

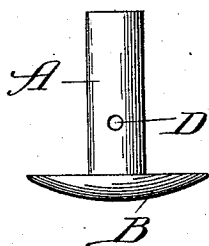
(No Model.)

D. W. COLHAPP.  
REPAIR PLUG FOR PNEUMATIC TIRES.

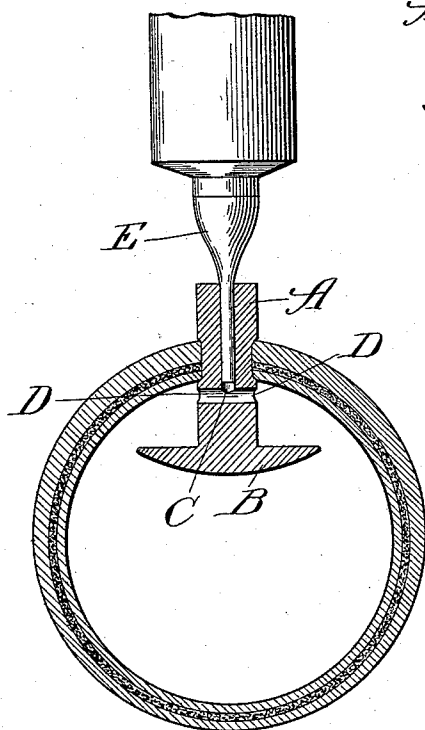
No. 571,108.

Patented Nov. 10, 1896.

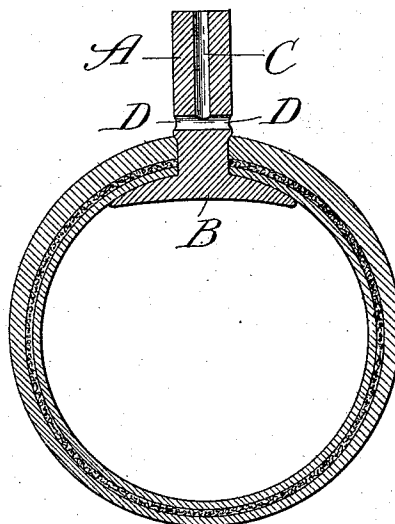
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



*Witnesses:*  
*Charles E. Chubbuck.*  
*John J. Allen.*

*Inventor:*  
*Daniel W. Colhapp,*  
*By Representative Depenput*  
*Att'y*

# UNITED STATES PATENT OFFICE.

DANIEL W. COLHAPP, OF CHICAGO, ILLINOIS.

## REPAIR-PLUG FOR PNEUMATIC TIRES.

SPECIFICATION forming part of Letters Patent No. 571,108, dated November 10, 1896.

Application filed August 7, 1896. Serial No. 601,971. (No model.)

*To all whom it may concern:*

Be it known that I, DANIEL W. COLHAPP, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Repair-Plugs for Pneumatic Tires, &c., of which the following is a specification.

My invention relates to an improvement in repair-plugs of the kind generally known as "mushroom" or "T-headed" plugs, and the purpose of the invention is to afford means for the more perfect adhesion of the plug to the tube in which it is inserted, more especially between the inner face of the head of said plug and the inner surface of the tube.

While my invention is more especially intended for use in connection with the repair of pneumatic tires, and particularly single-tube pneumatic tires, I do not limit myself to this use.

In the repair of single-tube pneumatic tires it is the common practice where the puncture is comparatively small to introduce through the puncture from without a T-headed or mushroom-shaped repair-plug, the plug being so introduced that the head thereof shall be within the bore of the tire, while the shank is held in the punctured wall thereof. For the introduction of such a plug various tools are in common use, and with my invention any tool adapted to introduce the plug into the tire may be employed.

My invention relates to the construction of the plug.

It is found that owing to the fact that the inner surface of the head of the plug is flat while the inner surface of the tire-tube is curved there is a tendency in the plug-head and tube-surface to separate under the vibration of the tube incident to its use as a bicycle-tire, and it is found that particularly where the original puncture was irregular the air is thus permitted to escape through the puncture notwithstanding the presence of the plug. With a view to remedying this objection it is common to cover the inner surface of the head of the plug as well as the shank thereof with rubber solution before introducing the plug into the tube; but this is not found always efficacious in entirely

preventing the escape of air, first, because the quantity of solution thus capable of employment is small, and partly because it becomes rubbed off in places while the plug is being introduced. It has also been suggested with a view to remedying this objection to introduce through the puncture after the plug has been placed in the tire-tube a small quantity of solution injected from a syringe, the plug being thereupon turned upon its own axis to cause an even spreading of the solution about the surface of the plug and tire; but this method is also found to fail in efficacy in many instances.

With a view particularly of overcoming the objections here noted I have contrived my present invention, which consists in constructing the plug with a central longitudinal passage having a lateral outlet through the shank at a point slightly removed from the head of the plug. One or more lateral openings may be provided affording a passage for solution from the end of the shank to the interior of the tire-tube while the plug is being put in place.

In the drawings, Figure 1 is a view in side elevation of a repair-plug constructed in accordance with my invention. Fig. 2 is a view, diagrammatic in its character, showing the mode of introducing solution after the plug has been introduced into the tire; and Fig. 3, a sectional view of a tire-tube, showing the plug in place for effecting a repair after the operation of introducing, solutioning, and setting has been effected.

The T-headed plug has the shank A and the head B. It is the practice to make these parts of one piece of rubber, the edges of the head being thin, while its center is thick. These plugs are of various sizes, adapting them to repair punctures of different dimensions. Extending centrally through the shank from its extremity to a point about as far from the head as will measure the thickness of the tire-wall is a passage C. From the inner end of this passage C extend laterally the passages D, one or more in number. It will thus be seen that the opening of the passages D is at a point sufficiently far removed from the head B of the plug to cause these passages to be at the outer surface of the tire-tube when the

plug, after being introduced, is drawn back and set in its intended final position.

The operation is as follows: The plug having been introduced into the tire-tube through the puncture in the common manner through the medium of any one of the tools in common use for this purpose, and while it is in the position with relation to the tire-tube illustrated in Fig. 2, the nozzle E of a common solution-syringe is introduced into the outer end of the passage C in the plug-shank and solution is forced into said passage, through which it passes to be expelled through the lateral passages D. On its expulsion it lies upon the surface of the shank and collects upon the head of the plug. The nozzle is then removed and the plug is drawn outward with the fingers until the inner face of the head of the plug comes into intimate contact with the inner wall of the tube. This operation of drawing outward the plug causes a uniform distribution of the solution between the surface of the plug-head and the wall of the tube, and this uniformity may be made more perfect, if necessary, by slightly turning the plug. When the plug is drawn out to the position indicated

in Fig. 3, it becomes set and the protruding part of the shank may then be cut off.

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

1. A repair-plug for pneumatic tires, &c., having a head and shank, the shank being provided with a duct for the passage of solution through the shank to the interior of the tube being repaired, substantially as described. 30

2. A repair-plug for pneumatic tires, &c., comprising the head B and shank A, said shank having the central passage C and lateral passage D, substantially as and for the purpose described. 35 40

3. The repair-plug for pneumatic tires, &c., comprising a head B and shank A, said shank having the central passage C terminating at a point distant from the head as described, and transverse passage D leading from the central passage to the exterior of the shank, all as set forth. 45

DANIEL W. COLHAPP.

Witnesses:

A. COLHAPP,  
R. PILKINGTON.