

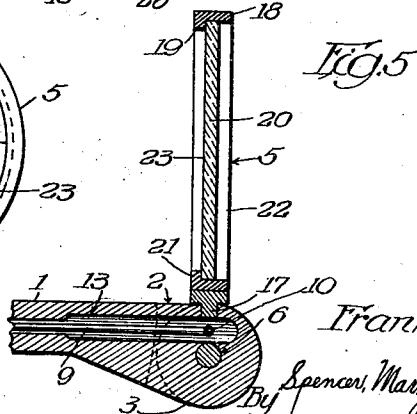
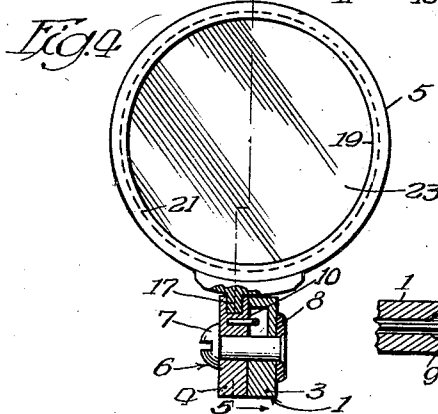
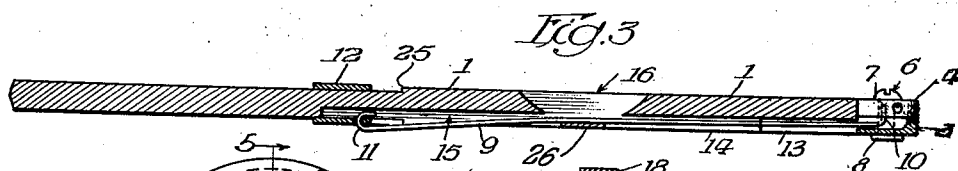
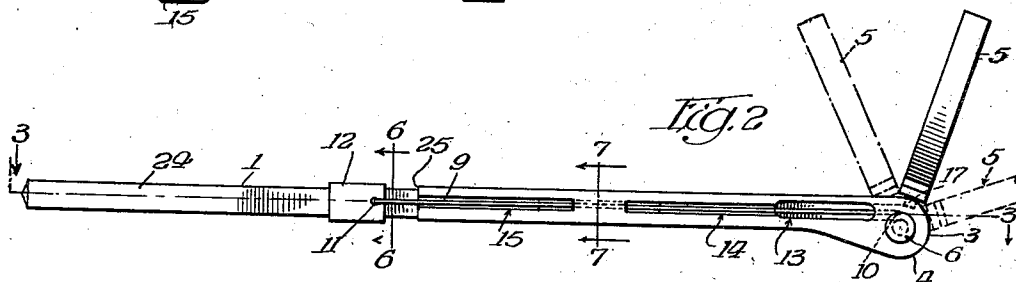
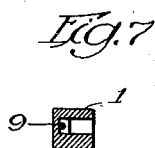
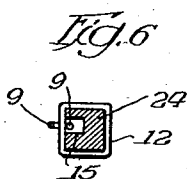
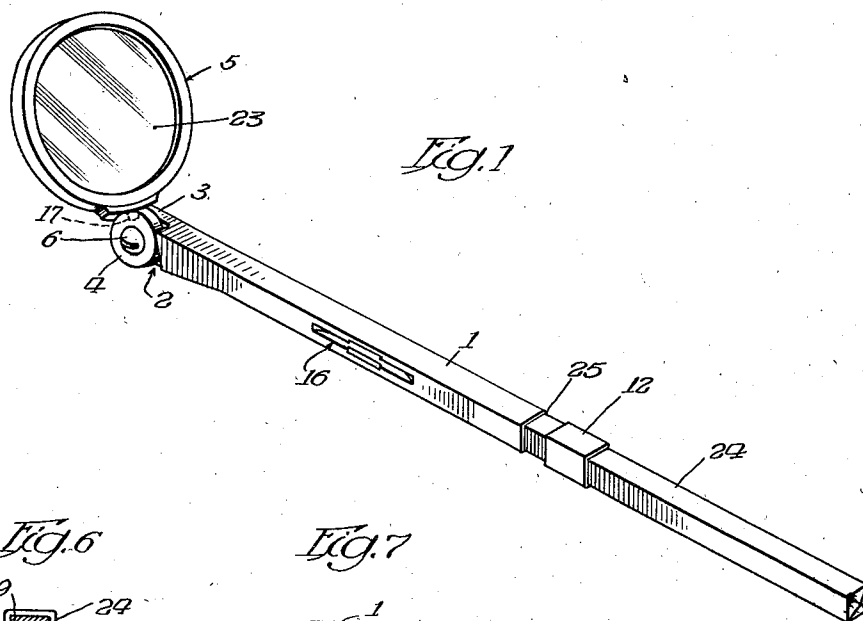
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INSPECTION TOOL

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INSPECTION TOOL

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1 Claim. (Cl. 88—104)

This invention relates to an inspection tool, and its primary object is the provision of a new and improved inspection tool having a reflecting surface whereby the tool may be inserted within an opening so that the inspector or operator may see the inside of an article or machine, the device being capable of being manipulated at a remote position from the reflector so as to shift the reflecting surface to various positions or angles.

Another object of the invention is the provision of an inspection tool having a mirrored surface which is adapted to be inserted in an opening for inspecting out-of-the-way places and dark corners of devices, such as automobile and airplane motors, there being new and improved means for effecting the angular position of the mirror with respect to the handle, whereby the operator or inspector, by shifting the angular position of the mirror, may examine various sections of the article being inspected.

A further object of the invention is the provision of an inspection tool constructed and arranged of a particular type of material so that when used in connection with a light source no shadows will occur, the mirror or other reflecting surface being maintained in rigid, locked and protected position so as to prevent breakage, there being new and improved means for moving the mirror or reflecting surface throughout various angles to promote the inspection effectively.

Numerous other objects and advantages will be apparent throughout the progress of the following specification.

The accompanying drawing illustrates a selected embodiment of the invention, and the views therein are as follows:

Fig. 1 is a detail perspective view of the improved inspection tool and embodying the invention;

Fig. 2 is a detail side elevation;

Fig. 3 is a longitudinal plan section;

Fig. 4 is a detail sectional view showing the manner in which the mirror or reflecting head is secured to the operating handle;

Fig. 5 is a detail sectional view on the line 5—5 of Fig. 4;

Fig. 6 is a detail transverse sectional view on the line 6—6 of Fig. 2; and

Fig. 7 is a detail sectional view on the line 7—7 of Fig. 2.

The particular device herein shown for the purpose of illustrating the invention comprises

an elongated handle member 1 having a part cut away at its end substantially one-half the thickness, as indicated at 2, Fig. 1, leaving a projection 3 acting as a bearing portion to receive a similar bearing portion 4 on the head 5. A pivot pin 6 in the form of a screw or otherwise pivotally connects the head 5 to the handle 1, as clearly shown in the various figures. This pivot connection 6 may comprise a threaded screw member 7 passing through the parts 3 and 4 and having its end peened over against a washer or nut 8 whereby the two parts are pivotally and frictionally held together by the pivot member 6.

A wire 9 is mounted within the handle 1 near the head end thereof and has its extreme end bent inwardly and engaging the part 4 on the head 5, as indicated at 10, Fig. 3. The opposite end of the wire 9 projects outwardly from the handle 1 and is connected at 11 to a sleeve 12. Thus, when the sleeve 12 is shifted longitudinally along the handle 1, the head 5 is adapted to assume various angular positions, as shown in Fig. 2. The body 1 is provided with cut-outs or open spaces 13, 14, 15, Fig. 2, so as to permit easy threading of the wire into the handle member 1 to permit quick and easy assembly. Moreover, the open space 15 is sufficiently elongated so as to permit the wire 9 to extend outwardly therefrom to be connected to the sleeve 12. A semi-circular depression or cut-out 16 is also formed in the handle 1 for the same purpose of permitting the proper application of the wire 9 in the handle 1.

In use when the sleeve 12 has been moved to rotate head 5 with its mirror 20 into desired oblique positions, head 5 is held in said position by the frictional engagement of circular end portion 3 of handle 1 with the circular portion 4 of head 5, and the additional frictional engagement of that portion of rod 9 contacting brake member 26 within handle 1.

The head 5 and the part 4 may be cast as a single unitary piece or the head 5 may be provided with a stud 17, Fig. 4, which engages the part 4 for connecting the parts 4 and 5 together. If desired, this member 17 may make a pivotal connection between the parts 5 and 4 so that the head 5 may be tilted on the member 17 acting as an axis.

The head 5 and handle 1 are preferably made from a plastic material that is clear and transparent, such as a cellulose derivative known as "Tenite." The head 5 comprises a circular body portion having an annular rim 18 which is turned

inwardly, as indicated at 19, Fig. 5, so as to provide a shoulder for a piece of reflecting material 20, such as a mirror, which is inserted from the rear of the head 5 and pressed against the annular shoulder or ring 21 formed by the turned-in edge 19. The mirror 20 is held in position against the shoulder 21 by a plug or backing member 22 which is also inserted from the rear of head 5. The back 22 is also preferably made of a plastic material similar to that of the head and is sealed in position in the head by a corresponding material, such as cellulose acetate, whereby the backing member is held in position by the normal characteristics of the material from which the head is made. The reflector 20 is therefore locked in position and is protected on the back and about the edges thereof, leaving the front surface 23 thereof in plain view for use in inspection purposes.

The handle 1 is preferably rectangular in cross section and has its outer end 24 slightly smaller at the point commencing at the shoulder 25. The part 24 is reduced sufficiently to conform substantially with the side of the co-operating ferrule or sleeve 12. Therefore, the sleeve or ferrule 12 can not be positioned inwardly any farther than the shoulder 25, at which time the head will be in relatively axial alinement with the handle 1.

The invention provides a relatively simple but efficiently operating device for use in inspection purposes, particularly for inspecting out-of-the-way places. For instance, the tool is particularly adaptable for viewing the inside surfaces of motors, blocks, pistons, and other pieces of machinery. The head is adapted to be inserted down into an opening, after which time the sleeve 12 is operated to effect the proper angular position so that the inspector may shift the head and bring the reflecting surface into position, so that the rear, back or inside parts may be viewed and inspected. Moreover, in many instances the inside of the article to be inspected is dark, and by making the inspection tool of a clear material

no shadows will be present when a flashlight or other light is used. The device is light in weight, rigid and durable in construction, positive and efficient in operation, and can be readily and inexpensively manufactured.

Changes may be made in the form, construction and arrangement of the parts without departing from the spirit of the invention or sacrificing any of its advantages, and the right is hereby reserved to make all such changes as fairly fall within the scope of the following claim.

This invention is hereby claimed as follows:

An inspection tool of the character described for mechanical inspection purposes comprising an elongated handle, a sleeve slidably mounted on the upper end of said handle, said sleeve having an opening, said handle having at its lower end a circular end portion, a head having a circular portion rotatably attached to and in frictional contact with said circular end portion of said handle, a mirror attached to said head, said circular portion of said head having an opening adjacent its circumference, a rod having an outwardly extending projection at its upper end extending into said opening of said sleeve for engagement of said sleeve, said rod extending into said handle and a brake member formed integrally with said handle and positioned between said sleeve and said head, said rod engaging in frictional contact with said brake member, said rod having an inwardly extending bend on its lower end extending within said opening in said circular portion for engagement of said circular portion, said sleeve adapted upon receipt of direct manual movement to slide along said handle to move said rod and rotate said head and mirror into desired oblique positions with respect to said handle, said head being held in said oblique positions by the frictional engagement of the circular end portion of the handle with the circular portion of said head and the frictional engagement of said rod with said brake member.

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