

Aug. 29, 1944.

R. E. LAURENCE

2,356,858

PORTABLE VULCANIZER

Filed March 24, 1942

Fig. 1

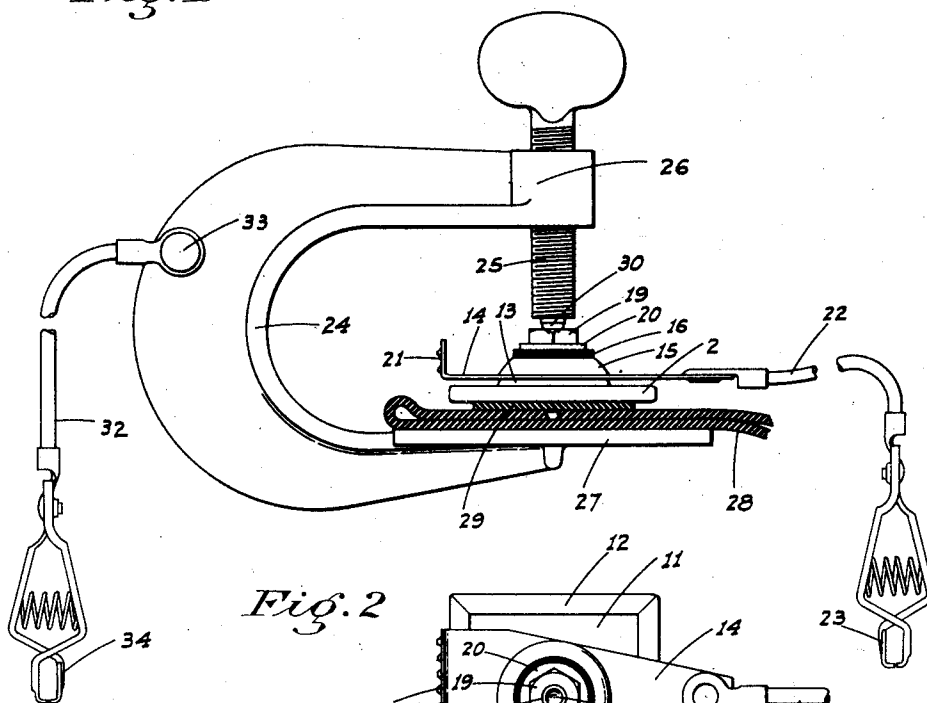


Fig. 2

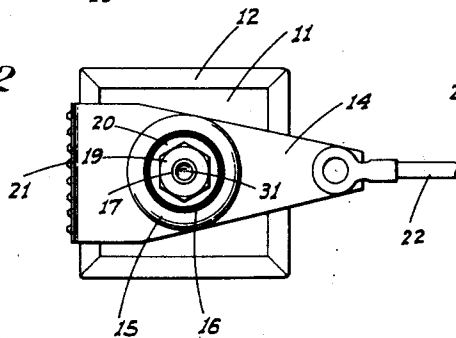


Fig. 3

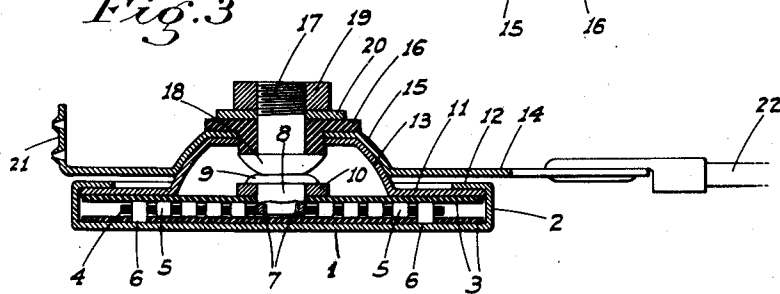
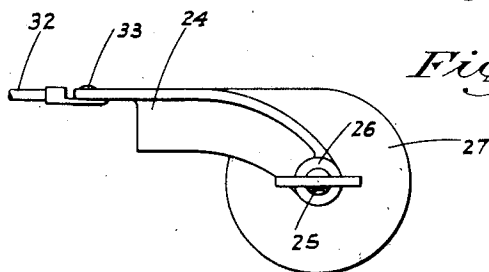


Fig. 4



INVENTOR.

Ralph E. Laurence

BY

Walter W. W. W.

ATTORNEYS

UNITED STATES PATENT OFFICE

2,356,858

PORTABLE VULCANIZER

Ralph E. Laurence, Fresno, Calif.

Application March 24, 1942, Serial No. 435,943

3 Claims. (Cl. 219-19)

This invention relates in general to improvements in vulcanizers for tire tubes and other rubber articles, and in particular the invention is directed to, and it is one of my objects to provide, a unique electric vulcanizer which is compact and portable and thus may be conveniently carried in a motor vehicle; the device being arranged for connection with the circuit of and to be energized by a six-volt storage battery, such as is conventionally used in automotive equipment.

Another object of my invention is to provide an electric vulcanizer which includes an electrically heated vulcanizing plate assembly, and a C-clamp holder in which the vulcanizing plate assembly is adapted to be removably disposed; the rubber article to be vulcanized being engaged between said plate assembly and a work-supporting bed on the C-clamp.

A further object of this invention is to provide an electric vulcanizer, as above, in which the circuit for the device includes two flexible lead wires having spring clips at their outer ends adapted for connection with a battery circuit. Such wires at their other ends are connected respectively with the C clamp, and the vulcanizing plate assembly which includes the resistance elements; the circuit being completed or closed when said assembly is engaged in the C clamp.

It is also an object of this invention to provide a novel form of C clamp, which is designed for ease of manufacture and which is especially useful in combination with an electrically actuated vulcanizing plate assembly.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawing similar characters of reference indicate corresponding parts in the several views:

Figure 1 is a side elevation of my improved portable vulcanizer.

Figure 2 is a plan view of the vulcanizing plate assembly detached from the C clamp.

Figure 3 is an enlarged sectional elevation of the vulcanizing plate assembly.

Figure 4 is a plan view of the C clamp.

Referring now more particularly to the characters of reference on the drawing, and particularly at present to the structure of the vulcanizing plate assembly, the numeral 1 indicates a

flat, square base or vulcanizing plate of metal, formed about its edges with upstanding sides 2. The plate 1 and sides 2 form in effect a shallow box in which is disposed a pair of square close fitting mica sheets 3 disposed in parallel, spaced relation and having interposed therebetween another dielectric sheet 4 of mica or the like; this last named sheet 4 being symmetrical to but of lesser size than sheets 3 and being spaced at its edges from the metallic sides 2, as clearly shown in Fig. 3. Two lengths of resistance ribbon 5 are wound about sheet 4 with the loops in spaced relation and to form two separate coils; the coils extending from opposite ends of sheet 4 to a point adjacent the center line thereof. At the opposite and outer ends of the coils, the resistance ribbons 5 are grounded to the bottom plate 1, as at 6, while at the adjacent and inner ends of the coils the ribbons are arranged in electrical contact, as at 7, with a hollow metallic pin 8 which extends centrally and vertically through the uppermost mica sheet 3 and into the corresponding portion of sheet 4. This pin 8 is headed as at 9, and a washer 10 is seated beneath the pin head and engages against the adjacent face of said uppermost mica sheet 3.

Another metallic plate 11 is disposed flush atop said uppermost mica sheet 3 and the sides 2 are bent over sheet 3 in the form of flanges 12 and in clamping relation. It will thus be seen that the plate 11 clamps the sheets 3, the sheet 4 and the resistance ribbon coils into an integral unit, with the coils in parallel between pin 8 and plate 1. Inwardly of flanges 12 and centrally of the plate 11 the latter is deformed outwardly and upwardly as an inverted cup 13, which is flat on top. A rigid metallic contact strip 14 of substantial length is formed with a corresponding inverted cup portion 15 which engages over the cup portion 13 of plate 11; the contact strip 14 being parallel to said plate 11. The inverted cup portions 13 and 15 at the top are provided with matching central openings in which is seated a top flanged dielectric sleeve 16 which projects downward through said openings to a termination slightly below the top of the cup 13. A bolt 17 projects upward through said dielectric sleeve and such bolt includes at its inner end a head 18 which seats against the head 9 of pin 8 in electrical contact therewith. At its upper end the bolt 17 is threaded and fitted with a nut 19. A washer 20 surrounds the bolt between the nut 19 and sleeve 16. It will be seen that with tightening of nut 19, the plate 11 and contact strip 14,

together with the cooperating inverted cup portions thereof, are drawn into unitary relation, and at the same time the bolt head 18 remains in electrical contact with pin 8, while the bolt is insulated from members 11 and 14.

The contact strip 14 overhangs the base 1 at both ends, at one end being provided with a toothed upstanding flange 21 which serves as a buffer, while the other end of the contact strip is connected with a lead wire 22 which includes a spring clip 23 at its outer end.

The above described arrangement comprises the electrically actuated vulcanizing plate assembly. For use, this assembly is adapted to be mounted in a C clamp holder which includes a C-shaped body 24, a thumb screw 25 being threaded vertically through a boss 26 on the outer end of the upper leg of body 24. A substantially circular work-supporting bed 27 is formed on the lower end of body 24 centrally below thumb screw 25 and at right angles thereto. As is clearly shown in Fig. 4 the bed 27, as well as the thumb screw 25 and adjacent portion of said upper leg of the body 24, are offset in the same direction from the major vertical plane of said body, the body being straight or flat along the opposite side. This offsetting of the bed and thumb screw is for a dual purpose. Firstly, it permits the body 24, which is of cast metal, to be formed in a one-piece mold, as said body is straight along one side; and secondly, by offsetting the top leg and bed, as described, it is possible to engage articles to be vulcanized either parallel or at right angles to the body 24.

The article to be vulcanized, such as an inner tube 28, is placed upon the circular bed 27 with a patch 29 of vulcanizing rubber over the point to be repaired; adjacent surfaces of the tube and patch having previously been prepared in conventional manner. Thereafter the vulcanizing plate assembly is seated on the patch 29, as clearly shown in Fig. 1, and the thumb screw 25 is run down against the upper end of bolt 17, the lower end of the thumb screw having a locating nub 30 which seats in a recess 31 in the upper end of bolt 17. The thumb screw is run down until the vulcanizing plate 1 exerts sufficient pressure on the article 28 and patch 29. The spring clip 23 is then connected with one terminal of a battery circuit. The other lead wire of the vulcanizer is indicated at 32 and is connected at one end to body 24, as at 33, while at the other end this wire carries a spring clip 34. This spring clip 34 is connected to the other terminal of the battery circuit. With the spring clips 23 and 34 so connected, a current passes through the coils of resistance ribbon 5, heating the same, which in turn heat the vulcanizing plate 1 and vulcanize the patch 29. As the circuit through the vulcanizing plate assembly is believed obvious, it is not here described in detail; pin 8 and contact strip 14 serving as the terminals for said assembly; thumb screw nub 30 making electrical contact with pin 8, and lead wire 22 being direct connected to strip 14.

The above described electric vulcanizer is not only handy and simple to use but produces a

quick and complete vulcanization of the patch, and as the device is electrically actuated entirely eliminates the danger of fire or sulphur type portable vulcanizers.

5 From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

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

1. In a portable electric vulcanizer, a metal C clamp having a hand screw and a bed and adapted for connection with a lead wire, and initially separate vulcanizing plate assembly having an electric heating element therein, and including a metallic top plate; a terminal bolt projecting through said top plate in insulated relation, the screw being adapted to seat against said bolt when the assembly is clamped against work on the bed, the heating element being connected in circuit between said bolt and said top plate, a contact strip engaging said top plate and secured thereto by a nut on said bolt, the bolt and nut being in insulated relation to said strip, and another lead wire connected to said strip, said top plate and contact strip being deformed to provide inverted cup-shaped portions which seat in snug symmetrical relation, said portions having matching openings through which the bolt projects; a dielectric sleeve about the bolt and through the openings and a dielectric flange on the sleeve engaging under the nut.

2. In an electric vulcanizer, a vulcanizing plate assembly including a housing having a metal top plate, an electric heating element in the housing in generally insulated relation thereto but connected at one end with the top plate, a central contact member within and insulated from the housing and to which the other end of the element is connected, a contact strip adapted for connection with a lead wire engaging the top plate and a bolt connecting the strip and housing and insulated therefrom and contacting at its inner end with said central member; said bolt at its outer end being adapted for electrical connection with another lead wire.

3. In an electric vulcanizer, a vulcanizing plate assembly including a housing having a metal top plate, an electric heating element in the housing in generally insulated relation thereto but connected at one end with the top plate, a contact strip adapted for connection with a lead wire and contacting the top plate, a bolt detachably securing the strip and top plate together and insulated therefrom, said bolt being adapted for electrical connection with another lead wire, and means in the housing connected to the element in insulated relation to the housing and establishing electrical connection with the bolt.

RALPH E. LAURENCE.