R. H. BOWEN.

PULLEY.

APPLICATION FILED AUG. 6, 1908.

1,031,907.

Patented July 9, 1912.

3 SHEETS—SHEET 1.

FIG. I.

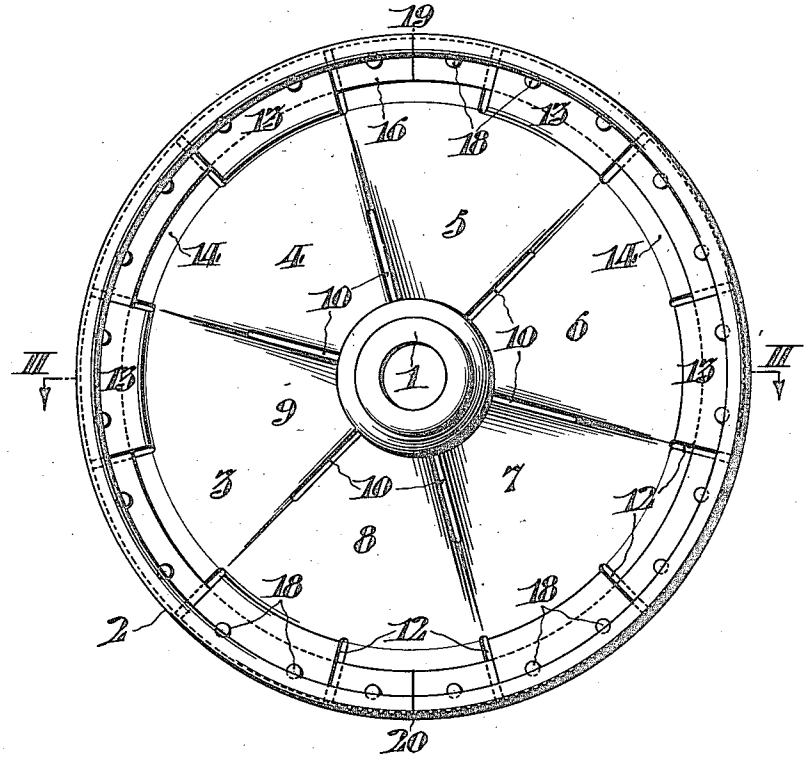
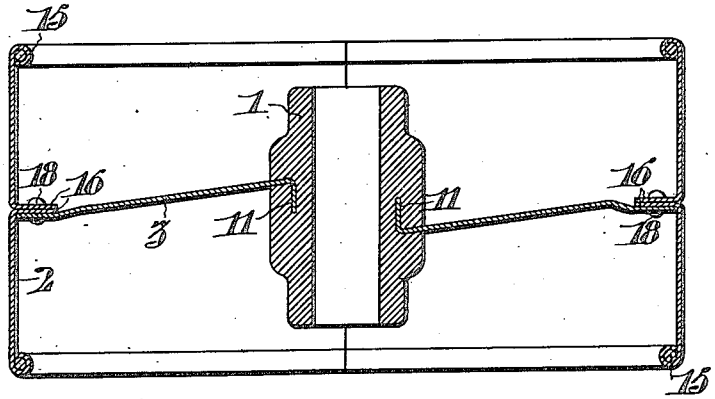


FIG. II.



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3 SHEETS—SHEET 2.

FIG. III.

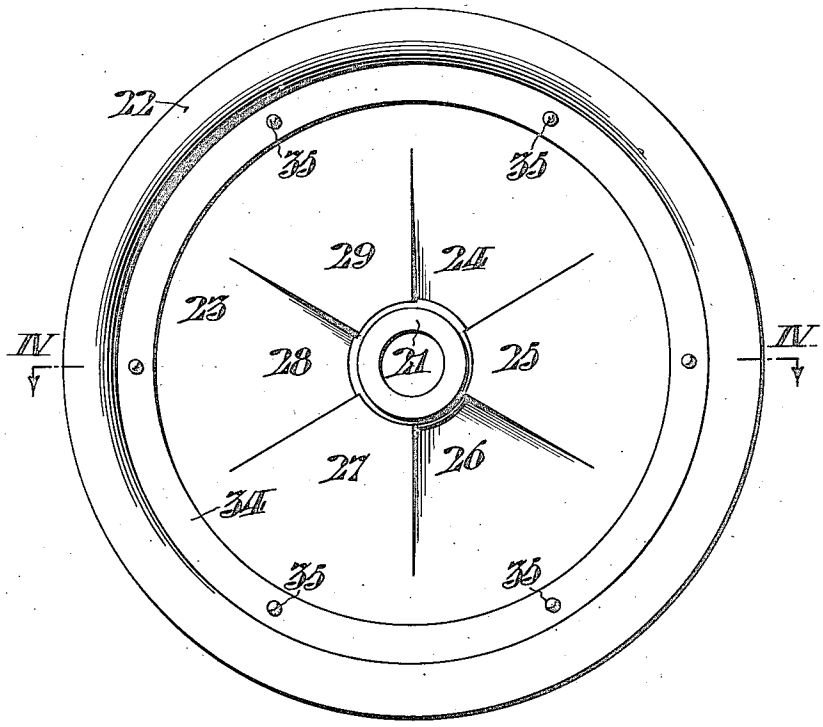
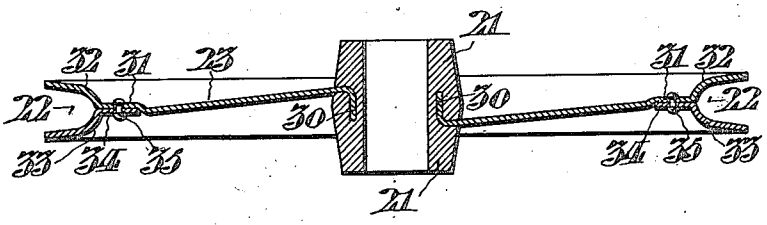


FIG. IV.



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3 SHEETS—SHEET 3.

FIG. V.

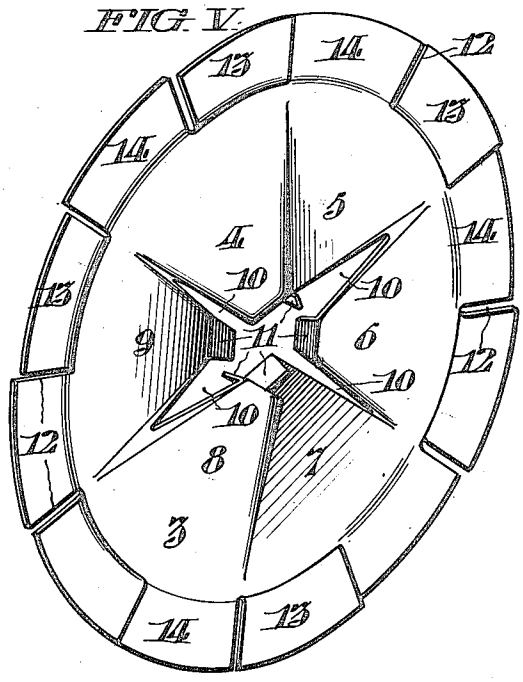
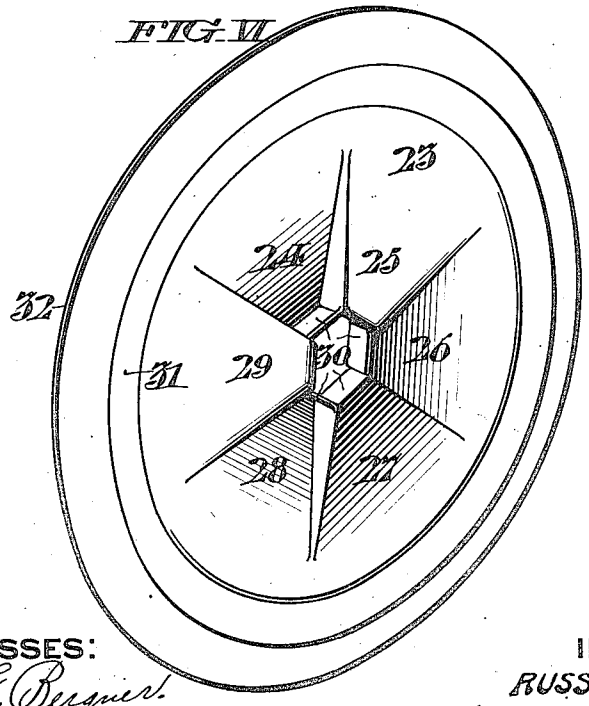


FIG. VI.



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UNITED STATES PATENT OFFICE.

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PULLEY.

1,031,907. Specification of Letters Patent. Patented July 9, 1912.

Application filed August 5, 1908. Serial No. 447,040.

To all whom it may concern:

Be it known that I, RUSSELL H. BOWEN, of Palmyra, in the county of Burlington and State of New Jersey, have invented certain new and useful Improvements in Pulleys, whereof the following is a specification, reference being had to the accompanying drawings, in which I have shown my invention in several forms, the underlying principle, however, being the same.

The object of my improvements is to construct with great economy of manufacture, a strong and relatively light pulley or sheave, the main portions of which are formed entirely of sheet metal which can be struck up by means of dies into the desired shapes.

Referring to the drawings, Figure I, represents a side elevation of a pulley embodying one form of my invention. Fig. II, is a diametrical transverse section through the same on the line II, II, of Fig. I. Fig. III, represents a side elevation of a sheave embodying another form of my invention. Fig. IV, is a diametrical sectional view on the line IV, IV, of Fig. III. Fig. V, represents, in perspective, the dished, or shaped, metallic sheet, of approximately disk form, by means of which the rim is mounted upon the hub, in the type of device shown in Figs. I, and II. Fig. VI, is a similar view in perspective of the metallic sheet used in the type shown in Figs. III, and IV; the purpose of these two perspective views being to indicate clearly the details of construction of the respective sheets.

Referring now to the type shown in Figs. I, II, and V,—1, represents the hub of the pulley, 2, the rim thereof, and 3, the metallic sheet of approximately disk form by means of which the hub and rim are united. This element 3, which may conveniently be referred to as a disk, is formed from a flat piece of sheet metal, which is pressed by means of dies, so as to form dished portions 4, 5, 6, 7, 8, and 9, (in this instance six in number), projecting alternately on opposite sides of what may be called the neutral plane of the disk itself, which is the median plane of the completed pulley structure.

The dished portions protrude most deeply at the region nearest to the center of the disk and grow shallow as they extend outward, preferably vanishing at a short distance from the extreme outer periphery. When the pulley is of considerable size, it is desirable that radial slots 10, should intervene between the proximate edges of the dished portions at the region of greatest depth, in order to permit the necessary displacement of the metal without risk of tearing. At the inner extremities of each of the dished portions, locking tongues 11, are formed which are bent inward, preferably at right angles to the neutral plane of the disk, so as to engage with the hub.

The outer periphery of the disk is slotted radially at intervals, as shown at 12, and the portions of metal intervening between the slots are pressed laterally outward, so as to form flanges which lie in planes parallel to the median plane of the structure, but disposed alternately on opposite sides thereof, as shown at 13, 14, in Fig. V, the flanges 13, being on the side which is nearest to the observer, while the flanges 14, lie on the side farthest from the observer, thus practically constituting a symmetrical channel whose sides alternate at intervals, but whose central axis lies substantially in the median plane of the finished pulley.

The sheet 3, may be secured to the hub by casting the latter directly about the locking tongues 11, as shown in the sectional view of Fig. II.

The rim 2, of the pulley, consists of bands of sheet steel, each of which is diametrically divided as shown at 19, 20, for convenience of application and each of which has at one edge a rolled bead 15, and at the other edge an inwardly projecting flange 16. Said flanges fit snugly together, and have a total thickness which conforms to the dimensions of the channel formed between the alternating flanges 13, 14, of the sheet 2.

The flanges 16, of the rim are secured within this channel by means of rivets 18, which pass through the flange of the channel at convenient intervals.

In the form shown in Figs. III, IV, and VI, the hub is indicated at 21, the grooved rim at 22, and the intervening disk at 23. Said disk is formed with alternately dished portions 24, 25, 26, 27, 28, and 29, preferably six in number, but as this method of construction is usually employed in a pulley

or sheave of relatively small size, no slots intervene between the adjacent edges of the dished portions, since the metal can flow sufficiently to attain the desired shape without rupture.

Tongues 30, are formed at the inner extremities of the dished portions, and the hub may be cast directly around said tongues, as before stated. The outer periphery of the disk is pressed laterally outward from the median plane of the sheave, so as to form a continuous flange 31, substantially parallel to said plane, and is then bent outwardly with a curved cross-section, as shown at 32, so as to constitute one half of the grooved rim of the sheave. The other half 33, of said grooved rim is formed from a separate piece of metal having the curved and flanged cross section indicated in Fig. IV, the flange 34, being of substantially the same radial depth as the flange 31. The two flanges are then secured together by means of rivets 35, arranged at convenient intervals, so that the portion 33, coöperates with the portion 32, to form a symmetrical groove of proper depth.

It will thus be seen that in the finished pulley or sheave, the dished portions of the disk which unites the hub and the rim are alternately disposed in symmetrical relation to the median plane of the pulley or sheave so as to afford the requisite strength in that portion of the structure, while the locking tongues firmly connect the sheet with the hub whether the latter be formed by casting, as preferred, or in any other manner.

Furthermore, in the most complete embodiment of the invention, the lateral displacement of the outer periphery of the sheet, either wholly to one side of the median plane of the structure as in the type shown in Figs. III, IV, and VI, or alternately on opposite sides of said median plane, as shown in Figs. I, II, and V, permits the location of the rim symmetrically with relation to said median plane, thereby affording a maximum of strength with a given amount of metal.

In my claims, I use the term pulley as broadly comprehending a sheave or similar structure, and the term rim as comprehending the peripheral element, whether the same be plain or grooved.

Having thus described my invention, I claim:

1. The combination with a hub; of a disk provided with dished portions alternating symmetrically with relation to the median plane thereof, said dished portions being provided at their inner extremities with locking tongues, projecting at an angle thereto, and adapted to engage with the hub; and a rim secured to the outer periphery of said disk, substantially as set forth.

2. In a pulley, a centrally-apertured sheet metal web formed from a disk provided with dished portions alternating symmetrically with relation to the median plane thereof, said dished portions being separated by radial slots and provided at their inner extremities with laterally projecting locking tongues adapted to engage with the hub.

3. The combination with a hub; of a disk provided with dished portions alternating symmetrically with relation to its median plane, and having its outer periphery disposed in alternating flanges on opposite sides of said median plane, said dished portions being provided at their inner ends with means for engaging the hub; and a rim provided with an internally projecting flange secured between the alternating flanges of the disk, substantially as set forth.

In testimony whereof, I have hereunto signed my name, at Philadelphia, Penna., this thirty-first day of July, 1908.

RUSSELL H. BOWEN.

Witnesses:
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GEORGE THOMAS.