

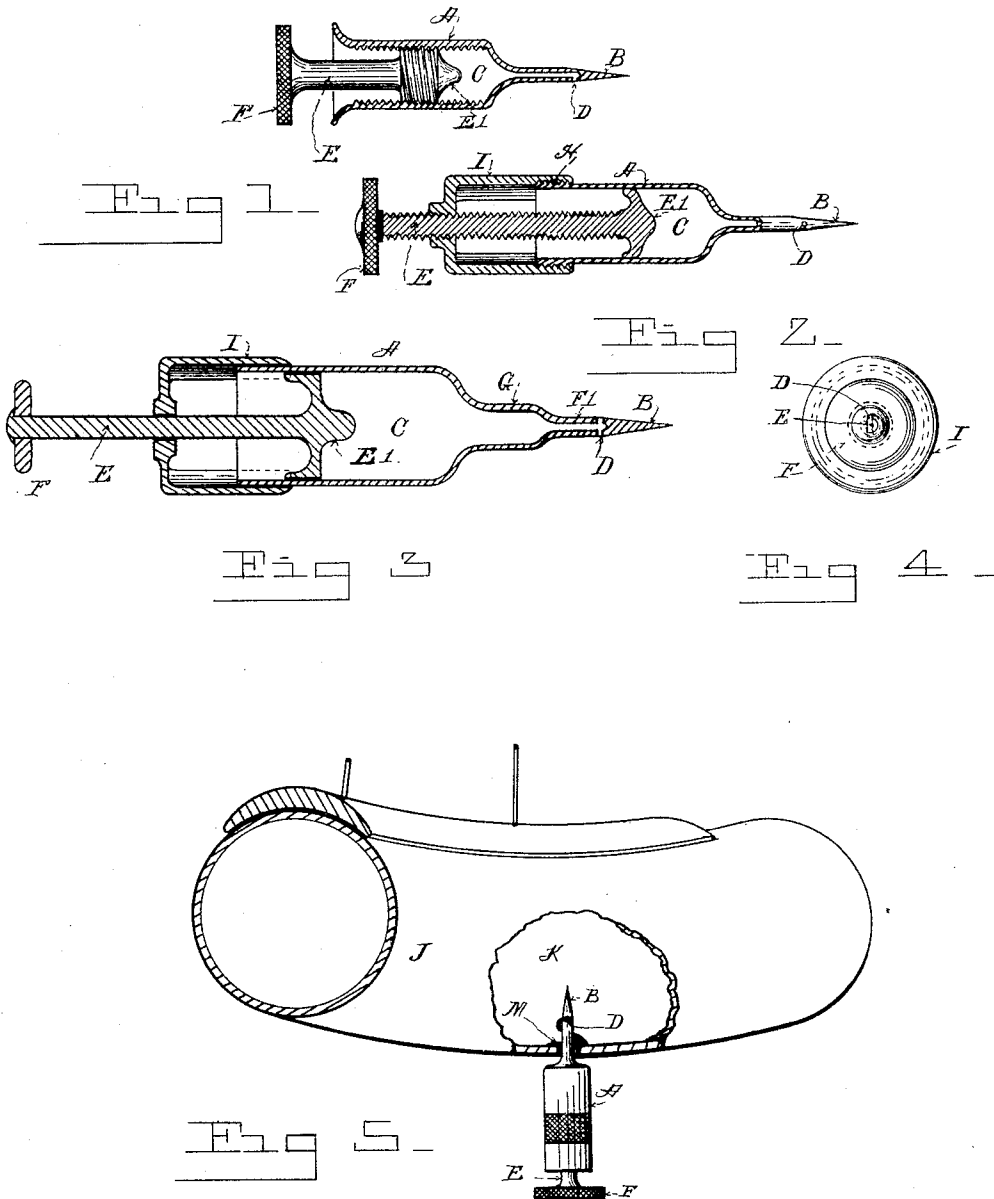
(No Model.)

C. F. WHITE.

NEEDLE FOR REPAIRING PUNCTURED BICYCLE TIRES WITH CEMENT.

No. 571,422.

Patented Nov. 17, 1896.



Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES FREDERICK WHITE, OF DENVER, COLORADO, ASSIGNOR OF ONE-THIRD TO ROBERT GERWING, OF SAME PLACE.

NEEDLE FOR REPAIRING PUNCTURED BICYCLE-TIRES WITH CEMENT.

SPECIFICATION forming part of Letters Patent No. 571,422, dated November 17, 1896.

Application filed March 24, 1896. Serial No. 584,655. (No model.)

To all whom it may concern:

Be it known that I, CHARLES FREDERICK WHITE, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Needles for Repairing Punctures in Tires with Cement; and I do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to an improved injecting-needle for repairing punctured bicycle-tires with cement, and especially that class of tires known as "single-tube" or "hose-pipe" tires; and the objects of my invention are, first, to provide a hollow needle having a solid point adapted to be inserted in the puncture in the tire and having an eye in its point connecting with the chamber in it; second, to provide means for ejecting a suitable quantity of suitable liquid cement through the needle while it is in position in the puncture of the tire; third, to provide means for distributing the cement concentrically around the needle and puncture before the needle is withdrawn from the puncture; fourth, to provide a hollow needle having a cement-ejecting plunger adapted to be reciprocated therein and which is arranged to permit introduction into the needle of the cement without separating the plunger from it. I attain these objects by the mechanism illustrated and described in the accompanying drawings and specification, in which—

Figure 1 represents a longitudinal section through the center of one form of my improved bicycle-tire needle and cement-injector. Fig. 2 represents a longitudinal section of another form of the same, drawn to a larger scale. Fig. 3 represents a sectional view of a third arrangement of the needle and its cement-ejector of still larger size. Fig. 4 represents an end view of Fig. 3. Fig. 5 represents a fragmentary view of a pneumatic tire, showing the application of my improved needle to a puncture.

Similar letters of reference refer to similar parts throughout the several views.

A designates the needle. It comprises, preferably, a cylindrical piece of metal with a sharp solid point B. Into the axial center of the needle I drill a hole which extends close to the end of the point and forms the cement-receiving chamber C. A small orifice D is drilled transversely through one side of the point into the chamber and makes a side outlet for the cement adjacent to the needle-point. In the form of needle shown in Fig. 1 I thread the chamber into the needle throughout its length.

E designates a plunger.

The piston E' is threaded to fit the chamber and the opposite end is formed into a head or finger disk F, the periphery of which is knurled to provide a frictional surface. I also knurl a portion of the body of the needle for the same purpose, as shown in Fig. 4. I flare the end of the needle outward at the end opposite its point in order to form a large entrance into its chamber for the cement.

In order to make a chamber in the needle large enough to hold sufficient cement to repair one or more small punctures, I make the body of the needle in two diameters for small needles, but for large needles I make two or more diameters adjacent to the point, as shown in Fig. 3, which allows any size puncture to be mended which a tire is liable to receive except a decided tear, the point and smallest diameter F' fitting all punctures up to the size of the smaller diameter of the needle, and the next diameter G all punctures as large as its diameter, while the cement-holding portion of the needle is still larger in diameter.

In the construction shown in Fig. 2 I cut a thread H on the outside of the needle at its end adjacent to the entrance into its cement-chamber, and on this threaded end I fit a cap I, which extends above it. This cap may be a circular cap of continuous metal adapted to be screwed off in order to fill the needle with cement, but I preferably make it with a diametrical opening through it from side to side large enough to allow the cement to be turned into the needle without removing the cap, which I screw on tight or solder. I pro-

vide the top of the cap with a centrally-threaded hole. The piston end of the plunger is adapted to fit snugly in the chamber of the needle, which is smoothly bored in this form of construction. I thread the stem of the plunger to fit the threaded hole in the cap, and on the outer end of the stem I secure a finger-disk which forms a head, knurling its periphery, as shown. This form of needle is far superior to that shown in Fig. 1, inasmuch as it is not necessary to detach any of the parts from one another, which obviates any danger of their getting separated and lost, in order to fill it with cement, as when the plunger is turned out against the cap there is room enough under it to introduce the cement through one of the open sides of the cap into the needle.

In Fig. 3 I illustrate a modification of the construction in Fig. 2. The needle is provided with a cap similar to Fig. 2; but the plunger is arranged to be reciprocated by direct movements in and out of its chamber.

In Fig. 5 I illustrate the application of the needle to the repairing of a puncture. J designates a fragment of a tire. At K a piece is cut out to disclose the interior of the tube. The needle is filled with cement before it is inserted in the puncture, or may be kept full of cement ready for use. It is necessary to inflate the tire under slight pressure to disclose the location of the puncture. Having found it, the point of the needle is inserted and pushed in far enough to introduce the eye of the needle inside of the tire. The plunger is then screwed into its chamber through its cap, which forces the cement out laterally through its eye. At the same time the needle is turned around in the puncture, which distributes the cement in the form of a thread concentrically around the needle and the puncture in a pyramidal mass that flows together. The needle is then withdrawn slowly, which, owing to the position of the eye below the point, allows the cement M to flow into the puncture and to completely cover it.

When using the construction of needle shown in Fig. 3, a less pressure will have to be employed to detect the puncture than where the plungers are threaded to the cap, when any pressure desired in the tubes may be employed to detect their location. I am aware that devices have been invented for introducing suitable liquid cement into the

punctures of bicycle-tubes and upon their inner side. Such devices, however, require for their manipulation the complete separation of their parts and the reversing of the plunger. By this separation of the parts they are liable to get lost, and the reversing of the cement-covered plunger brings the fingers or gloves in contact with the cement, which is extremely sticky and makes the repairing of a puncture a disagreeable task. The needle in such devices is also independent of the cement receptacle and its manipulation makes a tedious operation.

In view of the state of the art I do not claim the invention broadly; but

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

1. The combination in a needle for mending punctured tires with liquid cement of an instrument having a solid integral, tapering point, an eye or opening in or transversely through said point adjacent to its end, a cement-chamber in the needle communicating with said eye and adapted to hold the cement, a plunger having a piston fitted in said chamber, a cap detachably secured to said needle, a threaded hole through said cap, a threaded stem on said plunger adapted to the threaded cap, and a head or knurled disk on the stem of the plunger, as set forth.

2. The combination in a needle for mending punctured tires with liquid cement of an instrument having a solid point an eye in said point adjacent to its end, a chamber in the needle extending from its head to its eye, one or more steps of different diameters adjacent to said point and blending therefrom in increased diameter and in successive order adapted for various sizes of punctures, a plunger having a piston fitted to reciprocate in said chamber, a stem on said plunger, a head or knurled finger-disk on said stem, a cap secured to the head of said needle against displacement and arranged to extend above it, a diametrical opening through the side of said cap above the needle adapted for a cement-inlet to the chamber in the needle and a hole in said cap adapted to fit the stem of said plunger.

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

CHARLES FREDERICK WHITE.

Witnesses:

FREDERICK STANLEY WHITE,
SEYMOUR DOSS VAN METER.