

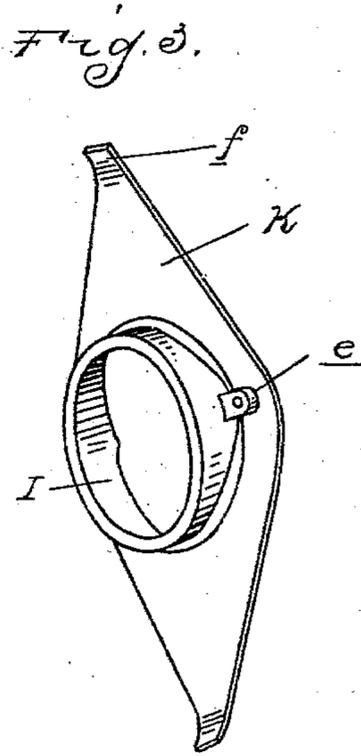
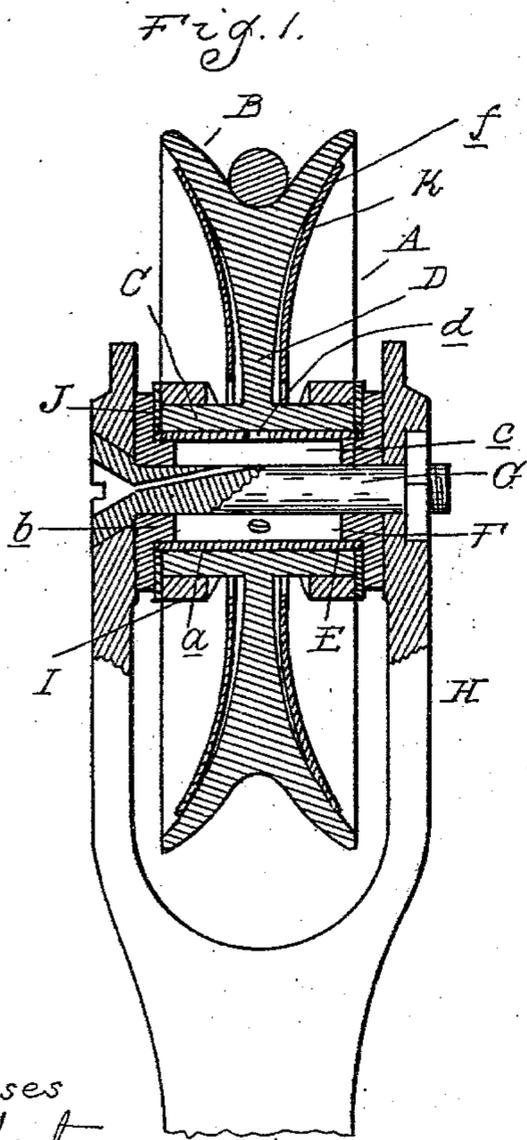
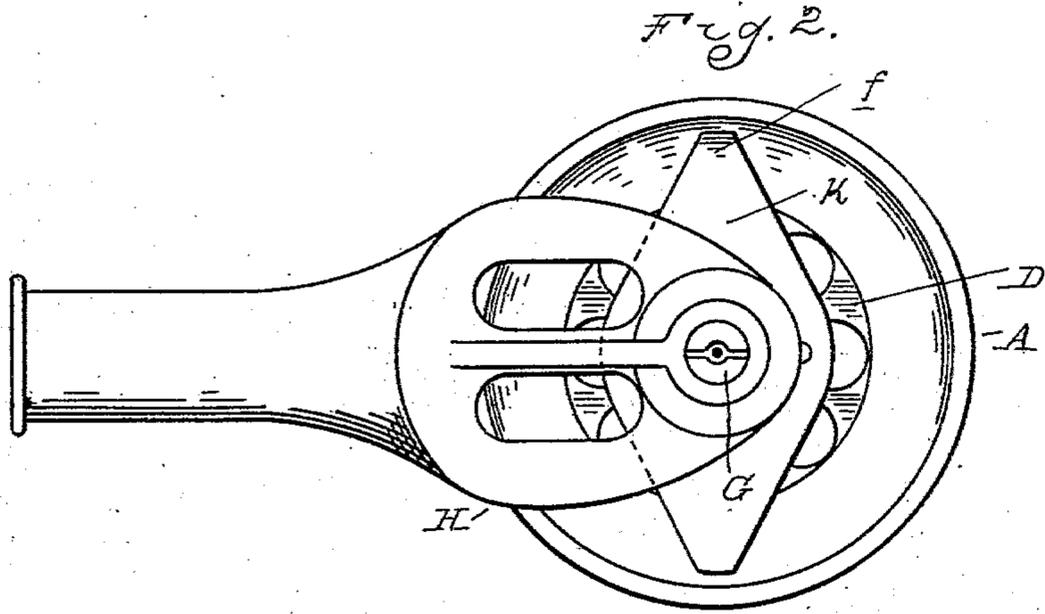
No. 745,614.

PATENTED DEC. 1, 1903.

H. HOLLAND.
TROLLEY.

APPLICATION FILED NOV. 11, 1902.

NO MODEL.



Witnesses
T. M. O'Gherly
A. S. Robertson

Inventor
Henry Holland
 By *A. S. Macquison*
 attys.

UNITED STATES PATENT OFFICE.

HENRY HOLLAND, OF DETROIT, MICHIGAN.

TROLLEY.

SPECIFICATION forming part of Letters Patent No. 745,614, dated December 1, 1903.

Application filed November 11, 1902. Serial No. 130,889. (No model.)

To all whom it may concern:

Be it known that I, HENRY HOLLAND, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Trolleys, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to improvements in trolleys; and it is the special object of the invention to provide means for conducting the current from the trolley-wheel directly to the "harp" or supporting-bearing upon the trolley-pole without the intervention of the lubricated bearing.

In the present state of the art it is common in the construction of trolleys to provide a hollow spindle or journal upon which the trolley-wheel revolves, the chamber within the hollow spindle being filled with lubricant, which passes out through the apertures therein and covers the bearing-surface of the wheel. As a consequence the current conducted from the trolley to the harp is obliged to pass through a film of lubricant which is of high electrical resistance. Moreover, there is danger of arcing of the current, with the result that the lubricant is carbonized and the contacting surface injured.

The present invention consists, essentially, in providing a contact member which bears upon the harp independent of the running-bearing of the trolley-wheel thereon, said contact having electrical connection with the trolley-wheel, which is also independent of the bearing.

The invention further consists in a construction in which this current-conducting contact is constantly pressed against the corresponding bearing-surface on the harp and has a lateral movement independent of that of the trolley, so as to automatically take up wear.

Still further, the invention consists in the means employed for conducting the current from the outer portion of the trolley-wheel to said contact, and, further, in the peculiar construction, arrangement, and combination of parts, as hereinafter described and claimed.

In the drawings, Figure 1 is a longitudinal central section through the trolley harp and

wheel. Fig. 2 is a side elevation thereof. Fig. 3 is a perspective view of the spring.

A is a trolley-wheel, which may be of any suitable construction and is provided with the usual peripheral groove B for engagement with the trolley-wire. As shown, the bearing of the wheel is formed by hubs C, projecting laterally from opposite sides of the central web D of the wheel and centrally apertured at E to fit the journal F. This journal, as shown, comprises the tube *a*, which at opposite ends fits over bearings upon caps or washers *b*, while the latter are sleeved upon the central bolt G.

H is the trolley-harp, which also may be of any suitable construction, but preferably, as shown, bears directly against the washers *b* and is clamped thereto by the bolt G. The chamber *c* within the tube *a* is filled with lubricant, and this passes outward through apertures *d*, so as to lubricate the running-surfaces. The proportion of the parts above described is such that when the bolt G is tightened to clamp the bifurcations of the harp H against the washers *b* the hubs C of the trolley will freely revolve upon the tube *a* without any binding of the washers *b* against the ends of the hubs. As a consequence the lubricant will pass freely not only between the tube *a* and the wheel, but also around the ends of the hubs C.

With the construction as thus far described it is evident that after the trolley has been in use for some time, so that the wearing-surfaces become worn, there is danger of separation between the wheel and its bearing, which will result in the arcing of the current. Moreover, as above stated, all of the surfaces of the wheel being covered with lubricant further resistance to the passage of the current is offered. To overcome these difficulties, I have provided a contact, which revolves with the wheel and bears against the harp, said contact being entirely external to the running-bearing of the wheel on the harp. As shown, this contact is formed by an annular member I, which surrounds the hub C and bears at its outer end against an annular surface on the harp. In order to provide a better bearing-surface, I preferably employ a washer J, which is interposed between the annular member I and the caps or washers *b*;

but these washers J are not an absolute necessity. For pressing the annular contact I outward against its bearing a spring is employed, preferably as shown at K, and formed of resilient sheet metal. In the construction shown this spring K also serves as the electric conductor for conveying the current from the trolley-wheel to the annular member I. It is obvious, however, that separate means might be employed for pressing the contact against its bearing and for conveying the electric current thereto. As shown, the spring K is apertured to surround the hub C and is electrically connected to the annular contact I, preferably by brazing or soldering to lugs e, projecting from said contact. From the center portion outward the spring preferably tapers, as shown, while its outer ends f bear upon the rim of the trolley-wheel and form an electric connection therewith, which is sufficient to convey the entire current. The construction being, as described, in operation, the current passing from the trolley wire to the wheel will be directly conducted by the spring K to the annular contact member I. On account of the resiliency of the member K and from the fact that it is flexed in the placing of the member I around the hub said member will be constantly pressed against the washer J, while the latter will be held in firm contact with the washer or cap b. This closed contact will be maintained even after the parts become worn through constant use. From the fact that the bearing of the contact I is much nearer the center of the wheel than the bearing-points f of the spring K the said spring will be caused to revolve with the wheel, and the sliding will be between the contact I and the washer J.

40 What I claim as my invention is—

1. In a trolley the combination with the wheel and the harp in which it is journaled of a yieldable contact having constant metallic electrical connection with said wheel external to the journal therefor, and means for holding said contact in constant contact with said harp external to the journal, and whereby the contact may rotate with the wheel.

2. In a trolley the combination with the wheel and the harp in which it is journaled of an annular contact surrounding and slidable upon the hub of the wheel and having constant electrical connection with said wheel, a cooperating annular bearing upon said harp and means for holding said annular contact in constant traveling contact with said annular bearing.

3. In a trolley the combination with the wheel and the harp in which it is journaled of an annular contact surrounding and slidable upon the hub of said wheel, a cooperating annular bearing on the harp and a resilient member connected to said contact and bear-

ing against said wheel said member forming a constant electrical connection with said wheel and also pressing said annular contact constantly against said annular bearing to maintain uninterrupted electrical connection.

4. In a trolley the combination with the harp and the wheel journaled therein comprising a hub portion and the grooved flanged portion of an annular contact surrounding and slidable upon said hub, a cooperating annular bearing on the harp, and resilient conductor-arms extending oppositely from said contact and bearing against the flange of the wheel for the purpose described.

5. In a trolley, the combination of a trolley-wheel, a harp in which said trolley-wheel is journaled, a contact-piece slidably mounted upon the hub of the wheel bearing against the inner face of the harp at the hub of the wheel, and a spring contacting the inner face of the trolley-wheel, which presses the contact-piece constantly against the harp.

6. In a trolley, the combination of a trolley-wheel, a harp in which said trolley-wheel is journaled, a removable contact-ring mounted upon and surrounding the hub of the wheel and bearing against the inner face of the harp and a spring contacting the inner face of the trolley-wheel which presses the ring against the harp.

7. In a trolley, the combination of a trolley-wheel, a harp in which said trolley is journaled, a contact-ring embracing the hub of the wheel and into which said hub projects, said ring bearing against the inner face of the harp and a spring to keep it in contact with the inner face of the harp and bearing with its ends against the inner face of the wheel.

8. In a trolley, the combination with the wheel and the harp in which it is journaled, of a yieldable contact surrounding and movable upon the hub of said wheel and having constant metallic electrical connection with said wheel external to the running-bearing of the wheel on the harp.

9. In a trolley, the combination of a trolley-wheel, the harp in which it is journaled, a contact-piece movably mounted upon the wheel and bearing against the inner face of the harp external to the running-bearing of the wheel on the harp, and a spring contacting the inner face of the trolley-wheel, which presses the contact-piece constantly against the harp.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY HOLLAND.

Witnesses:

M. B. O'DOGHERTY,
A. G. ROBERTSON.