March 2, 1943. A. T. FLETCHER 2,312,635

GLASS CUTTER

Filed Feb. 14, 1940

Fig. 1.

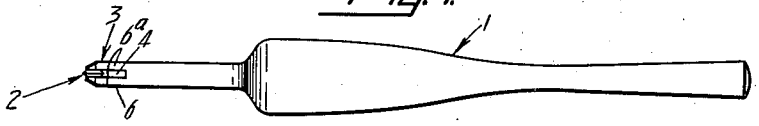


Fig. 2.

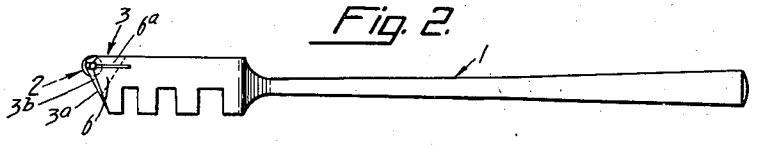


Fig. 3.

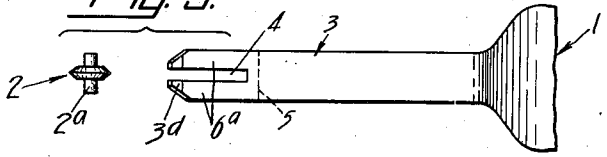


Fig. 5.

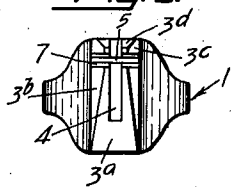
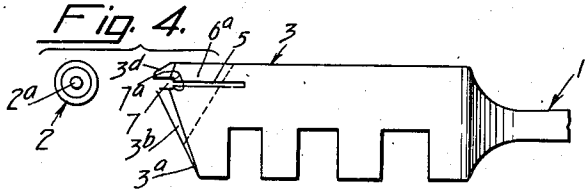


Fig. 4.



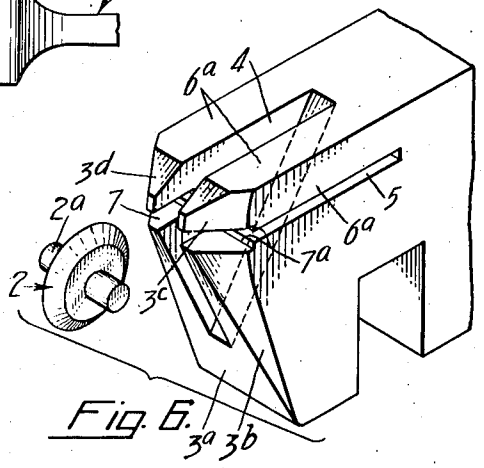


Fig. 6.

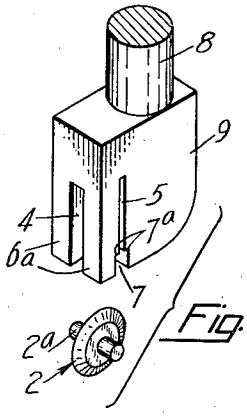


Fig. 9.

Fig. 7.

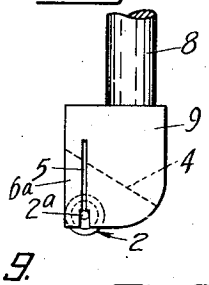
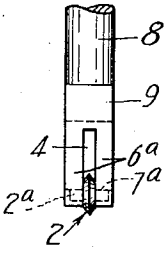


Fig. 8.



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UNITED STATES PATENT OFFICE

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GLASS CUTTER

Arthur T. Fletcher, Bristol, Conn.

Application February 14, 1940, Serial No. 318,904

8 Claims. (Cl. 49—52)

My invention relates to glass cutters.

It has among its objects to provide an improved and simplified glass cutter construction and one which both performs satisfactorily in service and is adapted to be very inexpensively manufactured. A further object of my invention is to provide improved and simplified cutter unit holding means whereby the cutter unit is secured in an improved manner in the holder, and in such manner as markedly to simplify and reduce the expense of the holding structures heretofore considered necessary. Still further objects of my invention are to provide an improved holder structure whereby it is made possible to utilize the resiliency of the material of the holder in such manner as to permit the holder directly to receive and grip the cutter wheel axles in an improved manner, and also to provide such an improved holder having an improved slotted structure cooperating to produce an improved resilient member formed of the same material as the holder and cooperating in an improved manner with the cutter wheel axles to enable new and improved results to be obtained. These and other advantages of my improved construction will, however, hereinafter more fully appear.

In the accompanying drawing, I have shown for purposes of illustration two embodiments which my invention may assume in practice.

In this drawing:

Figure 1 is a top plan view of an ordinary glass cutter equipped with my improvements;

Fig. 2 is a side elevation of the same;

Fig. 3 is an enlarged top plan view of one end of the holder with the cutter wheel unit disposed in spaced relation thereto ready to enter the same;

Fig. 4 is a side elevation with the parts disposed as shown in Figure 3;

Fig. 5 is an enlarged end view of the holder;

Fig. 6 is a further enlarged perspective view of the working end of the holder with the cutter unit disposed in spaced relation thereto;

Fig. 7 is a side elevation of a machine holder equipped with my improvement;

Fig. 8 is a front view of the same, and

Fig. 9 is a perspective view showing the machine holder and cutter unit in spaced relation with respect thereto.

Referring first to Figures 1 to 6, it will be noted that I have therein shown a metal holder 1 of the type adapted to be held in the hand during use and including a usual handle and having a cutter wheel unit, generally indicated at 2, suitably attached to the usual integral metal head 3 on its working end of this holder 1; the holder being provided with improved means for receiving and securing this unit 2 thereto, and the latter being of an improved construction enabling it to cooperate with said means, all as hereinafter described.

Referring more particularly to the metal head 3 of the holder, it will be observed that the same is provided with a vertical central slot 4 extending down through its top and angularly relative thereto and through a sloping front edge 3a in such manner as to provide a usual passageway for the rotating wheel of the cutter unit 2. Herein, it will also be noted that a longitudinal mill is provided in the metal head 3 and spaced sufficiently below the top surface thereof to provide resilient tongue or cutter unit axle gripping portions hereafter described, and preferably horizontally and parallel to said top surface. This mill herein is very narrow and forms kerfs or slots 5 extending through the inner walls of the bifurcations 6 of the working end 3 for the full depth of the slot 4 and also extending longitudinally slightlly beyond the end wall thereof. Attention is also directed to the fact that herein a second slightly wider but shorter horizontal mill is also provided in the working end 3 in such manner as to form outer wider slots 7 at the mouth of the slots 5 in each of these portions 6. Preferably, these slots 7 are also disposed symmetrically with the slots 5 and these slots 7 are also of uniform depth. If desired, the outer edges of the inclined working edge 3a of the holder may also be bevelled, as shown at 3b and 3c, while bevels 3d may also be provided on the upper end of the resilient gripping portions, or tines, 6a thus provided by the slots 5.

Cooperating with this improved holder structure is my improved cutter wheel carrying unit 2, the cutter wheel of which is adapted, as usual, to rotate in the slot 4. In this unit, the wheel is rotatable on an improved axle 2a of suitable metal such as phosphor bronze or steel and preferably glass hard. This axle 2a is also straight and of uniform diameter throughout its length and of slightly larger diameter than the width of the slots 7 heretofore described. While the difference in size may be varied, I find that with the axle five-thousandths of an inch (.005 inch) greater in diameter than the width of the slot, the desired results are obtained.

In the use of my invention, this axle 2a is merely forced longitudinally into the slots 7 in the holder 1, as illustrated, preferably until the ends of the axle 2a engage end abutments 7a. As

a result of expansion of the slots and the resultant gripping action of the portions 6a, the unit 2 is thus very securely positioned. More particularly, due to my improved construction the portions 6a, whether formed from holders of usual grey iron or of steel, make it possible to utilize the resiliency of the metal thereof and thus have sufficient resiliency to permit the reception of the ends of the axle 2a in the slots 7, and also to grip the axle ends very firmly in such manner as to make impossible accidental separation of the parts. Obviously, however, the unit when worn may be readily pried out.

As a result of my improved construction, it is made possible to eliminate all necessity for providing either special manually adjustable clamping means or special unit interlocking means on the holder, or for providing specially formed cooperating cutter units or such units carrying resilient holder gripping means. In addition, it is made possible to utilize both holders and units of extreme simplicity and each capable of being very inexpensively produced, and it is also made possible for them to be very readily and quickly connected and disconnected by mere reverse relative longitudinal movements of the parts. Also, all necessity for providing either elongated or bent axles, or for swedging the ends of the axle to secure the same on the holder, is eliminated; my improved construction functioning satisfactorily with short straight axles which do not extend beyond the sides of the holder and which also thereby enable the latter to have smooth sides. Further, as distinguished from the softer metal required in swedged or bent axles, it is made possible to use an absolutely hard axle having markedly increased life, while it is also made possible to utilize the hard character of this axle effectively in securing the same in the holder when the latter is made of ordinary grey iron. Like satisfactory gripping and holding of the cutter unit is also obtained where a holder of ordinary cast iron (Fig. 1) or steel (Fig. 7), is utilized. Here also it will be observed that it is made possible through my improved construction, requiring in addition to the slightly larger axle 2a only the milled slots 5 and 7 in the holder, to produce a construction wherein the slots may be readily inserted and controlled accurately as to size in such manner as thus markedly to facilitate manufacture. Moreover, the structure is such that the unit 2 may be readily pried out when desired and a new unit also readily inserted, and further such that many units may be worn out before the holder is so worn as to require replacement.

In Figures 7, 8 and 9, a modified construction is illustrated wherein the construction is embodied in a machine holder having a usual shank 8 and usual lower working end 9, the construction otherwise being similar to that heretofore described.

It will be understood that the forms of my invention described herein have been used for purposes of illustration, and that the invention may be modified and embodied in other forms without departing from its spirit or the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. In a glass cutter, a holder having an integral head which is normally substantially non-resilient, said head having an elongated narrow kerf cut therein in such manner as to form from the material of said head, a resilient portion therein, and a cutter wheel having an axle in said kerf of greater diameter than the normal width of said kerf and gripped by said resilient portion.

2. In a glass cutter, a holder having a cast iron head which is normally substantially non-resilient, said head being slotted for a portion of its extent in such manner as to provide a transverse slot therein with at least one wall of said slot relatively more resilient than the remainder of the head, and a cutter wheel having an axle in said slot of greater diameter than the normal width of said slot and gripped by said resilient wall.

3. In a glass cutter, a holder having an integral metal head which is normally substantially non-resilient, said head being slotted at one end to form from the material of said head, relatively transversely disposed intersecting slots therein providing a pair of tines on opposite sides of one of said slots and having the other slot including a narrow slit extending longitudinally of said head and close to one edge thereof and forming tines of sufficient length and limited cross section to permit gripping between said tines and the remainder of said head by reason of the inherent resiliency of the material of said head, and a cutter wheel in said slot having an axle in said other slot of greater diameter than the normal width of said other slot and gripped by said tines.

4. In a glass cutter, a holder having an integral metal head which is normally substantially non-resilient, said head being longitudinally slotted at one end to form a vertical slot for receiving a cutter wheel and having a transverse intersecting slot extending along and adjacent a marginal portion of said head to form resilient axle holding portions on opposite sides of such a wheel, and a cutter wheel having an axle having opposite ends in said transverse slot and gripped by said resilient portions, said transverse slot being narrow and elongated and having at its open end enlarged gripping portions receiving and expanded by and gripping the opposite ends of said axle.

5. In a glass cutter, a holder having an integral metal head which is normally substantially non-resilient, said head being longitudinally slotted at one end to form a vertical slot for receiving a cutter wheel and a transverse intersecting slot extending along and adjacent a marginal portion of said head to form resilient axle holding portions on opposite sides of such a wheel, a cutter wheel having an axle having opposite ends in said transverse slot and gripped by said resilient portions, said transverse slot being narrow and elongated and terminating at its open end in enlarged mouth portions receiving and expanded by and gripping the opposite ends of said axle, and abutments formed by the inner ends of said enlarged mouths providing abutments limiting the inward movement of said ends.

6. A glass cutter holder having an integral head which by reason of its mass is normally substantially non-resilient, said head having a longitudinal slot formed therein along one edge thereof in such a manner as to form from the material of the integral head, a portion of said material within the limits of said head comprising resilient cutter wheel axle holding means biased to holding position by the resiliency of the material comprising said portion.

7. A glass cutter holder having an integral head of cast iron having some inherent resiliency but which by reason of its mass is normally substantially non-resilient, said head having relatively transversely disposed intersecting slots therein

providing tines on opposite sides of one of said slots and of sufficient length and such limited cross section as to permit gripping by reason of the inherent resiliency of the material of said tines.

8. In a glass cutter holder having an integral metal head which by reason of its mass is normally substantially non-resilient, said head being longitudinally slotted at one end to form a vertical slot for receiving a cutter wheel and a transverse intersecting slot extending along and adjacent a marginal portion of said head for receiving a cutter wheel axle, said transverse slot being narrow and elongated and terminating at its open end in enlarged mouth portions and having the inner walls of said mouth portions forming abutments for such an axle.

ARTHUR T. FLETCHER.