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2,933,764

LOCKING MEANS FOR COLLAPSIBLE CURING RIMS

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2 Sheets-Sheet 1

FIG. 1

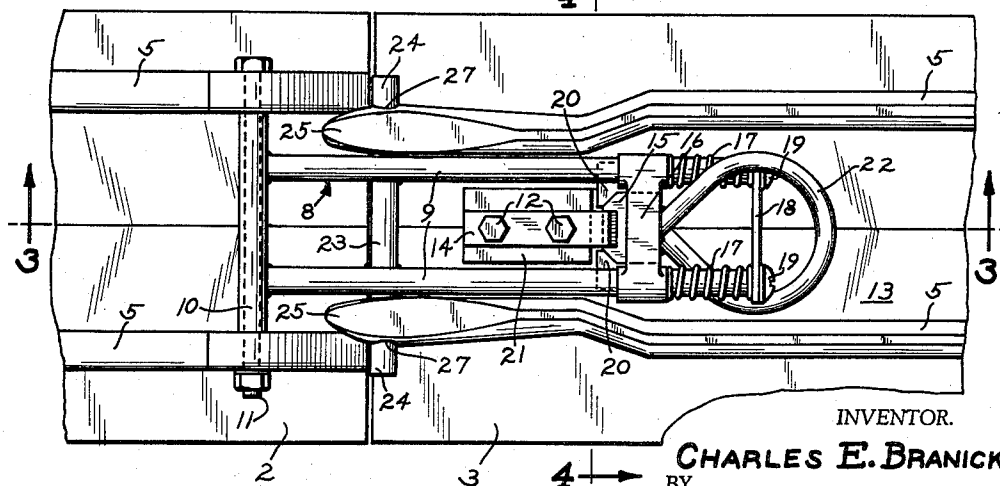
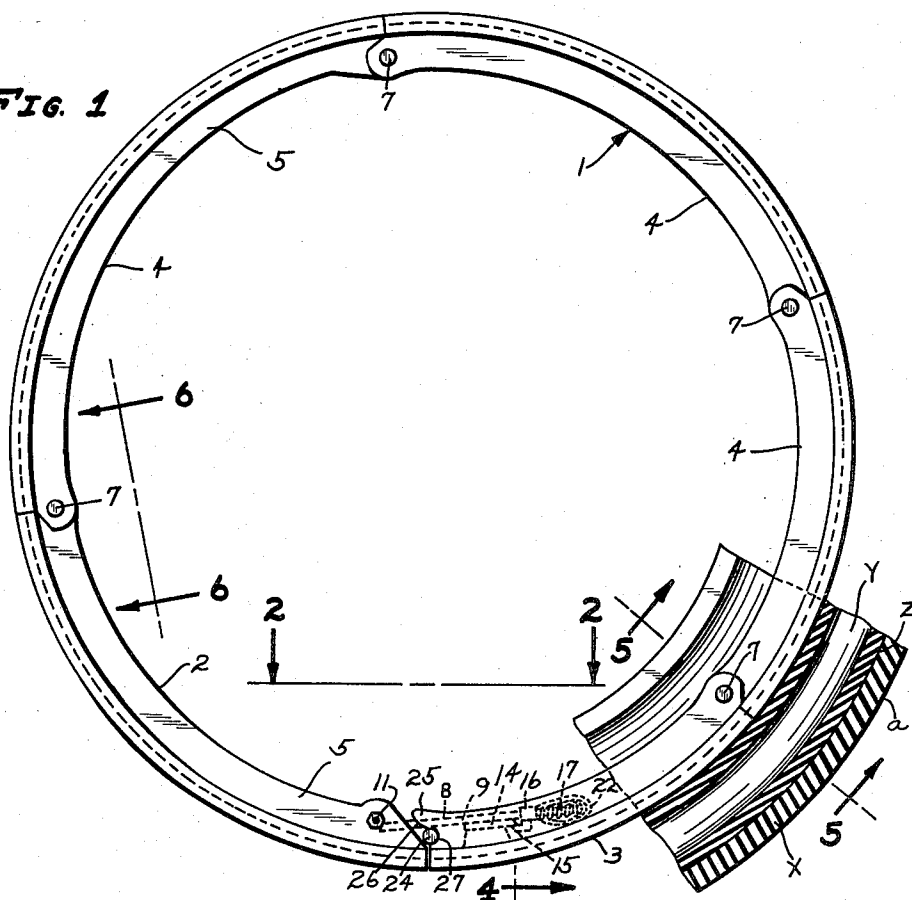


FIG. 2

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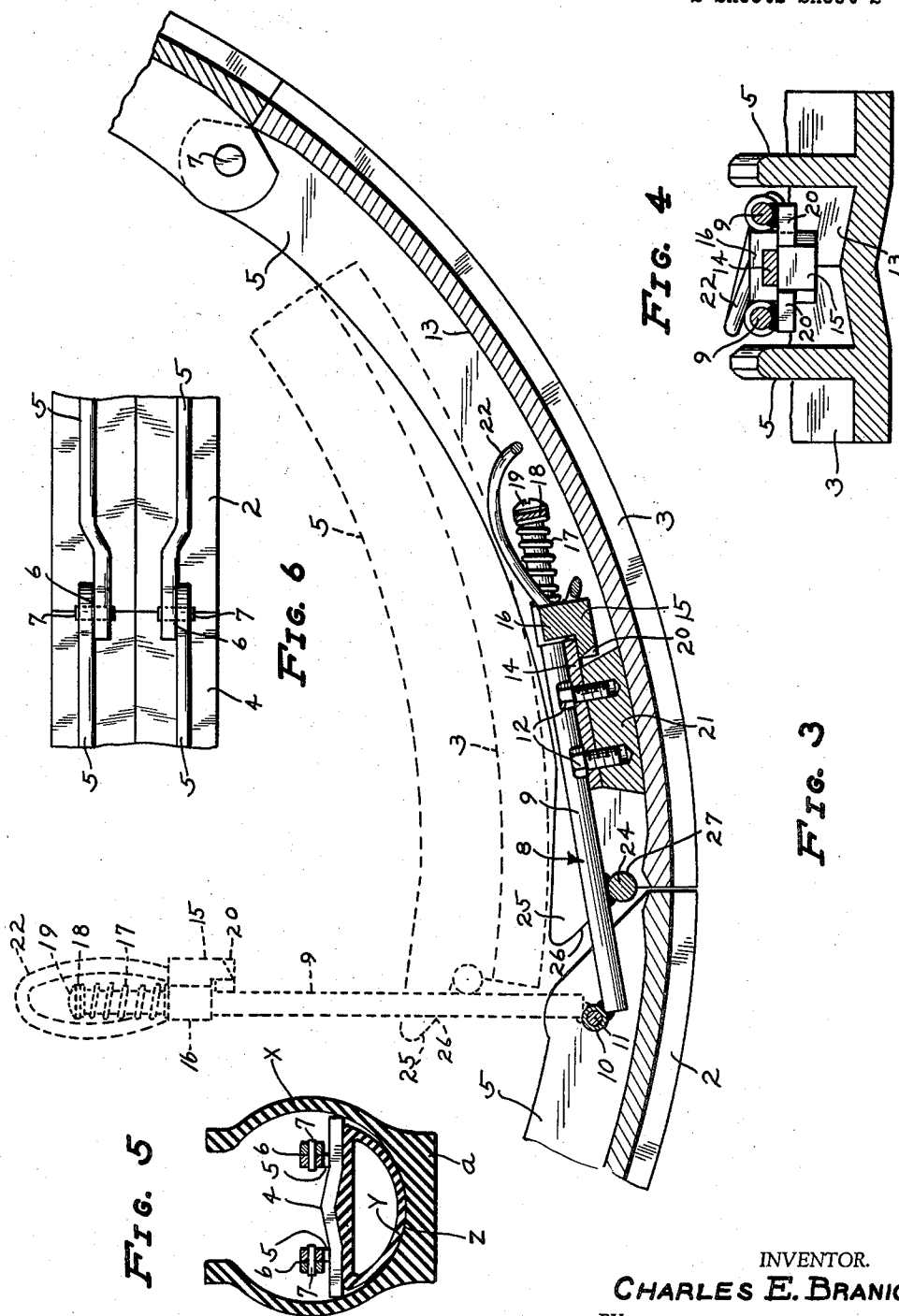
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## LOCKING MEANS FOR COLLAPSIBLE CURING RIMS

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3 Claims. (Cl. 18—43)

My invention relates to collapsible annular curing rims for pneumatic tires and more particularly to a novel section spreading, collapsing and locking mechanism therefor.

The primary object of my invention is the provision of a device of the class described which includes a plurality of hinged sections which define opposed end sections and intermediate sections, and in which components of the spreading, collapsing and locking mechanism are attached to the opposed end sections and hence are always available for their intended functions.

A still further object of my invention is the provision of a device of the class immediately above described which involves a minimum of working parts, which is relatively inexpensive to produce, and which is rugged, durable and efficient in its use and operation.

The above and still further objects of my invention will become apparent from the following detailed specification, appended claims and attached drawings.

Referring to the drawings wherein like characters indicate like parts throughout the several views:

Fig. 1 is a view in side elevation of my novel structure illustrating its use in a pneumatic tire casing, some parts being broken away and some parts shown in section;

Fig. 2 is an enlarged view in top plan as seen substantially from the line 2—2 of Fig. 1;

Fig. 3 is a sectional view taken substantially on the line 3—3 of Fig. 2, with some additional parts being shown;

Fig. 4 is a fragmentary sectional view as seen substantially from the line 4—4 of Fig. 2;

Fig. 5 is a view in transverse section as seen from the line 5—5 of Fig. 1; and

Fig. 6 is a fragmentary view in side elevation as seen substantially from the line 6—6 of Fig. 1.

Referring with greater particularity to the drawings, the numeral 1 indicates in its entirety my novel curing rim, said rim comprising a plurality of end sections 2 and 3 and intermediate sections 4. Each of the sections 2, 3 and 4 is preferably formed from cast metal to provide a pair of laterally spaced circumferentially extended radially inwardly projecting ribs 5. As shown particularly in Figs. 3 and 6, the ribs 5 on opposite ends of the intermediate sections 4 and on one end each of the end sections 2, 3 have offset overlapping relationship, as indicated at 6, for the reception of aligned pivot pins 7 which permit the several sections 2, 3, 4 to be collapsed inwardly from the arcuately aligned position of Fig. 1 wherein the adjacent ends of said sections are in substantially abutting relationship.

Pivotally secured between the ribs 5 of the end section 2 is a bifurcated arm, indicated in its entirety by the numeral 8, the spaced members of which are identified by the numeral 9. As shown particularly in Figs. 2 and 3, at one end the members 9 are welded or otherwise rigidly secured to a transverse tubular base 10 through which and the ribs 5 extends a nut-equipped pivot pin

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or bolt 11. The pivot pin 11 is thus parallel to the pivot pins 7. Rigidly secured, by means of bolts or the like 12, to the interior peripheral surface 13 of the end section 3 intermediate the members 9 of the bifurcated arm 8 is a latch element or plate 14 which is engageable by a cooperating strike element 15 carried by a crosshead 16 mounted for longitudinal sliding movements on the members 9 of the bifurcated arm 8. Preferably and as shown, the strike element 15 is biased toward engagement with the latch element 14 by means of coil compression springs 17 encompassing the free ends of the members 9 and interposed between the crosshead 16 and a tie bar 18 connecting the free ends of said members 9 and retained in position thereon by means of screws or the like 19. As shown particularly in Figs. 2 and 3, the strike element 15 underlies the latch element 14 when in operative position and longitudinal locking movement, which is imparted thereto by the coil springs 17, is limited beyond the position shown in Fig. 3 by engagement of the spaced ears 20 with the upstanding block 21 upon which the latch element 14 is mounted. To facilitate release of the strike element 15 from the latch element 14, against the bias of the coil spring 17, I provide a loop shaped handle 22 which is welded or otherwise rigidly secured to the crosshead 16.

Extending transversely of the members 9 and rigidly secured thereto, intermediate the crosshead 16 and the base 10 of the arm 8, is a finger 23, the opposite ends 24 of which extend laterally outwardly therefrom and underlie lugs 25 which are integral extensions of the ribs 5 formed integrally with the end section 3. Referring particularly to Fig. 3, it will be seen that the lugs 25 define surfaces 26 which are engageable by the extended ends 24 of the finger 23, whereby to guide said finger into engagement with aligned arcuate notches 27 formed in the circumferentially extended free ends of the flanges 5, immediately radially outwardly of the lugs 25. The dotted line showing of Fig. 3 illustrates how the arm 8, with the extended ends 24 of the finger 23 seated in the notches 27, is utilized to impart final spreading movements to the opposed end sections 2, 3 to cause same to come into the circumferential full line showing thereof with the free ends thereof in substantially abutting relationship.

The position which such a collapsible rim assumes during a vulcanizing or recapping operation of a pneumatic tire casing is illustrated in Figs. 1 and 5. As there shown, the rim 1 is of a type totally received within a tire casing X, an air bag or the like Y being interposed therebetween, and the inner peripheral portion Z of the tire casing X immediately overlying the road-engaging tread portion a thereof.

By reference to Fig. 2, it will be noted that the free end portions of the ribs 5 associated with the end section 3, from the tapered lug-forming outer ends 25 thereof to points identified by the numeral 28, form guides for the snug reception of the members 9 of the arm 8 during final locking movements thereof, whereby to assure lateral alignment of the sections 2, 3.

When it is desired to collapse the sections 2, 3, 4 for the purpose of removing same from a pneumatic tire casing X, the operator pulls outwardly on the handle 22, against the bias of springs 17, sufficiently to cause the strike element 15 carried by the crosshead 16 to be moved circumferentially outwardly from beneath the latch element 14. Thereafter, radially inward movement of the handle-equipped free end of the arm 8 will cause the sections 2, 3, to again assume the dotted line position of Fig. 3. Finally, the arm 8 is obviously allowed to swing completely away from the free end of section 3 and the lug 25 carried thereby and collapsing movements may progressively be imparted to all sections 2, 3, 4.

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My invention has been thoroughly tested and found to be completely satisfactory for the accomplishment of the above objects and while I have shown a preferred embodiment thereof, I wish it to be understood that same may be capable of modification without departure from the scope and spirit of the appended claims.

What I claim is:

1. Locking means for a collapsible annular curing rim wherein said rim comprises a plurality of pivotally connected intermediate and end sections having axially aligned pivot means, said locking means comprising a locking arm pivotally secured at one end to one of said end sections for swinging movement of the free end thereof toward and away from engagement with the other of said end sections and on an axis parallel to said axially aligned pivot means, said arm and the other of said end sections having interengaging portions which cooperate to move said end sections into substantially arcuate alignment upon swinging movement of said arm toward said other end section, a latch element and a striker element one on said arm and one on said other end section, said latch element having a hook portion adapted to hook over said striker portion, and means yieldingly urging said latch element toward hooking engagement with said strike element to releasably lock said end sections in arcuate alignment, said interengaging portions comprise a notch in said other end portion and a transversely extended finger carried by said arm intermediate the pivotal connection thereof and the latch element, and wherein said other end section is provided with a lug projecting angularly circumferentially and radially inwardly from said notch, said arm being movable at one side of said lug and said finger engaging the adjacent surface of said lug during swinging movements of the arm away from said other end section to collapse said sections, said finger engaging said adjacent surface of said lug during swinging movement of said arm toward said other end section and being guided thereby into said notch.

2. In a collapsible annular curing rim for pneumatic tire casings of the type comprising a plurality of segmental rim sections each of which is formed to provide a pair of spaced circumferentially extended radially inwardly projecting ribs and means pivotally securing ad-

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jacent ends of said ribs together to provide adjacent end sections and intermediate sections in substantially end to end relationship, the improvement which comprises a locking arm pivotally secured intermediate the ribs of one end section for swinging movement of the free end thereof toward and away from engagement with the other end section, the ribs of the other end section defining guide surfaces for the opposite sides of said arm to hold said end sections in aligned relationship, the ribs on said other end section having circumferentially outwardly opening notches, said arm having a transverse finger received in said notches to move said end sections into substantially abutting end to end relationship upon swinging movement of the arm toward said other end section; the ribs on said other end section being extended and defining lugs which project radially inwardly from said notches, said finger engaging the adjacent surfaces of the lugs during swinging movement of said arm away from said other end section to cause collapsing of said sections and engaging said adjacent surfaces during swinging movement of said arm toward said other end section and being guided thereby into said notches.

3. The structure as defined in claim 2 including latching means cooperating with said locking arm, said means comprising a movable latch element on said locking arm and a latch member on the other end section, spring means yieldably urging said movable latch element toward the notches for latching engagement with the latch member, a handle member operatively connected with said latch element for moving same out of latching engagement with said latch member against the bias of said spring means.

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