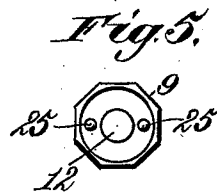
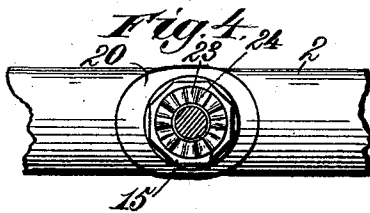
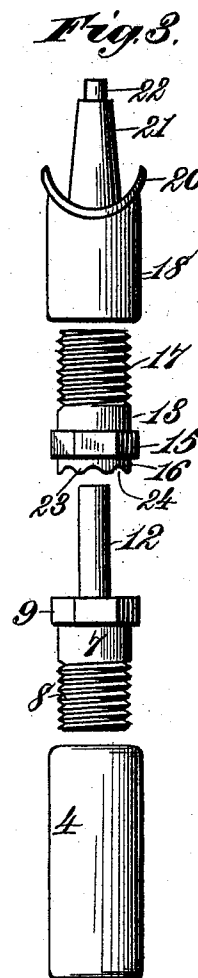
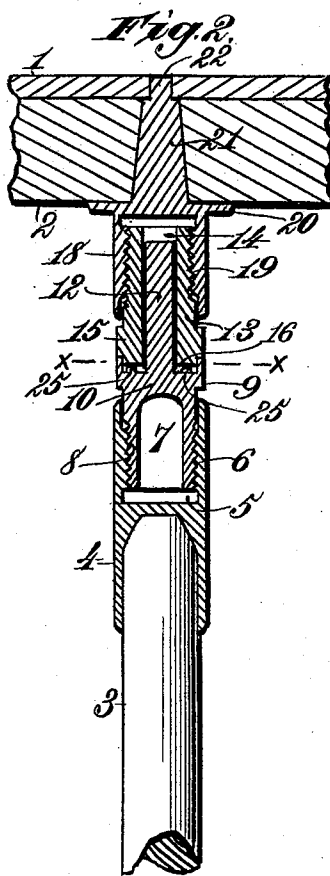
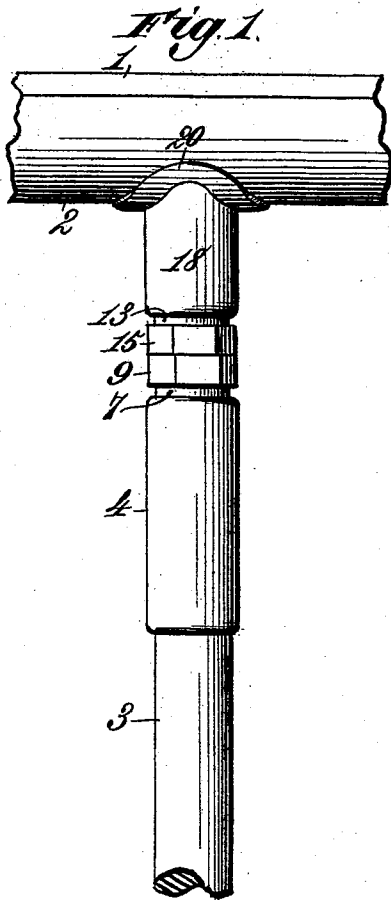


(No Model.)

J. A. ASHFORD.
TIRE TIGHTENER.

No. 498,756.

Patented June 6, 1893.



Witnesses,
Robert G. Smith.
William J. Parker.

Inventor,
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UNITED STATES PATENT OFFICE.

JAMES A. ASHFORD, OF MEMPHIS, TENNESSEE.

TIRE-TIGHTENER.

SPECIFICATION forming part of Letters Patent No. 498,756, dated June 6, 1893.

Application filed September 29, 1892. Serial No. 447,249. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. ASHFORD, a citizen of the United States, residing at Memphis, in the county of Shelby and State of Tennessee, have invented new and useful Improvements in Tire-Expanding Spoke Connections for Wheels, of which the following is a specification.

My present invention relates to that class of wheels for vehicles in which an expanding device is interposed between each spoke and the felly, whereby the tire may be tightened without depending upon the contraction of the tire which results from cooling the same, after it has been expanded by heat.

The purposes of my invention are to improve the construction and operation of this class of devices, to provide a strong, easily adjusted and simple connection between the spoke and felly, whereby the expansion of the latter and the compression of the tire may be regulated at any time, and to provide a construction of the parts effecting such adjustments which entirely avoids the danger of said parts working loose by the motion of the vehicle.

To accomplish these purposes, the invention consists in the several novel features of construction and new combinations of parts hereinafter fully explained and then particularly pointed out and defined in the claims which conclude this specification.

To enable others skilled in the art to make, construct, and use my said invention I will now describe the same in detail, reference being made to the accompanying drawings, in which—

Figure 1 is a side elevation of a portion of a felly of a vehicle-wheel, with part of a spoke connected to the felly. Fig. 2 is a section of the parts shown in Fig. 1, through the longitudinal center of the felly and the axis of the spoke. Fig. 3 is a detail view showing the parts of the spoke-connection separated, but in their true relative positions. Fig. 4 is a transverse section, taken upon the line 4—4, Fig. 2, the upper detached end being shown. Fig. 5 is a similar view, showing the lower sectional face.

The reference-numeral 1, in said drawings, indicates a portion of the metal tire, and the

numeral 2 a portion of the felly, which is formed of wood, or other suitable material.

The numeral 3 denotes the spoke, only that portion which lies nearest the felly being shown.

Between the end of the spoke and the felly is arranged the spoke-connection. This consists of a metallic casting 4, having a socket which receives the tenon of the spoke, the outer end of said casting projecting some distance beyond the extremity of the tenon and being provided with a cavity, or chamber 5, in the end of which nearest the end of the tenon is formed a female thread 6. Within this chamber 5 is inserted a bolt 7, which is preferably hollow, for the sake of lightness, its lower, or inner end, being provided with a male thread 8. At the other end is a head 9, of substantially the diameter of the outside of the casting 4, and preferably formed with a polygonal periphery, to facilitate the use of a wrench. The interior of this polygonal head is chambered, or hollowed out, to a depth nearly equal to the thickness of the head, the chamber thus formed being separated from the tubular body of the bolt by a web of metal 10. Integral with this web is a central spindle 12, of substantially uniform diameter throughout, and projecting outward, or toward the felly, and beyond the head 9 of the hollow bolt 7 for a distance which is not far from being equal to the length of said bolt 7 and head 9. Upon this spindle is slipped a second bolt 13, which is also hollow, or tubular, its central opening 14 being of such diameter, however, that it will fit the spindle without interfering with its freedom of movement thereon. This bolt is provided with a polygonal head 15, similar to that upon the bolt 7 and of about the same dimensions. Projecting from this head is a circular boss 16, integral with the head and of such size that it will easily enter the chamber in the head 9 of the bolt 7, thereby causing the heads of the two bolts 7 and 13 to abut against each other, their body-portions extending in opposite directions. The central opening for the spindle 12 extends entirely through the bolt 13 and through the head 15 and boss 16. A male thread 17 is formed upon the outer end, which is nearest the felly. The bolt 13 en-

ters a chambered casting 18, which is provided with a female thread 19 at its outer end, with which the male thread 17 engages. This casting is provided with a suitable felly-
 5 embrace 20, from the engaging, or contacting-face of which rises, or projects, a conical felly-tenon 21, passing entirely through the felly and provided upon its small, or truncated end, with a nipple 22, which enters a perforation
 10 in the tire, with the outside face of which it is substantially flush.

The bolts 7 and 13, with their heads abutting, are in effect right and left hand screw threaded as regards turning to tighten the
 15 tire, since one must be turned to the right and the other to the left. As a matter of fact, however, the two bolts are both formed with threads running in the same direction, but when set so that their heads about they
 20 become in effect right and left hand threaded bolts or parts and by rotating the two bolts 7 and 13 in opposite directions, they will each withdraw from the casting and the radial, or
 25 outward push, exerted upon the felly will be proportioned to the number of revolutions given to said bolts. In order to guard against
 their displacement, due to the motion of the vehicle, I may provide a clutch of the following
 30 construction: Upon the lower end of the boss 16 is a series of alternate projections 23 and recesses 24, somewhat resembling the teeth of a crown-gear, but having less prominence. In the chamber of the head 9, formed
 35 upon the bolt 7, are formed, or mounted, at one, two, or more points, projections 25, which are preferably, but not necessarily, integral with the metal of the head. If two of these
 40 points, or projections, are used, they will usually be placed upon diametrically opposite sides of the spindle 12. When the parts are in proper position, the boss 16, which lies in
 45 the chambered head of the bolt 7, will engage the points, or nipples, 25, alternating with the recesses or depressions 24, and will form a lock, or clutch, by which the revolution
 50 of the bolt will be prevented. As one part of this clutch is formed on one bolt and the other part upon the other bolt, it will readily be seen that any rotary movement of
 55 one of said bolts must necessarily, be accompanied by the same movement of the other bolt. As this change of adjustment cannot relieve the strain upon the tire, but will simply
 60 withdraw one bolt from its casting, or sheath, and retire the other bolt a like distance within its casting, it is evident that there will be no relief afforded to the outward,
 or radial stress, and for this reason the motion of the vehicle will have no tendency to
 65 produce such a displacement. To expand the fellies in close and solid contact with the tire, these bolts must be turned in the opposite direction, which can be done by the use of wrenches, with sufficient force applied to
 70 them to cause the corrugated surfaces 23 and 24 to pass the opposite projections 25.

While I have described and shown the

clutch for the bolt-heads, I do not wish to be understood as confining myself to this clutch as it is not indispensable.

The casting 18, may be variously constructed so long as it is adapted to engage the fellies and also to engage the threaded bolt or part 13.

What I claim is—

1. In a vehicle-wheel, the combination with a spoke and a felly, of two castings, one receiving the spoke-tenon and the other being provided with a felly-embrace, and two bolts, their threaded bodies having a screw-engage-
 80 ment with said castings and their heads being arranged to abut one upon the other, substantially as described.

2. The combination with a tire, a felly supporting said tire, and a spoke, of a spoke-
 85 connection consisting of two parts connected to the felly and the spoke, respectively, and two bolts placed head-to-head, each having a right-hand screw-thread engaging a like thread upon the connecting parts, substantially as described.

3. The combination with a felly-tire, and spoke, of a casting in which the spoke is socketed, a casting having a felly-embrace attached to the felly, a bolt engaging the casting on the spoke and having a chambered
 95 head, and a bolt engaging the other casting and having a boss upon its head, which boss enters the chamber in the head of the other bolt, said boss having upon its flat end alternate projections and recesses engaging points, or nipples, in the chambered head of the
 100 other bolt, substantially as described.

4. The combination with a felly, tire and spoke, of a casting on each, two bolts having
 105 screw-engagement with said castings, said bolts being placed head to head, and a clutch-fastening between the said bolt-heads, substantially as described.

5. In a vehicle wheel, the combination with
 110 a spoke, a felly, and two screw threaded castings which respectively engage the felly and spoke, of two independently rotatable screw threaded bolts or parts which abut each other and engage the screw threaded castings so
 115 that said screw threaded bolts or parts can turn in opposite directions while abutting, to tighten the wheel-tire, substantially as described.

6. The combination with the spoke and
 120 felly of a vehicle, of two independently rotatable screw bolts interposed between the spoke and felly and having their heads abutting so that they can turn in opposite directions to tighten the wheel-tire, substantially
 125 as described.

In testimony whereof I have hereunto set my hand and affixed my seal in presence of two subscribing witnesses.

JAMES A. ASHFORD. [L. s.]

Witnesses:

F. M. GUTHRIE,
 WM. M. SMITH.