

(No Model.)

2 Sheets—Sheet 1.

C. F. T. KANDELER.

BRIDGE.

No. 348,020.

Patented Aug. 24, 1886.

Fig. 1.

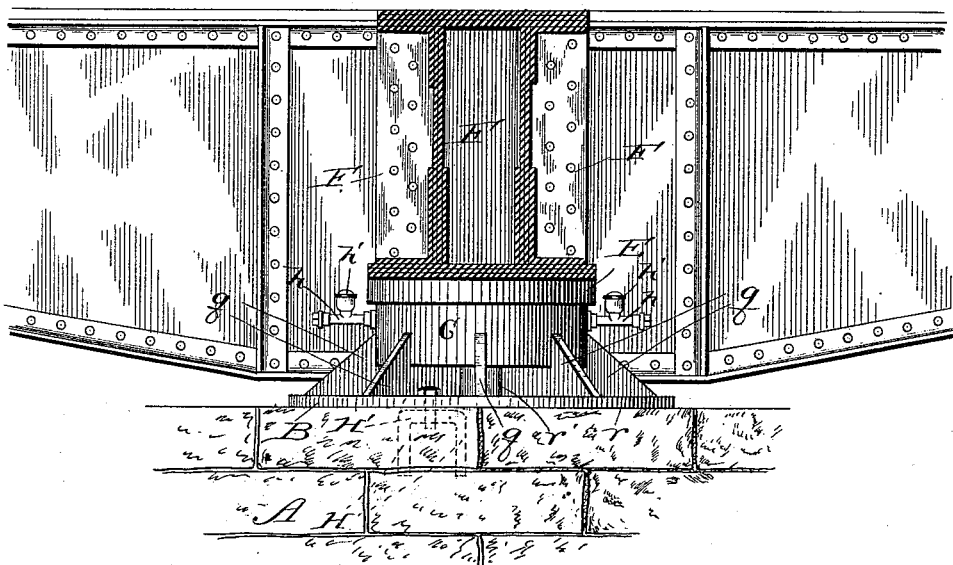


Fig. 2.

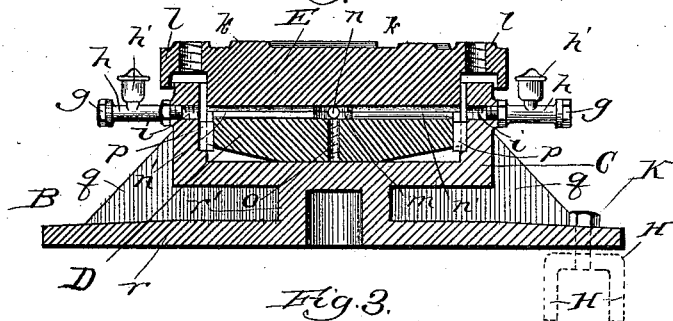
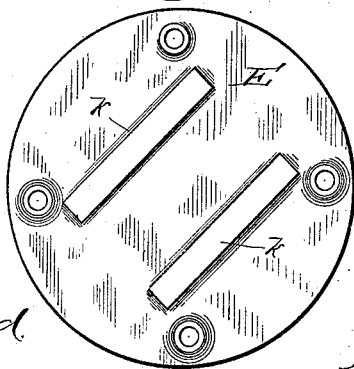


Fig. 3.



Witnesses:
Chas. E. Gaylord,
at. Pare'

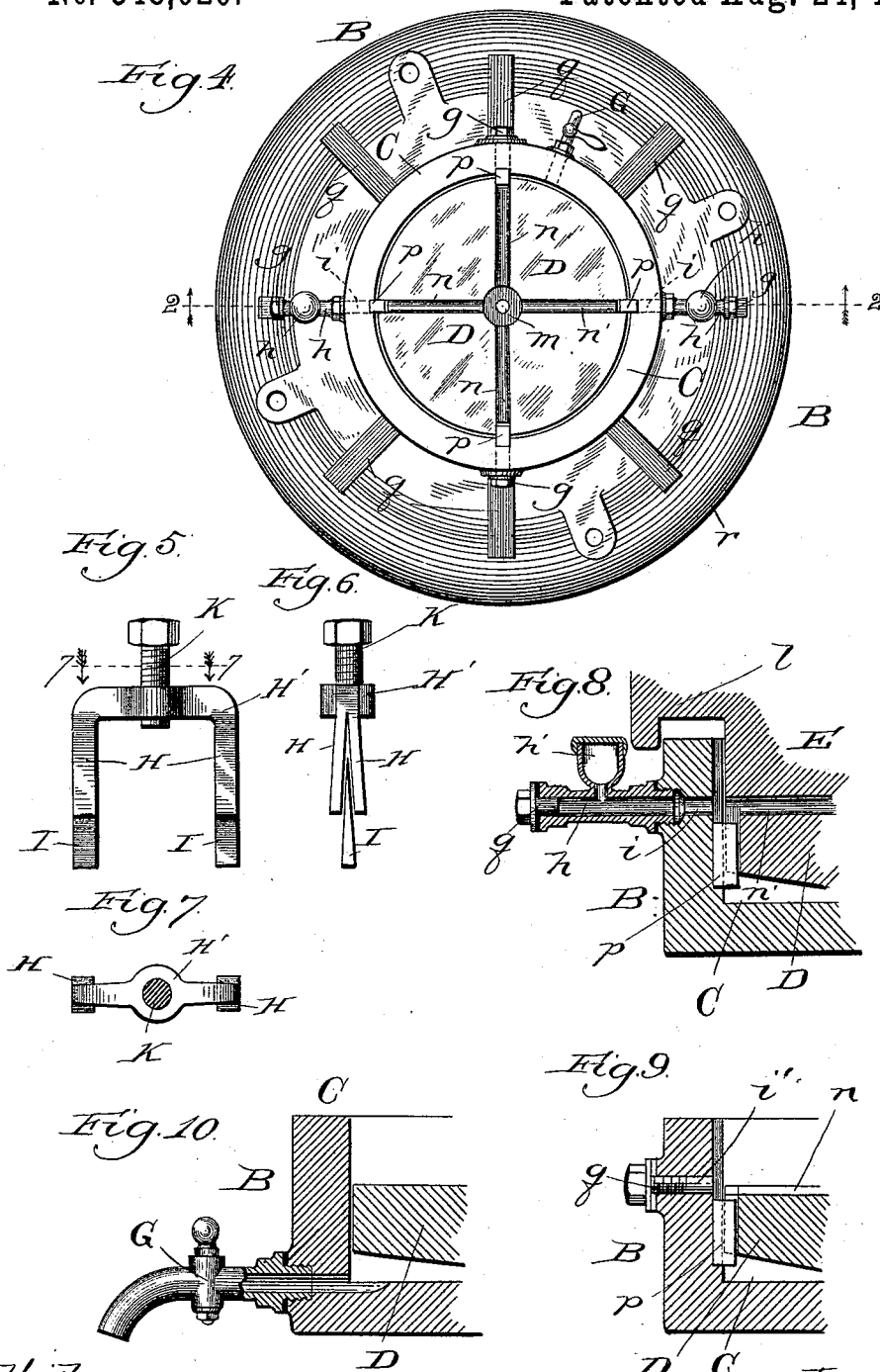
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Inventor:
C. F. Theodore Kandeler,
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UNITED STATES PATENT OFFICE.

C. F. THEODOR KANDELER, OF CHICAGO, ILLINOIS.

BRIDGE.

SPECIFICATION forming part of Letters Patent No. 348,020, dated August 24, 1886.

Application filed May 17, 1886. Serial No. 202,427. (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 improvement relates, particularly, to the class of pivot-bridges of comparatively large size and heavy weight, or those which are swung by a key at the center, and are commonly provided with a circular series of wheels surrounding the pivot and movable between circular tracks placed above and below them. These wheels present one of the main difficulties, in connection with the use of large and heavy bridges of the foregoing description, owing to the frequency of breakage of members of the series caused by the unequal strain produced in operating a bridge.

It is my object to provide a bridge, the pivotal part of which shall carry the main weight of the structure, and thereby relieve the wheels referred to from excessive strain; and it is also my object to provide improved means for securing the base of the pivotal part to the center pier to permit the base to be removed with comparative ease without requiring the bridge to be raised for the purpose beyond a slight degree.

My invention consists in the general construction of my improvements and in the manner of securing the supporting base to the center pier; 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 broken view of a transverse section of the part of a bridge containing my improved construction, taken at one side of the center; Fig. 2, a vertical section through the pivot portion, showing the principal features of its construction, and taken on the line 2 2 of Fig. 4; Fig. 3, a top plan view of the pivot; Fig. 4, a similar view of the parts which support the device shown in Fig. 3; Fig. 5, a view in front elevation of a detail; Fig. 6, a view in side elevation of the same; Fig. 7, a sectional view taken on the line 7 7 of Fig. 5, and viewed in the direction

of the arrows; Fig. 8, an enlarged sectional view of a portion of the device shown in Fig. 2; Fig. 9, a similar view of another portion of the same, showing a detail not represented in Fig. 2 but shown in Fig. 4; and Fig. 10 a similar view of another detail, shown also in Fig. 4.

A is the center pier.

B is a casting comprising a base, *r*, having a central neck, *r'*, and a bowl, C, strengthened by ribs *q*, cast with the device B, and provided internally with vertical sides and a horizontal base.

D is a solid disk or support, flat on its under side around the center and slanting in an upward direction from the flat portion toward the periphery. The diameter of the disk D is somewhat, preferably about one-thirty-second of an inch, less than that of the interior of the bowl C, to permit to it a slight rocking motion within a space of about one-sixty-fourth of an inch upon its seat on the base of the bowl within which it lies, and it is prevented from rotation by means of keys *p*, preferably four in number, as shown, inserted to lie below the upper surface of the disk D into recesses formed coincident with each other on the inner side of the bowl C, and the periphery of the said disk. A vertical threaded hole, *o*, extends through the disk D to permit the insertion of a screw in lifting the disk from its seat, and the disk is provided on its upper surface with two diametrical grooves, *n* and *n'*, at right angles to each other, a recess, *m*, being provided around the point of crossing of the grooves to afford a central oil-chamber.

E is the "center tap" forming the pivotal support, provided on its under side with grooves *n* and *n'* and a recess, *m*, to correspond with the same features on the disk D, upon which it rests, being of the same diameter as the latter to lie, like it, within the bowl C. An annular flange, *l*, extends around the pivot E, toward the upper part of the same, which is above the edge of the bowl C, and surrounds the latter though without normal contact with the same, and serves the purpose of keeping rain out of the bowl, and the upper side of the pivot E is provided with recesses *k*; to afford seats for the angle-irons and braces

shown in Fig. 1 as sustaining the cross-girders F.

On two opposite sides of the bowl C, and extending transversely through the same, are openings *i*, coincident with the groove *n* in the disk D, and about equal in diameter to that of both grooves *n* in the parts D and E, which grooves, when coincident, bring together the grooves *n* in both parts D and E, and thereby form lubricating-channels. Tubes *h*, plugged at their extremities, as shown, extend from the openings *i*, and are provided with oil-cups *h'*. The channels formed by the coincidence of the grooves *n* communicate with openings *i'* in the bowl C, which openings are plugged, like the tubes *h*, with screw-plugs *g*. A cock, G, communicates with the interior of the bowl at its base, and affords means for drawing off the lubricant.

The purpose and operation of the construction thus far described are as follows: The difficulty hitherto has been to operate a swinging bridge of comparatively large size and weight upon a central pivot, and afford the necessary lubricating means and provide uniform bearing on the sliding surface of the pivot. The supply of lubricating-oil in the cups *h'* lubricates the adjacent surfaces of the parts D and E by passing through the channels *n* and *n'*, being drawn off at the cock G, when required. As the cups *h'* communicate normally with each other through the grooves *n'*, the filling of one cup fills the other. Failure of the farther cup to fill in supplying the other cup indicates stoppage in the grooves or channels, and the necessity for cleaning them. The swinging of the bridge turns the pivot E upon the disk D, rendering necessary the matter of lubrication accomplished as above set forth.

Cleansing of the channels *n n'* is performed by means of a suitable brush or swab, which is inserted into them, when the bridge is swung open, on removing the plugs *g* through the coincident openings *i* and *i'*, and when the bridge is thus swung (whereby, as it will be understood, the grooves *n* and *n'* in both parts D and E are caused to coincide with each other) a suitable gage may be inserted to determine the amount of wear upon the adjacent surfaces. Of course cleansing and gaging of the lower grooves, *n* and *n'*, may be done with the bridge in any position, but not of the upper grooves unless coincident with the former, since it is only in the latter position that access may be had to them through the openings *i* and *i'* in the bowl.

Any uneven movement of the bridge rocks the disk D upon its seat, and the extent of bearing-surface underneath the disk D prevents crystallization by the rocking movement.

A common manner of anchoring or securing the corresponding part in other bridges of the part B to the pier A is to drive split bolts through the base into the masonry upon wedges, whereby the bolt is spread and thus securely held in place. To permit removal

of such part B (and other parts connected with it) for renewal or repair, the nuts on the bolts are taken off and the bridge raised to a sufficient height, which is considerable, to permit the part B to be lifted over the bolts before being withdrawn. The height to which the bridge must be raised for the purpose renders the operation very difficult and expensive.

To secure the base *r* of my device upon the pier A, I sink the devices H, preferably in the form of staples, into the masonry, flush with the surface of the same, spreading the split legs in the common manner upon wedges I, the cross-pieces H' being provided with screw-threaded openings or sockets to receive bolts K, which pass through the base *r*. By this means the parts B C D E may be removed by sliding the part B from under the bridge on withdrawing the bolts K and those connecting the parts E and F, and slightly raising the bridge to take its weight off the central support.

The staple form of the device H is the preferred one, because it affords two legs for embedding in the masonry of the pier. A socket, however, to receive a screw-bolt, K, and terminating in a single shank or leg, and embedded in the masonry, is included within my invention, though not affording the security of the staple form.

The contiguous surfaces of the disk D and pivot E may be faced with steel plates, if desired, to diminish the wear.

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

1. In a swinging bridge, the combination, with the center pier, of a rocking non-rotary confined support, D, and a confined rotary support, E, to rest and turn upon the support D, and carry the swinging portion of the bridge, substantially as described.

2. In a swinging bridge, the combination, with the center pier, of a pivot device to support the swinging portion of the bridge, comprising a bowl, C, a non-rotary disk, D, to lie within the bowl and rock upon its seat, a pivot, E, to rest and turn upon the disk D, and means, substantially as described, to lubricate the bearings, substantially as set forth.

3. In a swinging bridge, the combination, with the center pier, of a pivot device to support the swinging portion of the bridge, comprising a bowl, C, a disk, D, to lie within the bowl and rock upon its seat and keyed to prevent its rotation, a pivot, E, to rest and turn upon the disk D, and means, substantially as described, to lubricate the bearings, substantially as set forth.

4. In a swinging bridge, the combination, with the center pier, of a rocking non-rotary confined support, D, a confined rotatory support, E, to rest and turn upon the support D and carry the swinging portion of the bridge, and lubricating-channels between the parts D and E, substantially as described.

5. In a swinging bridge, the combination, with the center pier, of a pivot device to sup-

port the swinging portion of the bridge, comprising a bowl, C, a non-rotatory disk, D, to lie within the bowl and rock upon its seat, a pivot, E, to rest and turn upon the disk D, channels *n* and *n'* between the parts D and E, and means, substantially as described, for introducing a lubricant into the said channels and for withdrawing the said lubricant, substantially as set forth.

6. In a swinging bridge, the combination, with the center pier, of a pivot device to support the swinging portion of the bridge, comprising a bowl, C, on a base, *r*, secured to the center pier, a disk, D, to lie within the bowl and rock upon its seat and keyed to prevent its rotation, grooves *n* and *n'* upon its surface, a flanged pivot, E, to rest and turn upon the disk D, having grooves *n* and *n'*, openings *i* and *i'* in the bowl, to communicate with the channels formed by the grooves *n* and *n'*, plugs *g*, to close the openings *i* and *i'*, oil-cups *h'*, communicating with the openings *i*, and a cock, G, communicating with the base of the bowl, substantially as described.

7. The combination, with the center pier of a bridge, of means for securing thereto the intermediate support for the bridge, comprising a device, H, embedded in the pier and provided with an opening or socket, and a bolt, K, passing through the base of the said support, which rests upon the pier, into the said opening or socket, substantially as described.

8. The combination, with the center pier of a bridge, of means for securing thereto the intermediate support for the bridge, comprising a staple, H, sunk into the pier and having its legs split and forced over wedges and provided with an opening in its cross-piece, and a bolt, K, passing through the base of the said support, which rests upon the pier, into the opening in the said cross-piece, substantially as described.

C. F. THEODOR KANDELER.

In presence of—

J. W. DYRENFORTH,
HENRY HUDSON.