No. 609,901. Patented Aug. 30, 1898.

O. F. O'NEILL.

PNEUMATIC TIRE PLUG.

(Application filed Feb. 26, 1898.)

(No Model.)

Fig. 1

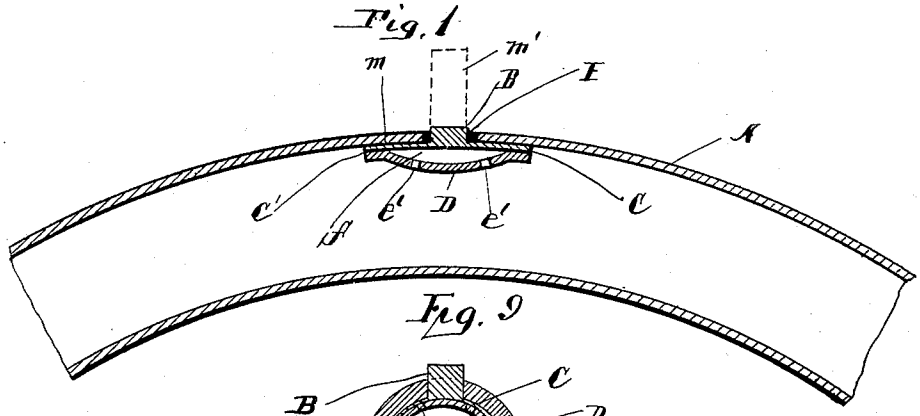


Fig. 9

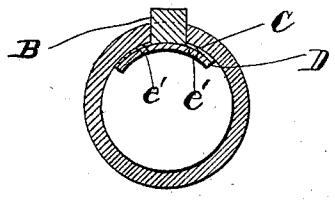


Fig. 2

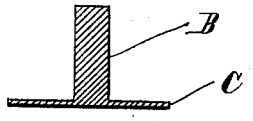


Fig. 3

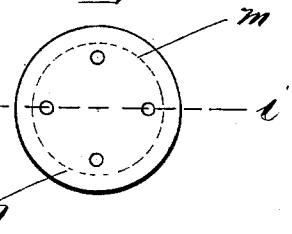


Fig. 4

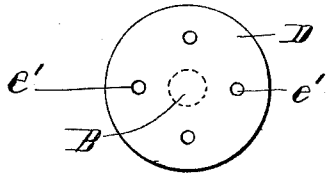


Fig. 5

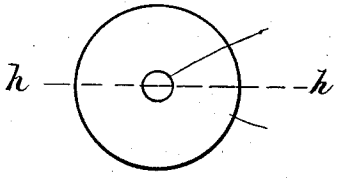


Fig. 6.

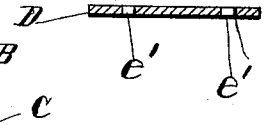


Fig. 7

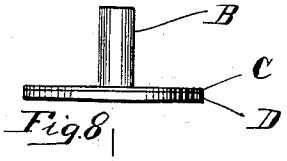
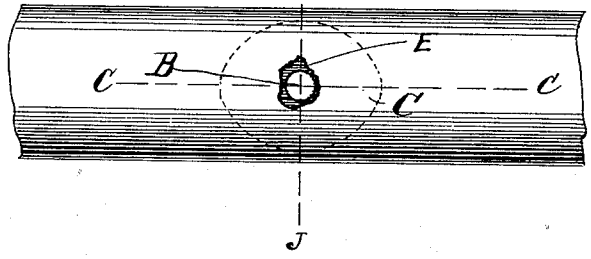


Fig. 8



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

OWEN F. O'NEILL, OF PHILADELPHIA, PENNSYLVANIA.

PNEUMATIC-TIRE PLUG.

SPECIFICATION forming part of Letters Patent No. 609,901, dated August 30, 1898.

Application filed February 26, 1898. Serial No. 671,856. (No model.)

To all whom it may concern:

Be it known that I, OWEN F. O'NEILL, a citizen of the United States of America, and a resident of the city and county of Philadelphia, Pennsylvania, have invented certain new and useful Improvements in Pneumatic-Tire Plugs, of which the following is a specification.

My invention has reference to plugs for pneumatic wheel-tires; and it consists of features fully set forth in the following specification and accompanying drawings, forming part thereof.

The object of my invention is to provide a plug for tires of the class described that will thoroughly and effectually repair any puncture they may by accident receive, and particularly punctures of large size.

It consists of a pneumatic plug formed from two parts, the one having a thin flexible rubber diaphragm or disk on which is integrally carried a laterally-projecting stem or plug. Fixed to this diaphragm by vulcanization or any effectual means is a second disk, heavier and more rigid in its structure. These two disks are only united in the manner described toward their respective circumferences, to be more particularly described hereinafter.

In the drawings like parts are referred to by marks of a corresponding kind in the different views.

Figure 1 is a vertical longitudinal section through a tire having a puncture therein repaired by my plug, being a section on line *c c* of Fig. 8. Fig. 2 is a vertical section through the plug-stem and its integral diaphragm, being a section on line *h h* of Fig. 5. Fig. 3 is a plan of my heavy disk. Fig. 4 is a bottom plan of my two disks united. Fig. 5 is a plan of my disk carrying the plug. Fig. 6 is a section on line *i i* of Fig. 3. Fig. 7 is a side elevation of my two disks united. Fig. 8 is a top plan of a wheel-tire, showing the puncture with my plug in position and indicating by dotted lines the position relatively to the disks. Fig. 9 is a transverse section through a tire, being a section through the line J of Fig. 8.

A is the tire. E represents a punctured hole therein, Figs. 1, 8, and 9.

B is a round stem carrying a thin flexible diaphragm or disk C. This disk and stem are preferably of rubber of pure quality, whereby the disk is rendered exceedingly flexible and can thus adapt itself to a broken and ragged edge. These parts can be made of many different sizes, and the comparative size shown in the drawings would be an extremely large size. D is also a disk made, preferably, of rubber, but of more body in cross-section, as shown in Fig. 6.

e' e' are a series of holes carried by the disk D. These holes are air-inlet passages and their function will be presently explained.

The disks D and C are firmly united at their circumferences by vulcanization or any effectual means. The dotted lines M in Figs. 1 and 3 indicate the inner circumference of the line of the vulcanization of the two said disks, making them or their contact-surfaces from M to the outer circumference substantially one solid integral mass. The inner centerward faces M^3 of the disks C and D are disconnected, as shown in Fig. 1 and indicated in Fig. 3.

C', Fig. 1 only, indicates a layer of cement intervening between the disk C and the inner face of the tire at the point of mend. This cement will of course extend partly up through the rupture. (Shown in Figs. 1, 9, and 8.)

Now it is a well-known fact that plugs for bicycle or other pneumatic tires where a stem is used having integral therewith a thick and rigid disk will not make an effectual and air-tight repair. This is because of the necessity of having this disk of strong and unyielding character, or rather that the necessity for strength makes such a demand for heavy body that it becomes thereby unyielding and will not adapt itself, therefore, to the irregularities of a broken edge or ragged section occasioned by the puncture. By reason of this inadaptation on the part of these former heavy disks if the cement failed (as it nearly always does) to thoroughly close all the minute air-outlets between the inner portion of the tire and the rupture the said rupture would leak. This is the defect which my invention overcomes. The disk C is thin, strong, but very flexible. This disk is cemented to the inner surface of the pneumatic tire. The disk D is more rigid and much heavier in body. The holes *e' e'* permit the air to pass therethrough and press upon the flexible disk C, whereby

and thereby this disk will adapt itself to inequalities of the edges of a puncture, and the pressure thus exerted will prevent the egress of the compressed air within the tire. The disk C therefore is the disk which, coacting with the cement, seals securely the rupture absolutely against leakage, and the disk D backs, strengthens, and reinforces disk C. In Fig. 1 I show the disks aforementioned as slightly separated and indicate the passage between them by *f*. This is to make clear the vulcanized union of the disks and the part that is not so united.

M′, Fig. 1, indicates that portion of the plug which is removed after same is set.

I do not confine myself to the specific structure set out, but could make modifications without departing from the spirit of my invention.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A plug for a pneumatic tire consisting of a plug, a thin flexible disk integral therewith, a secondary disk of heavier body, said latter disk having air-inlet holes and the two said disks being united by vulcanization or other means near their respective circumferences.

2. A plug for a pneumatic tire consisting of a stem or plug, a thin flexible integral plate carried thereby, a secondary plate heavier in body than said former plate, said latter plate having holes permitting air to pass therethrough, said two plates being united near their circumferences, whereby the said latter heavy plate relieves the former lighter one from undue tension thus strengthening the plug as a unit, and whereby the said lighter plug pneumatically assists in sealing the puncture.

Signed by me, at Philadelphia, this 4th day of February, 1898.

OWEN F. O'NEILL.

Witnesses:

HOMER A. HERR,

JOSHUA R. MORGAN.