

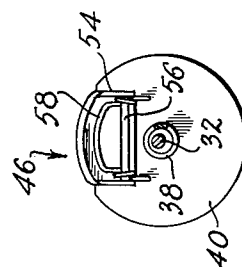
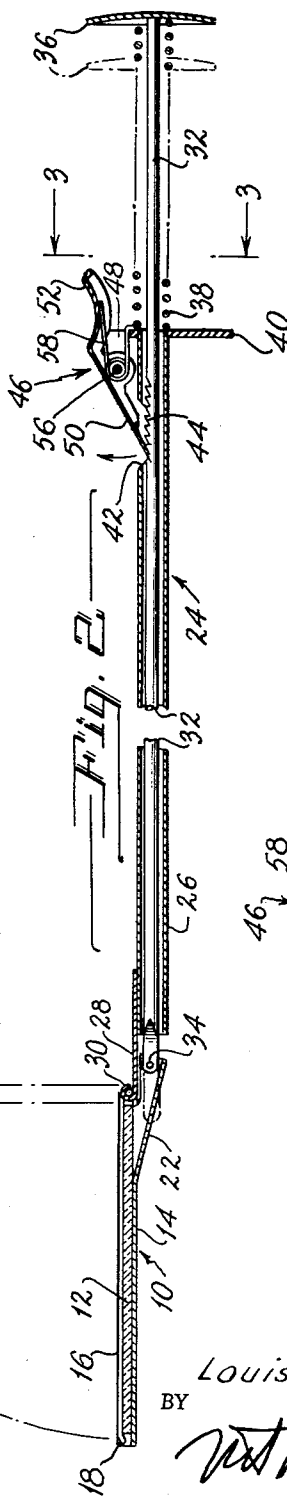
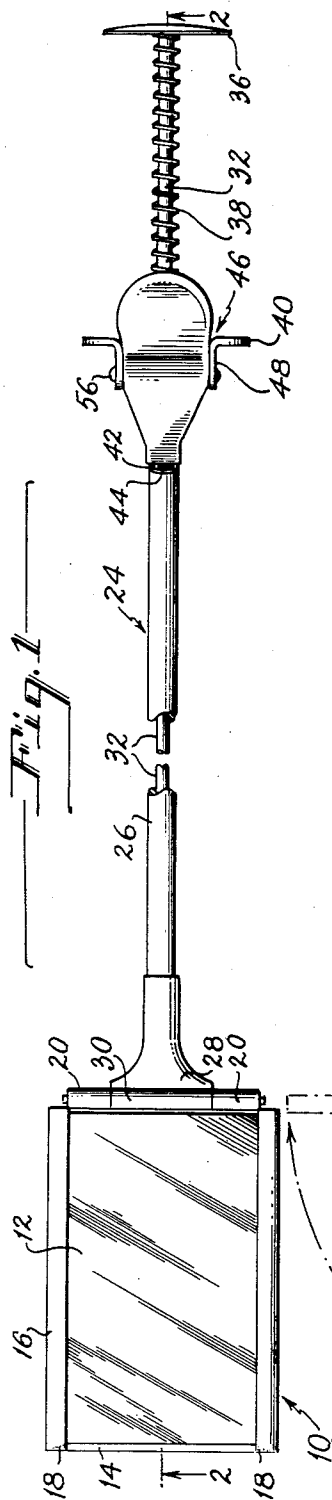
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WORK INSPECTING DEVICE

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3,003,397

WORK INSPECTING DEVICE

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The present invention relates to a work inspection device, of the type consisting of a reflector or mirror which is adjustably mounted at the end of a handle and is used by operators of machine tools, or like devices, for inspecting work surfaces that are remote or difficult of access, to avoid the need for moving about.

More particularly, the present invention is directed to work inspecting devices of the character described in which the position of the reflector or mirror, or its angular relation to the supporting handle may be adjusted from a point remote from the junction of the reflector with the handle, to eliminate the need for manual handling of the reflector each time its angle is to be changed, as after insertion through a narrow clearance or space, or for inspecting a different face or location on the work.

It is an object of the present invention to provide a work-inspecting device of the character described in which the position of the reflector or its angle to the supporting handle may be adjusted from the grip end of the handle with great ease and speed.

It is also an object of the present invention to provide a work-inspecting device of the character described in which the angle of the reflector to the handle supporting the same may be adjusted from the operating end of the handle with great accuracy and exactness.

It is another object of the present invention to provide a work-inspecting device of the character described in which the angle of the reflector to the supporting handle may be adjusted with maximum certainty and security against slipping or displacement, both, during the adjustment and also while in use, to thereby further enhance the ease, convenience and time-saving characteristics of the device.

It is a further object of the present invention to provide a work-inspecting device of the character described which is simple in its operation and highly convenient to use.

It is a still further object of the present invention to provide a work-inspecting device of the character described which is of simple construction, easy and simple to assemble, and economical to produce.

The foregoing and other objects and advantages of the work-inspecting device of the present invention will become more readily apparent to those skilled in the art from the embodiment thereof shown in the accompanying drawing and from the description following. It is to be understood, however, that such embodiment is shown by way of illustration only, to make the principles and practice of the invention more readily comprehensible, and without any intent of limiting the invention to the specific details therein shown.

In the drawings:

FIG. 1 is a foreshortened, front elevational view of a work-inspecting device made according to the present invention;

FIG. 2 is a side elevational view of the same; the broken lines indicating the maximum angular adjustment of the reflector relative to the supporting handle; and

FIG. 3 is a section taken on line 3—3 of FIG. 2.

Referring now, in greater detail, to the embodiment of the invention illustrated in the accompanying drawings, the same comprises a reflector, generally designated as 10, which may be of a conventional type, including a reflector, 12, which may be in the form of a glass mirror, and a mounting frame therefor, including a back, 14, and

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re-entrantly bent side flanges, 16, which overlap the side edges of the mirror 12, to hold it in place. The frame back 14 may be formed at its outer end with an edge portion, 18, that is bent to overhang the adjacent edge of the mirror 12 and forms retaining means for that end of the mirror. The frame back 14 is formed, at its other end, with spaced extensions that are curved to form hinge eyes, 20, that also serve as retaining means for the other end of the mirror 12. The frame back 14 is also provided, adjacent its last named edge, at a center point, intermediate the hinge eyes 20, with a preferably integral and tapering embossment, 22, that projects between, above and past the hinge eyes 20.

The device of the present invention further comprises a handle of elongated shape, generally designated as 24, consisting of an elongated tubular member or sleeve, 26, which preferably has, either integrally formed or secured thereto, a flattened extension, 28, at one end, whose outer edge is curved to form a hinge eye, 30, fitting between the hinge eyes 20 of the frame back 14 and co-operating with the latter for hingedly securing the reflector 10 on the handle 24.

The handle 24 also comprises a rod, 32, of greater length than the tube 26 and slidably disposed therewithin.

The rod 32 is pivotally connected at one end, as at 34, to the portion of the embossment 22 that projects above and past the hinge eyes 20 of the frame back 14, and is provided, at its other end, with a head, 36, which may be either integrally formed therewith or secured thereto, as may be desired. The rod 32 carries an expansion spring, 38, intermediate its head 36 and the adjacent, free end of the tube 26; such spring abutting said head and said tube end to normally maintain the head end of the rod 32 in outwardly extended position from the tube 26, to thereby resiliently maintain the reflector 10 in longitudinally aligned relation to the handle 24.

The outer or free end of the tube 26 is provided with a fingerpiece, preferably in the form of a laterally offset, preferably flat, ring-shaped flange, 40, of substantial size. The flange 40 may be engaged by an operator, as between his index and middle finger, while his thumb engages over the head 36 of the rod 32, to move the latter inwardly into the tube 26 and thereby offset the reflector 10 at an angle of as much as 90° to the handle 24; such reflector tending to resiliently return, under the pressure of spring 38, to normal position, upon release of the fingerpiece 40.

Means are provided on the work inspecting device of the present invention for maintaining the reflector 10 thereof securely in angularly adjusted position relative to the handle 24 and for releasing the same toward normal, aline position. Such means comprises an opening, 42, formed in the tube 26, preferably closely adjacent to the flange or fingerpiece 40 thereof, and ratchet teeth, 44, formed on the portion of the rod 32 that faces and reciprocates past such opening 42 in the course of its movement for actuating the reflector 10 from extended to maximum angular position relative to the handle 24. Such means also comprises a pawl, generally designated as 46, for engaging the ratchet teeth to limit the return movement of the rod 32 to reflector extending position. The pawl 46 comprises an operating end, 50, and a finger piece end, 52, and is preferably supported, intermediate such ends, with its operating end 50 directed toward and overlying the opening 42 and its finger piece 52 oppositely directed, on the flange 40. It is preferably supported in such position by means of inwardly offset ears, 54, provided thereon intermediate its ends, which ears are pivotally mounted on a pin, 56, that is supported between the lugs, 48, struck out from the flange 40. The pin 56 also supports a preferably U-shaped torsion spring, 58 that engages against the underside of the pawl

fingerpiece 52, to normally urge the operating end 50 of the pawl into contact with the ratchet teeth 44; the latter being formed with a sloping side facing the reflector 10, so as to permit the free movement of the rod 32 toward the reflector 10 without hinderance from such ratchet teeth.

This completes the description of the work inspecting device of the present invention. In operation, such device, with its reflector in extended position, may be moved to place its reflector adjacent the portion of the work desired to be inspected. Thereafter the rod 32 may be gradually pushed inwardly into the tube 26 until the reflector 10 is in appropriate position to reflect to the operator the part of the work desired. When such angle is reached, the rod movement may be released; the pawl and rack safely and securely holding the reflector in such position until it is desired to change the same. The changing of the reflector position may also be effected in the same manner, without the need for movement of the device away from the work.

It will be apparent from the foregoing that the device of the present invention is of simple construction, easy to operate and use and affords great convenience and time saving by its use.

It will also be apparent that numerous modifications and variations in the work inspecting device of the present invention may be made by any one skilled in the art, in accordance with the principles of the invention hereinabove set forth and without the exercise of any inventive ingenuity. I desire, therefore, to be protected for any and all such modifications and variations that may be made within the spirit of the invention and the scope of the claims hereto appended.

What I claim is:

1. A work-inspecting device comprising a reflector, an elongated tubular handle, means pivotally supporting said reflector by an edge thereof on one end of said tubular handle, a rod of greater length than said tubular handle slidably disposed therewithin, means on one end of said rod pivotally engaging said reflector for angular movement thereof relative to said tubular handle upon reciprocation of said rod relative to said handle, an expansion spring mounted over said rod intermediate its other end and the other end of said tubular handle, said expansion spring engaging said rod and said handle end to normally urge said rod end away from said handle end to thereby normally, resiliently maintain said reflector in extended position relative to said handle, and manually releasable spring tensioned means for regulating the relative movement of said rod and said handle to normal position comprising an opening formed in said tubular handle, a rack formed on the portion of said rod reciprocable past said opening, and a manually engageable pawl pivotally mounted on said handle in position to engage said rack and spring means mounted on said handle and engaging said pawl for normally urging said pawl into rack-engaging position.

2. A work-inspecting device comprising a reflector, an elongated tubular handle, means pivotally supporting said reflector by an edge thereof on one end of said tubular handle, a rod of greater length than said tubular handle slidably disposed therewithin, means on one end of said rod pivotally engaging said reflector for angular

movement thereof relative to said tubular handle upon reciprocation of said rod relative to said handle, an expansion spring mounted over said rod intermediate its other end and the other end of said tubular handle, said expansion spring engaging said rod and said handle end to normally urge said rod end away from said handle end to thereby normally, resiliently maintain said reflector in extended position relative to said handle, a laterally offset flange forming a fingerpiece at said other end of said handle, and releasable spring tensioned means for regulating the relative movement of said rod and said handle to normal position comprising an opening formed in said tubular handle adjacent said flange, a rack formed on the portion of said rod reciprocable past said opening, and a manually engageable pawl pivotally mounted on said flange in position to overlie said opening and engage said rack, and spring means mounted on said flange and engaging said pawl to urge it into rack-engaging position.

3. A work-inspecting device comprising a reflector, an elongated tubular handle, means pivotally supporting said reflector by an edge thereof on one end of said tubular handle, a rod of greater length than said tubular handle slidably disposed therewithin, means on one end of said rod pivotally engaging said reflector for angular movement thereof relative to said tubular handle upon reciprocation of said rod relative to said handle, an expansion spring mounted over said rod intermediate its other end and the other end of said tubular handle, said expansion spring engaging said rod and said handle end to normally urge said rod end away from said handle end to thereby normally, resiliently maintain said reflector in extended position relative to said handle, a laterally offset flange forming a fingerpiece at said other end of said handle, and manually releasable spring tensioned means for regulating the relative movement of said rod and said handle to normal position comprising an opening formed in said tubular handle adjacent said flange, a rack formed on the portion of said rod reciprocable past said opening, said flange having a pair of spaced struck-out lugs formed thereon, a pin mounted between said lugs, a pawl pivotally mounted intermediate its ends on said pin with the operating end thereof overhanging the said opening and a torsion spring mounted on said pin and engaging the underside of the other end of said pawl to urge the operating end thereof into engagement with said rack.

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