Dec. 7, 1954 J. H. CROWDER 2,696,240

DENT REMOVER

Filed Oct. 28, 1949

Fig. 1.

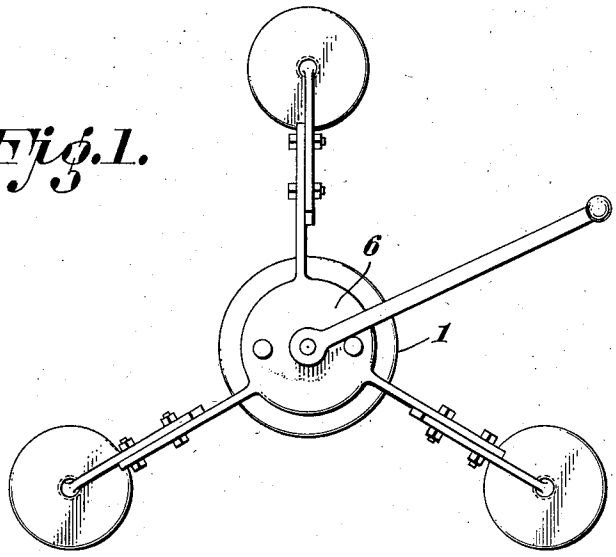


Fig. 3.

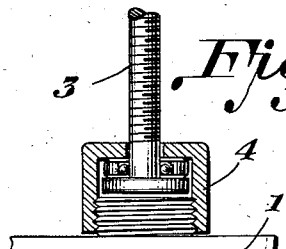


Fig. 2.

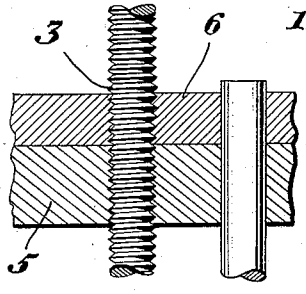


Fig. 4.

INVENTOR

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DENT REMOVER

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1 Claim. (Cl. 153—32)

My invention is of that class of devices used to remove dents from the fenders and bodies of automobiles. It can also be used for this purpose on aircraft, boats or other objects of material capable of being dented or bent.

Another use is in manufacturing where it is necessary to have an economical and efficient tool as a substitute for a forming press for bending or drawing materials to conform to certain shapes with a fair degree of accuracy. Other uses can come within my claim.

The main advantage of my invention over other devices for the removal of dents is that it does its work without leaving hammer marks and with a minimum of injury to the finished surfaces. Sanding, grinding or refinishing the surface is unnecessary after most jobs in which this device is used.

Due to the adjustability of the support of this device convex dents can be removed as well as concave ones, as the magnet can be placed on the inside or the outside of the material to be straightened.

In the drawings:

Figure 1 is a top plan of my invention showing the arrangement of the three legs of the tripod in relation to the plate which forms the top of it and which supports the thrust bearing and other moveable parts. Figure 2 is a side view showing my device in operation, partially in section. Figure 3 shows part of a leg of the tripod in which the manner of connecting the parts with bolts can be seen. Fig. 4 is a view of the screw through the yoke and plate of the tripod.

In order to better understand my invention, please refer to the drawing in which **1** is the electromagnet, having a thin cover **2** of non-abrasive material to keep the metal of the magnet from coming into direct contact with the surface from which the dent is to be removed.

A screw with a handle **3**, operating through a swivel **4** containing a thrust bearing actuates the magnet which is guided by the yoke **5** fastened to the plate **6** which forms the top of a heavy adjustable tripod.

Under some conditions this device may be used with the magnet only without the armature.

The feet of this tripod are broad as there is great pressure on them when the device is in operation and it is desirable to spread this pressure on the greatest area possible to prevent denting by the feet.

Under some conditions, such as the removal of deep dents in fairly heavy material it might become necessary to actuate the magnet by some means other than the screw in the tripod. In these cases a small crane or a jack could be used effectively.

Each leg of the tripod is made in two sections with holes **80** through which bolts may be placed. This allows adjustments in the length of the legs.

The adjustable legs **8** of the tripod have at their feet **9** non-abrasive material **10** so that they will not injure the finish of the surface on which the device is used.

A piece of magnetic metal **11** having a non-abrasive cover **12** to protect the finish of the material on which it is used, forms the armature of this device. This wound armature is for use where it is not practical to have one of the type of (**11**) such as when more flux is necessary to exert a greater pull.

Sections of magnetic metal of various shapes can be used as armatures to bring surfaces to the desired arc when removing dents from curved materials.

A large amount of current is necessary to operate this device as there is great flux leakage, especially when working on metals. I would recommend direct current of moderate voltage and high amperage as a result of my experiments. A D. C. arc welder generator would be excellent as a source of power although in some cases storage batteries could be used for a short time. A. C. seems to cause vibration in metal when the magnet is used on it and the finish might be damaged if it came in contact with the metal of the magnet or the armature. If no D. C. is available A. C. could be used.

In the operation of my invention, for example when it is desired to remove a dent from an automobile fender or body, the adjustable tripod is set up on the side towards which it is desired to move the material dented. The armature is placed on the opposite side.

The face of the magnet is now placed against the surface dented and the current turned on. The screw is revolved and the armature slowly pushes out the dent as it follows the magnet. When the desired position has been reached by the dented material the current is turned off and the device removed.

Having described my invention and its operation in detail, what I now claim and desire to secure by Letters Patent is:

An electro-magnetic dent remover for operation upon thin material comprising a tripod support having legs which are adjustable in length, a yoke rigidly mounted at the top of said tripod, guide members slidably mounted in said yoke, an electro-magnet secured to the inner ends of said guides, a screw threaded in said yoke and rotatably connected to said electro-magnet, and means connected to the outer end of said screw for turning the same.

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