

No. 661,600.

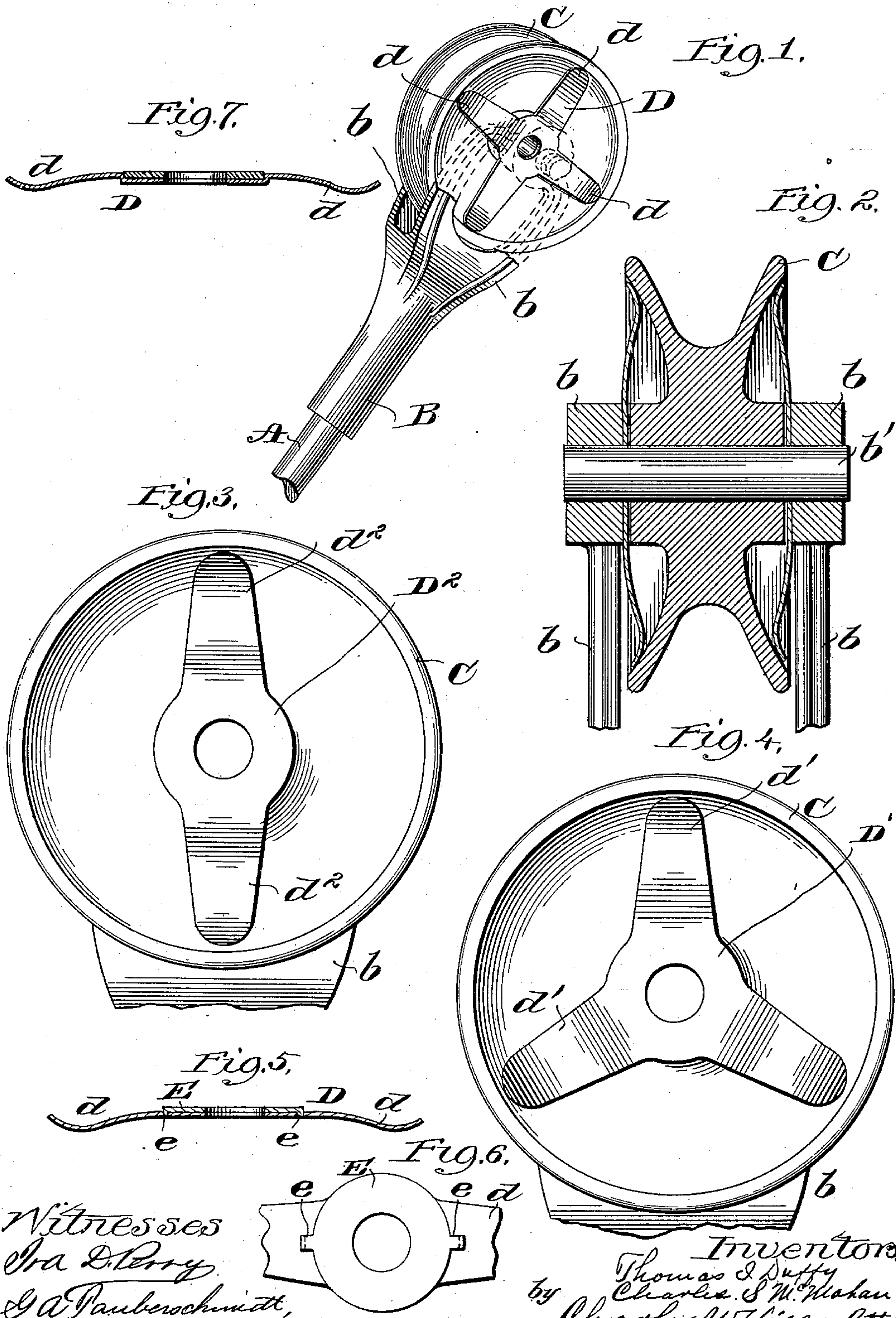
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TROLLEY WHEEL.

(Application filed July 16, 1900.)

(No Model.)



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TROLLEY-WHEEL.

SPECIFICATION forming part of Letters Patent No. 661,600, dated November 13, 1900.

Application filed July 16, 1900. Serial No. 23,789. (No model.)

To all whom it may concern:

Be it known that we, THOMAS I. DUFFY and CHARLES SIMS McMAHAN, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Electrical Contact-Springs for Trolley-Wheels, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Our invention relates to improvements in electrical contact-springs for trolley-wheels of that class adapted to hold said trolley-wheel true upon its bearing and at all times to provide a perfect electrical contact therewith and with the trolley-harp. Heretofore it has been usual to employ leaf-springs of conducting material for this purpose, said springs being riveted in the lower part of a harp, on each side thereof, and extending upwardly and adapted normally to press centrally on each side of said trolley-wheel. Springs of this sort have been subject to many objections, one of which was their short life, the same being subject not only to the frictional wear at the axis of the trolley-wheel, but also inasmuch as the same extend downwardly on each side between the trolley-wheel and the harp-arms the same were frequently subject to wear from contact with the periphery of the wheel. Said springs are in this way frequently cut in two, thereby destroying the efficiency of the contact, entailing in consequence not only a considerable item of expense for repairs, but when delays are considered a serious and vexatious source of annoyance as well. Our invention obviates these difficulties and consists in the matters hereinafter described, and more fully pointed out and defined in the appended claims.

In the drawings, Figure 1 is a perspective view of a device embodying our invention. Fig. 2 is a vertical section of the same, taken on a plane of the axis. Fig. 3 is a side elevation provided with one form of the contact-spring. Fig. 4 is a similar view showing said electrical contact-spring as provided with three radial arms. Fig. 5 is a longitudinal sectional view of the spring, illustrating a de-

tail of our invention. Fig. 6 is a plan view of the same. Fig. 7 is a sectional view similar to Fig. 5, illustrating means of applying a supplemental washer thereto.

As shown in the said drawings, A indicates a trolley-pole.

B indicates the trolley-harp, of familiar form and secured on the outer end of said trolley-pole and provided with upwardly-extending lateral arms *b b*, provided at the upper extremities of the same with a transverse bore adapted to receive the trolley-pivot *b'*. A grooved trolley-wheel C, of familiar form, is rotatively secured on said trolley-pivot. The width or distance between the outer ends of said harp-arms *b b* is somewhat greater than the length of the axis of said trolley-wheel, thereby providing a space between the inner surface of said harp-arms and the hub of said wheel sufficient to receive the spring D. Said spring is preferably constructed of spring-copper or other suitable conducting material and is provided with a central aperture adapted to receive the trolley-pivot. The spring is bowed or crowned outwardly near its center and adapted to press with its outer side against the inner side of the harp-arm adjacent to the pivot-pin and equally spaced about said center. As shown in Fig. 1, a plurality of radial arms *d d* are provided, which, as shown, are slightly upturned at the outer ends to afford a larger contact-surface with the trolley-wheel, which said arms firmly engage near its rim. Obviously any desired number of arms may be employed; but preferably three or more are used to hold the trolley-wheel true upon its pivot after the same has become slightly worn.

With the construction described any desired pressure may be brought to bear upon the trolley-wheel and in the inner side of the harp-arm, thereby assuring at all times perfect contact. Said springs will not be subject to wearing contact with the rim of the wheel, inasmuch as the frictional area is approximately equal to that at the center bearing. The distance of the extremities of said arms from the pivot afford a considerable leverage, thereby insuring that with approximately equal frictional contact said spring will turn against the inner surface of the

harp-arm. Means are provided for protecting said central part of the spring from wear against the inner side of the arm as follows: One or more small apertures are provided through said spring adjacent to the pivot-aperture, and a washer E, apertured to correspond with said pivot-aperture, is provided with lugs *e e*, adapted to be inserted in said small apertures and to afford means for attaching the same to the spring. Said washer when in position provides a supplemental wearing-surface for contact with the inner surface of the harp-arm, and inasmuch as the contact-surface between said two parts is of necessity, owing to their frictional contact at all times, bright, and said parts being pressed firmly together, the said washer, if desired, may be made materially harder than the spring proper without affecting its conducting power. If preferred, said washer may be retained in a central depression similar to that illustrated in Fig. 7 and when placed within the same may be efficiently held therein by contact with said spring and the harp-arm. If preferred, however, the same may obviously be secured in said depression by means of lugs, as before described, or any other preferred means of securing the said washer in position may be used as preferred. Obviously if said washer is not secured rigidly to said spring the same may be renewed at intervals at a materially less cost than the cost of said spring.

We claim as our invention—

1. An electrical contact-spring for trolley-wheels, comprising a plate of conducting material provided with a central pivot-aperture and adapted to press against the inner side of a harp-arm adjacent to said pivot, a contact-washer also of conducting material secured centrally on said spring and adapted for contact with said harp-arm and a plurality of electrical conducting radial spring-arms integral with said plate and curved on one side of the plane of the same and adapted to engage with their outer ends a trolley-wheel near its periphery at a point equally spaced about the wheel and acting to press said wheel oppositely from the harp-arm.
2. An electrical contact-spring for trolley-wheels, comprising an outwardly-dished plate

of conducting material adapted to be secured on a trolley-pivot between the harp-arm and the trolley-wheel and provided on its outer side with a depression adapted to receive a washer also of conducting material adapted for contact with a harp-arm at a point adjacent to the trolley-pivot, a plurality of inwardly-curved radial spring-arms integral with said plate and adapted to engage with their outer ends and press inwardly a trolley-wheel or the like, said arms being spaced at equal distances around the wheel.

3. The combination with a trolley-harp having a trolley-wheel pivoted therein, of an electrical contact-spring centrally apertured and adapted to be secured on each side of said trolley-wheel between the hub of the same and an arm of said harp and springs being outwardly dished near the center and adapted to pass outwardly against the harp-arm and having a plurality of inwardly-bent radial arms adapted to engage and pressing inwardly on said trolley-wheel near the periphery of the same, and a washer of conducting material removably secured on the trolley-pivot between the trolley-wheel and the harp and acting to afford electrical contact with each, while obviating wear on the spring.

4. The combination with a trolley-harp having a trolley-wheel pivoted thereon, of an electrical contact-spring centrally apertured and adapted to be secured on each side of said trolley-wheel between the hub of the same and said harp-arm said springs being outwardly dished near the center and adapted to press outwardly on the harp-arm and having a plurality of equally-spaced inwardly-bent radial arms adapted to engage and pressing inwardly on said trolley-wheel near the periphery of the same, and a hardened washer of conducting material bedded in said spring and removably secured to the same between the same and the harp-arm.

In testimony whereof we have hereunto subscribed our names in the presence of two subscribing witnesses.

THOMAS I. DUFFY.

CHARLES S. McMAHAN.

In presence of—

CHARLES W. HILLS,
LOUIS J. DELSON.