(No Model.) 3 Sheets—Sheet 1.

C. F. T. KANDELER.

BRIDGE.

No. 348,467. Patented Aug. 31, 1886.

Fig. 1.

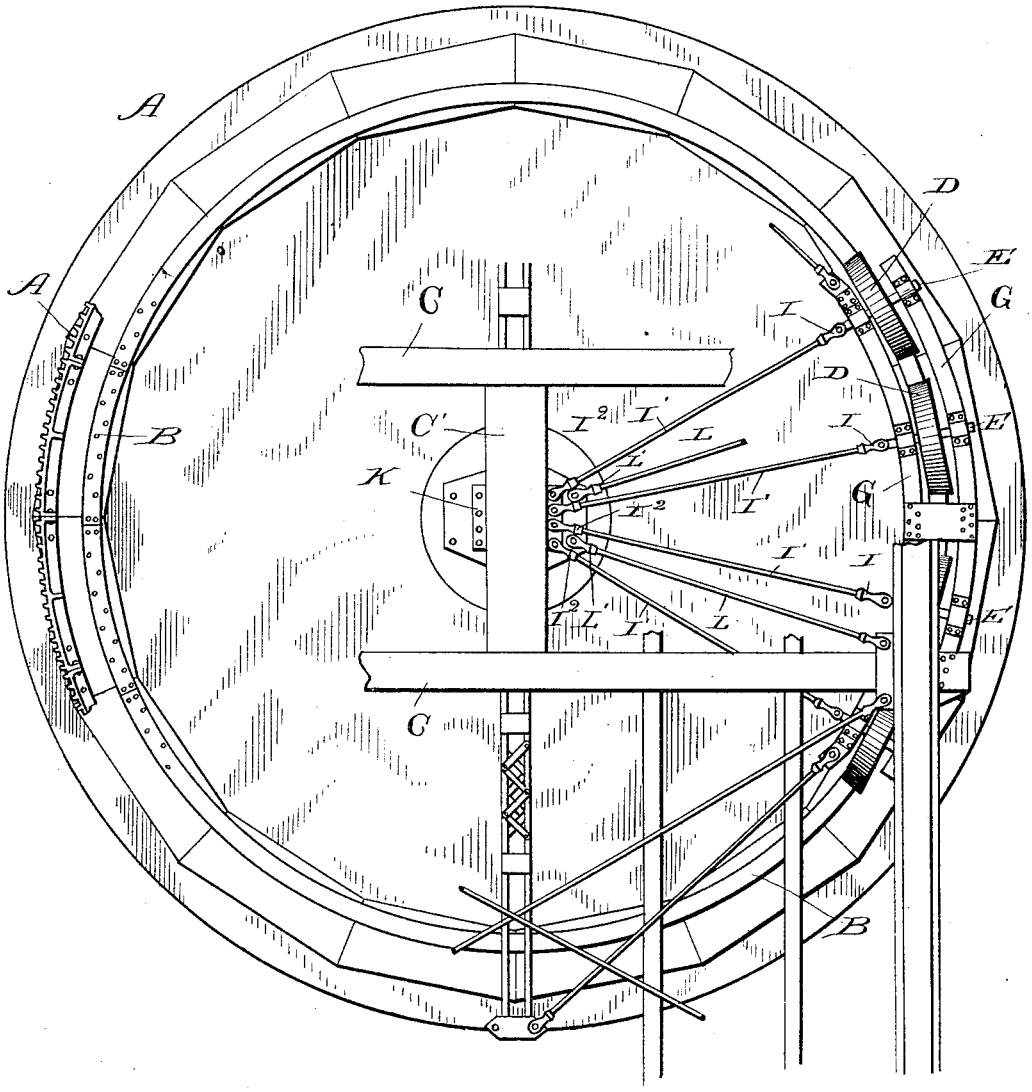

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Fig. 2.

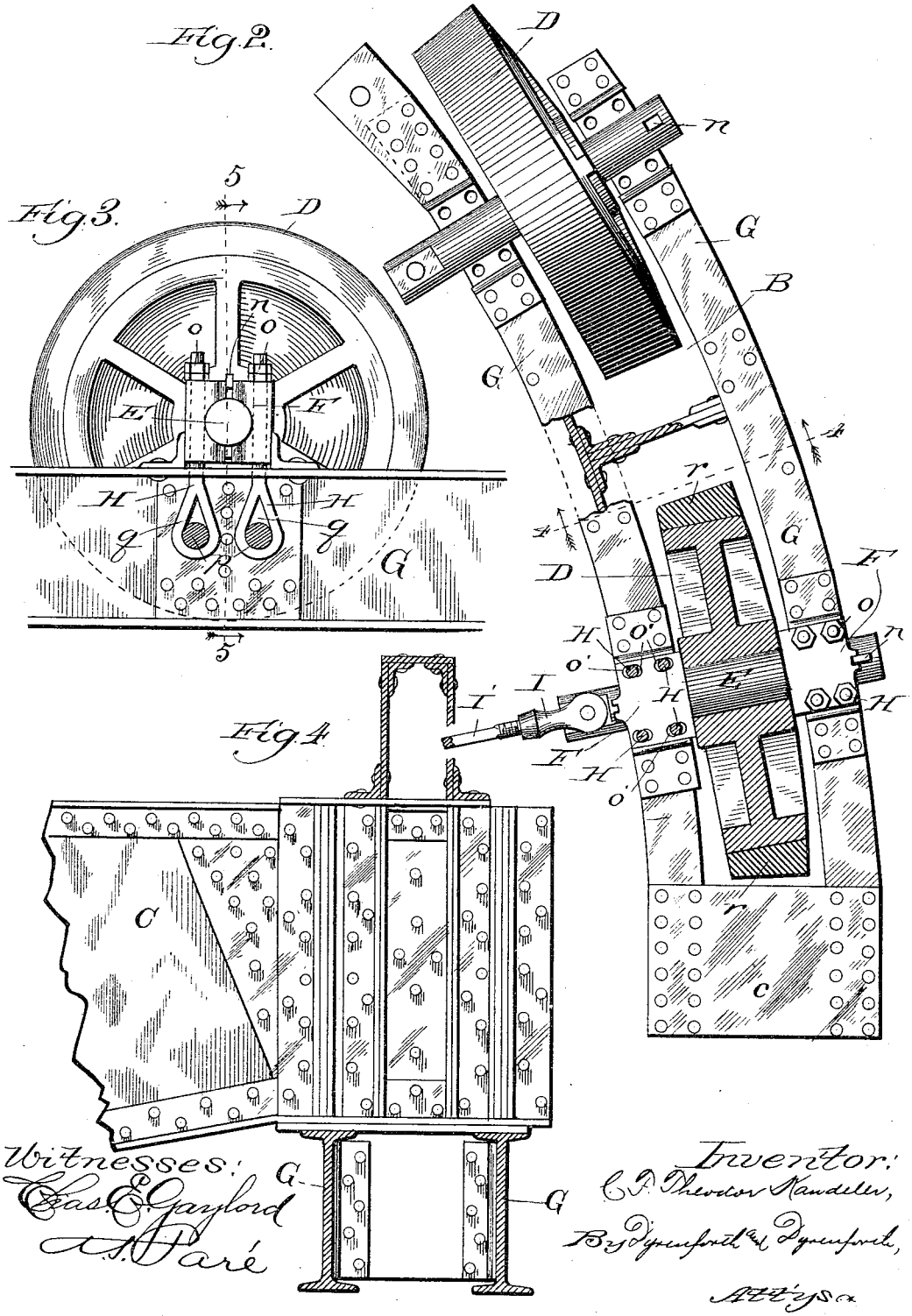

Fig. 3.

Fig. 4.

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Fig. 5.

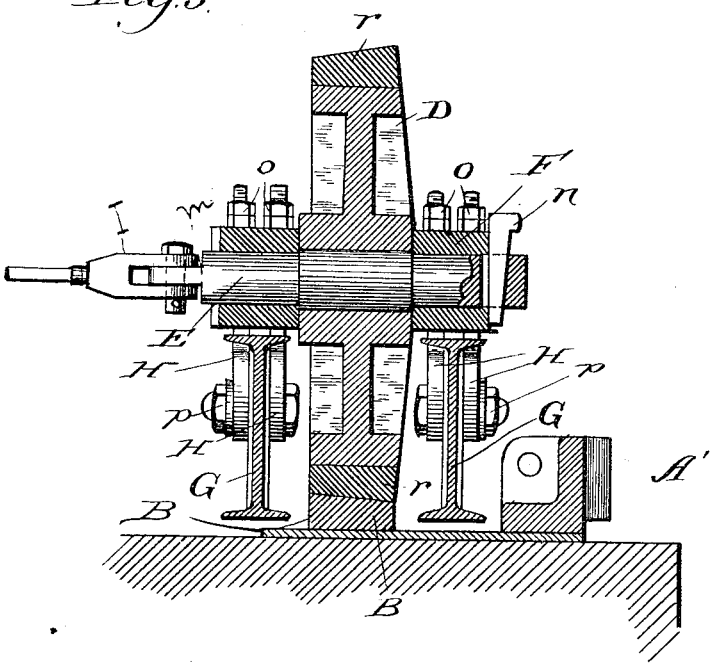
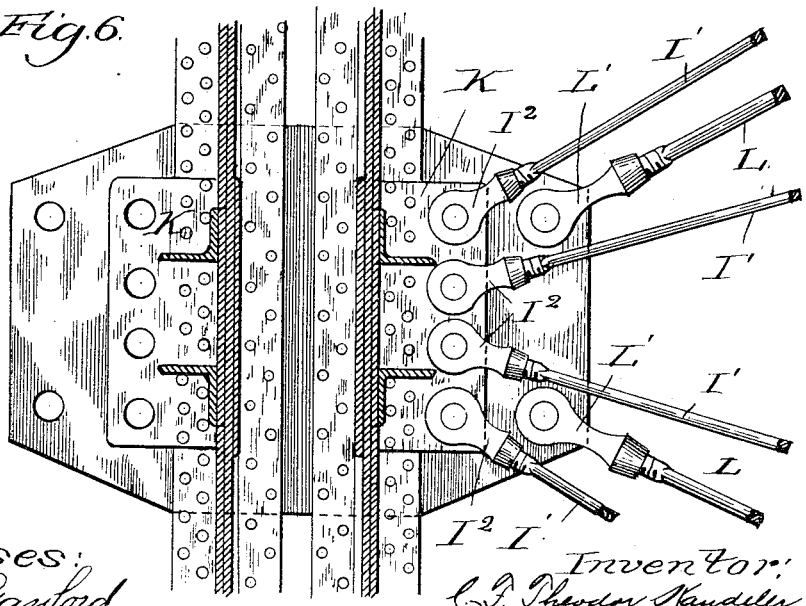


Fig. 6.



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UNITED STATES PATENT OFFICE.

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BRIDGE.

SPECIFICATION forming part of Letters Patent No. 348,467, dated August 31, 1886.

Application filed May 17, 1886. Serial No. 202,429. (No model.)

To all whom it may concern:

Be it known that I, C. F. THEODOR KANDELER, a subject of the Emperor of Germany, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Bridges; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates particularly to the class of pivot or draw bridges. In the larger structures of this class in which it is quite common to center the weight of the bridge by means of cross-girders upon the central pivot, difficulty is experienced by the frequent breakage of the guide-wheels, provided in circular series around the pivot, by unequal pressure. The cause of this frequent breakage is due to the unequal bearing of the members of the circular series of wheels, owing to the practical impossibility of constructing a mathematically-perfect circular track for them, and to various other conditions, principal among which may be mentioned the unequal settling and shrinkage of the parts.

It is my object to provide means for preventing the frequent breakage of these guide-wheels, by enabling them to be adjusted, with reference to the track upon which they move, to afford to them uniform bearing; and to this end my invention consists in the general construction by which I accomplish my object, and it also consists in certain details of construction and combinations of parts, all as hereinafter more fully set forth.

In the drawings, Figure 1 is a plan view of so much of the part of a draw-bridge which surrounds the pivot as will serve to illustrate my improvement without crowding the figure; Fig. 2, a broken section taken from Fig. 1 and enlarged; Fig. 3, a side elevation of one of the circular series of wheels and parts connected therewith; Fig. 4, a section taken on the line 4 4 of Fig. 2; Fig. 5, a section taken on the line 5 5 of Fig. 3; and Fig. 6, a broken horizontal section taken just above the central plate in Fig. 1, and showing the construction toward the central part of the pivotal device.

A, Fig. 1, is the circle supported on the center pier, provided with the usual peripheral rack, A′, and a track, B, formed of segments, and in the present instance inclined on its upper surface from the center of the circle. C C are the cross-girders, which rest at their ends at opposite sides of the circle A, and at their centers upon a cross-girder, C′, the girders C and C′ thus serving to support the structure and center its entire weight. This manner of centering the weight is designed to relieve the wheels D as much as possible, and in well-constructed bridges almost entirely from pressure of the structure when unloaded, the wheels taking up the pressure of extra weight imposed upon the bridge. Thus, when the bridge is closed and free from superimposed weight, the wheels D should properly rest without great pressure upon the track B, and have perfect and true bearing thereon, in order that when a train of cars or other moving body passes over it the weight thereof may be equally distributed upon all the wheels in the circle and upon their entire bearing-surfaces.

From various causes, as hereinbefore stated, uniform bearing of the wheels D upon the track is prevented, whereby some wheels are not only made to withstand excessive pressure, and others thus relieved from their predetermined share, but the bearing-surfaces of the wheels become disarranged and bear unequally, the consequence being frequent fracture of wheels, entailing great expense and trouble in the maintenance of the bridge.

To prevent the aforementioned consequences, I render the wheels D independently adjustable in lateral as well as vertical directions, the latter including also the vertical adjustment of opposite sides of the wheel to bring the entire bearing-surface on the periphery into contact with the track when distorted therefrom.

The wheels D are constructed with a view to lightness and strength, and are preferably provided with steel tires *r*, shrunk thereon in a common manner to form the peripheries and beveled on their bearing-surfaces, as shown, to coincide with the inclined surface of the track B. Each wheel is provided with an axle, E, supported in journal-bearings F, to extend in radial line with the center of the circle A, the journal-bearings comprising boxes carrying suspended **I**-beams G, through the medium of hangers H on opposite sides of the **I**-beams, and provided with eyes *q* at their lower extremities, through which bolts *p* are passed to secure them to the **I**-beams. The hangers H

extend toward their upper ends through transversely-elongated openings *o'* (see Fig. 2) in the journal-boxes F, and are held by nuts *o*. The wheels D revolve upon their axles, which are prevented from rotation by means of colters *n*, inserted through them toward their outer ends, and confined between the sides of slots in the outer edges of the top plates of the journal-boxes. The inner end of each axle is provided with a tongue, *m*, (see Fig. 5,) upon which to bolt a clevis, I, holding one end of a rod, I', which extends toward the center of the circle A, and is held in a clevis, I^2, bolted to the center plates, K, which may be riveted around the pivotal part of the structure, as shown. The tie-rods L, shown in Figs. 1 and 6 as held toward their inner ends by clevises L', bolted to the side of and below the plates K, and at their opposite ends by similar clevises, extend to the girders C and serve to brace them.

The construction and connections of the wheels permit their adjustment in lateral and vertical directions, as hereinbefore stated. Thus the lateral adjustment of the tread of any wheel upon the track B is effected by turning the rod I' of that particular wheel by means of a suitable wrench applied to the rod, whereby in turning it in one direction the rod is screwed into the clevises I I^2 at its opposite ends, thereby drawing the wheel toward the center and holding it, while turning it in the opposite direction forces the wheel, by the action of the screw portions shown in Fig. 2, away from the center and holds it.

To adjust a wheel vertically, the nuts *o* are tightened or loosened, and, when the bearing-surface of a wheel is out of parallel line with the track, whereby it fails to bear uniformly, or bears only on a portion of the tire, the nuts *o* on one side are loosened and those on the opposite side tightened. The turning of the nuts *o* on both sides of the wheels serves the further purposes of shifting the weight from the wheels to the center pivot, or vice versa, depending upon the direction of turning the nuts.

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

1. The combination, with a draw-bridge, of guide-wheels D, independently adjustable in lateral and vertical directions, substantially as and for the purpose set forth.

2. The combination, in a draw-bridge, of an inclined circular track, B, a series of wheels, D, having inclined bearing-surfaces to coincide with the track, and means, substantially as described, for adjusting the wheels D in vertical and lateral directions with reference to the track, substantially as set forth.

3. The combination, in a draw-bridge, of a track, B, wheels D, stationary axles E, carrying the wheels, journal-boxes F, I-beams G, hangers H, connecting the journal-boxes with the I-beams, and means, substantially as described, for adjusting the wheels D independently of each other with reference to the track in vertical and lateral directions, substantially as and for the purpose set forth.

4. The combination, in a draw-bridge, of an inclined track, B, wheels D, having inclined peripheries to coincide with the track, stationary axles E, carrying the wheels, journal-boxes F, provided with elongated openings *o*, I-beams G, hangers H, having eyes *q* at their lower extremities, and bolted through the eyes to the I-beams, and extending through the openings *o'* in the journal-boxes, and means, substantially as described, for adjusting the wheels D independently of each other with reference to the track in vertical and lateral directions, substantially as and for the purpose set forth.

5. The combination, in a draw-bridge, of an inclined track, B, wheels D, having steel tires *r*, inclined on their bearing-surfaces to coincide with the track, axles E, carrying the wheels, journal-boxes F, provided with elongated openings *o'*, colters *n*, extending through and connecting the axles with the journal-boxes to prevent rotation of the axles, I-beams G, hangers H, having eyes *q* at their lower extremities and bolted through the eyes to the I-beams and extending through the openings *o'* in the journal-boxes, and means, substantially as described, for adjusting the wheels D independently of each other with reference to the track in vertical and lateral directions, substantially as and for the purpose set forth.

6. The combination, in a draw-bridge, of an inclined track, B, wheels D, having inclined peripheries to coincide with the track, stationary axles E, carrying the wheels, journal-boxes F, provided with elongated openings *o'*, I-beams G, hangers H, having eyes *q* at their lower extremities, and bolted through the eyes to the I-beams, and extending through the openings *o'* in the journal-boxes, nuts *o*, holding the hangers within the openings in the journal-boxes and affording means to adjust the wheels vertically and produce uniform bearing thereof upon the track, and rods I', connected by clevises I to the inner ends of the axles, and by clevises I^2 toward the center of the circle described by the track, substantially as and for the purpose set forth.

C. F. THEODOR KANDELER.

In presence of—
J. W. DYRENFORTH,
HENRY HUDSON.