Oct. 31, 1939. J. E. SAKE 2,178,187

GROMMET SECURING TOOL

Filed Nov. 11, 1937

Fig. 1.

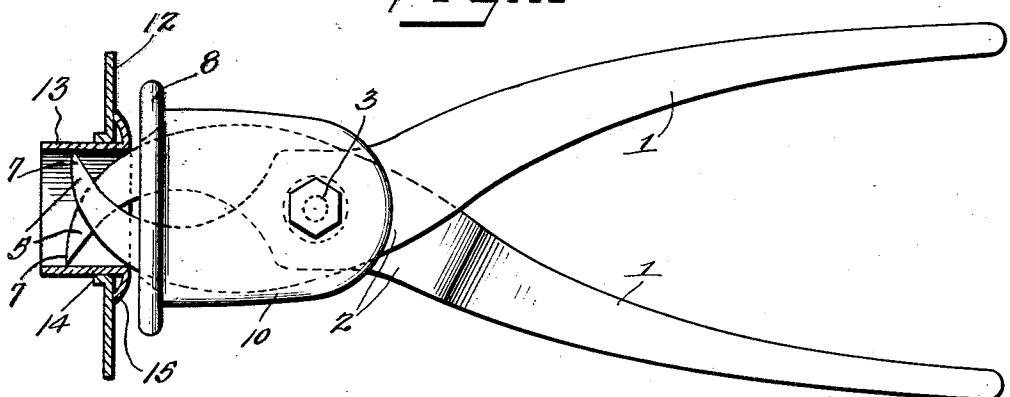



Fig. 2.

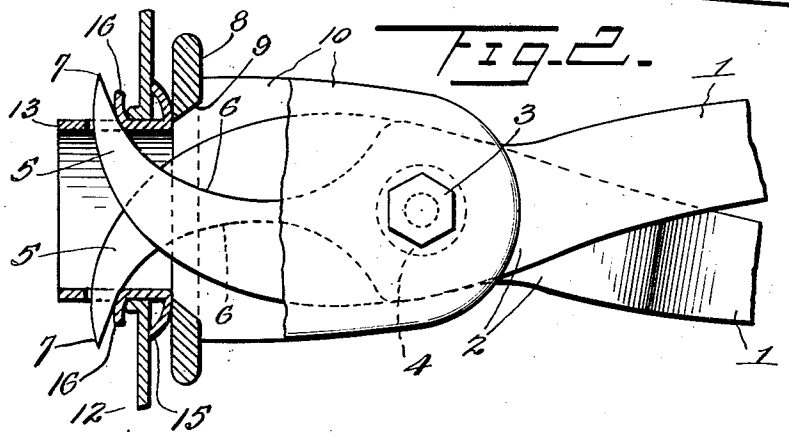



Fig. 3.

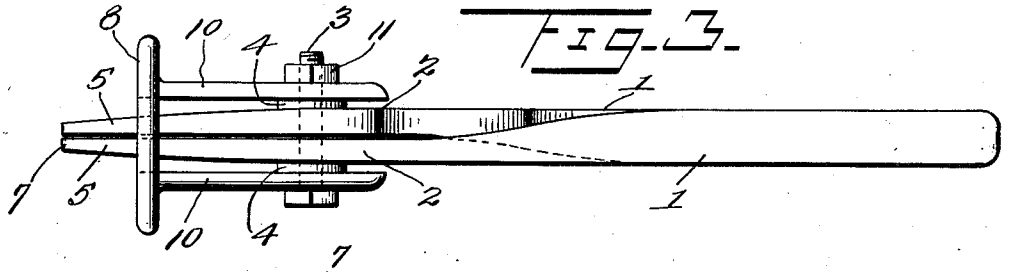
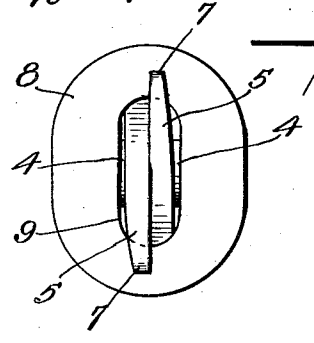



Fig. 4.




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## GROMMET SECURING TOOL

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Application November 11, 1937, Serial No. 174,112

4 Claims. (Cl. 81—5.1)

This invention relates to metal working tools and pertains particularly to a tool or implement for fixing metal grommets in apertures of sheet metal or similar material.

The present invention has for its primary object to provide an improved efficient tool for fixing metal grommets in apertures of sheet metal or similar material by the process of punching out locking or securing tongues from the material of the grommet, upon the side of the metal supporting body opposite from that which will constitute the face of the body when the work or job of which the body forms a part, is completed.

Another object of the invention is to provide a metal grommet fixing or securing implement in which a novel means is employed for applying pressure to one end of the grommet while simultaneously cutting out and turning securing tongues from the body of the grommet upon the opposite side of the work in which the grommet is being secured from that side against which the pressure is applied.

A still further object of the invention is to provide an implement of the above described character in which the metal tongue cutting portions operate in such a manner as to pull the implement into position against the end of the grommet thereby automatically applying compressive forces simultaneously against the cut-out tongue and the outer end of the grommet so that a tongue and outer end will be securely compressed against an interposed metal body in which the grommet is being fixed.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawing forming part of this specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing of the drawing but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawing:

Figure 1 is a view in side elevation of the tool embodying the present invention, the same being shown applied to a grommet in preparation for the tongue cutting operation by which the grommet is secured in place.

Fig. 2 is a view partly in side elevation and partly in vertical section thru the head end of the tool showing the same on a slightly enlarged scale over Fig. 1 at the completion of the grommet fixing operation.

Fig. 3 is a view in top plan of the tool as viewed in Fig. 1.

Fig. 4 is a view looking at the front end of the tool.

Referring now more particularly to the drawing, the numeral 1 indicates a pair of handle members having forward end portions 2 arranged in crossed relation similar to a pair of pliers. These forward ends 2 of the handles are coupled together by a pivot bolt 3 and mounted upon the bolt at the outer side of each end portion 2 is a spacer washer 4, the purpose of which will be hereinafter more fully described. The forward ends of the handles 1 are in the form of elongated arcuate fingers each of which is indicated by the numeral 5. These fingers have their convex faces or sides 6 directed oppositely so that the tapered forward ends or tips of the fingers are in overlapping relation, as illustrated in Fig. 1. The forward or free ends of the fingers are suitably formed to provide cutting edges or blades 7, and when the handles 1 of the tool are compressed or oscillated toward one another upon the bolt 3, these cutting points will move in arcuate paths and in opposite directions. In other words, the points 7 will move apart upon an arc struck from the bolt 3 as a center.

Disposed transversely of the fingers 5 between the points of the fingers and the bolt 3 is a presser plate 8 which is here illustrated as being in the form of an ellipse, altho it may be of any desired shape. This plate has a centrally elongated opening 9 thru which the crossed fingers 5 extend and it is held in position by wing members 10 which are integral with its rear face and which extend rearwardly over the outer faces of the fingers 5 to the bolt 3 which passes thru them and maintains them firmly against the washers 4 by means of the head at one end of the bolt and the nut 11 which is mounted upon the other end.

The application of the tool is illustrated in Figs. 1 and 2. In these figures the numeral 12 indicates a portion of a metal plate or similar body in which the grommet 13 is secured in the flanged opening 14 formed in the plate. These grommets are in the form of short cylinders upon the outer ends of which a bead or collar 15 is formed which, when the grommet is secured in place in the opening 14, bears against the outer face of the plate 12 and the grommets are made use of particularly in the construction of motor vehicle doors to provide a sleeve or bearing for the door handle.

After the grommet has been inserted into the opening 14 of the door panel, the crossed forward ends of the punch fingers 5 of the present imple-

ment are inserted to a position where the forward face of the plate 8 will be approximately ¼ of an inch away from the bead 15. This initial position is illustrated in Fig. 1. Upon the compression of the handles 1, the sharp cutting edges 7 at the ends of the fingers 5 will penetrate thru the tubular portion of the grommet, as illustrated in Fig. 2, cutting therefrom the tongue 16 which will be curled upwardly and forwardly toward the rear face of the panel 12 and across the flange which encircles the opening. The compression of the tongues across the flange may deform the latter slightly thus firmly fixing the grommet against rotation. This separatory movement of the forward ends of the fingers 5 along arcuate paths centered at the bolt 3 will effect the drawing of the tool toward the bead 15 of the grommet, thus bringing the face of the plate 8 into contact with the bead, as shown in Fig 2. Thus it will be seen that the arcuate face of each punch finger 5 will operate as a jaw to compress the adjacent tongue 16 against the flange of the opening 14 and also to draw the plate 8 toward the panel so that the bead 15 of the grommet will be held firmly thereagainst while the tongue is being bent into position.

In order that the bead at the outer end of the grommet may not be marred or damaged, the working face of the plate 8 is finished off smoothly.

From the foregoing it will be readily apparent that with an implement of the character herein described, grommets of the type described can be easily and quickly secured in position by the simple operation of inserting the points of the tool and compressing the handles, and this is done preferably two times to form four equidistantly spaced securing tongues whereby the grommet will be firmly secured and will not show the means by which it is maintained in place.

What is claimed is:

1. A punching tool of the character described, comprising two handle members having crossed forward ends, pivot means securing said crossed ends together, a longitudinally arcuate punch finger extending from the forward end of each handle, said fingers having their free ends oppositely directed, a cutting edge at the free end of each finger, and a press plate disposed in a plane extending transversely of the fingers between the ends thereof and said pivot means and supported on the tool in a manner whereby the fingers will move relatively to a face of the plate when the handles are oscillated.

2. A punching tool, comprising a pair of handles having crossed ends, a pivot member between said ends, a plate disposed forwardly of said pivot member in a plane perpendicular to said handles, means coupling the plate with the pivot member, the handles being oscillatable on the pivot independently of the plate, the plate having a central aperture, and a pair of punch fingers extending from the handles thru said plate aperture and so constructed and arranged as to move in opposite directions upon working movement of the handles and in an arcuate path leading toward the adjacent face of said plate.

3. A tool of the character set forth, comprising two handles having crossed forward ends, a pivot bolt coupling the said crossed ends, a relatively longitudinally arcuate punch finger extending from the forward end of each handle, the fingers having their outer ends in crossed relation, a cutting blade at the outer end of each finger, a plate member disposed in a plane transversely of the fingers between the outer ends thereof and the pivot bolt and having an opening thru which the fingers extend, and a pair of wing members projecting from the rear face of said plate and supported at the sides of the tool upon the bolt.

4. A grommet setting tool, comprising a pair of pivotally connected handles, an elongated longitudinally arcuate grommet punching finger extending from each handle, said fingers being movable upon actuation of the handles in side by side relation and in opposite paths, the ends of said fingers being oppositely directed and adapted to cut through the material of the grommet, and means carried by the tool for maintaining pressure against the grommet while said fingers are being actuated to penetrate the same, said means being supported from the pivot for the handles to maintain a stationary position relative to the grommet while the fingers are moving.

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