Nov. 11, 1969 R. G. SPRECHER 3,477,309

WINDOW REGULATOR HANDLE ASSEMBLY

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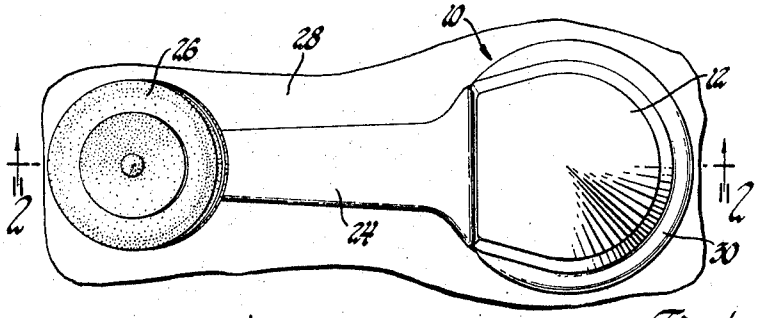

Fig. 1

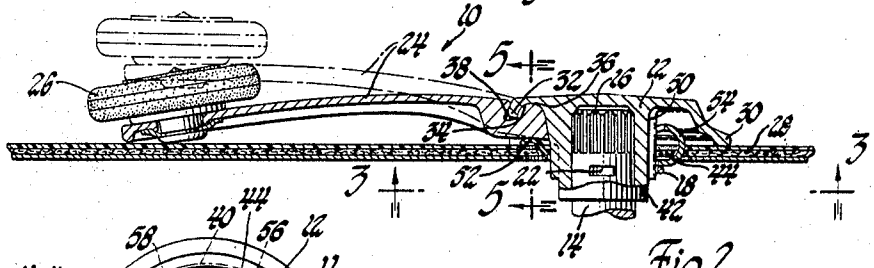

Fig. 2

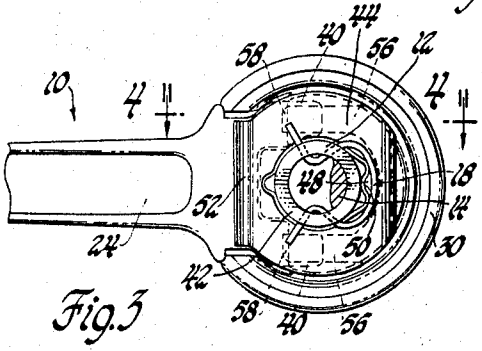

Fig. 3

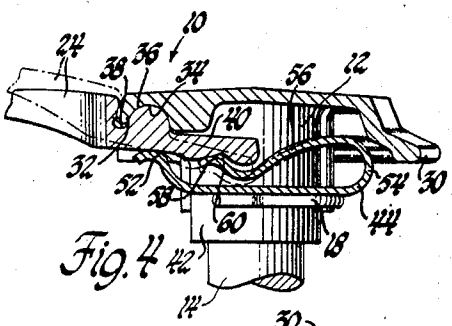

Fig. 4

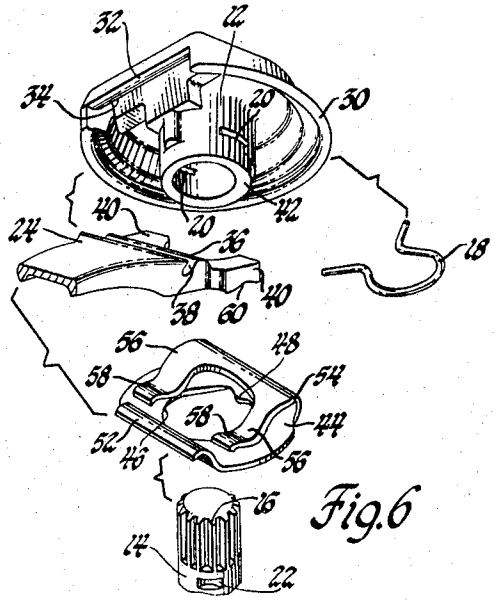

Fig. 6

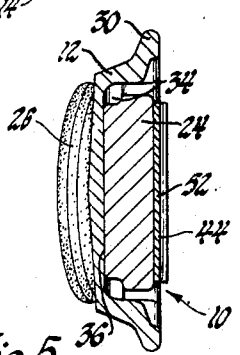

Fig. 5

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WINDOW REGULATOR HANDLE ASSEMBLY

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ABSTRACT OF THE DISCLOSURE

A window regulator handle assembly includes a hub which is conventionally attached by splines and an omega clip to a window regulator input shaft. An arm having a manual control knob mounted at one end is nonrotatably secured to the hub and is fulcrumed thereon for pivotal movement between a stored position adjacent a vehicle body trim panel and an extended use position. A spring clip maintains the fulcrum engagement and biases the handle to the stored position.

This invention relates generally to a vehicle window regulator handle assembly and more specifically to a moveable handle assembly.

Current window regulator handle assemblies are of the "low profile" type which lie closely adjacent the vehicle body trim panel. The proximity of the handle and control knob to the trim panel limits the amount of manipulative space.

This invention provides a window regulator handle assembly having a low profile stored position but which may be moved or extended to a spaced use position to provide more manipulative space.

It is an object of this invention to provide a window regulator handle assembly having a crank arm which is moveable relative to the hub from a stored position, closely adjacent the trim panel, to an extended use position spaced therefrom, and which automatically returns to the stored position when the crank arm is released.

In carrying out the aforementioned object, the crank arm and hub are provided with an elongated rib and groove arrangement about which the handle is pivotable and which provides a driving connection therebetween. A spring clip is mounted against the omega clip and has a portion maintaining the rib and groove engagement and a spaced portion engaging the crank arm and biasing it to the stored position.

Other objects and features of this invention will become more readily apparent upon reference to the following detailed description of the annexed drawings in which:

FIGURE 1 is a plan view of a vehicle window regulator handle assembly according to this invention;

FIGURE 2 is a sectional view taken generally along line 2—2 of FIGURE 1;

FIGURE 3 is a partial sectional view taken generally along line 3—3 of FIGURE 2;

FIGURE 4 is a sectional view taken generally along the line 4—4 of FIGURE 3;

FIGURE 5 is a sectional view taken generally along the line 5—5 of FIGURE 2; and

FIGURE 6 is an exploded perspective view.

Referring now to FIGURES 1 and 2 of the drawings, a window regulator handle assembly **10** includes a hub portion **12** which is drivingly connected to a window regulator input shaft **14** by splines **16**. As shown in FIGURE 3, an omega clip **18** projects through mating grooves **20** and **22** in the hub and shaft to axially lock the hub to the shaft. Assembly **10** also includes a crank arm **24** having a conventional padded operating portion or knob **26** at the extremity thereof. Arm **24** is connected to hub **12** for rotation therewith and for pivotal movement relative thereto between a low profile stored position adjacent the body trim panel **28**, as shown in solid lines in FIGURE 2, and an extended use position spaced from panel **28**, as shown in phantom lines in FIGURE 2, by means which will now be described.

Referring now to FIGURES 4, 5 and 6, hub portion **12** includes peripheral flange **30** which terminates in an elevated elongated lip **32** extending across one side of the hub. An elongated groove **34** of circular cross-section is formed in the hub adjacent lip **32** for engagement by a mating transverse rib **36** formed on handle portion **24**. A groove **38** is formed adjacent rib **36** to accommodate lip **32**. Referring now to FIGURES 3 and 6, crank arm **24** is bifurcated at its inner end, forming two legs **40** which embrace the cylindrical base **42** of hub **12**.

Referring again to FIGURES 3 and 6, a sheet metal spring clip **44** has a central aperture **46** which embraces base **42** and includes a tab **48** which engages a groove **50** on base **42** to non-rotatably secure the clip to the hub. The base of clip **44** engages omega clip **18** and includes a curved lip **52** which engages arm **24** beneath rib **36** and biases the rib into engagement with groove **34**. Clip **44** is reversely bent at **54** and divides into a pair of arms **56** which embrace base **42**. Arms **56** each terminate in a curved lip **58** which engage the crank arm legs **40** adjacent grooves **60** formed thereon.

Referring again to FIGURE 4, the spring clip **44** is compressed against omega clip **18** in the assembled condition. Thus, spring lip **52** maintains secure engagement of rib **36** in groove **34**. Since the lip **52** lies along the fulcrum plane, it has no effect on the positioning of crank arm **24**. The compressed spring arms **56**, being spaced from the fulcrum, bias the crank arm counter-clockwise to the stored position, as viewed in both FIGURES 2 and 4, in which the distal end of the crank arm engages the trim panel **28** and knob **26** lies closely adjacent thereto.

When it is desired to operate the window regulator, knob **26** is grasped and extended to the use position, pivoting arm **24** and further compressing spring clip arms **56**. This movement is limited by engagement of lip **32** with groove **38**. During this movement, the underside of crank arm **24** slides smoothly over the curved spring lip **52**. It will also be noted that crank arm legs **40** slide smoothly over the curved lips **58** of spring **44** until the lips **58** engage the arm grooves **60**. The window regulator handle assembly **10** may then be rotated in either direction in the extended position to operate the window regulator, not shown. Upon release of knob **26**, the compressed spring arms **56** fulcrum crank arm **24** counterclockwise about groove **34** to the stored position, with knob **26** lying adjacent panel **28**.

Thus this invention provides a low profile window regulator handle assembly which is stored closely adjacent the vehicle trim panel when not in use, but which may be moved to an extended use position to increase manipulative space when it is desired to operate the window regulator. Obvious modifications will occur to those skilled in the art and are contemplated within the scope of this invention.

I claim:

1. In a rotatable window regulator handle assembly having a rotatable hub member drivingly engaging a rotatable window regulator mechanism on one side of a vehicle body panel and having an arm member for rotating the hub member, the improvement comprising: interengaging fulcrum means on an intermediate portion of the arm member and on the hub member mounting the arm member on the hub member for pivotal move-

ment about an axis transverse of the hub rotation axis between a stored position adjacent the panel and an extended position spaced from the panel, and for effecting a rotary drive connection between the arm and hub members for unitary rotational movement about the hub member axis, biasing means engaging the arm member at the intermediate portion to maintain engagement of the fulcrum means, and second biasing means engaging the arm member adjacent one end thereof for biasing the arm member to the stored position thereof.

2. In a rotatable window regulator handle assembly having a hub member drivingly engaging a window regulator mechanism on one side of a vehicle body panel and having an arm member for rotating the hub member, the improvement comprising: a rib on an intermediate portion of the arm member, a groove formed on the hub member receiving the rib to mount the arm member on the hub member for rotary movement therewith and for pivotal movement relative thereto laterally of the hub member rotational axis between a stored position adjacent the panel and an extended position spaced from the panel, stop means limiting movement of the arm member to the extended position, and a spring member mounted on the hub member and having a first portion engaging the intermediate portion of the arm member to bias the rib into the groove and a second portion engaging the arm member adjacent one end thereof to bias the arm member from the extended position to the stored position.

3. A manually operable handle assembly for rotatably driving a mechanism comprising, in combination: a rotatable hub member having a base drivingly connected to the mechanism, a crank arm member having an operating portion at one end and being bifurcated at its other end to provide a pair of legs embracing the hub base, an elongated transverse groove formed on the arm member adjacent the bifurcated end thereof, a rib formed on the hub member and received within the groove to fulcrum the crank arm member on the hub member for pivotal movement axially thereof and for rotational movement therewith, a spring member mounted on the hub member base and having a first portion engaging the arm member adjacent the rib to bias the rib into the groove, the spring member including spaced second portions engaging the crank arm legs to pivot the crank arm member about the fulcrum and locate the operating portion in a first position axially of the hub member, the crank arm member being manually pivotable about the fulcrum against the force of the spring member second portions to locate the operating portion in a second position axially of the hub member, and stop means on the crank arm and hub members for limiting movement of the operating portion to the second position, the spring member second portions returning the crank arm member to the first position upon manual release of the crank arm member.

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U.S. Cl. X.R.

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