Dec. 16, 1924. 1,519,375

E. E. HEINTZ

HANDLE ASSEMBLY

Filed April 4, 1923

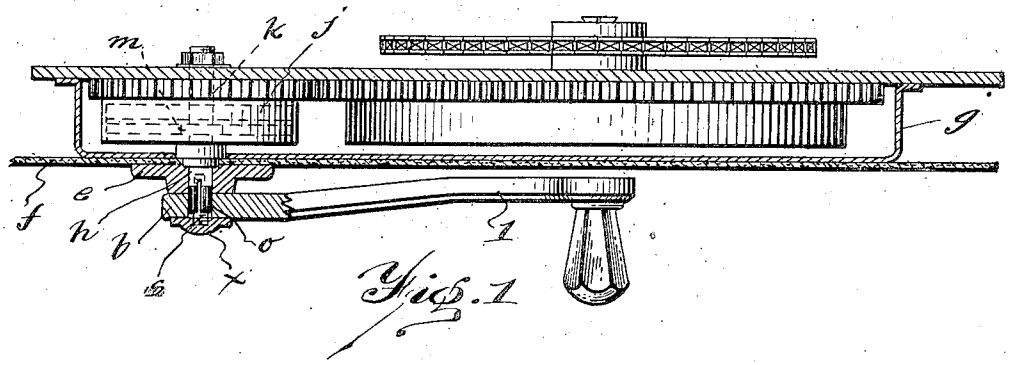


Fig. 1

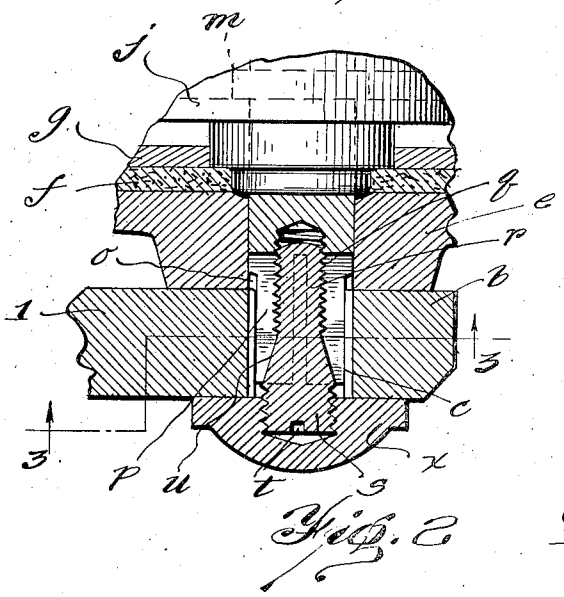


Fig. 2

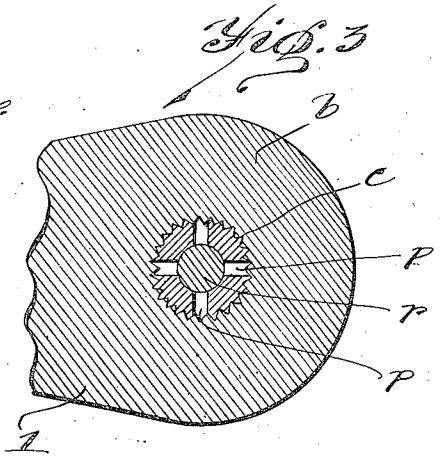


Fig. 3

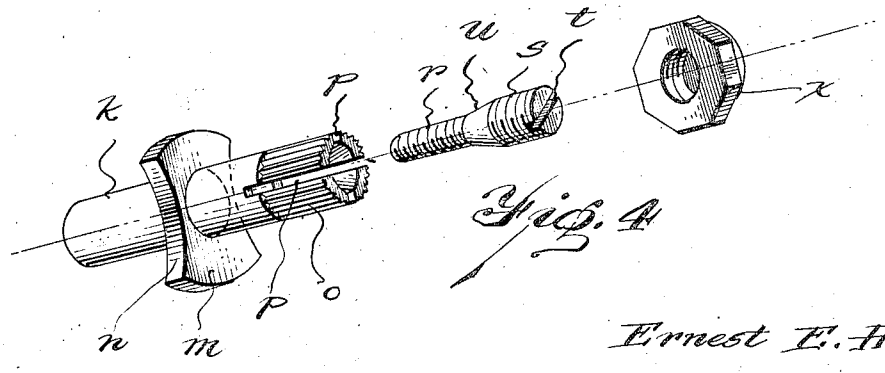


Fig. 4

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UNITED STATES PATENT OFFICE.

ERNEST E. HEINTZ, OF DETROIT, MICHIGAN, ASSIGNOR TO TERNSTEDT MANUFACTURING COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

HANDLE ASSEMBLY.

Application filed April 4, 1923. Serial No. 629,824.

To all whom it may concern:

Be it known that I, ERNEST E. HEINTZ, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Handle Assemblies, of which the following is a specification.

This invention relates to handle construction and has for its object, a cheaper, simple but effective way for fastening a crank handle to a spindle. It is especially designed and adapted for fastening a crank handle upon the spindle of a window regulator.

In the drawings:

Fig. 1 is a cross section of a window regulator showing the handle in place.

Fig. 2 is a section of a handle adjacent the hub.

Fig. 3 is a section on the line 3—3 of Fig. 2.

Fig. 4 is a composite perspective of the spindle and the fastening means.

Window regulators originally had the handle fastened to the spindle by a set screw. This is crude and unsightly and has pretty generally gone out of use. The most improved way of fastening the handle to the crank spindle today is to fasten the handle hub to the escutcheon plate by a die casting operation, or else by spinning over the inner end of the hub. The escutcheon then becomes a bearing and when the escutcheon plate is fastened to the window regulator housing, the hub of the handle with a squared opening fits over the squared end of the regulator spindle. This makes a very satisfactory and neat job, but is relatively expensive. It is the object of the present invention to afford a satisfactory fastening which is much cheaper and intended for the low priced regulators designed for low priced cars.

Referring to the drawings, 1 designates the handle which is blanked out in a stamping operation. This is provided with a hub *b* having a central serrated or toothed opening *c*. The teeth are relatively fine for a purpose hereinafter to be described. The escutcheon can be simply a thimble *e*, fitting up against the trimming *f*; *g* designates the regulator casing, or for that matter, no casing need be employed, the operating parts of the regulator being simply carried on the regulator plate. Projecting out of the regulator is the spindle *h*, which runs into the clutch housing *j* to operate the clutch parts in a way that is familiar. A variety of different forms of clutch can be used, and hence it is unnecessary to describe the clutch construction.

This regulator spindle is shown in detail in Fig. 4. It is a screw machine product comprising a stud member *k*, provided with a key wing *m*, flattened on one side as at *n*, to fit into the clutch member which it is calculated to turn. The outer end of the spindle is toothed or serrated as at *o*; it is also hollow and slotted as at *p*. Furthermore, the interior is tapped as at *q* to receive the screw stud *r* which is a special automatic screw machine product. The inner end of this screw is threaded like any other machine screw, but it has an elongated head *s* which is also threaded as well as slotted as at *t*, for the screwdriver. This elongated head *s* is connected with the reduced portion of the screw by a tapered shoulder or a cone *u* which I call the spreader or expanding portion. This is adapted to bear against the tapered or countersunk portion of the split end of the spindle. Obviously when the screw is screwed into the split end of the spindle, the tapered portions engaging serve to expand the end of the spindle.

The end of the screw is externally threaded to receive the blind nut *x*. If instead of using the blind nut, a cap screw is used, my purpose would not be as well accomplished for the reason that if the head of the cap screw were to lie tightly up against the hub of the handle it would be found that the screw had been stopped before the expansion had been completed. By my arrangement of a separate screw and blind nut, it is possible to turn the screw to any depth to get the required expansion and then put on the blind nut and turn this tightly down.

By using the expansion spindle I am able to use relatively fine teeth which would not otherwise be possible as the teeth would in the course of time wear so as to let the hub turn thereon. By using the expansion principle the teeth are so firmly imbedded in the substance of the hub that there is no chance of their ever coming loose to turn. By using the fine teeth I am enabled to get the handle at any angle so as to accommodate the handle to the regulator parts.

I am aware that it is not broadly new to

use expansion screws and bolts, that they are common in wall construction and other places, but so far as I am aware, they have not been used for the purpose here in view and they accomplish a new and improved result in tying a toothed spindle to a toothed handle hub in such a way as to permit the handle to be placed upon the spindle at almost any angle, due to the fine teeth that can be employed.

What I claim is:

1. In a handle assembly, the combination of a spindle having relatively fine serrations on its end with the ridge lines of said serrations extending longitudinally of the spindle, a handle having a hub with an opening having relatively fine complementary serrations on the walls of the hub, said serrated opening fitting over the serrated end of the spindle, and means for expanding the serrated end of the spindle into the serrations of the hub to provide a binding engagement, notwithstanding wear and what would otherwise be lack of proper fit of the fine serrations.

2. In a handle assembly, the combination of a spindle provided with a longitudinal split end in which the sections have relatively fine teeth on their exterior, the said teeth having their ridge lines extending longitudinally of the spindle, a handle provided with a hub having relatively fine complementary teeth on the inside of the hub and arranged to fit over the said end of the spindle, and a screw turning into the body portion of the spindle beyond the split and provided with an expanding portion adapted to engage the split portion to force said fine teeth into securing engagement regardless of the fit or wear that may have taken place on the teeth.

3. In a handle assembly, the combination of a spindle having a spreadable end, a handle provided with a hub fitting over such spreadable end, a screw having a slotted outer end adapted to screw into the spindle to spread the end of the spindle into the hub, and a concealing member fitting on to the end of the screw after the same has been driven in.

4. In a handle assembly, the combination of a spindle having a spreadable end, a handle provided with a hub fitting over such spreadable end, a screw adapted to screw into the end of the spindle to spread the same into the hub and having its outer headed end screwthreaded, and a blind nut screwed on to such head after the screw has been driven home.

In testimony whereof I affix my signature.

ERNEST E. HEINTZ.