered which is mounted in the holder or clamp 6 of the lathe 4. Of course, the holder or clamp 6 is adjustable, as usual, for centering the work 5 relative to the spindle 3.

Mounted on one end of the shank 2 and projecting into the tubular housing 1 is a stationary indicator pin 7. Adjacent the free end of the pin 7, the tubular housing 1 has formed therein a plurality of circumferentially elongated sight openings or windows 8. Journalled in the tubular housing 1 adjacent the windows 8 is a shaft 9 which is provided, on one end, with an operating head 10. A scale 11, the purpose of which will be presently set forth, is fixed on the shaft 9 for swinging movement in the housing 1, said scale being observable through the windows 8.

Secured by screws 12 in the forward end portion of the tubular housing 1 is a metallic block or body of segmental cross section constituting what may be referred to as a base or bracket 13. This is illustrated to advantage in Figs. 4 and 5 of the drawings. Threaded into the flat inner face of the bracket 13 is a pivot 14 having journalled thereon a segmental gear 15. Also rotatably mounted on the bracket 13 is a pinion gear 16 which meshes with the segmental gear 15 for actuation thereby. The reference numeral 17 designates a pointer which is fixed on the pinion gear 16 for swinging movement in the housing 1. It will be observed that the swinging pointer 17 terminates at its free end adjacent the stationary pin 7. Thus, the free end portion of the pointer 17 may be conveniently observed through the windows 8 of the housing 1.

The segmental gear 15 includes integral bifurcations 18 between which an adjustable, graduated plate 19 is frictionally clamped. The plate 19 is of substantially the shape shown to advantage in Fig. 2 of the drawings and said plate is journalled for adjustment on a screw 20 which clamps the bifurcations 18 against the sides of said plate. Projecting from the plate 19 is a threaded shank 21 on which a holder in the form

of an internally threaded tube 22 is removably mounted. The holder 22 includes a socket 23 which threadedly receives the shank 21. Threadedly mounted in the holder 22 is a removable sleeve 24 having an operating head 25 on one end. The reference numeral 26 designates a feeler which is adjustably and removably mounted in the sleeve 24 and secured in position through the medium of a set screw 27. It may be well to here state that one end of the feeler 26 is engageable with the walls of the hole or opening 28 in the work 5.

Projecting from the bracket 13 are pins 29 constituting stops for positively limiting the swinging movement of the pointer 17 in opposite directions. Also mounted on the bracket 13 is a spring 30 which is engaged with the swinging pointer 17 for actuating same in a manner to engage the feeler 26 with the work. This, of course, is accomplished through the pinion gear 16 and the segmental gear 15.

It is thought that the operation of the instrument will be readily apparent from a consideration of the foregoing. The feeler 26, after being properly adjusted, is positioned in the hole or opening in the work 5, as seen in Fig. 1 of the drawings. When thus engaged in the work, one end of the feeler 26 is maintained in constant contact with the walls of the hole or opening by the spring 30. The instrument rotates with the lathe spindle 3 and if the work is off center relative to said spindle the feeler 26, riding around the walls of the opening or hole in the work, will cause the pointer 17 to oscillate through the pinion gear 16 and the segmental gear 15. The extent to which the work is off center may then be estimated by comparing the oscillating pointer 17 with the stationary pin 7. When the instrument is stationary the scale 11 may be swung to operative position adjacent the free end of the pointer 17 for making a reading, as illustrated in Fig. 3 of the drawings. The stops 29 prevent the swinging pointer 17 from being damaged from shocks or strains to which it may be subjected when, for example, the work is far off center.

In Figs. 7, 8 and 9 of the drawings, there are illustrated several of a number of attachments which may be threadedly mounted on the shank 21 of the plate 19 for use on different kinds of work. For example, in Fig. 7 is illustrated a pointed element for use in conjunction with center punch marks and comparatively small holes of, for example, three-eighths or one-half of an inch in diameter. The cone shaped member illustrated in Fig. 8 of the drawings is also for use in centering small holes. Then, the member shown in Fig. 9 may be used to facilitate the centering of small pins. Other attachments are contemplated for various kinds of work. The attachments shown in Figs. 7, 8 and 9 of the drawings are designated by the reference numerals 31, 32 and 33, respectively. It will be noted that all of these attachments are socketed to threadedly receive the shank 21 on the plate 19. The plate 19 is adjustable relative to the segmental gear 15 for different kinds of work. The graduations on the plate 19, shown to advantage in Fig. 2 of the drawings, facilitate adjusting said plate as desired, said graduations being read in

conjunction with a mark 34 on one or both of the bifurcations 18.

In Figs. 10 and 11 of the drawings there is shown a scale for use in conjunction with the swinging pointer 17 which may be used in lieu of the swinging scale 11. This modified form of scale comprises a substantially concavo convex disc 35 which is fixed in the tubular housing 1 adjacent the windows 8. The disc 35 has formed therein a slot 36 in which the swinging pointer 17 is operable. Further, the disc 35 is graduated adjacent the longitudinal walls of the slots 36, as at 37. Mounted transversely in the free end portion of the swinging pointer 17 is a pin 38 which travels over the disc 35 and which is adapted to be observed in conjunction with the graduations 37.

It is believed that the many advantages of a centering device constructed in accordance with the present invention will be readily understood and although preferred embodiments of the instrument are as illustrated and described, it is to be understood that further modifications and changes in the details of construction may be resorted to which will fall within the scope of the invention as claimed.

What is claimed is:

1. A centering device of the class described comprising a tubular housing having windows therein, a shank threadedly mounted in one end portion of said housing and projecting longitudinally therefrom for engagement in a spindle for mounting the housing thereon, a bracket mounted in the other end portion of the housing, a substantially segmental gear journaled for oscillation on said bracket, a pinion gear rotatably mounted on the bracket and engaged with the segmental gear for actuation thereby, a pointer fixed on the pinion gear and adapted for swinging movement in the housing, said pointer being observable through the windows in the housing, integral bifurcations on the segmental gear, a pivotally adjustable plate mounted between said bifurcations, a feeler removably mounted on said plate and operatively engageable with a piece of work, and resilient means for engaging the feeler with the work.

2. A centering device of the class described comprising a tubular housing having windows therein, a shank threadedly mounted in one end portion of said housing and projecting longitudinally therefrom for engagement in a spindle for mounting the housing thereon, a bracket mounted in the other end portion of the housing, a substantially segmental gear journaled for oscillation on said bracket, a pinion gear rotatably mounted on the bracket and engaged with the segmental gear for actuation thereby, a pointer fixed on the pinion gear and adapted for swinging movement in the housing, said pointer being observable through the windows in the housing, integral bifurcations on the segmental gear, a pivotally adjustable plate mounted between said bifurcations, a feeler removably mounted on said plate and operatively engageable with a piece of work, and resilient means for engaging the feeler with the work, said resilient means including a spring mounted on the bracket in the housing and engaged with the pointer.

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