May 12, 1931. J. H. JACOBS 1,805,285

CENTER TESTER

Filed April 1, 1929

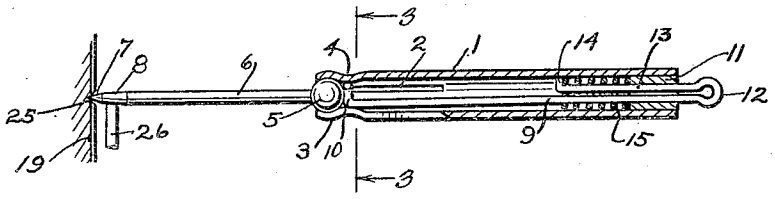


Fig. 1.

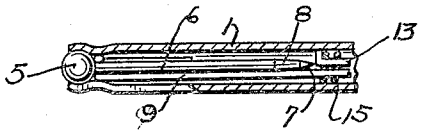


Fig. 2.



Fig. 3.

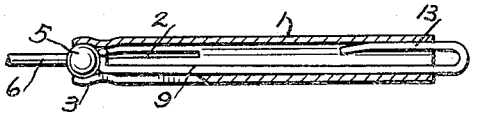


Fig. 4.

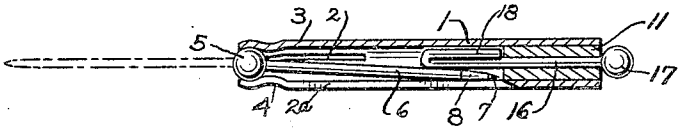


Fig. 5.

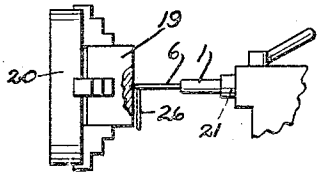


Fig. 6.

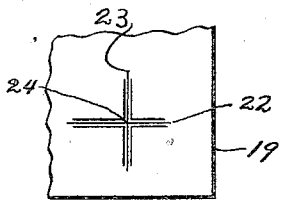


Fig. 7.

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UNITED STATES PATENT OFFICE

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CENTER TESTER

Application filed April 1, 1929. Serial No. 351,565.

This invention relates to center testers of the type employed for centering work in a lathe chuck, drill press or boring machine.

When fine machine work is to be done, great care must be exercised in locating the centers of holes and this requires a great amount of skill and care. One method of obtaining accurate locations of centers necessitates the use of toolmakers buttons, but this method is very slow and requires very great skill and care on the part of the operator.

It is the object of this invention to produce a center tester of a very simple construction and of small size, which can be easily carried in the pocket and which can be employed for accurately locating the work to be drilled.

It is another object of this invention to produce a center tester that can be very cheaply made and which shall be of substantial construction and be adapted to obtain great accuracy in the location of the work.

This invention, briefly described, consists of a tubular member, one end of which is provided with a plurality of cuts that separate it into three or more fingers. The outer ends of these fingers have somewhat conical inner surfaces and are adapted to hold a ball attached to the end of a scriber. This scriber is provided with a sharp point of conical shape, whose vertex has an angle of about sixty degrees, the surface of the scriber adjacent the conical point is ground so as to be exactly concentric with the point of the scriber. When not in use the scriber can be removed from the handle and then inserted into the handle so that the sharp point will be concealed within the handle, thereby protecting the point and making it possible for the workman to carry the tool in his pocket or attached to a chain. Means is provided for readily disconnecting the scriber portion from the handle whenever it is to be changed from operative to inoperative position, or from inoperative to operative position.

Having thus briefly described the invention, the same will now be described in detail, and for this purpose reference will be had to the accompanying drawings in which the preferred embodiment has been illustrated, and in which:

Fig. 1 is a longitudinal diametrical section through the improved center tester showing the same in position for centering a piece to be drilled;

Fig. 2 is a diametrical section of the center tester shown in Fig. 1 and shows the position of the scriber portion when the tool is not in use, a portion of the handle has been omitted;

Fig. 3 is a transverse section taken on line 3—3, Fig. 1;

Fig. 4 is a section similar to that shown in Fig. 1 and illustrates a slightly modified construction;

Fig. 5 is a diametrical longitudinal section showing a further slightly modified form of construction;

Fig. 6 is a view showing the manner in which the tester is employed for centering a piece of work in a lathe chuck; and

Fig. 7 is a view of a portion of a piece of material showing the manner of locating the centers.

In the drawings reference numeral 1 indicates the tubular handle portion of the center tester. One end of this handle is provided with a plurality of inwardly extending cuts 2, which separates it into a number of fingers 3, preferably three cuts and three fingers are employed. The outer ends of the fingers 3 are inwardly bent at 4 so as to provide an inwardly convex portion. The outer ends of the fingers are concave on the inner side so that they will fit the ball 5 on the end of the scriber 6. When the scriber is in place in the manner shown in the drawings, the ball will be located between the inner surfaces of the fingers and is free to move in any direction about its center. The outer end of the scriber terminates in a conical point 7 and adjacent to this is a surface 8, which is ground so as to be concentric with the point of the conical portion. The surface 8 may be conical as shown in the drawings; or it may be cylindrical and may be of any length. For the purpose of removing the ball 5 from its position between the fingers, an ejector

has been provided. This ejector consists of a wire 9, one end of which is bent at right angles and curved so as to form a susbtantially semi-circular hook portion 10, that is adapted to engage the ball in the manner shown in Fig. 1, and which when the scriber is in the inoperative position shown in Fig. 2 will encircle the latter. The end of the handle opposite from the fingers is provided with a tubular bushing 11 through which the ejector extends. The outer end of the ejector is curved as indicated at 12 and there is a straight portion 13 projecting inwardly through the bushing 11 and terminates in a hook 14. A spring 15 is located between the hook 14 and the inner end of bushing 11. This spring does not need to be very strong as its function is primarily to hold the ejector in its innermost position.

When the parts are in the position shown in Fig. 1 and it is desired to remove the scriber for the purpose of inserting it in the position shown in Fig. 2, the workman grasps the handle and exerts pressure on the end 12 of the ejector, thereby pushing the ball 5 out from its position between the fingers. The scriber is then reversed and inserted in the position shown in Fig. 2. When the parts are in the position shown in Fig. 2, the scriber is protected against injury and the point is also enclosed so that the scriber can be safely carried in the pocket.

In Fig. 4 a slightly modified form of construction has been shown. The only difference between this embodiment and the one just described, is that the bushing 11 has been omitted, together with the spring 15. The reversely bent end 13 is spaced from the part 9 of the ejector so that it will produce sufficient friction against the inner surfaces of the handle to keep the ejector from falling out. The operation is otherwise identical to that above described.

In Fig. 5 I have shown another modification which differs from those above described in several particulars. With the construction shown in Fig. 5, it is not the intention to remove the scriber at any time, but to fold the same into the handle in a manner somewhat analogous to the folding of a blade in a jack knife. For the purpose of permitting the scriber to be folded, one of the slots that corresponds to slots 2 and which has been indicated as 2*a*, is longer than the other slots, its length being such that the scriber can be folded in the manner shown. The ejector shown in Figs. 1 and 4 is replaced by a wire 16 whose outer end is provided with a ball 17. The inner end of this wire is bent reversely so as to produce a portion 18 that lies parallel to the part 16. When the wire 16 is rotated, the part 18, which moves about the center of rotation, moves the scriber 6 outwardly through the slot a sufficient distance to enable the point to be grasped for the purpose of moving it to the operative position shown by dot and dash lines.

Let us now assume that a piece of material indicated by reference numeral 19 is to be centered in the chuck 20 for the purpose of drilling a hole at a certain point. One of the center testers above described is secured in the tail stock 21 of the lathe. Before the block 19 is fastened in the chuck, the exact point where the hole is to be drilled has first been designated by means of cross lines 22 and 23. The point where these lines cross and which has been indicated by reference numeral 24, is the exact center point of the hole to be drilled. The centers are located by means of scribers which cut a triangular groove like that indicated by reference numeral 25 in Fig. 1. This groove has an angle of 45 degrees and should, in every case, have a larger angle than the angle of the conical portion 27, so that there will be no binding or bending of the point of the scriber during the centering operation. With the center point 24 located, the block 19 is placed in the chuck and roughly centered. The scriber, which is attached to the tailstock, is then moved towards the block and the point is inserted into the center point 24. This point can be readily detected by moving the scriber along one of the lines 22 or 23 as there is always a slight depression where these lines cross. An indicator 26 of any ordinary construction is now put in place so as to contact with the surface 8. The chuck is now rotated through one hundred and eighty degrees and adjustments made so as to center the piece 19 along one line. After the piece has been centered along one line, it is then turned ninety degrees and centered along a line perpendicular to the first line. It is apparent from an inspection of Fig. 6 that if the center 24 does not coincide with the center of the lathe that it will generate a circle when the chuck is rotated and since the point of the scriber is secured to the center, the latter will move about the center of rotation and since the indicator 26 contacts with the surface 8, any eccentricity can be readily detected. After the work has been centered along one diameter, the indicator will give the same reading for two positions one hundred eighty degrees apart, and when this has been accomplished, as above intimated, the work is rotated through an angle of ninety degrees and centered on a diameter perpendicular to the first.

It will be seen from the above description that by means of the center tester described herein and illustrated on the drawings, it is possible to very accurately locate the center of any piece of work, as the variations can be detected by means of an indicator which is very sensitive and therefore the limits of error can be made as small as necessary.

I also desire to call attention to the compact arrangement of this tester and to the

fact that it can be readily carried by the workman in his pocket or attached to a chain so as to be available for instant use.

In the drawings three different modifications have been illustrated, but they are all provided with a tubular handle having one end provided with a plurality of cuts forming fingers whose end surfaces are concave so that they will hold the ball 5. This construction results in a tool that is adapted for use with an indicator in the manner above described and which makes it possible to determine variations mechanically instead of by observation as is now the usual custom.

Having described the invention what is claimed as new is:

1. A center tester comprising, in combination, a tubular handle having a plurality of radially spaced cuts extending inwardly from one end thereof, whereby a plurality of spaced fingers are formed, the inner surfaces of the fingers being concave near their free ends, a scriber attached to the handle, one end of said scriber terminating in a conical point adapted to be inserted into a depression, the other end terminating in a ball adapted to be seated in the concave portions of the fingers and means for ejecting the ball from its seat.

2. A center tester comprising, in combination, a tubular handle, having a plurality of radially spaced cuts extending inwardly from one end thereof, whereby a plurality of spaced fingers are formed, the inner surfaces of the fingers being concave near their free ends, a scriber attached to the handle, one end of said scriber terminating in a conical point adapted to be inserted into a depression, the other end terminating in a ball adapted to be seated in the concave portions of the fingers, and means for ejecting the ball from its seat, said last named means comprising an elongated member slidably connected with the handle, one end of said ejector protruding from the handle and the other end terminating adjacent the ball.

3. A center tester comprising, in combination, a tubular handle having a plurality of radially spaced cuts extending inwardly from one end thereof, whereby a plurality of spaced fingers are formed, the inner surfaces of the fingers being concave near their free ends, a scriber attached to the handle, one end of said scriber terminating in a conical point adapted to be inserted into a depression, the other end terminating in a ball adapted to be seated in the concave portions of the fingers, means for ejecting the ball from its seat, said last named means comprising an elongated member slidably connected with the handle, one end of said ejector protruding from the handle and the other end terminating adjacent the ball and means for holding the ejector against accidental removal.

4. A center tester comprising, in combination, a tubular handle having a plurality of radially spaced cuts extending inwardly from one end thereof, whereby a plurality of spaced fingers are formed, the inner surfaces of the fingers being concave near their free ends, a scriber attached to the handle, one end of said scriber terminating in a conical point adapted to be inserted into a depression, the other end terminating in a ball adapted to be seated in the concave portions of the fingers, a rod-like member extending inwardly through the handle from the end opposite from the fingers, one end of said member terminating adjacent the ball, the other end protruding from the handle and means for holding the member against accidental removal.

In testimony whereof I affix my signature.

JOSEPH H. JACOBS.