June 11, 1935. F. W. BECKER ET AL 2,004,561

EXPANDING PINTLE FOR HINGES

Filed Aug. 17, 1933

Fig. 1.

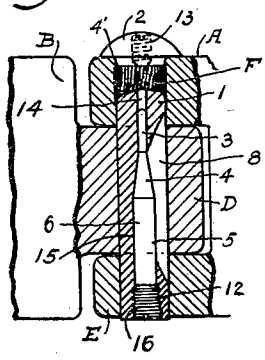


Fig. 2.

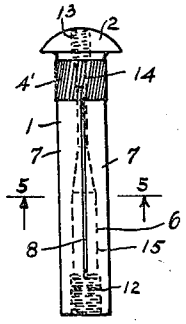


Fig. 3.

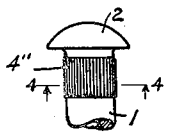


Fig. 4.

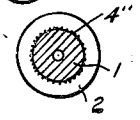


Fig. 5.

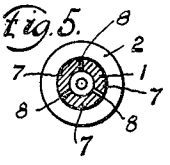


Fig. 7.



Fig. 8.

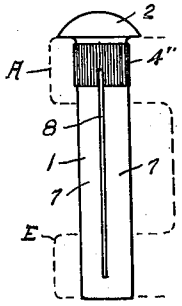


Fig. 6.

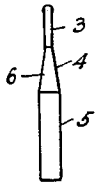


Fig. 10.

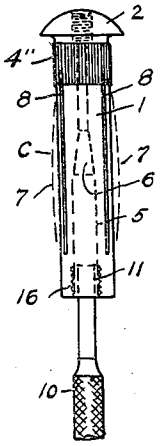
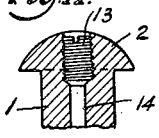


Fig. 9.



Fig. 11.



INVENTORS:
Frederick W. Becker;
Reginald P. Hinsley;

By Harold D. Perman,

ATTORNEY.

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EXPANDING PINTLE FOR HINGES

Frederick W. Becker and Reginald P. Kinsley, Albany, N. Y., assignors to Watervliet Tool Company, Inc., Albany, N. Y., a corporation of New York

Application August 17, 1933, Serial No. 685,517

2 Claims. (Cl. 16—168)

The present invention relates to an improvement in door hinge or pintle pins, and more especially for automobile door hinges, and has for its principal feature the provision of means whereby the pintle may be expanded in, and locked in expanded position in the hinge bores, thereby to tighten the pintle, in its fitting, to thereby adjust for wear and to eliminate rattle and noise and to prolong the life of the hinge and pintle structure through the consequent elimination of looseness.

Automobile door hinges are, as is well known, subject to rapid deterioration and wear, due to vibratory forces, and as there is no provision in hinges, provided with a solid pintle, for take up, deterioration is rapid and cumulative, and in a short time the hinge connections become loose, and permits the door to rattle badly.

The present hinge pintle has several novel features to meet the conditions above noted, one is in the provision of an integral pintle, of complete length to fit the coacting hinge structures, hollow to receive an expanding pilot pintle, threaded to lock the expander in operative position to prevent its backing out, and loss, and finally, is provided with a self-broaching and keying means for firmly seating the pintle in one of the coacting hinge elements thereby to be operatively held in one hinge element against self-rotation and against subsequent pintle expanding forces, when the pintle is reset and re-expanded. This latter feature also permits the pintle to be expanded, in situ, any number of times without the necessity of removal of the pintle from the hinge.

Thus the subsequent adjusting, re-expansions of the pintle is a matter of only a few moments' attention.

These and other features will be apprehended as the herein description proceeds and it is obvious that modifications may be made in the structure herein without departing from the spirit hereof or the scope of the appended claims.

In the drawing,

Fig. 1 is a fragmentary, transverse, sectional view of a door hinge with the present improvement, also in section, located in operative position therein;

Fig. 2 is a view of the pintle in elevation;

Fig. 3 is a fragmented view of the pintle showing a modified form of knurling under the head;

Fig. 4 is a sectional view taken on the line 4—4, Fig. 3, looking in the direction of the arrows;

Fig. 5 is a sectional view, taken on the line 5—5, Fig. 2, looking in the direction of the arrows;

Fig. 6 is an elevational view of the expander pilot pintle;

Fig. 7 is an elevational view of the expander pilot lock screw;

Fig. 8 is an elevational view of the hinge pintle with the slots cut longer to embrace all the trunnions of the hinge joint;

Fig. 9 is an elevational view of an expander set punch;

Fig. 10 shows the hinge pintle slightly expanded, with the set punch in the operative position of causing said expansion; and

Fig. 11 is a fragmentary sectional view of the head portion of a pintle showing a provision of means for a knock out for the expander pintle.

The hinge pintle comprises a cylindrical body 1, having a head 2 thereon, and the body, as in Fig. 1, is bored with a compound bore 14 and 15 from its bottom to receive therein an expander pin 6 having a cylindrical lead or pilot 3, a tapered expanding portion 4, and a straight, larger cylindrical lower stem 5. The compound bore is so contoured as to fit the stem 5, with the taper 4 of said pin fitting a corresponding taper in said bore. The expander pilot is separately shown in Fig. 6.

The cylindrical bored body 1 of the pintle is slotted, as in Figs. 2 and 5, with a plurality of radial slots 8, which cut into the inner pintle bore 15, and as in Fig. 5, this leaves the pintle body 1 with plural sectors 7 which are flexibly expandible by the expander pilot 6, when it is forced upwardly into the compound bore of said pin.

To cause such expansion, a set punch 10, Fig. 9, having a reduced cylindrical end 11, may be introduced into the bore in body 1, and is in contact with the lower end of the interiorly located expander pilot 6, and by means of a hammer, the set punch drives the expander pilot upwardly into the compound bore, and causes the sectors 7 to bulge radially outwardly, about as in Fig. 10, shown dotted, and thus expand in the bore of the swinging hinge section B, Fig. 1. In the above noted structure the length of slots 8, are so arranged that the expanding sections of body 1 are limited to the bore in the hinge section D, or swinging hinge B.

In the alternate form of pintle shown in Fig. 8, the slots 8 are cut longer so as to embrace the bores in the knuckle sections E and F of the fixed or other hinge section A, shown dotted in Fig. 8. Thus the friction and expansion can be arranged to act along, substantially, the entire active bore

fitting length of the body 1. This latter structure is useful in fitting new pins in old and worn hinge joints where all of the bores are badly worn.

The slotting of Fig. 2 is useful when fitting the pins to new hinges the bores of which are unworn.

After the expander pilot has been set up by the set punch 11, a headless set screw 12, Fig. 7, is introduced into the lower threaded end 16 of the compound bore in body 1, as in Fig. 1, and is tightly screwed into contact with the lower end of expander pilot 6, thus to maintain the pilot in set position and to prevent its working out. The set screw 12 may always be removed, in subsequent settings and replaced after re-expansion.

As a means to cause the hinge pintle to be firmly fastened in its hinge position in the knuckle F of fixed hinge A, the upper portion of the body 1, immediately under the head 2, is so knurled as to create a bore broaching portion 4', Fig. 2, the knurling being arranged in a helical like formation. When the pintle thus treated is driven home to its head in lug F, the teeth of the knurling 4' are driven into the surface of the bore in lug F, and thus lock the pintle in said bore against rotation. Further, the knurling being helical, it permits the expanding of the sectors 7 as described for Fig. 10, while the pintle is in its operative hinge coacting position, as the helical knurling 4' prevents the pintle from moving upwardly under the force of the hammer blows on set punch 10.

A straight form of knurling 4'' is shown in Figs. 3 and 4, and this can be used in new hinges with the same function as described for Figs. 1 and 2.

As above described, the principle of both forms of knurled and slotted hinge pintles are the same, and when properly set in either, new or worn hinge members, the expanded pintles take out all the play and thus eliminate all looseness and noise. As wear advances the hinge pintles may be additionally expanded from time to time, as required, and the set screw 12, set up to follow up and lock the inward adjustment of pin 6.

It is sometimes required that the hinge pintles must be removed from the hinges, and in order to accomplish this the pintle may have the internal pilot bore extended up through its head portion, as at 14, Fig. 11, to form a knockout bore, whereby the expanded pin 6, after removal of set screw 12, may be knocked downwardly to remove it from the pintle, and the pintle may then be knocked upwardly, to remove it from the hinge. The extended bore 14, may be closed by a headless or other screw 13, Fig. 11, to protect the pintle bore against the entrance of moisture.

It will thus be noted that the present improvement is unitary in structure, and is completely assembled as a single piece. In this assembled form it may be introduced into the hinge bore and thus operates as a solid pintle for the hinge until wear is encountered, after which it may be expanded as above set forth.

Having thus described our invention what we claim is:

1. In a door hinge, comprising a member having spaced knuckles, a member having an intermediate knuckle between the spaced knuckles, the three knuckles having alined bores, a single piece pintle having one end headed, and having locking means at said headed end, and having an axial bore therein, said axial bore having large and small cylindrical portions intermediately connected by a wedging portion, the large cylindrical portion of the bore being threaded, a plurality of peripheral slots in said pintle extending substantially the entire length of said pintle and into said axial bore to form expander sections in the three alined bores of the said knuckles, a solid wedge ended expansion pilot in said axial bore with its wedge end fitting the wedging portion of said axial bore and an independent set screw tightly engaging the threaded end of said axial bore to engage said wedge ended pilot to hold the latter in position under the stress of expansion of said pintle.

2. A pintle, as in claim 1, in which said pintle is locked against movement in one of the spaced lugs by the said locking means and is slidably fitted to the intermediate knuckle and the other spaced knuckle, whereby the intermediate knuckle can be rotated upon the pintle and the pintle is free to slidably foreshorten in the said intermediate and spaced knuckles as the expansion pilot is driven into the pintle to expand the expander sections.

FREDERICK W. BECKER.
REGINALD P. KINSLEY.