I. E. McELROY & L. RISK.

VULCANIZER.

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1,301,721. Patented Apr. 22, 1919.

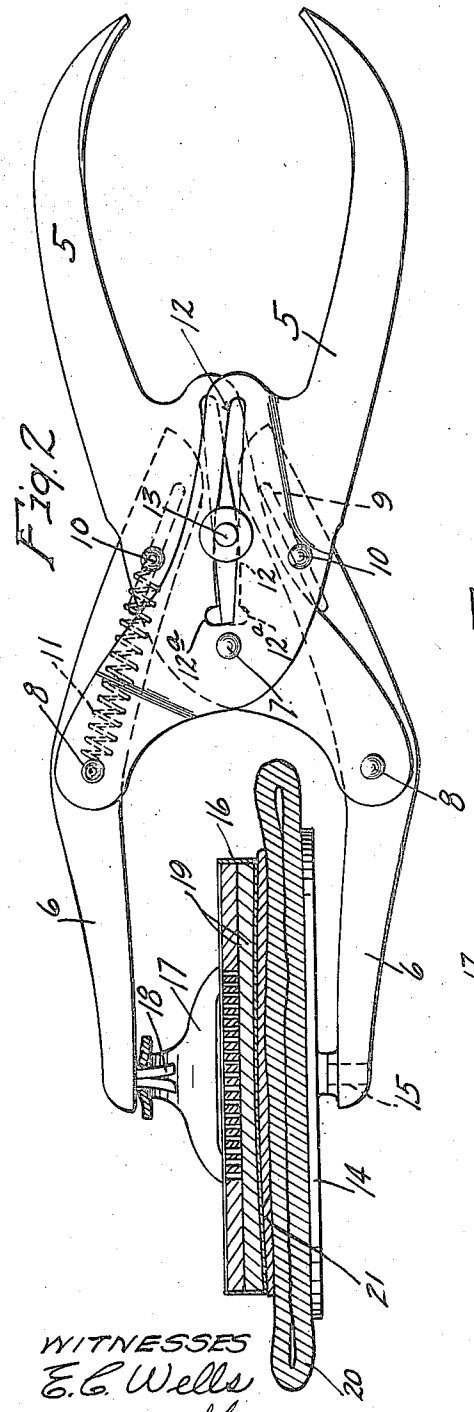


Fig. 2

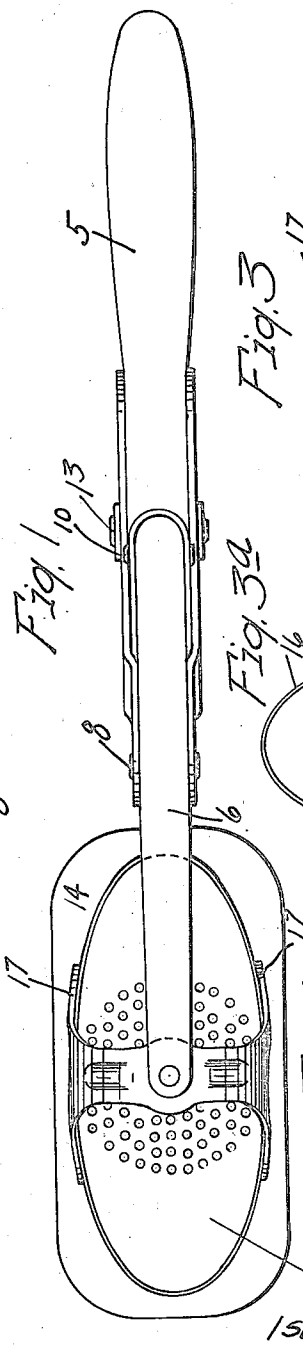


Fig. 1

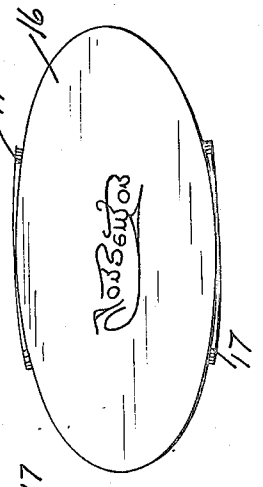


Fig. 3

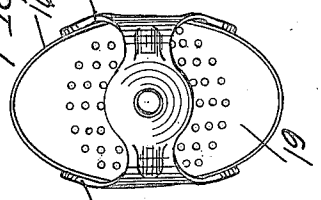


Fig. 3a

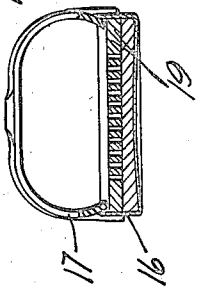


Fig. 4

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UNITED STATES PATENT OFFICE.

ISAAC E. McELROY AND LOREN RISK, OF MINNEAPOLIS, MINNESOTA; SAID McELROY ASSIGNOR OF HIS RIGHT TO CHARLES H. ROGERS, OF ST. PAUL, MINNESOTA.

VULCANIZER.

1,301,721. Specification of Letters Patent. Patented Apr. 22, 1919.

Application filed April 14, 1917. Serial No. 161,964.

To all whom it may concern:

Be it known that we, ISAAC E. McELROY and LOREN RISK, citizens of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Vulcanizers; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention has for its object to provide an extremely simple and highly efficient vulcanizing tool; and to such ends, generally stated, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

The tool is in the form of a pair of pliers, one of the jaws thereof being equipped with a platen or anvil plate, and the other with a coöperating clamping member in the form of a fuel pan.

Preferably, the plier is made up of a pair of compound levers and the coöperating clamping members, to wit, the platen and the fuel pan, are elongated structures pivotally connected to the coöperating levers.

The levers are combined with a lock of novel construction, whereby the levers, and hence the coöperating clamping members, may be locked in infinitesimally different positions anywhere between extreme closed to extreme open position. The invention also involves certain other minor, but important features, as will hereinafter appear.

The invention is illustrated in the accompanying drawings wherein like characters indicate like parts throughout the several views. Referring to the drawings,

Figure 1 is a plan view of the complete vulcanizing device;

Fig. 2 is a side elevation thereof, with some parts broken away and some parts sectioned and showing an inner tube and vulcanizing patch clamped between the platen and the bottom of the fuel pan;

Fig. 3 is a bottom view of the fuel pan;

Fig. 3ª is a plan view showing a fuel pan that is smaller than that shown in Fig. 3 and other views; and

Fig. 4 is a section through the fuel pan of Fig. 1.

In the preferred form of the device illustrated, the pliers are, as indicated, made up of a pair of compound levers. These compound levers comprise primary levers 5 and secondary levers 6. The primary levers 5 form the handles of the pliers and both have pronged laterally spaced end portions, the prongs to the one being extended between the prongs of the other and pivotally connected thereto at 7. The laterally spaced front ends of the primary levers 5 are pivoted at 8 to the intermediate portions of the secondary levers 6 and the rear end portions of the said secondary levers are provided with longitudinal, cam-acting slots 9 that are engaged by cam-acting pins 10 extended therethrough and through the laterally spaced sides of the primary levers and riveted, or otherwise, rigidly secured to the latter. This form of compound lever plier is not new, *per se*, but in our invention, it is combined with certain highly important novel features, one of these features being a lock mechanism presently to be described.

The front ends of the secondary levers and the handle ends of the primary levers are yieldingly opened or forced apart by a suitable spring which, as shown, is a coupled spring 11 anchored to one of the pivot pins, and to the cam pin 10 that is on the same side of the plier.

The overlapping laterally spaced sides of the primary levers 5 are formed with lock slots 12, which, when the plier is opened, converge rearwardly from a point immediately at the rear of the main pivot 7. At their front extremities, the slots 12 are formed with laterally projected notches 12ª for a purpose which will presently appear. Here, also, it should be noted that the inner side edges of the two slots 12 are not straight, but, on the contrary, are inwardly bowed or curved and that the bow or concavity is the greatest in approximately the front half portions thereof. This is also highly important, as will presently appear.

Extending through the slots 12 and cooperating with the diverging bowed edge surface thereof, is a lock pin 13 that is loosely seated, but is provided with sides which hold it in working position while free to travel in the said slots. The operation of this lock will be hereinafter described.

As already stated, one of the coöperating

clamping members is in the form of a plate-like anvil, and the other in the form of a fuel pan. This plate-like anvil 14 is an elongated plate, preferably having slightly rounded ends and provided with a depending central stud or trunnion 15 that is detachably and pivotally seated in the end of one of the secondary levers 6.

The fuel pan 16 is preferably an oval pan-like structure of slightly less lateral and longitudinal dimension than the anvil plate. This fuel pan has an arch bar 17 secured to the sides of the upturned flanges thereof, and extended across the minor axis of the said pan. At the center of its crown, the arch bar 17 has a perforation that is adapted to be engaged with a split pin 18, one end of which is welded, formed in, or otherwise rigidly secured to the end of the coöperating secondary lever 6. The split end of the pin 18 is slightly tapered and its prongs are slightly bent apart or expanded, so that the normal spring therein, will keep the arch bar, and hence, the fuel pan, from falling off from the said pin, but free for rotation therewith. Also, of course, it enables the fuel pan to be easily applied to, or removed from the said pin, simply by overcoming the spring tension of the said pin. This is not only cheap construction, but good construction from every point of view, inasmuch as it is strong and durable and requires no adjustments of the parts.

The bottom of the fuel pan is preferably made slightly concave, so as to form a convex back surface on an ordinary vulcanizable material. Also, as an important feature, the bottom of the fuel pan is formed with letters or character dies, or impressions in reverse, so that they will produce characters on the back of the patch applied to the tool. These letters or characters may be used to produce a trade mark, for example.

Particularly, the fuel pan is designed to contain a vulcanizing fuel, such as that disclosed and claimed in the Risk Patent No. 1,209,206, of date, December 19, 1916; but may, of course, be used for containing other types of combustible elements.

In the drawings, a solid combustible element or fuel such as that disclosed and claimed in the said Risk patent, is indicated, as an entirety, by the numeral 19 (see Fig. 4). In Fig. 2, the numeral 20 indicates the inner tube of a tire, and the numeral 21 indicates a vulcanizing patch which is being applied thereto, by the use of the improved vulcanizing device.

Obviously, in view of the pivotal mounting of the anvil plate and fuel pan, they may be set with their major axis or longest dimensions either transversely, or longitudinally of the tube to which the patch is to be applied, depending, of course, on the character of the puncture or cut which is to be vulcanized. This adjustment is therefore important. The so-called anvil plate is made readily detachable, so that the tool may be packed in small space for shipment and so that when desired, anvil plates of different size may be substituted, one for the other. Fuel pans of different sizes may also be quickly and easily applied, and, as indicated, when applied, will not accidentally drop from working position.

The lock feature, which is highly important, will, as above briefly noted, lock the pliers, and hence, the clamping members in any and all adjustments, that is, in infinitesimally different adjustments within the range of extreme closed and extreme open positions. To cause the locking of the pliers, and hence, of the clamping members, the lock pin 13 is simply moved outward or toward the handle end of the pliers, and is wedged and frictionally locked between the diverging edge surfaces of the slots 12. Experience has shown that where these edges of the slots 12 are made straight, it is nearly or quite impossible to obtain a good locking action, but that where the clamping edges of the said slots are curved, substantially as shown in Fig. 2, this locking action is made perfect.

When the tool is held with the handle end slightly downward, the lock pin will automatically assume its locking position, but where the handle ends of the pliers are slightly elevated, or truly horizontal, the lock pin must be moved into locking position. The frictional clamping biting action of the slightly diverging edges of the slots 12 on the said lock pin, will hold the same where set, but it is a very easy matter to release said lock pin, simply by first slightly pressing the handle ends of the pliers together, and then moving said lock pin forward. When the lock pin is in the notch 12^a, it will be held against accidental movement into locking position, and moreover, these notches allow extreme open movements of the free ends of the secondary levers 6.

The arrangement of the arch bar and fuel pan is also important. It is preferably extended across the minor axis of the pan, or across its narrowest dimension, for, in this way, maximum strength is obtained, and a minimum of material is used in the said arch bar. By applying the said arch bar to the sides of the pan, at opposite points, it is made an easy matter to insert the fuel 19 into the same.

The operativeness and practicability of this vulcanizing device has been demonstrated by extensive commercial use thereof.

What we claim is:

1. A vulcanizing device comprising a pair of pliers, an anvil plate attached to one of the levers thereof, the coöperating lever of said pliers having a split pin with normally

expanded end, for detachable engagement with the perforated bar of a fuel pan, or the like.

2. A vulcanizing device comprising a pair of pliers, an anvil plate attached to one of the levers thereof, a coöperating lever of said pliers having a split pin with normally expanded end, and a fuel pan having an arch bar formed with a perforation through which the said split pin is inserted, the said split pin supporting said fuel pan for rotary and leveling adjustments and making the same readily attachable and detachable.

3. A vulcanizing device comprising a pair of pliers having clamping elements applied to the jaw ends of the levers thereof, certain of the coöperating levers of said pliers having diverging lock surfaces, and a lock element arranged to movably engage said diverging lock surfaces and operative to lock said pliers in infinitesimally different positions varying from open to closed positions.

4. A vulcanizing device comprising a pair of pliers having clamping elements applied to the jaw ends of certain of the levers thereof, certain of the levers of said pliers having slots with diverging clamping edges, and a lock pin working in said slots and arranged to be clamped between the diverging clamping edges thereof, in infinitesimally different positions varying from open to closed positions.

5. A vulcanizing device comprising a pair of pliers having clamping elements applied to the jaw ends of certain of the levers thereof, certain of the levers of said pliers having slots with diverging clamping edges, and a lock pin working in said slots and arranged to be clamped between the diverging clamping edges thereof, in infinitesimally different positions, varying from open to closed positions, the clamping edges of said slots being reversely curved to maintain the biting action thereof on said lock pin.

6. A vulcanizing device comprising a pair of pliers having clamping elements applied to the jaw ends of certain of the levers thereof, certain of the levers of said pliers having slots with diverging clamping edges, and a lock pin working in said slots and arranged to be clamped between the diverging clamping edges thereof, in any position from open to closed, retaining all clamping pressure upon differing thicknesses of material, varying from open to closed positions.

7. A vulcanizing device comprising a pair of pliers having clamping elements applied to the jaw ends of certain of the levers thereof, certain of the levers of said pliers having slots with diverging clamping edges, and a lock pin working in said slots and arranged to be clamped between the diverging clamping edges thereof, in any position from open to closed, retaining all clamping pressure upon differing thicknesses of material, varying from open to closed positions, the said slots, at their inner extremities, having reversely offset positions to receive said lock pin in the extreme open position of the levers of said pliers.

8. A vulcanizing device comprising a pair of pliers having clamping elements applied to the jaw ends of certain of the levers thereof, certain of the levers of said pliers having slots with diverging clamping edges, and a lock pin working in said slots and arranged to be clamped between the diverging clamping edges thereof, in infinitesimally different positions varying from extreme open to extreme closed positions, the clamping edges of said slots being reversely curved to maintain the biting action thereof on said lock pin, the said slots, at their inner extremities, having reversely offset positions to receive said lock pin in the extreme open position of the levers of said pliers.

In testimony whereof we affix our signatures in presence of two witnesses.

ISAAC E. McELROY.
LOREN RISK.

Witnesses:
BERNICE G. WHEELER,
HARRY D. KILGORE.