

E. A. L. ROBERTS.
Vulcanizing Apparatus.

No. 37,523.

Patented Jan. 27, 1863.

Fig 1

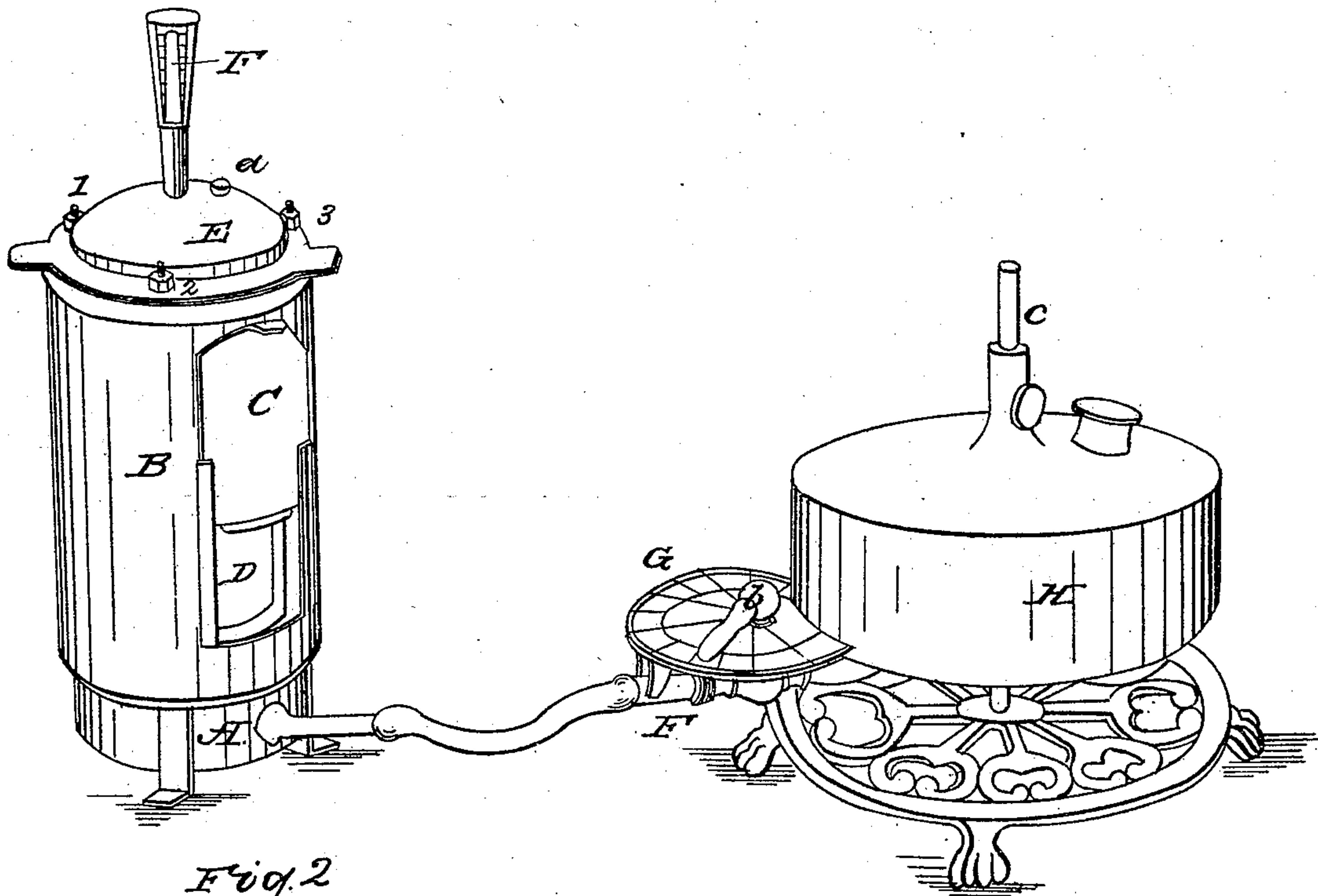


Fig 2

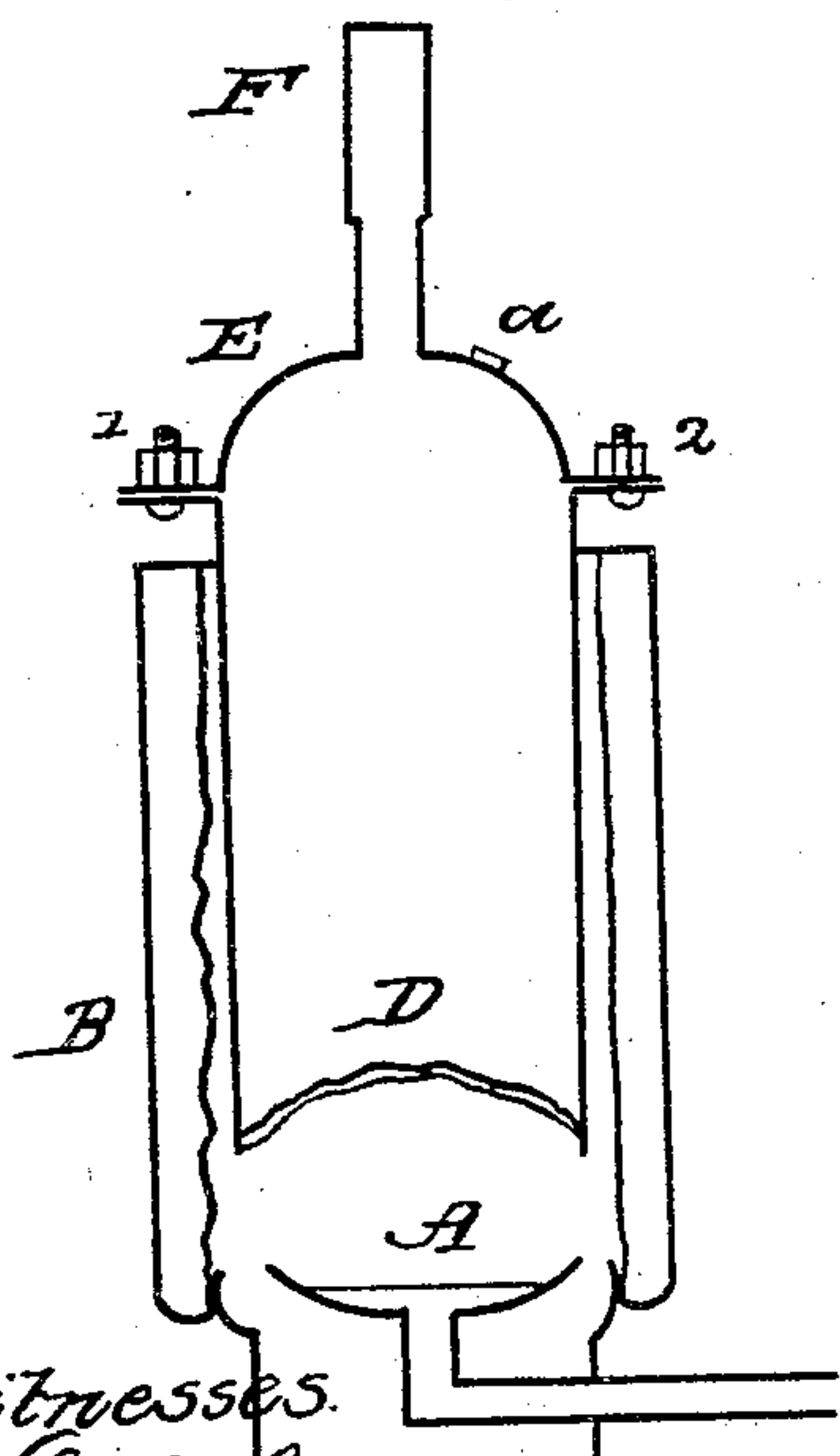
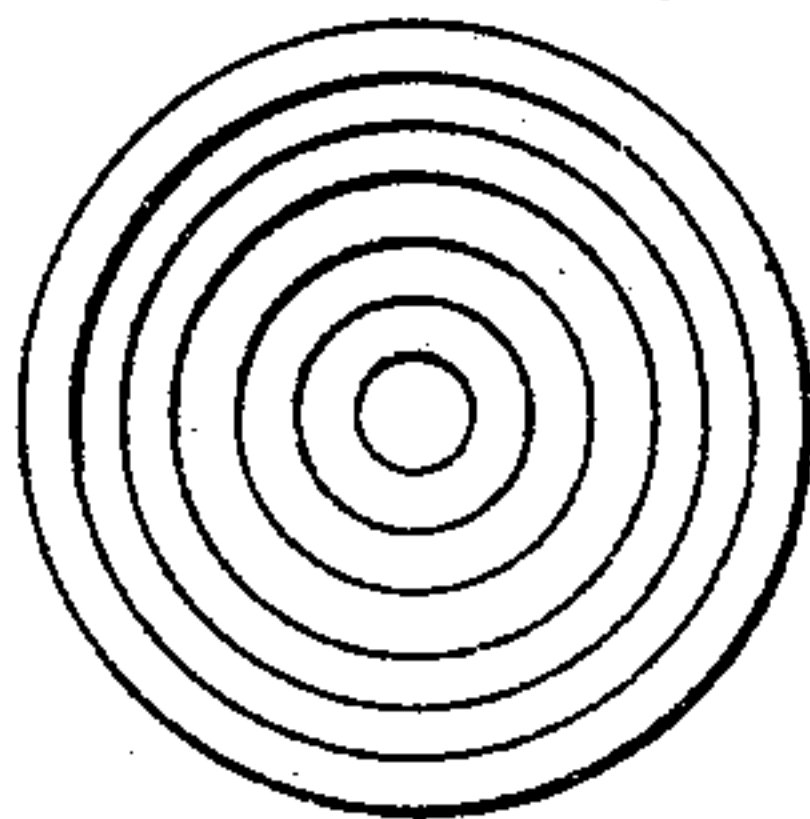


Fig 3



witnesses.
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UNITED STATES PATENT OFFICE.

EDWARD A. L. ROBERTS, OF NEW YORK, N. Y.

IMPROVED VULCANIZING-MACHINE.

Specification forming part of Letters Patent No. 37,523, dated January 27, 1863.

To all whom it may concern:

Be it known that I, EDWARD A. L. ROBERTS, of the city and State of New York, have invented a new and Improved Machine or Apparatus for Vulcanizing India-Rubber, Gutta-Percha, &c.; and I do hereby declare that the following is a full, clear, and exact description thereof, and of its construction and mode or manner of operation, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

Figure 1 is a general view of the machine and of the parts connected therewith. Fig. 2 is a sectional view of the machine or apparatus. Fig. 3 is a bottom view of the vulcanizer.

The nature of my invention or improvement consists in producing a vulcanizing apparatus which is compact in form and particularly adapted for dentists' uses, or when small articles are to be vulcanized, and by which the vulcanization can be produced or effected in the same chamber or vessel in which the water used for the vulcanization is contained, and by which the operation can be produced with a trifling expense for fuel, and the heat perfectly controlled and regulated as desired.

The lower part or stand, A, contains the burner, which is arranged like those used in ordinary gas-stoves; or it may be a wick when a lamp is used. Upon this rests a hollow cylinder, B, which should be lined with some non-conductor—plaster and asbestos are easily applied and will be lasting—so as to prevent the radiation or escape of the heat. In this may be placed a door, C, for the admission of cold air when necessary. Within this cylinder is placed the vulcanizer D, which is a hollow casting, or other metallic vessel, of a single piece, except as to the cover E, which is fitted to a flange upon the upper part of D, and to which it is firmly fastened by the screw-bolts 1 2 3. In order to make the joints between the two steam-tight, a ring of vulcanized rubber or other packing is inserted between them.

In the cover E is fixed a thermometer, F, to indicate the temperature of the steam within the vulcanizer, which is made strong enough to bear at least double the pressure required to effect the process of vulcanizing.

In order, however, to guard against danger or accident, there is inserted in the cover E a fusible plug, *a*, which fuses at a temperature considerably less than the vulcanizer will sustain, but not at any temperature required for vulcanizing; or a fusible metallic packing may be substituted for such fusible plug. Such fusible plug or packing may be made of equal parts of tin and lead, which melts at about 400°, or it may be made of two parts of tin and one of lead, which will melt at about 360°, either of which is higher than the temperature necessary for vulcanization. The component parts or particular proportions of such alloy may, however, be varied, as it can be made of different metals and these mixed in different proportions, it being only necessary that it should be capable of readily sustaining a temperature (about 300°) proper for vulcanization, but melt from 50° to 100° above that point.

The advantage secured by the use of a fusible plug instead of a safety-valve is this, that in order to secure perfect and effectual vulcanization it is desirable that the vessel in which the vulcanization is being performed should be perfectly steam tight. This end it is very difficult to attain by the use of an ordinary safety-valve, while it is easy to so fit a fusible plug or packing that it shall be entirely steam-tight, and at the same time afford all the protection of the safety-valve. The action of the machine in effecting vulcanization is not, however, in any way dependent upon or affected by the presence or absence of either the fusible plug or packing, these being added merely for the greater safety of the operation.

The bottom of the vulcanizer may also be corrugated, as shown in Fig. 3, so as to give an increased surface to be exposed to the heat and quicken the whole operation of vulcanization.

The vulcanizer D and E fits within the hollow cylinder B, but not so tightly but that the hot air and products of combustion can escape, and it can readily be removed when the operation is completed. It can then be placed in cold water, to be cooled more rapidly, if desired, and the charge removed.

To the gas-tube F' or feeder from the lamp, when a lamp, H, is used, (and a spirit or other lamp will be sufficient where gas is not used,)

is attached a graduated plate or disk, G, over which moves the cock-lever *b*, or an index-hand, to measure the quantity of gas or spirits burned.

When the vulcanizer is first placed over the burner, a full flow of gas or spirits may be used, so as to raise quickly the heat to the required temperature, after which only such a supply will be required as will preserve the temperature uniform, and the exact quantity necessary for such purpose can be determined by the position of the lever or index *b* upon the graduated disk G. This arrangement thus affords a convenient and certain way of keeping the temperature at the required point, which is highly desirable for perfect vulcanization, and of certainly regulating the supply of gas or spirits for such purpose. If a spirit-lamp, H, is used, the flow of the liquid may be further controlled by making the lamp movable upon a standard, *c*, so that by raising or lowering the lamp H the flow will be more or less rapid. This arrangement for controlling the supply or flow of gas or spirits is not intended to be claimed in the present application.

The water for the generation of the steam is put directly in the vulcanizer D, in which are put supports of any kind to sustain the article to be vulcanized. The cover E being tight, and no steam escaping, the water in the vulcanizer is prevented, in a great degree, from having such agitation as is usually the case when boiled, and does not therefore come in immediate contact with the article to be vulcanized.

In vulcanizing-machines as heretofore constructed the vulcanization has been effected by high heat, generally produced by steam, and in vessels or chambers not in contact or immediate connection with the boiler where the water is; or, if the two vessels containing the water and the thing to be vulcanized have been in contact, there have been used, as in the patent of Roberts and Demorest of May 10, 1859, diaphragms or plates or disks to separate the water from the vulcanizing-chamber and prevent it (the water) from reaching the article being vulcanized. All such devices are, however, rendered unnecessary by this inven-

tion, and the same chamber which contains the water holds also the thing being vulcanized.

For very many uses—as for vulcanizing bases for artificial teeth and like operations—it is very desirable to have a machine which will accomplish the vulcanization with the smallest quantity of water and with the least consumption of fuel, and which can be used without causing any unpleasant odor.

With the above-described machine two vulcanite bases can be produced in about three hours with the use of less than half a pint of water, and without consuming as much gas as is delivered from an ordinary burner, or with less than half a pint of alcohol, and without any odor or smell whatever. The vulcanizers are generally made of a size just about sufficient to hold two pieces or bases, but may be made to hold four or more, as desired.

The construction of this vulcanizer is such, from its being perfectly tight, and from the substitution of the fusible plug, which cannot leak, in place of the safety-valve, that the operation of vulcanization is performed with the smallest possible space of water and steam chamber, and with the smallest quantity of water and least consumption of gas, spirits, &c.

I am aware that fusible plugs have been applied in steam-boilers and some other apparatuses. I therefore do not claim, broadly, a plug of fusible metal, nor do I claim any combination of metals for the purpose of forming such a plug.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The construction and arrangement of the vulcanizer, substantially as described, whereby the process of vulcanization is carried on and effected in the same vessel or chamber in which the water is contained.

2. A fusible plug or disk, in combination with a vulcanizer-chamber, substantially as and for the purpose set forth and described.

E. A. L. ROBERTS.

Witnesses

S. D. LAW,

J. C. WILSON.