Oct. 14, 1930. N. A. PLUMMER 1,778,686

TIRE REPAIRING TOOL

Filed Oct. 3, 1929

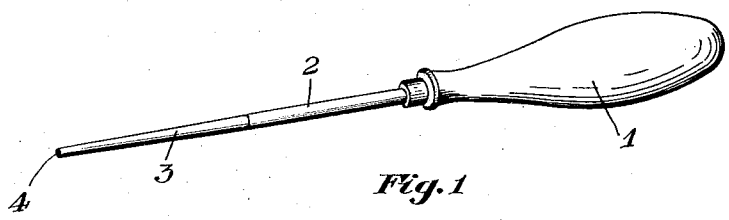


Fig. 1

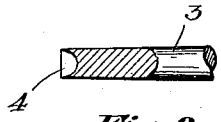


Fig. 2

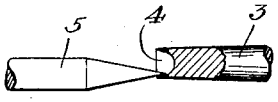


Fig. 3

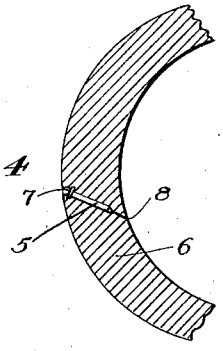


Fig. 4

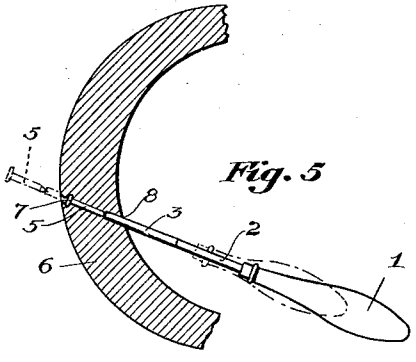


Fig. 5

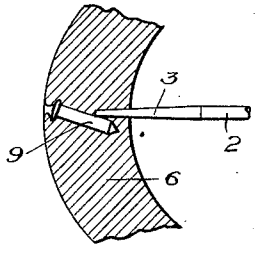


Fig. 6

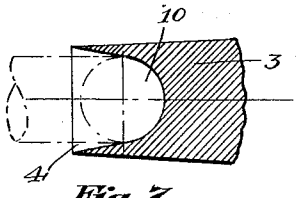


Fig. 7

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UNITED STATES PATENT OFFICE

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TIRE-REPAIRING TOOL

Application filed October 3, 1929. Serial No. 397,027.

My invention relates, generally, to tools by which repairs to motor vehicle tires are made, but specifically, concerns an implement which may advantageously be employed to remove articles embedded in the shoe of the tire, as for instance, nails or tacks which the tire frequently picks up during the passage of the vehicle over the street or highway.

It is of common occurrence for a nail to be forced into a shoe in such a manner that its extraction therefrom becomes rather a difficult and tedious operation. Often the point of a nail will completely pass through the shoe, puncture the inner tube and upon the expansion of the rubber retract into the shoe so that it is not visible from the inside. The aperture made by the nail closes, and even this spot, except by very close inspection, is hard to locate.

The usual practice in such cases is to make an attempt to withdraw or pull out the nail by applying pinchers or tweezers on its head portion. If the nail has been driven deeply into the shoe this operation more often than not enlarges the hole—further injuring the tire.

On the other hand, if the operation of removing the nail is performed from the inside of the shoe by inserting a small, flat end tool somewhat after the order of a nail set into the puncture, the difficulty encountered is the slipping of the smooth end of the tool off the point of the nail—the tool passing by without accomplishing the object desired.

In my present invention the working end of the projector is cupped or concaved so that once the pointed end of the embedded article is located no difficulty is experienced in holding it in contact with the tool, and by outwardly directed force removing the foreign object from the tire.

The character of the invention may best be understood by reference to the description found in the following specification when taken in connection with the accompanying drawing in which like reference characters are employed to identify similar parts in all the different views thereof.

In the drawing,

Fig. 1 is a perspective view of the projector;

Fig. 2 is a fragmentary view thereof, partly in section;

Fig. 3 is the same as Fig. 2, showing the point of a nail being located by the cupped end of the tool;

Fig. 4 is a fragmentary sectional view of a shoe with a nail inserted therein, the inner portion of the puncture being closed;

Fig. 5 illustrates the application of the tool in removing a nail from a shoe;

Fig. 6 shows another adaptation of the tool, and

Fig. 7 is an enlarged sectional view of the working end of the projector tool.

Referring to the drawing, 1 is a handle and 2 is a steel rod having a tapered portion 3. The extreme end is cupped, as at 4, the depression preferably having a depth at least as great as its diameter.

This keen, knife-edge border, after being hardened and ground provides the tool with facilities which adapt it to incise the side of a nail or other metal substance embedded in the shoe and as its service is not severe—as if operated by being pounded by a mallet or hammer, or like the impact required in using a cold chisel, the tool will remain effective even after long and continuous use.

In Fig. 4 is shown a very common condition found in punctured tires. The nail 5 has been forced into the shoe 6 until its head 7 is beneath the outer surface of the shoe. The tire, when punctured by the nail, compresses sufficiently to drive the nail completely through the outer or shoe portion and we will assume has also punctured the inner tube (not shown). Upon the punctured portion coming off the ground, as the tire revolves, the rubber expands and the nail retracts so that its point is not visible from the inner side of the shoe. A casual observation of this inner surface will oftentimes not even show indications of a puncture having been made but close inspection will reveal the orifice which has quite completely closed, and then the end 4 of the projector is inserted therein.

By the sense of feeling the end of the nail may be located with the tool—after which a

slight pressure outwardly will eject the nail, as shown in dotted lines in Fig. 5.

On other occasions a nail or perhaps some other metallic substance has entered the shoe but does not entirely pass through, nevertheless it is thought best to remove the obstruction. This condition is illustrated in Fig. 6 in which the cutting edge of the projector has landed on the side of the nail 9 and obtained a hold thereon by shearing into its side sufficiently to effect an outward movement of the nail so that its head protrudes beyond the outer surface of the shoe where it then may be easily withdrawn. The object of this knife-edge on the border of the tool is thus apparent.

It is desirable that in instances like the last one mentioned as small a hole as is possible should be made in the shoe. So for general purposes the extreme end of the tapered portion of the tool is made no larger than one sixteenth of an inch in diameter, and even then it is often advisable to precede the insertion of the projector by a pointed tool to open a passage through which the projecting tool passes to reach the object to be removed.

In Fig. 7 I show what has proven to be the most efficient and lasting form in which to make the end 4 of the projector. A half-round nose drill is first used to provide this shape for the bottom of the depression 10, making the depth such that if the full circle was inscribed (see dotted lines) it would fall wholly inside the cutting edge of the tool. A reamer then clears the stock away at the sides, leaving tangential lines from the half-round bottom to the cutting edge of the tool. After hardening and tempering the outside may be ground to provide a keen cutting edge.

The practicability of this simple tool has been thoroughly tested out on numerous occasions and on various kinds of jobs having to do with the removal of embedded articles in the shoes of motor vehicle tires, and it is believed that by its use the tire repairer is enabled to reduce the time—and incidentally the cost, of performing operations of this character.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

In a device of the character described, comprising a tapered shaft, means on the larger end of said shaft for manually gripping the same, a socket on the smaller end of said shaft of at least as great a depth as is its diameter, and a cutting edge formed around the margin of said socket.

In testimony whereof I affix my signature.

NORMAN A. PLUMMER.