No. 819,982. PATENTED MAY 8, 1906.

R. CROASDALE.

SPLIT BUSHING.

APPLICATION FILED MAR. 25, 1905.

Fig. 1.

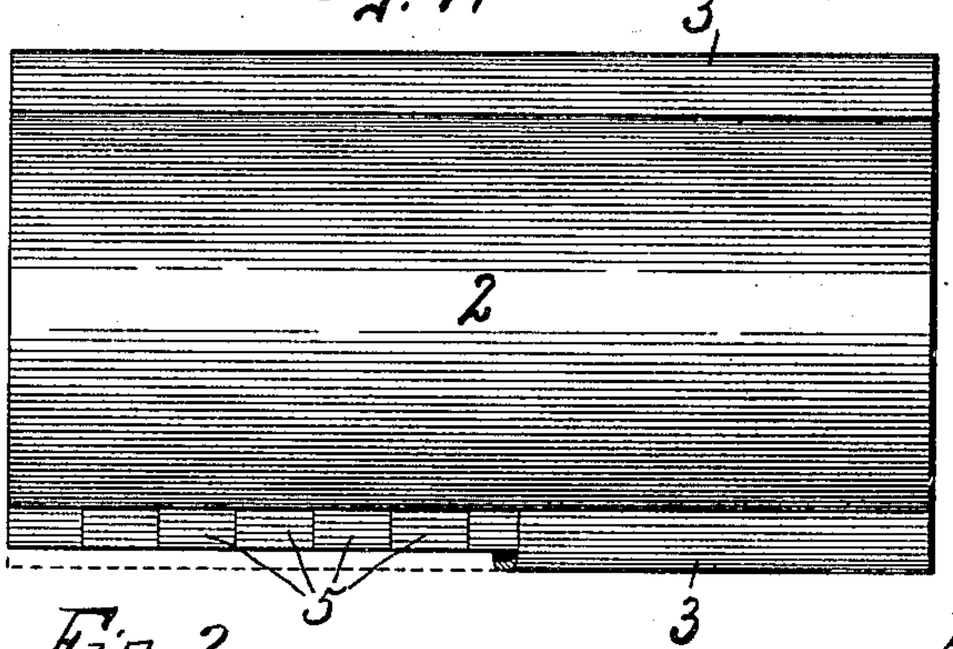



Fig. 2.

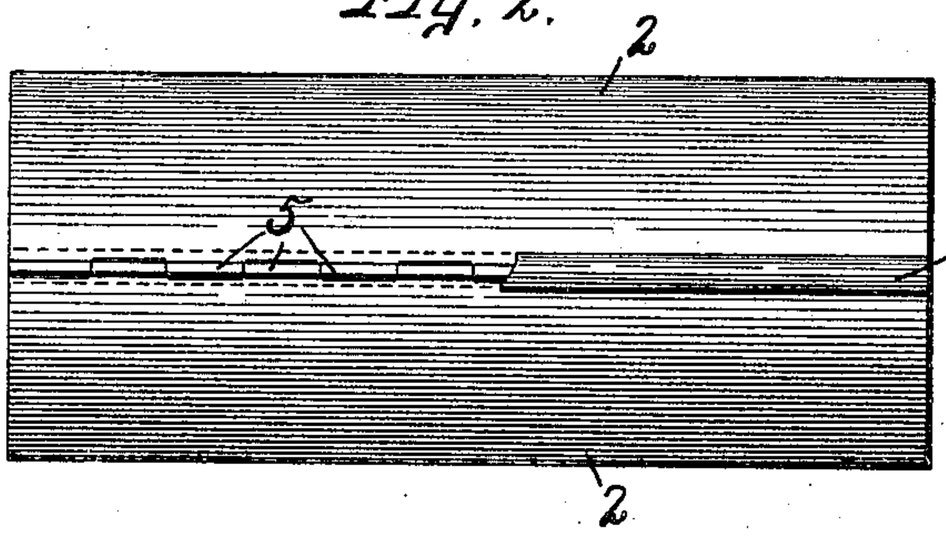



Fig. 3.

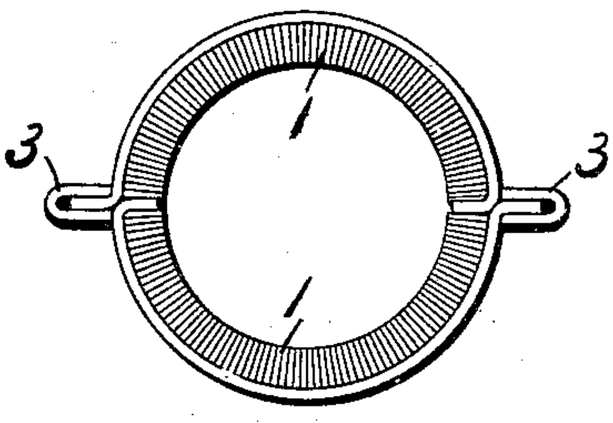
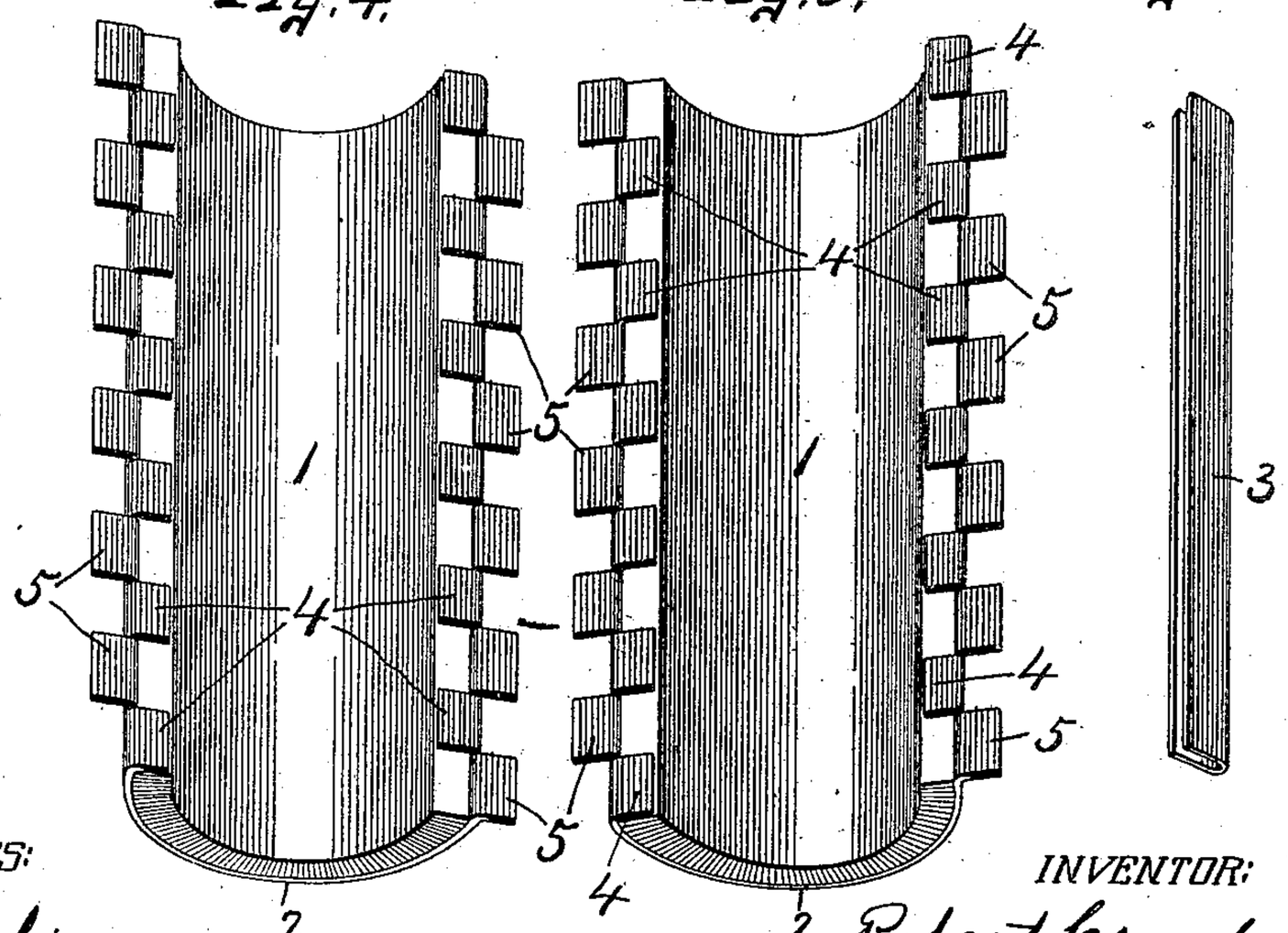



Fig. 4.

Fig. 5.

Fig. 6.

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# UNITED STATES PATENT OFFICE.

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## SPLIT BUSHING.

No. 819,982. Specification of Letters Patent. Patented May 8, 1906.

Application filed March 25, 1905. Serial No. 251,986.

*To all whom it may concern:*

Be it known that I, ROBERT CROASDALE, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Split Bushings, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to improvements in split bushings for journal-bearings, loose pulleys, and other uses to which such a bushing might be adapted, and refers more particularly to the means for incasing an inner split sleeve composed of laminated sections of hide, oil-saturated wood, or equivalent self-lubricating material.

Each of the inner sleeve-sections is preferably made from a series of strips or folds of the hide, which are arranged flatwise in substantially radial planes and are firmly pressed together in segments to form a unitary semicylindrical or concavo-convex body possessing great tenacity and wearing qualities and is more or less self-lubricating. A sectional bushing-sleeve built up of strips or laminations in the manner described requires some external bond or casing to maintain the integrity of the laminated structure, particularly when subjected to severe usage.

The primary object of my invention is to incase each semicylindrical laminated sleeve-section in a separate sheet-metal retainer of substantially the same contour, which is fitted snugly upon the periphery of the laminated section and is formed with retaining tongues or projections, which are impinged against the meeting edges of the bearing-sleeve section, thereby firmly locking the sleeve-section and its casing together and at the same time more firmly compressing the laminations circumferentially to obviate any liability of displacement.

Another object is to provide the meeting edges of each semicylindrical casing-section with a series of tongues, which are spaced apart in such manner that when the two half-sections are brought together the tongues of one section fit into the spaces between the tongues of the other section, thereby locking the two half-sections against relative longitudinal movement, the tongues of both sections at each side of the bushing being brought into substantially the same plane.

A still further object is to provide suitable clamping members, which fit upon the tongues of both casing-sections, and thereby lock them together against radial displacement.

Other objects and uses will appear in the following description.

In the drawings, Figure 1 is the top plan of my improved bushing, one of the clamping members being partly broken away to show the interlocking tongues of the casing-section. Fig. 2 is a side elevation of the device seen in Fig. 1 and also showing one of the clamping members as partly broken away to show the interlocking tongues of the casing-sections. Fig. 3 is an end view of the same bushing. Figs. 4 and 5 are perspective views of the opposite half-sections of the bushing. Fig. 6 is a perspective view of one of the detached clamps for locking the bushing-sections together.

This bushing consists, essentially, of two similar semicylindrical parts or halves, each comprising an inner semicylindrical section 1 and an outer semicylindrical casing-section 2, both of which parts are united together in a manner hereinafter described to form a unitary structure which is substantially semicircular in cross-section and constitutes a complete half of the bushing, such halves being substantially brought together upon the shaft and held together by suitable clamping members 3.

Each inner half-section 1 is preferably composed of a series of strips or folds of hide, oil-saturated wood, or other equivalent self-lubricating material, which strips or folds are brought together face to face and firmly compressed under a high degree of pressure into semicylindrical form, so that the strips lie in substantially radial planes with reference to the center of the bushing, thereby presenting the edges of the strips to the shaft and affording an exceedingly-tenacious bearing which possesses superior wearing qualities and at the same time is extremely light and more or less self-lubricating. After these inner laminated sections are thus formed in the rough the two sections are brought together upon a suitable arbor, and their exterior surfaces are then turned or trued up to the desired diameter for the reception of the casing-sections 2. Each of these casing-sections 2 is formed of comparatively thin sheet metal, but of sufficient strength to withstand the strain to which the bushing is subjected and is semicylindrical in form, of such a diameter as to fit snugly upon the periphery of its inner section 1.

The meeting edges of each casing-section 2 are slit or cut transversely at regular intervals to form a series of tongues 4 and 5 of substantially the same length, and the adjacent tongues on each meeting edge are bent radially in the opposite direction, so that alternate tongues, as 4, are bent inwardly upon the meeting face or edge of the inner section 1, while the intervening tongues 5 are bent outwardly in substantially the same plane. It is now clear that by turning the adjacent tongues in opposite directions intervening spaces are formed between the tongues, and therefore these spaces alternate with their respective series of tongues and are of substantially the same length as said tongues.

It will be observed that the tongues at one end of the casing-section are both turned in the same direction—that is, one is turned inwardly over the meeting edge of the bushing and the other outwardly—while the tongues at the opposite end of the same casing-section are turned in the opposite direction, which permits the bushing-sections to be reversed end for end and also brings the inturned tongues of one section into registration with the spaces between the inturned tongues of the other section and at the same time brings the outturned tongues of one section into registration with the spaces between the outturned tongues of the other section. Therefore the tongues of each section enter the spaces between the similar tongues of the other section and lock the two sections together against relative endwise movement. It is also apparent that by forming these tongues in the manner described those at each side of the bushing are brought into substantially the same plane coincident with the diametrical plane of the bushing. The inturned tongues 4 are pressed firmly against the meeting faces of their respective inner sleeve-sections 1, thereby locking the inner sleeve-section and its casing-section firmly together against circumferential or axial movement relative to each other. The outturned tongues 5 constitute lengthwise flanges which are adapted to be clamped between the hub-sections of a split pulley or bearing, and in some instances, as in extremely light pulleys, the clamping of the hub-sections of the pulley or the opposite parts of a bearing upon the outwardly-projecting flanges or tongues 5 of the casing-sections 2 will suffice to hold the bushing in operative position without liability of unduly straining or breaking any part of the bushing; but for heavier work I prefer to reinforce these lengthwise flanges formed by the interlocking tongues 5, and therefore I provide the U-shaped clamping members 3. Each of these clamping members preferably consists of a strip of sheet metal folded transversely upon itself to form an open-sided groove for receiving the tongues 5, and after the bushing-sections have been brought together base to base the clamping members 3 are slipped over the alined tongues 5 of each casing-section, thereby clamping the bushing-sections firmly together and at the same time reinforcing the flanges formed by said tongues 5. The completed bushing is now ready to be inserted into the hub of a split pulley or between the sections of a journal-bearing, the opposite halves of the pulley or bearing serving to engage the opposite faces of the clamping members 3, which are sufficiently yielding to permit the opposite halves of the pulley or journal-bearing to be drawn tightly together, thereby more firmly impinging the opposite sides of the clamping members against the opposite faces of the tongues 5 of both casing-sections to prevent accidental endwise displacement or movement of the bushing in the hub of the pulley or in the journal-bearing. After the casing-sections are fitted upon the inner sleeves the completed bushing is then mounted in a suitable lathe, and the inner bore is then turned to the desired diameter.

The manner of constructing and operating this bushing is believed to be fully set forth in the foregoing description, and although I have shown and described the casing-sections as each formed with a series of tongues and intervening spaces it is clearly apparent that the number of these tongues is immaterial, the only requirement being that the casing-section be provided with one or more tongues arranged in such manner as to interlock with each other and to form outwardly-projecting flanges adapted to be clamped between the opposite halves of a split pulley or between the sections of a journal-bearing.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A split bushing comprising two semicylindrical sleeve-sections of sheet metal each having its meeting edges formed with outturned radially-projecting tongues lying in substantially the same plane as, and edge to edge with those of the other section.

2. A split bushing comprising two semicylindrical sleeve-sections of sheet metal each having its meeting edges formed with outturned radially-projecting tongues lying in substantially the same plane as, and edge to edge with those of the other section, and U-shape bars fitted upon said radially-projecting tongues to clamp the sleeve-sections together.

3. A bushing comprising an inner sleeve divided longitudinally forming opposite halves, and semicylindrical sheet-metal sections inclosing the first-named sleeve and having their meeting edges formed with inturned tongues spaced apart and bearing against the adjacent meeting face of its inner sleeve-sec-

tion, the tongues of one section fitting between those of the other section.

4. A split bushing comprising an inner sleeve divided longitudinally forming opposite halves, and two sheet-metal half-sections each fitted upon the outer face of one of the inner sleeve-sections and having its meeting edges formed with inturned tongues engaging and retaining its inner section, said meeting edges also having outturned clamping-tongues, and means for engaging the clamping-tongues of both sections for locking the bushing-sections together.

5. A casing for laminated semicylindrical bushing-sections, comprising opposed concavo-convex sheet-metal sections arranged base to base each section having its meeting edges formed with oppositely-projecting tongues, those projecting in one direction alternating with those which project in the opposite direction and the tongues of each section fitting between and in substantially the same plane as those of the other section.

6. A bushing comprising an inner cylindrical sleeve divided longitudinally into opposite halves, and two semicylindrical sheet-metal sections inclosing the first-named sleeve and having their meeting edges formed with outturned tongues spaced apart, the tongues of one section fitting between and lying in substantially the same plane as those of the other section.

7. A split bushing comprising two semicylindrical sleeve-sections of sheet metal, and radial tongues projecting inwardly from the meeting edges of each section and spaced apart, the tongues of one section fitting between those of the other section.

8. A split bushing comprising two semicylindrical sleeve-sections, there being tongues on the meeting edges of said sections and spaced apart, the tongues of each section fitting between and lying in substantially the same plane as the tongues of the other section and means for holding the tongues of both sections in said plane.

9. A split bushing comprising two semicylindrical sleeve-sections, tongues on the meeting edges of said sections and spaced apart, the tongues of each section fitting between and lying in substantially the same plane as the tongues of the other section and opposite clamping members engaging the tongues of both sections to hold them in such plane.

10. A bushing comprising a split inner sleeve and a casing therefor consisting of sheet-metal sections inclosing the sleeve and having their meeting edges formed with outturned tongues spaced apart, those of one section fitting between those of the other section, and U-shape bars fitted upon said tongues.

In witness whereof I have hereunto set my hand on this 23d day of March, 1905.

ROBERT CROASDALE.

Witnesses:
H. E. CHASE,
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