

No. 698,979.

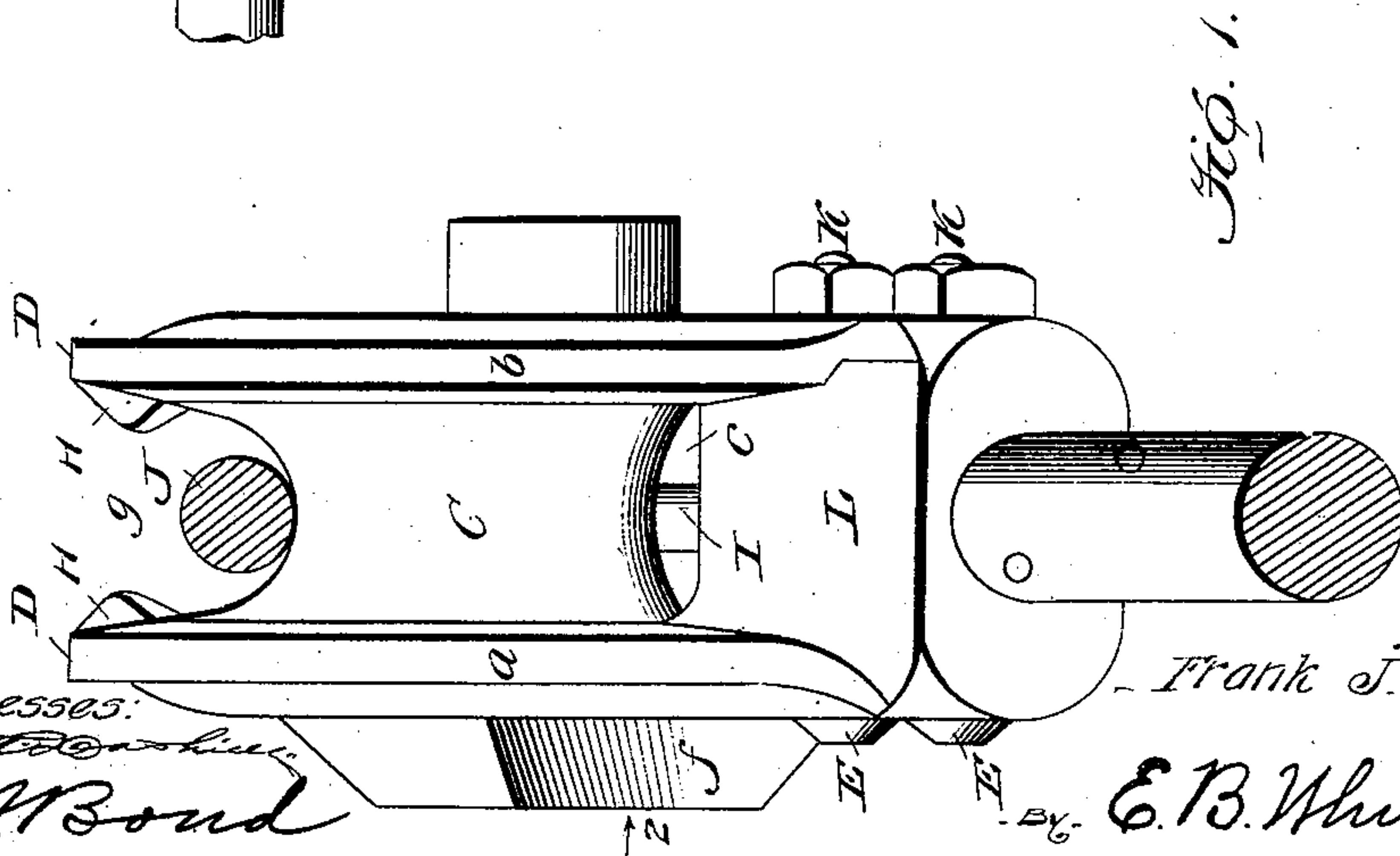
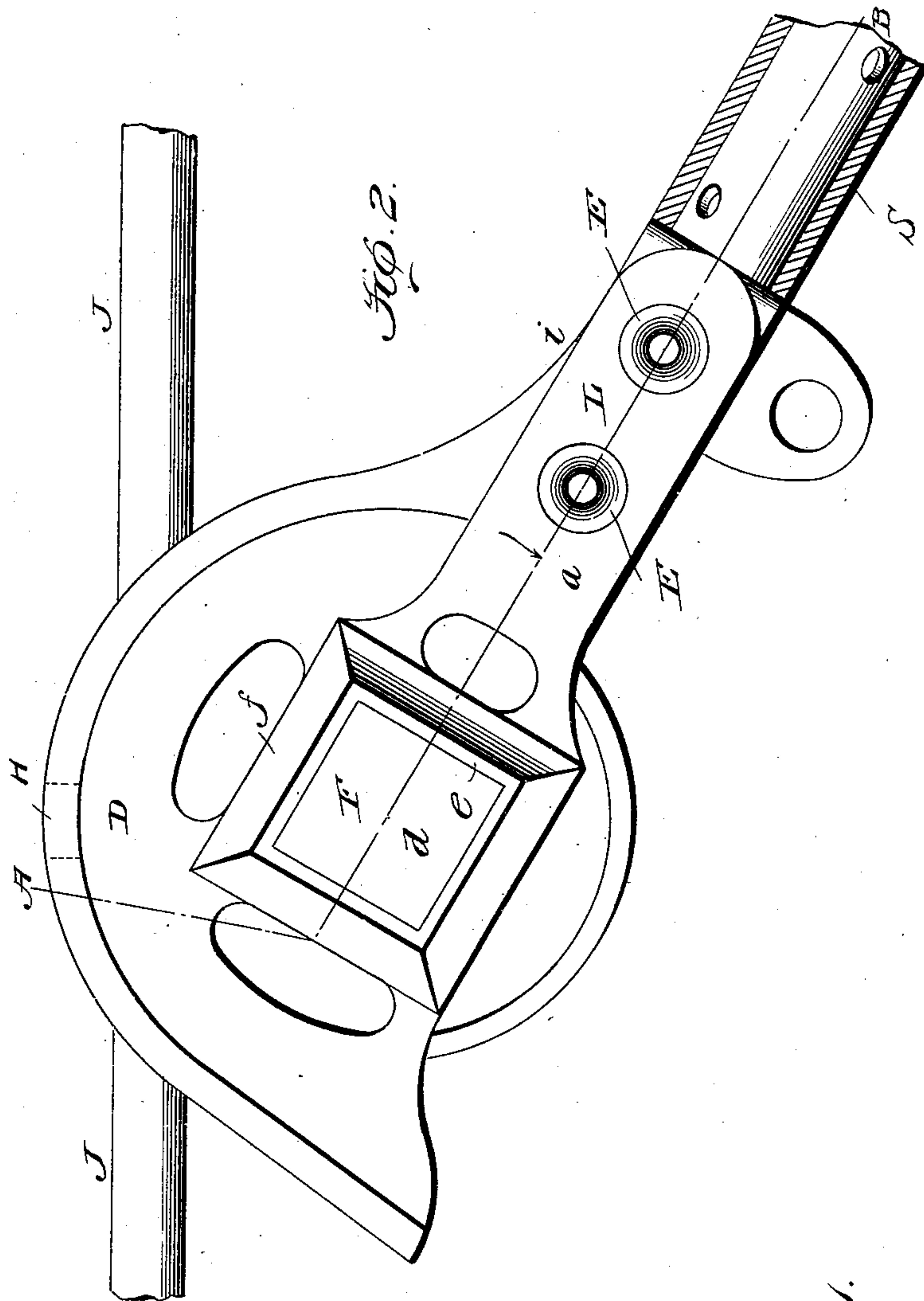
Patented Apr. 29, 1902.

F. J. LUDOLPH.
TROLLEY ARM HEAD.

Application filed Aug. 31, 1901.

(No Model.)

2 Sheets—Sheet 1.



Witnesses:

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Inventor.
Frank J. Ludolph

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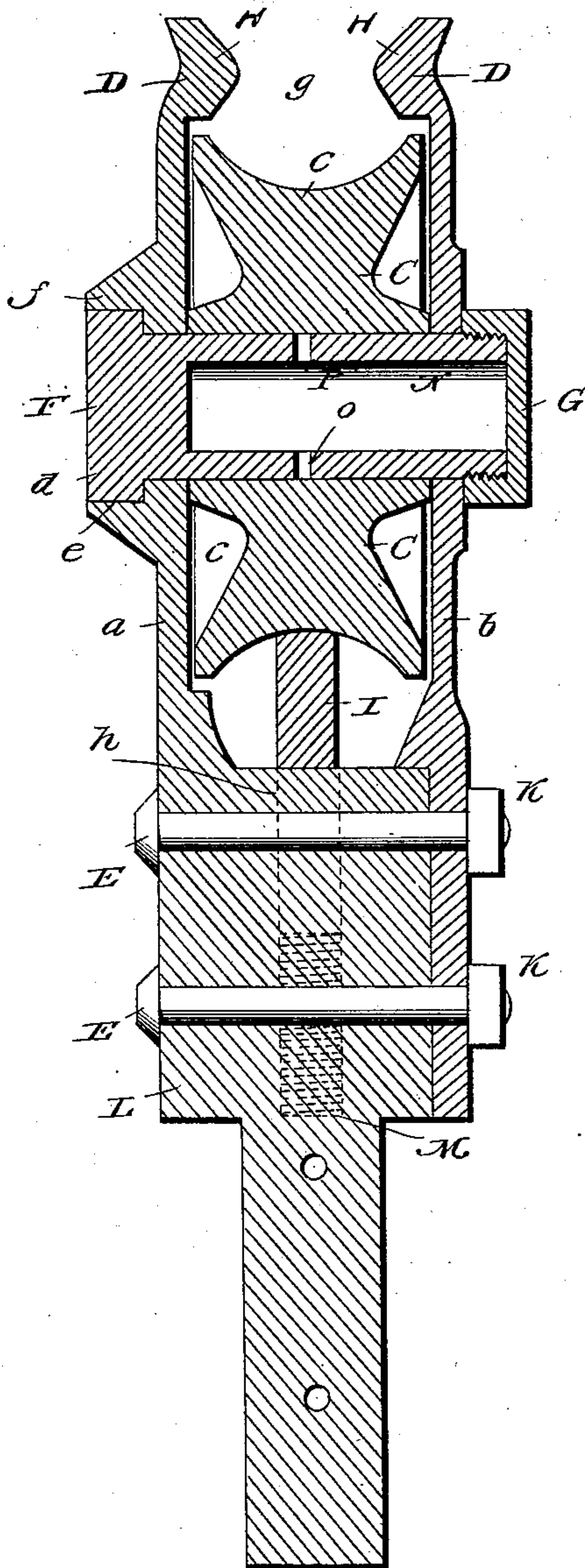
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2 Sheets—Sheet 2.

Fig. 3.



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Att'y

UNITED STATES PATENT OFFICE.

FRANK J. LUDOLPH, OF IRONDEQUOIT, NEW YORK.

TROLLEY-ARM HEAD.

SPECIFICATION forming part of Letters Patent No. 698,979, dated April 29, 1902.

Application filed August 31, 1901. Serial No. 74,040. (No model.)

To all whom it may concern:

Be it known that I, FRANK J. LUDOLPH, of Irondequoit, in the county of Monroe and State of New York, have invented a new and useful Improvement in Trolley-Arm Heads, which improvement is fully set forth in the following specification and shown in the accompanying drawings.

In using electric trolley-wires and trolley-arms for the purpose of propelling street-cars and for other purposes difficulty is experienced on account of the tendency of the trolley-wheel to at times jump the wire, particularly at the turns and bends in the wire and at switches, &c.

My invention is an improved trolley-arm head with wheel attached, the main object of the invention being to provide means for preventing the wheel from leaving the wire by accident.

Other objects and advantages of the invention will be brought out and made to appear in the following specification, the invention being fully described, and more particularly pointed out in the claims.

Referring to the drawings, forming a part of the specification, Figure 1 is a front view of the device looking as along the trolley-wire. Fig. 2 is a side elevation looking in the direction of the arrow in Fig. 1. Fig. 3 is a longitudinal section of the yoke and associated parts, taken on the dash-and-dot line A B in Fig. 2.

R is the trolley-arm head, comprising a yoke L and a grooved wheel C for traveling the wire J. The yoke is made of metal and is secured by some simple means at the upper end of the trolley-pole S. The yoke consists of two main parts—that is to say, a major part *a* and a minor part *b*, Fig. 3, secured detachably to the part *a* by means of screw-bolts E with clamping-nuts K. Between the parts *a* and *b* is a space *c*, in which is placed the trolley-wheel C. F is a transverse axial shaft held in the yoke to cross the space *c*, constituting an axle for the wheel C upon which to turn. The axle F is formed with a square head *d*, occupying an angular cavity or recess *e*, formed in an extended part *f* of the main part *a* of the yoke, as appears in Figs. 2 and 3, and held to place by a blind screw-nut G. This axle is hollow, having a cavity

N, as shown in Fig. 3, for holding lubricating-oil for the wheel, openings O P being formed through its sides to allow the oil to pass outward to the wheel, the nut G also serving to close the cavity N.

The extreme parts or edges D D of the yoke on both sides of the wheel are in part circular and concentric with the wheel and extend beyond and cover the periphery of the wheel, forming guards therefor, as clearly shown in Fig. 3. These extensions or continuations are tangentially disposed from a point in vertical line with the axis of the wheel when the latter is in operative position, as seen in Fig. 2. By this construction should a cross-wire be encountered the trolley-arm head will on account of these tangential portions of the guards be easily carried under said cross-wire or other wires that might be encountered, and so avoid accident and breakage. Upon the inner opposing faces of the guards D D are formed inward lateral projections H H, partially covering the groove of the wheel and the trolley-wire J, as appears in Fig. 1. These projections are directly over the wire when the wheel is pressing the wire and extend toward each other, leaving an opening *g* between them sufficiently wide to permit the wire to pass in or out, but serve to hold the wheel from leaving the wire in rounding curves or passing switches and the like. It is known that usually when the wheel leaves the wire by accident it does not move straight downward away from the wire, but by a side-wise motion, together with the downward motion. This causes the wire to tend to move out of or escape from the yoke at one side or the other, in doing which it will encounter one or the other of the projections H, and so be caught and held against the wheel.

It is found in practice that the surface of the trolley-wheel in contact with the wire is liable to become fouled with dust or other foreign non-conducting matter, rendering the electric contact between the wire and the wheel imperfect. To overcome this difficulty, a contact-pin I is employed, seated in a longitudinal cavity *h* in the yoke, as appears in Fig. 3. This pin is urged against the bottom of the groove of the wheel by a coiled spring M at the bottom of the cavity *h*, which serves to remove dust or other foreign matter tend-

ing to collect upon the face of the wheel. By means of this constant abrasion of the wheel by the pin the surface of the former normally in contact with the wire is kept clean and free from adhering matter, insuring a perfect conductor for the current between the wire and the trolley-pole.

The surface of the yoke at *z z* is formed with an easy curve, so that in case the yoke at any time strikes the cross-wires holding the current-wire it will glide easily under them and not catch or tend to displace them.

With this construction of trolley-arm head the wheel is readily removable from the yoke, it being only necessary to remove the axle *F*, when the wheel will drop out from between the guards, as will be readily understood by viewing Fig. 2.

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

1. A trolley-arm head comprising a yoke and guard-flanges, which latter on their upper sides are concentric with the wheel-flange and have continuations extending rearwardly and downwardly to a point below the bottom

of the groove of the wheel, said continuations being tangentially disposed from a point in vertical line with the axis of the wheel rearward when said wheel and head are in operative position, as set forth.

2. A trolley-arm head comprising a yoke and guard-flanges thereon, said flanges on their upper sides being concentric with the wheel-flange and having continuations extending rearwardly and downwardly to a point below the bottom of the groove of the wheel, said continuations being tangentially disposed from a point in vertical line with the axis of the wheel when said wheel and head are in operative position, said flanges being provided upon their inner faces in vertical line with the axis of the wheel with inturned protuberances, as and for the purpose specified.

In witness whereof I have hereunto set my hand, this 22d day of August, 1901, in the presence of two subscribing witnesses.

FRANK J. LUDOLPH.

Witnesses:

M. SMITH,

M. D. PHILLIPS.