No. 754,473. PATENTED MAR. 15, 1904.

A. H. MATHESIUS.

GUIDE WHEEL.

APPLICATION FILED FEB. 14, 1901.

NO MODEL.

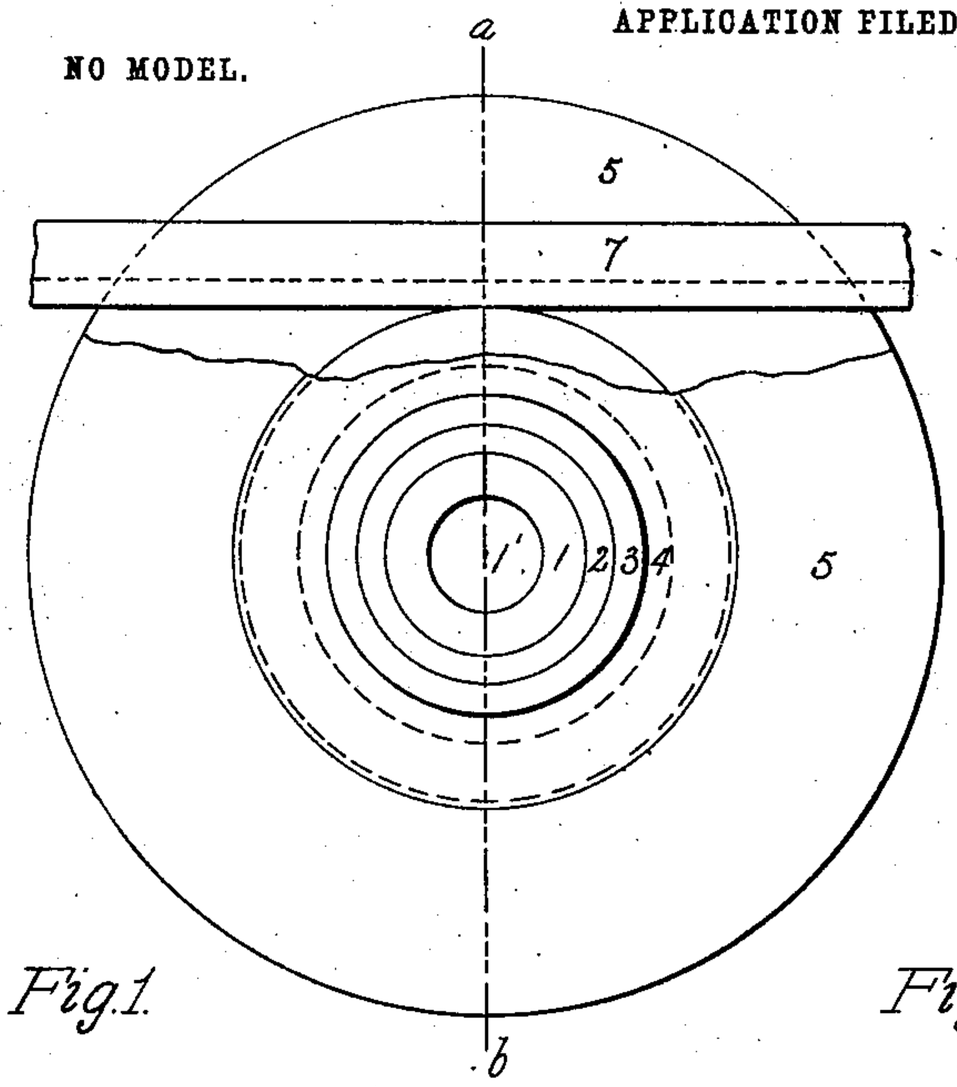

Fig. 1.

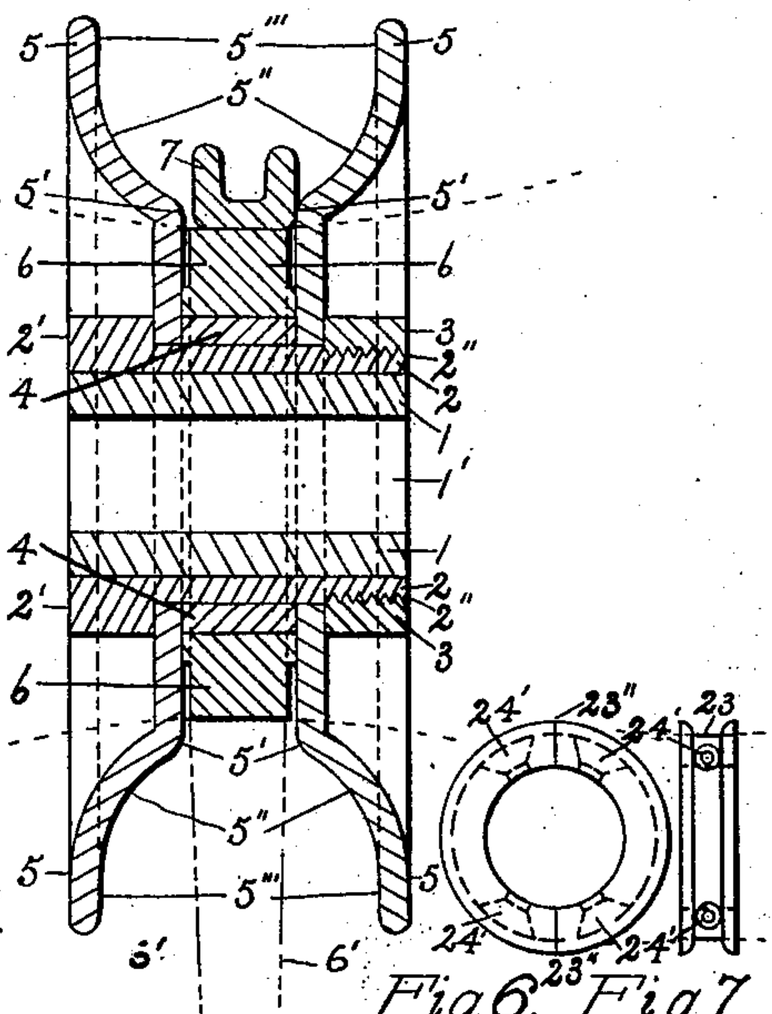

Fig. 2.

Fig. 6.

Fig. 7.

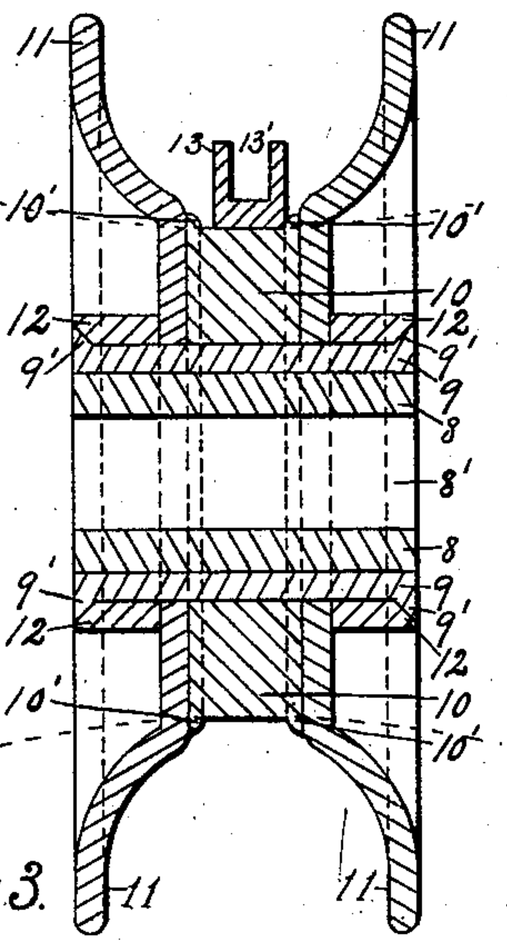

Fig. 3.

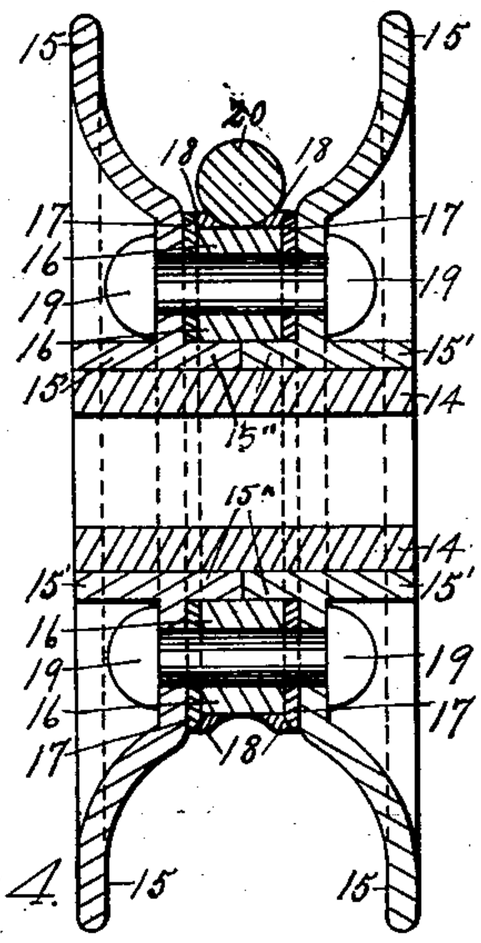

Fig. 4.

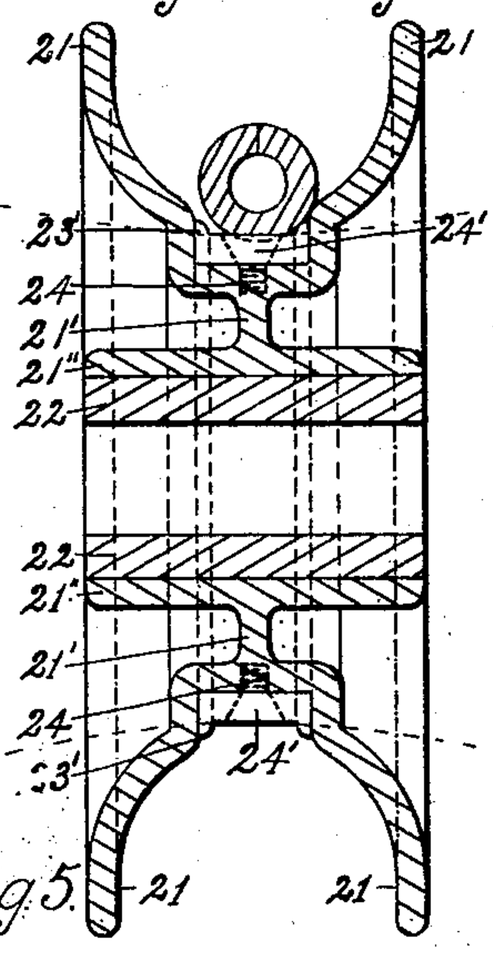

Fig. 5.

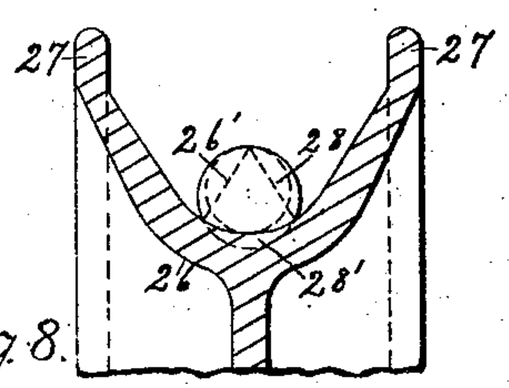

Fig. 8.

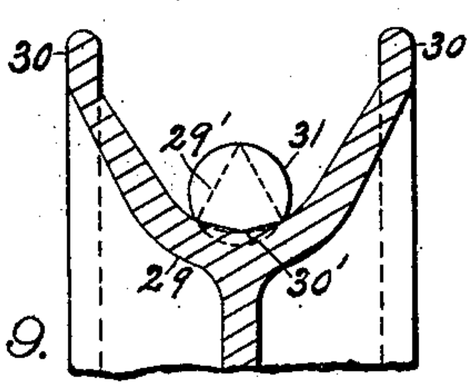

Fig. 9.

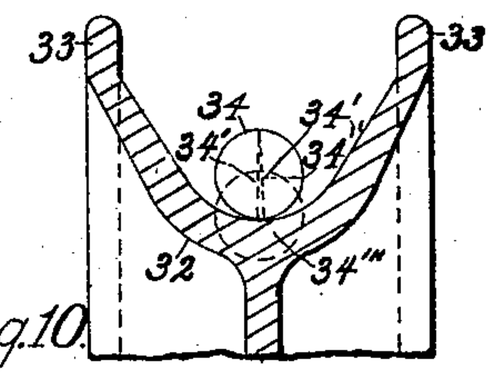

Fig. 10.

Witnesses.
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No. 754,473. Patented March 15, 1904.

UNITED STATES PATENT OFFICE.

ALEXANDER H. MATHESIUS, OF BROOKLYN, NEW YORK.

GUIDE-WHEEL.

SPECIFICATION forming part of Letters Patent No. 754,473, dated March 15, 1904.

Original application filed March 26, 1900, Serial No. 10,287. Divided and this application filed February 14, 1901. Serial No. 47,339.

(No model.)

To all whom it may concern:

Be it known that I, ALEXANDER H. MATHESIUS, a citizen of the United States, residing in the city of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Guide-Wheels, which improvements are fully set forth in the following specification and accompanying drawings.

My invention has relation to means for conveying power from an electrical conductor, moving rope, or the like, and also relates to certain details and apparatus to be used in connection therewith.

This application is a division ordered by the examiner April 30, 1900, of my patent filed March 26, 1900, patented February 10, 1903, No. 720,454.

This application relates in part to improvements in guide-wheels and comprehends certain modifications of improvements upon the general construction set out in Letters Patent No. 432,757, granted to me on July 22, 1890.

In my Letters Patent above referred to I have disclosed an original type of guide-wheel having for its special novelty the divided central bearing, which is made of a number of separate sections in a manner that the circumference of each section is free to revolve with a velocity in correspondence to the length of its radius, thereby reducing the slipping and abrasion of the guide-rope or the like and of the central bearing of the guide-wheel.

A part of my present invention has for its object a further development of the same general features—namely, reducing the slipping and abrasion of curved transverse contact-lines of the central bearings of the guide-wheels and of the electrical conductor, guide, or rope with which the guide-wheels revolve in contact.

In carrying out my invention I provide the central bearing of the guide-wheel and the electrical conductor, guide-rope, or the like with transverse contact-lines which are less curved than those heretofore used, and I make the curved transverse contact-lines of the circumference of the central bearing of the guide-wheel approach as near as practicable the circumference of a cylinder. Thereby all the points of the curved transverse contact-lines of the central bearing revolve with an approximate even velocity in contact with the electrical conductor, &c., and reduce the slipping and abrasion of the metals in contact in proportion as the curvature of the transverse contact-lines of the central bearing of the guide-wheel is reduced. In cases where the electrical conductors of circular cross-section are already installed I convert the acute-curved transverse contact-lines of such electrical conductors into less curved transverse contact-lines by employing my improved central bearing of the guide-wheel and make it of harder material than the material of which the electrical conductor with which it revolves in contact is made.

I obtain the object of my invention by the improvements illustrated in the accompanying drawings, in which—

Figure 1 is a side view of a guide-wheel fitted with an independently-revolving central bearing which is shown to be in contact with an angular electrical conductor. Fig. 2 is a vertical section of *a b*, Fig. 1. Fig. 3 is a vertical central section of an entire guide-wheel of modified details, of which the central bearing is shown to be in contact with an electrical conductor of another angular cross-section. Fig. 4 is a vertical central section of an entire guide-wheel of other modified details, of which the central bearing is shown to be in contact with an electrical conductor of circular cross-section. Fig. 5 is a vertical central section of an entire guide-wheel of other modified details, of which the central bearing is shown to be in contact with an electrical conductor of a curvilinear cross-section other than circular. Fig. 6 is a side view in detail of the central bearing shown in Fig. 5. Fig. 7 is an end view of the central bearing shown in Fig. 6. Fig. 8 is a vertical central section of a fraction of a guide-wheel fitted with a modified central bearing in contact with an electrical conductor of another curvilinear cross-section. Fig. 9 is a vertical central section of a fraction of a guide-wheel fitted with a modified central bearing in contact with an

electrical conductor of partly-curvilinear and partly-angular cross-section. Fig. 10 is a vertical central section of a fraction of a guide-wheel fitted with a modified central bearing in contact with a rope of circular cross-section.

Similar reference-numbers denote like parts throughout the several views.

The bushing 1 (shown in Figs. 1 and 2) is made of suitable material. It is made of a shape and size to be forced into the hub 2, where it is held in its proper position by friction. The bushing is also provided with a central longitudinal hole 1′, which is intended to receive a pin or shaft (not shown) around which the bushing and the parts connected therewith may revolve.

The hub 2 (shown in Figs. 1 and 2) is made of suitable material and provided with a central longitudinal hole to receive the bushing 1. The hub is also provided near one end with a shoulder 2′ and at the other end with screw-threads 2″, adapted to fit the screw-nut 3, between which shoulder and screw-nut the separating-ring 4 and flanges 5 5 are located.

The screw-nut 3 (shown in Figs. 1 and 2) is made of suitable material and provided with screw-threads 2″ to fit the screw-threads of the hub 2. Tightening of the screw-nut 3 will press the separating-ring 4 and the flanges 5 5 against the shoulder 2′ of the hub 2, holding the different details in proper position for revolving in unity around the central axis.

The separating-ring 4, (shown in Figs. 1 and 2,) is made of suitable material. It is provided with a central longitudinal hole to admit of its being mounted upon the hub 2 between the flanges 5 5. It is made a trifle wider than the width of the central bearing 6, to the end that the latter may revolve independently between said flanges. Its circumference is finished suitably to serve as a journal for said central bearing.

The flanges 5 5 (shown in Figs. 1 and 2) are made of suitable material. They are provided with central holes to the end that they may be mounted on the hub 2. They are also provided near the central bearing 6 with small convex curves 5′ 5′, which serve to guide the guide-wheel centrally when in contact with the electrical conductor. The curved cavity 5″ 5″ of the flanges adjoining the convex curves 5′ 5′ serves to allow the guide-wheel to assume the different angles with the electrical conductor which are required to go around curves. The vertical lines 5‴ 5‴, adjoining the curves 5″ 5″, serve to prevent the guide-wheel from leaving or jumping the electrical conductor when the guide-wheel is forced sidewise by jolting or otherwise.

The central bearing 6, (shown in Figs. 1 and 2,) is made of suitable material and provided with a central hole to admit of its being mounted loosely upon the separating-ring 4, between the flanges 5 5, where it is capable of revolving independently of the flanges. The circumference of the central bearing is shown to be fitted with curved transverse contact-lines which may be generated by the radius 6′ in a manner that the central bearing becomes approximately a cylinder. When the central bearing is brought in contact with the electrical conductor and the guide-wheel is started from a state of rest, the central bearing will commence to revolve first independently of the remainder of the wheel. Then when the inertia of the heavier collective mass of the other parts of the guide-wheel is overcome by the friction of the revolving central bearing upon the separating-ring and the other joints in contact therewith the whole wheel will gradually commence to revolve around its central axis until it has obtained its maximum velocity. When one or the other convex curves 5′ 5′ of the flanges is brought in contact with the sides of the electrical conductor or moving rope by a lateral motion, it will cause an independent and faster revolution of the central bearing 6 than the revolution of the adjoining flanges 5 5. Thereby the slipping and abrasion of the electrical conductor and of the central bearing of the guide-wheel may be reduced to a minimum.

The guide-wheels which are shown completely by central vertical sections of all their circular parts in Figs. 3, 4, and 5, are modifications of the guide-wheel shown in Figs. 1 and 2.

The bushing 8 (shown in Fig. 3) is made of suitable material and fitted into the hub 9, where it is held in proper position by friction. The bushing is also provided with a central longitudinal hole, which is fitted to receive a pin or shaft (not shown) around which the bushing and the parts connected therewith may revolve.

The hub 9 (shown in Fig. 3) is made of suitable material and provided with a central longitudinal hole to retain the bushing 8. Its circumference is suitably finished for pressing it into the central hole of the central bearing 10, into the central holes of the flanges 11, and into the central holes of the clamping-rings. After the different details are placed on the hub in their proper position the heads 9′, which are then made at each end of the integral part of the hub, serve to hold the details together.

The clamping-rings 12 12 (shown in Fig. 3) are made of suitable material and provided with central holes into which the hub 9 is pressed. The flanges, the central bearing, and the hub are held in their proper position by forming heads of the integral part of the hub 9 into the recesses 9′ 9′ of the clamping-rings, as shown.

The flanges 11 11 (shown in Fig. 3) are made of suitable material. They are provided with central holes for mounting upon the hub 9.

They are also provided with curved and straight lines which form the outline of the cavity for guiding the electrical conductor to the central bearing.

The central bearing 10 (shown in Fig. 3) is fitted to revolve in unity with the flanges 11 11. It is provided with transverse contact-lines which may be generated by radii like 6′, (shown in Fig. 2,) making it an approximate cylinder. It is provided with curved circular projections 10′ 10′, which serve to restrain the guide-wheel laterally by contact with the sides of the electrical conductor or moving rope, &c., near the circumference of the central bearing. For the purpose of reducing slipping and abrasion of the metals of the electrical conductor or moving rope and the central bearing of the guide-wheel I make the projections 10′ 10′ of such curvature that they present their contact-lines to the sides of the electrical conductor or moving rope as near as practicable to the circumference of the central bearing. The contact-lines of the projections being made of small dimensions will wear away very rapidly if made of ordinary soft material. Therefore I make the central bearing and the projections 10′ 10′ of harder material than the material of which the electrical conductor is made.

The guide-wheel, Fig. 4, is completely shown in all its parts by a vertical central section.

The bushing 14 (shown in Fig. 4) is made of suitable material and of a shape and size to be forced into the hub 15, where it is held by friction. The bushing is also provided with a central longitudinal hole, which is intended to receive a pin or shaft, around which the bushing and the parts connected therewith may revolve.

The flanges 15 15 (shown in Fig. 4) are provided with projections 15′ 15′, which serve as a hub, which is fitted with a central longitudinal hole to receive the bushing 14. The flanges are also provided with projections 15″ 15″, which are fitted for mounting the central bearing 16 and the circular projections 17 17. Each flange is also provided with proper curves and straight lines which form a cavity for the purpose of guiding and angular accommodation of the electrical conductor or moving rope. The flanges 15 15, the central bearing 16, and the circular projections 17 17 are held laterally together by the rivets 19 19.

The central bearing 16 (shown in Fig. 4) is made of suitable material and fitted to revolve in unity with the flanges 15 15. It is provided with a longitudinal hole, which is fitted to receive the projections 15″ 15″ of the flanges, whereby it is restrained centrally. The circumference of the central bearing may be fitted with any form of suitable transverse contact-lines; but for an illustration I have shown it to be provided with curved transverse contact-lines which may be generated by a radius 6′. (Shown in Fig. 2.) It may be used in connection with electrical conductors, for example, of circular cross-section, as shown by 20, which are already installed. This central bearing is made of harder material than the material of which the electrical conductor with which it may revolve in contact is made for the purpose of crushing and rolling the acute curves of the transverse contact-lines of the electrical conductor into the less curved form of the transverse contact-lines of the central bearing. This design is practicable for all ordinary purposes, as explained; but when the central bearing is made of very hard material and the transverse contact-lines generated by a long radius its contact with a small circular conductor will present a contact which is too small to transmit the required flow of the electrical current from the electrical conductor to a large fast-running motor without undue heating and burning the metals in contact. When it is used for such purposes, the circumference of the central bearing is fitted with a compensating ring 18, which may be made of a material, such as soft copper, which is a good conductor of electricity and softer than the material of which the electrical conductor is made. I provide this compensating ring with a circumferential groove to fit the acute curve of the electrical conductor 20 in a manner that the electrical conductor receives a contact of the hard circumference of the central bearing and a contact of the softer compensating ring at the same time. The compensating ring 18 being made of softer material than the material of which the electrical conductor is made will gradually wear away and subject the contact-lines of the electrical conductor to the full pressure with which the central bearing is pressed against the electrical conductor. Thereby an increased contact area is obtained, and the acute curves of the electrical conductor are first crushed and then gradually rolled into the shape of the less curved transverse contact-lines of the central bearing. In order to fit the compensating ring 18 upon the central bearing conveniently, I make the circular projections 17 17 separate from the central bearing and mount them upon the projections 15″ 15″ of the flanges in a manner that they adjoin the central bearing. The projections 17 17 are also made of harder material than the material of which the elecrical conductor is made and are separated from each other more than the transverse distance between the contact-lines of the sides of the electrical conductor with which they may revolve in contact for the purpose of preserving the small contact-lines which are brought in contact with the sides of the electrical conductor. This central bearing is shown to be provided with suitable holes to receive the rivets 19 19, which hold the central bearing and the flanges in their proper lateral position.

It is well known by men versed in the science of electrical engineering that the circular electrical conductors for overhead trolley-lines are generally made of copper, which is drawn through a series of reducing-dies, which process makes the copper harder than soft iron or steel, of which material some of the central bearings of trolley-wheels are made. Heretofore some central bearings of trolley-wheels have been made of softer material than the material of which the electrical conductor with which they may revolve in contact is made, and at the same time they are provided with transverse contact-lines of which the curvature is greater than the circular curvature of the same electrical conductor. Other central bearings of trolley-wheels have heretofore been made of harder material than the material of which the electrical conductor with which it may revolve in contact is made, but at the same time they are provided with transverse contact-lines which are curved to embrace closely the circular curvature of the same electrical conductor—for example, as shown by the compensating ring 18 and the electrical conductor 20; but none of the trolley-wheels have heretofore been made with a central bearing which is made of harder material than the material of which the electrical conductor with which they may revolve in contact is made and at the same time provided with transverse contact-lines of which the curvature is greater than the circular curvature of the same electrical conductor. It is also well known that overhead electrical conductors of various diameters are used by different trolley-railroad companies. Therefore the transverse contact-lines of the central bearings of trolley-wheels have heretofore been made of different curvatures, all of which I do not claim as my invention; but I claim to be the inventor of the combination of a guide-wheel having a central bearing which is made of harder material than the material of which the electrical conductor with which it may revolve in contact is made in combination with transverse contact-lines of the guide-wheel's central bearing, of which the curvature is greater than the circular curvature of the same electrical conductor.

The guide-wheel shown in Fig. 5 is also shown in vertical central section of all its circular parts.

The flanges 21 21 (shown in Fig. 5) are made of suitable material and are united into a solid wheel by the web 21′. The web 21′ is also connected solidly to the hub 21″, which hub is properly fitted with a central longitudinal hole to receive the bushing 22. Between the flanges 21 21 is provided a circumferential recess for the purpose of receiving the central bearing 23, which is made in the form of a circular ring and cut in two parts, as shown in Figs. 6 and 7, and secured in the recess by screws 24 24. The heads of the screws are recessed into the circumference of the central bearing, as shown by 24′ 24′. The cavity of the flanges 21 21 is provided with similar curves and straight lines and for the same purpose as shown in Figs. 2, 3, 4, and 5.

The bushing 22 (shown in Fig. 5) is made of suitable material and fitted similar and for the same purpose as the bushing shown in Figs. 1 and 2.

The fraction of the vertical section of the central bearing 26 (shown in Fig. 8) is a modification of the central bearings shown in Figs. 1, 2, and 3. It is made an integral part of the adjoining flanges 27 27. The curved transverse contact-lines of this central bearing may be generated by the radius 26′. They are made only slightly less curved than the acute curved transverse contact-lines of the circular electrical conductor 20. (Shown in Fig. 4.) Instead of employing the compensating ring 18, Fig. 4, central bearings, which are provided with curved transverse contact-lines like those shown in Fig. 8 and which are made of harder material than the material of which the circular electrical conductor is made, may be employed for converting acute curved transverse contact-lines of an electrical conductor, such as 20, (shown in Fig. 4,) into less-curved transverse contact-lines, such as shown in Figs. 1, 2, 3, and 5, by employing in succession central bearings for that purpose which are provided with curved transverse contact-lines of decreasing curvature.

The electrical conductor 28 (shown in Fig. 8) is made of suitable material and of a circular cross-section except the curved transverse contact-lines, which may be described by a radius 26′, which is only a trifle longer than the radius 28 of the circular conductor. By reducing the curvature of the curved transverse contact-lines of the electrical conductor and of the central bearing of the guide-wheel even the trifle as shown in Fig. 8 it reduces the slipping and abrasion of the metals in contact to the extent shown by the dotted curved line 28′.

The fraction of the vertical section of the central bearing 29 (shown in Fig. 9) is a modification of the central bearing shown in Figs. 1, 2, and 3. It is made an integral part of the adjoining flanges 30 30. The curved transverse contact-lines of this central bearing are composed of several curves angular to one another, which may be described by an arc 30′ of less curvature than the curves of the transverse contact-lines of an electrical conductor of circular cross-section, (shown by 31.)

The electrical conductor 31 (shown in Fig. 9) is provided with a circular cross-section, except the transverse contact-lines, which are angular and may be described by an arc of a circle, shown by the dotted lines 30′.

The fraction of the vertical section of the central bearing 32 (shown in Fig. 10) is a

modification of the central bearing shown in Figs. 1, 2, and 3. It is made an integral part of the adjoining flanges 33 33. The curved transverse contact-lines of this central bearing may be generated by the radius 34′, which is a trifle longer than the radius 34″, by which the circular circumference of the electrical conductor or rope may be described, which is shown to be in contact with the transverse contact-lines of the central bearing of the wheel. The short arc of the transverse contact-lines 32, which is shown in Fig. 10 as intercepted by the two radii 34′ 34′, is of such small magnitude that the pressure with which the guide-wheel and the electrical conductor or rope 34′ are forced together crushes the ordinary soft metal in contact. In course of the revolutions of the central bearing of the guide-wheel the electrical conductor or rope exposes repeatedly new uncrushed transverse contact-lines to the crushed transverse contact-lines of the central bearing. The effect of this action is that the transverse contact-lines of the central bearing are crushed deeper and deeper until they are of sufficient magnitude to prevent further crushing. Thereafter the transverse contact-lines are gradually deepened by abrasion into the circumference of the central bearing of the guide-wheel until the electrical conductor 34 is embedded into the groove 34‴ (shown by the dotted curved line) to its semicircumference. In this state of the central bearing the curved transverse contact-lines at the bottom of the groove will revolve with less velocity than the extreme ends of the contact-lines by a difference equal to the length of the radius of the electrical conductor or rope, with which it may revolve in contact. The slipping and abrasion of the metals in contact are then at their maximum, and the central bearings of the wheels and the transverse contact-lines of the electrical conductor or rope are thereafter destroyed very rapidly.

The electrical conductor or rope 34 (shown in Fig. 10) is of ordinary construction. It is used in connection with this figure for the purpose of illustration.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A guide-wheel for use with an electrical conductor, rope or the like, having a central bearing which is provided with transverse contact-lines which are less curved than the same length of an arc of the largest circle which may be inscribed in the boundary of the cross-section of an electrical conductor, rope or the like, with which the central bearing may revolve in contact, the central bearing being made of harder material than the material of which the electrical conductor, rope or the like with which the central bearing may revolve in contact, is made, for the purpose specified.

2. A guide-wheel for use with an electrical conductor, rope or the like, having a central bearing which is provided with transverse contact-lines which are less curved than the same length of an arc of the largest circle which may be inscribed in the boundary of the cross-section of an electrical conductor, rope or the like, with which the central bearing may revolve in contact; shoulders which adjoin and project beyond the central bearing, but which are of smaller diameter than the largest diameter of circular flanges of the guide-wheel, for the purpose specified.

3. A guide-wheel for use with an electrical conductor, rope or the like, having a central bearing which is provided with transverse contact-lines which are less curved than the same length of an arc of the largest circle which may be inscribed in the boundary of the cross-section of an electrical conductor, rope or the like, with which the central bearing may revolve in contact, convex curves which adjoin and project beyond the central bearing and which are located near the bottom of the cavity between circular flanges of the guide-wheel, for the purpose specified.

4. A guide-wheel for use with an electrical conductor, rope or the like, having a central bearing which is provided with transverse contact-lines which are less curved than the same length of an arc of the largest circle which may be inscribed in the boundary of the cross-section of an electrical conductor, rope or the like, with which the central bearing may revolve in contact, the central bearing being made of harder material than the material of which the electrical conductor, rope or the like, with which the central bearing may revolve in contact is made; flanges which project beyond the circumference of the central bearing, a hub, for the purpose specified.

5. A guide-wheel for use with an electrical conductor, rope or the like, having a central bearing which is provided with transverse contact-lines which are less curved than the same length of an arc of the largest circle which may be inscribed in the boundary of the cross-section of an electrical conductor, rope or the like, with which the central bearing may revolve in contact, and which is made of harder material than the material of which the electrical conductor, rope or the like, with which the central bearing revolves in contact, is made, flanges which project beyond the circumference of the central bearing, for the purpose specified.

6. A guide-wheel for use with an electrical conductor, rope or the like, having a central bearing which is provided with transverse contact-lines which are less curved than the same length of an arc of the largest circle which may be inscribed in the boundary of the cross-section of an electrical conductor, rope or the like, with which the central bearing may revolve in contact, flanges which are fitted with convex curves near the central bearing, con-

cave curves joined thereto and straight lines near their largest diameters, for the purpose specified.

7. A guide-wheel for use with an electrical conductor, rope or the like, having a central bearing which is provided with transverse contact-lines which are less curved than the same length of an arc of the largest circle which may be inscribed in the boundary of the cross-section of an electrical conductor, rope or the like, with which the central bearing may revolve in contact, flanges which are fitted with convex curves near the central bearing and concave curves joined thereto, for the purpose specified.

8. A guide-wheel for use with an electrical conductor, rope or the like, having a central bearing which is provided with transverse contact-lines which are less curved than the same length of an arc of the largest circle which may be inscribed in the boundary of the cross-section of an electrical conductor, rope or the like, with which the central bearing may revolve in contact, flanges which are provided with a cavity which is composed of straight lines near their largest diameter, and concave lines joined thereto nearer the central bearing, for the purpose specified.

9. A guide-wheel for use with an electrical conductor, rope or the like, having a hub which is provided at each end with a head made of the integral part of the hub, an independently-fitted central bearing, for the purpose specified.

10. A guide-wheel for use with an electrical conductor, rope or the like, having a hub which is provided at each end with a head made of the integral part of the hub, independently-fitted flanges, for the purpose specified.

11. A guide-wheel for use with an electrical conductor, rope or the like, having a central bearing which is provided with transverse contact-lines which are less curved than the same length of an arc of the largest circle which may be inscribed in the boundary of the cross-section of an electrical conductor, rope or the like, with which the central bearing may revolve in contact, a hub which is fitted with a screw-nut, for the purpose specified.

12. A guide-wheel for use with an electrical conductor, rope or the like, having a central bearing which is provided with transverse contact-lines which are less curved than the same length of an arc of the largest circle which may be inscribed in the boundary of the cross-section of an electrical conductor, rope or the like, with which the central bearing may revolve in contact, a hub which is fitted with a shoulder at one end and a screw-nut at the other end, for the purpose specified.

13. A guide-wheel for use with an electrical conductor, rope or the like, having a central bearing which is provided with transverse contact-lines which are less curved than the same length of an arc of the largest circle which may be inscribed in the boundary of the cross-section of an electrical conductor, rope or the like, with which the central bearing may revolve in contact, bolts located between the central bearing and the hub, for the purpose specified.

14. A guide-wheel composed of a central bearing of which the transverse contact-lines are less curved than the same length of an arc of the largest circle which may be inscribed in the boundary of the cross-section of an electrical cenductor, rope or the like, with which it may revolve in contact; a separating-ring; a hub; a bushing; flanges which project beyond the transverse contact-lines of the central bearing; means for connecting the details together; and means for guiding them from a common axis, for the purpose specified.

15. A guide-wheel composed of a central bearing of which the transverse contact-lines are less curved than the same length of an arc of the largest circle which may be inscribed in the boundary of the cross-section of an electrical conductor, rope or the like, with which it may revolve in contact; a hub; a bushing; flanges which project beyond the transverse contact-lines of the central bearing; means for connecting the details together; and means for guiding them from a common axis, for the purpose specified.

16. A guide-wheel which is composed of a central bearing of which the transverse contact-lines are less curved than the same length of an arc of the largest circle which may be inscribed in the boundary of a cross-section of an electrical conductor, rope or the like, with which it may revolve in contact; a hub; flanges which project beyond the transverse contact-lines of the central bearing; means for connecting the details together; and means for guiding them from a common axis, for the purpose specified.

In witness whereof I have signed my name.

ALEXANDER H. MATHESIUS.

Witnesses:

G. A. MATHESIUS,

I. S. RAUMAN.

Disclaimer in Letters Patent No. 754,473.

DISCLAIMER.

754,473.—*Alexander H. Mathesius*, Brooklyn, N. Y. GUIDE-WHEELS. Patent dated March 15, 1904. Disclaimer filed September 24, 1910, by the inventor.

Enters this disclaimer to those parts of the specification and claims of said Letters Patent which are in the following words:

Page 1, line 12, moving rope, or the like;
Page 1, lines 39 and 40, guide, or rope;
Page 1, line 44, guide-rope, or the like;
Page 1, line 54, &c.;
Page 2, lines 5 and 6, in contact with a rope of circular cross-section;
Page 2, line 87, or moving rope;
Page 3, lines 13 and 14, or moving rope, &c.;
Page 3, line 17, or moving rope;
Page 3, line 21, or moving rope;
Page 3, lines 51 and 52, or moving rope;
Page 5, line 8, or rope;
Page 5, line 16, or rope;
Page 5, line 20, or rope;
Page 5, line 43, or rope;
Page 5, line 45, or rope;
Page 5, line 52, rope or the like;
Page 5, lines 57 and 58, rope or the like;
Page 5, lines 61 and 62, rope or the like;
Page 5, line 66, rope or the like;
Page 5, lines 71 and 72, rope or the like;
Page 5, line 79, rope or the like;
Page 5, lines 84 and 85, rope or the like;
Page 5, line 92, rope or the like;
Page 5, lines 97 and 98, rope or the like;
Page 5, lines 101 and 102, rope or the like;
Page 5, line 107, rope or the like;
Page 5, lines 112 and 113, rope or the like;
Page 5, line 116, rope or the like;
Page 5, line 122, rope or the like;
Page 5, lines 127 and 128, rope or the like;
Page 6, line 5, rope or the like;
Page 6, lines 10 and 11, rope or the like;
Page 6, line 17, rope or the like;
Page 6, lines 22 and 23, rope or the like;
Page 6, line 30, rope or the like;
Page 6, line 36, rope or the like;
Page 6, line 41, rope or the like;
Page 6, lines 46 and 47, rope or the like;
Page 6, line 51, rope or the like;
Page 6, lines 56 and 57, rope or the like;
Page 6, line 62, rope or the like;
Page 6, lines 67 and 68, rope or the like;
Page 6, line 77, rope or the like;
Page 6, line 89, rope or the like;
Page 6, line 101, rope or the like.

(OFFICIAL GAZETTE, *October 4, 1910.*)

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