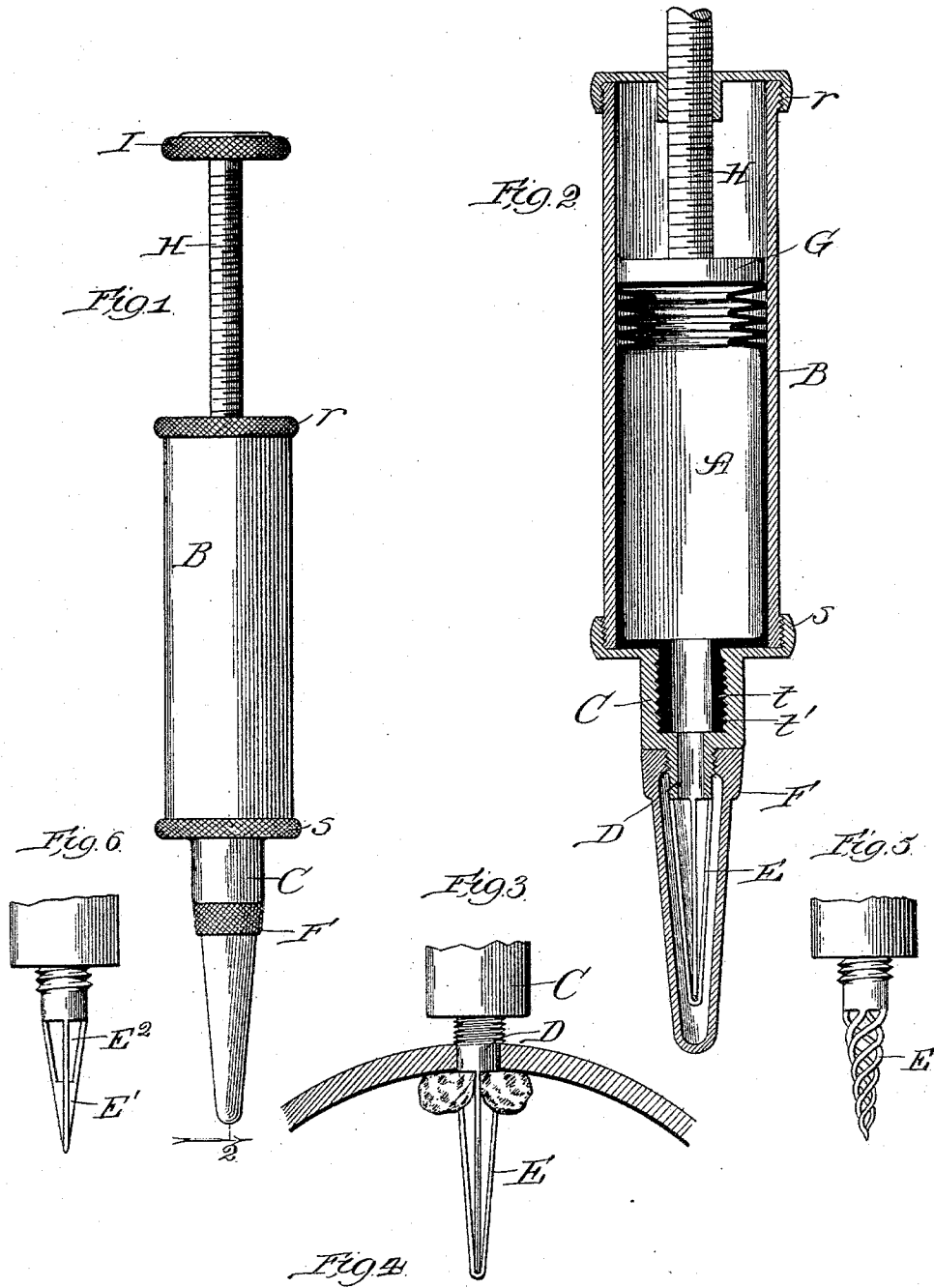


(No Model.)

J. F. PALMER.
REPAIR DEVICE FOR PNEUMATIC TIRES.

No. 603,045.

Patented Apr. 26, 1898.



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UNITED STATES PATENT OFFICE.

JOHN FULLERTON PALMER, OF RIVERSIDE, ILLINOIS.

REPAIR DEVICE FOR PNEUMATIC TIRES.

SPECIFICATION forming part of Letters Patent No. 603,045, dated April 26, 1898.

Application filed March 19, 1897. Serial No. 628,319. (No model.)

To all whom it may concern:

Be it known that I, JOHN FULLERTON PALMER, a citizen of the United States, residing at Riverside, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Repair Devices for Pneumatic Tires, of which the following is a specification.

The object of my invention is to provide means whereby pneumatic tires when punctured may be readily and perfectly repaired, and is more particularly applicable to the repair of so-called "single-tube" pneumatic tires.

In the use of my invention a patch or repair-plug is ordinarily not necessary, and while such patch or repair-plug may be employed with my improvement, it is in no sense limited thereto, and no further specific reference to the use of such a patch or repair-plug will be made.

My invention is in the nature of a device particularly adapted for introducing into the interior of the tire, through the puncture therein, a quantity of fluid rubber, preferably in the form of a somewhat thick cement; and to this end it consists in a holder for the ordinary solution-tube having a nozzle or outlet presenting elongated openings, the nozzle being adapted to enter the puncture freely. The holder may be rigid and contain the flexible solution-tube, or it may be itself a flexible solution-tube provided with a nozzle-outlet, as described. Where the holder is rigid, I prefer to form it cylindrical and to provide it with a plunger operated by a screw, which serves to collapse the solution-tube and force the solution out of it as desired. The nozzle is conveniently covered with a tubular cap, and the device embodying my preferred construction thus becomes attractive, compact, easily operated, and permits the effecting of a repair to be accomplished without the disagreeable soiling of the fingers which results from the handling of the solution in the ordinary way.

My invention consists, further, in the preferred general and specific details of construction, all as herein more fully set forth.

In the drawings, Figure 1 is a view in elevation of a repair device involving my invention in its preferred form. Fig. 2 is a verti-

cal section taken on the line 2 of Fig. 1 and viewed in the direction of the arrow. Fig. 3 is a view, partly in section and partly in elevation, showing the method of effecting a repair by the use of my improved repair device. Fig. 4 is a section of a part of a tire, showing the repair effected; and Figs. 5 and 6 show modifications.

A represents a solution-tube provided, as usual, with a discharge-orifice *t*, externally screw-threaded, as indicated at *u*.

B represents a cylinder, one end of which is provided with a cap *r* and the other end by preference with the cap *s*. The cap *s* has an internally-threaded opening C, the externally-threaded tubular extension thereto, D, and the converging wires E, extending forward from the outlet extension D. This end of the cylinder B receives the cap F, which at one end is internally screw-threaded to fit the screw-threads on the extension D. At the opposite end the cylinder B receives a plunger G on the screw-threaded stem H, operated by a handle I, the stem H engaging screw-threads (not shown) in the cap *r*.

The purpose of the wires E is to afford a means for dividing the flow of solution from the solution-tube A, and the number of wires may be increased or diminished as desired. A further object of the wires, however, is to afford a means for expanding the puncture and holding it in an expanded position while the solution is being forced into the tire. Instead of wires any other form of perforated cap can be employed, it being especially desirable, however, that the apertures therein shall be elongated vertically or transversely, or both.

To effect a repair, the operation is as follows: The cap F being unscrewed, the point of the converging wires E is introduced into the puncture and pushed inward until the widest point in the wires engages and holds the lips of the cut apart. Turning the screw-threaded stem H forces the plunger G inward to collapse the flexible solution-tube A and force solution out of the same and through the longitudinal openings between the wires into the interior of the tire. The solution being thick, it forms beads on all sides of the inserted tool, while owing to its plasticity when the tool is withdrawn the beads run together

into a single bead or button, which soon hardens and forms a perfect closure. The method of injecting the solution permits some of the solution to be placed against the edges or lips of the cut and the withdrawal of the tube by a species of wiping action causing a deposit of a still further amount of solution on the edges of the cut with the result that these edges when they come together become closely adherent.

One advantage found in the use of the cylinder and plunger is that it permits solution to be introduced into a tire while the latter contains air under pressure. It is found that where the ordinary flexible tube is operated by hand this is difficult. At the same time it will be obvious that where the particular advantage of the plunger is not desired all the other advantages of my improved device may be obtained with the plunger and cylinder omitted.

In the modifications illustrated in Figs. 5 and 6 the same essential characteristics are found; but in the construction in Fig. 5 the wires E are bent to a spiral form, and it is intended that this nozzle shall be introduced into the tire by a twisting or screw action. It is removed ordinarily by a reverse action. This form is particularly desirable where, owing to the texture of the fabric used as the

strain-resisting envelop, the tire is so stiff that the introduction of the widening-nozzle by direct pressure presents difficulties. In the modification shown in Fig. 6 the wires E are omitted and in their place are tapering plates E', having the cut-away portion E² to provide an outlet for the solution. The tapering nozzle formed of the plates E' may be either of separate pieces joined together or of two pieces bent and joined at the apex or of a single piece cut or drawn to the proper configuration. The operation is the same as that described with relation to the construction shown in Figs. 2 and 3.

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

A repair device for pneumatic tires comprising a cylinder and a piston movable therein, a flexible solution-tube within the cylinder, an outlet for the solution having a tapering end, elongated longitudinal apertures in said tapering end, and a cap covering the tapering end and serving to inclose the solution-tube and its outlet entirely within the cylinder, substantially as described.

JOHN FULLERTON PALMER.

In presence of—

RICHARD SPENCER,
J. H. LEE.