

C. E. MARSHALL.
PORTABLE VULCANIZER.
APPLICATION FILED APR. 17, 1912.

1,058,316.

Patented Apr. 8, 1913.

Fig. 1.

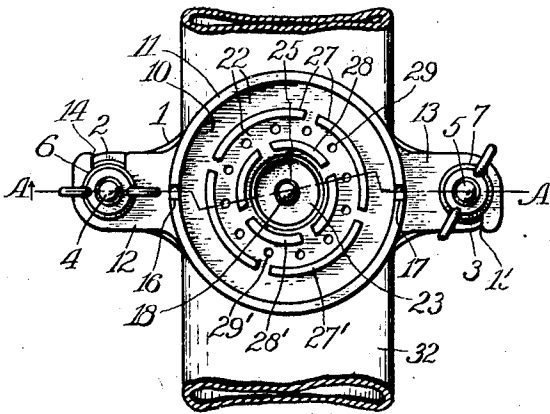


Fig. 2.

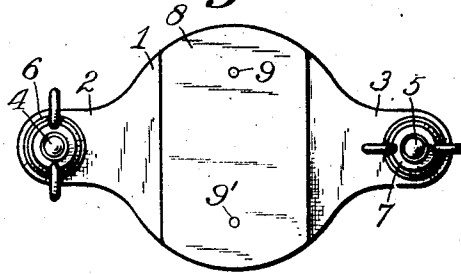


Fig. 3.

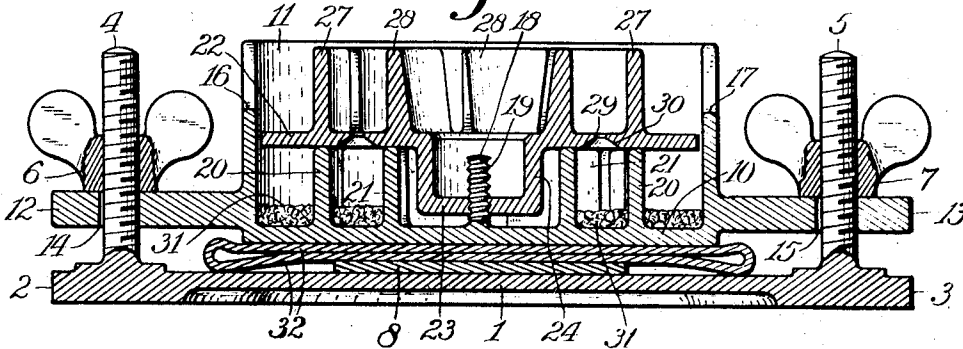


Fig. 4.

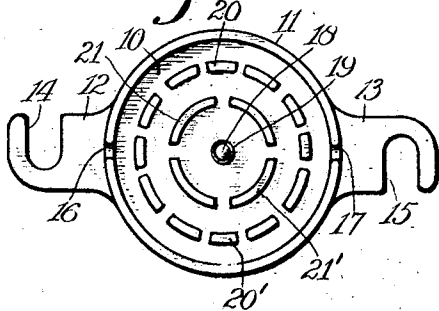
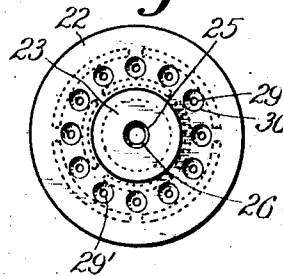


Fig. 5.



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UNITED STATES PATENT OFFICE.

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PORTABLE VULCANIZER.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES EDWIN MARSHALL, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Portable Vulcanizer, of which the following is a specification, reference being had to the accompanying drawings and to the letters and figures of reference marked thereon.

This invention relates to apparatus for vulcanizing rubber or rubber composition, especially in the operation of repairing fractured or damaged articles, such as punctured or slitted pneumatic tires or air tubes thereof, the invention having reference more particularly to a portable vulcanizer of the above mentioned character.

The object of the invention is to provide a safe and reliable vulcanizer for jobbing work and one especially adapted for use in emergency, in order to enable users of pneumatic tires to quickly repair punctures either in the garage or out on the road in emergency.

A further object is to provide a portable and simple vulcanizer that shall be so constructed as to be adapted to generate and burn gas and be cheaply manufactured, not liable to derangement when carried about in vehicles and which shall be durable, efficient and economical in use.

With the above mentioned and other objects in view, the invention consists in a gas generating and burning vulcanizer comprising a base or bed on which to place damaged articles, and a combined gas generator and burner adapted to cooperate with the base to hold the article in proper position to be acted on, the generator and burner constituting a heater for effecting the vulcanizing operation. The invention consists also in the novel parts and in the combinations and arrangements of parts as hereinafter particularly described and claimed.

Referring to the drawings, Figure 1, is a top plan of the vulcanizer and a portion of an air tube in position therein to be acted upon; Fig. 2, a top plan of the base of the vulcanizer; Fig. 3, a vertical section approximately on the planes of the line A A in Fig. 1; Fig. 4, a top plan of a part of the heater, and Fig. 5, an inverted plan of a part of the heater.

Similar reference characters in the different figures of the drawings indicate corre-

sponding elements or features of construction herein referred to.

A practical embodiment of the invention comprises a substantially flat base 1 having two integral arms 2 and 3 on opposite edge portions thereof, the arms being provided with upright screw-threaded studs 4 and 5 respectively, on which are securing nuts 6 and 7 respectively. The base 1 is metallic and has a heat-insulating plate 8 thereon formed of any suitable non-metallic substance such as wood, asbestos board or vulcanized fiber adapted to prevent the base from becoming undesirably heated during the vulcanizing operation. The plate 8 preferably is secured to the base 1 by suitable rivets 9 and 9'. The plate 8 is of suitable width so as to be somewhat narrower than the air tube to be mended when the latter is doubled or flattened together.

The heater or vulcanizing member comprises a flat plate 10 which is adapted to rest upon the article to be mended and hold it in flat condition on the base, and it constitutes also the bottom of a font to hold liquid fuel from which to generate fuel-gas, the plate 10 having a cylindrical side wall 11 thereon of suitable height, and two arms 12 and 13 are cast integrally with opposite portions of the plate and the wall that have slots 14 and 15 therein to receive the studs 4 and 5 respectively, the studs guiding the heater relative to the base and the arms are engaged by the nuts 6 and 7 for holding the heater in the desired position on the top of the article to be acted upon. Two opposite portions of the wall 11 have slots 16 and 17 therein extending from the top of the wall downward a suitable distance toward the plane of the plate 10. The middle portion of the plate 10 has a clamping stud 18 thereon provided with screw-threads 19, and the plate 10 preferably has also a suitable number of heat-conductors 20, 20', arranged thereon in a circle concentrically to the wall 11, the plate preferably having also another series of heat-conductors 21, 21', arranged in a circle also concentrically and somewhat closer to the stud than the first mentioned heat-conductors. The heat-conductors constitute also supporting posts upon which a burner plate 22 is placed within the wall 11, the plate 22 being so shaped as to form a pilot-burner comprising a bottom 23 and a side wall 24 cast integrally with the plate, the bottom having a hole 25 therein pro-

vided with screw-threads 26 and receiving the stud 18 which fills the hole and retains the plate 22 in proper position.

The pilot-burner constitutes a cup in which a relatively small quantity of liquid-fuel may be held while being burned. The plate 22 is approximately equal in diameter to the internal diameter of the wall 11 and the parts not being machined are rough faced and permit gas to escape between the plate and the wall. The arrangement is such that the bottom 23 of the pilot-burner is maintained somewhat above the plate 10 constituting the heater. The upper side of the burner plate 22 has a suitable number of curved barriers 27, 27', cast integrally and arranged at suitable distances apart in the circle somewhat less in diameter than the plate and concentric to the wall 11, the plate 22 having also another series of similar barriers 28, 28', thereon also arranged at suitable distances apart between the first mentioned barriers and the axis of the stud 18. The plate 22 has a suitable number of relatively small apertures 29 to form gas jets arranged in a circle between the barriers 27 and the barriers 28, the lower ends of the apertures having counter-bores 30.

The generator preferably is provided with a suitable absorbent or other substance 31 which is placed loosely upon the plate 10 in the spaces between the wall 11 and the barriers 27 and the barriers 28 for preventing over heating of the plate 10 and too rapid generation of gas with consequent waste of the fuel.

In practical use the article to be repaired, such as an air tube 32, is placed on the plate 8 of the base with the defective portion of the tube uppermost. The patch is properly prepared and placed on the upper side of the tube in the required position to close the aperture or slit, the patch being of well known composition. The heater is then placed upon the tube so that the heater plate 10 covers the patch, and the nuts 6 and 7 are screwed down on the arms 12 and 13 with only a sufficient pressure to hold the tube in flat condition. A suitable quantity of gasoline or other combustible liquid, such as kerosene oil or alcohol, is poured into the pilot-burner font, a sufficient quantity of the liquid being required to flow over the plate 22 and down through the holes 29 in the compartment below the burner-plate and partially fill the compartment. The liquid in the pilot-burner font is then ignited and while being consumed the heat is generated which is required to heat the plate 22 and the heat conductors supporting the plate and generate gas from the liquid in the compartment of the burner. The gas rising through the holes 29 and past the edge of the plate 22 becomes ignited and is mixed with air drawn in through the slots 16 and

17, the circulation being distributed over the plate 22 by the barriers thereon which prevent concentrated currents. The liquid fuel on the plate 10 becomes highly heated and boils but prevents the plate 10 from becoming dry-hot or sufficiently heated to injure the rubber. When the gas has become consumed it will be found that the tube has been perfectly vulcanized and the quality of rubber around the patch considerably improved.

Having thus described the invention, what is claimed as new is—

1. A vulcanizer including a supporting base having two studs thereon, nuts on the studs, a heater having a generator and burner thereon and provided with slotted arms guided by the studs and adjustably held by the nuts opposite the base, the generator and burner comprising a cylindrical wall on the heater having two slots in opposite portions of the top thereof, a burner plate secured within the wall inclosure at a distance from the heater and having a cup in the middle portion thereof, the top of the burner plate having a plurality of barriers thereon arranged in two circles concentrically to the wall and between the slots in the wall, the burner plate having also a plurality of apertures therein arranged in a circle between the two circles of the barriers, and heat-conductors extending from the burner plate to the heater.

2. In a vulcanizer, the combination with a supporting base, of a heater coöperating with the base and comprising a flat plate having a central screw-threaded stud and also a plurality of heat-conductors thereon, the plate having also a wall thereon surrounding the heat-conductors, and a burner plate seated upon the heat-conductors and having a cup-shaped middle portion extending toward the flat plate, the bottom of said cup-shaped portion being screwed onto said stud, said burner plate extending to opposite portions of said wall and having a plurality of apertures therein.

3. In a vulcanizer, the combination with a supporting base, of a heater coöperating with the base and comprising a flat plate having a plurality of heat-conductors thereon and a wall surrounding the heat-conductors, a burner plate secured upon the ends of the heat-conductors and extending to opposite portions of said wall, the burner plate having a plurality of barriers thereon arranged in two concentric circles and having also a plurality of apertures therein between the two circles of barriers, the middle portion of said burner plate being cup-shaped.

4. In a vulcanizing device, the combination with a receptacle adapted to contain a combustible liquid, the bottom of the receptacle constituting a vulcanizing member, of

a combined gas generator and burner comprising a plate having a cup-shaped middle portion and secured in the receptacle opposite to the bottom thereof for preventing access of gas flame to the liquid, the burner plate having barriers thereon and also apertures therein, the wall of the receptacle extending about the barriers and having openings in its upper portion.

5. In a vulcanizing device, the combination with a receptacle adapted to contain a combustible liquid, the bottom of the receptacle constituting a vulcanizing member, the wall of the receptacle having slots in its upper portion, of a burner plate fixedly secured in the receptacle in a plane between the bottom of the receptacle and the slots, the plate having apertures therein and having also barriers on the outer side thereof.

6. In a vulcanizing device, the combination of a vulcanizing plate having a screw-threaded stud centrally arranged thereon and having also a wall thereon extending about the stud, with a burner plate having a cup-shaped middle portion and arranged within the wall inclosure, the bottom of the cup-shaped portion being screwed onto said stud, said burner plate having a plurality of apertures therein arranged about said cup-shaped portion.

7. In a vulcanizing device, the combination of a base, an insulating plate on the base, a heater plate connected to the base and extending opposite to the insulating plate, the heater plate having a screw-threaded stud on

the middle portion thereof and having also a wall thereon concentric to the stud, the wall having slots in opposite portions thereof, a covering substance on the heater plate extending about the stud within the wall inclosure, and a burner plate arranged in the wall inclosure and having a cup-shaped middle portion screwed onto said stud, the burner plate extending approximately to all portions of the wall and having apertures therein and also barriers thereon.

8. In a vulcanizing device, the combination with a burner plate having a depressed middle portion and having also apertures arranged about the middle portion for the passage of gas, of a receptacle associated with the burner plate and constructed for retaining a combustible liquid about and adjacent to the depressed middle portion of the burner plate for generating gas from the liquid by heat radiated from the burner plate, and including a wall extending about the burner plate and provided with openings in opposite portions thereof for admitting outer air to the gas passing from the receptacle through the apertures, said receptacle including a plate adapted to be applied to the material to be vulcanized.

In testimony whereof, I affix my signature in presence of two witnesses.

CHAS. EDWIN MARSHALL.

Witnesses:

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