

No. 647,643.

Patented Apr. 17, 1900.

E. M. BIRDSALL.
PNEUMATIC TIRE.

(Application filed Oct. 18, 1899.)

(No Model.)

Fig. 1.

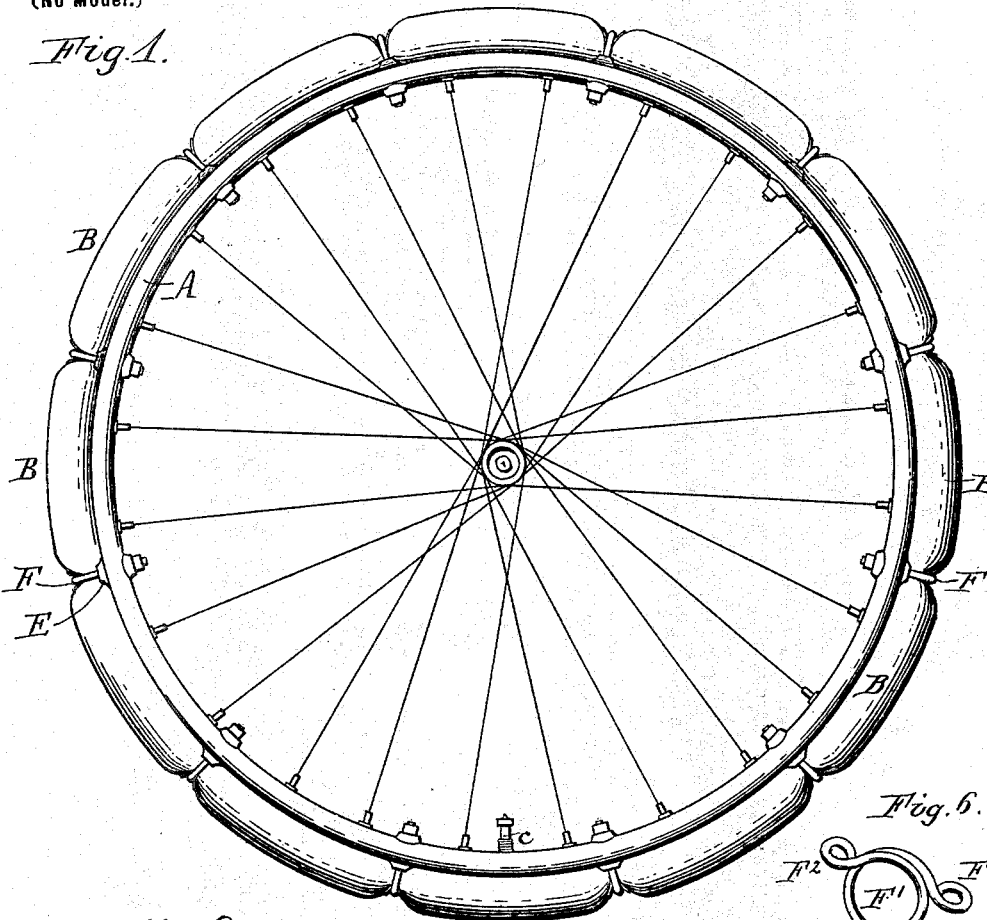


Fig. 6.



Fig. 2.

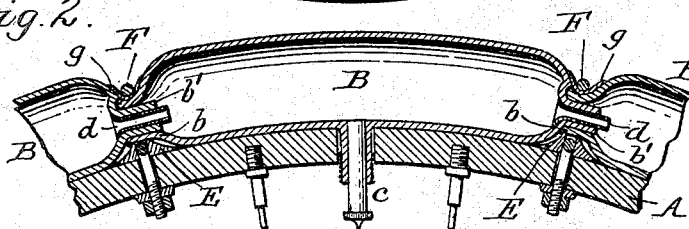


Fig. 3.

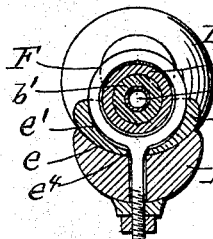


Fig. 4.

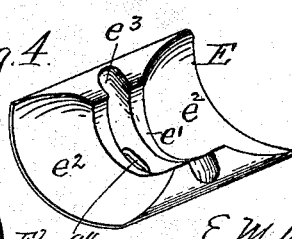
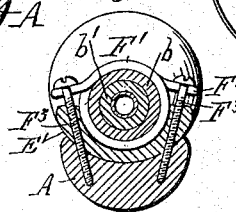


Fig. 5.



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PNEUMATIC TIRE.

SPECIFICATION forming part of Letters Patent No. 647,643, dated April 17, 1900.

Application filed October 18, 1899. Serial No. 733,983. (No model.)

To all whom it may concern:

Be it known that I, EDGAR M. BIRDSALL, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Pneumatic Tires, of which the following is a specification.

This invention relates to that class of pneumatic tires which are composed of communicating inflatable sections or chambers arranged end to end around the wheel-rim and forming a practically-continuous tire.

The objects of my invention are to firmly secure the sections to the wheel-rim and to provide reliable joints between the sections, which effectually prevent leakage and which at the same time permit one or more of the sections to be readily detached for conveniently repairing the same in case of a puncture or other damage or for substituting a new section for an unserviceable one.

In the accompanying drawings, Figure 1 is a side elevation of a bicycle-wheel provided with my improved tire. Fig. 2 is a fragmentary longitudinal section thereof on an enlarged scale. Fig. 3 is a cross-section of the same, taken through one of the eyebolts which clamp the telescopic ends of the sections together and secure the sections to the wheel-rim. Fig. 4 is a perspective view of one of the saddles in which the adjoining ends of the sections are seated. Fig. 5 is a cross-section of the tire, showing a modified construction of the clamping devices. Fig. 6 is a perspective view of one of said clamping devices.

Like letters of reference refer to like parts in the several figures.

A is the wheel-rim, provided in its face with the usual circumferential groove.

B represents the inflatable sections or separate chambers of the sectional tire seated end to end in the groove of the wheel-rim and projecting beyond the rim. These sections are arranged closely together and extend throughout the circumference of the wheel, and they are constructed of a suitable flexible or resilient material, preferably rubber, and are of such a length that they properly conform to the wheel-rim. The sections are bulb-like in form and cylindrical nearly throughout their length. The ends of the sections are reduced

to form projecting hollow necks or stems b b' , which communicate with the interior of the sections. The stems at opposite ends of the same section are of different diameters, and the large stem b of each section receives the small stem b' of the adjoining section, while its small stem fits into the large stem of the adjacent section, as shown in Fig. 2. By this construction all of the various sections are connected by hollow telescopic joints, so that upon forcing air into any one of the sections through an ordinary valve-stem c all of the sections are inflated. The inner or small stems b' of the sections are provided with an internal thimble or bushing d , of metal or other rigid material, which forms a rigid hollow core for the stems and prevents collapsing of the same.

E represents saddles or raised supports which are arranged between the grooved face of the wheel-rim and the inner side of the telescopic stems b b' , which connect adjoining sections of the tire and against which said stems are tightly clamped by radial clamping or eye bolts F, so as to form air-tight joints. Each of the saddles E is provided with a convex inner face e , which conforms to the grooved face of the wheel-rim, and with a concave outer face or seat e' , which is arranged transversely in the middle of the saddle and receives the inner half of the circumference of the adjoining joint. The portions of the saddle on opposite sides of the concave seat e' are concaved and tapered toward the ends of the saddle, as shown at e^2 , to conform to the rounded ends of the adjoining sections B. Each saddle is provided in its seat e' with a transverse groove or depression e^3 , which receives the inner half of the adjacent eyebolt F, and the saddle is formed in the center of said seat with a slot or opening e^4 , through which the body or shank of the bolt passes. The wheel-rim is provided with radial openings for the passage of the bolts F, which openings coincide with those of the saddles E. The nuts of these bolts bear against the inner face of the wheel-rim. The eyes of the bolts F embrace or encircle the outer stems b of the telescopic joints, and the radius of the groove in the concave seat e' of each saddle is somewhat greater than the radius of the eyebolt to permit of a limited

radial movement of the bolt in said groove, while the seat *e'* is concentric with the stems *b b'*, forming the telescopic joint, as shown in Fig. 2. Upon tightening the nuts of the eye-bolts their eyes are drawn farther into the grooves *e'* of the saddle, and the telescopic stems of the joint are clamped against the concave seat *e'* of the saddle. The stems are by this construction gripped or compressed between the seat *e'* which embraces the inner half-circle of the stems and the outer portion of the eyebolt which embraces the outer half-circle of the stems, thereby firmly clamping the stems against the internal rigid thimble throughout their circumference and producing a reliable non-leaking joint. The eyebolts, while tightly connecting the adjoining tire-sections, at the same time serve to secure the sections to the wheel-rim.

A metallic washer *g* is preferably interposed between the outer portion of each bolt-eye and the outer stem *b* of the joint to prevent cutting of this stem upon tightening the bolt.

In assembling the parts of the tire the thimbles *d* are first inserted in the small stems *b'* of the tire-sections and the eyebolts *F* are placed upon the large stems *b* of the sections. The sections are then assembled around the grooved wheel-rim and their stems telescoped, the saddles *E* are put in place, and the shanks of the eyebolts passed through the coinciding openings of the saddles and the wheel-rim, after which the nuts are applied to the bolts and the latter tightened.

In case a section of the tire becomes punctured or otherwise damaged the same can be readily removed for repairing it or replacing it with a new section by removing the two bolts which connect it with adjoining sections. Upon replacing the repaired section or substituting a new one for the same the tire is restored to its original condition, and either of these repairs can be made in a comparatively-short time and without the aid of skilled labor.

If desired, other clamping devices may be employed for drawing or forcing the telescopic stems of adjoining tire-sections into close contact with each other. For example, a contractible eye or coil *F'*, of wire, may be substituted for the eyebolt *F* of the first-described construction. This coil encircles the outer stem *b* of the telescopic joint which connects adjoining sections, and the ends or branches of the coil extend laterally in opposite directions and terminate in eyelets *F'*², which receive fastening-screws *F'*³. These screws pass through openings formed in the saddle *E'* on

opposite sides of the joint and enter the wheel-rim. The coil *F'* is seated in the transverse groove of the saddle. Upon tightening the screws *F'*³ the branches of the coil are drawn toward the wheel-rim and the coil is contracted, thereby pinching or compressing the telescopic stems of the joint and preventing leakage of air.

I claim as my invention—

1. The combination with a wheel-rim, of a pneumatic tire composed of inflatable sections arranged end to end around the face of the wheel-rim and having contracted end portions which are separably connected by hollow telescopic joints, and clamping devices attached to the wheel-rim and embracing the joints between the tire-sections, substantially as set forth.

2. The combination with a wheel-rim, of a pneumatic tire composed of inflatable sections arranged end to end around the face of the wheel-rim and separably connected by hollow telescopic joints, and clamping-eyes connected with the wheel-rim and embracing said joints, substantially as set forth.

3. The combination with a wheel-rim, of a pneumatic tire composed of inflatable sections arranged end to end around the face of the wheel-rim and separably connected by flexible telescopic joints, saddles resting against the grooved face of the wheel-rim opposite said joints and each provided with a concave seat which receives the inner side of the corresponding joint, and eyebolts which embrace the outer sides of said joints and which pass through said saddles and the wheel-rim, substantially as set forth.

4. The combination with a wheel-rim, of a pneumatic tire composed of inflatable sections arranged end to end around the face of the wheel-rim and separably connected by flexible telescopic joints, saddles resting against the grooved face of the wheel-rim opposite said joints and each having a concave transverse seat which is concentric with the adjacent joint and which is provided with a concave groove or depression of greater radius than the radius of the seat, and radial eyebolts which embrace the outer sides of said joints and clamp the inner sides thereof against the concave seat of said saddles and which pass through said saddles and the wheel-rim, substantially as set forth.

Witness my hand this 12th day of October, 1899.

EDGAR M. BIRDSALL.

Witnesses:

JNO. J. BONNER,

CLAUDIA M. BENTLEY.